



# RADIO TEST REPORT

For

MODEL NO.:1855

FCC ID: C3K1855

IC ID: 3048A-1855

Test Report No. R-TR516-FCCISED-WLAN-3

Issue Date: July 15, 2019

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

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TESTING CERT #3472.01

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# Test Report Attestation

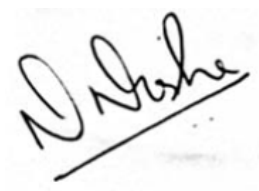
**Microsoft Corporation****Model: 1855****FCC ID: C3K1855****IC ID: 3048A-1855****Applicable Standards**

| Specification                                                                           | Test Result |
|-----------------------------------------------------------------------------------------|-------------|
| FCC 47CFR Rule Parts 15.207, 15.209, 15.247                                             | Pass        |
| Innovation, Science and Economic Development<br>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-WLAN-2 issued July 2<sup>nd</sup>, 2019.



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Reviewed/ Issued By:

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## 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 67<sup>th</sup> 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 18 GHz)           | 5.12        | dB   |
| Radiated disturbance (18-26.5 GHz)               | 4.86        | 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                   | 83          | kHz  |
| Uncertainty for DC power test                    | 0.05        | %    |
| Uncertainty for test site temperature            | 0.5         | °C   |
| 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 device with IEEE 802.11a/b/g/n/ac MIMO radio supporting 20/40/80MHz bandwidths, Bluetooth 5.0.          |
| Model:                             | 1855                                                                                                                      |
| FCC ID:                            | C3K1855                                                                                                                   |
| IC ID:                             | 3048A-1855                                                                                                                |
| Radio under test:                  | IEEE 802.11 b/g/n MIMO Radio supporting 20 and 40MHz Bandwidth (2.4 GHz- 2.4835 GHz)                                      |
| Modulation(s):                     | CCK, BPSK, OFDM, and QAM modulation                                                                                       |
| Antenna Information:               | Integral Antenna.<br><b>Manufacturer declared Antenna Gain:</b><br>Chain 0: 3.3dBi<br>Chain 1: 2.7dBi                     |
| EUT Classification:                | DTS                                                                                                                       |
| Equipment Design State:            | Prototype/Production Equivalent (EV3)                                                                                     |
| Equipment Condition:               | Good                                                                                                                      |
| Test Sample Details:               | <b>RF Conducted Test Sample-</b> S/N- A24964030091844A<br><b>RF Radiated Test Sample-</b> S/N- 900218190956, 900054391556 |

### 5.1 Test Configurations

Test software “QRCT4” (V 4.0.00113) was used to program the EUT to transmit continuously. All modes of operation were investigated initially with full testing performed on the worst-case modes. This report contains data from the following worst-case modes of operation:

802.11b: 1Mbps

802.11g: 6Mbps

802.11n: 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 °C to 40 °C (50 °F to 104 °F) 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

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

### 5.3.1 Antenna Gain

| Antenna Gain         |                                       |                                       |                          |
|----------------------|---------------------------------------|---------------------------------------|--------------------------|
| Frequency Band (MHz) | Wi-Fi Chain 0 Antenna Peak Gain (dBi) | Wi-Fi Chain 1 Antenna Peak Gain (dBi) | Total Antenna Gain (dBi) |
| 2400 – 2483.5        | 3.3                                   | 2.7                                   | 3.01 (Uncorrelated)      |
| 2400 – 2483.5        | 3.3                                   | 2.7                                   | 6.02 (Correlated)        |

Simultaneous transmission on both transmit chains was observed to be the worst-case mode of operation for all test cases. Since OFDM 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:

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

In the case that  $G1 = 3.3\text{dBi}$ ,  $G2 = 2.7\text{dBi}$ :

$$\text{Uncorrelated Directional gain} = 10\log [(10^{3.3/10} + 10^{2.7/10})/2] = 3.01\text{dBi}$$

Since OFDM 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:

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

In the case that  $G1 = 3.3\text{dBi}$ ,  $G2 = 2.7\text{dBi}$ :

$$\text{Correlated Directional gain} = 10\log [(10^{3.3/20} + 10^{2.7/20})^2/2] = 6.02\text{dBi}$$

## 5.4 Equipment Modifications

No modifications were made during testing.

## 5.5 Dates of Testing

Testing was performed from March 28<sup>th</sup> to May 30<sup>th</sup>, 2019.

## 6 Test Results Summary

| Test Description                                       | FCC CFR 47/<br>ISED Rule Part                    | Limit                                     | Test Result |
|--------------------------------------------------------|--------------------------------------------------|-------------------------------------------|-------------|
| Duty Cycle                                             | Reporting & Measurements                         | Reporting & Measurements Purposes only    | N/A         |
| 6dB Bandwidth                                          | 15.247 (a)(2)<br>RSS-247 [5.2]                   | $\geq 500\text{kHz}$                      | Pass        |
| Occupied Bandwidth                                     | Reporting & Measurements                         | Reporting & Measurements Purposes only    | N/A         |
| Output Power                                           | 15.247 (b)(3)<br>RSS-247 [5.4]                   | $\leq 1 \text{ Watt}$                     | Pass        |
| Equivalent Isotropic Radiated Power                    | RSS-247 [5.4]                                    | $\leq 4 \text{ Watt}$                     | Pass        |
| Power Spectral Density                                 | 15.247 (e)<br>RSS-247 [5.2]                      | $\leq 8\text{dBm}/3\text{kHz}$            | Pass        |
| Conducted Band Edge/Spurious Emissions                 | 15.247 (d)<br>RSS-247 [5.5]                      | At least 20dBc                            | Pass        |
| Radiated Spurious Emissions/ Restricted Band Emissions | 15.205, 15.209<br>RSS-247 [5.5]<br>RSS-Gen [8.9] | FCC CFR 47 15.209 limits<br>RSS-Gen [8.9] | Pass        |
| AC Power Line Conducted Emissions                      | 15.207<br>RSS-Gen [8.8]                          | FCC CFR 47 15.207 limits<br>RSS-Gen [8.8] | Pass        |

## 7 Test Equipment List

| Equipment used for Radiated and Conducted Measurements |                            |              |          |                 |
|--------------------------------------------------------|----------------------------|--------------|----------|-----------------|
| 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    | 3160-09      | RF-179   | 7/30/2019       |
| ETS-Lindgren                                           | Antenna – Standard Gain    | 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                                        | 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             |

| Manufacturer    | Description   | Model #               | Asset #  | Calibration Due |
|-----------------|---------------|-----------------------|----------|-----------------|
| 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             |
| 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             |
| 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             |

| 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 placed 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 9kHz- 30 MHz

The EUT is positioned on a turntable at a height of 80cm using a non-conducting table. A loop antenna is positioned at 3m from the EUT periphery at 1m height from the ground. The turntable is rotated 360 degrees to determine the highest emissions. This is repeated for three orientations of the measurement antenna- parallel, perpendicular and ground-parallel. 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 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 vertical standing mode was identified as the worst-case configuration.

#### 8.1.3 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 take these correction factors into account.

### 8.3 Test Setup Diagrams

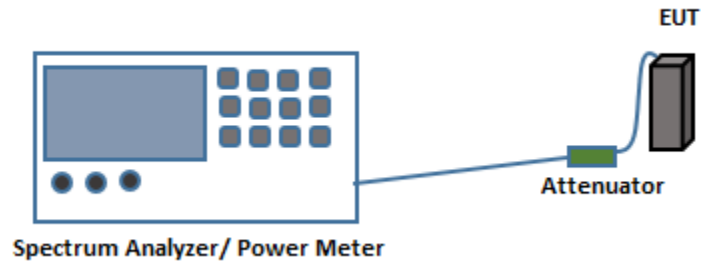


Figure 1. Test Setup for Antenna port conducted measurements

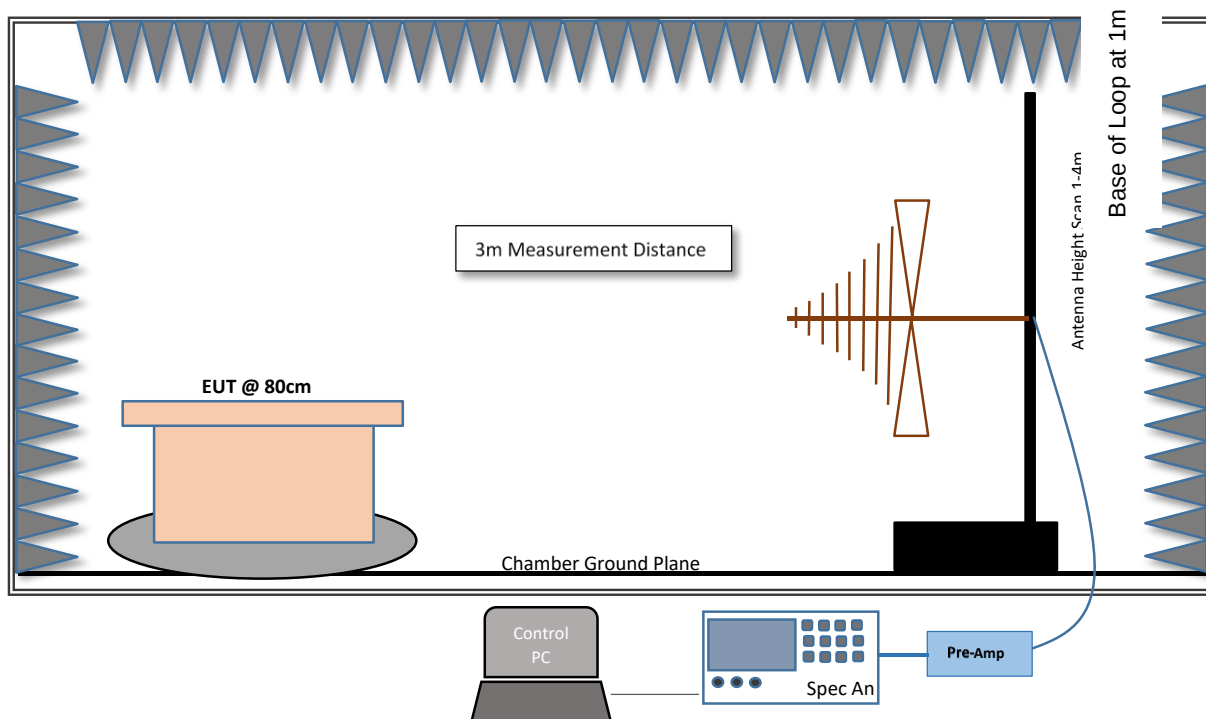


Figure 2. Test Setup for Radiated measurements in 30MHz- 1GHz Range

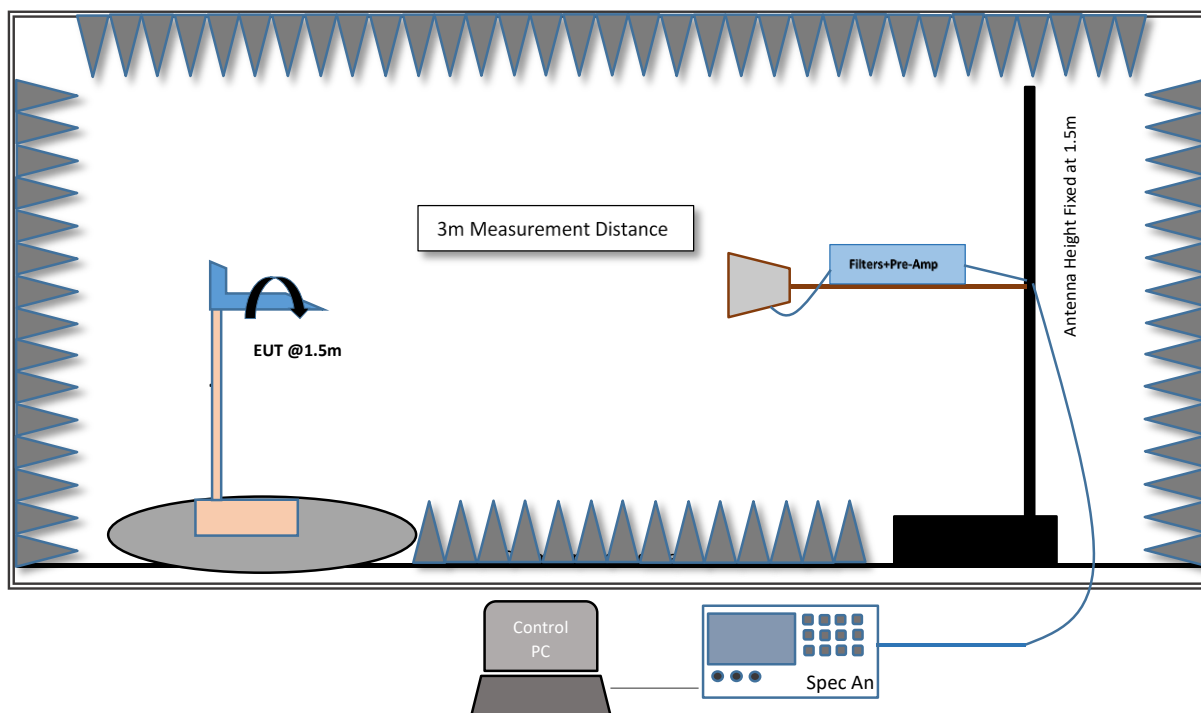


Figure 3. Test Setup for Radiated measurements in 1GHz- 18GHz Range

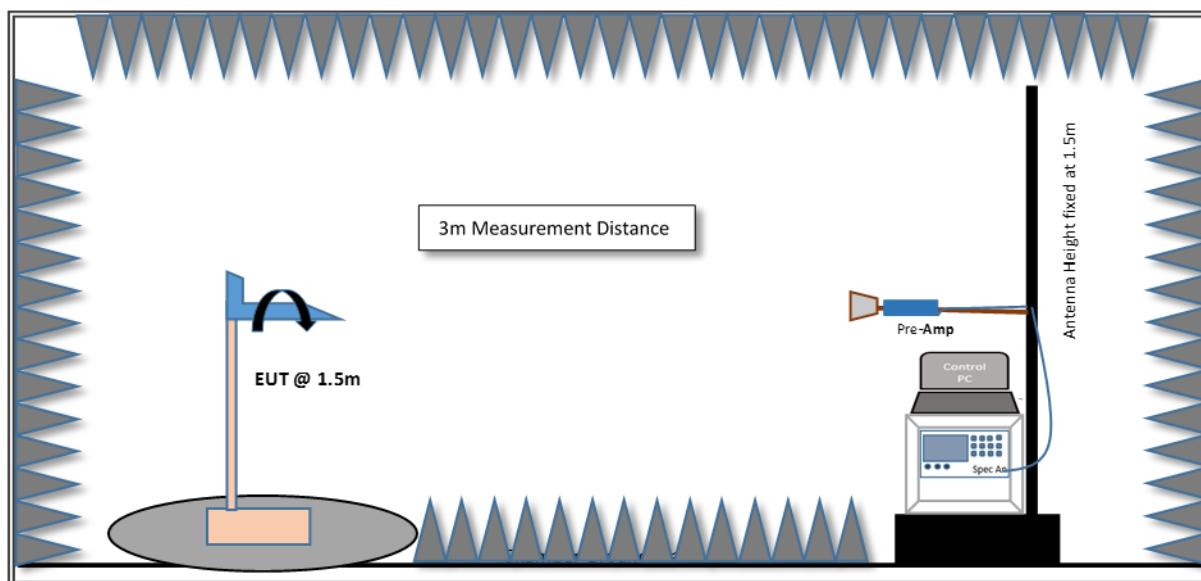


Figure 4. Test Setup for Radiated measurements >18GHz

## 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** =  $10 \log*(1/DC) = 10 \log (1/0.92) = 0.362\text{dB}$

#### 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) |
|-----------|-----------|--------------|-------------|----------------|-----------------------------------|
| 802.11b   | 0         | 8.595        | 8.670       | 99.135         | 0.000                             |
| 802.11b   | 1         | 8.579        | 8.645       | 99.237         | 0.000                             |
| 802.11g   | 0         | 1.585        | 1.635       | 96.942         | 0.135                             |
| 802.11g   | 1         | 1.589        | 1.640       | 96.890         | 0.137                             |
| 802.11n20 | 0         | 1.485        | 1.535       | 96.743         | 0.144                             |
| 802.11n20 | 1         | 1.474        | 1.525       | 96.656         | 0.148                             |
| 802.11n40 | 0         | 0.735        | 0.795       | 92.453         | 0.341                             |
| 802.11n40 | 1         | 0.729        | 0.795       | 91.698         | 0.376                             |

## 9.1.6 Test Data:

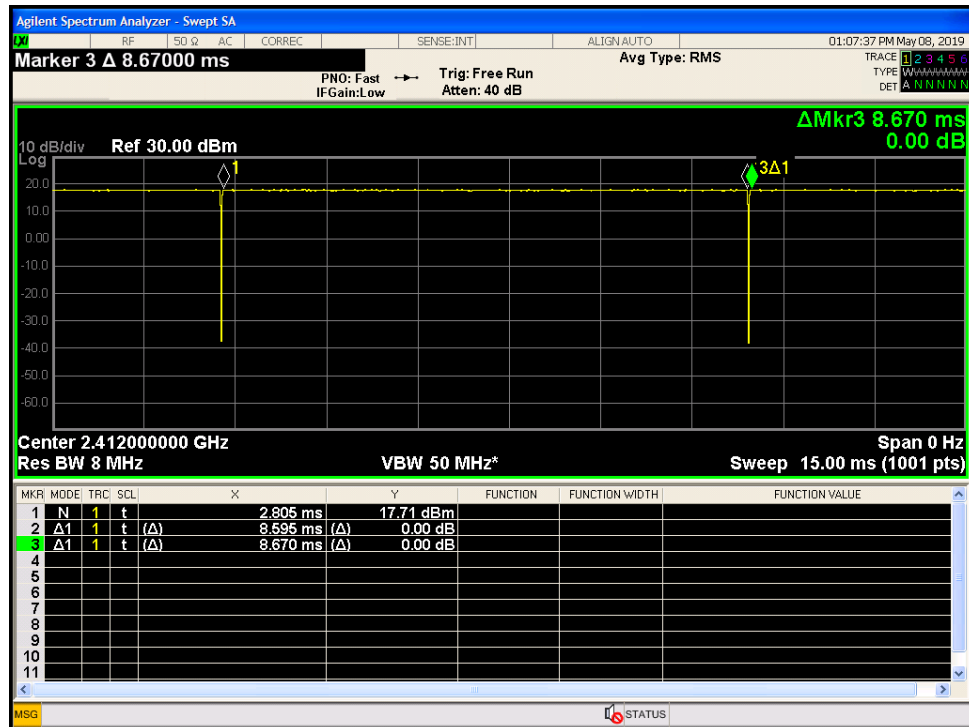


Figure 9-1 Duty Cycle 802.11b -Chain 0

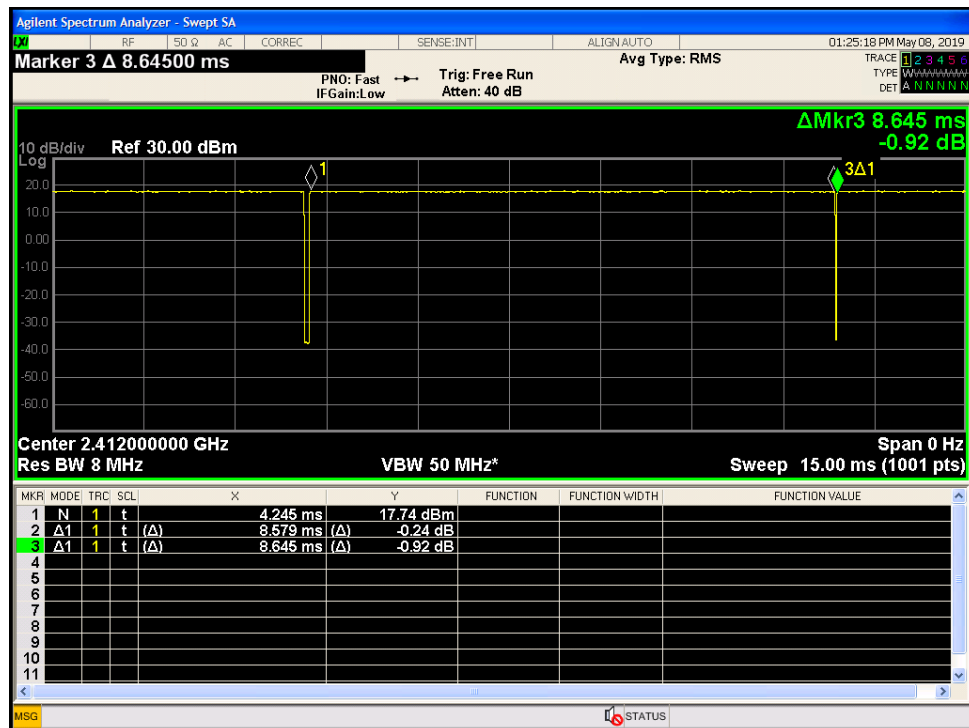


Figure 9-2 Duty Cycle 802.11b -Chain 1

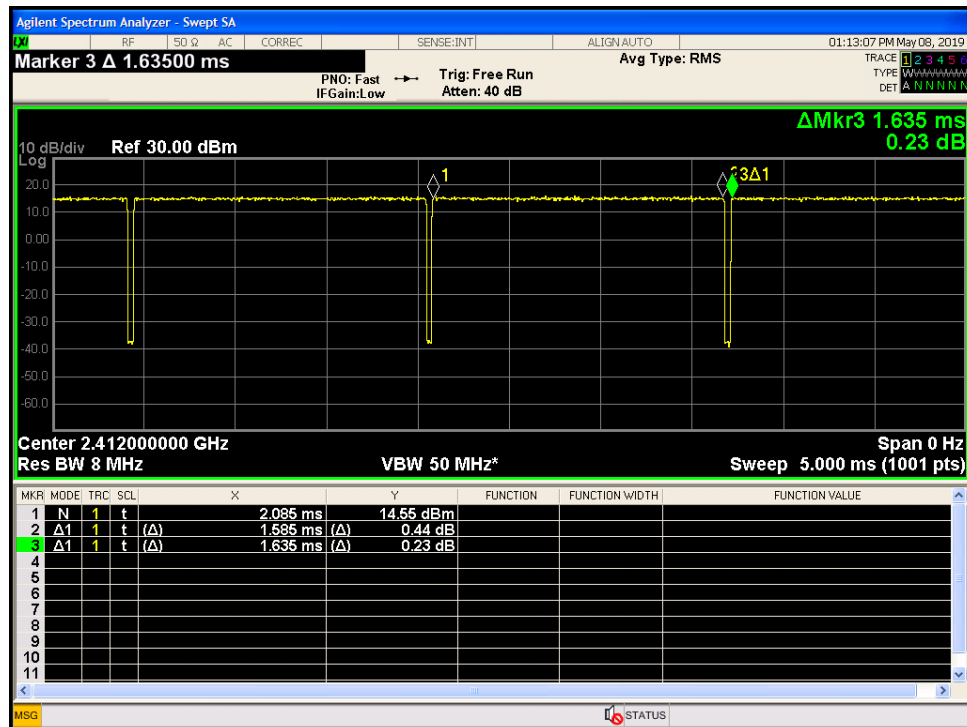


Figure 9-3 Duty Cycle 802.11g -Chain 0

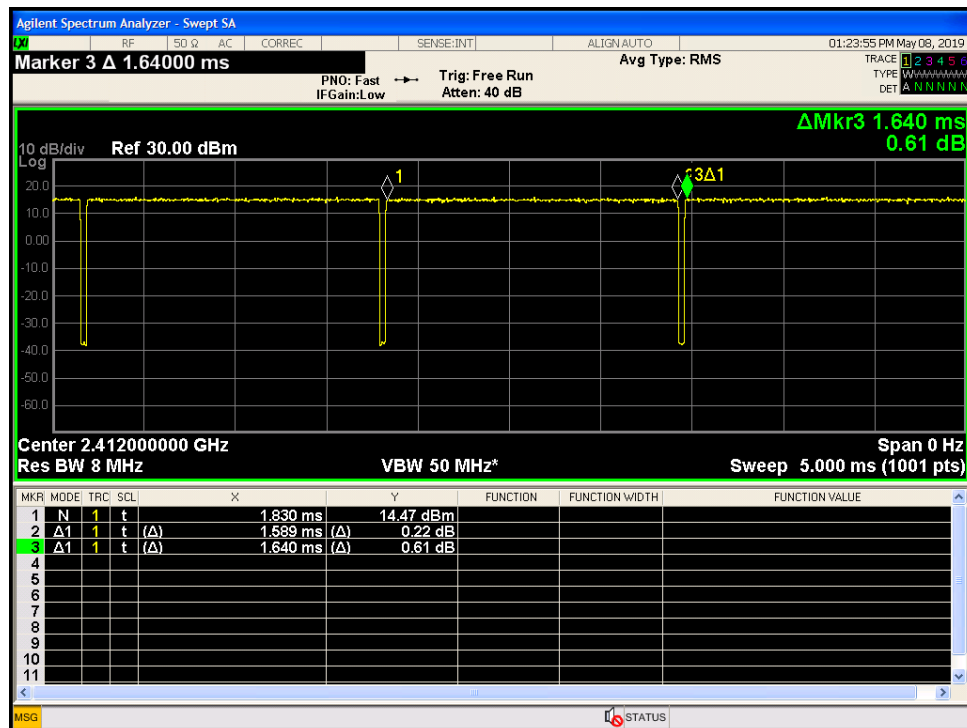


Figure 9-4 Duty Cycle 802.11g -Chain 1

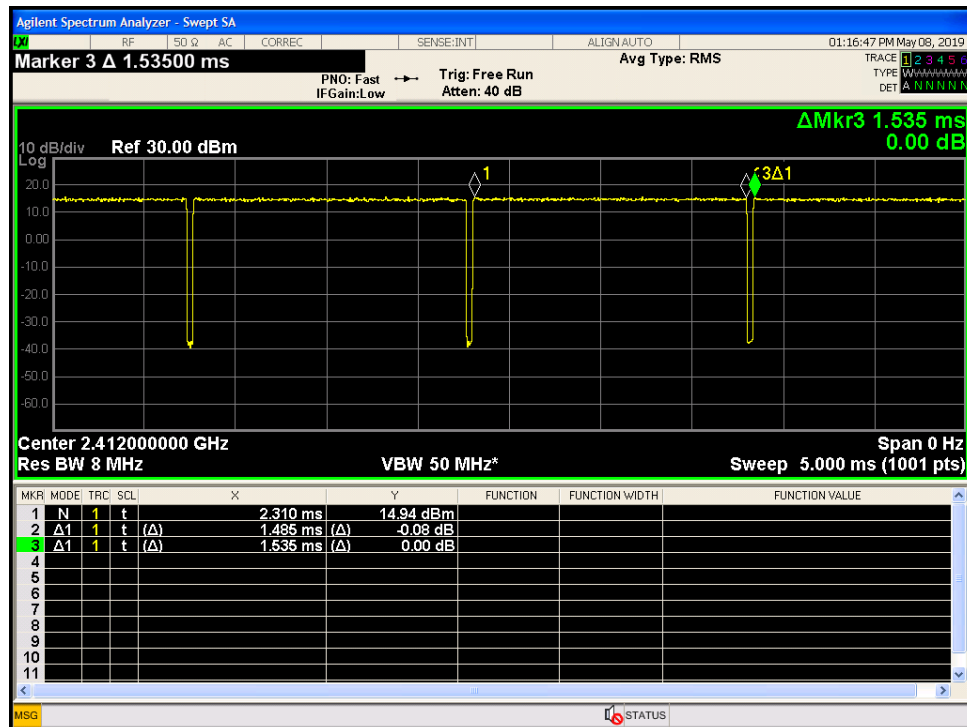


Figure 9-5 Duty Cycle 802.11n20 -Chain 0

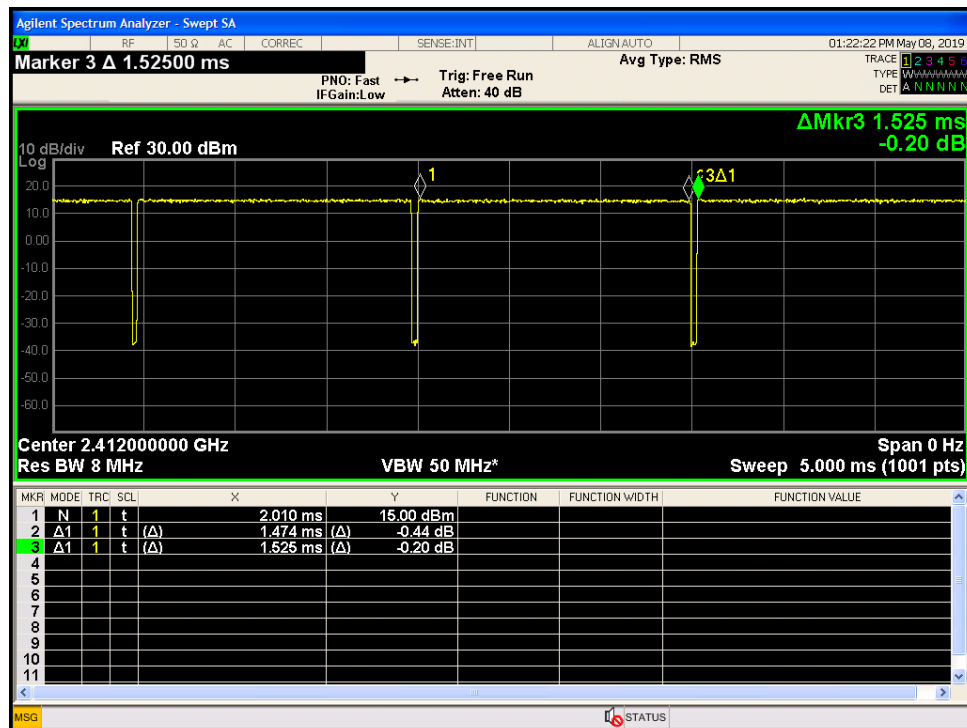


Figure 9-6 Duty Cycle 802.11n20 -Chain 1

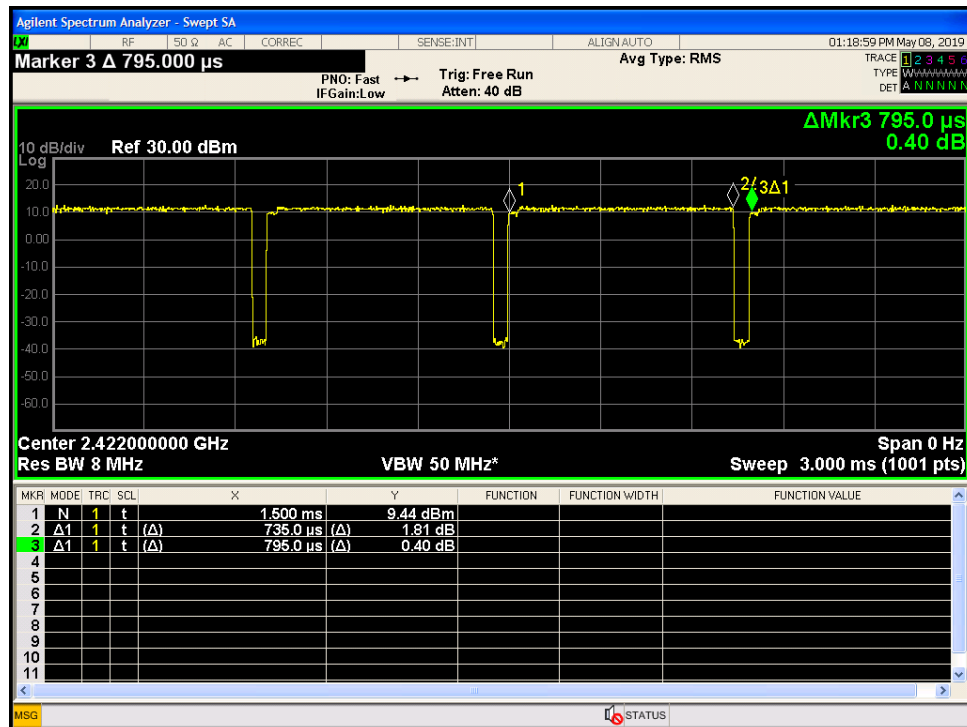


Figure 9-7 Duty Cycle 802.11n40 -Chain 0

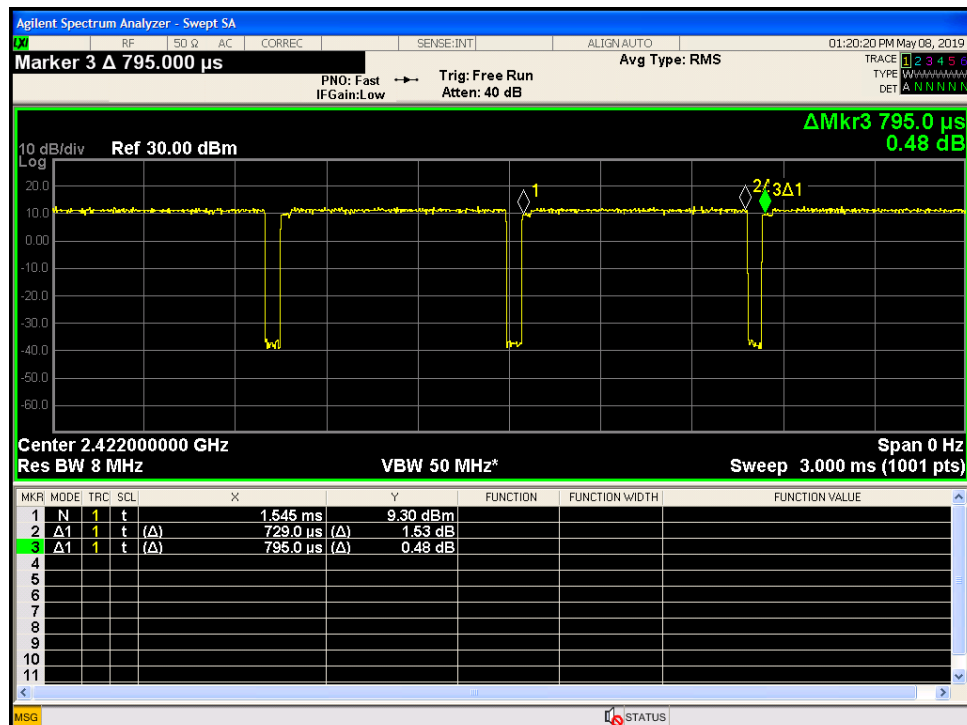


Figure 9-8 Duty Cycle 802.11n40 -Chain 1

## 9.2 DTS Bandwidth

### 9.2.1 Test Requirement:

FCC CFR 47 Rule Part 15.247 (a)(2)

ISED RSS-247 [5.2]

### 9.2.2 Test Method:

Measurements were performed according to the procedure defined in KDB 558074- Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 V05 and ANSI C63.10: 2013.

