

**Produkte**  
*Products*

|  |   |  |  |                      |                     |
|--|---|--|--|----------------------|---------------------|
| <b>Prüfbericht - Nr.:</b> 19660145 001   |   | <b>Seite 1 von 172</b>                           |  |                      |                     |
| <i>Test Report No.:</i>  |   | <i>Page 1 of 172</i>                             |  |                      |                     |
| <b>Auftraggeber:</b><br><i>Client:</i>   | Redpine Signals Inc<br>2107 N.First Street, Suite 680,<br>San Jose, CA 95131-2019<br>United States  |  |  |                      |                     |
| <b>Gegenstand der Prüfung:</b><br><i>Test item:</i>  | Dual Band Combo Module  |  |  |                      |                     |
| <b>Bezeichnung:</b><br><i>Identification:</i>  | RS9113DB  | <b>Serien-Nr.:</b><br><i>Serial No.</i>          | Engineering Sample   |                      |                     |
| <b>Wareneingangs-Nr.:</b><br><i>Receipt No.:</i>   | 18030552861   | <b>Eingangsdatum:</b><br><i>Date of receipt:</i> | 11.11.2014   |                      |                     |
| <b>Prüfört:</b><br><i>Testing location:</i>  | Refer Page 4 of 172 for test facilities   |  |  |                      |                     |
| <b>Prüfgrundlage:</b><br><i>Test specification:</i>  | FCC Part 15: Subpart C Section 15.247<br>ANSI C63.4-2009  |  |  |                      |                     |
| <b>Prüfergebnis:</b><br><i>Test Result:</i>  | Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).<br><i>The test items passed the test specification(s).</i>   |  |  |                      |                     |
| <b>Prüflaboratorium:</b><br><i>Testing Laboratory:</i>   | TÜV Rheinland (India) Pvt. Ltd.<br>82/A, 3rd Main, West Wing, Electronic City Phase 1<br>Hosur Road, Bangalore – 560 100. India<br><br>FCC Registration No.: 176555 |  |  |                      |                     |
| <b>geprüft / tested by:</b>  |   | <b>kontrolliert / reviewed by:</b>               |  |                      |                     |
| 08.12.2014   | Vinay N<br>Sr. Engineer   | 08.12.2014                                       | Raghavendra Kulkarni<br>Sr. Manager  |                      |                     |
| <i>Datum</i>   | <i>Name/Stellung</i>  | <i>Unterschrift</i>                              | <i>Datum</i>   | <i>Name/Stellung</i> | <i>Unterschrift</i> |
| <i>Date</i>  | <i>Name/Position</i>  | <i>Signature</i>                                 | <i>Date</i>  | <i>Name/Position</i> | <i>Signature</i>    |
| <b>Sonstiges / Other Aspects:</b> FCC ID : XF6-RS9113DB  |   |  |  |                      |                     |
| <b>Abkürzungen:</b>  | P(ass) = entspricht Prüfgrundlage<br>F(ail) = entspricht nicht Prüfgrundlage<br>N/A = nicht anwendbar<br>N/T = nicht getestet                                       | <b>Abbreviations:</b>                            | P(ass) = passed<br>F(ail) = failed<br>N/A = not applicable<br>N/T = not tested |                      |                     |
| <p><b>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.</b></p> <p><i>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.</i></p> |   |  |  |                      |                     |

**Test Result Summary**

| <b>Clause</b>           | <b>Test Item</b>  | <b>Result</b> |
|-------------------------|---|---------------|
| 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**

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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: -40°C to 85° C   |          |

#### Test Conditions:

Supply Voltage: 5V DC from USB

#### Environmental conditions:

Temperature: +24 °C      RH: 62%

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## **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**

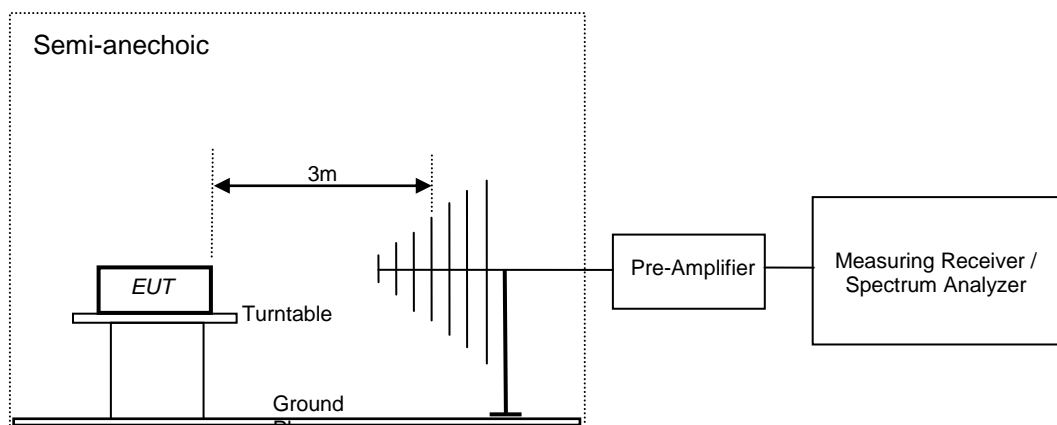
For Radiated spurious emissions, the tests were performed for all data rates and only worst case results are reported in this report.

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## 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.



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## 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:**



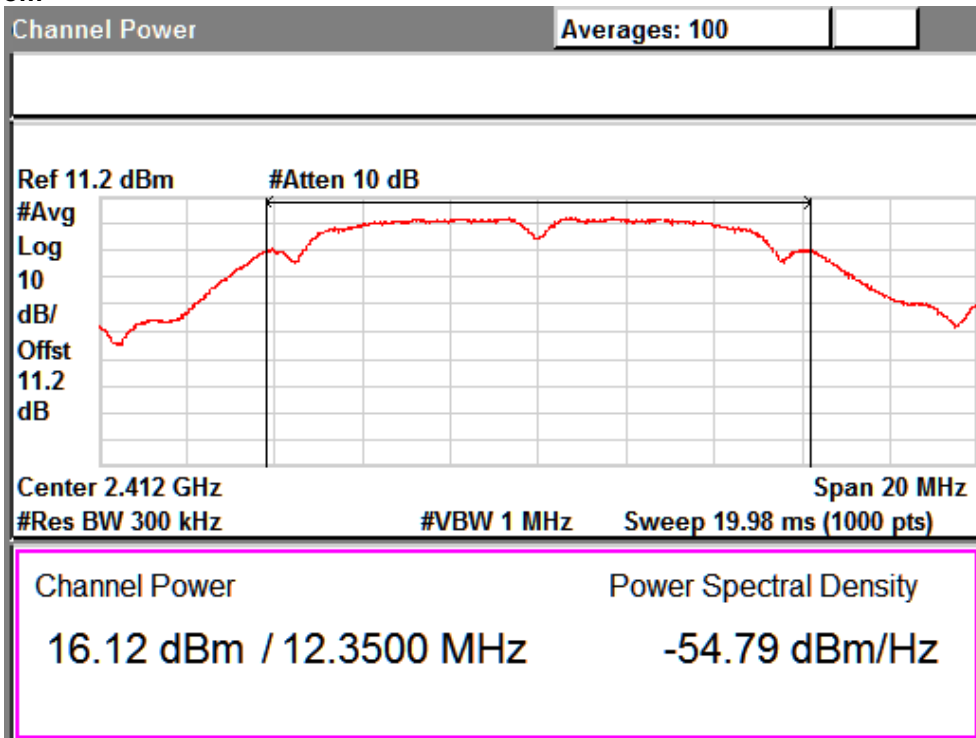
**Note:** For measurement of Maximum Average conducted output power method AVGSA-1 was used

**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      |

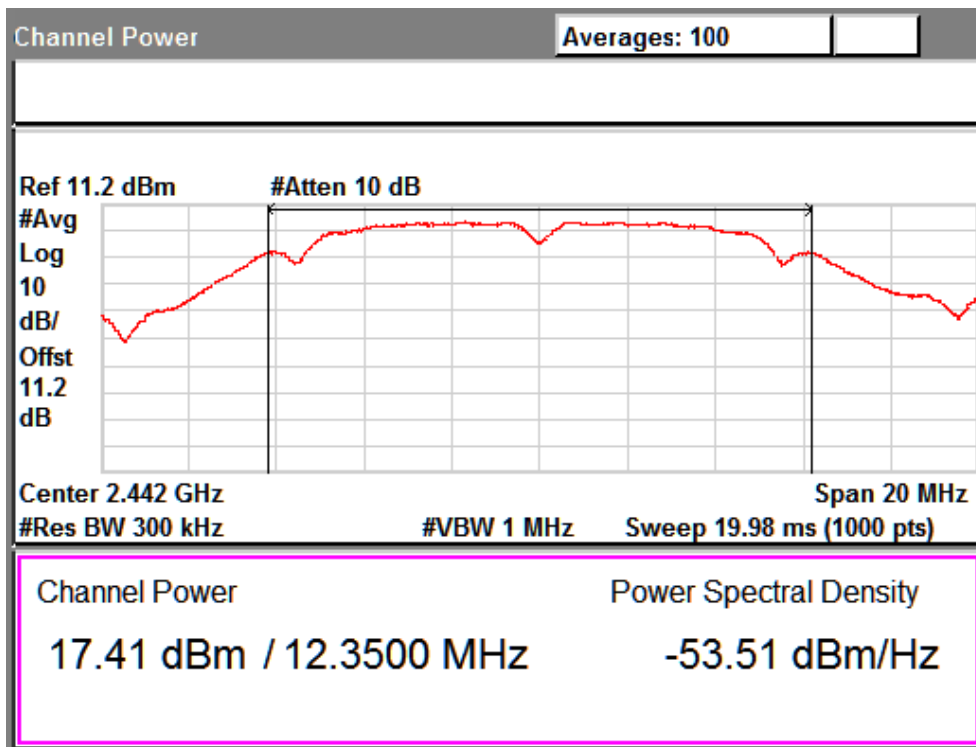


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Data rate: 1 Mbps

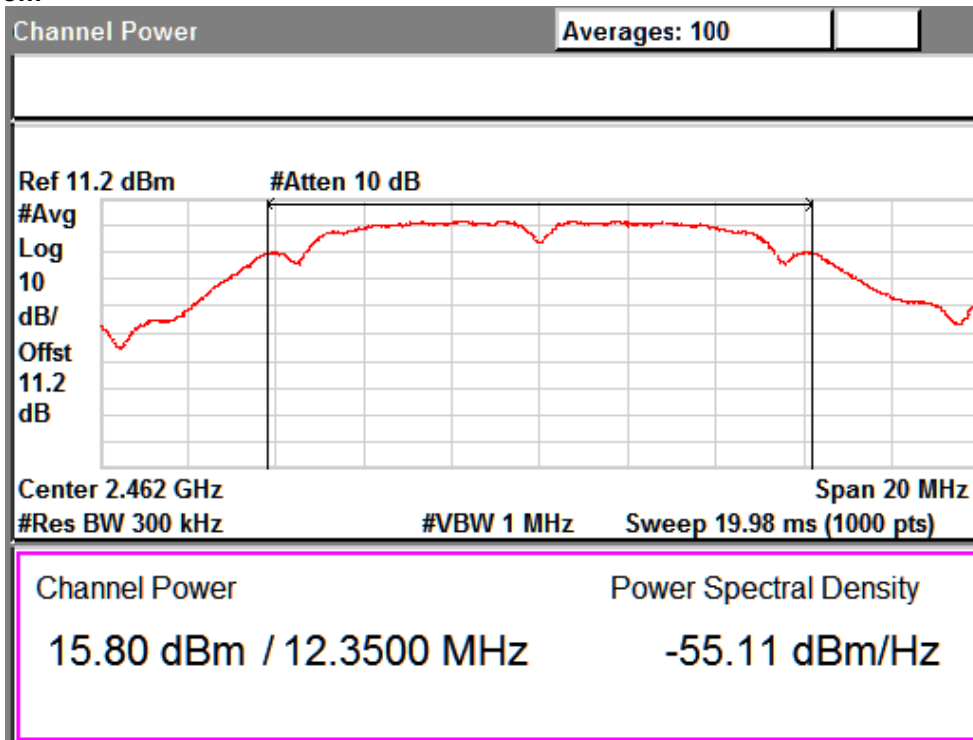
Channel Frequency: 2412 MHz



Data rate: 1 Mbps

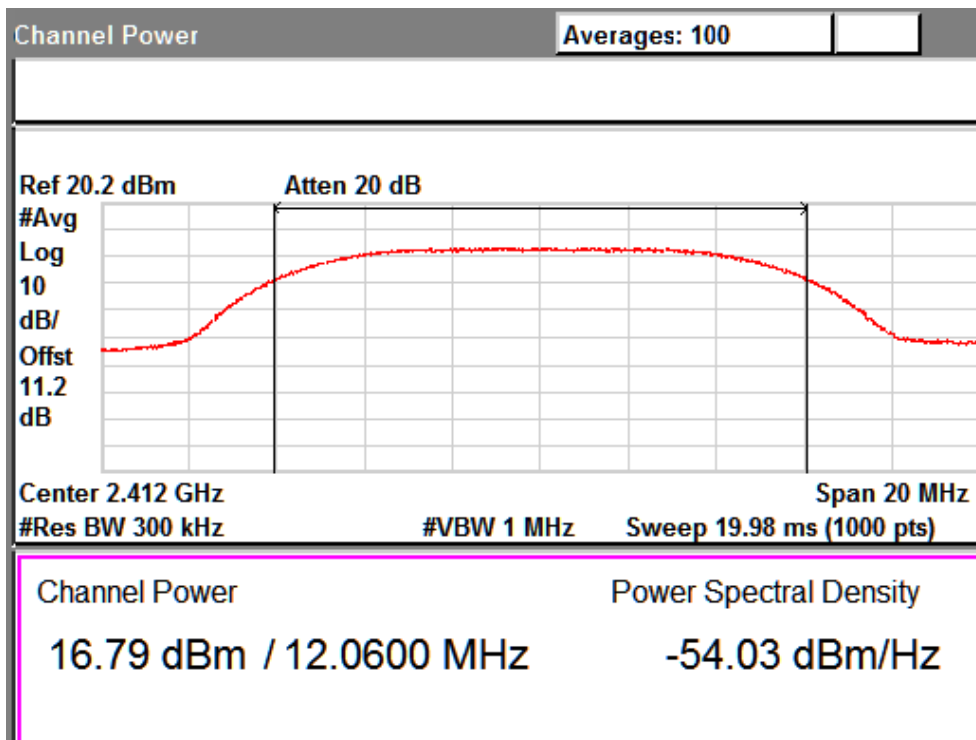
Channel Frequency: 2442 MHz

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Data rate: 1 Mbps

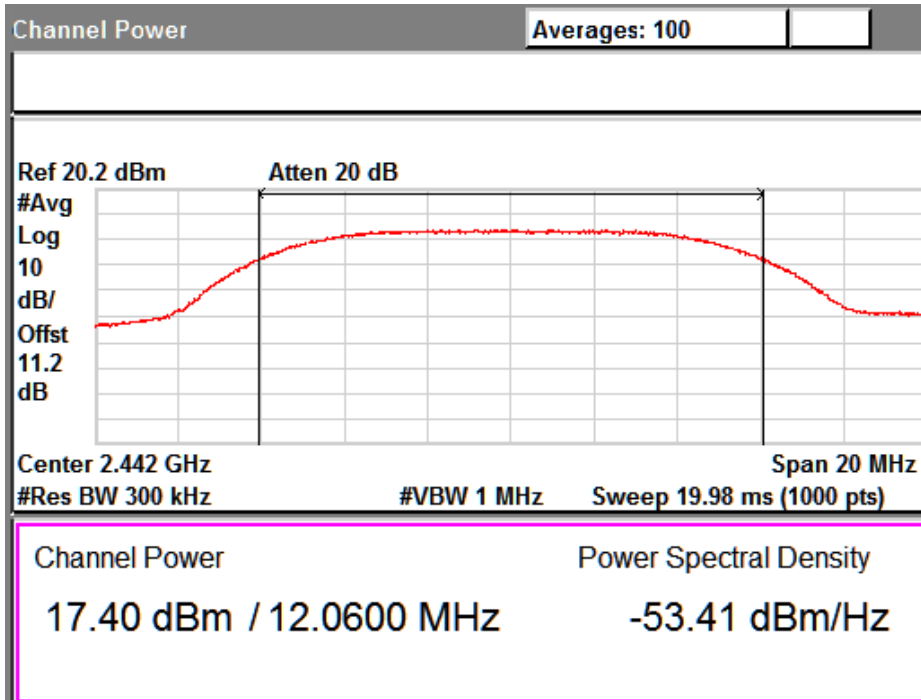
Channel Frequency: 2462 MHz



Data rate: 11 Mbps

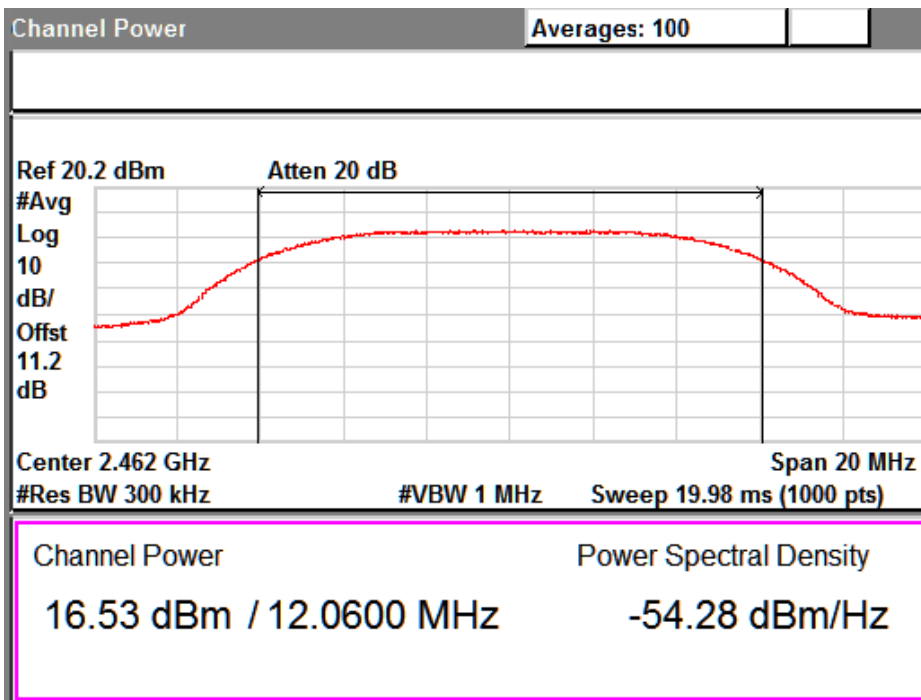
Channel Frequency: 2412 MHz

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Data rate: 11 Mbps

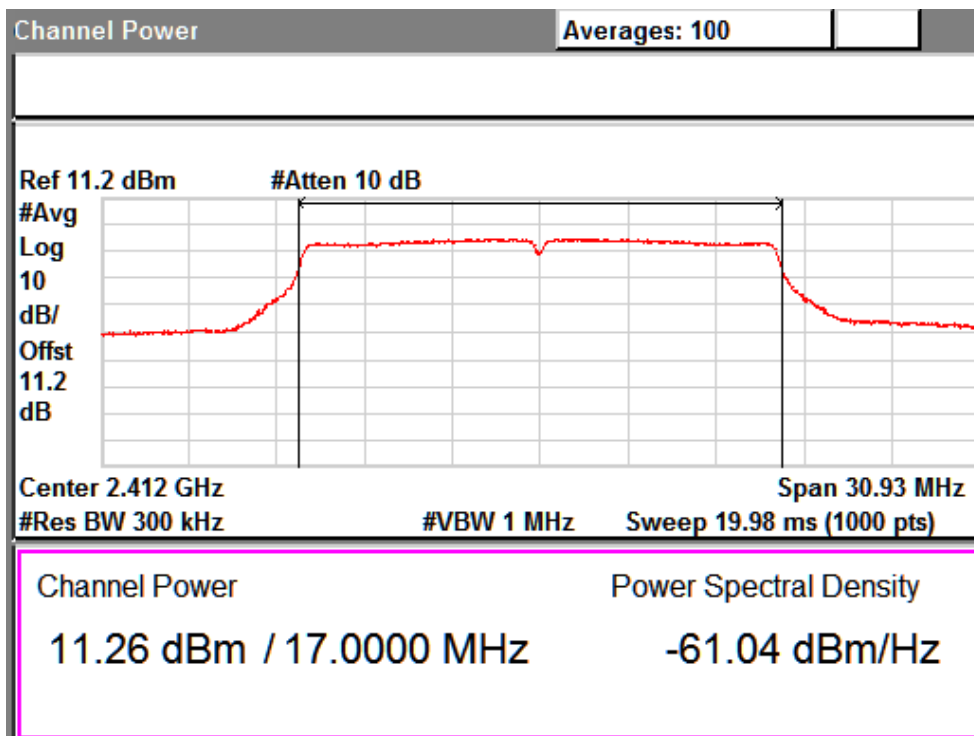
Channel Frequency: 2442 MHz



Data rate: 11 Mbps

Channel Frequency: 2462 MHz

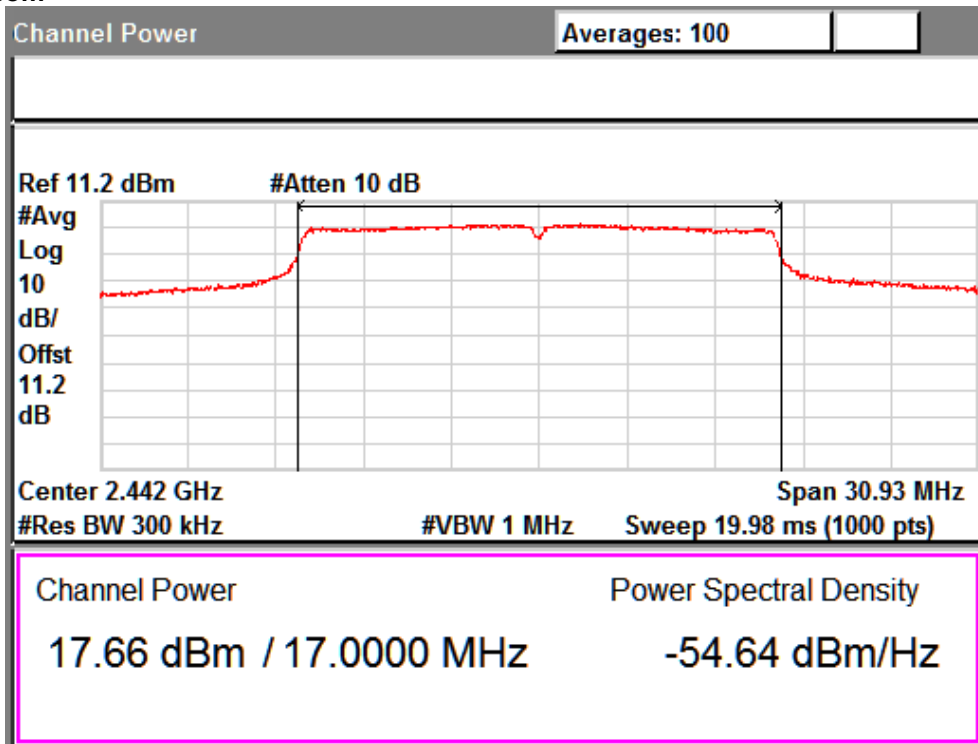
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|------------------|-------------------------|-------------------|-------------|-------------|
| g               | 6                | 2412                    | 11.26             | 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

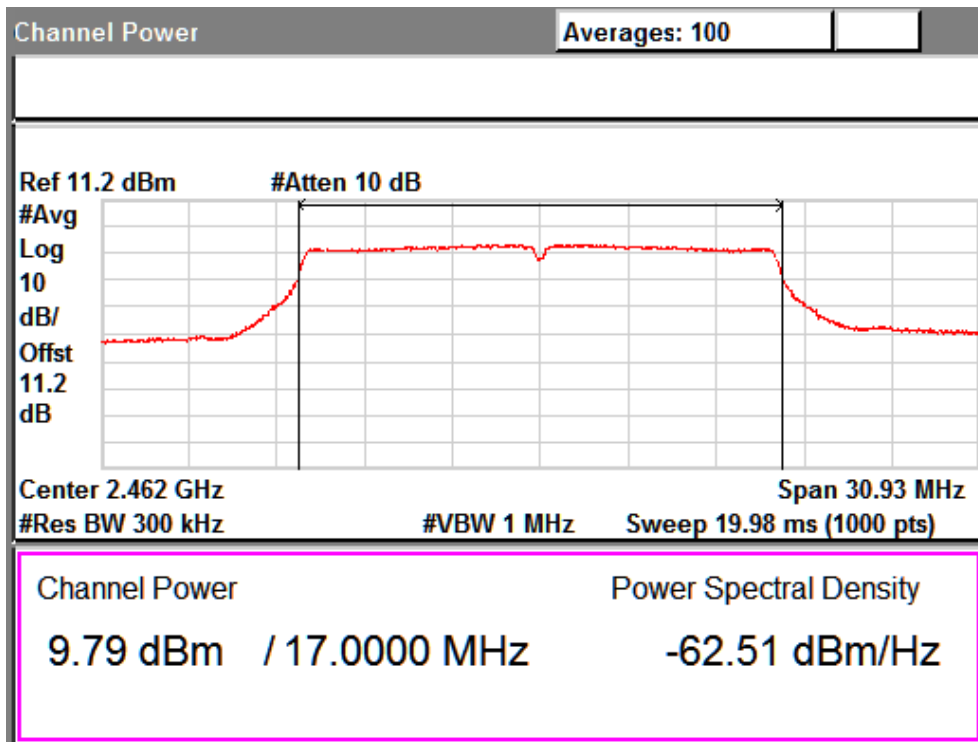
Channel Frequency: 2412 MHz

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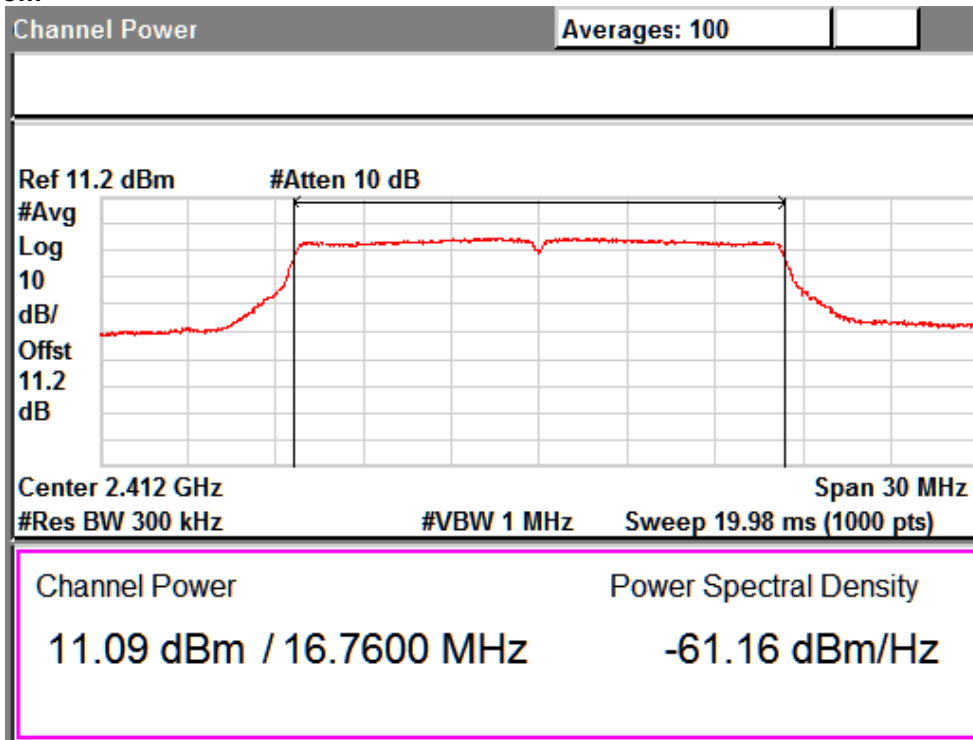
Data rate: 6 Mbps

Channel Frequency: 2442 MHz



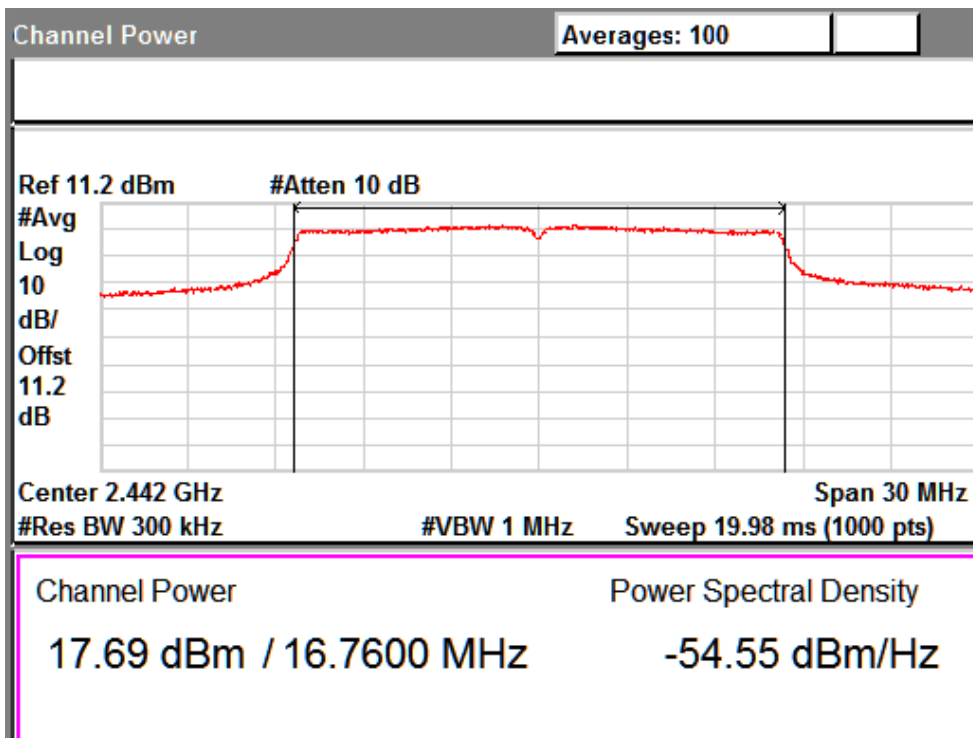
Data rate: 6 Mbps

Channel Frequency: 2462 MHz



Data rate: 24 Mbps

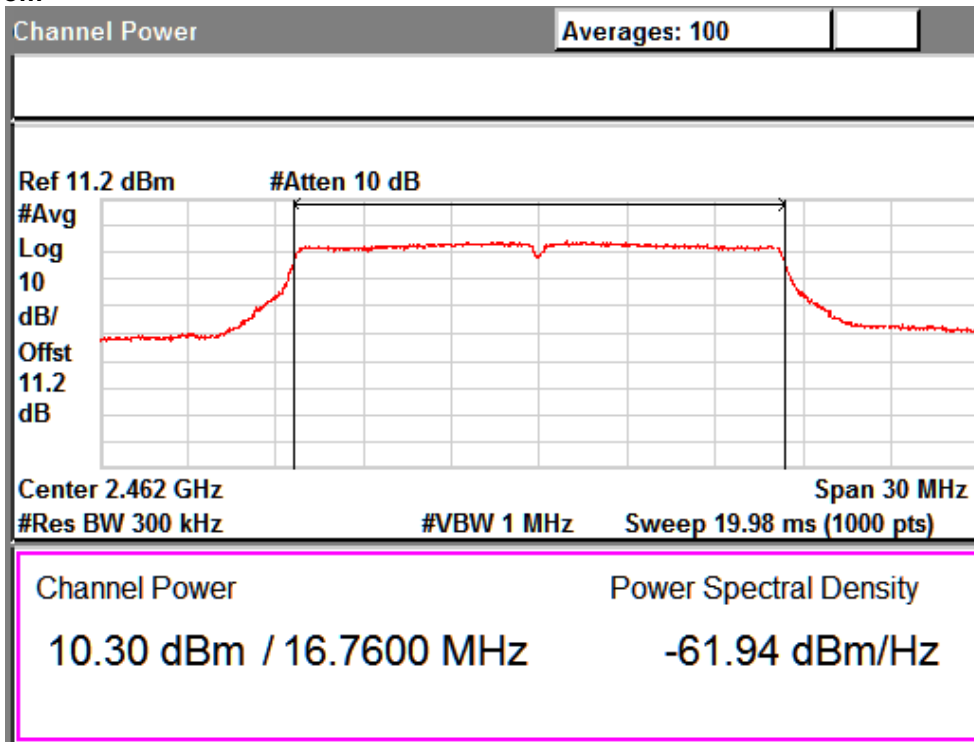
Channel Frequency: 2412 MHz



Data rate: 24 Mbps

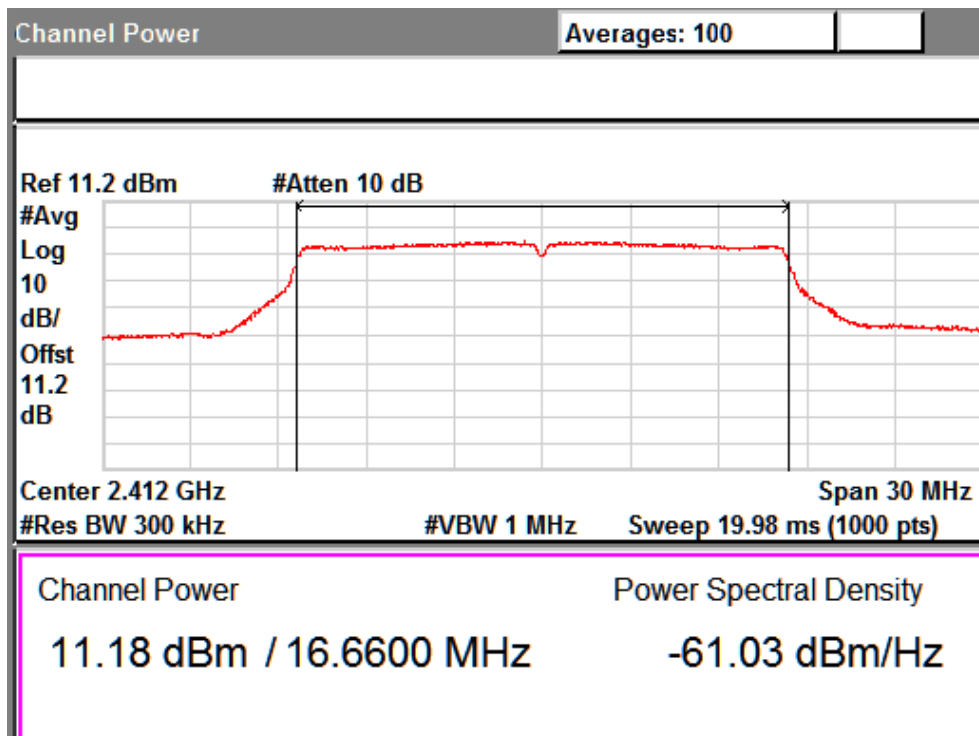
Channel Frequency: 2442 MHz

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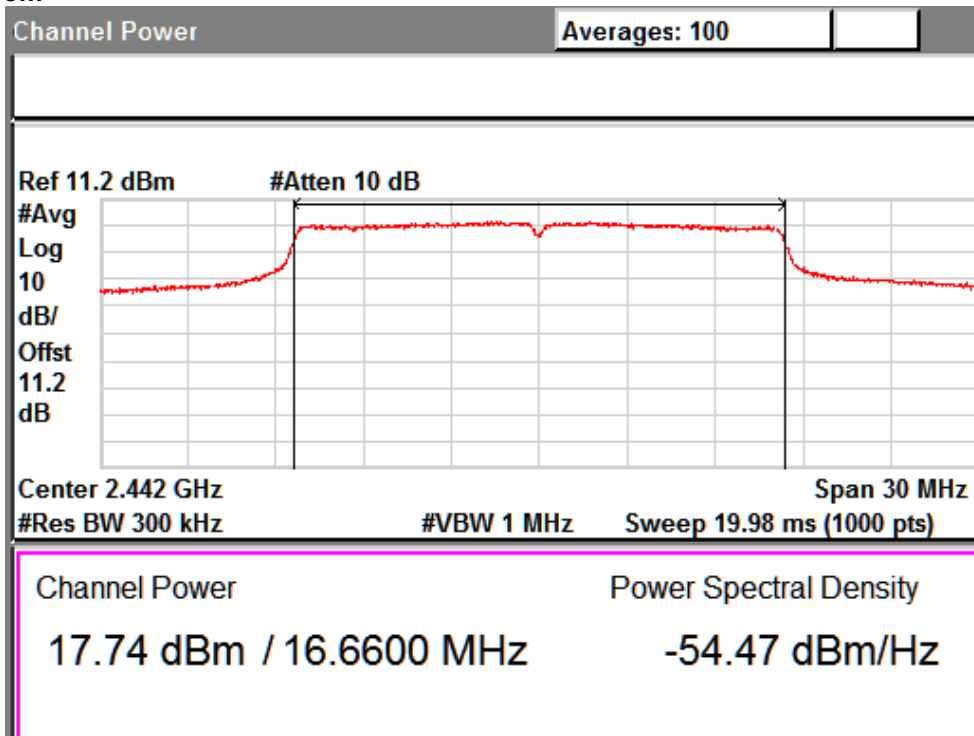
Data rate: 24 Mbps

Channel Frequency: 2462 MHz



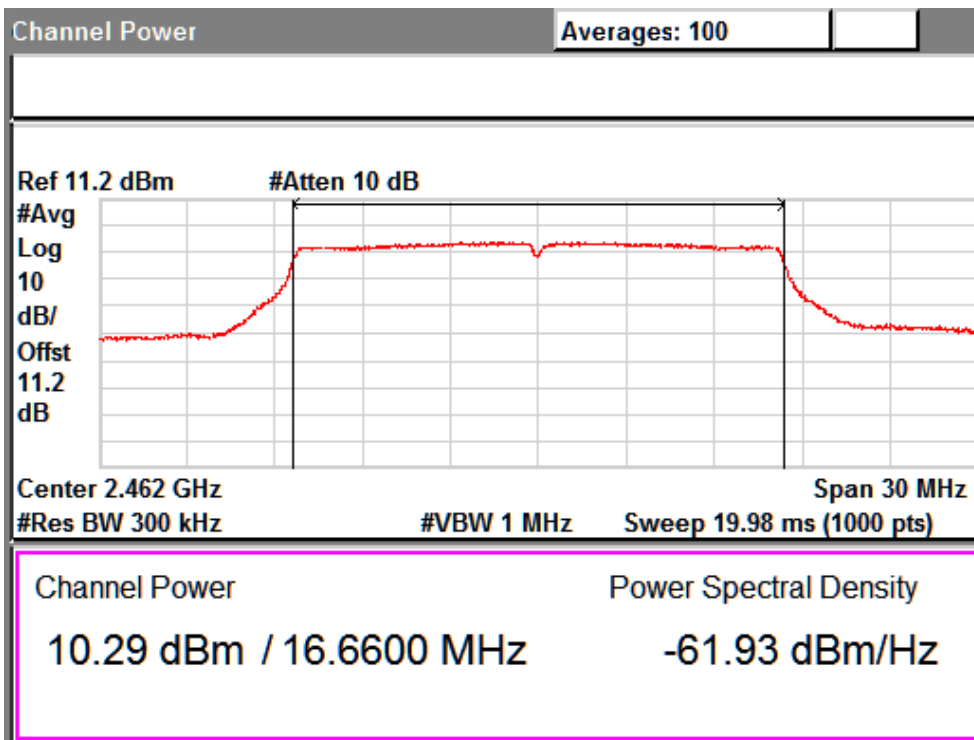
Data rate: 54 Mbps

Channel Frequency: 2412 MHz



Data rate: 54 Mbps

Channel Frequency: 2442 MHz

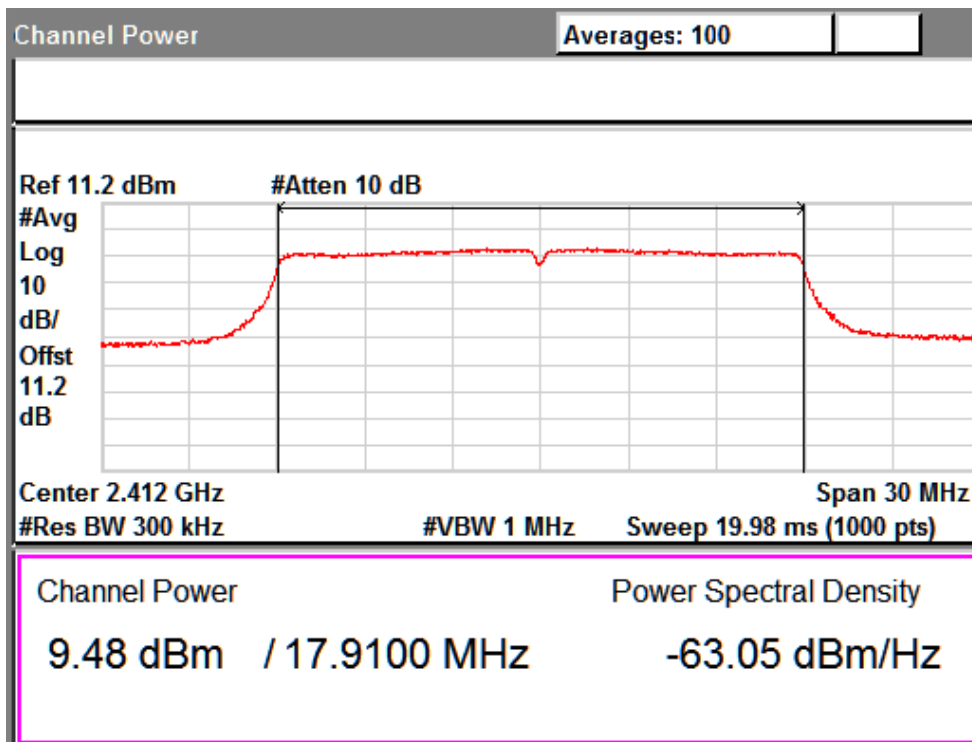


Data rate: 54 Mbps

Channel Frequency: 2462 MHz



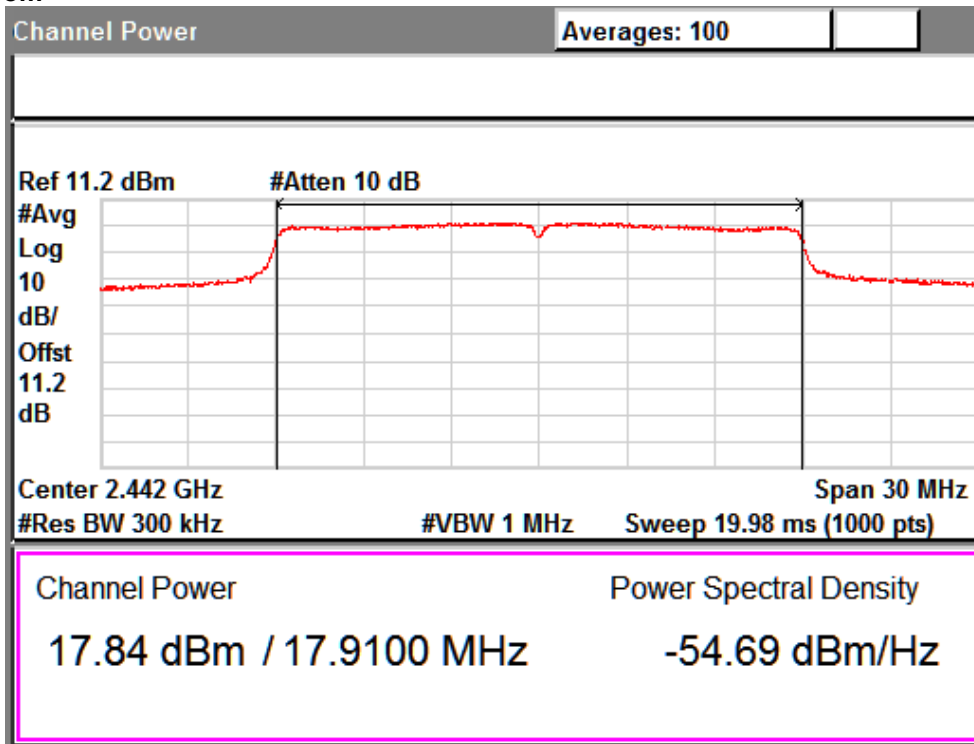
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|------------------|-------------------------|-------------------|-------------|-------------|
| n               | 6.5              | 2412.00                 | 09.48             | 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

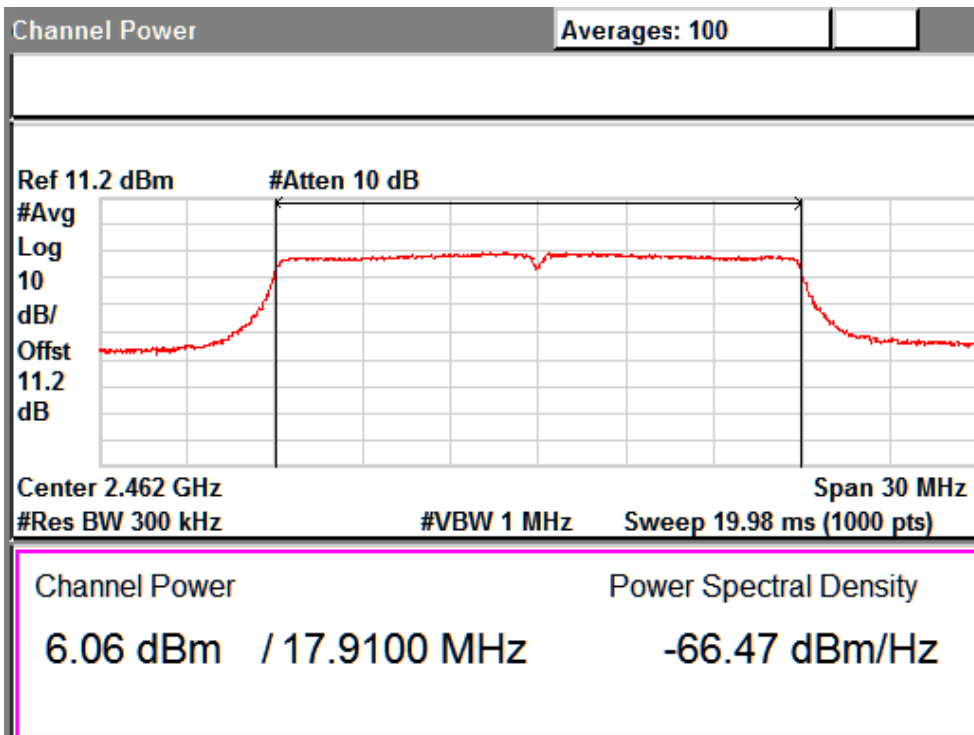
Channel Frequency: 2412 MHz

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Data Rate: 6.5 Mbps

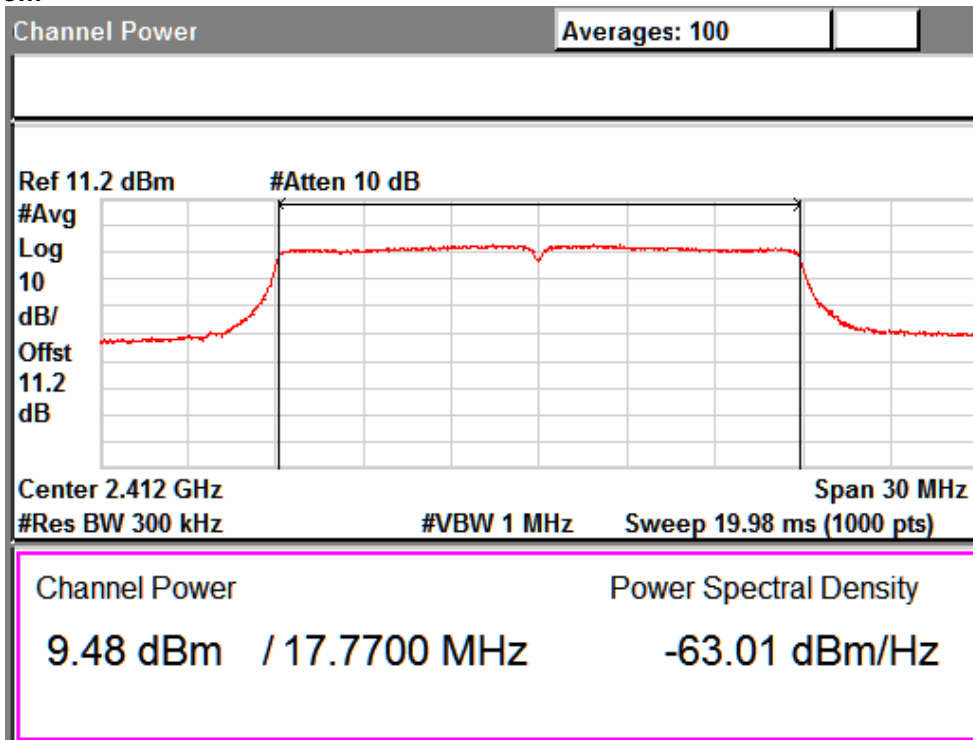
Channel Frequency: 2442 MHz



Data Rate: 6.5 Mbps

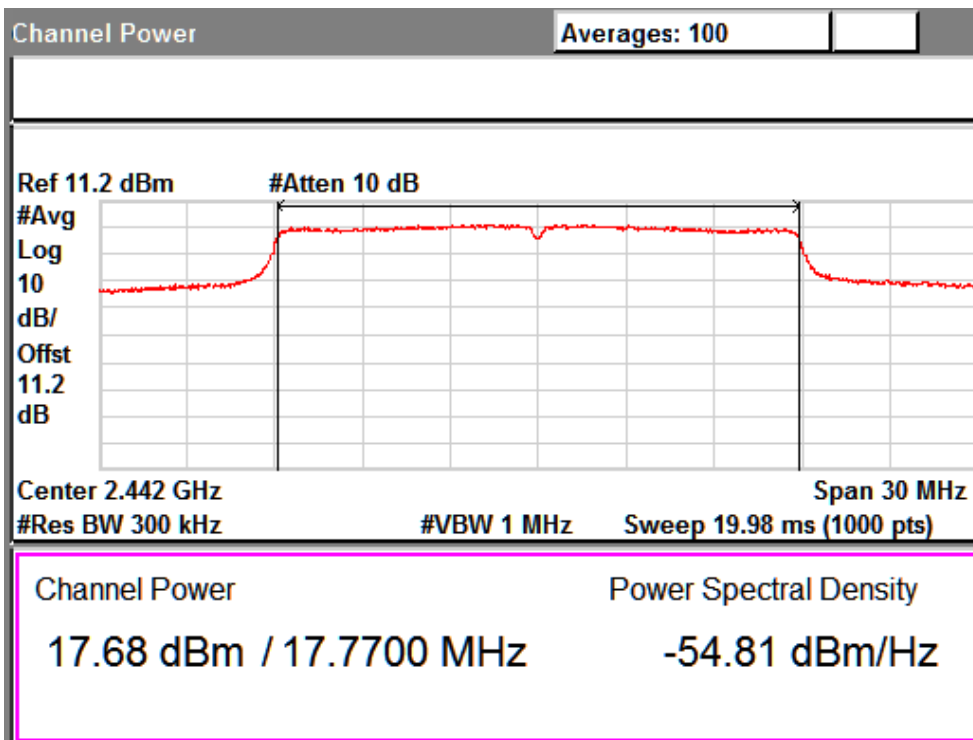
Channel Frequency: 2462 MHz

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Data Rate: 39 Mbps

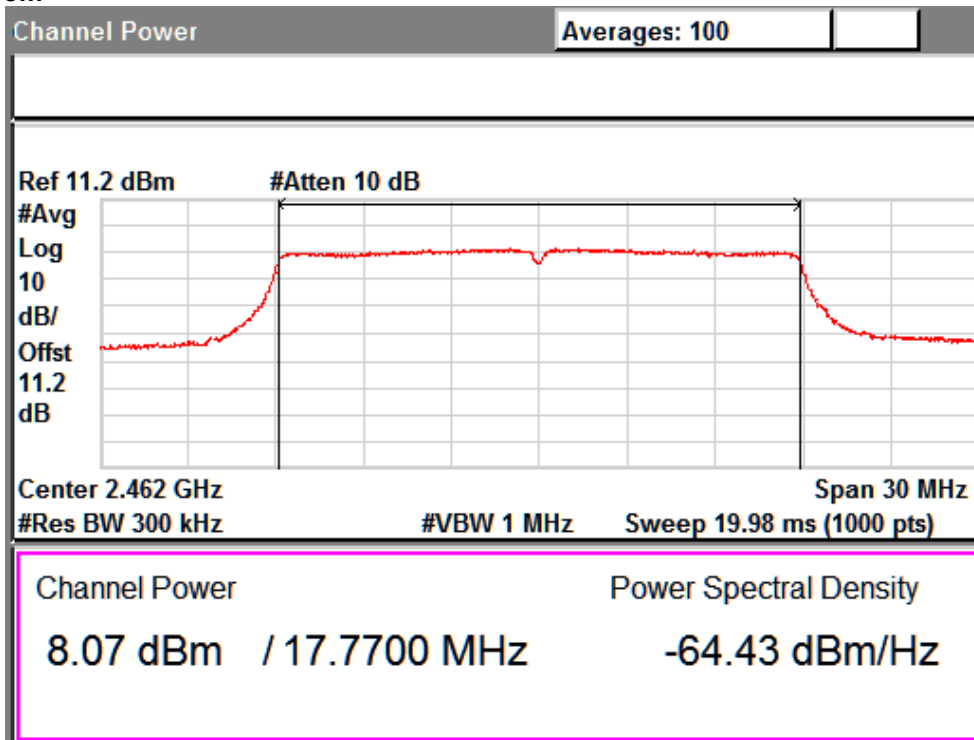
Channel Frequency: 2412 MHz



Data Rate: 39 Mbps

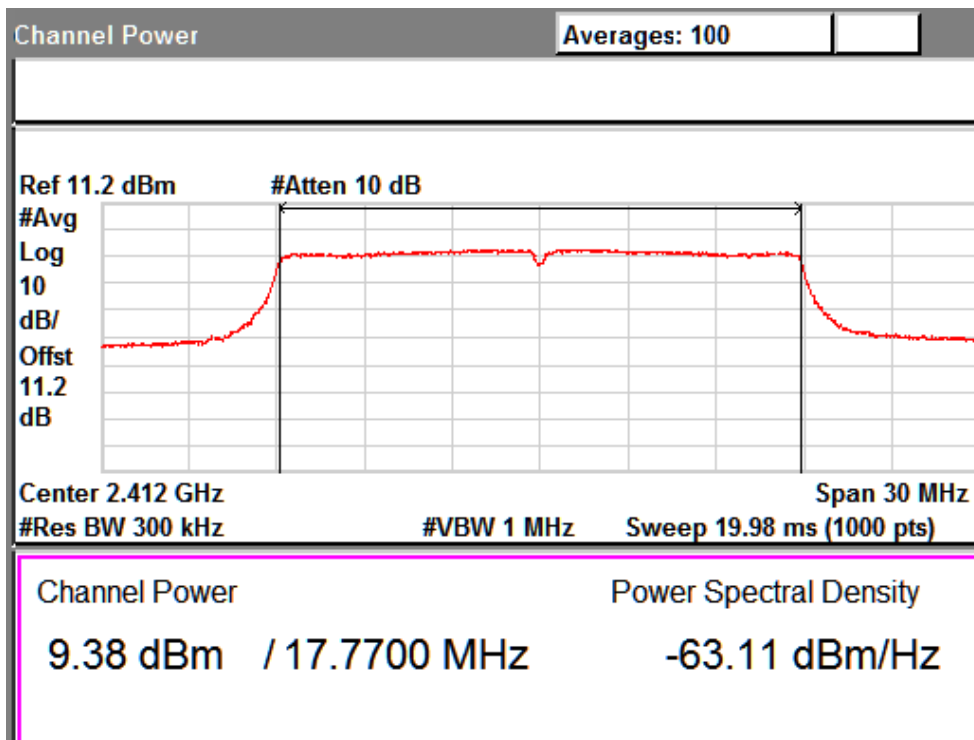
Channel Frequency: 2442 MHz

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Data Rate: 39 Mbps

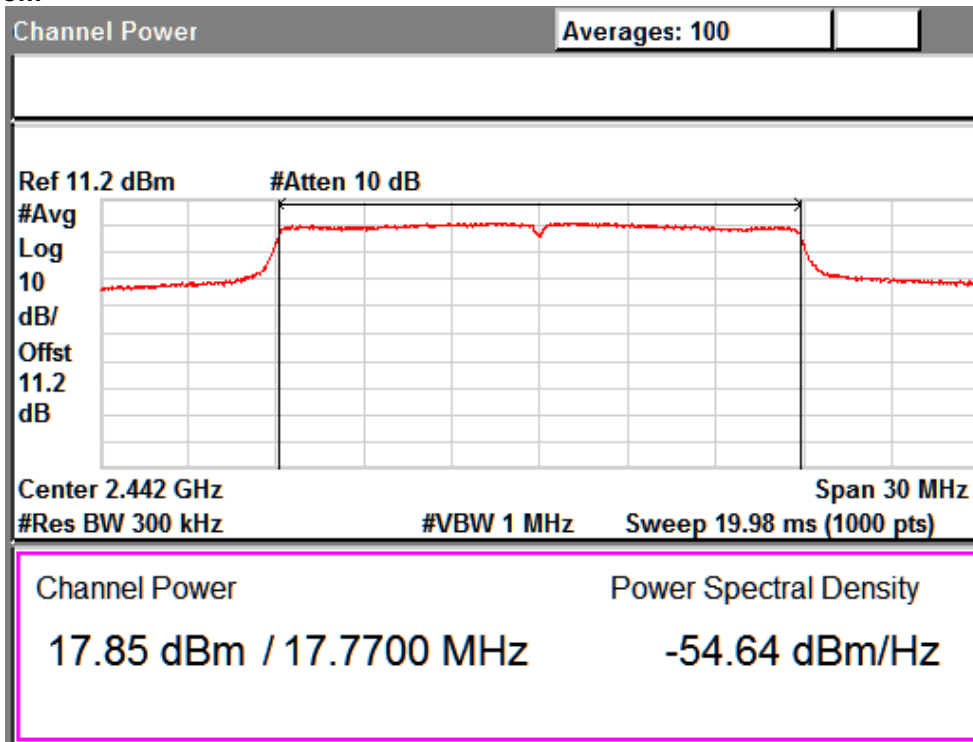
Channel Frequency: 2462 MHz



Data Rate: 65 Mbps

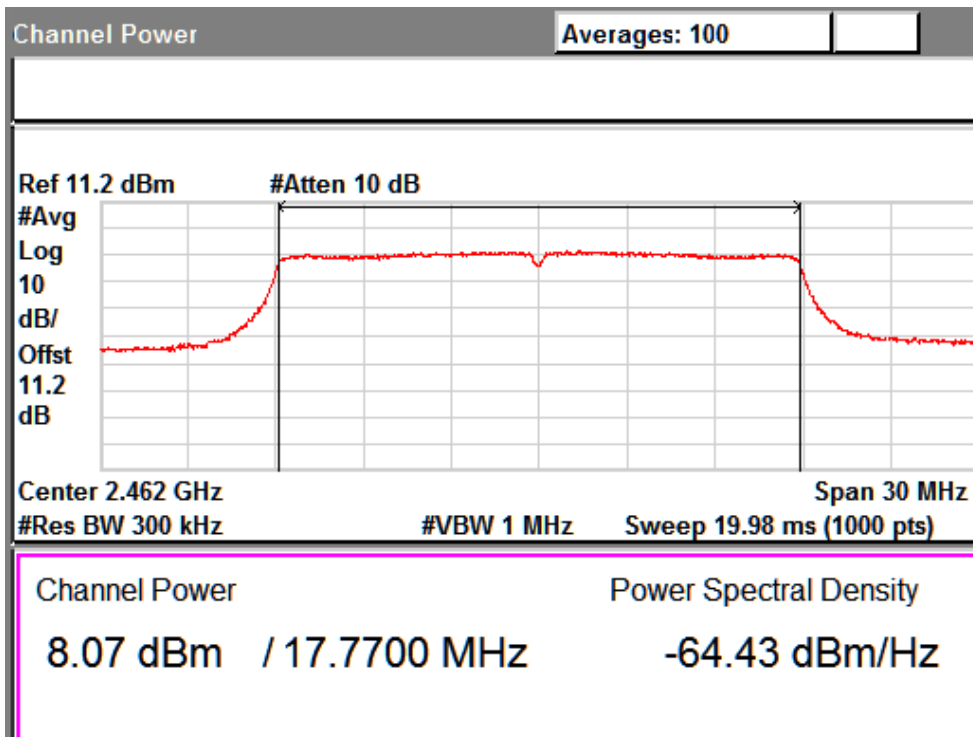
Channel Frequency: 2412 MHz

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Data Rate: 65 Mbps

Channel Frequency: 2442 MHz



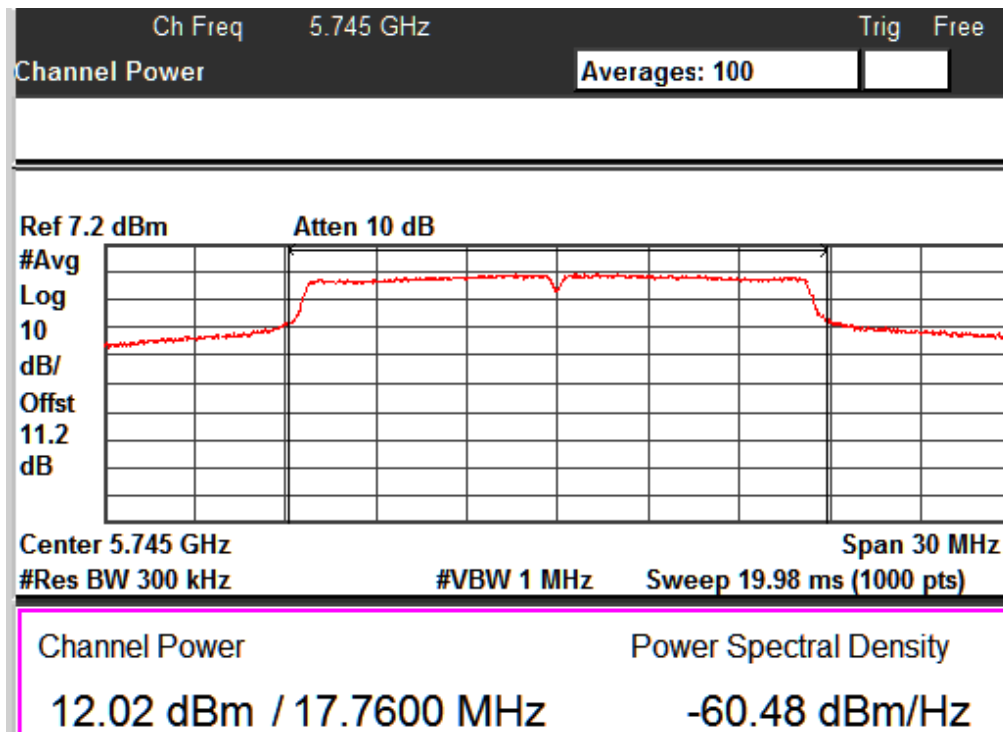
Data Rate: 65 Mbps

Channel Frequency: 2462 MHz

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5GHz Band

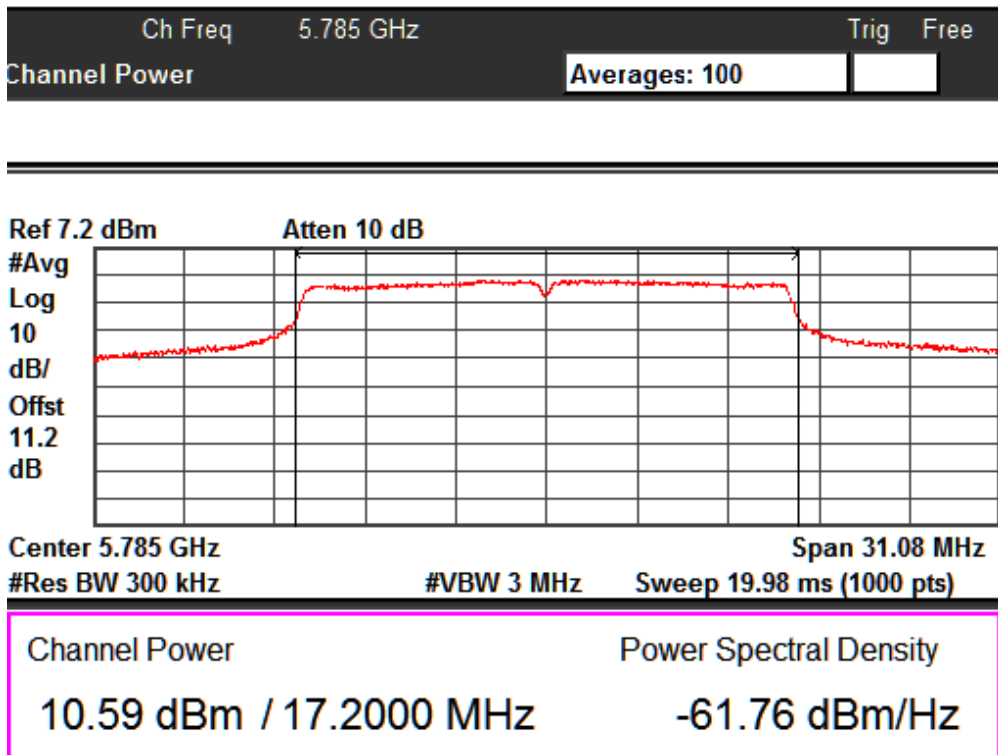
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|------------------|-------------------------|-------------------|-------------|-------------|
| a               | 6                | 5745                    | 12.02             | 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

