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**Produkte**
*Products*

| | | |
|---|---|---|
| **Prüfbericht - Nr.:** *Test Report No.:* | **19660145 001** | **Seite 1 von 172** *Page 1 of 172* |
| **Auftraggeber:** *Client:* | **Redpine Signals Inc**<br>**2107 N.First Street, Suite 680,**<br>**San Jose, CA 95131-2019**<br>**United States** | |
| **Gegenstand der Prüfung:** *Test item:* | **Dual Band Combo Module** | |
| **Bezeichnung:** *Identification:* | **RS9113DB** | **Serien-Nr.:** *Serial No.* **Engineering Sample** |
| **Wareneingangs-Nr.:** *Receipt No.:* | **18030552861** | **Eingangsdatum:** *Date of receipt:* **11.11.2014** |
| **Prüfort:** *Testing location:* | **Refer Page 4 of 172 for test facilities** | |
| **Prüfgrundlage:** *Test specification:* | **FCC Part 15: Subpart C Section 15.247**<br>**ANSI C63.4-2009** | |
| **Prüfergebnis:** *Test Result:* | **Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).**<br>*The test items passed the test specification(s).* | |
| **Prüflaboratorium:** *Testing Laboratory:* | **TÜV Rheinland (India) Pvt. Ltd.**<br>82/A, 3rd Main, West Wing, Electronic City Phase 1<br>Hosur Road, Bangalore – 560 100. India<br>**FCC Registration No.: 176555** | |

| **geprüft** / *tested by:* | | | **kontrolliert** / *reviewed by:* | | |
|---|---|---|---|---|---|
| 08.12.2014 | Vinay N<br>Sr. Engineer | Vinay.N | 08.12.2014 | Raghavendra Kulkarni<br>Sr. Manager | Kulkarni |
| **Datum** *Date* | **Name/Stellung** *Name/Position* | **Unterschrift** *Signature* | **Datum** *Date* | **Name/Stellung** *Name/Position* | **Unterschrift** *Signature* |

**Sonstiges** /*Other Aspects:* **FCC ID : XF6-RS9113DB**

| *Abkürzungen:* | | | | *Abbreviations:* | | | |
|---|---|---|---|---|---|---|---|
| *P(ass)* | = | *entspricht Prüfgrundlage* | | *P(ass)* | = | *passed* | |
| *F(ail)* | = | *entspricht nicht Prüfgrundlage* | | *F(ail)* | = | *failed* | |
| *N/A* | = | *nicht anwendbar* | | *N/A* | = | *not applicable* | |
| *N/T* | = | *nicht getestet* | | *N/T* | = | *not tested* | |

**Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.**

*This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.*

## Test Result Summary

| Clause | Test Item | Result |
|---|---|---|
| FCC 15.247(b) (3) | Maximum Average Conducted Output Power | Pass |
| FCC 15.247(a) (2) | 6dB Bandwidth | Pass |
| FCC 15.247(e) | Maximum Power Spectral Density | Pass |
| FCC 15.247(d) | Band-edge compliance | Pass |
| FCC 15.209 / FCC 15.205 | Spurious Radiated Emissions and Restricted Bands of Operation | Pass |

**Note:** Conducted measurements are done according to the procedure given in KDB No. **558074 D01 DTS Meas Guidance v03r02**

# Content

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# List of Test and Measurement Instruments

## TUV Rheinland (India) Pvt. Ltd. , Bangalore

| Equipment | Manufacturer | Model | S/N | Calibration Due Date |
|---|---|---|---|---|
| EMI Test Receiver | Rohde &Schwarz | ESU 40 | 100288 | 04.10.2015 |
| Hybrid Log Periodic antenna | ETS Lindgren | 3142D | 00081354 | 26.07.2015 |
| Broadband Horn Antenna | Frankonia | HAX-18 | HAX18-802 | 23.03.2015 |
| Double-Ridged Waveguide Horn Antenna | ETS Lindgren | 116794 | 00133356 | 01.09.2015 |
| Emission Horn Antenna | ETS Lindgren | 116706 | 00107323 | 24.08.2015 |
| Active Loop Antenna | Frankonia | LAX-10 | LAX-10-800 | 11.04.2015 |
| Spectrum Analyser | Agilent Technologies | E4407B | US41192772 | 27.03.2015 |

**Testing Facilities:**

1) TUV Rheinland (India) Private Limited
No. 108, West Wing
Electronic city Phase I
Bangalore – 560100

# General Product Information

### Product Function and Intended Use

The RS9113 module integrates a multi-threaded MAC processor with integrated analog peripherals and support for digital peripherals, baseband digital signal processor, analog front-end, crystal oscillator, calibration OTP memory, Dual band RF transceiver, Dual-band high-power amplifiers, baluns, diplexers, diversity switch and Quad-SPI Flash thus providing a fully-integrated solution for embedded wireless applications. The RS9113 based chips and modules leverage and improve upon Redpine's proven low power innovations from Lite-FTM products (RS9110) and provide WLAN 802.11n, BT4.0 and ZigBee convergence solution for integration into mobile and M2M communication devices. It can connect to a host processor through SDIO, USB, SPI or UART interfaces.

### Ratings and System Details

| | | |
|---|---|---|
| Operating Frequency Range | 2400MHz – 2483.50MHz | |
| No. of channel | 11 – Wi-Fi (2.4GHz), 5 – Wi-Fi (5GHz)<br>15 – Zigbee<br>79 - BT Classic<br>40 – BT LE | |
| Channel Spacing | 5MHz – Wi-Fi, Zigbee<br>1MHz – BT Classic<br>2MHz – BT LE | |
| Transmitted Power | 802.11b | 17.42dBm |
| | 802.11g | 17.74dBm |
| | 802.11n | 17.85dBm |
| | 802.11a – 5GHz | 12.02dBm |
| | 802.11n – 5GHz | 12.08dBm |
| | Bluetooth LE | 14.63dBm |
| | Zigbee | 15.42dBm |
| Data Rate | 802.11b: 1,2, 5.5,11 Mbps<br>802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps<br>802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps<br>802.11n: 6.5, 14.4, 21.7, 28.9, 39, 57.8, 65Mbps<br>Bluetooth – 1,2,3 Mbps<br>Zigbee – 250Kbps | |
| Number of antenna | One | |
| Antenna Gain and Antenna type | PCB Trace Antenna, 0.5dBi | |
| Supply Voltage to Module | 3.1V – 3.6V DC from Host device | |
| Environmental | Operational Temperature: -40ºC to 85º C | |

**Test Conditions:**

Supply Voltage: 5V DC from USB

**Environmental conditions:**

Temperature: +24 º C RH: 62%

# Test Set-up and Operation Mode

### Principle of Configuration Selection

Transmission was enabled with 100% duty cycle duty on low, mid and high channel.

### Test Operation and Test Software

Test software was used to enable the transmission with 100% duty cycle, changing channels (low/mid/high) and data rates on the EUT for the tests in this report.

### Special Accessories and Auxiliary Equipment

- None

### Countermeasures to achieve EMC Compliance

- None

### Test Modes – Data Rates and Modulations

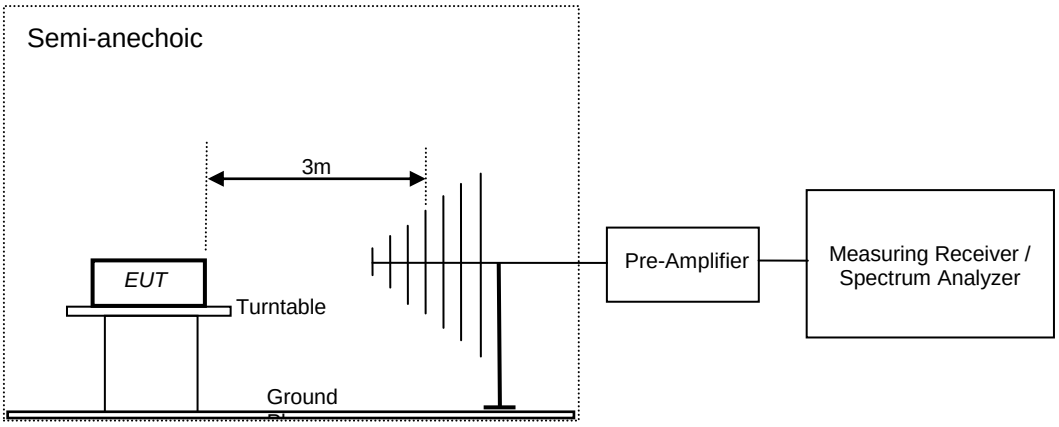
For Radiated spurious emissions, the tests were performed for all data rates and only worst case results are reported in this report.

# Test Methodology

**Radiated Emission Test**

The radiated emission measurement was performed according to the procedures in ANSI C63.4-2009. The equipment under test (EUT) was placed at the middle of the 80 cm high turntable, and the EUT is 3 meters far from the measuring antenna. The turntable was rotated 360° for obtaining the maximum emission. The height of the measuring antennas was scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained. The measurement above 1000MHz was performed by horn antenna. The measurement below 30MHz was performed by loop antenna.

The EUT was rotated around the X-, Y-, and Z-Axis and the results from worst case axis are recorded.



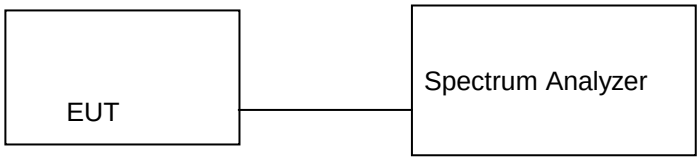
# Test Results

**Maximum Average Conducted Output Power** **Section 15.247(b) (3)**

**Result** **Pass**

| | |
|---|---|
| Test Specification | FCC Part 15 Subpart C |
| Measurement Bandwidth (RBW) | 300 kHz/1MHz |
| Requirement | <1 watt (30dBm). |

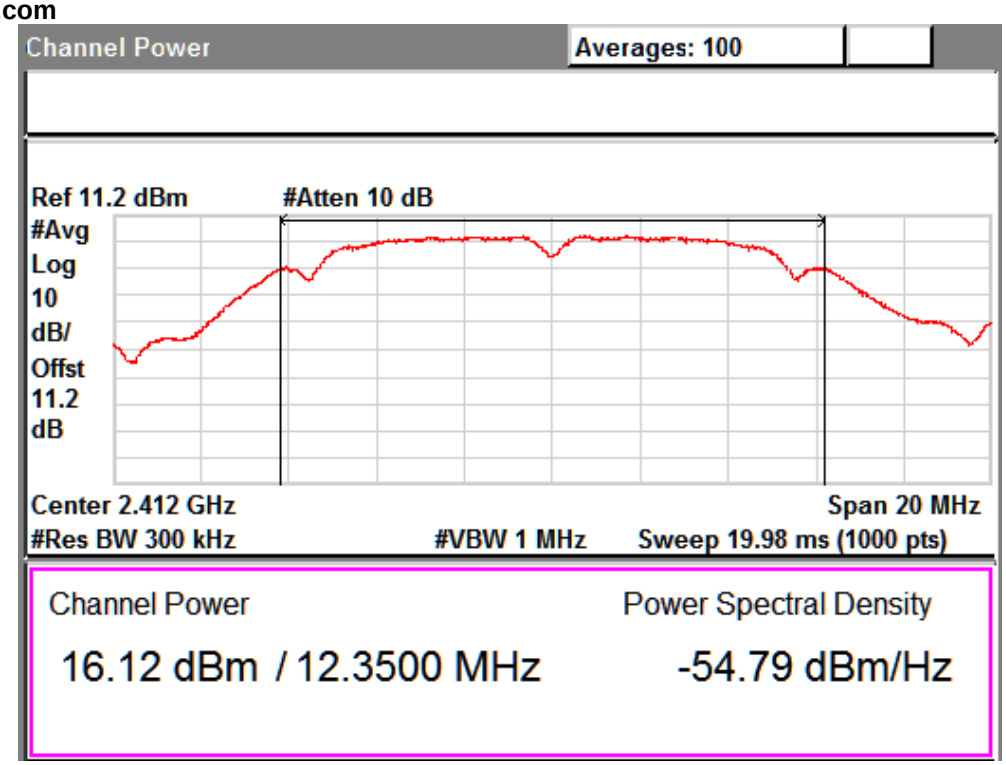
**Test Method:**



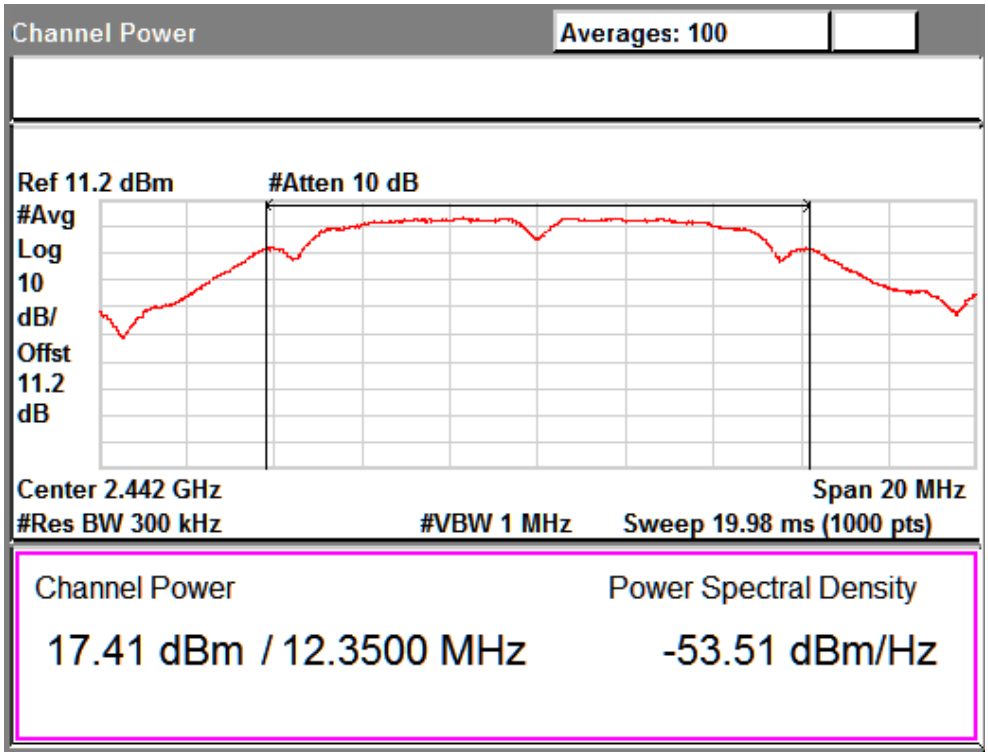

**Note: For measurement of Maximum Average conducted output power method AVGSA-1 was used**

**Test Result: Wi-Fi**

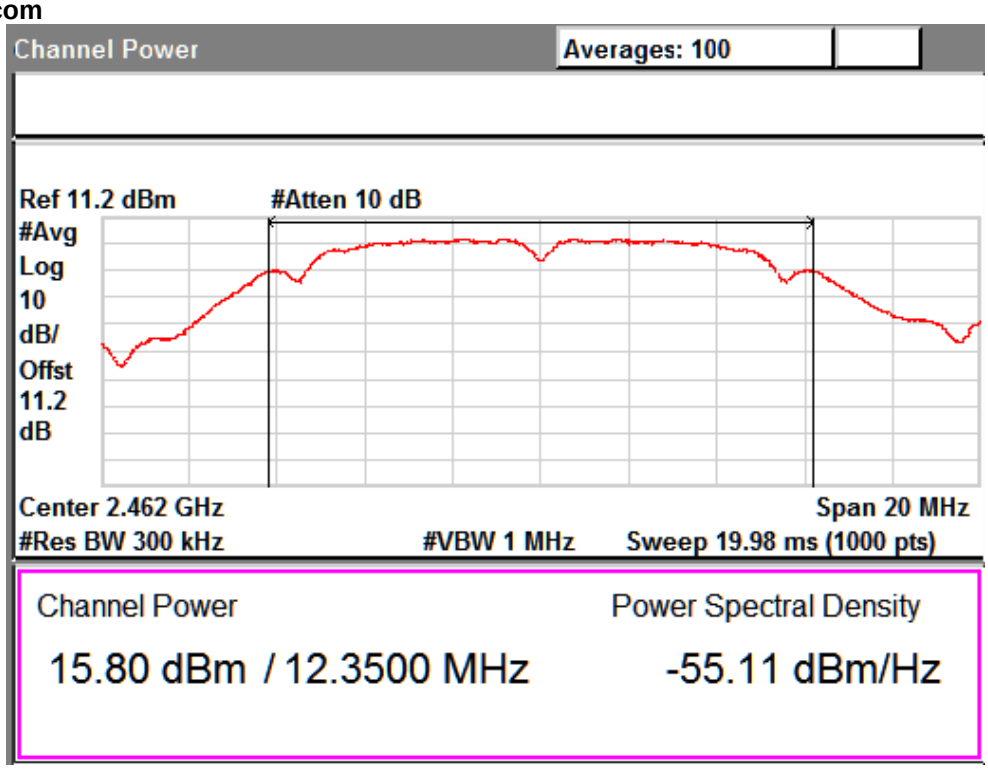
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|
| b | 1 | 2412.00 | 16.12 | 30.00 | -13.88 |
| | | 2442.00 | 17.41 | 30.00 | -12.59 |
| | | 2462.00 | 15.80 | 30.00 | -14.20 |
| | 11 | 2412.00 | 16.79 | 30.00 | -13.41 |
| | | 2442.00 | 17.40 | 30.00 | -12.60 |
| | | 2462.00 | 16.53 | 30.00 | -13.47 |



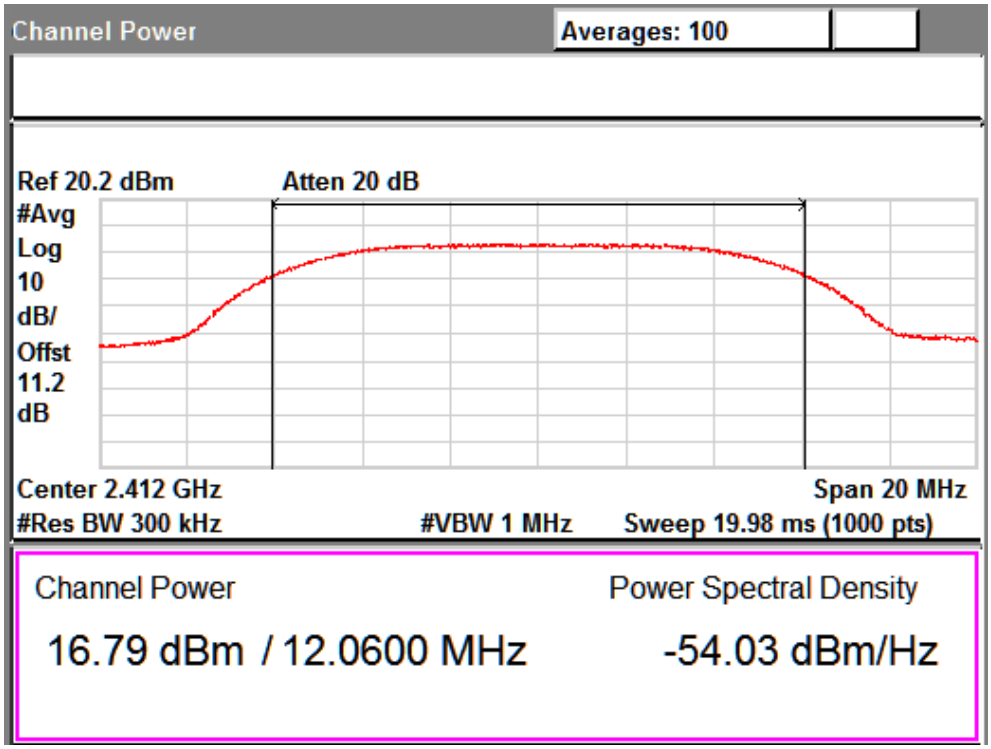

**Data rate: 1 Mbps** **Channel Frequency: 2412 MHz**



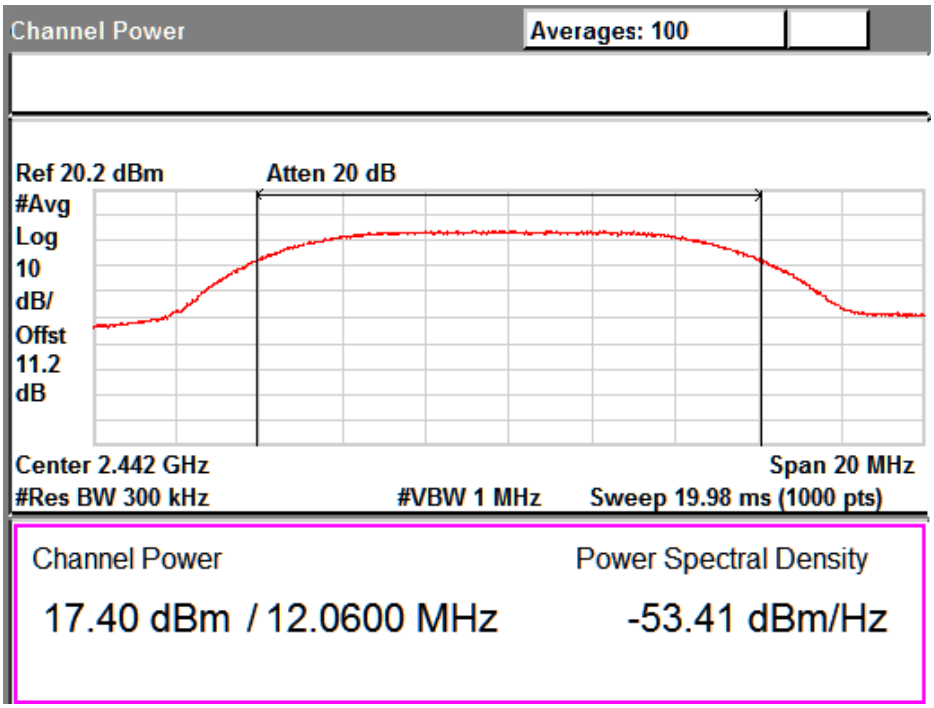

**Data rate: 1 Mbps** **Channel Frequency: 2442 MHz**



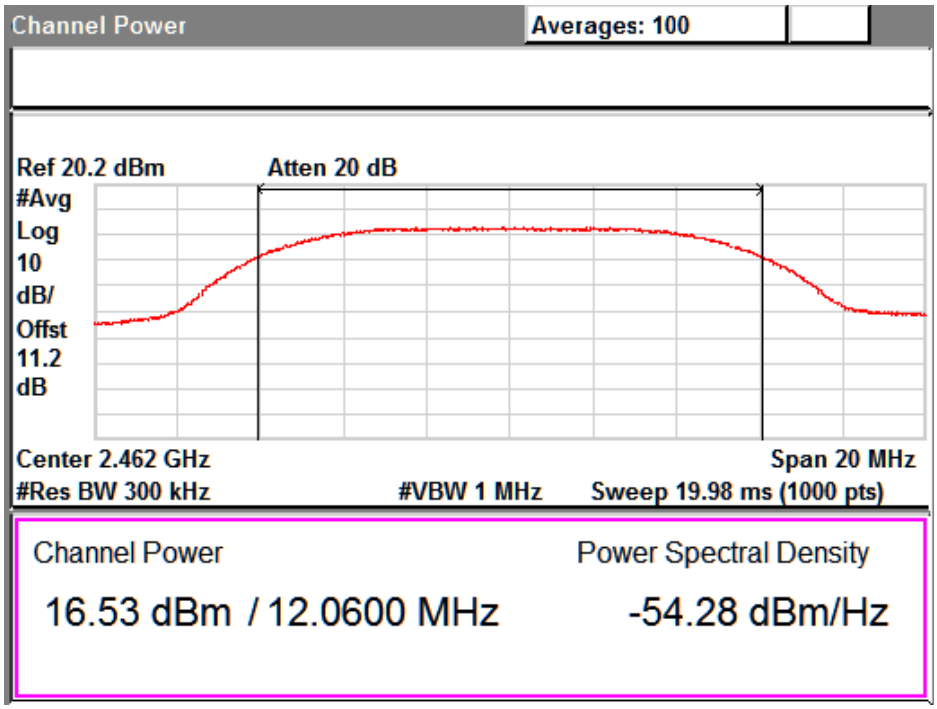

**Data rate: 1 Mbps** **Channel Frequency: 2462 MHz**




**Data rate: 11 Mbps** **Channel Frequency: 2412 MHz**

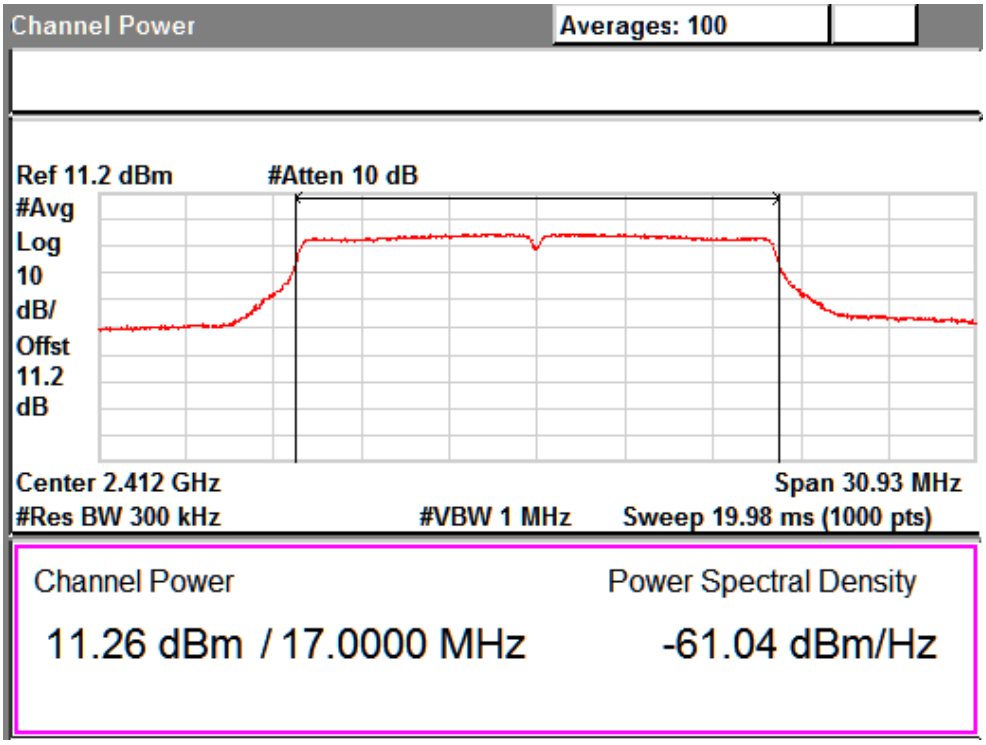



**Data rate: 11 Mbps** **Channel Frequency: 2442 MHz**

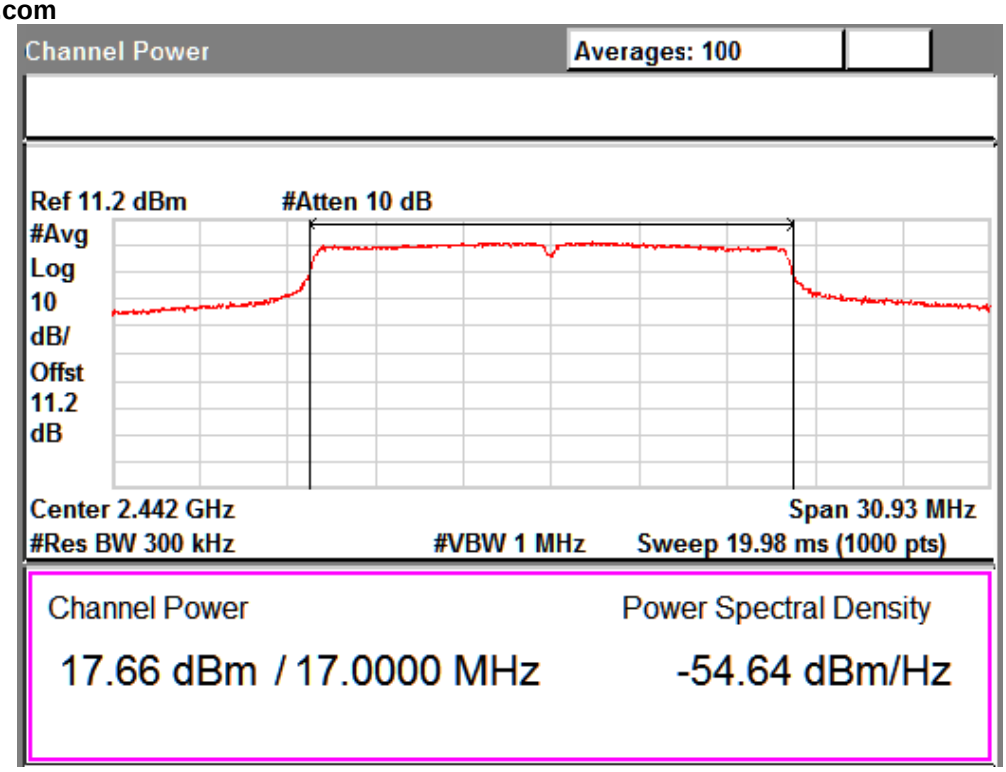



**Data rate: 11 Mbps** **Channel Frequency: 2462 MHz**

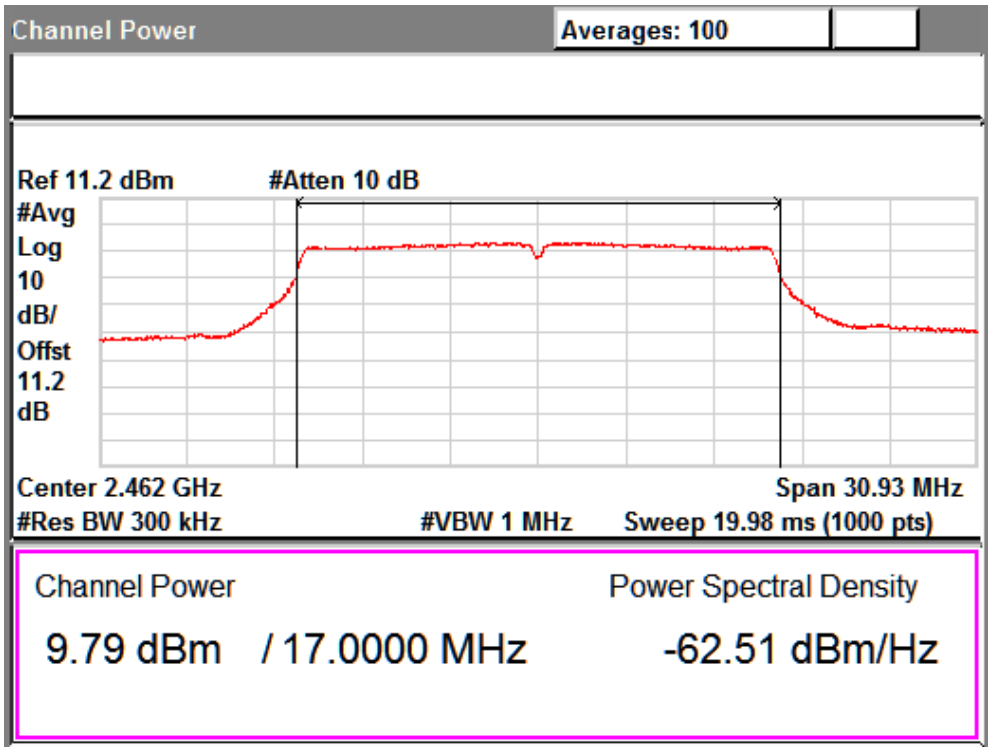
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|
| g | 6 | 2412 | 11.26 | 30.00 | -18.74 |
| | | 2442 | 17.66 | 30.00 | -12.34 |
| | | 2462 | 09.79 | 30.00 | -20.21 |
| | 24 | 2412 | 11.09 | 30.00 | -18.91 |
| | | 2442 | 17.69 | 30.00 | -12.31 |
| | | 2462 | 10.30 | 30.00 | -19.7 |
| | 54 | 2412 | 11.18 | 30.00 | -18.82 |
| | | 2442 | 17.74 | 30.00 | -12.26 |
| | | 2462 | 10.29 | 30.00 | -19.71 |



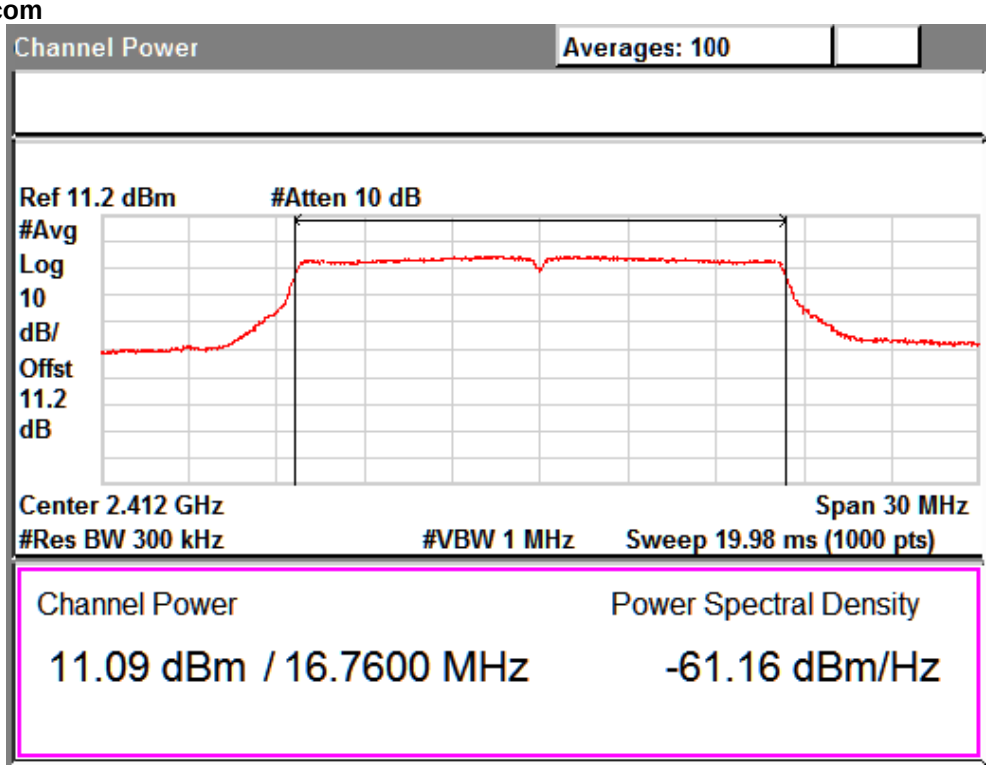

**Data rate: 6 Mbps** **Channel Frequency: 2412 MHz**



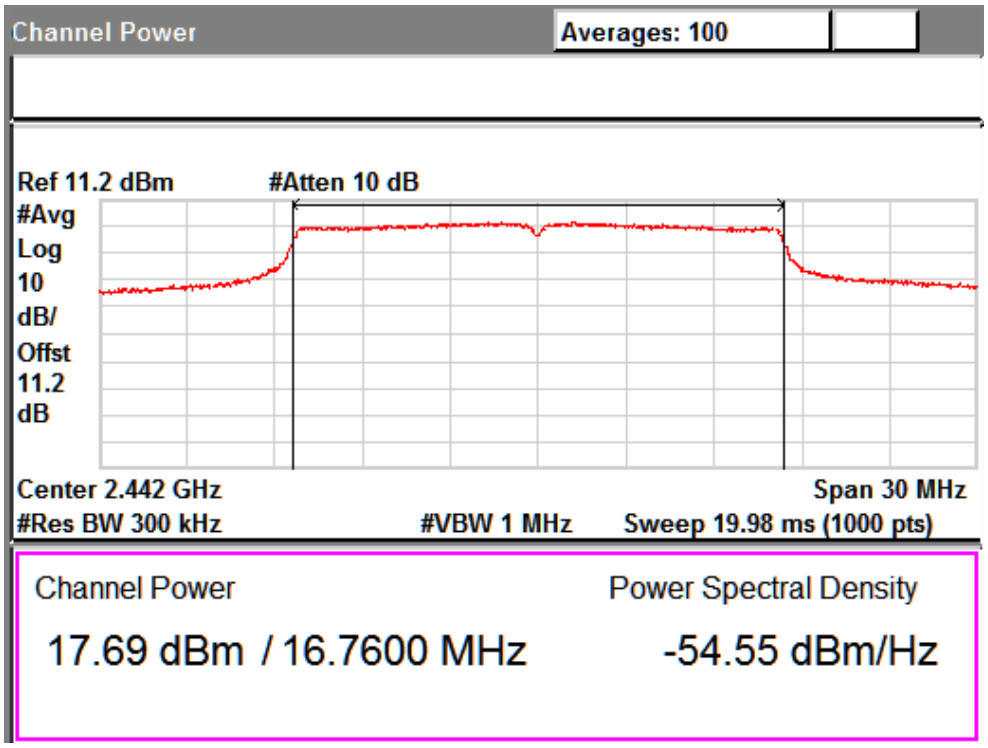

**Data rate: 6 Mbps** **Channel Frequency: 2442 MHz**



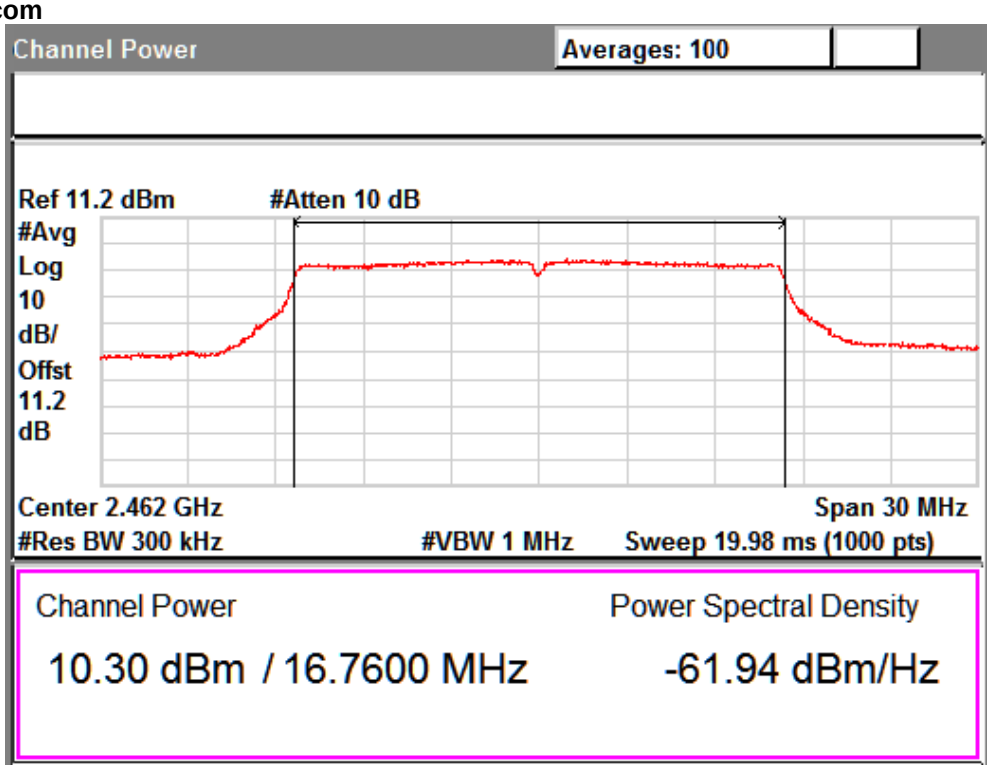

**Data rate: 6 Mbps** **Channel Frequency: 2462 MHz**



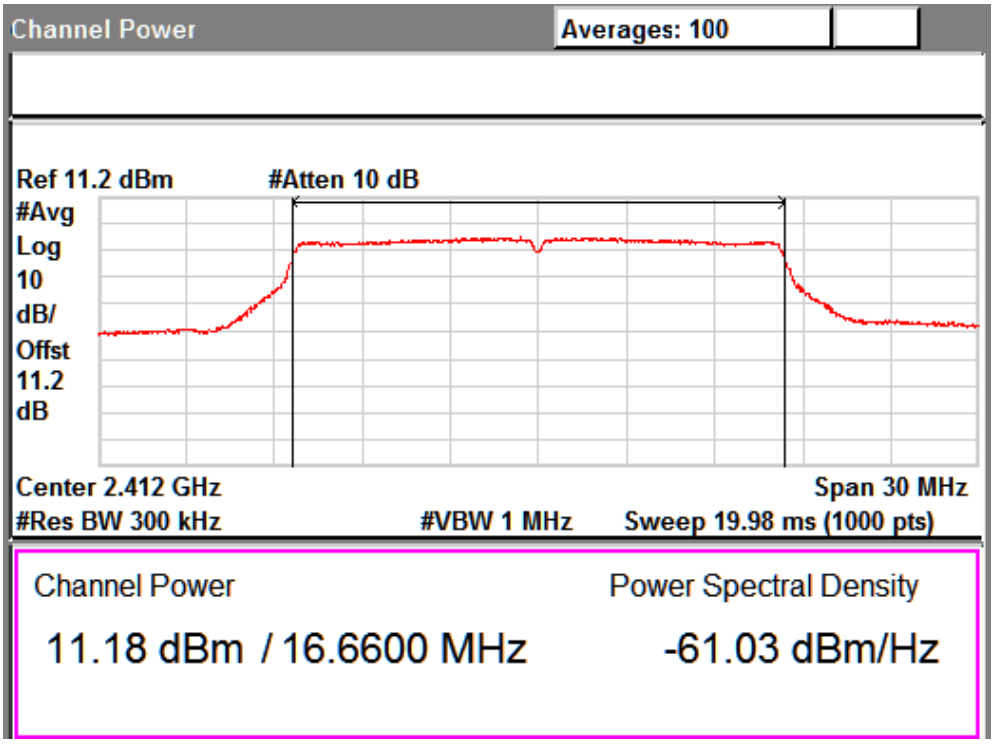

**Data rate: 24 Mbps** **Channel Frequency: 2412 MHz**



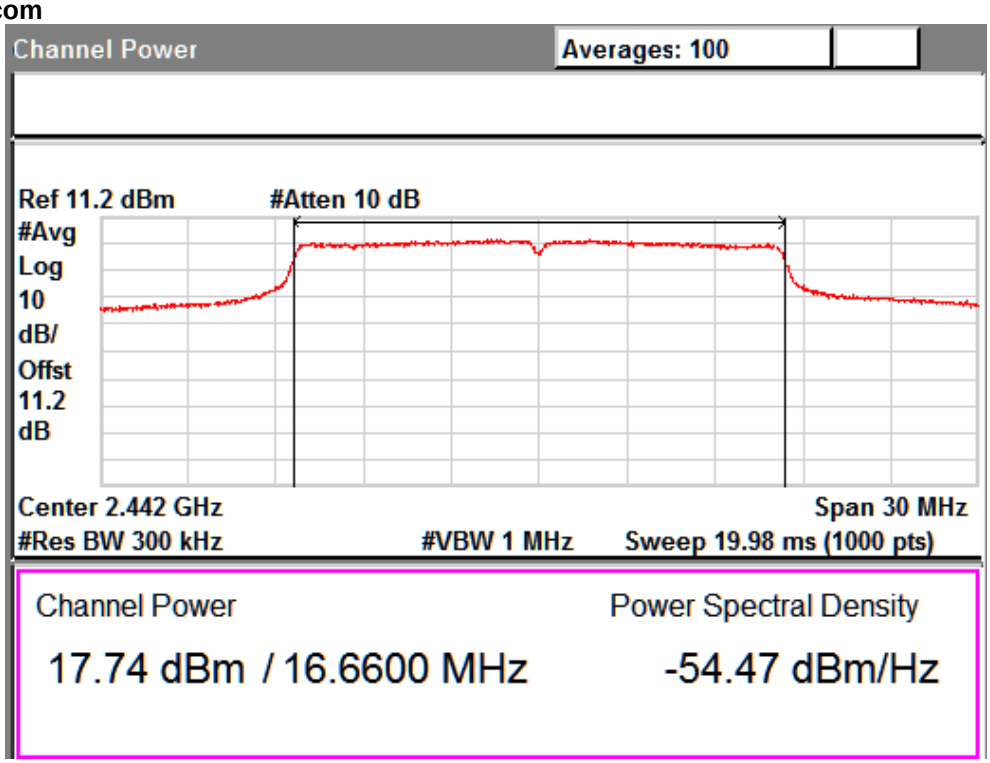

**Data rate: 24 Mbps** **Channel Frequency: 2442 MHz**



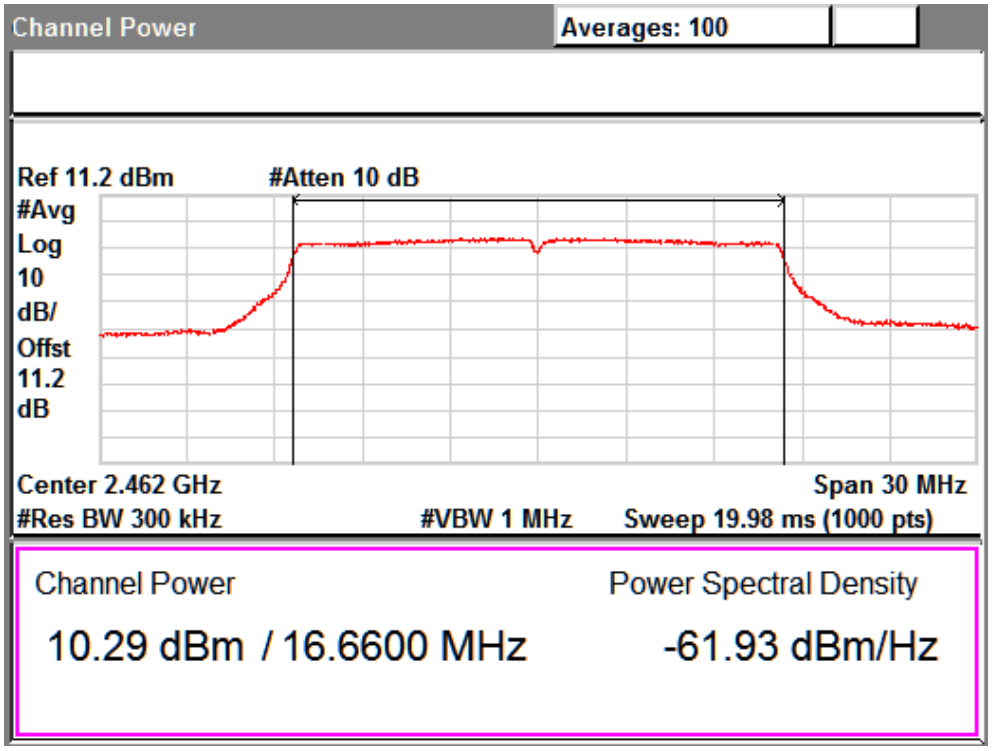

**Data rate: 24 Mbps** **Channel Frequency: 2462 MHz**




**Data rate: 54 Mbps** **Channel Frequency: 2412 MHz**

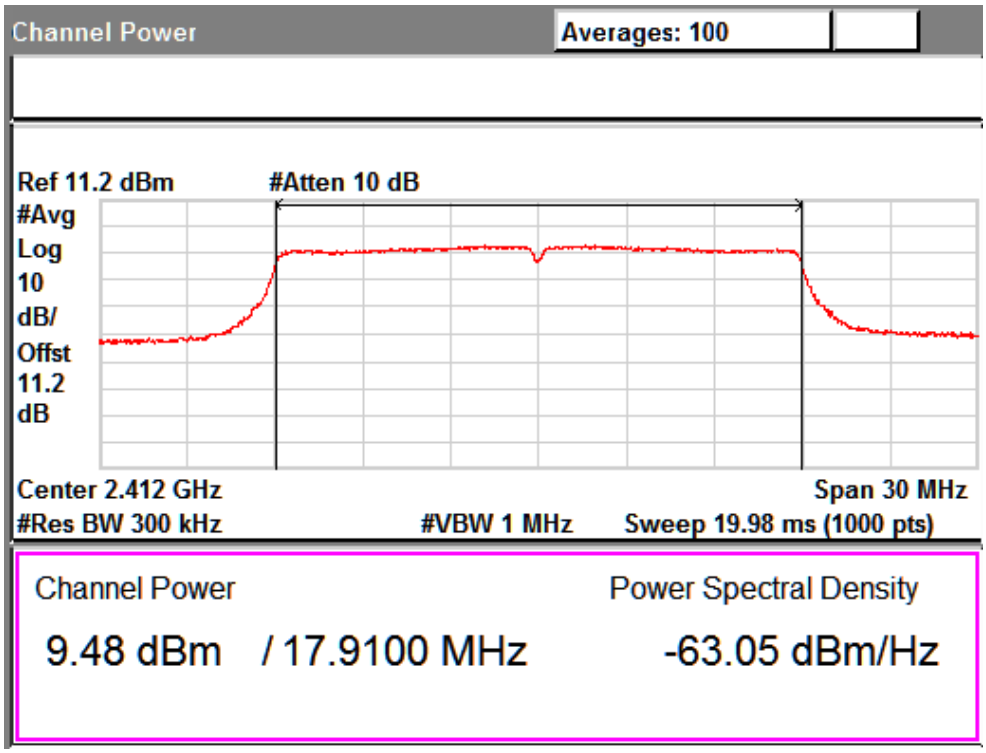



**Data rate: 54 Mbps** **Channel Frequency: 2442 MHz**

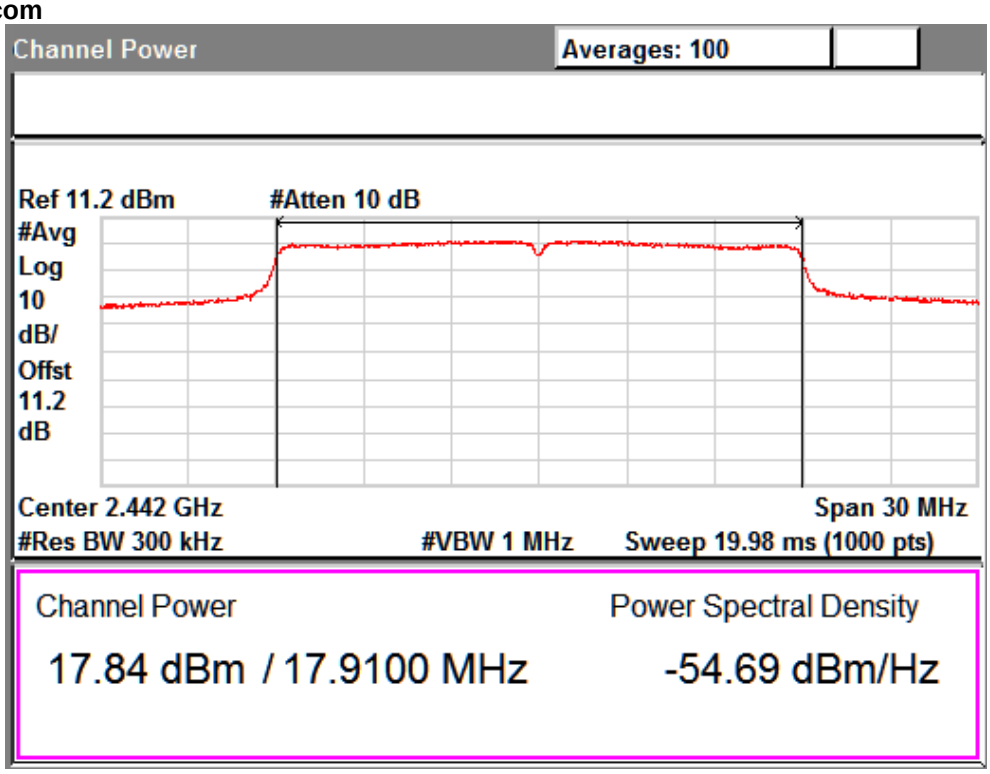



**Data rate: 54 Mbps** **Channel Frequency: 2462 MHz**

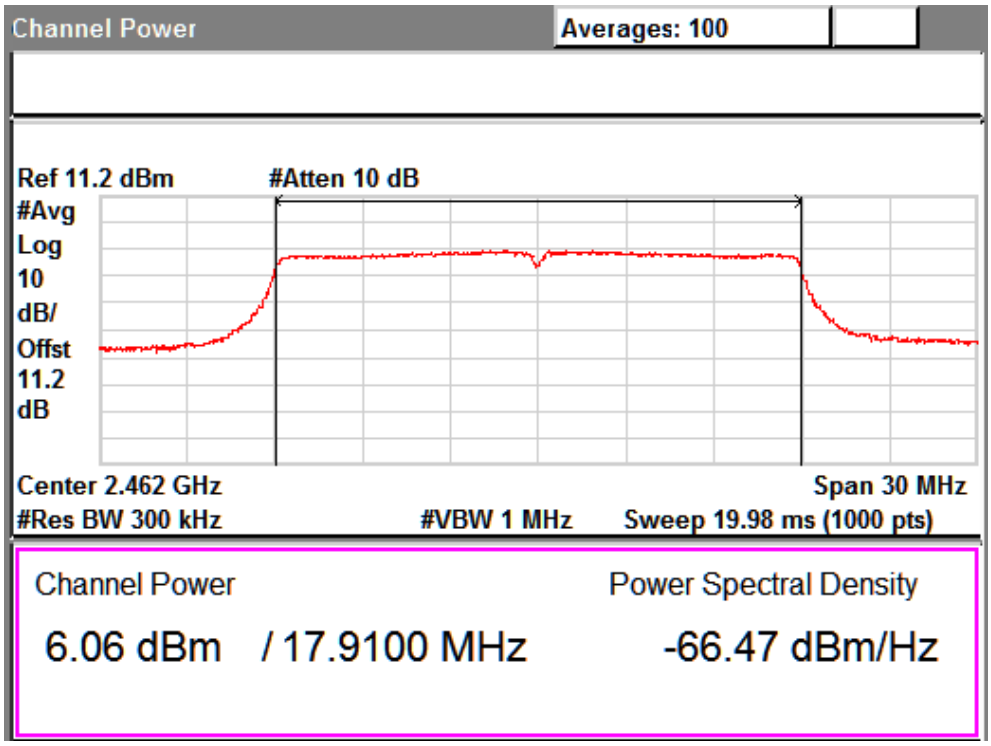
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|
| n | 6.5 | 2412.00 | 09.48 | 30.00 | -20.52 |
| | | 2442.00 | 17.84 | 30.00 | -12.16 |
| | | 2462.00 | 06.06 | 30.00 | -23.94 |
| | 39 | 2412.00 | 09.84 | 30.00 | -20.16 |
| | | 2442.00 | 17.68 | 30.00 | -12.32 |
| | | 2462.00 | 08.07 | 30.00 | -21.93 |
| | 65 | 2412.00 | 09.38 | 30.00 | -20.62 |
| | | 2442.00 | 17.85 | 30.00 | -12.15 |
| | | 2462.00 | 08.07 | 30.00 | -21.93 |



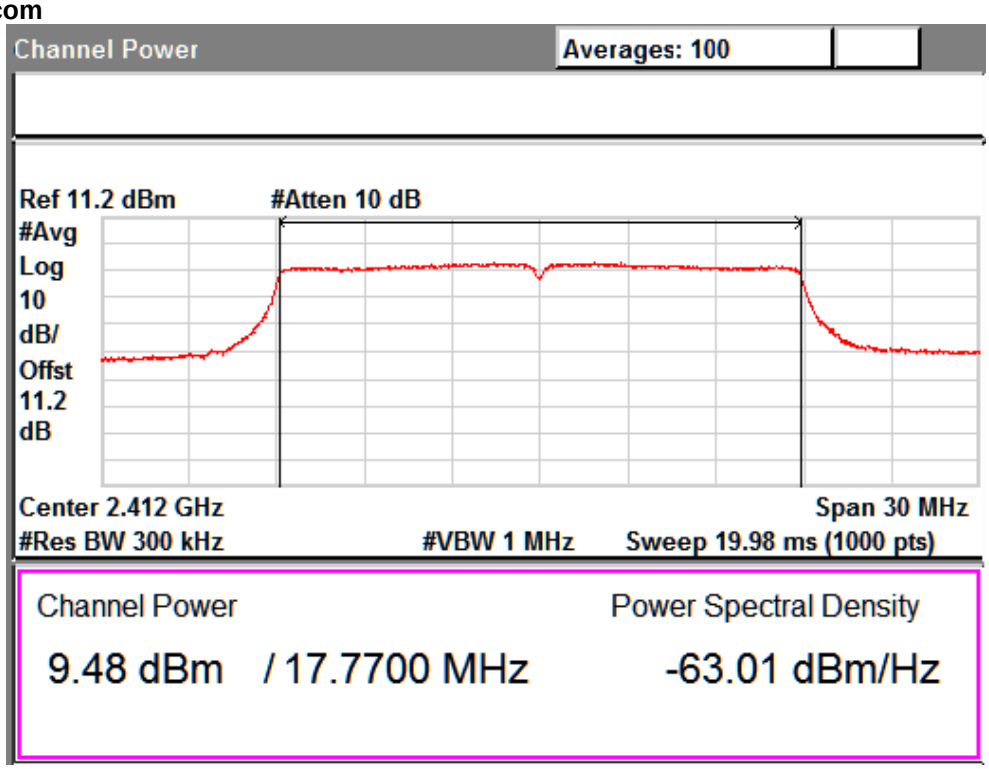

**Data Rate: 6.5 Mbps** **Channel Frequency: 2412 MHz**



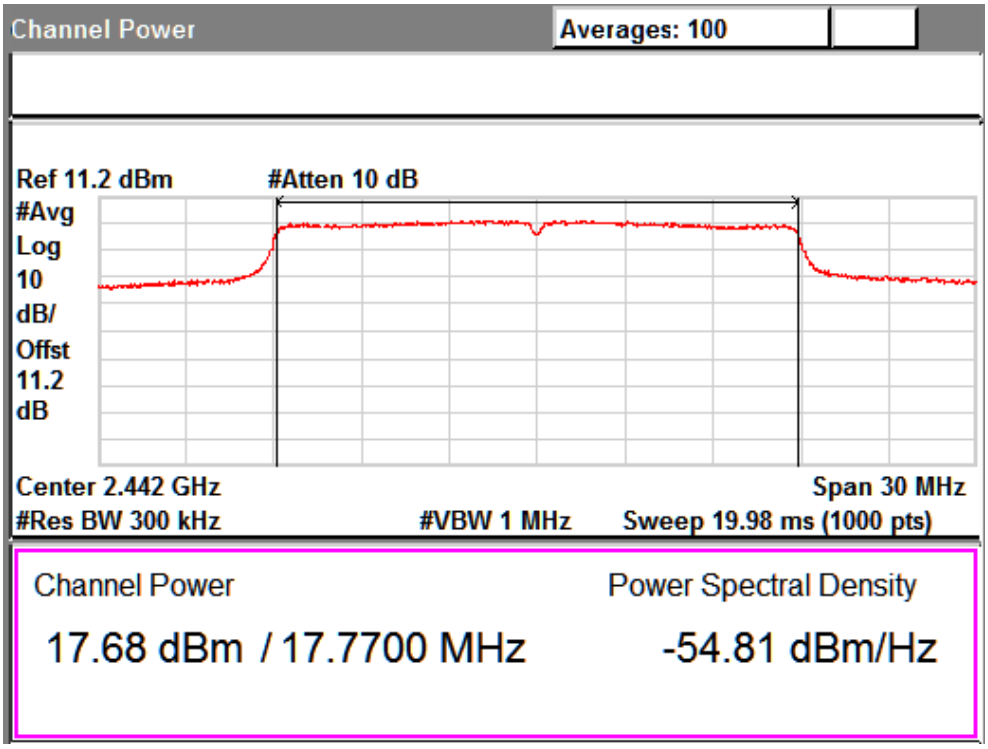

**Data Rate: 6.5 Mbps** **Channel Frequency: 2442 MHz**



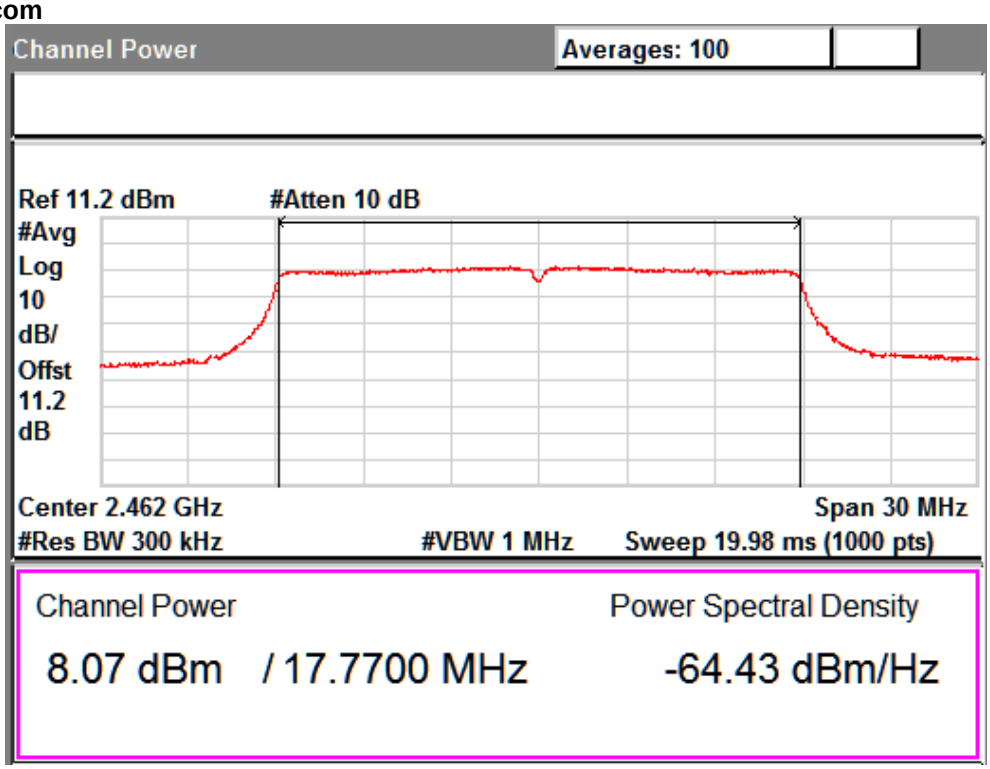

**Data Rate: 6.5 Mbps** **Channel Frequency: 2462 MHz**



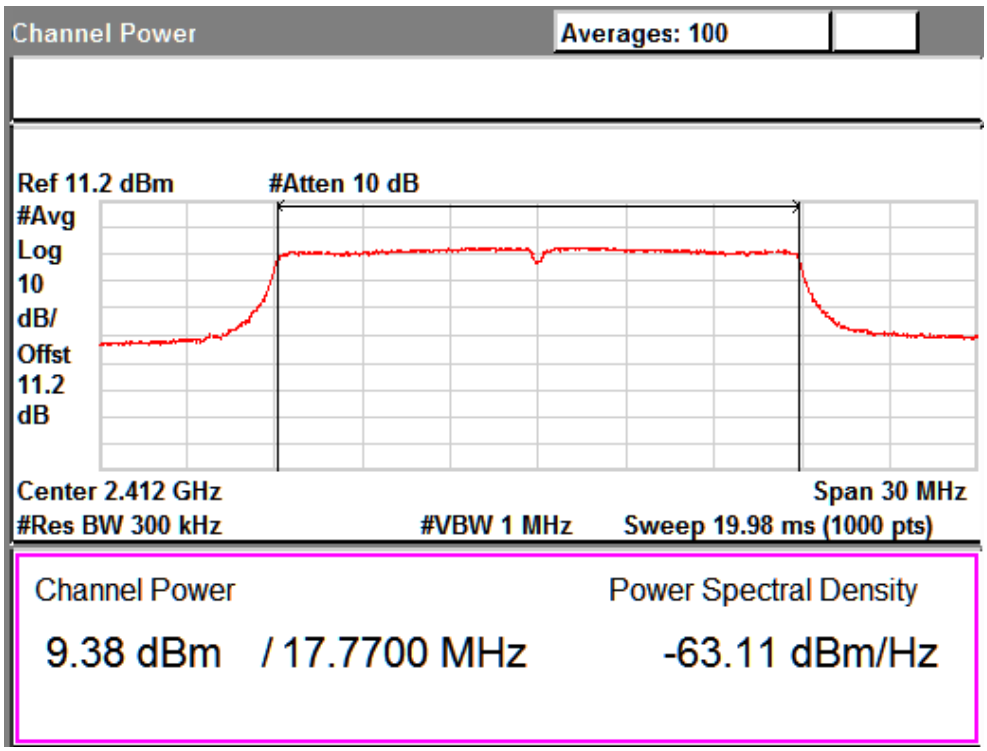

**Data Rate: 39 Mbps** **Channel Frequency: 2412 MHz**



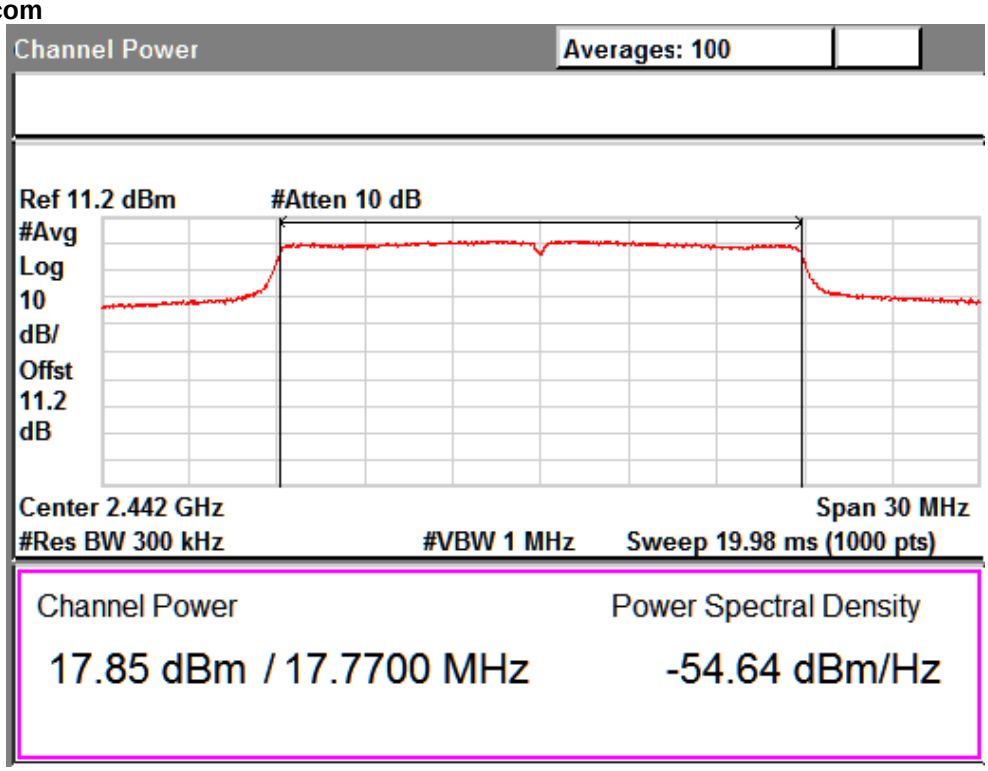

**Data Rate: 39 Mbps** **Channel Frequency: 2442 MHz**



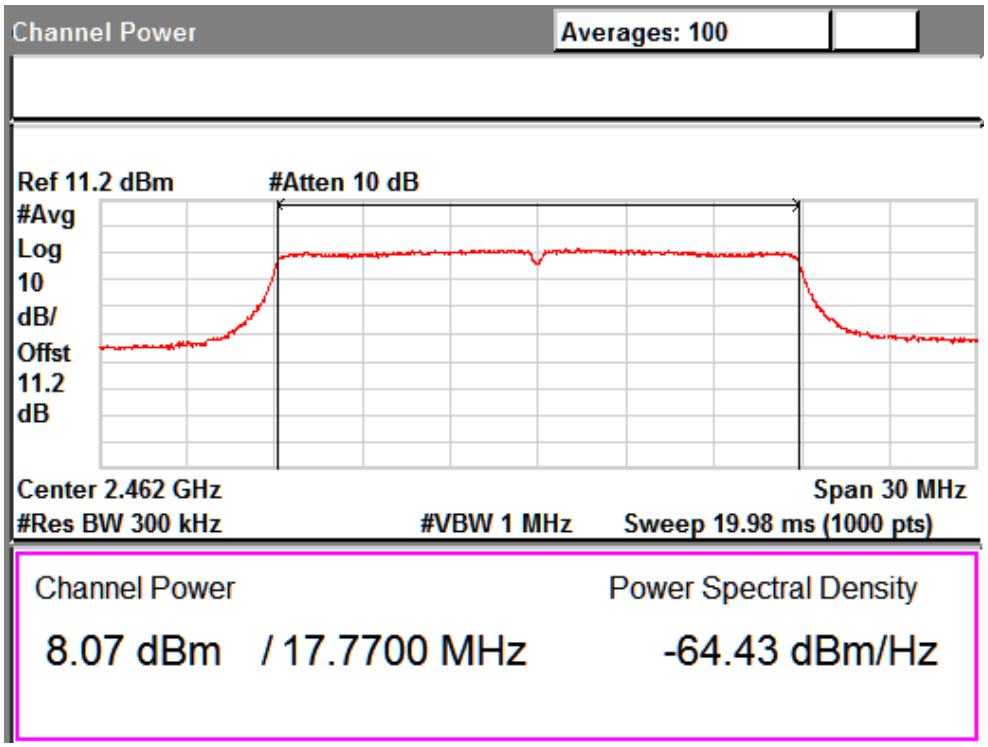

**Data Rate: 39 Mbps** **Channel Frequency: 2462 MHz**




**Data Rate: 65 Mbps** **Channel Frequency: 2412 MHz**



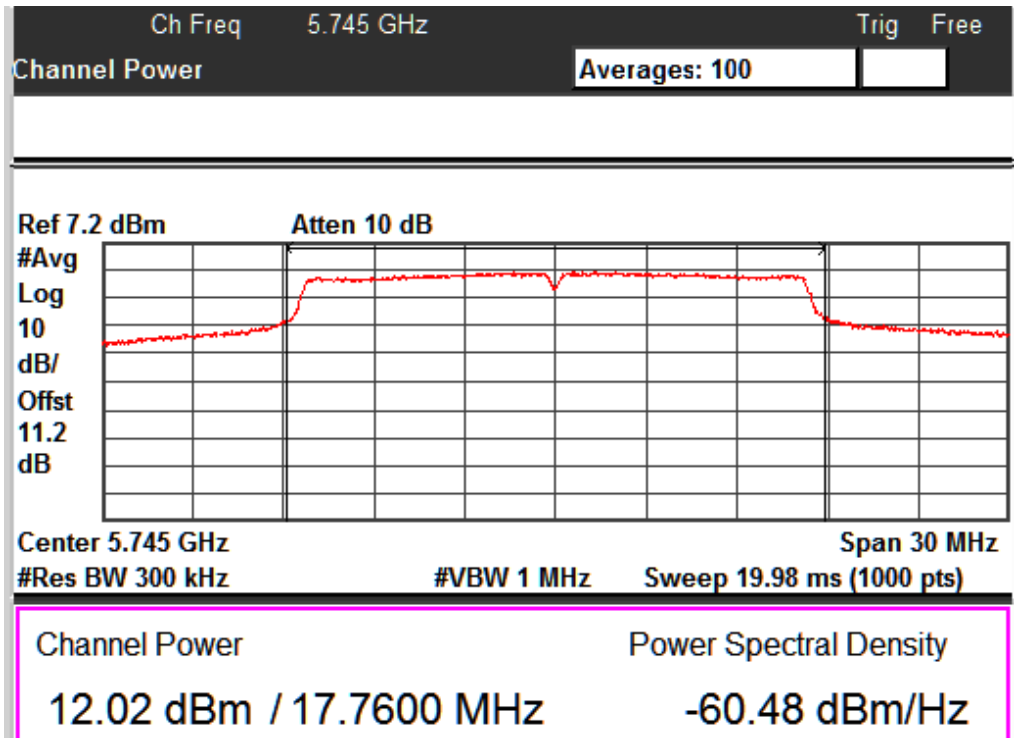

**Data Rate: 65 Mbps** **Channel Frequency: 2442 MHz**



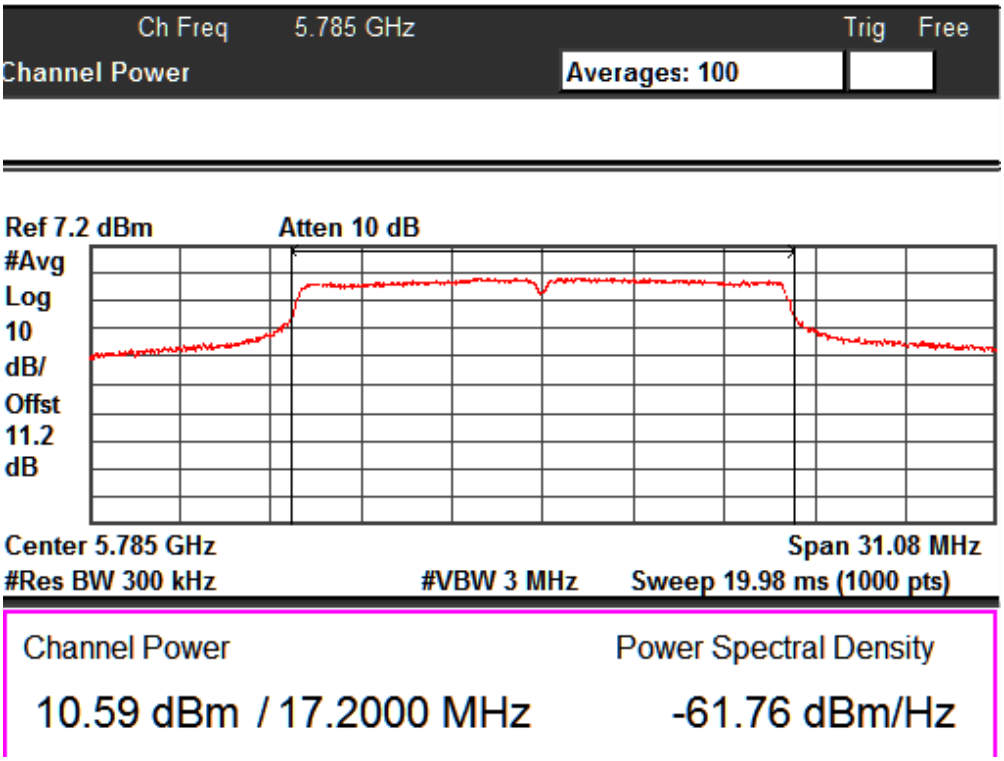

**Data Rate: 65 Mbps** **Channel Frequency: 2462 MHz**

**5GHz Band**

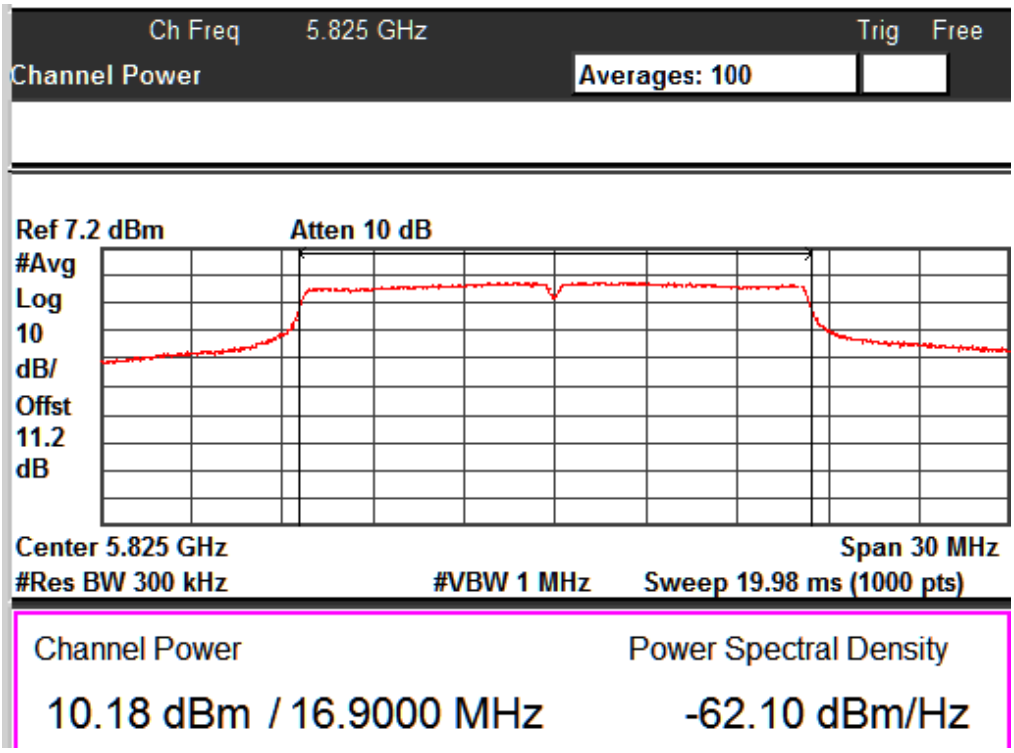
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|
| a | 6 | 5745 | 12.02 | 30.00 | -17.98 |
| | | 5785 | 10.59 | 30.00 | -19.41 |
| | | 5825 | 10.18 | 30.00 | -19.82 |
| | 24 | 5745 | 11.97 | 30.00 | -18.03 |
| | | 5785 | 10.51 | 30.00 | -19.49 |
| | | 5825 | 10.12 | 30.00 | -19.88 |
| | 54 | 5745 | 12.02 | 30.00 | -17.98 |
| | | 5785 | 10.42 | 30.00 | -19.58 |
| | | 5825 | 10.17 | 30.00 | -19.83 |