#### **Spectrum Analyzer Settings:**

RBW= 100 kHz

VBW $\geq$  3  $\times$  RBW

Detector = Peak

Span = 30MHz

Trace Mode= Max Hold

Sweep time= Auto Couple

The in-built functionality of the Spectrum Analyzer is used to measure the 6-dB bandwidth.

#### **Sample Calculation:**

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

### 9.2.3 Limits:

The 6-dB bandwidth shall be at least 500 kHz

## 9.2.4 Test Results:

| Chain 0 802.11b 6-dB Emission Bandwidth   |                 |                               |             |        |
|-------------------------------------------|-----------------|-------------------------------|-------------|--------|
| Channel No.                               | Frequency (MHz) | 6-dB Emission Bandwidth (MHz) | Limit (MHz) | Result |
| 1                                         | 2412            | 9.04                          | $\geq 0.5$  | Pass   |
| 6                                         | 2437            | 8.60                          | $\geq 0.5$  | Pass   |
| 11                                        | 2457            | 8.60                          | $\geq 0.5$  | Pass   |
| 12                                        | 2462            | 9.05                          | $\geq 0.5$  | Pass   |
| 13                                        | 2467            | 9.08                          | $\geq 0.5$  | Pass   |
| Chain 0 802.11g 6-dB Emission Bandwidth   |                 |                               |             |        |
| Channel No.                               | Frequency (MHz) | 6-dB Emission Bandwidth (MHz) | Limit (MHz) | Result |
| 1                                         | 2412            | 16.41                         | $\geq 0.5$  | Pass   |
| 6                                         | 2437            | 16.40                         | $\geq 0.5$  | Pass   |
| 11                                        | 2457            | 16.37                         | $\geq 0.5$  | Pass   |
| 12                                        | 2462            | 16.43                         | $\geq 0.5$  | Pass   |
| 13                                        | 2467            | 16.38                         | $\geq 0.5$  | Pass   |
| Chain 0 802.11n20 6-dB Emission Bandwidth |                 |                               |             |        |
| Channel No.                               | Frequency (MHz) | 6-dB Emission Bandwidth (MHz) | Limit (MHz) | Result |
| 1                                         | 2412            | 17.61                         | $\geq 0.5$  | Pass   |
| 6                                         | 2437            | 17.63                         | $\geq 0.5$  | Pass   |
| 11                                        | 2462            | 17.63                         | $\geq 0.5$  | Pass   |
| 12                                        | 2467            | 17.62                         | $\geq 0.5$  | Pass   |
| 13                                        | 2472            | 17.64                         | $\geq 0.5$  | Pass   |
| Chain 0 802.11n40 6-dB Emission Bandwidth |                 |                               |             |        |
| Channel No.                               | Frequency (MHz) | 6-dB Emission Bandwidth (MHz) | Limit (MHz) | Result |
| 3                                         | 2422            | 36.40                         | $\geq 0.5$  | Pass   |
| 7                                         | 2442            | 36.39                         | $\geq 0.5$  | Pass   |
| 9                                         | 2452            | 36.39                         | $\geq 0.5$  | Pass   |
| 10                                        | 2457            | 36.40                         | $\geq 0.5$  | Pass   |
| 11                                        | 2462            | 36.36                         | $\geq 0.5$  | Pass   |

| Chain 1 802.11b 6-dB Emission Bandwidth   |                 |                               |             |        |
|-------------------------------------------|-----------------|-------------------------------|-------------|--------|
| Channel No.                               | Frequency (MHz) | 6-dB Emission Bandwidth (MHz) | Limit (MHz) | Result |
| 1                                         | 2412            | 8.58                          | $\geq 0.5$  | Pass   |
| 6                                         | 2437            | 8.55                          | $\geq 0.5$  | Pass   |
| 11                                        | 2462            | 9.02                          | $\geq 0.5$  | Pass   |
| 12                                        | 2467            | 8.57                          | $\geq 0.5$  | Pass   |
| 13                                        | 2472            | 8.59                          | $\geq 0.5$  | Pass   |
| Chain 1 802.11g 6-dB Emission Bandwidth   |                 |                               |             |        |
| Channel No.                               | Frequency (MHz) | 6-dB Emission Bandwidth (MHz) | Limit (MHz) | Result |
| 1                                         | 2412            | 16.43                         | $\geq 0.5$  | Pass   |
| 6                                         | 2437            | 16.40                         | $\geq 0.5$  | Pass   |
| 11                                        | 2462            | 16.40                         | $\geq 0.5$  | Pass   |
| 12                                        | 2467            | 16.43                         | $\geq 0.5$  | Pass   |
| 13                                        | 2472            | 16.36                         | $\geq 0.5$  | Pass   |
| Chain 1 802.11n20 6-dB Emission Bandwidth |                 |                               |             |        |
| Channel No.                               | Frequency (MHz) | 6-dB Emission Bandwidth (MHz) | Limit (MHz) | Result |
| 1                                         | 2412            | 17.63                         | $\geq 0.5$  | Pass   |
| 6                                         | 2437            | 17.61                         | $\geq 0.5$  | Pass   |
| 11                                        | 2462            | 17.62                         | $\geq 0.5$  | Pass   |
| 12                                        | 2467            | 17.61                         | $\geq 0.5$  | Pass   |
| 13                                        | 2472            | 17.57                         | $\geq 0.5$  | Pass   |
| Chain 1 802.11n40 6-dB Emission Bandwidth |                 |                               |             |        |
| Channel No.                               | Frequency (MHz) | 6-dB Emission Bandwidth (MHz) | Limit (MHz) | Result |
| 3                                         | 2422            | 36.34                         | $\geq 0.5$  | Pass   |
| 7                                         | 2442            | 36.14                         | $\geq 0.5$  | Pass   |
| 9                                         | 2452            | 35.81                         | $\geq 0.5$  | Pass   |
| 10                                        | 2457            | 36.19                         | $\geq 0.5$  | Pass   |
| 11                                        | 2462            | 35.96                         | $\geq 0.5$  | Pass   |