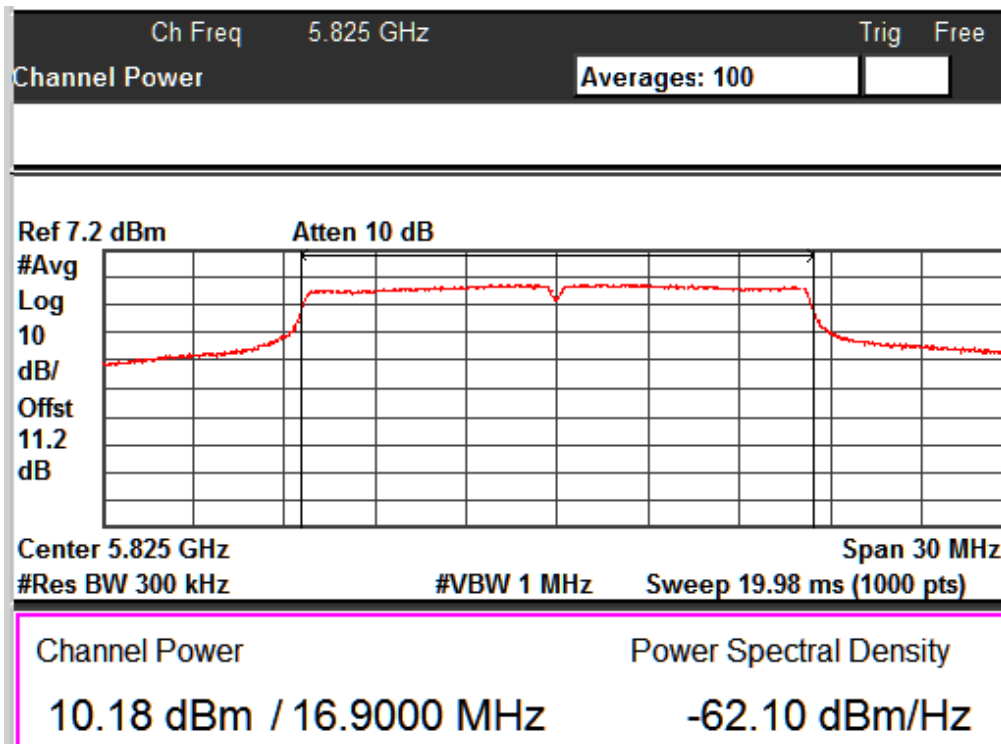
Channel Frequency: 5745 MHz

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Data Rate: 6 Mbps

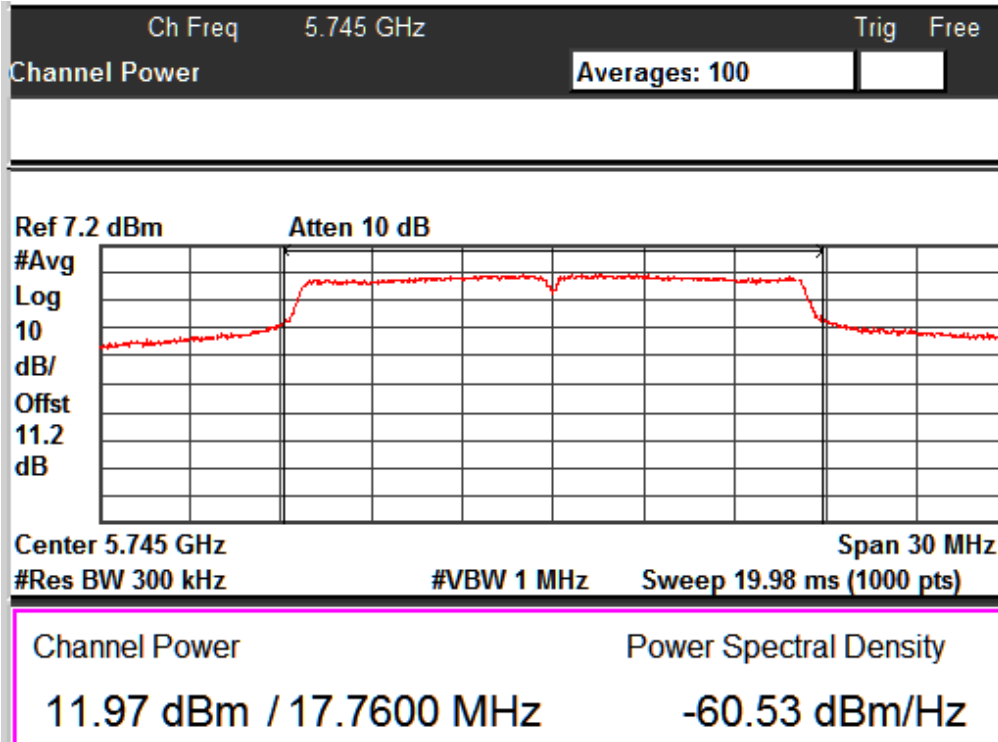
Channel Frequency: 5785 MHz



Data Rate: 6 Mbps

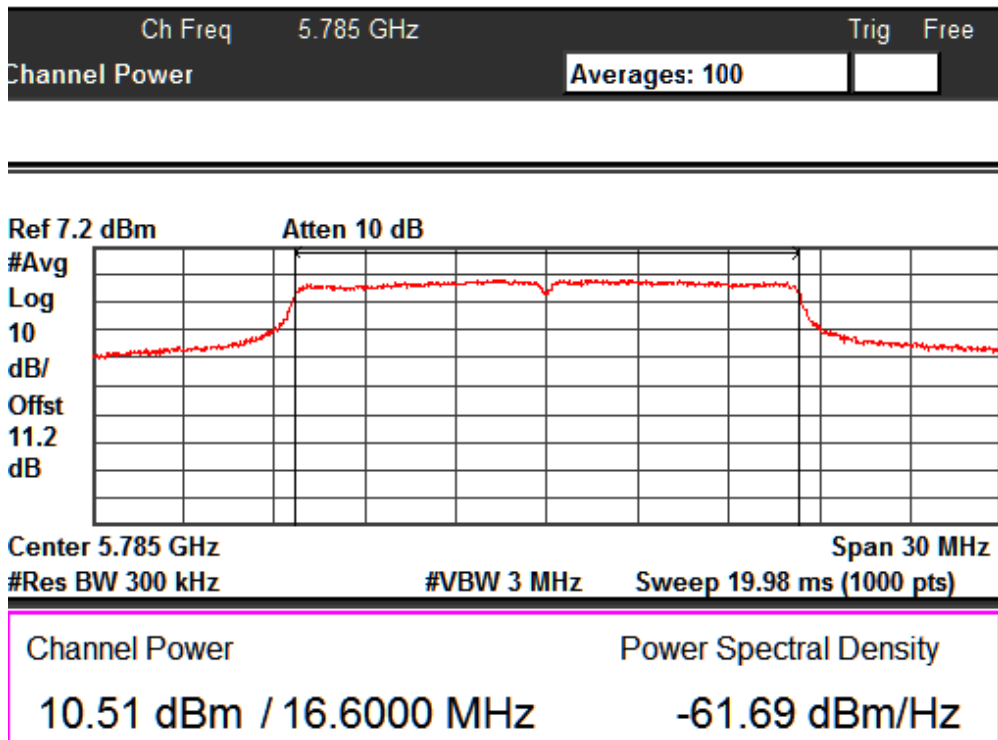
Channel Frequency: 5825 MHz

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Data Rate: 24 Mbps

Channel Frequency: 5745 MHz

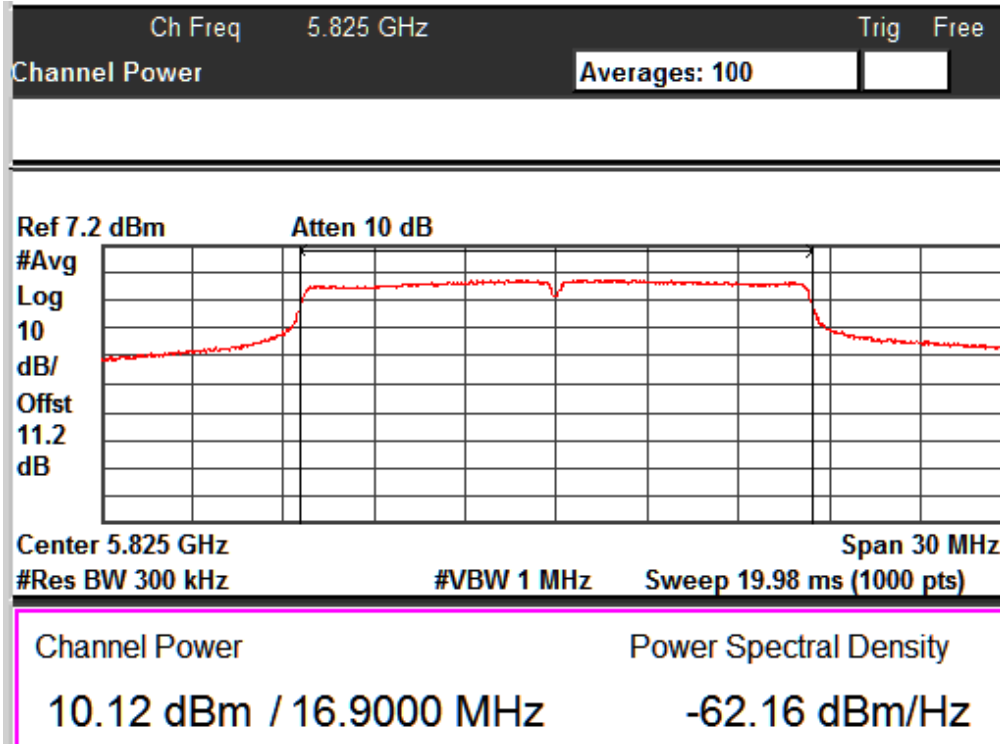


Data Rate: 24 Mbps

Channel Frequency: 5785 MHz

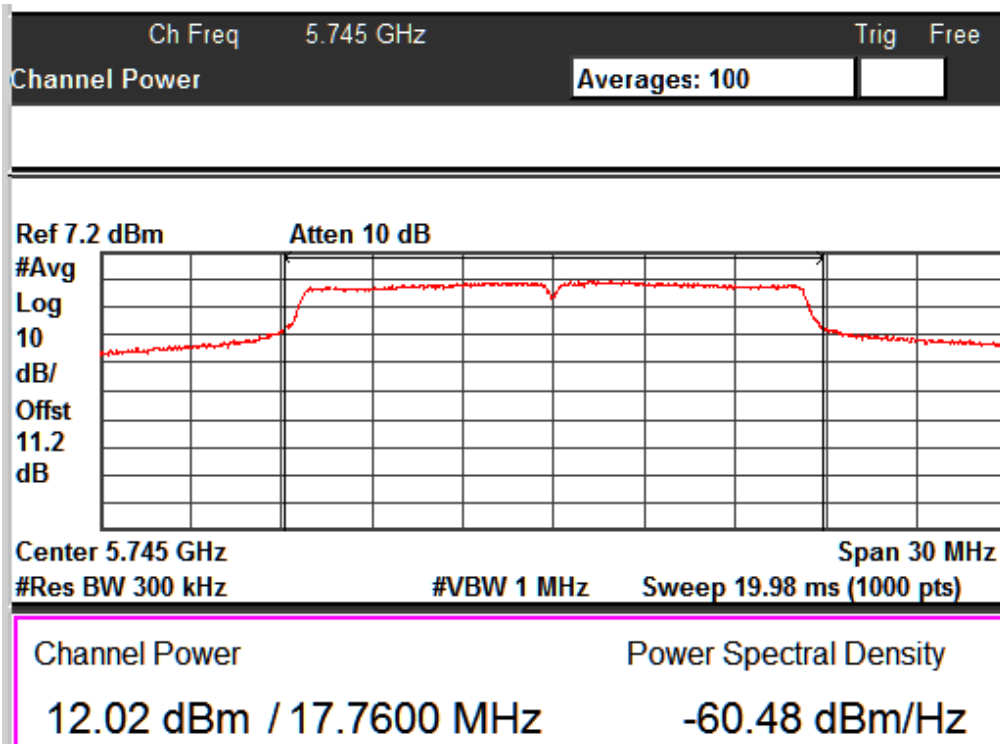


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Data Rate: 24 Mbps

Channel Frequency: 5825 MHz

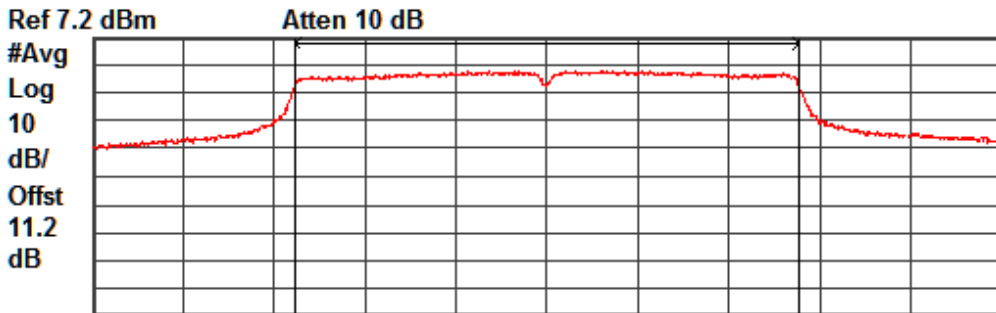


Data Rate: 54 Mbps

Channel Frequency: 5745 MHz

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Ch Freq 5.785 GHz Trig Free  
 Channel Power Averages: 100



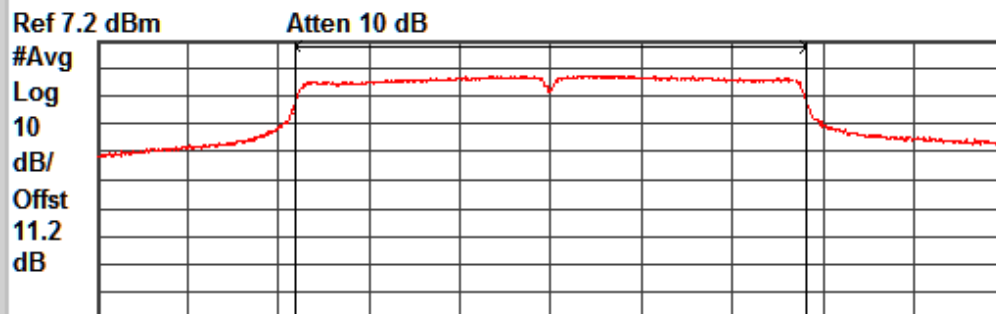
Center 5.785 GHz Span 30 MHz  
 #Res BW 300 kHz #VBW 3 MHz Sweep 19.98 ms (1000 pts)

|                         |                        |
|-------------------------|------------------------|
| Channel Power           | Power Spectral Density |
| 10.42 dBm / 16.6000 MHz | -61.78 dBm/Hz          |

Data Rate: 54 Mbps

Channel Frequency: 5785 MHz

Ch Freq 5.825 GHz Trig Free  
 Channel Power Averages: 100



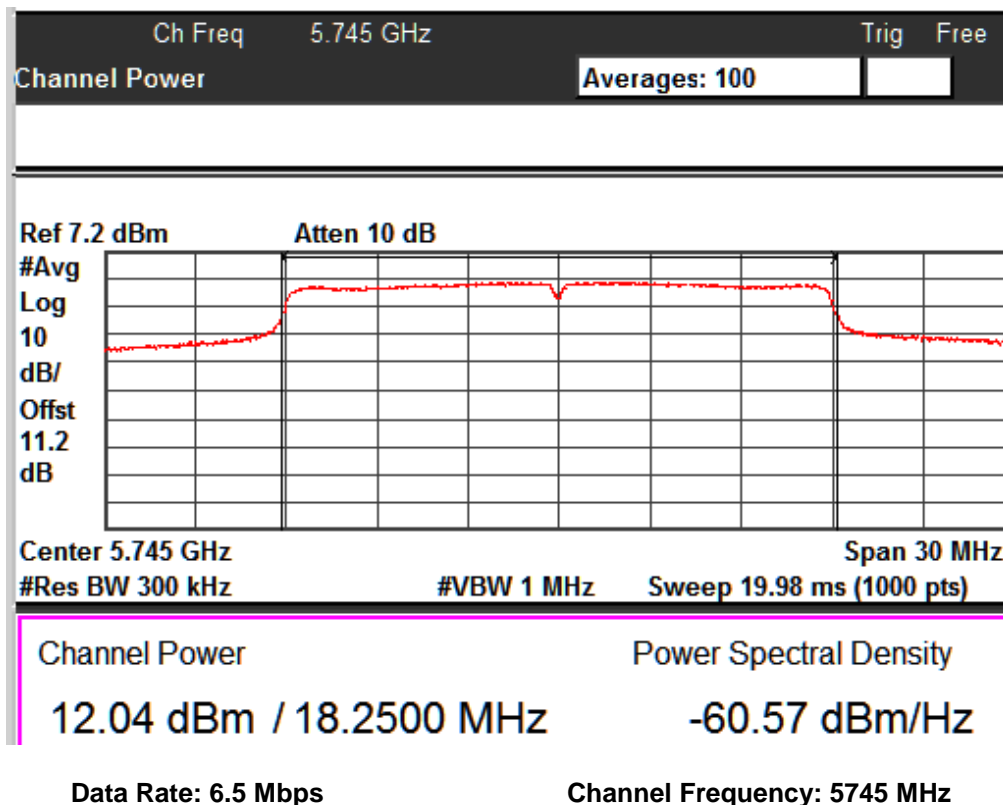
Center 5.825 GHz Span 30 MHz  
 #Res BW 300 kHz #VBW 1 MHz Sweep 19.98 ms (1000 pts)

|                         |                        |
|-------------------------|------------------------|
| Channel Power           | Power Spectral Density |
| 10.17 dBm / 16.9000 MHz | -62.10 dBm/Hz          |

Data Rate: 54 Mbps

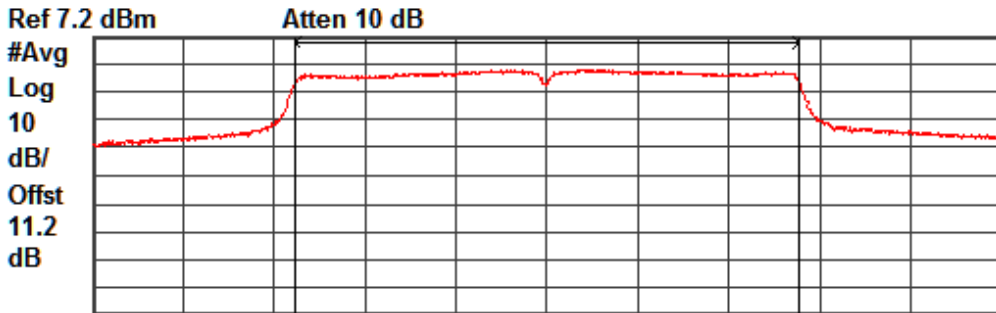
Channel Frequency: 5825 MHz

| 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      |



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Ch Freq 5.785 GHz Trig Free  
 Channel Power Averages: 100



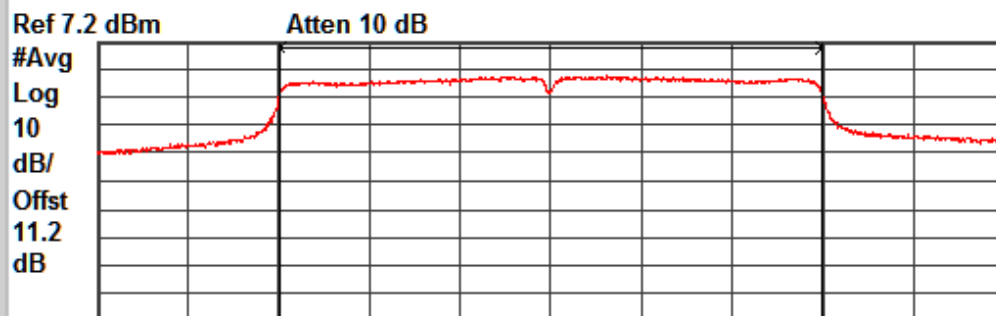
Center 5.785 GHz Span 31.99 MHz  
 #Res BW 300 kHz #VBW 3 MHz Sweep 19.98 ms (1000 pts)

Channel Power Power Spectral Density  
 10.75 dBm / 17.7000 MHz -61.73 dBm/Hz

Data Rate: 6.5 Mbps

Channel Frequency: 5785 MHz

Ch Freq 5.825 GHz Trig Free  
 Channel Power Averages: 100



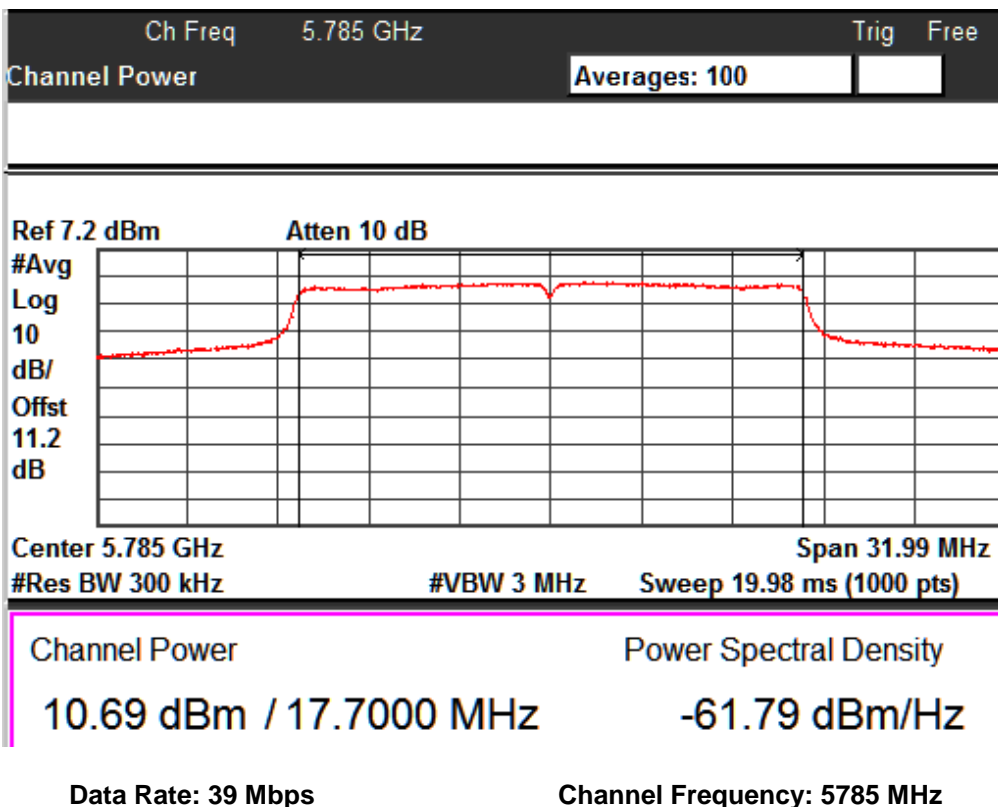
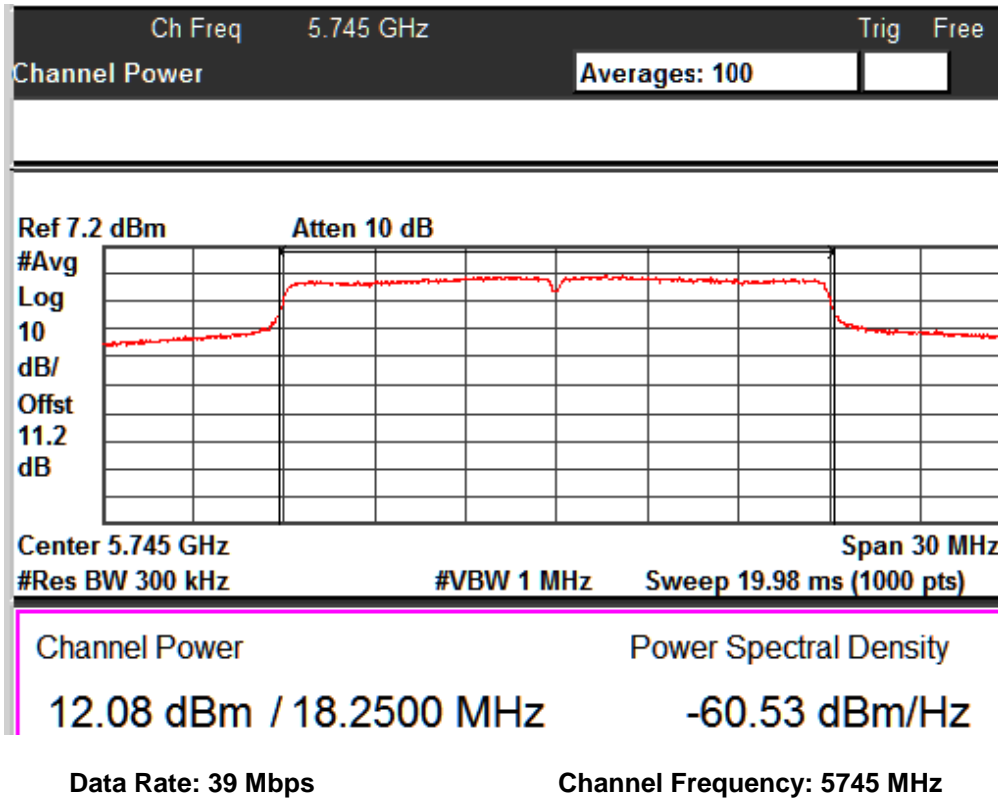
Center 5.825 GHz Span 30 MHz  
 #Res BW 300 kHz #VBW 1 MHz Sweep 19.98 ms (1000 pts)

Channel Power Power Spectral Density  
 10.54 dBm / 17.8400 MHz -61.98 dBm/Hz

Data Rate: 6.5 Mbps

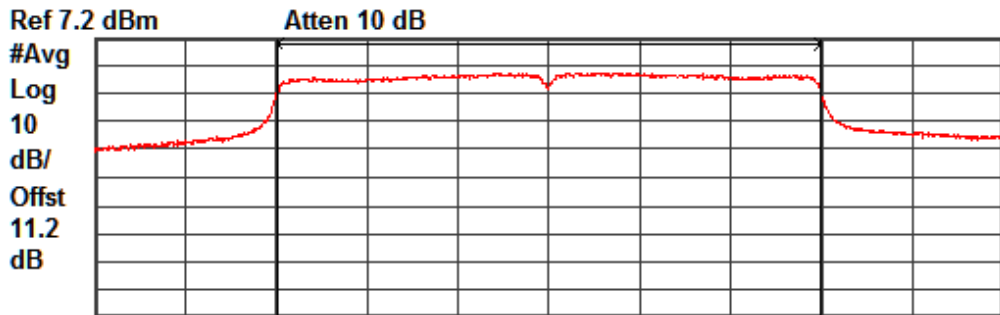
Channel Frequency: 5825 MHz

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Ch Freq 5.825 GHz Trig Free  
 Channel Power Averages: 100



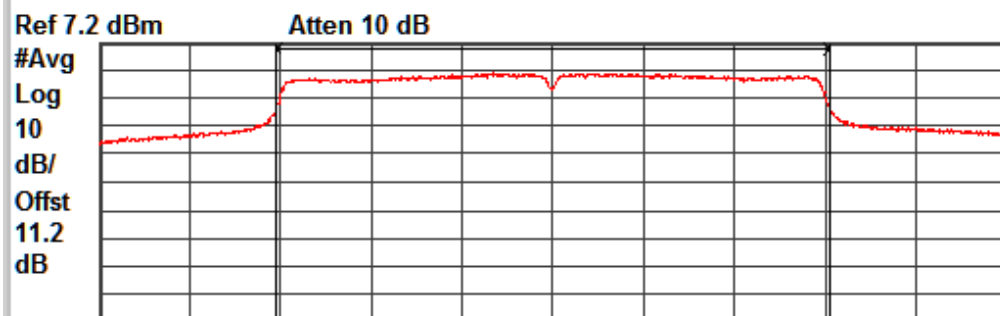
Center 5.825 GHz Span 30 MHz  
 #Res BW 300 kHz #VBW 1 MHz Sweep 19.98 ms (1000 pts)

Channel Power Power Spectral Density  
 10.51 dBm / 17.8400 MHz -62.00 dBm/Hz

Data Rate: 39 Mbps

Channel Frequency: 5825 MHz

Ch Freq 5.745 GHz Trig Free  
 Channel Power Averages: 100



Center 5.745 GHz Span 30 MHz  
 #Res BW 300 kHz #VBW 1 MHz Sweep 19.98 ms (1000 pts)

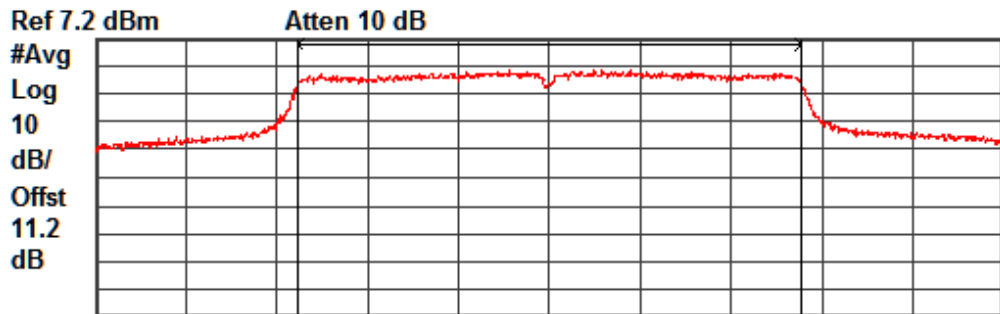
Channel Power Power Spectral Density  
 12.05 dBm / 18.2500 MHz -60.57 dBm/Hz

Data Rate: 65 Mbps

Channel Frequency: 5745 MHz

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Ch Freq 5.785 GHz Trig Free  
**Channel Power** Averages: 100



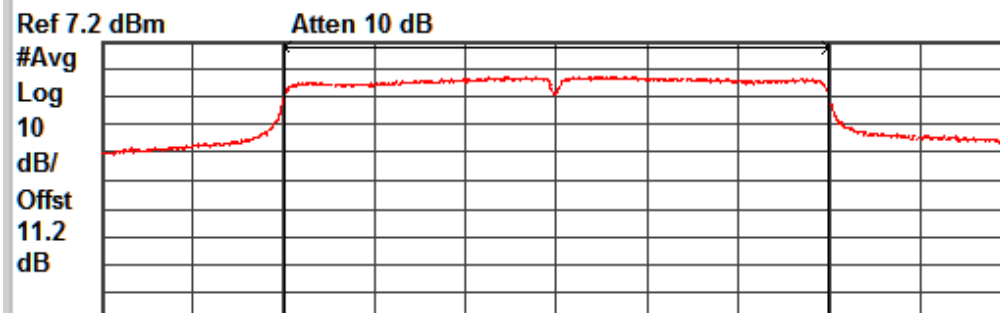
Center 5.785 GHz Span 31.99 MHz  
 #Res BW 300 kHz #VBW 1 MHz Sweep 19.98 ms (1000 pts)

|                         |                        |
|-------------------------|------------------------|
| Channel Power           | Power Spectral Density |
| 10.64 dBm / 17.7000 MHz | -61.83 dBm/Hz          |

Data Rate: 65 Mbps

Channel Frequency: 5785 MHz

Ch Freq 5.825 GHz Trig Free  
**Channel Power** Averages: 100



Center 5.825 GHz Span 30 MHz  
 #Res BW 300 kHz #VBW 1 MHz Sweep 19.98 ms (1000 pts)

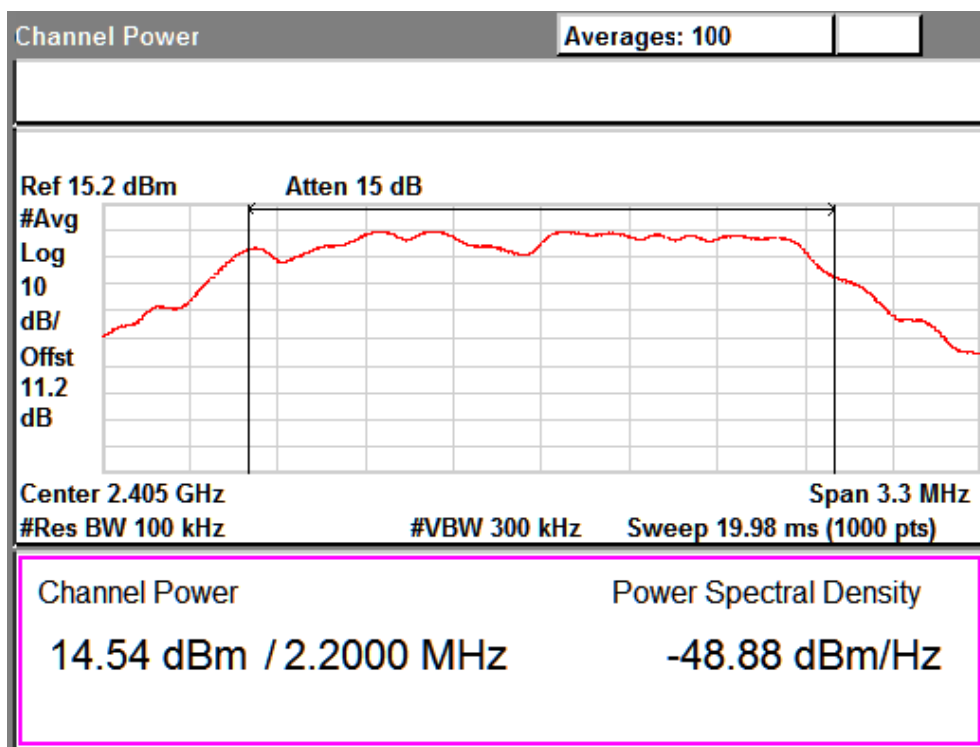
|                         |                        |
|-------------------------|------------------------|
| Channel Power           | Power Spectral Density |
| 10.34 dBm / 17.8400 MHz | -62.17 dBm/Hz          |

Data Rate: 65 Mbps

Channel Frequency: 5825 MHz

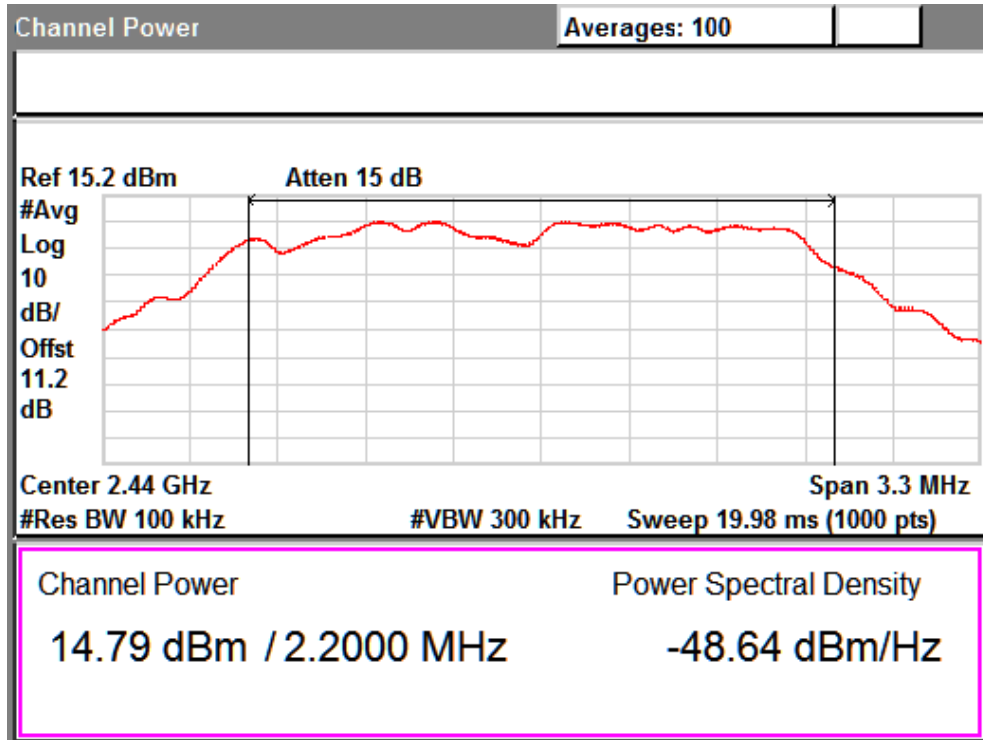
**Test Result: ZigBee**

| 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      |

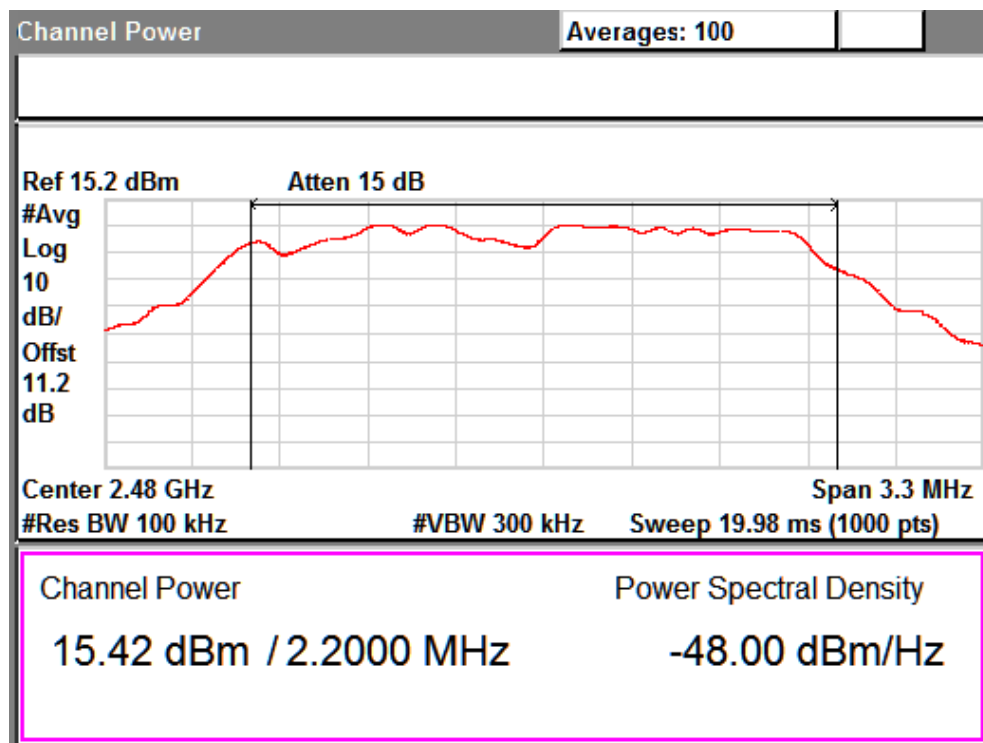


Channel Frequency: 2405 MHz





Channel Frequency: 2440 MHz

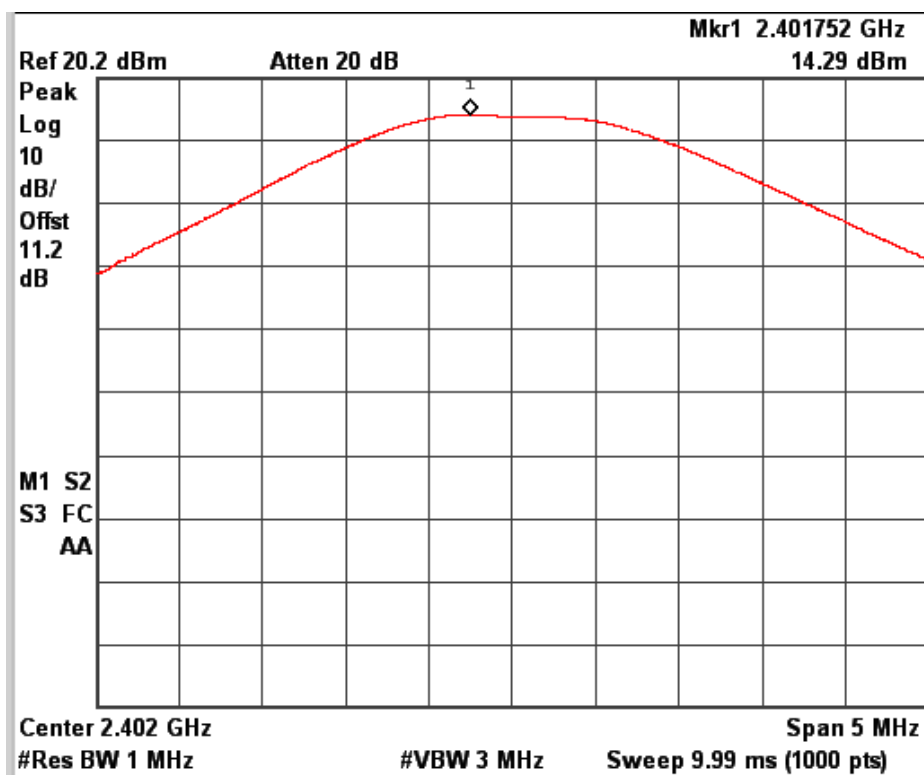


Channel Frequency: 2480 MHz

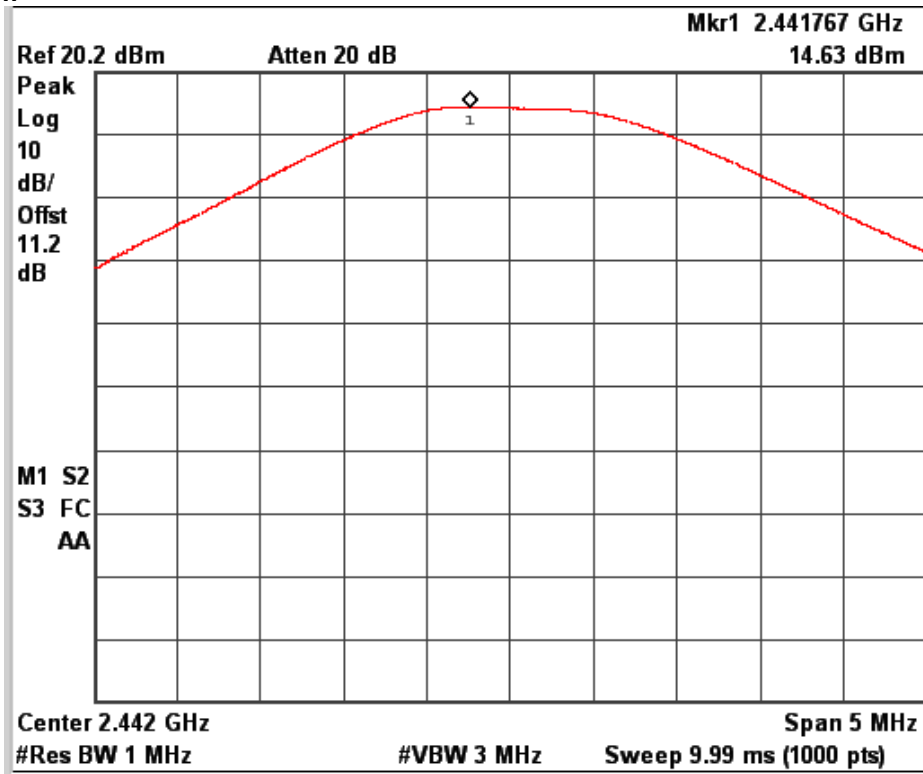
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**Test Result: Bluetooth LE**

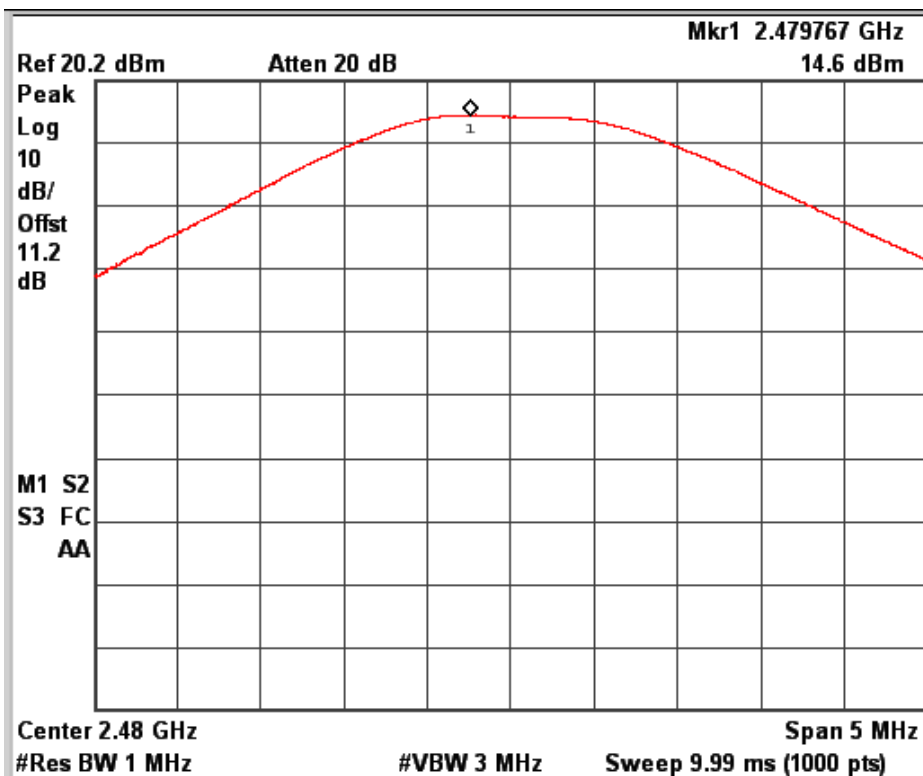
| Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|-------------------------|-------------------|-------------|-------------|
| 2402.00                 | 14.29             | 30.00       | -15.71      |
| 2442.00                 | 14.63             | 30.00       | -15.37    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



**Channel Frequency: 2402 MHz**



Channel Frequency: 2440 MHz



Channel Frequency: 2480 MHz

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**Maximum Power Spectral Density**

**Section 15.247(e)**

**Result**

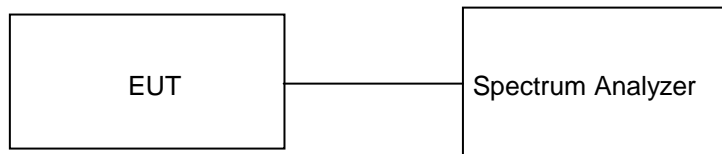
**Pass**

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**

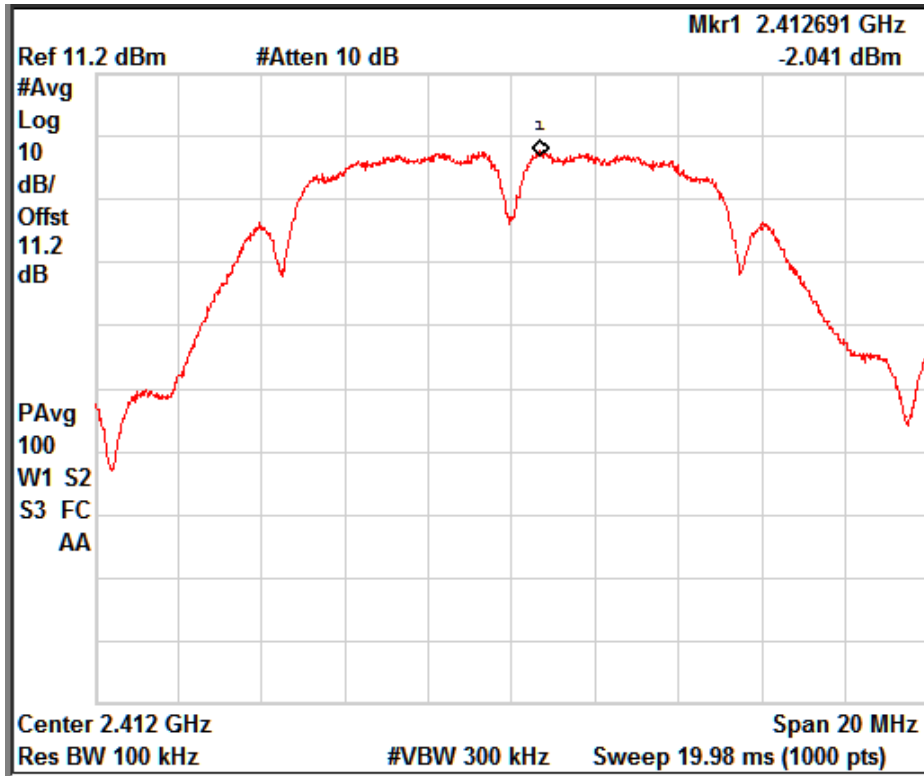
**Test Method:**



**Test Result:**

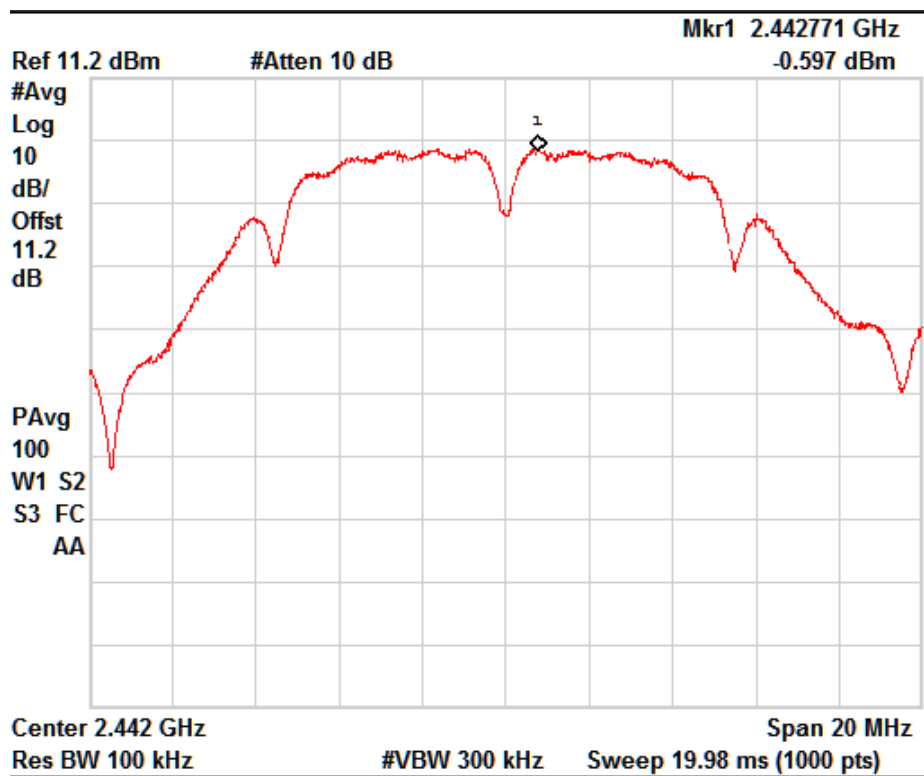
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total PSD (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|------------------|-------------------------|-----------------|-------------|-------------|
| b               | 1                | 2412.00                 | -02.04          | 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      |