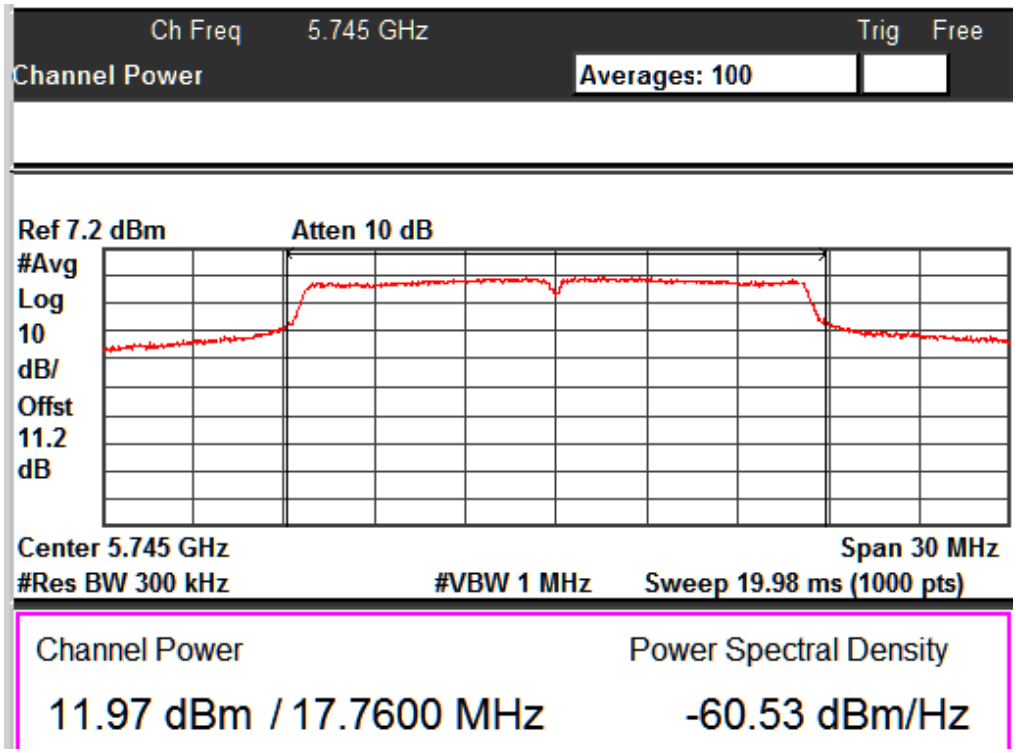

**Data Rate: 6 Mbps** **Channel Frequency: 5745 MHz**



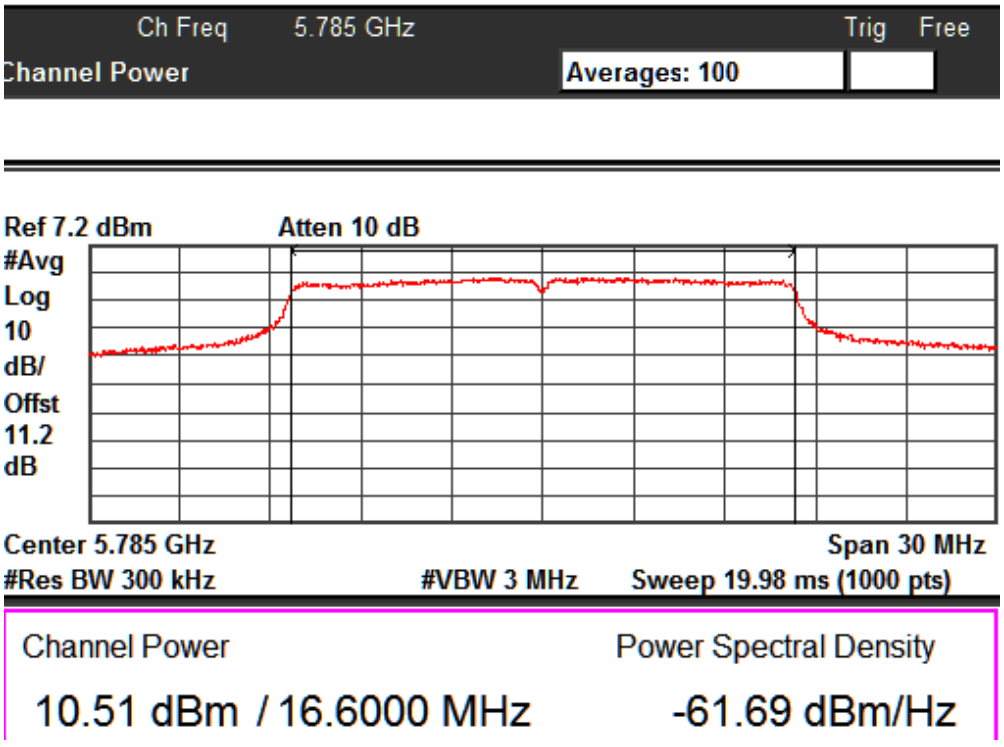

**Data Rate: 6 Mbps** **Channel Frequency: 5785 MHz**



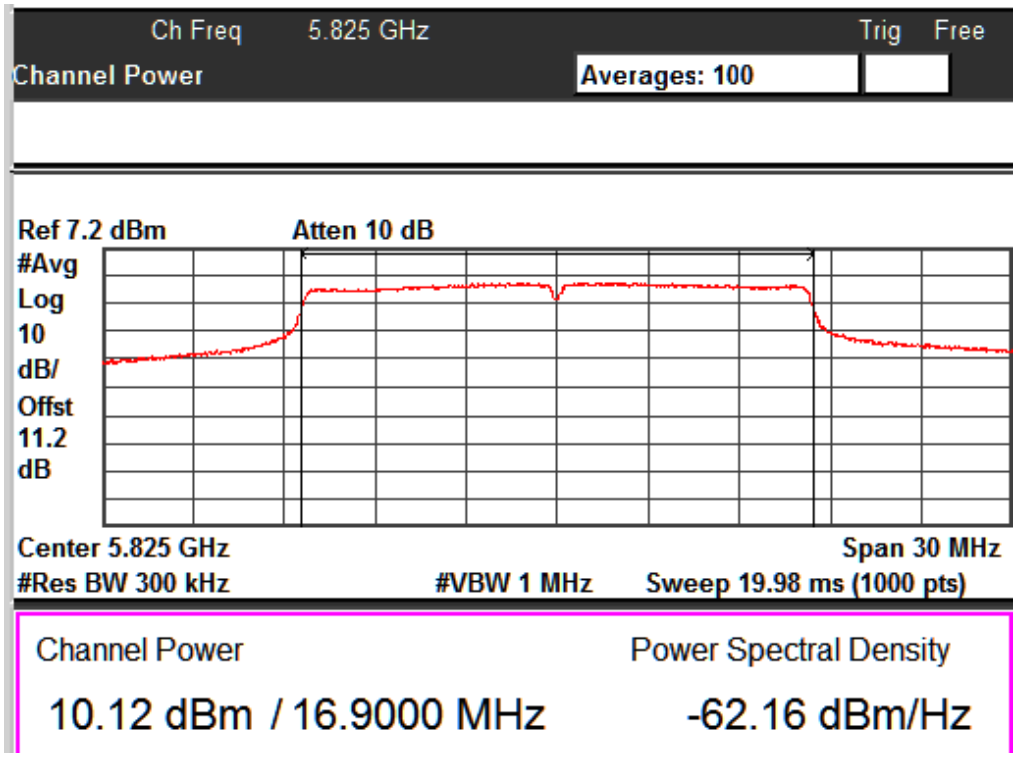

**Data Rate: 6 Mbps** **Channel Frequency: 5825 MHz**



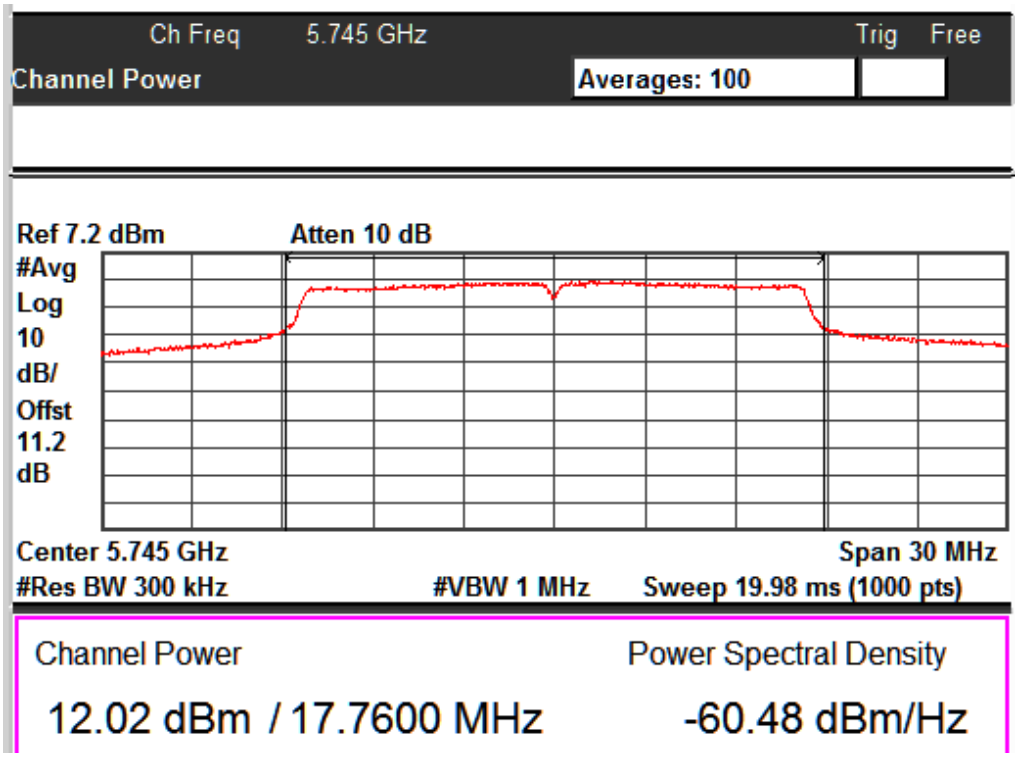

**Data Rate: 24 Mbps** **Channel Frequency: 5745 MHz**



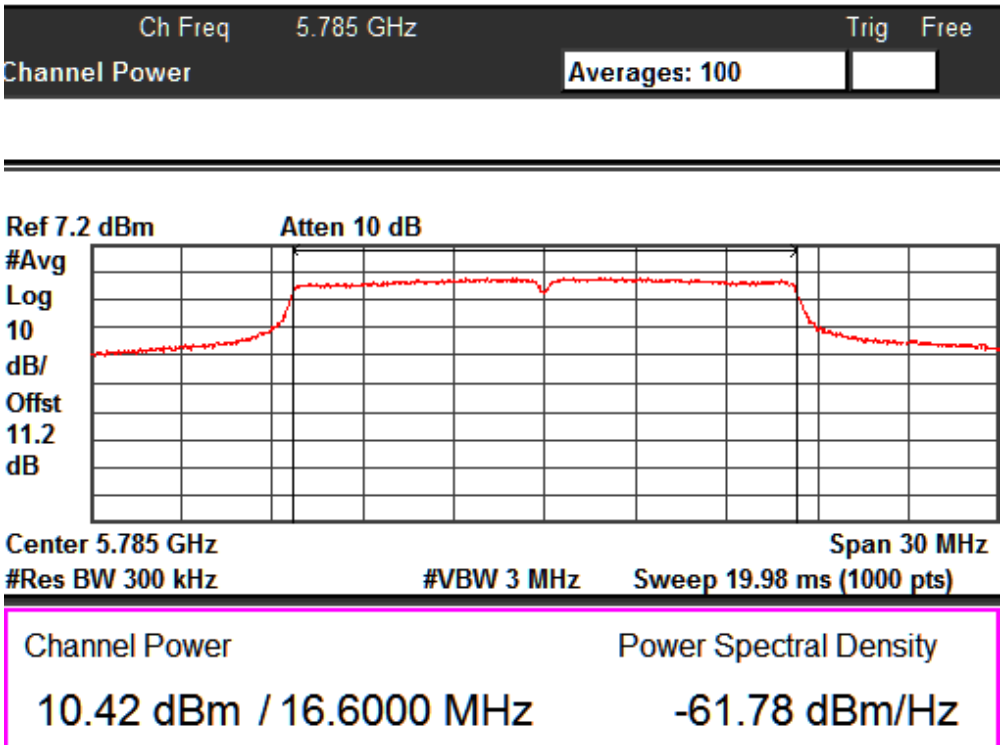

**Data Rate: 24 Mbps** **Channel Frequency: 5785 MHz**



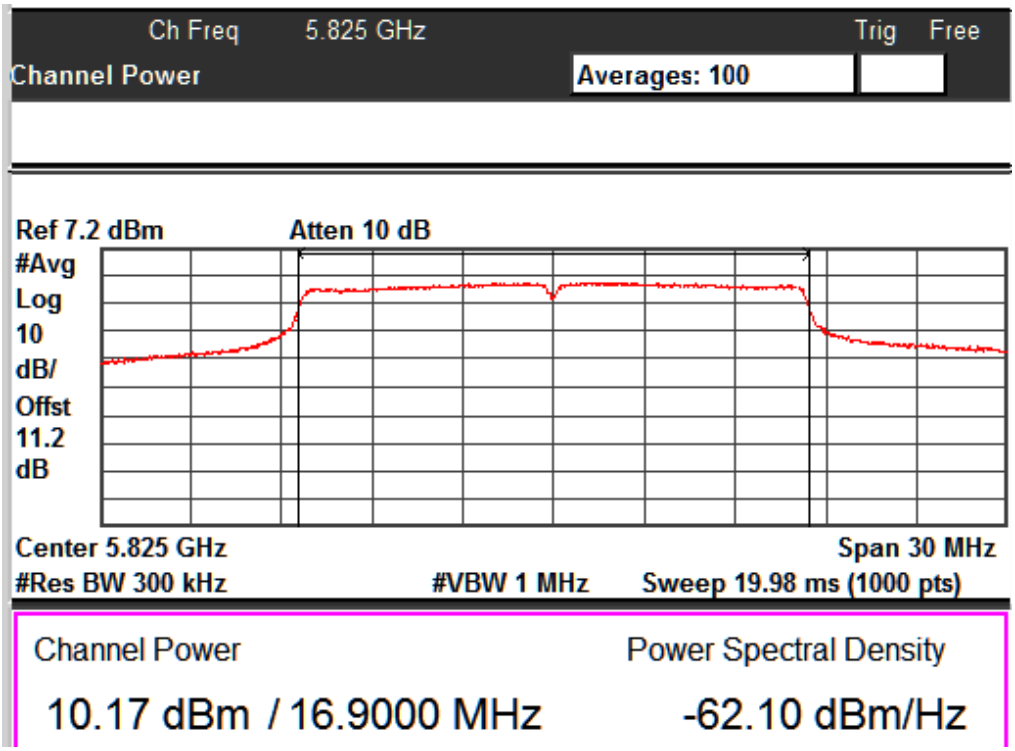

**Data Rate: 24 Mbps** **Channel Frequency: 5825 MHz**




**Data Rate: 54 Mbps** **Channel Frequency: 5745 MHz**

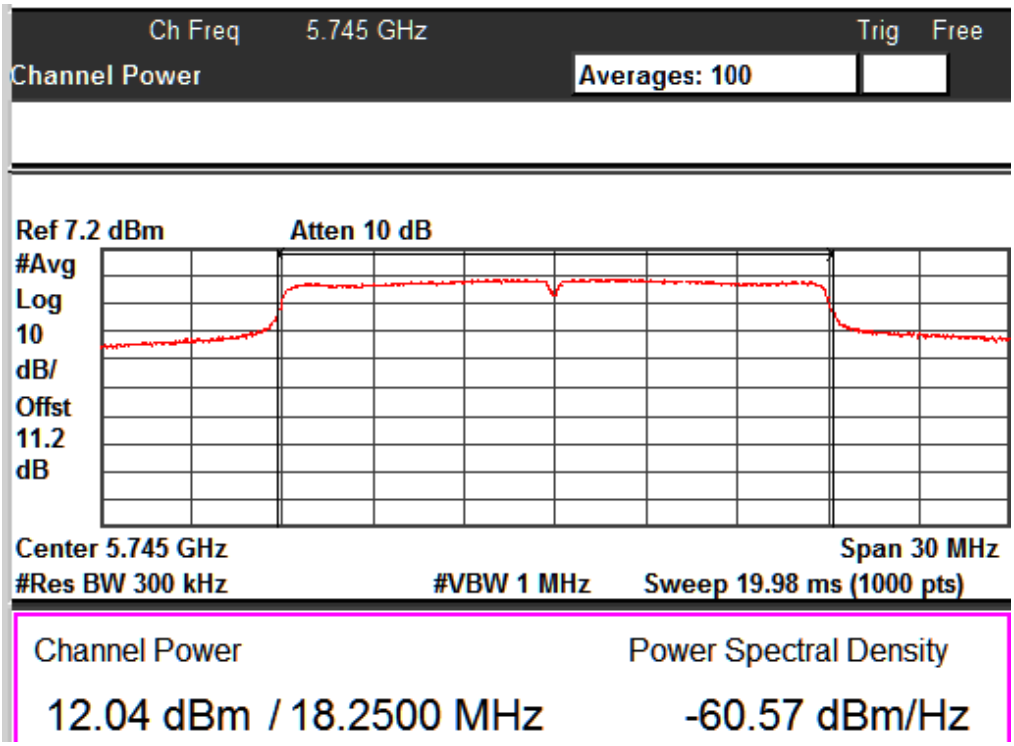



**Data Rate: 54 Mbps** **Channel Frequency: 5785 MHz**

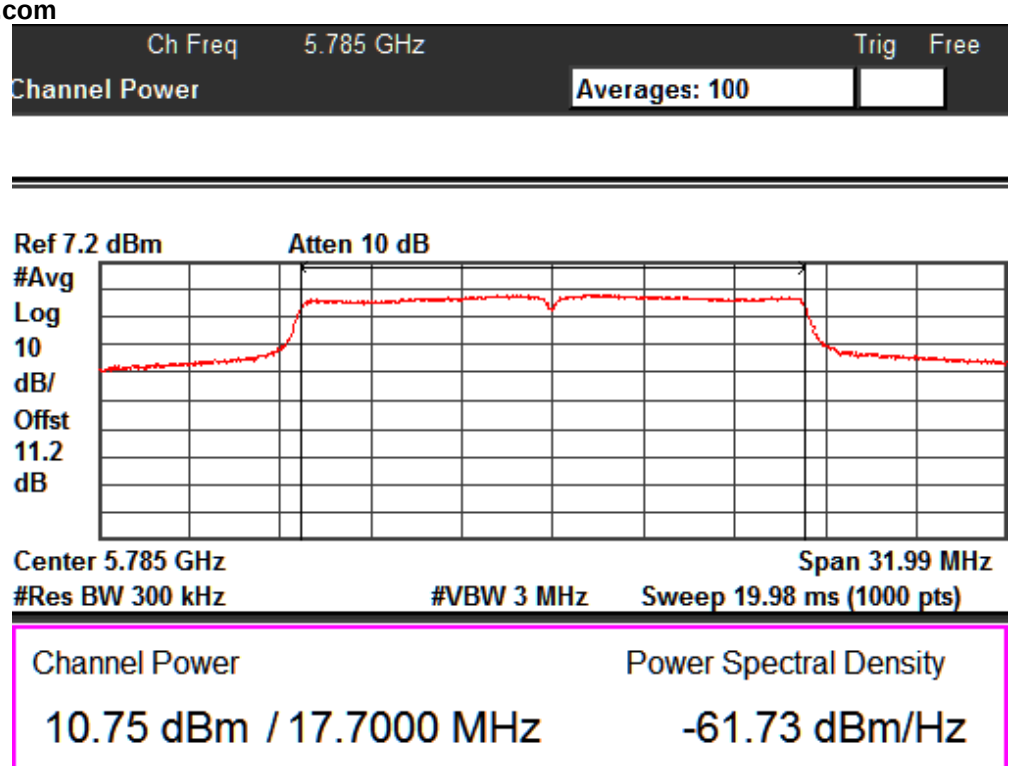



**Data Rate: 54 Mbps** **Channel Frequency: 5825 MHz**

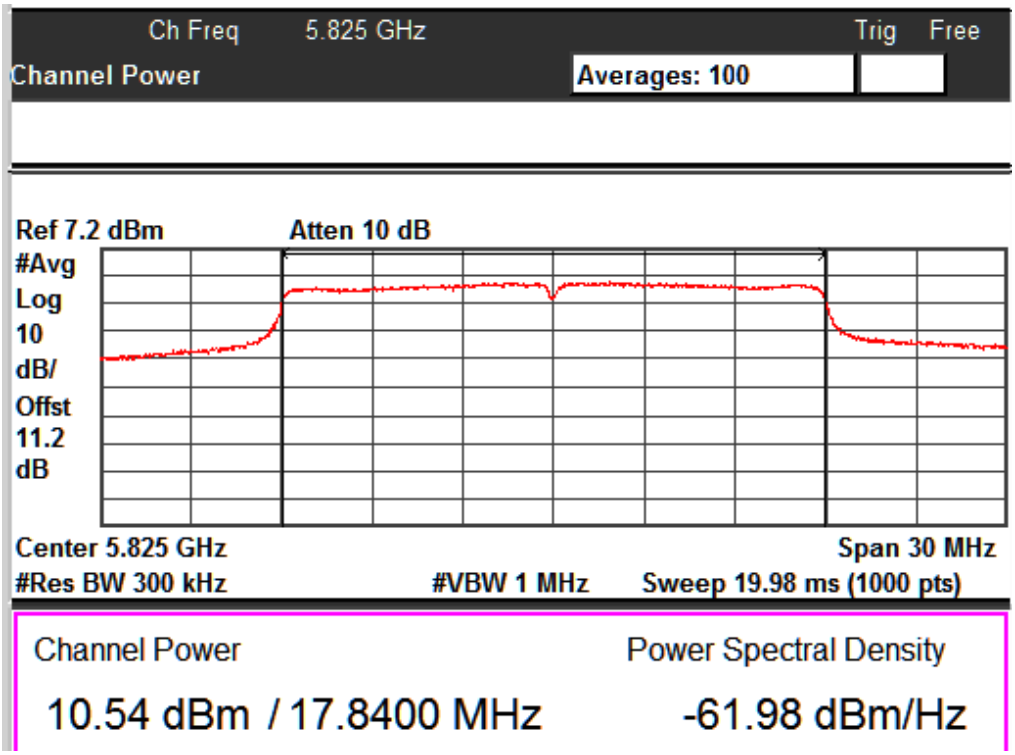
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|
| n | 6.5 | 5745 | 12.04 | 30.00 | -17.96 |
| | | 5785 | 10.75 | 30.00 | -19.25 |
| | | 5825 | 10.54 | 30.00 | -19.46 |
| | 39 | 5745 | 12.08 | 30.00 | -17.92 |
| | | 5785 | 10.69 | 30.00 | -19.31 |
| | | 5825 | 10.51 | 30.00 | -19.49 |
| | 65 | 5745 | 12.05 | 30.00 | -17.95 |
| | | 5785 | 10.64 | 30.00 | -19.36 |
| | | 5825 | 10.34 | 30.00 | -19.66 |



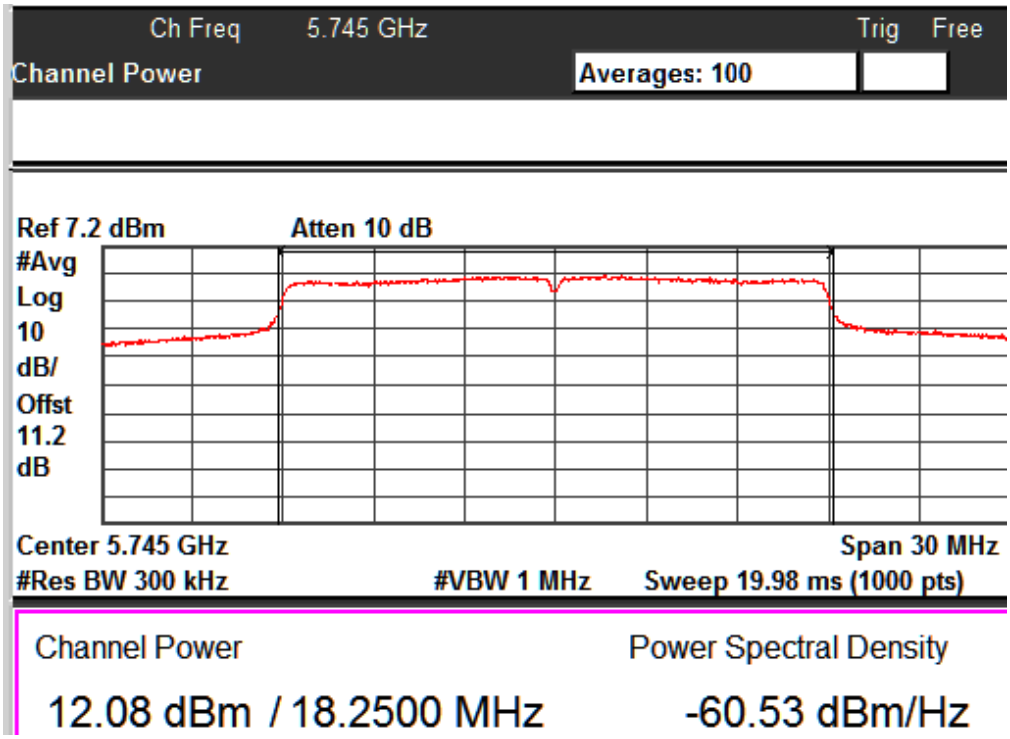

**Data Rate: 6.5 Mbps** **Channel Frequency: 5745 MHz**



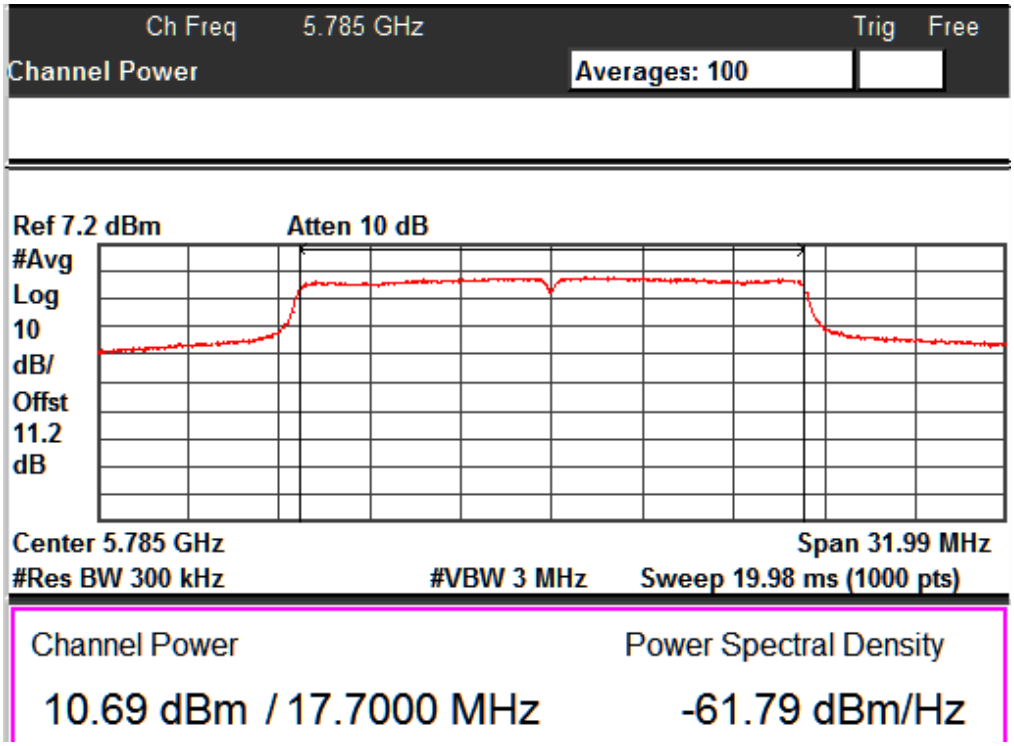

**Data Rate: 6.5 Mbps** **Channel Frequency: 5785 MHz**



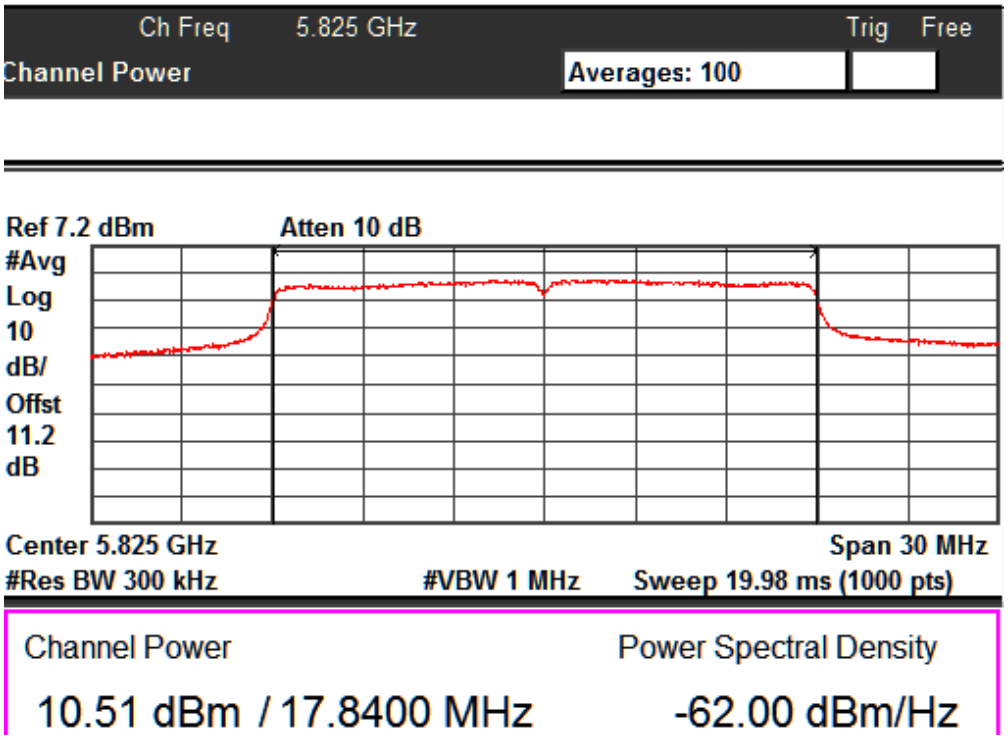

**Data Rate: 6.5 Mbps** **Channel Frequency: 5825 MHz**



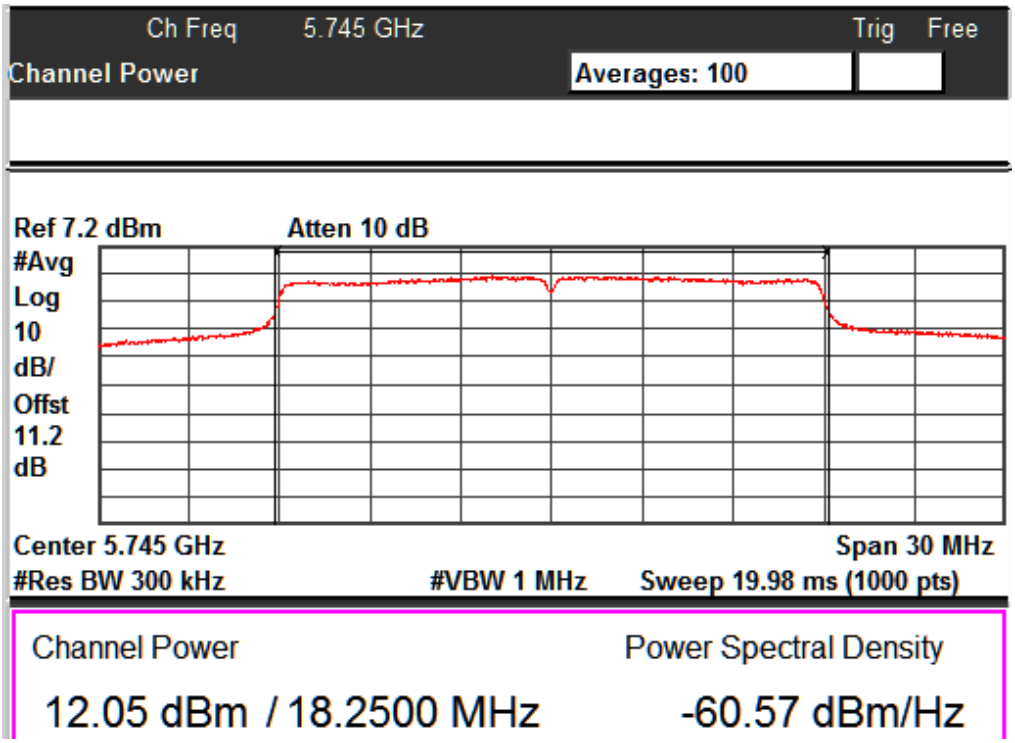

**Data Rate: 39 Mbps** **Channel Frequency: 5745 MHz**



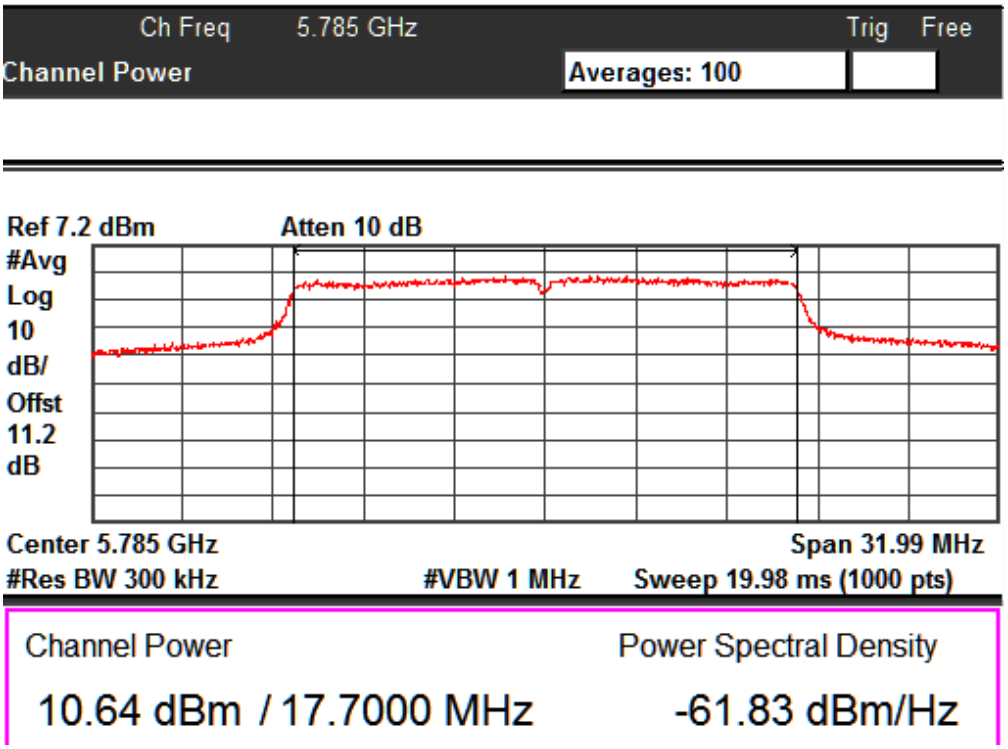

**Data Rate: 39 Mbps** **Channel Frequency: 5785 MHz**



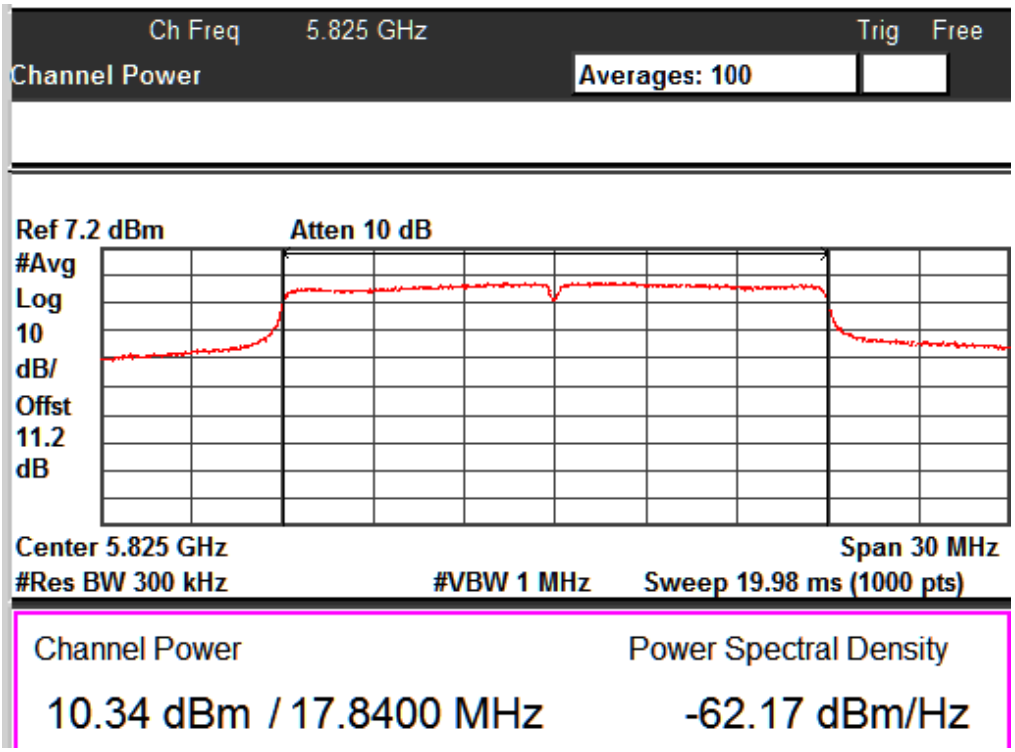

**Data Rate: 39 Mbps** **Channel Frequency: 5825 MHz**




**Data Rate: 65 Mbps** **Channel Frequency: 5745 MHz**



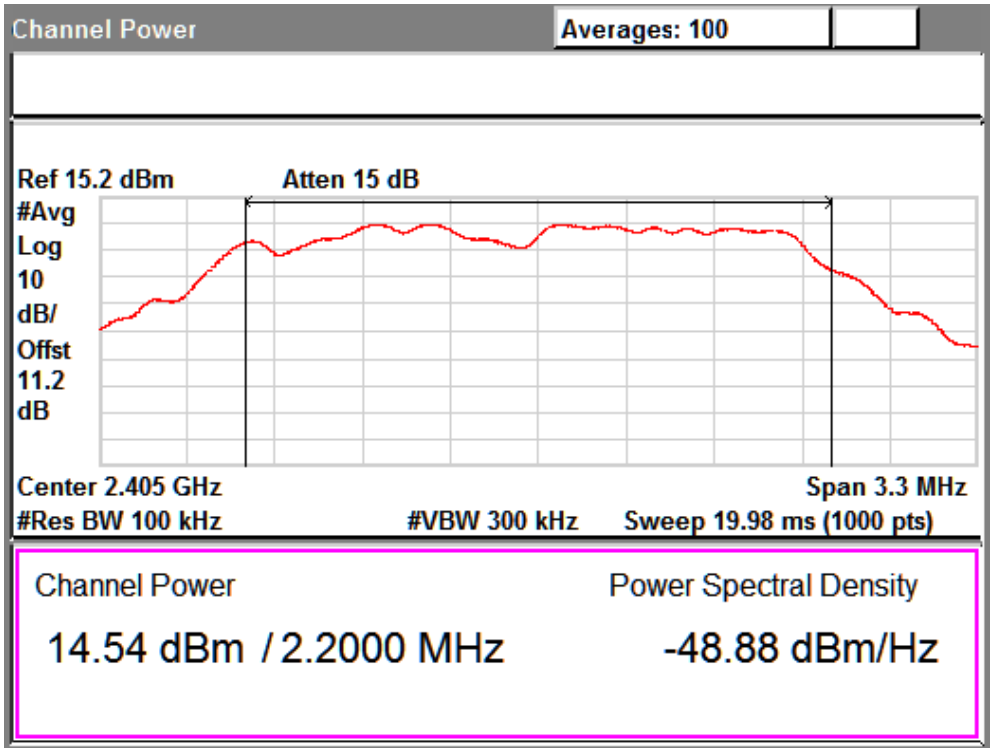

**Data Rate: 65 Mbps** **Channel Frequency: 5785 MHz**



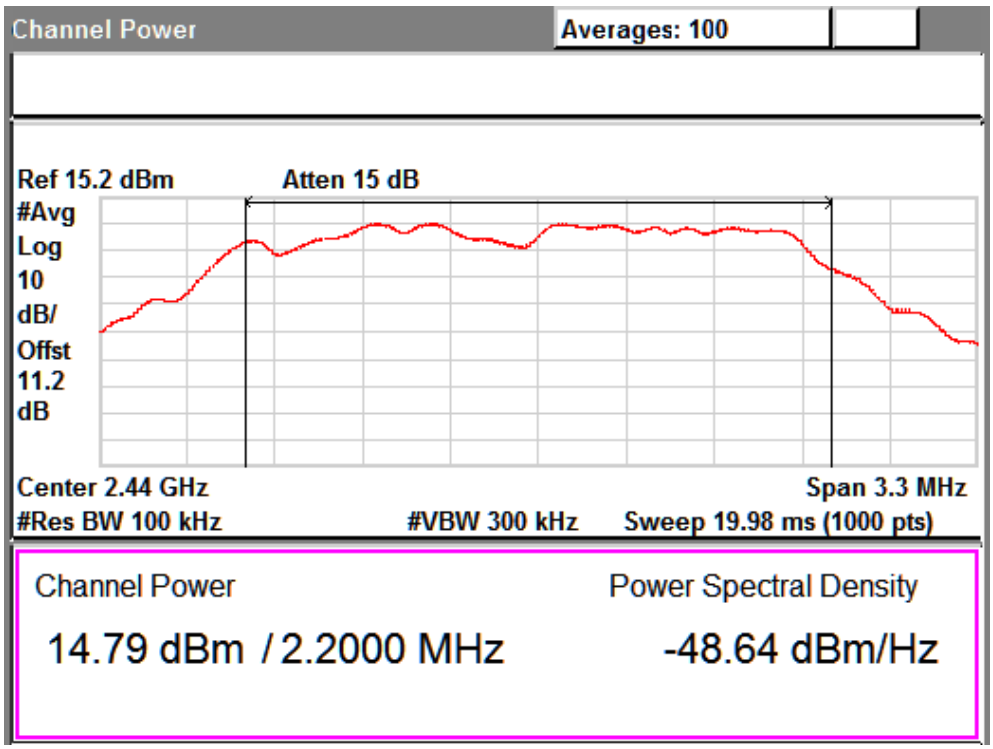

**Data Rate: 65 Mbps** **Channel Frequency: 5825 MHz**

**Test Result: ZigBee**

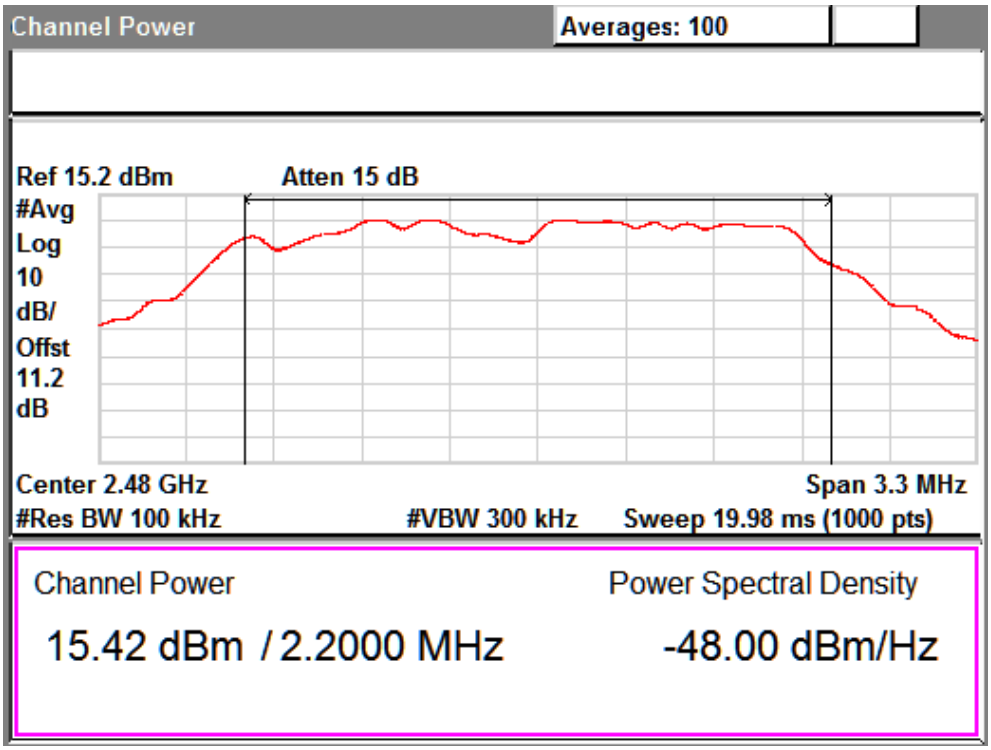
| Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|
| 2405.00 | 14.54 | 30.00 | -15.46 |
| 2440.00 | 14.79 | 30.00 | -15.21 |
| 2480.00 | 15.42 | 30.00 | -14.58 |




**Channel Frequency: 2405 MHz**



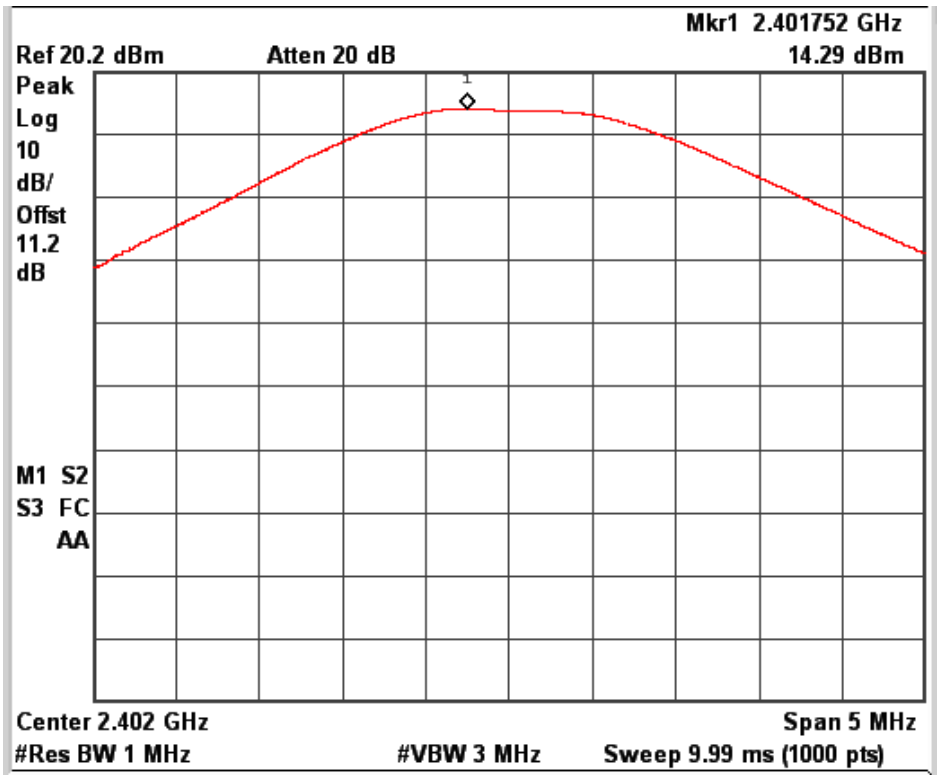

**Channel Frequency: 2440 MHz**



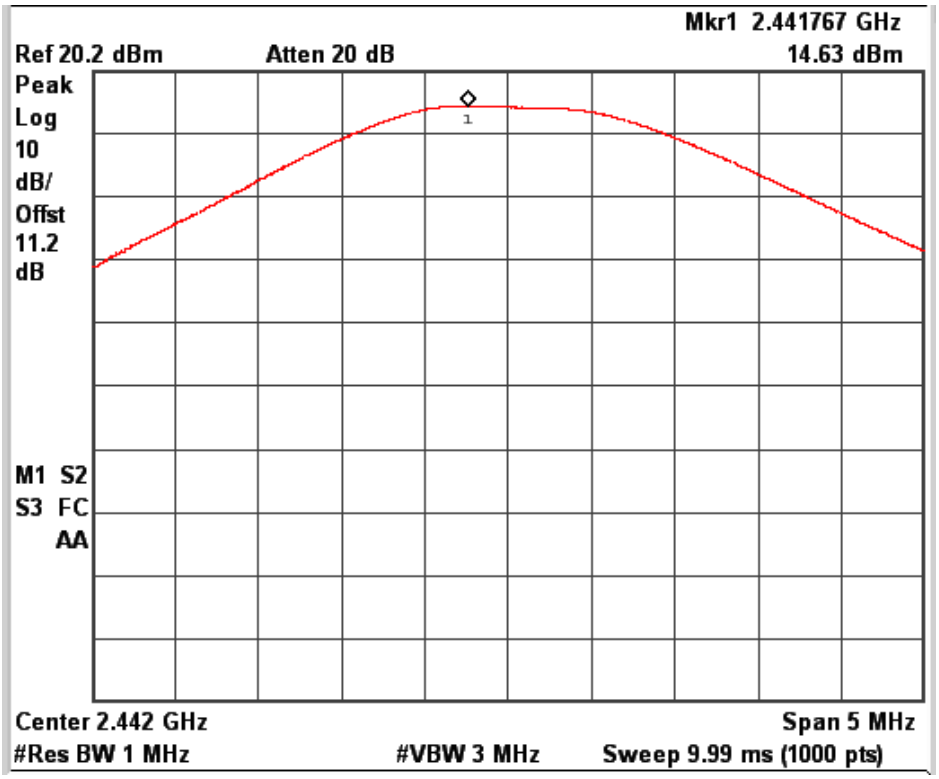

**Channel Frequency: 2480 MHz**

**Test Result: Bluetooth LE**

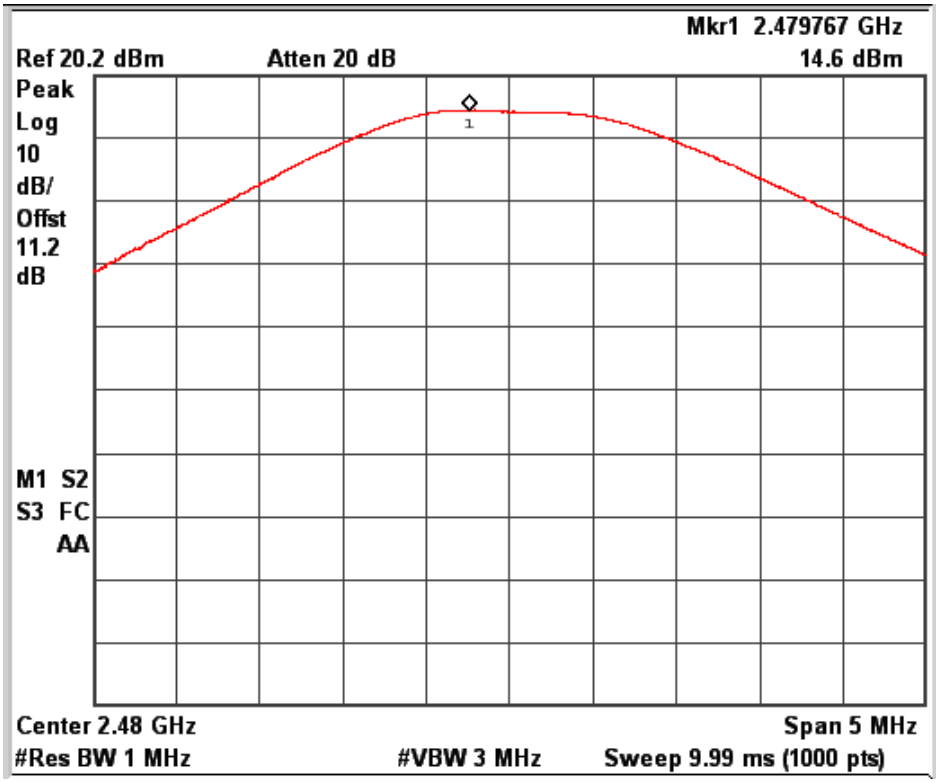
| Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|
| 2402.00 | 14.29 | 30.00 | -15.71 |
| 2442.00 | 14.63 | 30.00 | -15.37 |
| 2480.00 | 14.60 | 30.00 | -15.40 |




**Channel Frequency: 2402 MHz**




**Channel Frequency: 2440 MHz**




**Channel Frequency: 2480 MHz**

**Maximum Power Spectral Density** **Section 15.247(e)**

**Result** **Pass**

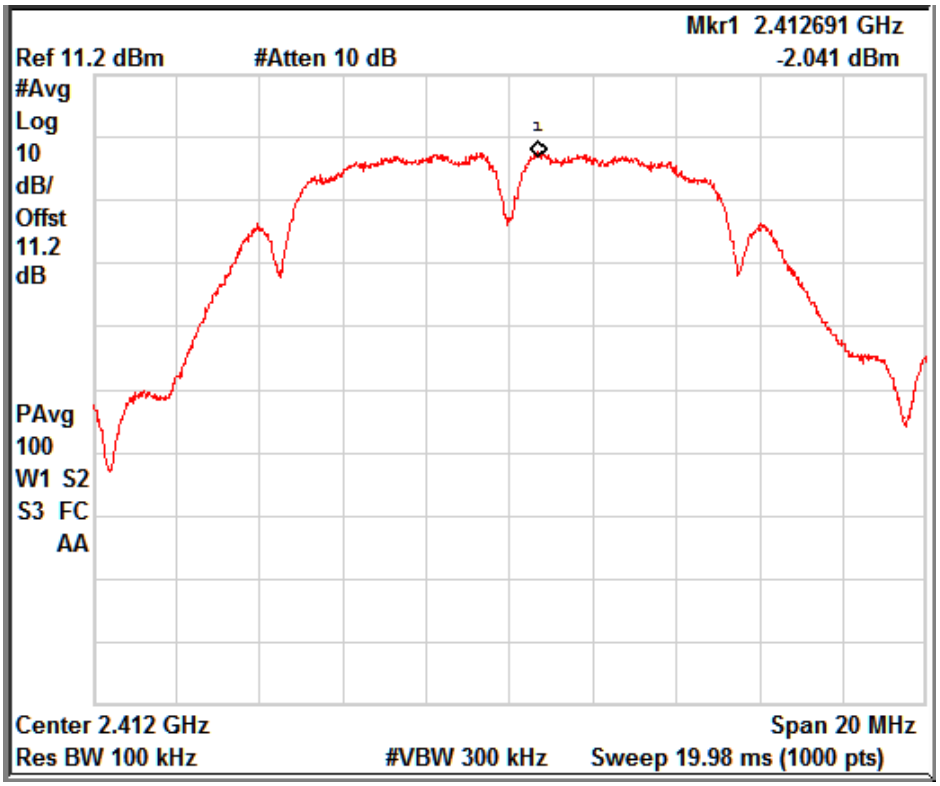
| | |
|---|---|
| Test Specification | FCC Part 15 Section 15.247 (e) |
| Detector Function | Peak |
| Requirement | For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm. |

**Note: For measurement of Maximum power spectral density option 1 was used**

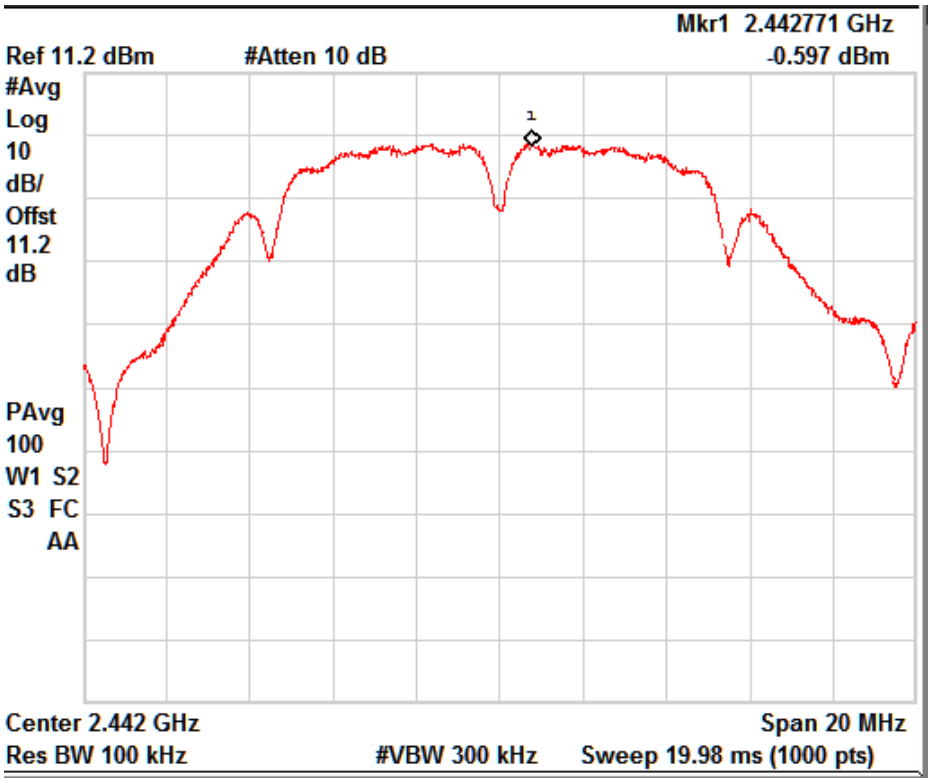
**Test Method:**


**Test Result:**

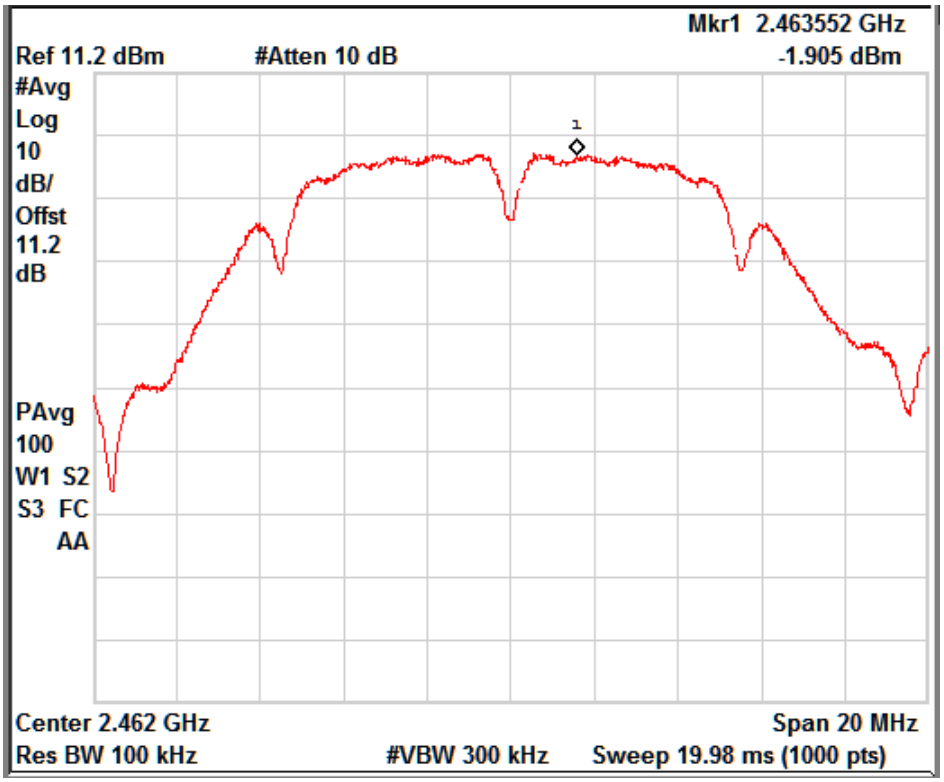
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total PSD (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|
| b | 1 | 2412.00 | -02.04 | 8.00 | -10.04 |
| | | 2442.00 | -00.59 | 8.00 | -08.59 |
| | | 2462.00 | -01.90 | 8.00 | -09.90 |
| | 11 | 2412.00 | -00.95 | 8.00 | -08.95 |
| | | 2442.00 | -00.97 | 8.00 | -08.97 |
| | | 2462.00 | -01.17 | 8.00 | -09.17 |



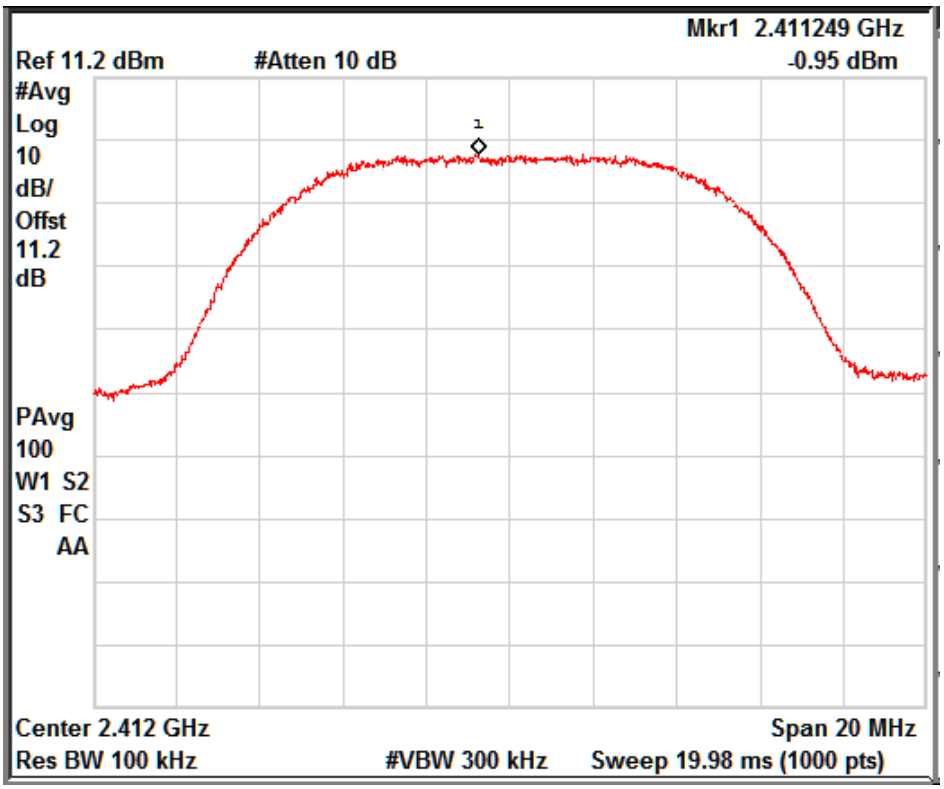

**Data rate: 1 Mbps** **Channel Frequency: 2412 MHz**



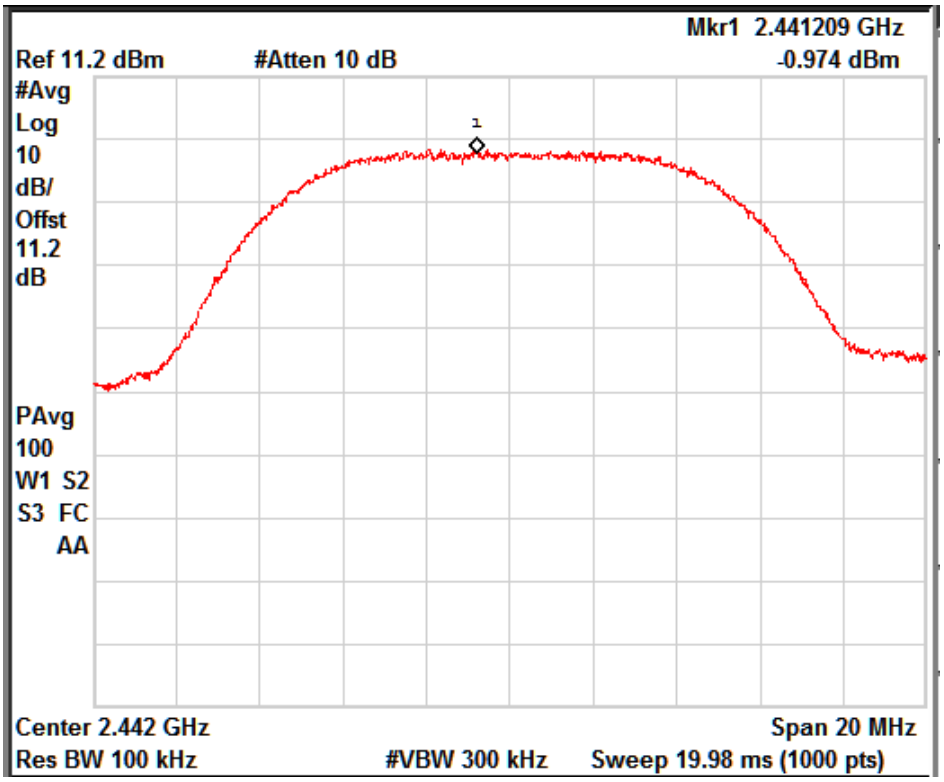

**Data rate: 1 Mbps** **Channel Frequency: 2442 MHz**



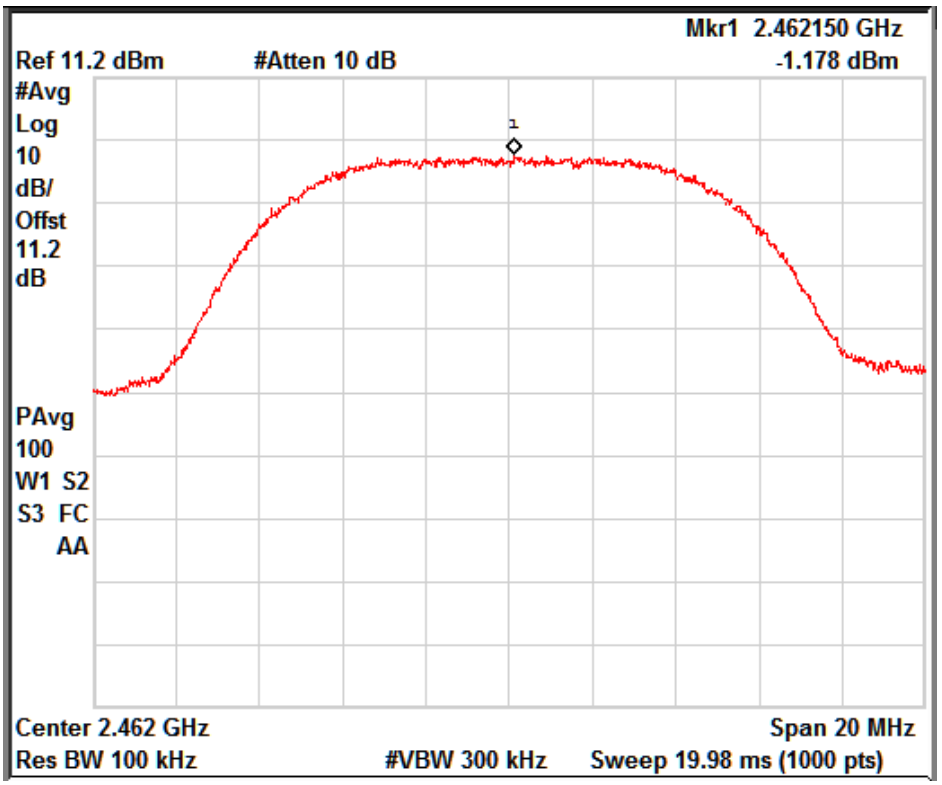

**Data rate: 1 Mbps** **Channel Frequency: 2462 MHz**




**Data rate: 11 Mbps** **Channel Frequency: 2412 MHz**

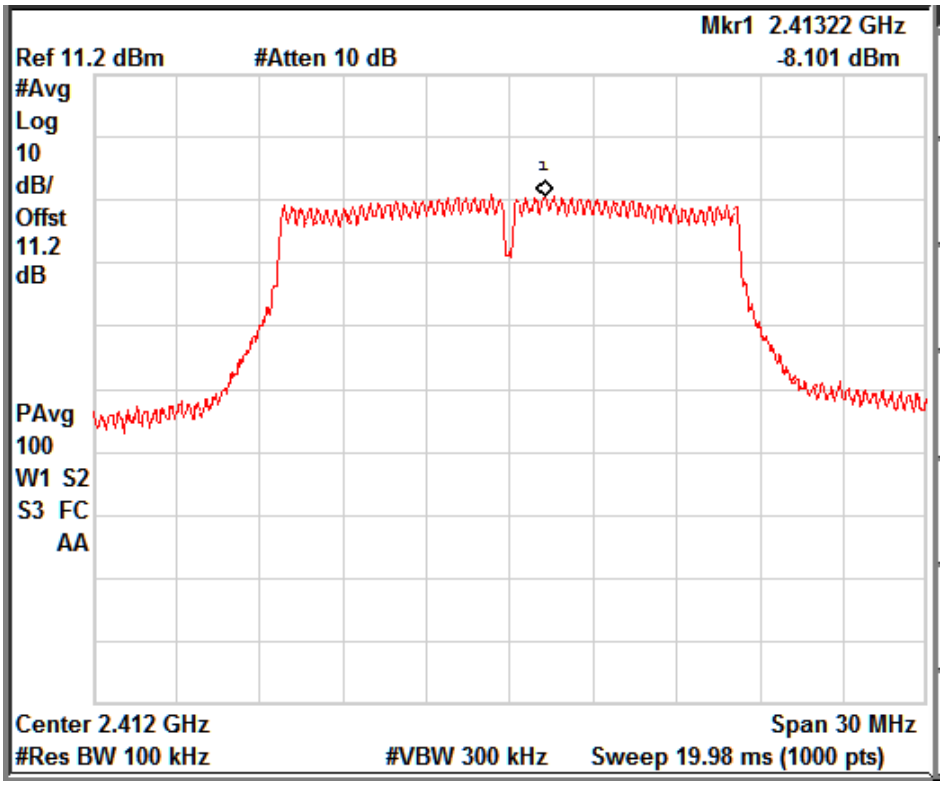



**Data rate: 11 Mbps** **Channel Frequency: 2442 MHz**

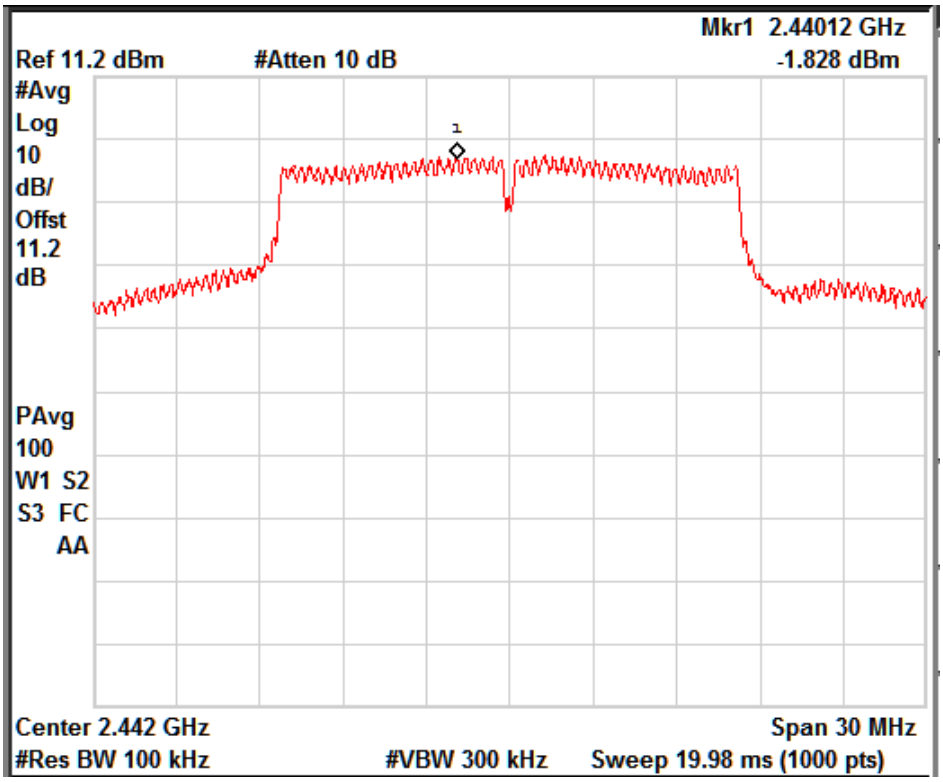



**Data rate: 11 Mbps** **Channel Frequency: 2462 MHz**

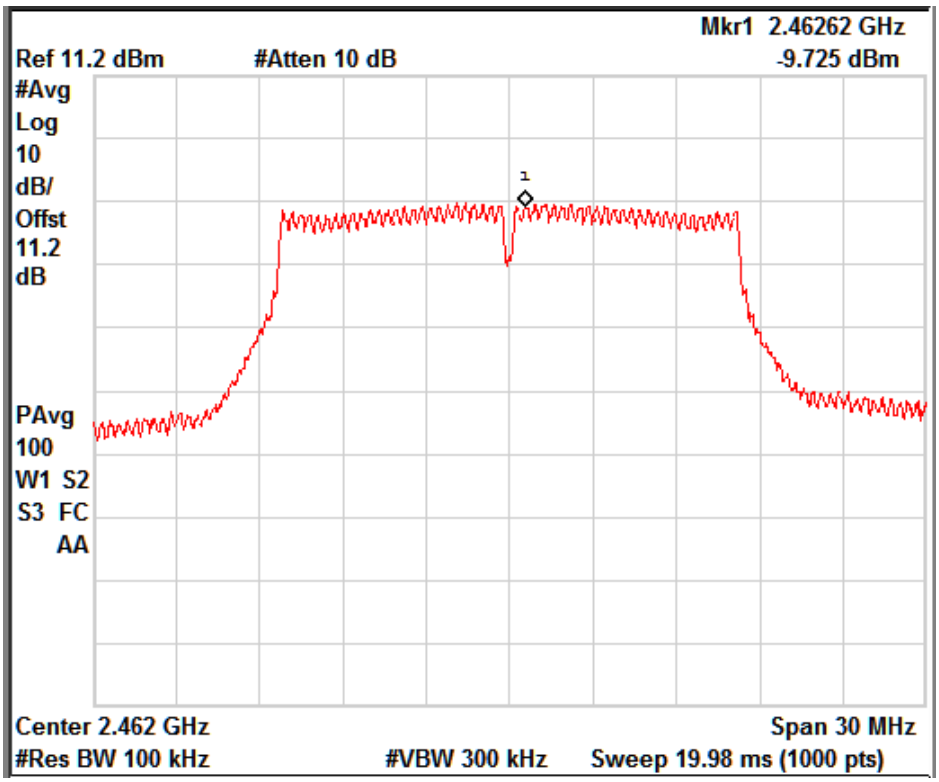
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total PSD (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|
| g | 6 | 2412.00 | -08.10 | 8.00 | -16.10 |
| | | 2442.00 | -01.82 | 8.00 | -09.82 |
| | | 2462.00 | -09.72 | 8.00 | -17.72 |
| | 24 | 2412.00 | -08.38 | 8.00 | -16.38 |
| | | 2442.00 | -01.90 | 8.00 | -09.90 |
| | | 2462.00 | -09.04 | 8.00 | -17.04 |
| | 54 | 2412.00 | -08.54 | 8.00 | -16.54 |
| | | 2442.00 | -01.60 | 8.00 | -09.60 |
| | | 2462.00 | -09.51 | 8.00 | -17.51 |