## 9.2.5 Test Data:

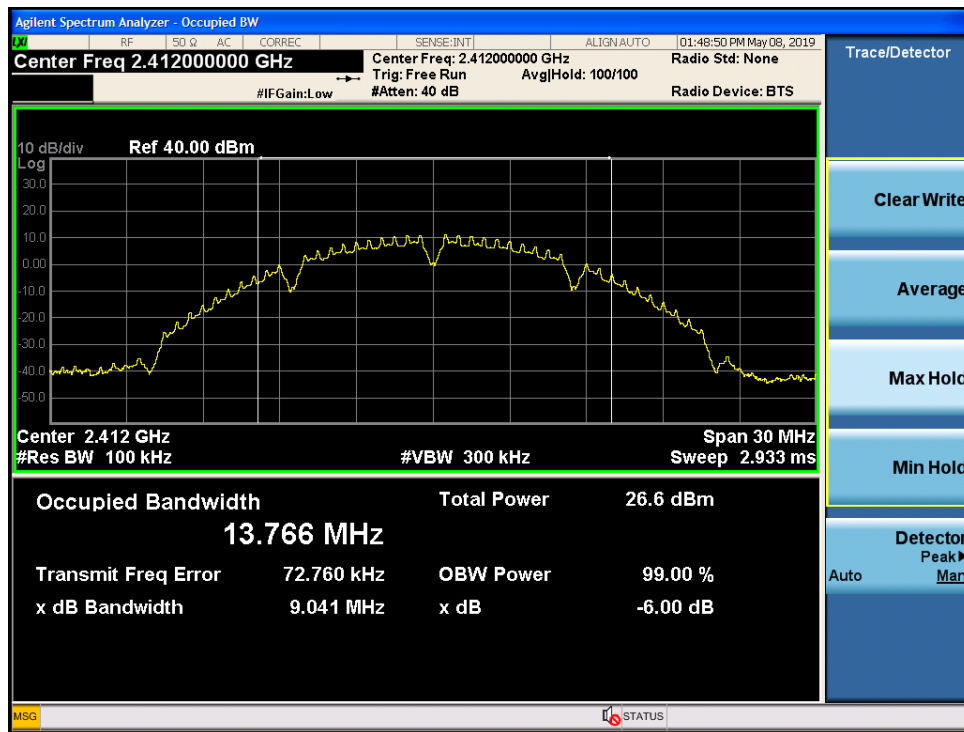


Figure 9-9 Chain 0 DTS Bandwidth 802.11b mode - Ch.1

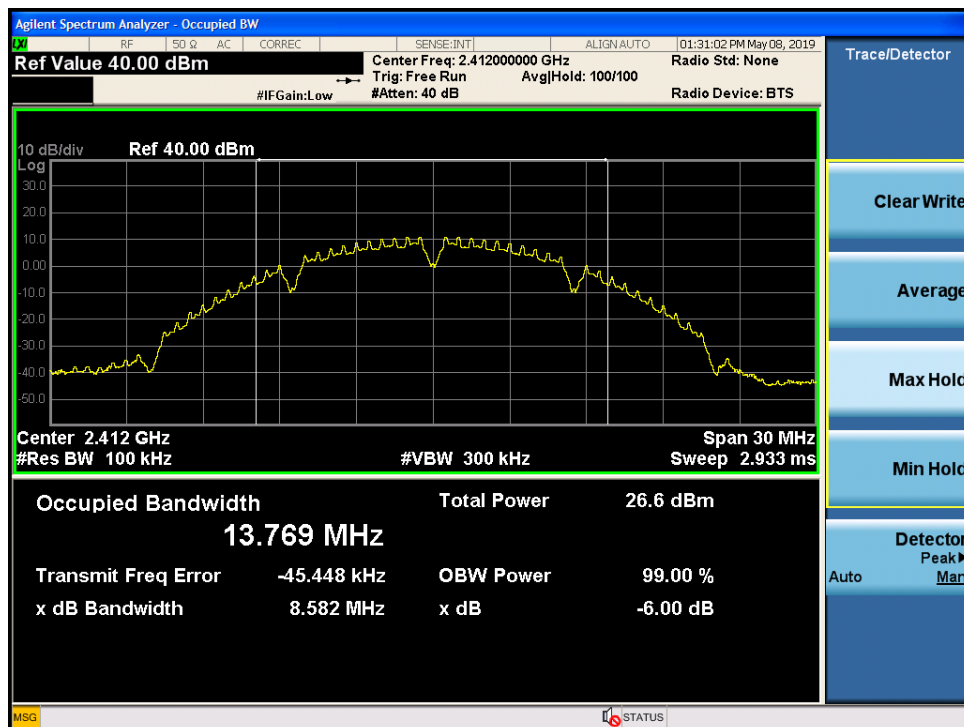


Figure 9-10 Chain 1 DTS Bandwidth 802.11b mode - Ch.1

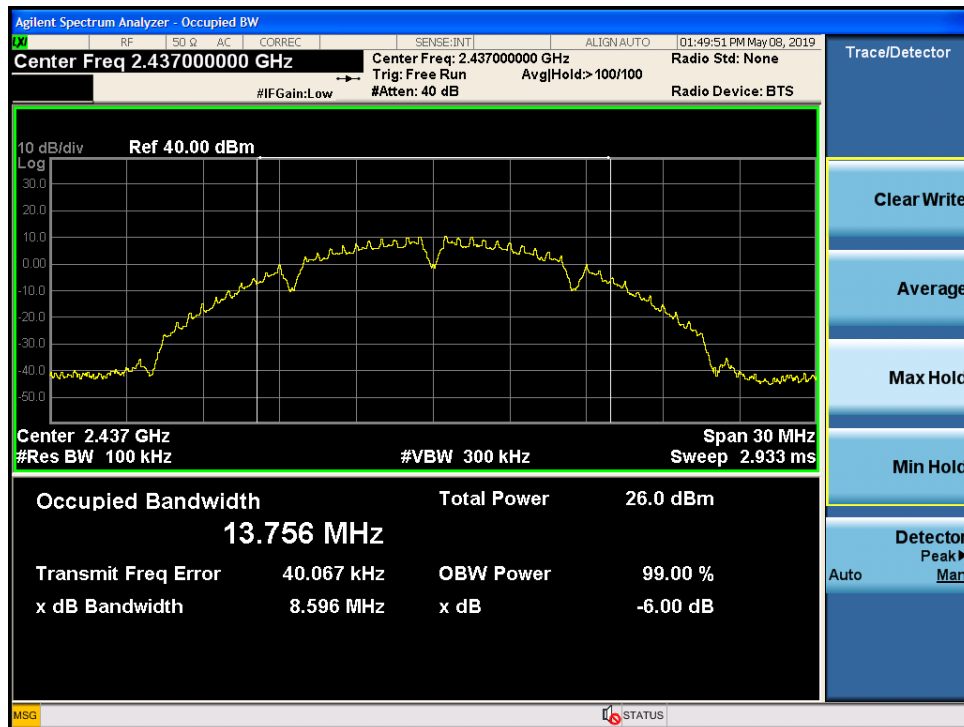


Figure 9-11 Chain 0 DTS Bandwidth 802.11b mode - Ch.6

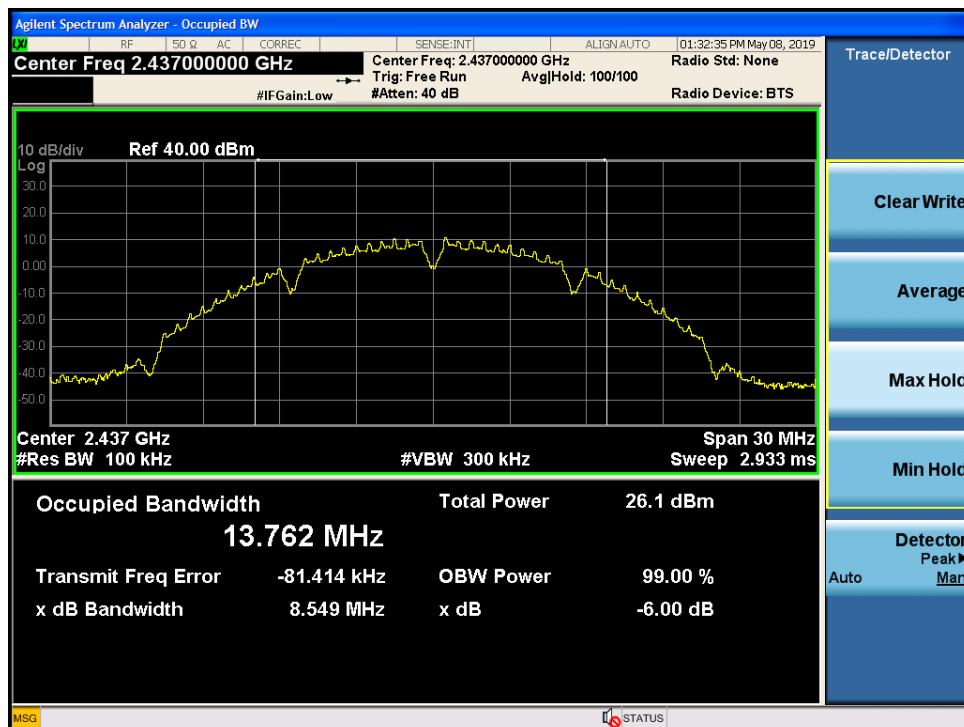


Figure 9-12 Chain 1 DTS Bandwidth 802.11b mode - Ch.6

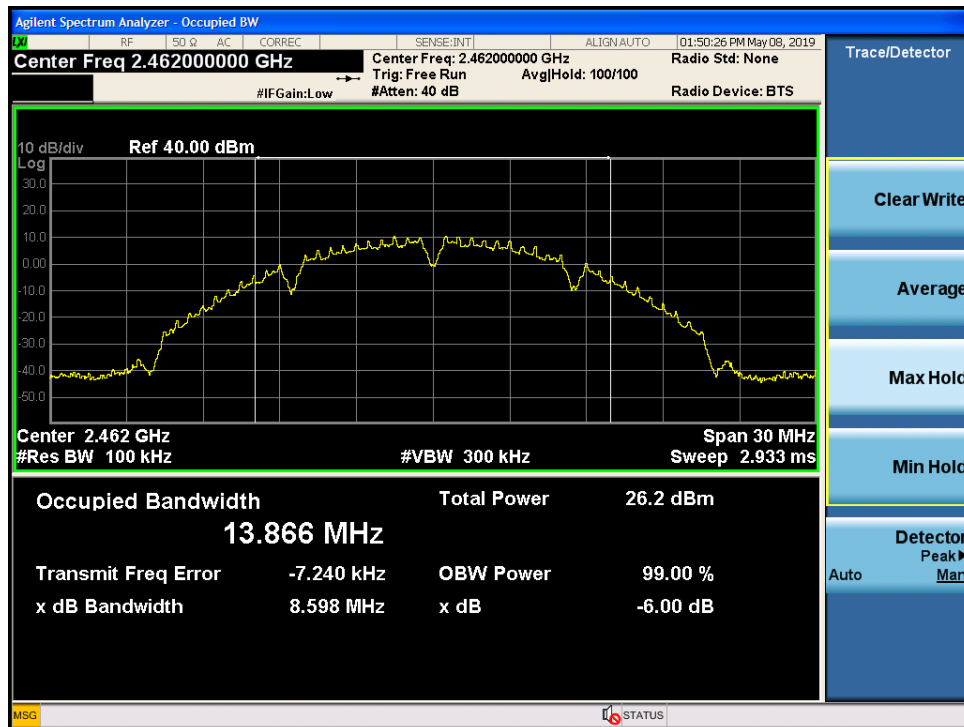


Figure 9-13 Chain 0 DTS Bandwidth 802.11b mode - Ch.11



Figure 9-14 Chain 1 DTS Bandwidth 802.11b mode - Ch.11

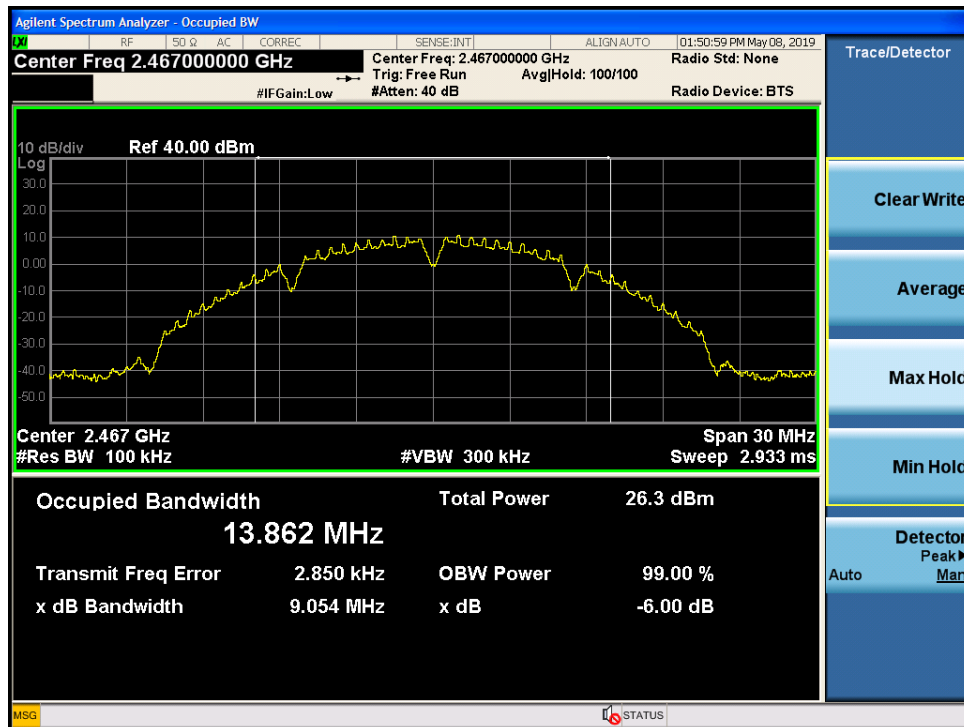


Figure 9-15 Chain 0 DTS Bandwidth 802.11b mode - Ch.12

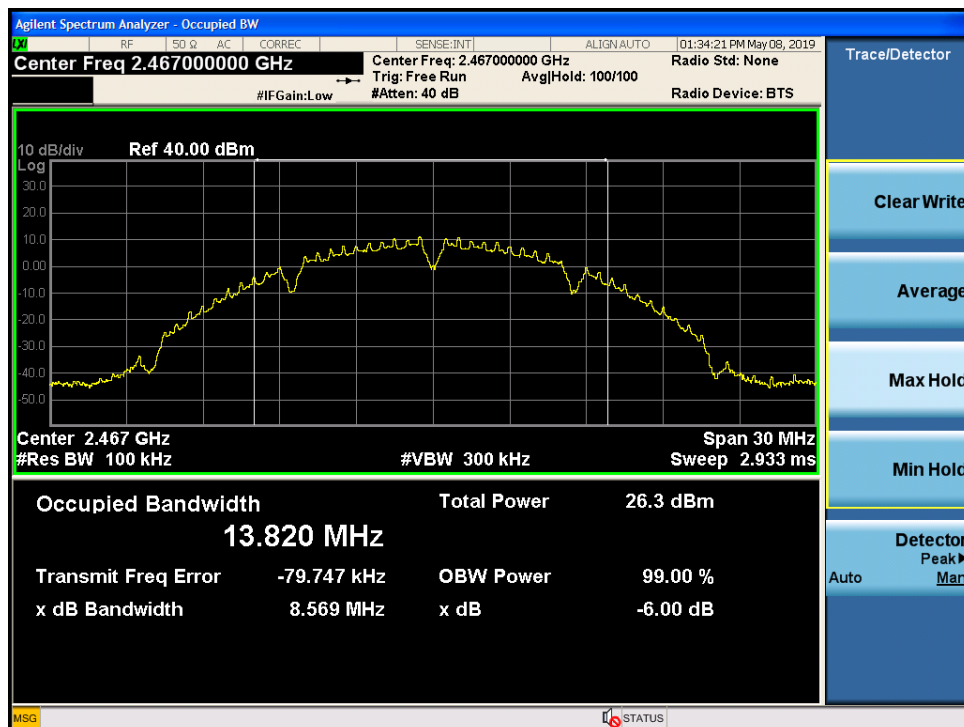


Figure 9-16 Chain 1 DTS Bandwidth 802.11b mode - Ch.12

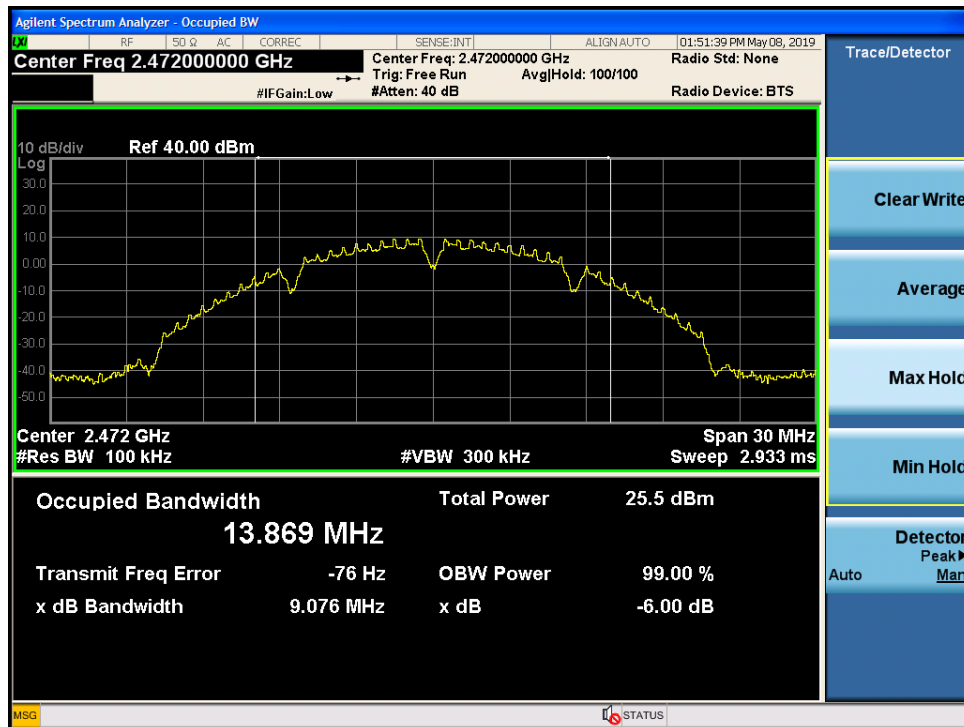


Figure 9-17 Chain 0 DTS Bandwidth 802.11b mode - Ch.13

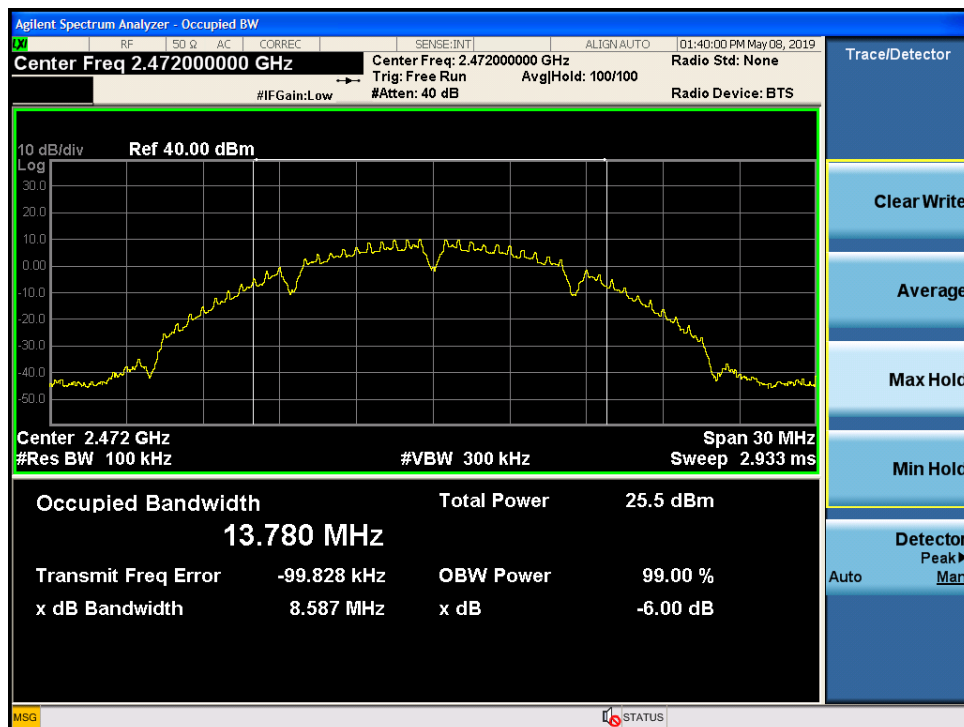


Figure 9-18 Chain 1 DTS Bandwidth 802.11b mode - Ch.13

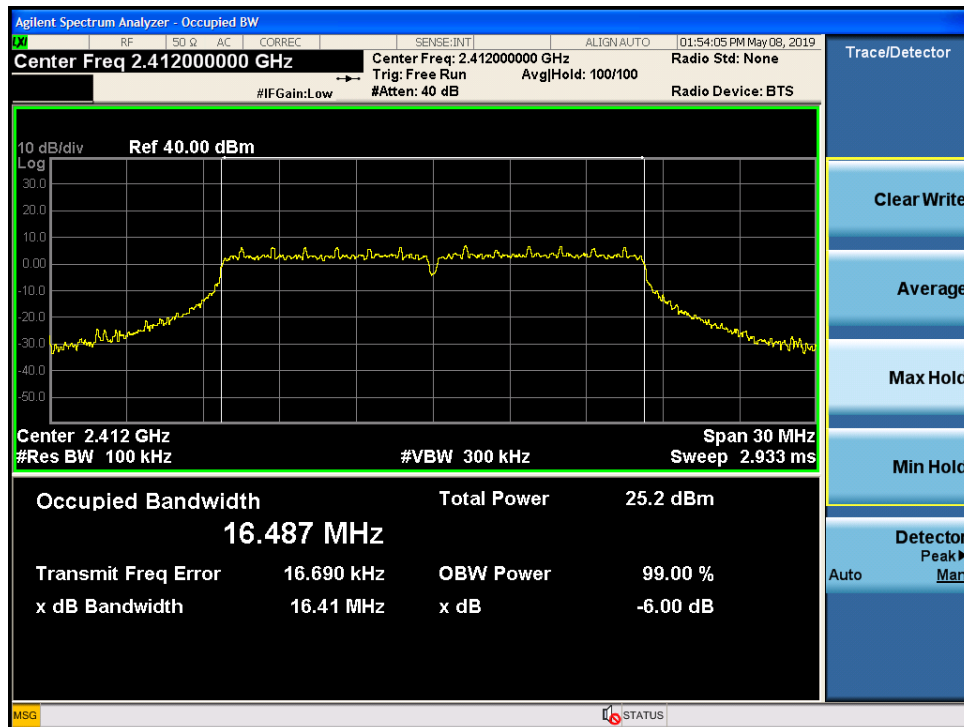


Figure 9-19 Chain 0 DTS Bandwidth 802.11g mode - Ch.1

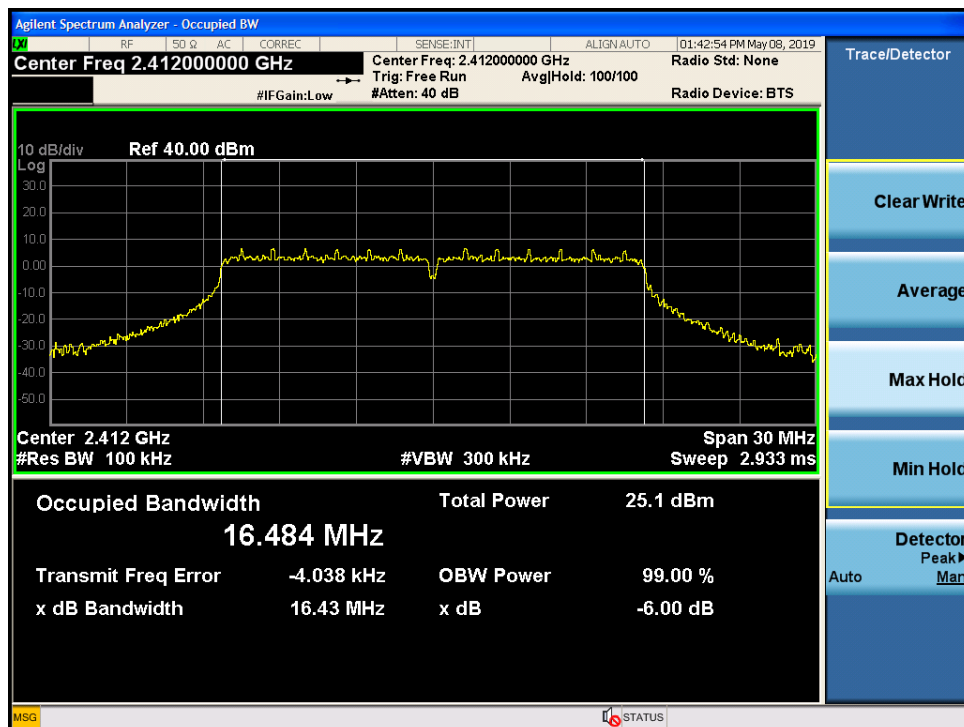


Figure 9-20 Chain 1 DTS Bandwidth 802.11g mode - Ch.1

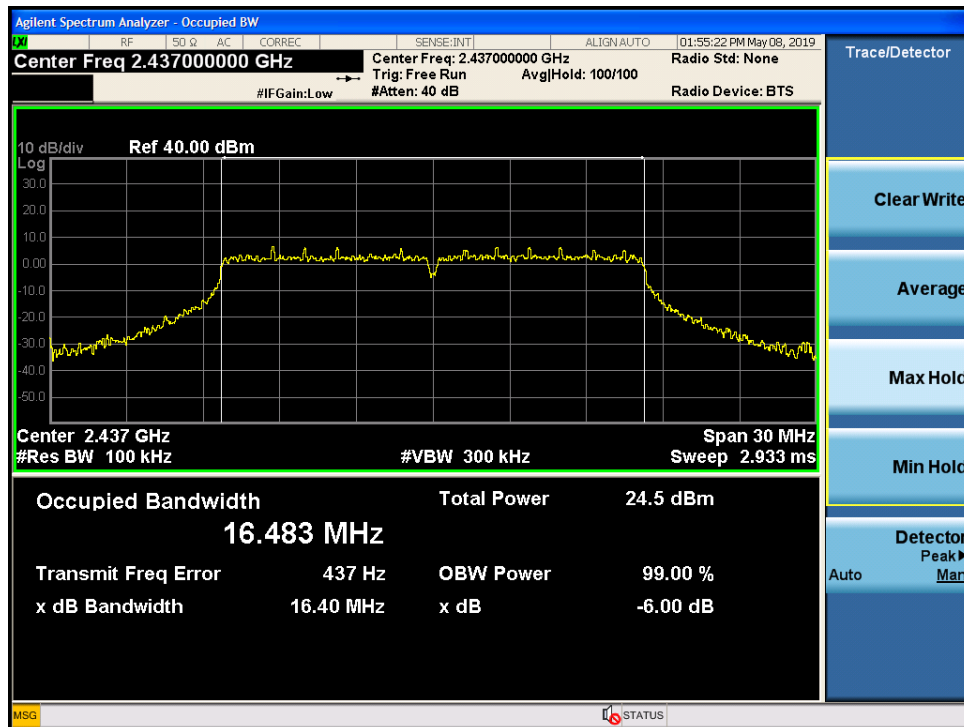


Figure 9-21 Chain 0 DTS Bandwidth 802.11g mode - Ch.6

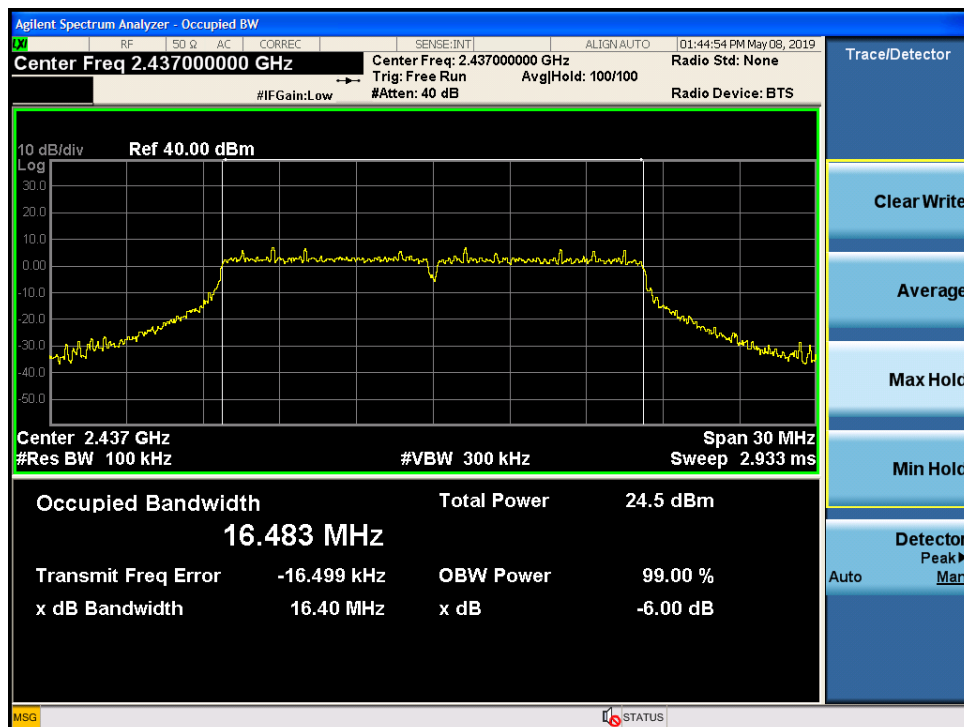


Figure 9-22 Chain 1 DTS Bandwidth 802.11g mode - Ch.6

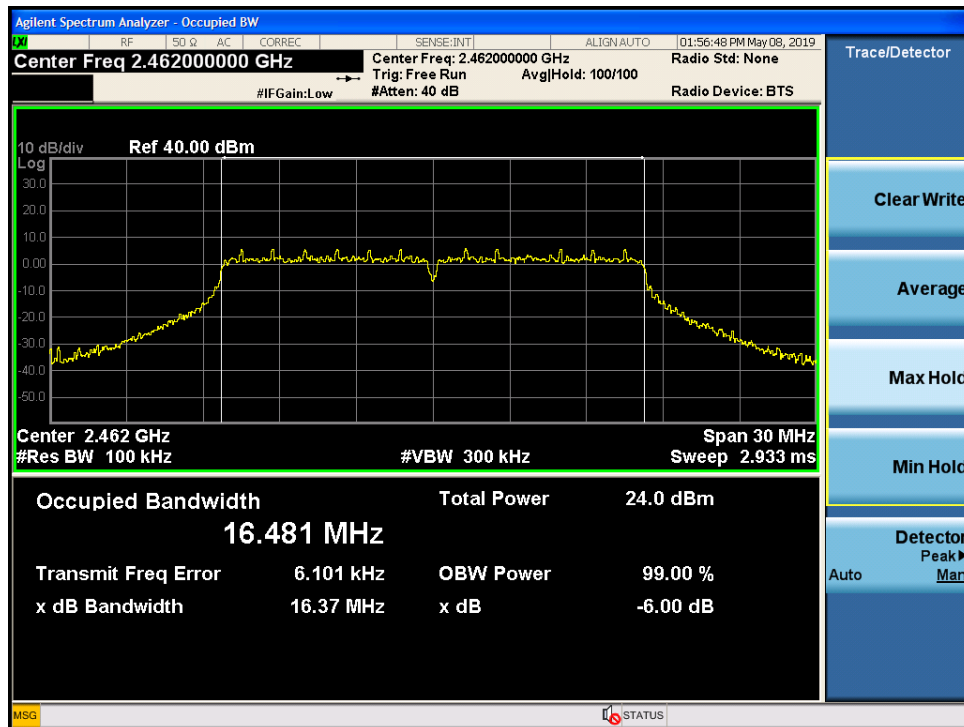


Figure 9-23 Chain 0 DTS Bandwidth 802.11g mode - Ch.11

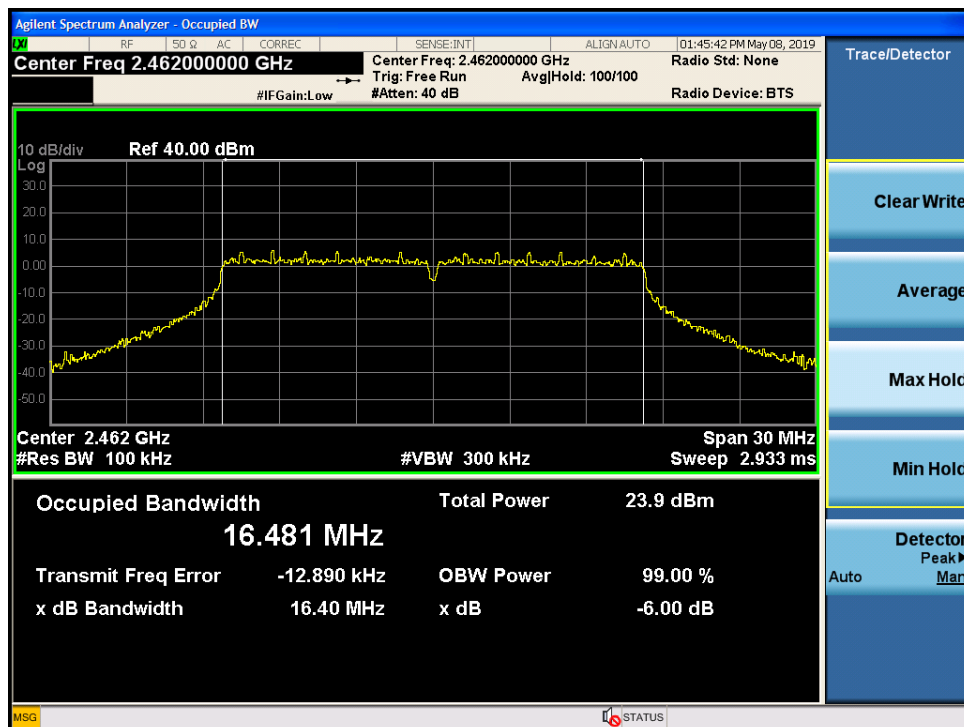


Figure 9-24 Chain 1 DTS Bandwidth 802.11g mode - Ch.11

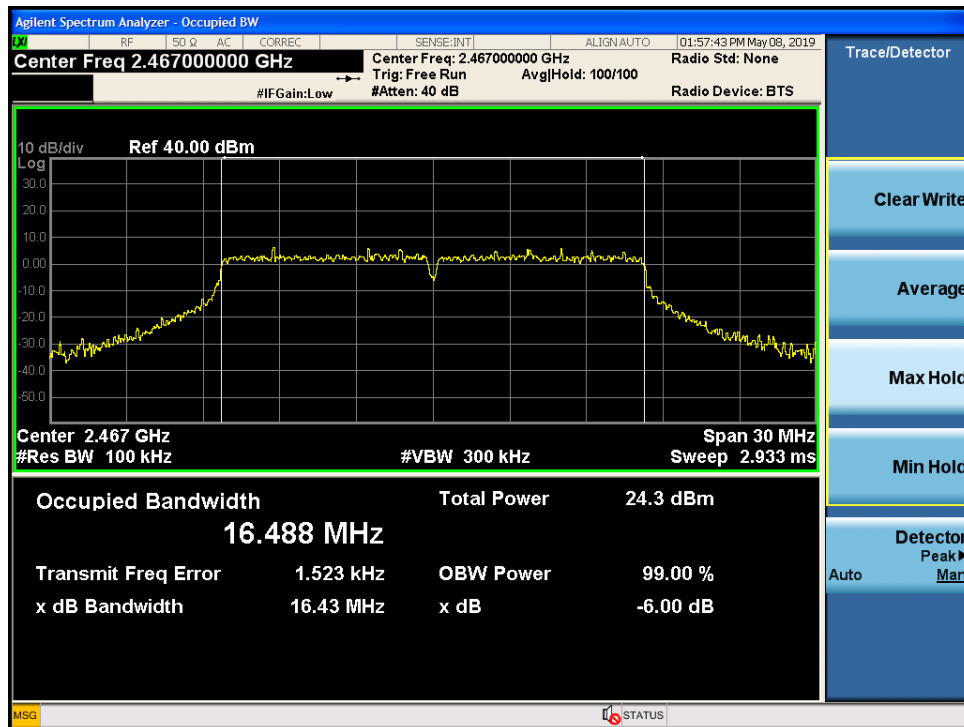


Figure 9-25 Chain 0 DTS Bandwidth 802.11g mode - Ch.12

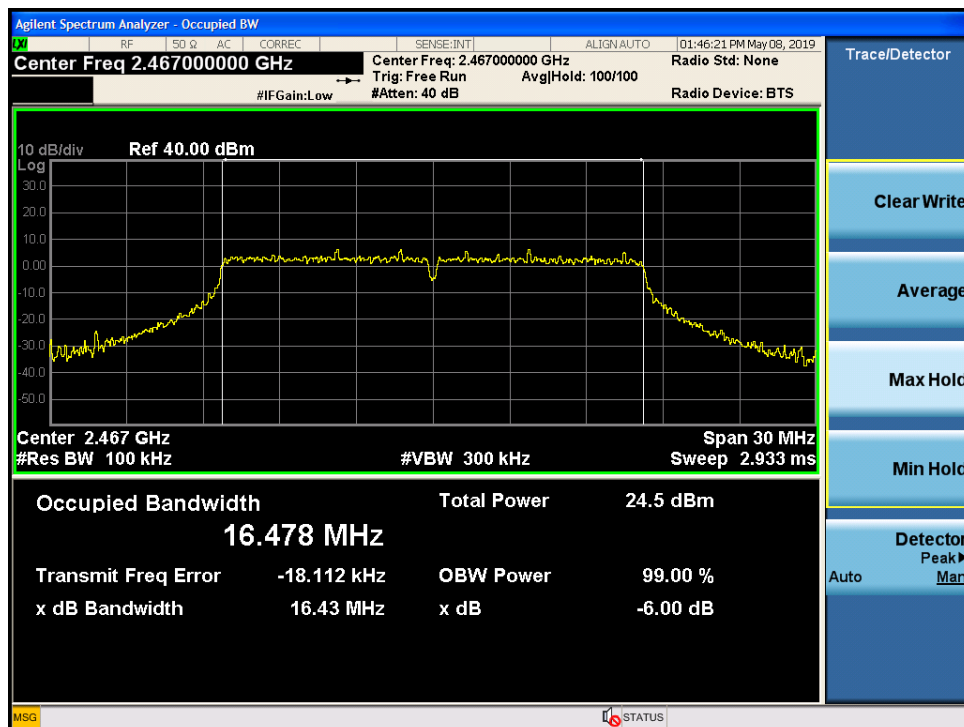


Figure 9-26 Chain 1 DTS Bandwidth 802.11g mode - Ch.12

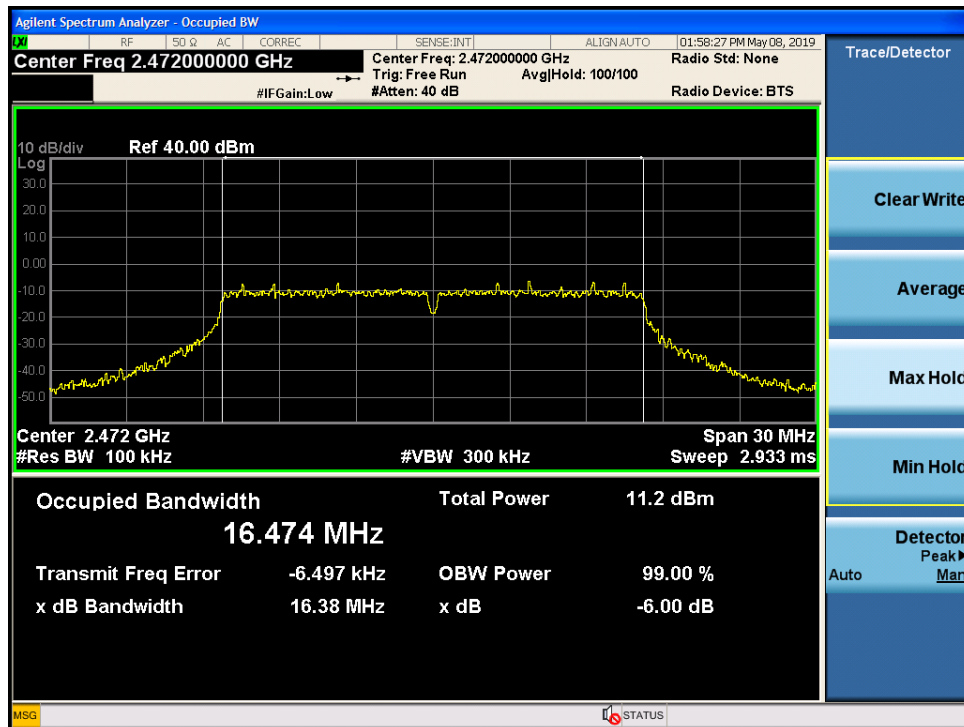


Figure 9-27 Chain 0 DTS Bandwidth 802.11g mode - Ch.13

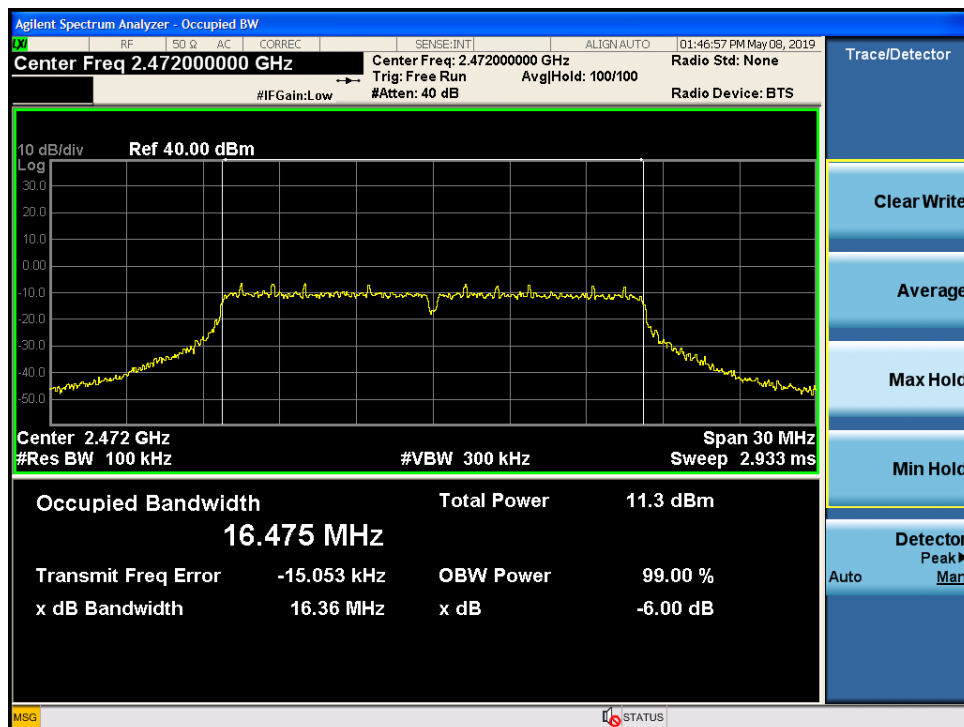


Figure 9-28 Chain 1 DTS Bandwidth 802.11g mode - Ch.13

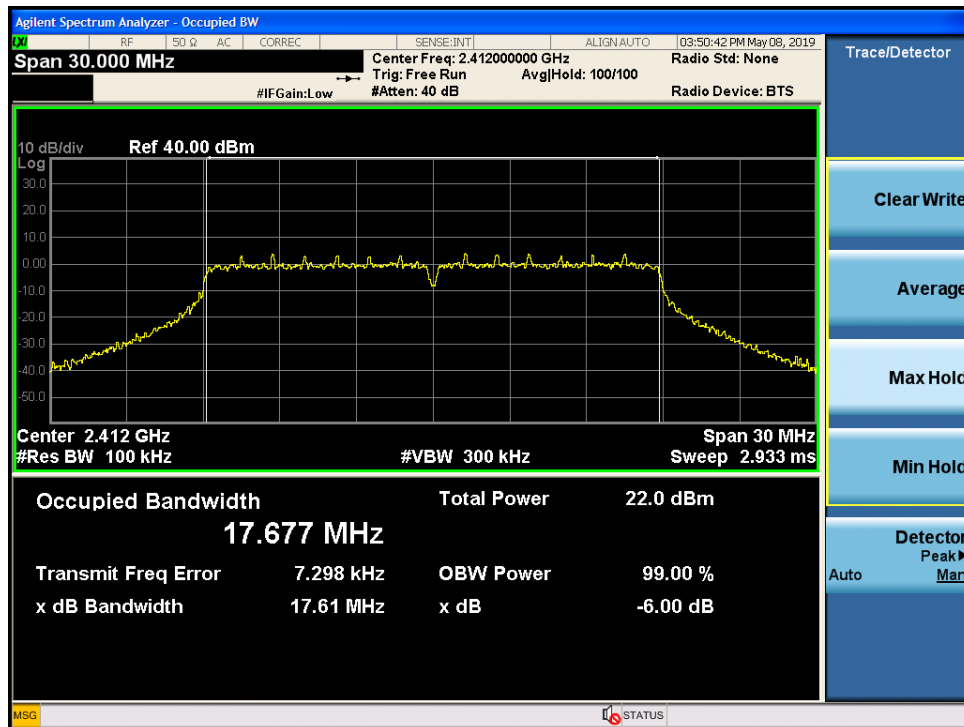


Figure 9-29 Chain 0 DTS Bandwidth 802.11n20 mode - Ch.1

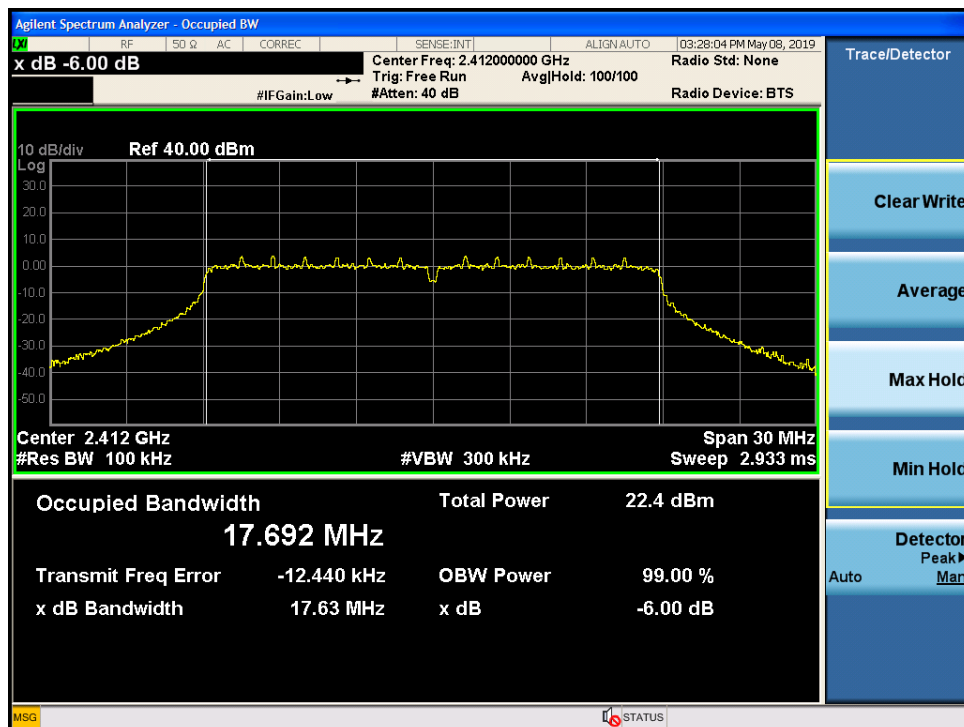


Figure 9-30 Chain 1 DTS Bandwidth 802.11n20 mode - Ch.1

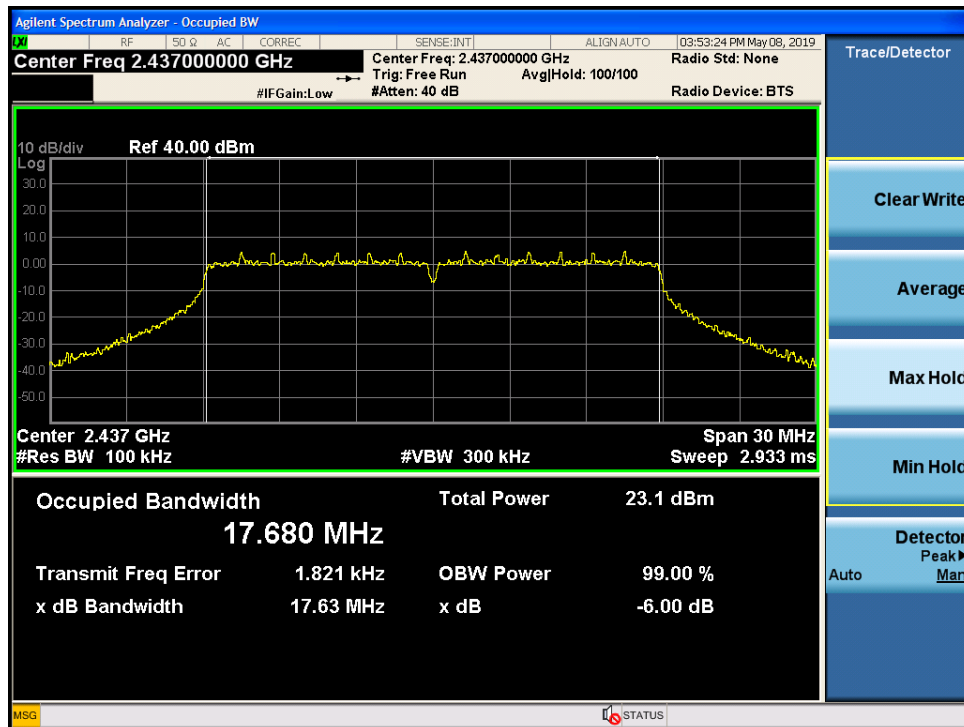


Figure 9-31 Chain 0 DTS Bandwidth 802.11n20 mode - Ch.6

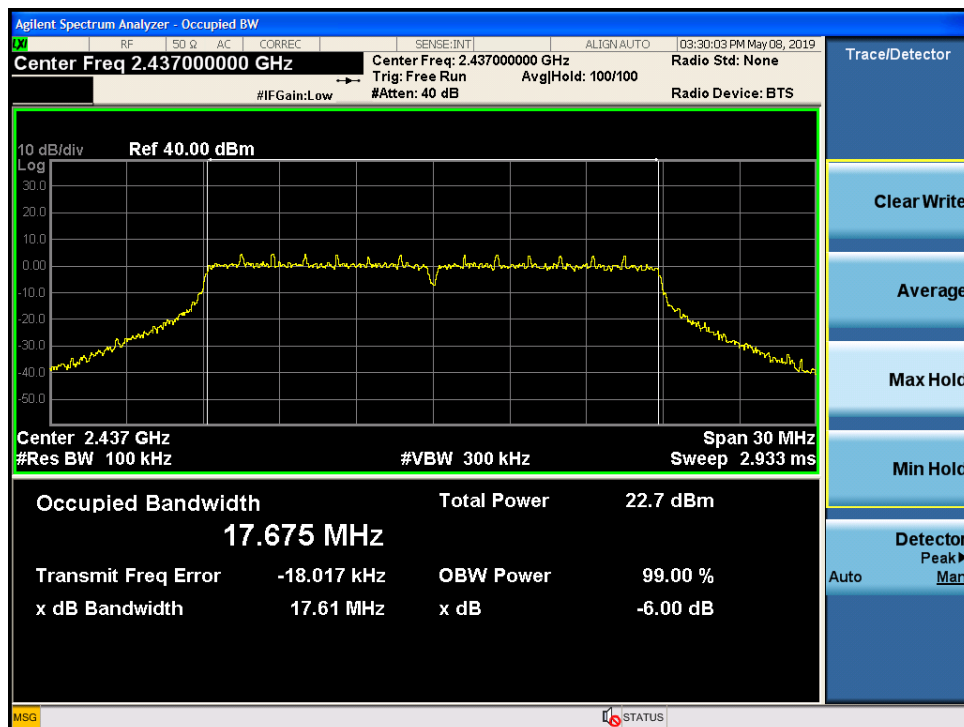


Figure 9-32 Chain 1 DTS Bandwidth 802.11n20 mode - Ch.6

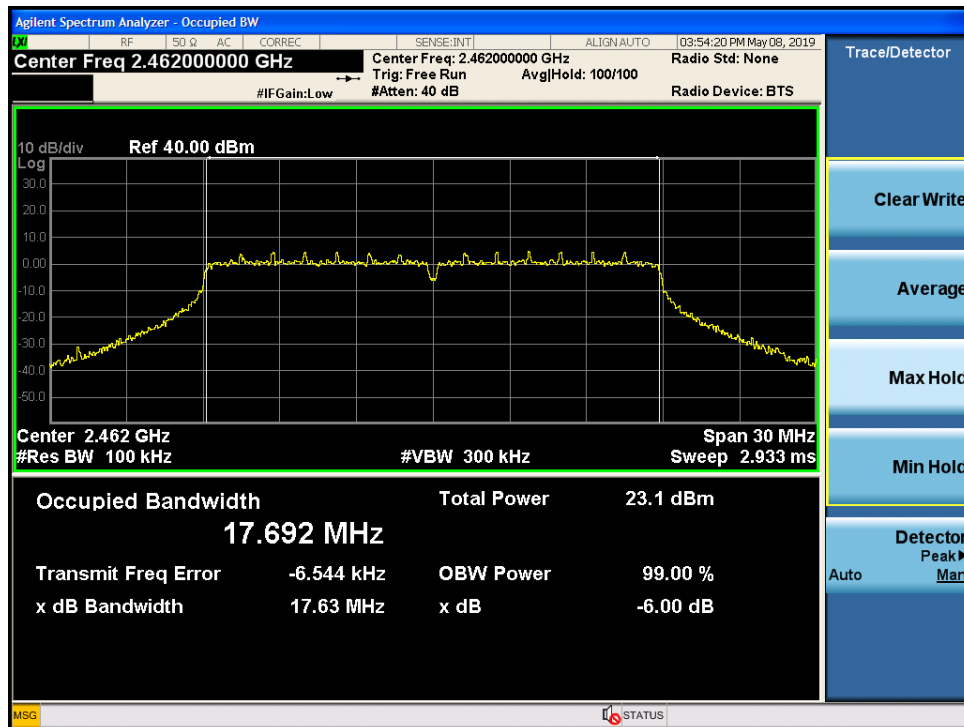


Figure 9-33 Chain 0 DTS Bandwidth 802.11n20 mode - Ch.11

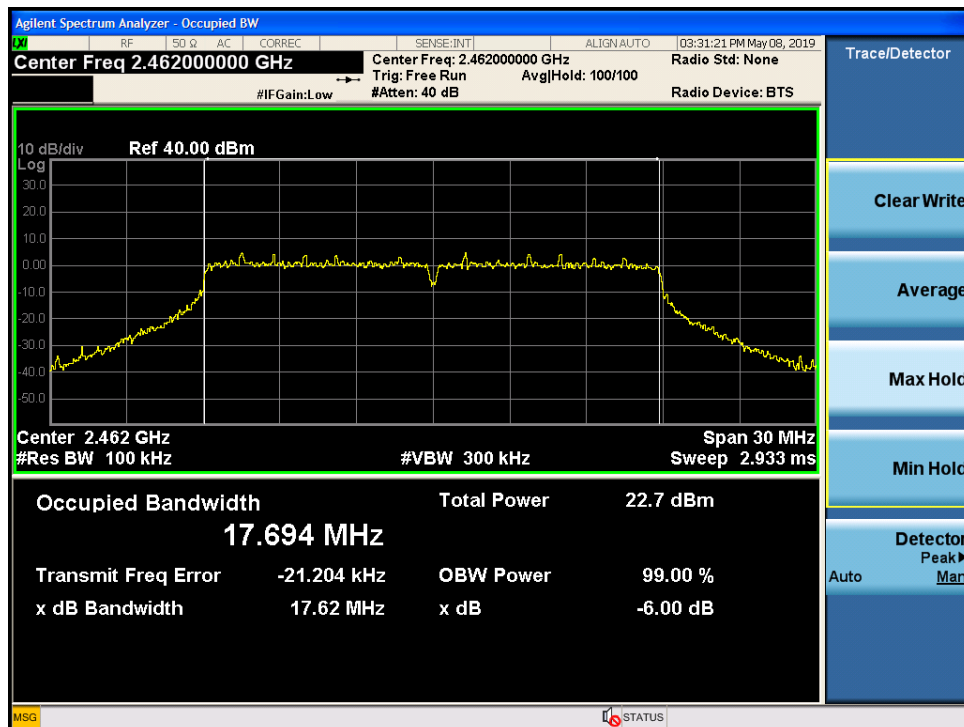


Figure 9-34 Chain 1 DTS Bandwidth 802.11n20 mode - Ch.11

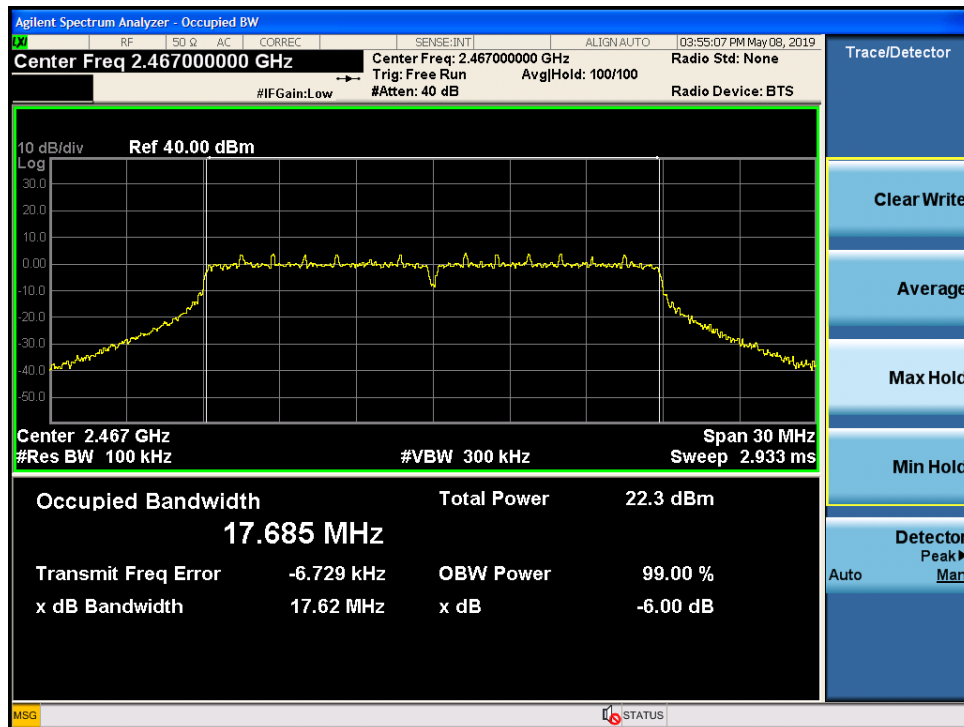


Figure 9-35 Chain 0 DTS Bandwidth 802.11n20 mode - Ch.12

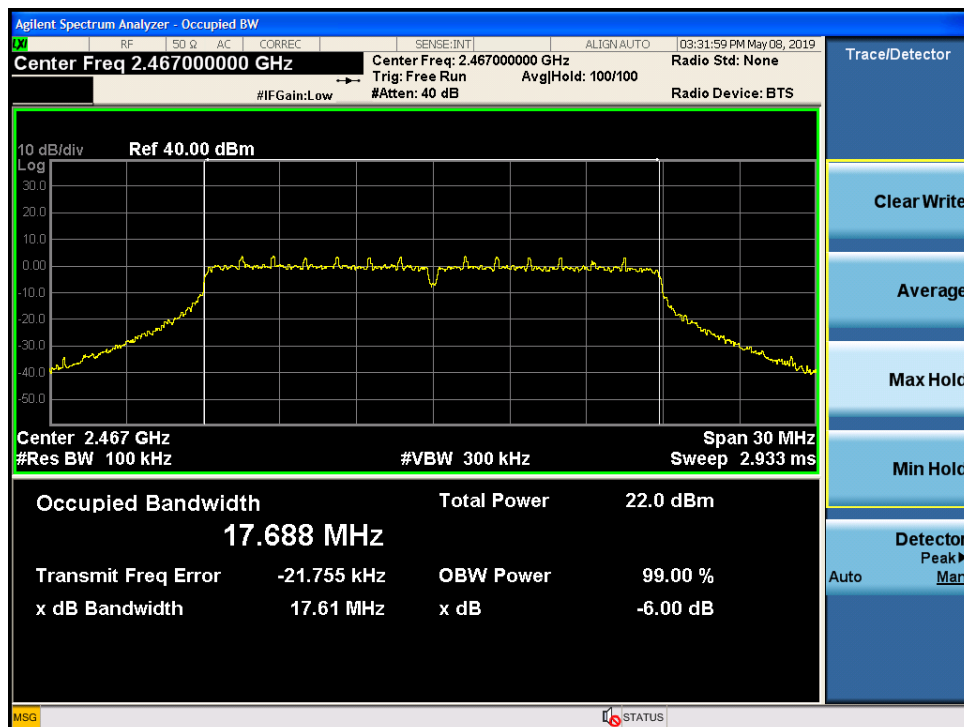


Figure 9-36 Chain 1 DTS Bandwidth 802.11n20 mode - Ch.12

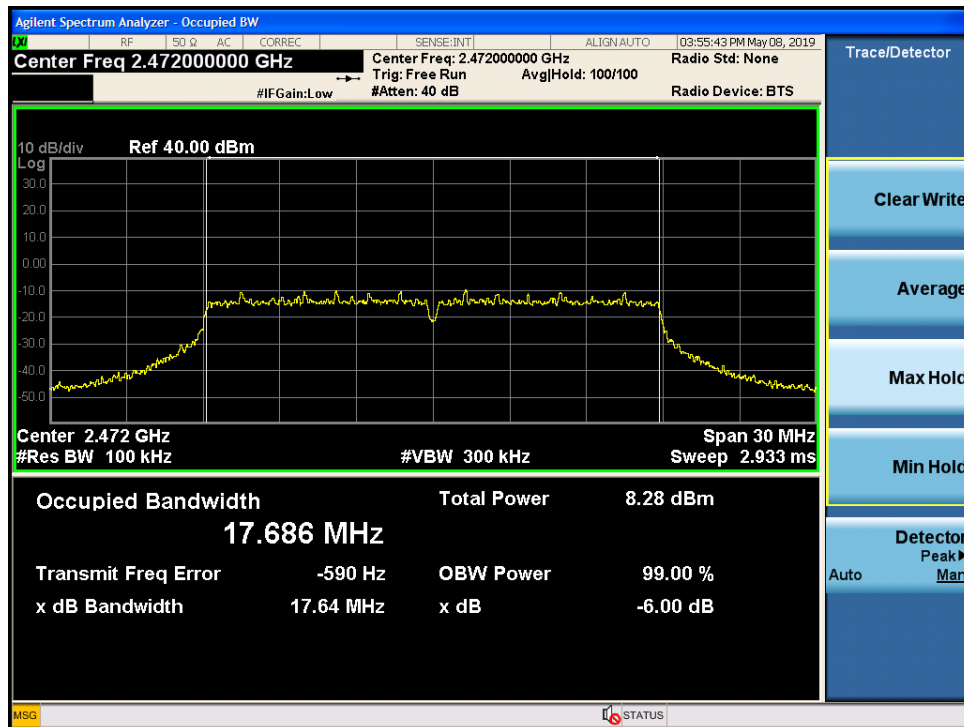


Figure 9-37 Chain 0 DTS Bandwidth 802.11n20 mode - Ch.13

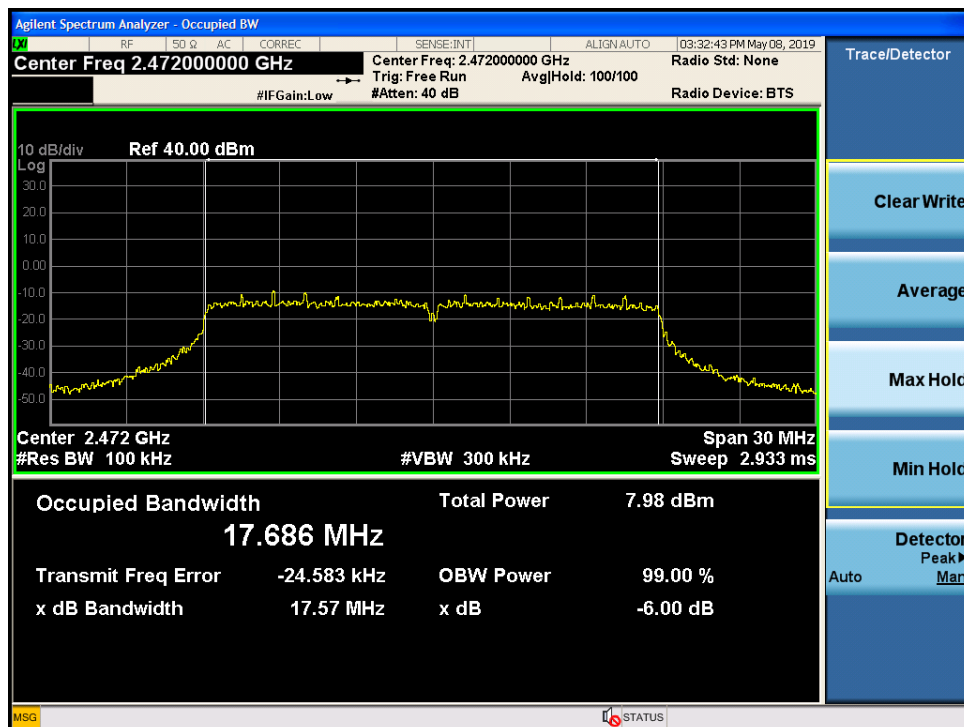


Figure 9-38 Chain 1 DTS Bandwidth 802.11n20 mode - Ch.13

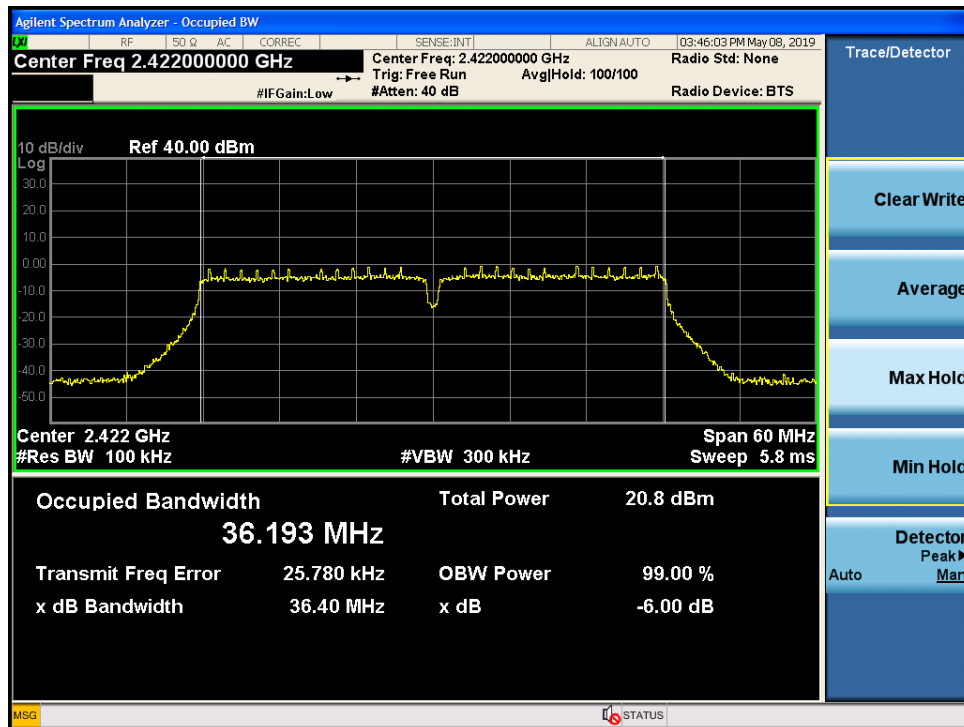


Figure 9-39 Chain 0 DTS Bandwidth 802.11n40 mode - Ch.3

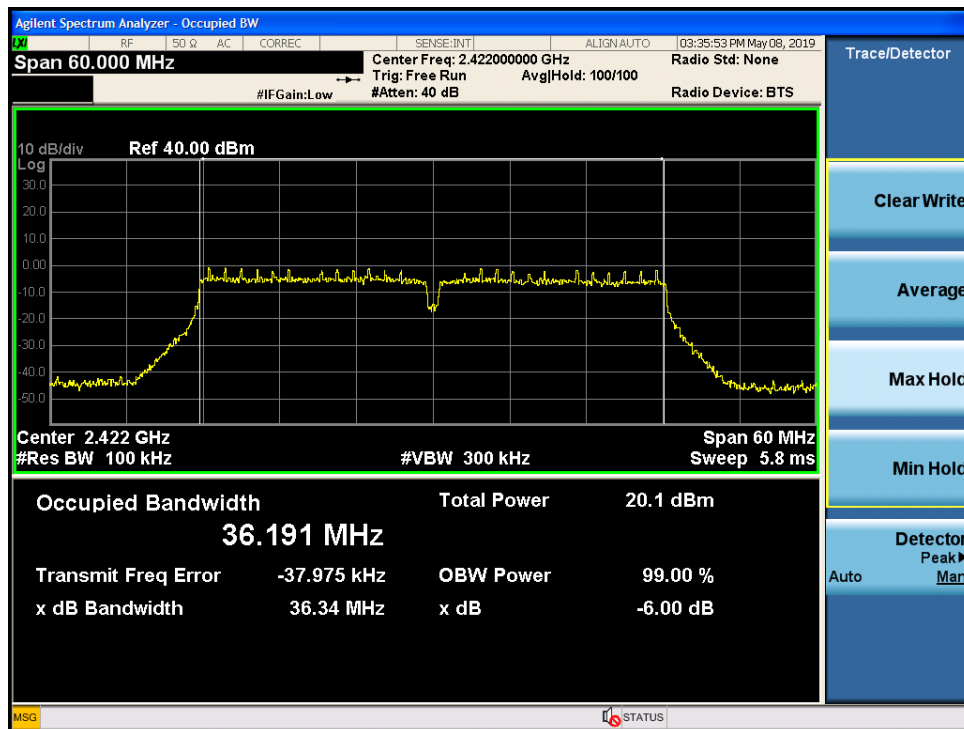


Figure 9-40 Chain 1 DTS Bandwidth 802.11n40 mode - Ch.3