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Data rate: 1 Mbps

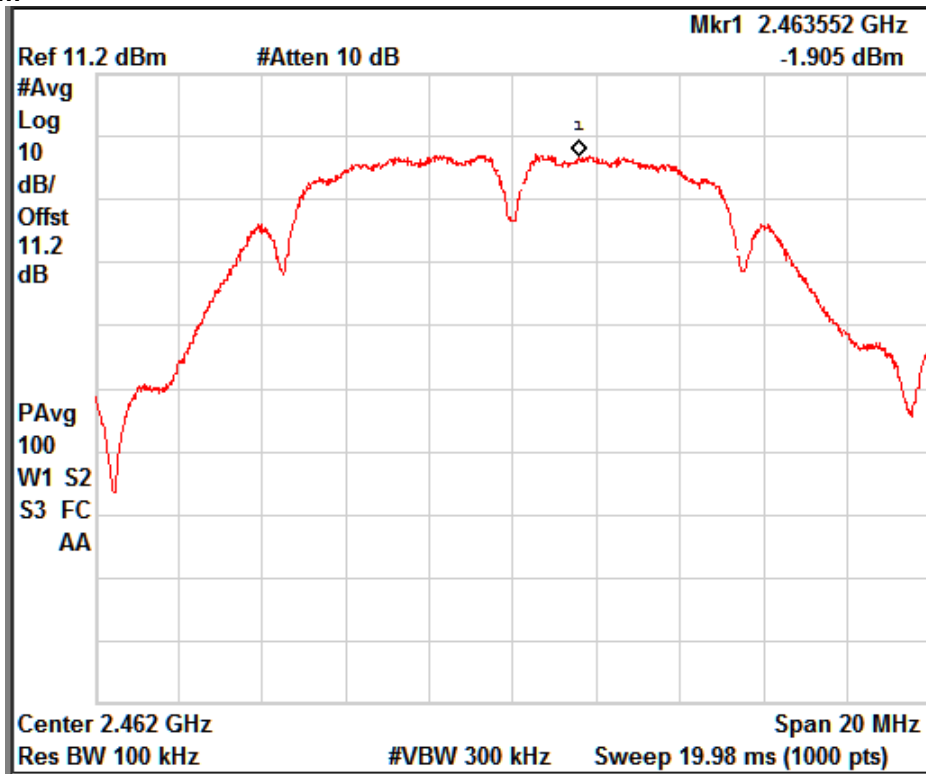
Channel Frequency: 2412 MHz



Data rate: 1 Mbps

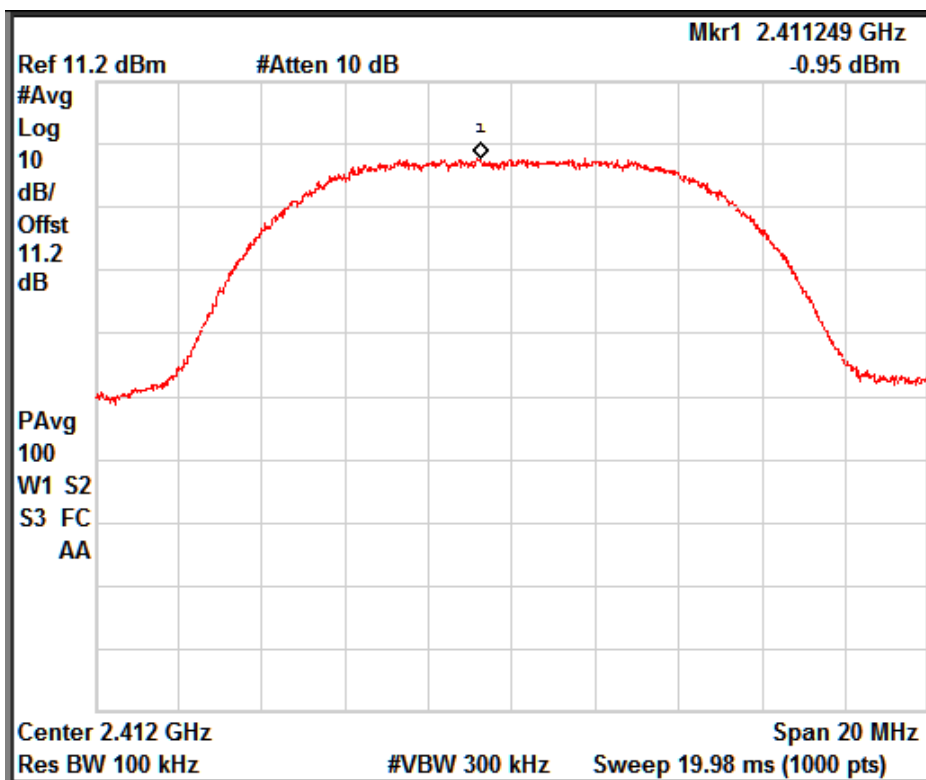
Channel Frequency: 2442 MHz

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Data rate: 1 Mbps

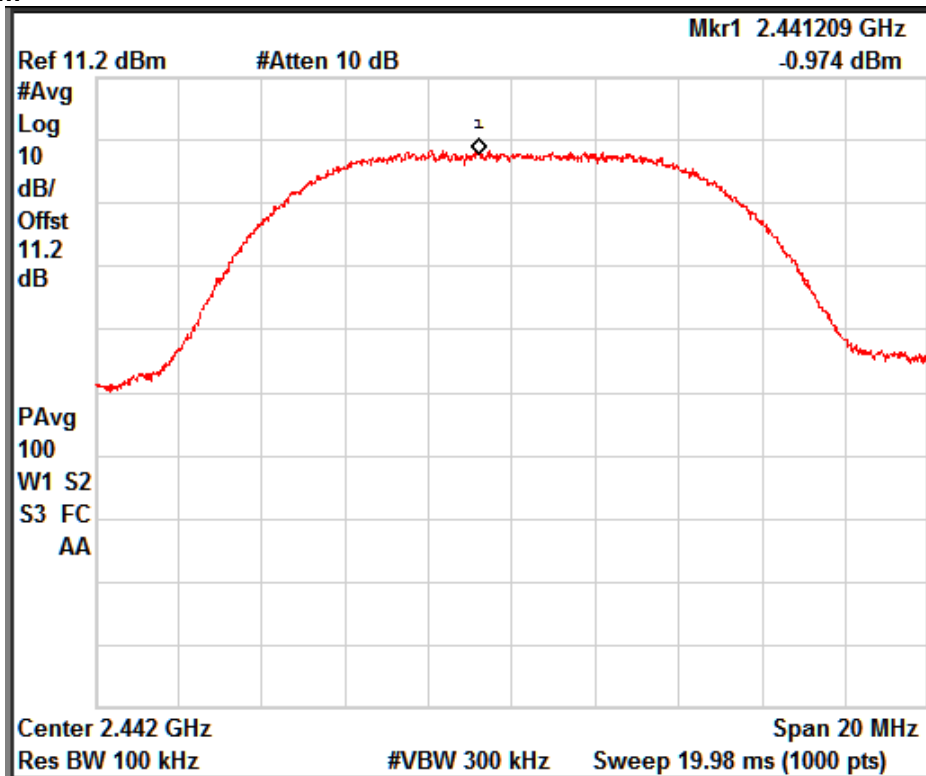
Channel Frequency: 2462 MHz



Data rate: 11 Mbps

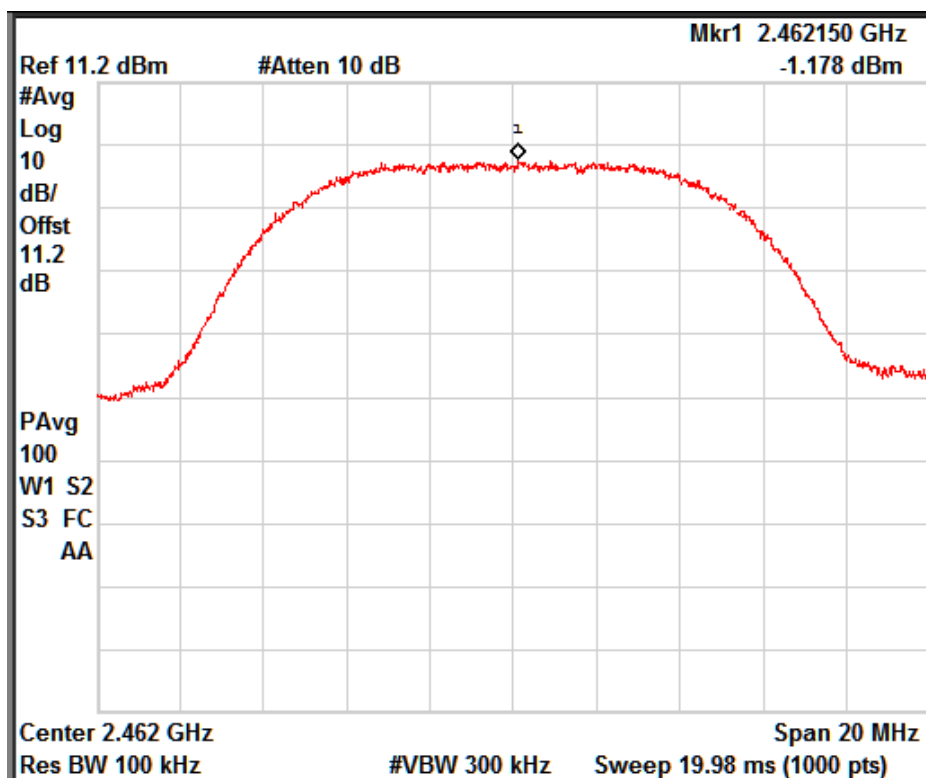
Channel Frequency: 2412 MHz

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Data rate: 11 Mbps

Channel Frequency: 2442 MHz

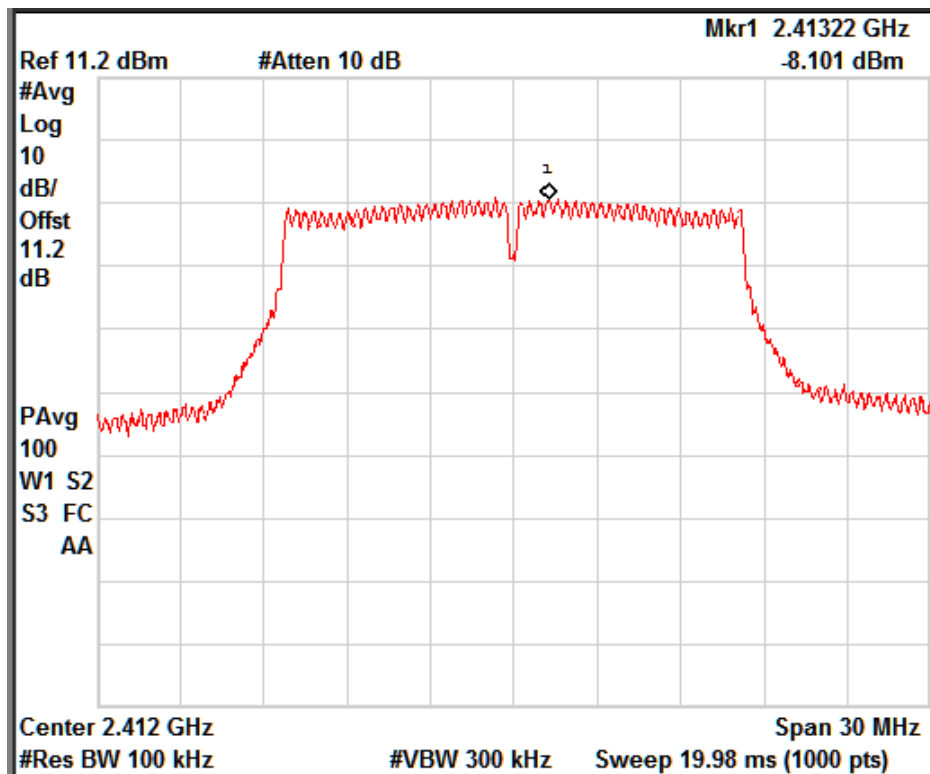


Data rate: 11 Mbps

Channel Frequency: 2462 MHz

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| 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      |

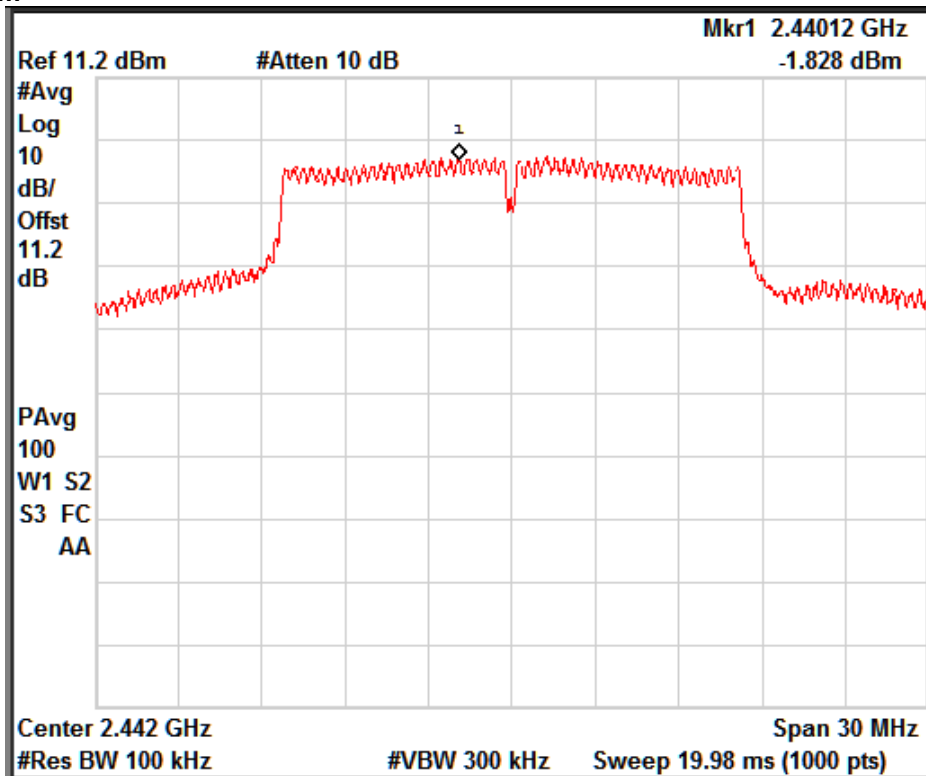


Data rate: 6 Mbps

Channel Frequency: 2412 MHz

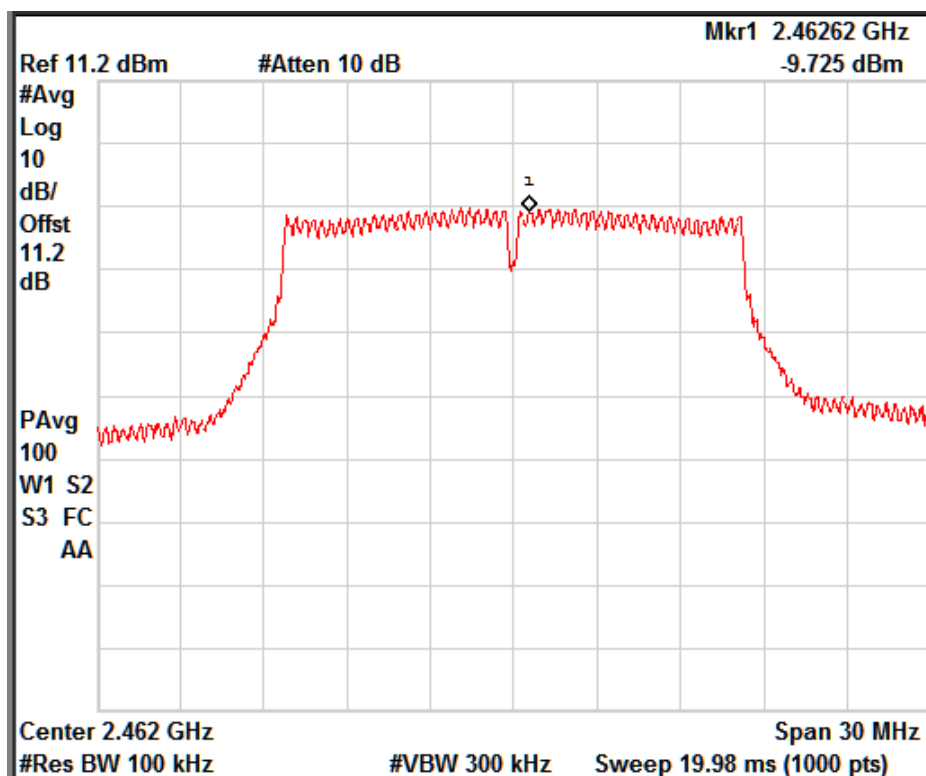


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Data rate: 6 Mbps

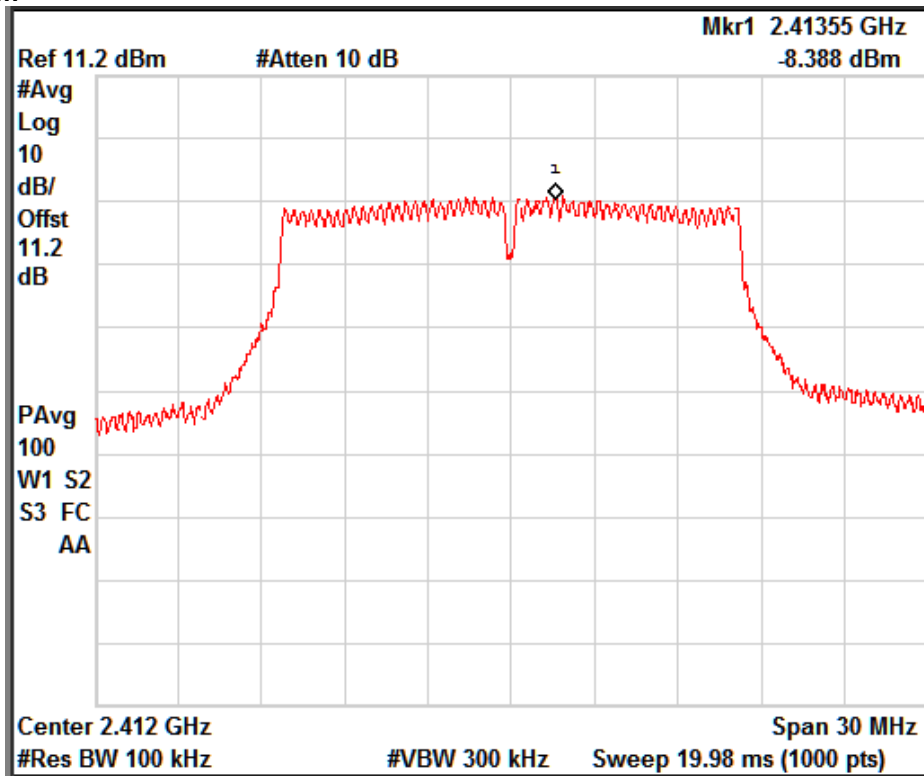
Channel Frequency: 2442 MHz



Data rate: 6 Mbps

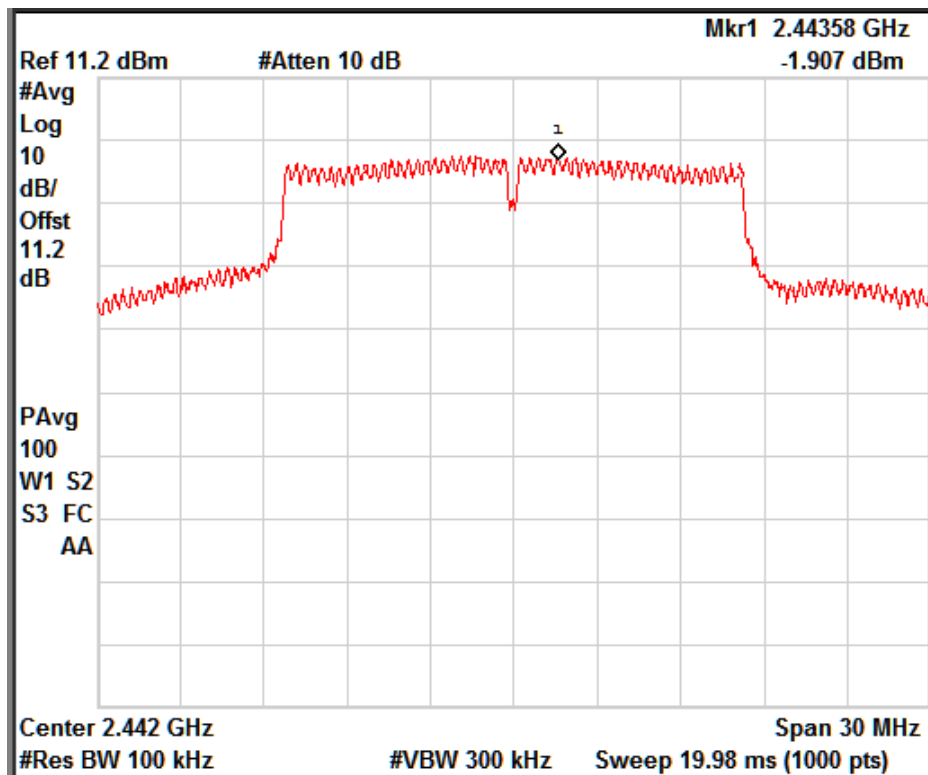
Channel Frequency: 2462 MHz

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Data rate: 24 Mbps

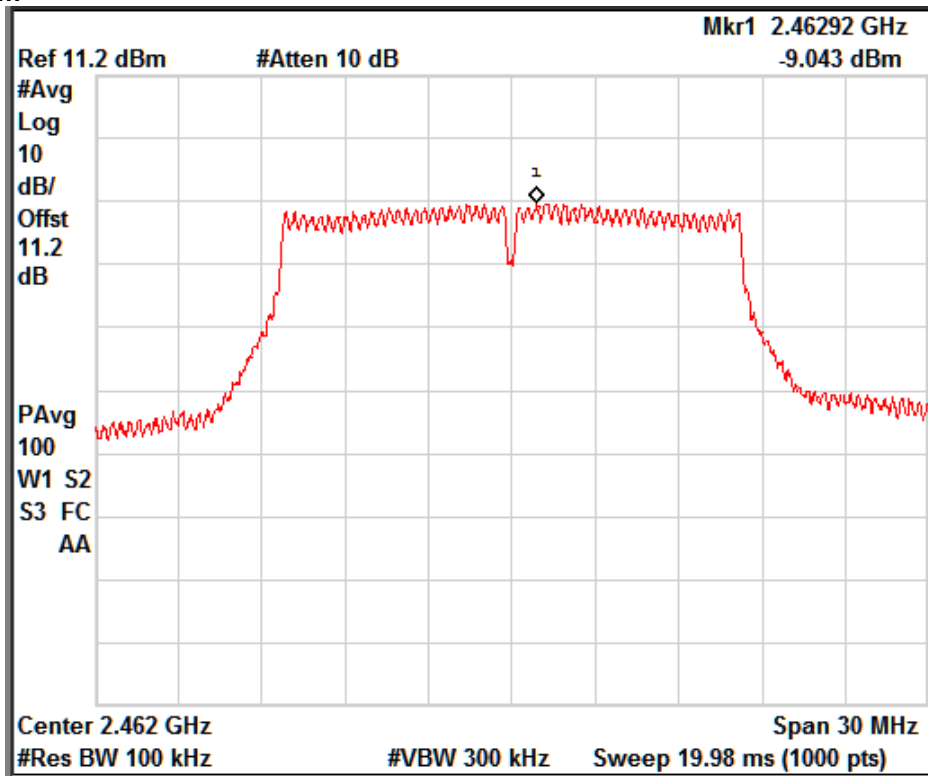
Channel Frequency: 2412 MHz



Data rate: 24 Mbps

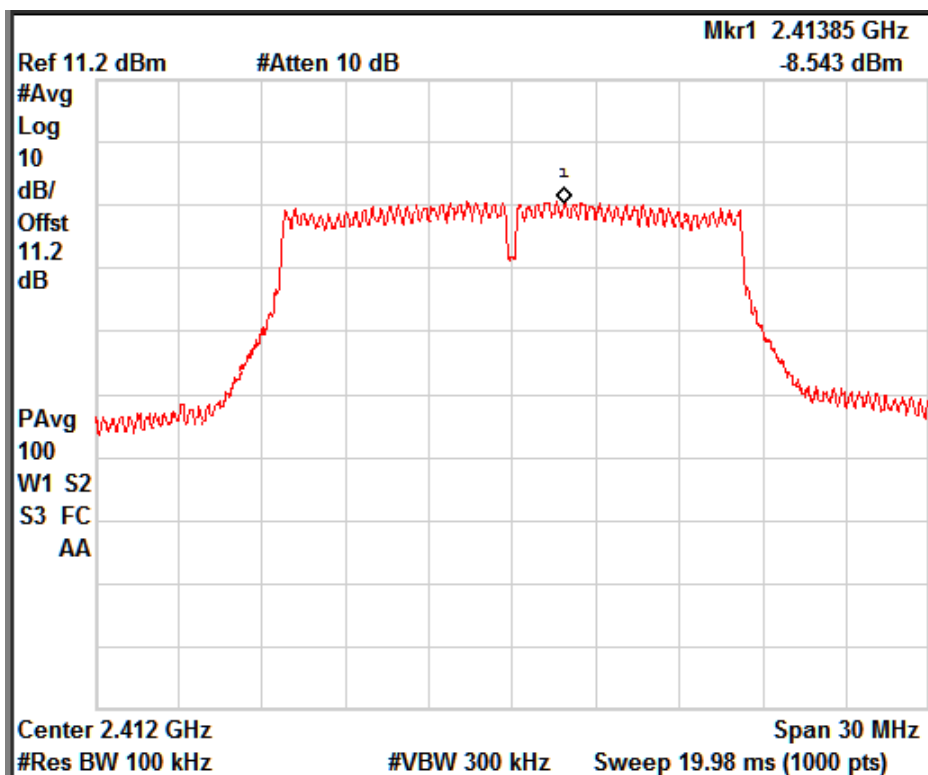
Channel Frequency: 2442 MHz

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Data rate: 24 Mbps

Channel Frequency: 2462 MHz

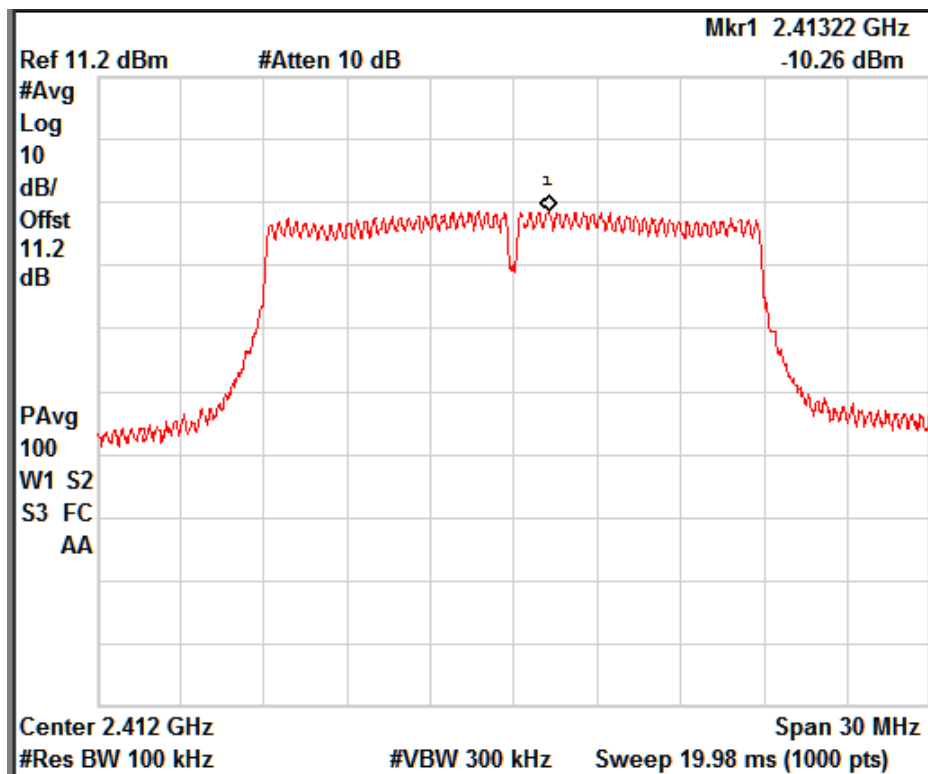


Data rate: 54 Mbps

Channel Frequency: 2412 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      |



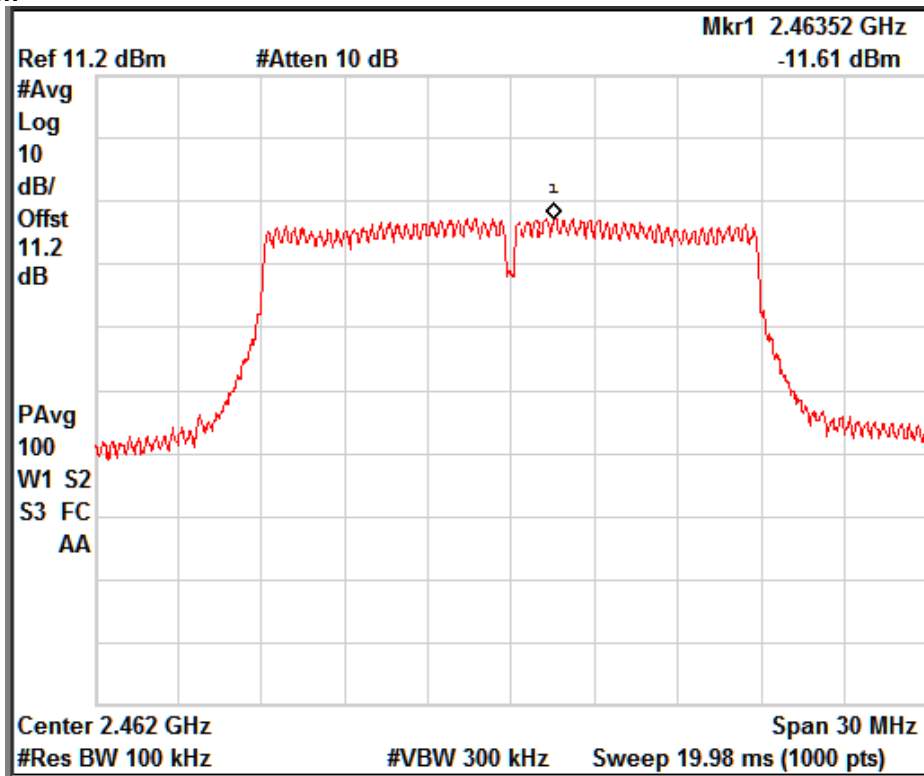
Data rate: 6.5 Mbps

Channel Frequency: 2412 MHz



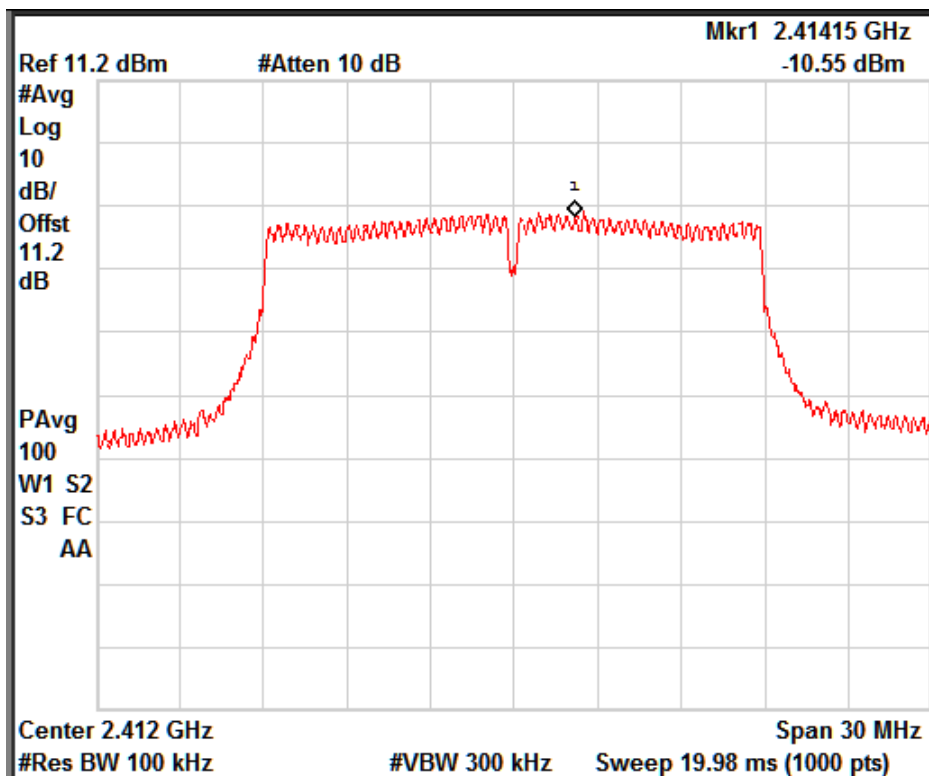


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Data rate: 39 Mbps

Channel Frequency: 2462 MHz

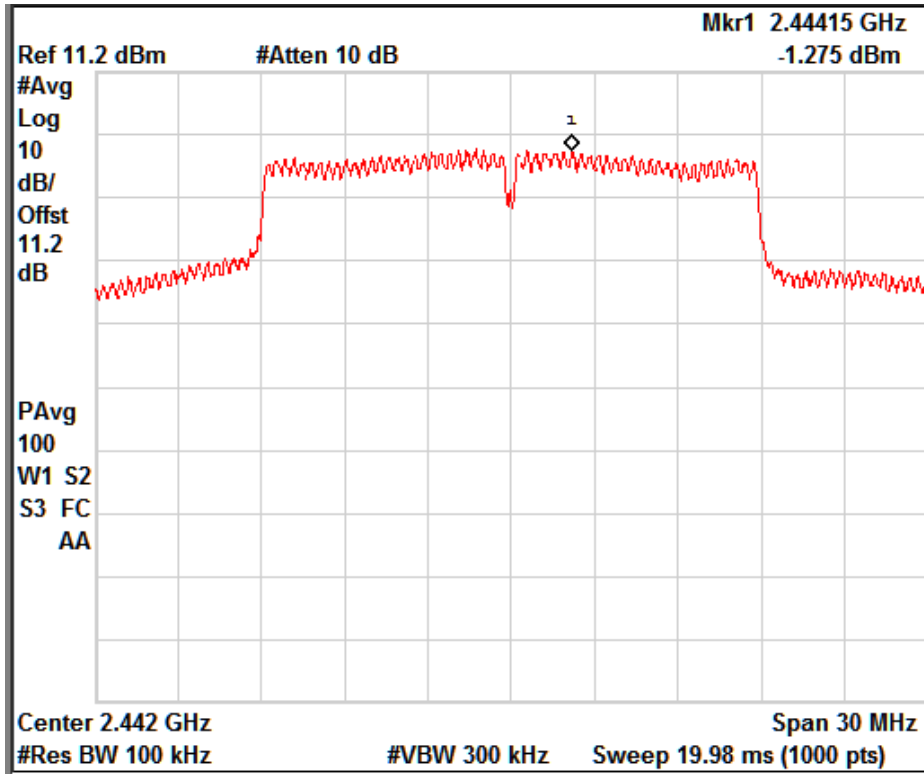


Data rate: 65 Mbps

Channel Frequency: 2412 MHz

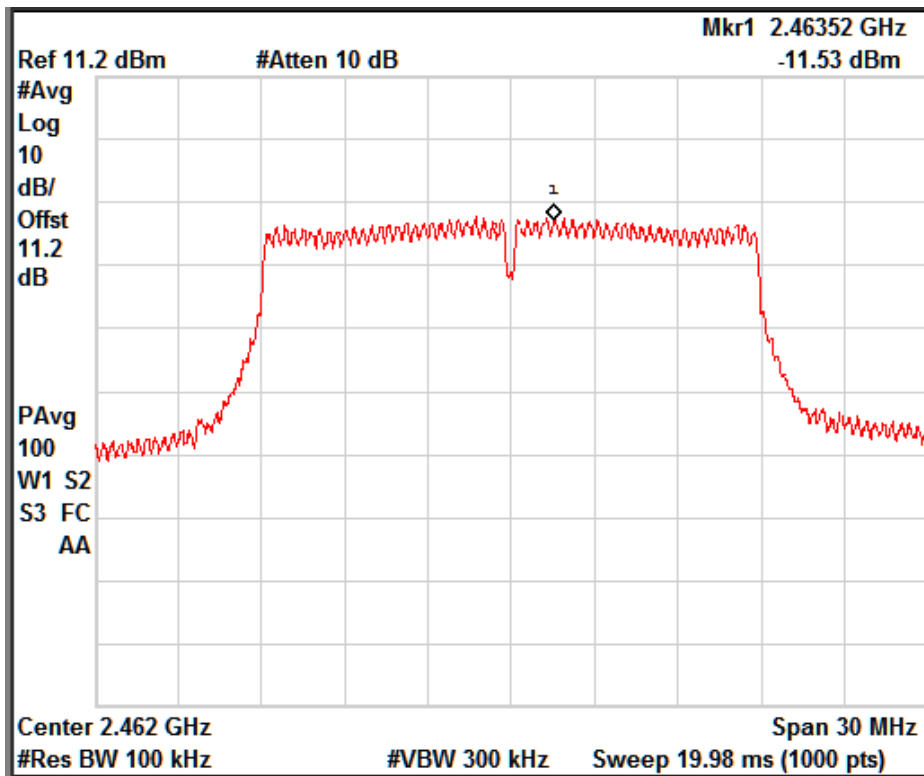


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Data rate: 65 Mbps

Channel Frequency: 2442 MHz



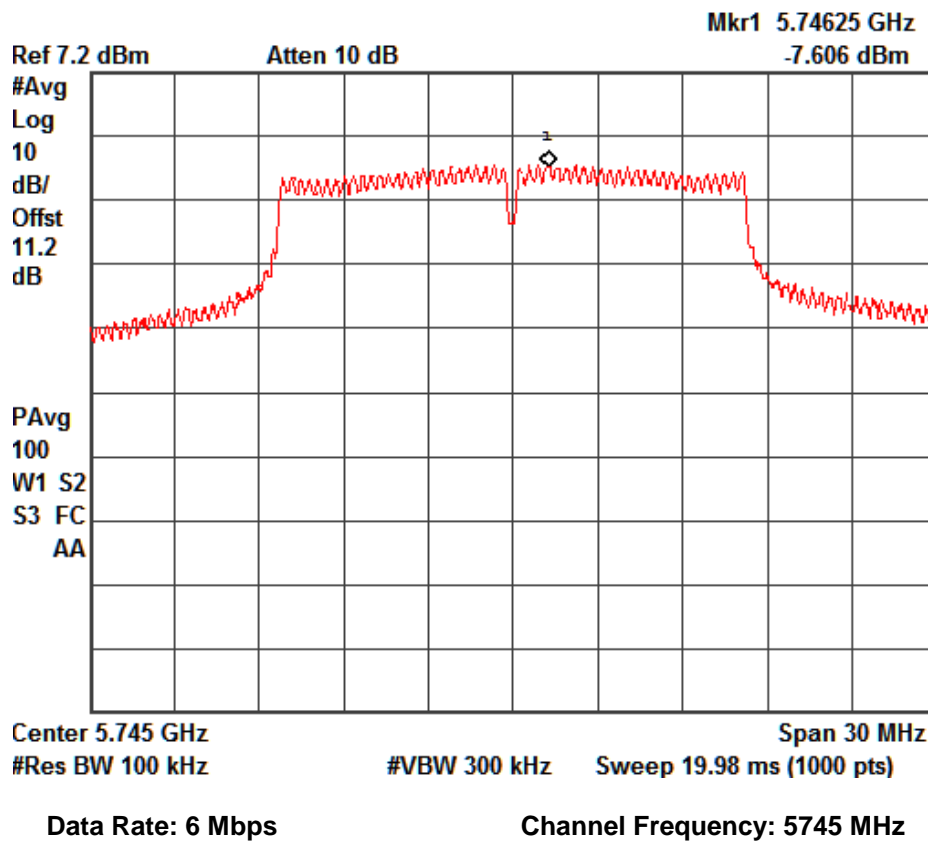
Data rate: 65 Mbps

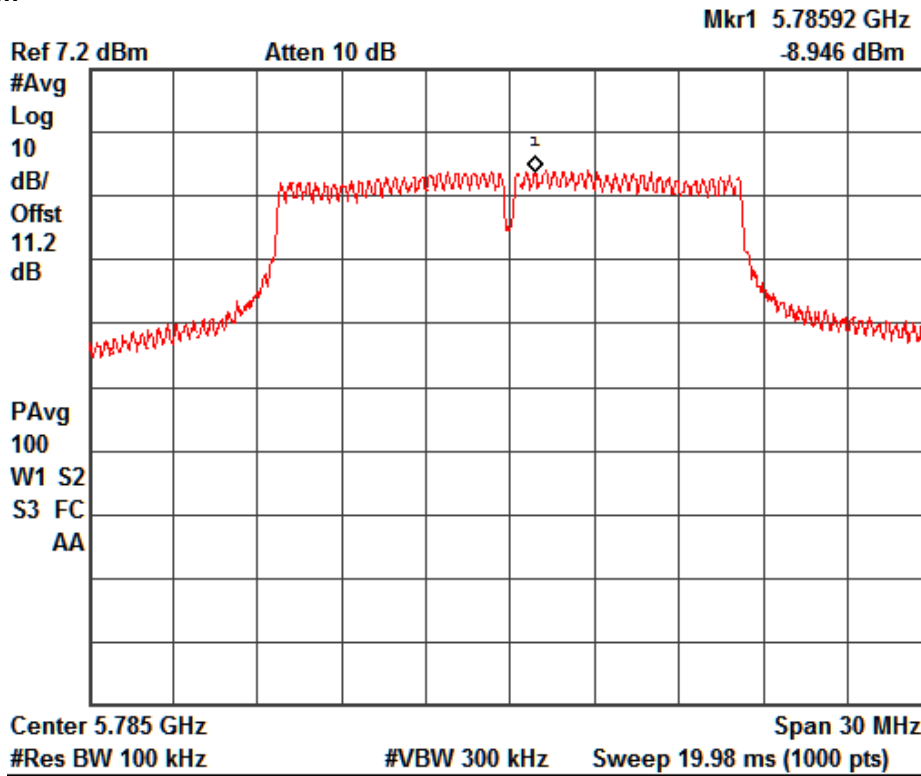
Channel Frequency: 2462 MHz

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5GHz Band

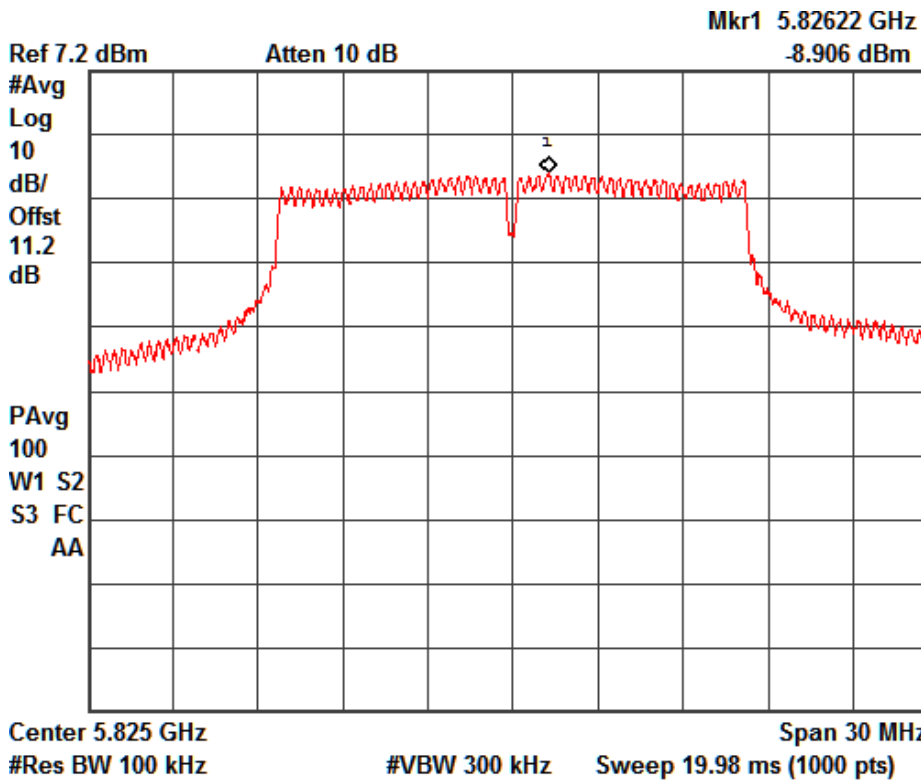
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|------------------|-------------------------|-------------------|-------------|-------------|
| a               | 6                | 5745                    | -8.60             | 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      |





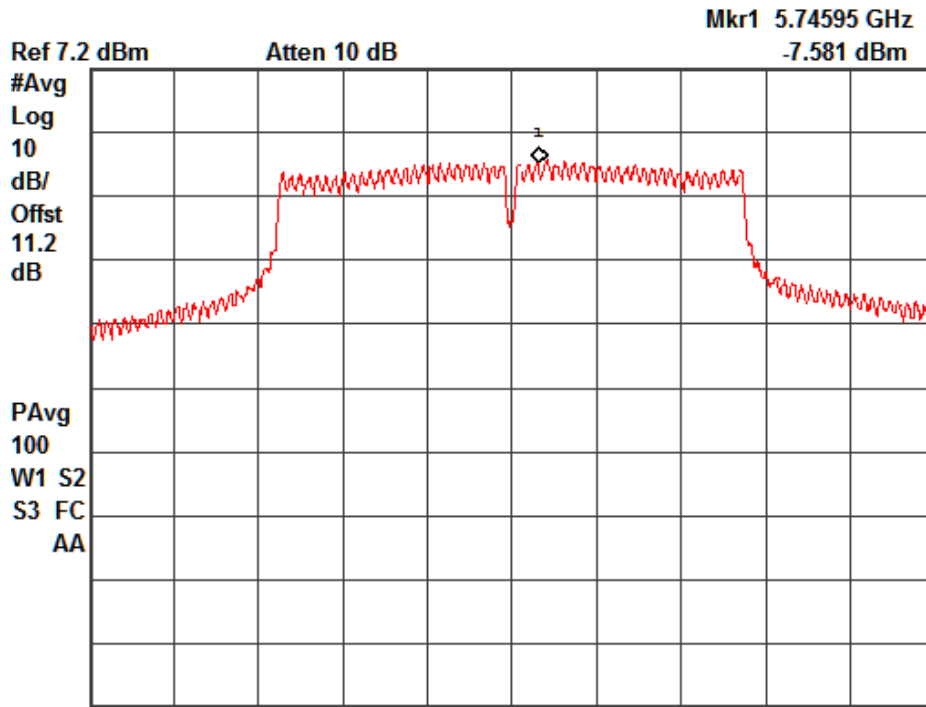
Data Rate: 6 Mbps

Channel Frequency: 5785 MHz



Data Rate: 6 Mbps

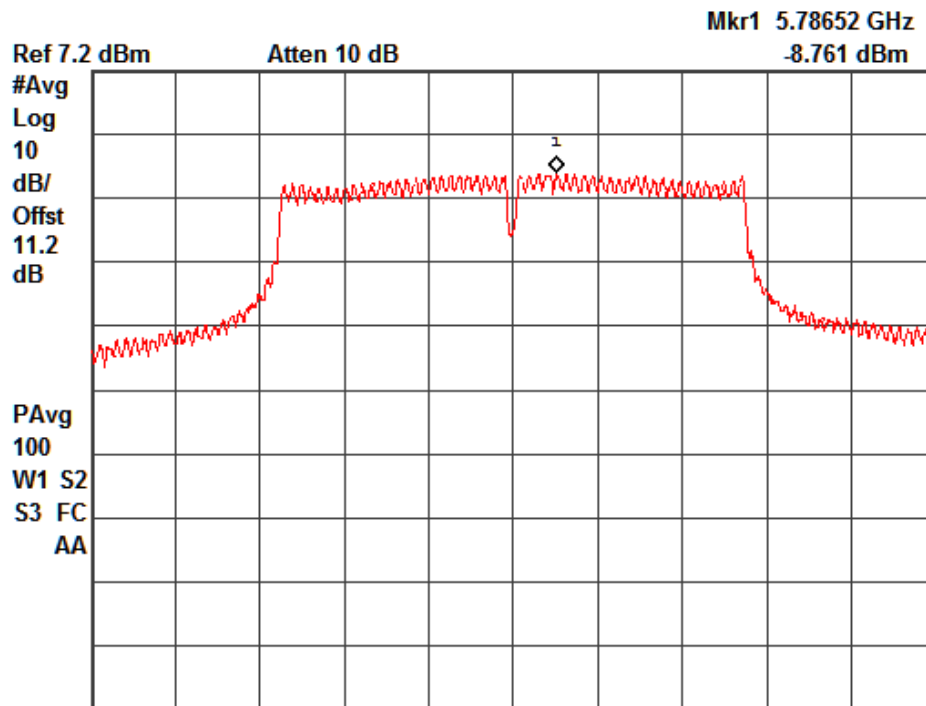
Channel Frequency: 5825 MHz



Center 5.745 GHz      Span 30 MHz  
 #Res BW 100 kHz      #VBW 300 kHz      Sweep 19.98 ms (1000 pts)

Data Rate: 24 Mbps

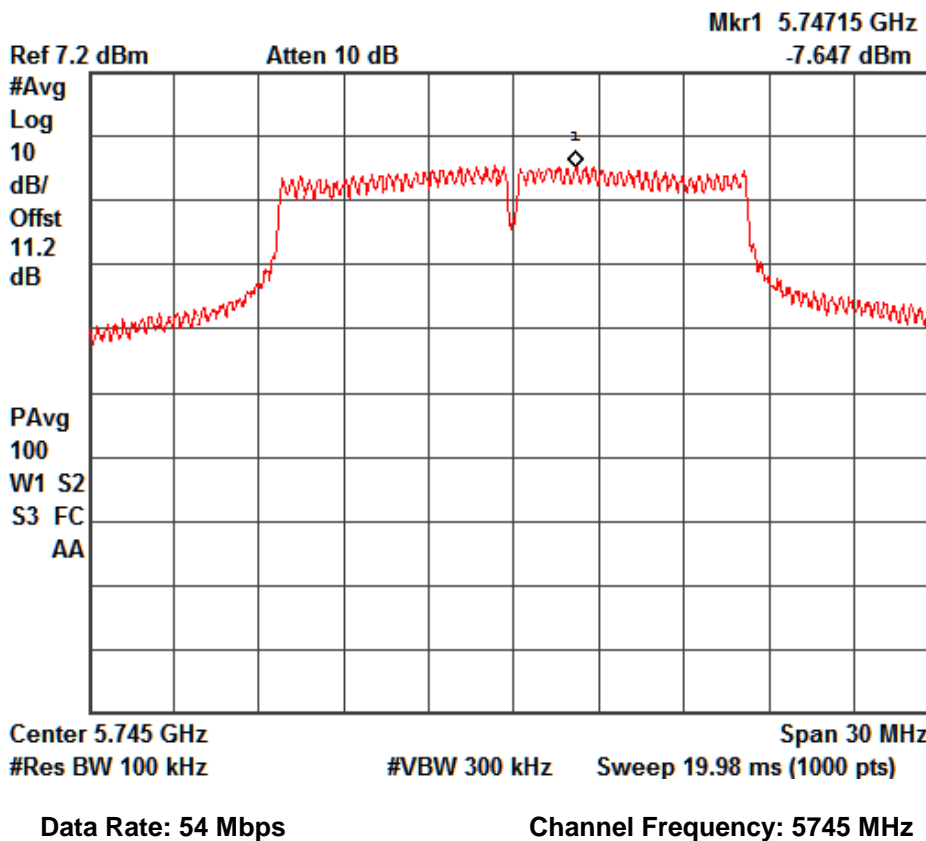
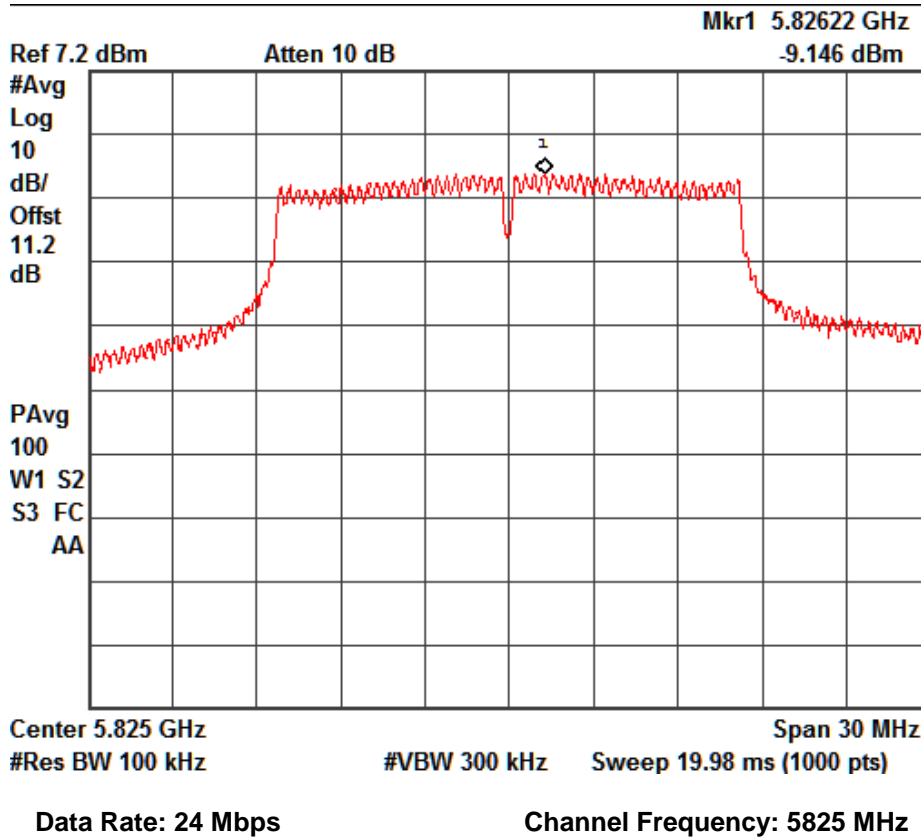
Channel Frequency: 5745 MHz

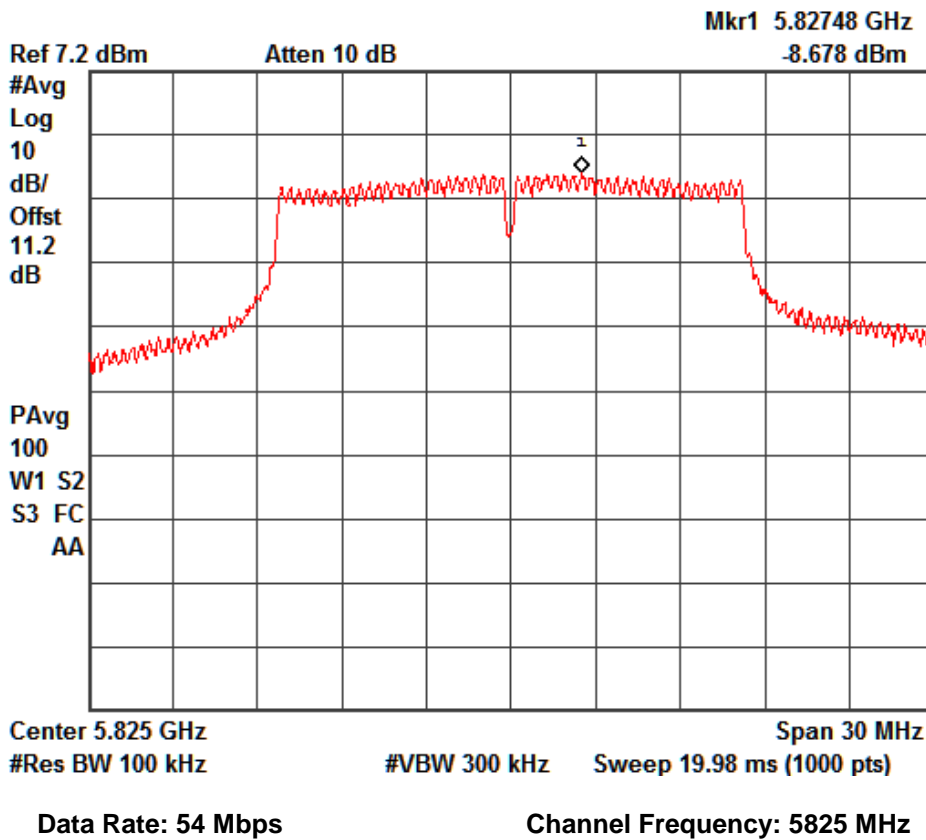
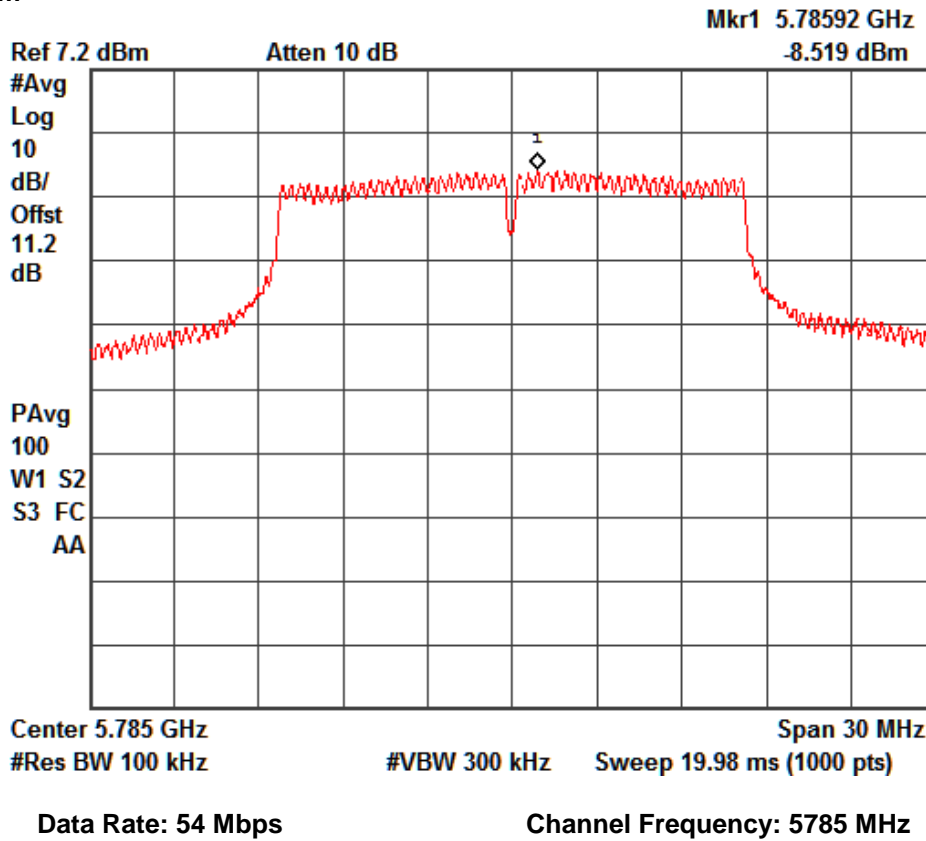


Center 5.785 GHz      Span 30 MHz  
 #Res BW 100 kHz      #VBW 300 kHz      Sweep 19.98 ms (1000 pts)

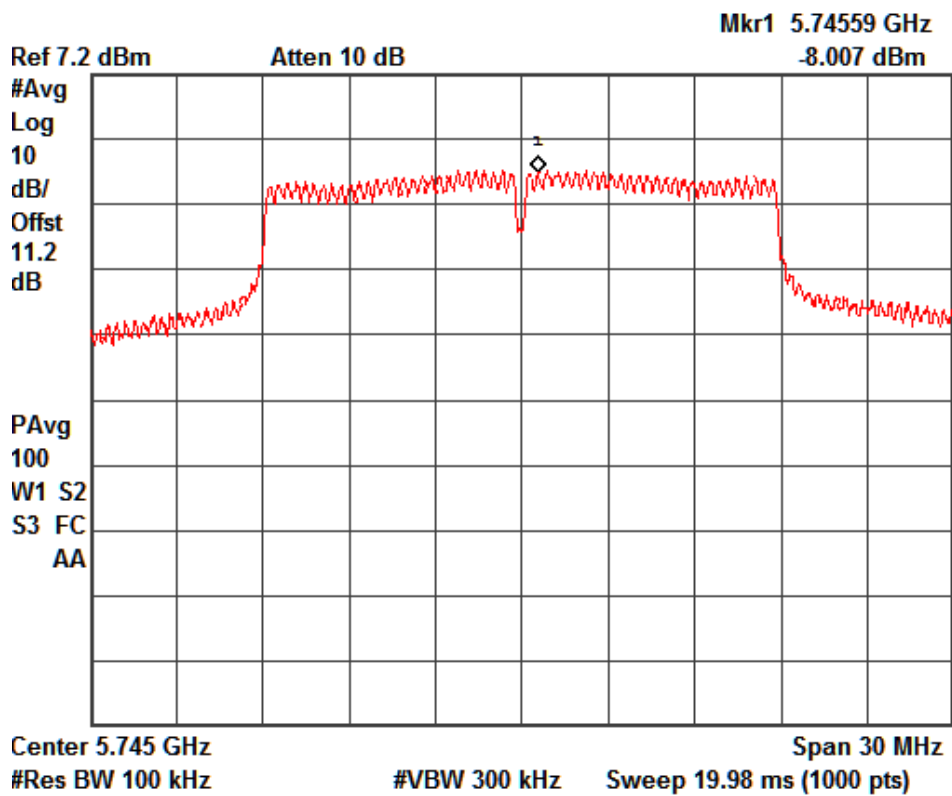
Data Rate: 24 Mbps

Channel Frequency: 5785 MHz





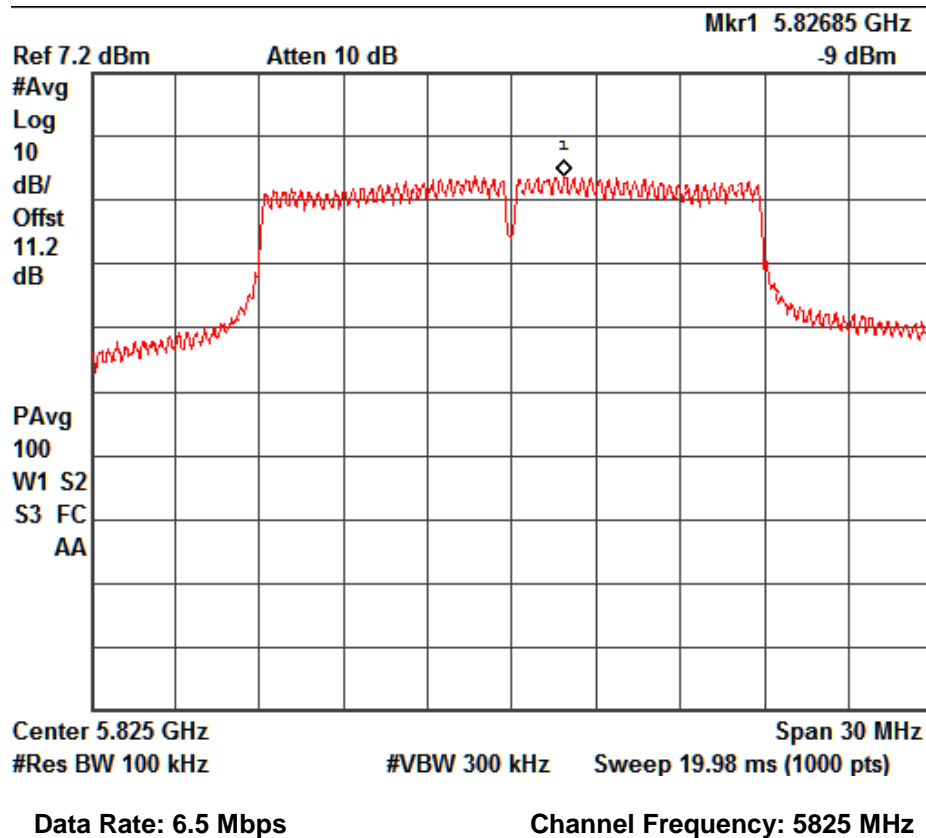
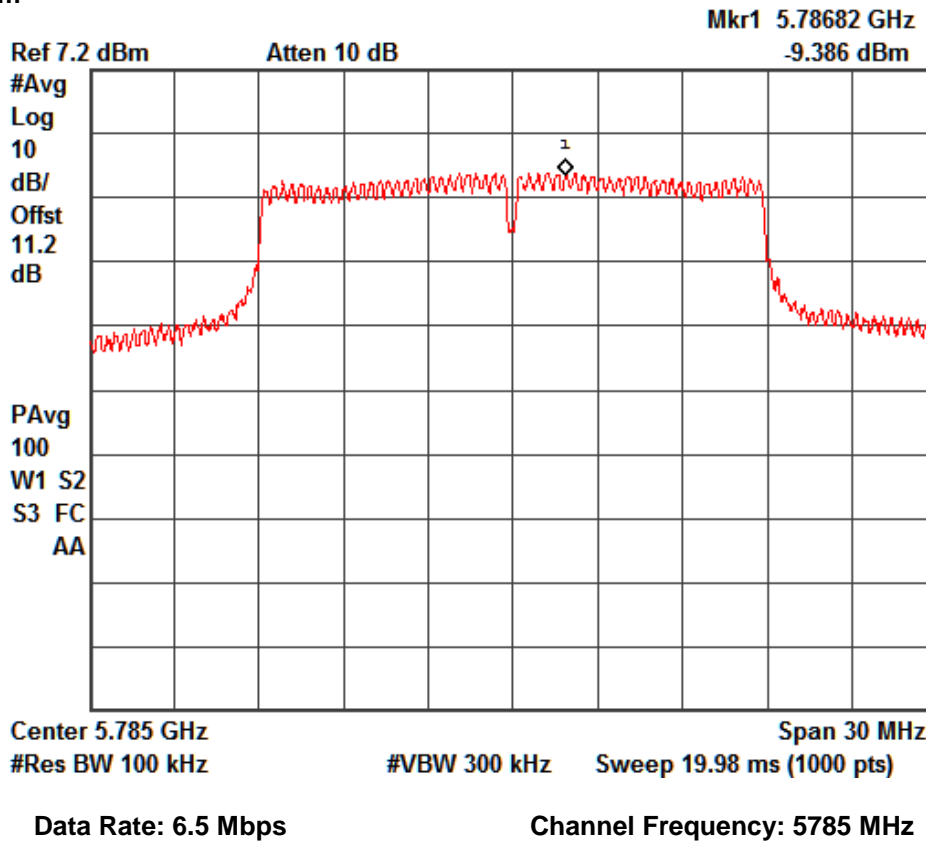
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Total Power (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|------------------|-------------------------|-------------------|-------------|-------------|
| n               | 6.5              | 5745                    | -8.00             | 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