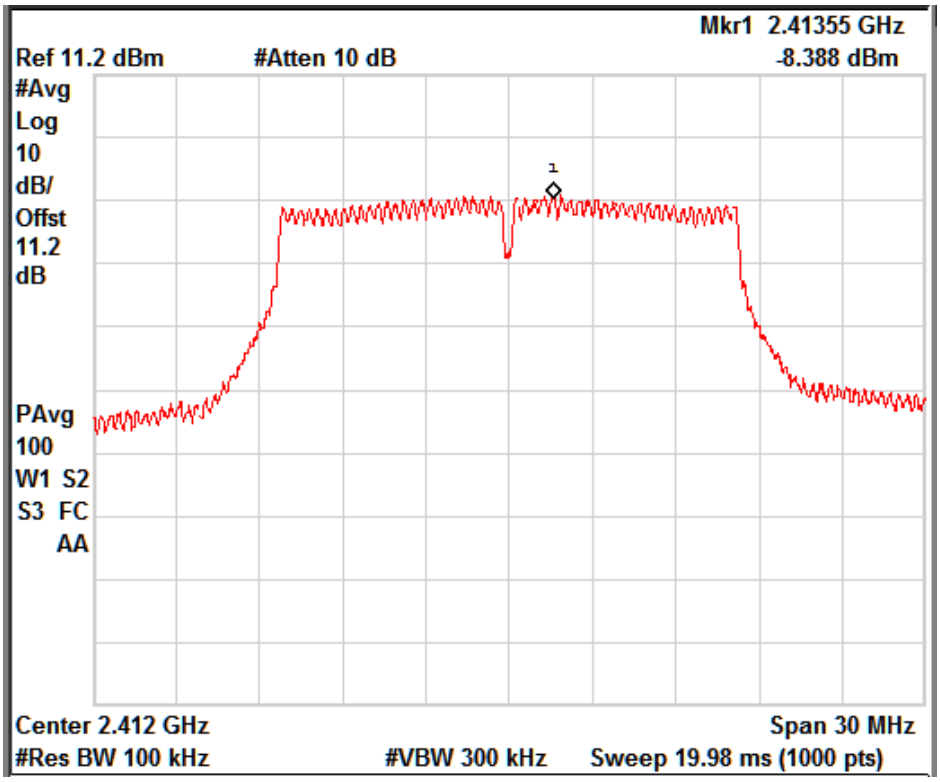

**Data rate: 6 Mbps** **Channel Frequency: 2412 MHz**



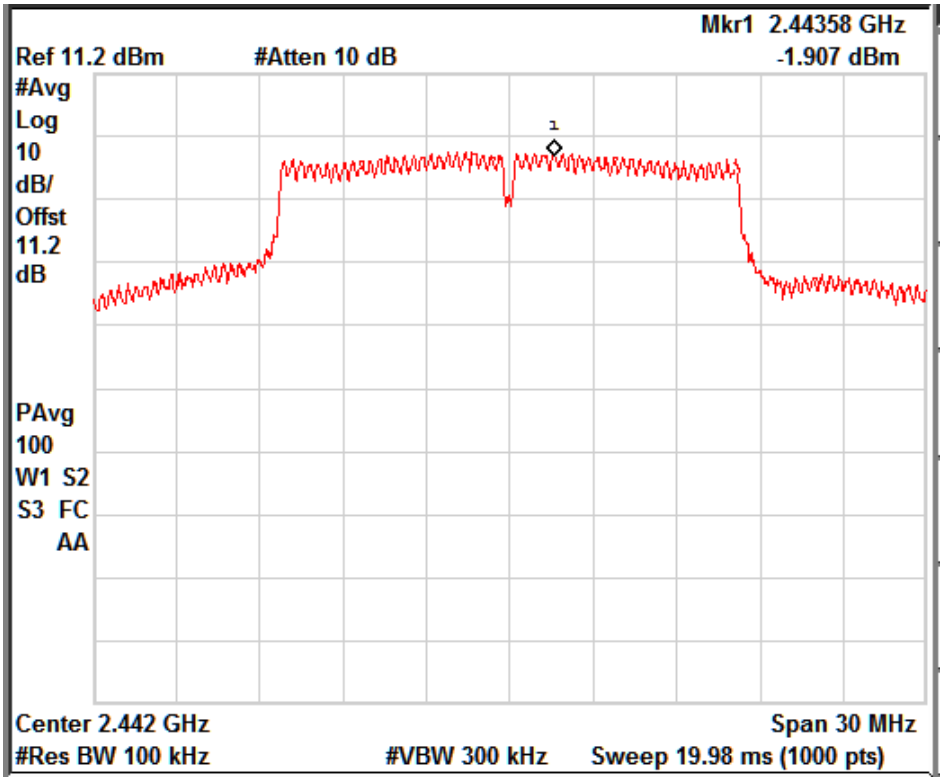

**Data rate: 6 Mbps** **Channel Frequency: 2442 MHz**



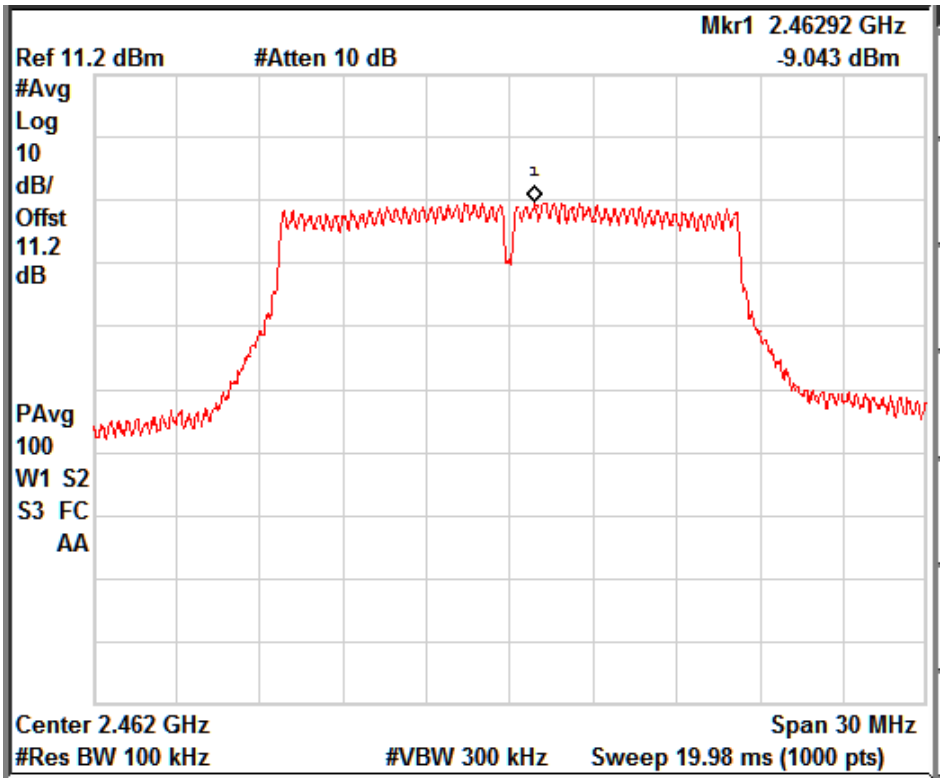

**Data rate: 6 Mbps** **Channel Frequency: 2462 MHz**



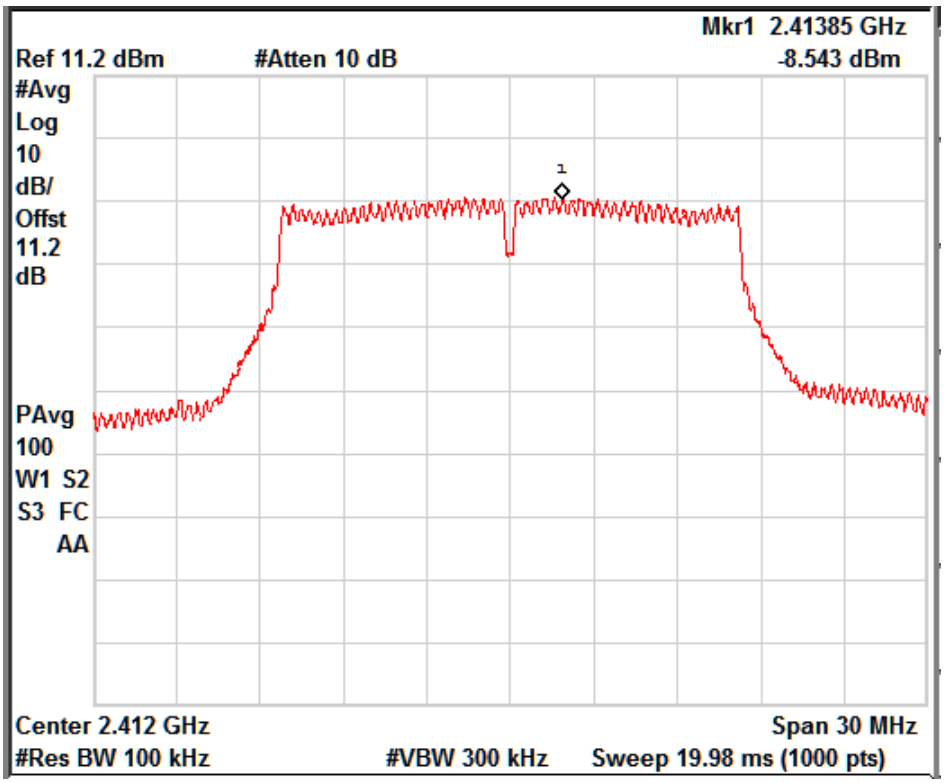

**Data rate: 24 Mbps** **Channel Frequency: 2412 MHz**



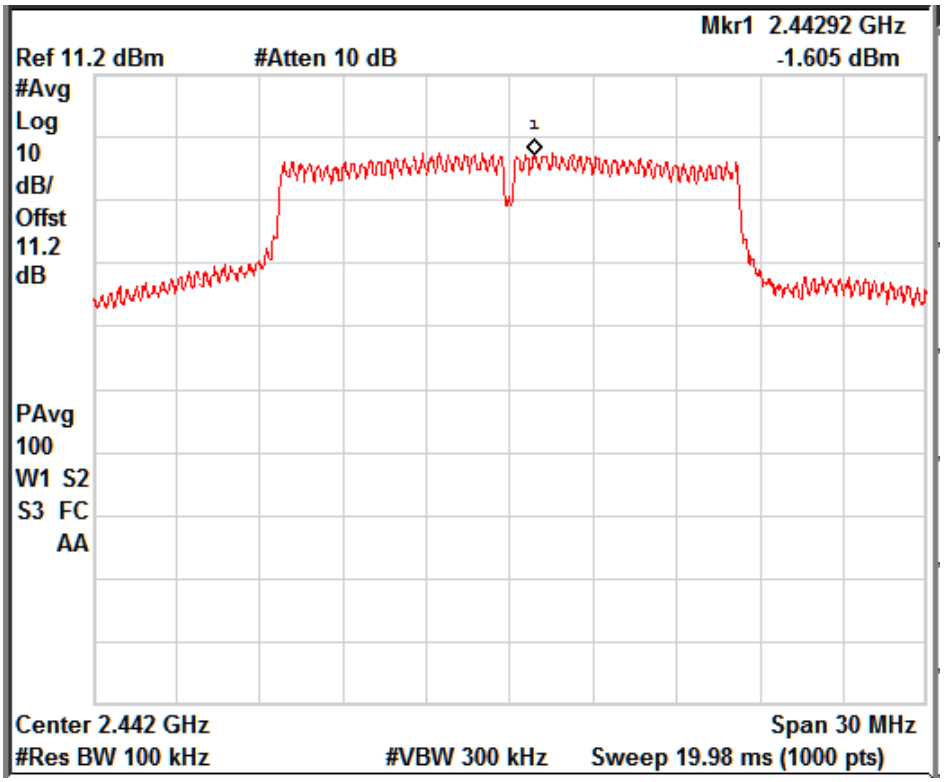

**Data rate: 24 Mbps** **Channel Frequency: 2442 MHz**



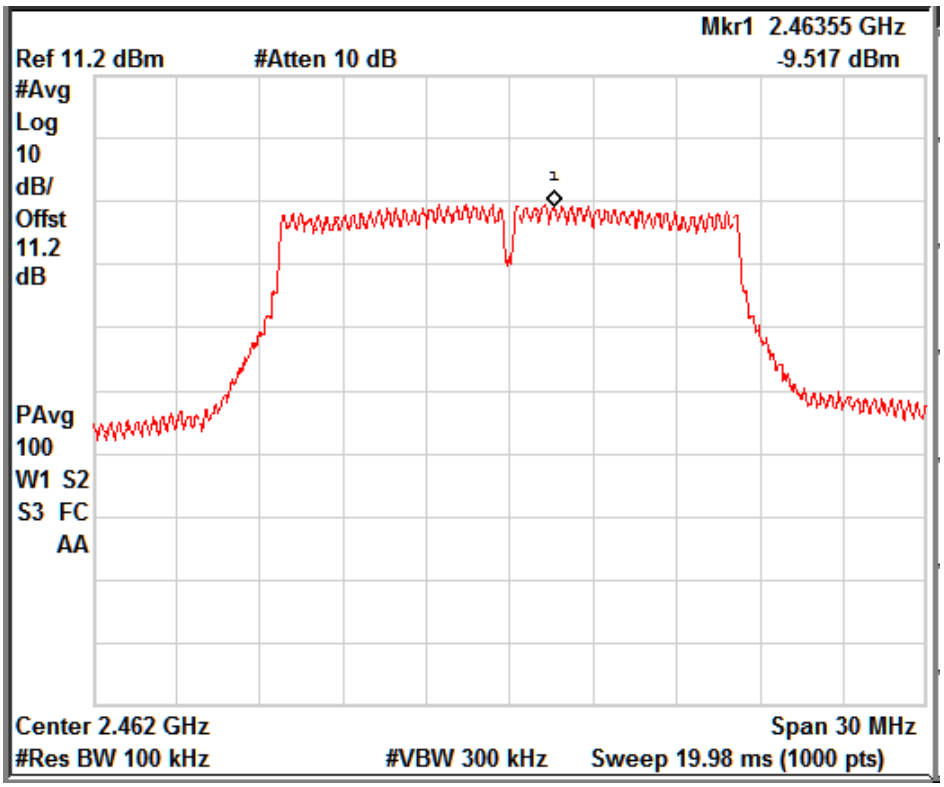

**Data rate: 24 Mbps** **Channel Frequency: 2462 MHz**




**Data rate: 54 Mbps** **Channel Frequency: 2412 MHz**

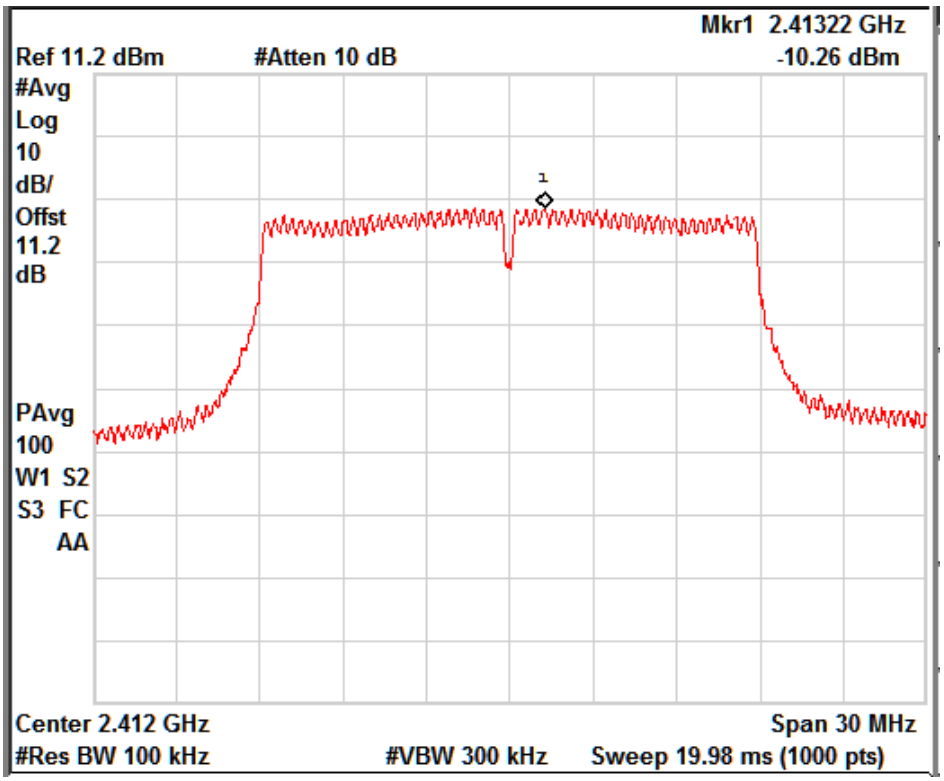



**Data rate: 54 Mbps** **Channel Frequency: 2442 MHz**

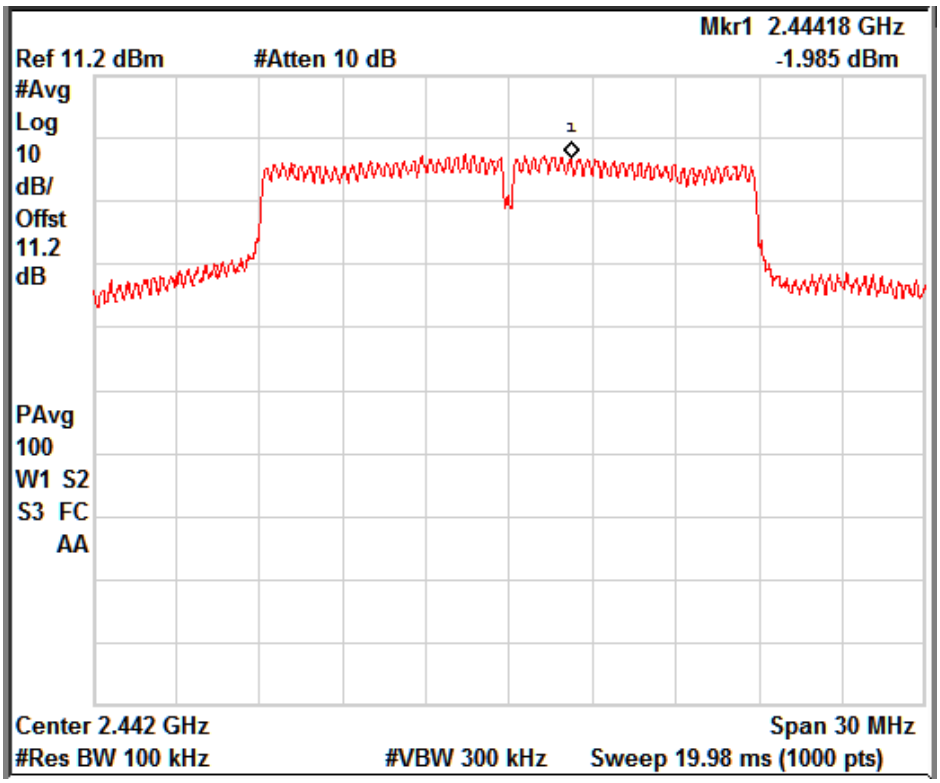



**Data rate: 54 Mbps** **Channel Frequency: 2462 MHz**

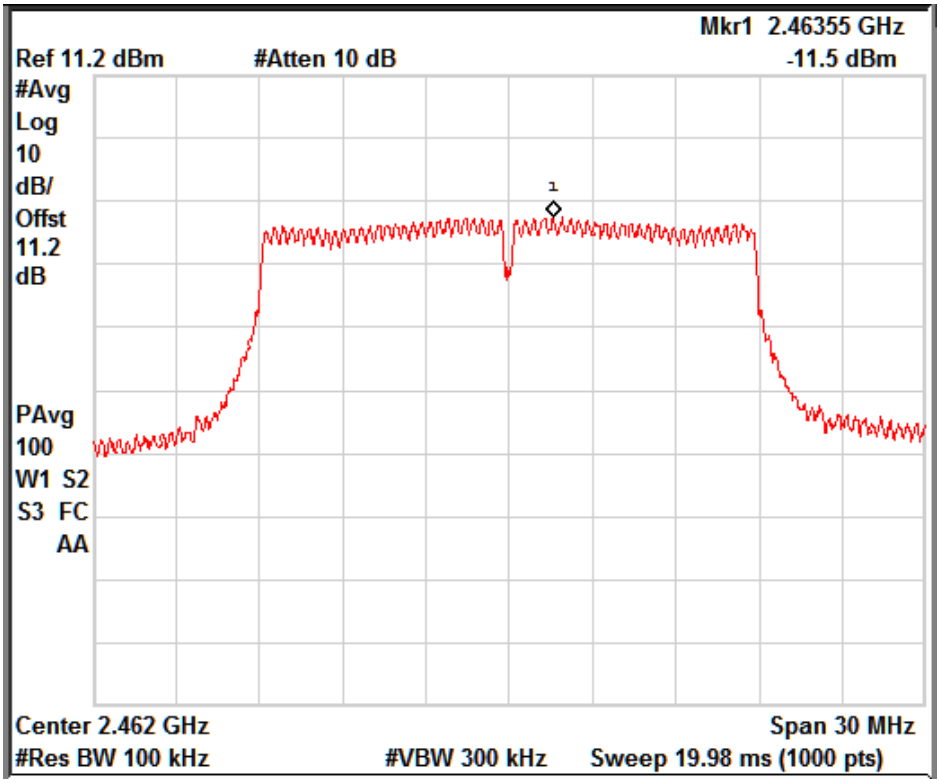
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total PSD (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|
| n | 6.5 | 2412.00 | -10.26 | 8.00 | -18.26 |
| | | 2442.00 | -01.98 | 8.00 | -09.98 |
| | | 2462.00 | -11.50 | 8.00 | -19.50 |
| | 39 | 2412.00 | -10.76 | 8.00 | -18.76 |
| | | 2442.00 | -01.32 | 8.00 | -09.32 |
| | | 2462.00 | -11.61 | 8.00 | -19.61 |
| | 65 | 2412.00 | -10.55 | 8.00 | -18.55 |
| | | 2442.00 | -01.27 | 8.00 | -09.27 |
| | | 2462.00 | -11.53 | 8.00 | -19.53 |



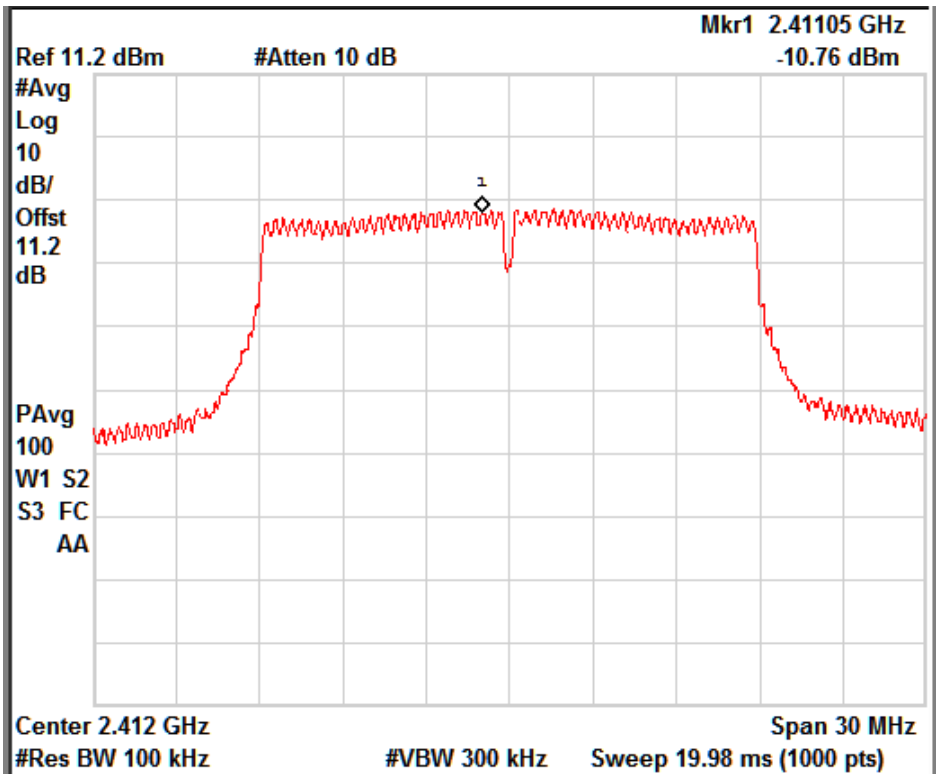

**Data rate: 6.5 Mbps** **Channel Frequency: 2412 MHz**



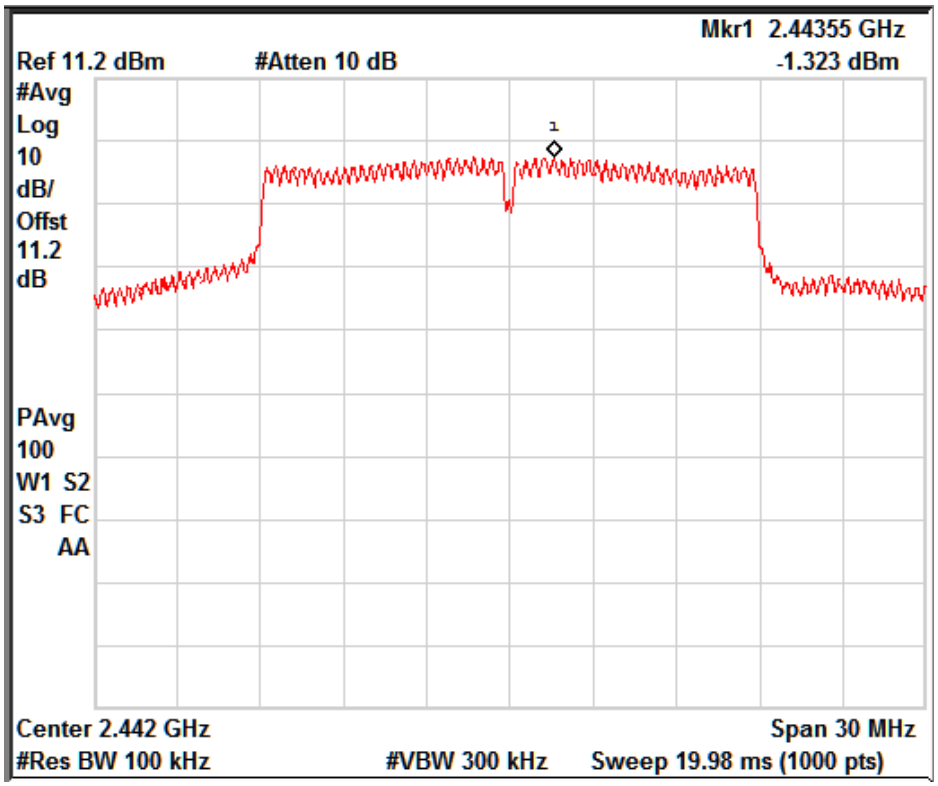

**Data rate: 6.5 Mbps** **Channel Frequency: 2442 MHz**



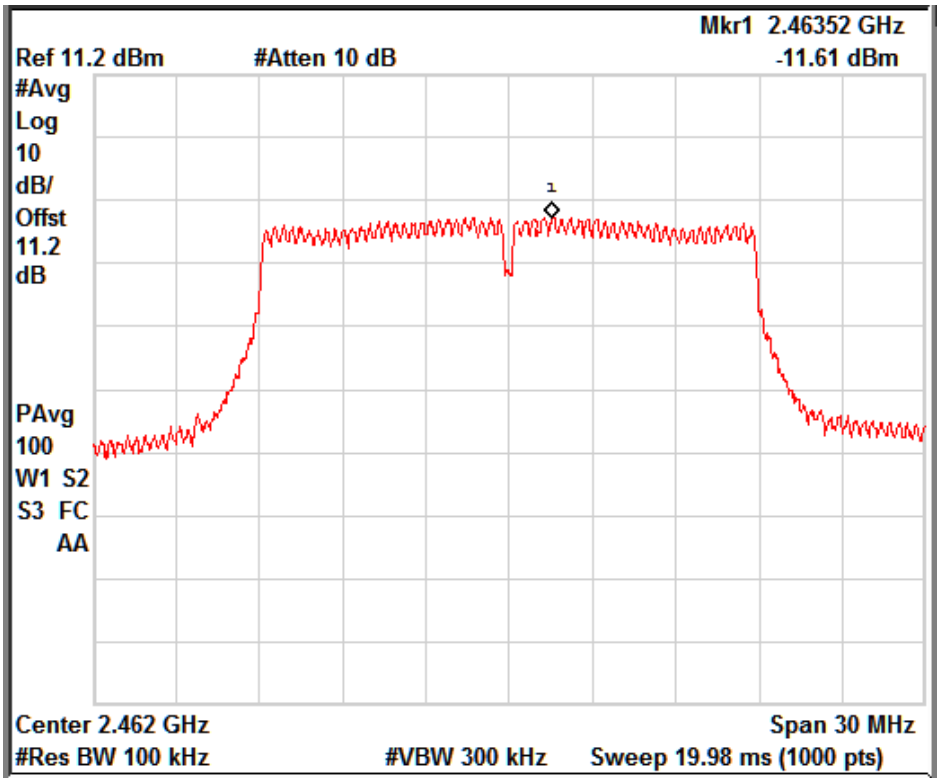

**Data rate: 6.5 Mbps** **Channel Frequency: 2462 MHz**



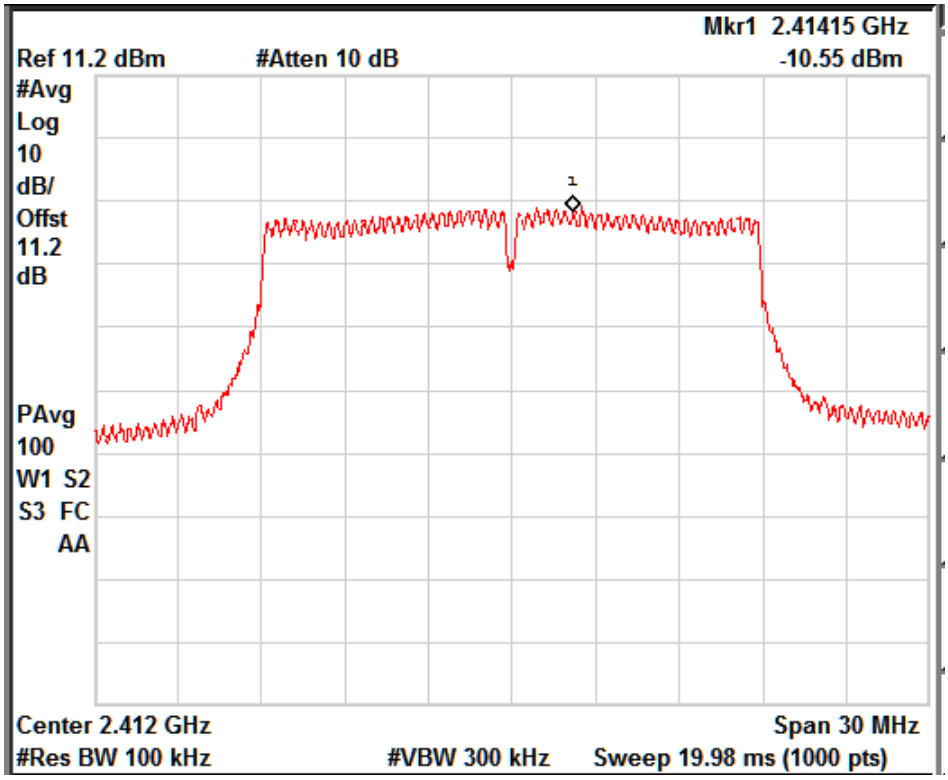

**Data rate: 39 Mbps** **Channel Frequency: 2412 MHz**



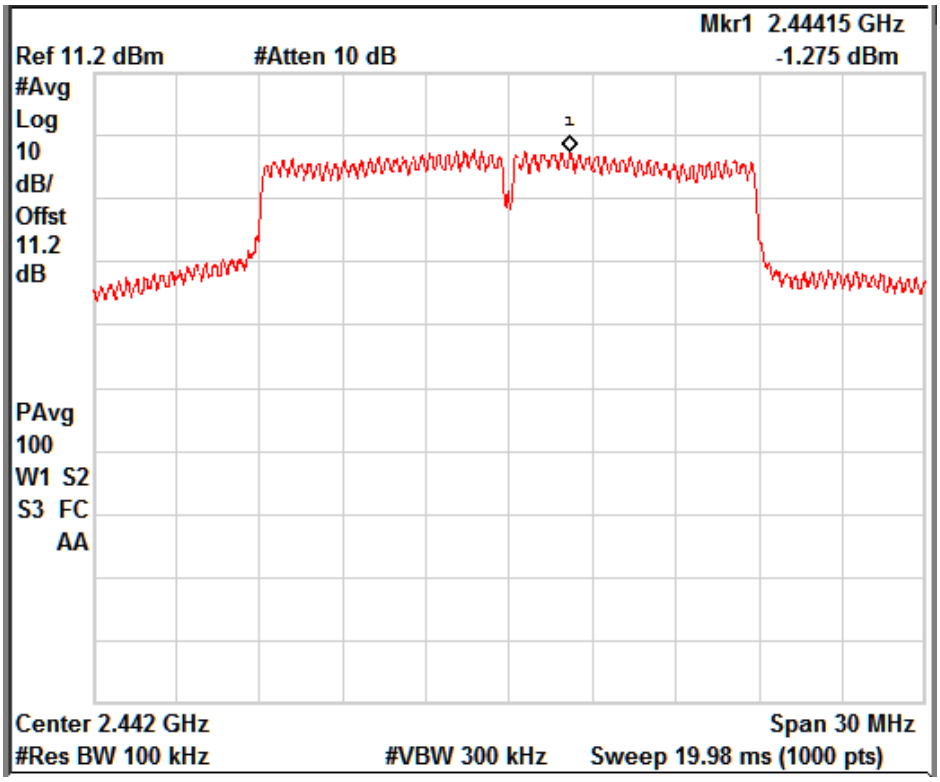

**Data rate: 39 Mbps** **Channel Frequency: 2442 MHz**



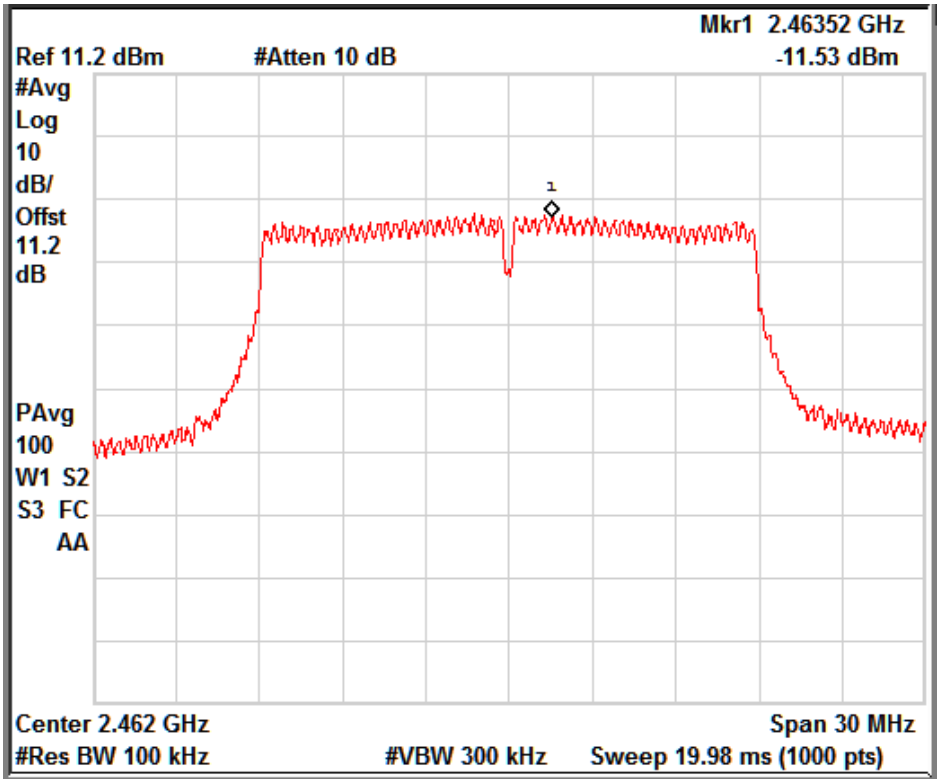

**Data rate: 39 Mbps** **Channel Frequency: 2462 MHz**




**Data rate: 65 Mbps** **Channel Frequency: 2412 MHz**



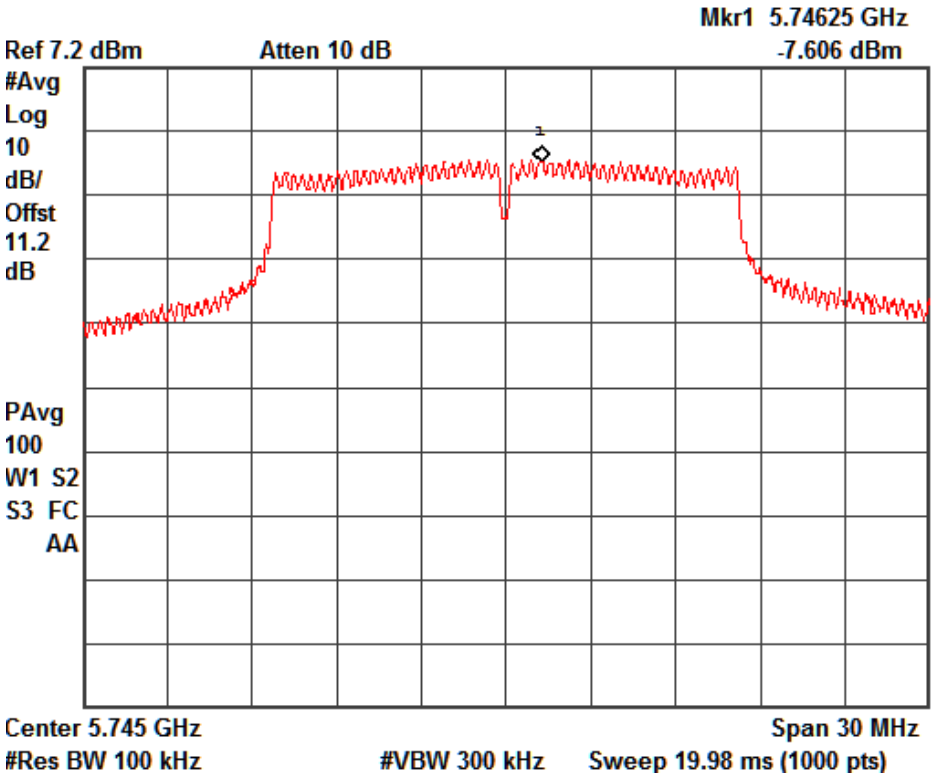

**Data rate: 65 Mbps** **Channel Frequency: 2442 MHz**



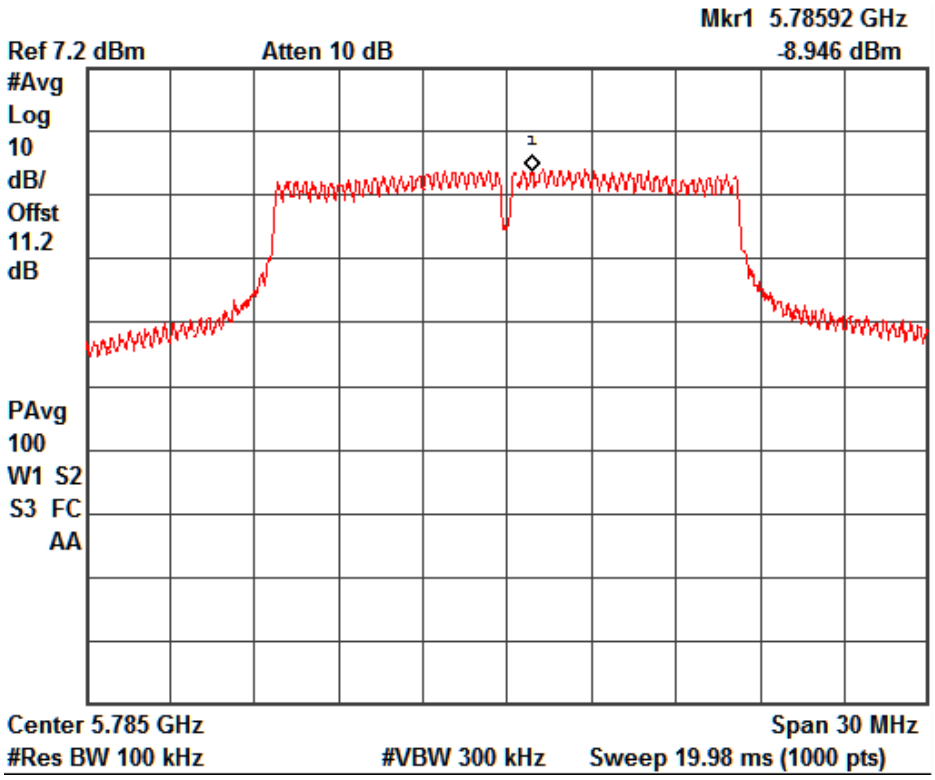

**Data rate: 65 Mbps** **Channel Frequency: 2462 MHz**

**5GHz Band**

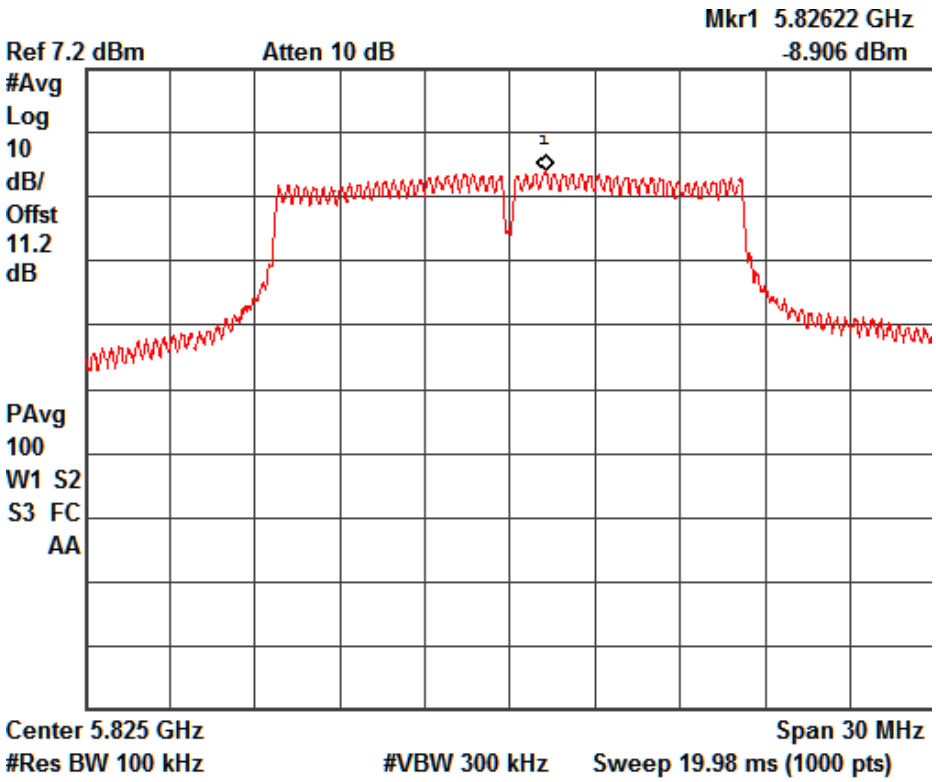
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|
| a | 6 | 5745 | -8.60 | 8.00 | -16.60 |
| | | 5785 | -8.94 | 8.00 | -16.94 |
| | | 5825 | -8.90 | 8.00 | -16.90 |
| | 24 | 5745 | -7.58 | 8.00 | -15.58 |
| | | 5785 | -8.76 | 8.00 | -16.76 |
| | | 5825 | -9.14 | 8.00 | -17.14 |
| | 54 | 5745 | -7.64 | 8.00 | -15.64 |
| | | 5785 | -8.51 | 8.00 | -16.51 |
| | | 5825 | -8.67 | 8.00 | -16.67 |



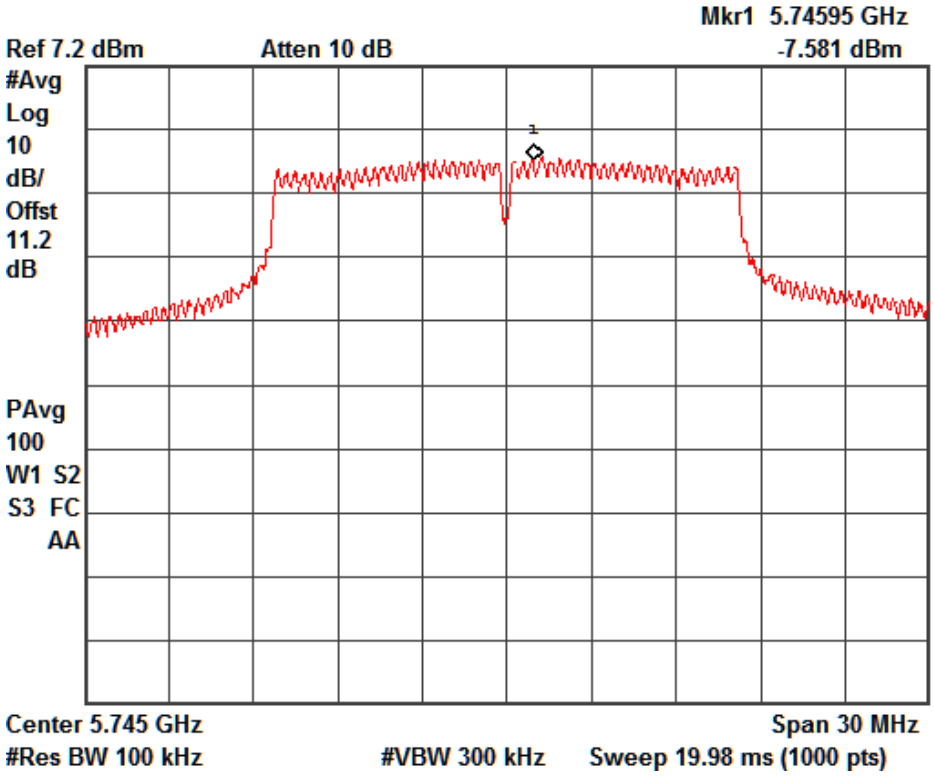

**Data Rate: 6 Mbps** **Channel Frequency: 5745 MHz**



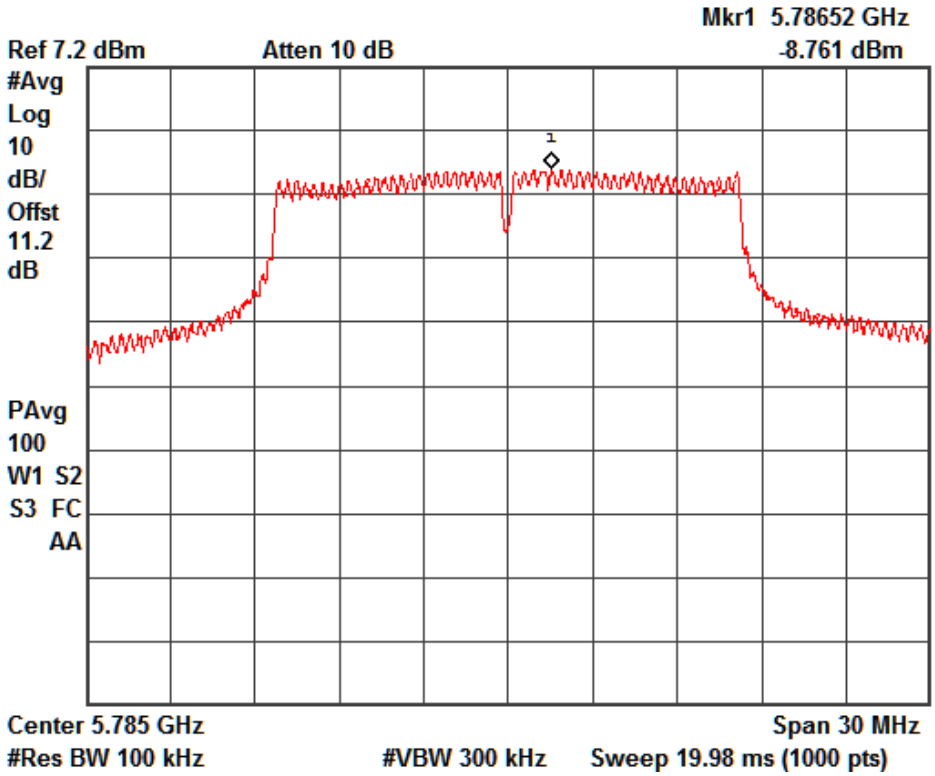

**Data Rate: 6 Mbps** **Channel Frequency: 5785 MHz**



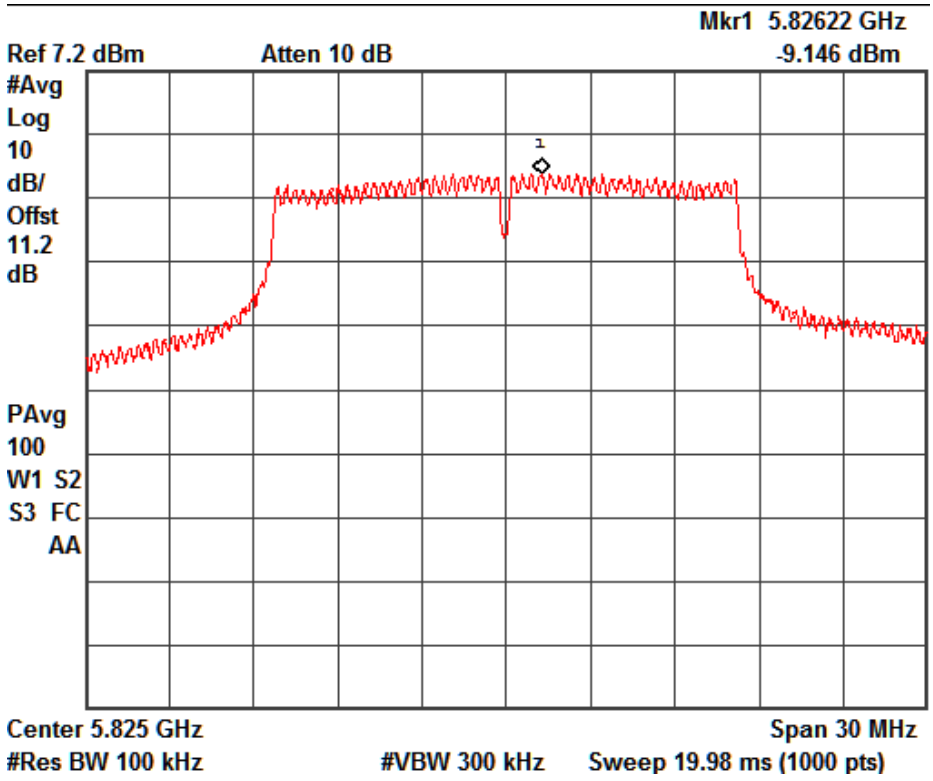

**Data Rate: 6 Mbps** **Channel Frequency: 5825 MHz**



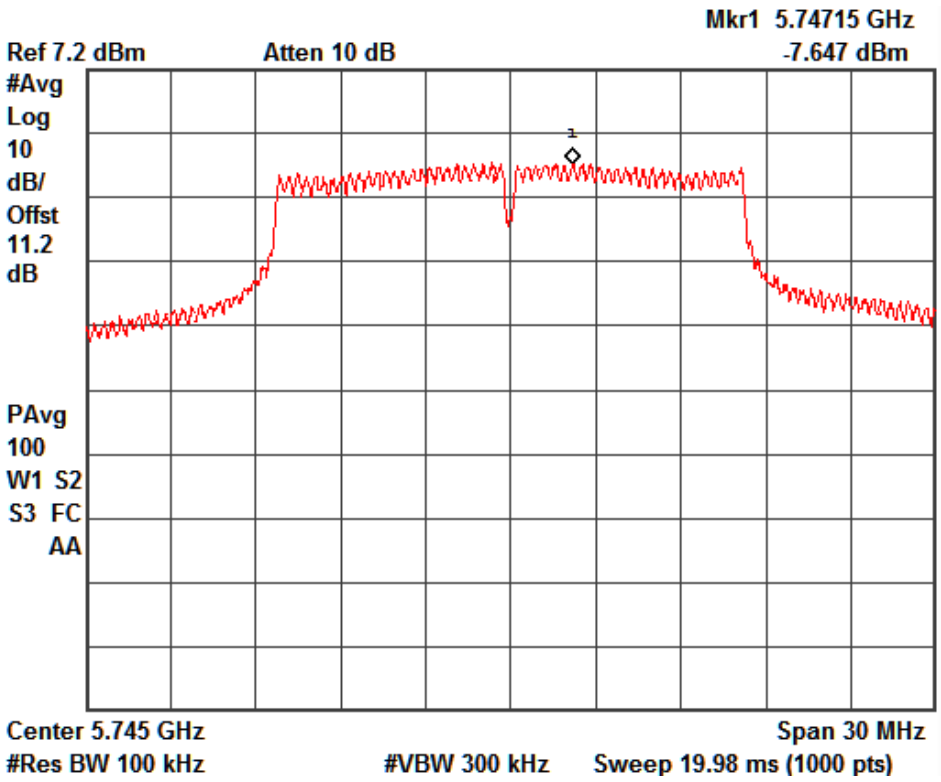

**Data Rate: 24 Mbps** **Channel Frequency: 5745 MHz**



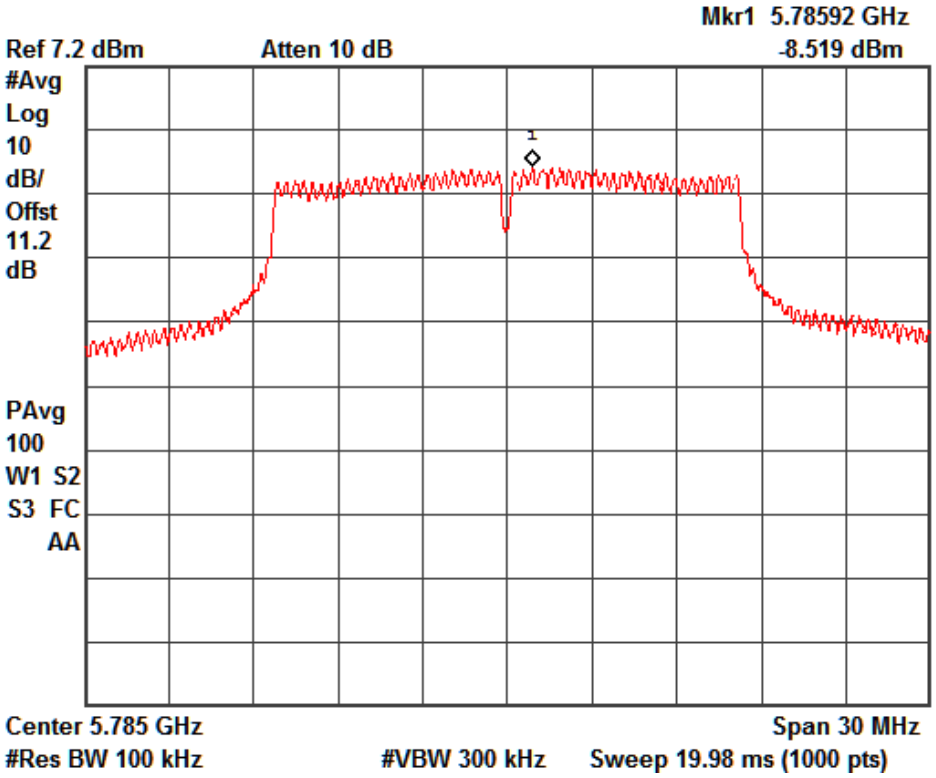

**Data Rate: 24 Mbps** **Channel Frequency: 5785 MHz**



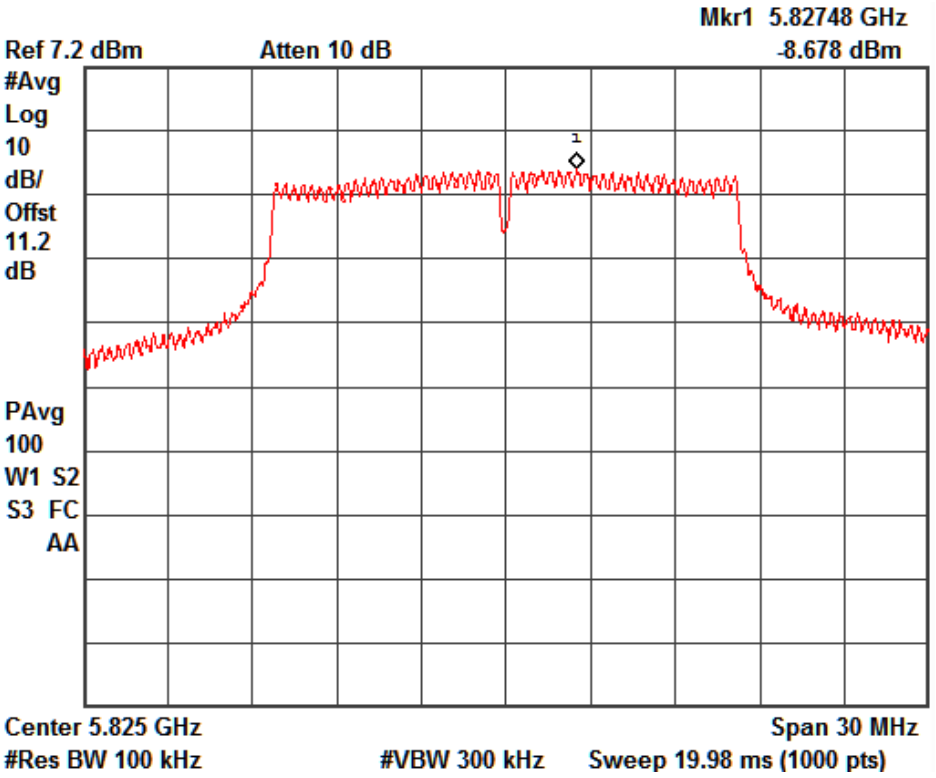

**Data Rate: 24 Mbps** **Channel Frequency: 5825 MHz**




**Data Rate: 54 Mbps** **Channel Frequency: 5745 MHz**

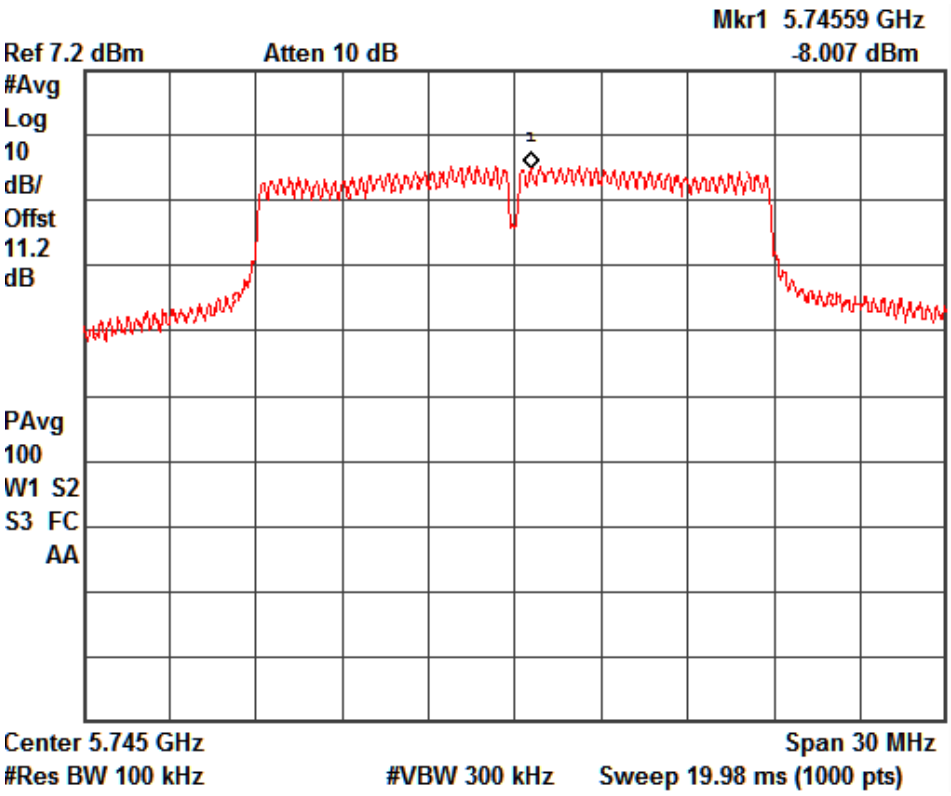



**Data Rate: 54 Mbps** **Channel Frequency: 5785 MHz**

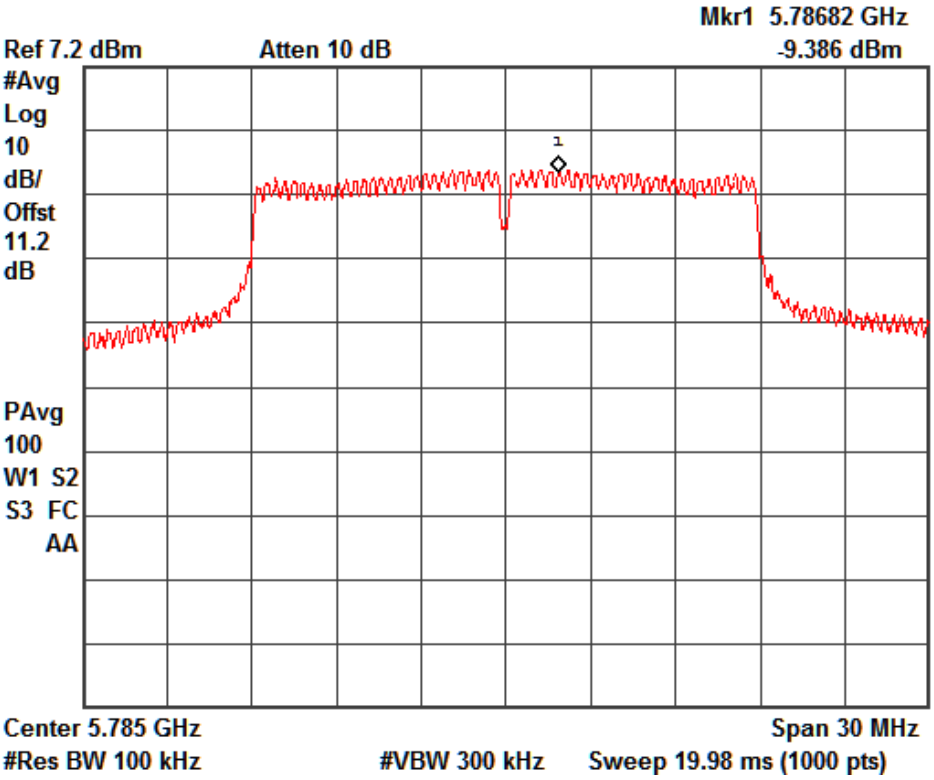



**Data Rate: 54 Mbps** **Channel Frequency: 5825 MHz**

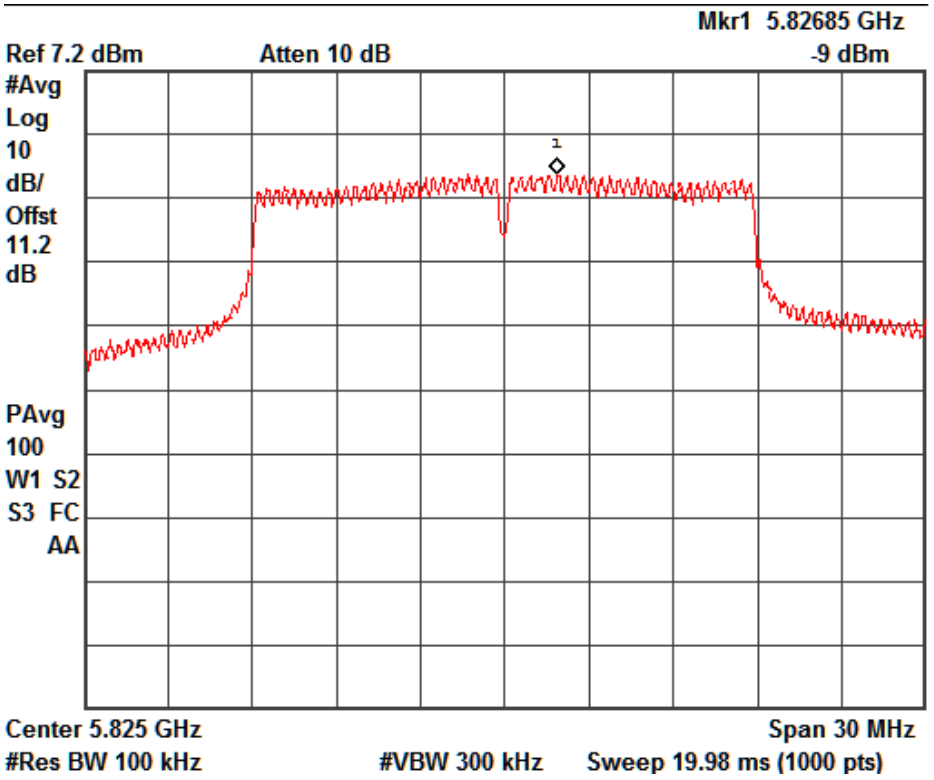
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|
| n | 6.5 | 5745 | -8.00 | 8.00 | -16.00 |
| | | 5785 | -9.86 | 8.00 | -17.86 |
| | | 5825 | -9.00 | 8.00 | -17.00 |
| | 39 | 5745 | -7.83 | 8.00 | -15.83 |
| | | 5785 | -9.21 | 8.00 | -17.21 |
| | | 5825 | -9.89 | 8.00 | -17.89 |
| | 65 | 5745 | -7.67 | 8.00 | -15.67 |
| | | 5785 | -9.30 | 8.00 | -17.30 |
| | | 5825 | -9.41 | 8.00 | -17.41 |



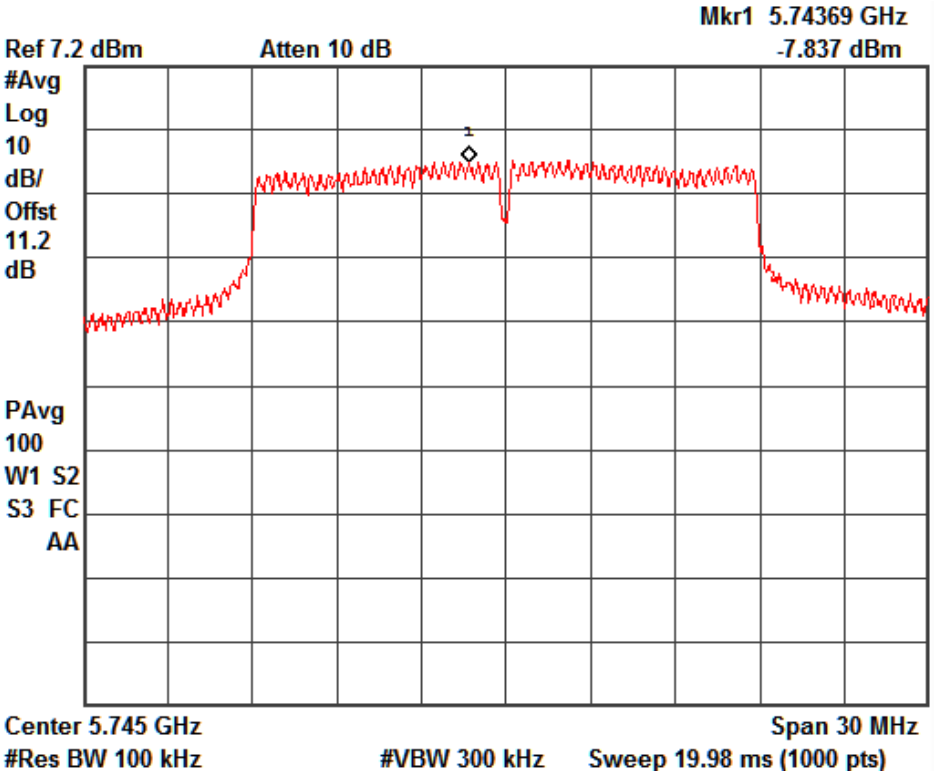

**Data Rate: 6.5 Mbps** **Channel Frequency: 5745 MHz**



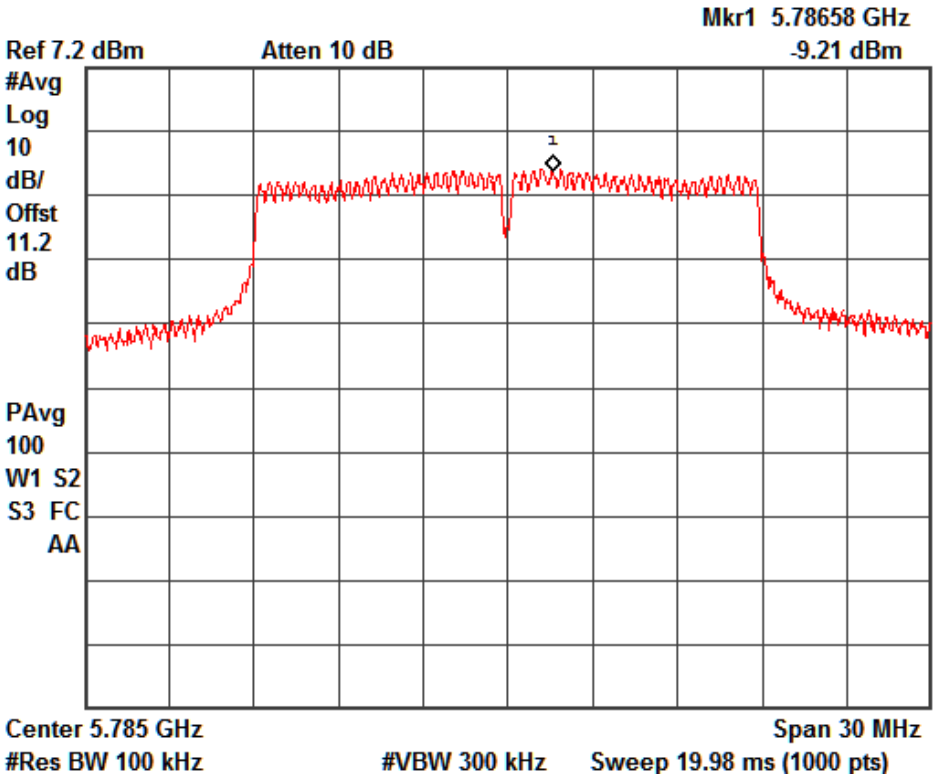

**Data Rate: 6.5 Mbps** **Channel Frequency: 5785 MHz**



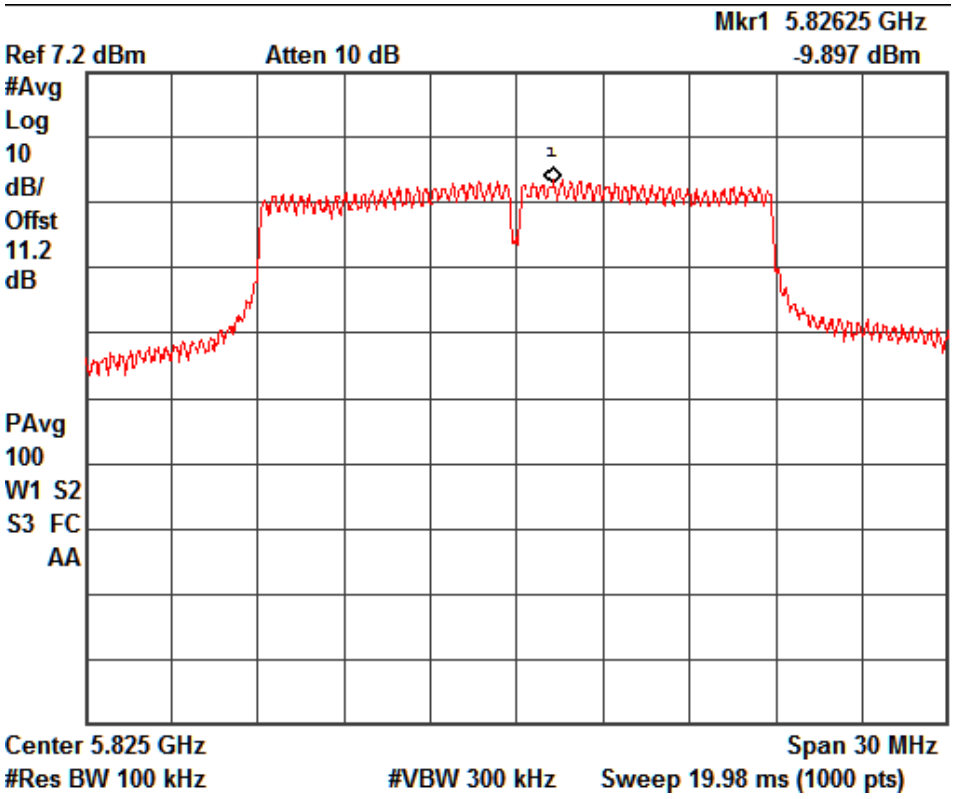

**Data Rate: 6.5 Mbps** **Channel Frequency: 5825 MHz**



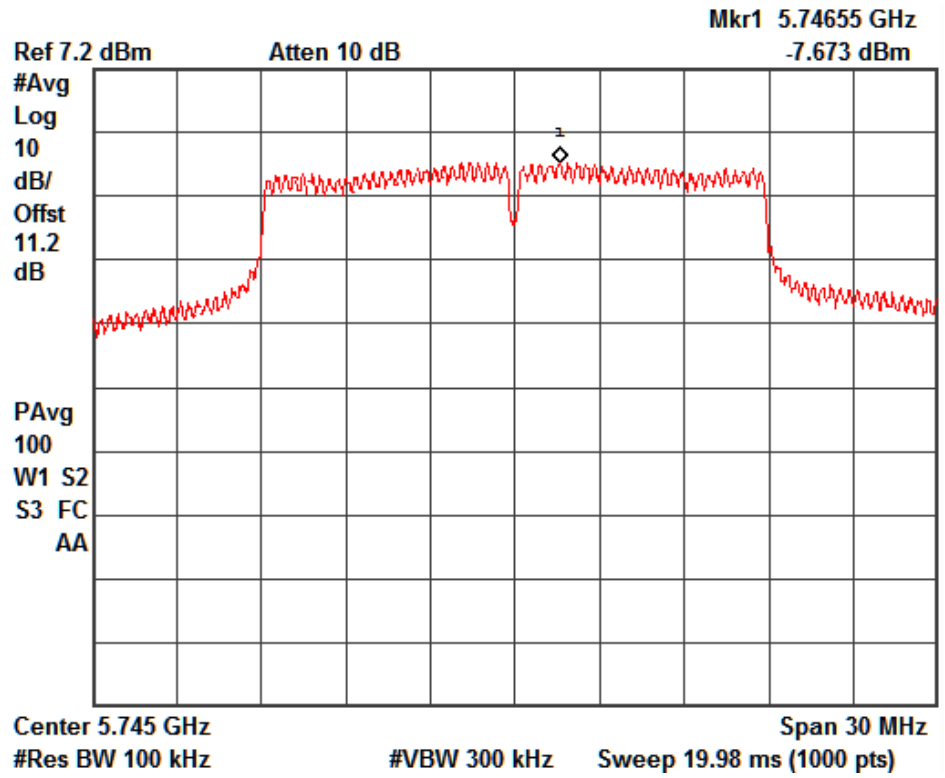

**Data Rate: 39 Mbps** **Channel Frequency: 5745 MHz**



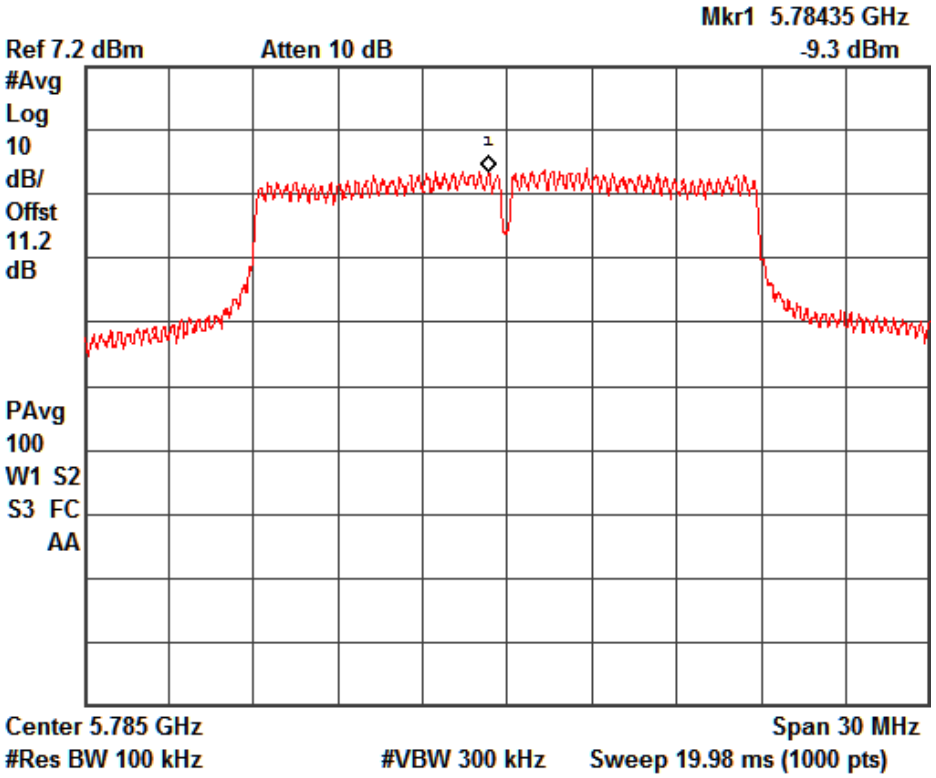

**Data Rate: 39 Mbps** **Channel Frequency: 5785 MHz**



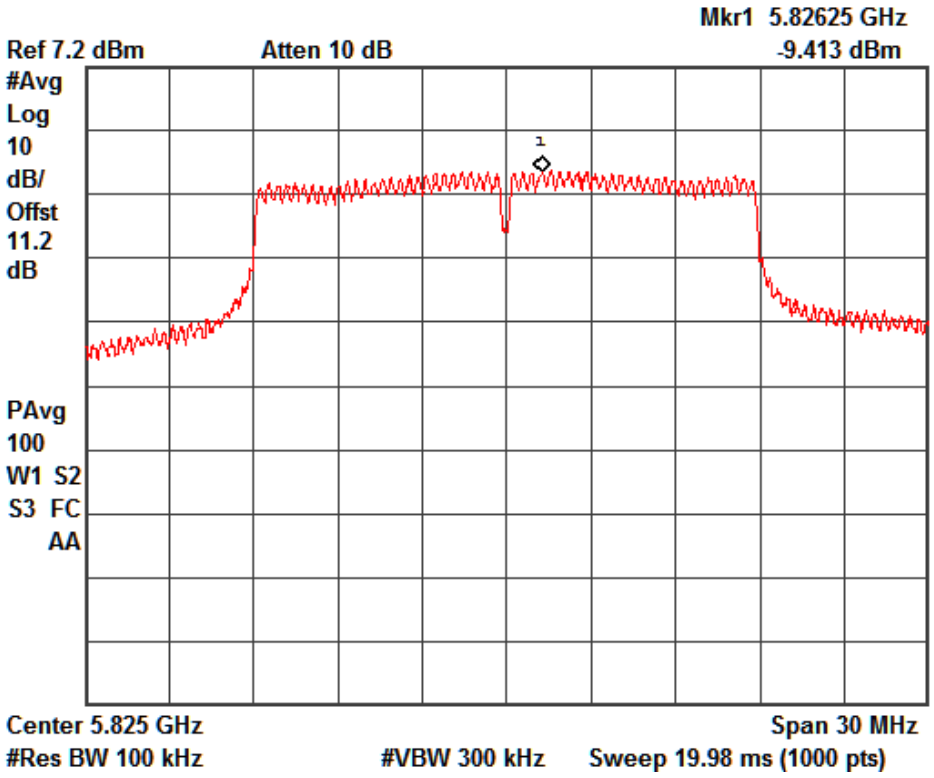

**Data Rate: 39 Mbps** **Channel Frequency: 5825 MHz**




**Data Rate: 65 Mbps** **Channel Frequency: 5745 MHz**



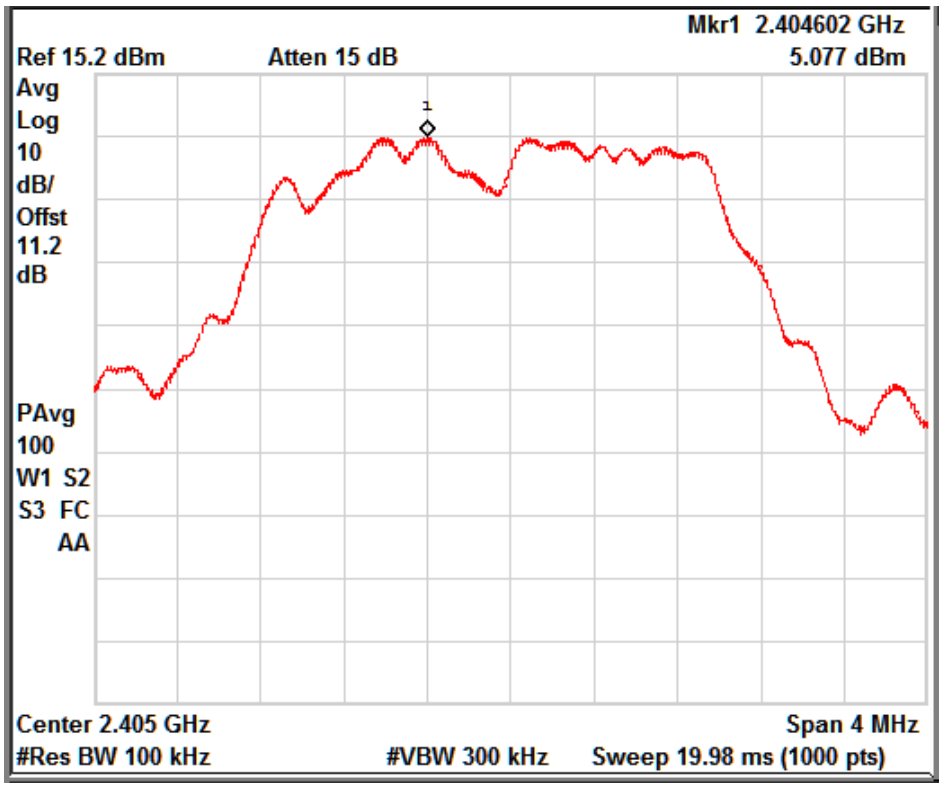

**Data Rate: 65 Mbps** **Channel Frequency: 5785 MHz**



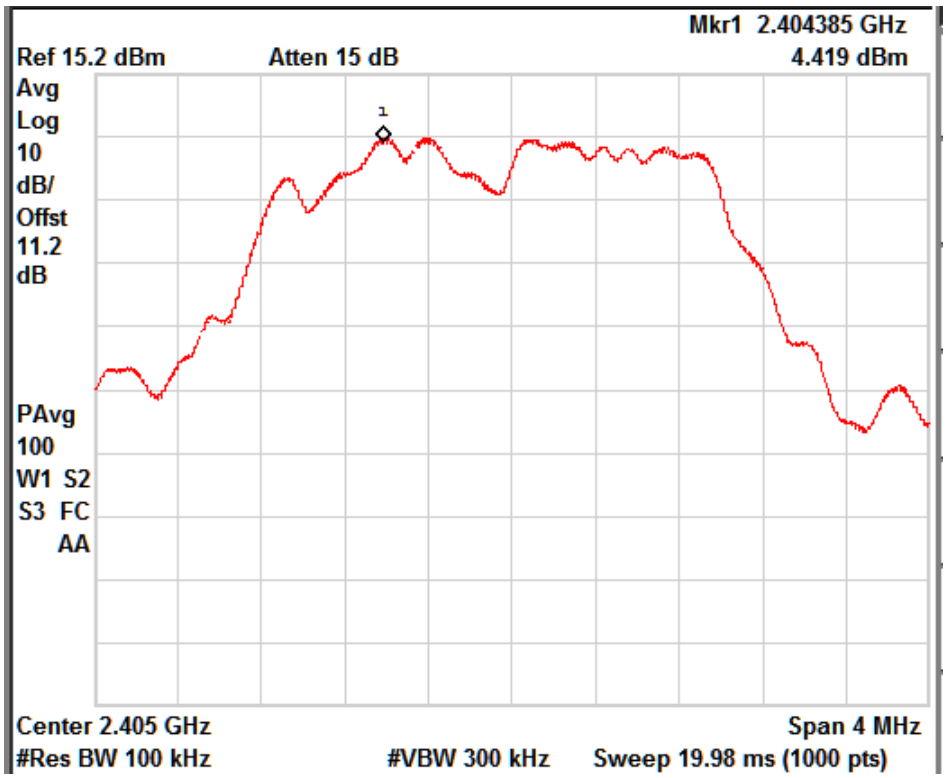

**Data Rate: 65 Mbps** **Channel Frequency: 5825 MHz**

**Test Result: ZigBee**

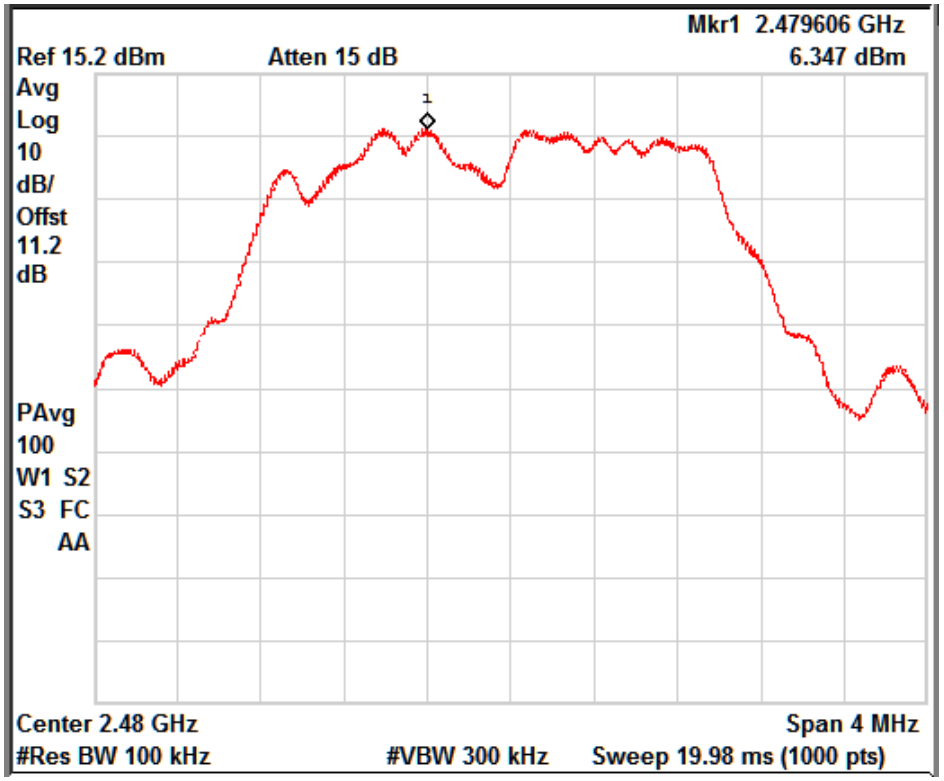
| Channel Frequency (MHz) | Total PSD (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|
| 2405.00 | 05.07 | 8.00 | -02.93 |
| 2440.00 | 04.41 | 8.00 | -03.59 |
| 2480.00 | 06.34 | 8.00 | -01.66 |




**Channel Frequency: 2405 MHz**



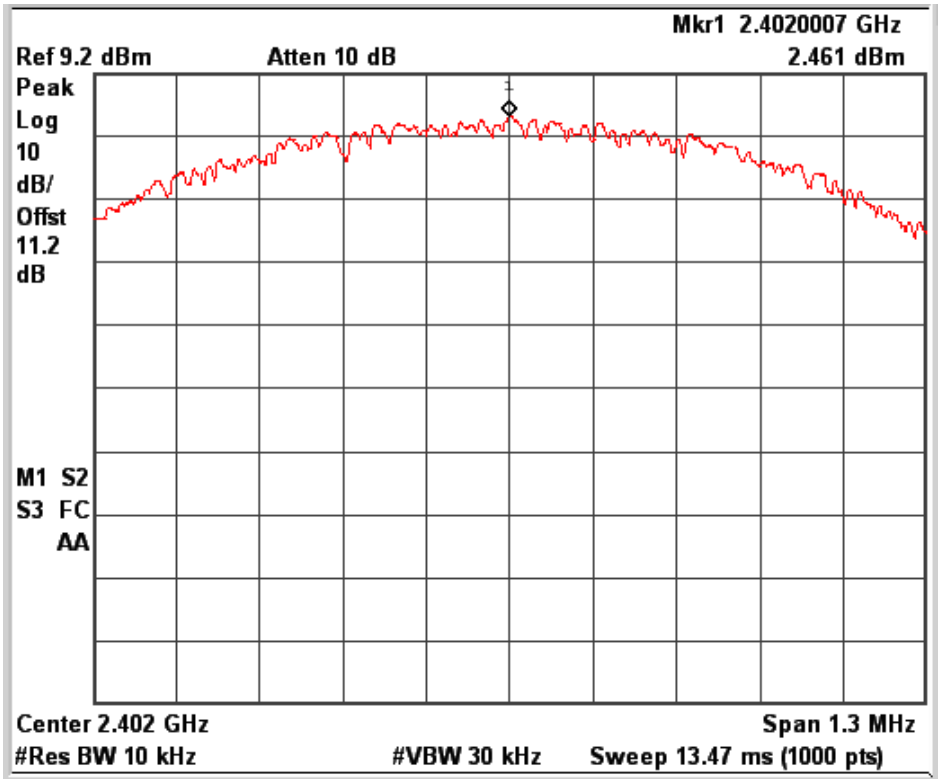

**Channel Frequency: 2440 MHz**



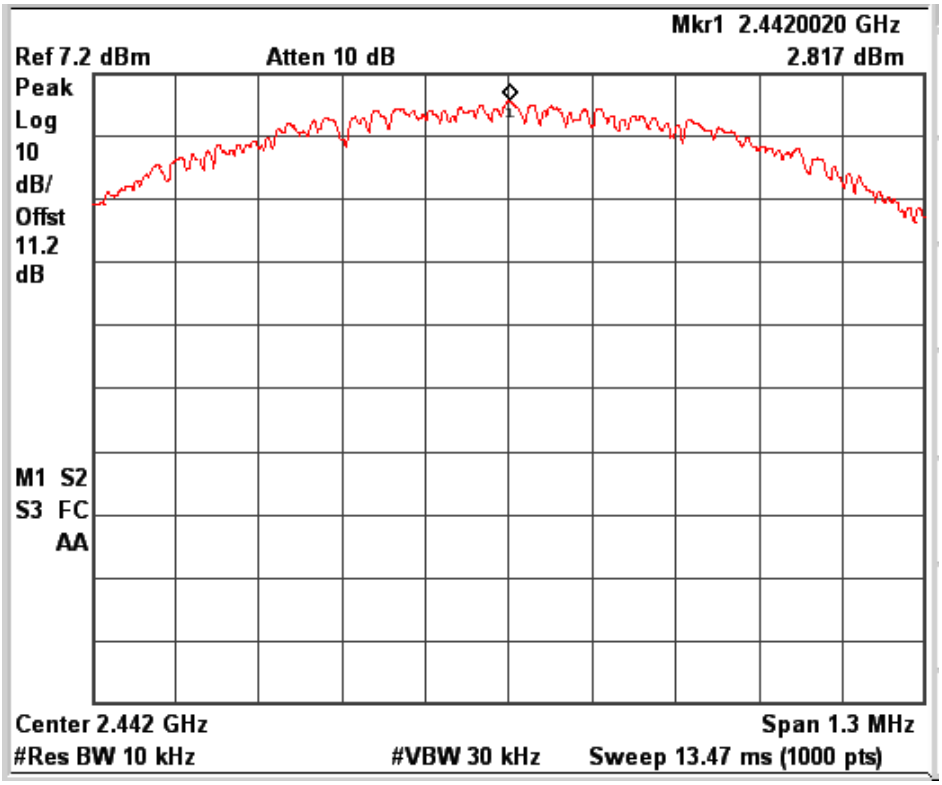

**Channel Frequency: 2480 MHz**

**Test Result: Bluetooth LE**

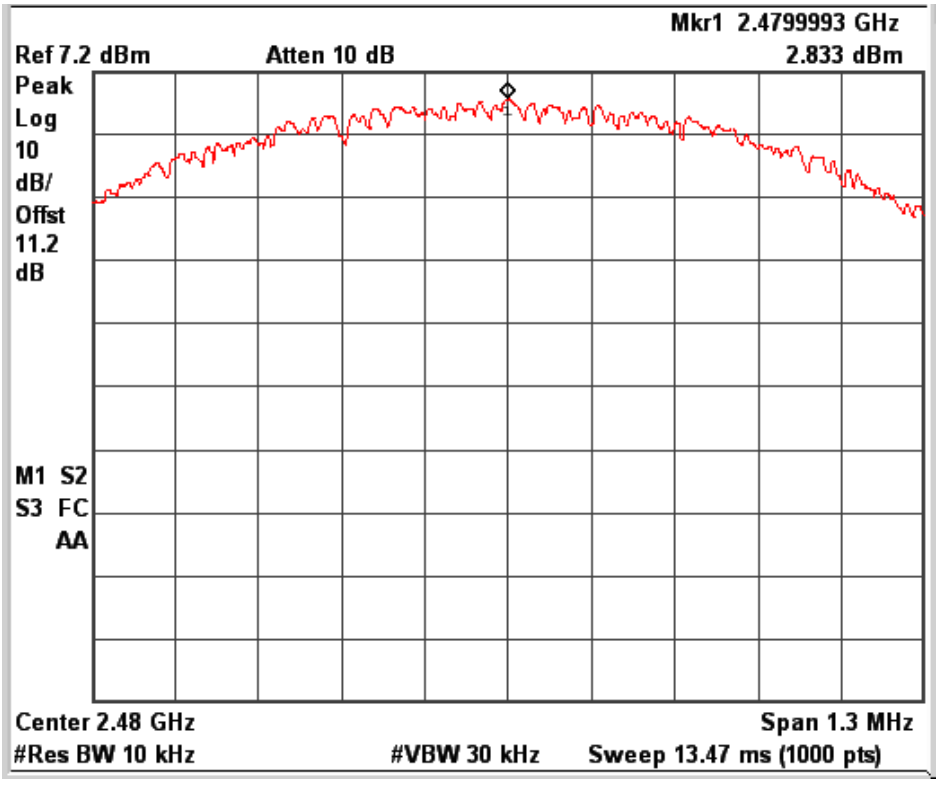
| Channel Frequency (MHz) | Total PSD (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|
| 2402.00 | 02.46 | 8.00 | -05.54 |
| 2442.00 | 02.81 | 8.00 | -05.19 |
| 2480.00 | 02.83 | 8.00 | -05.17 |




**Channel Frequency: 2402 MHz**




**Channel Frequency: 2442 MHz**



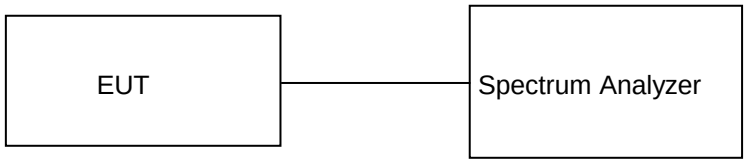

**Channel Frequency: 2480 MHz**

**6 dB Bandwidth** **Section 15.247(a) (2)**

**Result** **Pass**

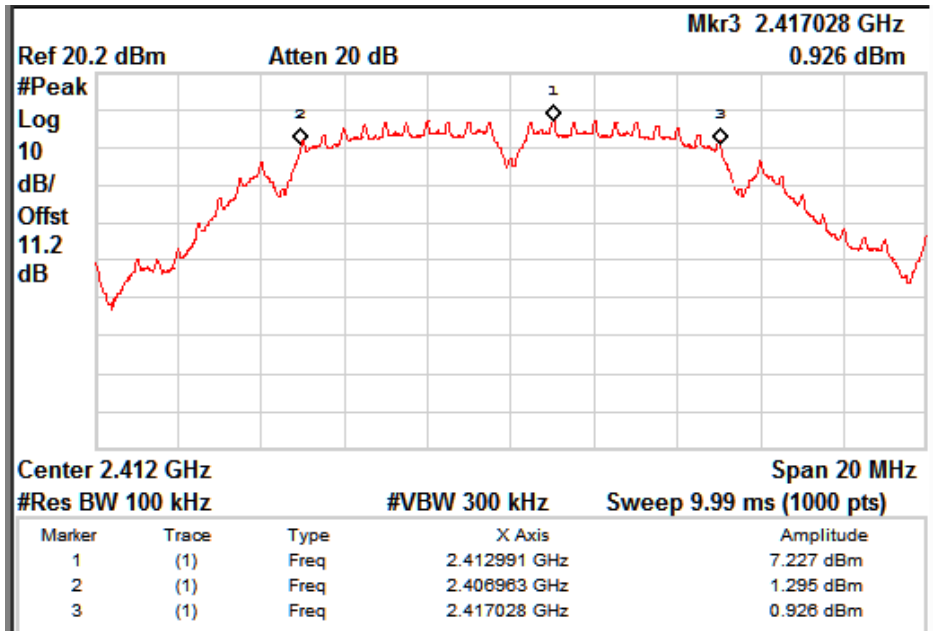
Test Specification FCC Part 15 Section 15.247 (a) (2)
Requirement The minimum 6 dB bandwidth shall be at least 500 kHz.