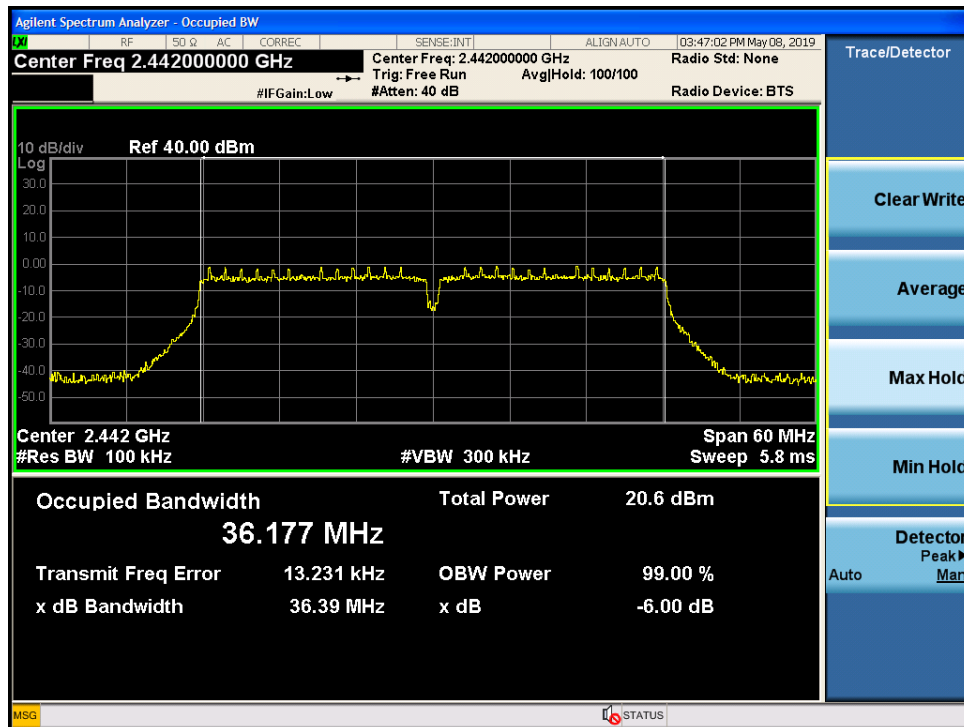


Figure 9-41 Chain 0 DTS Bandwidth 802.11n40 mode - Ch.7

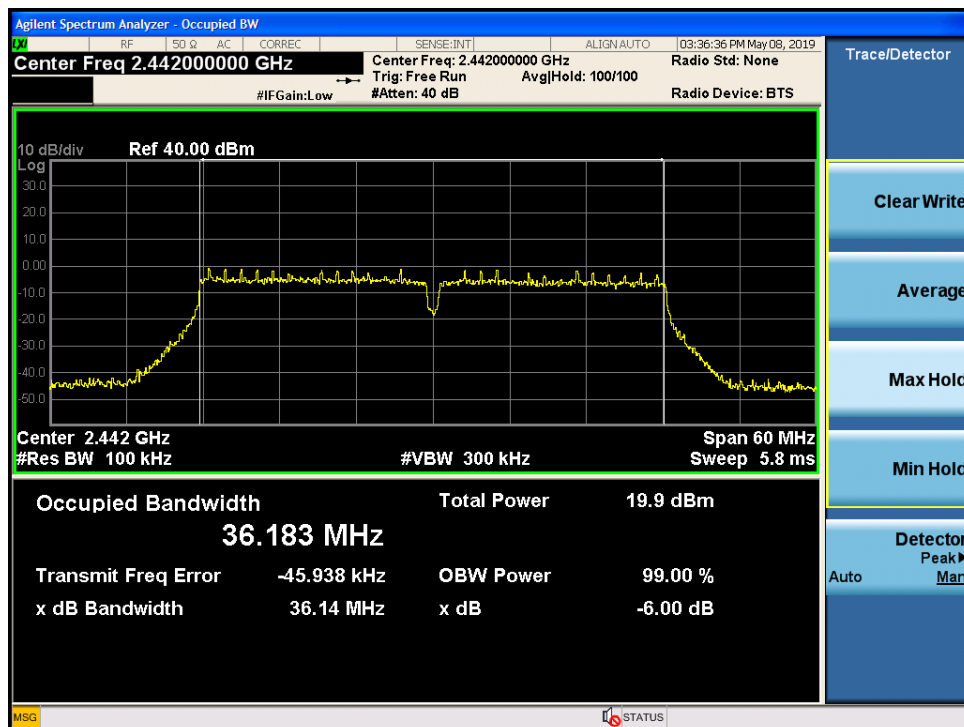


Figure 9-42 Chain 1 DTS Bandwidth 802.11n40 mode - Ch.7

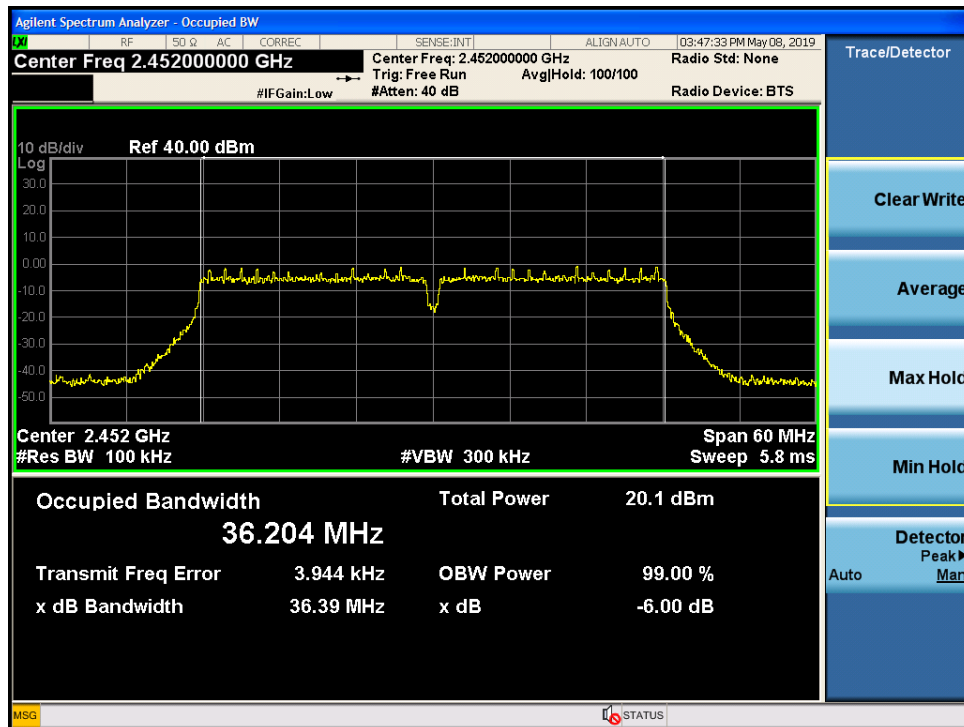


Figure 9-43 Chain 0 DTS Bandwidth 802.11n40 mode - Ch.9

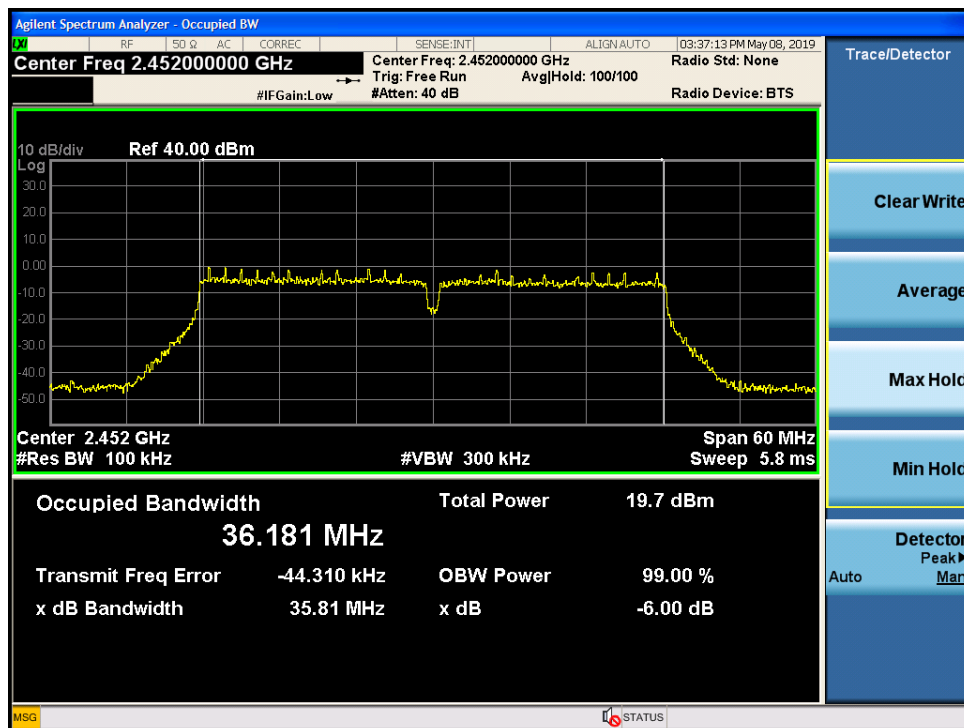


Figure 9-44 Chain 1 DTS Bandwidth 802.11n40 mode - Ch.9

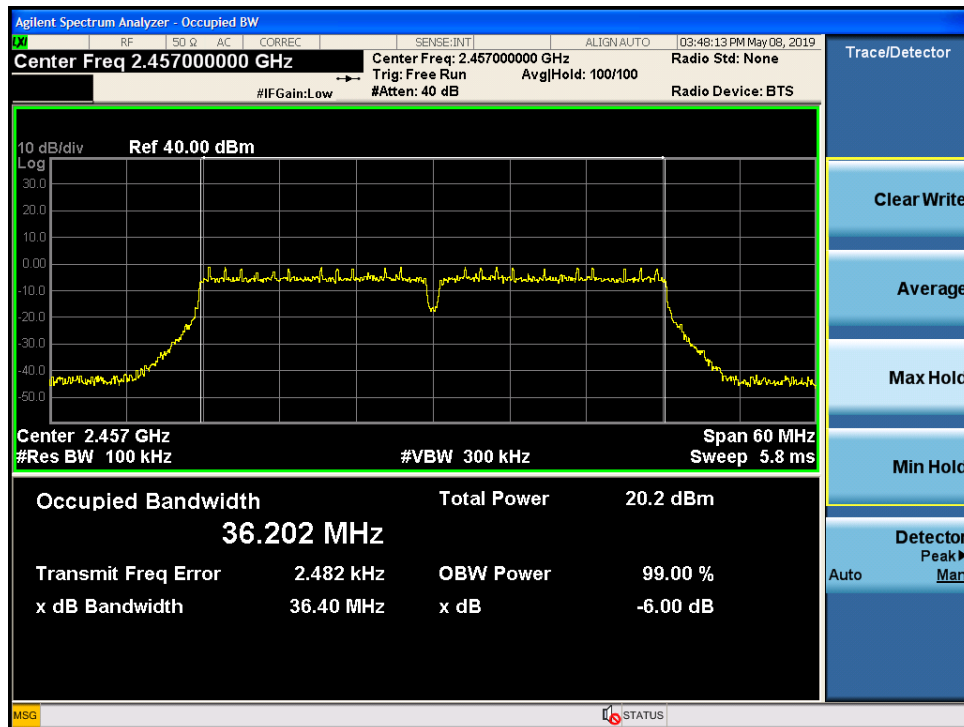


Figure 9-45 Chain 0 DTS Bandwidth 802.11n40 mode - Ch.10

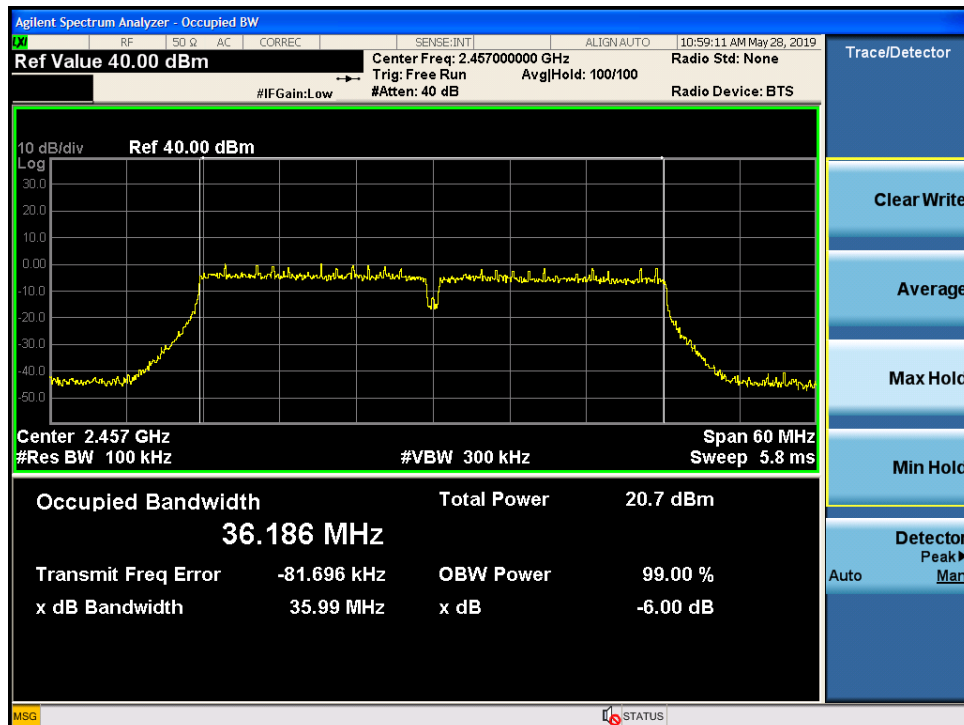


Figure 9-46 Chain 1 DTS Bandwidth 802.11n40 mode - Ch.10

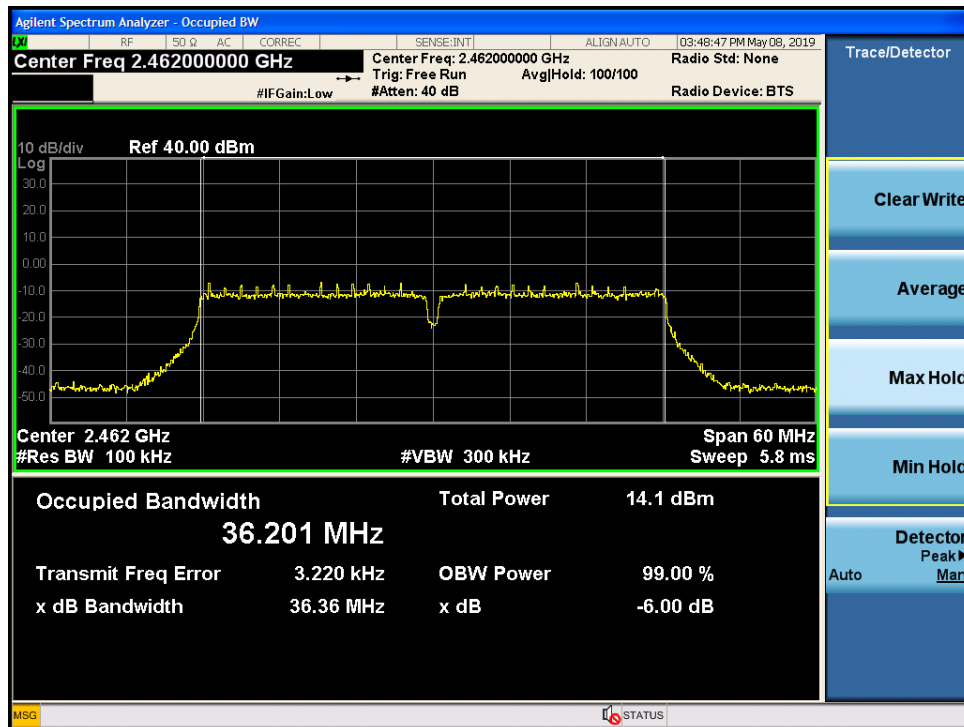


Figure 9-47 Chain 0 DTS Bandwidth 802.11n40 mode - Ch.11

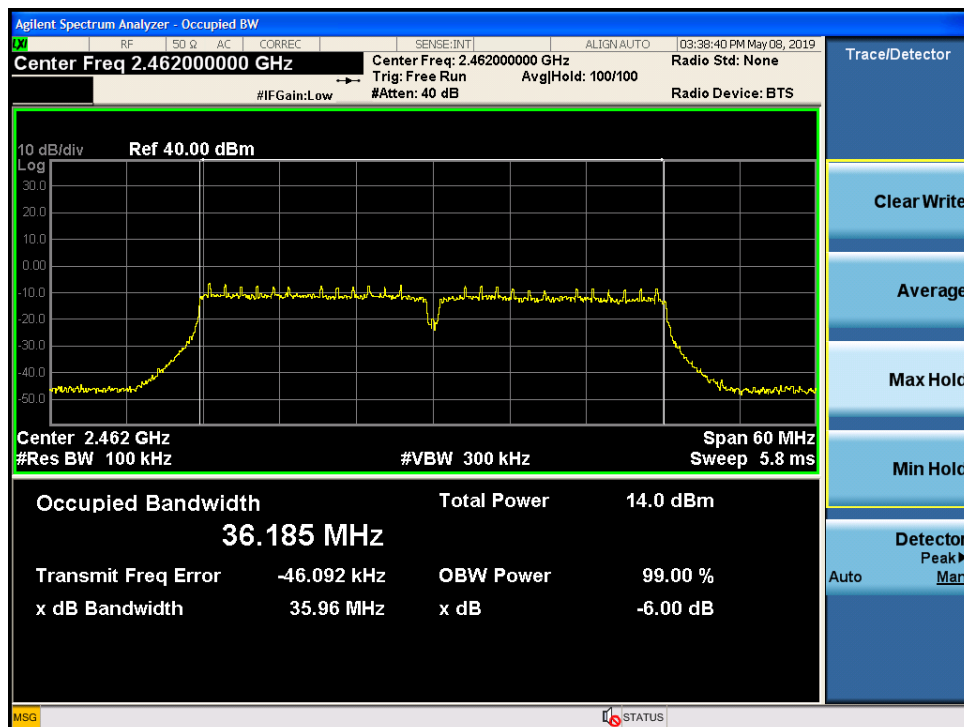


Figure 9-48 Chain 1 DTS Bandwidth 802.11n40 mode - Ch.11

## 9.3 99% Bandwidth

### 9.3.1 Test Requirement:

The 99% Occupied Channel Bandwidth is the bandwidth that contains 99 % of the power of the signal. This test is performed for reporting and measurement purposes only.

### 9.3.2 Test Method:

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

#### **Spectrum Analyzer settings:**

Set analyzer center frequency to the nominal EUT channel frequency

Span set to between 1.5 and 5.0 times the DTS bandwidth

RBW to: 1% to 5% of the OBW

VBW  $\geq$  3 RBW

Detector = Peak

Sweep time = auto couple

Trace mode = max hold

Use the 99% power bandwidth function of the instrument.

#### **Sample Calculations:**

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

### 9.3.3 Limit:

Reporting and measurement purposes only.

### 9.3.4 Test Results:

| Chain 0 802.11b 99% Bandwidth (MHz) |                 |                     |
|-------------------------------------|-----------------|---------------------|
| Channel No.                         | Frequency (MHz) | 99% Bandwidth (MHz) |
| 1                                   | 2412            | 13.79               |
| 6                                   | 2437            | 13.82               |
| 11                                  | 2462            | 13.84               |
| 12                                  | 2467            | 13.84               |
| 13                                  | 2472            | 13.85               |
| Chain 0 802.11g 99% Bandwidth (MHz) |                 |                     |
| Channel No.                         | Frequency (MHz) | 99% Bandwidth (MHz) |
| 1                                   | 2412            | 16.82               |
| 6                                   | 2437            | 16.90               |
| 11                                  | 2462            | 16.86               |
| 12                                  | 2467            | 16.88               |
| 13                                  | 2472            | 16.81               |
| Chain 0 802.11n 99% Bandwidth (MHz) |                 |                     |
| Channel No.                         | Frequency (MHz) | 99% Bandwidth (MHz) |
| 1                                   | 2412            | 18.02               |
| 6                                   | 2437            | 18.03               |