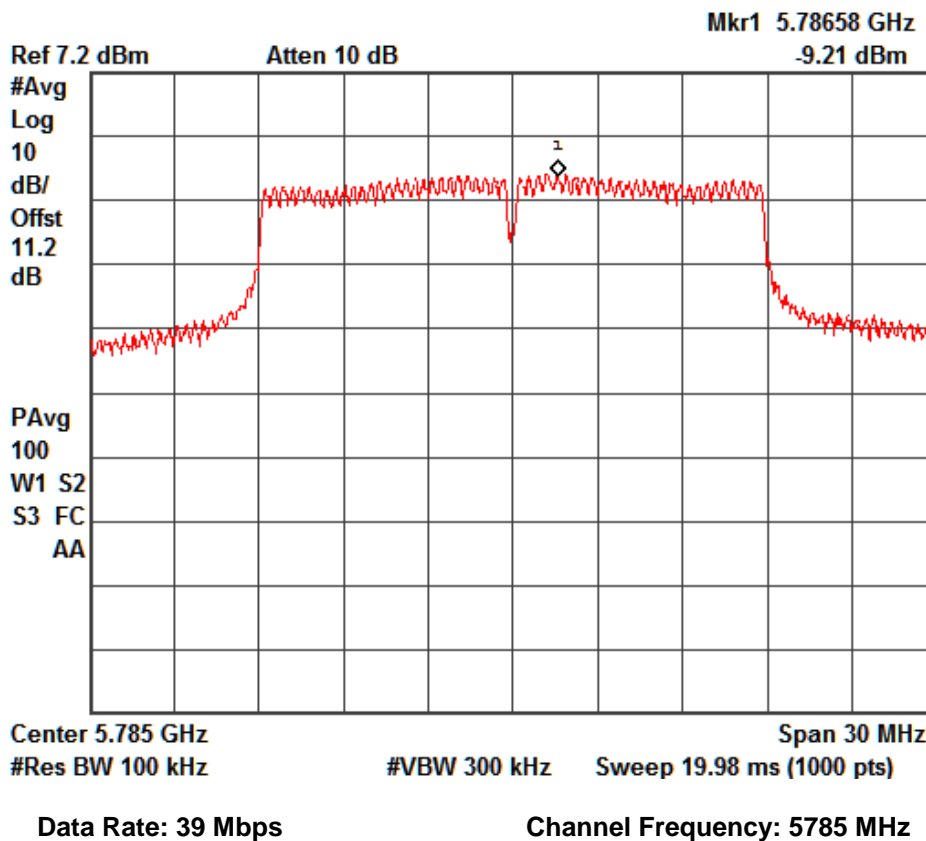
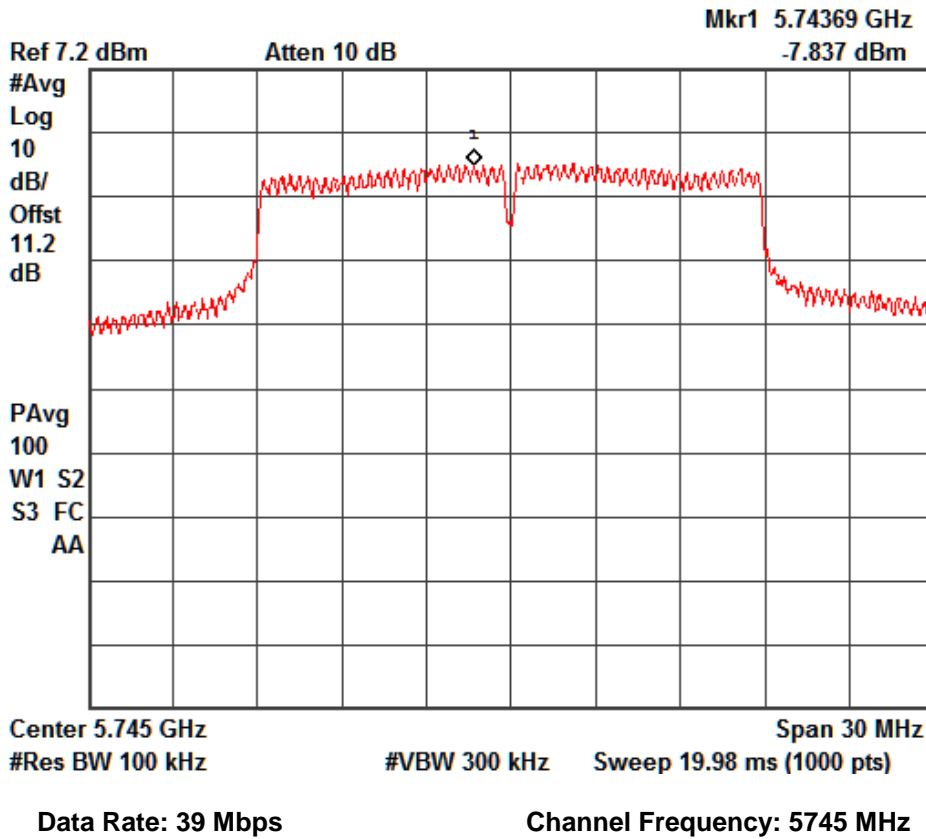
Channel Frequency: 5745 MHz

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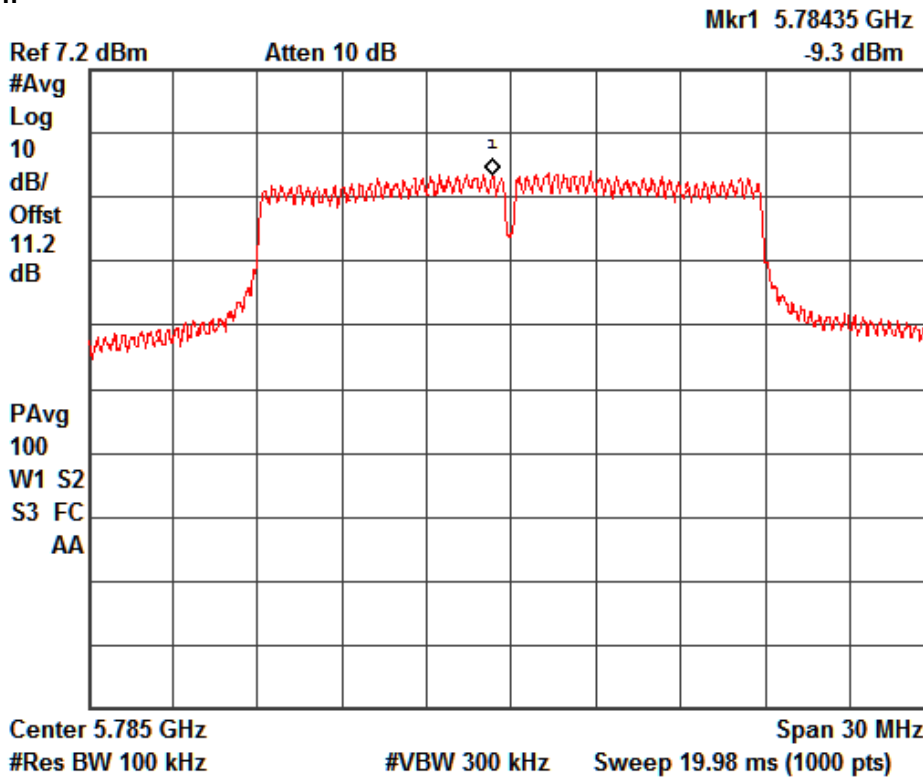


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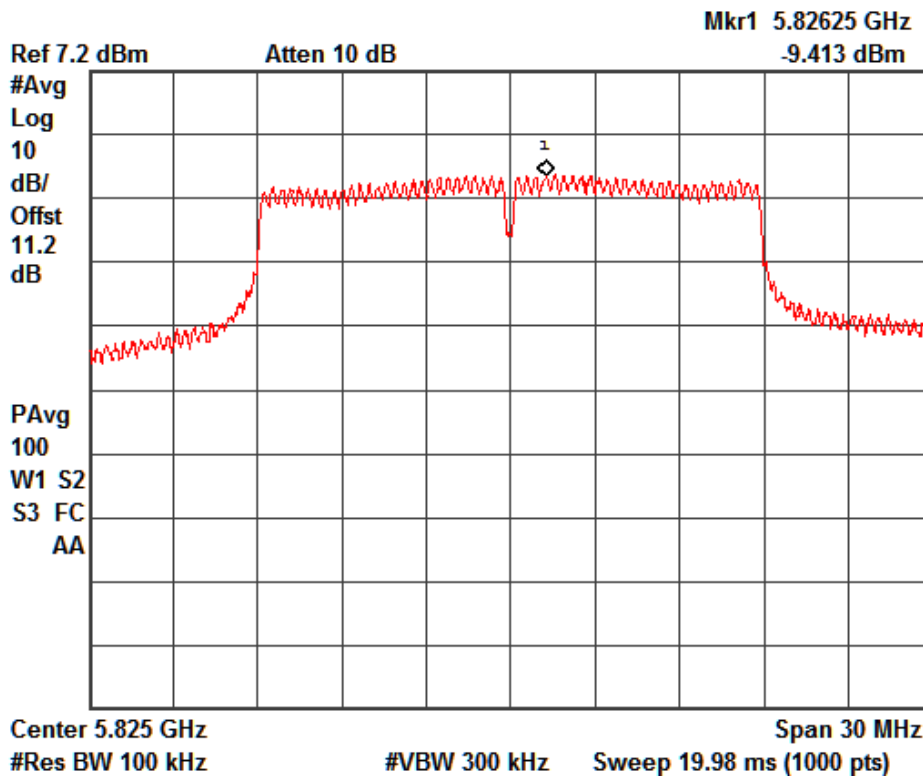


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Data Rate: 65 Mbps

Channel Frequency: 5785 MHz



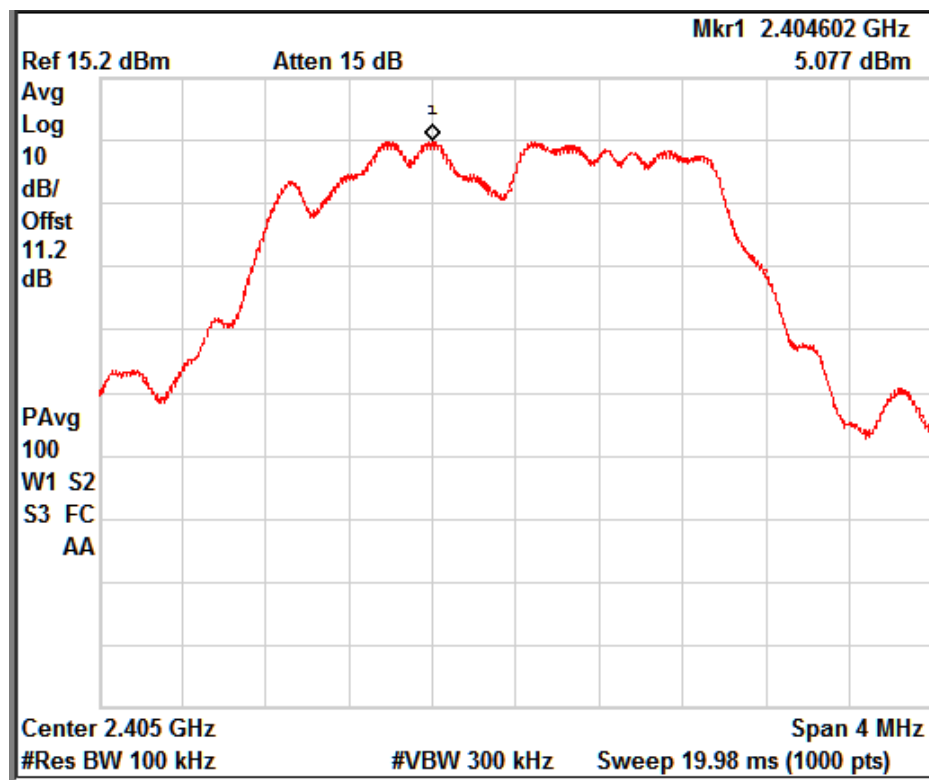
Data Rate: 65 Mbps

Channel Frequency: 5825 MHz

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Test Result: ZigBee

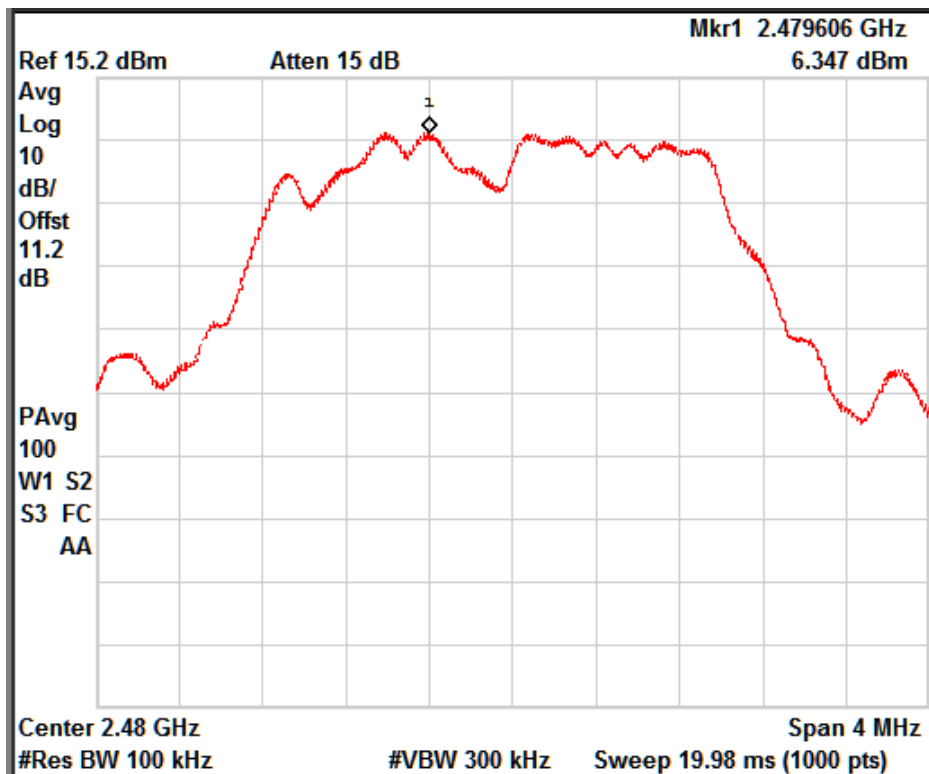
| Channel Frequency (MHz) | Total PSD (dBm) | Limit (dBm) | Margin (dB) |
|-------------------------|-----------------|-------------|-------------|
| 2405.00                 | 05.07           | 8.00        | -02.93      |
| 2440.00                 | 04.41           | 8.00        | -03.59      |
| 2480.00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



Channel Frequency: 2405 MHz



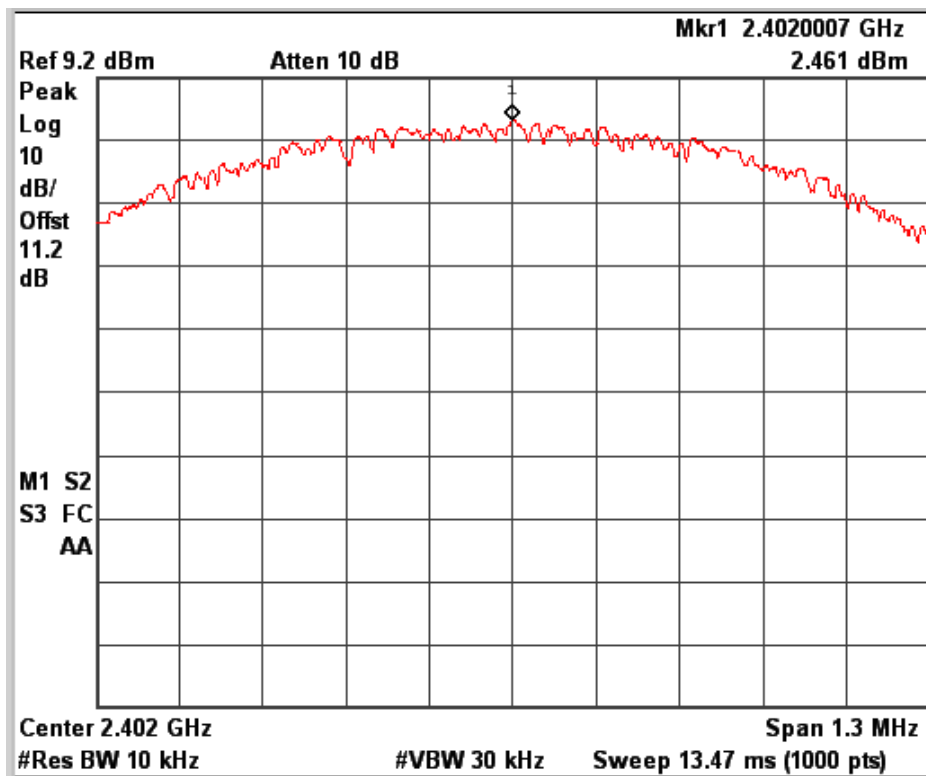
Channel Frequency: 2440 MHz



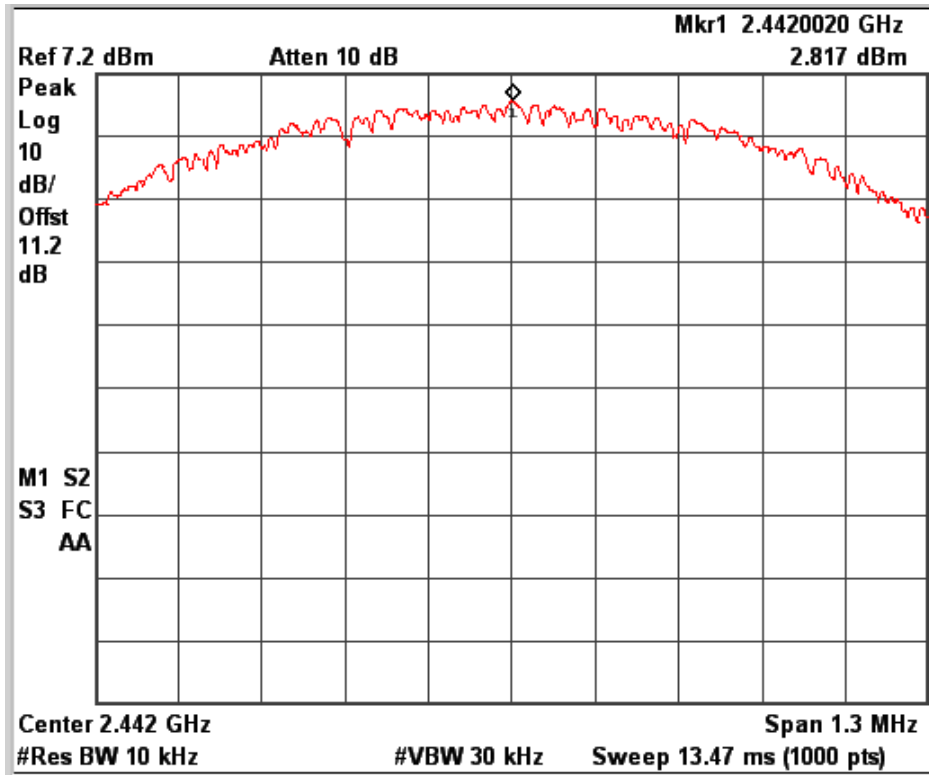
Channel Frequency: 2480 MHz

**Test Result: Bluetooth LE**

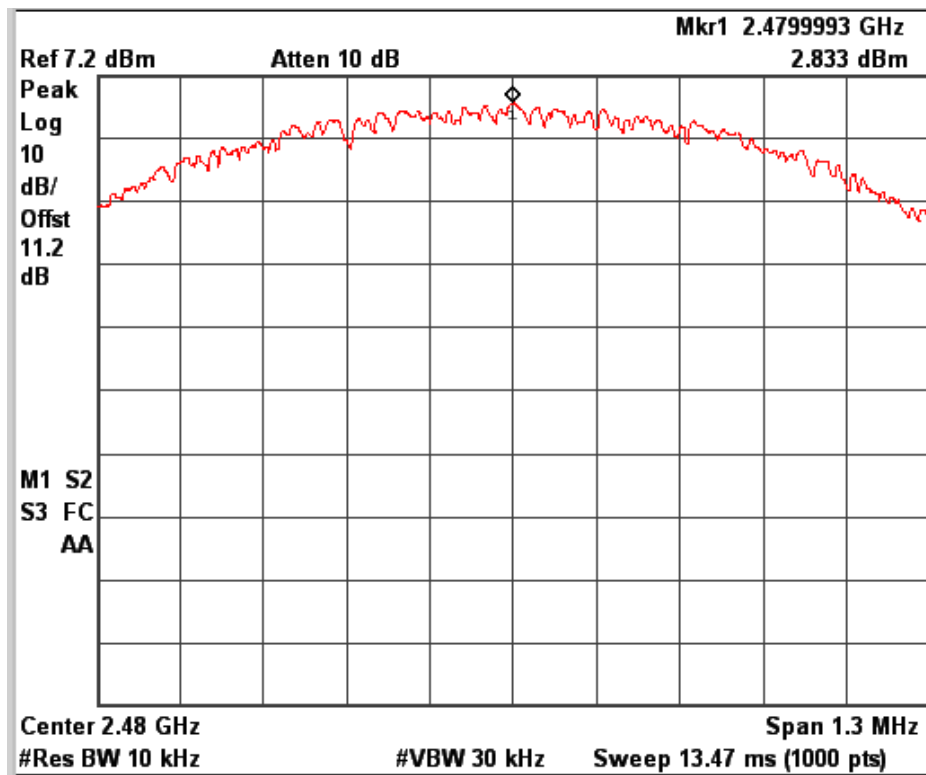
| Channel Frequency (MHz) | Total PSD (dBm) | Limit (dBm) | Margin (dB) |
|-------------------------|-----------------|-------------|-------------|
| 2402.00                 | 02.46           | 8.00        | -05.54      |
| 2442.00                 | 02.81           | 8.00        | -05.19      |
| 2480.00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



**Channel Frequency: 2402 MHz**



Channel Frequency: 2442 MHz



Channel Frequency: 2480 MHz

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**6 dB Bandwidth**

**Section 15.247(a) (2)**

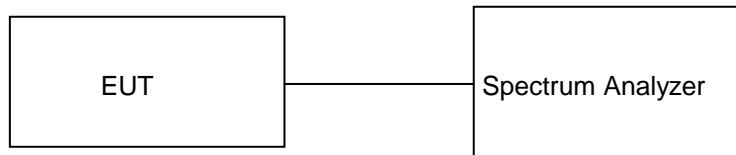
**Result**

**Pass**

Test Specification Requirement

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

**Test Method:**

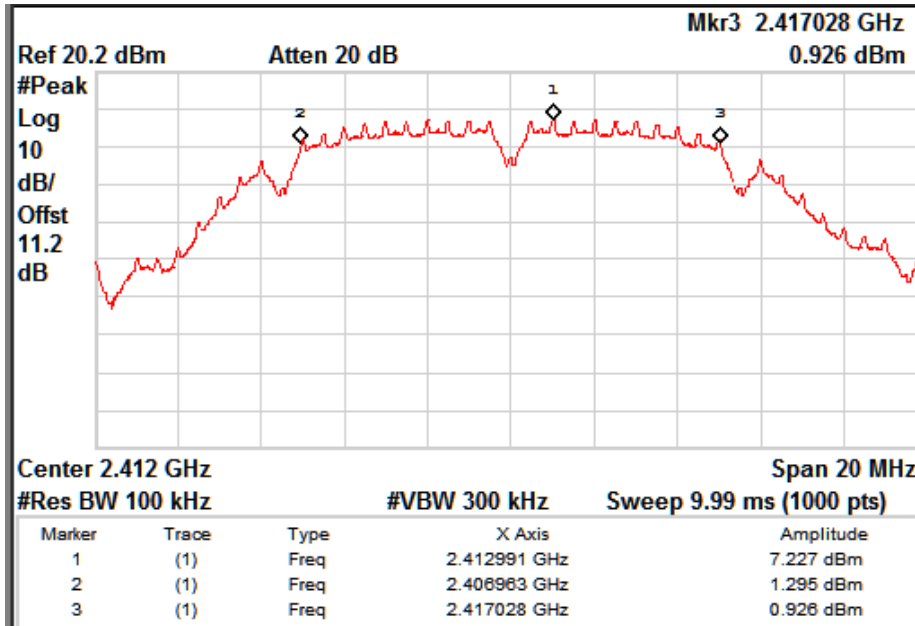


**Test Result:**

| 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        |

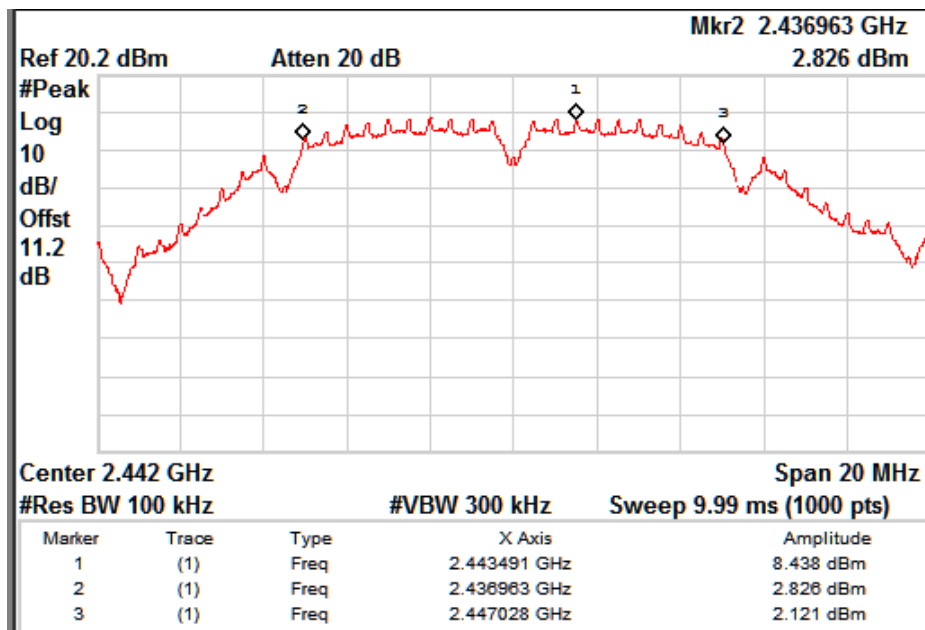


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Data Rate: 1 Mbps

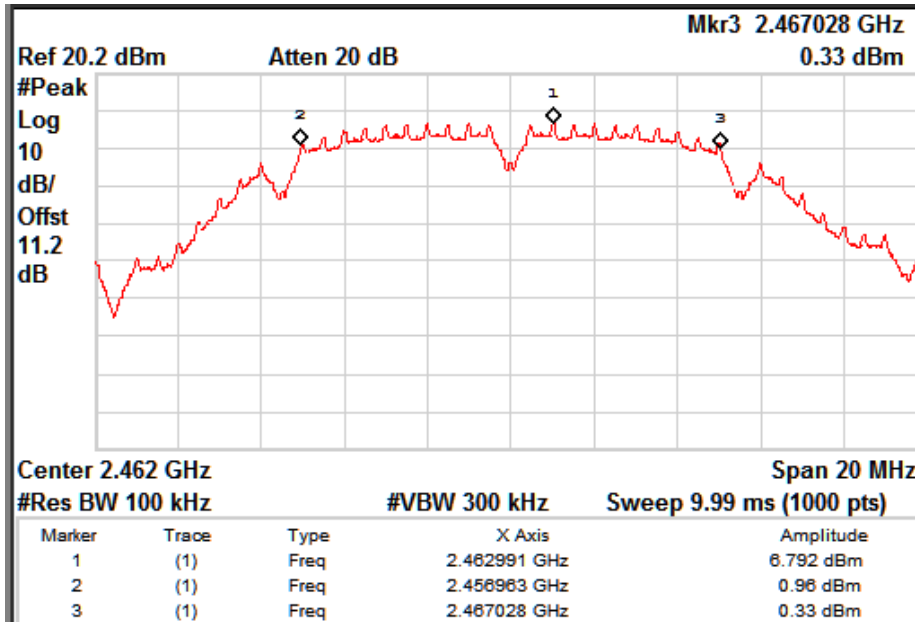
Channel frequency: 2412 MHz



Data Rate: 1 Mbps

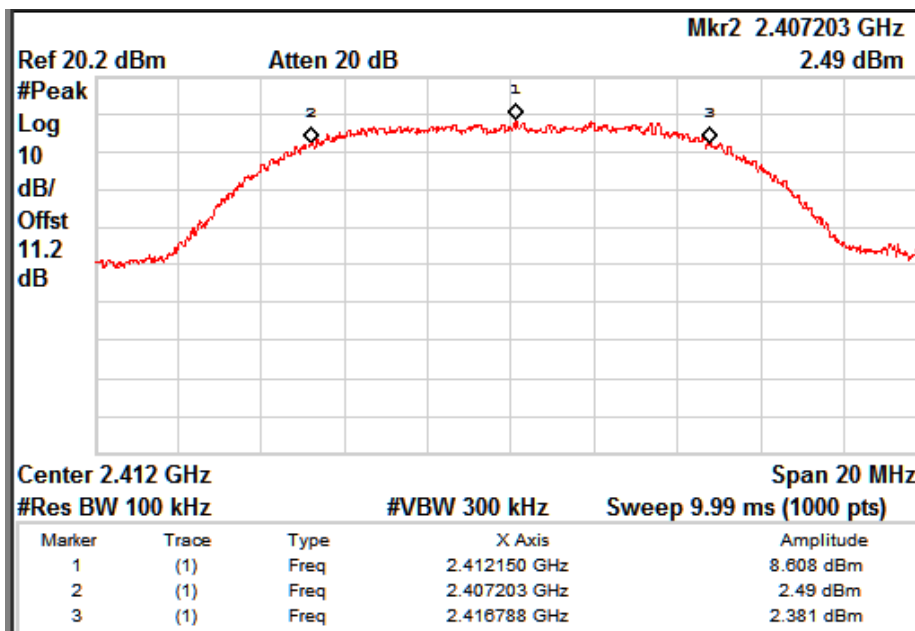
Channel frequency: 2442 MHz

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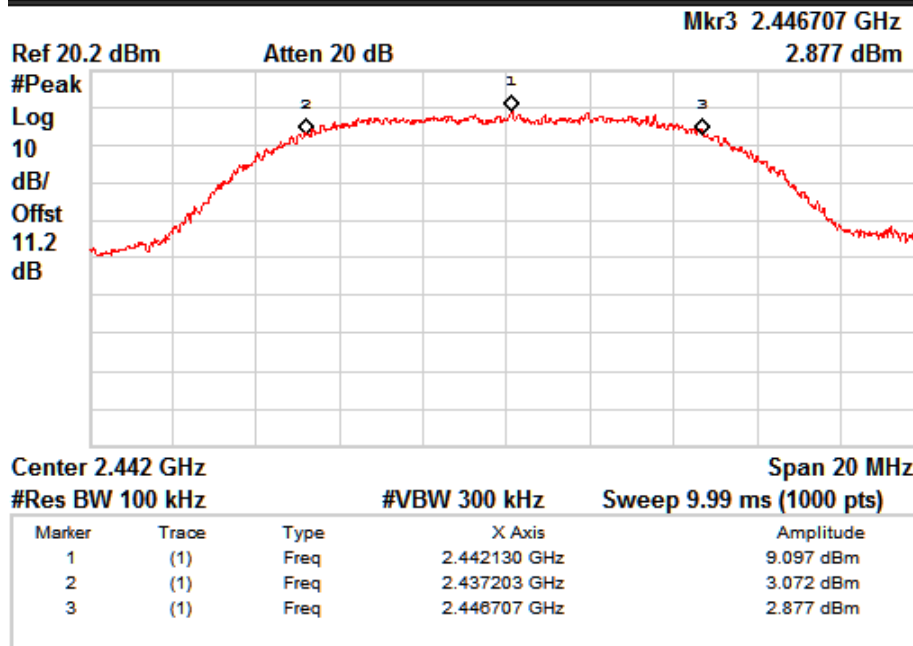
Data Rate: 1 Mbps

Channel frequency: 2462 MHz



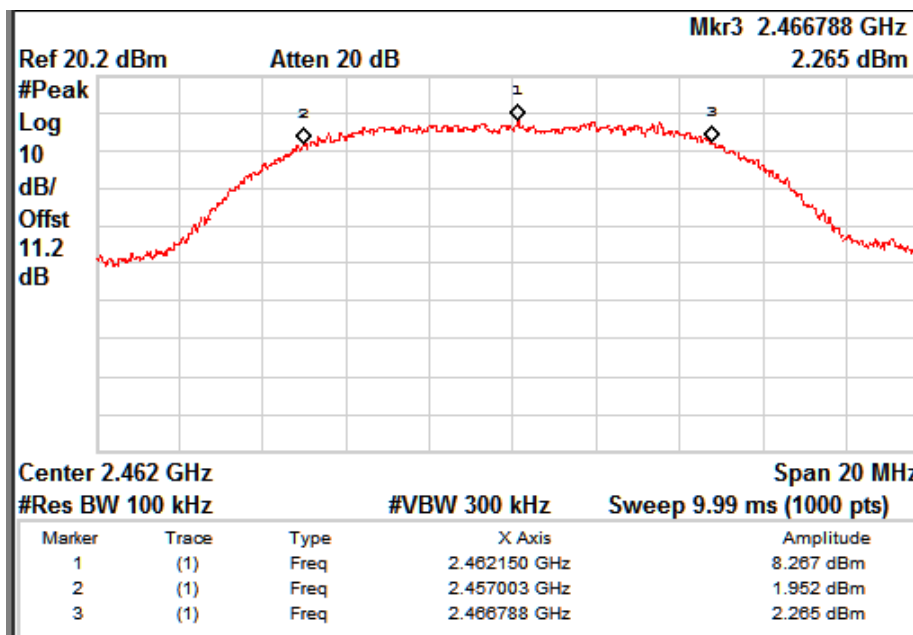
Data Rate: 11 Mbps

Channel frequencies: 2412 MHz



Data Rate: 11 Mbps

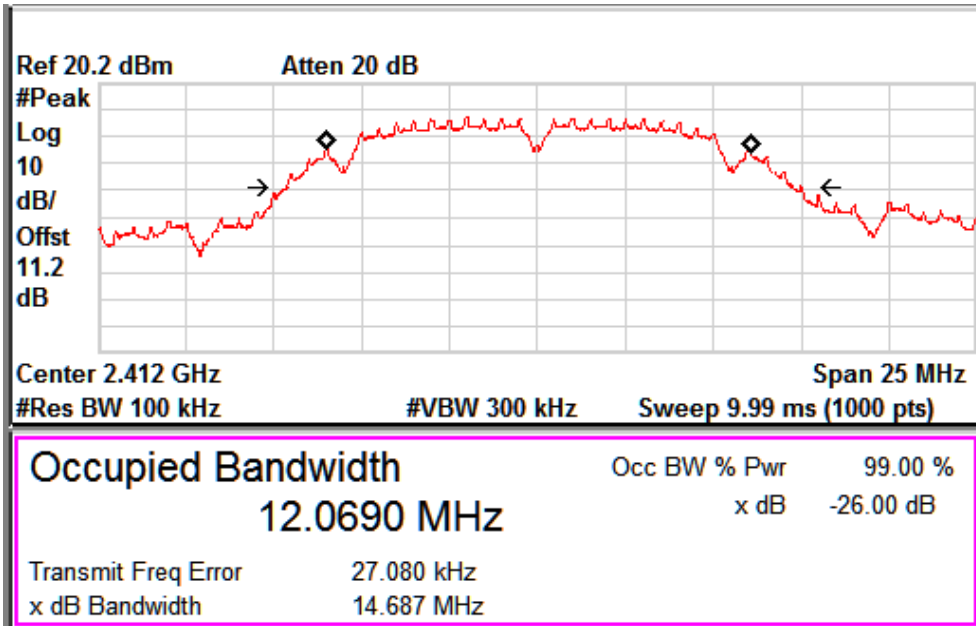
Channel frequency: 2442 MHz



Data Rate: 11 Mbps

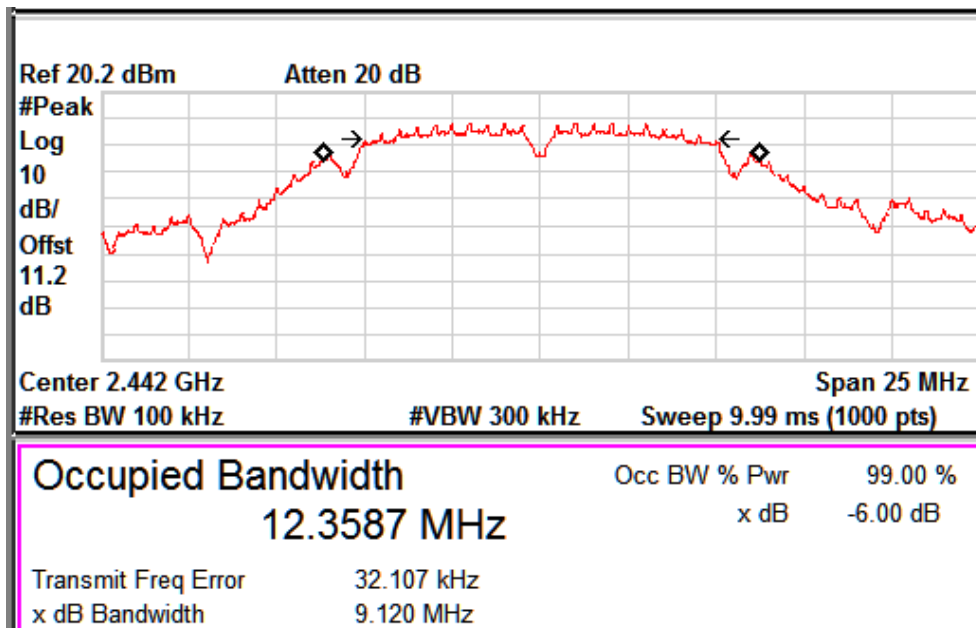
Channel frequency: 2462 MHz

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Data rate: 1 Mbps

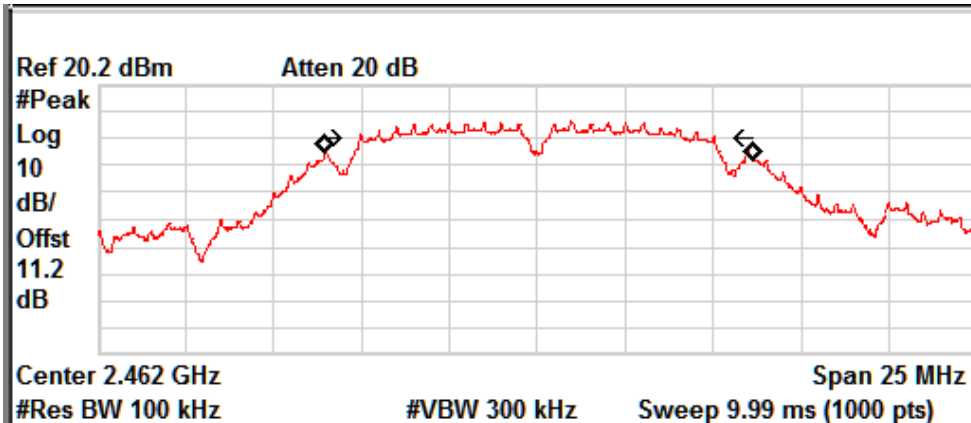
99% Occupied Bandwidth: Channel 2412MHz



Data rate: 1 Mbps

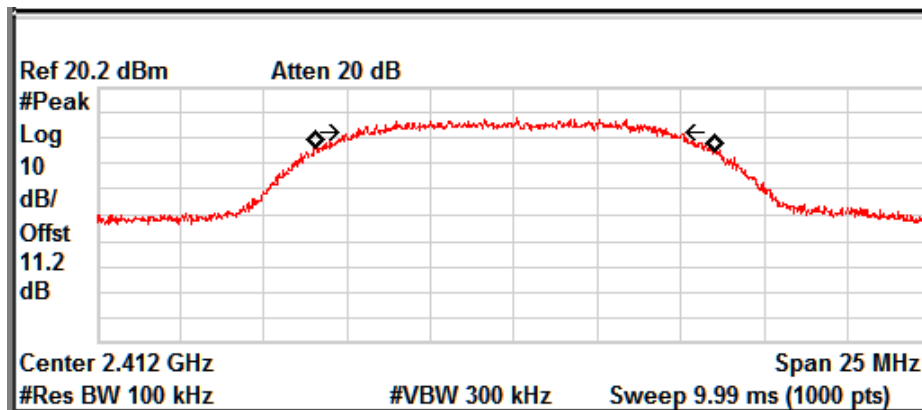
99% Occupied Bandwidth: Channel 2442MHz

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|                           |            |              |          |
|---------------------------|------------|--------------|----------|
| <b>Occupied Bandwidth</b> |            | Occ BW % Pwr | 99.00 %  |
| 12.1658 MHz               |            | x dB         | -6.00 dB |
| Transmit Freq Error       | 38.326 kHz |              |          |
| x dB Bandwidth            | 10.052 MHz |              |          |

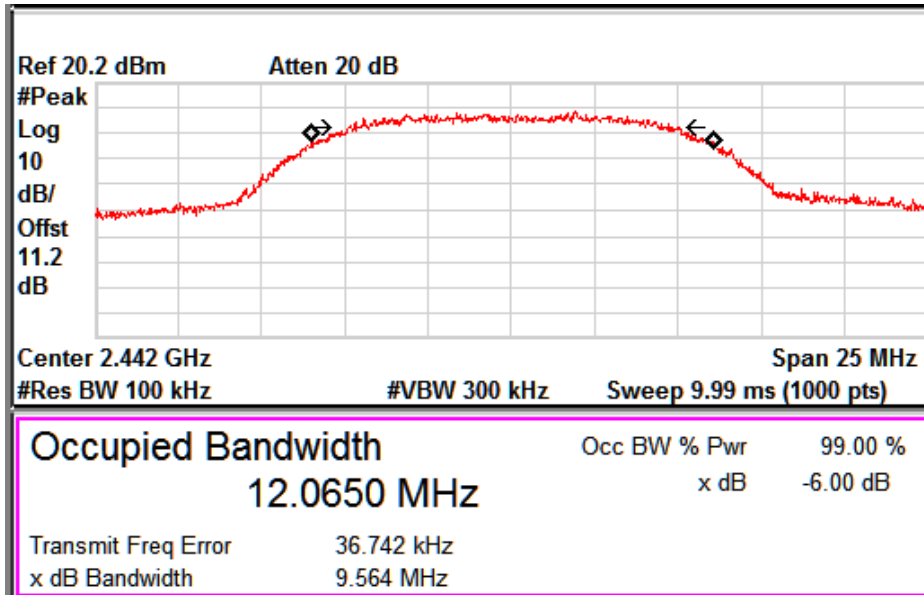
Data rate: 1 Mbps                      99% Occupied Bandwidth: Channel 2462MHz



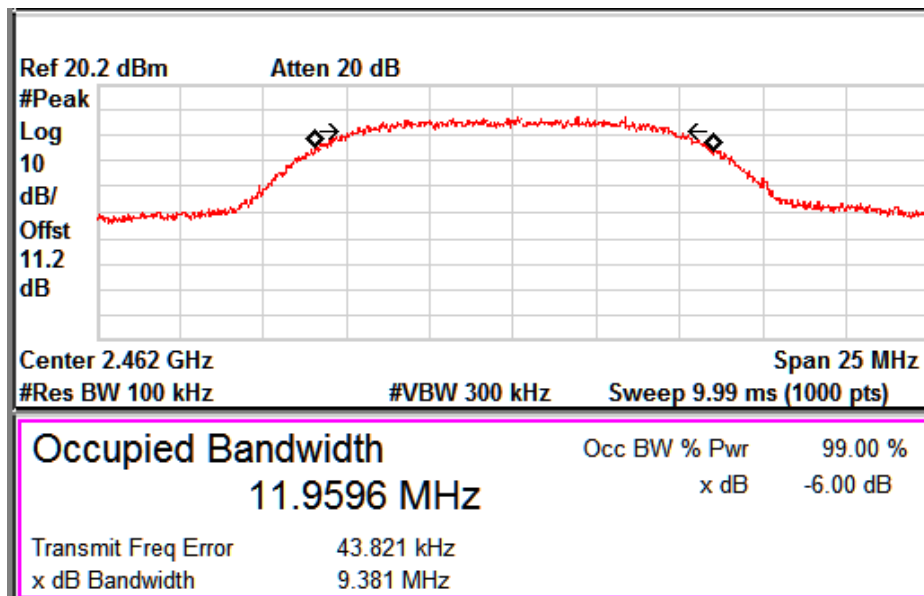
|                           |           |              |          |
|---------------------------|-----------|--------------|----------|
| <b>Occupied Bandwidth</b> |           | Occ BW % Pwr | 99.00 %  |
| 11.9579 MHz               |           | x dB         | -6.00 dB |
| Transmit Freq Error       | 3.341 kHz |              |          |
| x dB Bandwidth            | 9.274 MHz |              |          |

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

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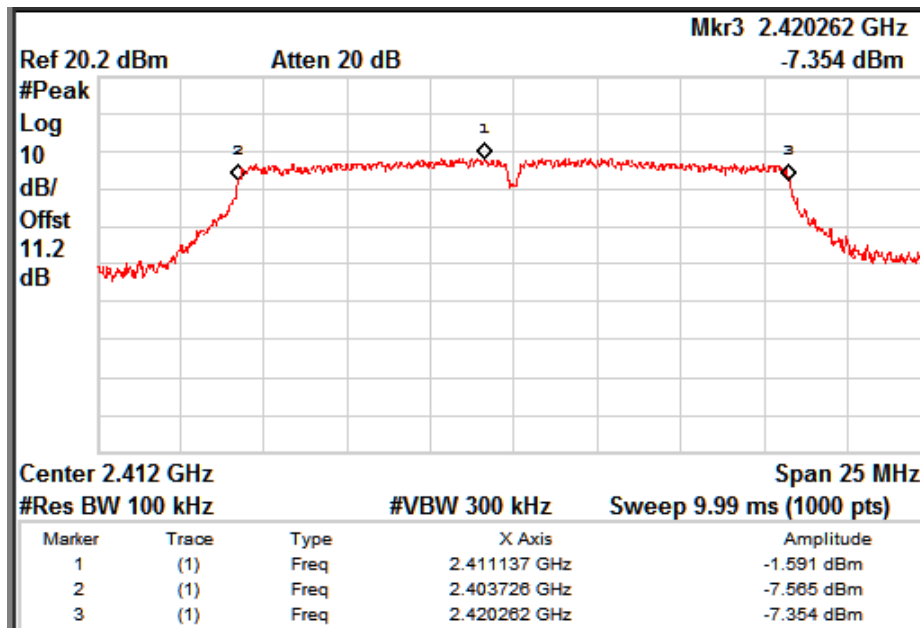
Data rate: 11 Mbps      99% Occupied Bandwidth: Channel 2442MHz



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

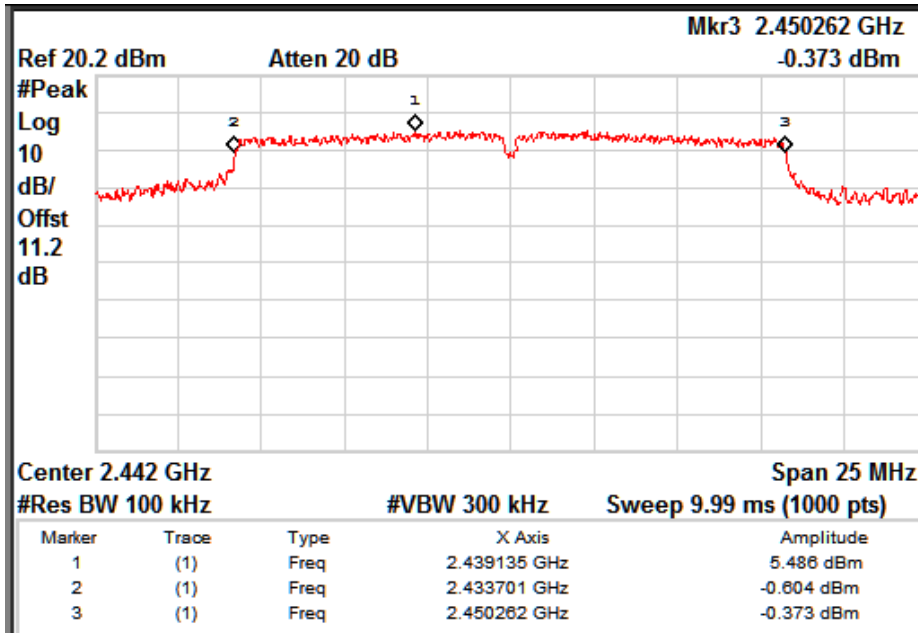
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| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Lower Frequency (MHz) | Upper Frequency (MHz) | 6 dB Bandwidth (MHz) | 99% OBW (MHz) |
|-----------------|------------------|-------------------------|-----------------------|-----------------------|----------------------|---------------|
| 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        |



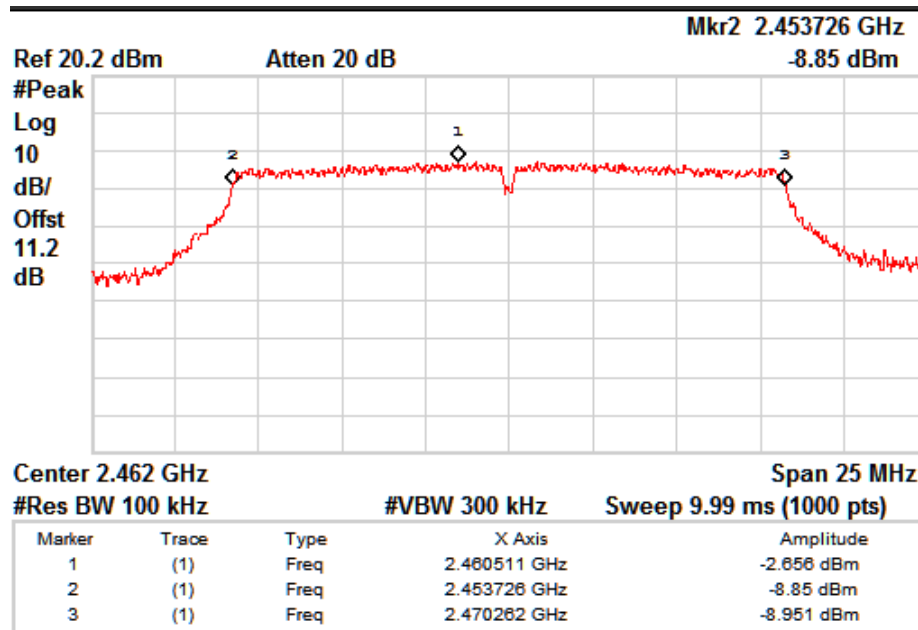
Data Rate: 6 Mbps

Channel frequencies: 2412 MHz



Data Rate: 6 Mbps

Channel frequencies: 2442 MHz

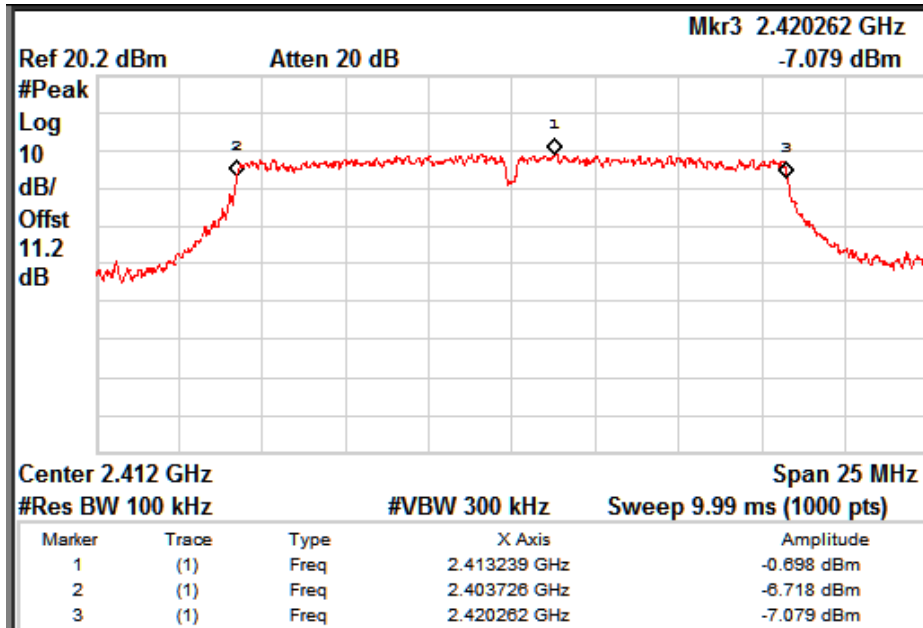


Data Rate: 6 Mbps

Channel frequencies: 2462 MHz

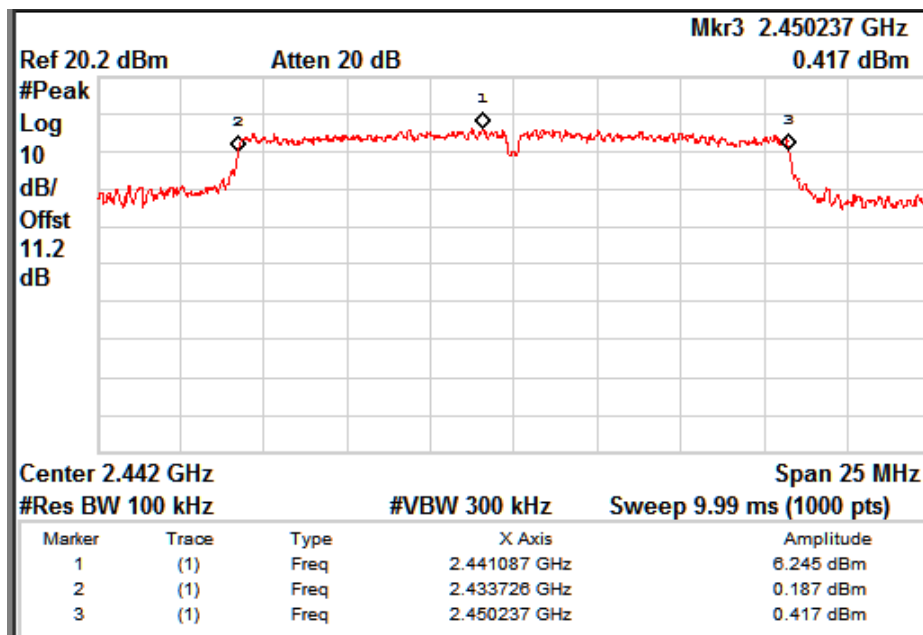


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Data Rate: 24 Mbps

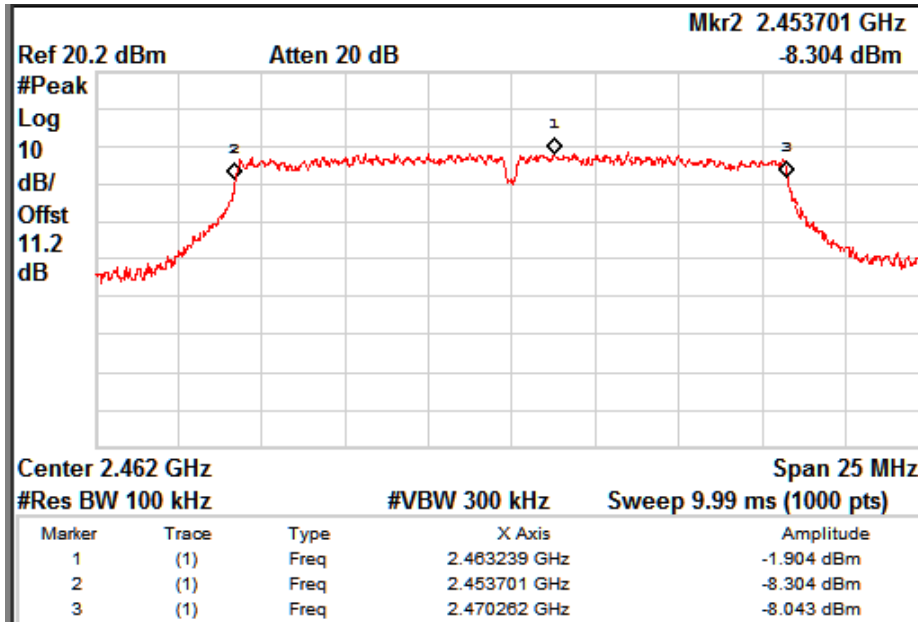
Channel frequencies: 2412 MHz



Data Rate: 24 Mbps

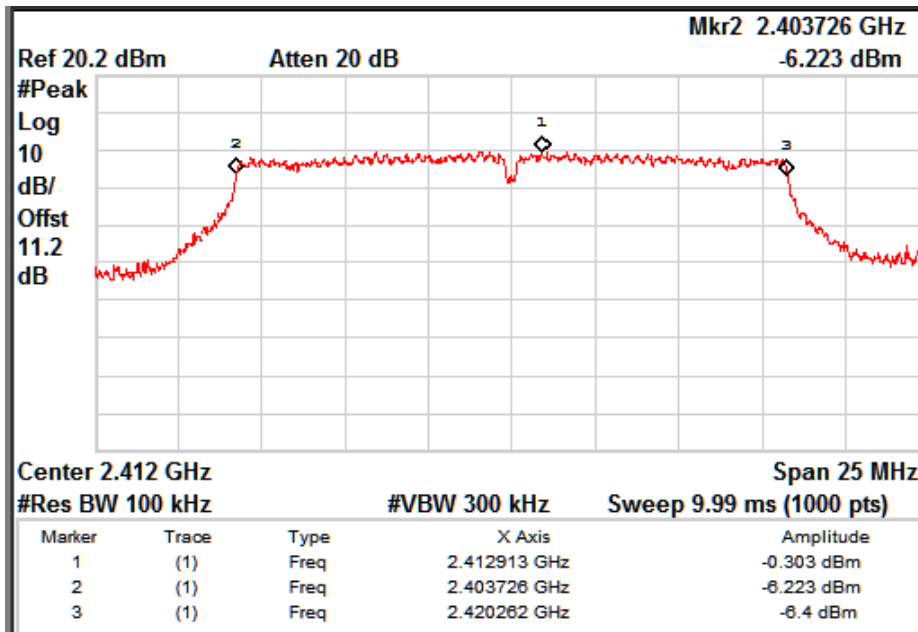
Channel frequencies: 2442 MHz

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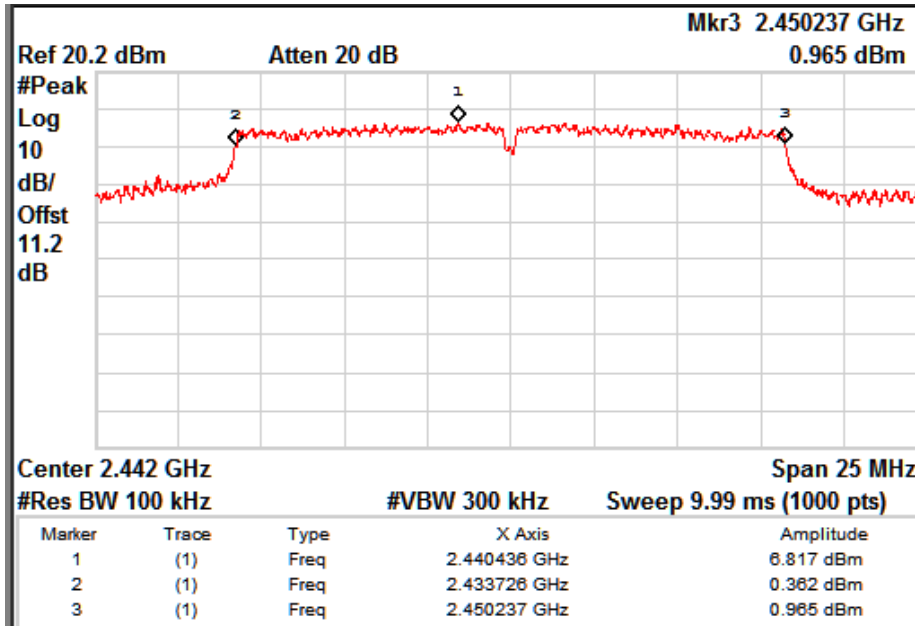
Data Rate: 24 Mbps