**Test Method:**

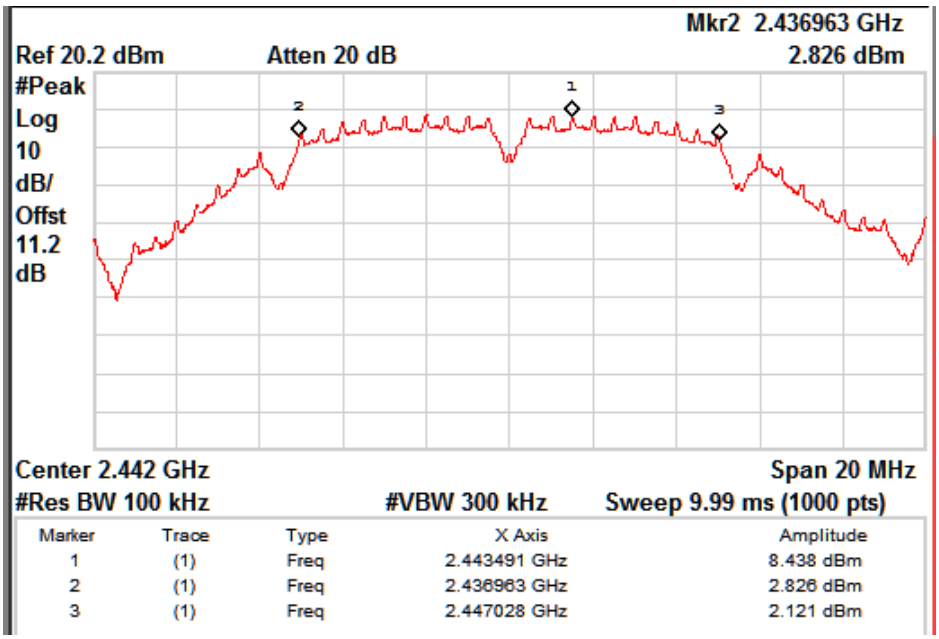



**Test Result:**

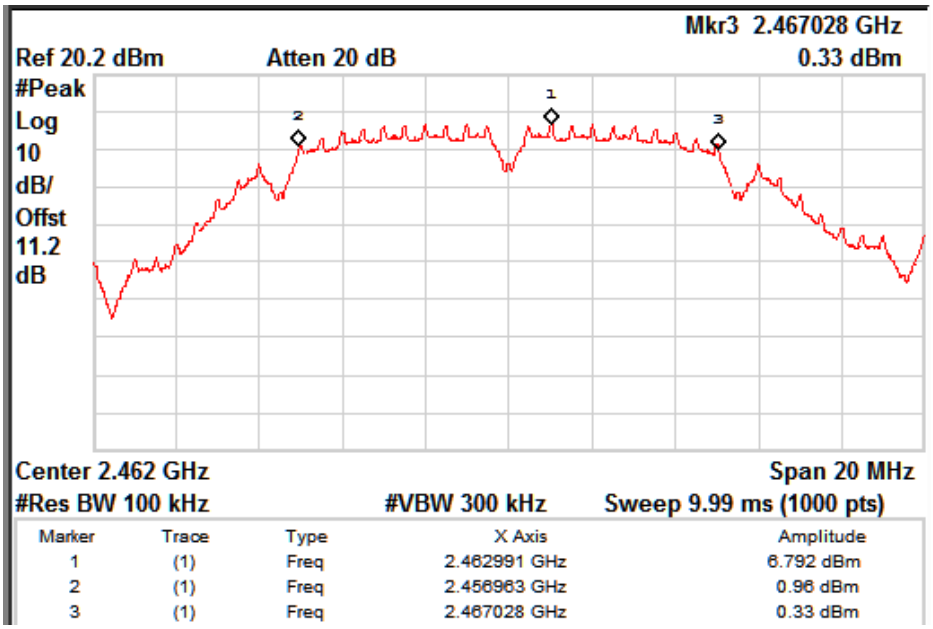
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Lower Frequency (MHz) | Upper Frequency (MHz) | 6 dB Bandwidth (MHz) | 99% OBW (MHz) |
|---|---|---|---|---|---|---|
| b | 1 | 2412.00 | 2406.963 | 2417.028 | 10.065 | 12.069 |
| | | 2442.00 | 2436.963 | 2447.028 | 10.065 | 12.359 |
| | | 2462.00 | 2456.963 | 2467.028 | 10.065 | 12.166 |
| | 11 | 2412.00 | 2407.203 | 2416.788 | 9.585 | 11.958 |
| | | 2442.00 | 2437.203 | 2446.707 | 9.504 | 12.065 |
| | | 2462.00 | 2457.003 | 2466.788 | 9.785 | 11.960 |



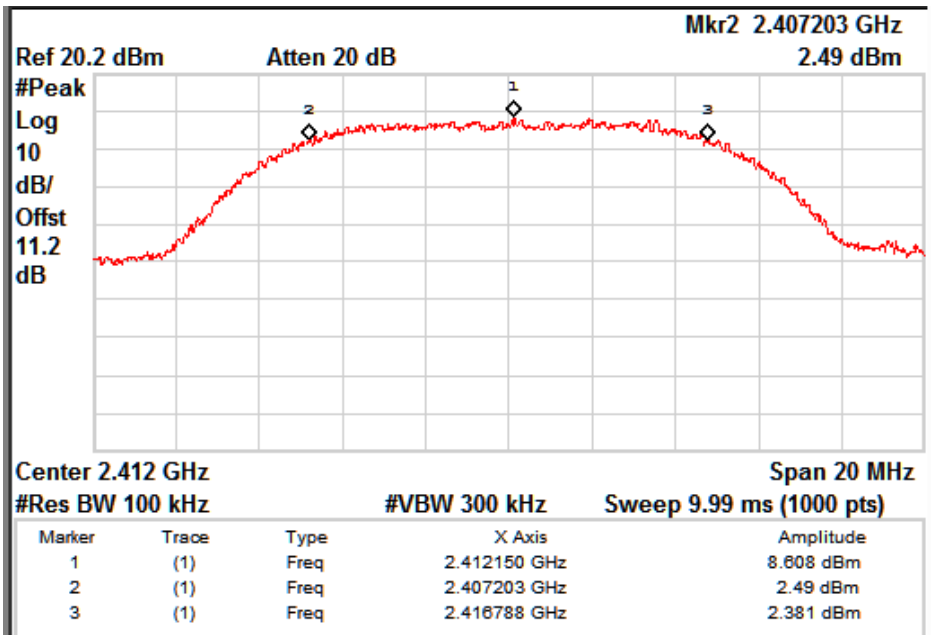

**Data Rate: 1 Mbps** **Channel frequency: 2412 MHz**



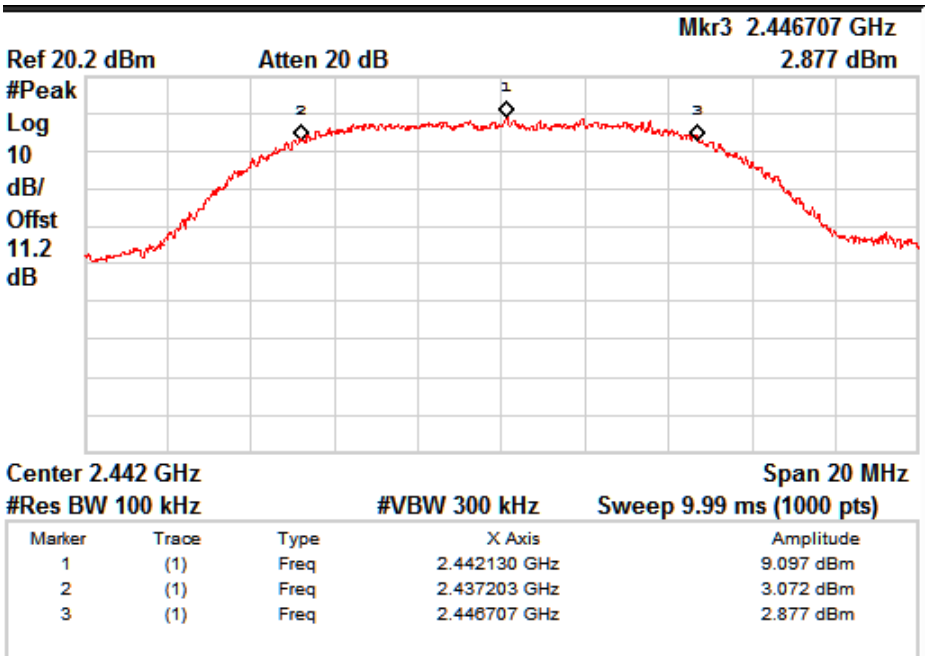

**Data Rate: 1 Mbps** **Channel frequency: 2442 MHz**




**Data Rate: 1 Mbps** **Channel frequency: 2462 MHz**

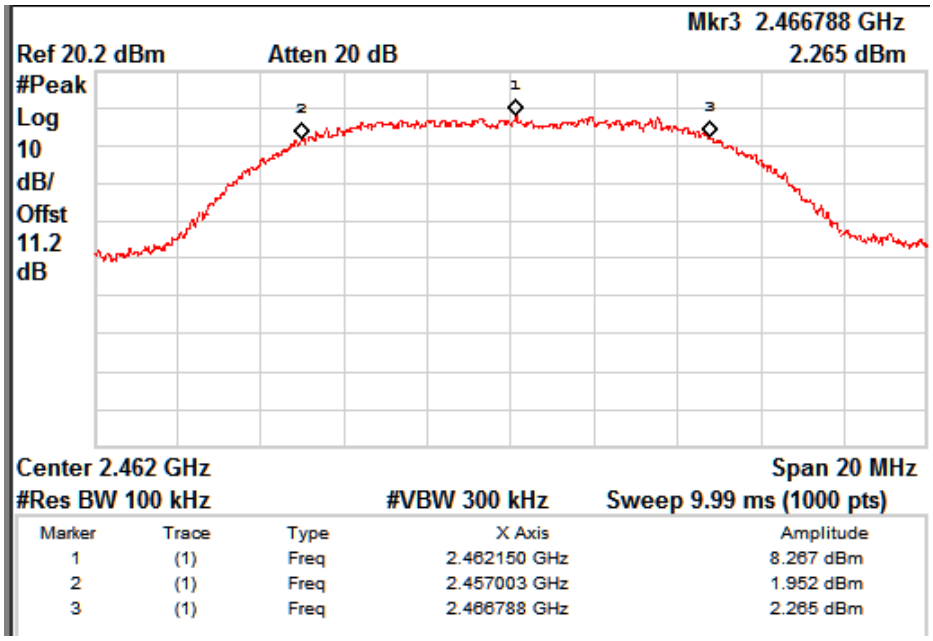



**Data Rate: 11 Mbps** **Channel frequencies: 2412 MHz**



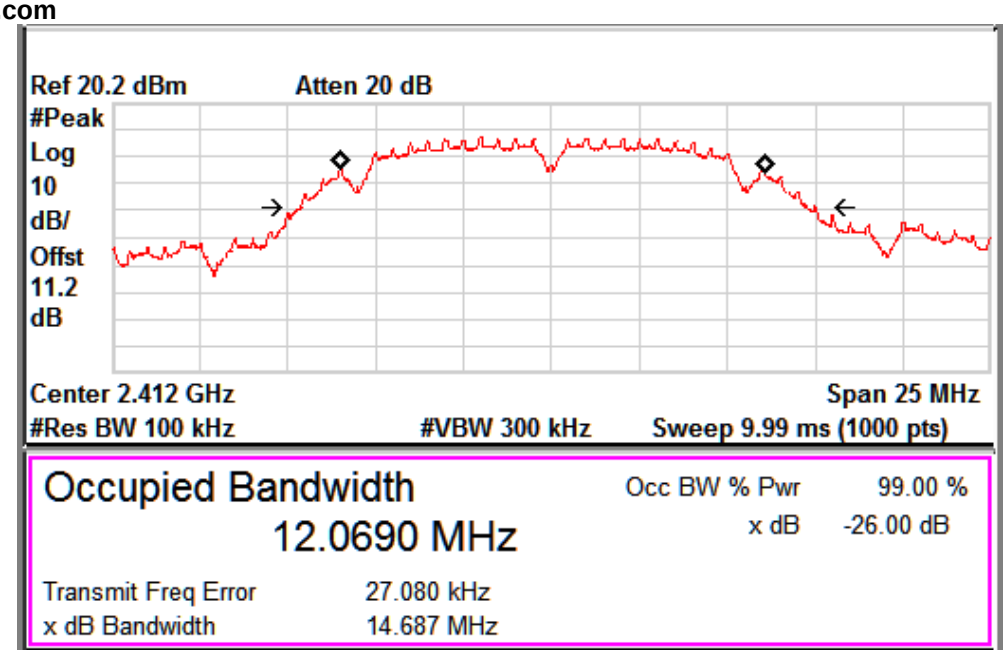

| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 2.442130 GHz | 9.097 dBm |
| 2 | (1) | Freq | 2.437203 GHz | 3.072 dBm |
| 3 | (1) | Freq | 2.446707 GHz | 2.877 dBm |

**Data Rate: 11 Mbps** **Channel frequency: 2442 MHz**

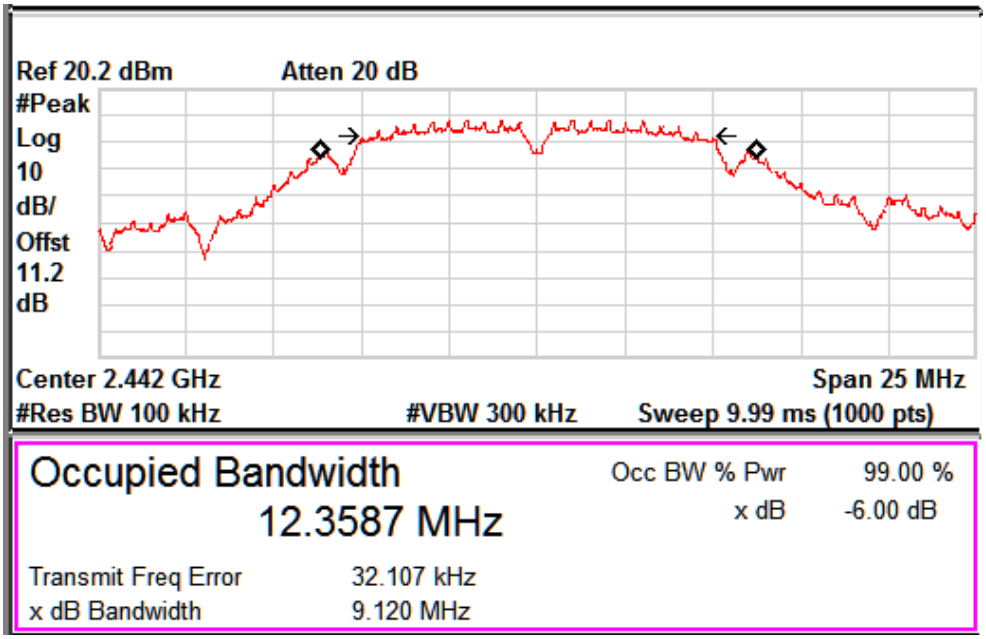



| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 2.462150 GHz | 8.267 dBm |
| 2 | (1) | Freq | 2.457003 GHz | 1.952 dBm |
| 3 | (1) | Freq | 2.466788 GHz | 2.265 dBm |

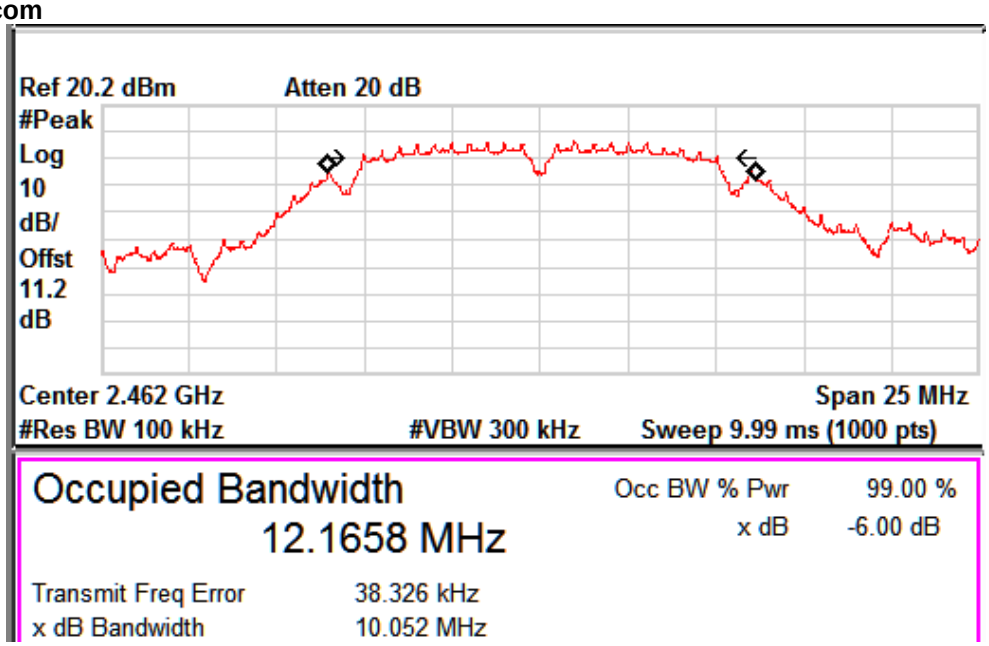
**Data Rate: 11 Mbps** **Channel frequency: 2462 MHz**



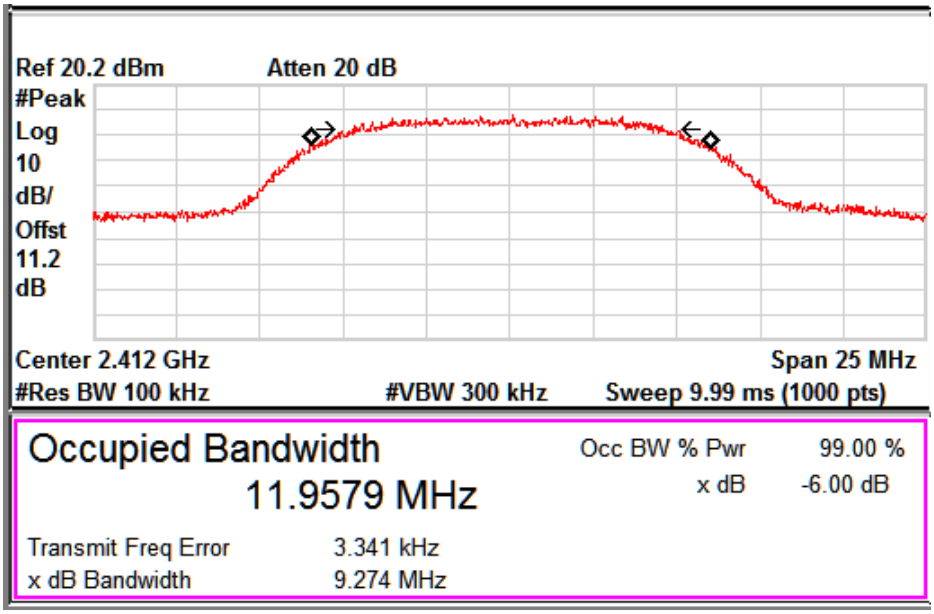

**Data rate: 1 Mbps** **99% Occupied Bandwidth: Channel 2412MHz**



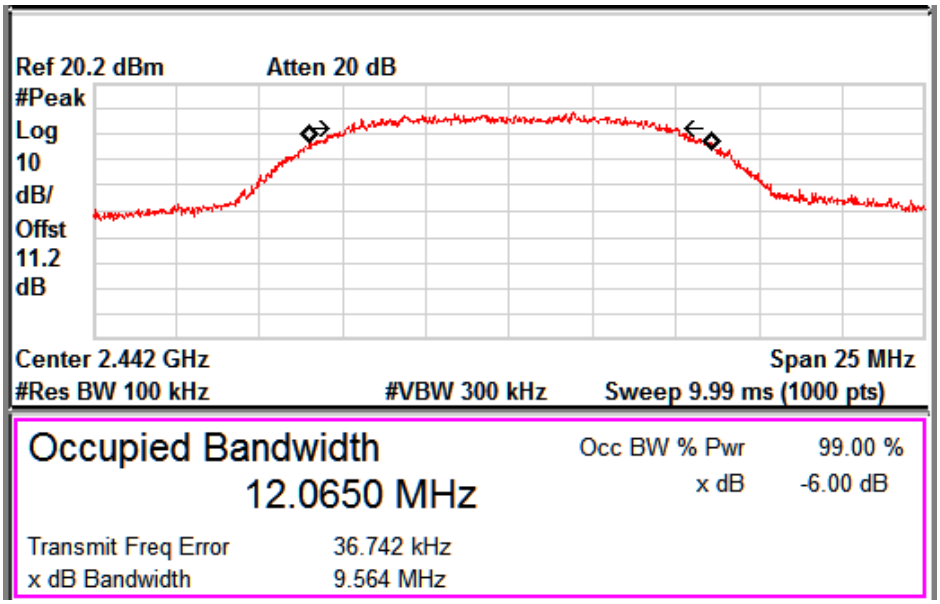

**Data rate: 1 Mbps** **99% Occupied Bandwidth: Channel 2442MHz**



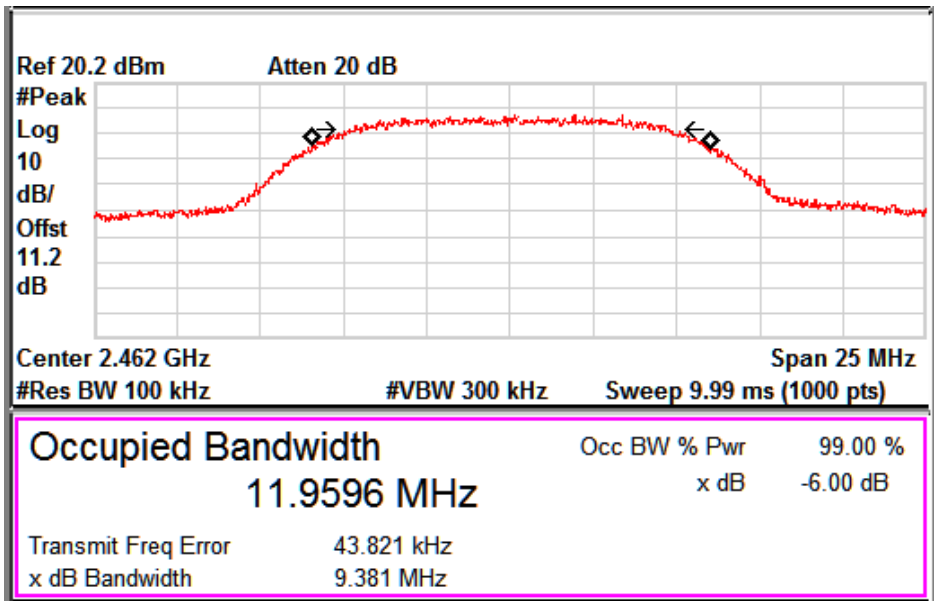

**Data rate: 1 Mbps** **99% Occupied Bandwidth: Channel 2462MHz**




**Data rate: 11 Mbps** **99% Occupied Bandwidth: Channel 2412MHz**

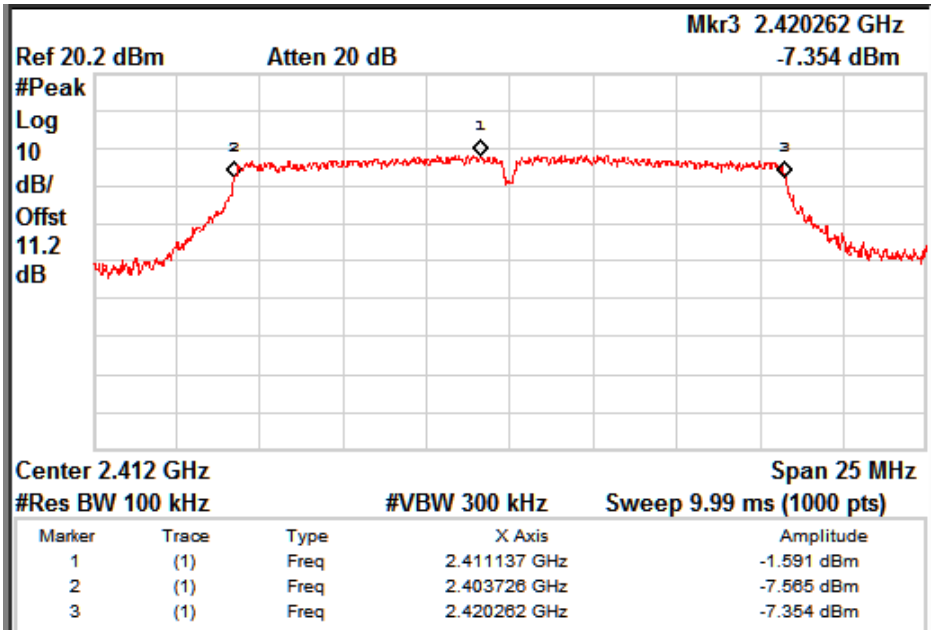



**Data rate: 11 Mbps** **99% Occupied Bandwidth: Channel 2442MHz**

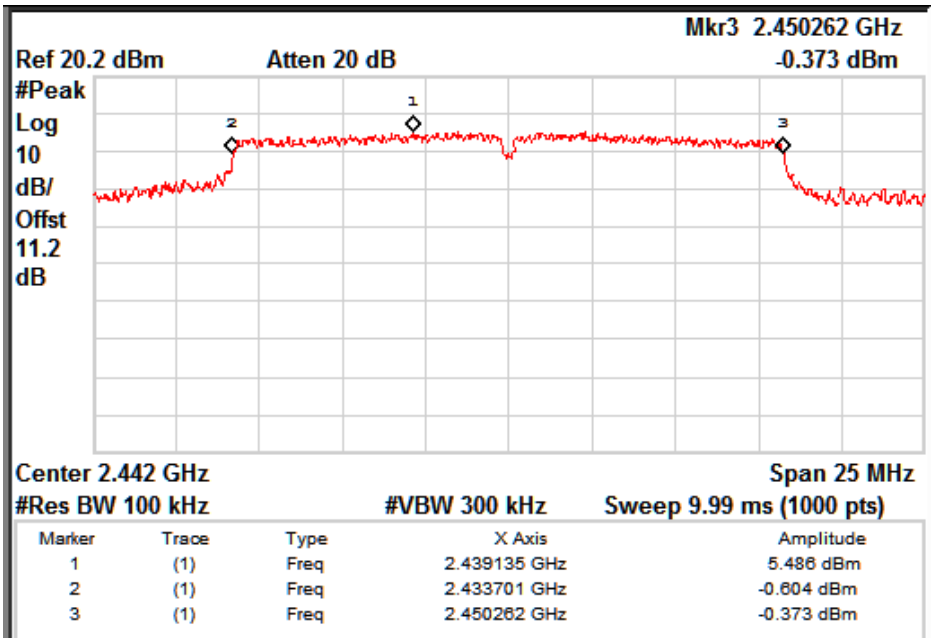



**Data rate: 11 Mbps** **99% Occupied Bandwidth: Channel 2462MHz**

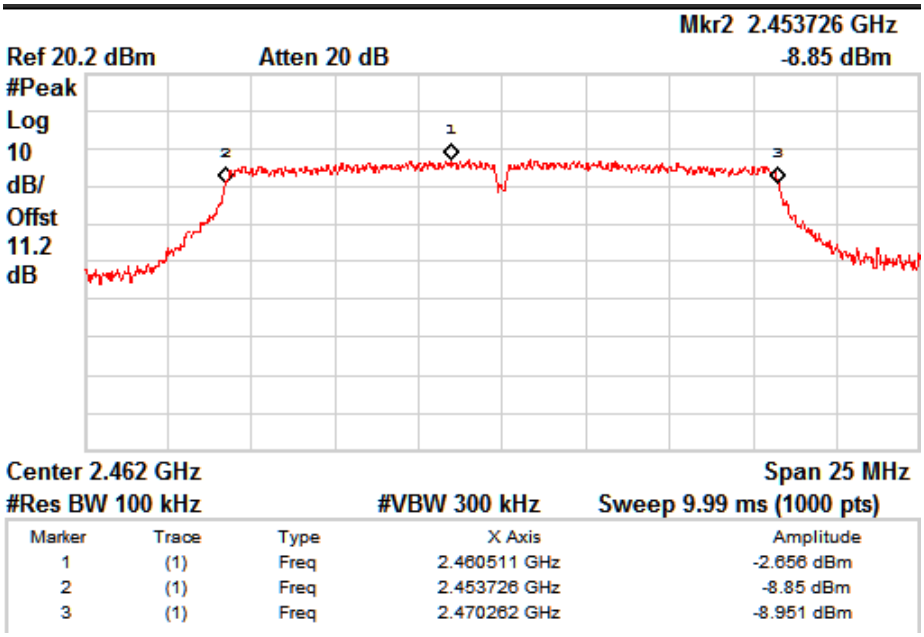
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Lower Frequency (MHz) | Upper Frequency (MHz) | 6 dB Bandwidth (MHz) | 99% OBW (MHz) |
|---|---|---|---|---|---|---|
| g | 6 | 2412.00 | 2403.726 | 2420.262 | 16.536 | 16.493 |
| | | 2442.00 | 2433.701 | 2450.262 | 16.561 | 17.009 |
| | | 2462.00 | 2453.726 | 2470.262 | 16.536 | 16.493 |
| | 24 | 2412.00 | 2403.726 | 2420.262 | 16.536 | 16.425 |
| | | 2442.00 | 2433.726 | 2450.237 | 16.511 | 16.767 |
| | | 2462.00 | 2453.701 | 2470.262 | 16.561 | 16.448 |
| | 54 | 2412.00 | 2403.726 | 2420.262 | 16.536 | 16.446 |
| | | 2442.00 | 2433.726 | 2450.237 | 16.511 | 16.663 |
| | | 2462.00 | 2453.701 | 2470.262 | 16.561 | 16.458 |



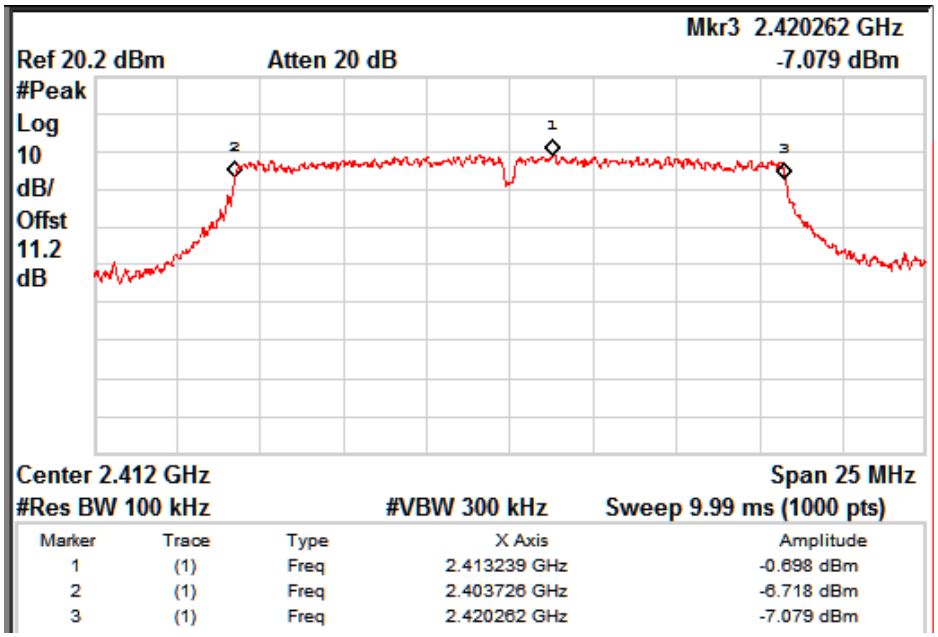

**Data Rate: 6 Mbps** **Channel frequencies: 2412 MHz**



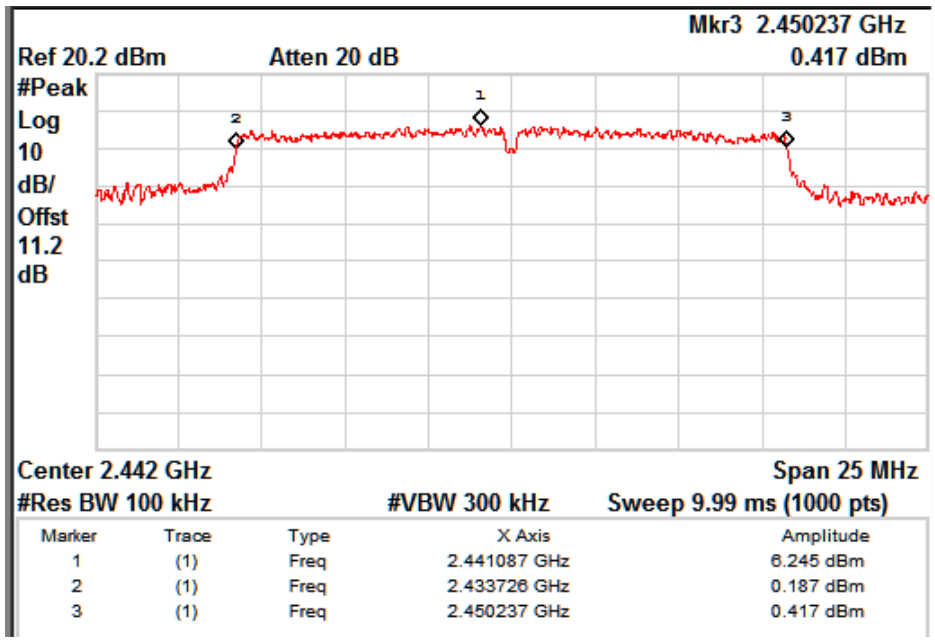

**Data Rate: 6 Mbps** **Channel frequencies: 2442 MHz**



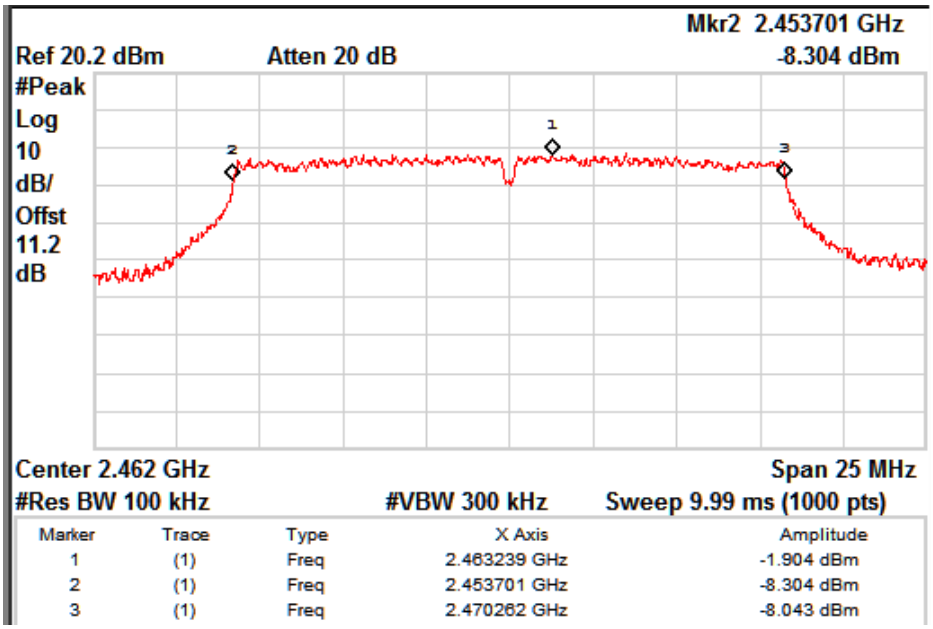

**Data Rate: 6 Mbps** **Channel frequencies: 2462 MHz**



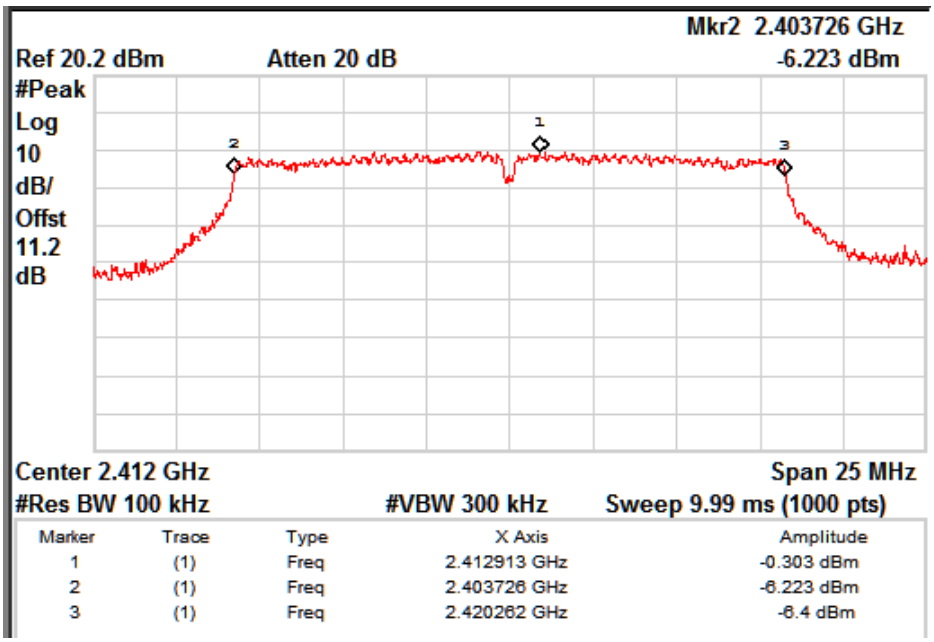

**Data Rate: 24 Mbps** **Channel frequencies: 2412 MHz**



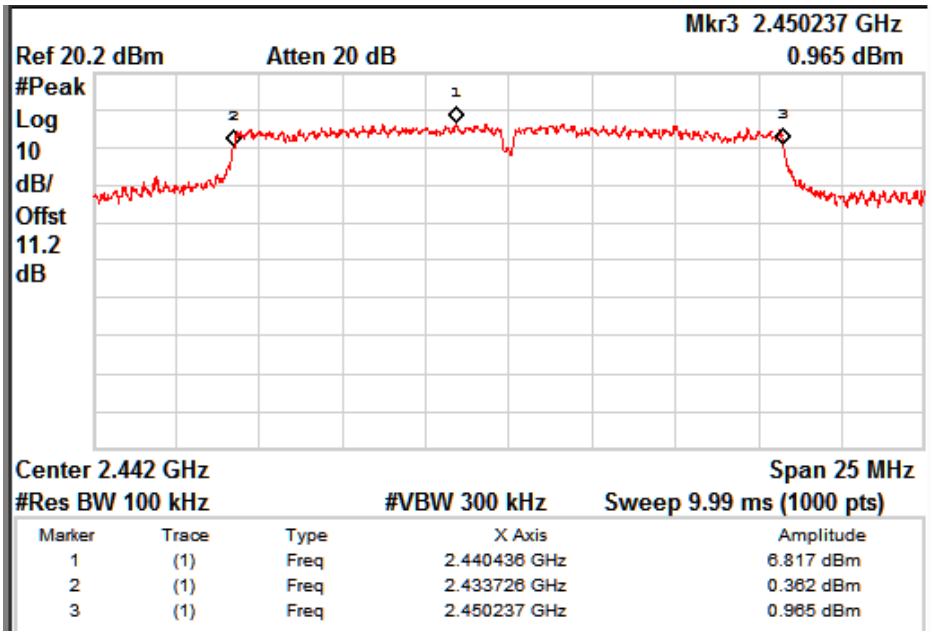

**Data Rate: 24 Mbps** **Channel frequencies: 2442 MHz**



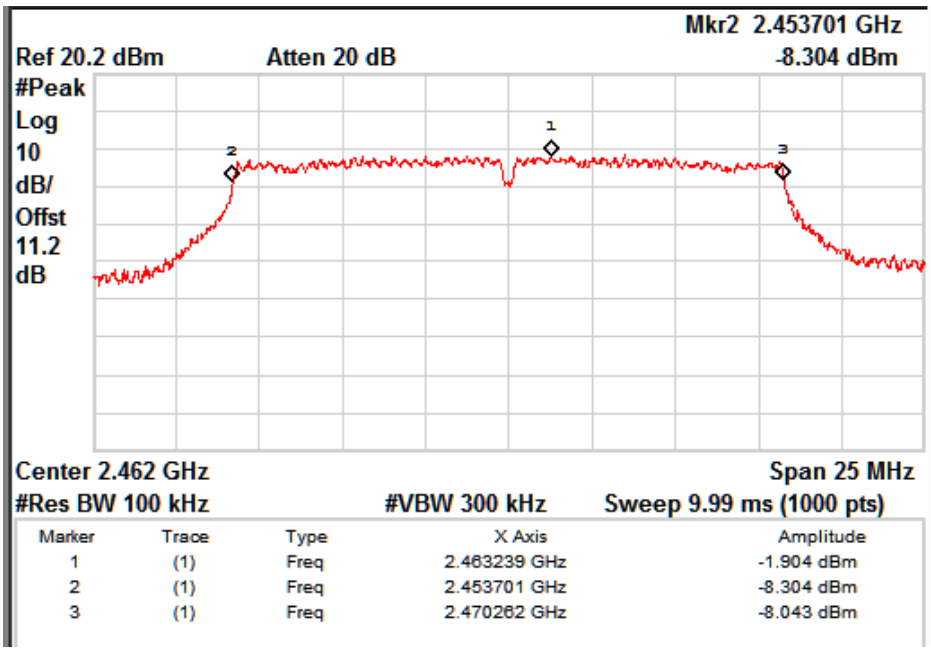

**Data Rate: 24 Mbps** **Channel frequencies: 2462 MHz**



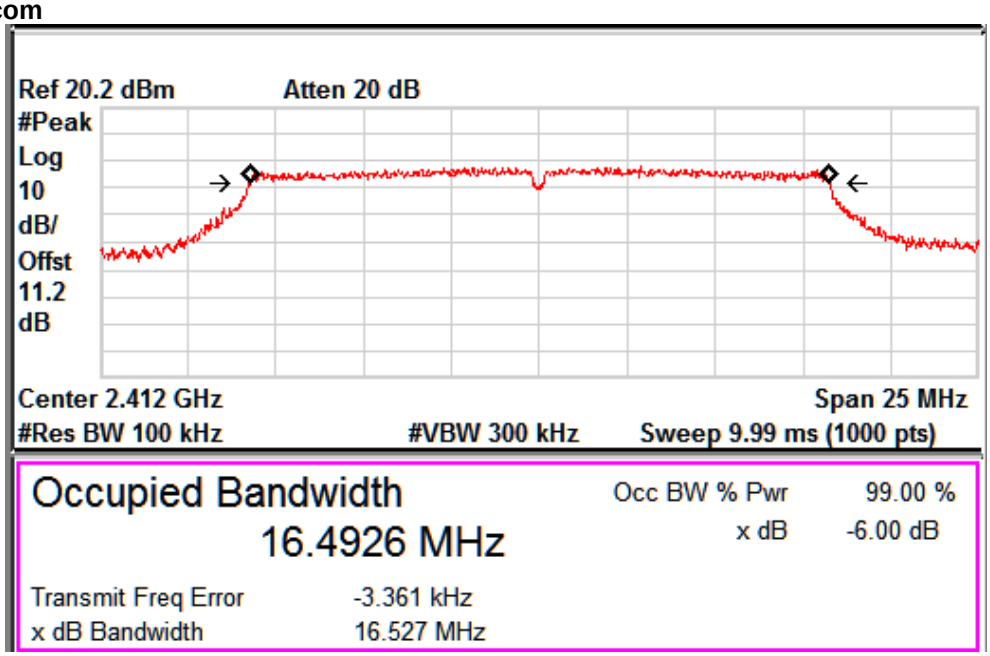

**Data Rate: 54 Mbps** **Channel frequencies: 2412 MHz**



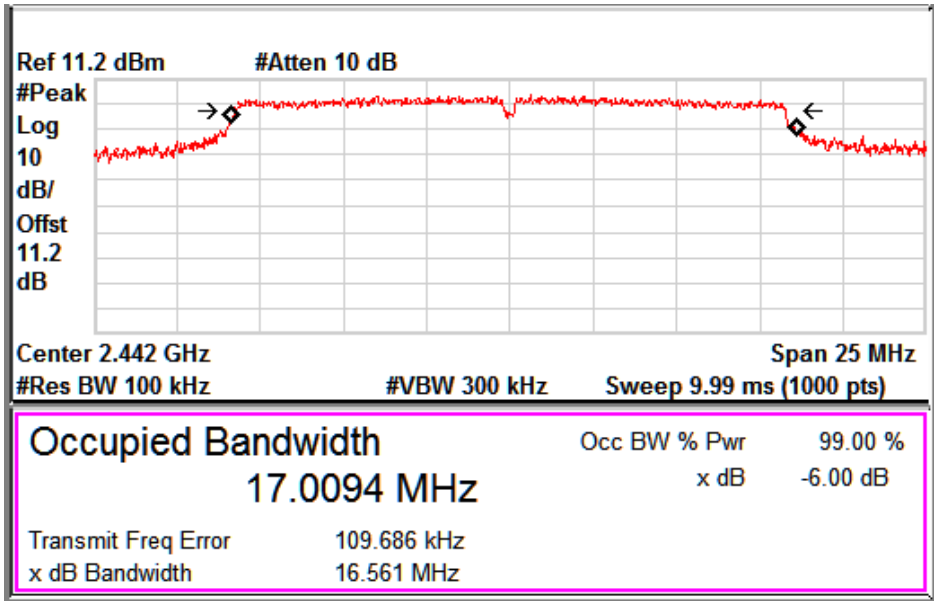

**Data Rate: 54 Mbps** **Channel frequencies: 2442MHz**



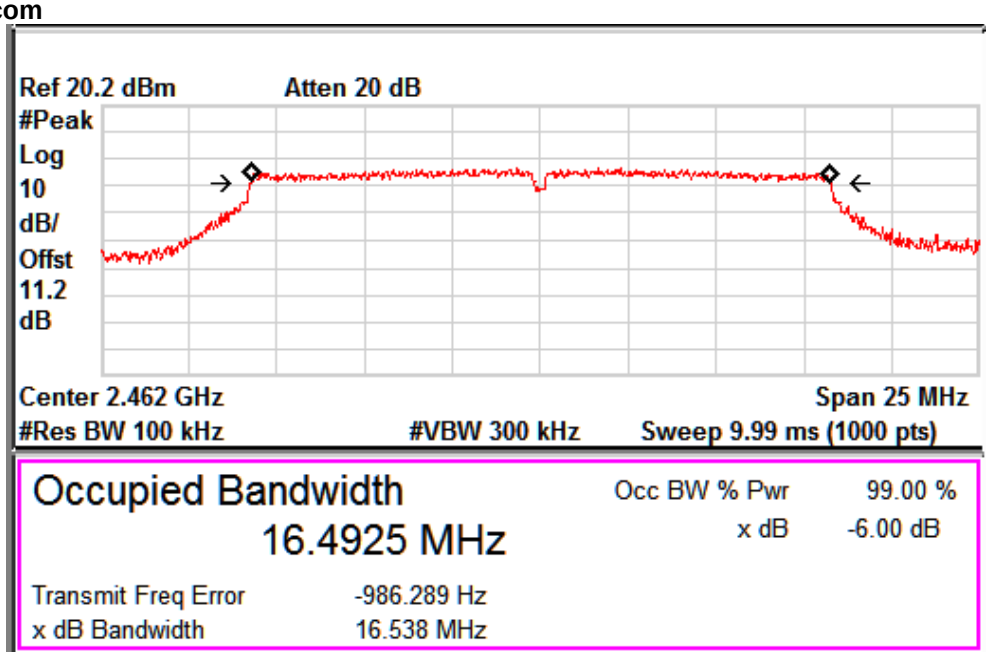

**Data Rate: 54 Mbps** **Channel frequencies: 2472 MHz**



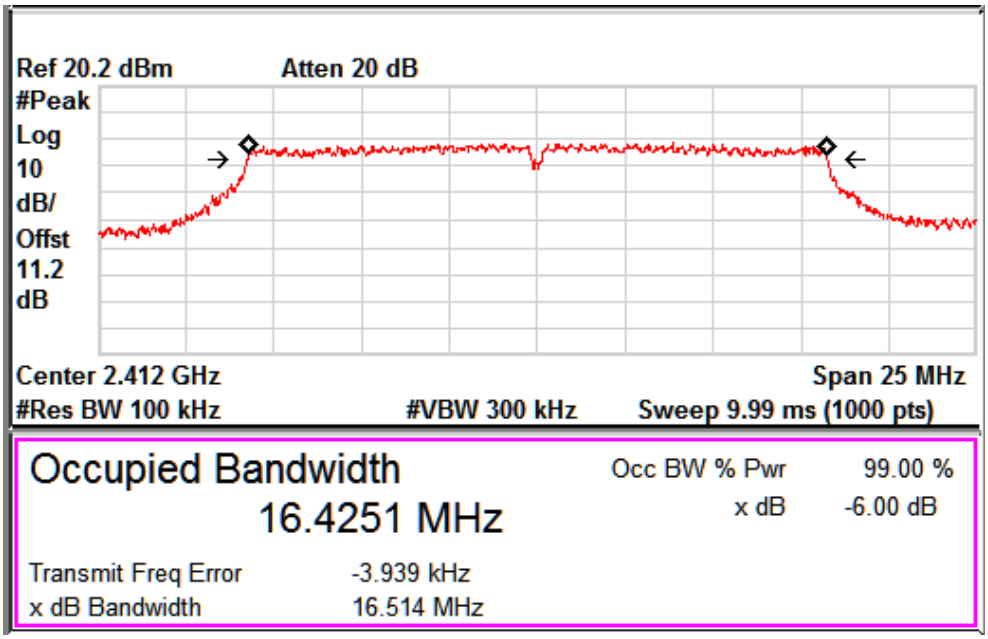

**Data Rate: 6 Mbps** **99% Occupied Bandwidth: Channel 2412MHz**



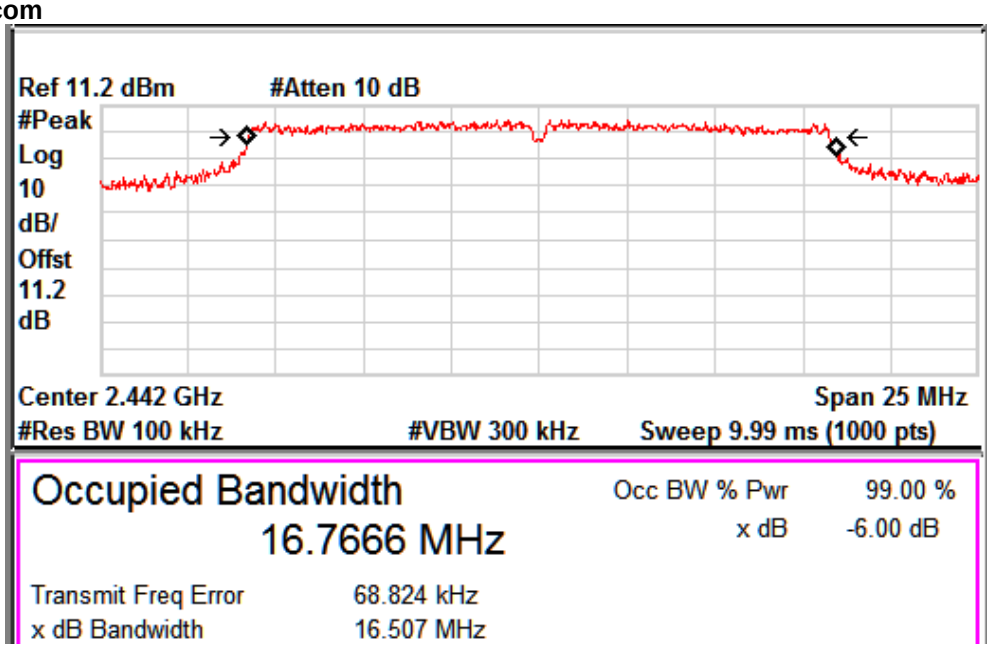

**Data Rate: 6 Mbps** **99% Occupied Bandwidth: Channel 2442MHz**



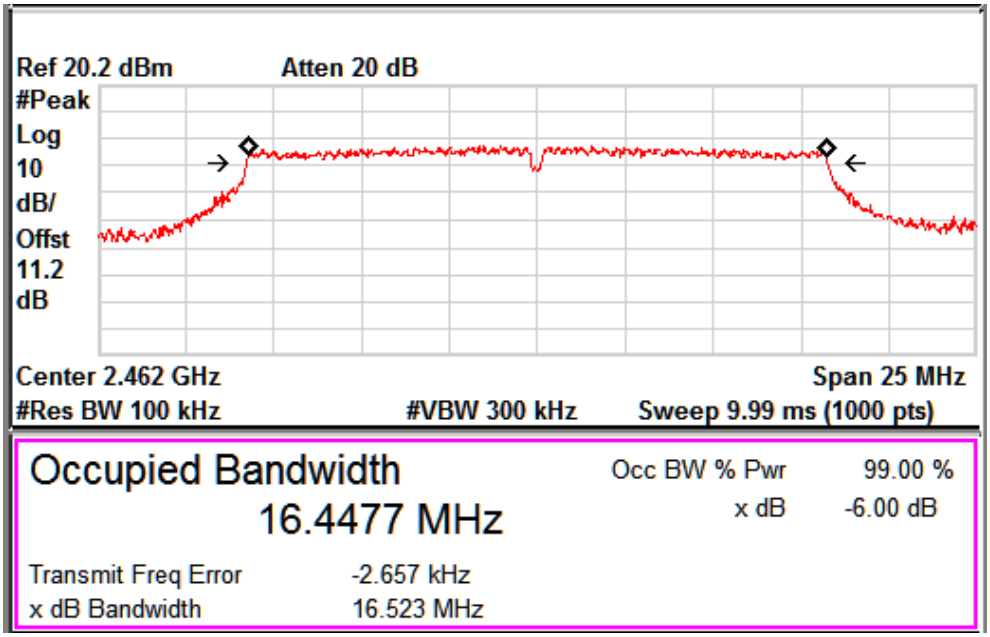

**Data Rate: 6 Mbps** **99% Occupied Bandwidth: Channel 2462MHz**



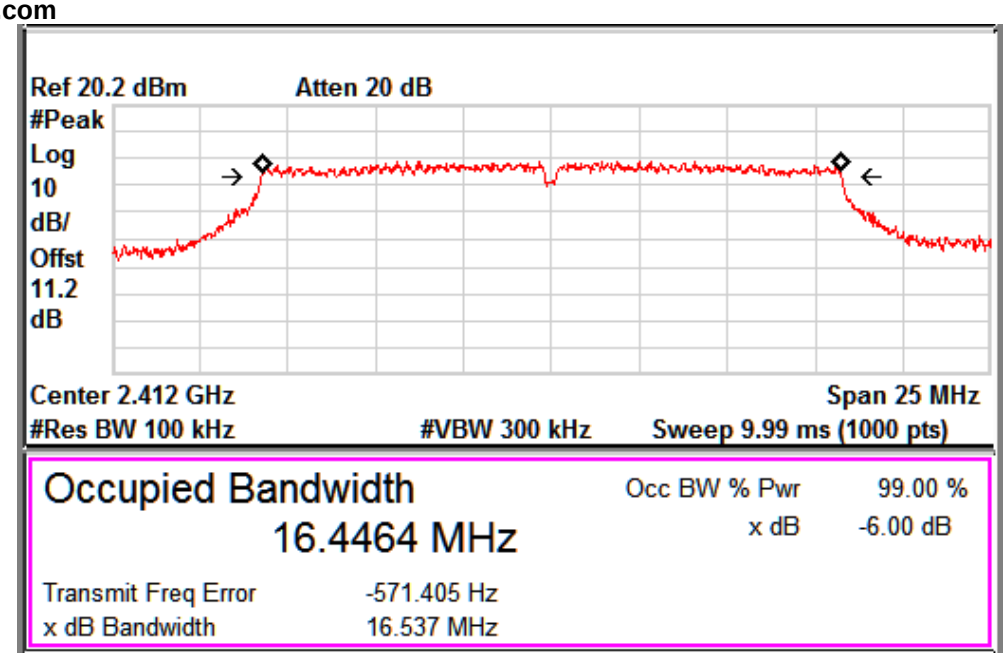

**Data Rate: 24 Mbps** **99% Occupied Bandwidth: Channel 2412MHz**



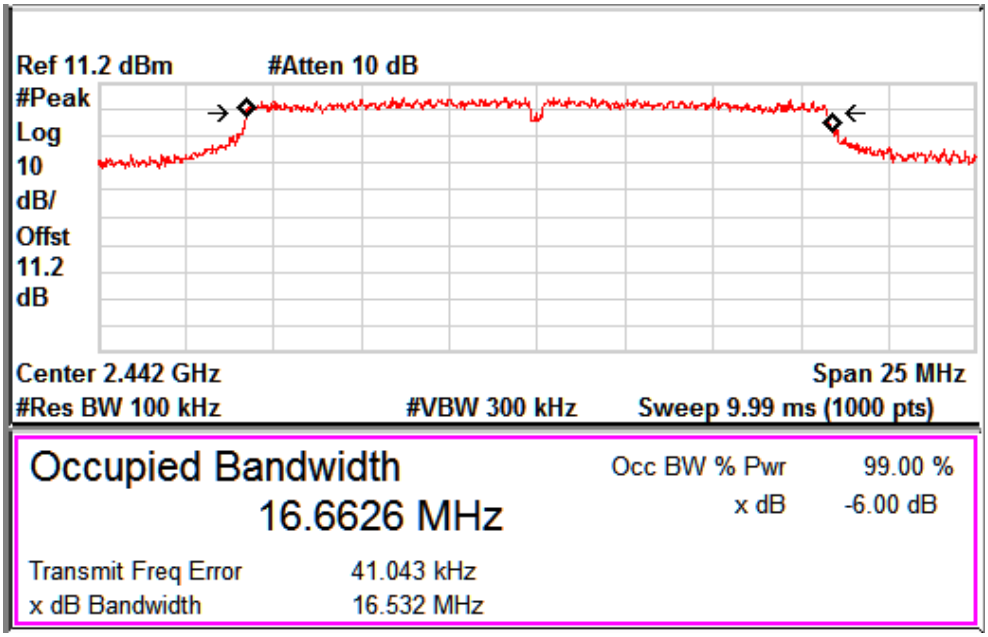

**Data Rate: 24 Mbps** **99% Occupied Bandwidth: Channel 2442MHz**



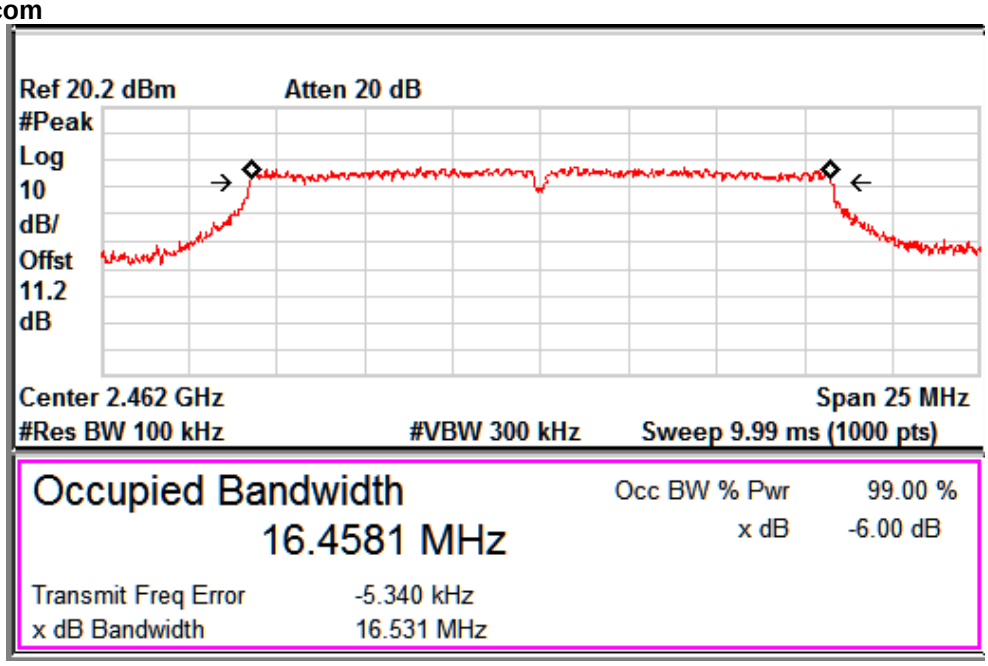

**Data Rate: 24 Mbps** **99% Occupied Bandwidth: Channel 2462MHz**




**Data Rate: 54 Mbps** **99% Occupied Bandwidth: Channel 2412MHz**

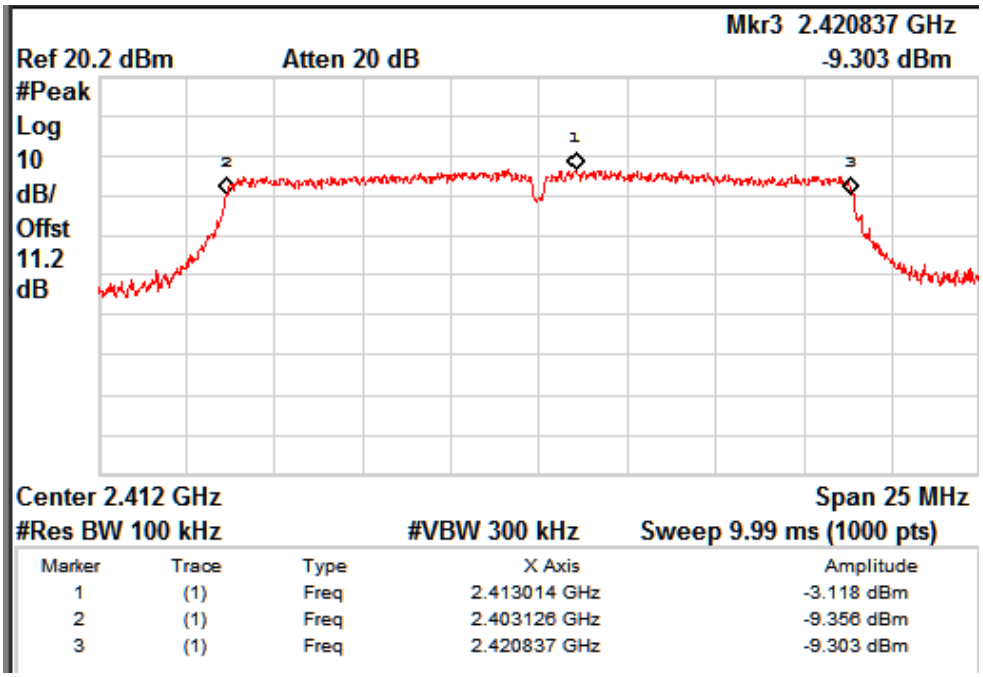



**Data Rate: 54 Mbps** **99% Occupied Bandwidth: Channel 2442MHz**

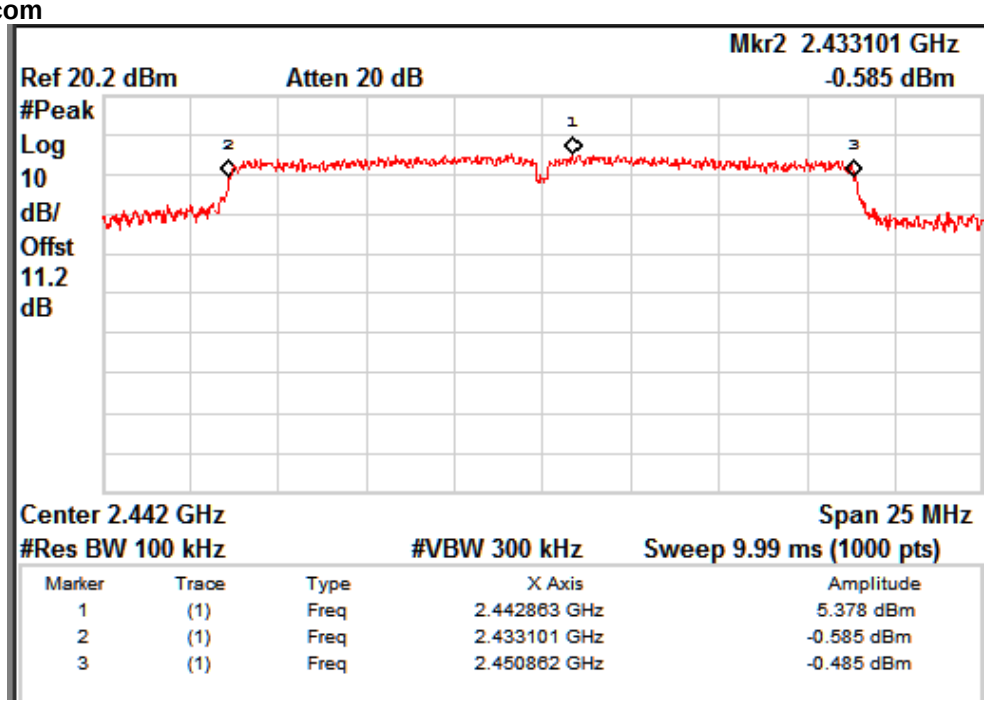



**Data Rate: 54 Mbps** **99% Occupied Bandwidth: Channel 2462MHz**

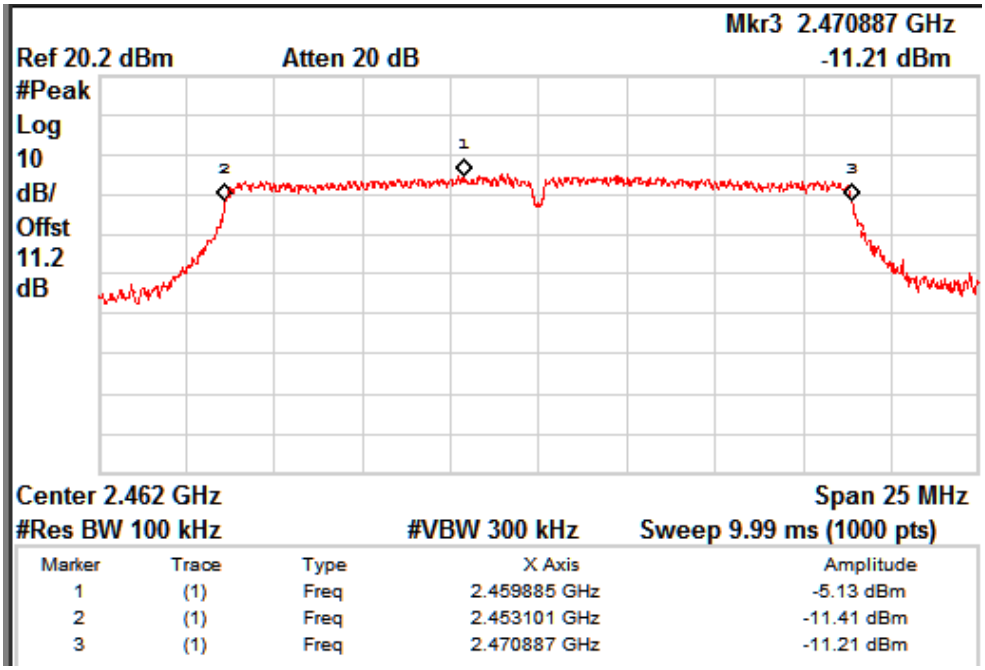
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Lower Frequency (MHz) | Upper Frequency (MHz) | 6 dB Bandwidth (MHz) | 99% OBW (MHz) |
|---|---|---|---|---|---|---|
| n | 6.5 | 2412.00 | 2403.126 | 2420.837 | 17.711 | 17.632 |
| | | 2442.00 | 2433.101 | 2450.862 | 17.761 | 17.916 |
| | | 2462.00 | 2453.101 | 2470.887 | 17.786 | 17.639 |
| | 39 | 2412.00 | 2403.101 | 2420.837 | 17.736 | 17.620 |
| | | 2442.00 | 2433.101 | 2450.862 | 17.761 | 17.773 |
| | | 2462.00 | 2453.101 | 2470.887 | 17.786 | 17.614 |
| | 65 | 2412.00 | 2403.101 | 2420.862 | 17.761 | 17.617 |
| | | 2442.00 | 2433.101 | 2450.887 | 17.786 | 17.773 |
| | | 2462.00 | 2453.101 | 2470.887 | 17.786 | 17.629 |