| 11                                  | 2462            | 18.02               |
| 12                                  | 2467            | 17.99               |
| 13                                  | 2472            | 18.04               |
| Chain 0 802.11n 99% Bandwidth (MHz) |                 |                     |
| Channel No.                         | Frequency (MHz) | 99% Bandwidth (MHz) |
| 3                                   | 2422            | 36.62               |
| 7                                   | 2442            | 36.53               |
| 9                                   | 2452            | 36.54               |
| 10                                  | 2457            | 36.61               |
| 11                                  | 2462            | 36.62               |

| Chain 1 802.11b 99% Bandwidth (MHz) |                 |                     |
|-------------------------------------|-----------------|---------------------|
| Channel No.                         | Frequency (MHz) | 99% Bandwidth (MHz) |
| 1                                   | 2412            | 13.80               |
| 6                                   | 2437            | 13.81               |
| 11                                  | 2462            | 13.80               |
| 12                                  | 2467            | 13.81               |
| 13                                  | 2472            | 13.78               |
| Chain 1 802.11g 99% Bandwidth (MHz) |                 |                     |
| Channel No.                         | Frequency (MHz) | 99% Bandwidth (MHz) |
| 1                                   | 2412            | 16.89               |
| 6                                   | 2437            | 16.95               |
| 11                                  | 2462            | 16.94               |
| 12                                  | 2467            | 16.93               |
| 13                                  | 2472            | 16.85               |
| Chain 1 802.11n 99% Bandwidth (MHz) |                 |                     |
| Channel No.                         | Frequency (MHz) | 99% Bandwidth (MHz) |
| 1                                   | 2412            | 18.04               |
| 6                                   | 2437            | 18.02               |
| 11                                  | 2462            | 18.01               |
| 12                                  | 2467            | 18.01               |
| 13                                  | 2472            | 18.01               |
| Chain 1 802.11n 99% Bandwidth (MHz) |                 |                     |
| Channel No.                         | Frequency (MHz) | 99% Bandwidth (MHz) |
| 3                                   | 2422            | 36.59               |
| 7                                   | 2442            | 36.59               |
| 9                                   | 2452            | 36.57               |
| 10                                  | 2457            | 36.59               |
| 11                                  | 2462            | 36.63               |