Channel frequencies: 2462 MHz



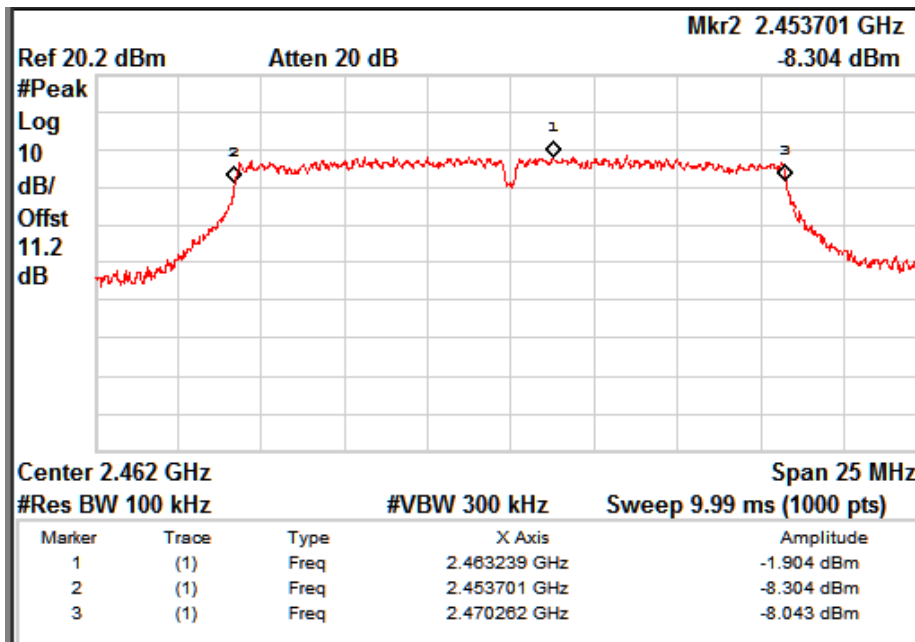
Data Rate: 54 Mbps

Channel frequencies: 2412 MHz



Data Rate: 54 Mbps

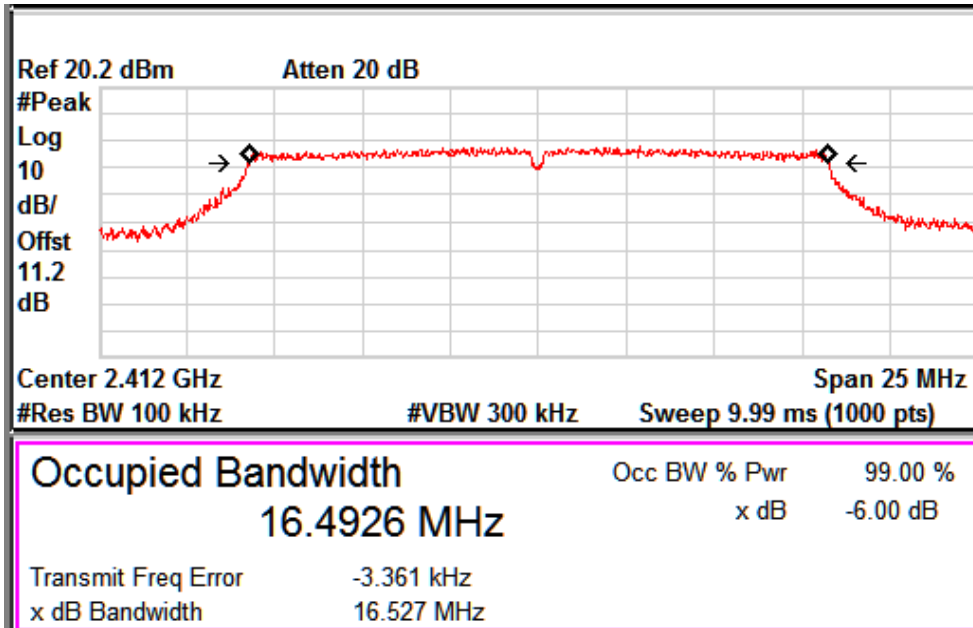
Channel frequencies: 2442MHz



Data Rate: 54 Mbps

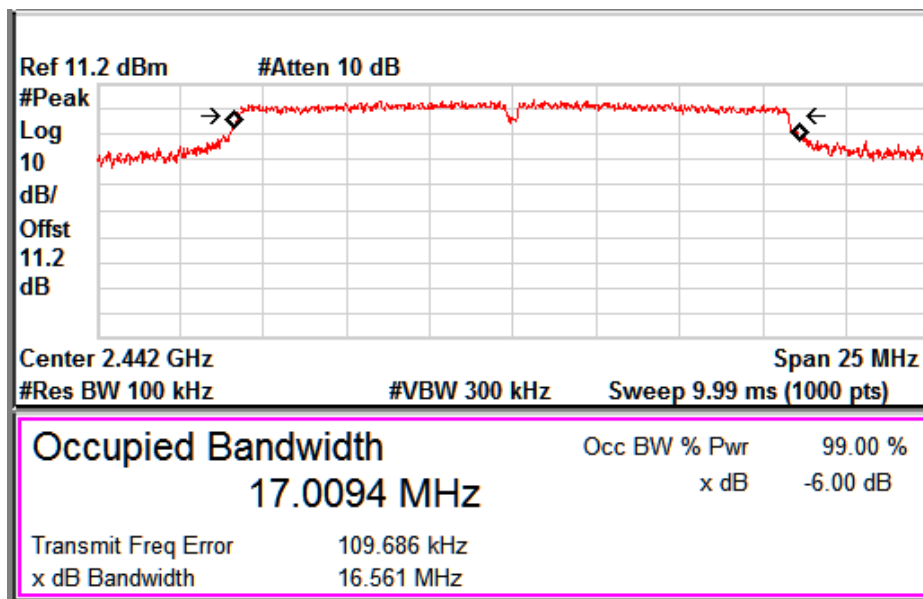
Channel frequencies: 2472 MHz

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Data Rate: 6 Mbps

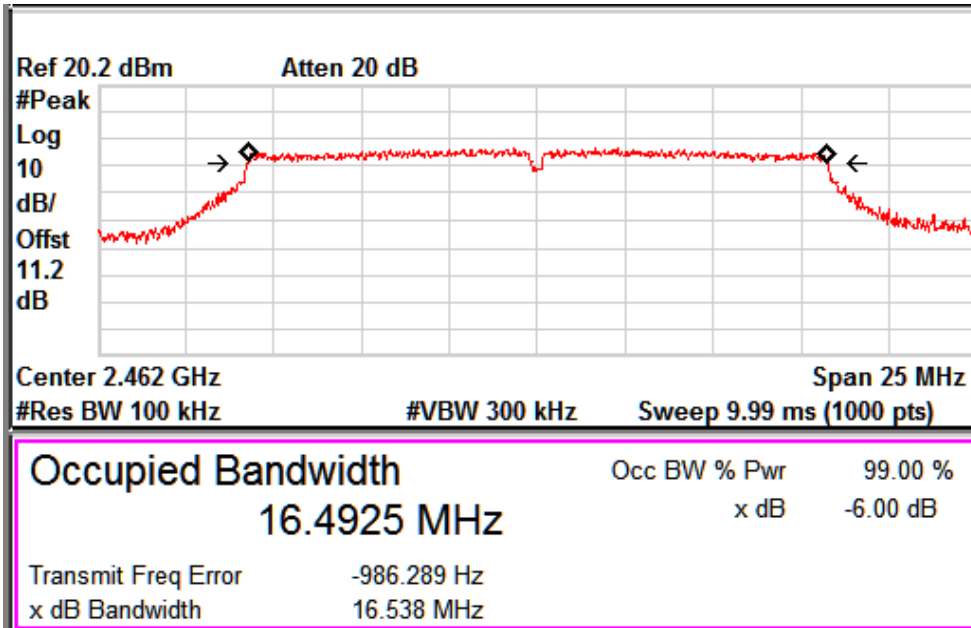
99% Occupied Bandwidth: Channel 2412MHz



Data Rate: 6 Mbps

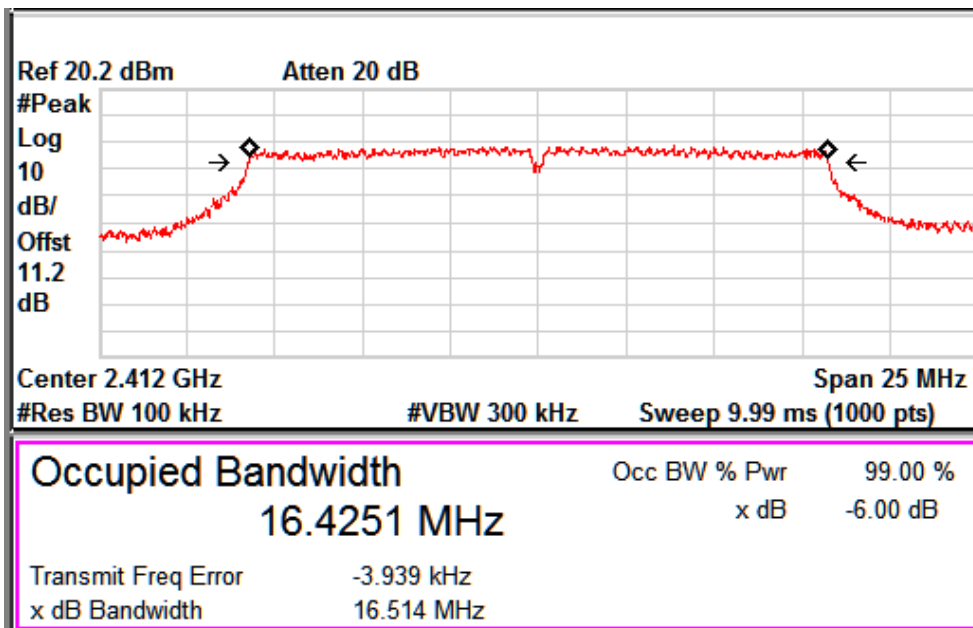
99% Occupied Bandwidth: Channel 2442MHz

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Data Rate: 6 Mbps

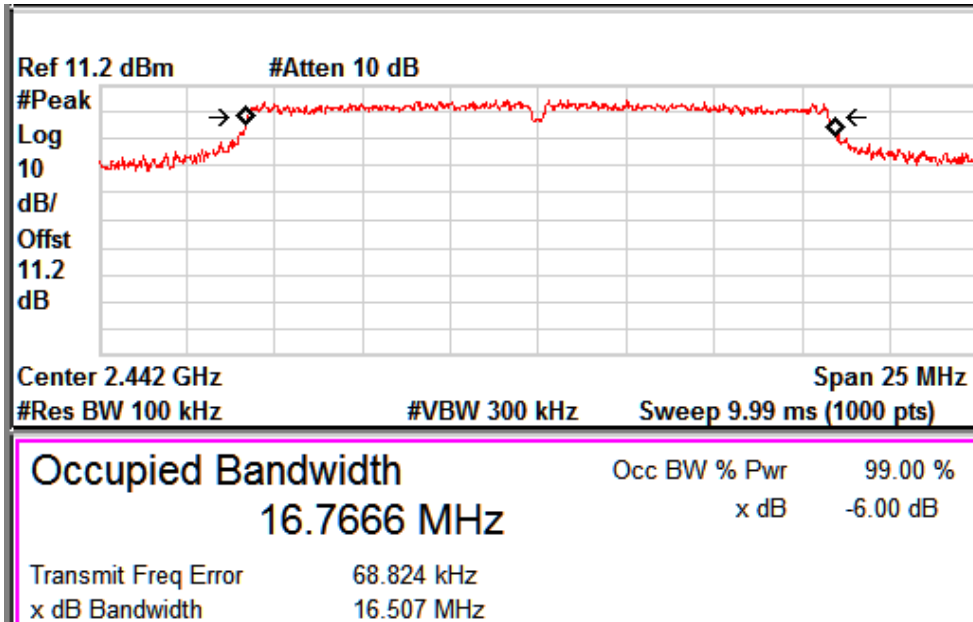
99% Occupied Bandwidth: Channel 2462MHz



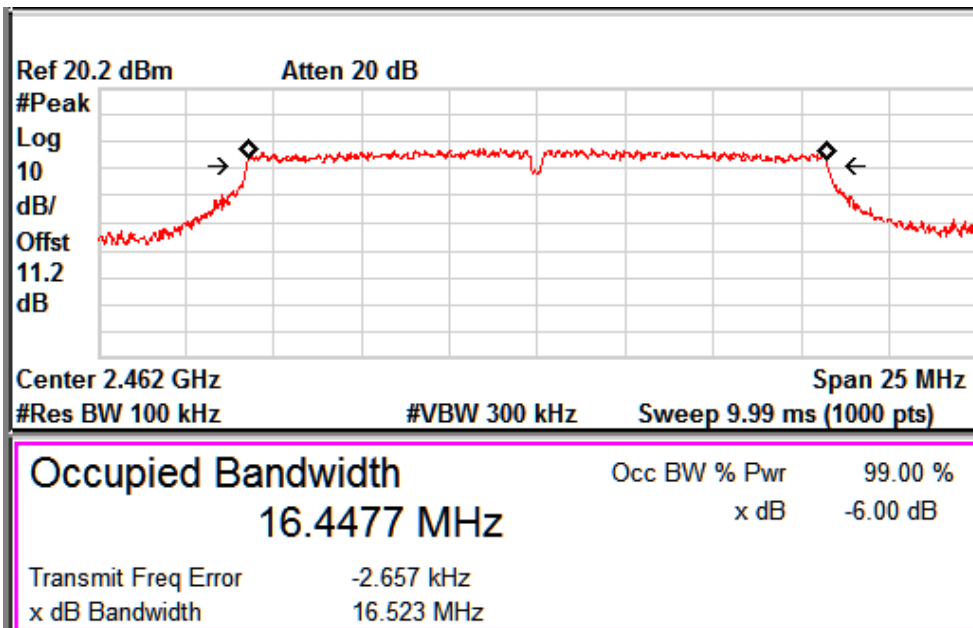
Data Rate: 24 Mbps

99% Occupied Bandwidth: Channel 2412MHz

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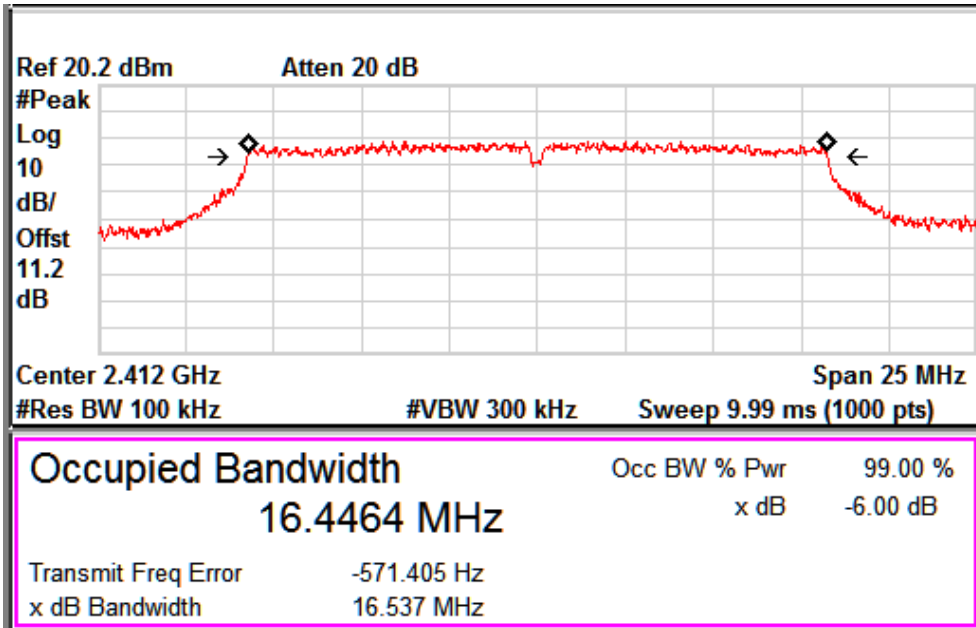


Data Rate: 24 Mbps      99% Occupied Bandwidth: Channel 2442MHz



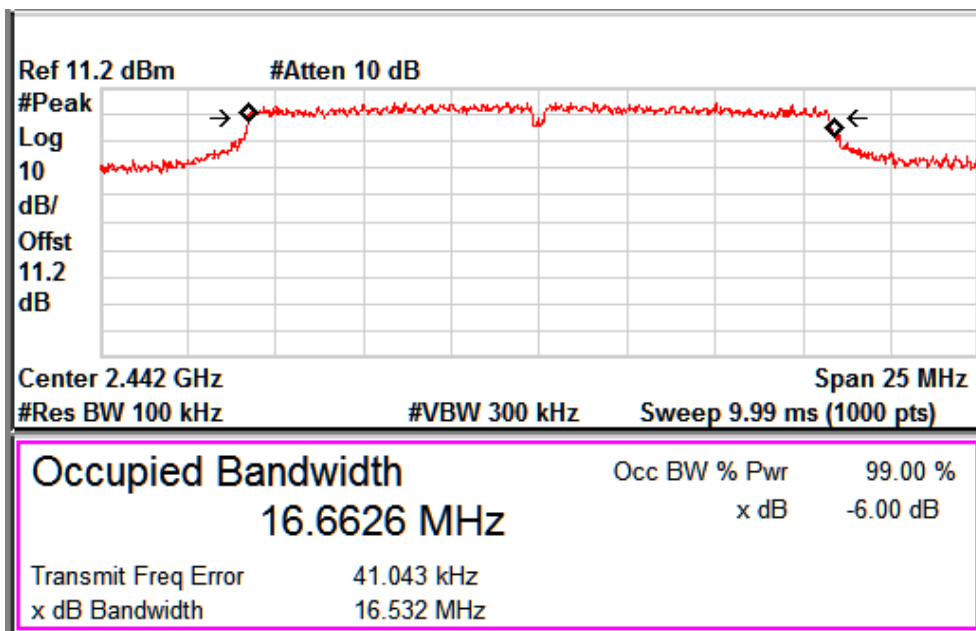
Data Rate: 24 Mbps      99% Occupied Bandwidth: Channel 2462MHz

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Data Rate: 54 Mbps

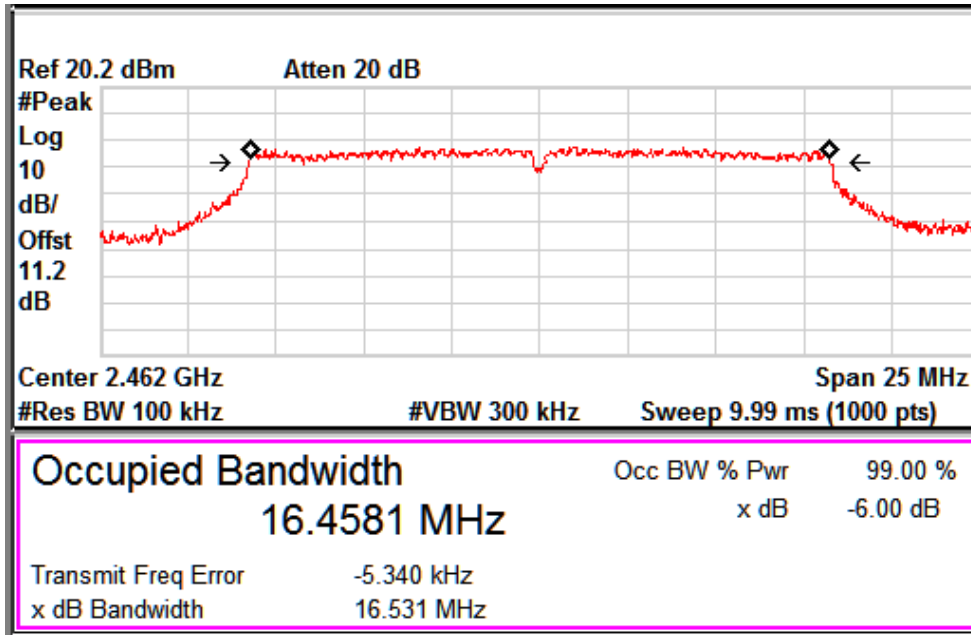
99% Occupied Bandwidth: Channel 2412MHz



Data Rate: 54 Mbps

99% Occupied Bandwidth: Channel 2442MHz

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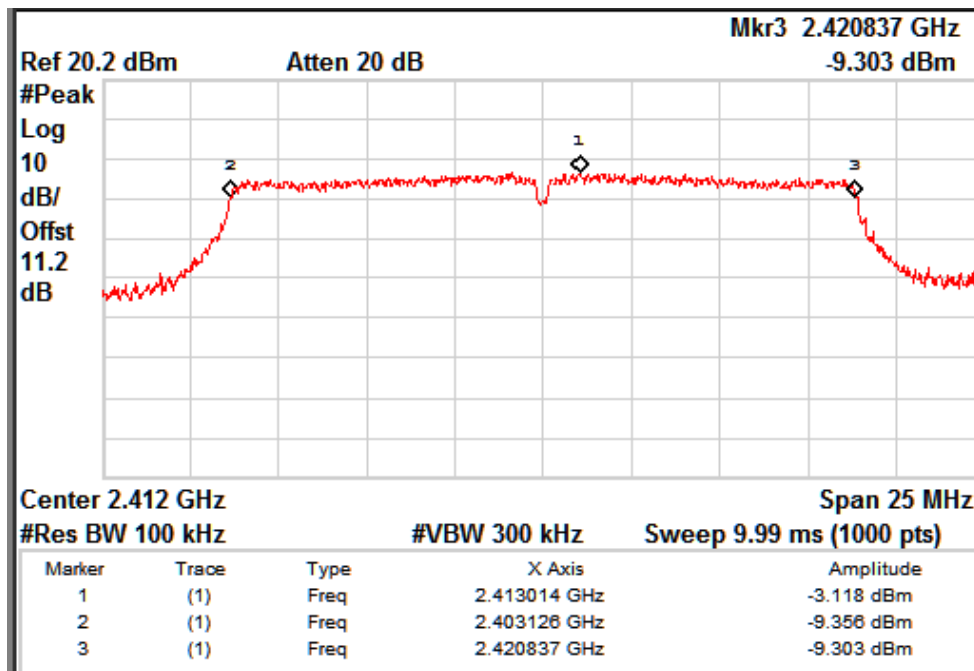


Data Rate: 54 Mbps

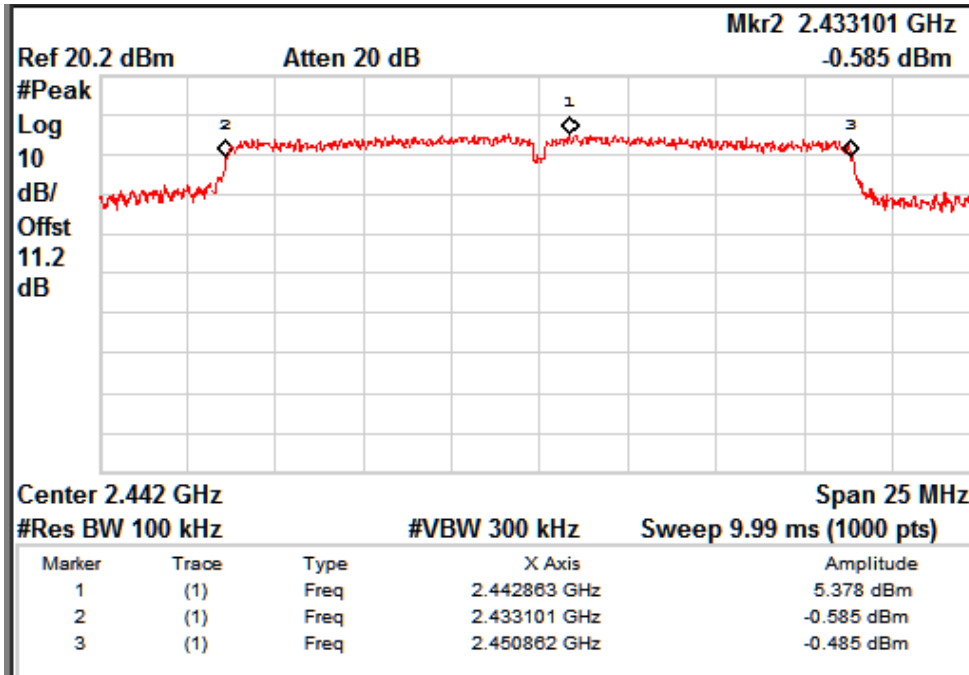
99% Occupied Bandwidth: Channel 2462MHz



| 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        |

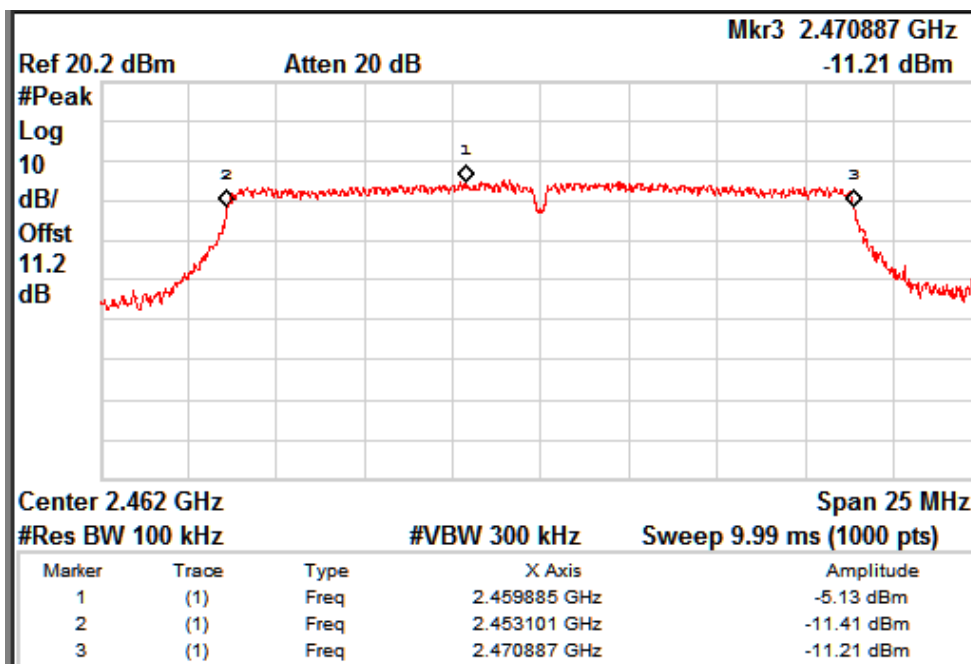

**Data Rate: 6.5 Mbps**
**Channel: 2412 MHz**

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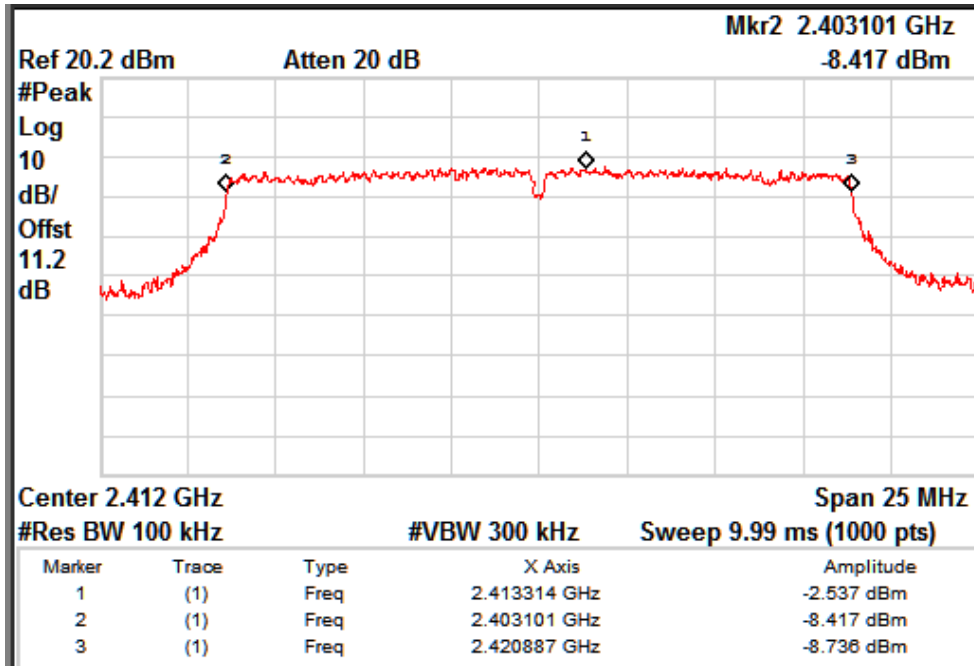
Data Rate: 6.5 Mbps

Channel: 2442 MHz



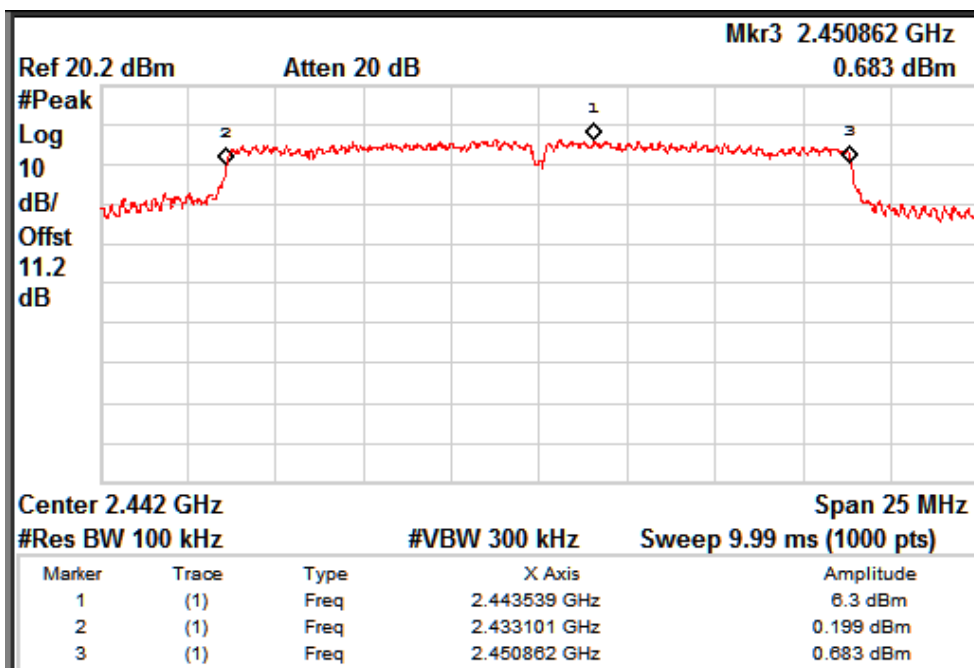
Data Rate: 6.5 Mbps

Channel: 2462 MHz



Data Rate: 39 Mbps

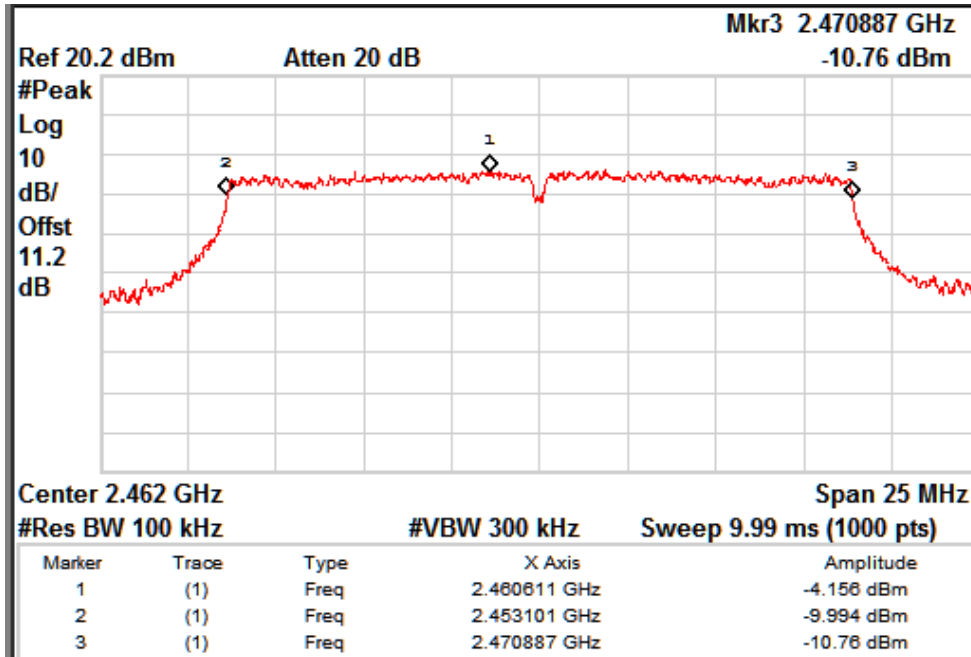
Channel: 2412 MHz



Data Rate: 39 Mbps

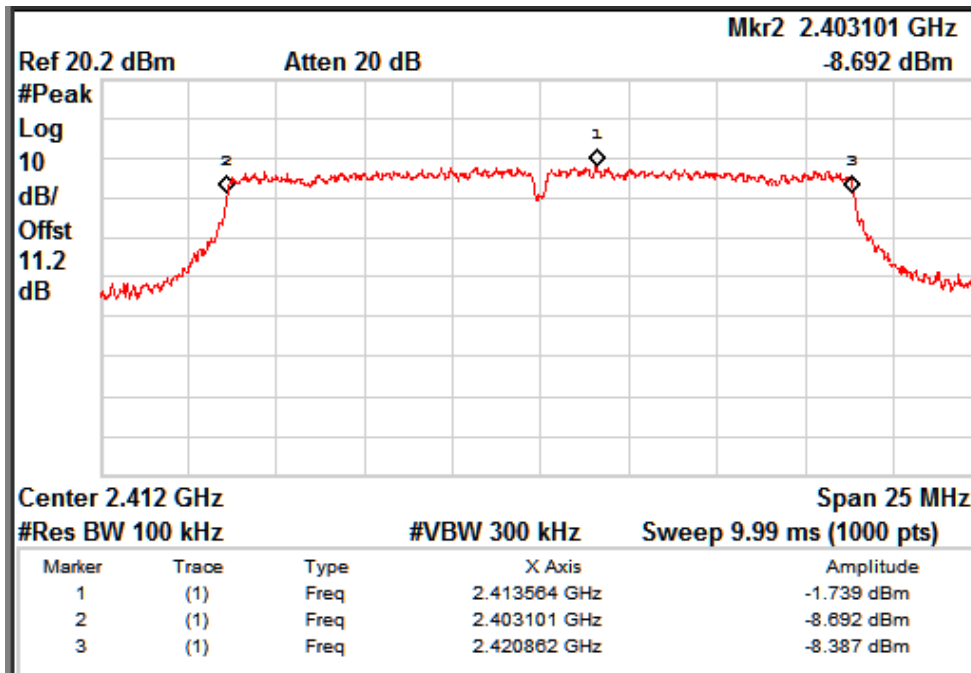
Channel: 2442 MHz

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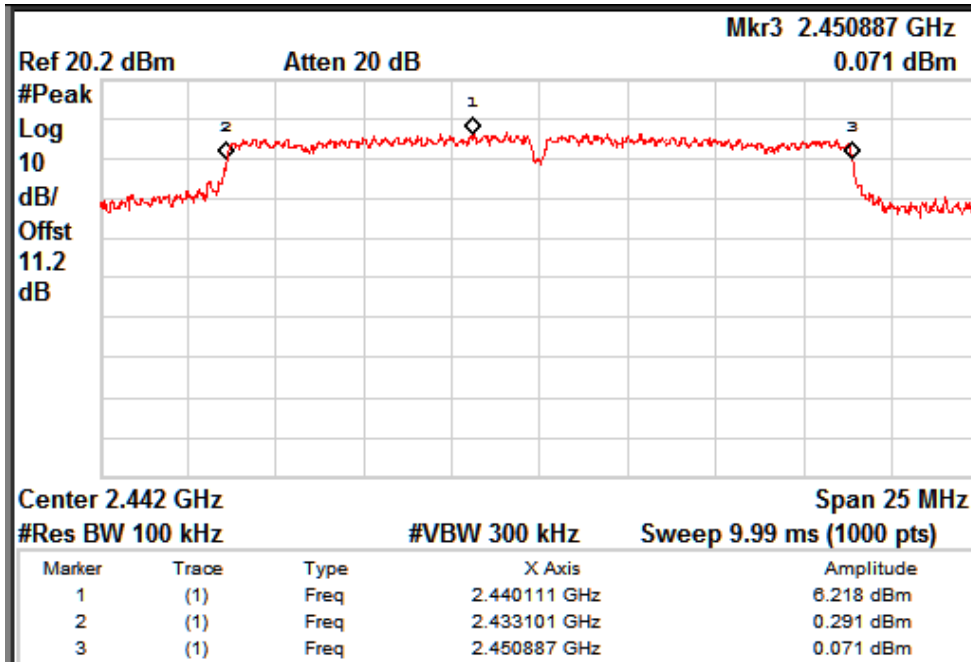
Data Rate: 39 Mbps

Channel: 2462 MHz



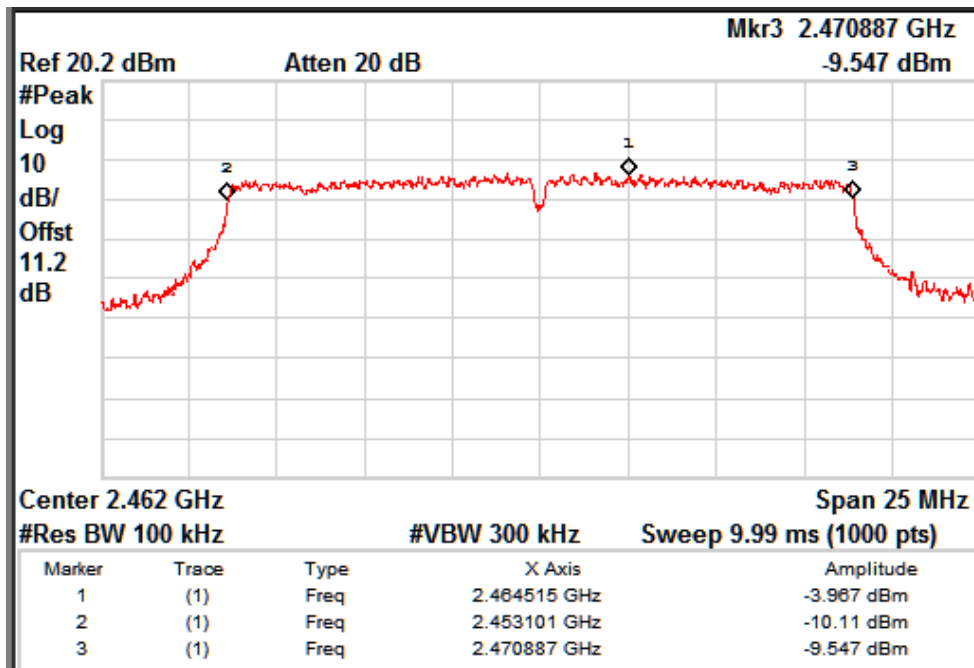
Data Rate: 65 Mbps

Channel: 2412 MHz



Data Rate: 65 Mbps

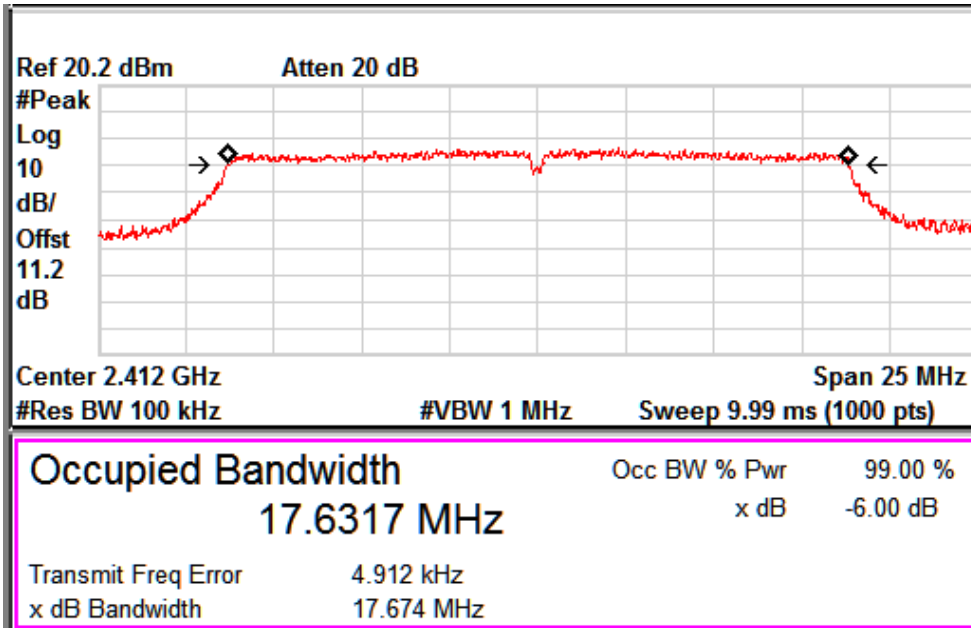
Channel: 2442MHz



Data Rate: 65 Mbps

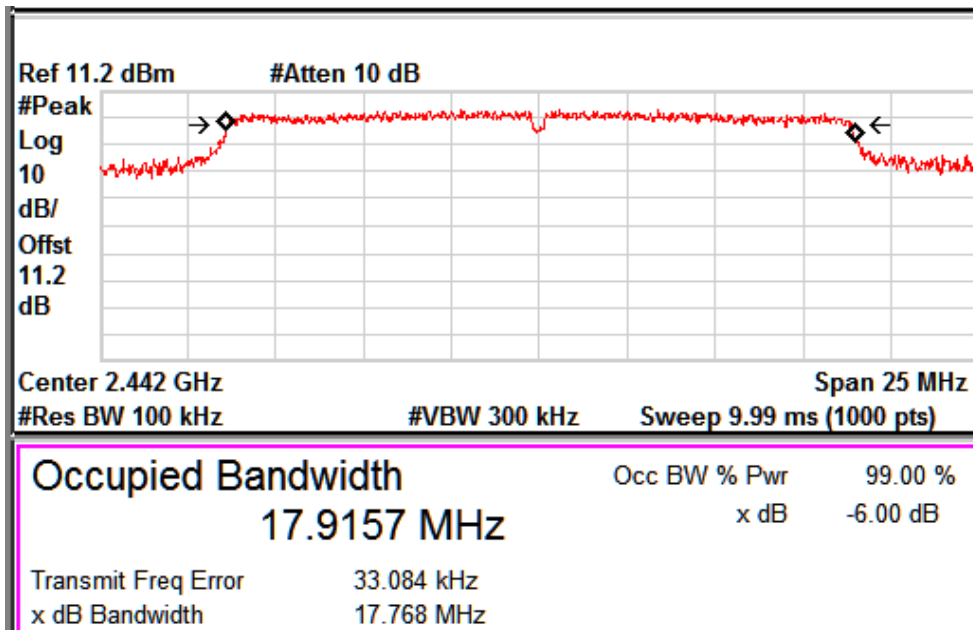
Channel: 2462 MHz

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Data Rate: 6.5 Mbps

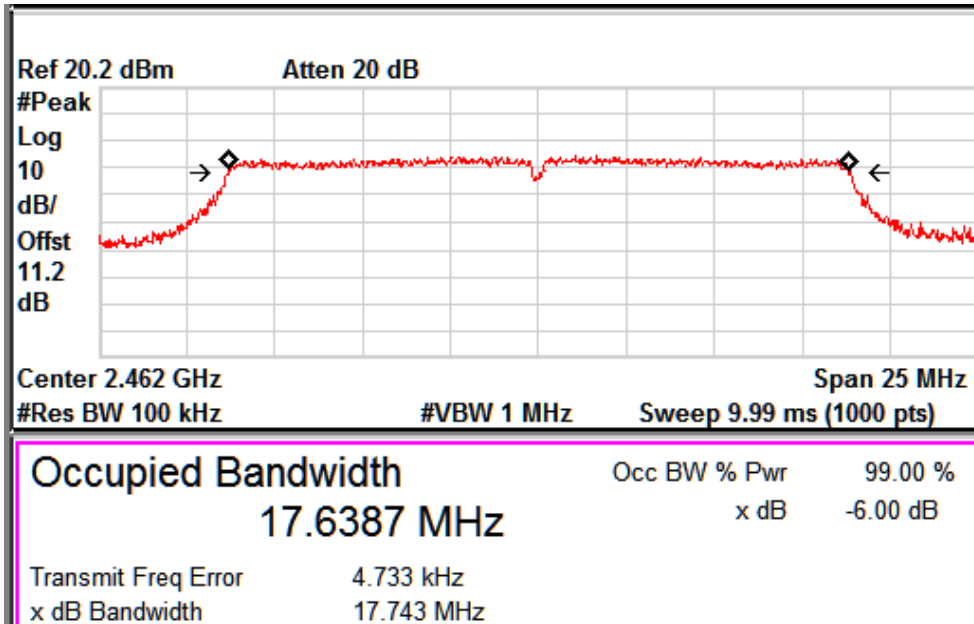
99% Occupied Bandwidth: Channel 2412MHz



Data Rate: 6.5 Mbps

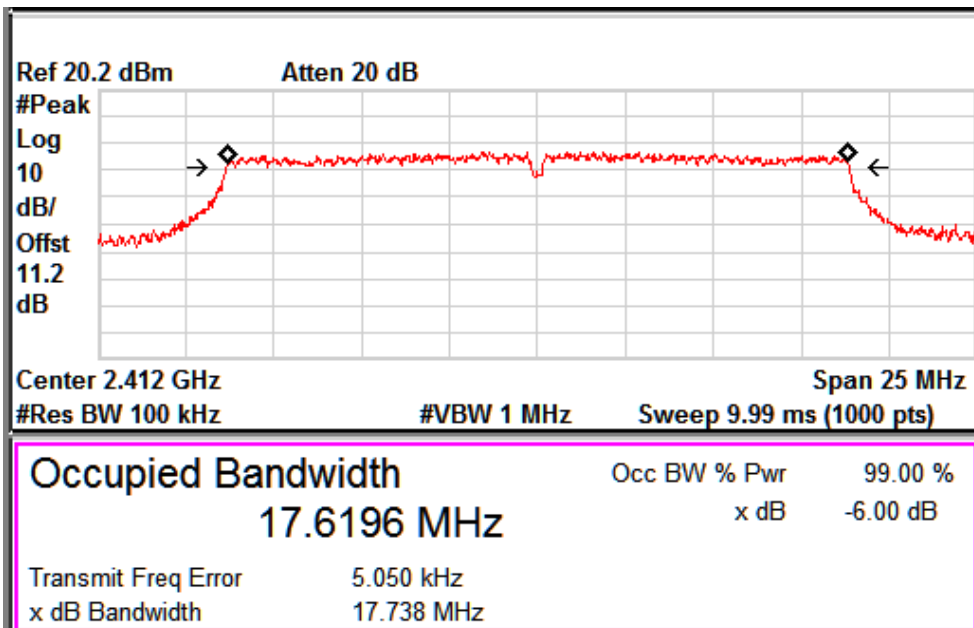
99% Occupied Bandwidth: Channel 2442MHz

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Data Rate: 6.5 Mbps

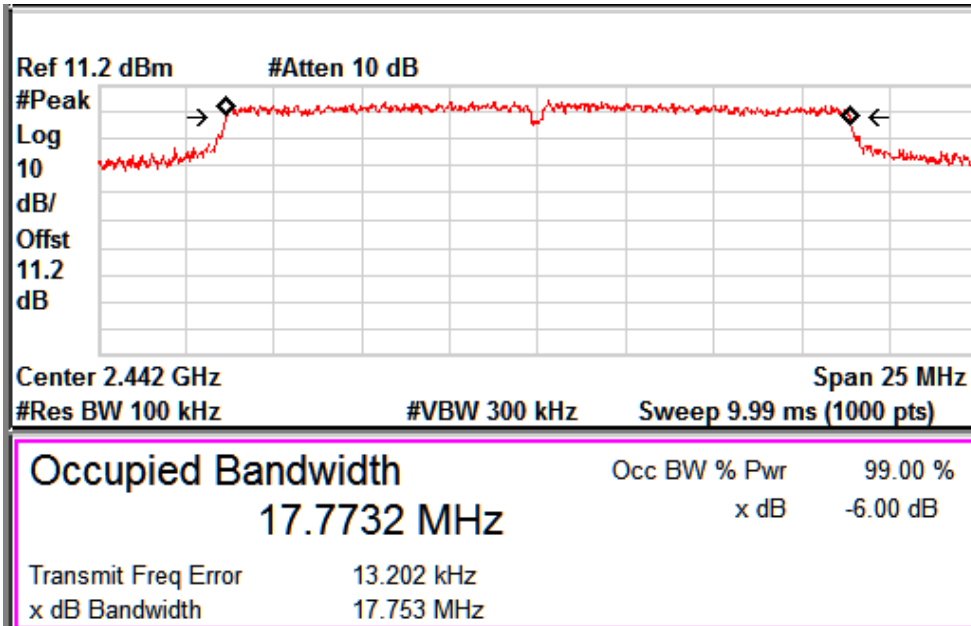
99% Occupied Bandwidth: Channel 2462MHz



Data Rate: 39 Mbps

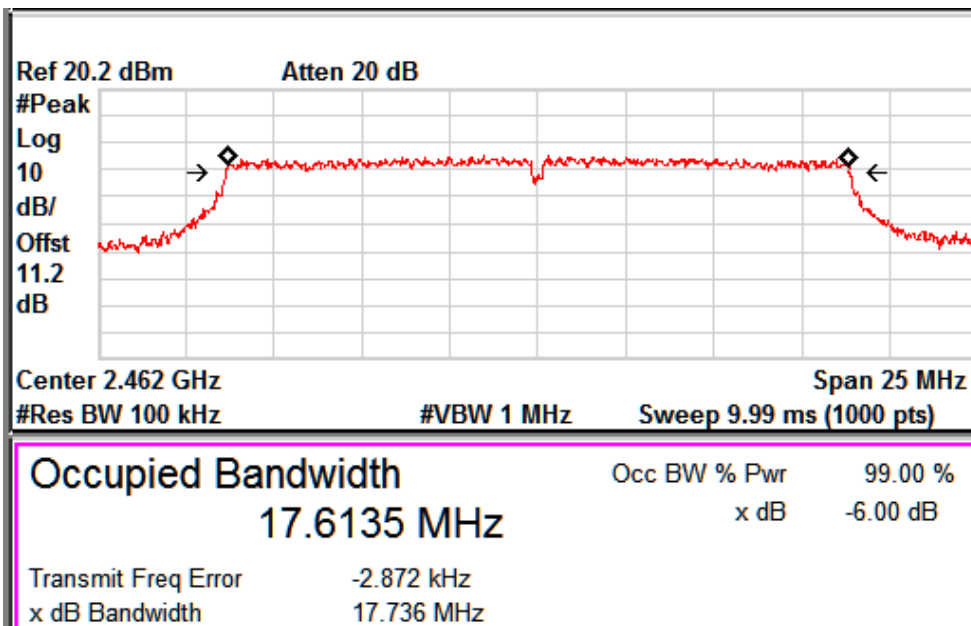
99% Occupied Bandwidth: Channel 2412MHz

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Data Rate: 39 Mbps

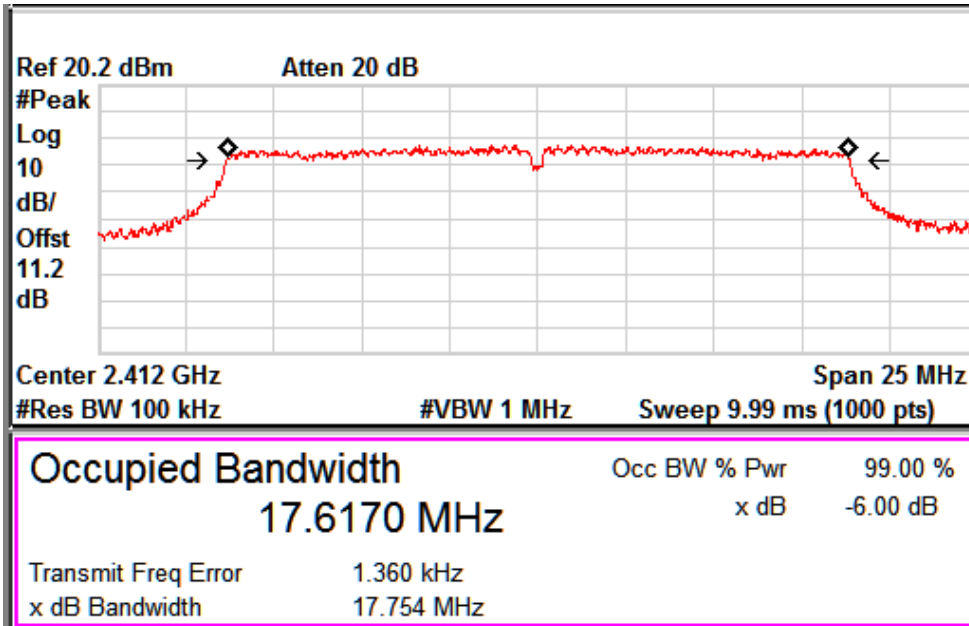
99% Occupied Bandwidth: Channel 2442MHz



Data Rate: 39 Mbps

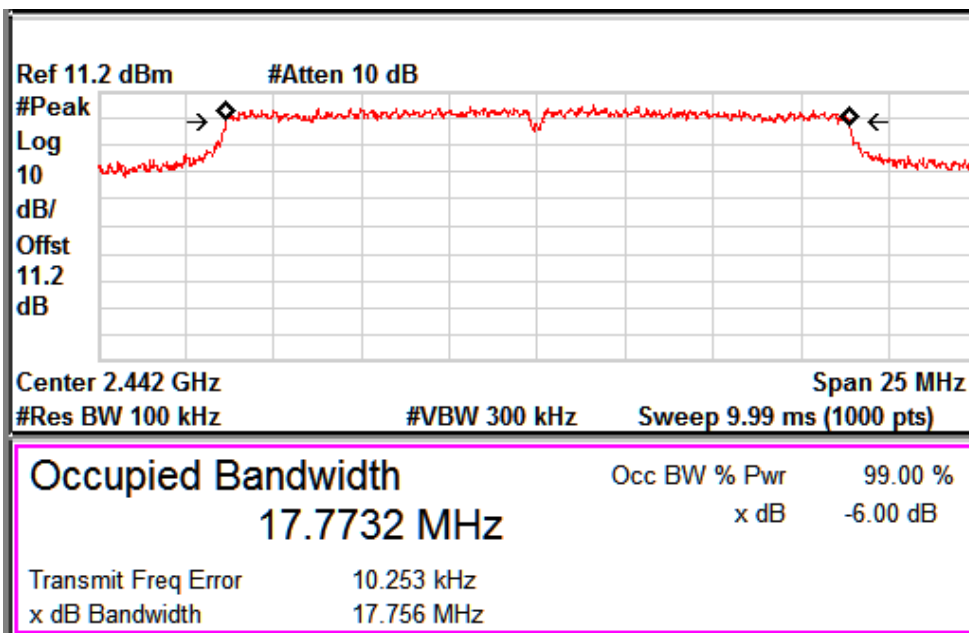
99% Occupied Bandwidth: Channel 2462MHz





Data Rate: 65 Mbps

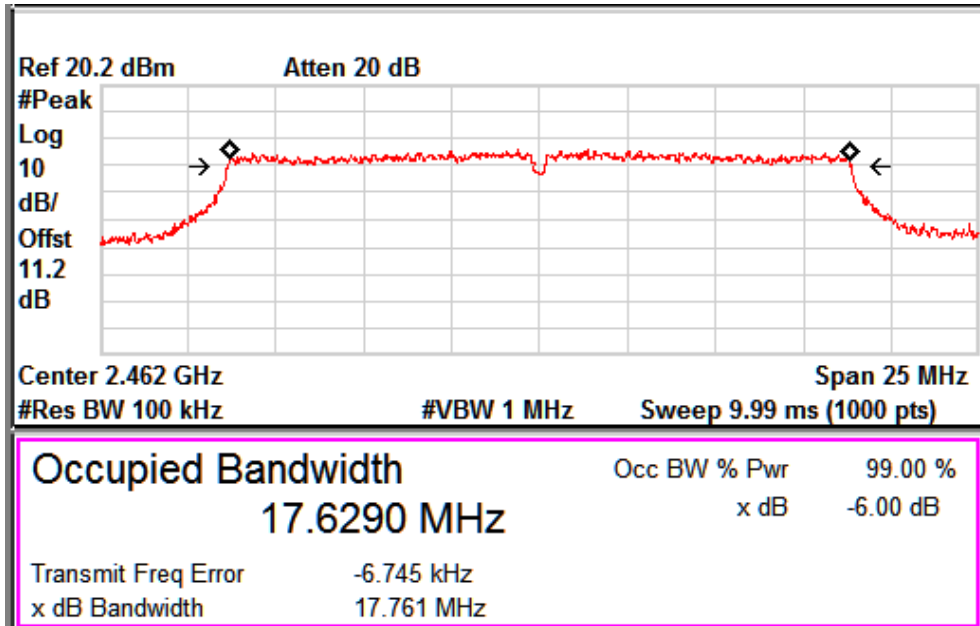
99% Occupied Bandwidth: Channel 2412MHz



Data Rate: 65 Mbps

99% Occupied Bandwidth: Channel 2442MHz

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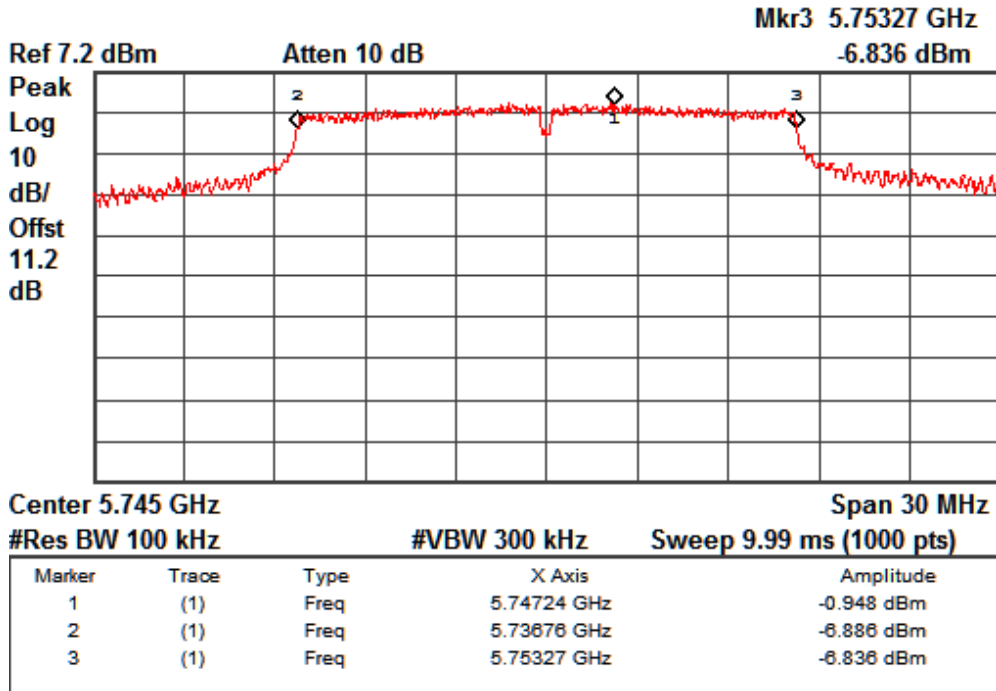
Data Rate: 65 Mbps