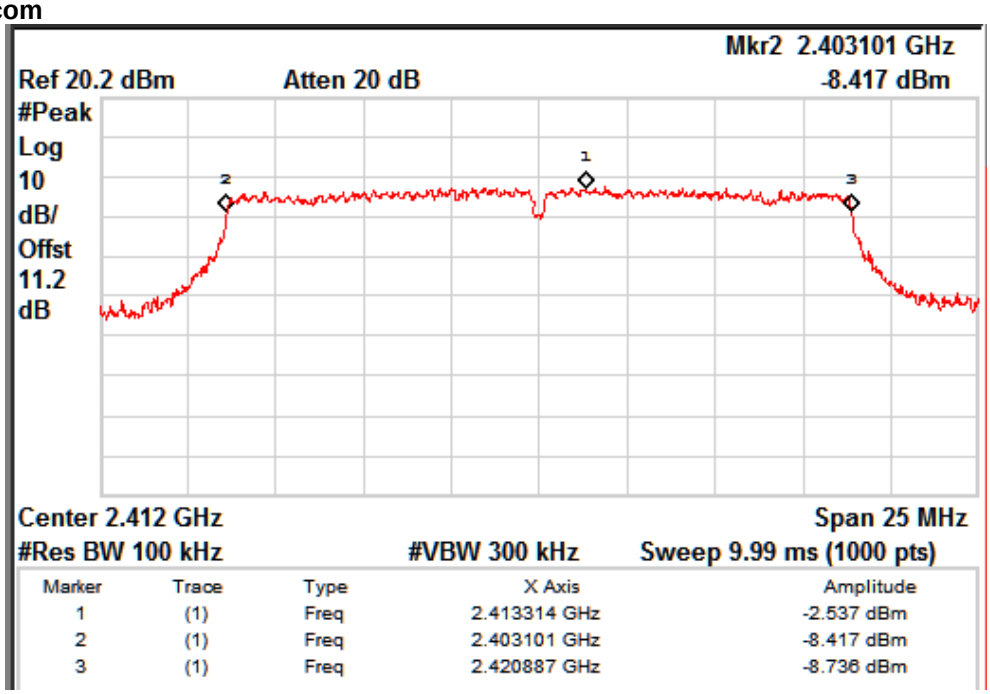

**Data Rate: 6.5 Mbps** **Channel: 2412 MHz**



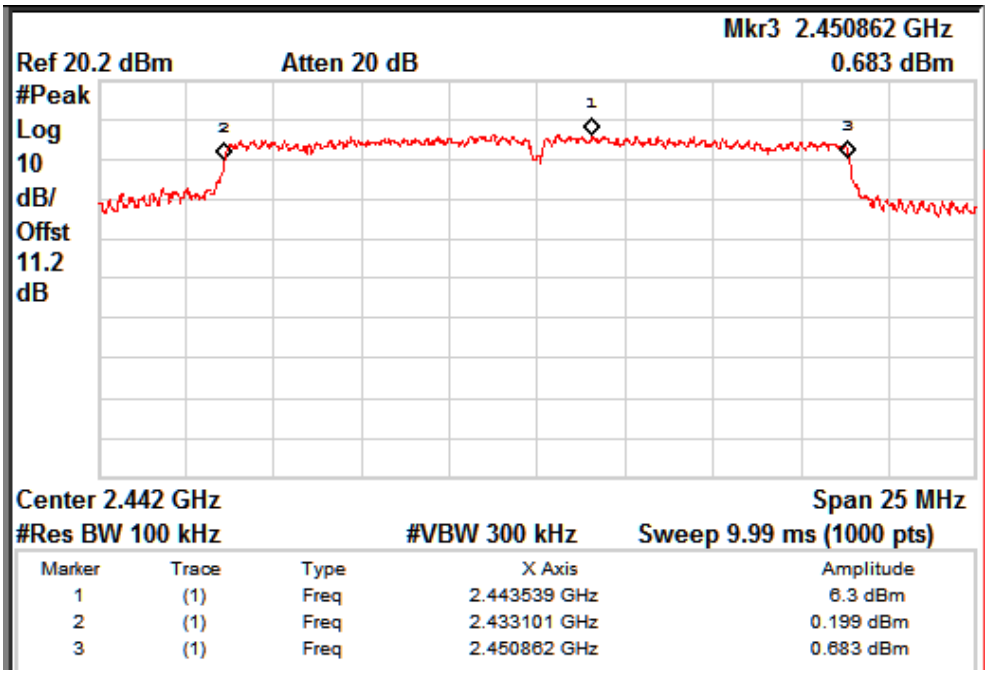

**Data Rate: 6.5 Mbps** **Channel: 2442 MHz**



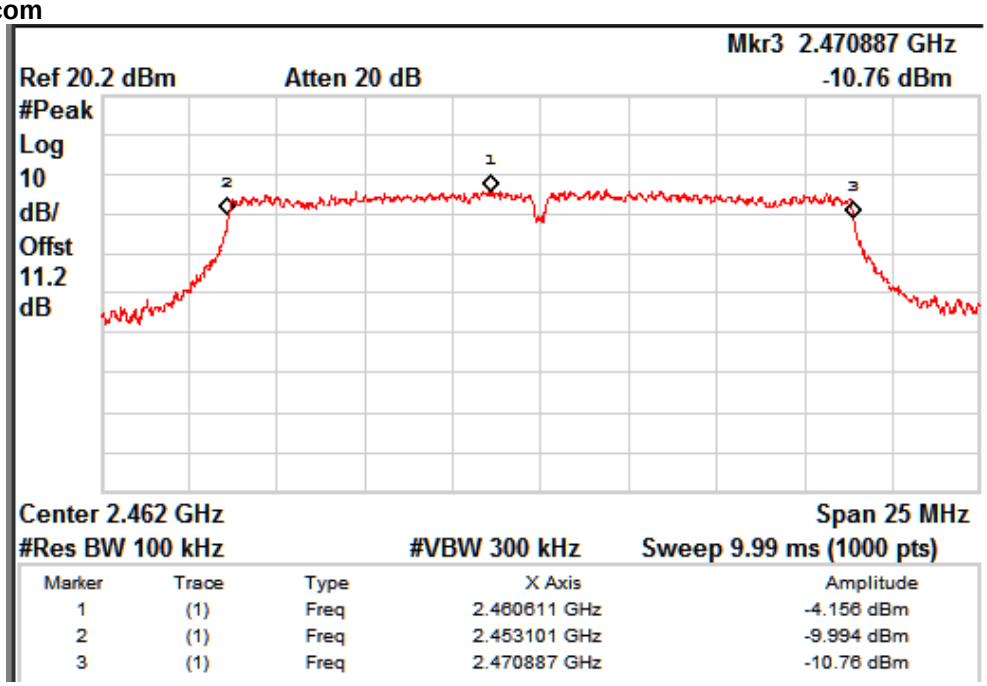

**Data Rate: 6.5 Mbps** **Channel: 2462 MHz**



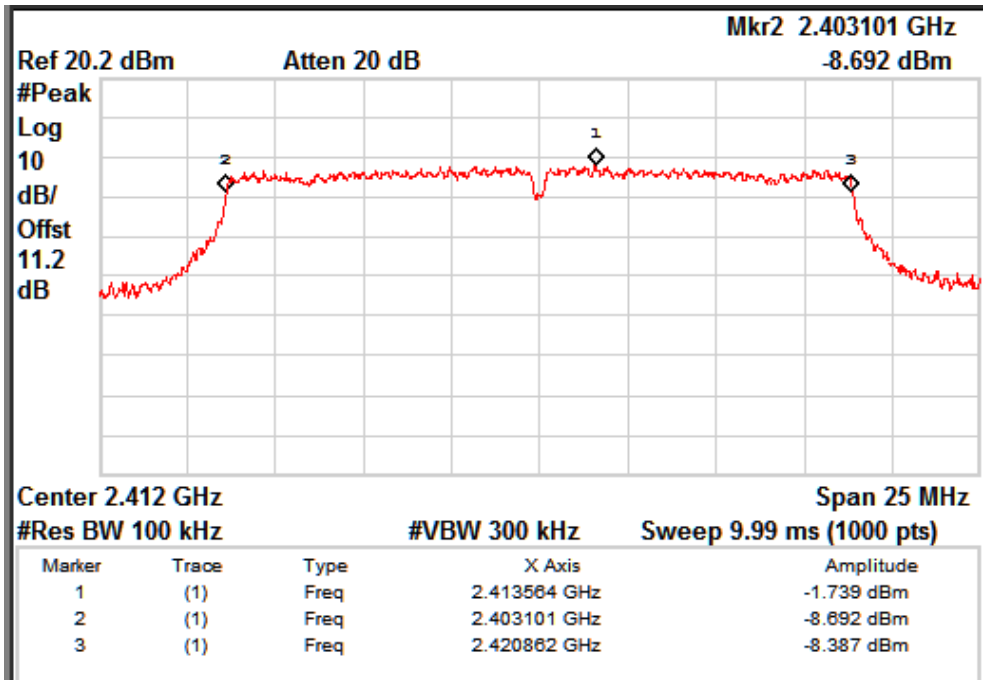

**Data Rate: 39 Mbps** **Channel: 2412 MHz**



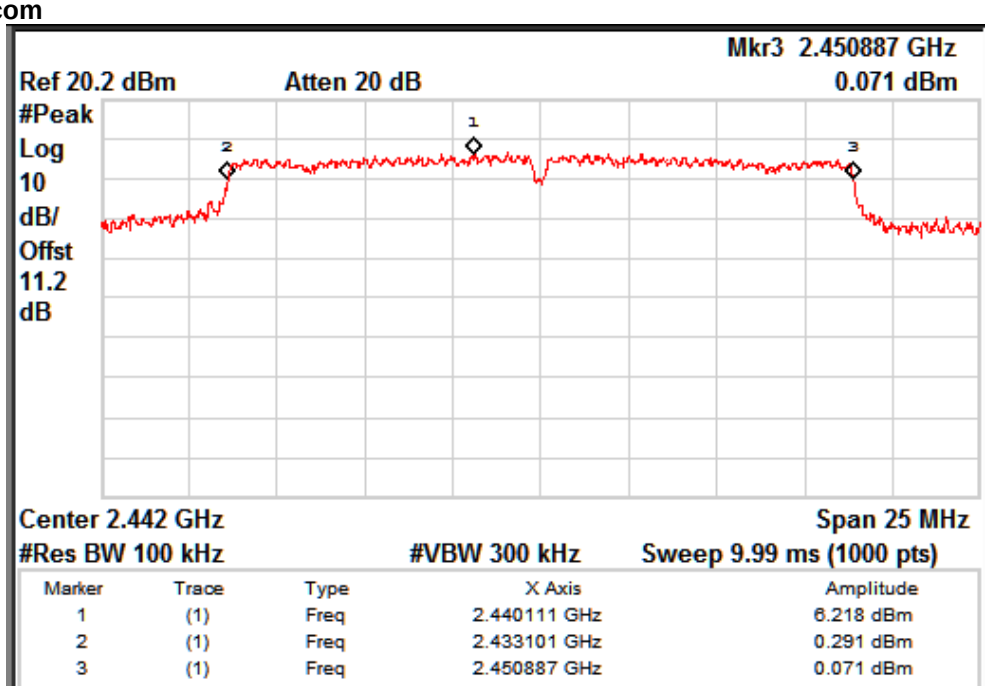

**Data Rate: 39 Mbps** **Channel: 2442 MHz**



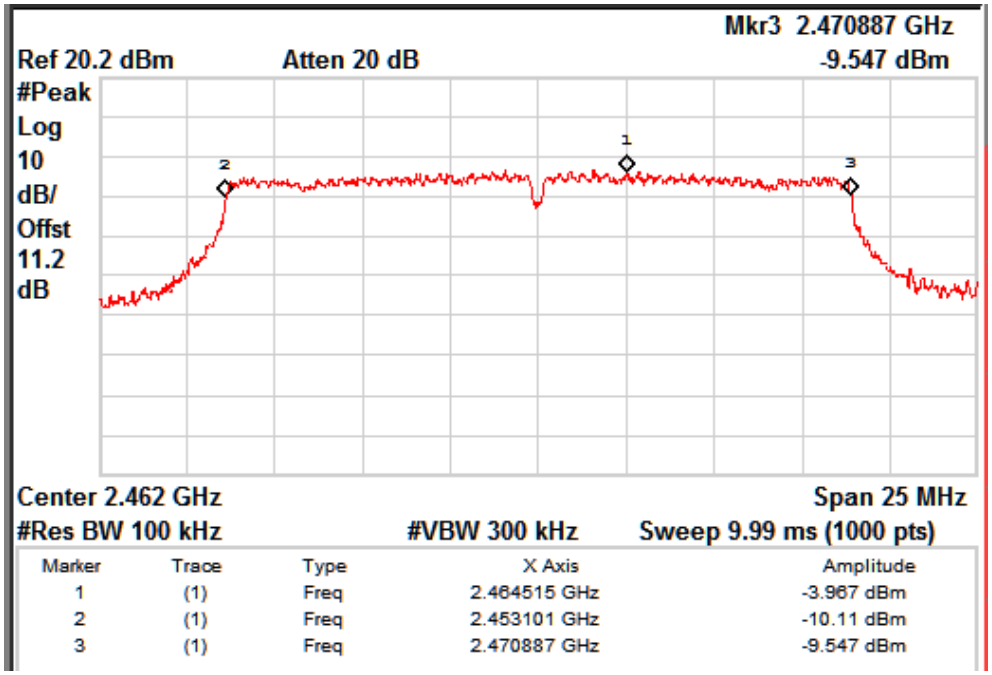

**Data Rate: 39 Mbps** **Channel: 2462 MHz**



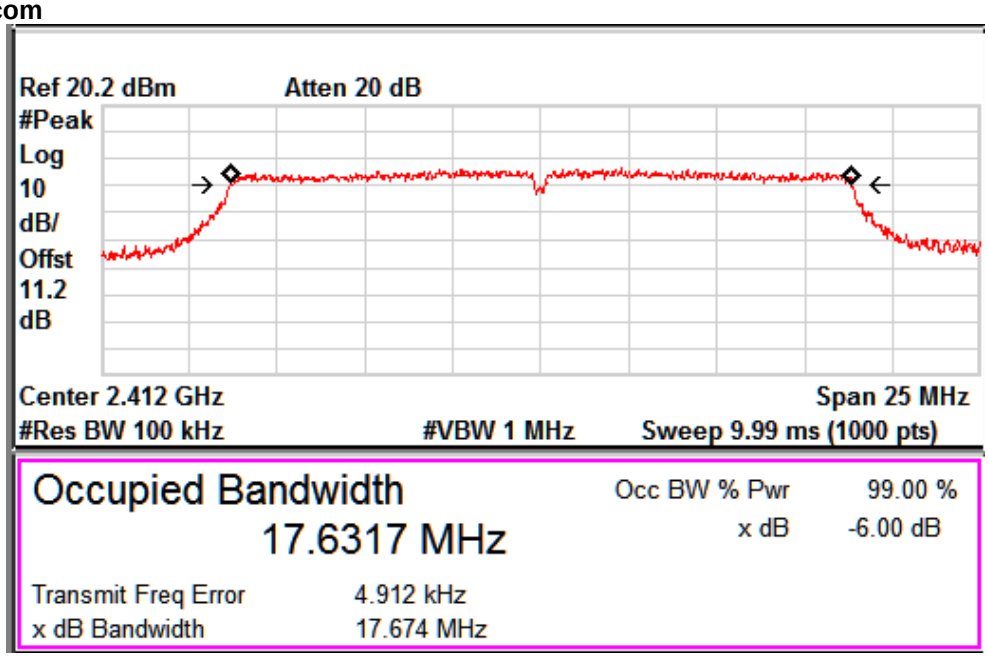

**Data Rate: 65 Mbps** **Channel: 2412 MHz**



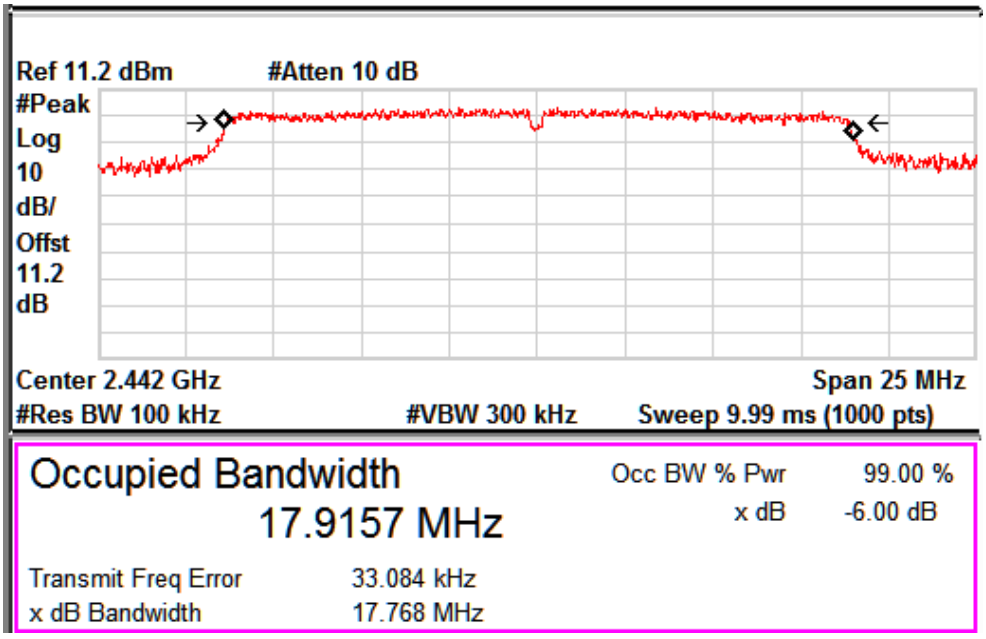

**Data Rate: 65 Mbps** **Channel: 2442MHz**



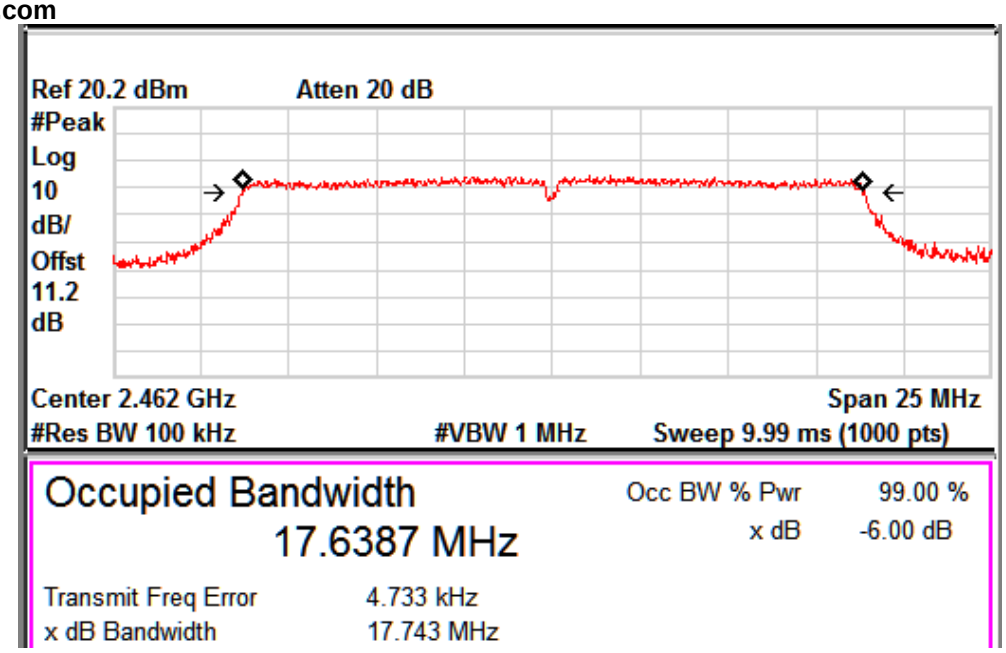

**Data Rate: 65 Mbps** **Channel: 2462 MHz**



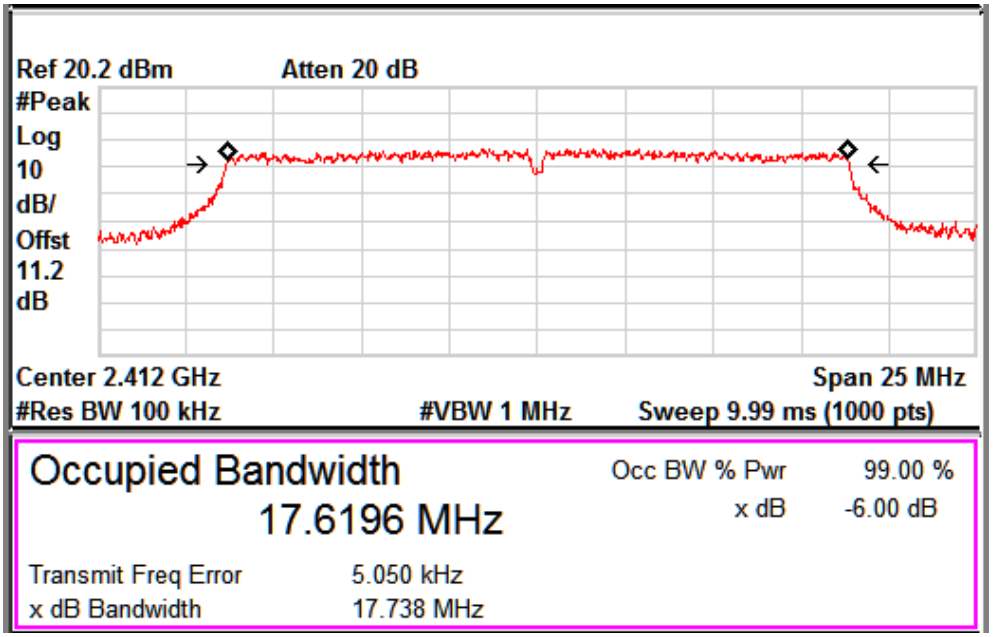

**Data Rate: 6.5 Mbps** **99% Occupied Bandwidth: Channel 2412MHz**



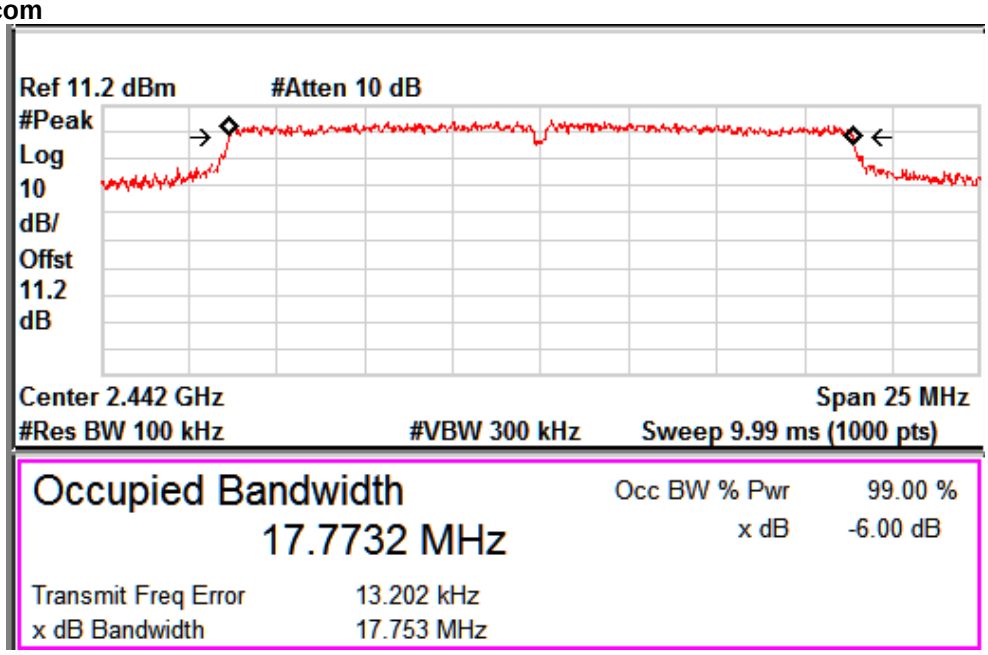

**Data Rate: 6.5 Mbps** **99% Occupied Bandwidth: Channel 2442MHz**



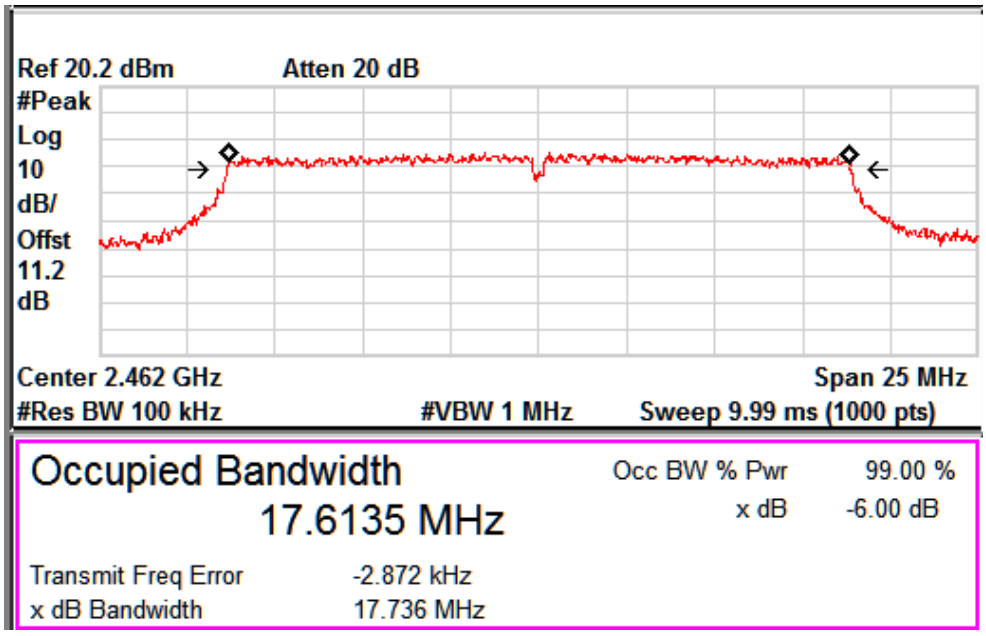

**Data Rate: 6.5 Mbps** **99% Occupied Bandwidth: Channel 2462MHz**



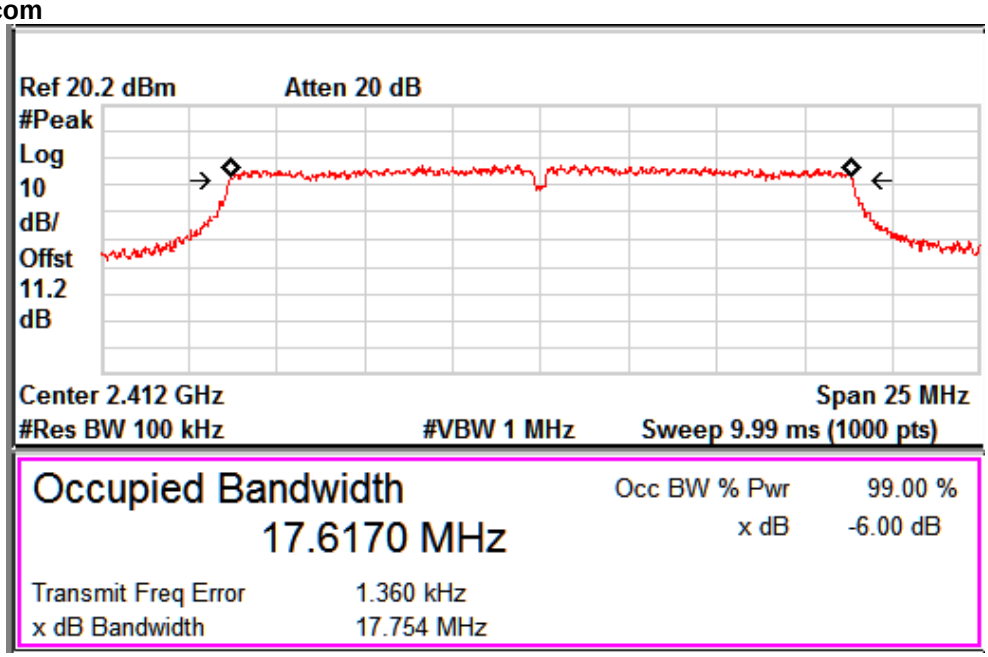

**Data Rate: 39 Mbps** **99% Occupied Bandwidth: Channel 2412MHz**



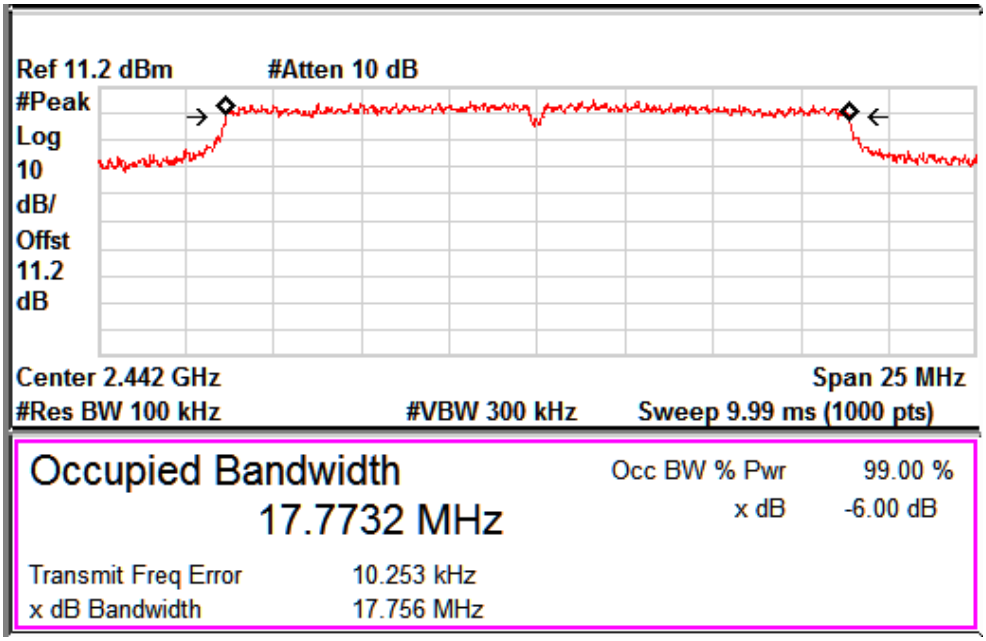

**Data Rate: 39 Mbps** **99% Occupied Bandwidth: Channel 2442MHz**



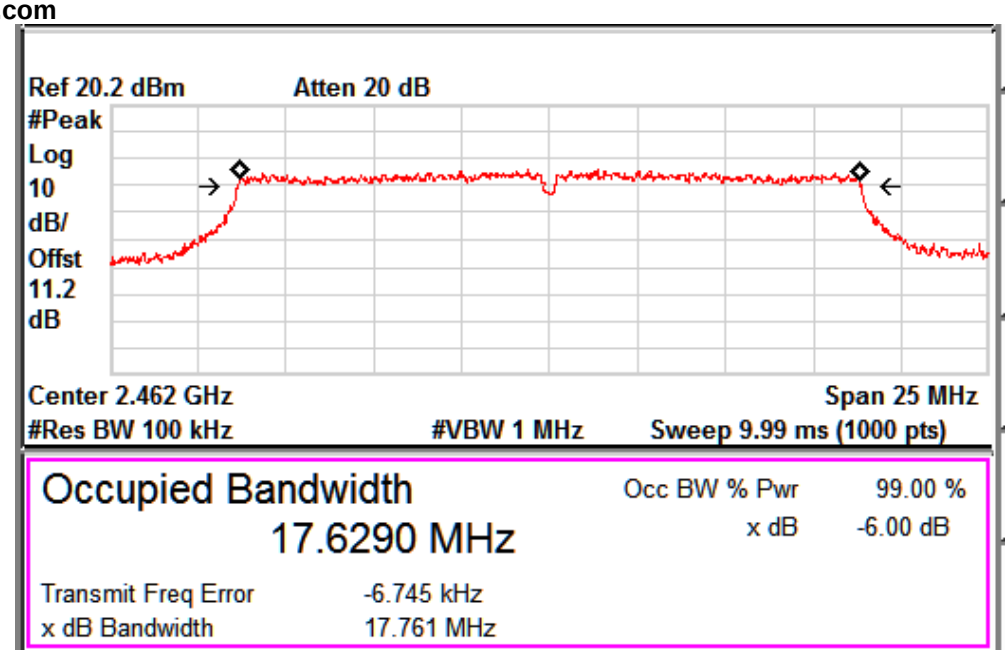

**Data Rate: 39 Mbps** **99% Occupied Bandwidth: Channel 2462MHz**




**Data Rate: 65 Mbps** **99% Occupied Bandwidth: Channel 2412MHz**



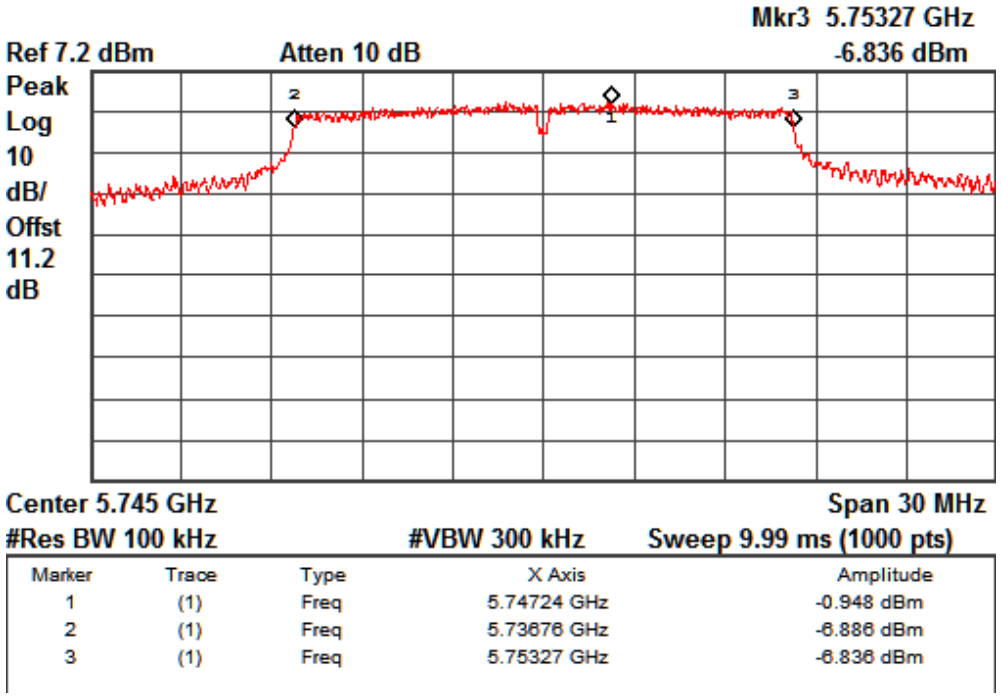

**Data Rate: 65 Mbps** **99% Occupied Bandwidth: Channel 2442MHz**




**Data Rate: 65 Mbps** **99% Occupied Bandwidth: Channel 2462MHz**

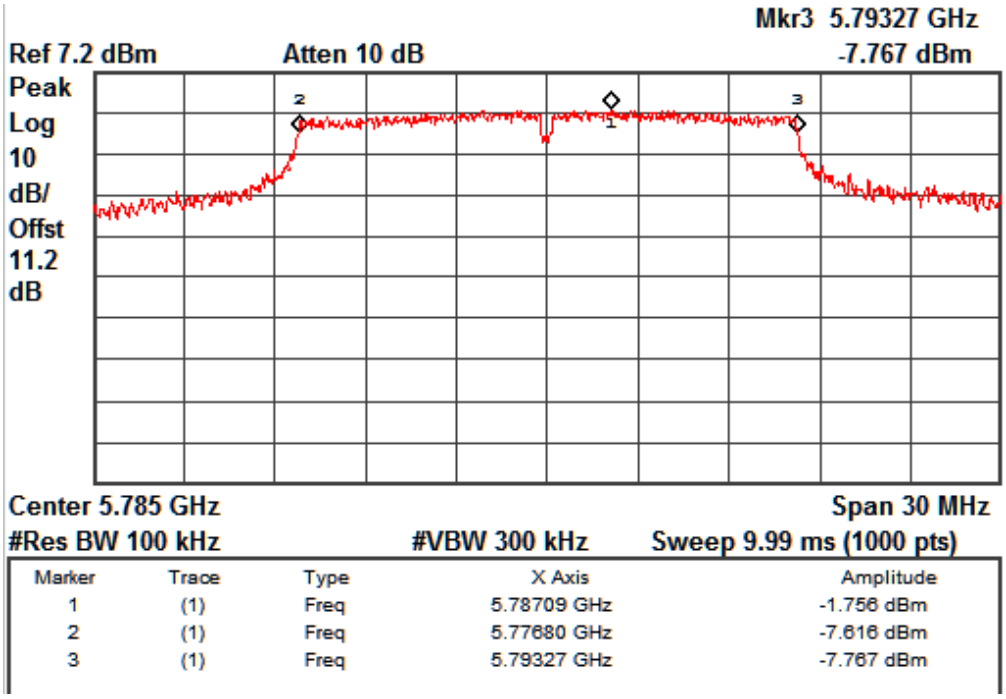
**5GHz Band**

| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Lower Frequency (MHz) | Upper Frequency (MHz) | 6 dB Bandwidth (MHz) | 99% OBW (MHz) |
|---|---|---|---|---|---|---|
| a | 6 | 5745 | 5736.76 | 5753.27 | 16.51 | 17.71 |
| | | 5785 | 5776.8 | 5793.27 | 16.47 | 17.22 |
| | | 5825 | 5816.73 | 5833.27 | 16.54 | 16.9 |
| | 24 | 5745 | 5736.73 | 5753.27 | 16.54 | 16.97 |
| | | 5785 | 5776.75 | 5793.27 | 16.52 | 16.61 |
| | | 5825 | 5816.73 | 5833.27 | 16.54 | 16.62 |
| | 54 | 5745 | 5736.73 | 5753.27 | 16.54 | 16.88 |
| | | 5785 | 5776.74 | 5793.27 | 16.53 | 16.68 |
| | | 5825 | 5816.73 | 5833.27 | 16.54 | 16.69 |



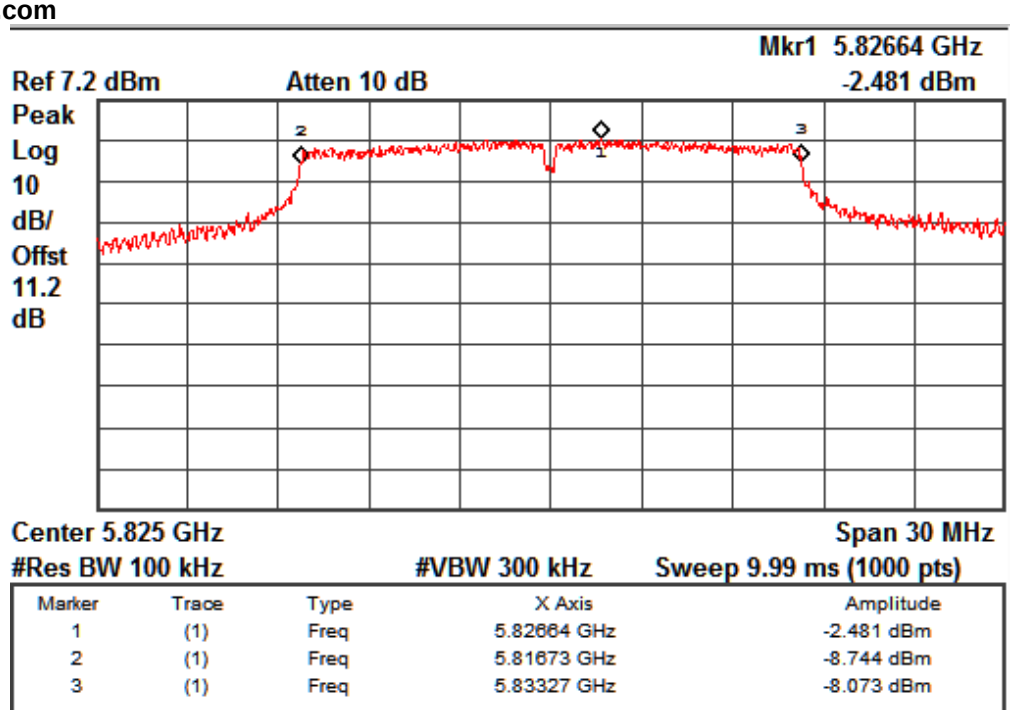

| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.74724 GHz | -0.948 dBm |
| 2 | (1) | Freq | 5.73676 GHz | -6.886 dBm |
| 3 | (1) | Freq | 5.75327 GHz | -6.836 dBm |

**Data Rate: 6 Mbps** **Channel: 5745 MHz**



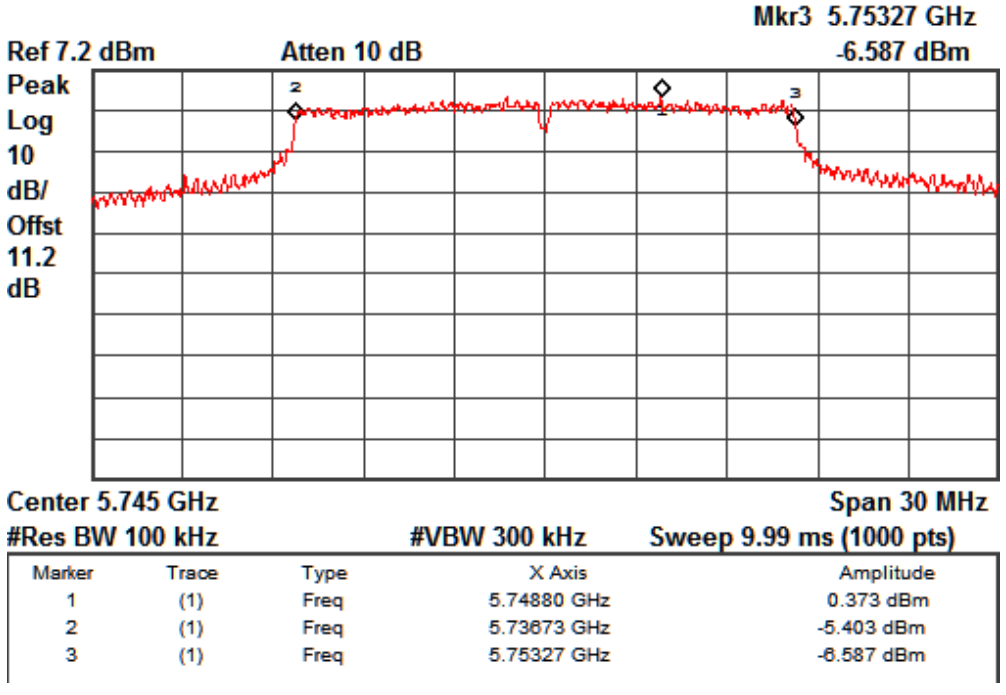

| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.78709 GHz | -1.756 dBm |
| 2 | (1) | Freq | 5.77680 GHz | -7.616 dBm |
| 3 | (1) | Freq | 5.79327 GHz | -7.767 dBm |

**Data Rate: 6 Mbps** **Channel: 5785 MHz**



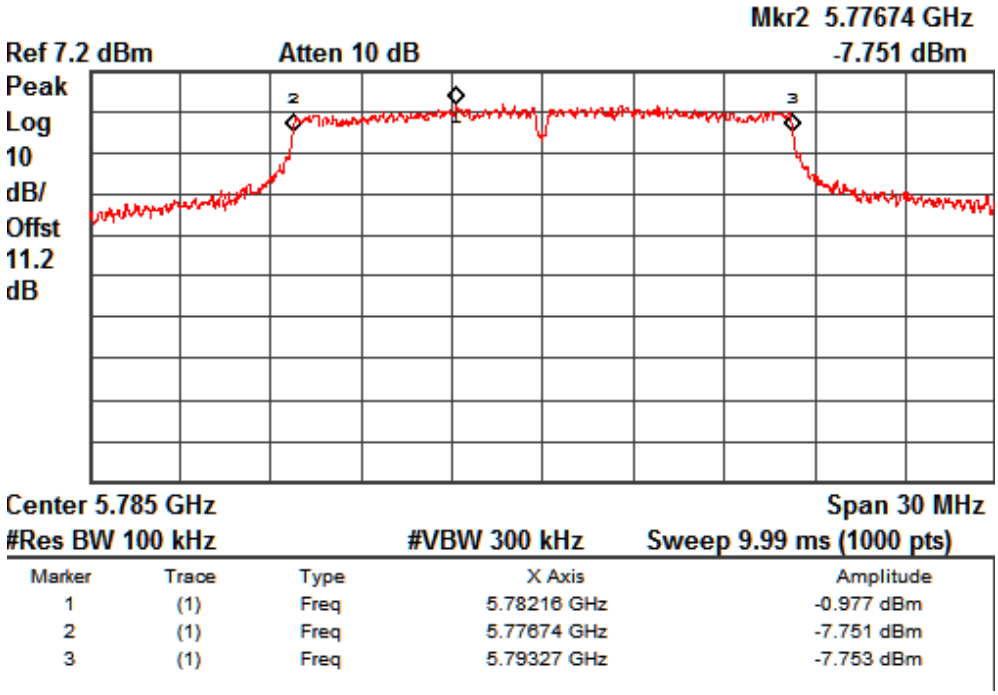

| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.82664 GHz | -2.481 dBm |
| 2 | (1) | Freq | 5.81673 GHz | -8.744 dBm |
| 3 | (1) | Freq | 5.83327 GHz | -8.073 dBm |

**Data Rate: 6 Mbps** **Channel: 5825 MHz**



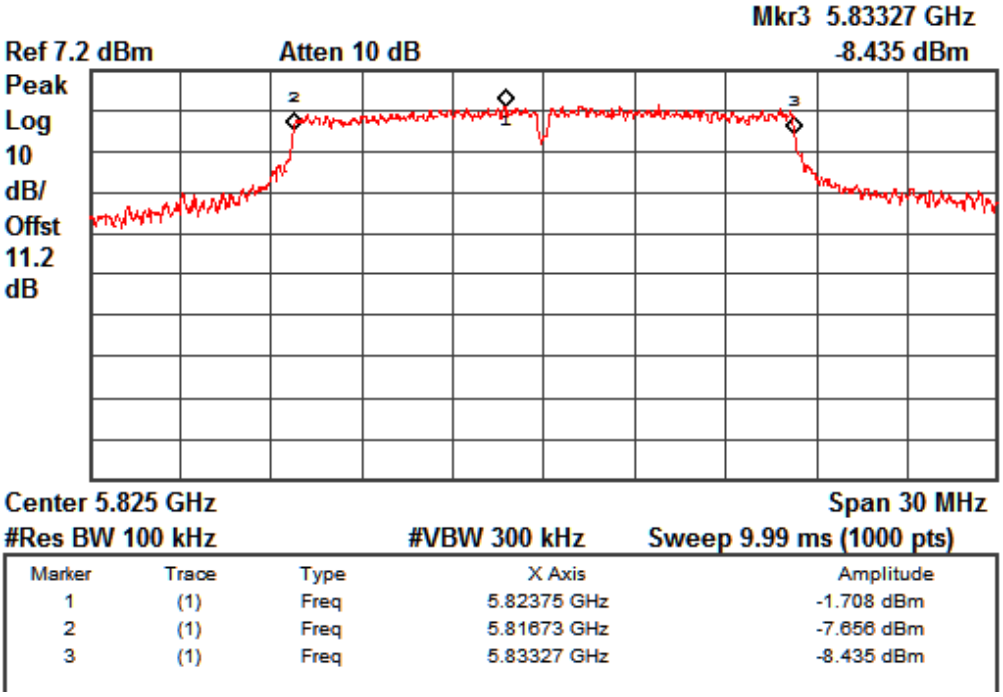

| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.74880 GHz | 0.373 dBm |
| 2 | (1) | Freq | 5.73673 GHz | -5.403 dBm |
| 3 | (1) | Freq | 5.75327 GHz | -6.587 dBm |

**Data Rate: 24 Mbps** **Channel: 5745 MHz**



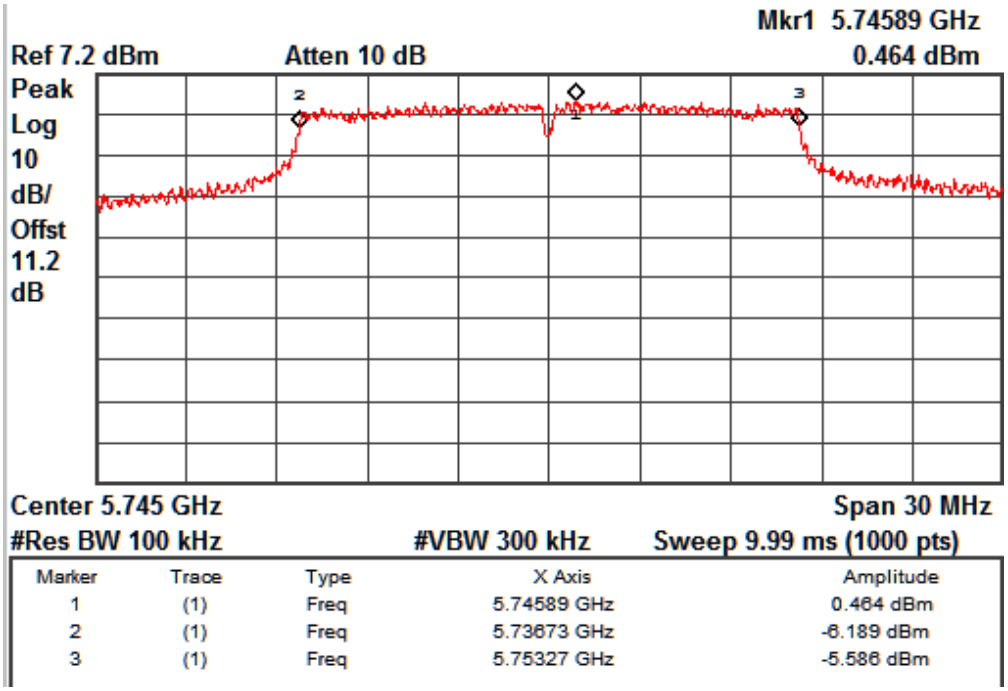

| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.78216 GHz | -0.977 dBm |
| 2 | (1) | Freq | 5.77674 GHz | -7.751 dBm |
| 3 | (1) | Freq | 5.79327 GHz | -7.753 dBm |

**Data Rate: 24 Mbps** **Channel: 5785 MHz**

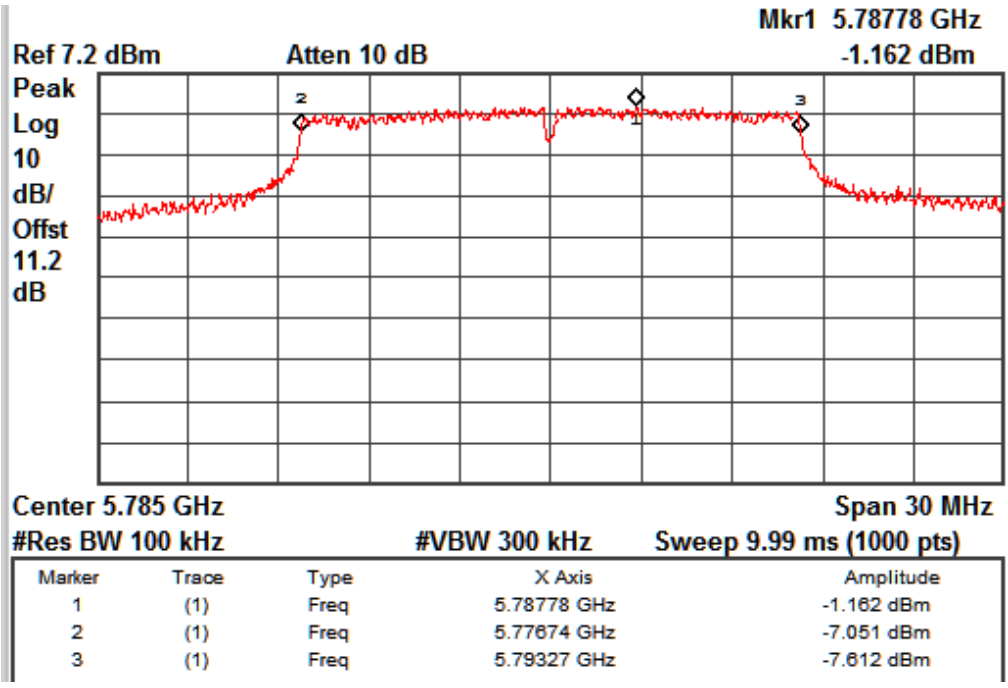



| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.82375 GHz | -1.708 dBm |
| 2 | (1) | Freq | 5.81673 GHz | -7.656 dBm |
| 3 | (1) | Freq | 5.83327 GHz | -8.435 dBm |

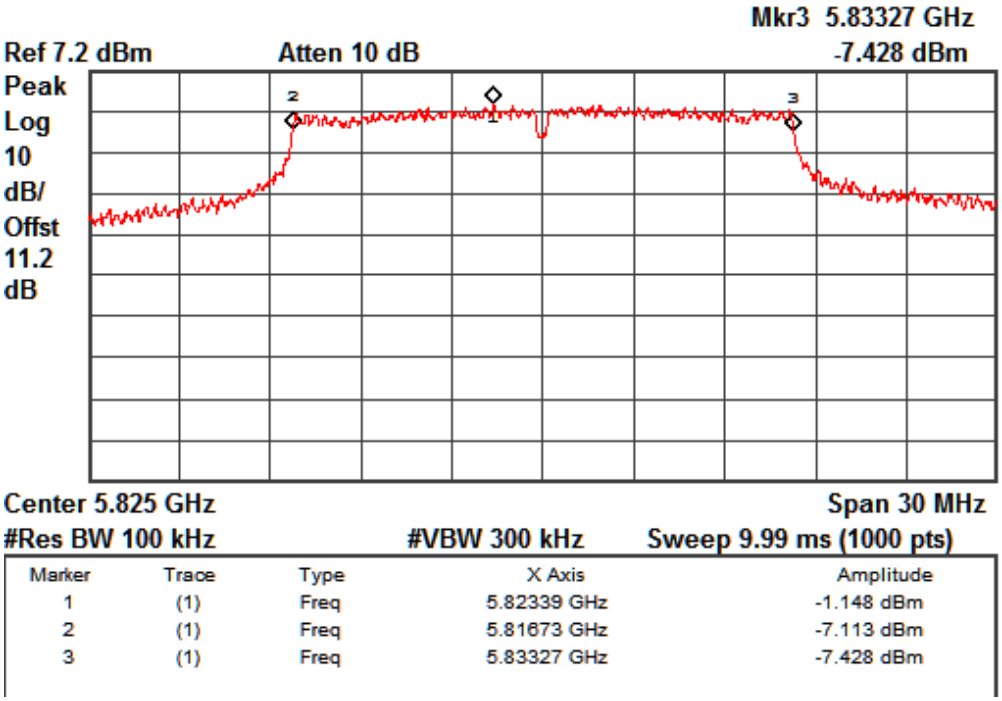
**Data Rate: 24 Mbps** **Channel: 5825 MHz**



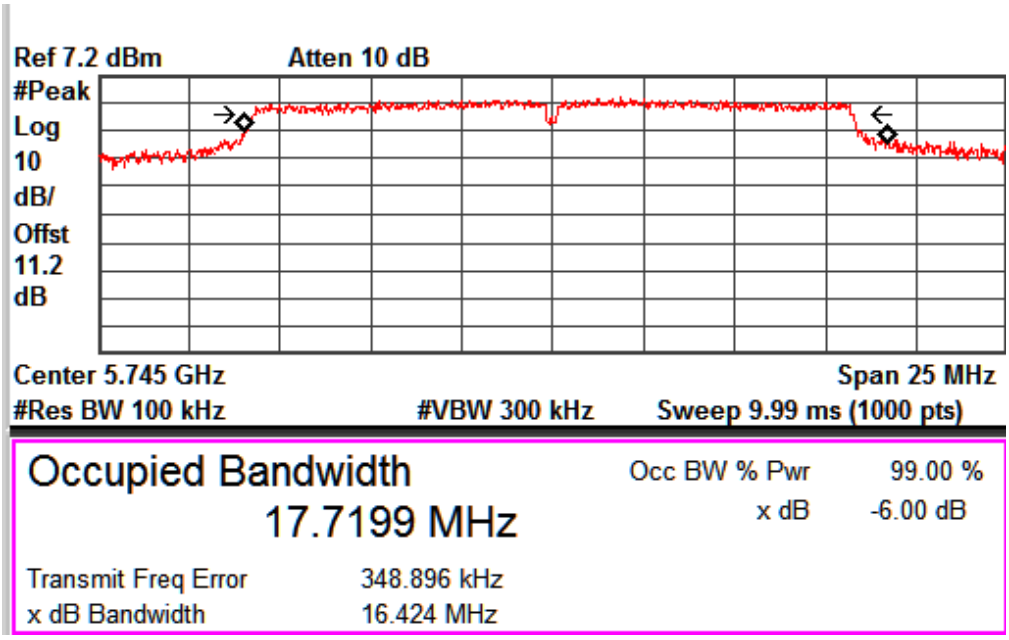

**Data Rate: 54 Mbps** **Channel: 5745 MHz**



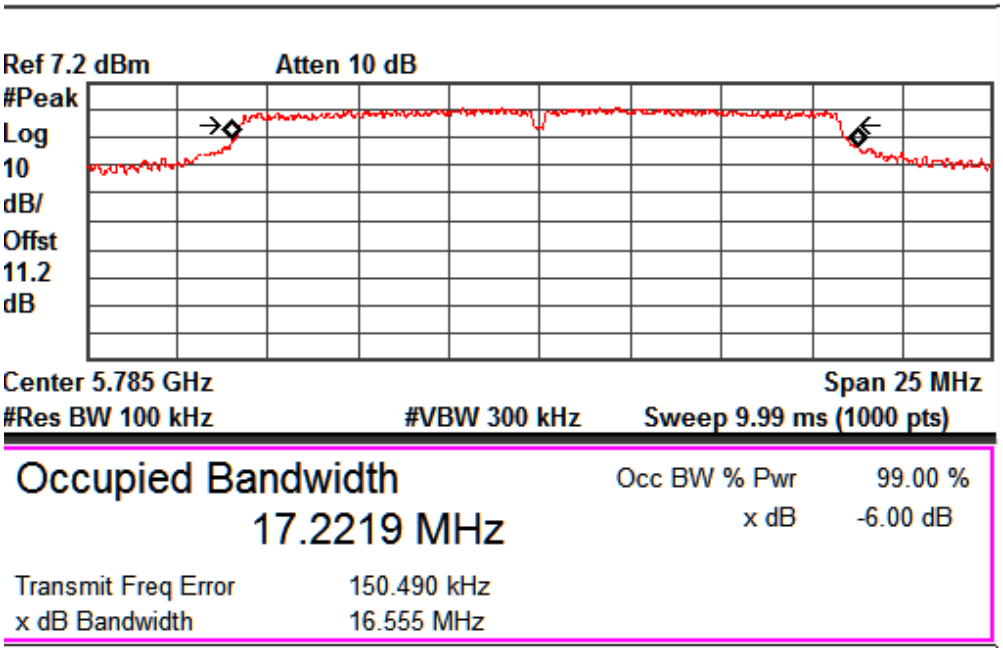

**Data Rate: 54 Mbps** **Channel: 5785 MHz**



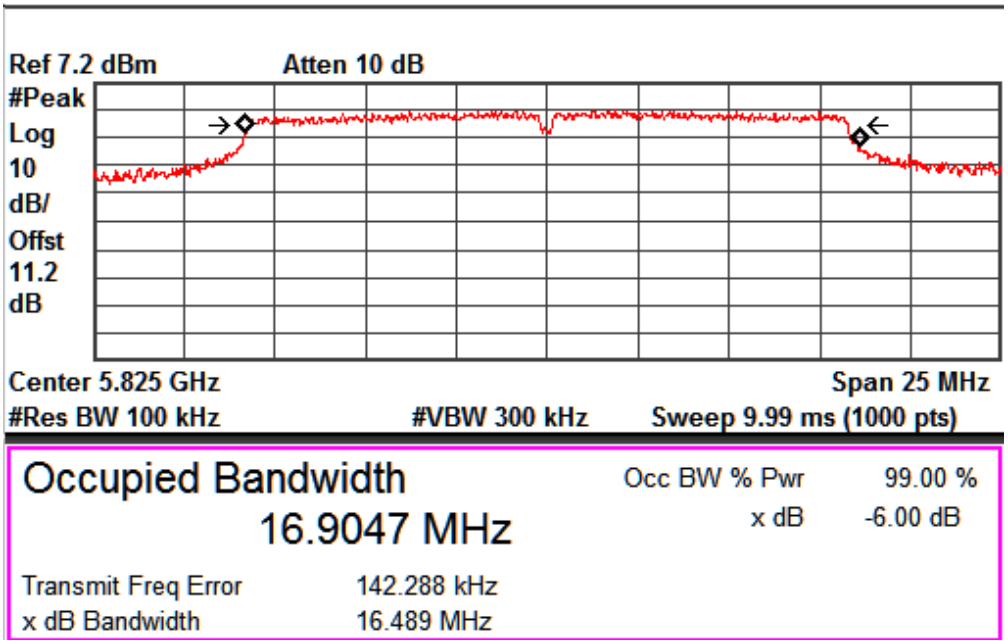

**Data Rate: 54 Mbps** **Channel: 5825 MHz**



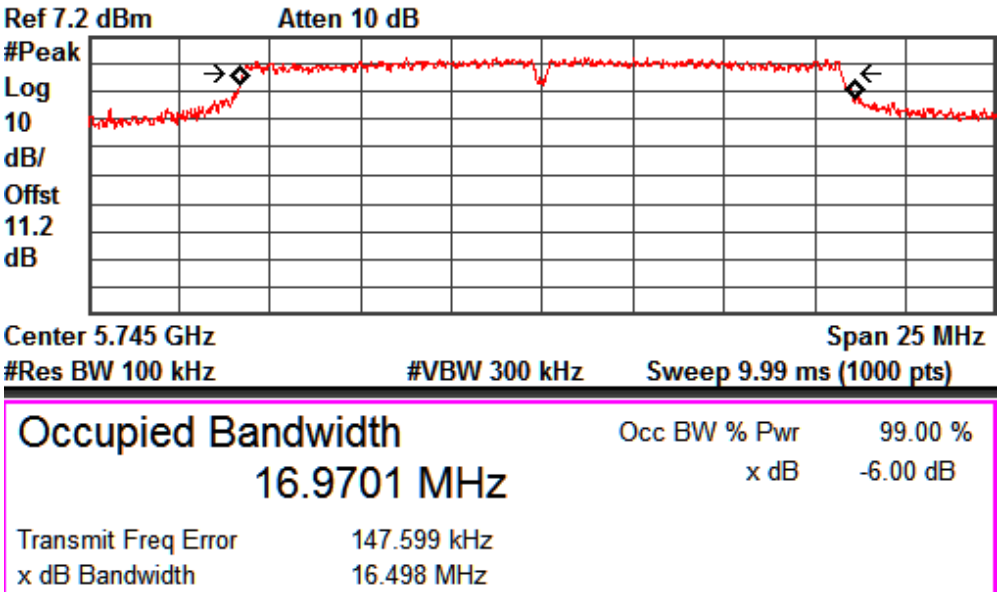

**Data Rate: 6 Mbps** **99% Occupied Bandwidth: Channel 5745MHz**



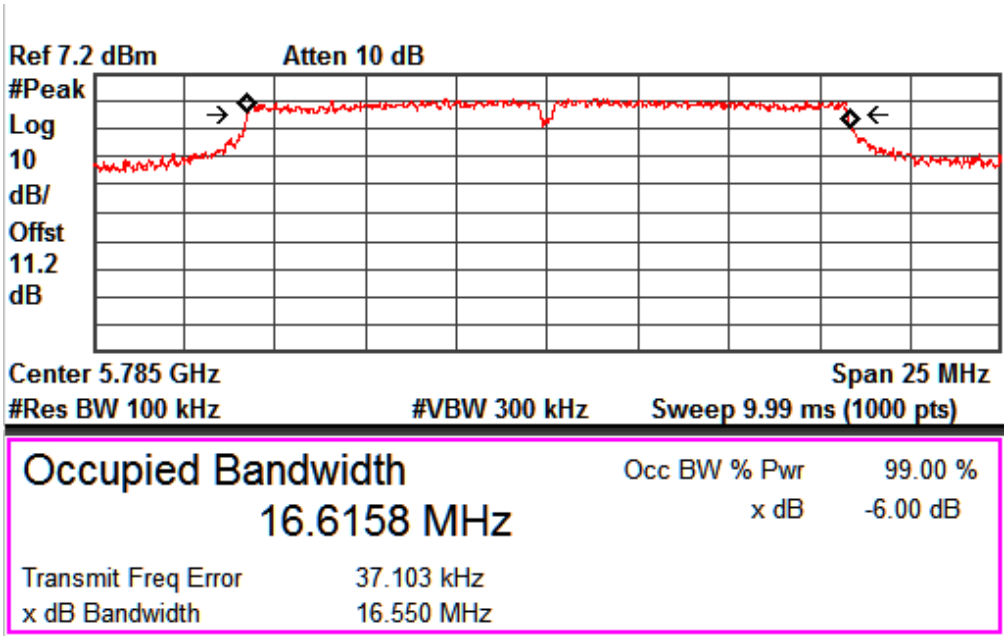

**Data Rate: 6 Mbps** **99% Occupied Bandwidth: Channel 5785MHz**



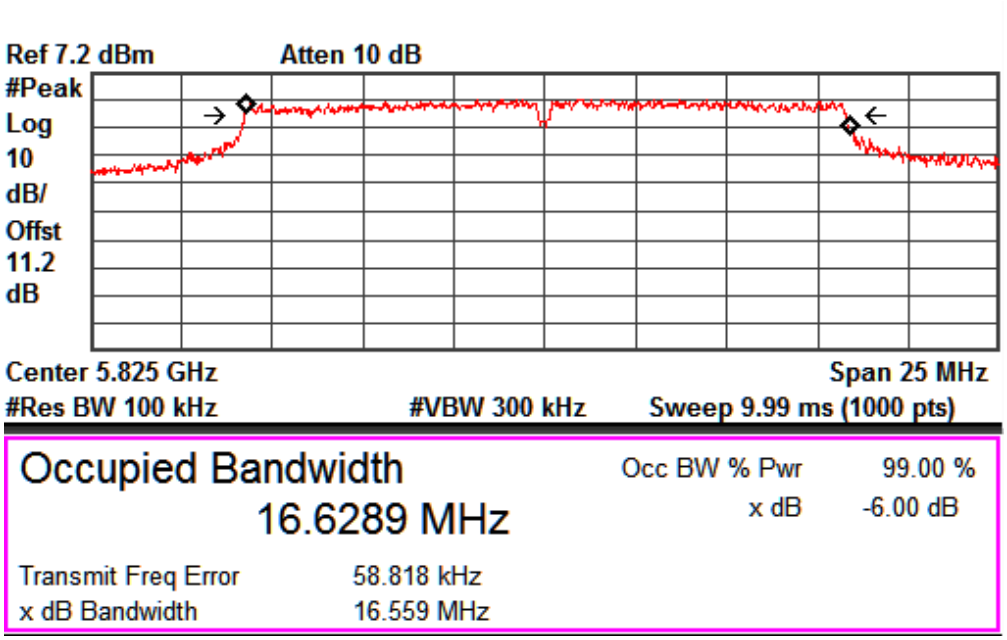

**Data Rate: 6 Mbps** **99% Occupied Bandwidth: Channel 5825MHz**



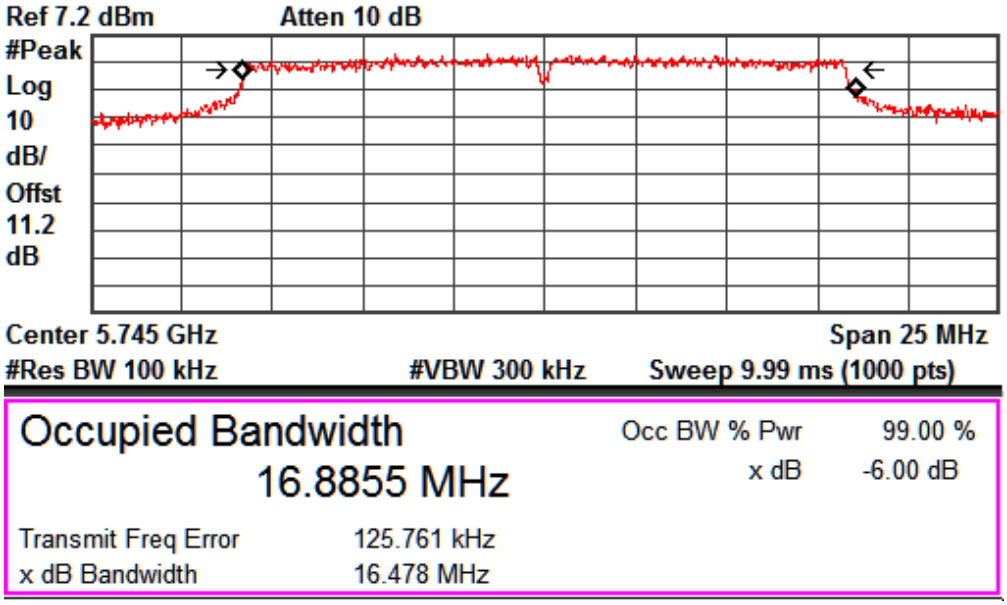

**Data Rate: 24 Mbps** **99% Occupied Bandwidth: Channel 5745MHz**



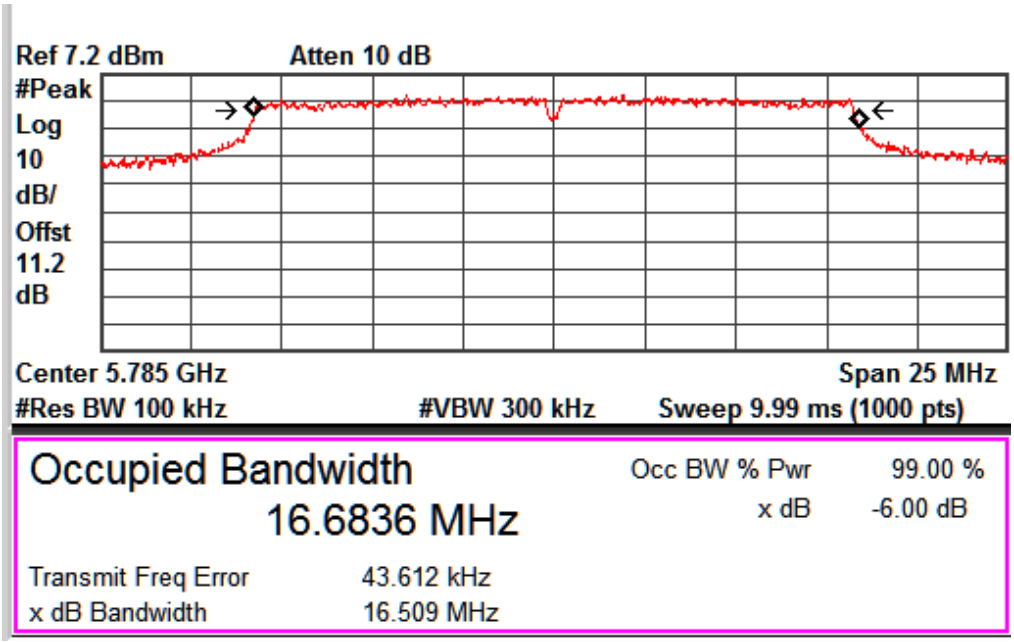

**Data Rate: 24 Mbps** **99% Occupied Bandwidth: Channel 5785MHz**



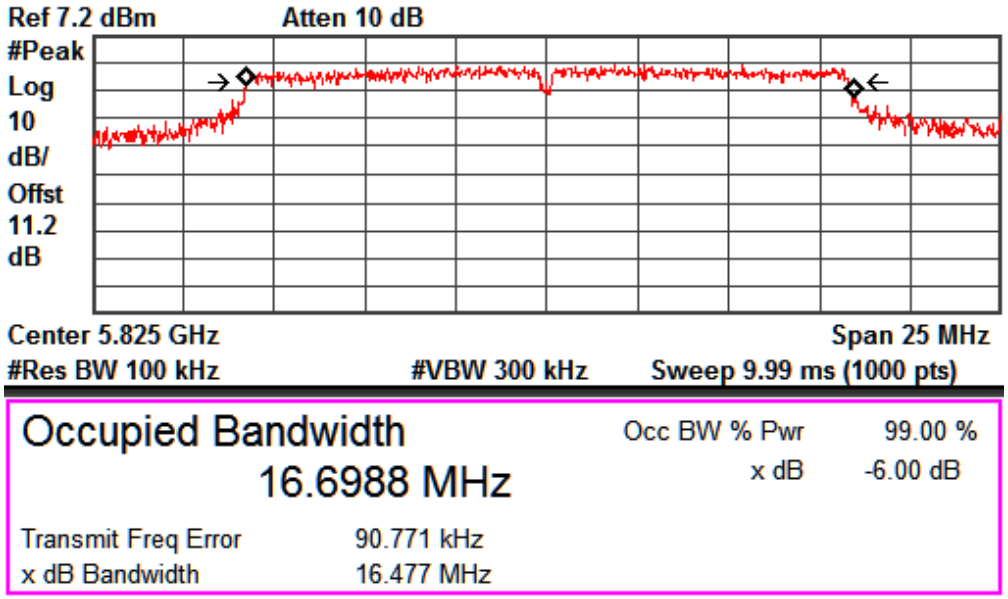

**Data Rate: 24 Mbps** **99% Occupied Bandwidth: Channel 5825MHz**




**Data Rate: 54 Mbps** **99% Occupied Bandwidth: Channel 5745MHz**

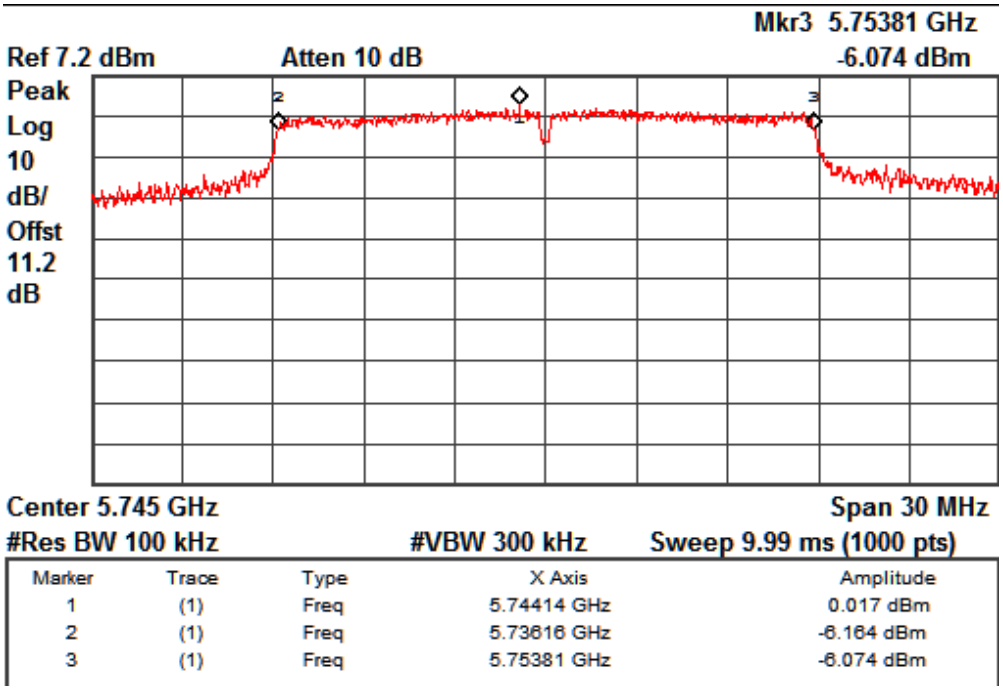



**Data Rate: 54 Mbps** **99% Occupied Bandwidth: Channel 5785MHz**

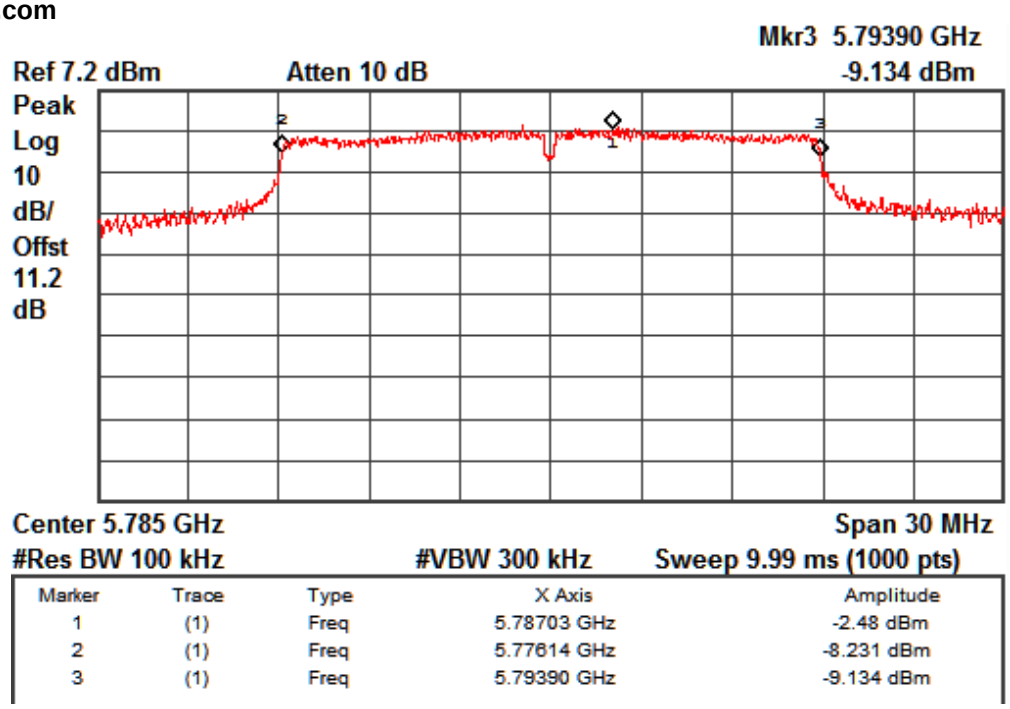



**Data Rate: 54 Mbps** **99% Occupied Bandwidth: Channel 5825MHz**

| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Lower Frequency (MHz) | Upper Frequency (MHz) | 6 dB Bandwidth (MHz) | 99% OBW (MHz) |
|---|---|---|---|---|---|---|
| n | 6.5 | 5745 | 5736.16 | 5753.81 | 17.65 | 18.29 |
| | | 5785 | 5776.14 | 5793.9 | 17.76 | 17.94 |
| | | 5825 | 5816.16 | 5833.87 | 17.71 | 17.84 |
| | 39 | 5745 | 5736.13 | 5753.87 | 17.74 | 17.88 |
| | | 5785 | 5776.11 | 5793.87 | 17.76 | 17.72 |
| | | 5825 | 5816.16 | 5833.87 | 17.71 | 17.71 |
| | 65 | 5745 | 5736.13 | 5753.87 | 17.74 | 17.85 |
| | | 5785 | 5776.14 | 5793.87 | 17.73 | 17.74 |
| | | 5825 | 5816.13 | 5833.87 | 17.74 | 17.7 |

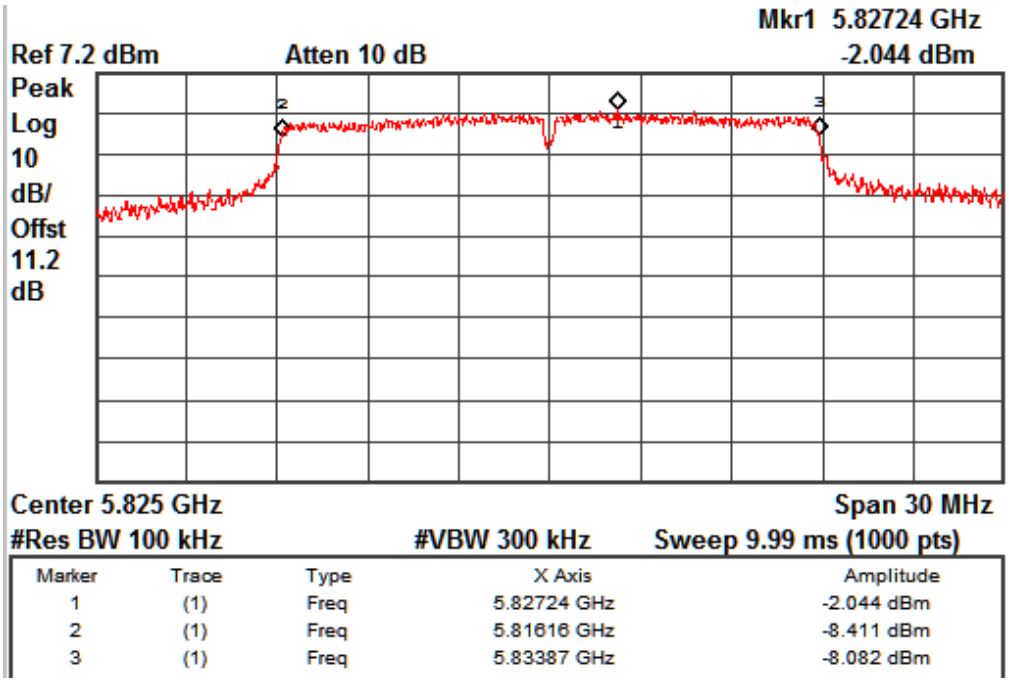



**Data Rate: 6.5 Mbps** **Channel: 5745 MHz**



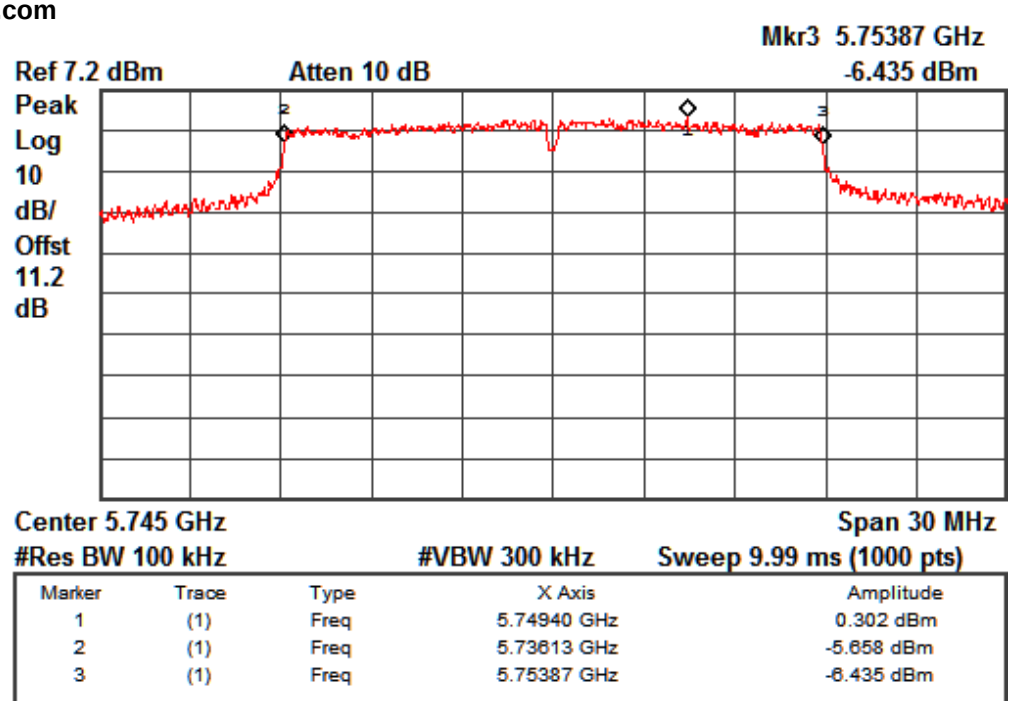

| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.78703 GHz | -2.48 dBm |
| 2 | (1) | Freq | 5.77614 GHz | -8.231 dBm |
| 3 | (1) | Freq | 5.79390 GHz | -9.134 dBm |