### 9.3.5 Test Data:

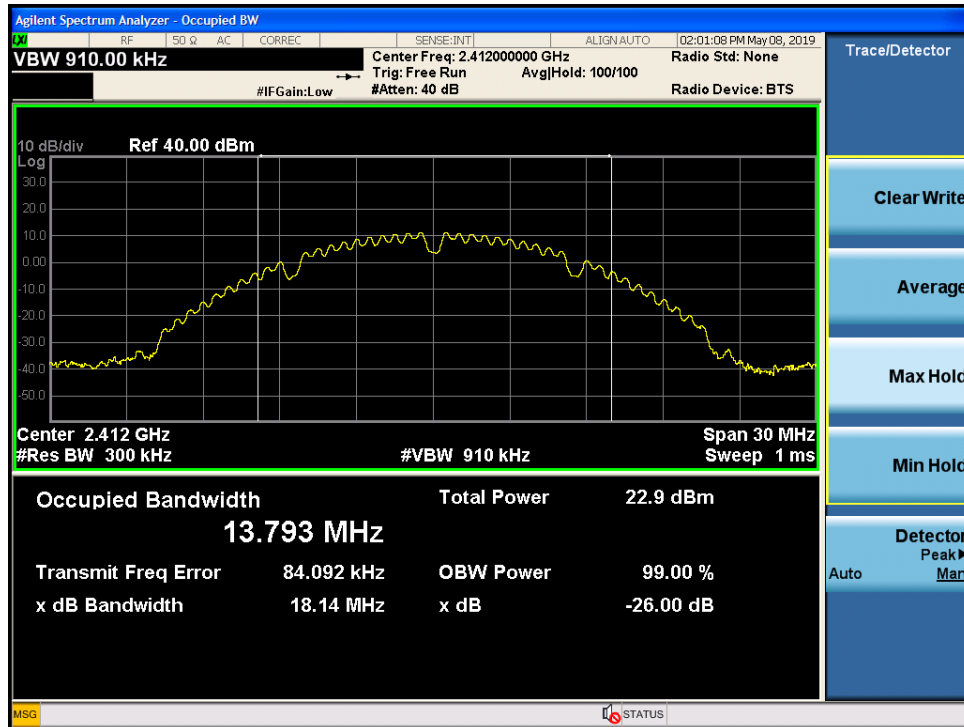


Figure 9-49 Chain 0 99% Bandwidth 802.11b - Ch.1

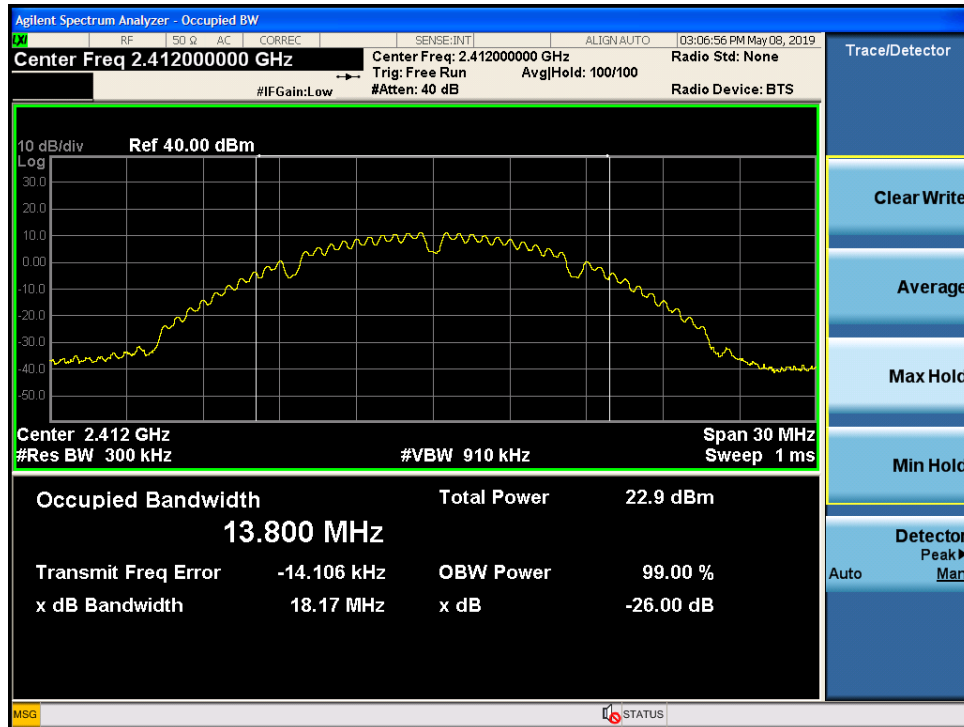


Figure 9-50 Chain 1 99% Bandwidth 802.11b - Ch.1

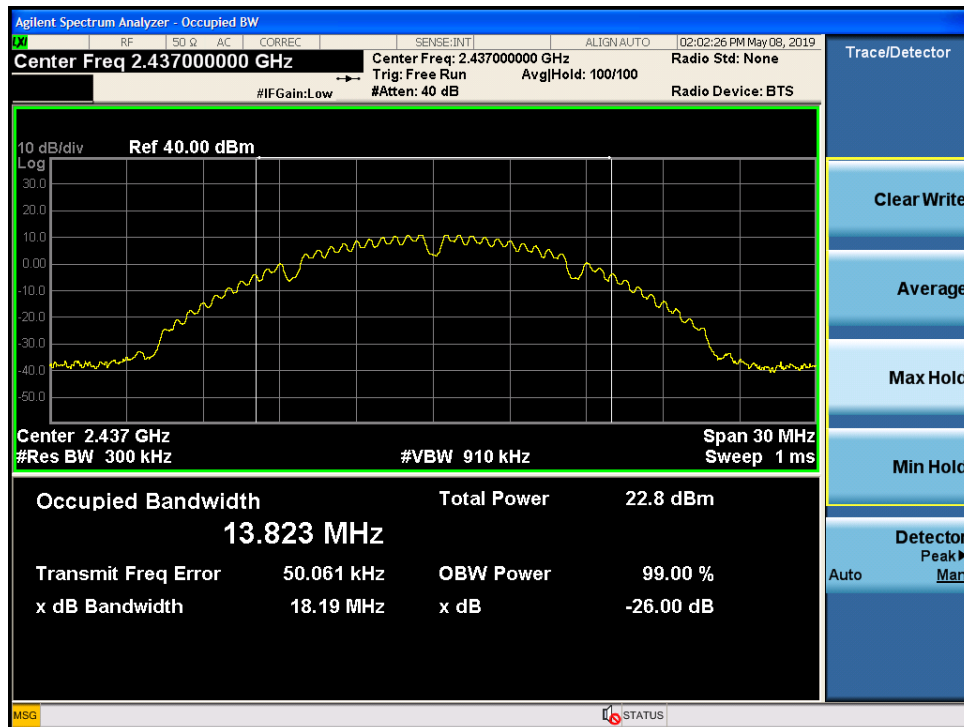


Figure 9-51 Chain 0 99% Bandwidth 802.11b - Ch.6

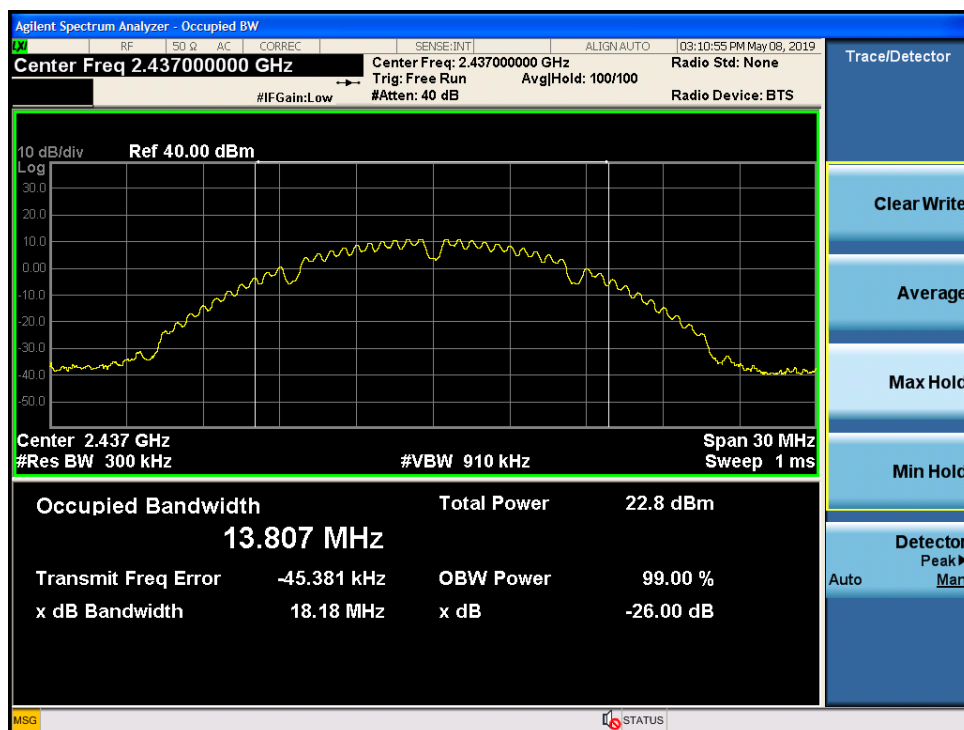


Figure 9-52 Chain 1 99% Bandwidth 802.11b - Ch.6

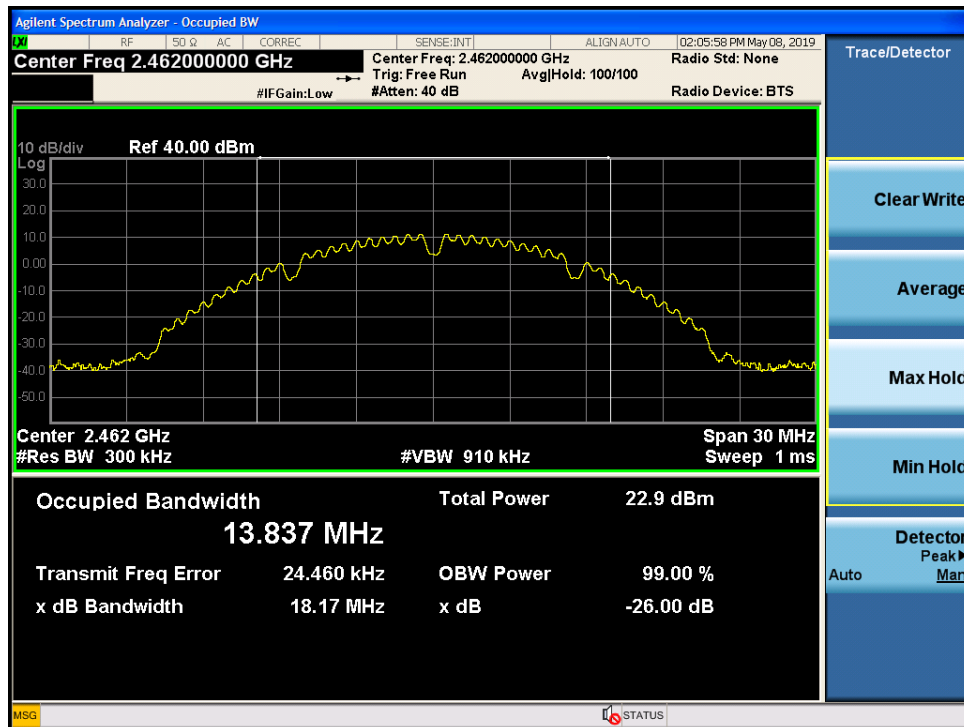


Figure 9-53 Chain 0 99% Bandwidth 802.11b - Ch.11

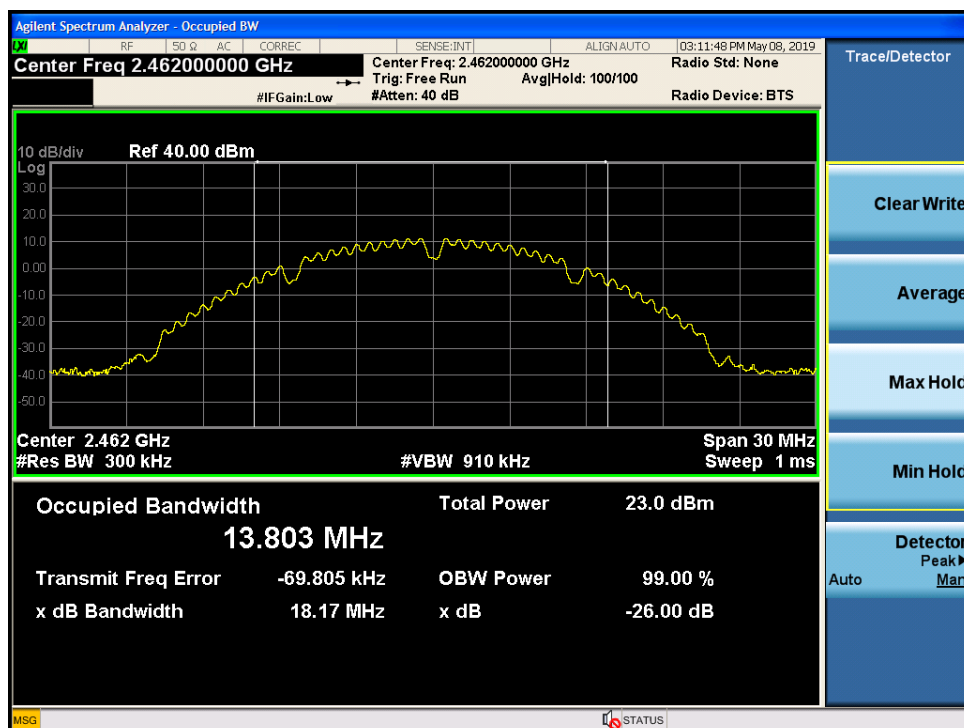


Figure 9-54 Chain 1 99% Bandwidth 802.11b - Ch.11

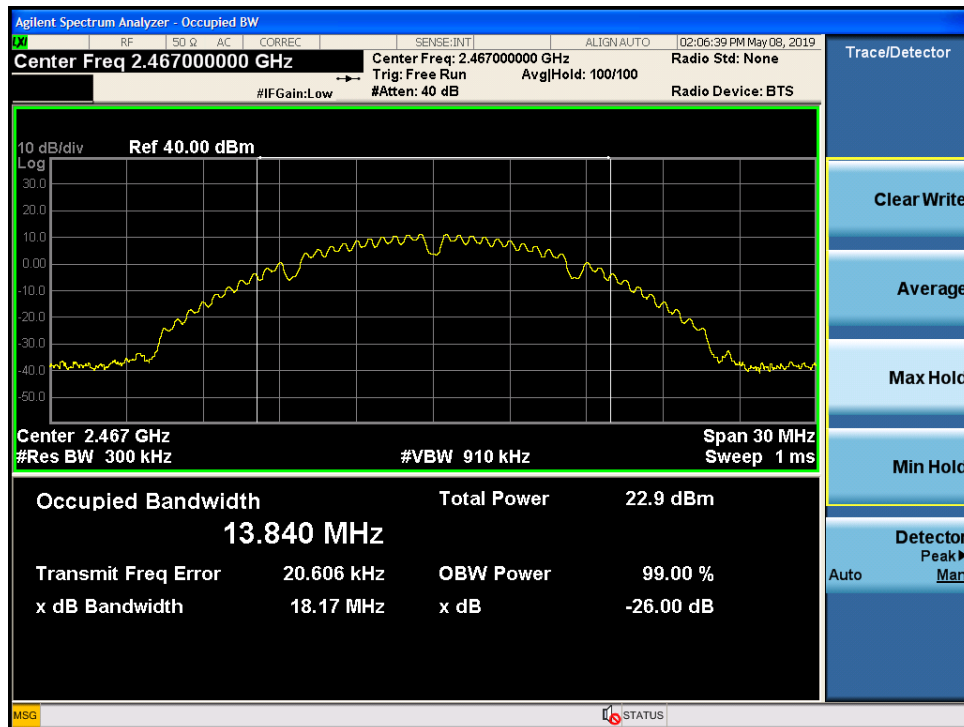


Figure 9-55 Chain 0 99% Bandwidth 802.11b - Ch.12



Figure 9-56 Chain 1 99% Bandwidth 802.11b - Ch.12

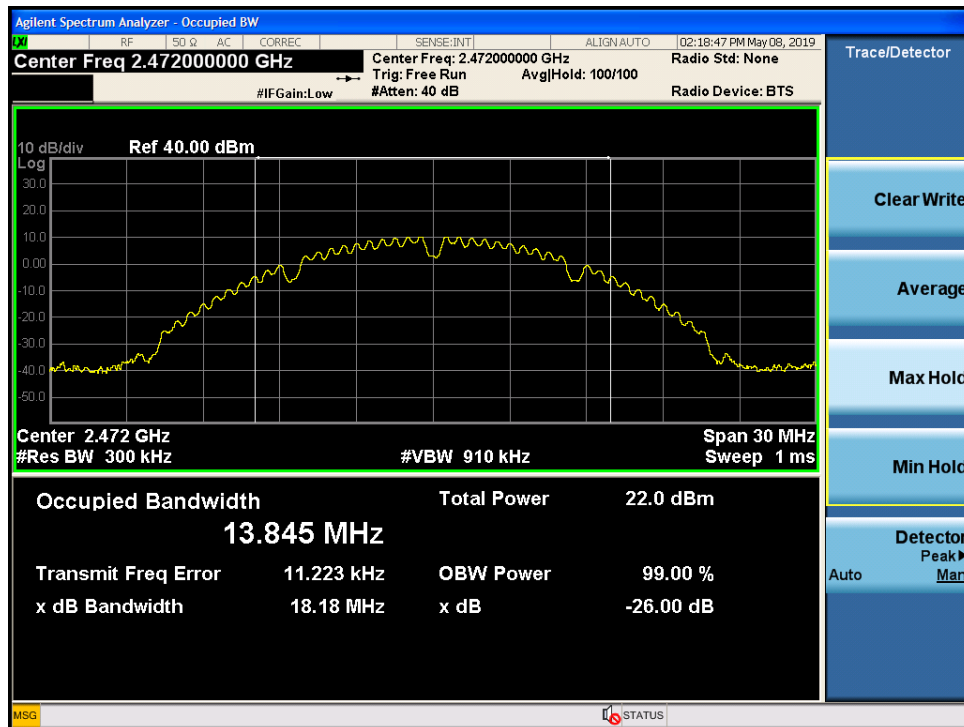


Figure 9-57 Chain 0 99% Bandwidth 802.11b - Ch.13

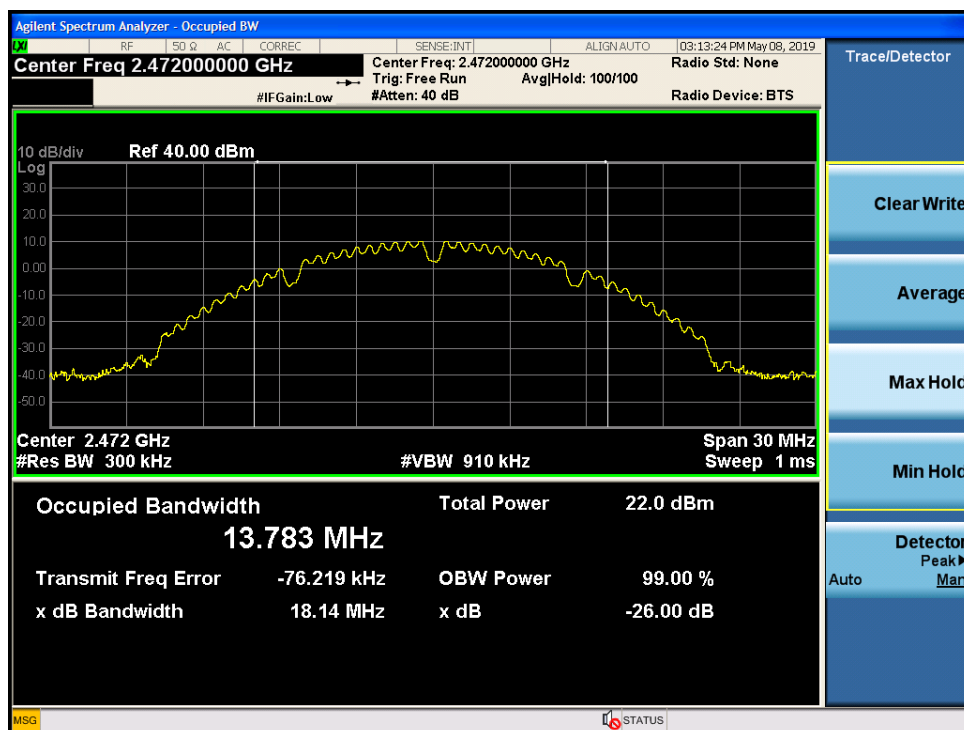


Figure 9-58 Chain 1 99% Bandwidth 802.11b - Ch.13

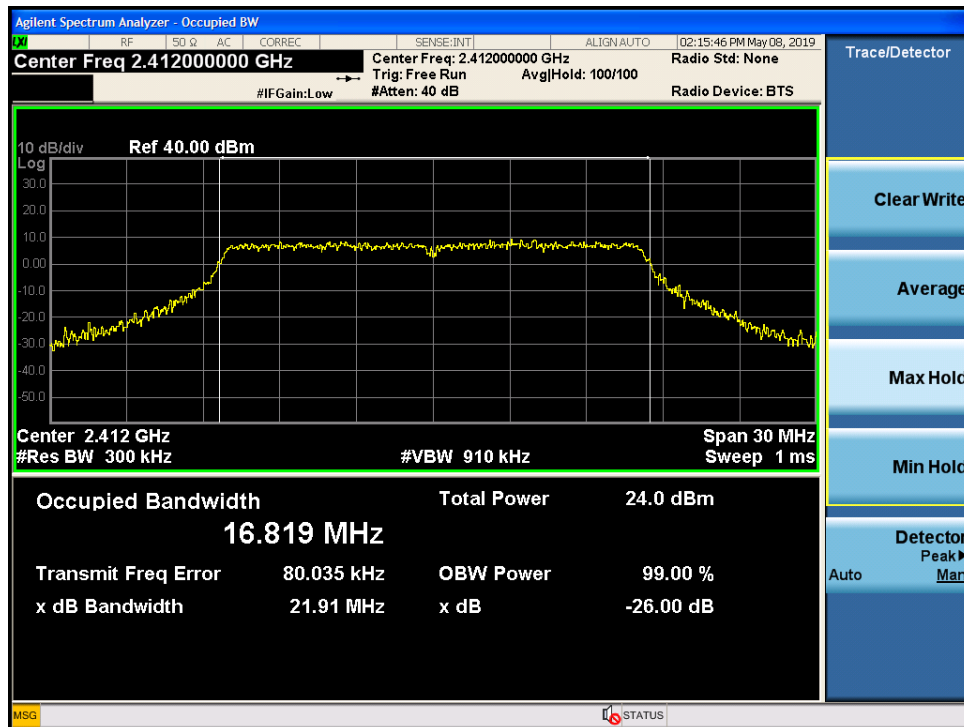


Figure 9-59 Chain 0 99% Bandwidth 802.11g - Ch.1

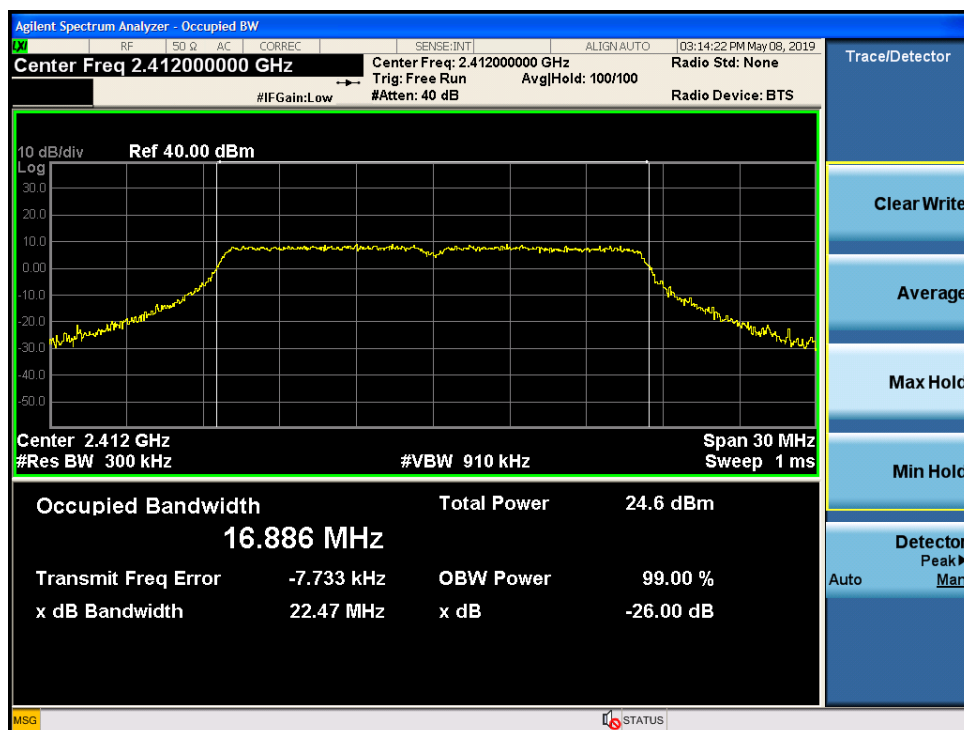


Figure 9-60 Chain 1 99% Bandwidth 802.11g - Ch.1

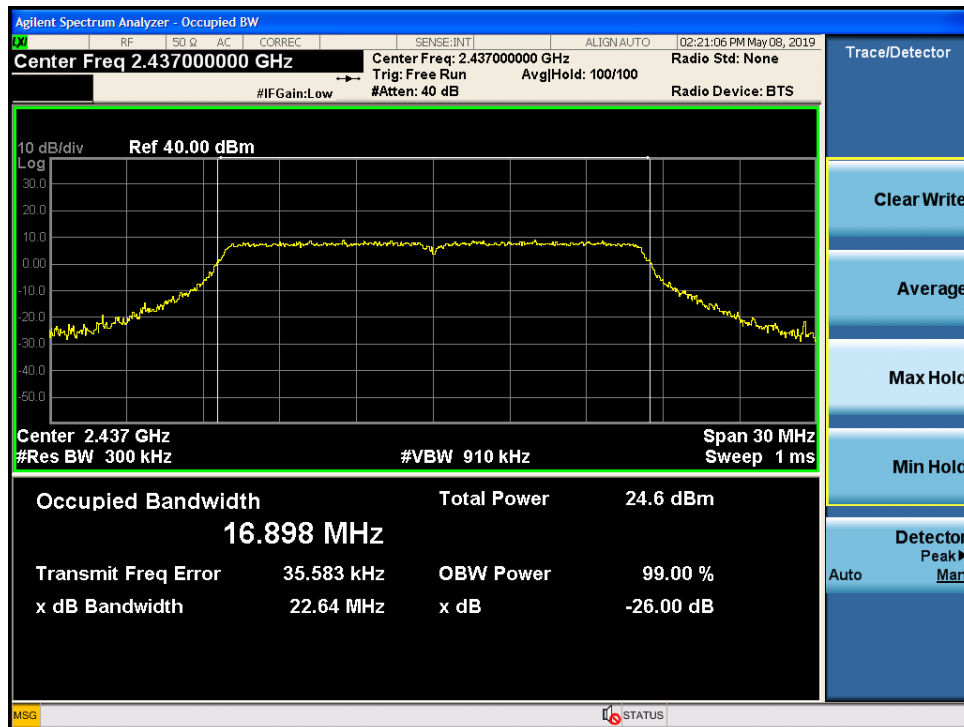


Figure 9-61 Chain 0 99% Bandwidth 802.11g - Ch.6

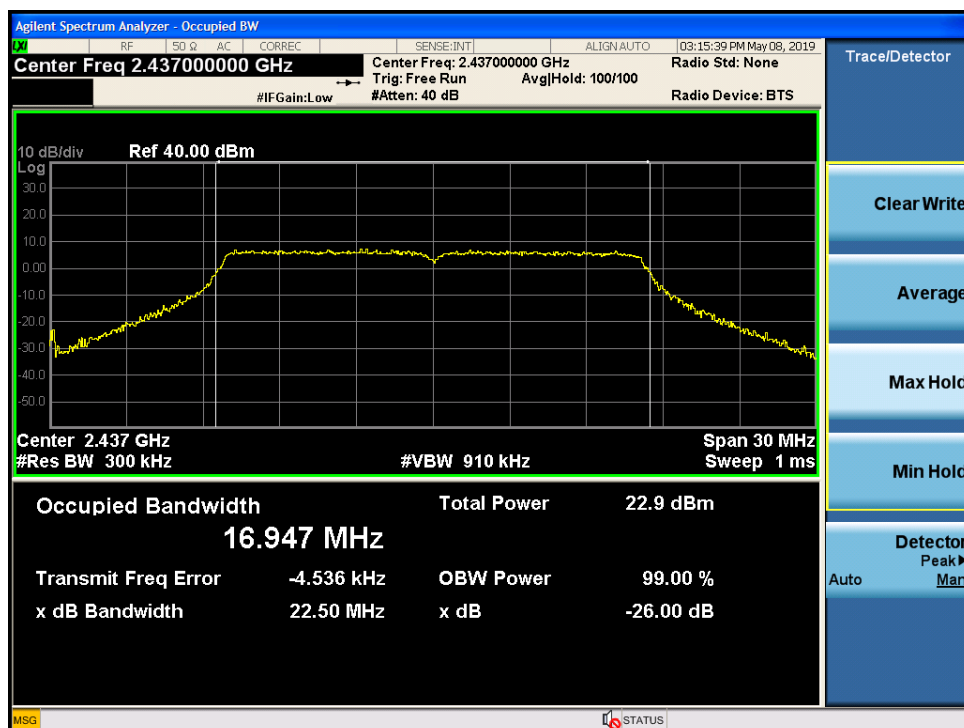


Figure 9-62 Chain 1 99% Bandwidth 802.11g - Ch.6

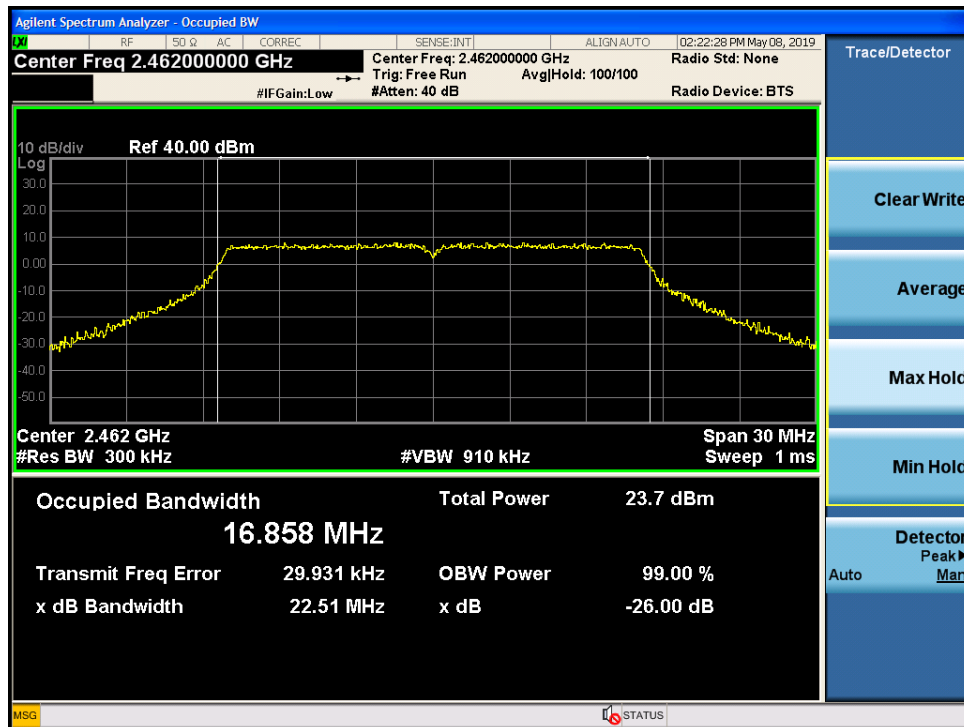


Figure 9-63 Chain 0 99% Bandwidth 802.11g- Ch.11

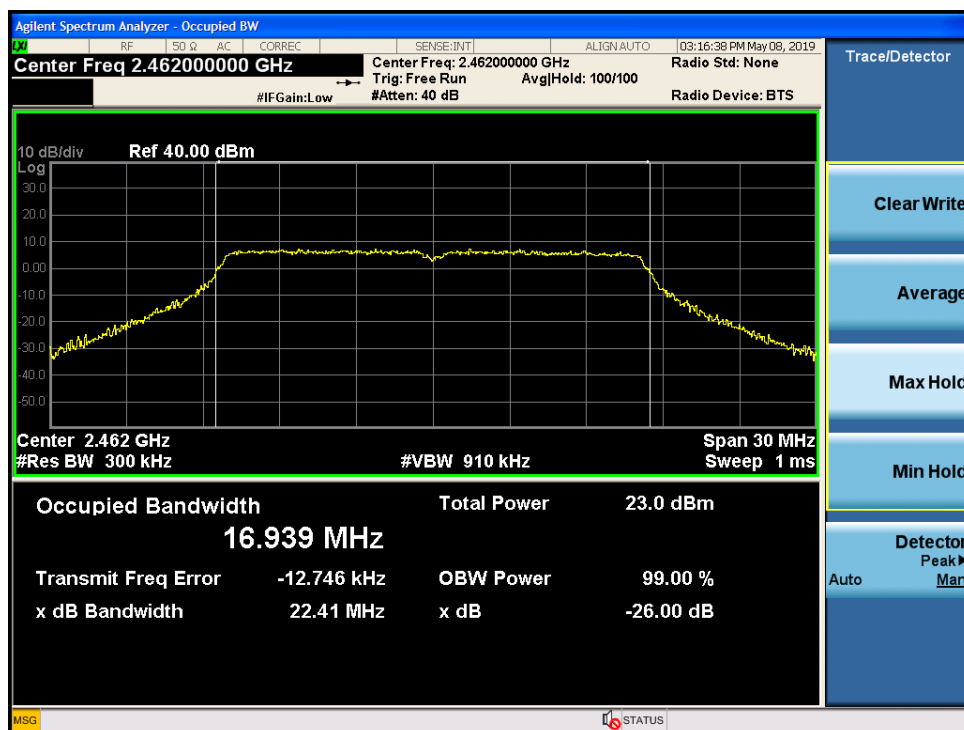


Figure 9-64 Chain 1 99% Bandwidth 802.11g- Ch.11

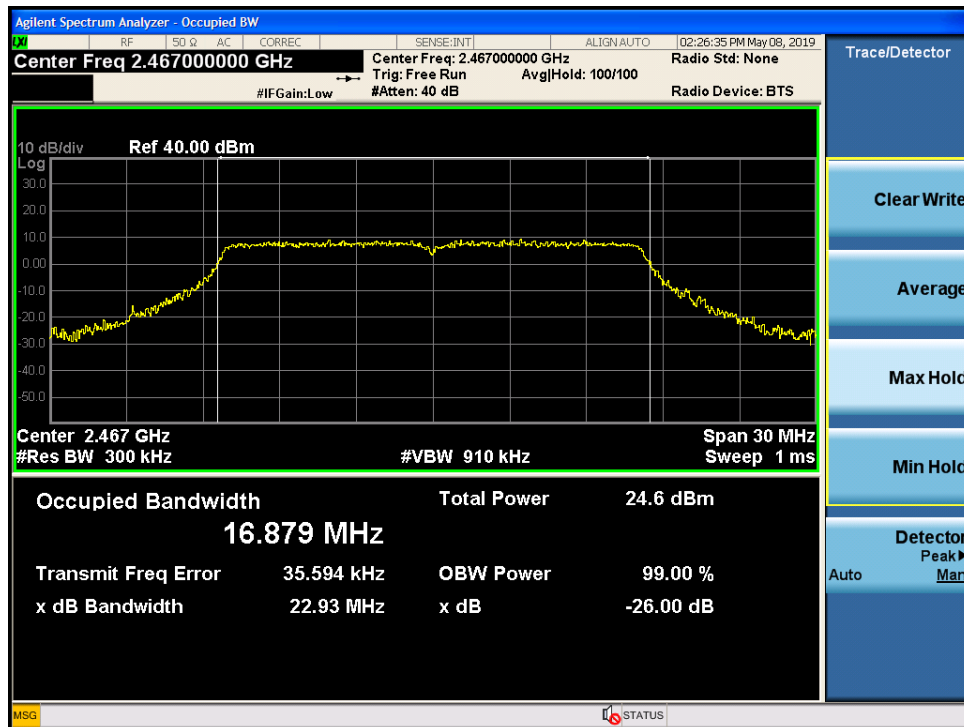


Figure 9-65 Chain 0 99% Bandwidth 802.11g- Ch.12

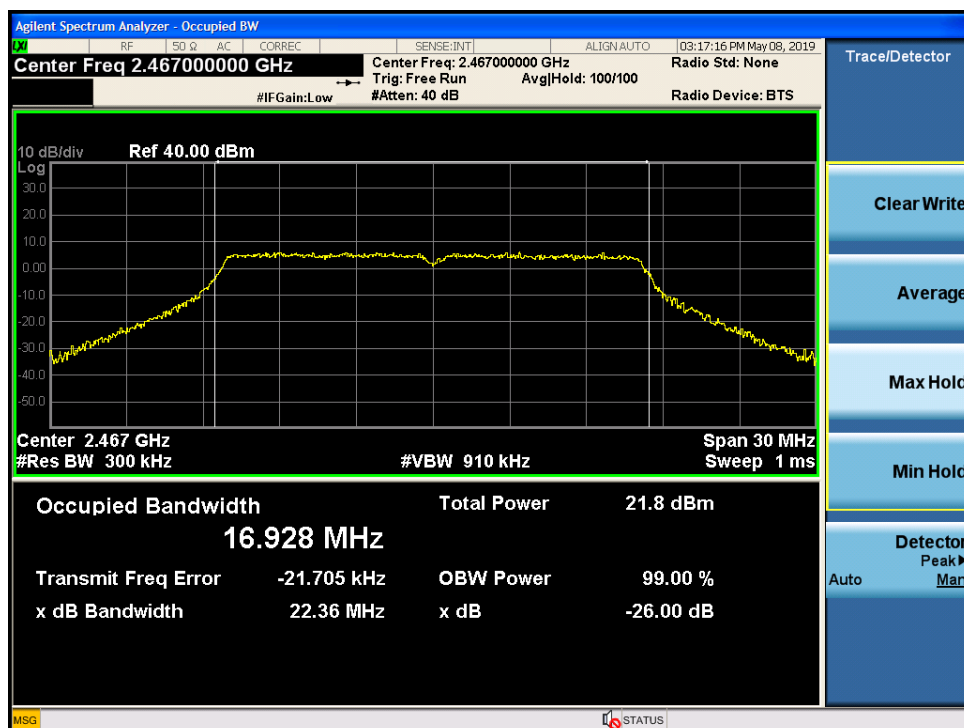


Figure 9-66 Chain 1 99% Bandwidth 802.11g- Ch.12

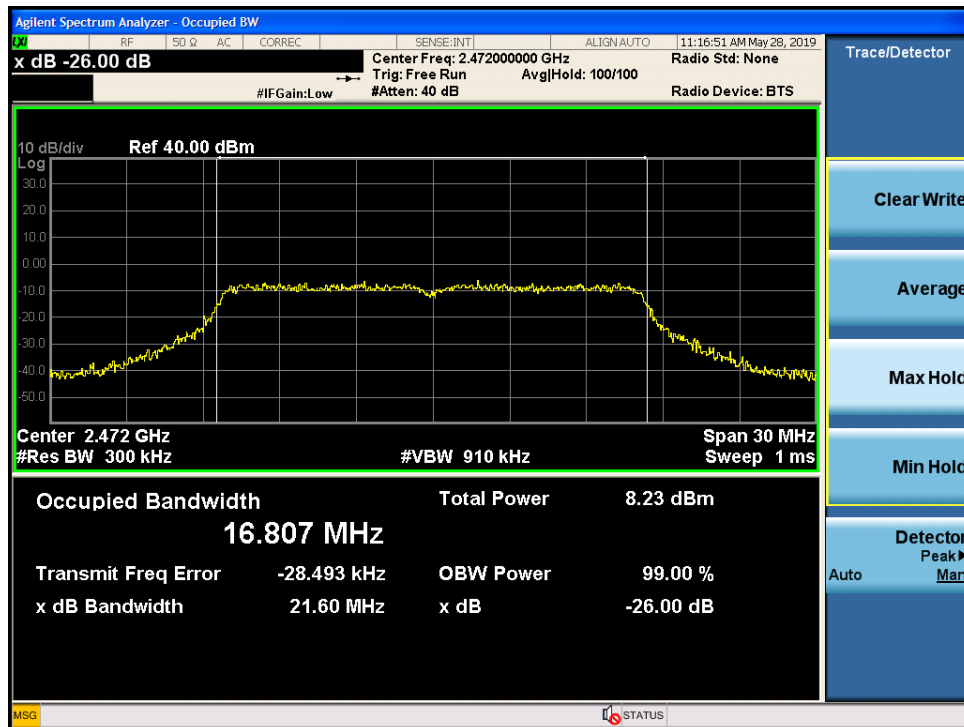


Figure 9-67 Chain 0 99% Bandwidth 802.11g - Ch.13

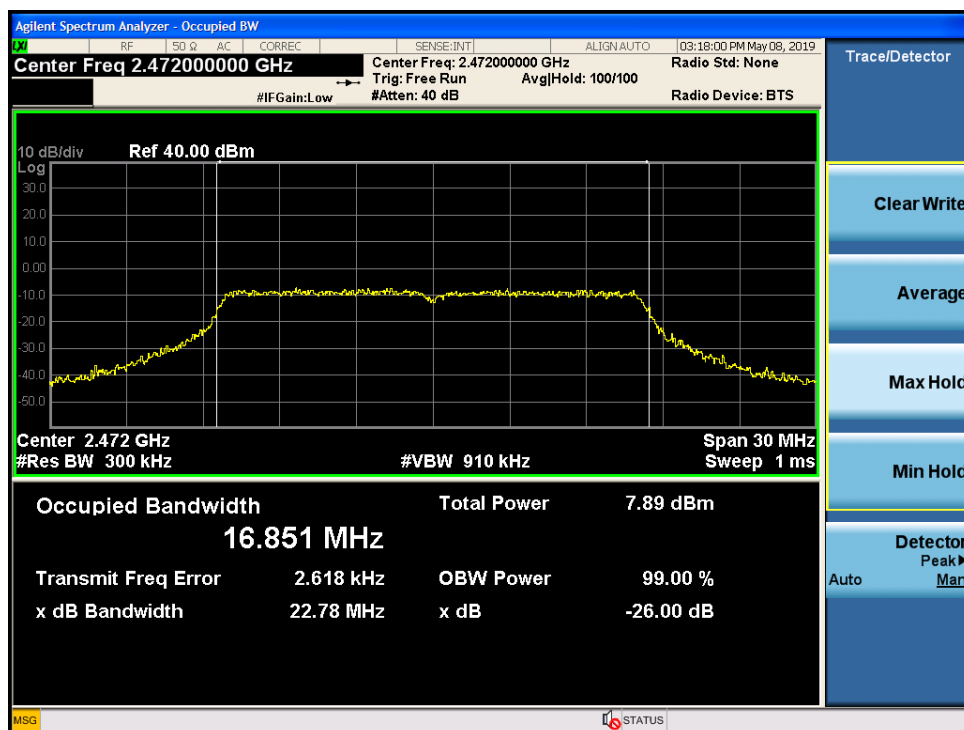


Figure 9-68 Chain 1 99% Bandwidth 802.11g - Ch.13

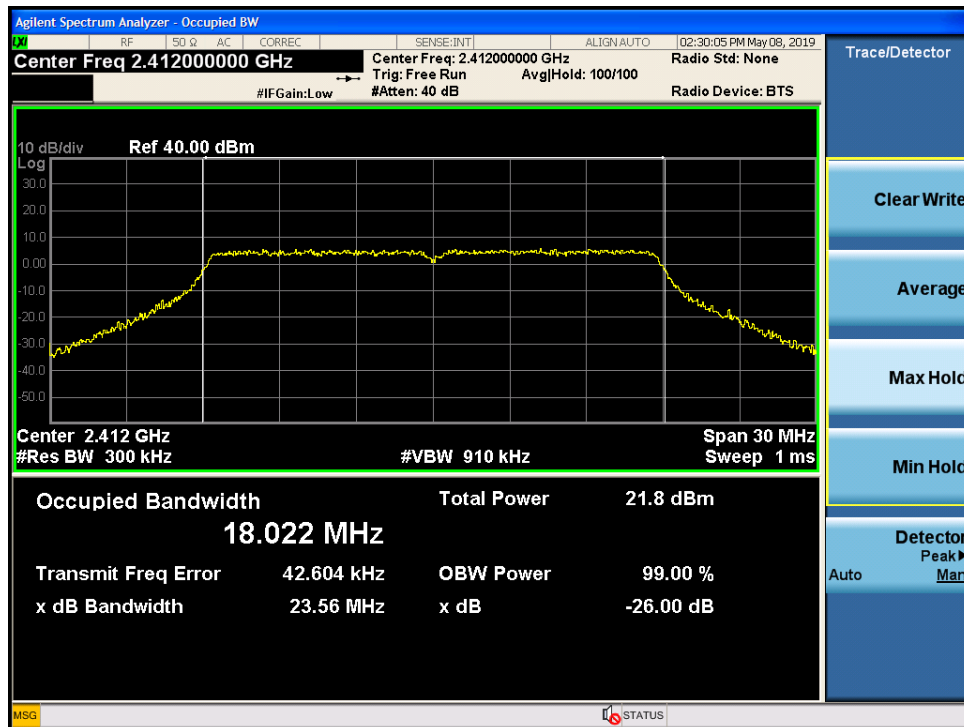


Figure 9-69 Chain 0 99% Bandwidth 802.11g - Ch.1

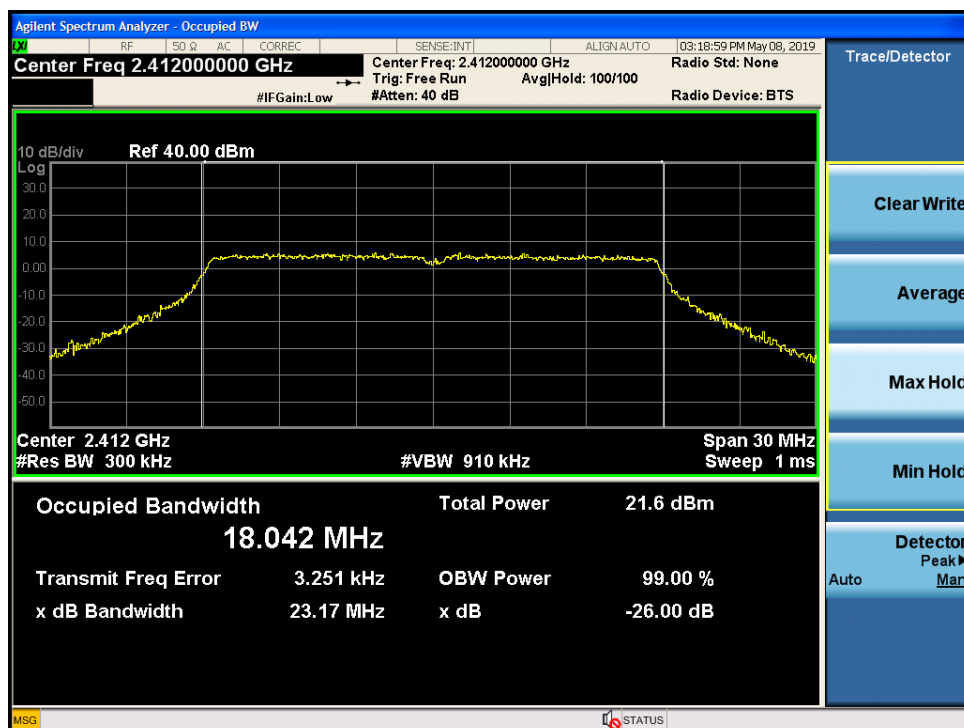


Figure 9-70 Chain 1 99% Bandwidth 802.11n20 - Ch.1

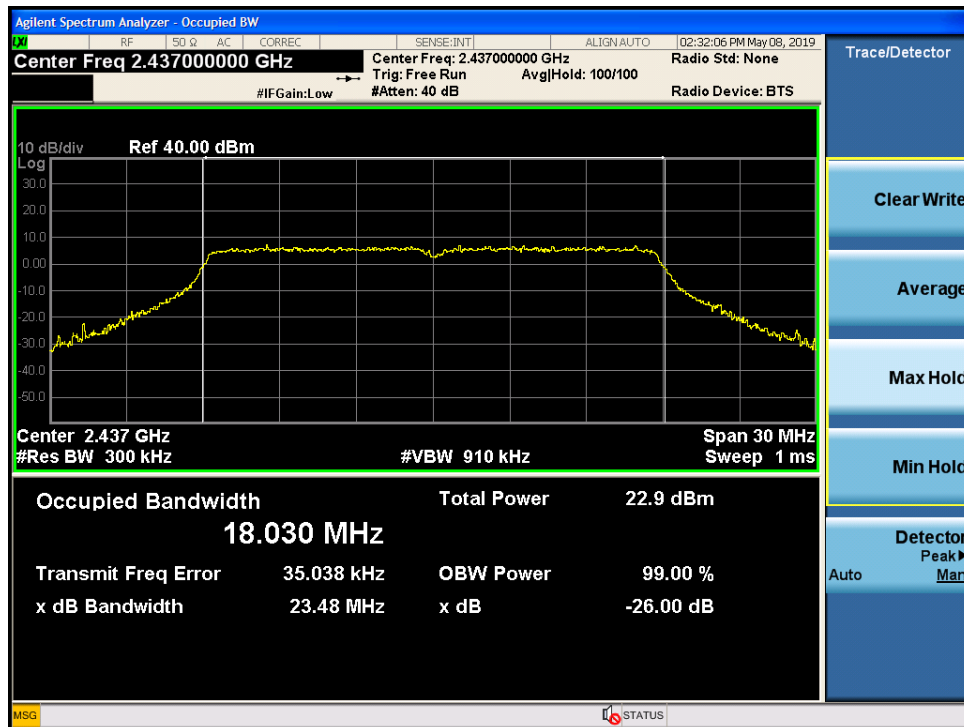


Figure 9-71 Chain 0 99% Bandwidth 802.11n20 - Ch.6

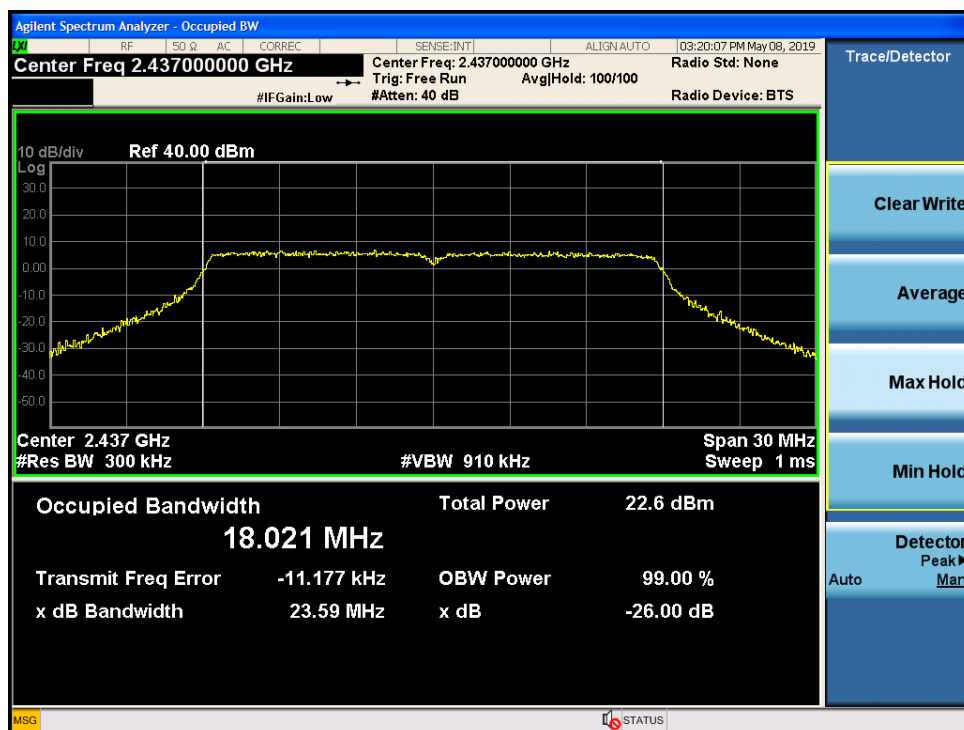


Figure 9-72 Chain 1 99% Bandwidth 802.11n20 - Ch.6

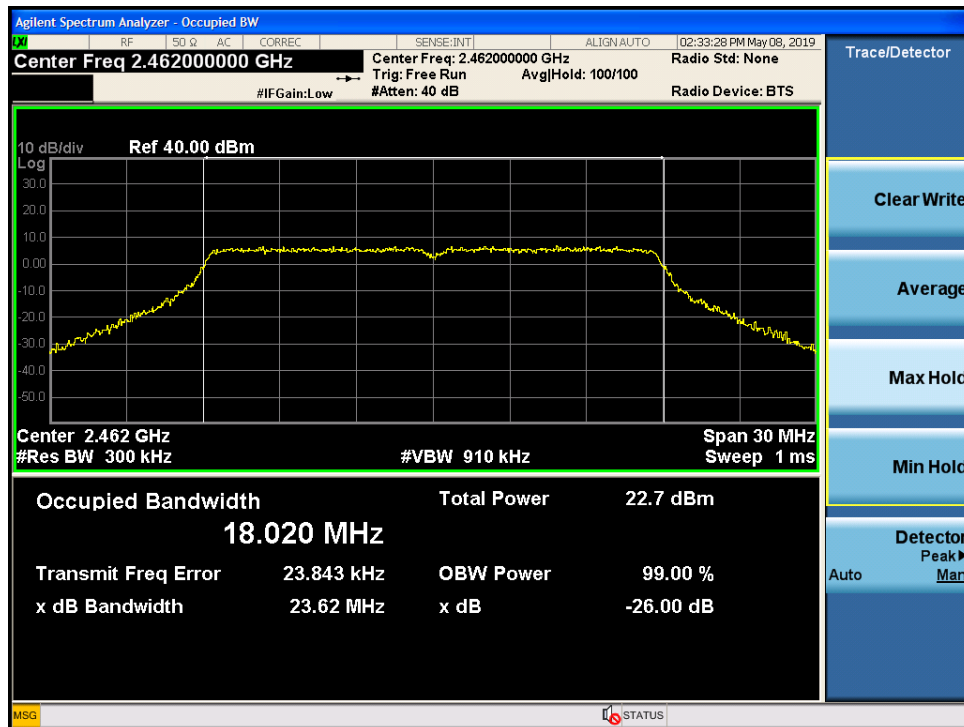


Figure 9-73 Chain 0 99% Bandwidth 802.11n20 - Ch.11

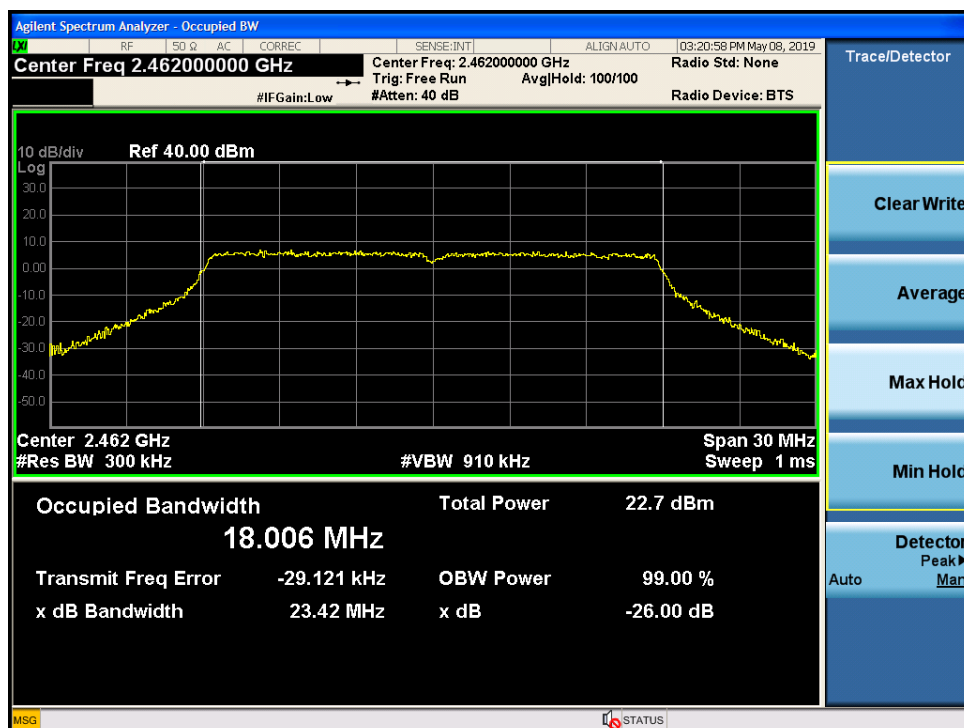


Figure 9-74 Chain 1 99% Bandwidth 802.11n20 - Ch.11

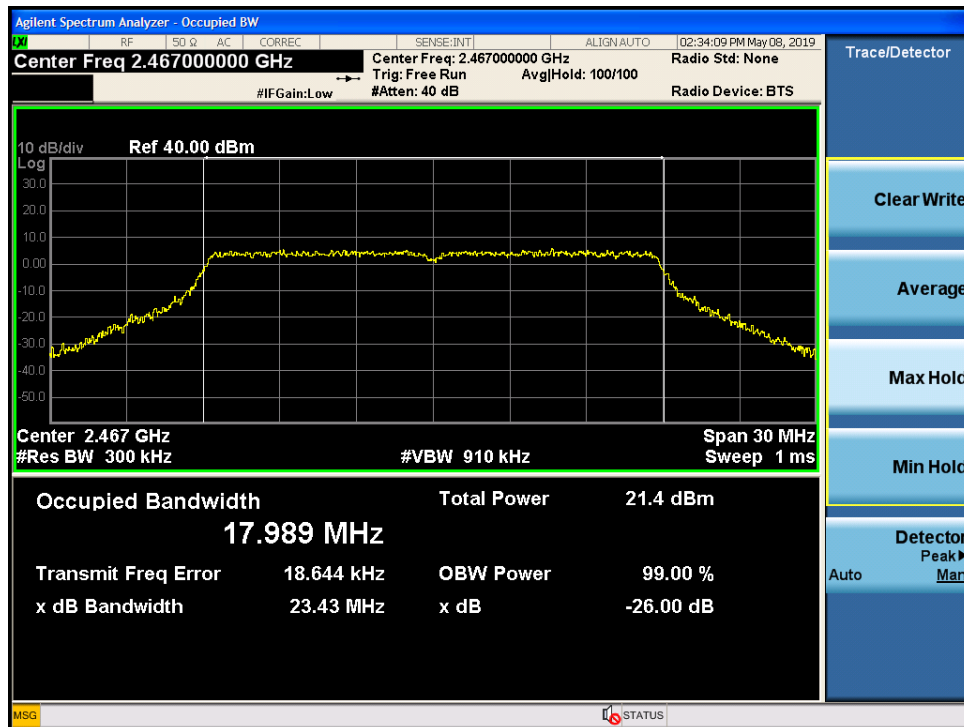


Figure 9-75 Chain 0 99% Bandwidth 802.11n20 - Ch.12

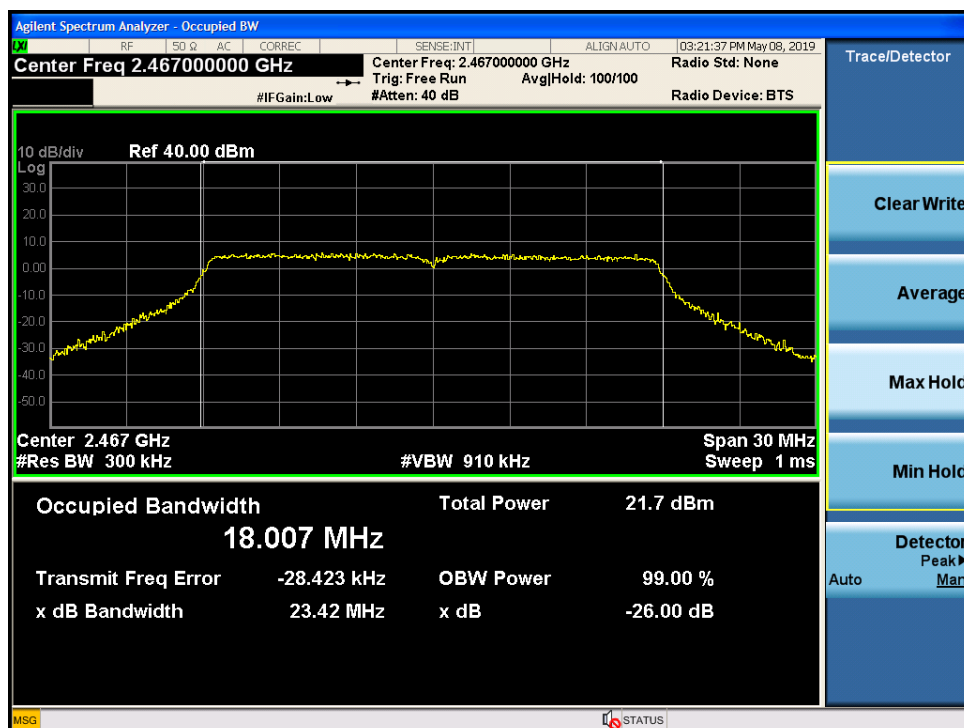


Figure 9-76 Chain 1 99% Bandwidth 802.11n20 - Ch.12

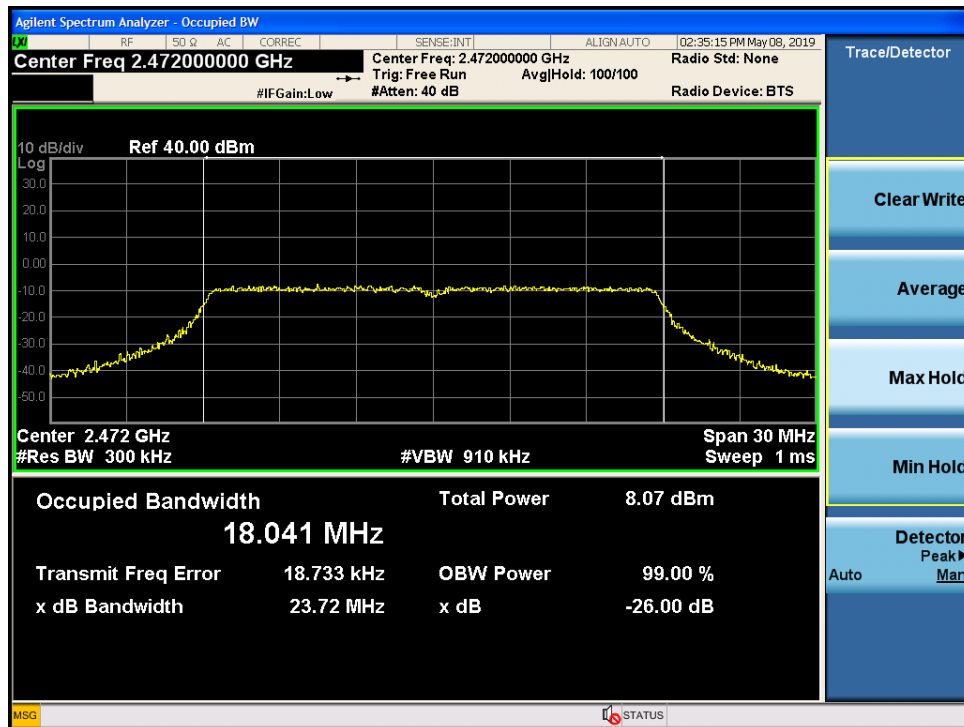


Figure 9-77 Chain 0 99% Bandwidth 802.11n20 - Ch.13

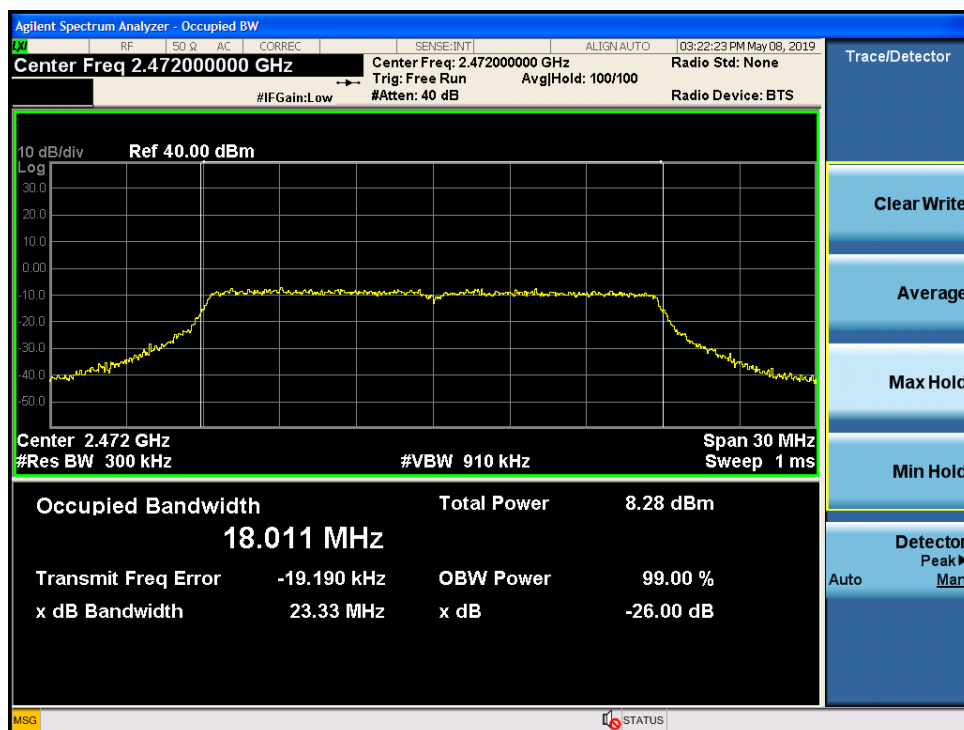


Figure 9-78 Chain 1 99% Bandwidth 802.11n20 - Ch.13

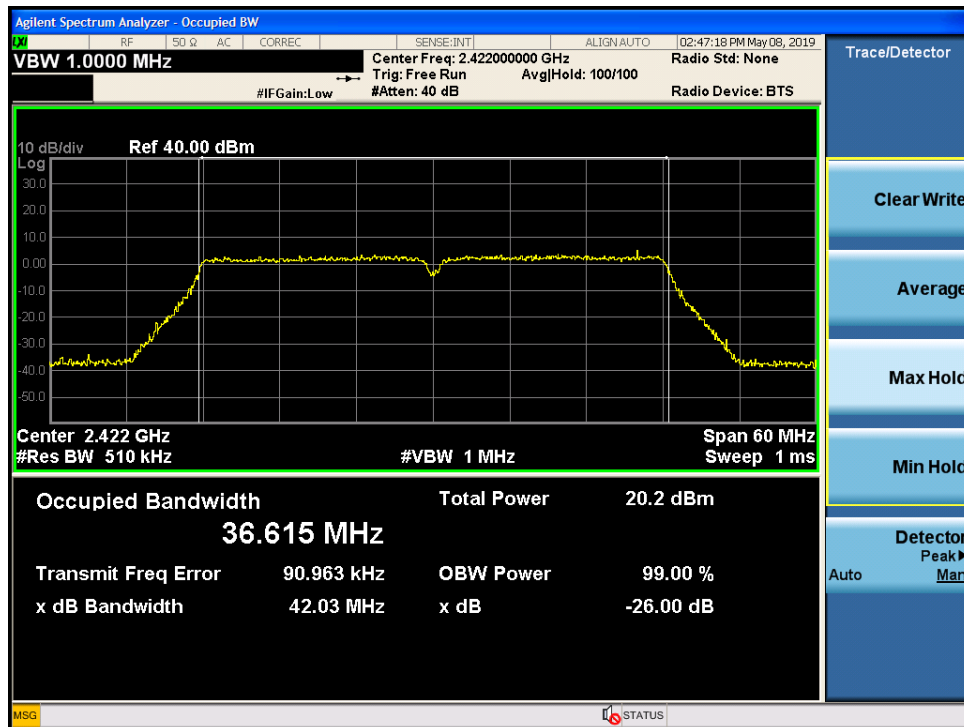


Figure 9-79 Chain 0 99% Bandwidth 802.11n40 - Ch.3

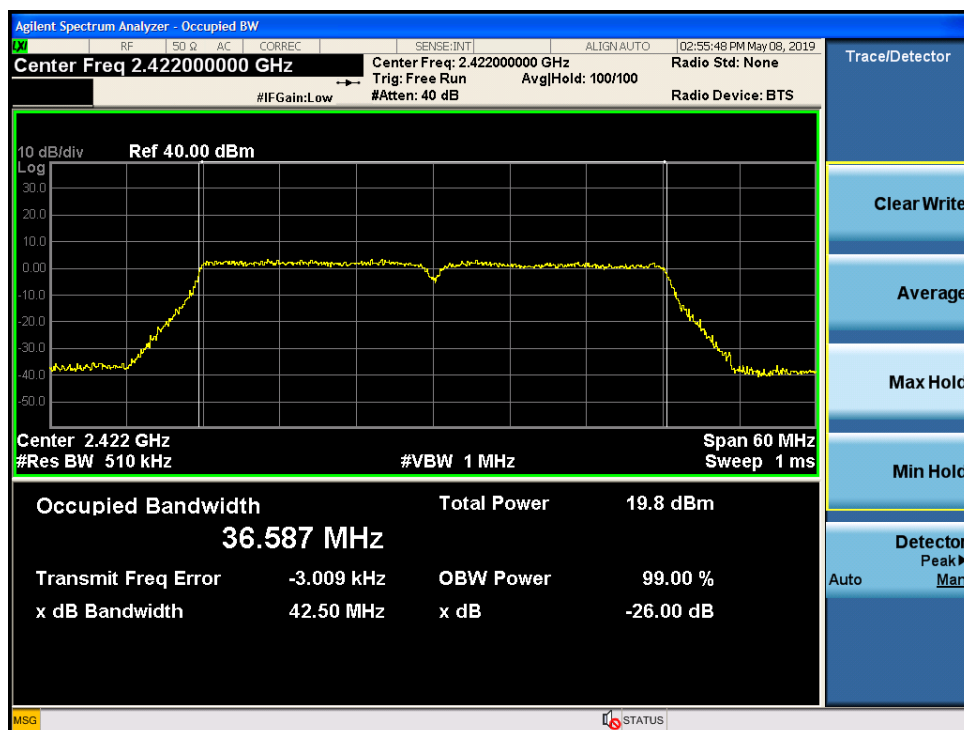


Figure 9-80 Chain 1 99% Bandwidth 802.11n40 - Ch.3

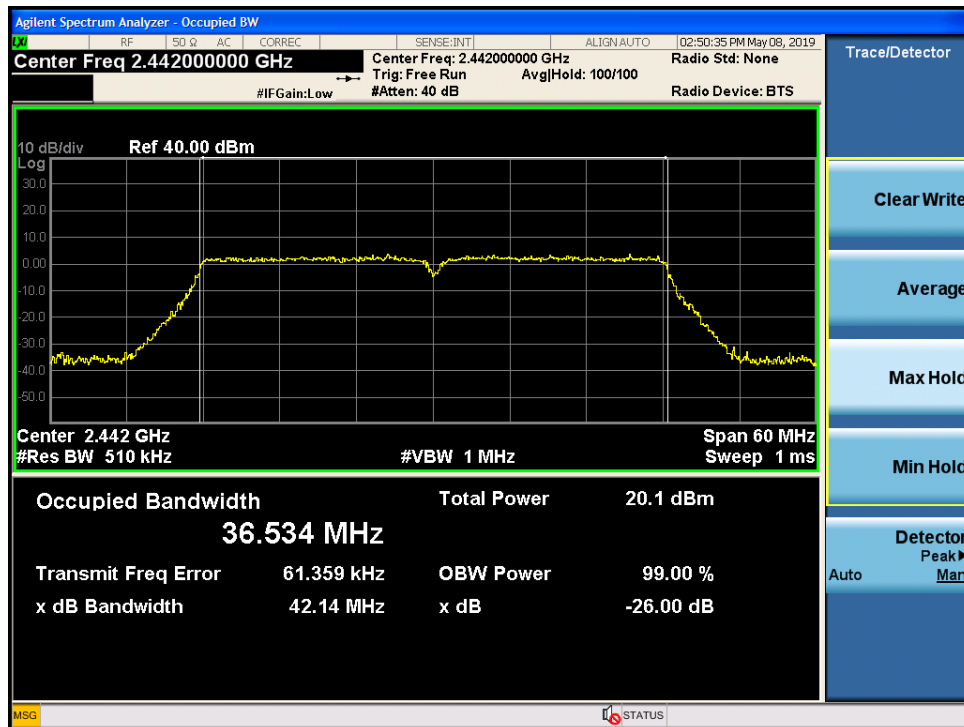


Figure 9-81 Chain 0 99% Bandwidth 802.11n40 - Ch.7

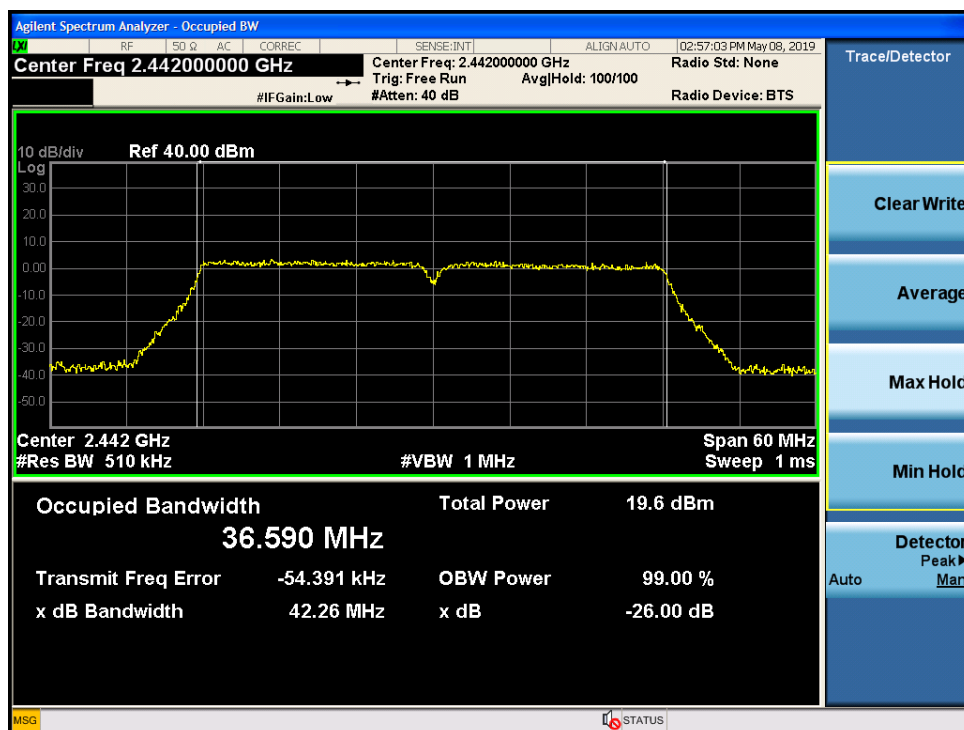


Figure 9-82 Chain 1 99% Bandwidth 802.11n40 - Ch.7

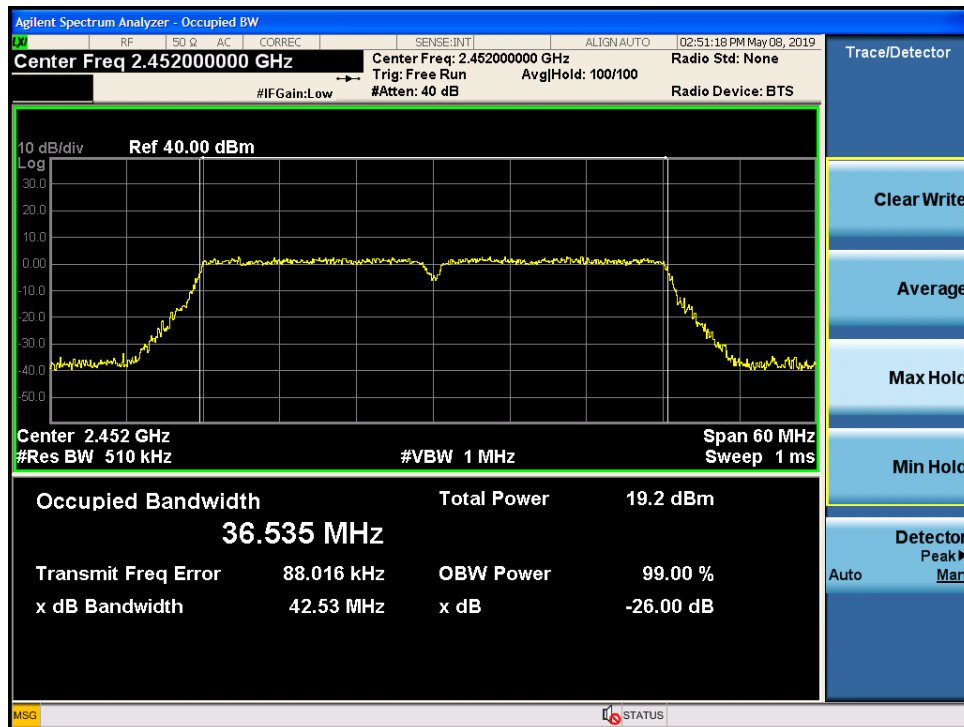


Figure 9-83 Chain 0 99% Bandwidth 802.11n40 - Ch.9

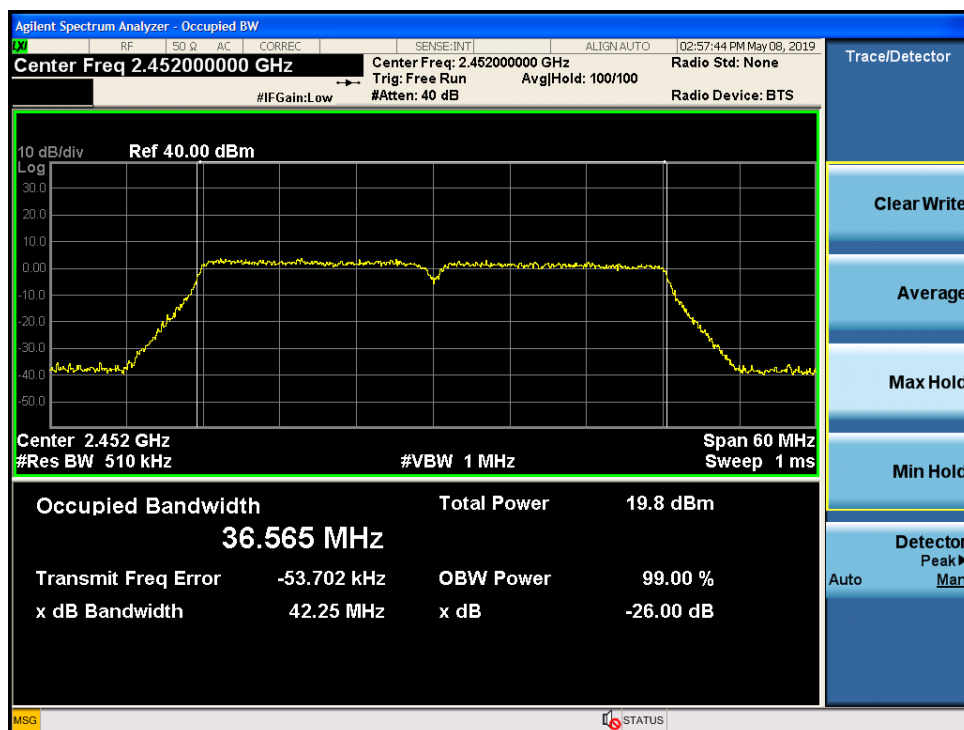


Figure 9-84 Chain 1 99% Bandwidth 802.11n40 - Ch.9

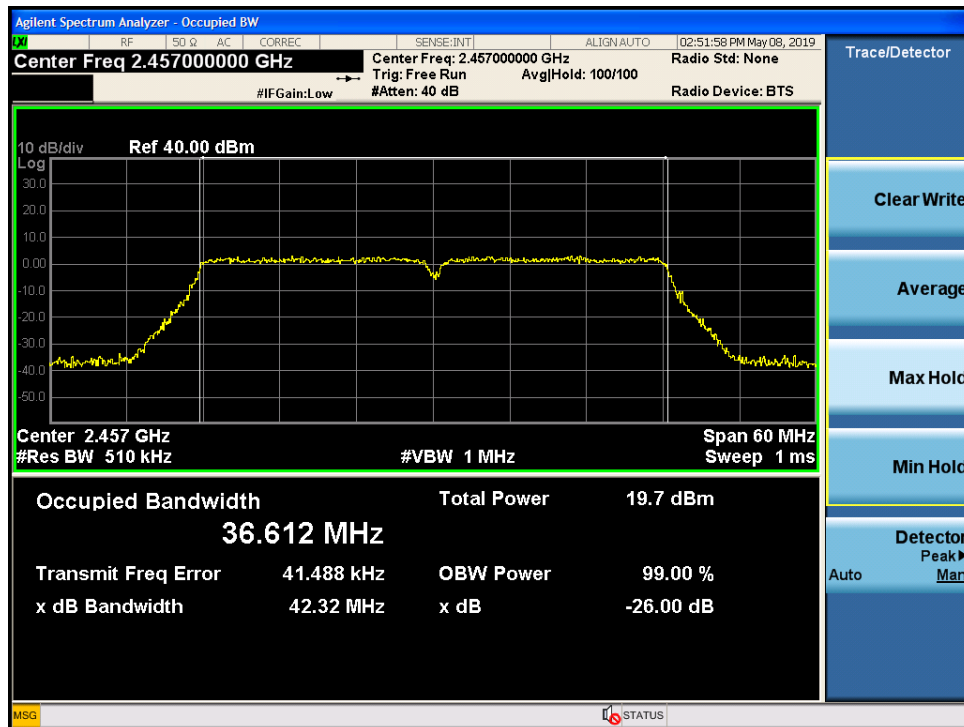


Figure 9-85 Chain 0 99% Bandwidth 802.11n40 - Ch.10

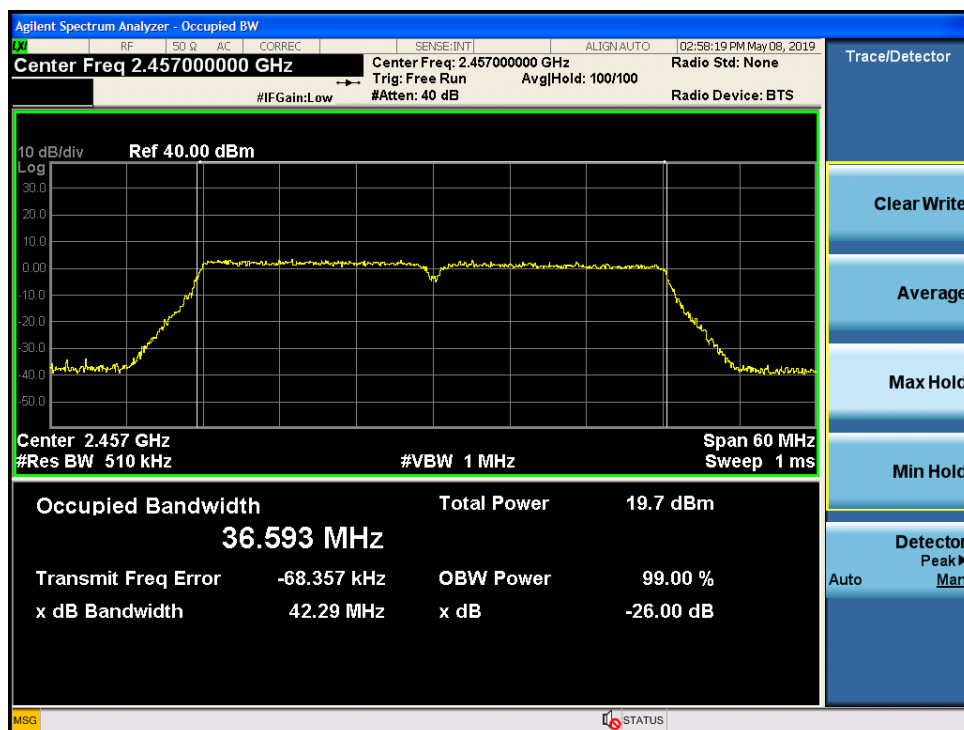


Figure 9-86 Chain 1 99% Bandwidth 802.11n40 - Ch.10

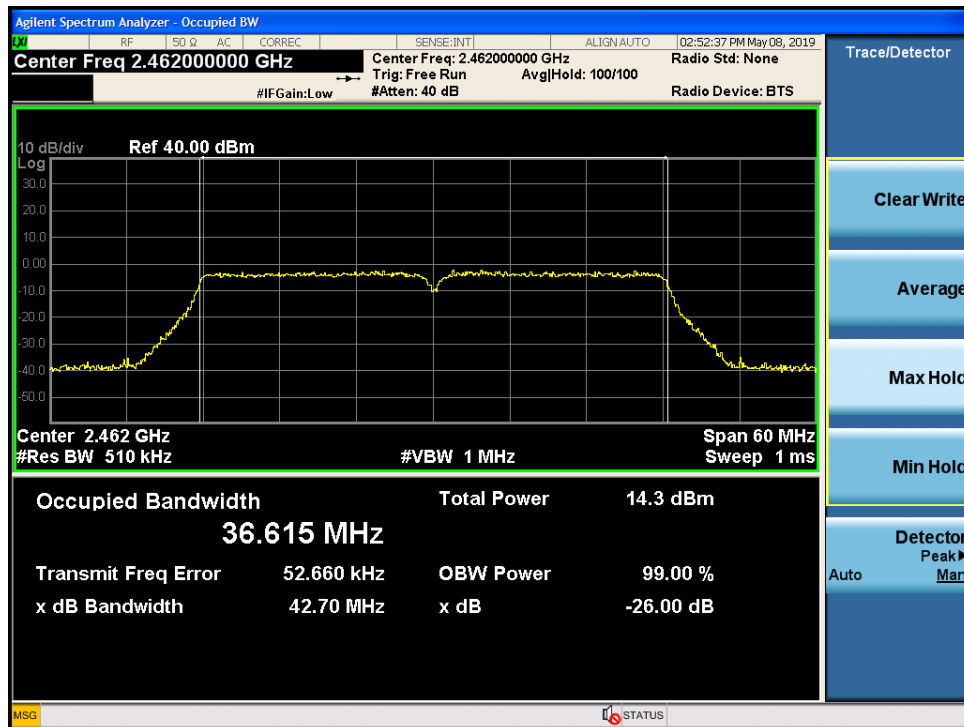


Figure 9-87 Chain 0 99% Bandwidth 802.11n40 - Ch.11

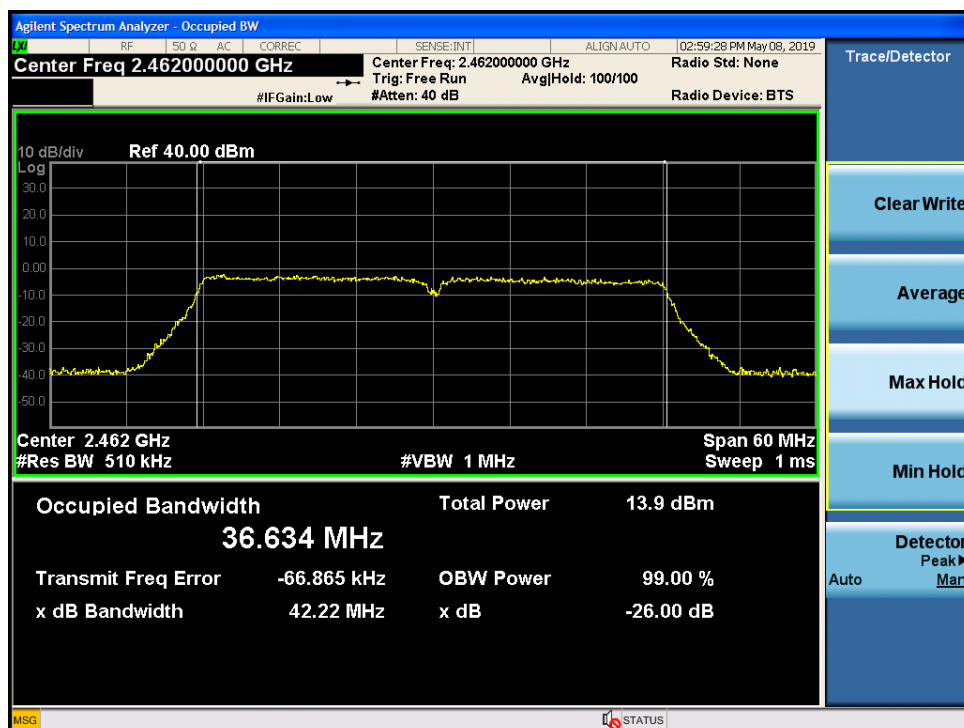


Figure 9-88 Chain 1 99% Bandwidth 802.11n40 - Ch.11

## 9.4 Output Power

### 9.4.1 Test Requirement:

FCC CFR 47 Rule Part 15.247 (b)(3)

ISED RSS-247 [5.4]

### 9.4.2 Test Method:

Measurements were performed according to the procedure defined in KDB 558074- Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 V05 and ANSI C63.10: 2013.

### 9.4.3 Sample Calculation:

For MIMO, the total average power is calculated as follows,

$$\text{Total Average Power} = [10 \cdot \log((10^{\text{Power}_{(\text{Chain } 0)}/10}) + 10^{\text{Power}_{(\text{Chain } 1)}/10})] + \text{DCF}$$

For e.g.

$$\text{Total Power} = [10 \cdot \log(10^{(17.54/10)} + 10^{(17.36/10)})] + \text{DCF} = (20.46 + 0.14) = 20.6 \text{ dBm}$$

### 9.4.4 Limits:

15.247: The maximum permissible peak output power is 30 dBm (1 W)