99% Occupied Bandwidth: Channel 2462MHz

**5GHz Band**

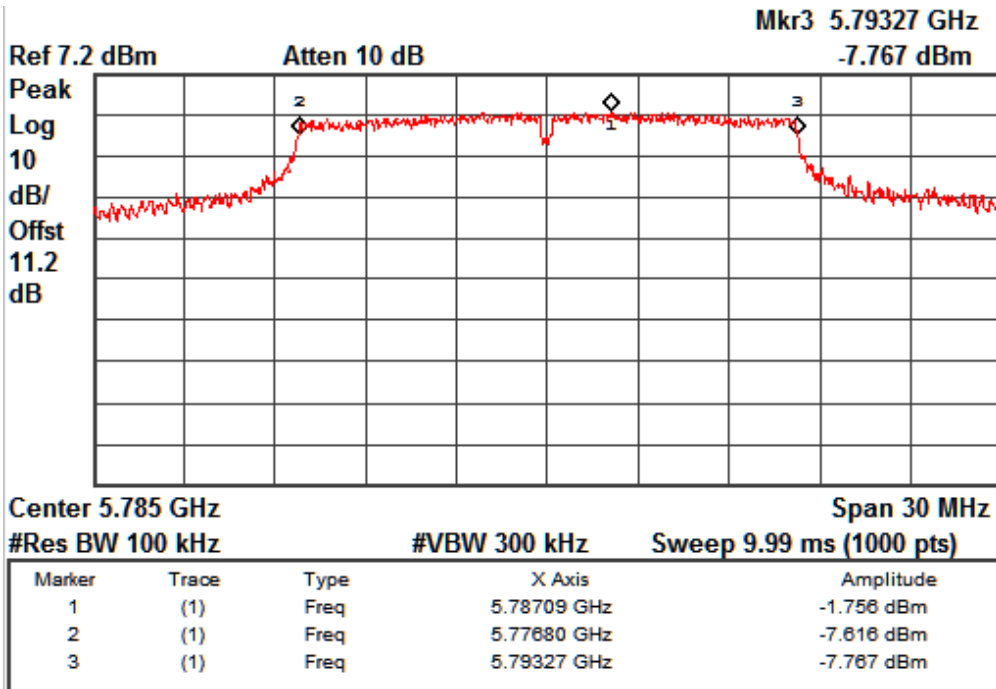
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Lower Frequency (MHz) | Upper Frequency (MHz) | 6 dB Bandwidth (MHz) | 99% OBW (MHz) |
|-----------------|------------------|-------------------------|-----------------------|-----------------------|----------------------|---------------|
| 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         |

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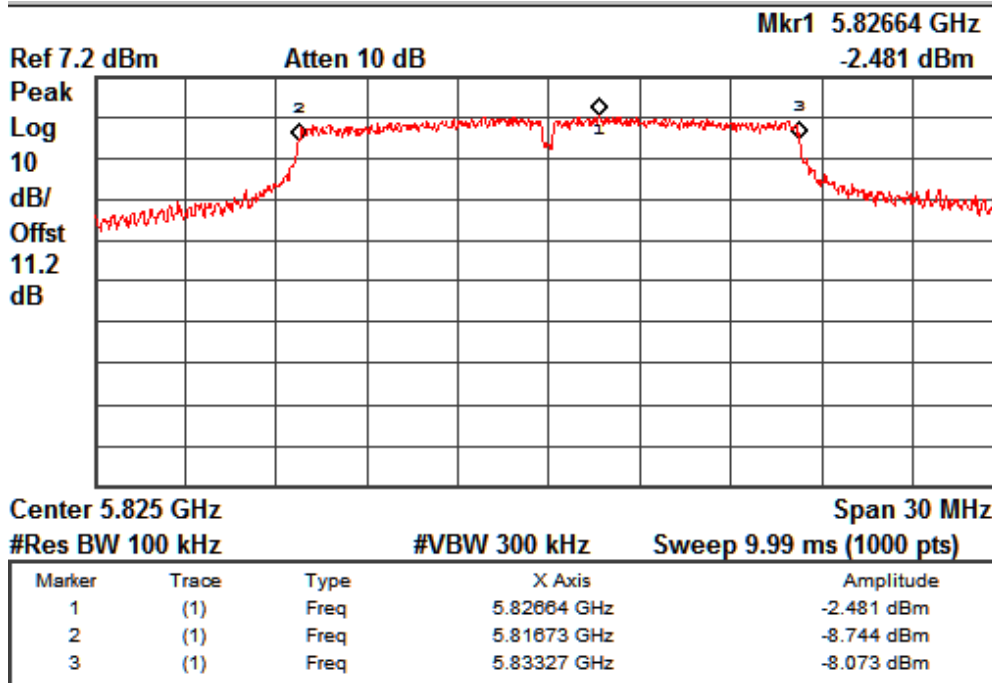
Data Rate: 6 Mbps

Channel: 5745 MHz



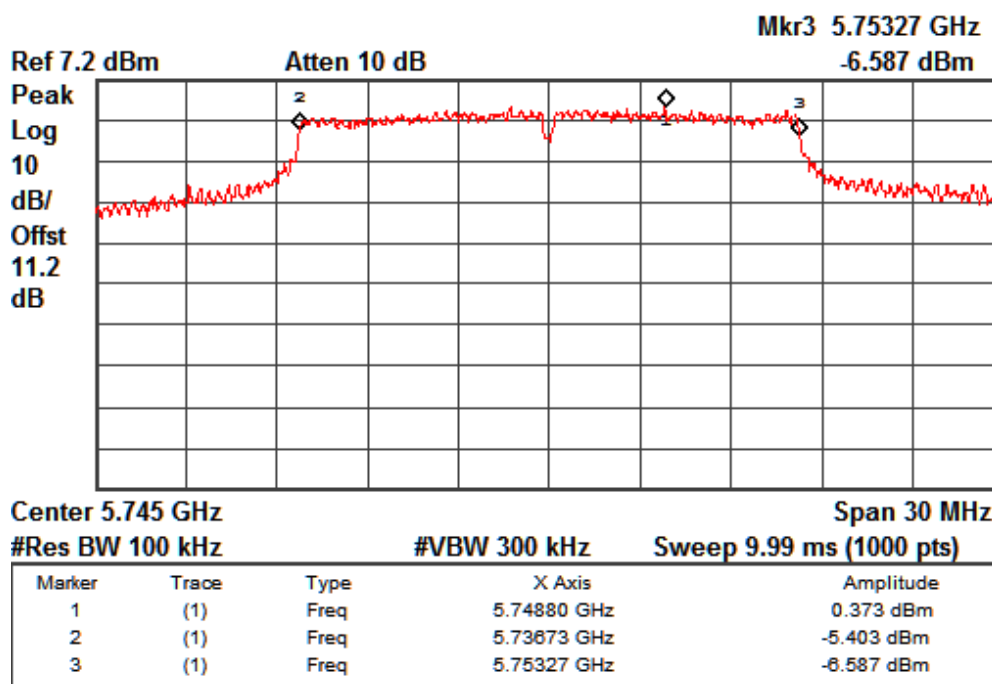
Data Rate: 6 Mbps

Channel: 5785 MHz



**Data Rate: 6 Mbps**

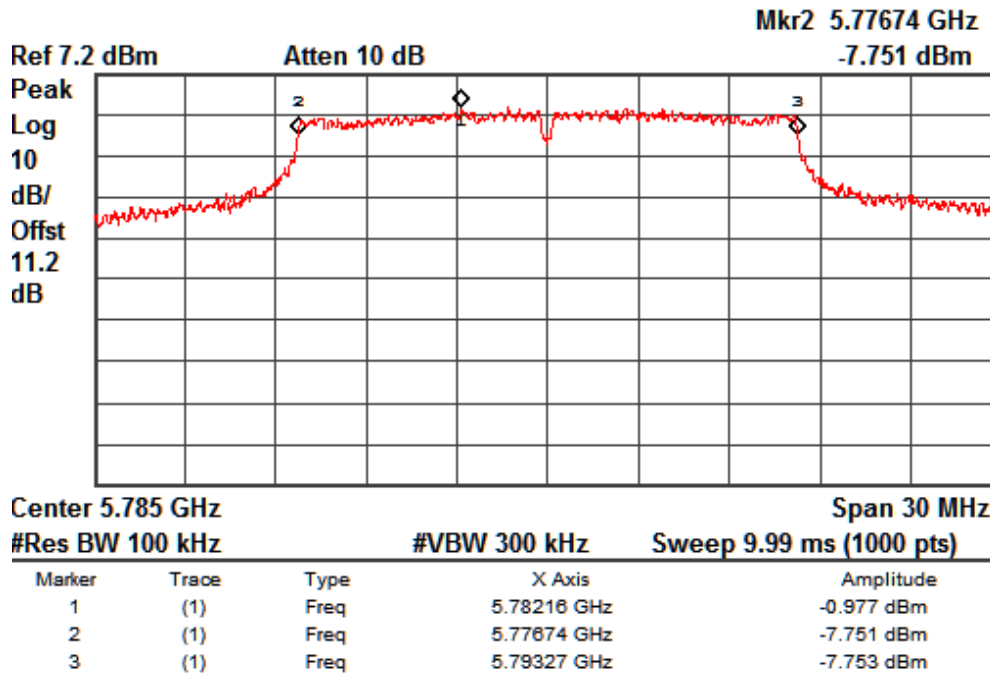
**Channel: 5825 MHz**



**Data Rate: 24 Mbps**

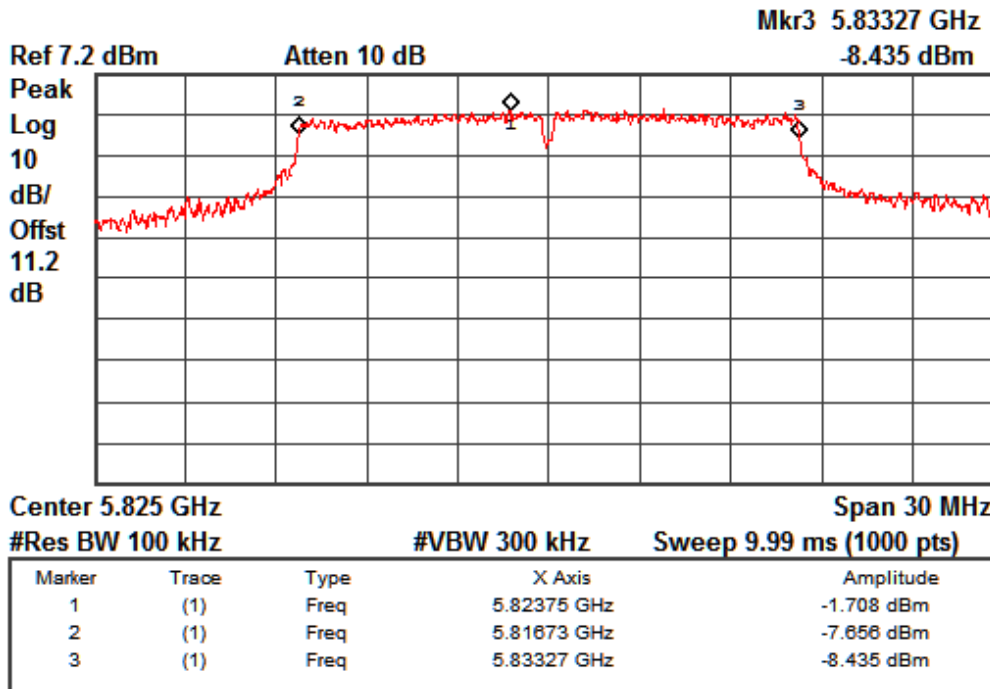
**Channel: 5745 MHz**

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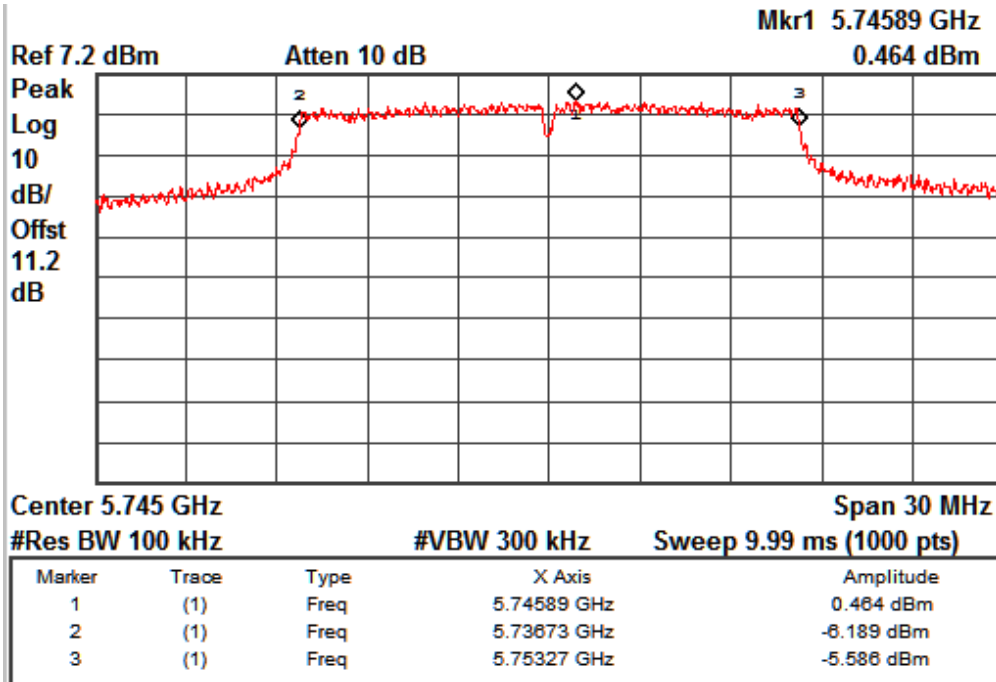
Data Rate: 24 Mbps

Channel: 5785 MHz



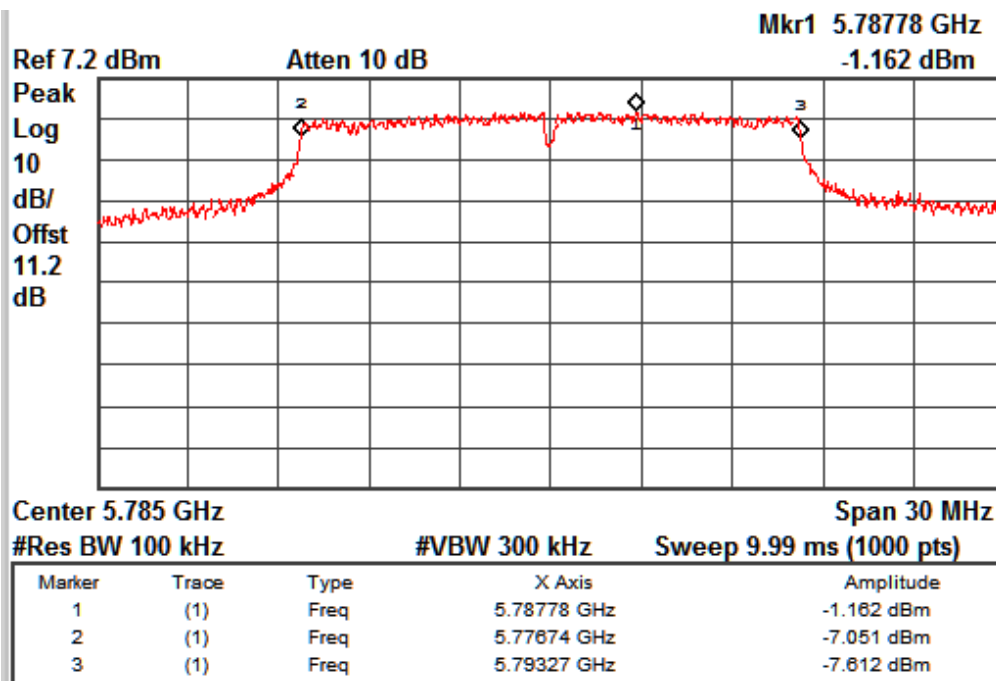
Data Rate: 24 Mbps

Channel: 5825 MHz



Data Rate: 54 Mbps

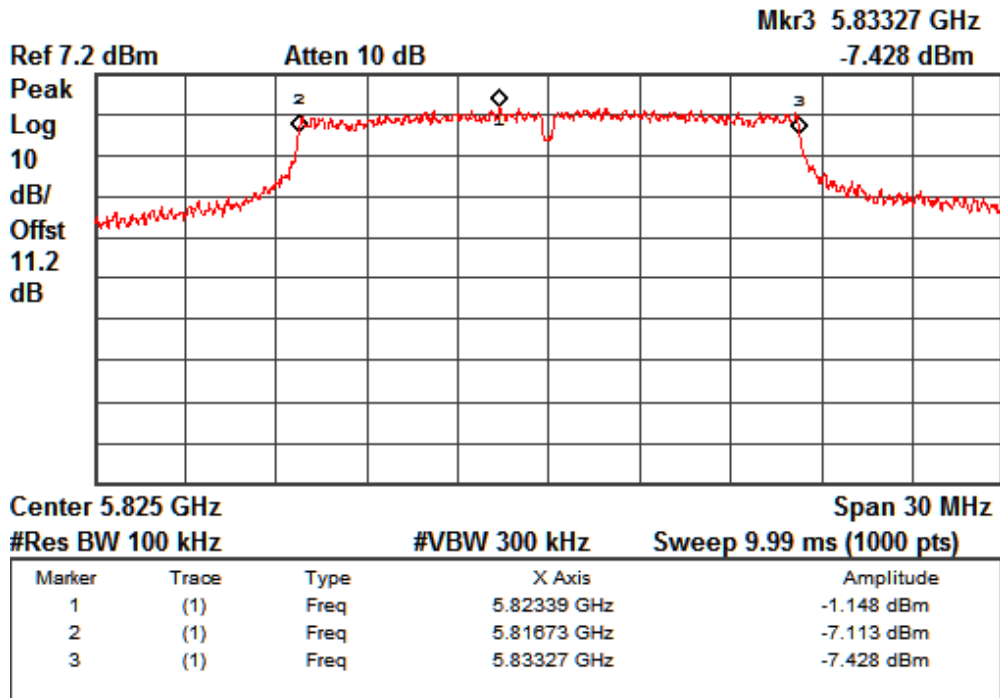
Channel: 5745 MHz



Data Rate: 54 Mbps

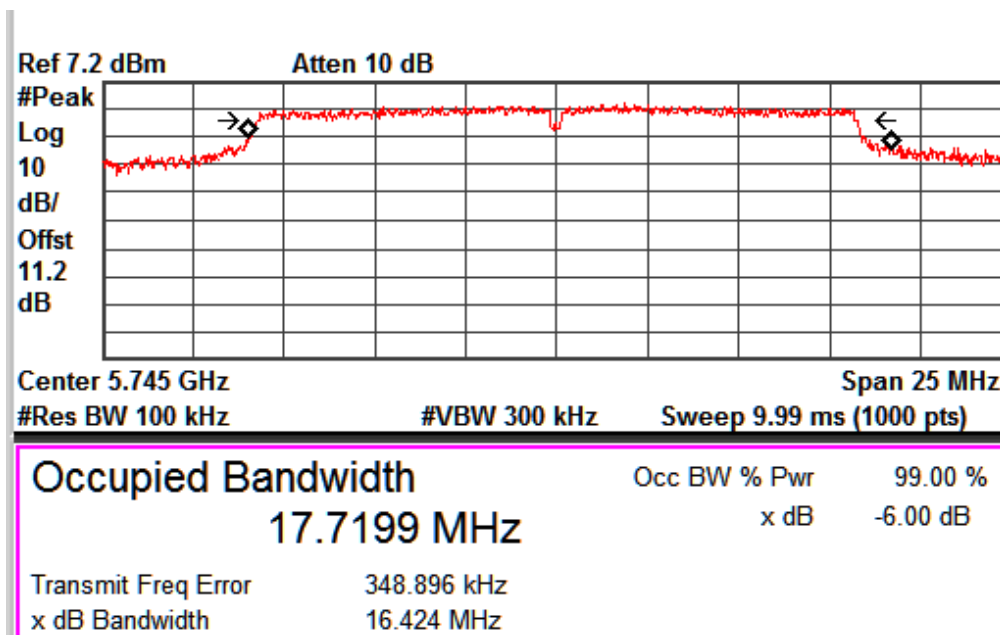
Channel: 5785 MHz

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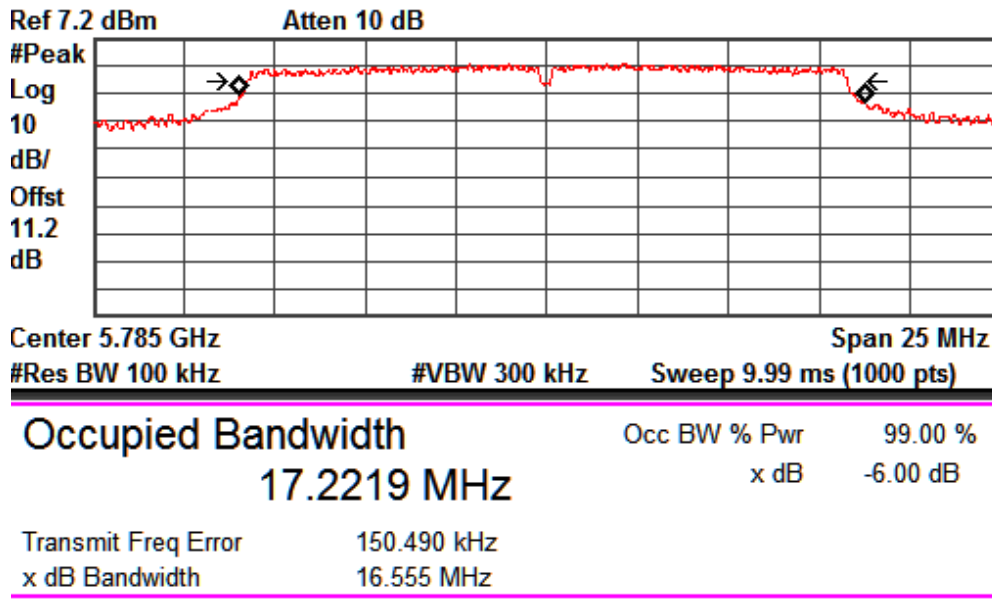
Data Rate: 54 Mbps

Channel: 5825 MHz



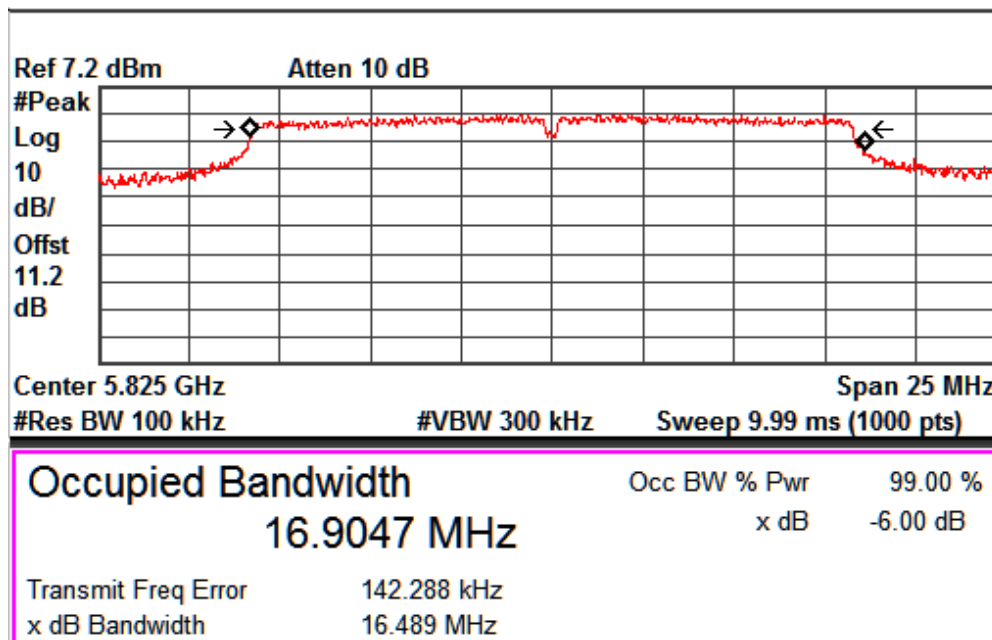
Data Rate: 6 Mbps

99% Occupied Bandwidth: Channel 5745MHz



Data Rate: 6 Mbps

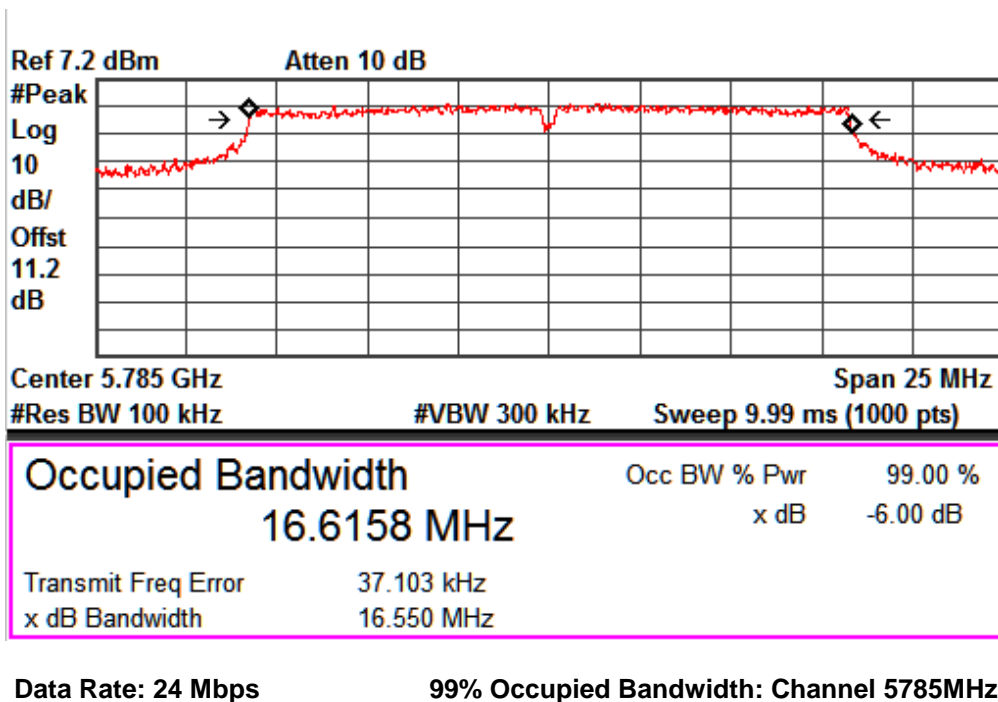
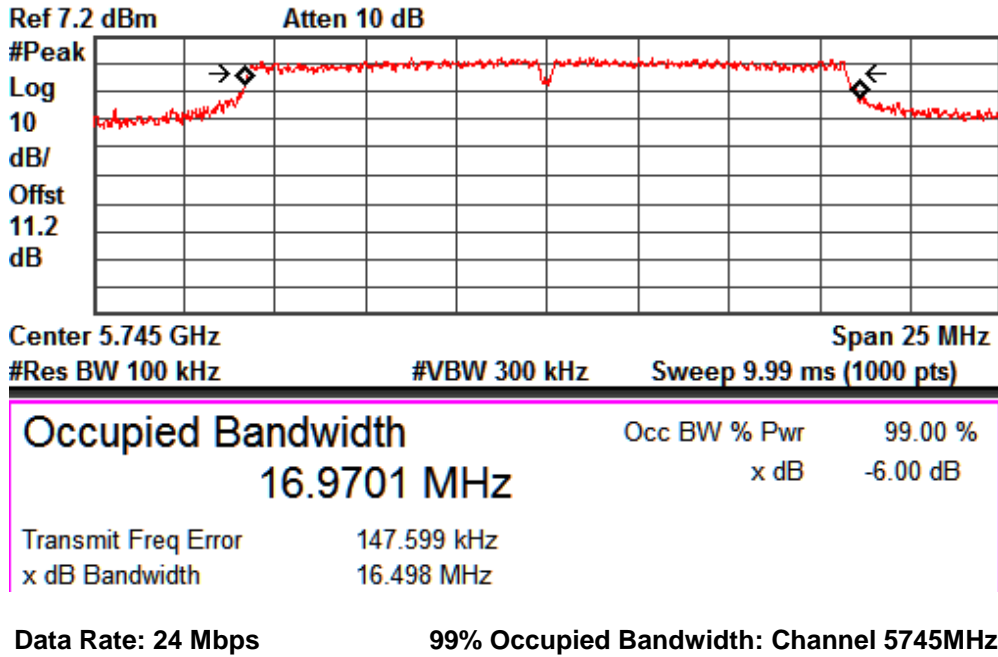
99% Occupied Bandwidth: Channel 5785MHz



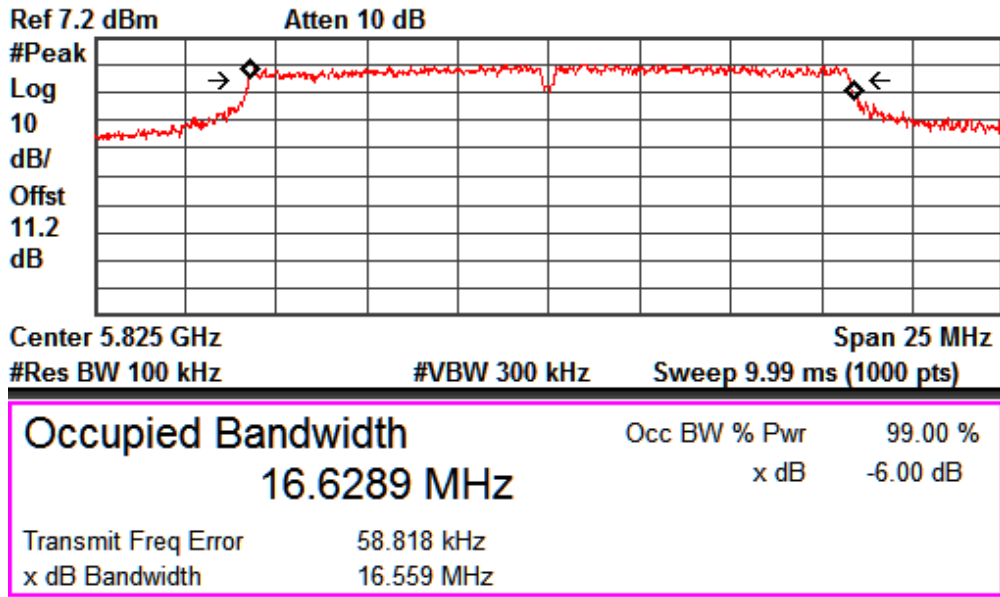
Data Rate: 6 Mbps

99% Occupied Bandwidth: Channel 5825MHz



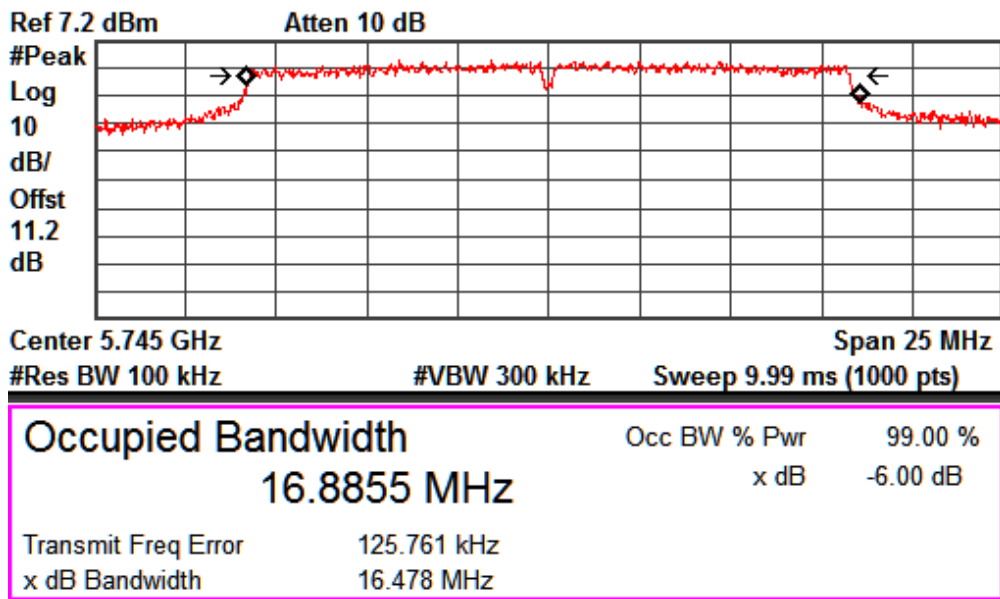


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Data Rate: 24 Mbps

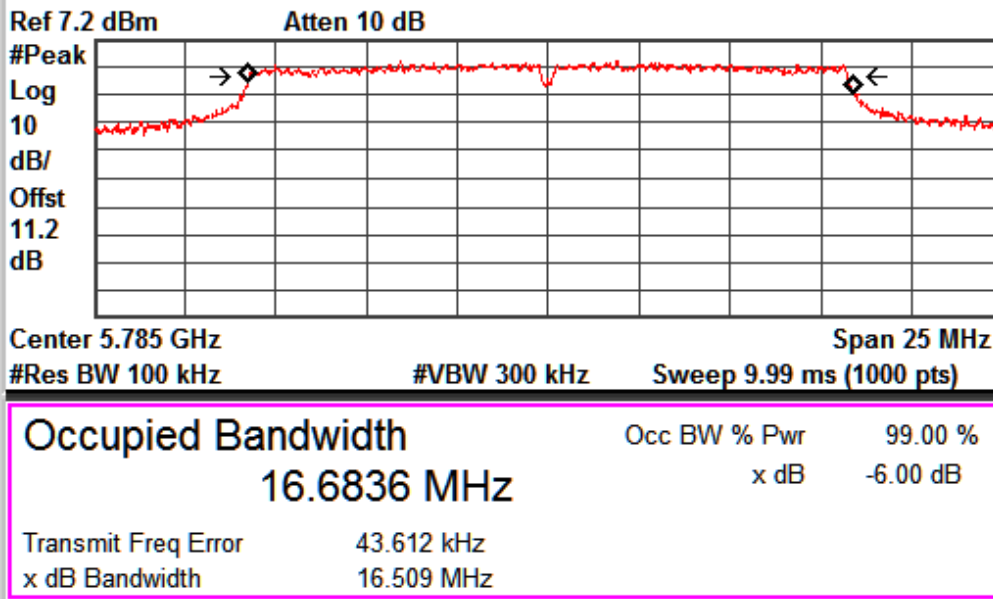
99% Occupied Bandwidth: Channel 5825MHz



Data Rate: 54 Mbps

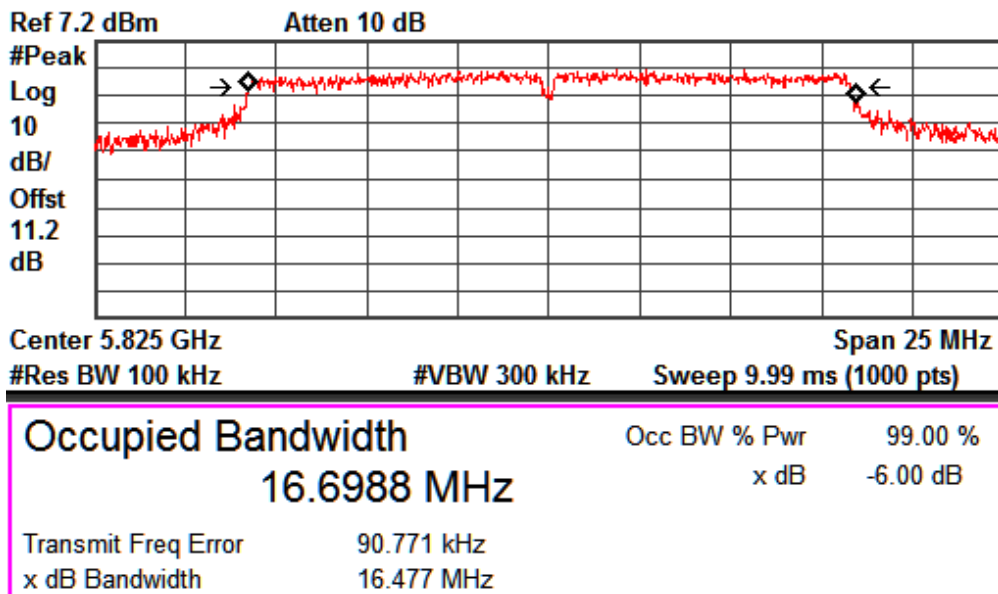
99% Occupied Bandwidth: Channel 5745MHz

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Data Rate: 54 Mbps

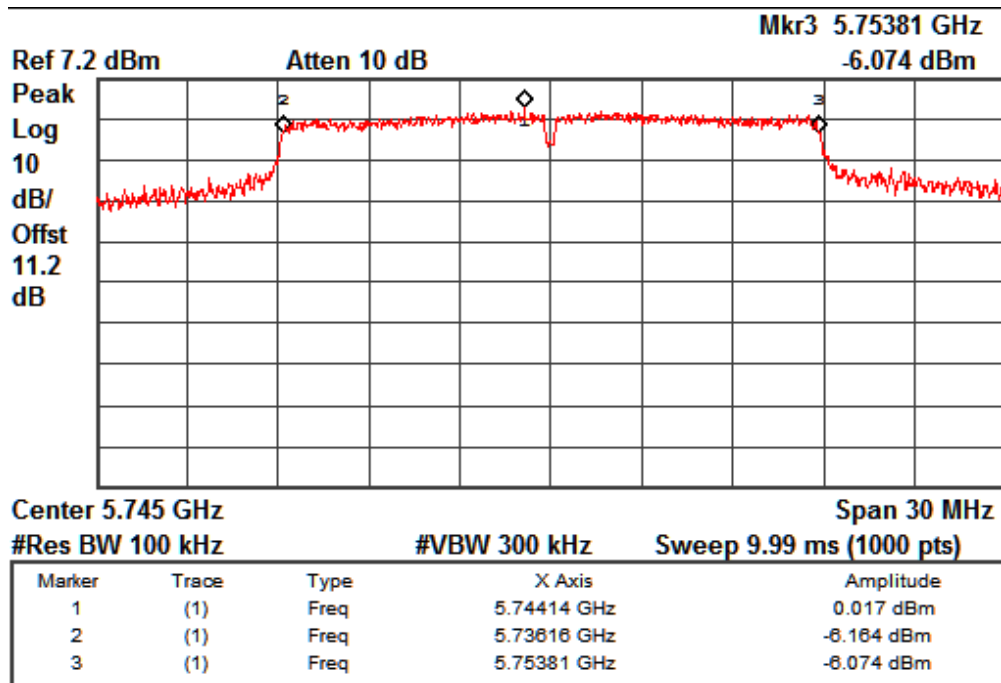
99% Occupied Bandwidth: Channel 5785MHz



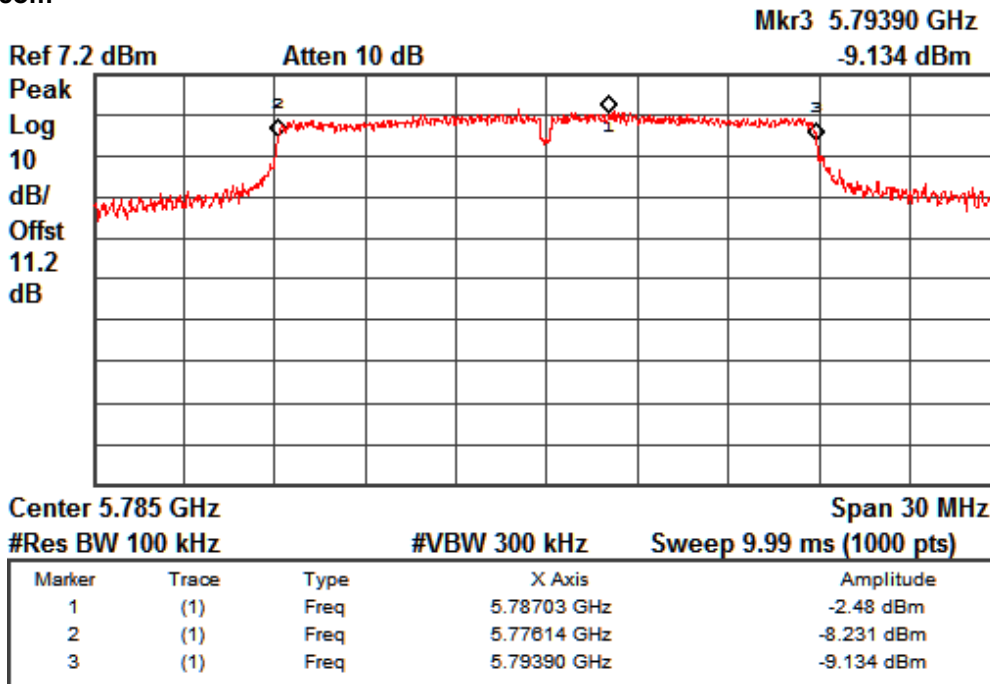
Data Rate: 54 Mbps

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          |

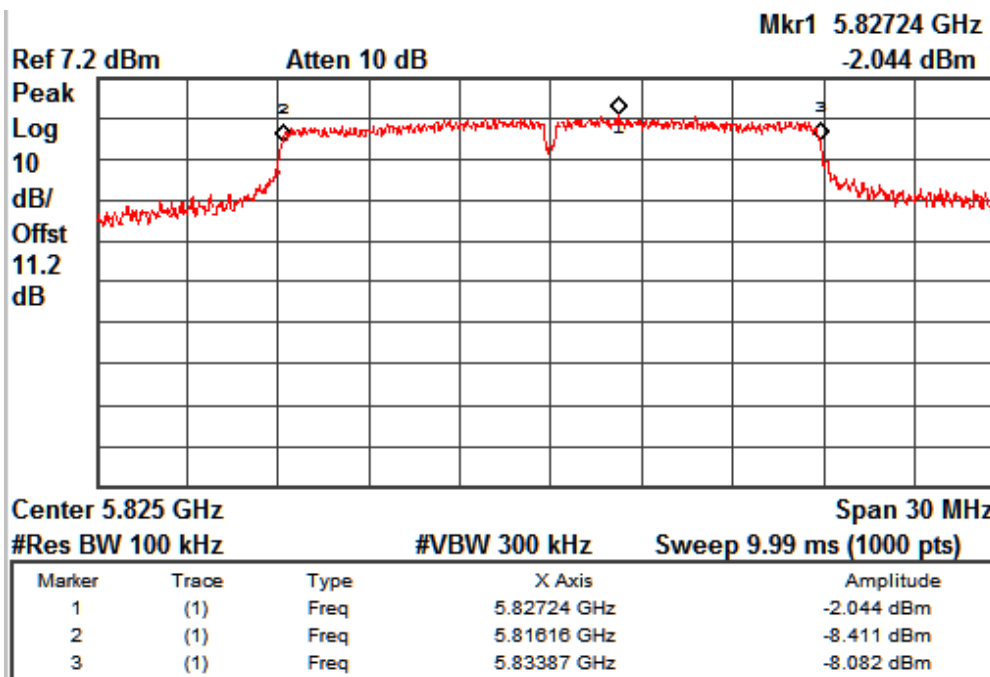

**Data Rate: 6.5 Mbps**
**Channel: 5745 MHz**

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Data Rate: 6.5 Mbps

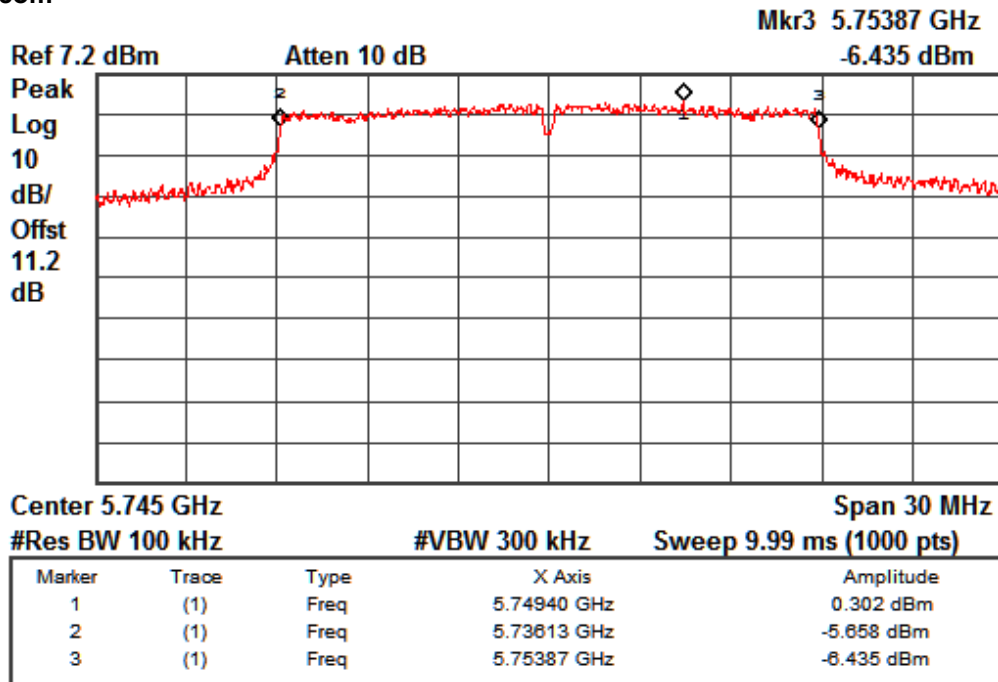
Channel: 5785 MHz



Data Rate: 6.5 Mbps

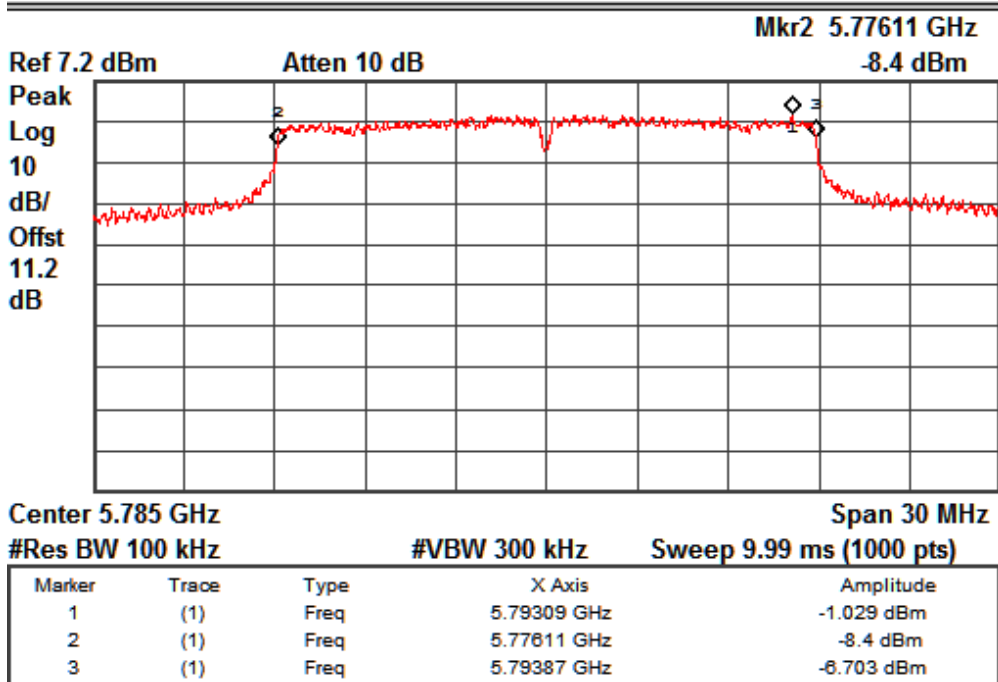
Channel: 5825 MHz

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Data Rate: 39 Mbps

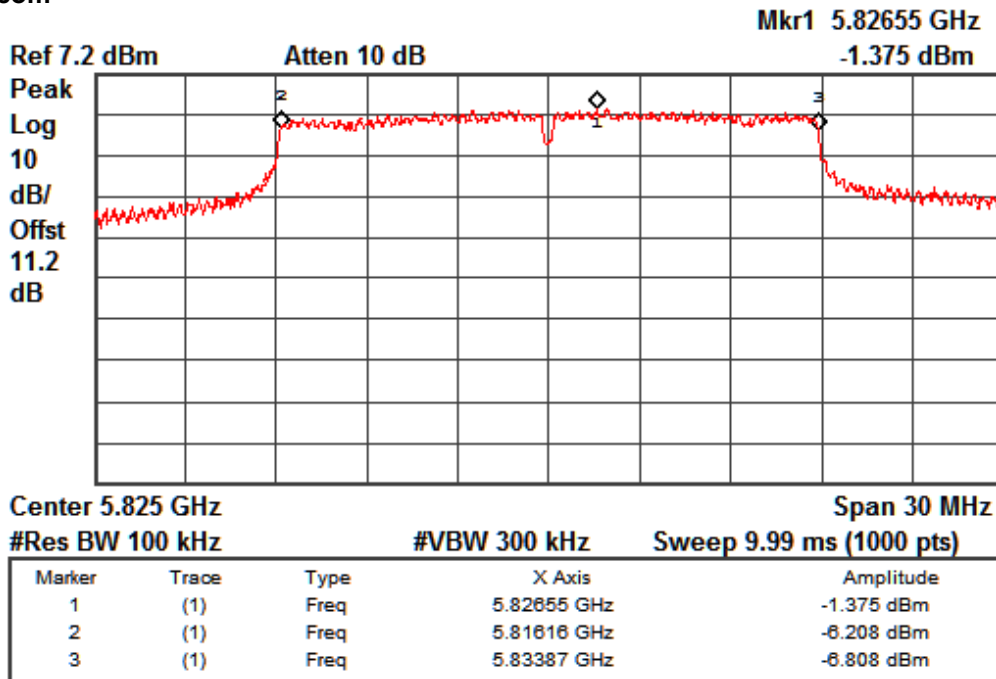
Channel: 5745 MHz



Data Rate: 39 Mbps

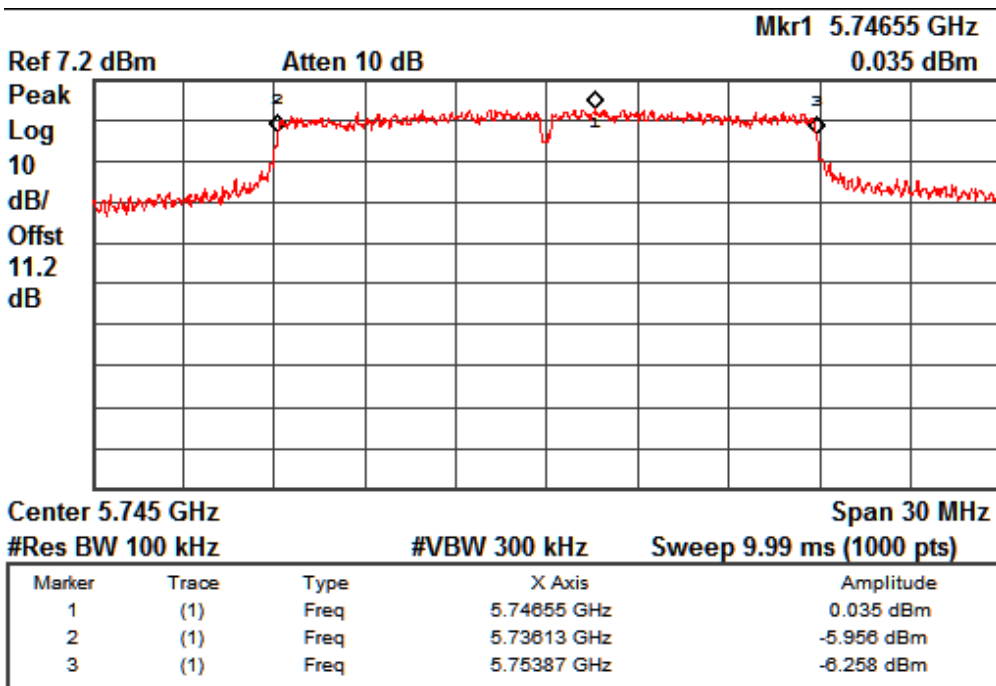
Channel: 5785 MHz

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Data Rate: 39 Mbps

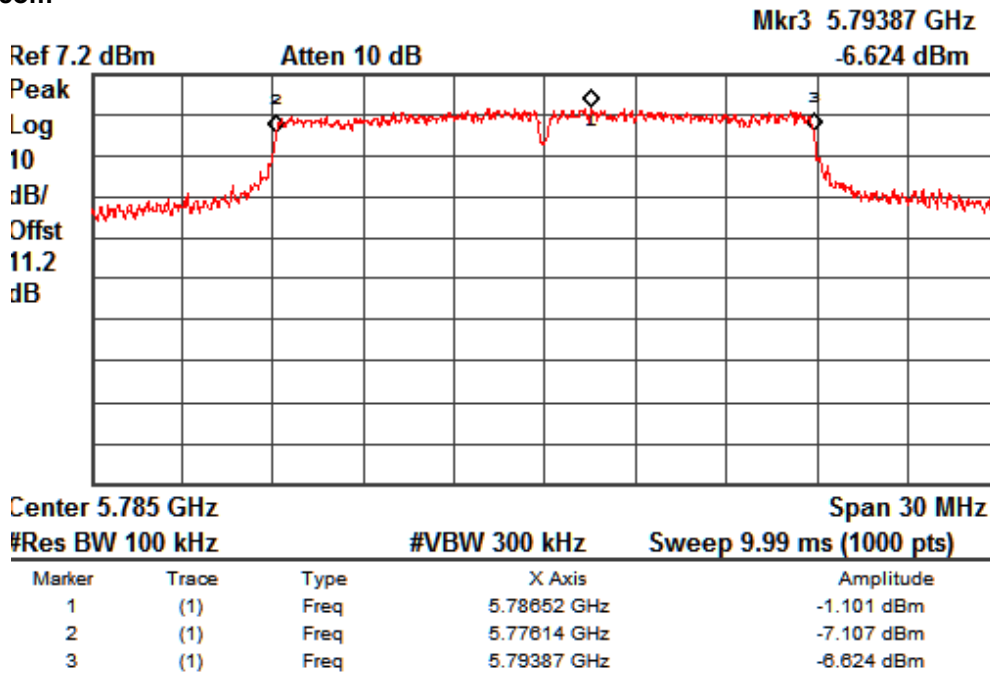
Channel: 5825 MHz



Data Rate: 65 Mbps

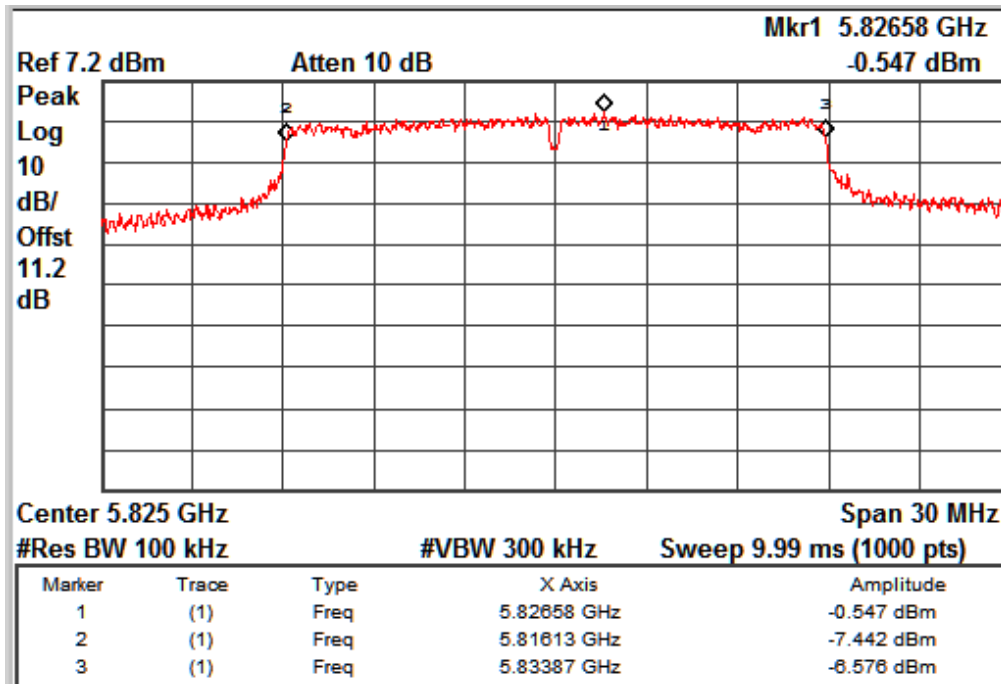
Channel: 5745 MHz

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Data Rate: 65 Mbps

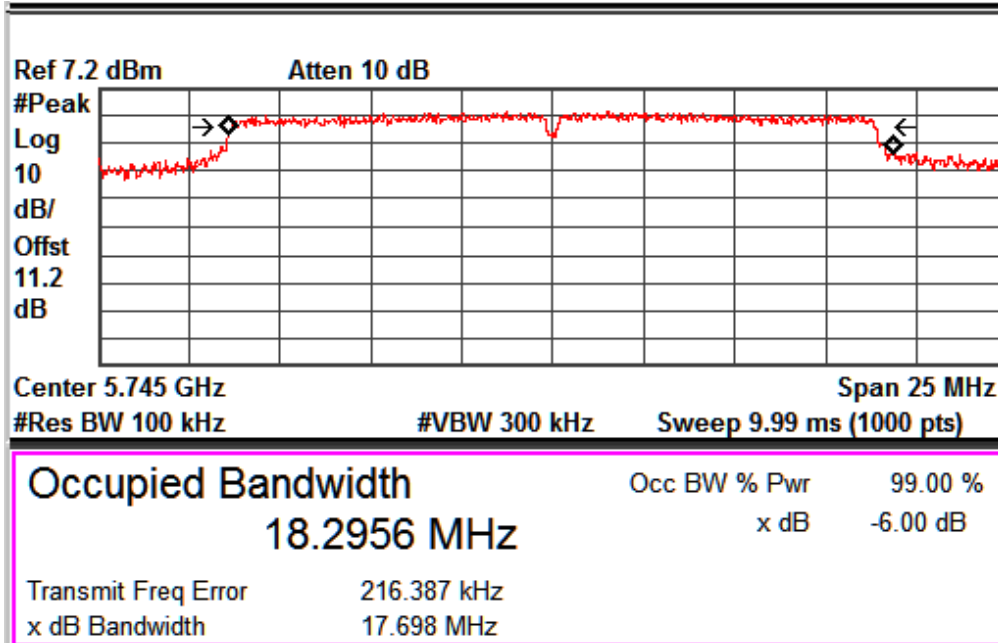
Channel: 5785 MHz



Data Rate: 65 Mbps

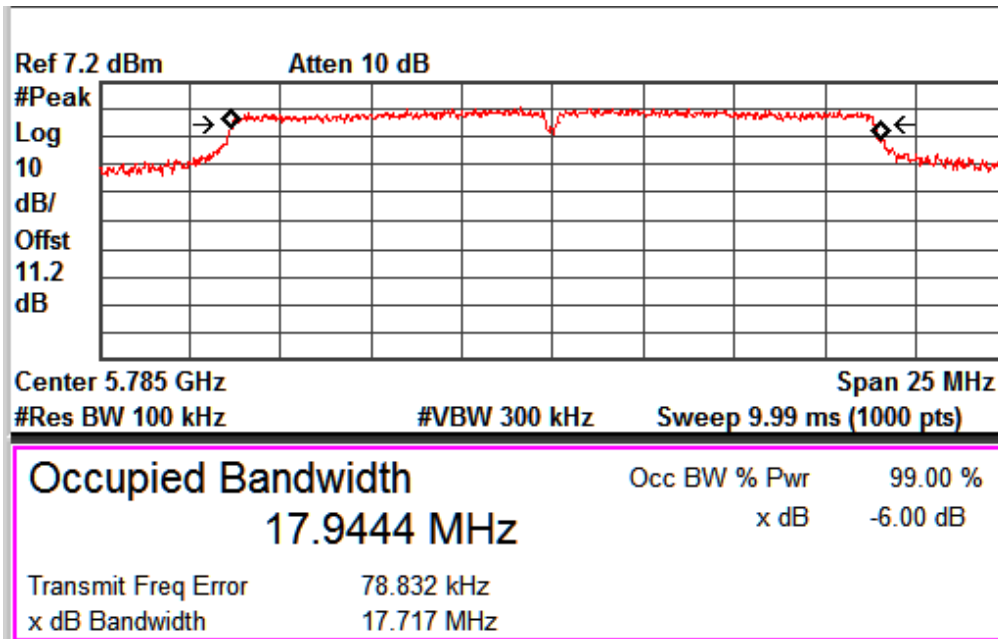
Channel: 5825 MHz





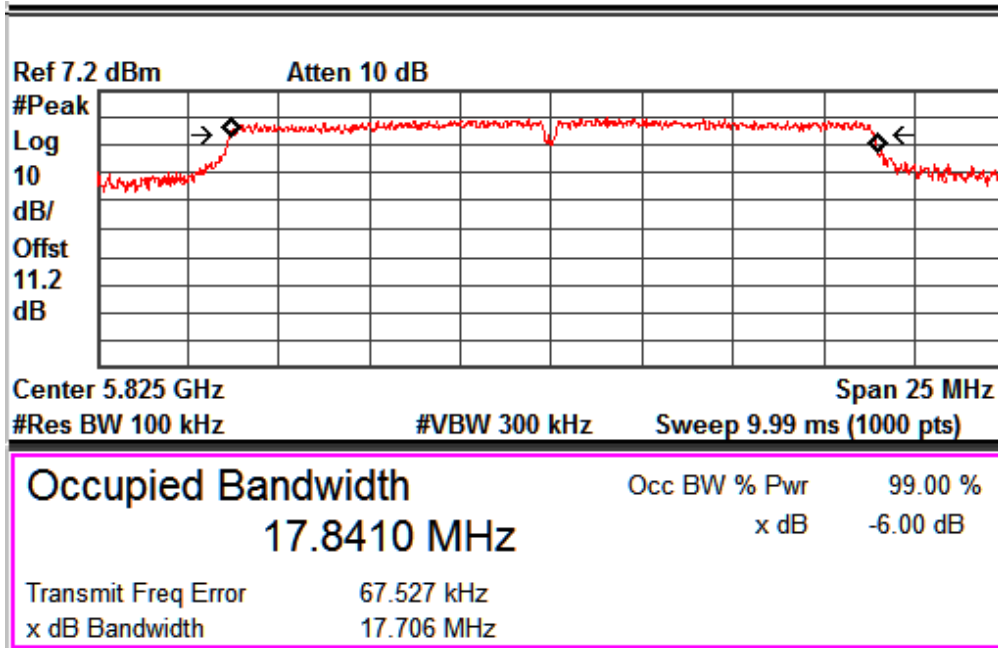
Data Rate: 6.5 Mbps

99% Occupied Bandwidth: Channel 5745MHz



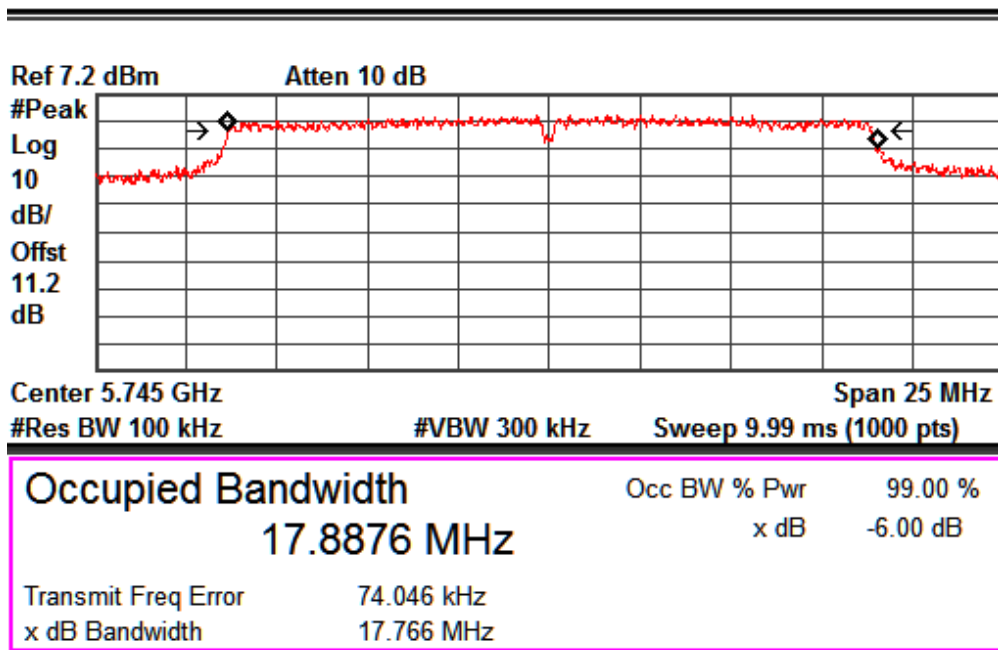
Data Rate: 6.5 Mbps

99% Occupied Bandwidth: Channel 5785MHz



Data Rate: 6.5 Mbps

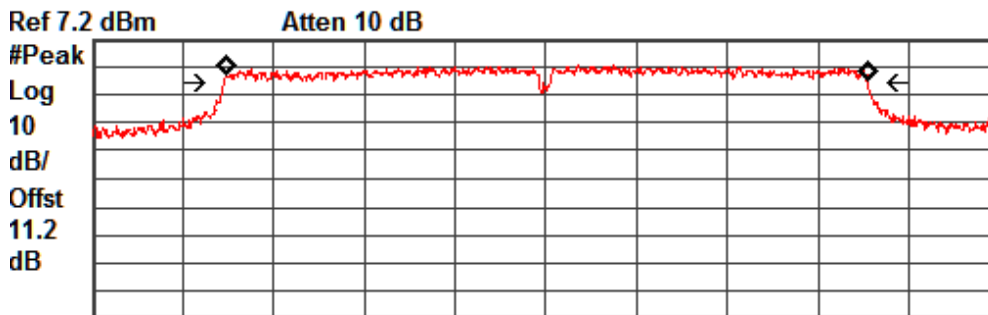
99% Occupied Bandwidth: Channel 5825MHz



Data Rate: 39 Mbps

99% Occupied Bandwidth: Channel 5745MHz

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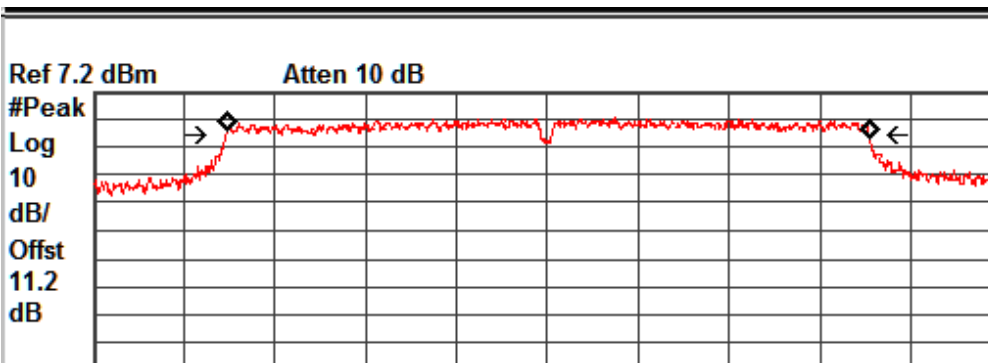