**Data Rate: 6.5 Mbps** **Channel: 5785 MHz**



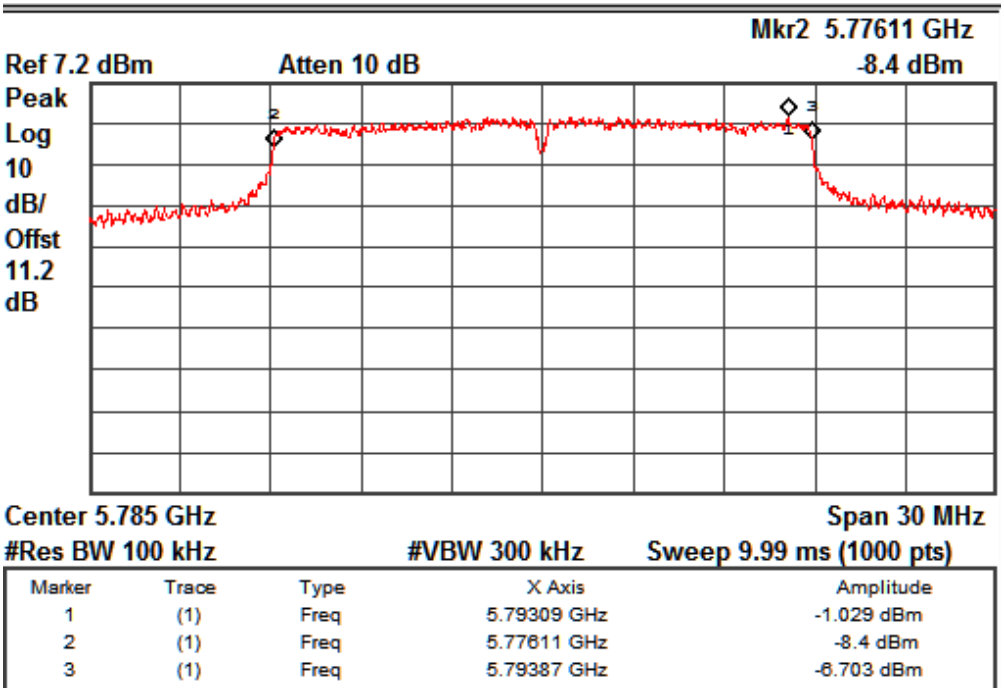

| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.82724 GHz | -2.044 dBm |
| 2 | (1) | Freq | 5.81616 GHz | -8.411 dBm |
| 3 | (1) | Freq | 5.83387 GHz | -8.082 dBm |

**Data Rate: 6.5 Mbps** **Channel: 5825 MHz**



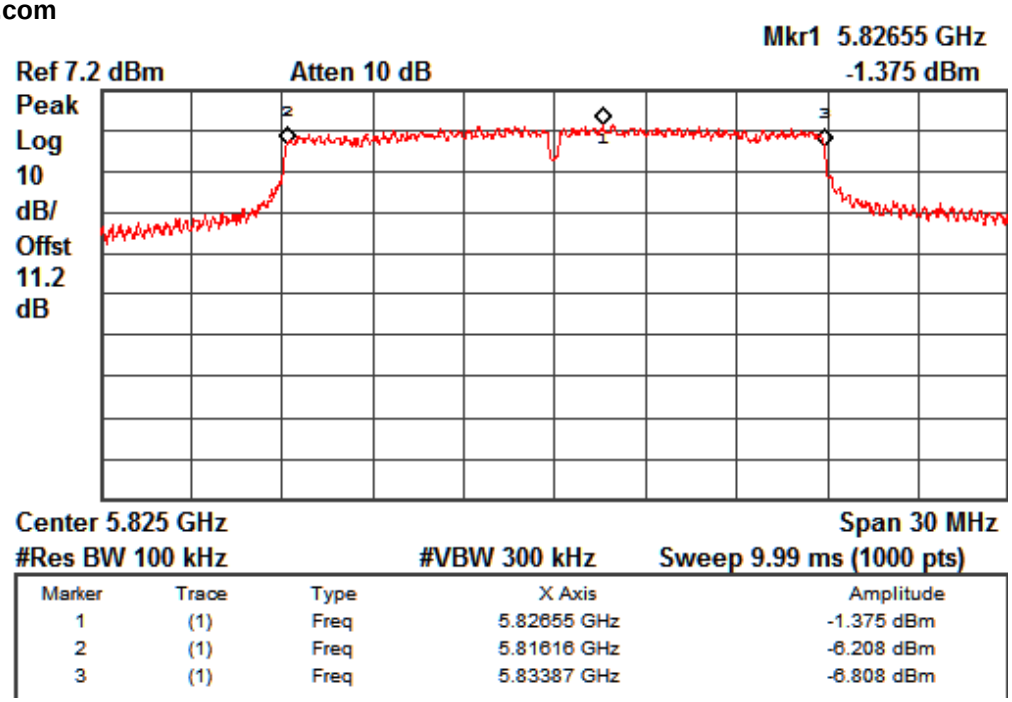

| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.74940 GHz | 0.302 dBm |
| 2 | (1) | Freq | 5.73613 GHz | -5.658 dBm |
| 3 | (1) | Freq | 5.75387 GHz | -6.435 dBm |

**Data Rate: 39 Mbps** **Channel: 5745 MHz**



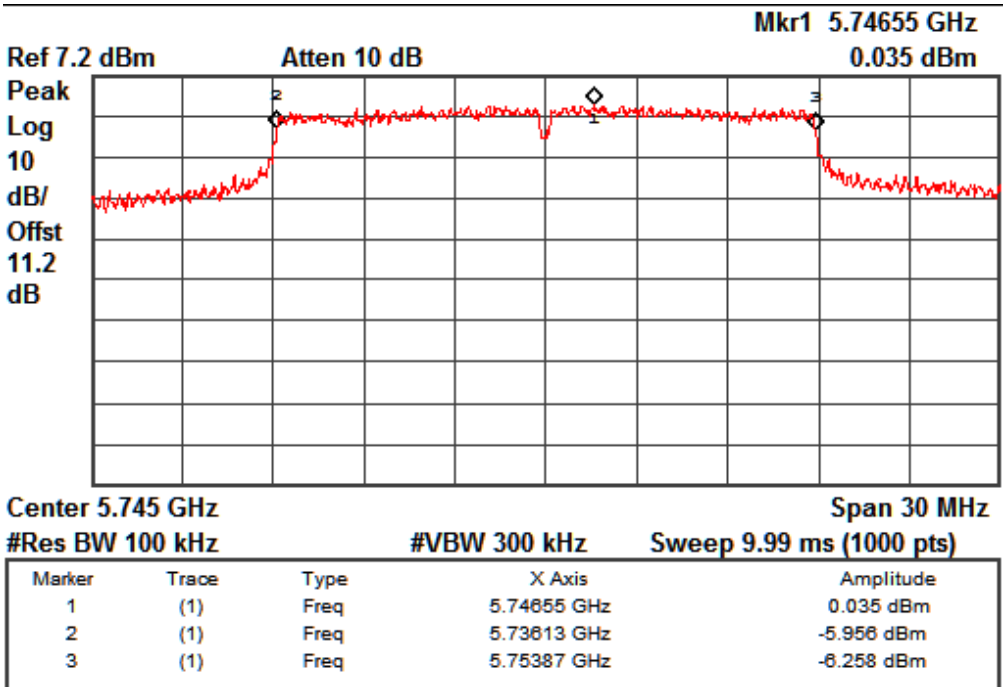

| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.79309 GHz | -1.029 dBm |
| 2 | (1) | Freq | 5.77611 GHz | -8.4 dBm |
| 3 | (1) | Freq | 5.79387 GHz | -6.703 dBm |

**Data Rate: 39 Mbps** **Channel: 5785 MHz**



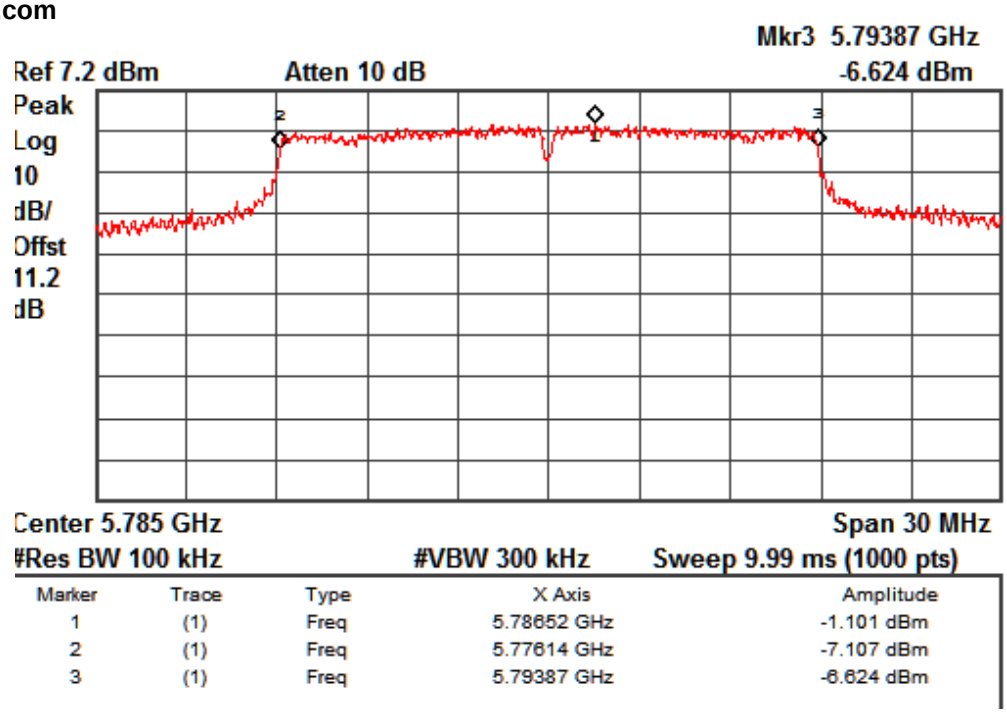

| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.82655 GHz | -1.375 dBm |
| 2 | (1) | Freq | 5.81616 GHz | -6.208 dBm |
| 3 | (1) | Freq | 5.83387 GHz | -6.808 dBm |

**Data Rate: 39 Mbps** **Channel: 5825 MHz**



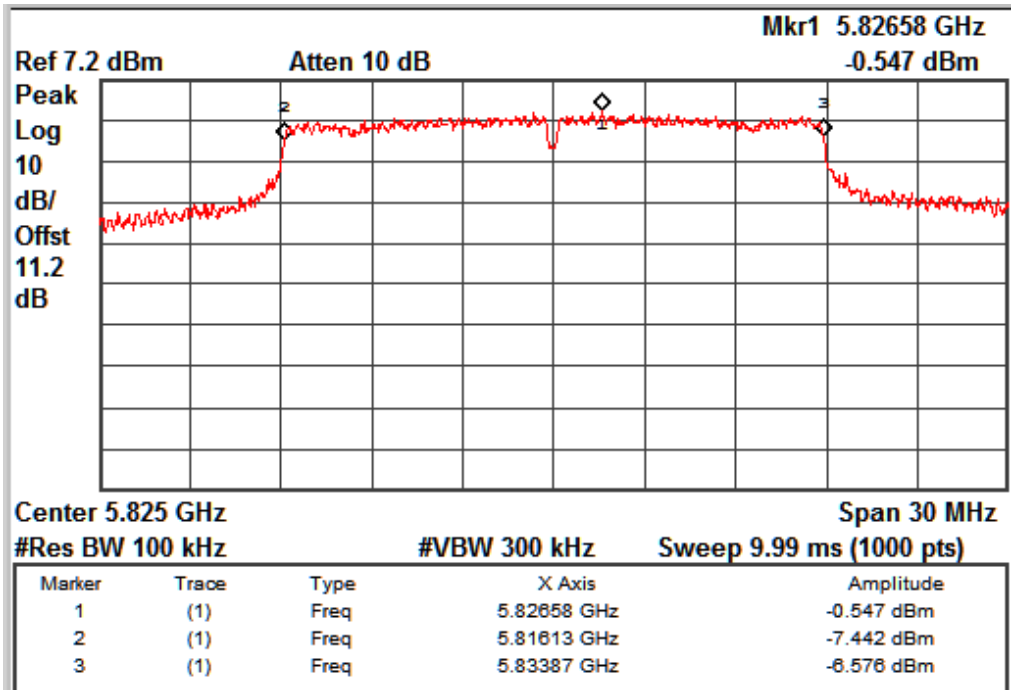

| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.74655 GHz | 0.035 dBm |
| 2 | (1) | Freq | 5.73613 GHz | -5.956 dBm |
| 3 | (1) | Freq | 5.75387 GHz | -6.258 dBm |

**Data Rate: 65 Mbps** **Channel: 5745 MHz**



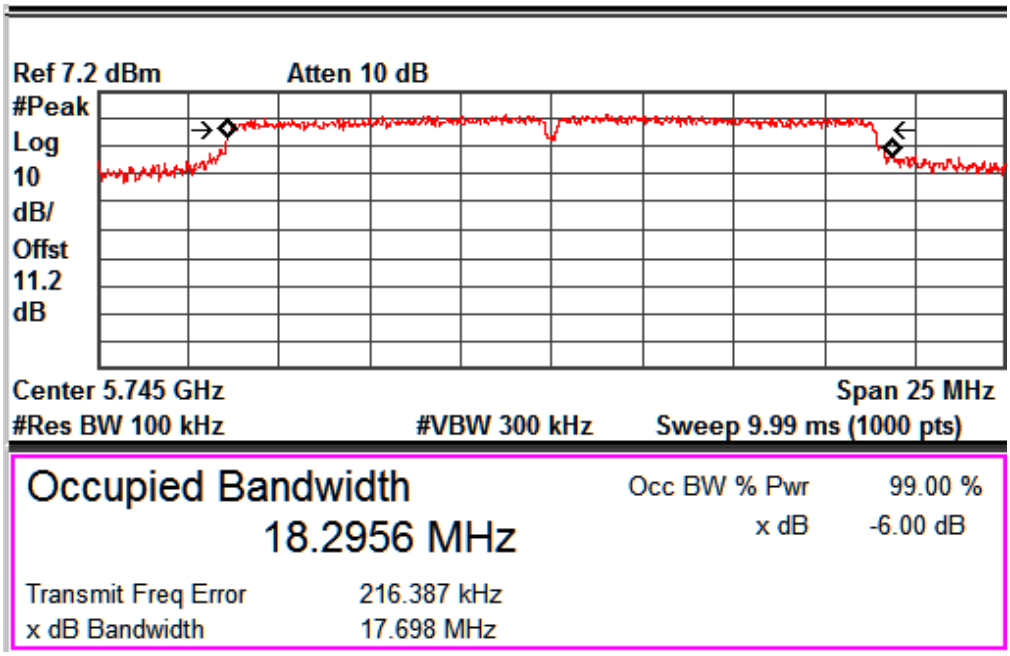

| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.78652 GHz | -1.101 dBm |
| 2 | (1) | Freq | 5.77614 GHz | -7.107 dBm |
| 3 | (1) | Freq | 5.79387 GHz | -6.624 dBm |

**Data Rate: 65 Mbps** **Channel: 5785 MHz**

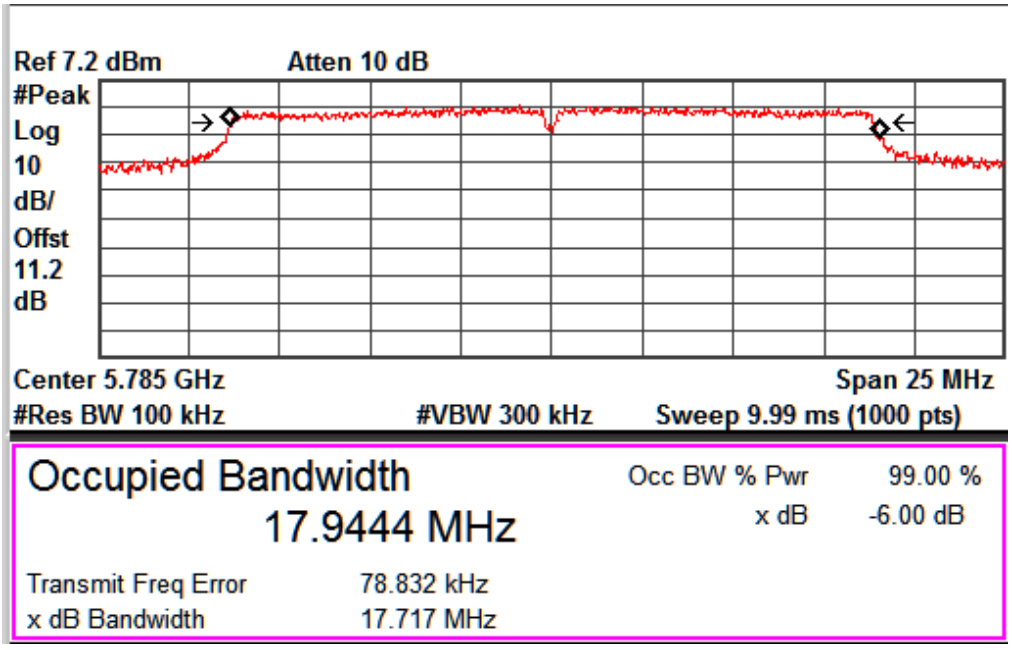



| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.82658 GHz | -0.547 dBm |
| 2 | (1) | Freq | 5.81613 GHz | -7.442 dBm |
| 3 | (1) | Freq | 5.83387 GHz | -6.576 dBm |

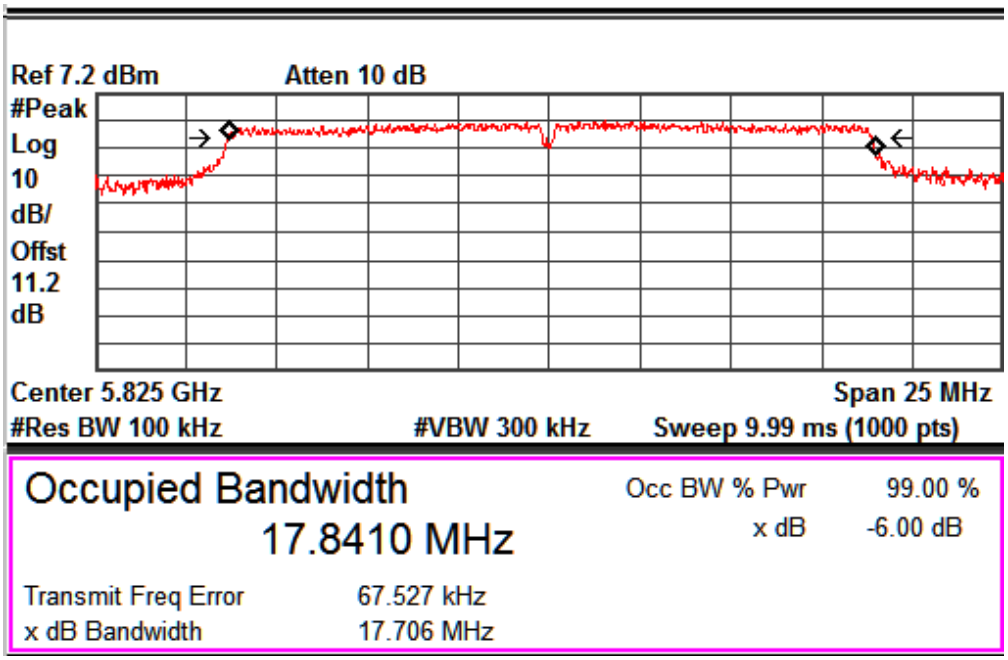
**Data Rate: 65 Mbps** **Channel: 5825 MHz**



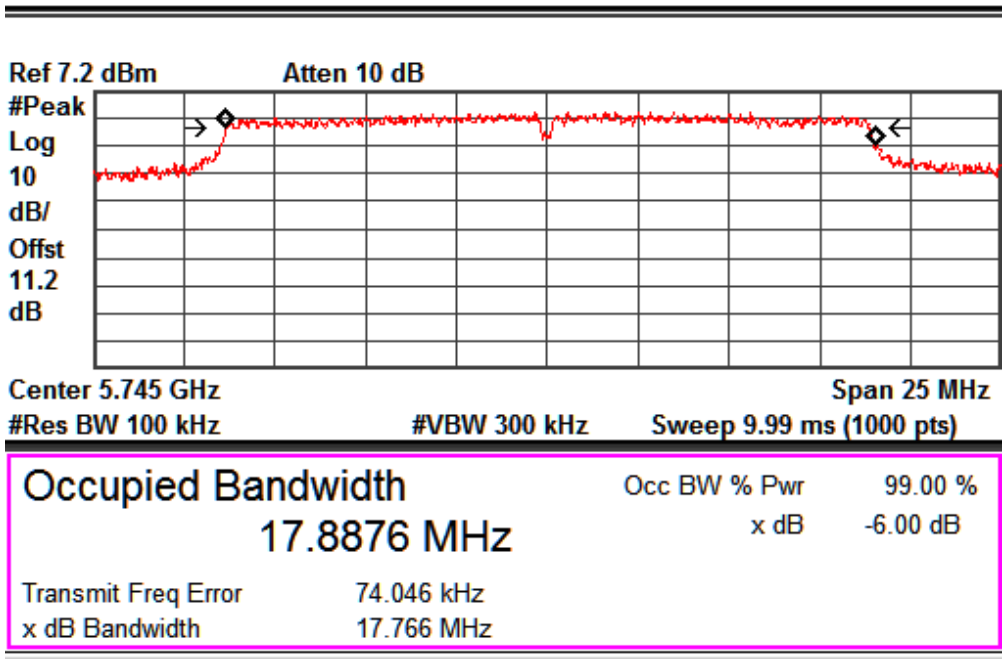

**Data Rate: 6.5 Mbps** **99% Occupied Bandwidth: Channel 5745MHz**



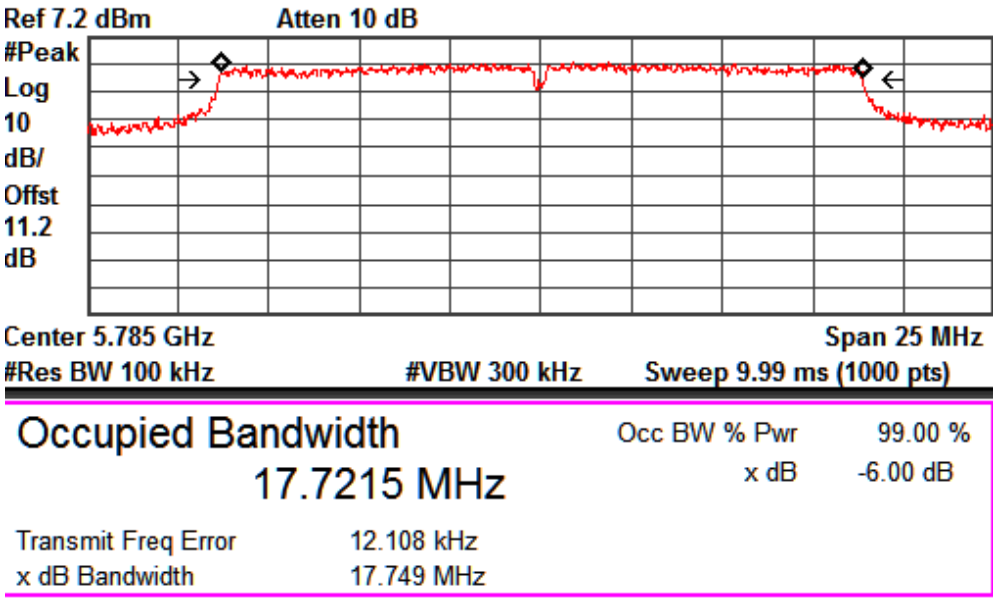

**Data Rate: 6.5 Mbps** **99% Occupied Bandwidth: Channel 5785MHz**



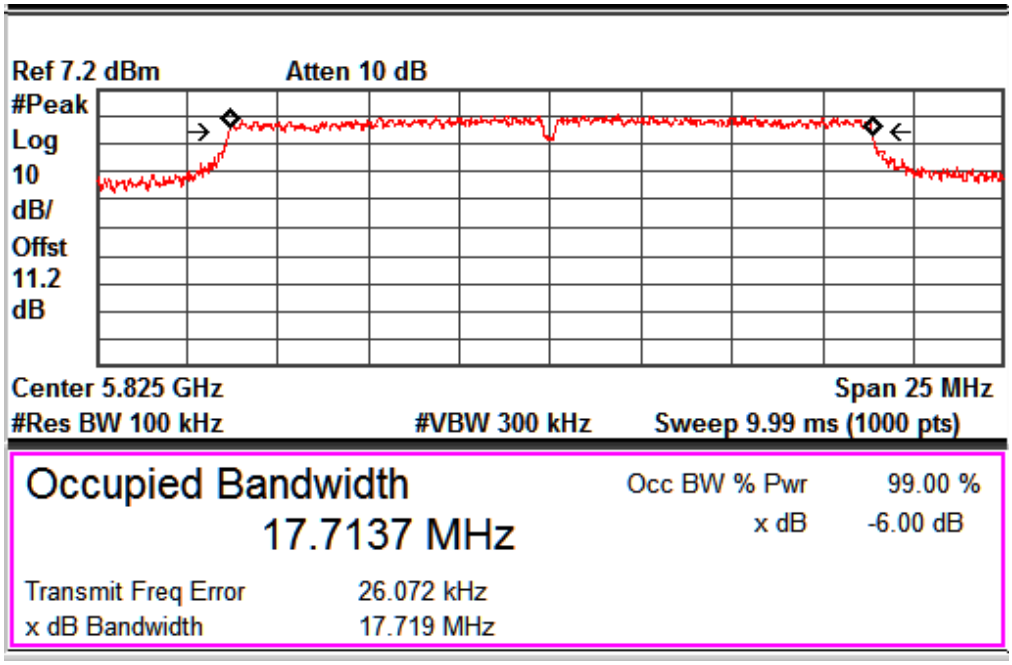

**Data Rate: 6.5 Mbps** **99% Occupied Bandwidth: Channel 5825MHz**



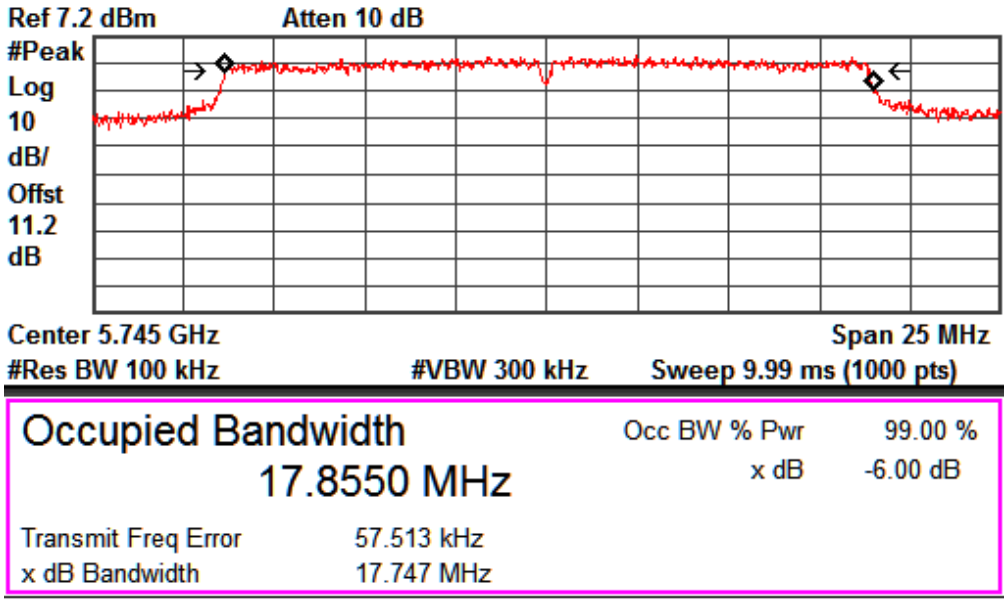

**Data Rate: 39 Mbps** **99% Occupied Bandwidth: Channel 5745MHz**



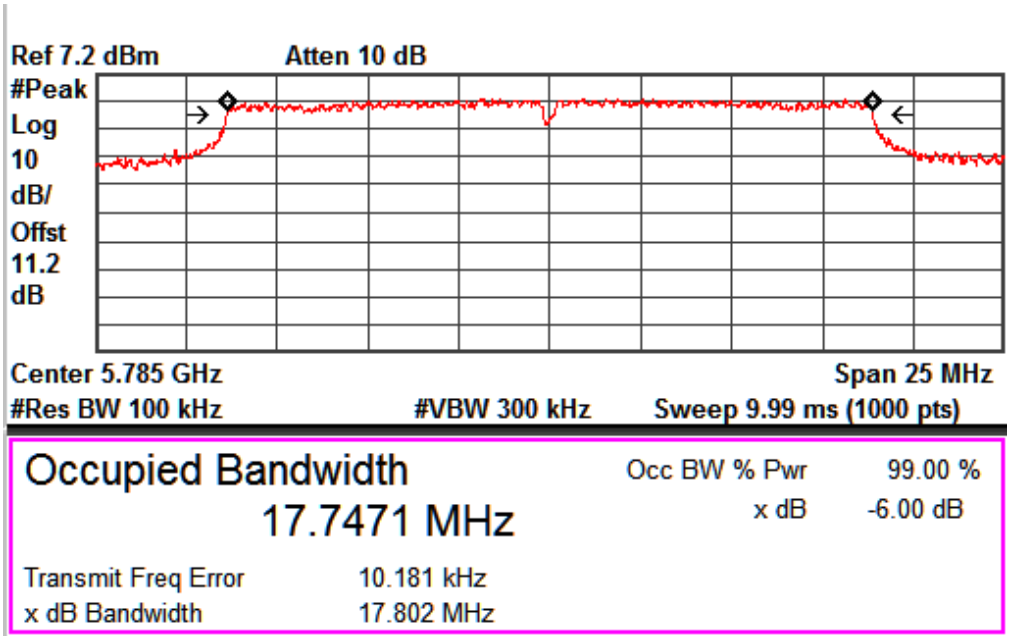

**Data Rate: 39 Mbps** **99% Occupied Bandwidth: Channel 5785MHz**



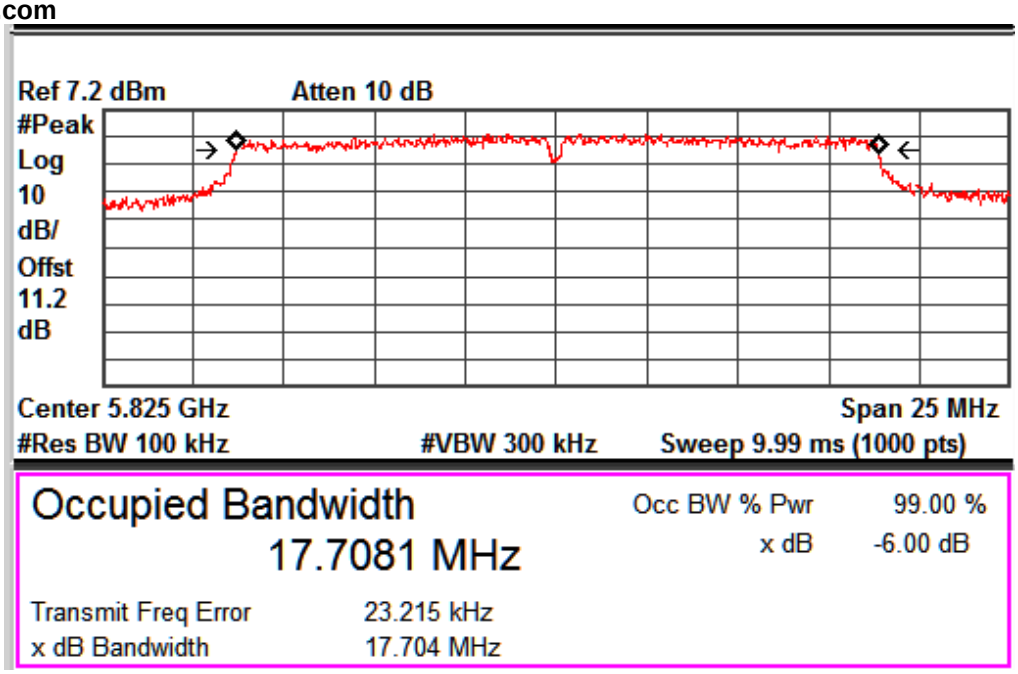

**Data Rate: 39 Mbps** **99% Occupied Bandwidth: Channel 5825MHz**




**Data Rate: 65 Mbps** **99% Occupied Bandwidth: Channel 5745MHz**



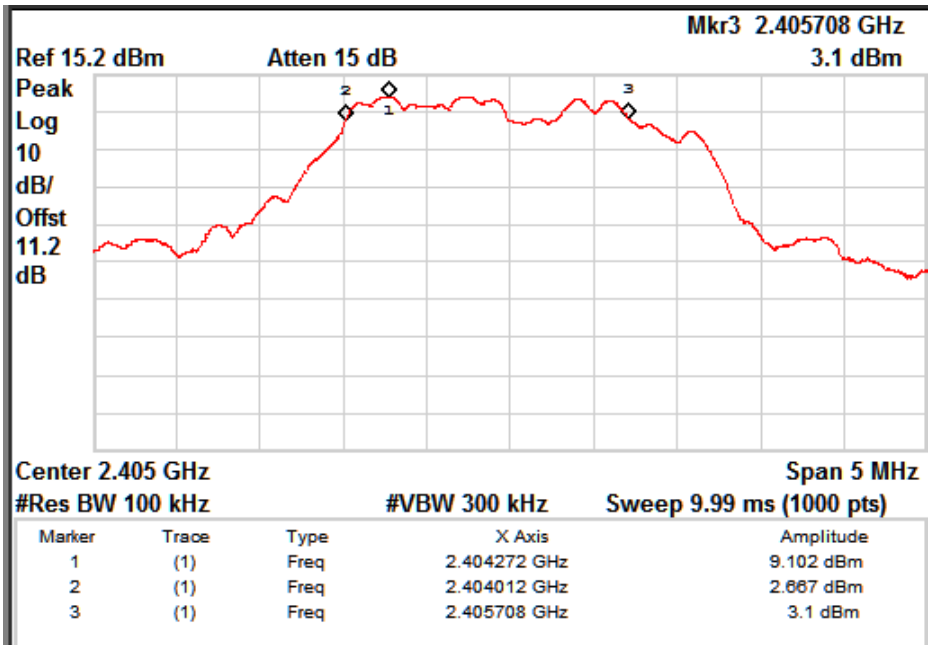

**Data Rate: 65 Mbps** **99% Occupied Bandwidth: Channel 5785MHz**

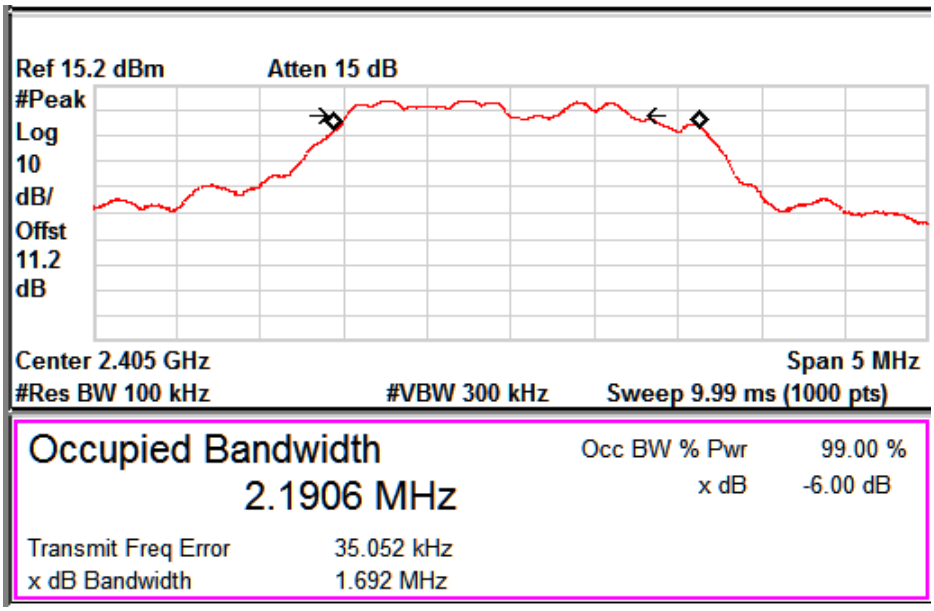



**Data Rate: 65 Mbps** **99% Occupied Bandwidth: Channel 5825MHz**

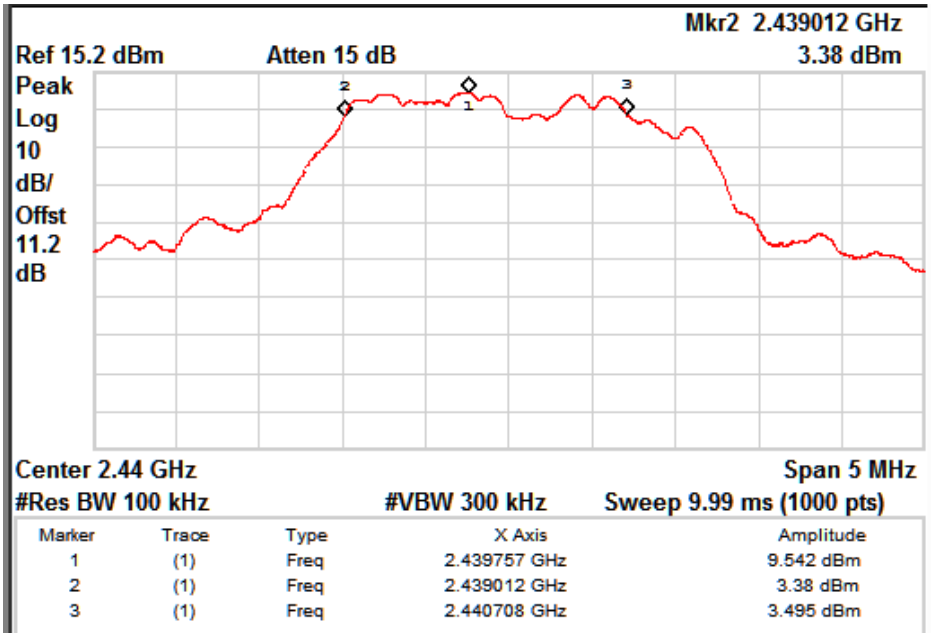
**Test Result: ZigBee**

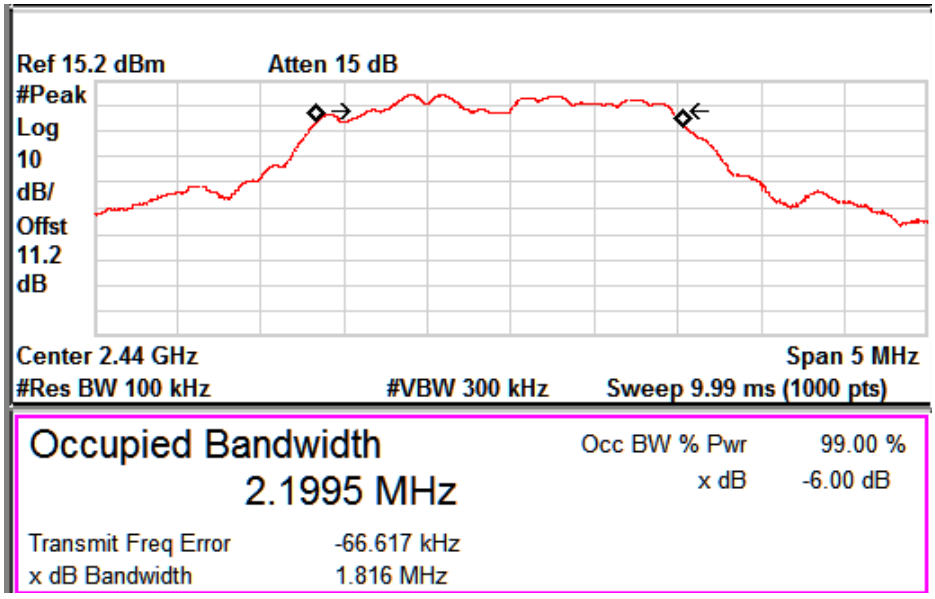
| Channel Frequency (MHz) | Lower Frequency (MHz) | Upper Frequency (MHz) | 6 dB Bandwidth (MHz) | 99% OBW (MHz) |
|---|---|---|---|---|
| 2405.00 | 2404.012 | 2405.708 | 1.696 | 2.191 |
| 2440.00 | 2439.012 | 2440.708 | 1.696 | 2.200 |
| 2480.00 | 2479.012 | 2480.708 | 1.696 | 2.203 |



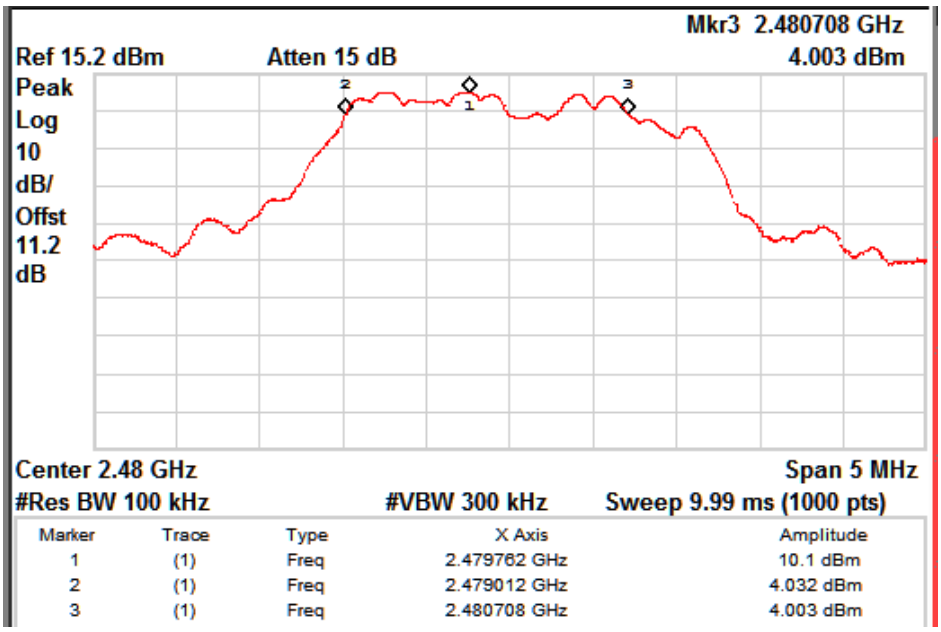



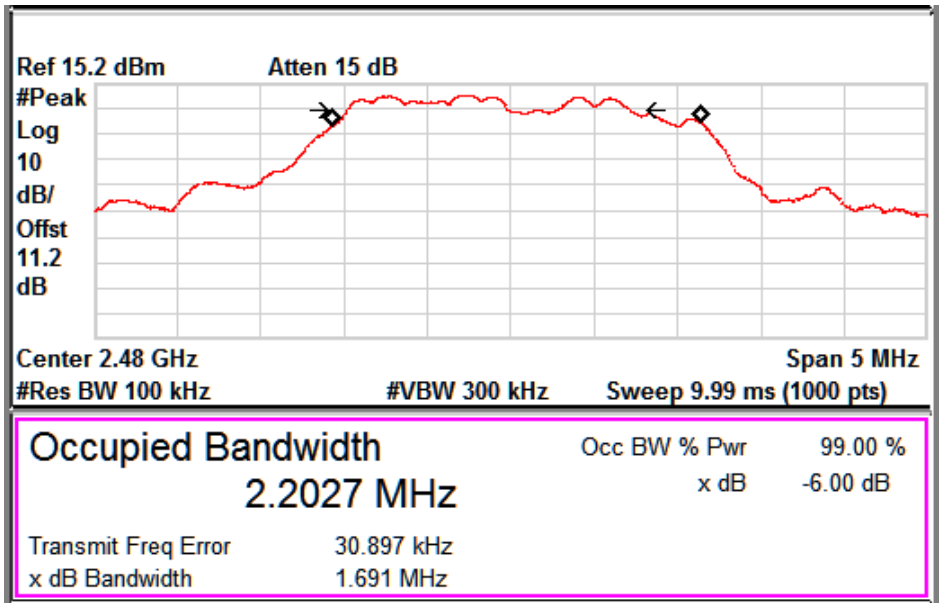

**Channel Frequency: 2405 MHz**




**Channel Frequency: 2440 MHz**

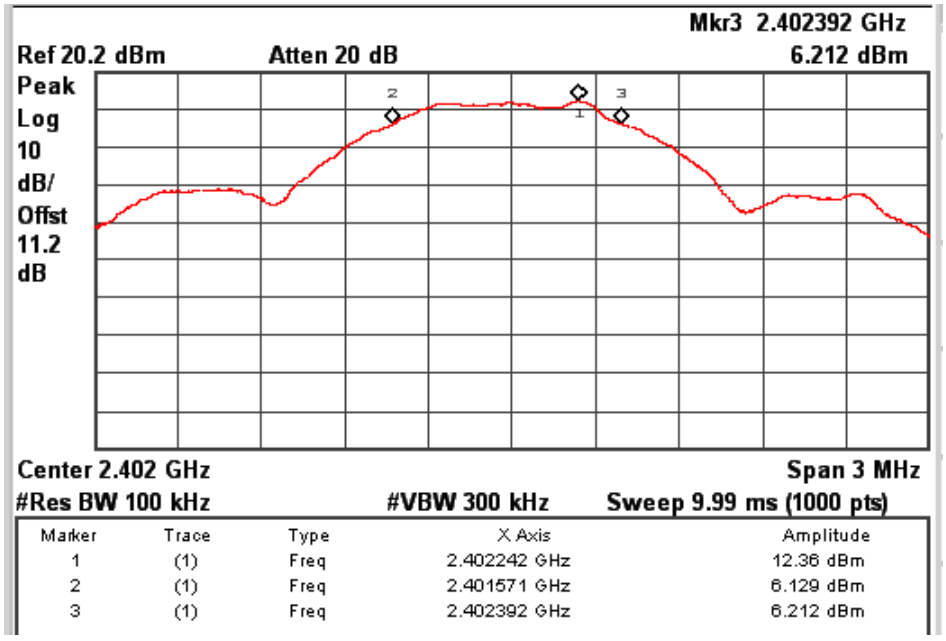


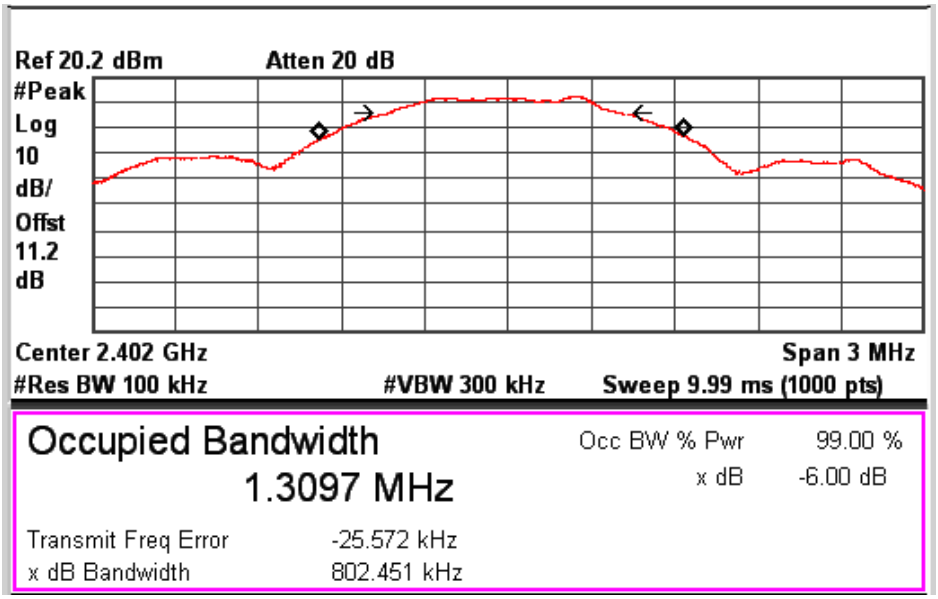




**Channel Frequency: 2480 MHz**

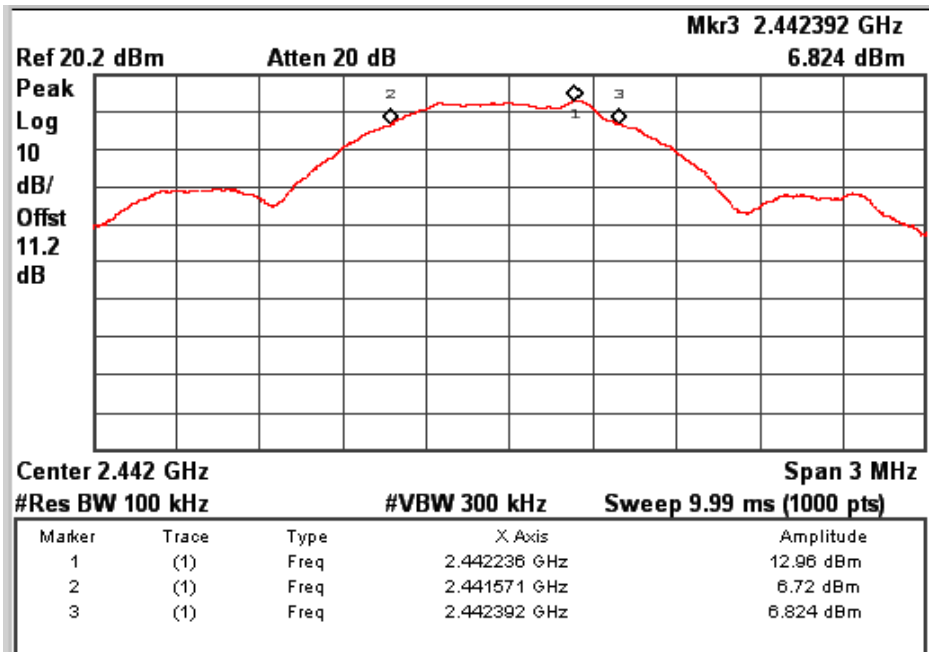
**Test Result: Bluetooth LE**

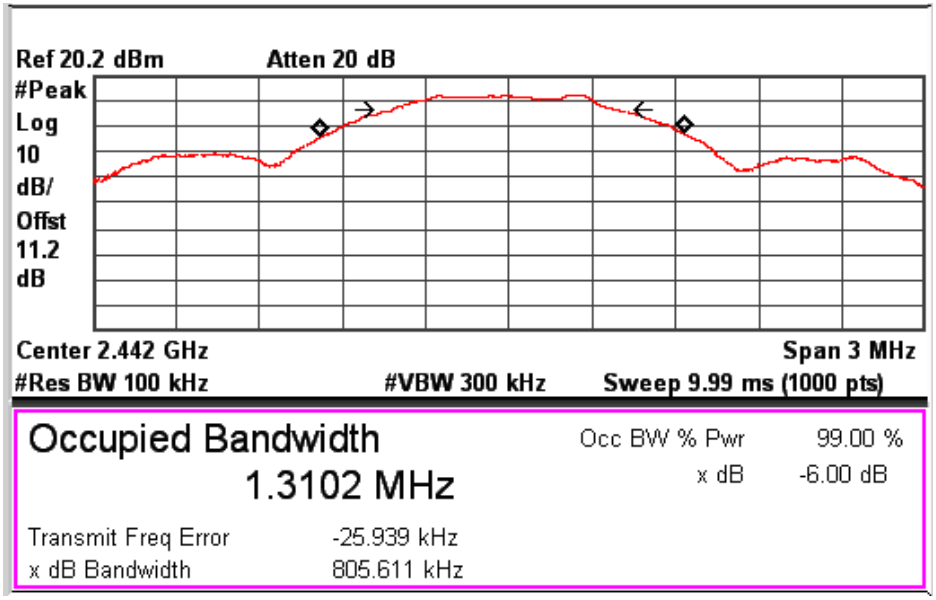
| Channel Frequency (MHz) | Lower Frequency (MHz) | Upper Frequency (MHz) | 6 dB Bandwidth (MHz) | 99% OBW (MHz) |
|---|---|---|---|---|
| 2402.00 | 2401.571 | 2402.392 | 0.806 | 1.310 |
| 2442.00 | 2441.571 | 2442.392 | 0.809 | 1.310 |
| 2480.00 | 2479.571 | 2480.392 | 0.818 | 1.312 |



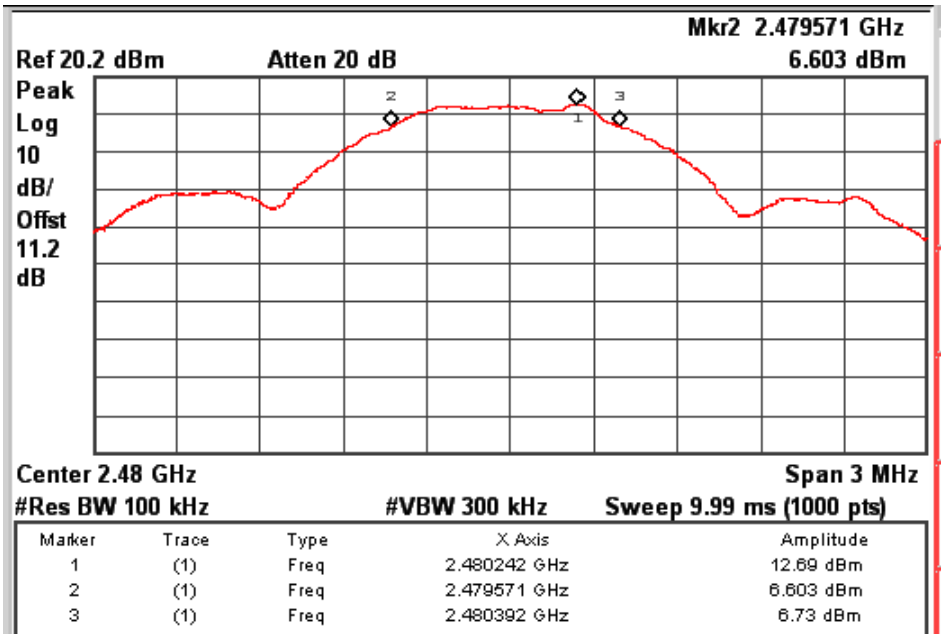



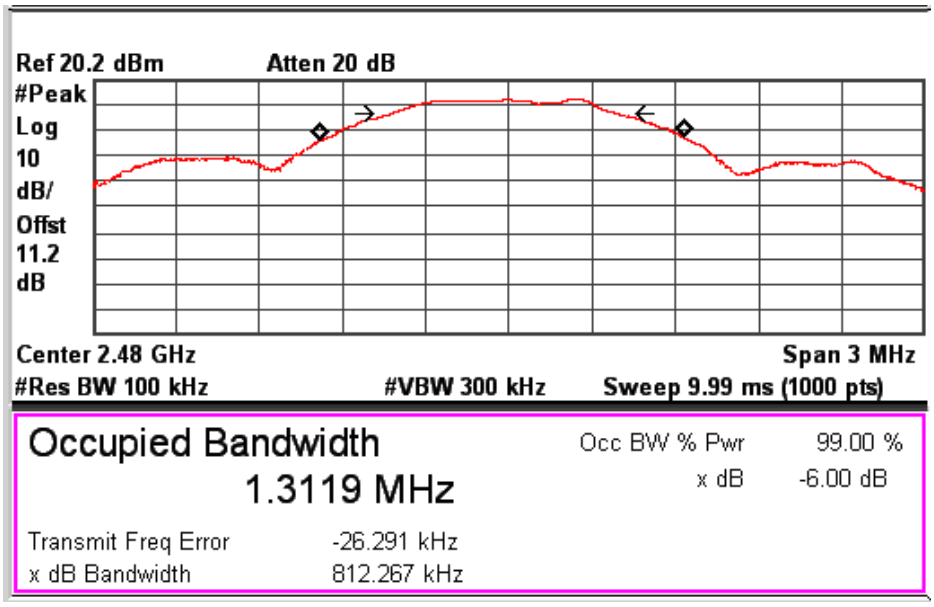

**Channel Frequency: 2402 MHz**




**Channel Frequency: 2442 MHz**



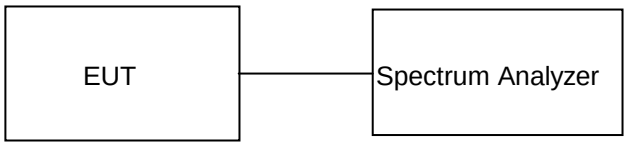

**Channel Frequency: 2480 MHz**

**Band-edge Compliance** **Section 15.247(d)**

**Result** **Pass**

| | |
|---|---|
| Test Specification | FCC Part 15 Section 15.247(d) |
| Detector Function | Peak |
| Requirement | In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. |

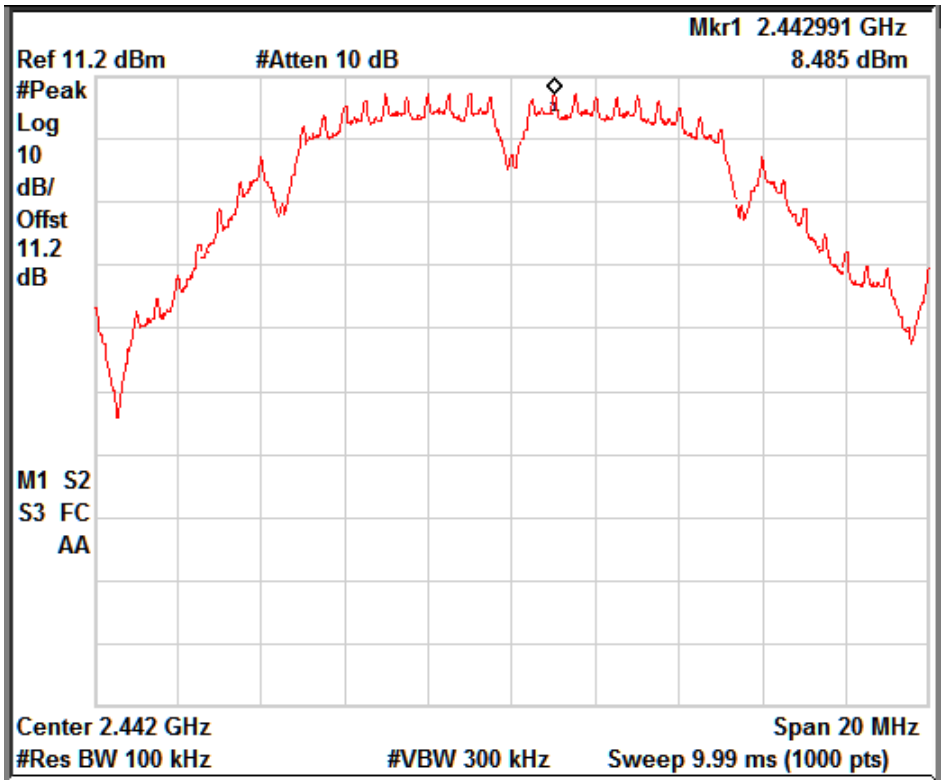
**Test Method:**



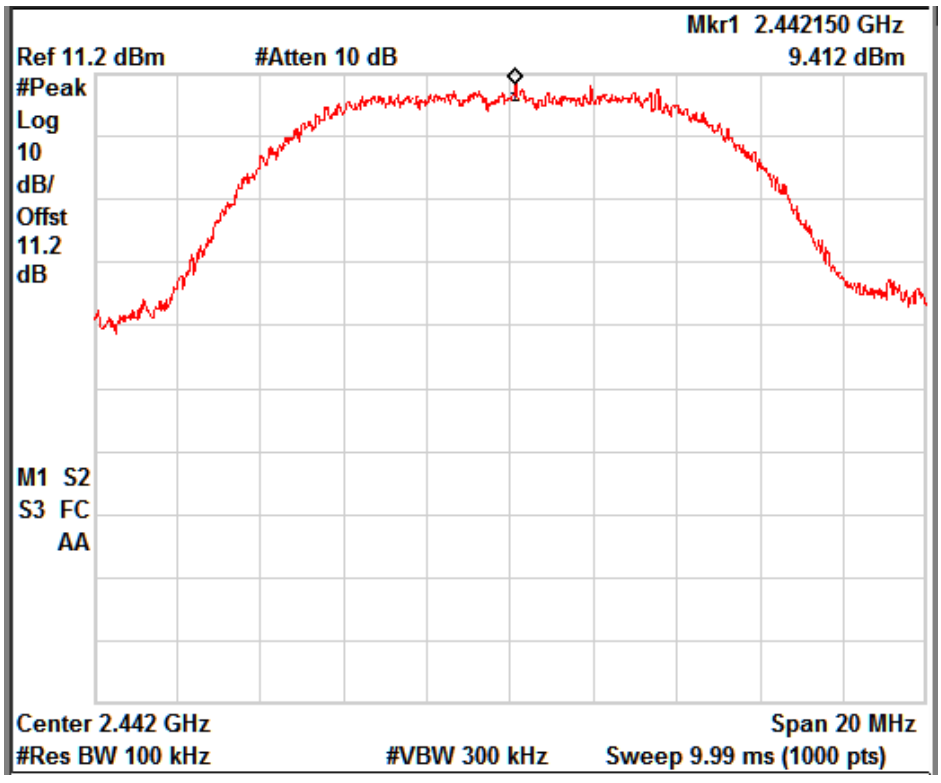

**Test Result: Wi-Fi**

| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Value at Band Edge | | Reference Value B (dBm) | Band Edge Value A-B (dBc) | Limit (dBc) |
|---|---|---|---|---|---|---|---|
| | | | Frequency (MHz) | Value A (dBm) | | | |
| b | 1 | 2412 | 2397.05 | -35.13 | 8.48 | -43.61 | -30.00 |
| | | 2462 | 2483.5 | -39.52 | 8.48 | -48.00 | -30.00 |
| | 11 | 2412 | 2397.49 | -29.49 | 9.41 | -38.90 | -30.00 |
| | | 2462 | 2484.43 | -42.22 | 9.41 | -51.63 | -30.00 |

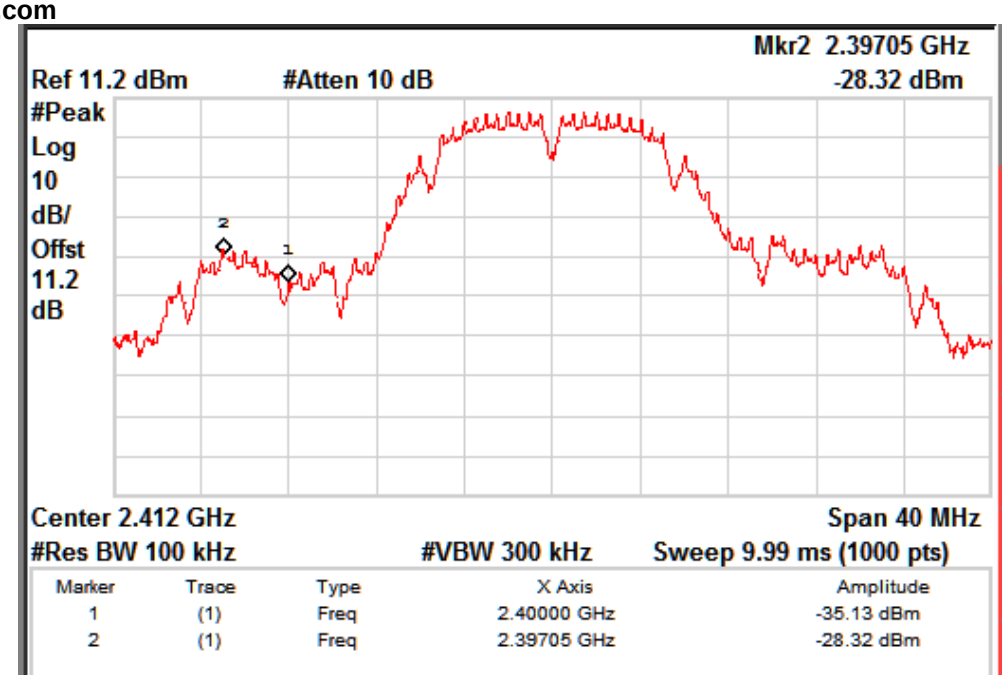
**Note:** The channel no. 7 (2442 MHz) found to contain the maximum PSD level and is used to establish the reference level.



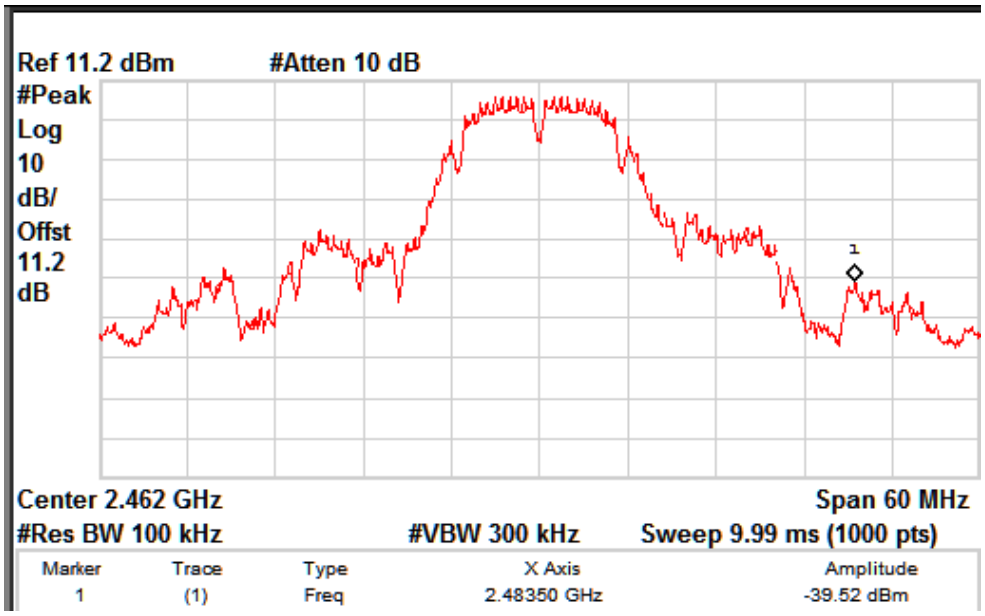

**Reference Level Plot: 1Mbps**



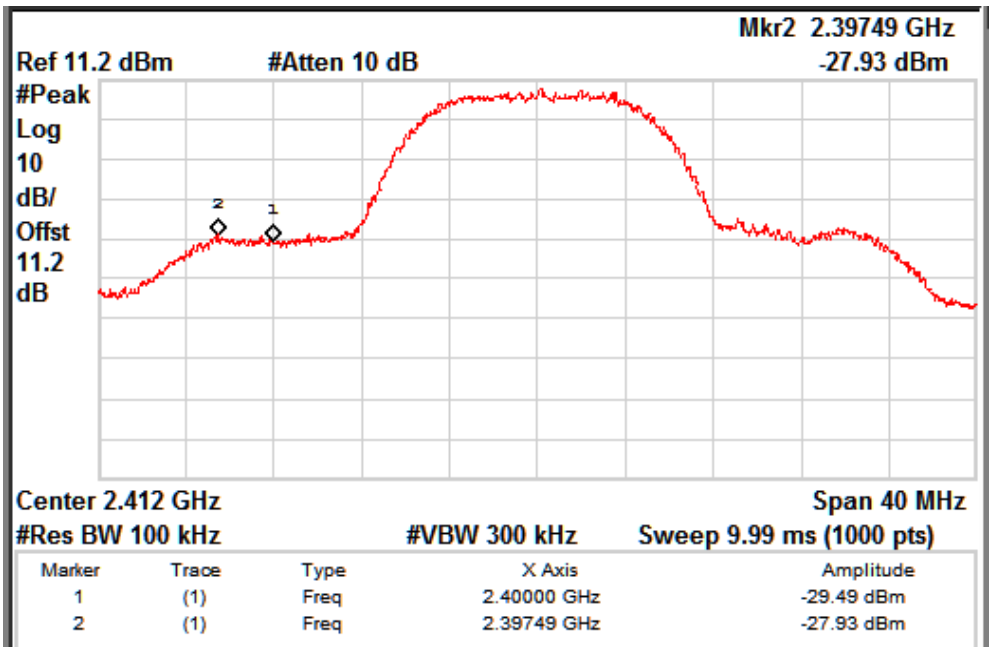

**Reference Level Plot: 11Mbps**



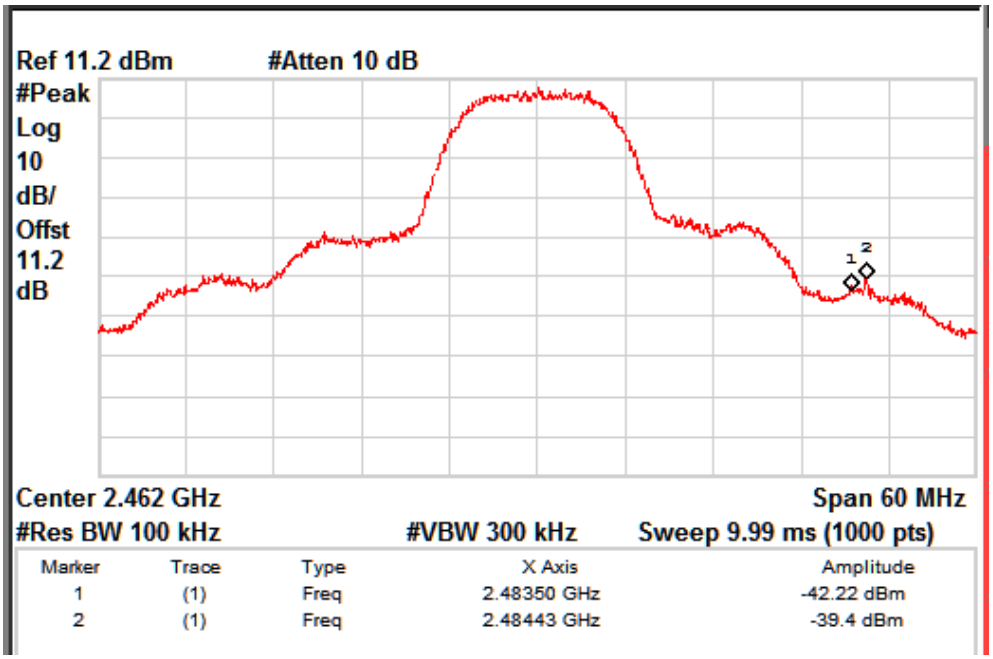

**Data Rate: 1 Mbps** **Channel frequency: 2412 MHz**




**Data Rate: 1 Mbps** **Channel frequency: 2462 MHz**



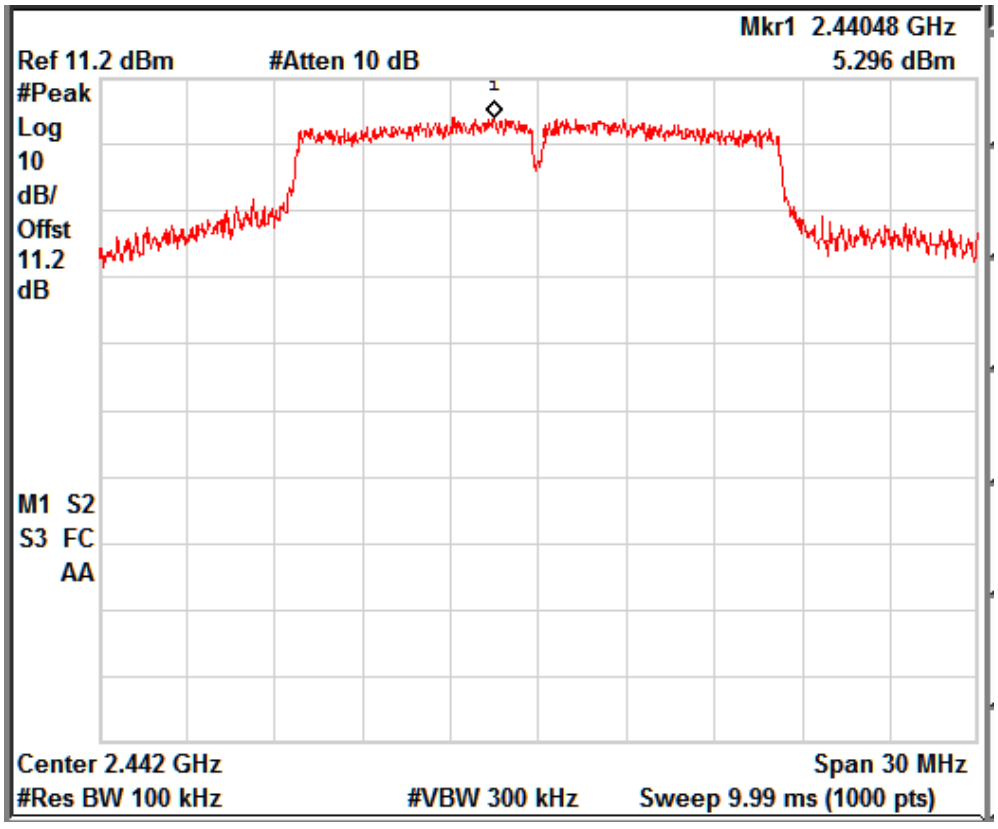

**Data Rate: 11 Mbps** **Channel frequency: 2412 MHz**



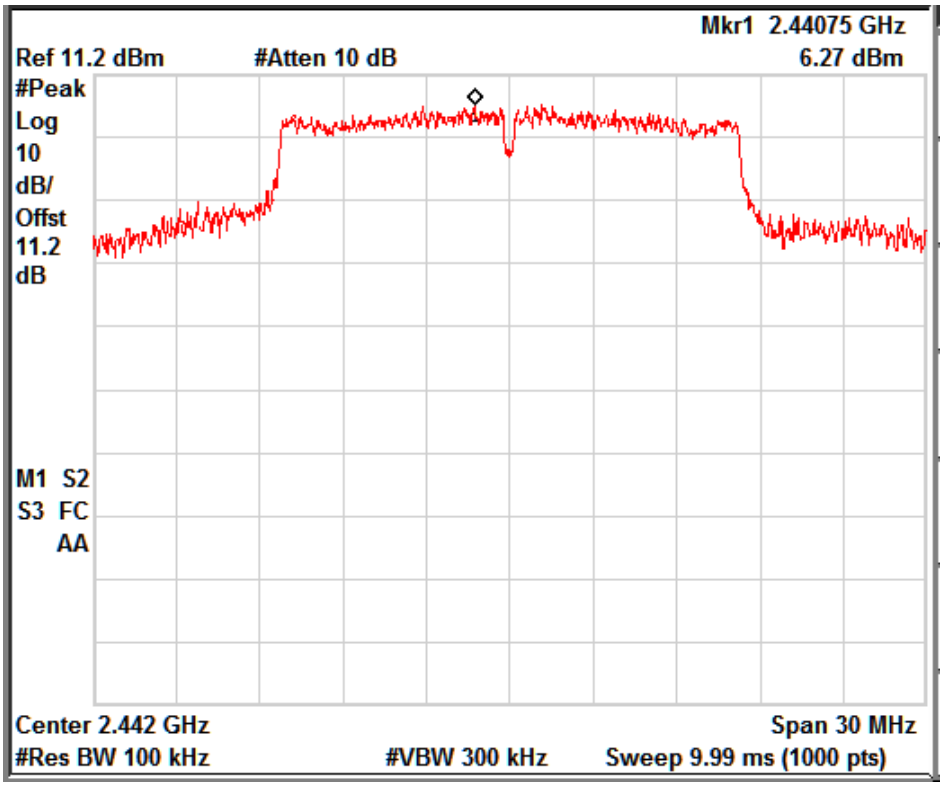

**Data Rate: 11 Mbps** **Channel frequency: 2462 MHz**

| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Value at Band Edge | | Reference Value B (dBm) | Band Edge Value A-B (dBc) | Limit (dBc) |
|---|---|---|---|---|---|---|---|
| | | | Frequency (MHz) | Value A (dBm) | | | |
| g | 6 | 2412 | 2398.61 | -32.97 | 5.30 | -38.27 | -30.00 |
| | | 2462 | 2483.5 | -39.82 | 5.30 | -45.12 | -30.00 |
| | 24 | 2412 | 2395.8 | -33.14 | 6.27 | -39.41 | -30.00 |
| | | 2462 | 2483.5 | -38.74 | 6.27 | -45.01 | -30.00 |
| | 54 | 2412 | 2439.885 | -30.82 | 6.09 | -36.91 | -30.00 |
| | | 2462 | 2483.5 | -38.64 | 6.09 | -44.73 | -30.00 |

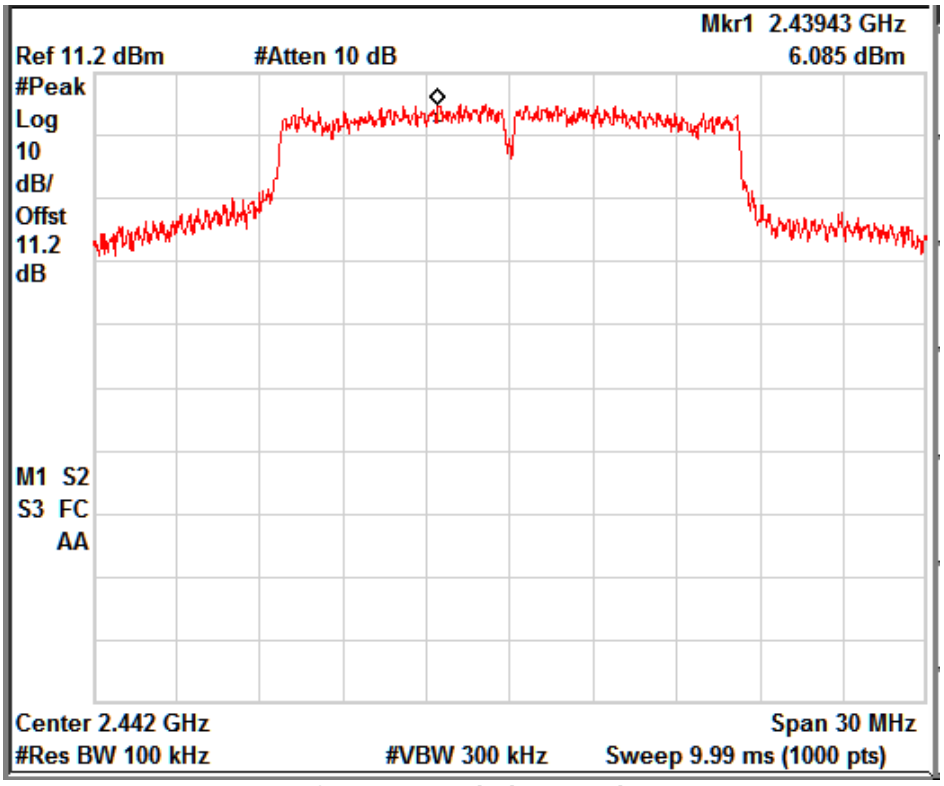
**Note:** The channel no. 7 (2442 MHz) found to contain the maximum PSD level and is used to establish the reference level.