RSS-247: The maximum peak conducted output power shall not exceed 30dBm (1 W) and the maximum radiated output power shall not exceed 36dBm (4 W) EIRP.

#### 9.4.5 Test Results:

| 802.11 mode | Frequency (MHz) | Chain 0 Conducted Output power (dBm) | Chain 1 Conducted Output Power (dBm) | Total Average Cond Power (dBm) | Conducted Limit (dBm) | Margin (dB) | Result |
|-------------|-----------------|--------------------------------------|--------------------------------------|--------------------------------|-----------------------|-------------|--------|
| b           | 2412            | 17.22                                | 17.21                                | 20.23                          | 30.00                 | -12.76      | Pass   |
| b           | 2437            | 17.37                                | 17.21                                | 20.30                          | 30.00                 | -12.69      | Pass   |
| b           | 2462            | 17.35                                | 17.33                                | 20.35                          | 30.00                 | -12.64      | Pass   |
| b           | 2467            | 17.49                                | 17.3                                 | 20.41                          | 30.00                 | -12.58      | Pass   |
| b           | 2472            | 17.46                                | 17.29                                | 20.39                          | 30.00                 | -12.60      | Pass   |
| g           | 2412            | 17.24                                | 17.19                                | 20.36                          | 30.00                 | -12.63      | Pass   |
| g           | 2437            | 17.41                                | 17.16                                | 20.43                          | 30.00                 | -12.56      | Pass   |
| g           | 2462            | 16.90                                | 16.75                                | 19.97                          | 30.00                 | -13.02      | Pass   |
| g           | 2467            | 14.95                                | 15.79                                | 18.54                          | 30.00                 | -14.45      | Pass   |
| g           | 2472            | 5.64                                 | 5.21                                 | 8.58                           | 30.00                 | -24.41      | Pass   |
| n20         | 2412            | 14.79                                | 14.63                                | 17.87                          | 30.00                 | -15.12      | Pass   |
| n20         | 2417            | 17.39                                | 17.13                                | 20.42                          | 30.00                 | -12.57      | Pass   |
| n20         | 2462            | 15.85                                | 15.8                                 | 18.98                          | 30.00                 | -14.01      | Pass   |
| n20         | 2467            | 13.53                                | 13.70                                | 16.77                          | 30.00                 | -16.22      | Pass   |
| n20         | 2472            | 0.84                                 | -0.37                                | 3.44                           | 30.00                 | -29.55      | Pass   |
| n40         | 2422            | 12.74                                | 12.51                                | 16.01                          | 30.00                 | -16.98      | Pass   |
| n40         | 2442            | 14.87                                | 14.68                                | 18.16                          | 30.00                 | -14.83      | Pass   |
| n40         | 2452            | 13.83                                | 13.58                                | 17.09                          | 30.00                 | -15.90      | Pass   |
| n40         | 2457            | 13.41                                | 13.04                                | 16.61                          | 30.00                 | -16.37      | Pass   |
| n40         | 2462            | 6.48                                 | 6.05                                 | 9.66                           | 30.00                 | -23.33      | Pass   |