Center 5.785 GHz      Span 25 MHz  
 #Res BW 100 kHz      #VBW 300 kHz      Sweep 9.99 ms (1000 pts)

|                           |              |          |
|---------------------------|--------------|----------|
| <b>Occupied Bandwidth</b> | Occ BW % Pwr | 99.00 %  |
| <b>17.7215 MHz</b>        | x dB         | -6.00 dB |
| Transmit Freq Error       | 12.108 kHz   |          |
| x dB Bandwidth            | 17.749 MHz   |          |

Data Rate: 39 Mbps

99% Occupied Bandwidth: Channel 5785MHz

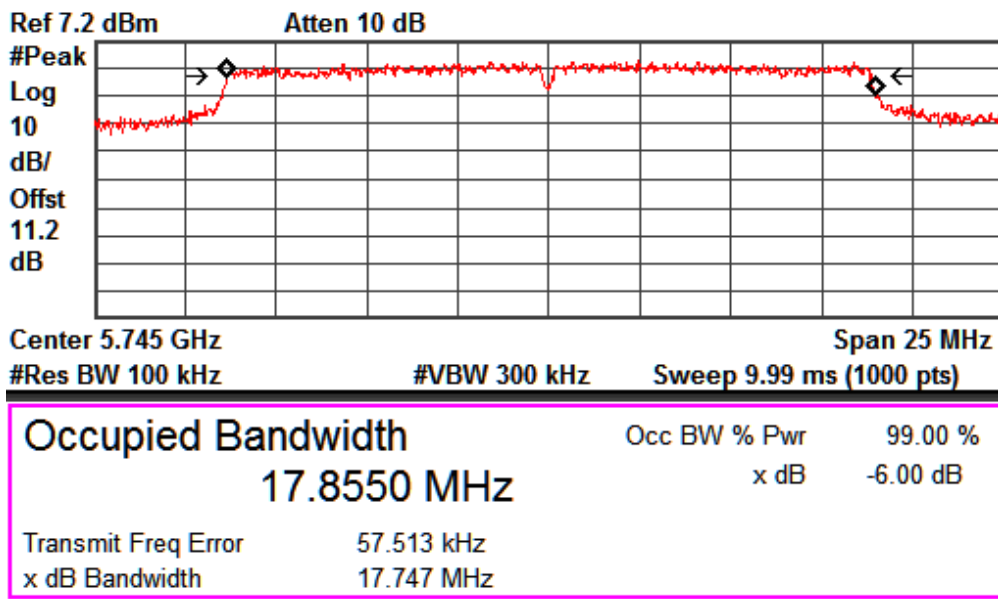


Center 5.825 GHz      Span 25 MHz  
 #Res BW 100 kHz      #VBW 300 kHz      Sweep 9.99 ms (1000 pts)

|                           |              |          |
|---------------------------|--------------|----------|
| <b>Occupied Bandwidth</b> | Occ BW % Pwr | 99.00 %  |
| <b>17.7137 MHz</b>        | x dB         | -6.00 dB |
| Transmit Freq Error       | 26.072 kHz   |          |
| x dB Bandwidth            | 17.719 MHz   |          |

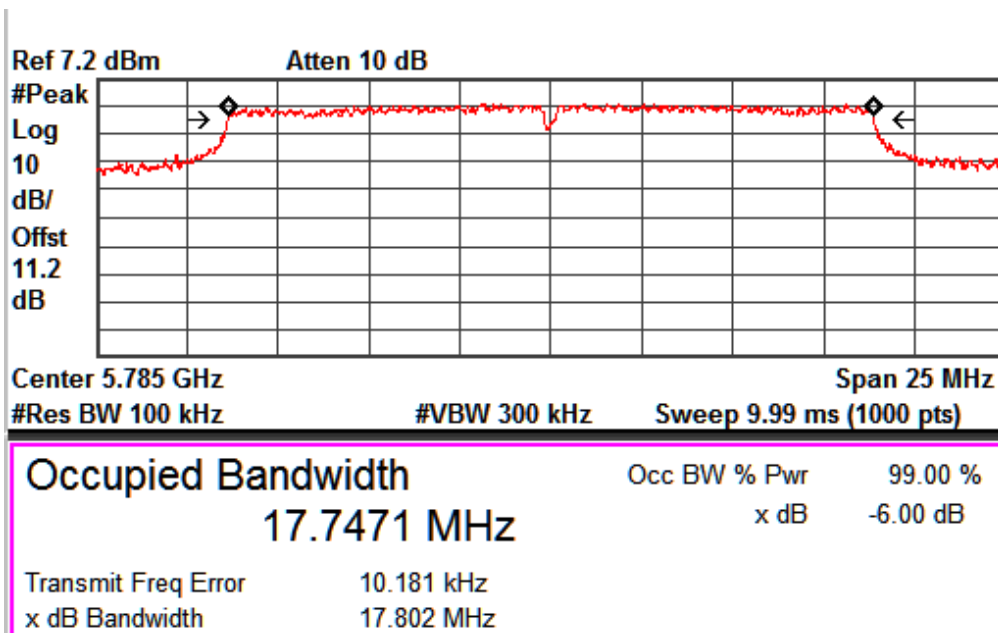
Data Rate: 39 Mbps

99% Occupied Bandwidth: Channel 5825MHz



Data Rate: 65 Mbps

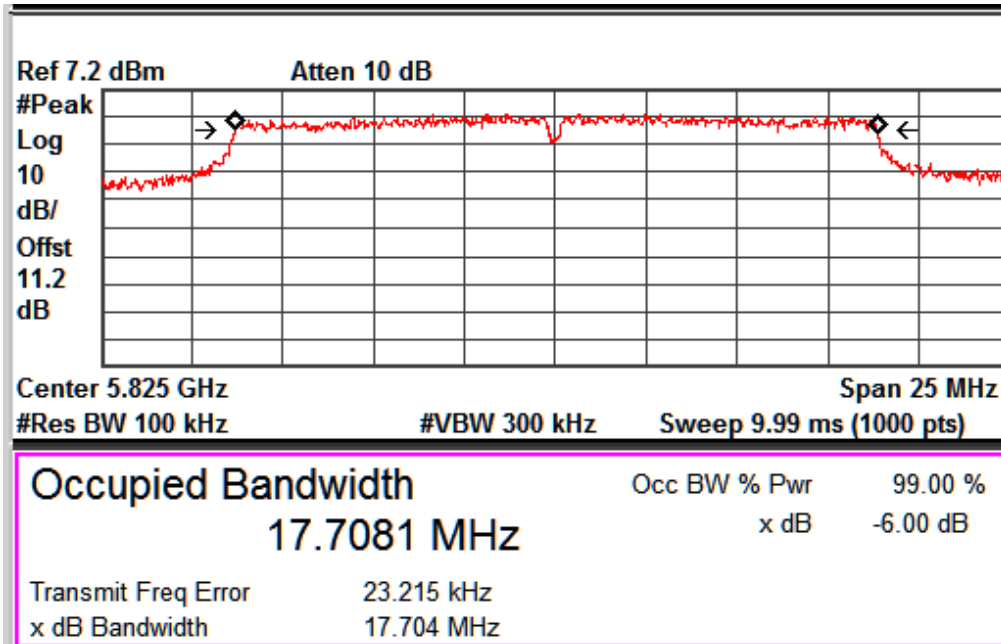
99% Occupied Bandwidth: Channel 5745MHz



Data Rate: 65 Mbps

99% Occupied Bandwidth: Channel 5785MHz

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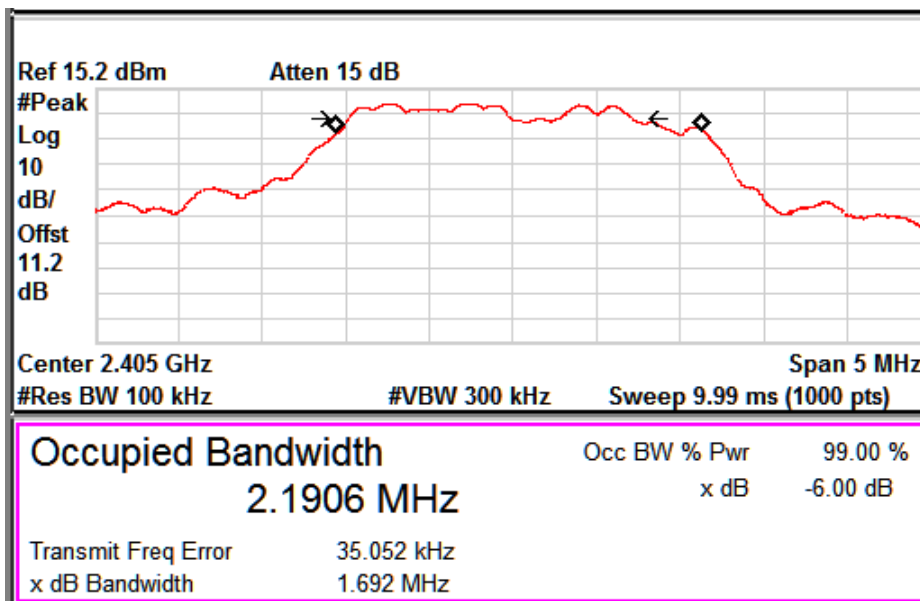
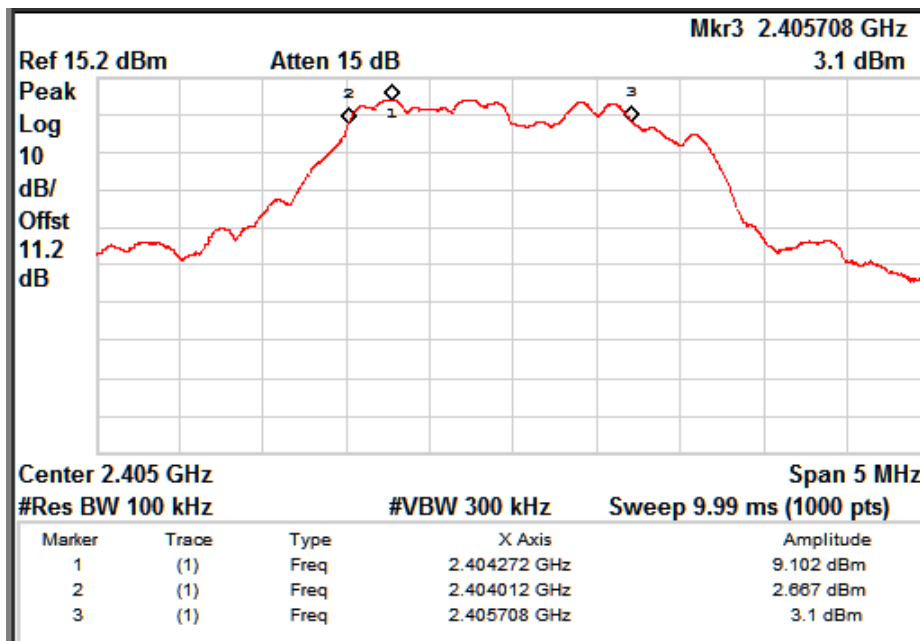


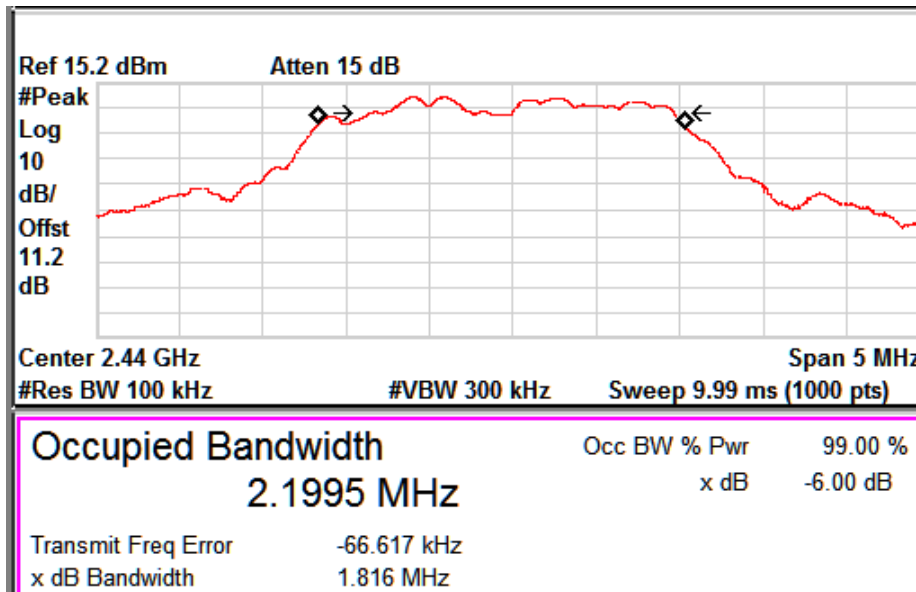
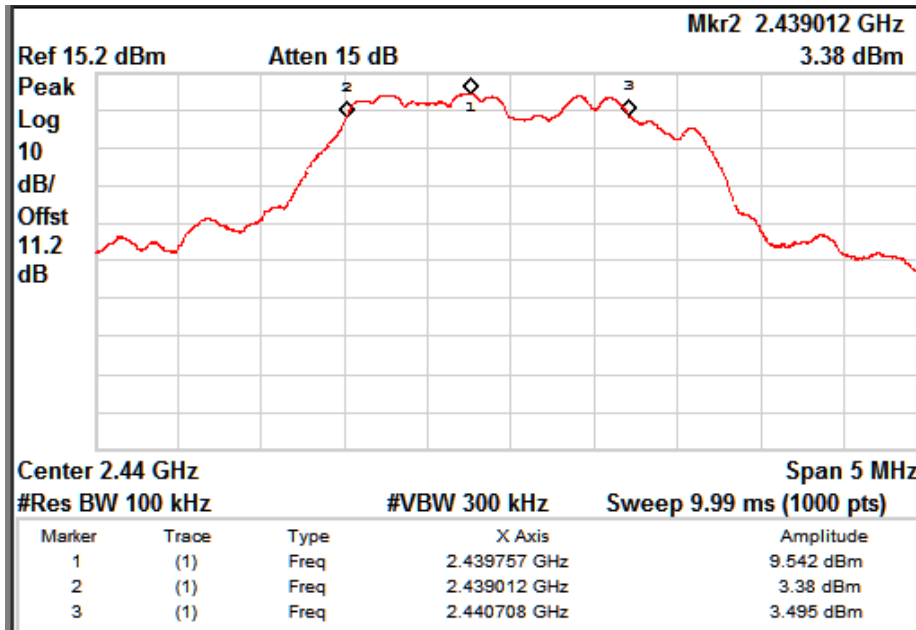
Data Rate: 65 Mbps

99% Occupied Bandwidth: Channel 5825MHz

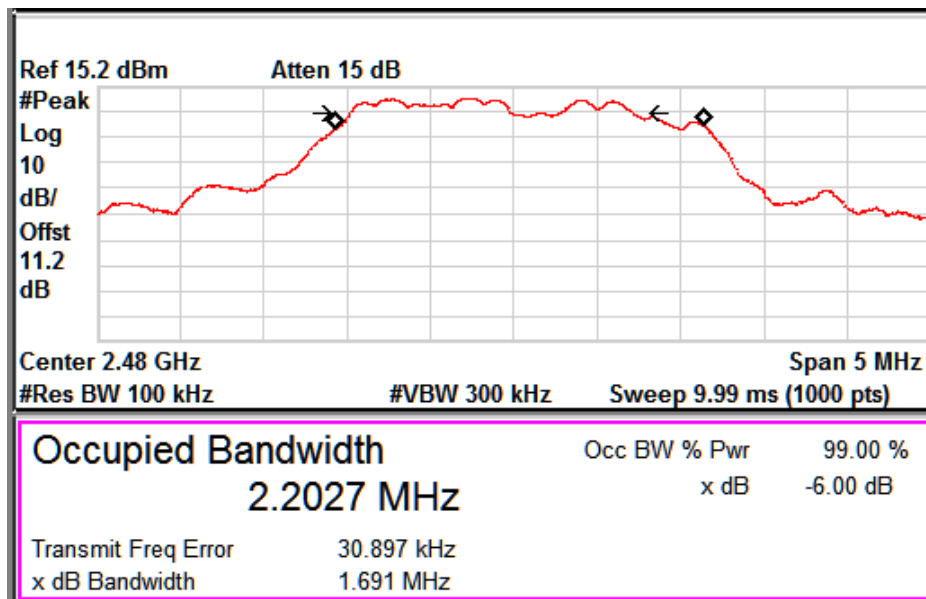
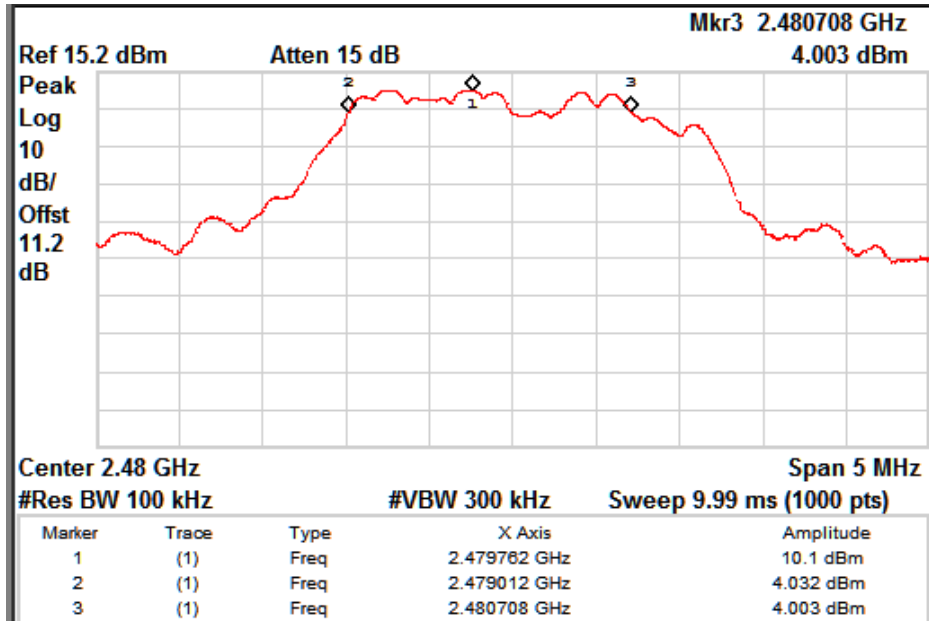
**Test Result: ZigBee**

| 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



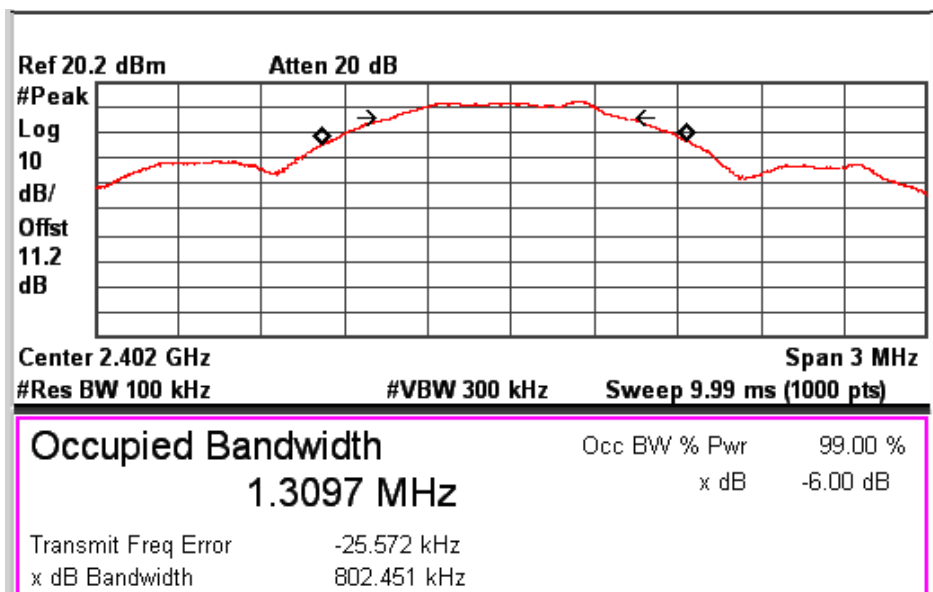
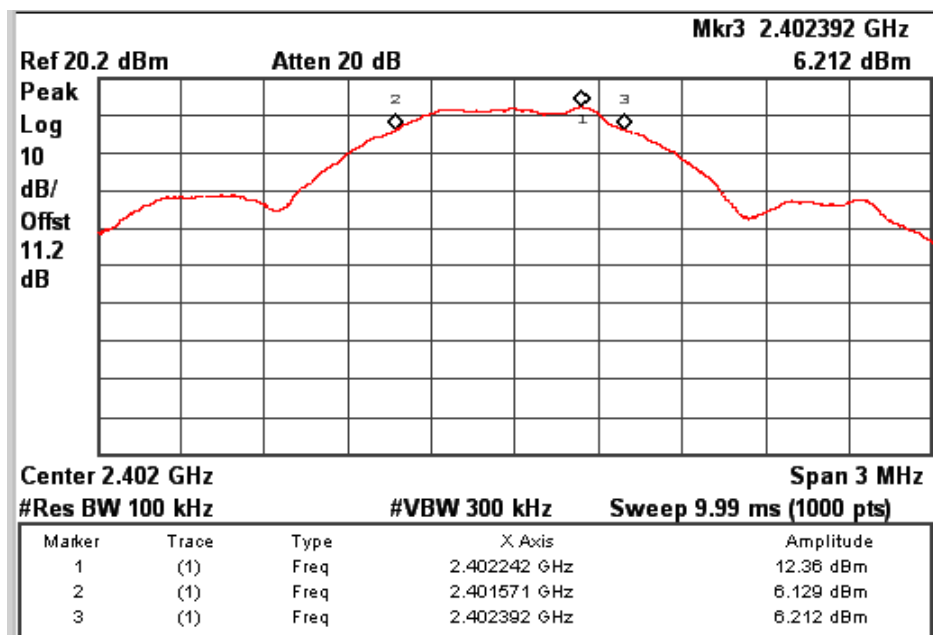
**Channel Frequency: 2480 MHz**



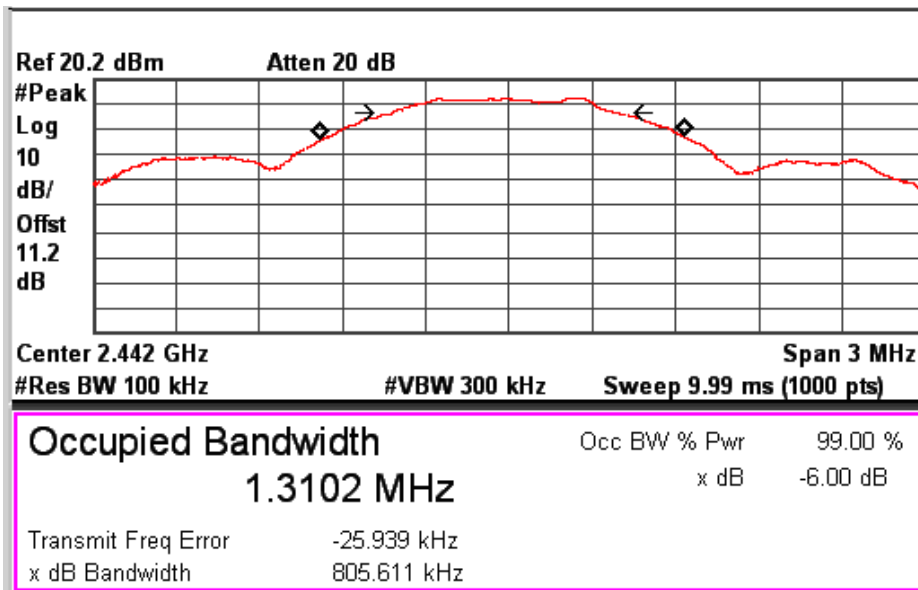
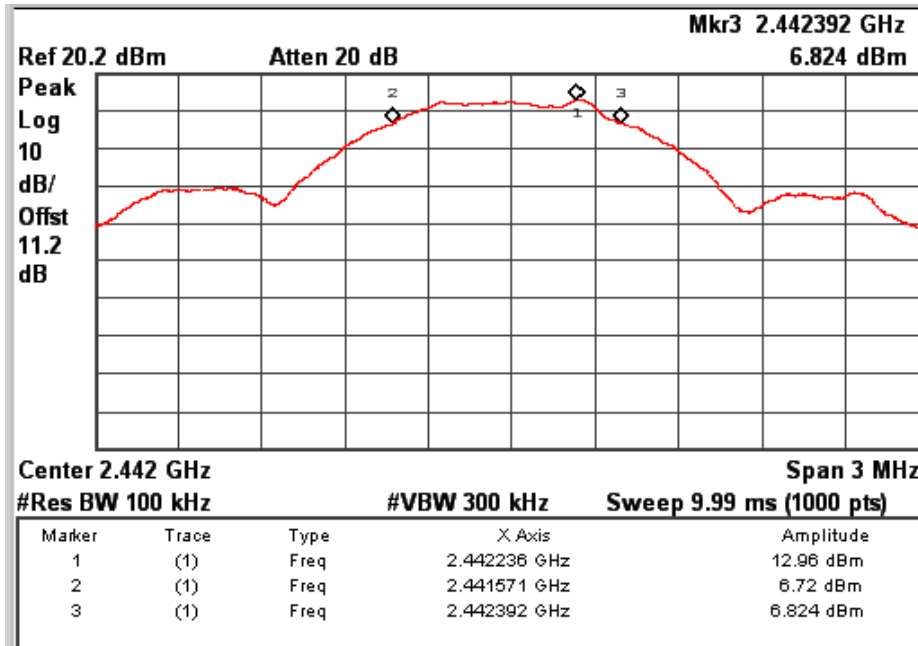
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Test Result: Bluetooth LE

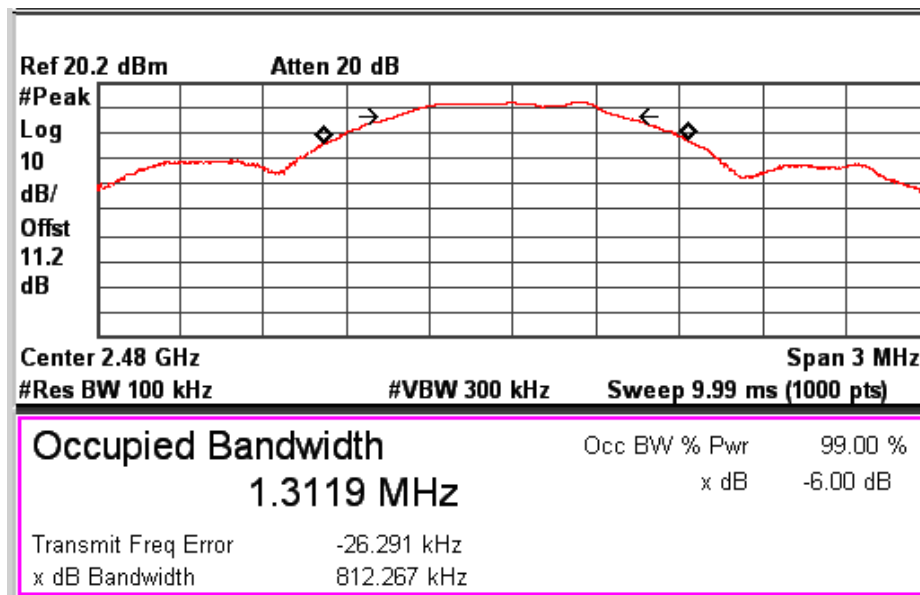
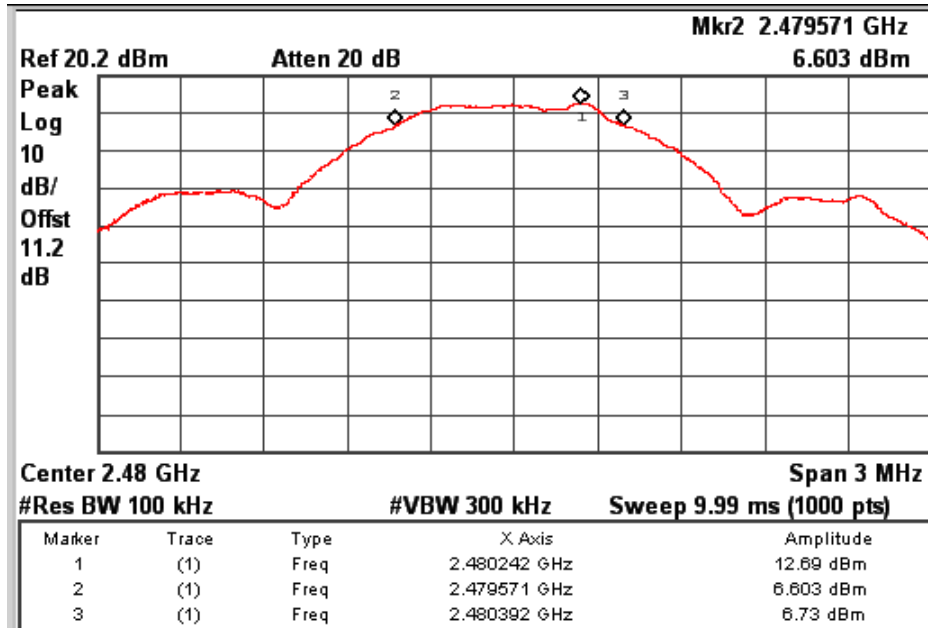
| Channel Frequency (MHz) | Lower Frequency (MHz) | Upper Frequency (MHz) | 6 dB Bandwidth (MHz) | 99% OBW (MHz) |
|-------------------------|-----------------------|-----------------------|----------------------|---------------|
| 2402.00                 | 2401.571              | 2402.392              | 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**

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**Band-edge Compliance**

**Section 15.247(d)**

**Result**

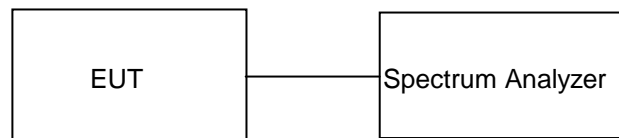
**Pass**

Test Specification  
 Detector Function  
 Requirement

FCC Part 15 Section 15.247(d)  
 Peak

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.

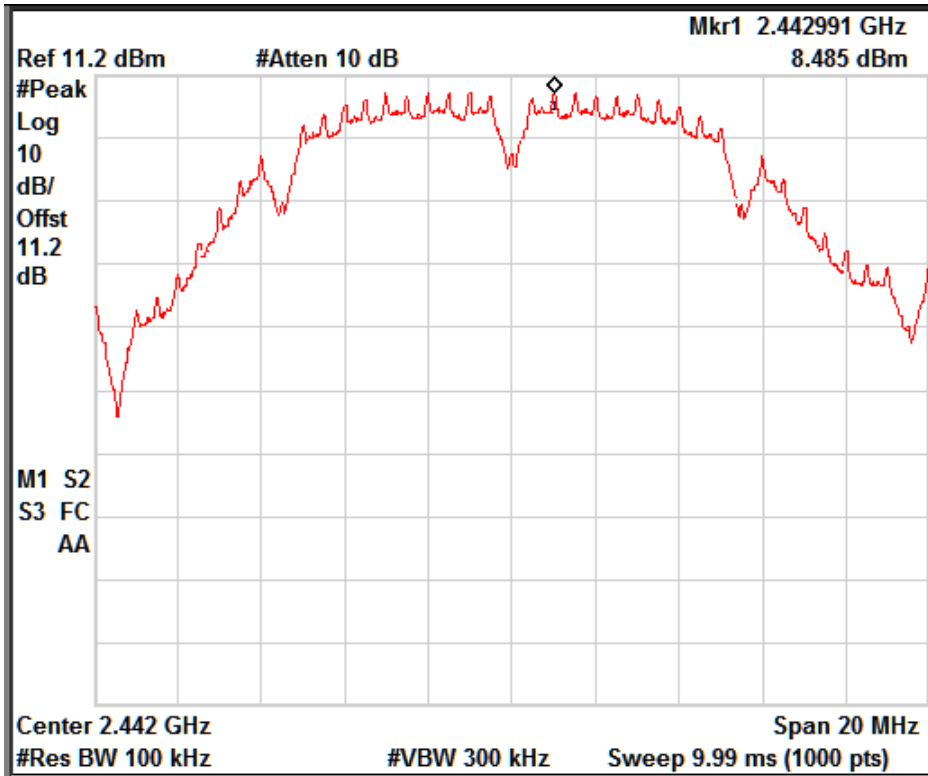
**Test Method:**



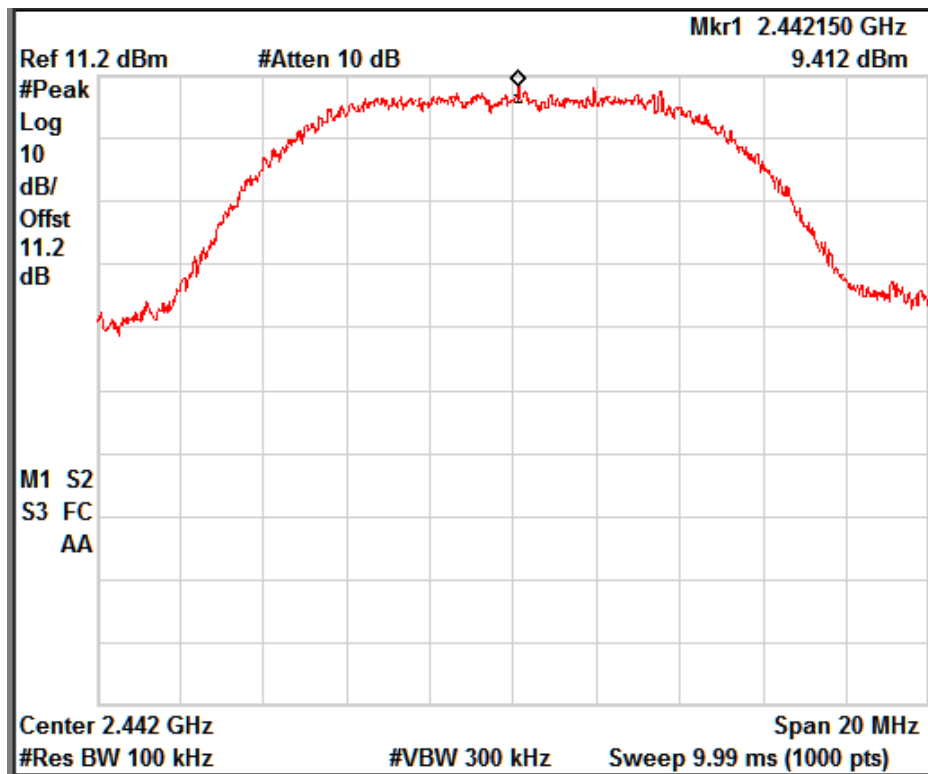
**Test Result: Wi-Fi**

| 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      |

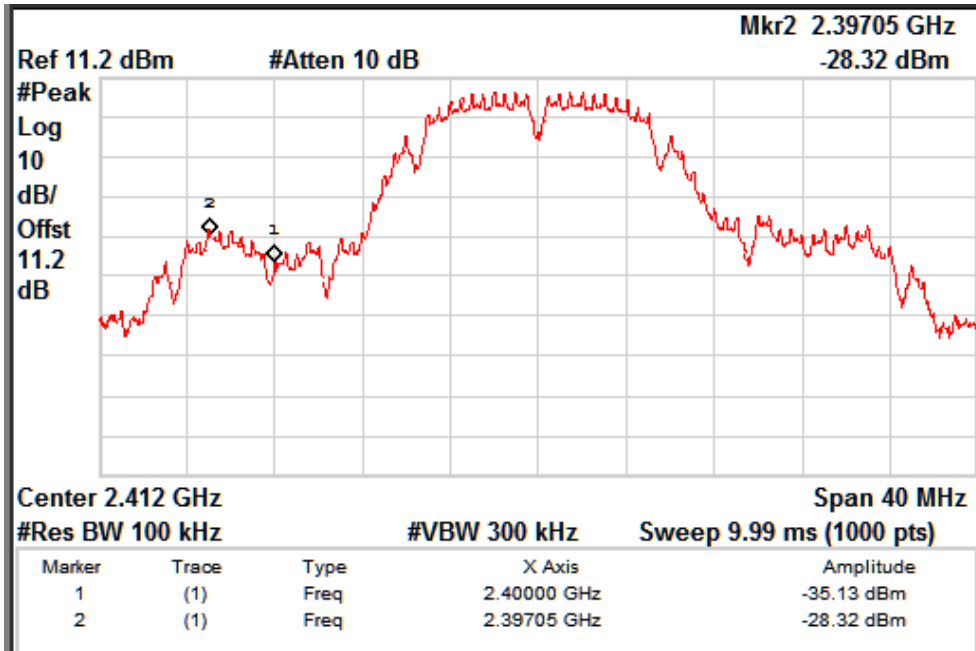
**Note:** The channel no. 7 (2442 MHz) found to contain the maximum PSD level and is used to establish the reference level.



Reference Level Plot: 1Mbps

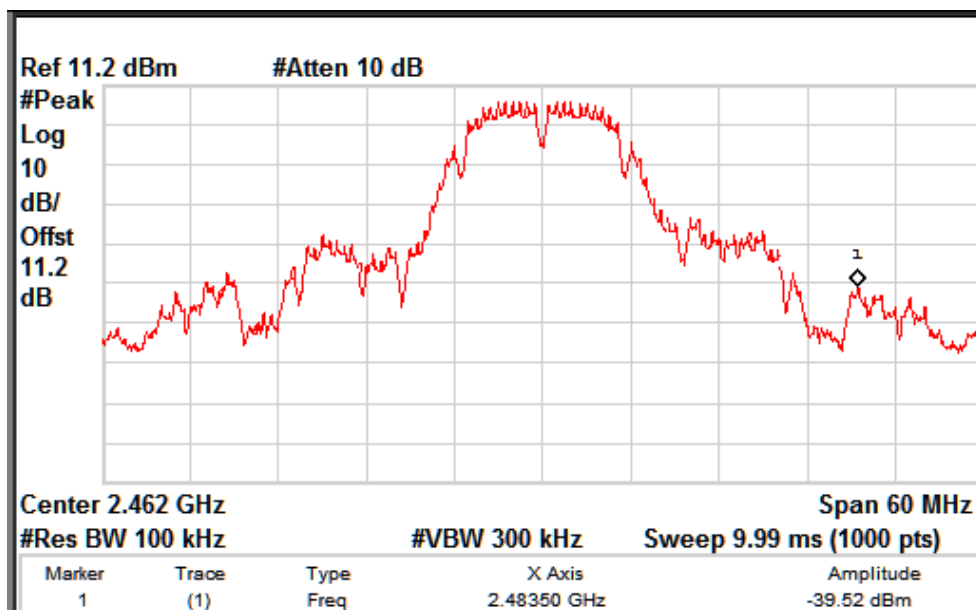


Reference Level Plot: 11Mbps



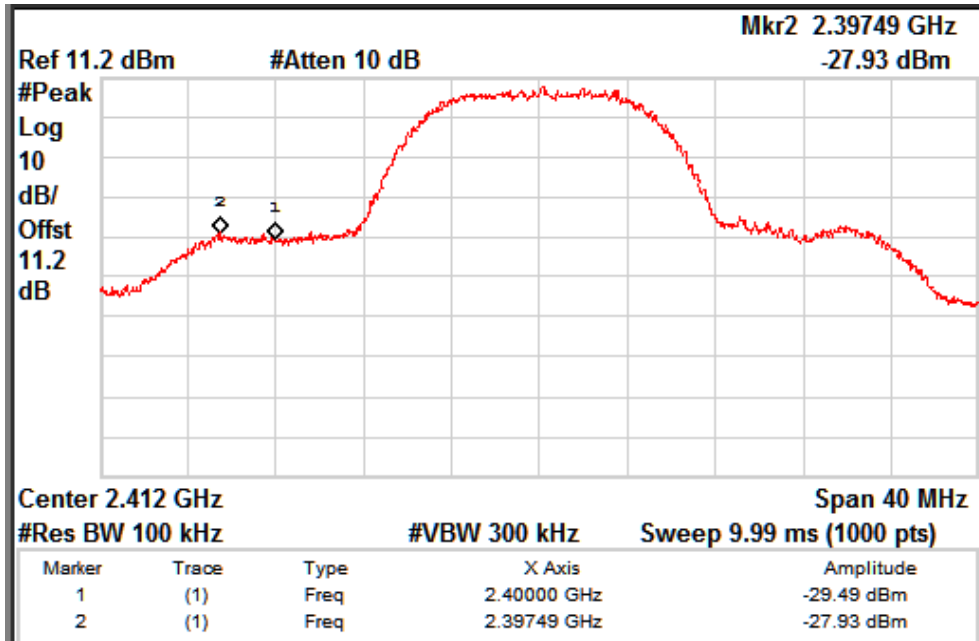
Data Rate: 1 Mbps

Channel frequency: 2412 MHz



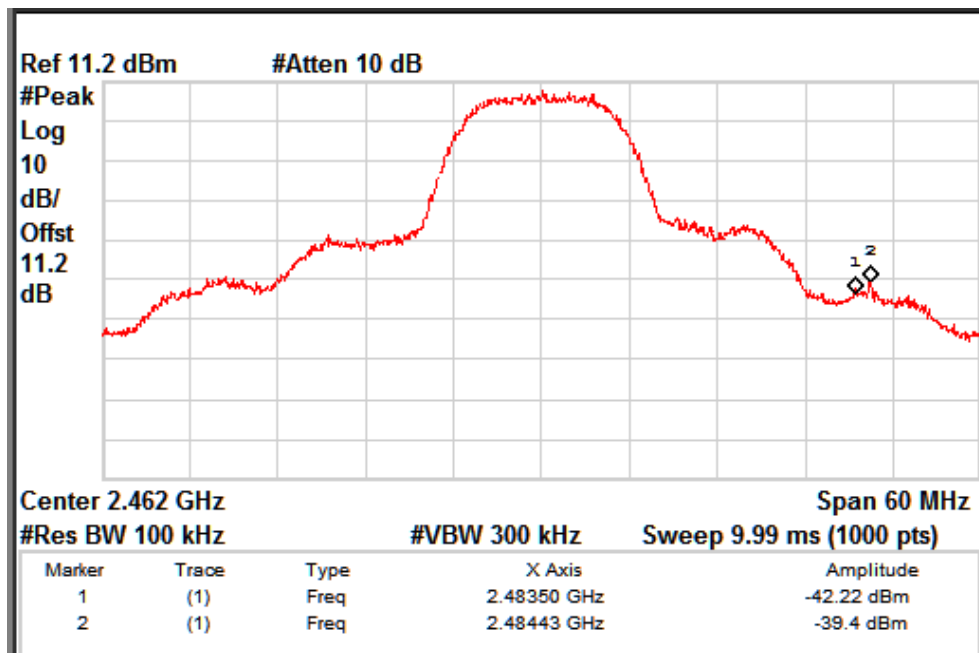
Data Rate: 1 Mbps

Channel frequency: 2462 MHz



Data Rate: 11 Mbps

Channel frequency: 2412 MHz



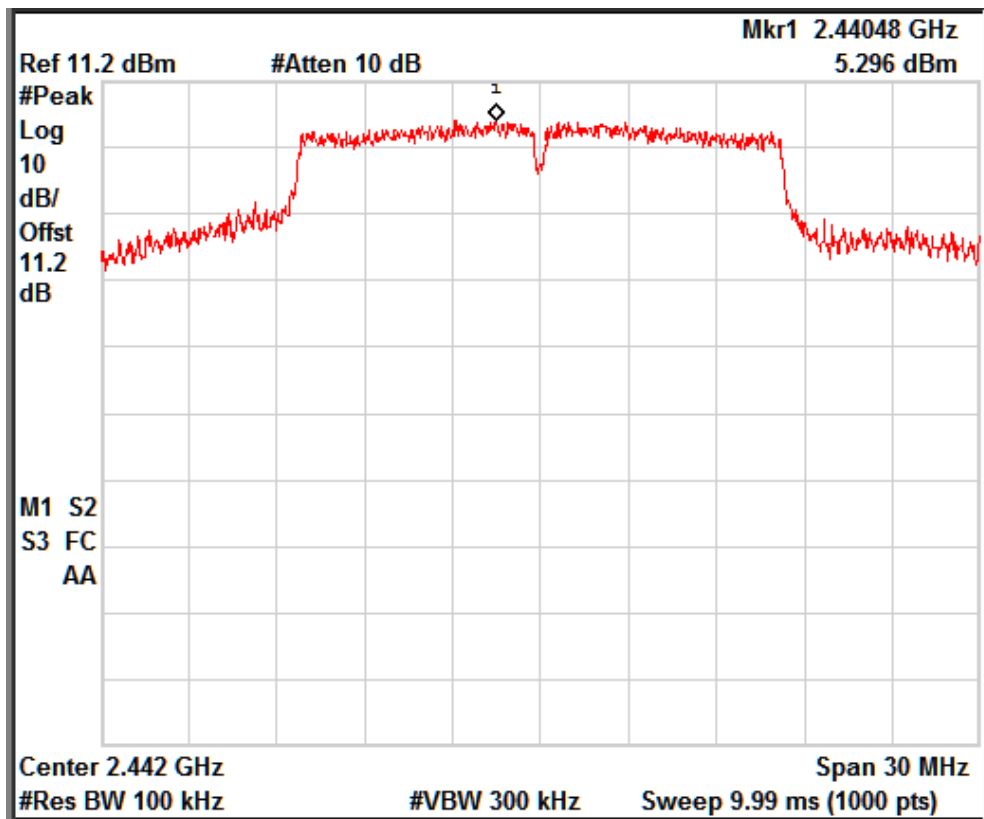
Data Rate: 11 Mbps

Channel frequency: 2462 MHz

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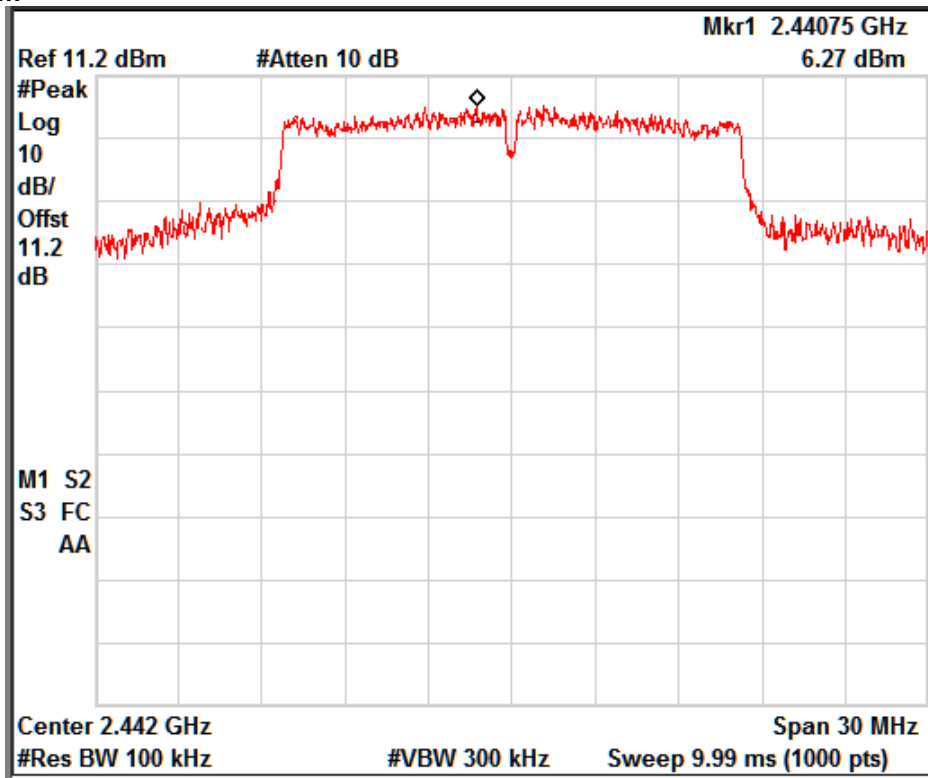
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Value at Band Edge |               | Reference Value B (dBm) | Band Edge Value A-B (dBc) | Limit (dBc) |
|-----------------|------------------|-------------------------|--------------------|---------------|-------------------------|---------------------------|-------------|
|                 |                  |                         | 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.