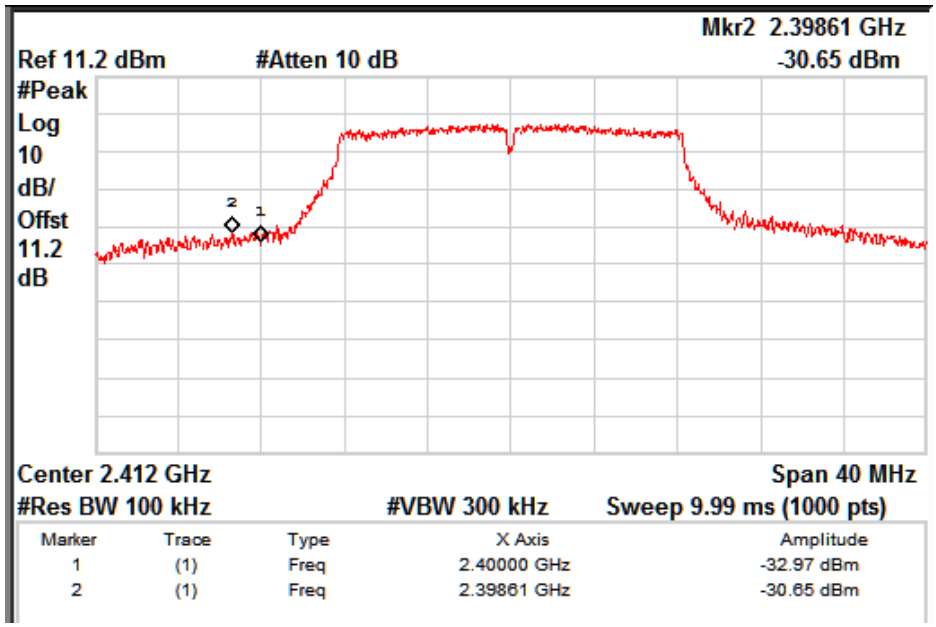

**Reference Level Plot: 6 Mbps**



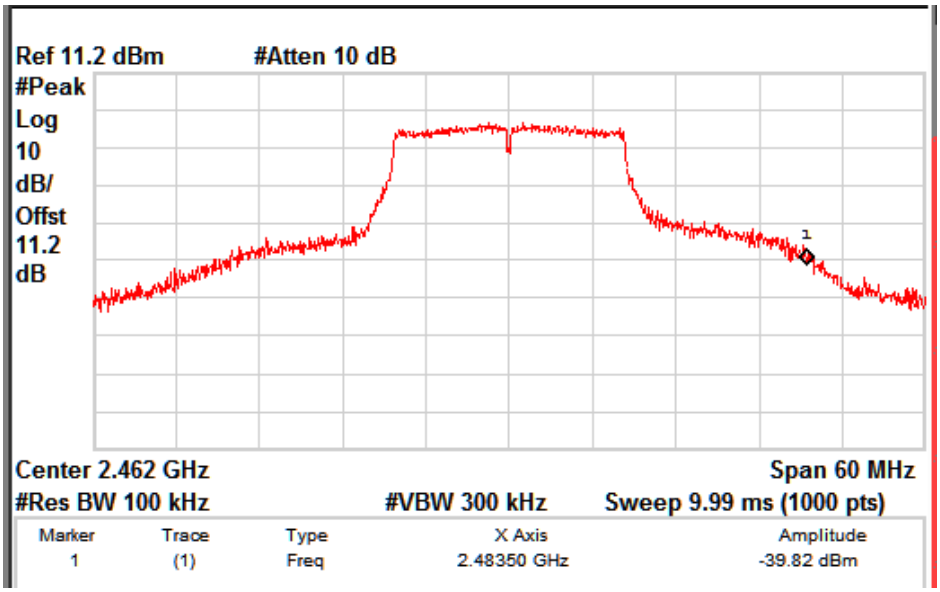

**Reference Level Plot: 24 Mbps**



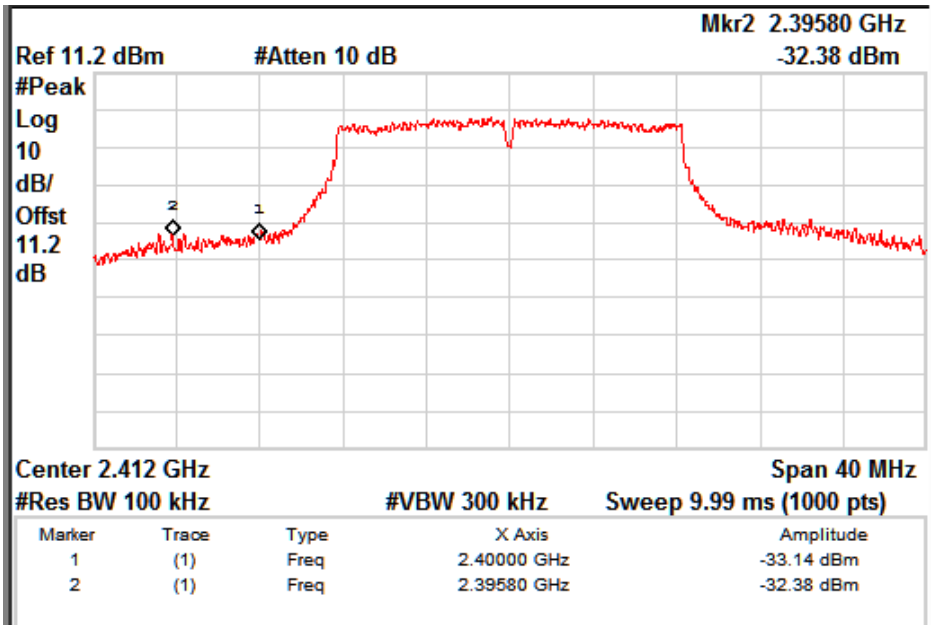

**Reference Level Plot: 54 Mbps**



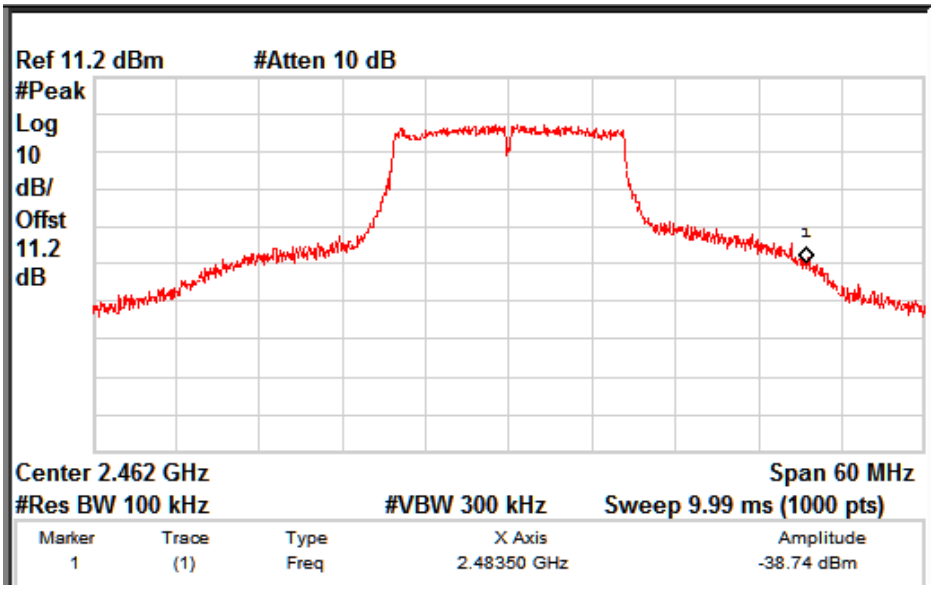

**Data Rate: 6 Mbps** **Channel frequency: 2412 MHz**



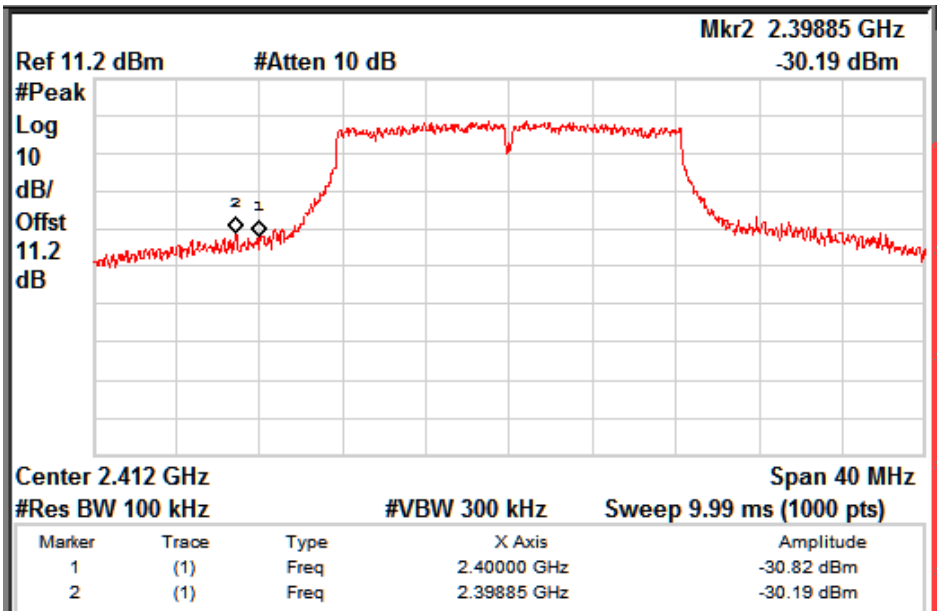

**Data Rate: 6 Mbps** **Channel frequency: 2462 MHz**



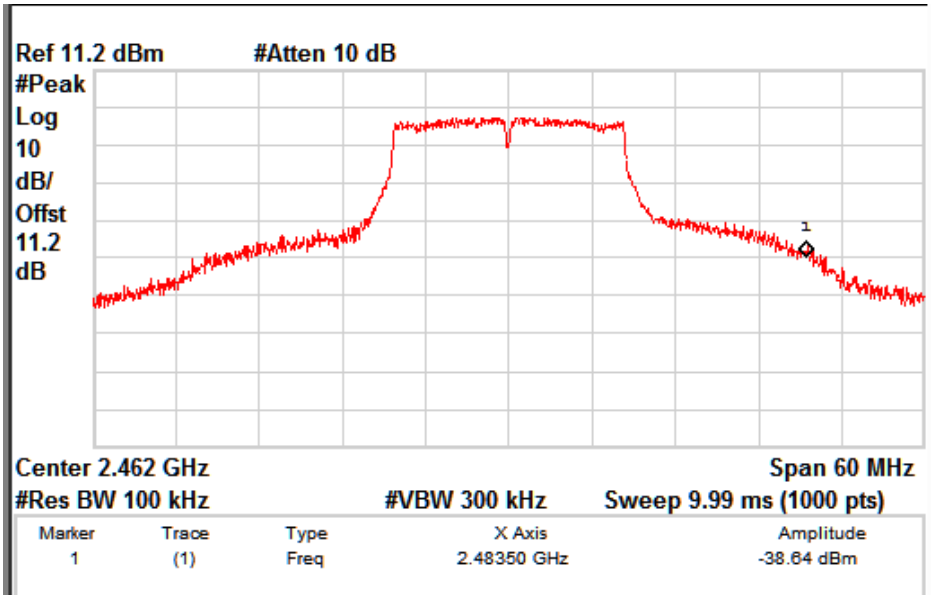

**Data Rate: 24 Mbps** **Channel frequency: 2412 MHz**




**Data Rate: 24 Mbps** **Channel frequency: 2462 MHz**



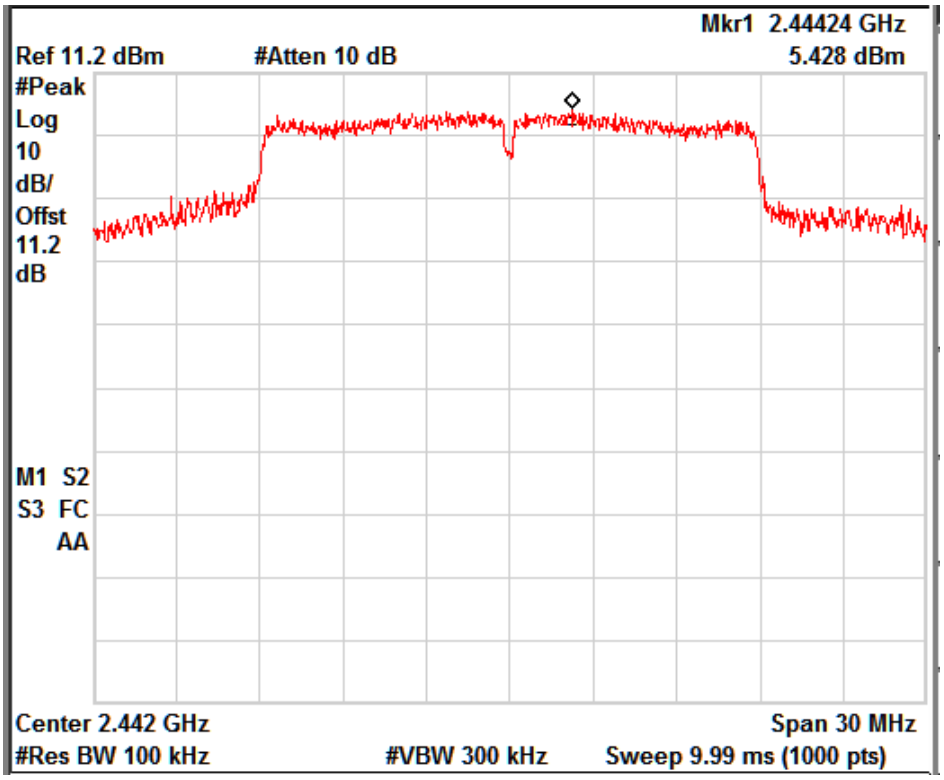

**Data Rate: 54 Mbps** **Channel frequency: 2412 MHz**



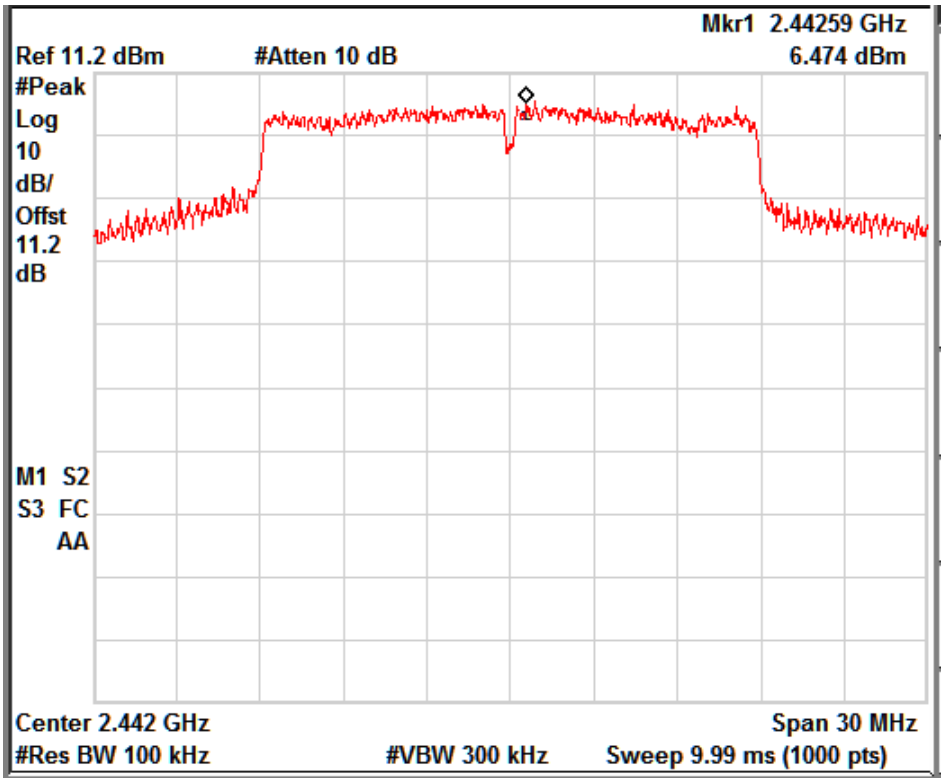

**Data Rate: 54 Mbps** **Channel frequency: 2462 MHz**

| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Value at Band Edge | | Reference Value B (dBm) | Band Edge Value A-B (dBc) | Limit (dBc) |
|---|---|---|---|---|---|---|---|
| | | | Frequency (MHz) | Value A (dBm) | | | |
| n | MCS0 (6.5) | 2412 | 2398.57 | -34.39 | 5.43 | -39.82 | -30.00 |
| | | 2462 | 2483.5 | -39.43 | 5.43 | -44.86 | -30.00 |
| | MCS4 (39) | 2412 | 2400 | -34.29 | 6.47 | -40.76 | -30.00 |
| | | 2462 | 2483.5 | -39.60 | 6.47 | -46.07 | -30.00 |
| | MCS7 (65) | 2412 | 2399.85 | -35.67 | 6.25 | -41.92 | -30.00 |
| | | 2462 | 2483.5 | -38.76 | 6.25 | -45.01 | -30.00 |

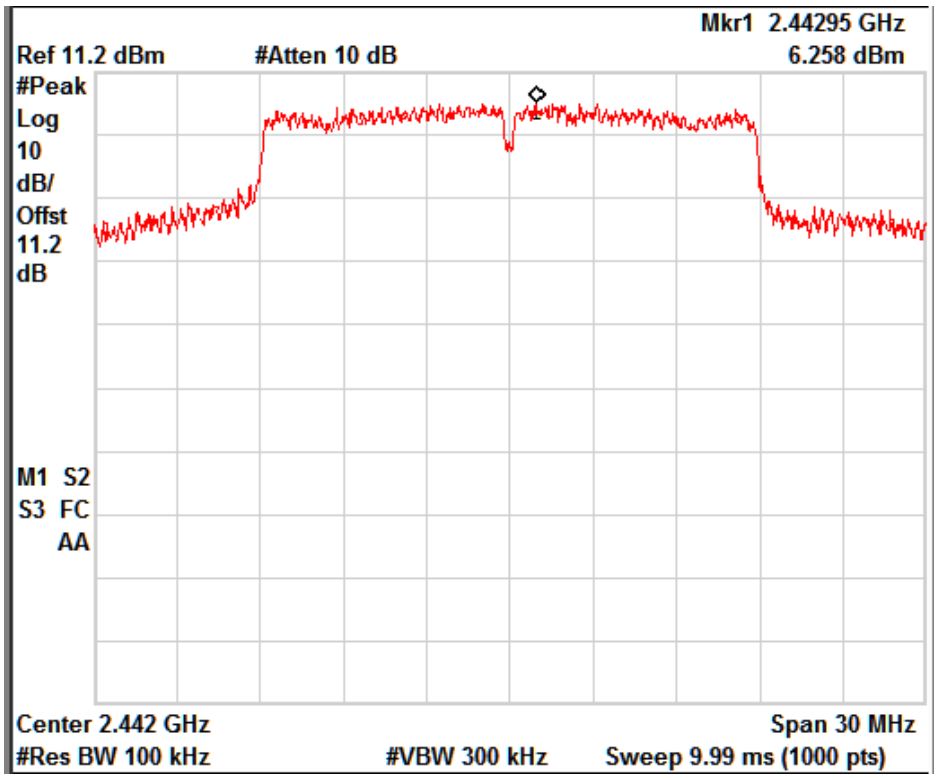
**Note:** The channel no. 7 (2442 MHz) found to contain the maximum PSD level and is used to establish the reference level.



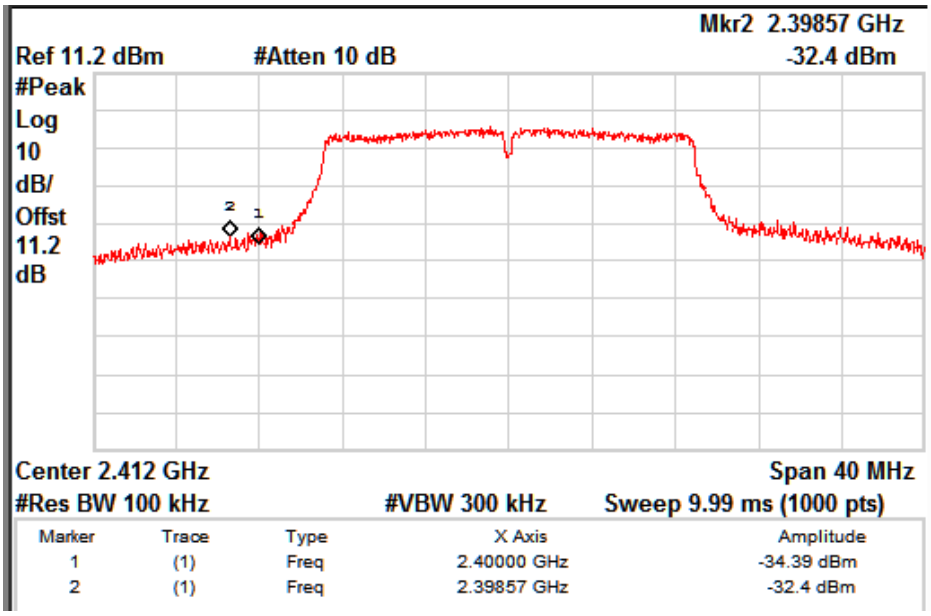

**Reference Level Plot: 6.5 Mbps**



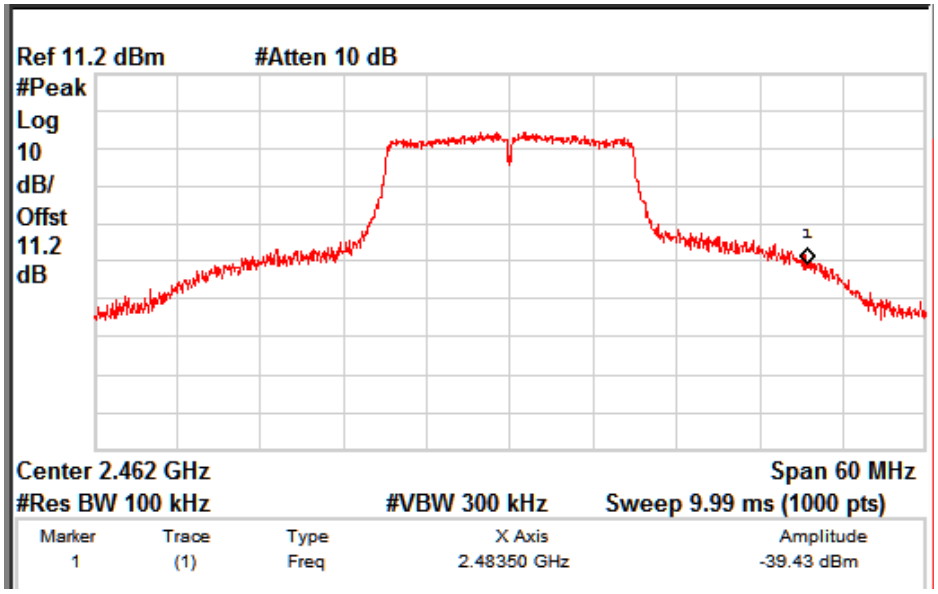

**Reference Level Plot: 39 Mbps**



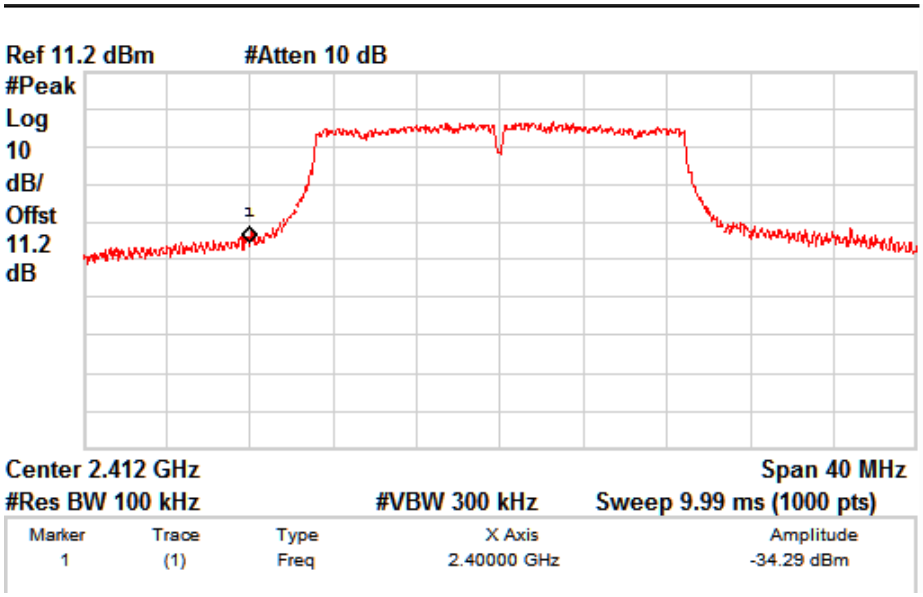

**Reference Level Plot: 65 Mbps**



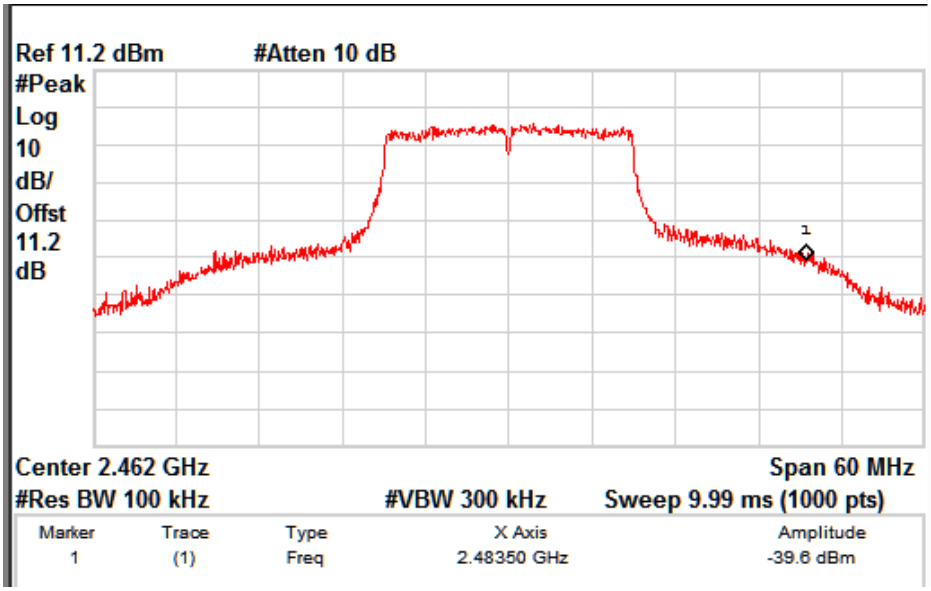

**Data Rate: 6.5 Mbps** **Channel frequency: 2412 MHz**



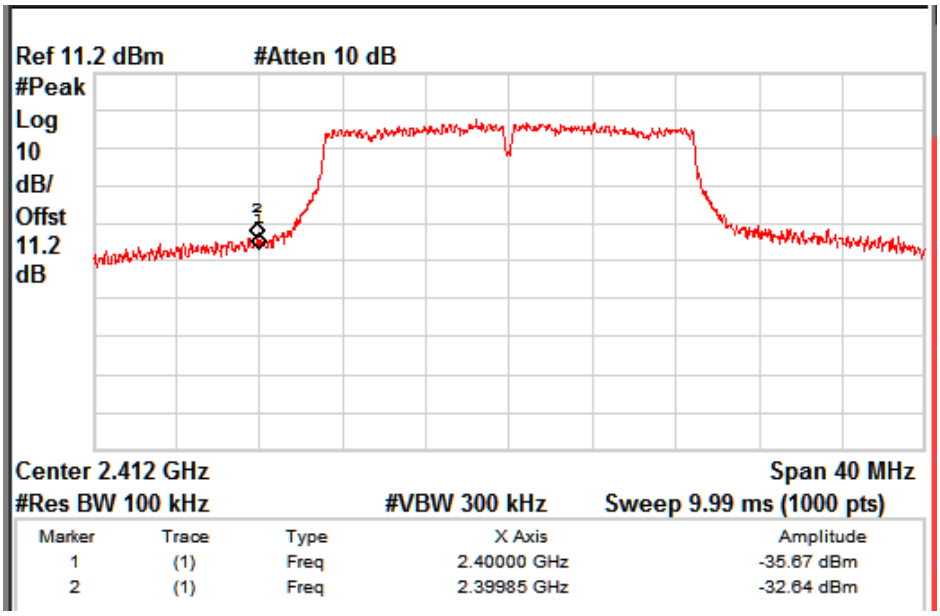

**Data Rate: 6.5 Mbps** **Channel frequency: 2462 MHz**



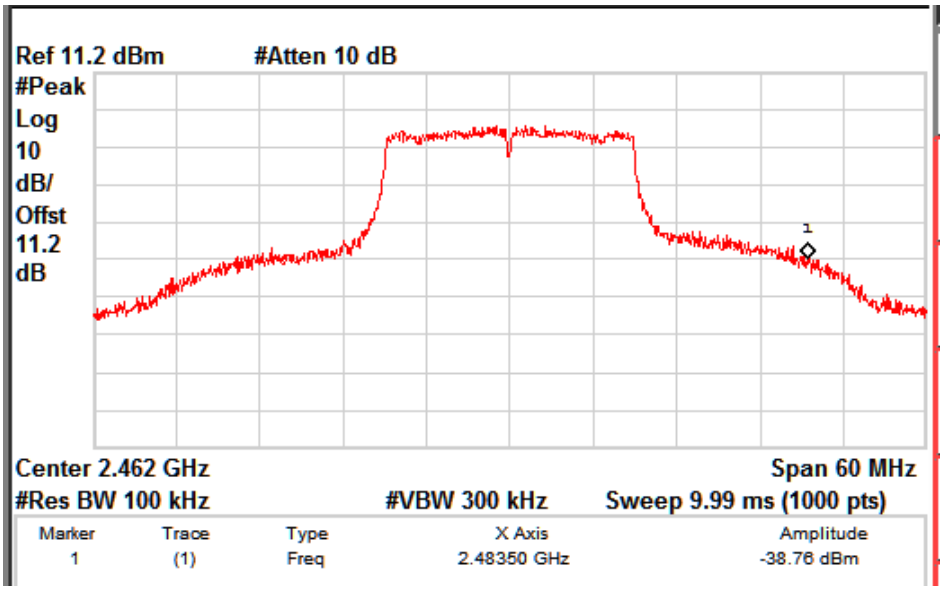

**Data Rate: 39 Mbps** **Channel frequency: 2412 MHz**




**Data Rate: 39 Mbps** **Channel frequency: 2462 MHz**



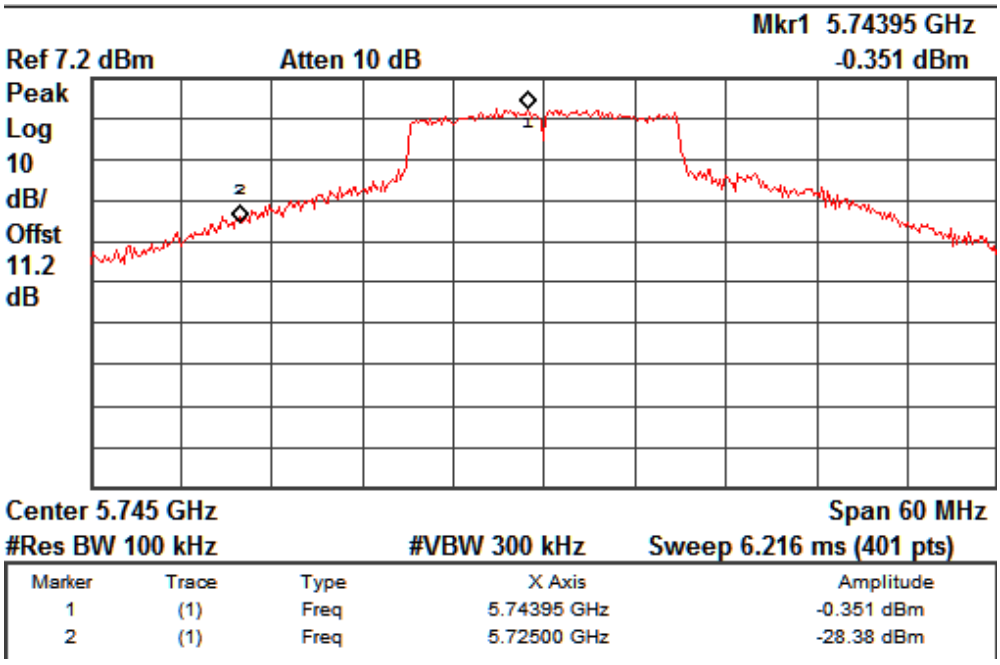

**Data Rate: 65 Mbps** **Channel frequency: 2412 MHz**



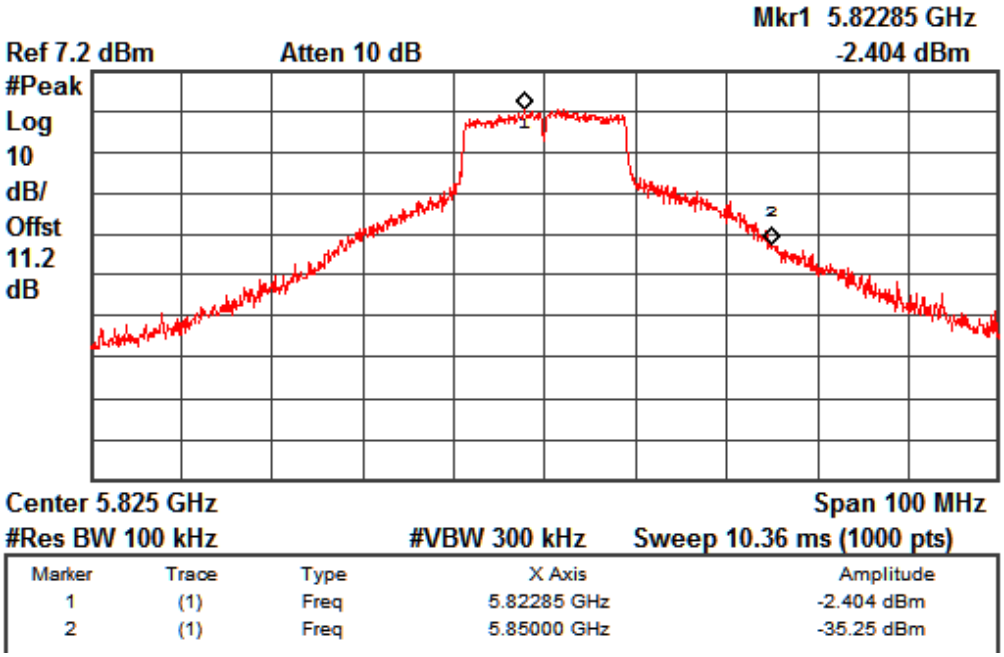

**Data Rate: 65 Mbps** **Channel frequency: 2462 MHz**

**5GHz Band**

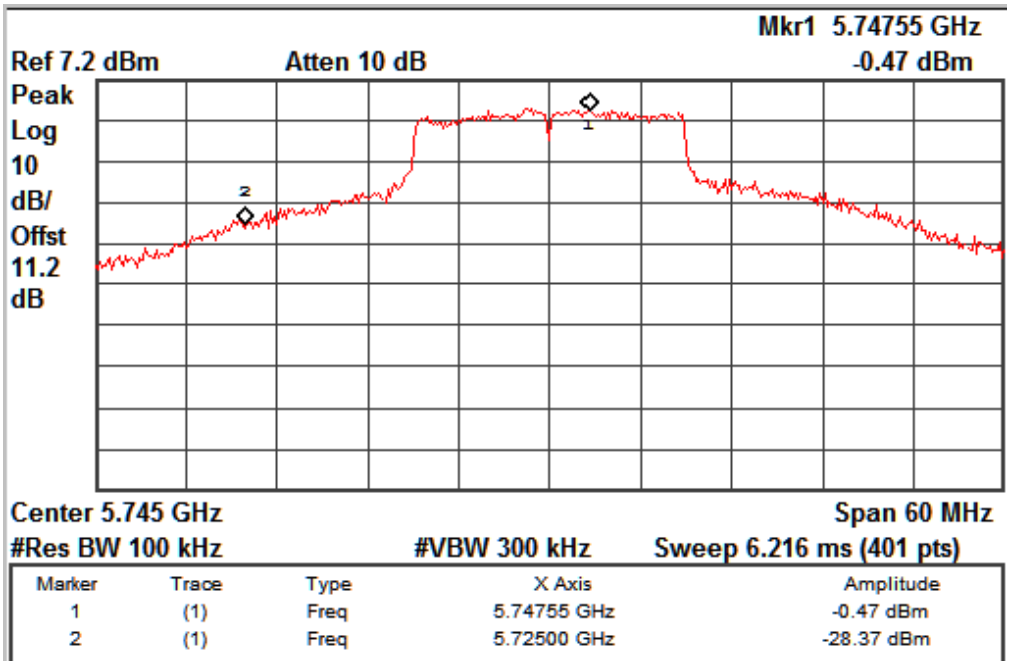
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Value at Band Edge | | Reference Value B (dBm) | Band Edge Value A-B (dBc) | Limit (dBc) |
|---|---|---|---|---|---|---|---|
| | | | Frequency (MHz) | Value A (dBm) | | | |
| n | 6.5 | 5745 | 5725 | -28.38 | -0.35 | -28.03 | -20 |
| | | 5825 | 5850 | -35.25 | -2.40 | -32.85 | -20 |
| | 39 | 5745 | 5725 | -28.37 | -0.47 | -27.90 | -20 |
| | | 5825 | 5850 | -35.08 | -1.95 | -33.13 | -20 |
| | 65 | 5745 | 5725 | -29.17 | 0.37 | -29.54 | -20 |
| | | 5825 | 5850 | -34.96 | -1.24 | -33.72 | -20 |



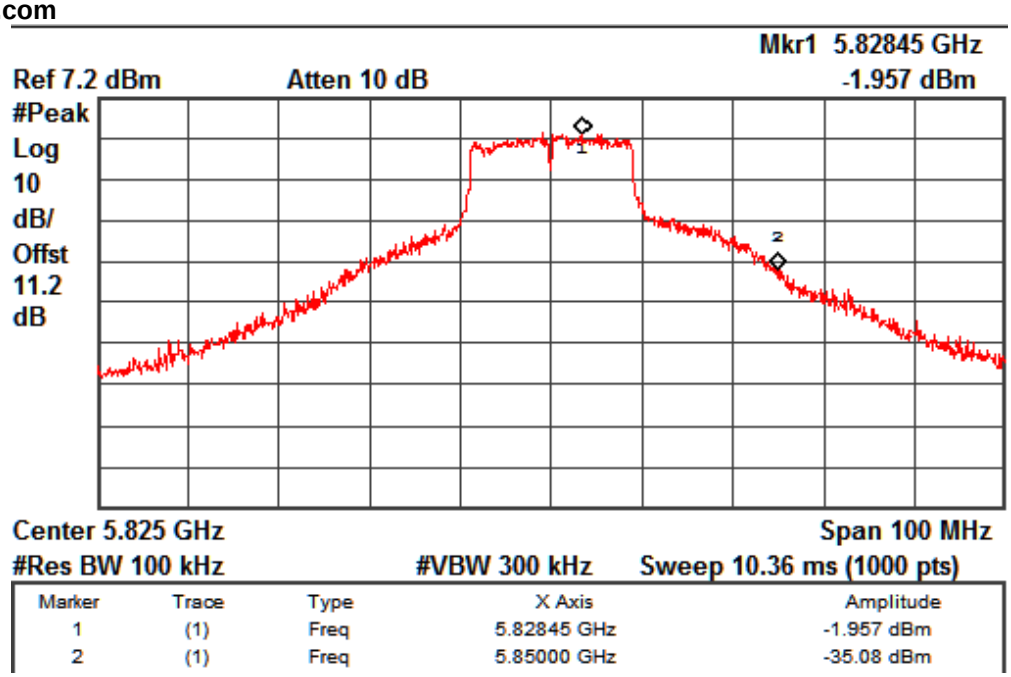

**Data Rate: 6.5 Mbps** **Channel frequency: 5745 MHz**



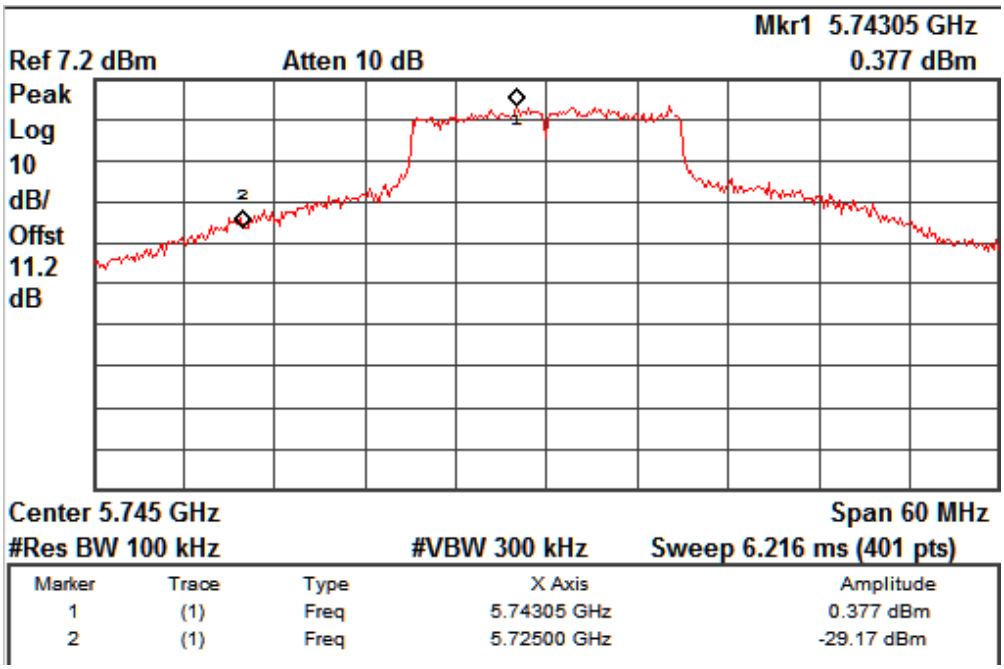

**Data Rate: 6.5 Mbps** **Channel frequency: 5825 MHz**



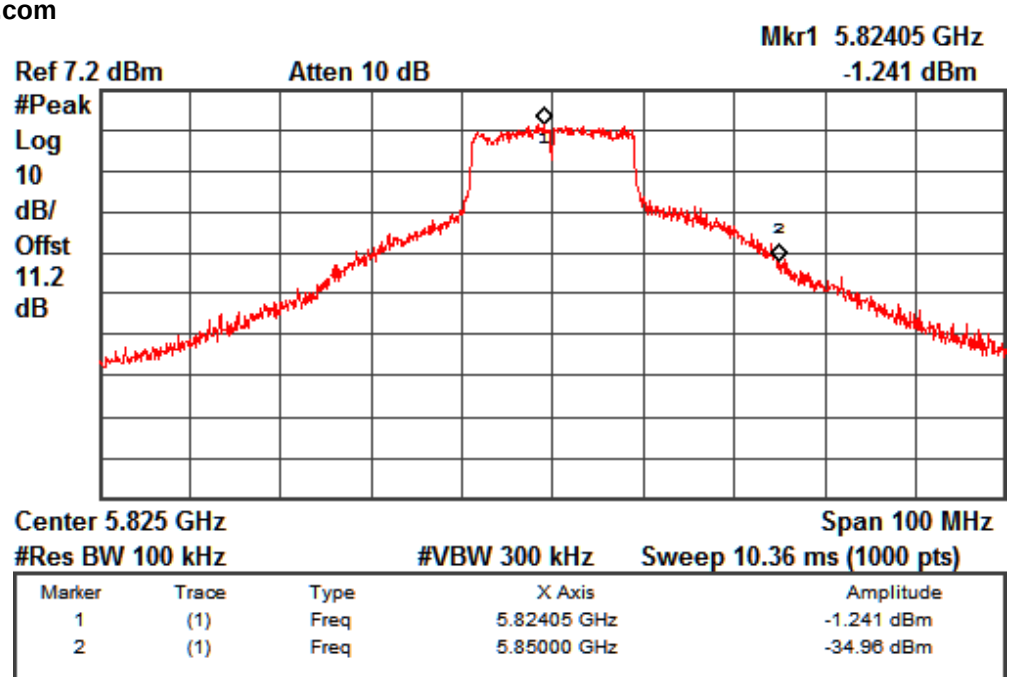

**Data Rate: 39 Mbps** **Channel frequency: 5745 MHz**




**Data Rate: 39 Mbps** **Channel frequency: 5825 MHz**



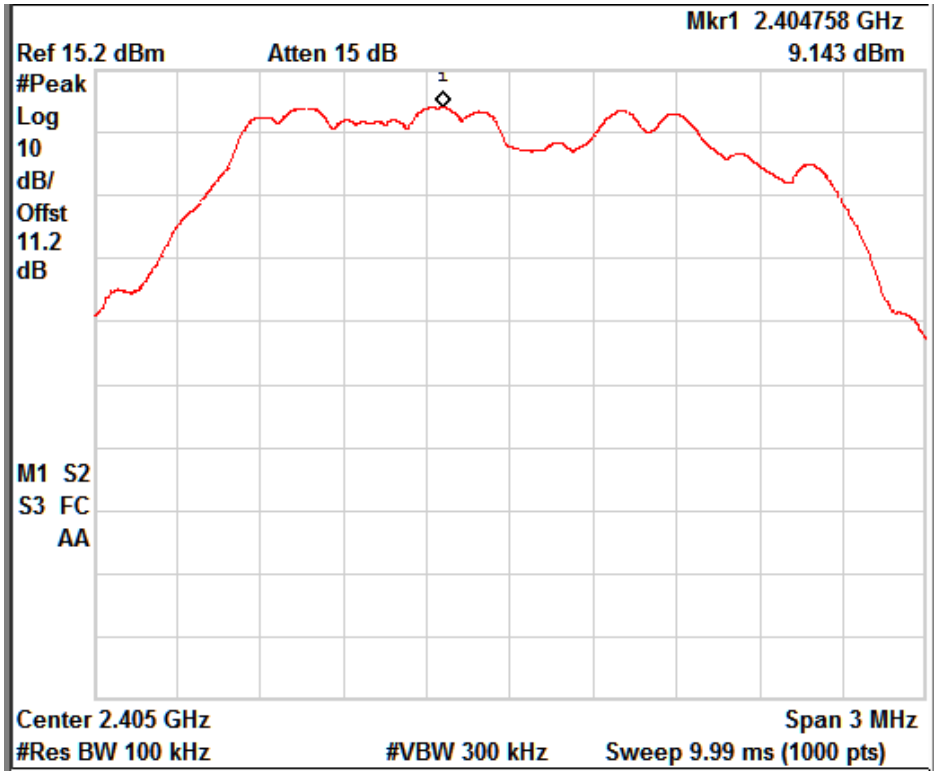

**Data Rate: 65 Mbps** **Channel frequency: 5745 MHz**



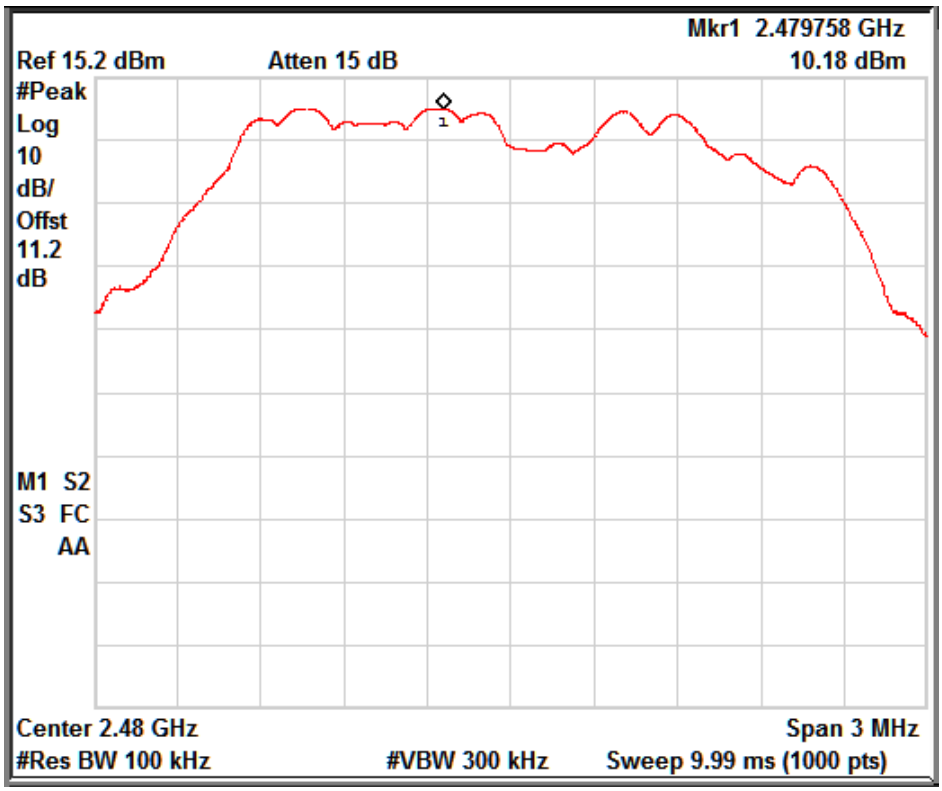

**Data Rate: 65 Mbps** **Channel frequency: 5825 MHz**

**Test Result: ZigBee**

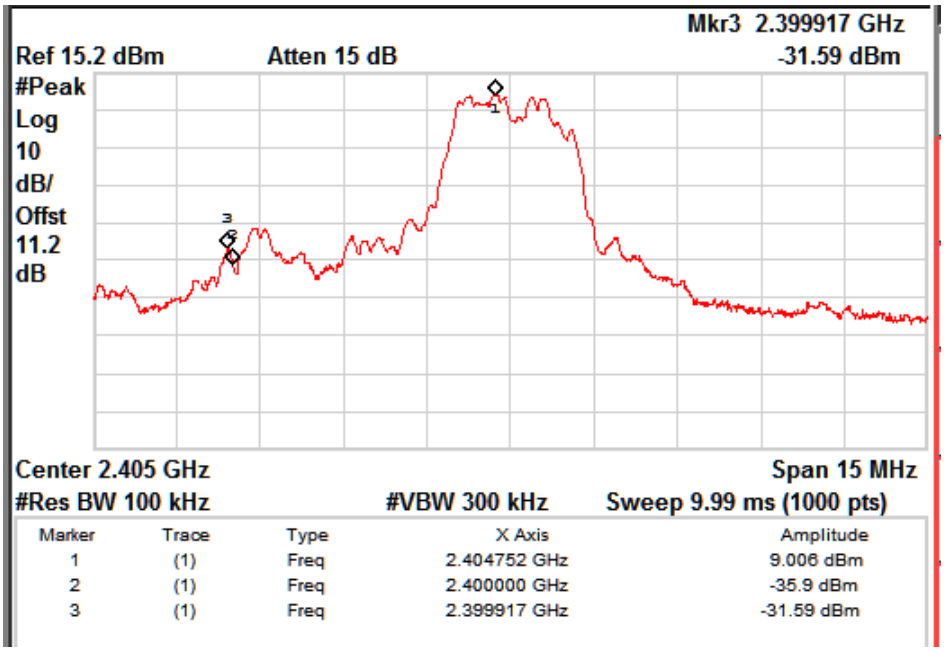
| Channel Frequency (MHz) | Value at Band Edge | | Reference PSD Value B (dBm) | Band Edge Value A-B (dBc) | Limit (dBc) |
|---|---|---|---|---|---|
| | Frequency (MHz) | Value A (dBm) | | | |
| 2405 | 2399.91 | -35.90 | 9.14 | -45.04 | -30.00 |
| 2480 | 2483.50 | -45.32 | 10.18 | -55.50 | -30.00 |



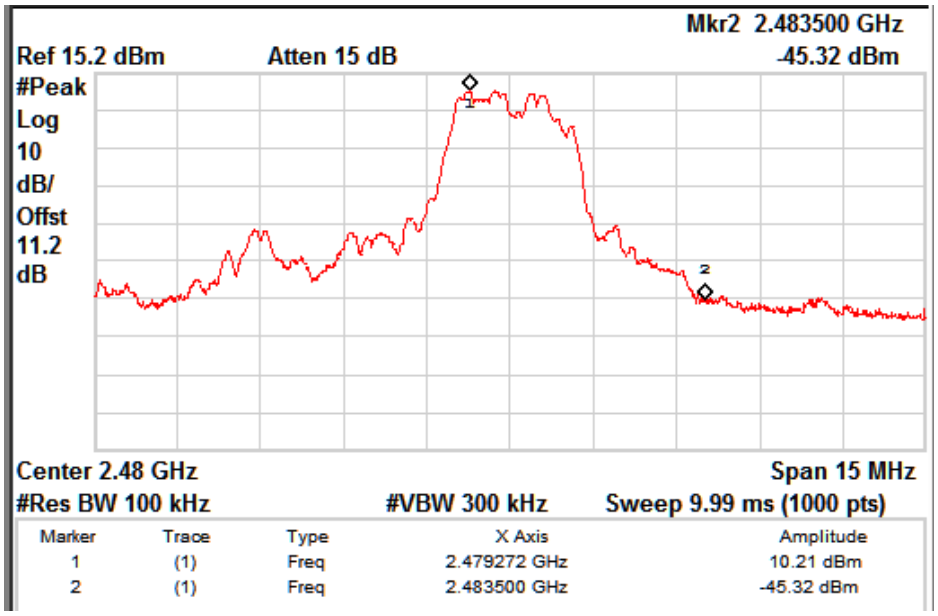

**Reference Level Plot Channel Low**




**Reference Level Plot Channel High**



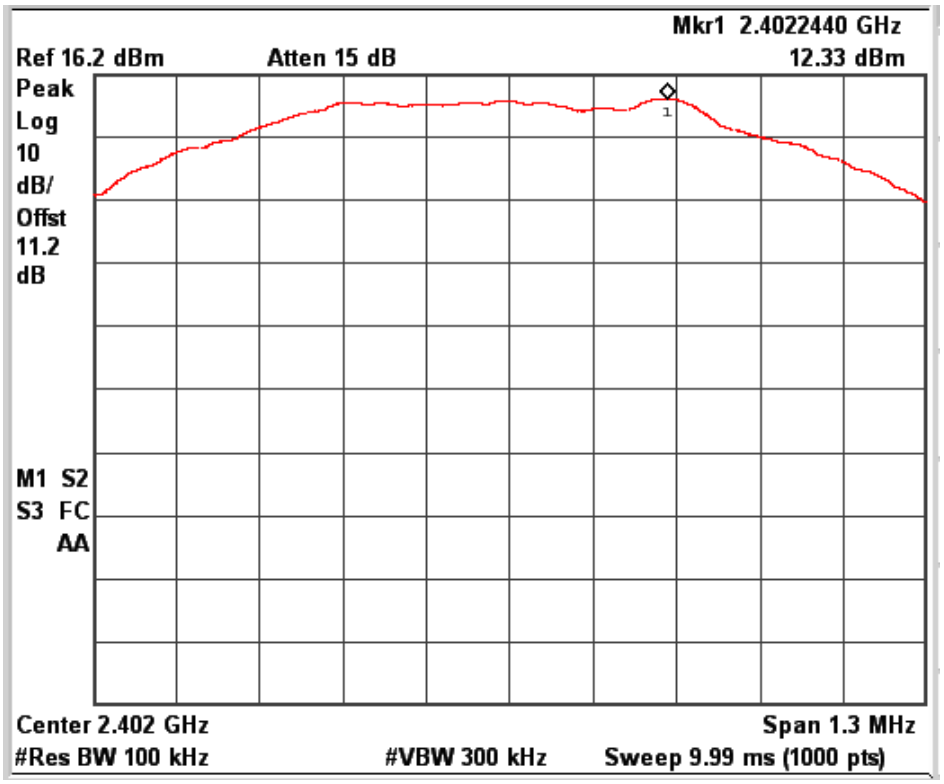

**Channel Frequency 2405 MHz**



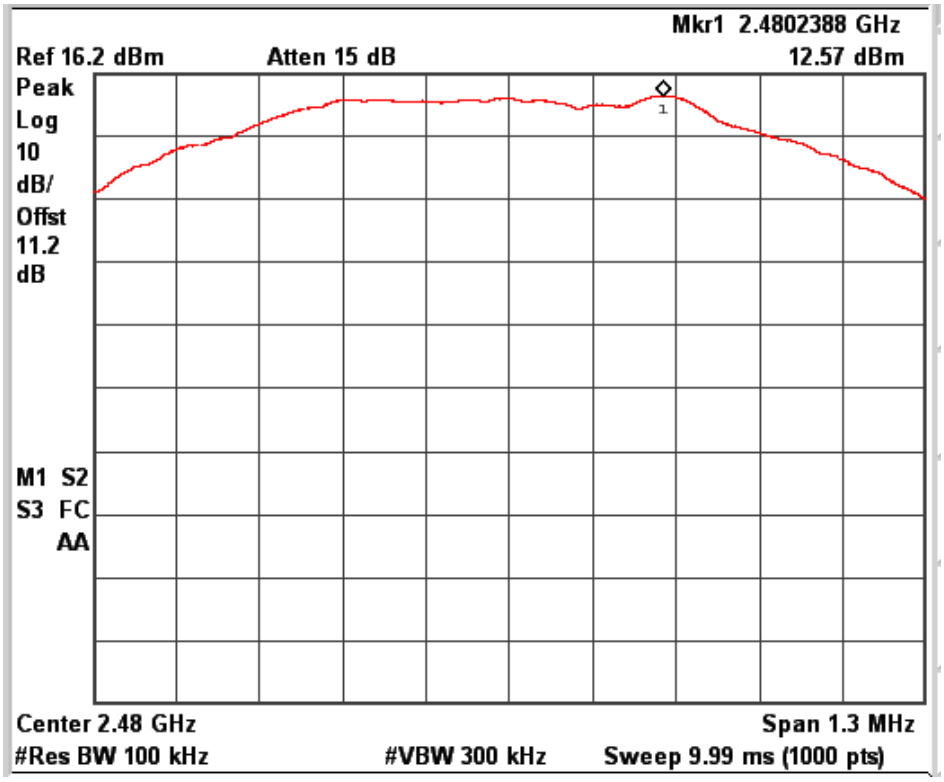

**Channel Frequency 2480 MHz**

**Test Result: Bluetooth LE**

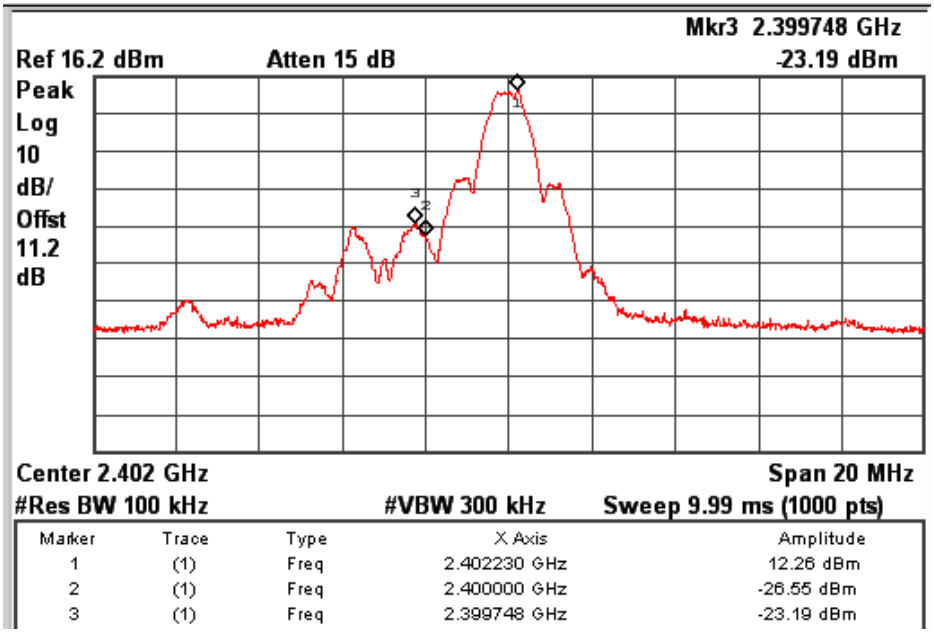
| Channel Frequency (MHz) | Value at Band Edge | | Reference PSD Value B (dBm) | Band Edge Value A-B (dBc) | Limit (dBc) |
|---|---|---|---|---|---|
| | Frequency (MHz) | Value A (dBm) | | | |
| 2405 | 2399.74 | -26.55 | 12.33 | -38.88 | -30.00 |
| 2480 | 2483.50 | -48.10 | 12.57 | -60.67 | -30.00 |