| 802.11 mode | Frequency (MHz) | Total Average Conducted Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|-------------|-----------------|-------------------------------------|--------------------|------------|------------------|-------------|--------|
| b           | 2412            | 20.23                               | 3.01               | 23.24      | 36.00            | -12.76      | Pass   |
| b           | 2437            | 20.30                               | 3.01               | 23.31      | 36.00            | -12.69      | Pass   |
| b           | 2462            | 20.35                               | 3.01               | 23.36      | 36.00            | -12.64      | Pass   |
| b           | 2467            | 20.41                               | 3.01               | 23.42      | 36.00            | -12.58      | Pass   |
| b           | 2472            | 20.39                               | 3.01               | 23.40      | 36.00            | -12.60      | Pass   |
| g           | 2412            | 20.36                               | 3.01               | 23.37      | 36.00            | -12.63      | Pass   |
| g           | 2437            | 20.43                               | 3.01               | 23.44      | 36.00            | -12.56      | Pass   |
| g           | 2462            | 19.97                               | 3.01               | 22.98      | 36.00            | -13.02      | Pass   |
| g           | 2467            | 18.54                               | 3.01               | 21.55      | 36.00            | -14.45      | Pass   |
| g           | 2472            | 8.58                                | 3.01               | 11.59      | 36.00            | -24.41      | Pass   |
| n20         | 2412            | 17.87                               | 3.01               | 20.88      | 36.00            | -15.12      | Pass   |
| n20         | 2417            | 20.42                               | 3.01               | 23.43      | 36.00            | -12.57      | Pass   |
| n20         | 2462            | 18.98                               | 3.01               | 21.99      | 36.00            | -14.01      | Pass   |
| n20         | 2467            | 16.77                               | 3.01               | 19.78      | 36.00            | -16.22      | Pass   |
| n20         | 2472            | 3.44                                | 3.01               | 6.45       | 36.00            | -29.55      | Pass   |
| n40         | 2422            | 16.01                               | 3.01               | 19.02      | 36.00            | -16.98      | Pass   |
| n40         | 2442            | 18.16                               | 3.01               | 21.17      | 36.00            | -14.83      | Pass   |
| n40         | 2452            | 17.09                               | 3.01               | 20.10      | 36.00            | -15.90      | Pass   |
| n40         | 2457            | 16.62                               | 3.01               | 19.63      | 36.00            | -16.37      | Pass   |
| n40         | 2462            | 9.66                                | 3.01               | 12.67      | 36.00            | -23.33      | Pass   |

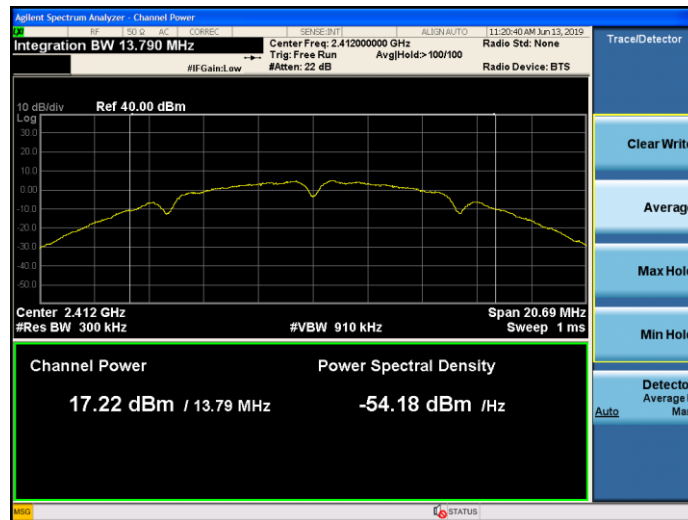


Figure 9-89 Chain 0 Average Power 802.11b - Ch.1

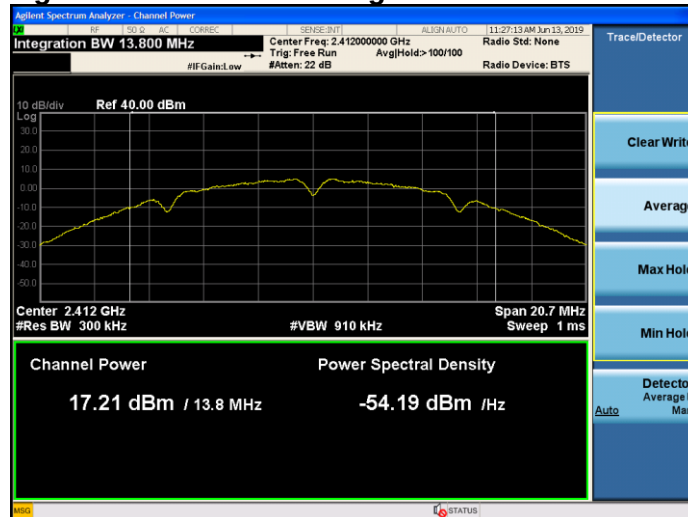


Figure 9-90 Chain 1 Average Power 802.11b - Ch.1



Figure 9-91 Chain 0 Average Power 802.11b - Ch.6

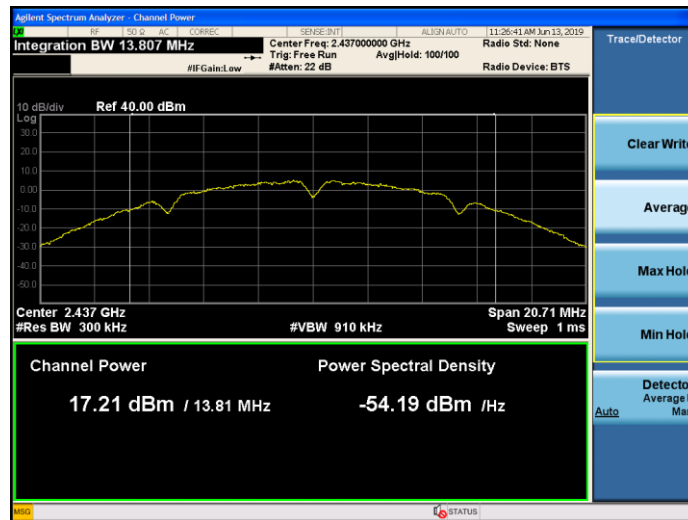


Figure 9-92 Chain 1 Average Power 802.11b - Ch.6

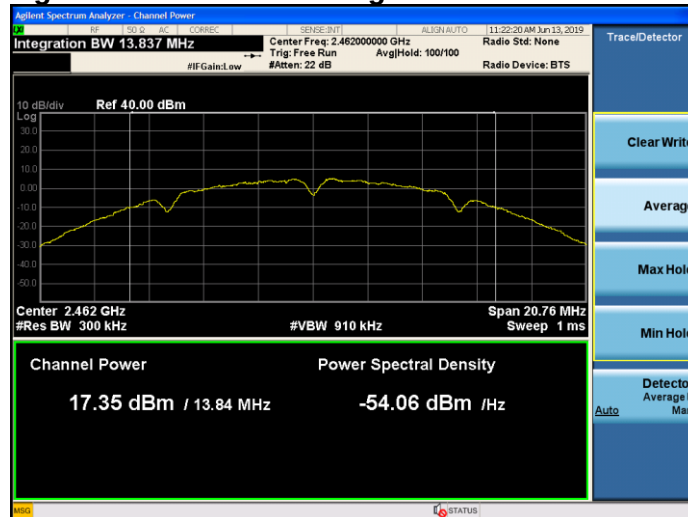


Figure 9-93 Chain 0 Average Power 802.11b - Ch.11



Figure 9-94 Chain 1 Average Power 802.11b - Ch.11

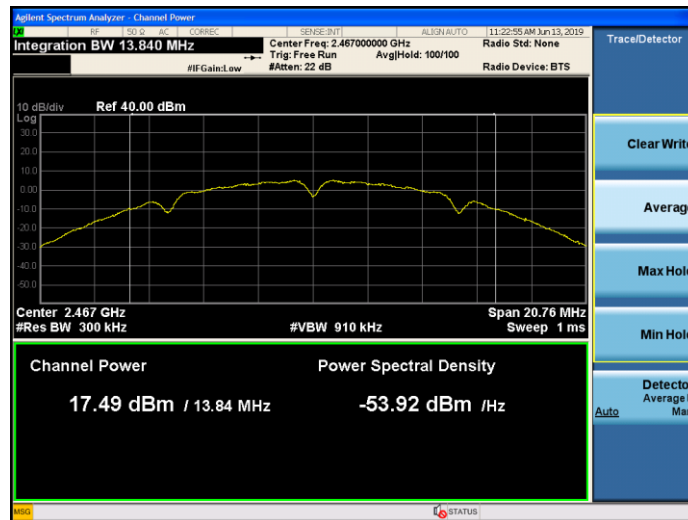


Figure 9-95 Chain 0 Average Power 802.11b - Ch.12

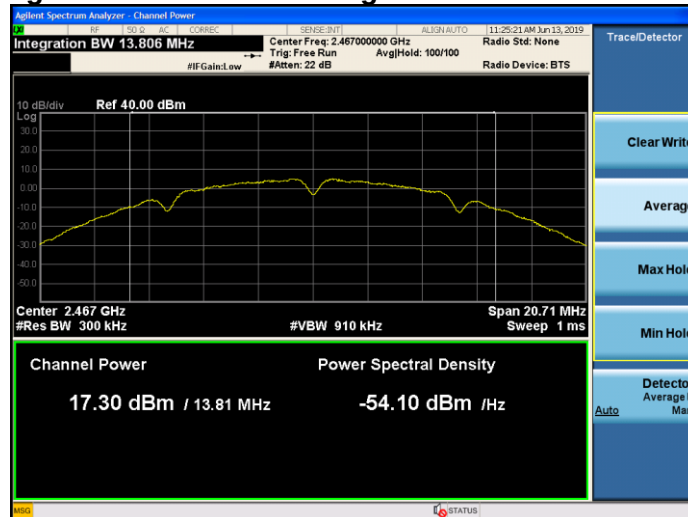


Figure 9-96 Chain 1 Average Power 802.11b - Ch.12



Figure 9-97 Chain 0 Average Power 802.11b - Ch.13

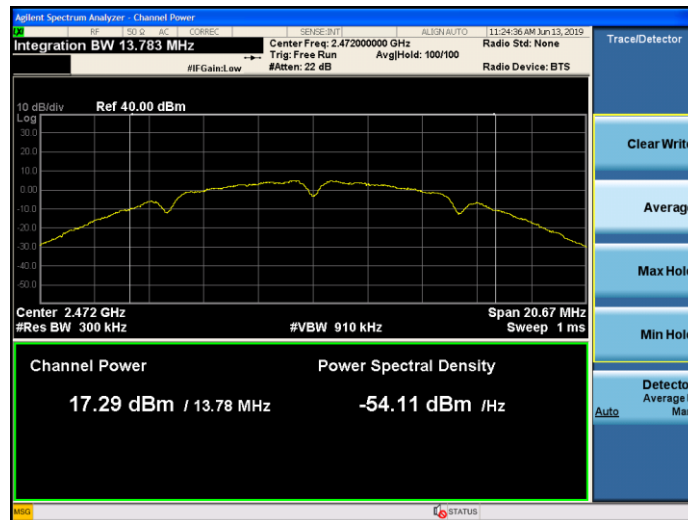


Figure 9-98 Chain 1 Average Power 802.11b - Ch.13

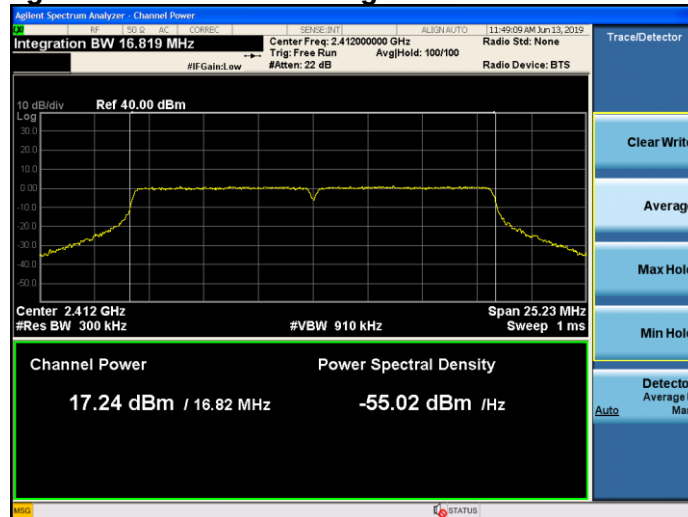


Figure 9-99 Chain 0 Average Power 802.11g - Ch.1

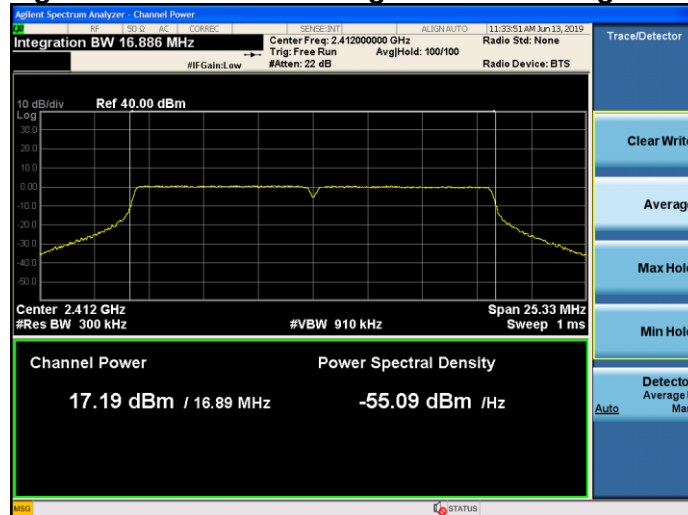


Figure 9-100 Chain 1 Average Power 802.11g - Ch.1

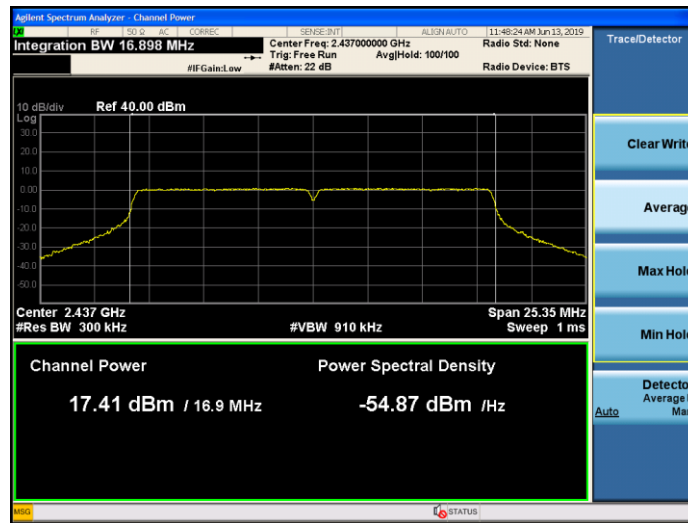


Figure 9-101 Chain 0 Average Power 802.11g - Ch.6

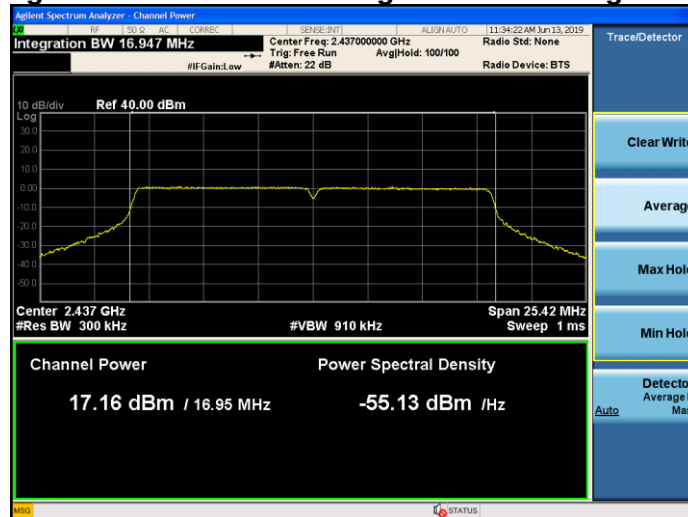


Figure 9-102 Chain 1 Average Power 802.11g - Ch.6

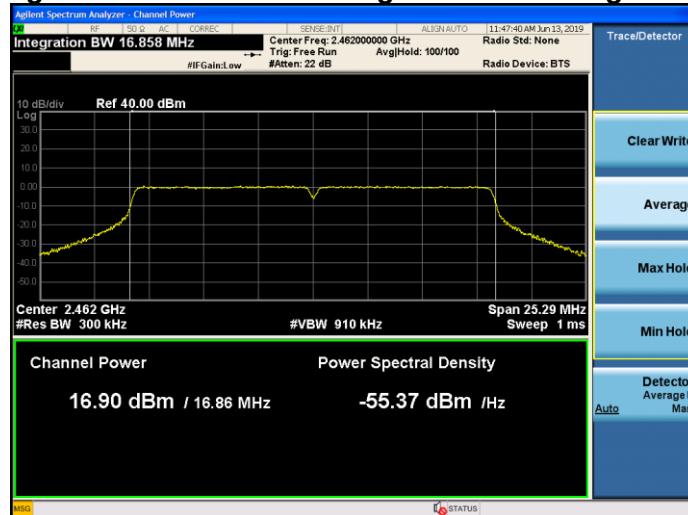


Figure 9-103 Chain 0 Average Power 802.11g- Ch.11