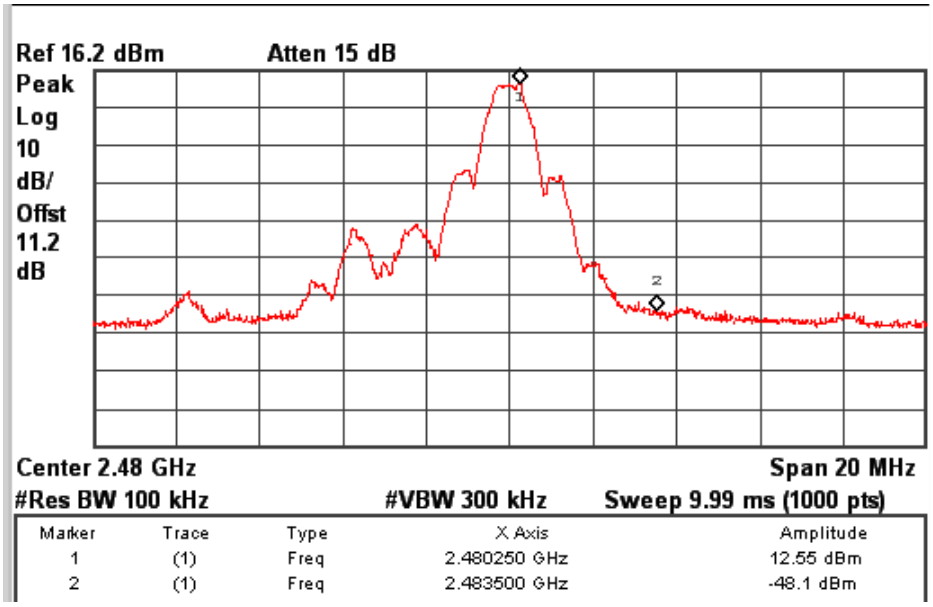

**Reference Level Plot Channel Frequency: 2402MHz**




**Reference Level Plot Channel Frequency: 2480MHz**



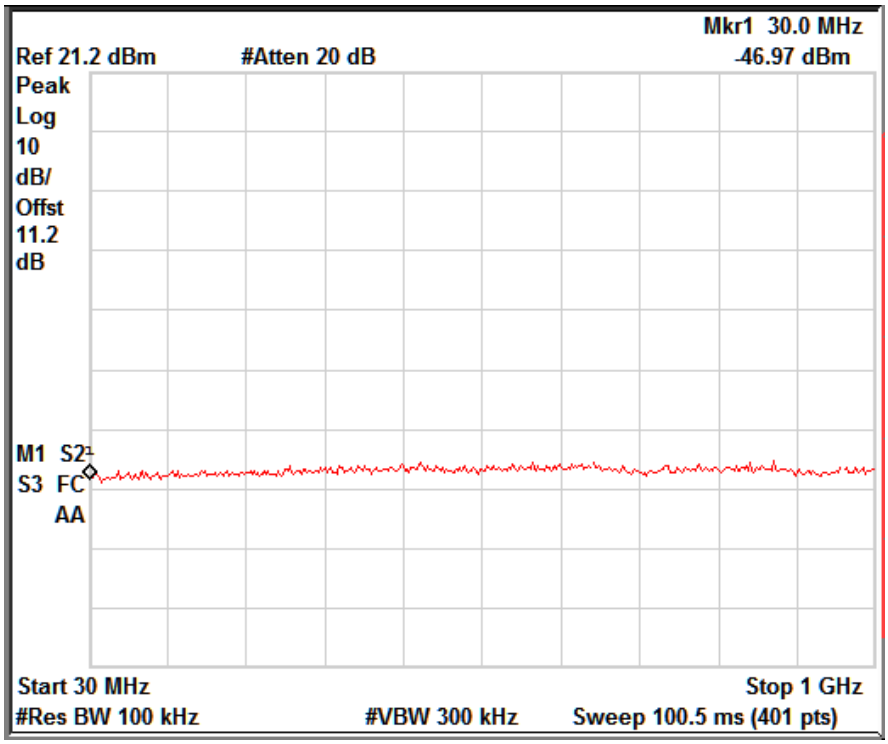

**Channel Frequency 2402 MHz**

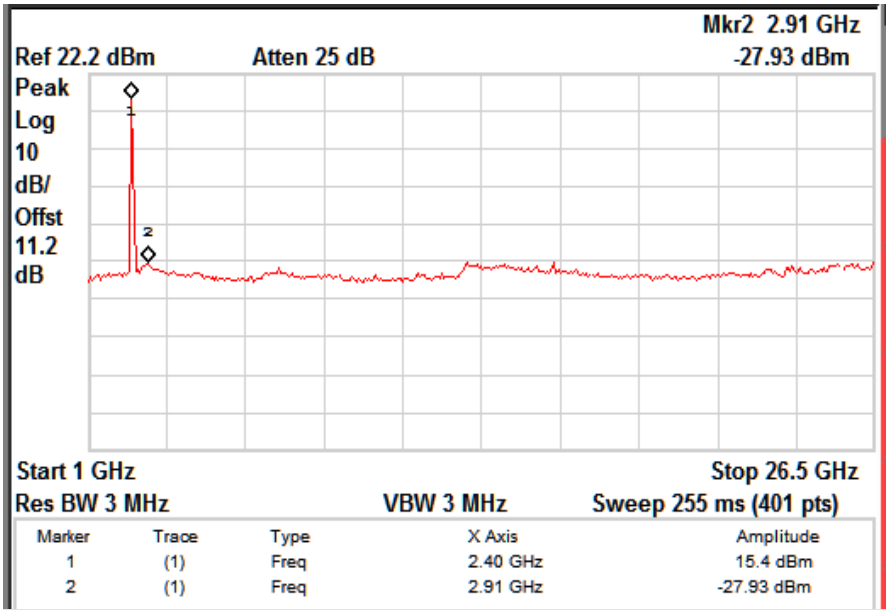



**Channel Frequency 2480 MHz**

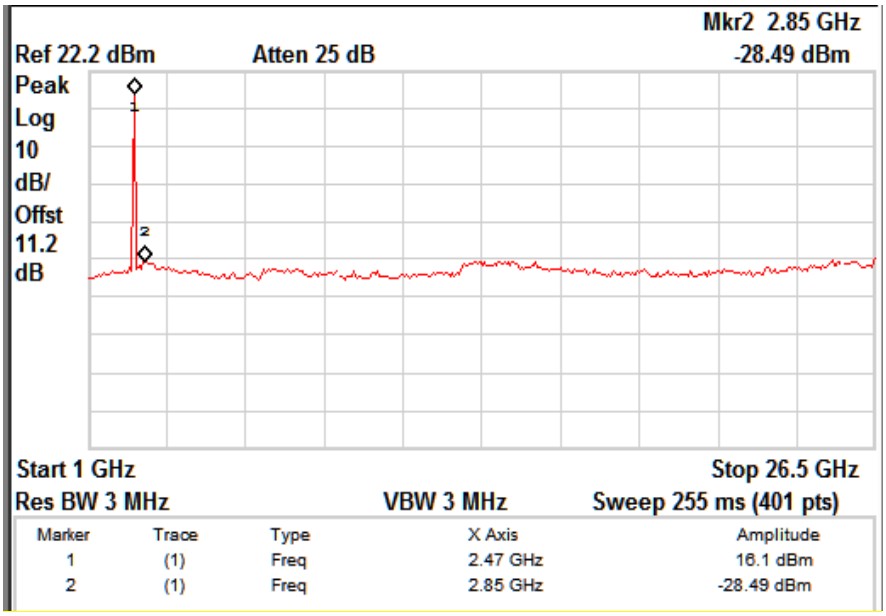
**Conducted Spurious Emission**

**WiFi**

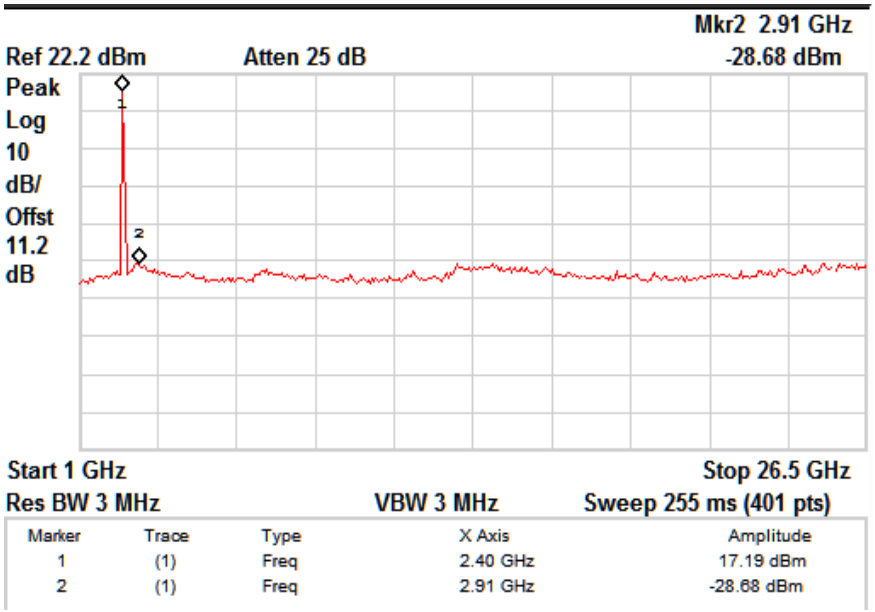


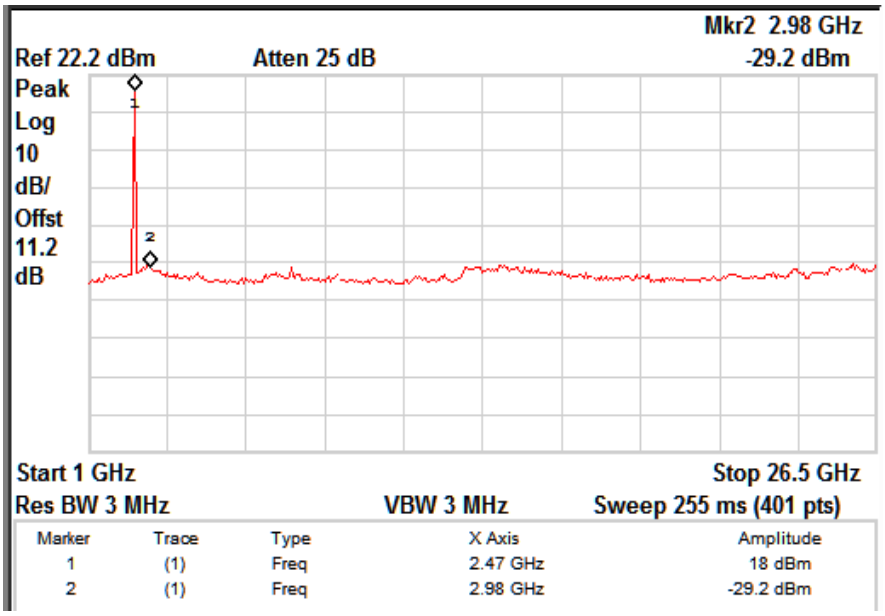

**Data Rate: 1Mbps** **Channel frequency: 2412 MHz**



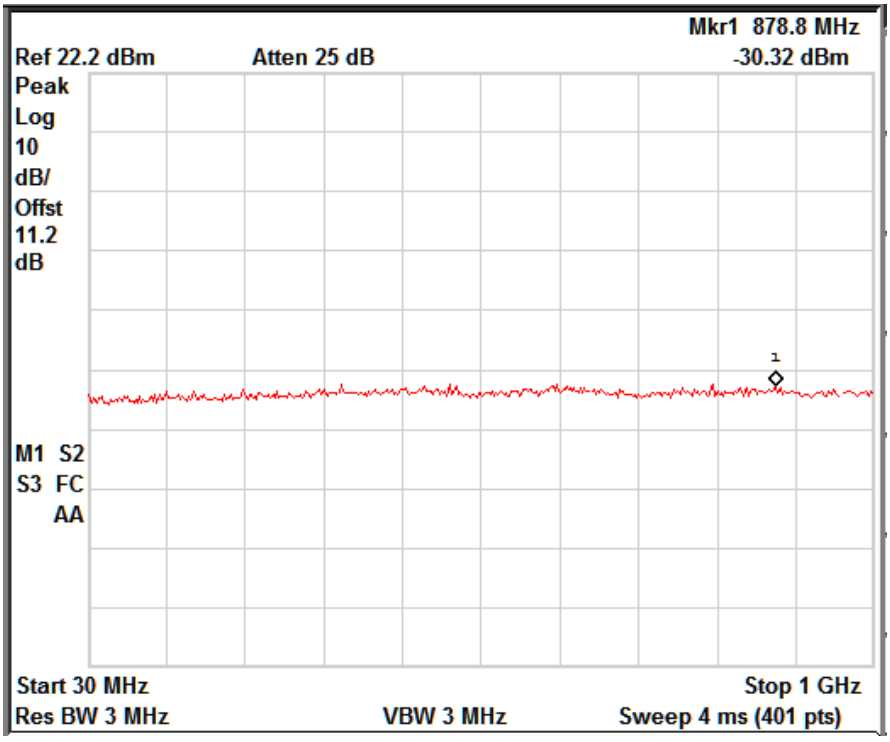

**Data Rate: 1Mbps** **Channel frequency: 2462 MHz**

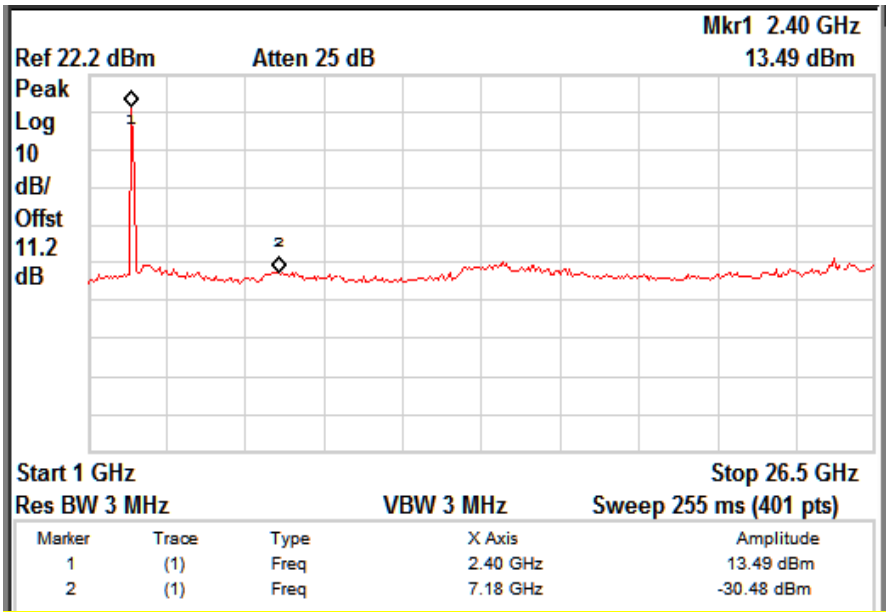



**Data Rate: 11Mbps** **Channel frequency: 2412 MHz**

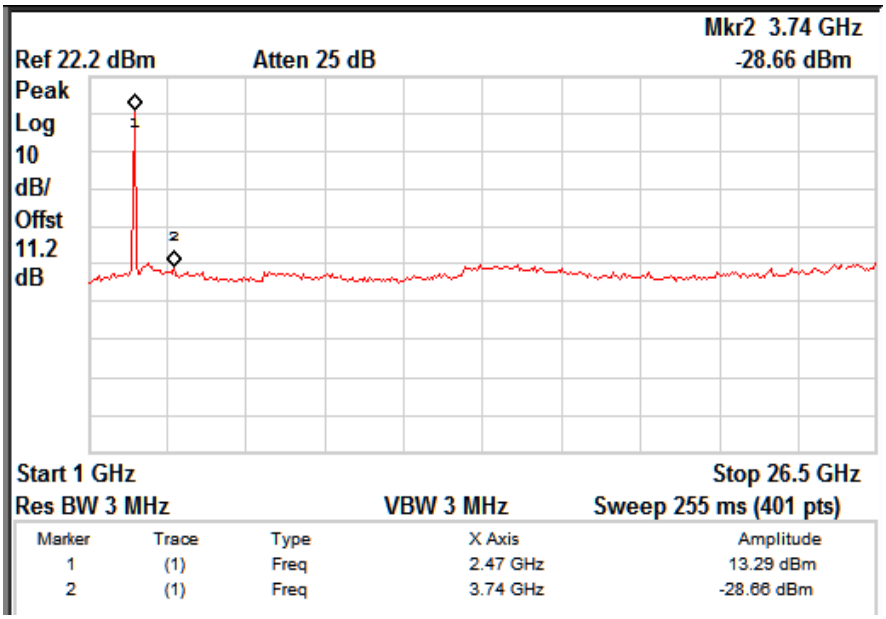



**Data Rate: 11Mbps** **Channel frequency: 2462 MHz**

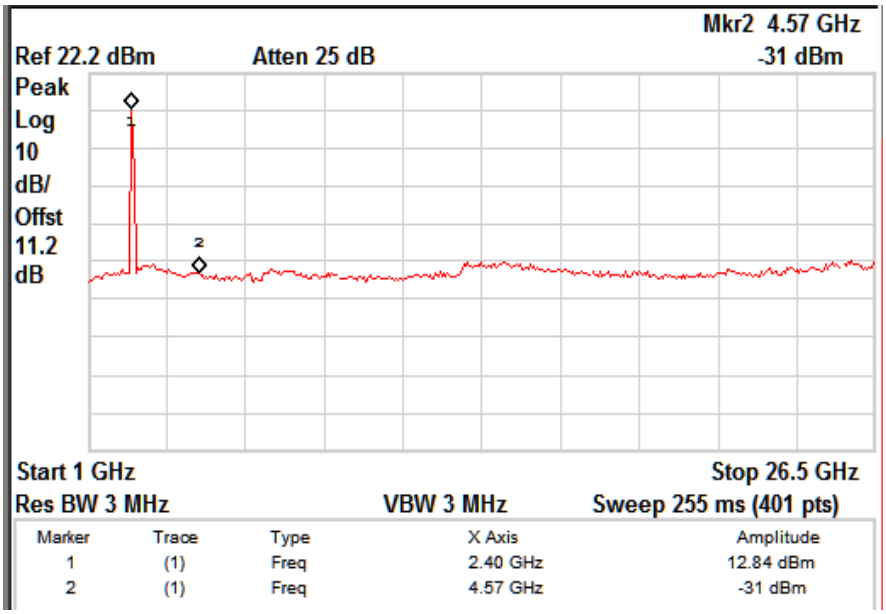




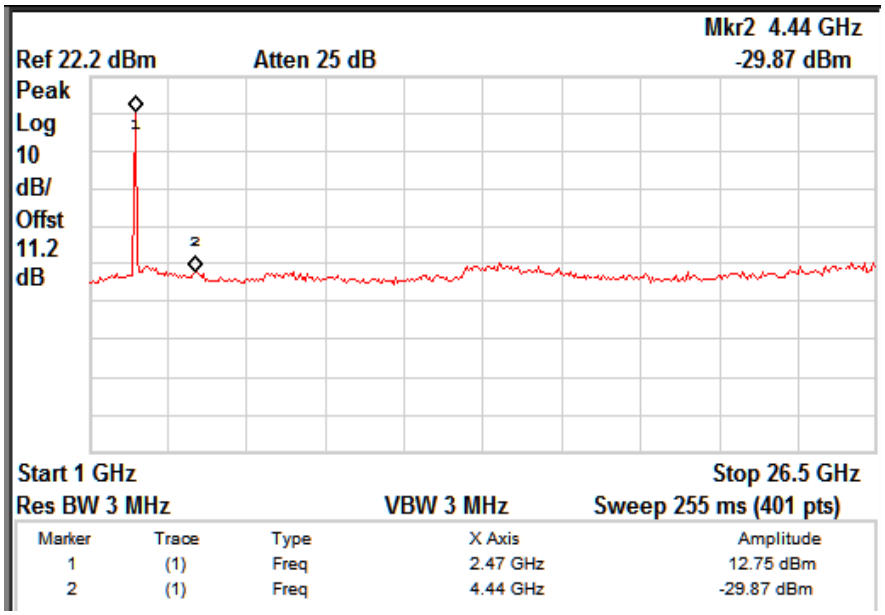

**Data Rate: 6Mbps** **Channel frequency: 2412 MHz**



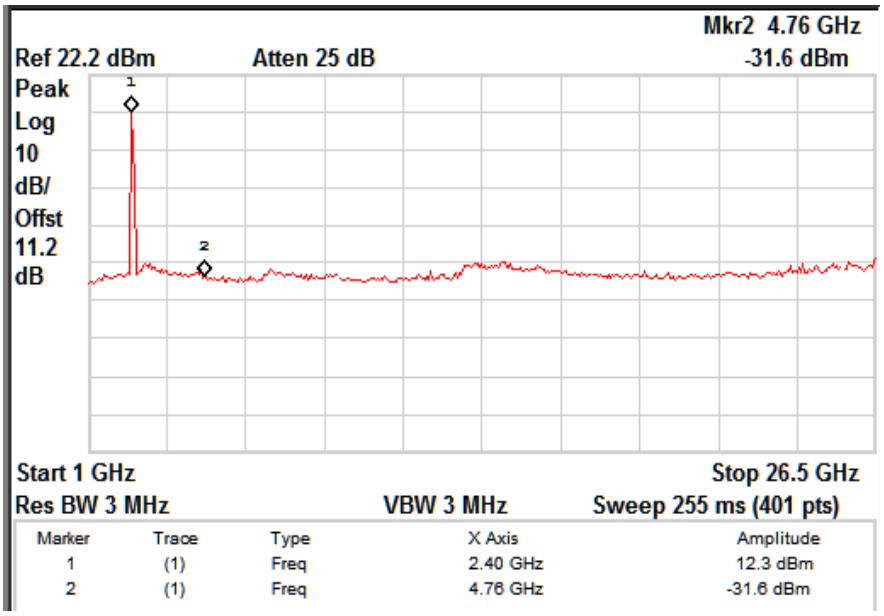

**Data Rate: 6Mbps** **Channel frequency: 2462 MHz**



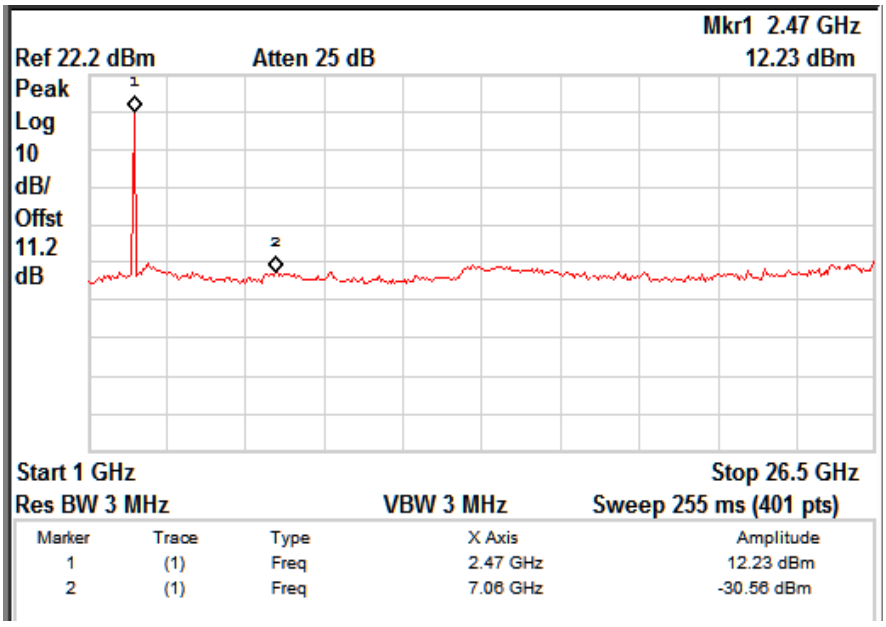

**Data Rate: 24Mbps** **Channel frequency: 2412 MHz**



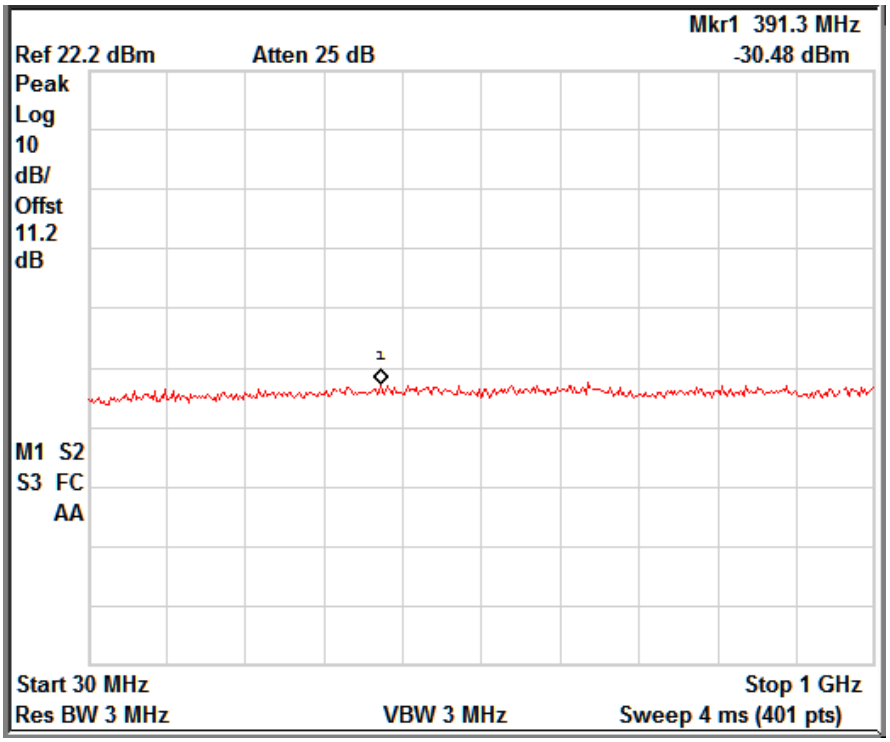

**Data Rate: 24Mbps** **Channel frequency: 2462 MHz**

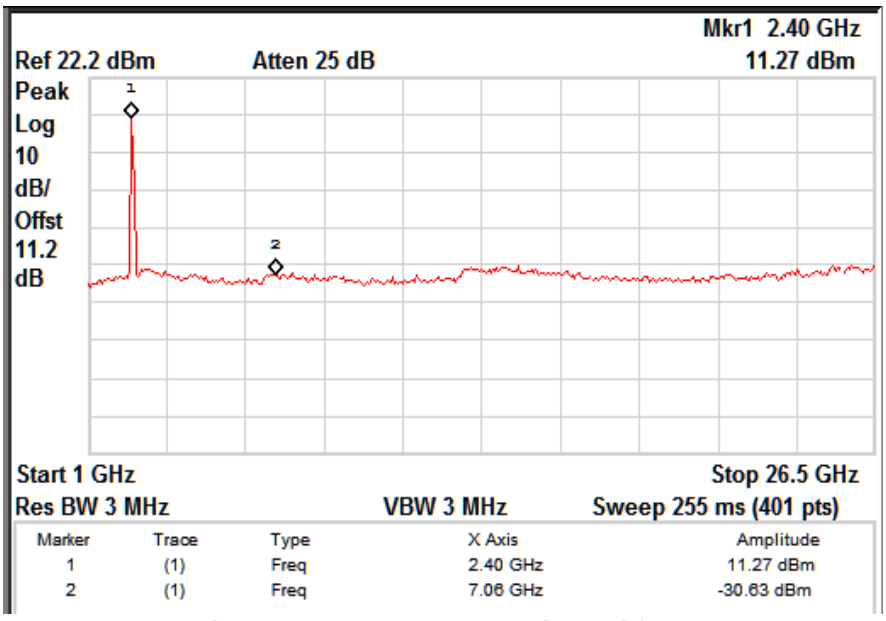



**Data Rate: 54Mbps** **Channel frequency: 2412 MHz**

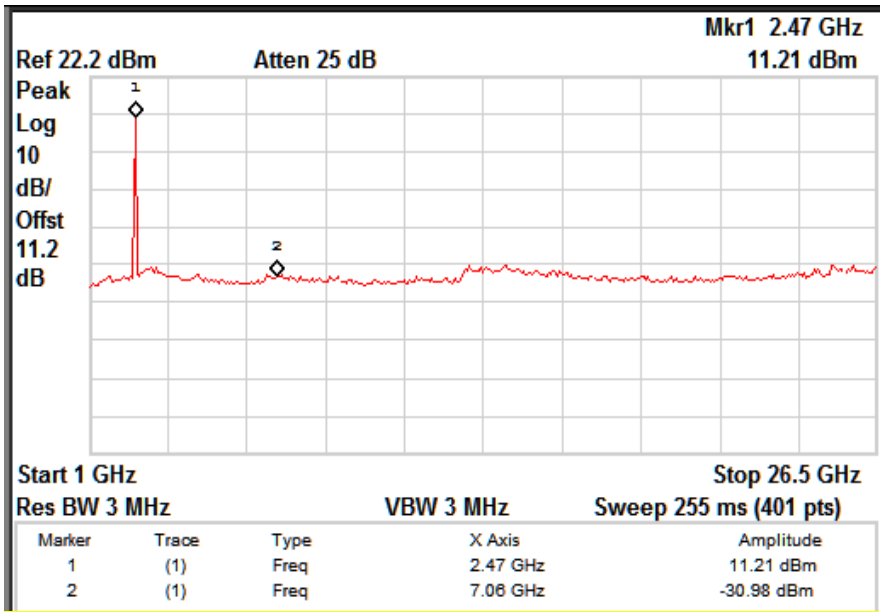



**Data Rate: 54Mbps** **Channel frequency: 2462 MHz**

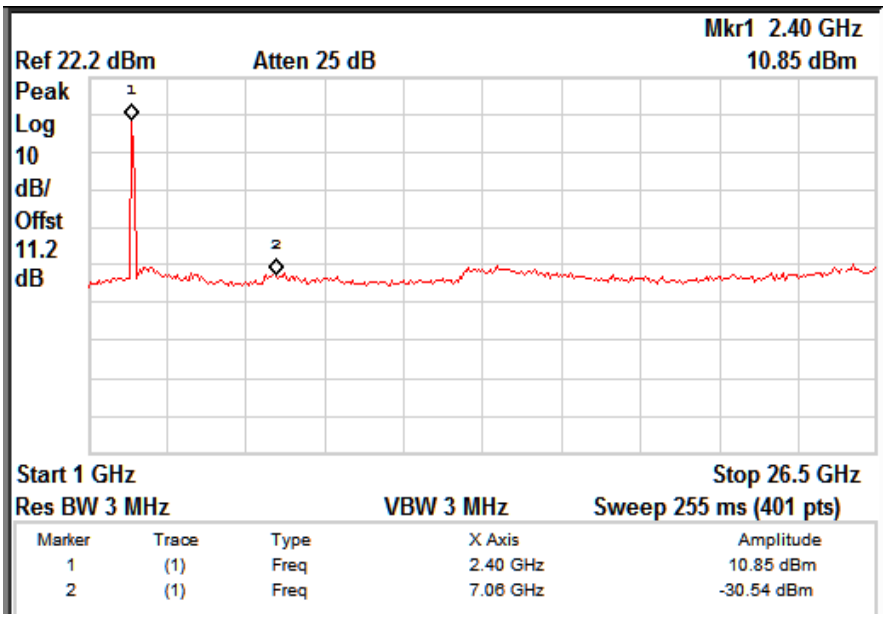


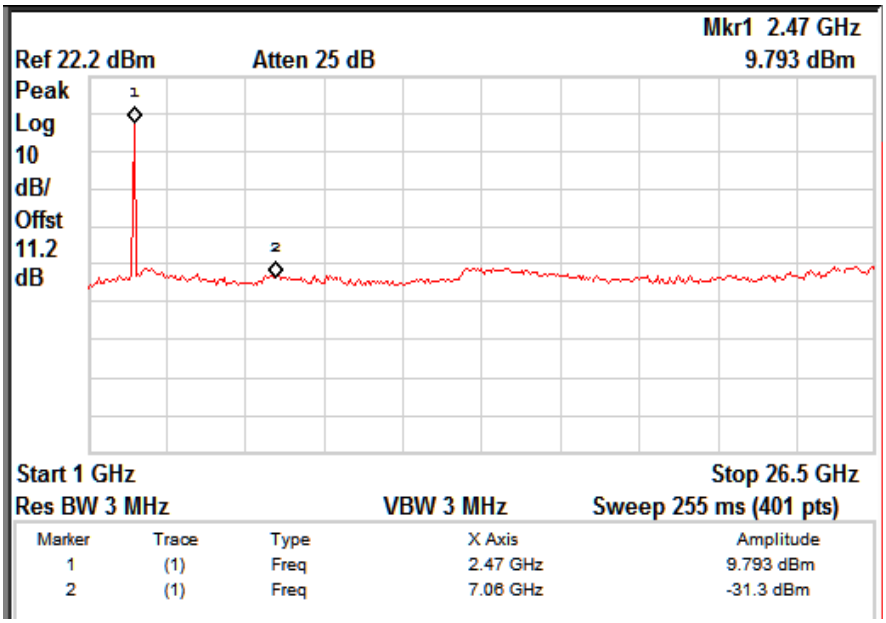

**Data Rate: 6.5 Mbps** **Channel frequency: 2412 MHz**



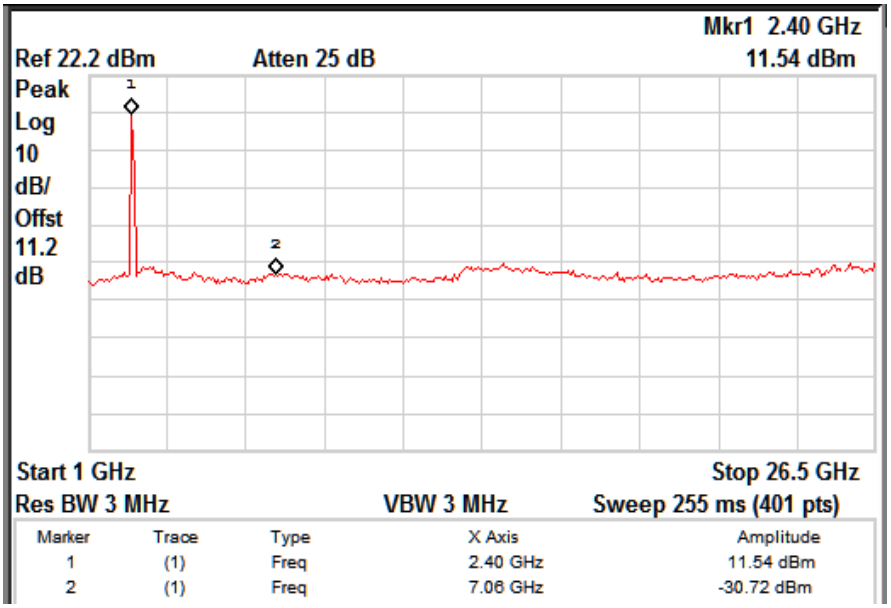

**Data Rate: 6.5 Mbps** **Channel frequency: 2462 MHz**



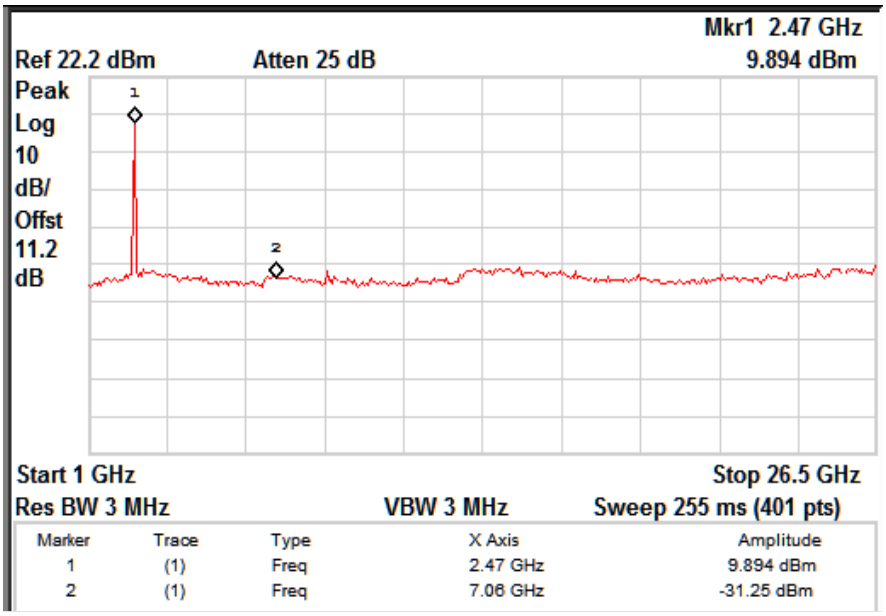

**Data Rate: 39 Mbps** **Channel frequency: 2412 MHz**




**Data Rate: 39 Mbps** **Channel frequency: 2462 MHz**

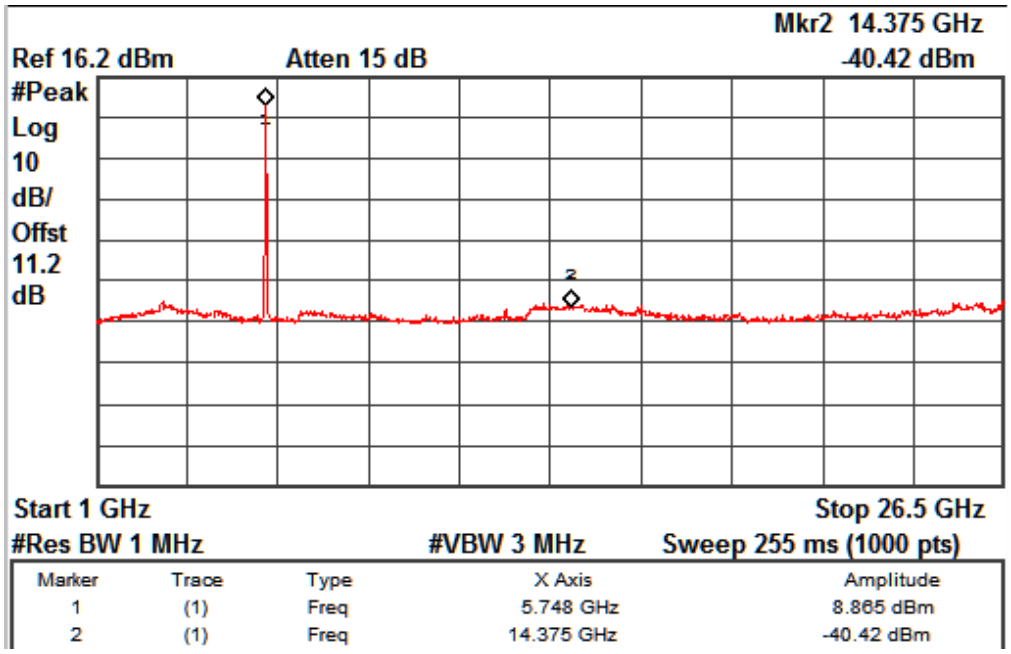



**Data Rate: 65 Mbps** **Channel frequency: 2412 MHz**

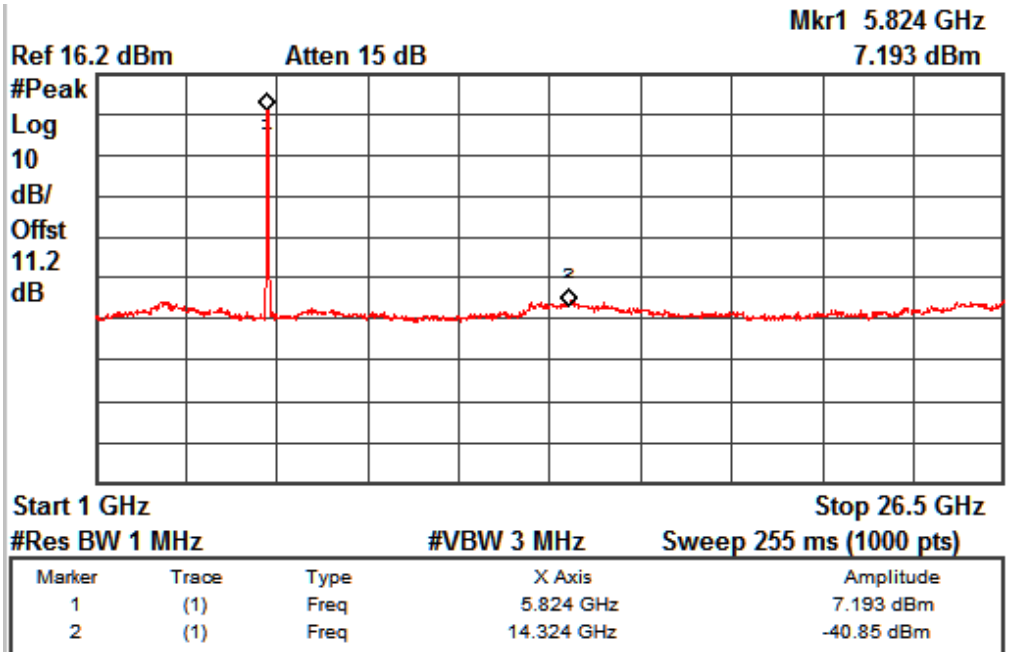



**Data Rate: 65 Mbps** **Channel frequency: 2462 MHz**

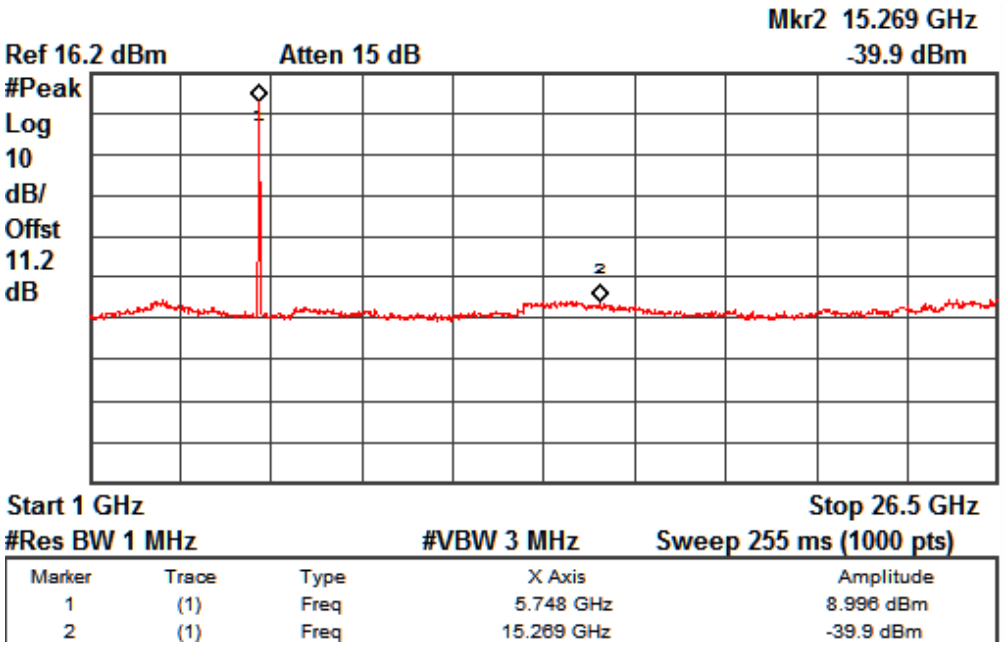
**5GHz Band**



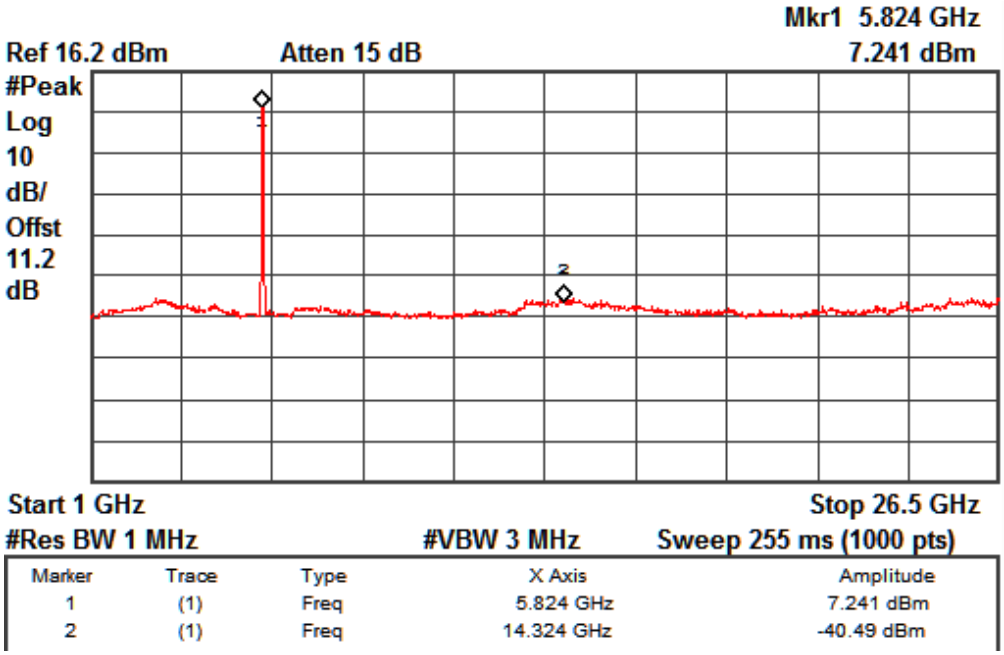

**Data Rate: 6 Mbps** **Channel Frequency: 5745 MHz**



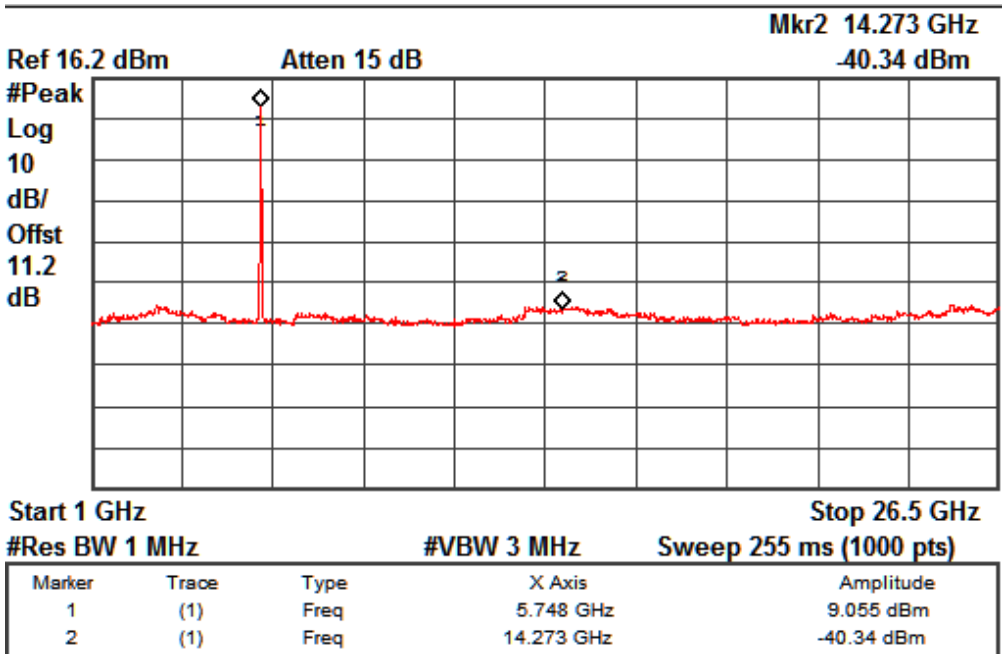

**Data Rate: 6 Mbps** **Channel Frequency: 5825 MHz**



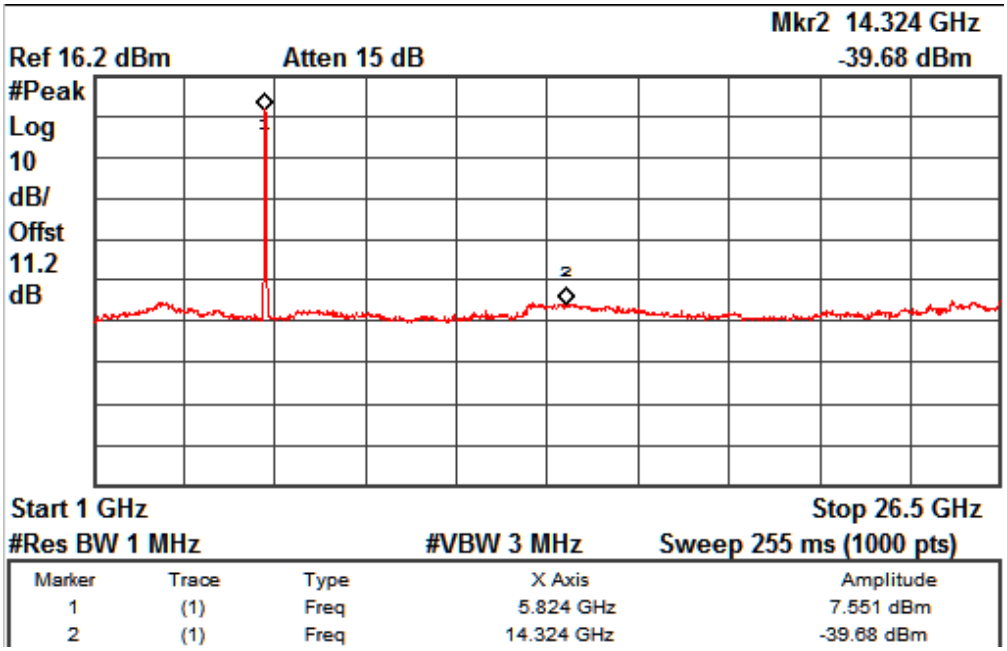

**Data Rate: 24 Mbps** **Channel Frequency: 5745 MHz**



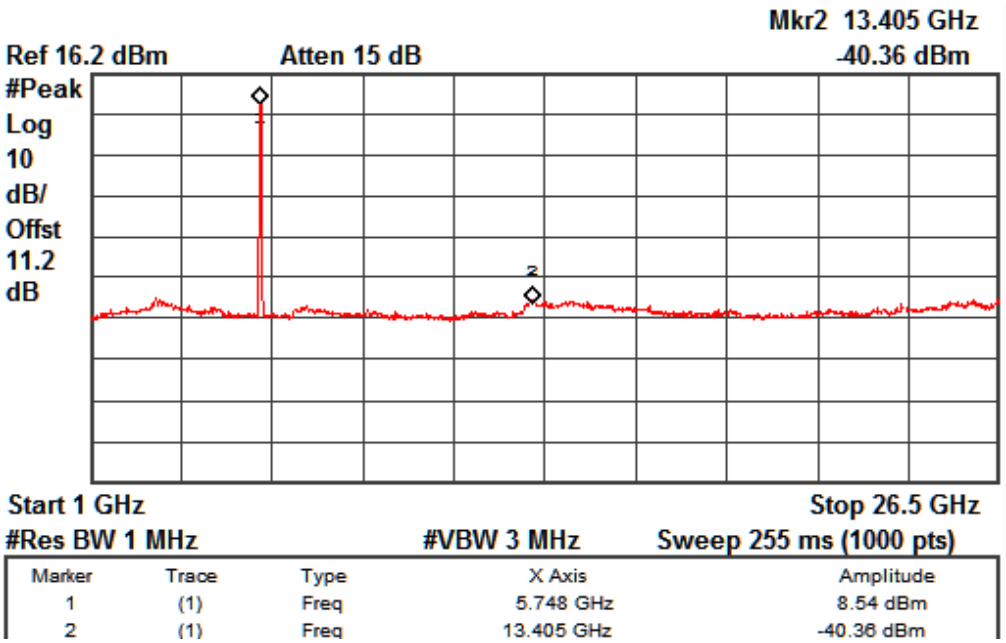

**Data Rate: 24 Mbps** **Channel Frequency: 5825 MHz**



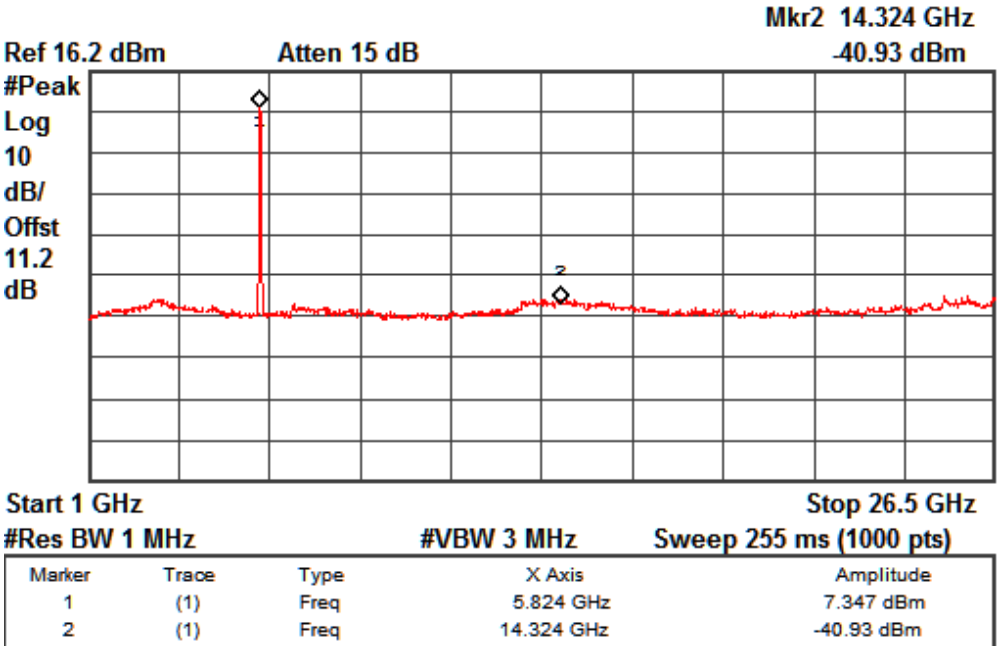

**Data Rate: 54 Mbps** **Channel Frequency: 5745 MHz**



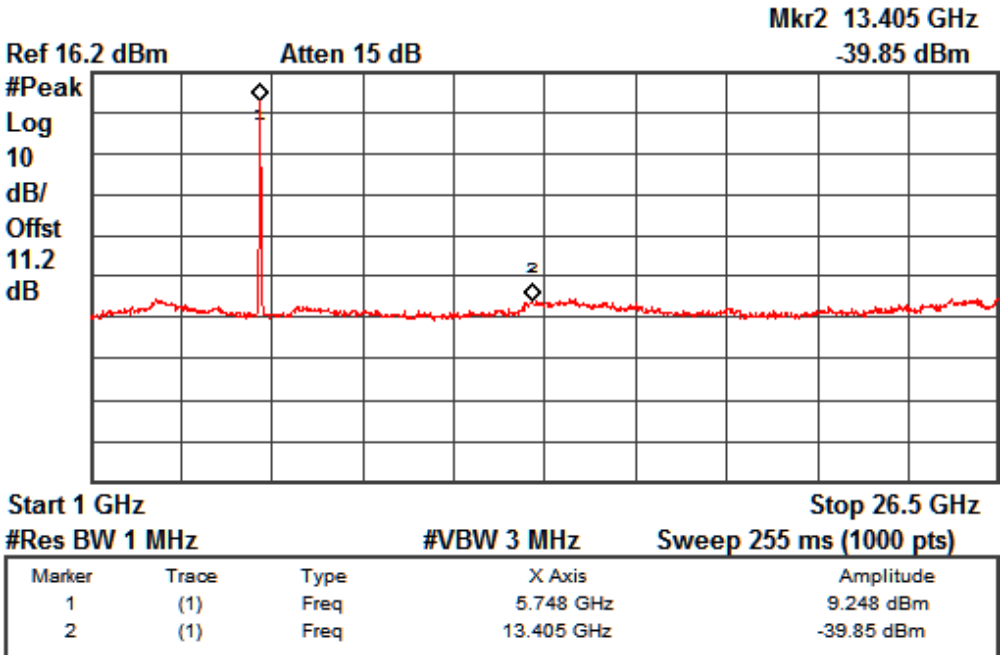

**Data Rate: 54 Mbps** **Channel Frequency: 5825 MHz**



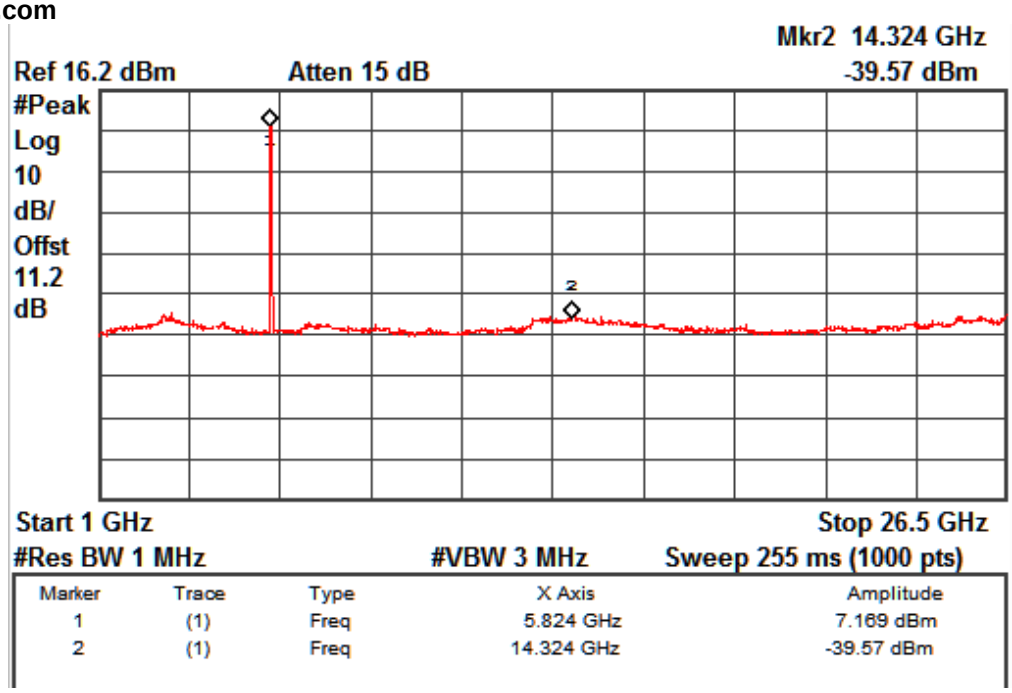

**Data Rate: 6.5 Mbps** **Channel Frequency: 5745 MHz**



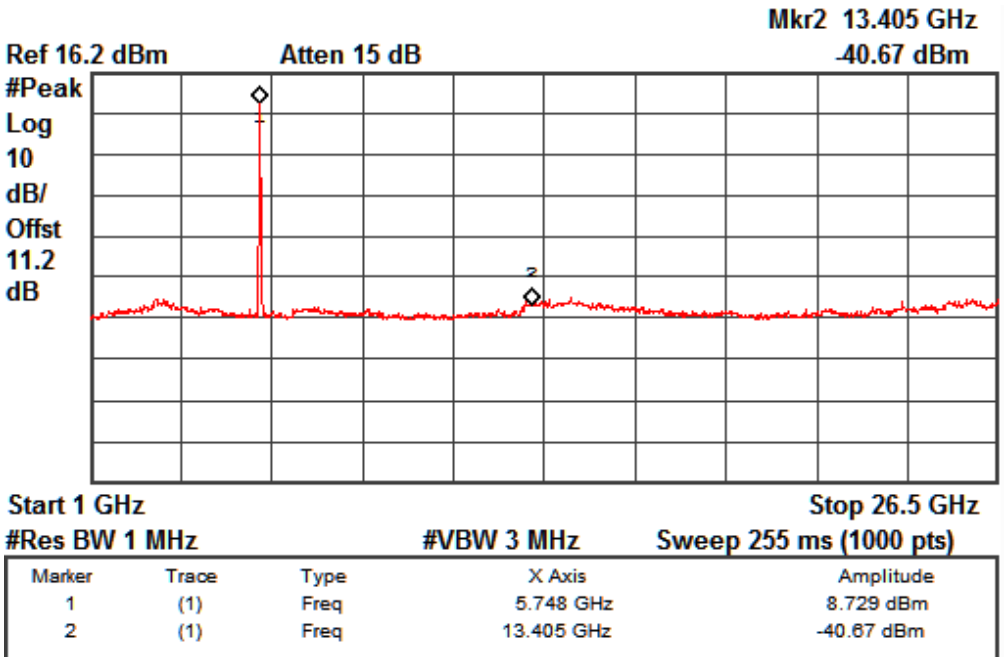

**Data Rate: 6.5 Mbps** **Channel Frequency: 5825 MHz**



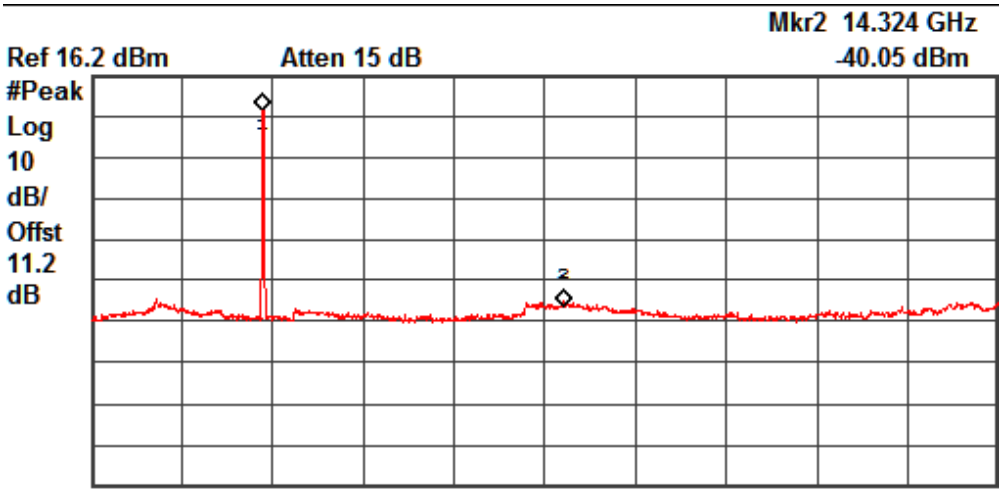

**Data Rate: 39 Mbps** **Channel Frequency: 5745 MHz**




**Data Rate: 39 Mbps** **Channel Frequency: 5825 MHz**

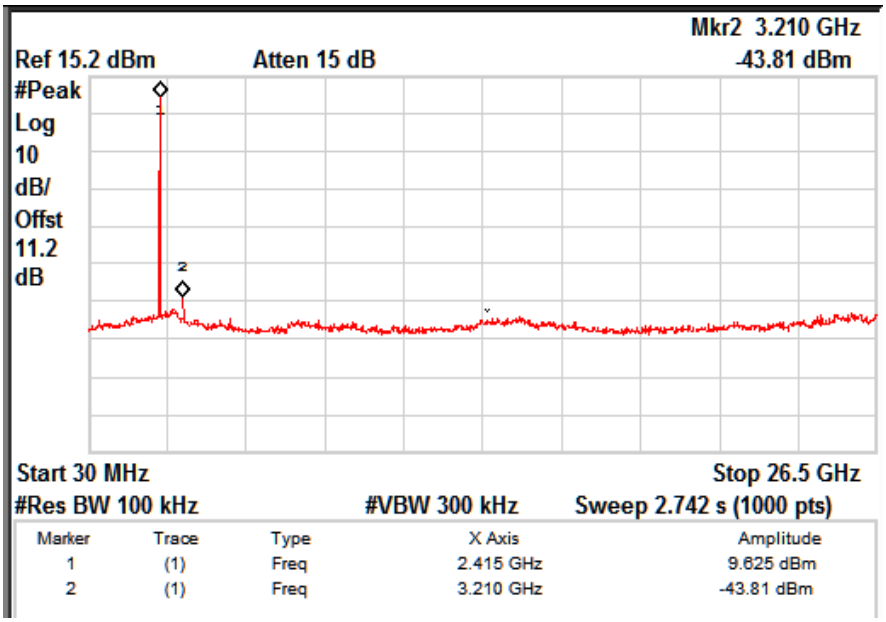



**Data Rate: 65 Mbps** **Channel Frequency: 5745 MHz**

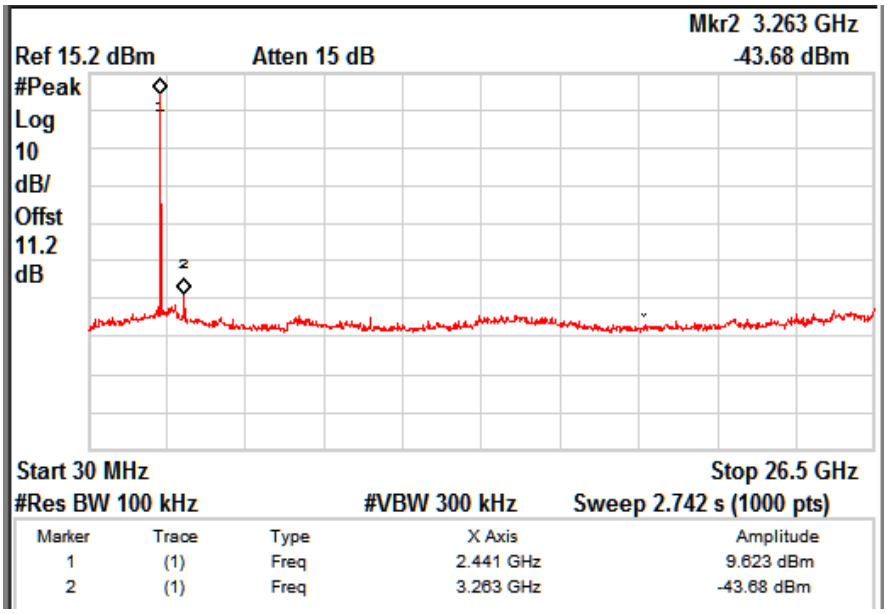



| Marker | Trace | Type | X Axis | Amplitude |
|---|---|---|---|---|
| 1 | (1) | Freq | 5.824 GHz | 7.414 dBm |
| 2 | (1) | Freq | 14.324 GHz | -40.05 dBm |

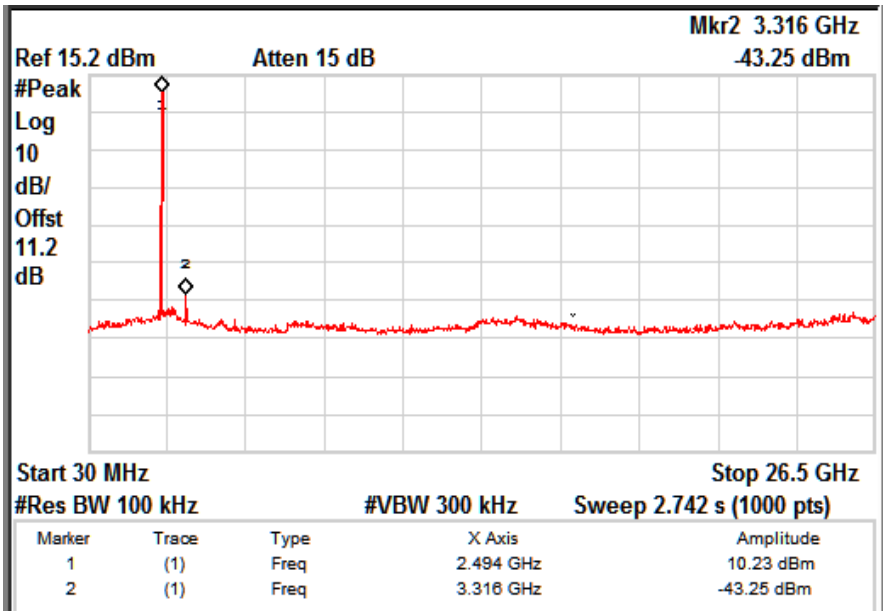
**Data Rate: 65 Mbps** **Channel Frequency: 5825 MHz**




**Channel Frequency 2405 MHz**

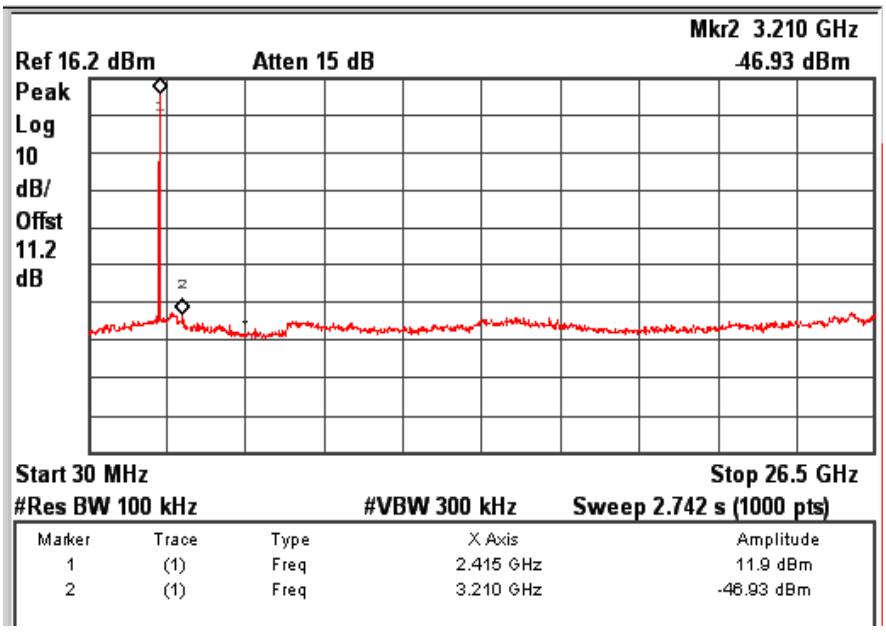



**Channel Frequency 2440 MHz**

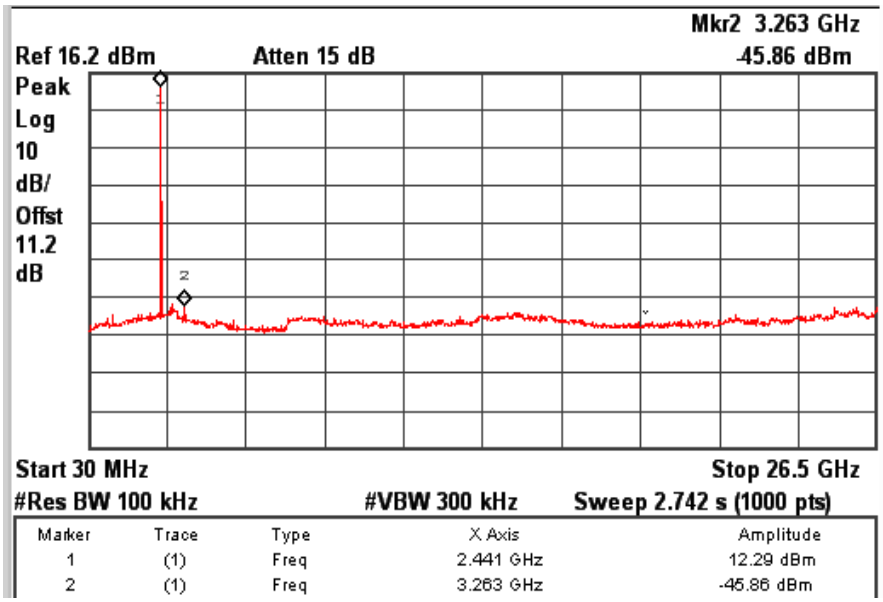



**Channel Frequency 2480 MHz**

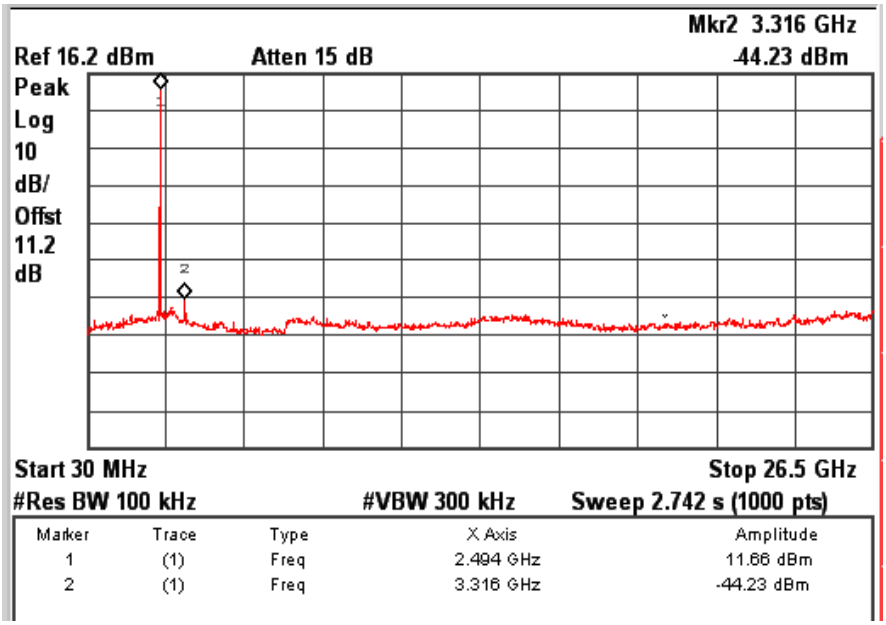
**Bluetooth LE**




**Channel Frequency 2402 MHz**




**Channel Frequency 2442 MHz**




**Channel Frequency 2480 MHz**

**Spurious Radiated Emissions and**

**Restricted Bands of Operation** **Section 15.209 and 15.205**

**Result** **Pass**

| | |
|---|---|
| Test Specification | FCC Part 15 Section 15.209 &15.205 |
| Test Method | ANSI C63.4-2009 |
| Measurement Location | Semi Anechoic Chamber |
| Measuring Distance | 3m |
| Detection | QP for frequency below 1GHz, Average for frequency above 1GHz |
| Requirement | As per the limits mentioned in the bellow table |

**Limit for Radiated Emission of Section 15.209:**

| Frequency (MHz) | Field strength (μV/m) | Field strength (dBμV/m) | Distance of Measurement (m) |
|---|---|---|---|
| 0.009 – 0.490 | 2400/F(kHz) | 48.50 – 13.80 | 300* |
| 0.490 – 1.705 | 24000/F(kHz) | 33.80 – 23.00 | 30* |
| 1.705 -30 | 30 | 29.54 | 30* |
| 30-88 | 100 | 40.0 | 3 |
| 88-216 | 150 | 43.5 | 3 |
| 216-960 | 200 | 46.0 | 3 |
| Above 960 | 500 | 54.0 | 3 |

Remark: * The limit shows in the table above of frequency range 0.009 – 0.490, 0.490 – 1.705 MHz and 1.705-30MHz is at 300 meter, 30 meter and 30 meter range respectively, which corresponds to 88.50 – 53.80, 53.80 – 43.00 and 49.5dBμV/m at 3m range by extrapolation calculation and the measurement of loop antenna.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector.

# Test results:

**For frequency Range 9kHz - 1 GHz**

No emissions found in this frequency range.

**For frequency above 1GHz**

**Test results for worst case data rate are listed below.**

**WiFi:**

| B Mode: 1Mbps | | | | | |
|---|---|---|---|---|---|
| Channel | Polarization | Frequency (MHz) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| Low | V | 2390 (Pk) | 51.62 | 74.00 | -22.38 |
| | | 2390 (Av) | 45.39 | 54.00 | -8.61 |
| | | 2412 (Pk) | 97.38 | - | * |
| | | 2412 (Av) | 94.29 | - | * |
| | | 4824 (Pk) | 53.29 | 74.00 | -20.71 |
| | | 4824 (Av) | 47.88 | 54.00 | -6.12 |
| | | 7236 (Pk) | 56.54 | 74.00 | -17.46 |
| | | 7236 (Av) | 43.92 | 54.00 | -10.08 |
| | H | 2390 (Pk) | 58.62 | 74.00 | -15.38 |
| | | 2390 (Av) | 53.01 | 54.00 | -0.99 |
| | | 2412 (Pk) | 105.15 | - | * |
| | | 2412 (Av) | 102.52 | - | * |
| | | 4824 (Pk) | 57.33 | 74.00 | -16.67 |
| | | 4824 (Av) | 53.01 | 54.00 | -0.99 |
| | | 7236 (Pk) | 57.91 | 74.00 | -16.09 |
| | | 7236 (Av) | 47.05 | 54.00 | -6.95 |
| Mid | V | 4874 (Pk) | 53.36 | 74.00 | -20.64 |
| | | 4874 (Av) | 47.96 | 54.00 | -6.04 |
| | | 7311 (Pk) | 57.38 | 74.00 | -16.62 |
| | | 7311 (Av) | 44.61 | 54.00 | -9.39 |
| | H | 4874 (Pk) | 55.69 | 74.00 | -18.31 |
| | | 4874 (Av) | 52.18 | 54.00 | -1.82 |
| | | 7311 (Pk) | 57.51 | 74.00 | -16.49 |
| | | 7311 (Av) | 47.49 | 54.00 | -6.51 |
| High | V | 2462 (Pk) | 97.33 | - | * |
| | | 2462 (Av) | 94.45 | - | * |
| | | 2483.5 (Pk) | 50.06 | 74.00 | -23.94 |
| | | 2483.5 (Av) | 44.59 | 54.00 | -9.41 |
| | | 4924 (Pk) | 53.29 | 74.00 | -20.71 |

| | | | | | |
|---|---|---|---|---|---|
| | | 4924 (Av) | 47.92 | 54.00 | -6.08 |
| | | 7386 (Pk) | 57.29 | 74.00 | -16.71 |
| | | 7386 (Av) | 44.81 | 54.00 | -9.19 |
| | H | 2462 (Pk) | 104.34 | - | * |
| | | 2462 (Av) | 101.75 | - | * |
| | | 2483.5 (Pk) | 57.98 | 74.00 | -16.02 |
| | | 2483.5 (Av) | 53.47 | 54.00 | -0.53 |
| | | 4924 (Pk) | 57.21 | 74.00 | -16.79 |
| | | 4924 (Av) | 53.28 | 54.00 | -0.72 |
| | | 7386 (Pk) | 56.98 | 74.00 | -17.02 |
| | | 7386 (Av) | 47.22 | 54.00 | -6.78 |

| B Mode: 11Mbps | | | | | |
|---|---|---|---|---|---|
| Channel | Polarization | Frequency (MHz) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| Low | V | 2390 (Pk) | 54.37 | 74.00 | -19.63 |
| | | 2390 (Av) | 43.23 | 54.00 | -10.77 |
| | | 2412 (Pk) | 102.43 | - | * |
| | | 2412 (Av) | 94.36 | - | * |
| | | 4824 (Pk) | 51.47 | 74.00 | -22.53 |
| | | 4824 (Av) | 38.64 | 54.00 | -15.36 |
| | | 7236 (Pk) | 57.85 | 74.00 | -16.15 |
| | | 7236 (Av) | 44.72 | 54.00 | -9.28 |
| | H | 2390 (Pk) | 63.15 | 74.00 | -10.85 |
| | | 2390 (Av) | 51.77 | 54.00 | -2.23 |
| | | 2412 (Pk) | 110.03 | - | * |
| | | 2412 (Av) | 102.55 | - | * |
| | | 4824 (Pk) | 56.73 | 74.00 | -17.27 |
| | | 4824 (Av) | 43.55 | 54.00 | -10.45 |
| | | 7236 (Pk) | 58.20 | 74.00 | -15.80 |
| | | 7236 (Av) | 47.58 | 54.00 | -6.42 |
| Mid | V | 4874 (Pk) | 53.06 | 74.00 | -20.94 |
| | | 4874 (Av) | 41.02 | 54.00 | -12.98 |
| | | 7311 (Pk) | 54.57 | 74.00 | -19.43 |
| | | 7311 (Av) | 42.59 | 54.00 | -11.41 |
| | H | 4874 (Pk) | 56.83 | 74.00 | -17.17 |
| | | 4874 (Av) | 43.48 | 54.00 | -10.52 |
| | | 7311 (Pk) | 56.80 | 74.00 | -17.20 |
| | | 7311 (Av) | 41.91 | 54.00 | -12.09 |
| High | V | 2462 (Pk) | 102.29 | - | * |
| | | 2462 (Av) | 94.48 | - | * |
| | | 2483.5 (Pk) | 54.51 | 74.00 | -19.49 |

| | | | | | |
|---|---|---|---|---|---|
| | | 2483.5 (Av) | 42.05 | 54.00 | -11.95 |
| | | 4924 (Pk) | 54.37 | 74.00 | -19.63 |
| | | 4924 (Av) | 40.76 | 54.00 | -13.24 |
| | | 7386 (Pk) | 57.67 | 74.00 | -16.33 |
| | | 7386 (Av) | 45.34 | 54.00 | -8.66 |
| | H | 2462 (Pk) | 109.64 | - | * |
| | | 2462 (Av) | 101.78 | - | * |
| | | 2483.5 (Pk) | 62.29 | 74.00 | -11.71 |
| | | 2483.5 (Av) | 50.01 | 54.00 | -3.99 |
| | | 4924 (Pk) | 59.56 | 74.00 | -14.44 |
| | | 4924 (Av) | 46.55 | 54.00 | -7.45 |
| | | 7386 (Pk) | 59.89 | 74.00 | -14.11 |
| | | 7386 (Av) | 49.57 | 54.00 | -4.43 |

| G Mode: 6Mbps | | | | | |
|---|---|---|---|---|---|
| Channel | Polarization | Frequency (MHz) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| Low | V | 2390 (Pk) | 61.01 | 74.00 | -12.99 |
| | | 2390 (Av) | 44.60 | 54.00 | -9.40 |
| | | 2412 (Pk) | 96.44 | - | * |
| | | 2412 (Av) | 87.14 | - | * |
| | | 4824 (Pk) | 50.15 | 74.00 | -23.85 |
| | | 4824 (Av) | 36.21 | 54.00 | -17.79 |
| | | 7236 (Pk) | 55.21 | 74.00 | -18.79 |
| | | 7236 (Av) | 42.98 | 54.00 | -11.02 |
| | H | 2390 (Pk) | 70.00 | 74.00 | -4.00 |
| | | 2390 (Av) | 52.45 | 54.00 | -1.55 |
| | | 2412 (Pk) | 104.08 | - | * |
| | | 2412 (Av) | 94.96 | - | * |
| | | 4824 (Pk) | 59.68 | 74.00 | -14.32 |
| | | 4824 (Av) | 45.22 | 54.00 | -8.78 |
| | | 7236 (Pk) | 60.21 | 74.00 | -13.79 |
| | | 7236 (Av) | 46.89 | 54.00 | -7.11 |
| Mid | V | 4874 (Pk) | 55.45 | 74.00 | -18.55 |
| | | 4874 (Av) | 41.43 | 54.00 | -12.57 |
| | | 7311 (Pk) | 56.99 | 74.00 | -17.01 |
| | | 7311 (Av) | 43.84 | 54.00 | -10.16 |
| | H | 4874 (Pk) | 55.41 | 74.00 | -18.59 |
| | | 4874 (Av) | 42.24 | 54.00 | -11.76 |
| | | 7311 (Pk) | 54.77 | 74.00 | -19.23 |
| | | 7311 (Av) | 42.50 | 54.00 | -11.50 |
| High | V | 2462 (Pk) | 95.11 | - | * |

| | | | | | |
|---|---|---|---|---|---|
| | | 2462 (Av) | 85.95 | - | * |
| | | 2483.5 (Pk) | 63.36 | 74.00 | -10.64 |
| | | 2483.5 (Av) | 45.20 | 54.00 | -8.80 |
| | | 4924 (Pk) | 48.38 | 74.00 | -25.62 |
| | | 4924 (Av) | 36.58 | 54.00 | -17.42 |
| | | 7386 (Pk) | 56.88 | 74.00 | -17.12 |
| | | 7386 (Av) | 42.69 | 54.00 | -11.31 |
| | H | 2462 (Pk) | 103.66 | - | * |
| | | 2462 (Av) | 93.96 | - | * |
| | | 2483.5 (Pk) | 71.27 | 74.00 | -2.73 |
| | | 2483.5 (Av) | 53.25 | 54.00 | -0.75 |
| | | 4924 (Pk) | 58.59 | 74.00 | -15.41 |
| | | 4924 (Av) | 44.58 | 54.00 | -9.42 |
| | | 7386 (Pk) | 59.89 | 74.00 | -14.11 |
| | | 7386 (Av) | 46.58 | 54.00 | -7.42 |

| N Mode: MCS0 | | | | | |
|---|---|---|---|---|---|
| Channel | Polarization | Frequency (MHz) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| Low | V | 2390 (Pk) | 61.91 | 74.00 | -12.09 |
| | | 2390 (Av) | 43.79 | 54.00 | -10.21 |
| | | 2412 (Pk) | 94.09 | - | * |
| | | 2412 (Av) | 85.11 | - | * |
| | | 4824 (Pk) | 50.10 | 74.00 | -23.90 |
| | | 4824 (Av) | 37.89 | 54.00 | -16.11 |
| | H | 2390 (Pk) | 70.88 | 74.00 | -3.12 |
| | | 2390 (Av) | 52.76 | 54.00 | -1.24 |
| | | 2412 (Pk) | 101.78 | - | * |
| | | 2412 (Av) | 92.76 | - | * |
| | | 4824 (Pk) | 55.69 | 74.00 | -18.31 |
| | | 4824 (Av) | 44.58 | 54.00 | -9.42 |
| Mid | V | 4874 (Pk) | 53.82 | 74.00 | -20.18 |
| | | 4874 (Av) | 41.41 | 54.00 | -12.59 |
| | H | 4874 (Pk) | 55.28 | 74.00 | -18.72 |
| | | 4874 (Av) | 42.62 | 54.00 | -11.38 |
| High | V | 2462 (Pk) | 93.48 | - | * |
| | | 2462 (Av) | 84.22 | - | * |
| | | 2483.5 (Pk) | 62.24 | 74.00 | -11.76 |
| | | 2483.5 (Av) | 45.03 | 54.00 | -8.97 |
| | | 4924 (Pk) | 50.29 | 74.00 | -23.71 |
| | | 4924 (Av) | 37.89 | 54.00 | -16.11 |
| | H | 2462 (Pk) | 100.59 | - | * |

| | | | | | |
|---|---|---|---|---|---|
| | | 2462 (Av) | 91.29 | - | * |
| | | 2483.5 (Pk) | 70.20 | 74.00 | -3.80 |
| | | 2483.5 (Av) | 52.14 | 54.00 | -1.86 |
| | | 4924 (Pk) | 57.45 | 74.00 | -16.55 |
| | | 4924 (Av) | 44.69 | 54.00 | -9.31 |

**5GHz Band**

| Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Polarization | Frequency (MHz) | Measured field Strength (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 802.11a | 6 | 5745 | V | 5745 (Pk) | 98.13 | - | * |
| | | | | 5745 (Av) | 87.98 | - | * |
| | | | | 11490 (Pk) | No Harmonic Found | | |
| | | | | 11490 (Av) | | | |
| | | | H | 5745 (Pk) | 108.27 | - | * |
| | | | | 5745 (Av) | 100.02 | - | * |
| | | | | 11490 (Pk) | No Harmonic Found | | |
| | | | | 11490 (Av) | | | |
| | | 5825 | V | 5825 (Pk) | 97.45 | - | * |
| | | | | 5825 (Av) | 87.56 | - | * |
| | | | | 11650 (Pk) | No Harmonic Found | | |
| | | | | 11650 (Av) | | | |
| | | | H | 5825 (Pk) | 107.89 | - | * |
| | | | | 5825 (Av) | 99.67 | - | * |
| | | | | 11650 (Pk) | No Harmonic Found | | |
| | | | | 11650 (Av) | | | |

| Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Polarization | Frequency (MHz) | Measured field Strength (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|
| 802.11n | 6.5 | 5725 | V | 5745 (Pk) | 98.43 | - | * |
| | | | | 5745 (Av) | 87.45 | - | * |
| | | | | 5745 (Pk) | No Harmonic Found | | |
| | | | | 5745 (Av) | | | |
| | | | H | 11490 (Pk) | 109.12 | - | * |
| | | | | 11490 (Av) | 100.24 | - | * |
| | | | | 11650 (Pk) | No Harmonic Found | | |
| | | | | 11650 (Av) | | | |
| | | 5825 | V | 5825 (Pk) | 97.87 | - | * |
| | | | | 5825 (Av) | 88.11 | - | * |
| | | | | 11650 (Pk) | No Harmonic Found | | |
| | | | | 11650 (Av) | | | |
| | | | H | 5745 (Pk) | 108.78 | - | * |
| | | | | 5745 (Av) | 100.23 | - | * |
| | | | | 11490 (Pk) | No Harmonic Found | | |
| | | | | 11490 (Av) | | | |

**ZigBee:**

| Channel | Polarization | Frequency (MHz) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|
| Low | V | 2390 (Pk) | 50.03 | 74.00 | -23.97 |
| | | 2390 (Av) | 32.33 | 54.00 | -21.67 |
| | | 2405 (Pk) | 103.64 | - | * |
| | | 2405 (Av) | 98.84 | - | * |
| | | 4810 (Pk) | 54.22 | 74.00 | -19.78 |
| | | 4810 (Av) | 46.60 | 54.00 | -7.40 |
| | | 7215 (Pk) | 61.18 | 74.00 | -12.82 |
| | | 7215 (Av) | 52.07 | 54.00 | -1.93 |
| | H | 2390 (Pk) | 49.96 | 74.00 | -24.04 |
| | | 2390 (Av) | 39.91 | 54.00 | -14.09 |
| | | 2405 (Pk) | 107.35 | - | * |
| | | 2405 (Av) | 103.67 | - | * |
| | | 4810 (Pk) | 55.67 | 74.00 | -18.33 |
| | | 4810 (Av) | 48.45 | 54.00 | -5.55 |
| | | 7215 (Pk) | 58.54 | 74.00 | -15.46 |
| | | 7215 (Av) | 47.15 | 54.00 | -6.85 |
| Mid | V | 4880 (Pk) | 53.71 | 74.00 | -20.29 |
| | | 4880 (Av) | 44.06 | 54.00 | -9.94 |
| | | 7320 (Pk) | 61.61 | 74.00 | -12.39 |
| | | 7320 (Av) | 49.27 | 54.00 | -4.73 |

| | | | | | |
|---|---|---|---|---|---|
| | H | 4880 (Pk) | 54.61 | 74.00 | -19.39 |
| | | 4880 (Av) | 45.85 | 54.00 | -8.15 |
| | | 7320 (Pk) | 58.67 | 74.00 | -15.33 |
| | | 7320 (Av) | 46.31 | 54.00 | -7.69 |
| High | V | 2480 (Pk) | 103.22 | - | * |
| | | 2480 (Av) | 98.30 | - | * |
| | | 2483.5 (Pk) | 52.08 | 74.00 | -21.92 |
| | | 2483.5 (Av) | 41.33 | 54.00 | -12.67 |
| | | 4960 (Pk) | 52.23 | 74.00 | -21.77 |
| | | 4960 (Av) | 40.74 | 54.00 | -13.26 |
| | | 7440 (Pk) | 59.67 | 74.00 | -14.33 |
| | | 7440 (Av) | 48.75 | 54.00 | -5.25 |
| | H | 2480 (Pk) | 107.47 | - | * |
| | | 2480 (Av) | 103.62 | - | * |
| | | 2483.5 (Pk) | 61.66 | 74.00 | -12.34 |
| | | 2483.5 (Av) | 50.76 | 54.00 | -3.24 |
| | | 4960 (Pk) | 55.10 | 74.00 | -18.90 |
| | | 4960 (Av) | 46.11 | 54.00 | -7.89 |
| | | 7440 (Pk) | 59.17 | 74.00 | -14.83 |
| | | 7440 (Av) | 46.33 | 54.00 | -7.67 |

**Bluetooth LE:**

| Channel | Polarization | Frequency (MHz) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|
| Low | V | 2390 (Pk) | 44.98 | 74.00 | -29.02 |
| | | 2390 (Av) | 31.38 | 54.00 | -22.62 |
| | | 2402 (Pk) | 102.54 | - | * |
| | | 2402 (Av) | 93.42 | - | * |
| | | 4804 (Pk) | 52.12 | 74.00 | -21.88 |
| | | 4804 (Av) | 40.01 | 54.00 | -13.99 |
| | H | 2390 (Pk) | 47.98 | 74.00 | -26.02 |
| | | 2390 (Av) | 34.55 | 54.00 | -19.45 |
| | | 2402 (Pk) | 106.78 | - | * |
| | | 2402 (Av) | 98.78 | - | * |
| | | 4804 (Pk) | 55.89 | 74.00 | -18.11 |
| | | 4804 (Av) | 44.32 | 54.00 | -9.68 |
| Mid | V | 4884 (Pk) | 51.67 | 74.00 | -22.33 |
| | | 4884 (Av) | 36.37 | 54.00 | -17.63 |
| | H | 4884 (Pk) | 56.15 | 74.00 | -17.85 |
| | | 4884 (Av) | 37.43 | 54.00 | -16.57 |

| | | | | | |
|---|---|---|---|---|---|
| High | V | 2480 (Pk) | 102.01 | - | * |
| | | 2480 (Av) | 94.21 | - | * |
| | | 2483.5 (Pk) | 50.34 | 74.00 | -23.66 |
| | | 2483.5 (Av) | 36.12 | 54.00 | -17.88 |
| | | 4960 (Pk) | 52.33 | 74.00 | -21.67 |
| | | 4960 (Av) | 38.53 | 54.00 | -15.47 |
| | H | 2480 (Pk) | 107.01 | - | * |
| | | 2480 (Av) | 101.2 | - | * |
| | | 2483.5 (Pk) | 52.54 | 74.00 | -21.46 |
| | | 2483.5 (Av) | 36.23 | 54.00 | -17.77 |
| | | 4960 (Pk) | 54.32 | 74.00 | -19.68 |
| | | 4960 (Av) | 42.58 | 54.00 | -11.42 |

**Conducted Emission Test on A.C. Power Line** **Section 15.207**

**Result** **Pass**

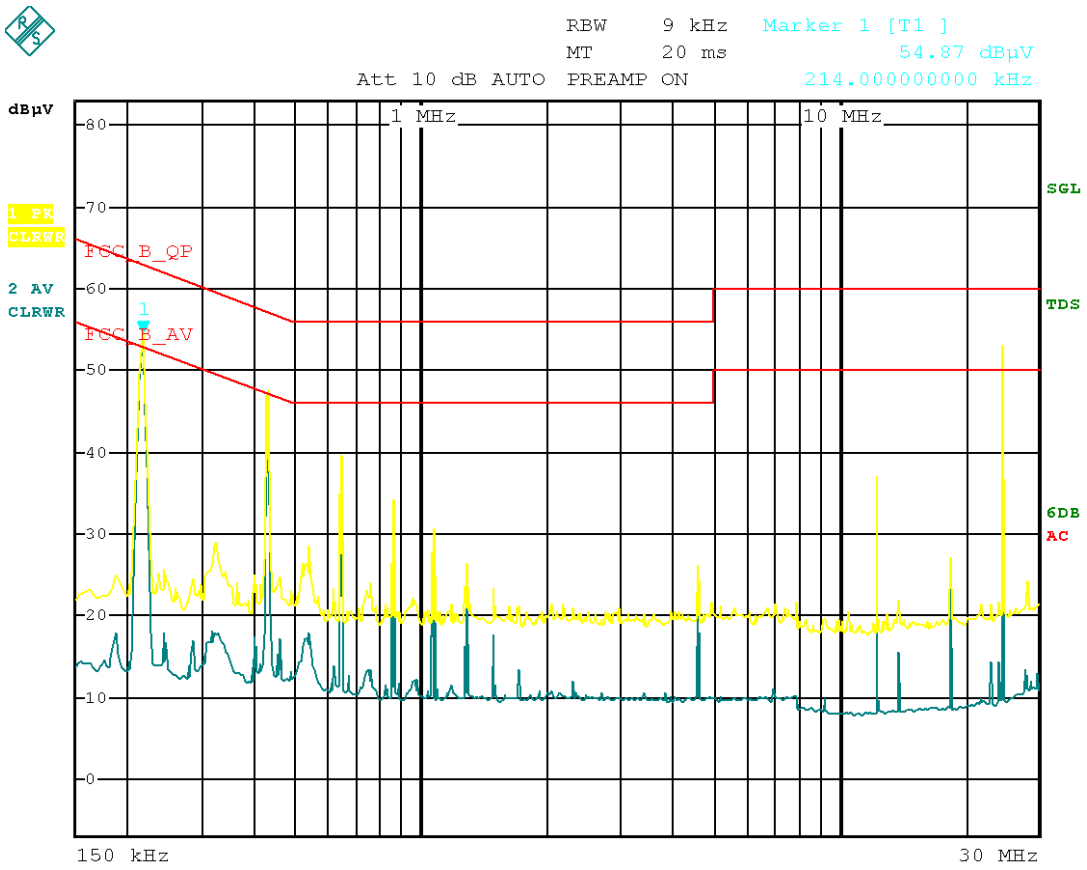
| | | |
|---|---|---|
| Test Specification | : | FCC Part 15 Section 15.207 |
| Test Method | : | ANSI C63.4-2009 |
| Testing Location | : | Screened room |
| Measurement Bandwidth | : | 9kHz |
| Frequency Range | : | 150kHz – 30MHz |
| Supply Voltage | : | 120VAC,60Hz |

**Limit of section 15.207**

| Frequency of emission (MHz) | QP Limit (dBµV) | AV Limit (dBµV/m) |
|---|---|---|
| 0.15 – 0.5 | 66 – 56* | 56 – 46* |
| 0.5 – 5 | 56 | 46 |
| 5 – 30 | 60 | 50 |

* Decreases with the logarithm of the frequency

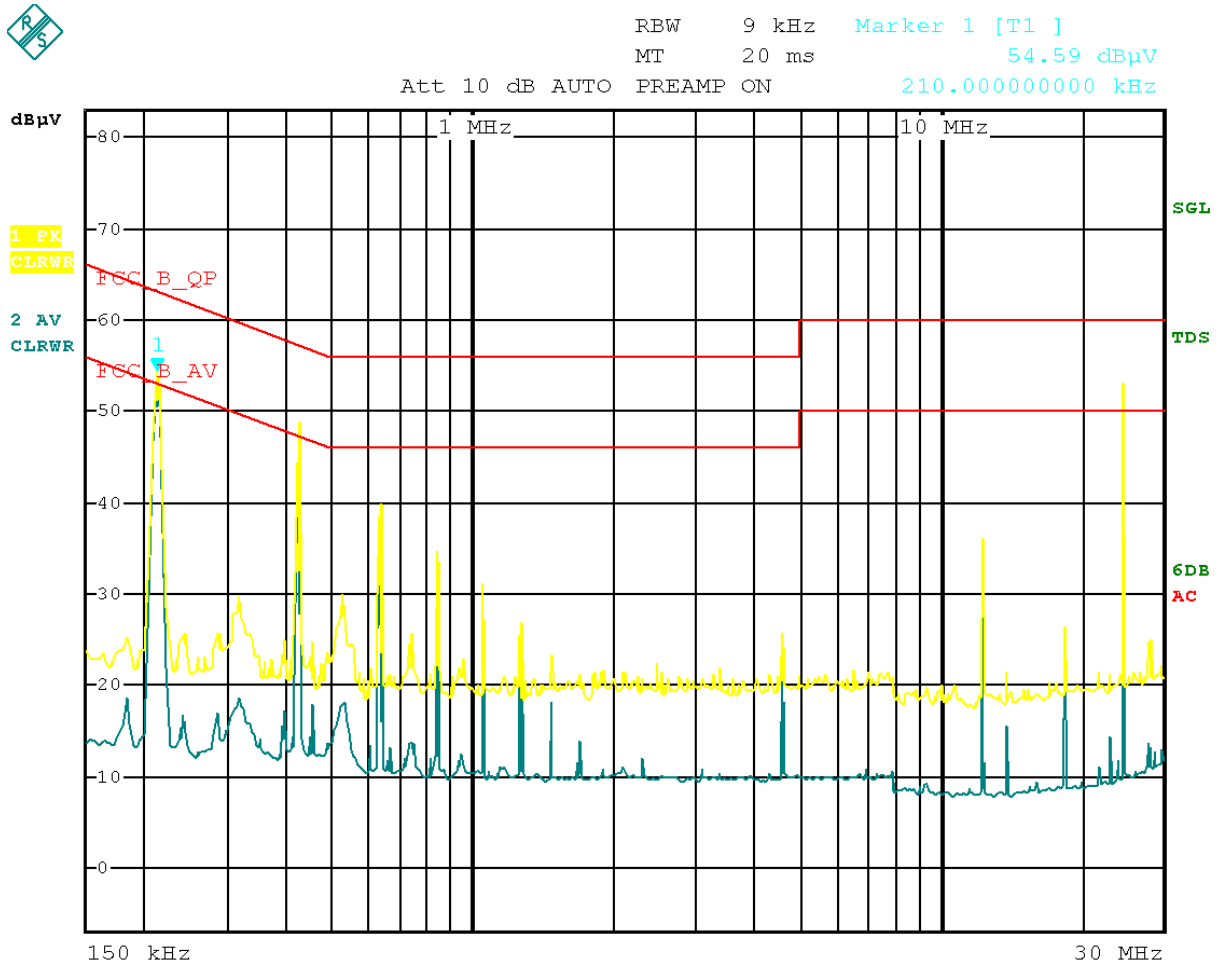
**Test Result:**




**Line Graph**

| EDIT PEAK LIST (Final Measurement Results) | | | |
|---|---|---|---|
| Trace1: | FCC_B_QP | | |
| Trace2: | FCC_B_AV | | |
| Trace3: | --- | | |
| TRACE | FREQUENCY | LEVEL dBµV | DELTA LIMIT dB |
| 1 Quasi Peak | 24.578 MHz | 52.42 L1 | -7.57 |
| 1 Quasi Peak | 214 kHz | 52.49 L1 | -10.55 |
| 2 Average | 12.29 MHz | 36.01 L1 | -13.98 |
| 2 Average | 430 kHz | 33.05 L1 | -14.19 |
| 1 Quasi Peak | 12.29 MHz | 35.91 L1 | -24.08 |
| 1 Quasi Peak | 430 kHz | 32.27 L1 | -24.98 |
| 2 Average | 642 kHz | 20.54 L1 | -25.45 |
| 2 Average | 858 kHz | 10.08 L1 | -35.91 |
| 1 Quasi Peak | 642 kHz | 19.72 L1 | -36.27 |
| 1 Quasi Peak | 858 kHz | 15.09 L1 | -40.90 |

**Line: Table**




**Neutral: Graph**

| EDIT PEAK LIST (Final Measurement Results) | | | |
|---|---|---|---|
| Trace1: | FCC_B_QP | | |
| Trace2: | FCC_B_AV | | |
| Trace3: | --- | | |
| TRACE | FREQUENCY | LEVEL dBµV | DELTA LIMIT dB |
| 2 Average | 422 kHz | 44.38 N | -3.02 |
| 1 Quasi Peak | 24.578 MHz | 52.45 N | -7.54 |
| 1 Quasi Peak | 210 kHz | 54.43 N | -8.76 |
| 1 Quasi Peak | 422 kHz | 43.99 N | -13.41 |
| 2 Average | 12.29 MHz | 34.97 N | -15.02 |
| 2 Average | 634 kHz | 25.64 N | -20.35 |
| 2 Average | 842 kHz | 22.81 N | -23.18 |
| 1 Quasi Peak | 12.29 MHz | 34.90 N | -25.09 |
| 1 Quasi Peak | 634 kHz | 24.70 N | -31.29 |
| 1 Quasi Peak | 842 kHz | 22.86 N | -33.13 |

**Neutral: Table**

**Power level Settings used during testing:**

| | | Channels | | |
|---|---|---|---|---|
| **Mode** | **Data Rate (Mbps)** | **Low** | **Mid** | **High** |
| 802.11 b | 1 | 18 | 20 | 18 |
| | 11 | 19 | 20 | 19 |
| 802.11 g | 6 | 13 | 20 | 12 |
| | 24 | 13 | 20 | 12 |
| | 54 | 13 | 20 | 12 |
| 802.11 n | MCS0 | 11 | 20 | 10 |
| | MCS4 | 11 | 20 | 10 |
| | MCS7 | 11 | 20 | 10 |
| Bluetooth | 1 | 15 | 15 | 15 |
| | 2 | 15 | 15 | 15 |
| | 3 | 15 | 15 | 15 |
| | LE | 15 | 15 | 15 |
| Zigbee | 250kbps | 16 | 16 | 16 |