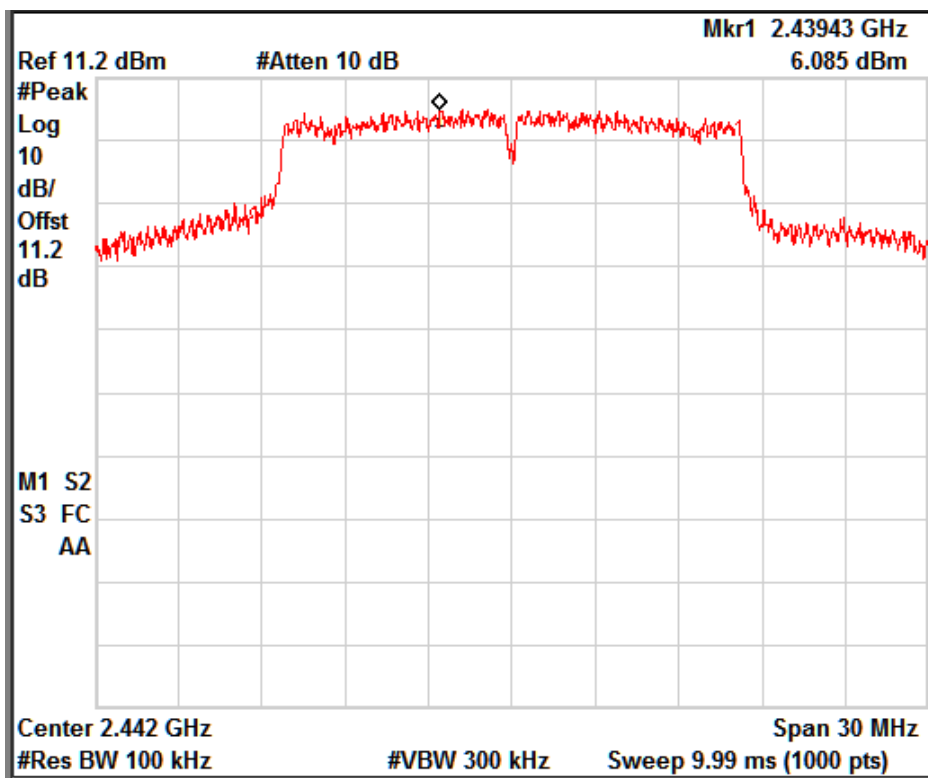


Reference Level Plot: 6 Mbps



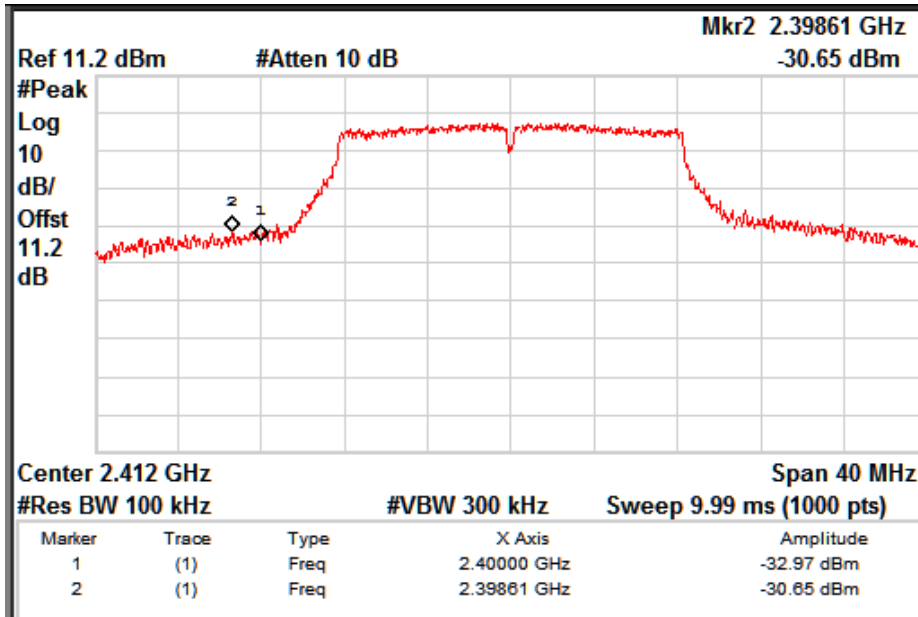


Reference Level Plot: 24 Mbps



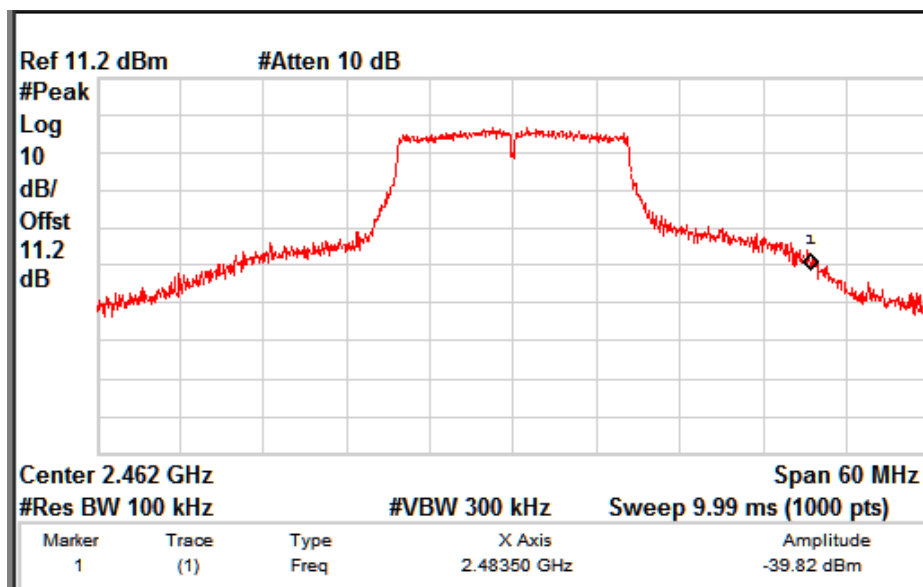
Reference Level Plot: 54 Mbps

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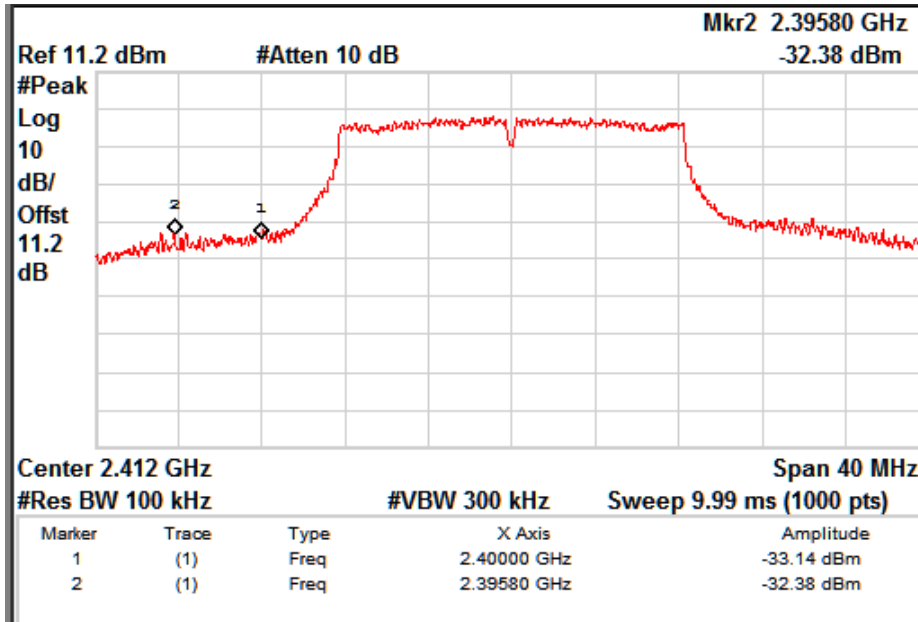
Data Rate: 6 Mbps

Channel frequency: 2412 MHz



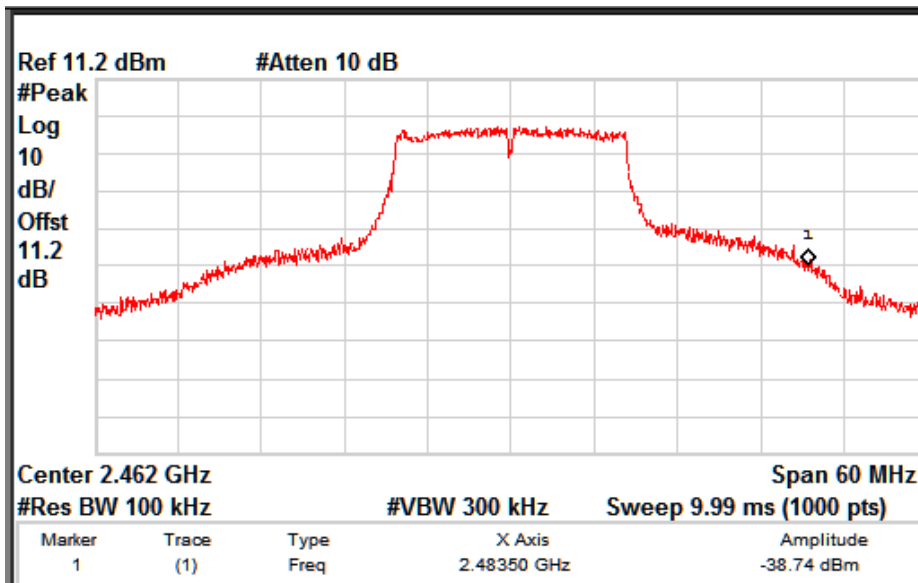
Data Rate: 6 Mbps

Channel frequency: 2462 MHz



Data Rate: 24 Mbps

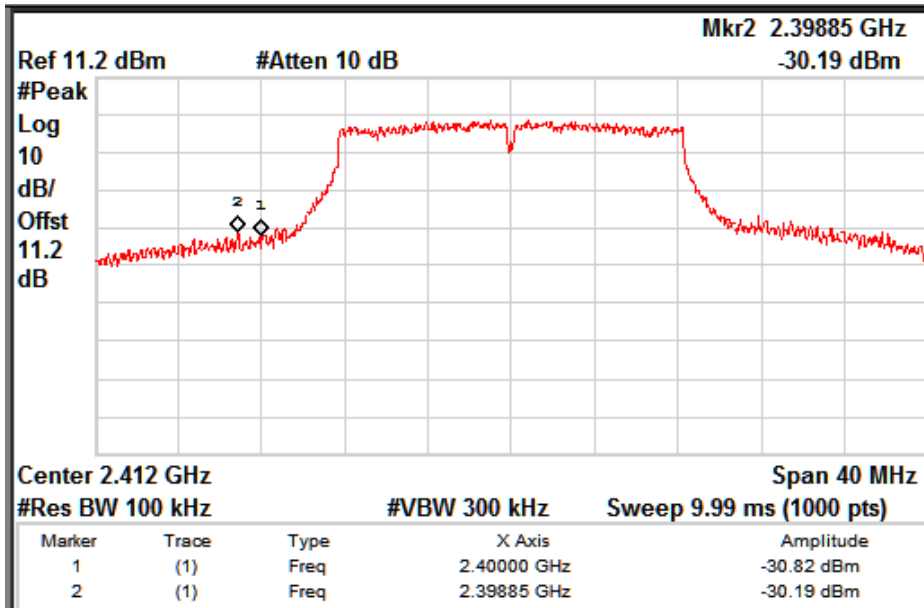
Channel frequency: 2412 MHz



Data Rate: 24 Mbps

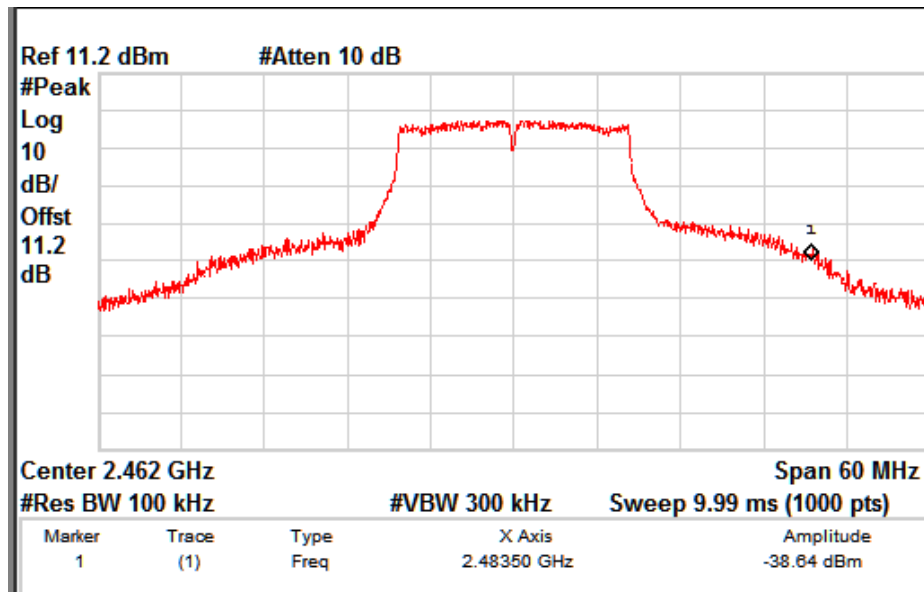
Channel frequency: 2462 MHz

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Data Rate: 54 Mbps

Channel frequency: 2412 MHz



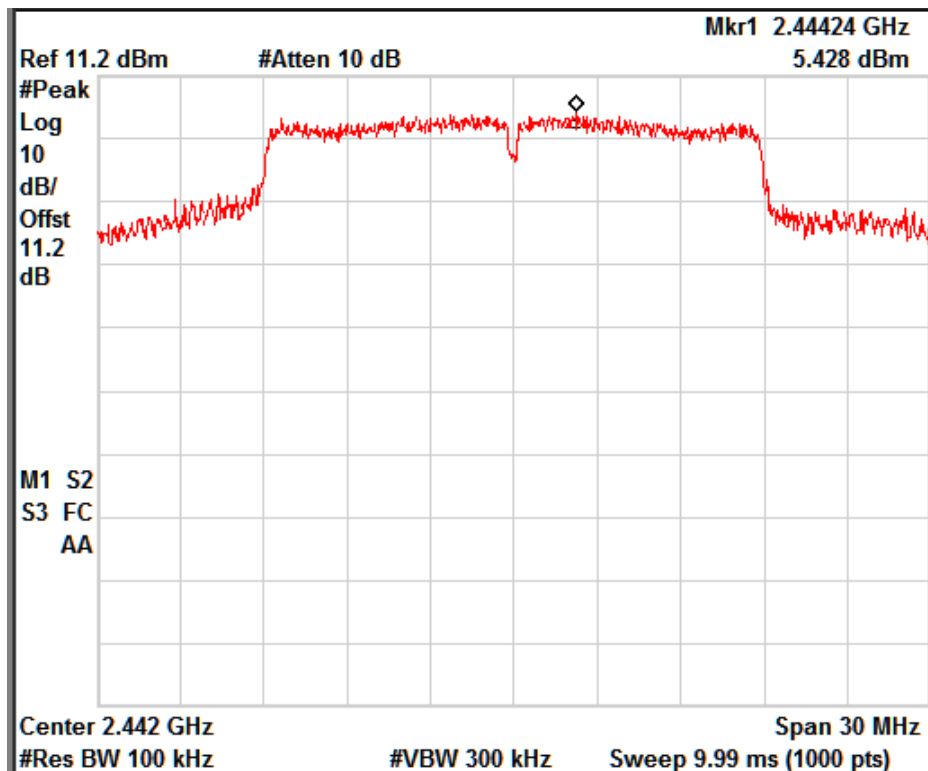
Data Rate: 54 Mbps

Channel frequency: 2462 MHz

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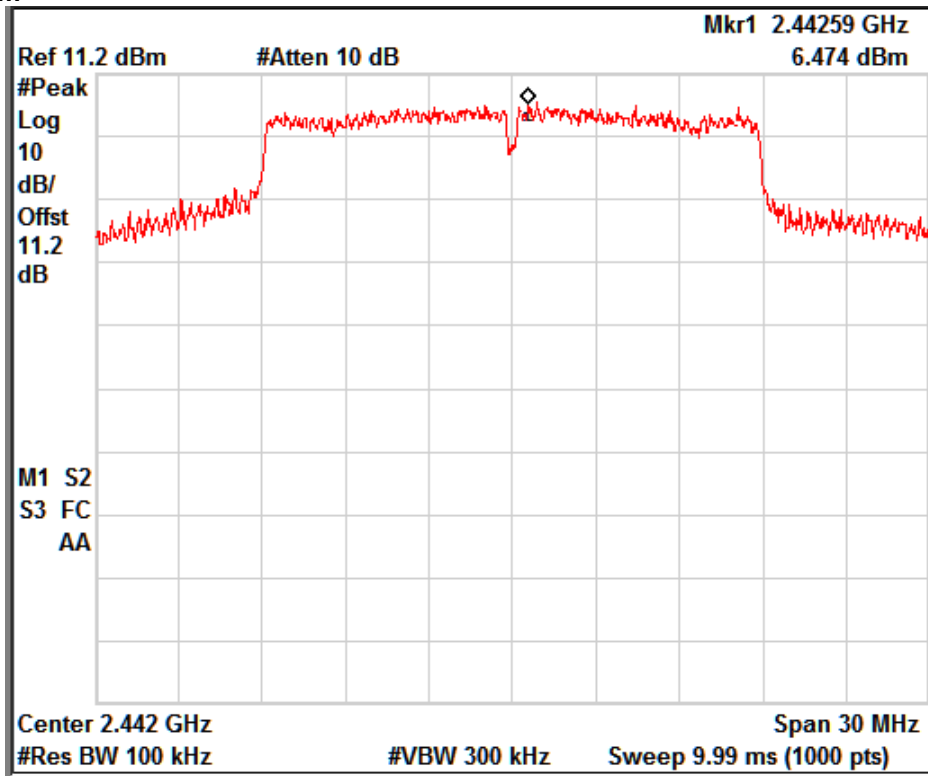
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Value at Band Edge |               | Reference Value B (dBm) | Band Edge Value A-B (dBc) | Limit (dBc) |
|-----------------|------------------|-------------------------|--------------------|---------------|-------------------------|---------------------------|-------------|
|                 |                  |                         | 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.

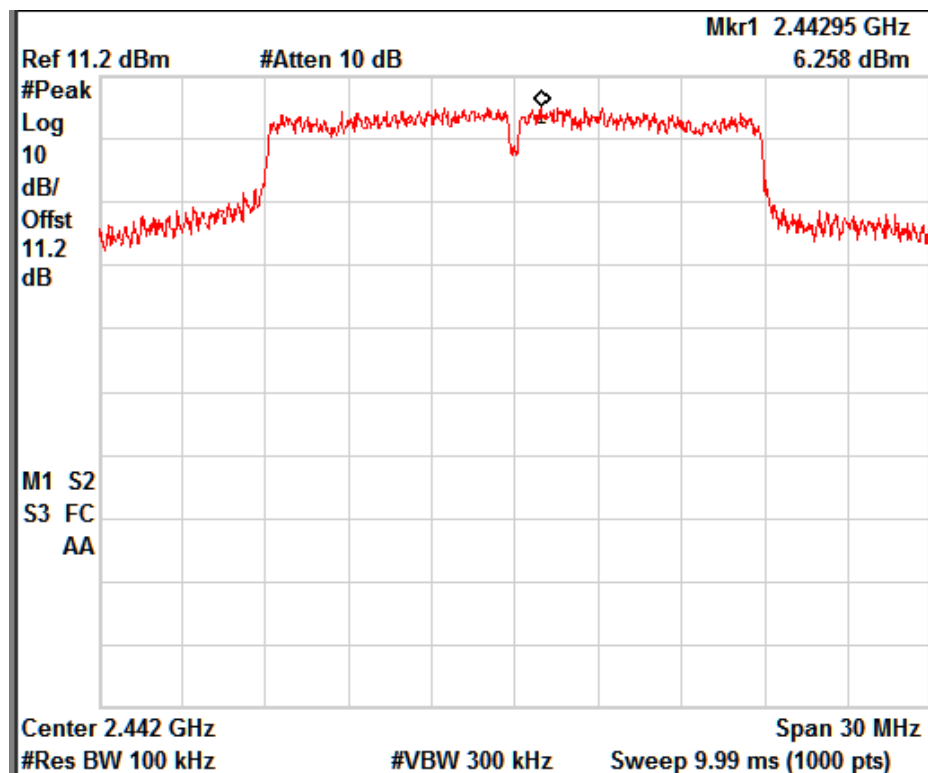


Reference Level Plot: 6.5 Mbps

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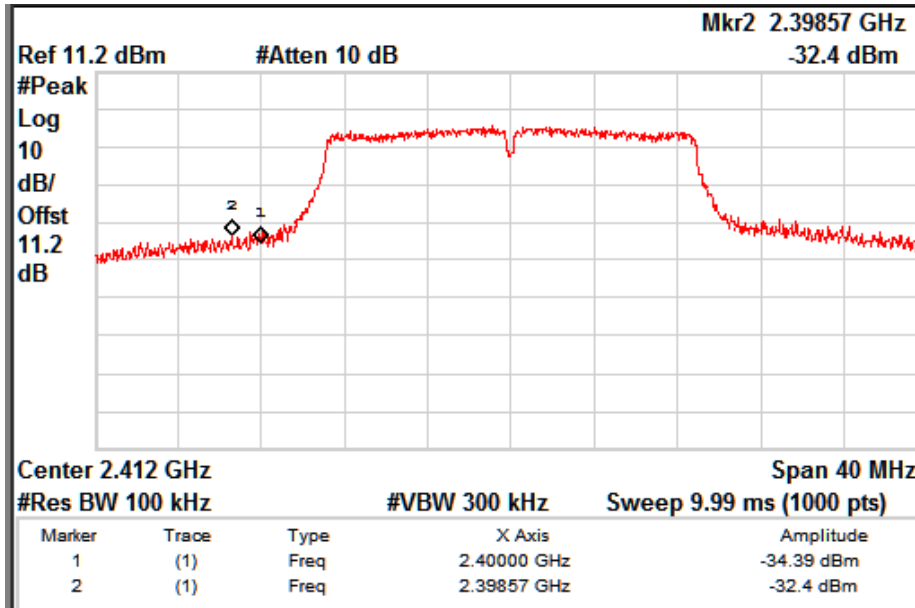


Reference Level Plot: 39 Mbps



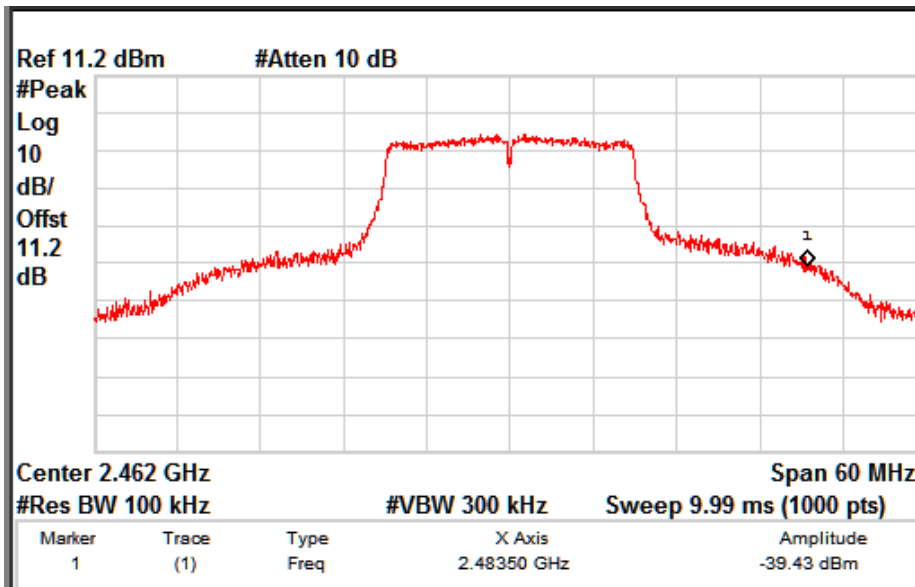
Reference Level Plot: 65 Mbps

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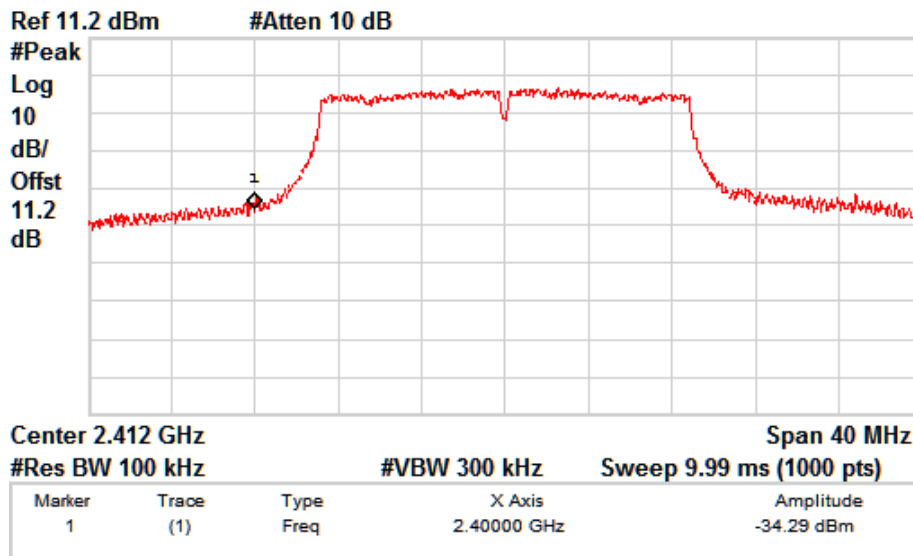
Data Rate: 6.5 Mbps

Channel frequency: 2412 MHz



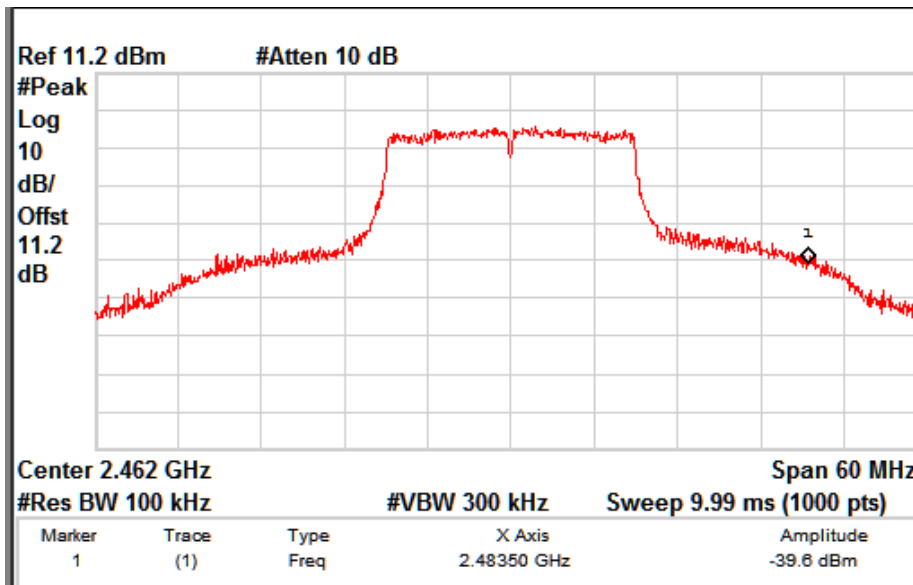
Data Rate: 6.5 Mbps

Channel frequency: 2462 MHz



Data Rate: 39 Mbps

Channel frequency: 2412 MHz

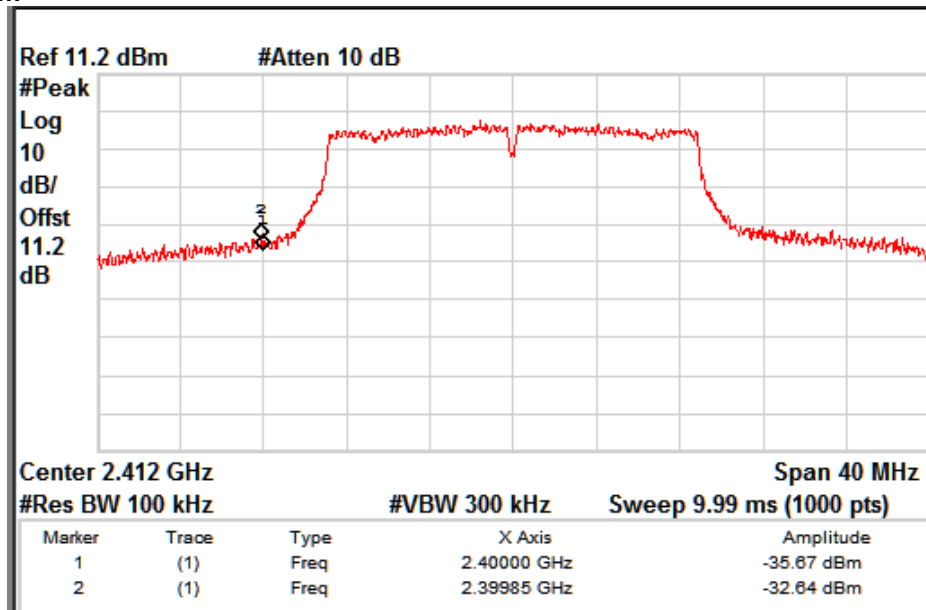


Data Rate: 39 Mbps

Channel frequency: 2462 MHz

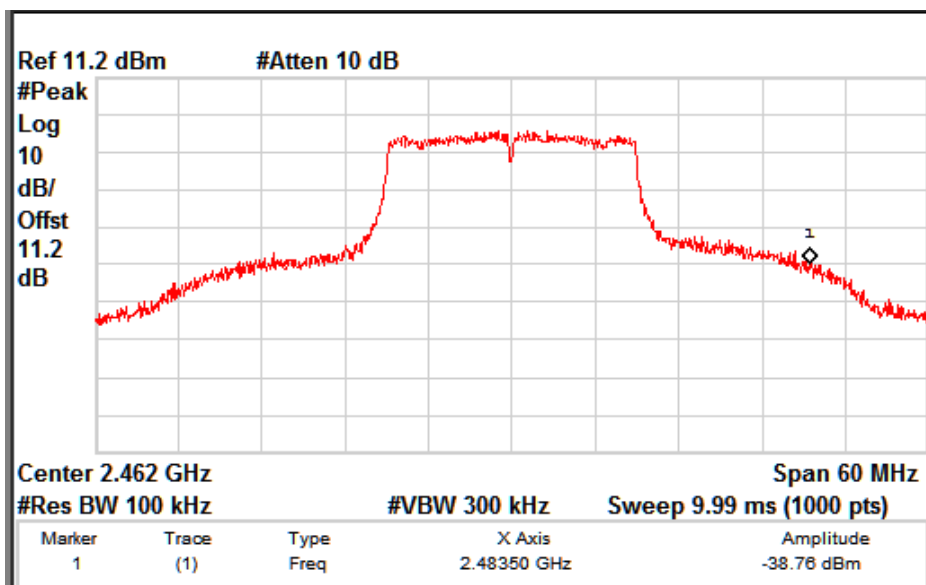


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Data Rate: 65 Mbps

Channel frequency: 2412 MHz



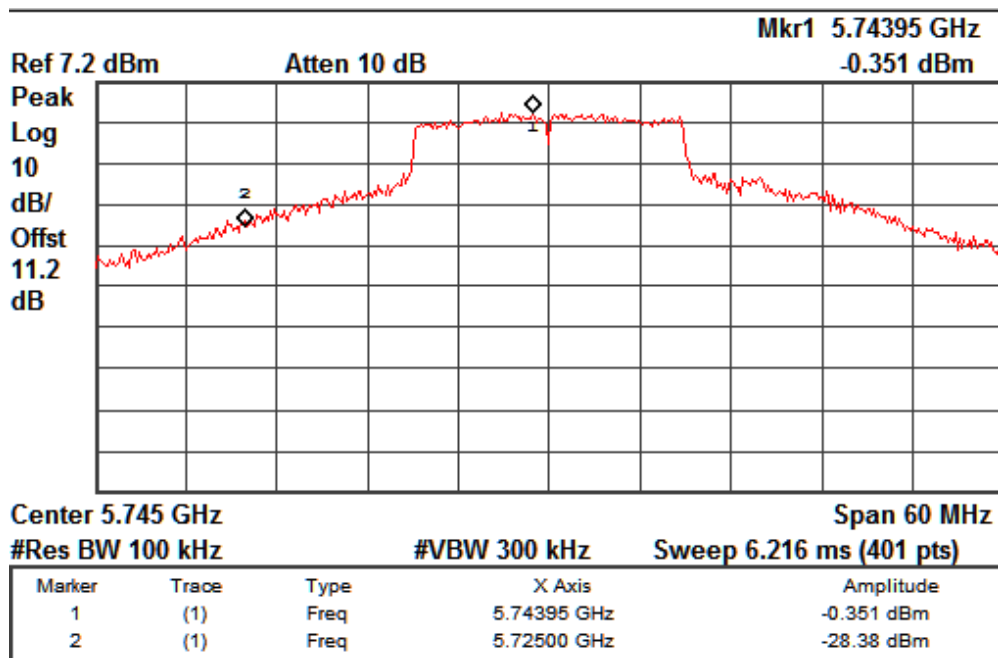
Data Rate: 65 Mbps

Channel frequency: 2462 MHz

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5GHz Band

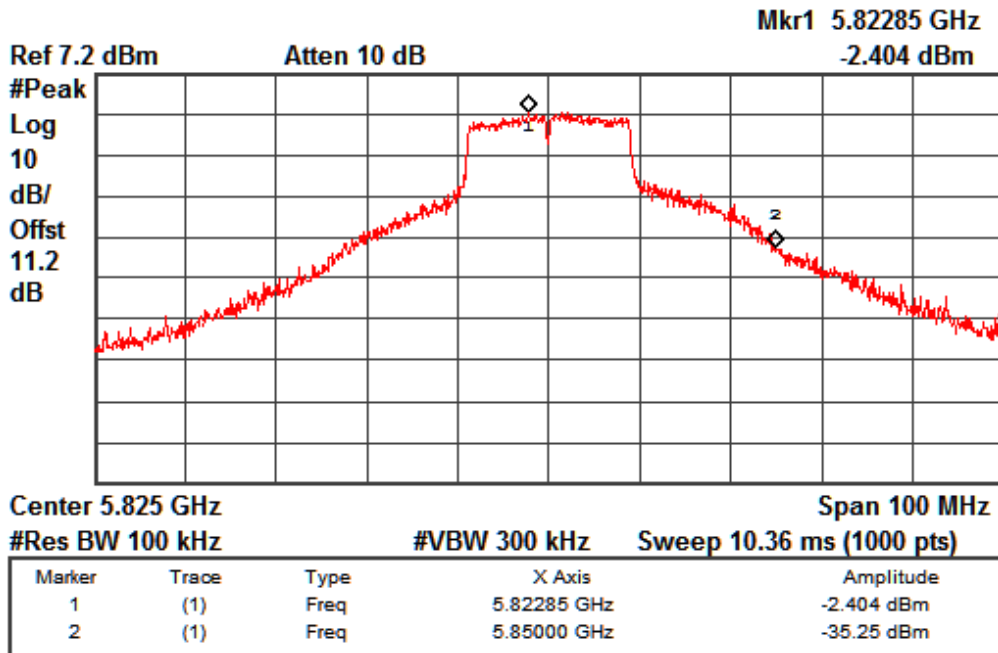
| 802.11 Protocol | Data Rate (Mbps) | Channel Frequency (MHz) | Value at Band Edge |               | Reference Value B (dBm) | Band Edge Value A-B (dBc) | Limit (dBc) |
|-----------------|------------------|-------------------------|--------------------|---------------|-------------------------|---------------------------|-------------|
|                 |                  |                         | 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

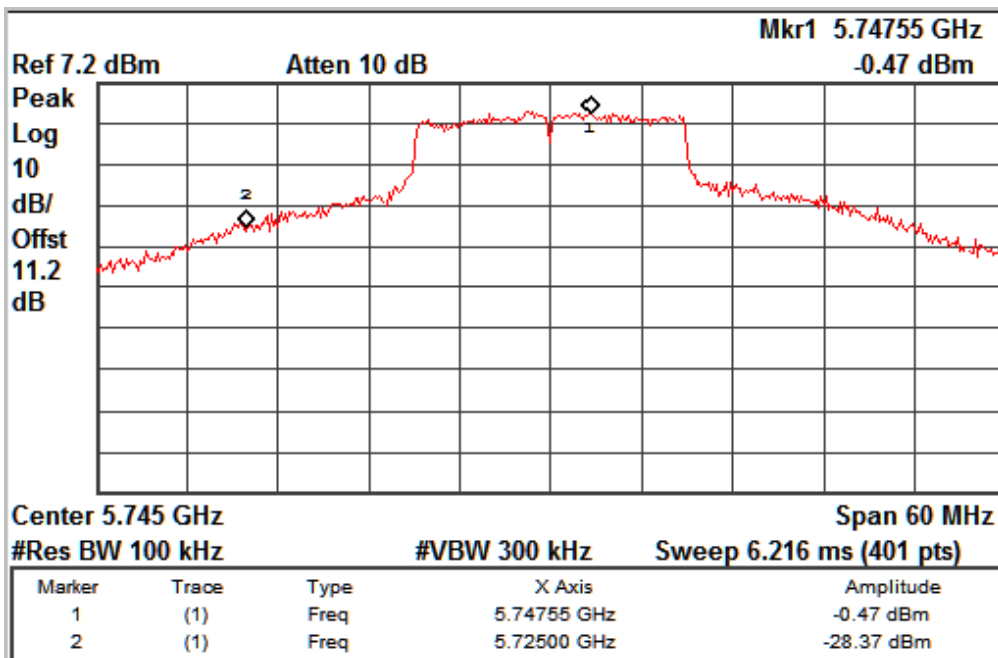
Channel frequency: 5745 MHz

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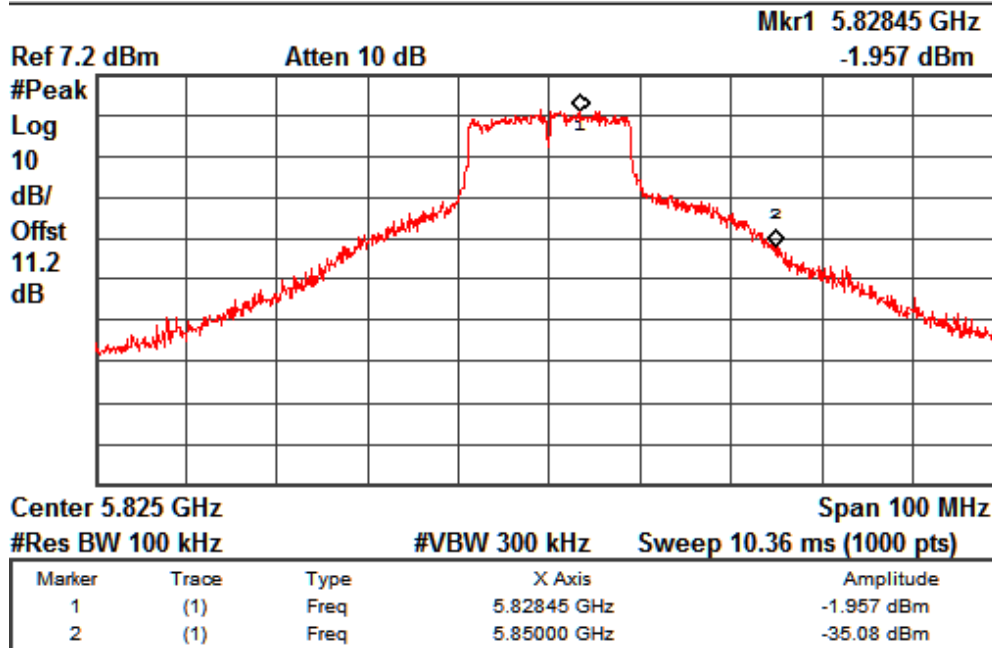
Data Rate: 6.5 Mbps

Channel frequency: 5825 MHz



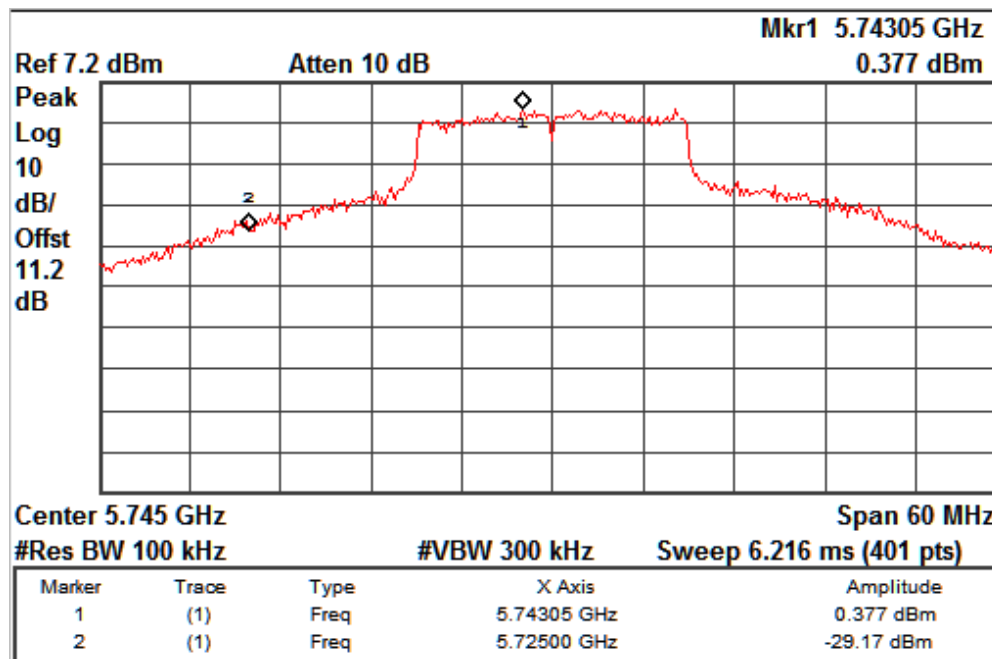
Data Rate: 39 Mbps

Channel frequency: 5745 MHz



Data Rate: 39 Mbps

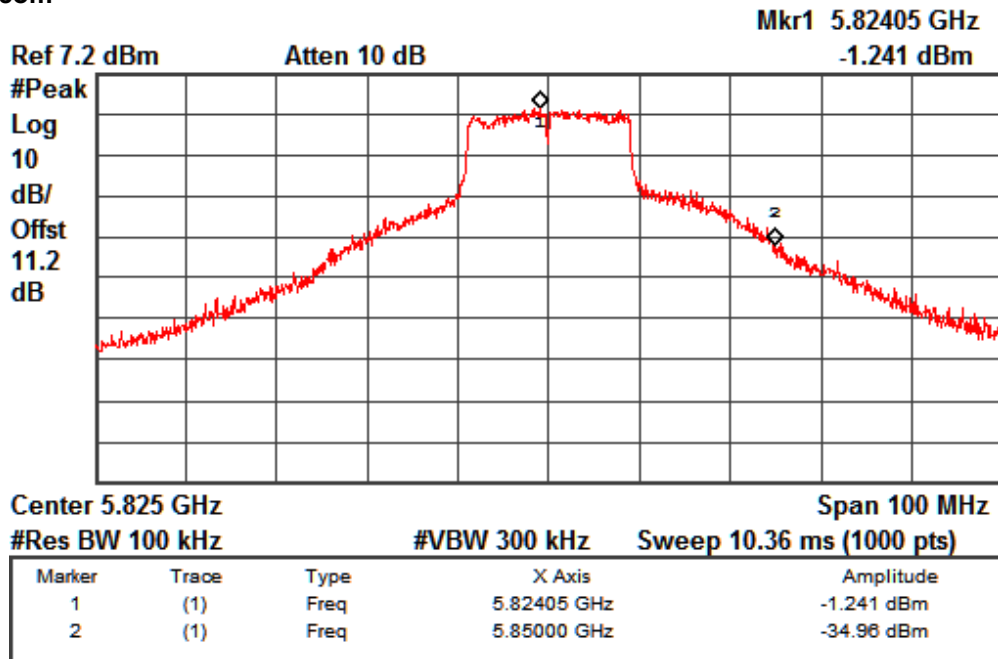
Channel frequency: 5825 MHz



Data Rate: 65 Mbps

Channel frequency: 5745 MHz

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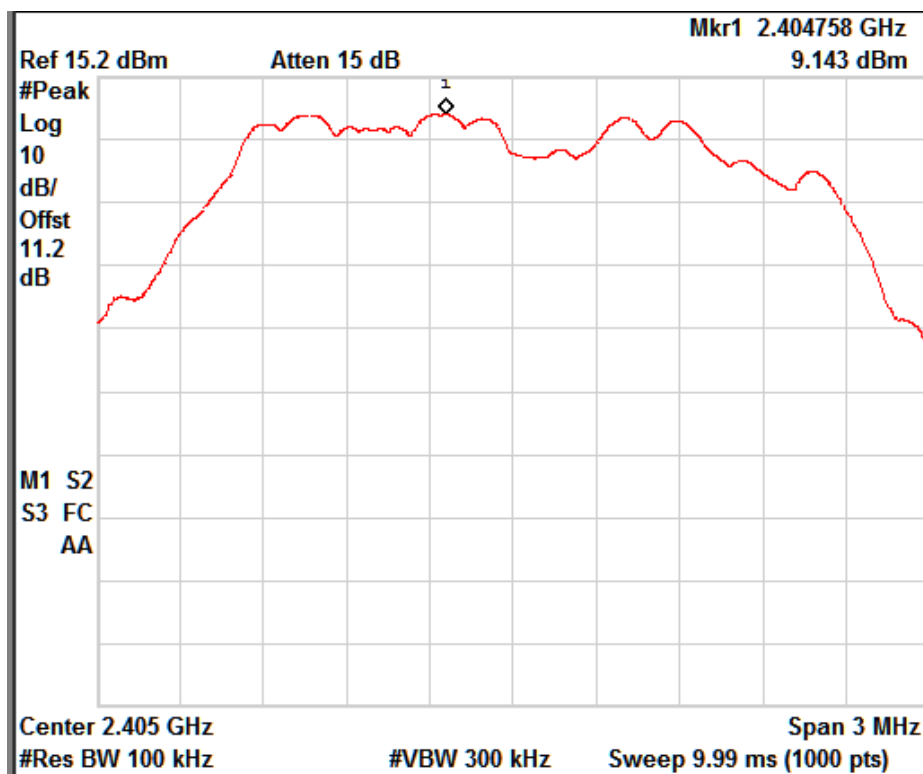


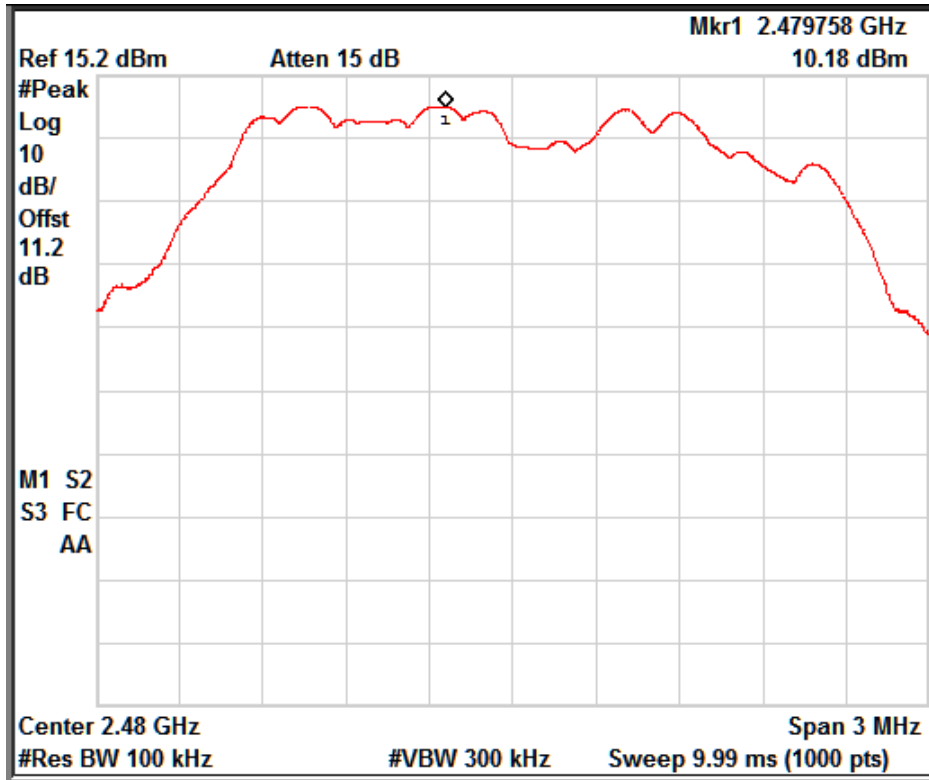
**Data Rate: 65 Mbps**

**Channel frequency: 5825 MHz**

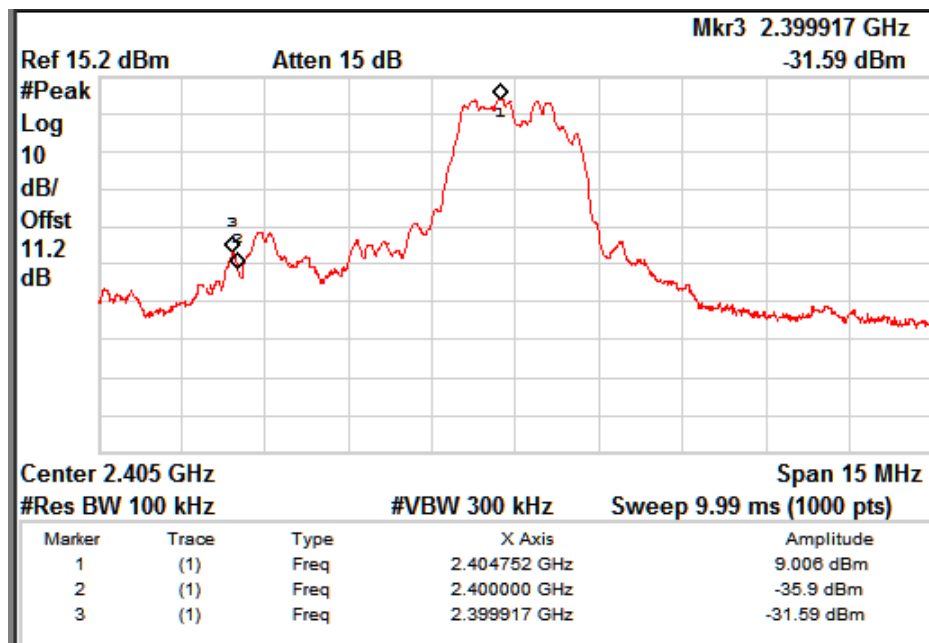
**Test Result: ZigBee**

| 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**

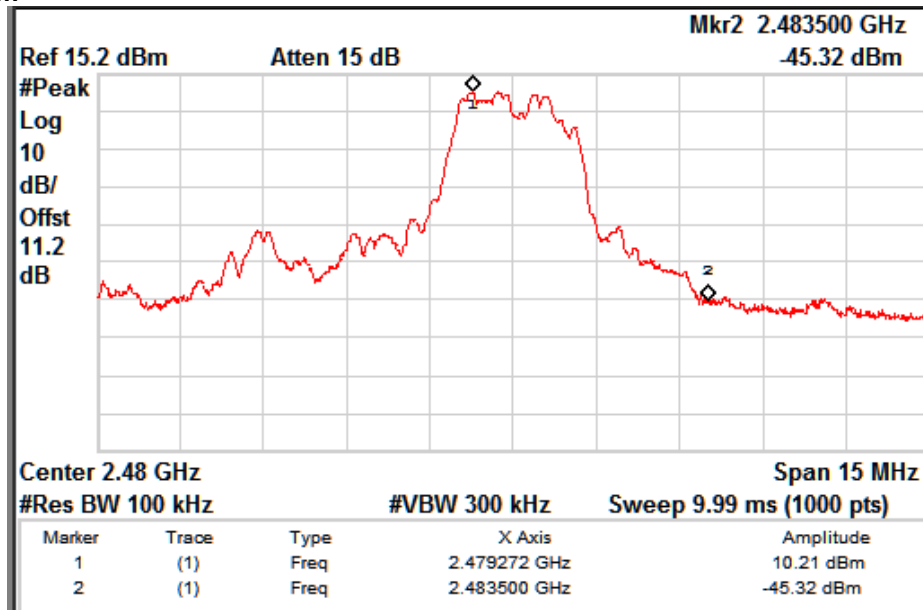


Reference Level Plot Channel High



Channel Frequency 2405 MHz

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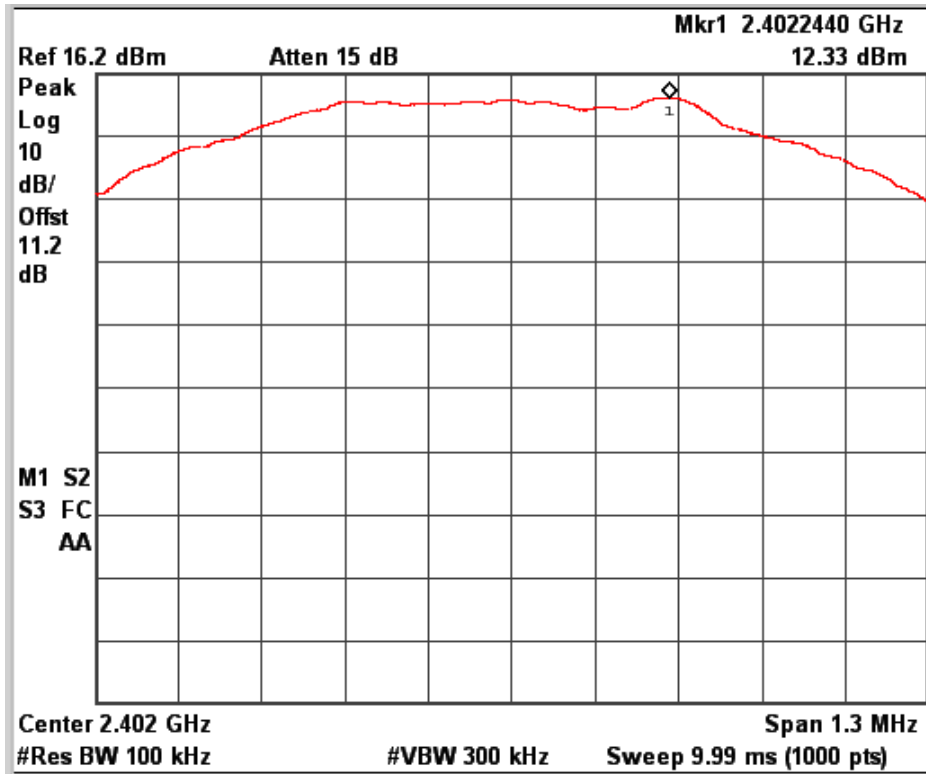
**Channel Frequency 2480 MHz**

**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      |

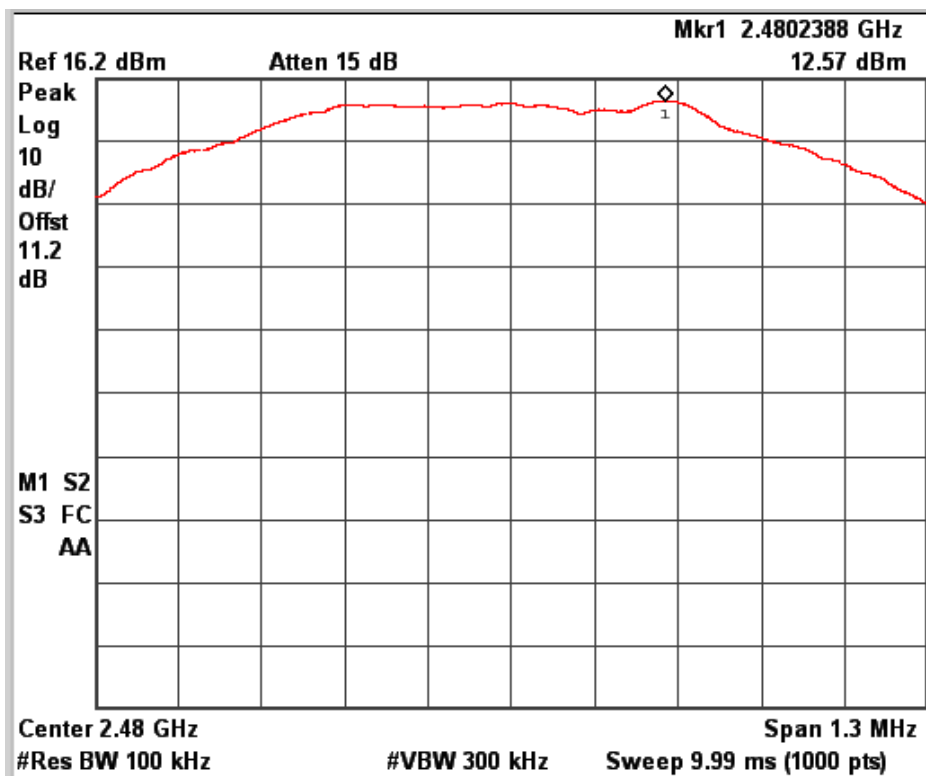


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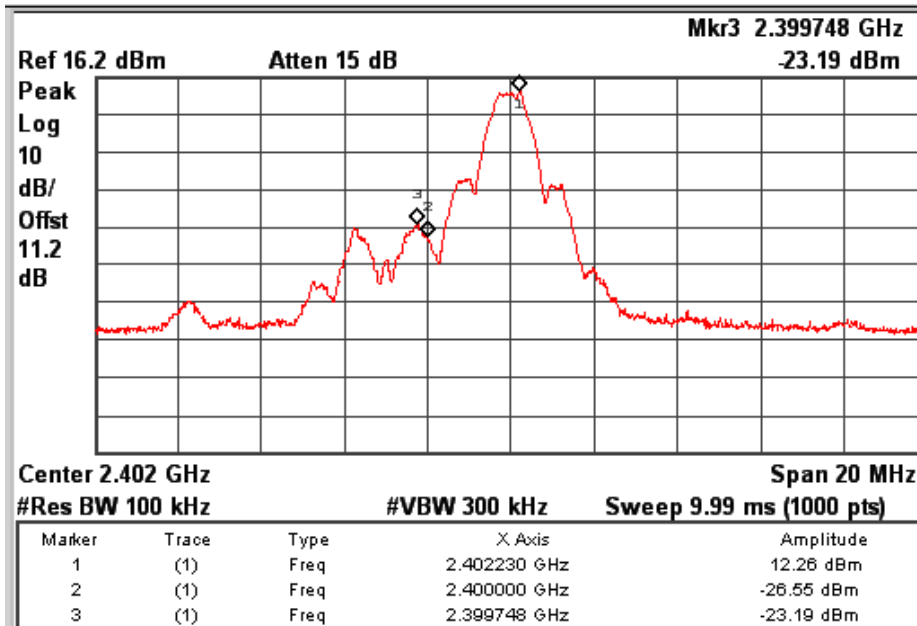
Reference Level Plot

Channel Frequency: 2402MHz

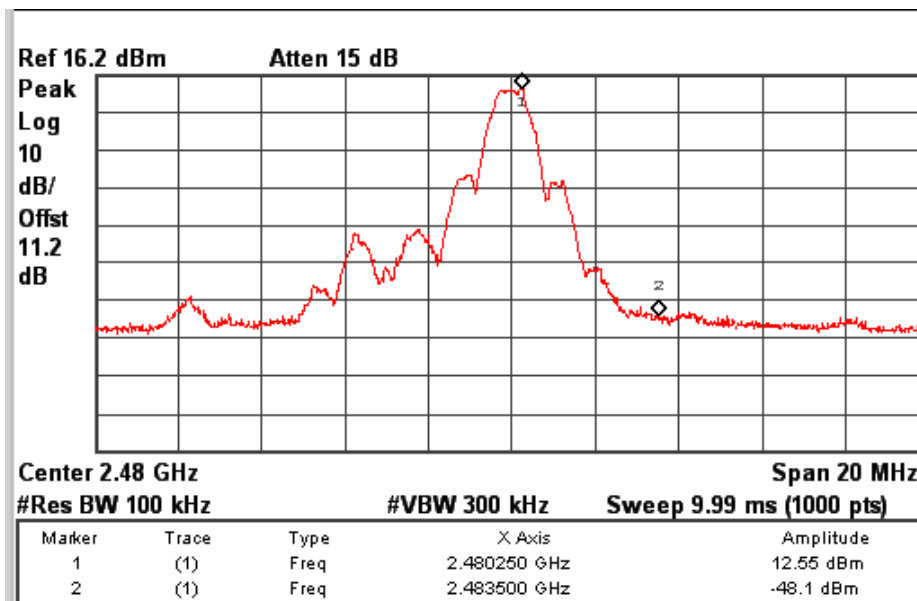


Reference Level Plot

Channel Frequency: 2480MHz



**Channel Frequency 2402 MHz**

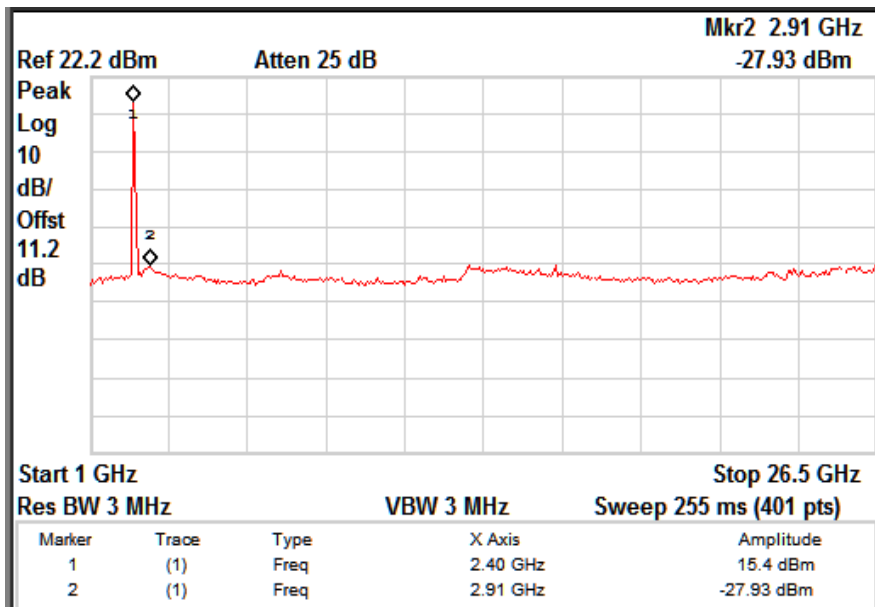
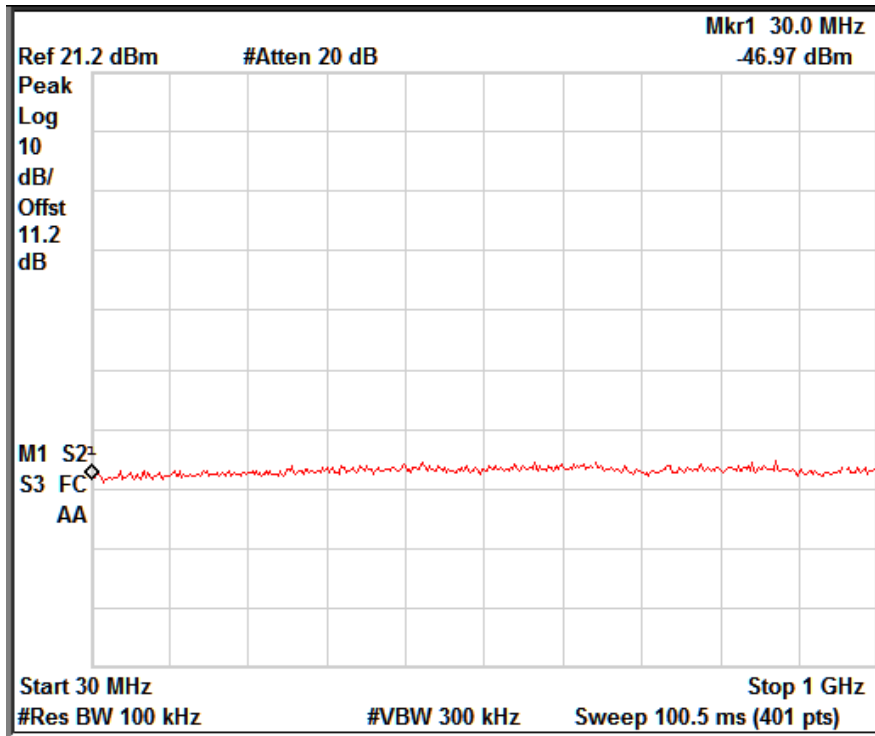


**Channel Frequency 2480 MHz**

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**Conducted Spurious Emission**

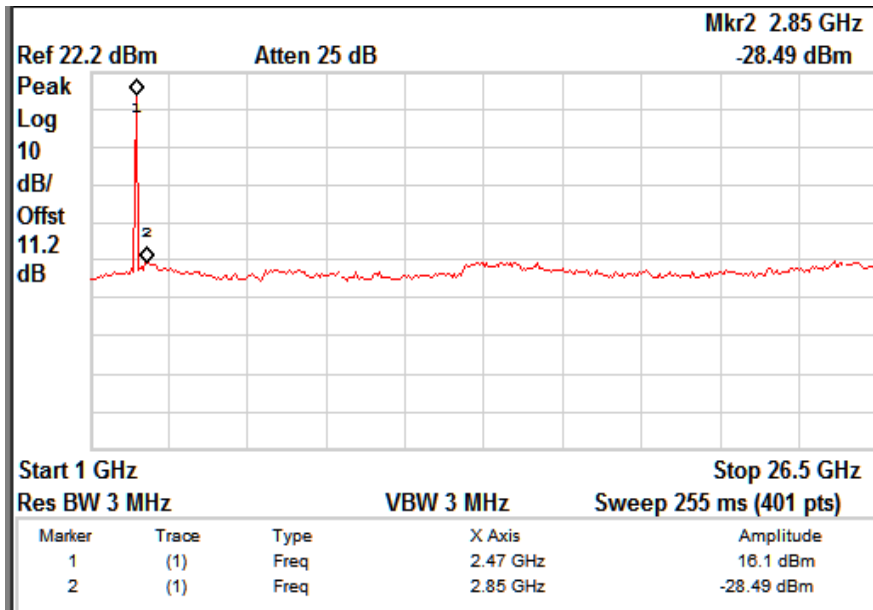
WiFi



Data Rate: 1Mbps

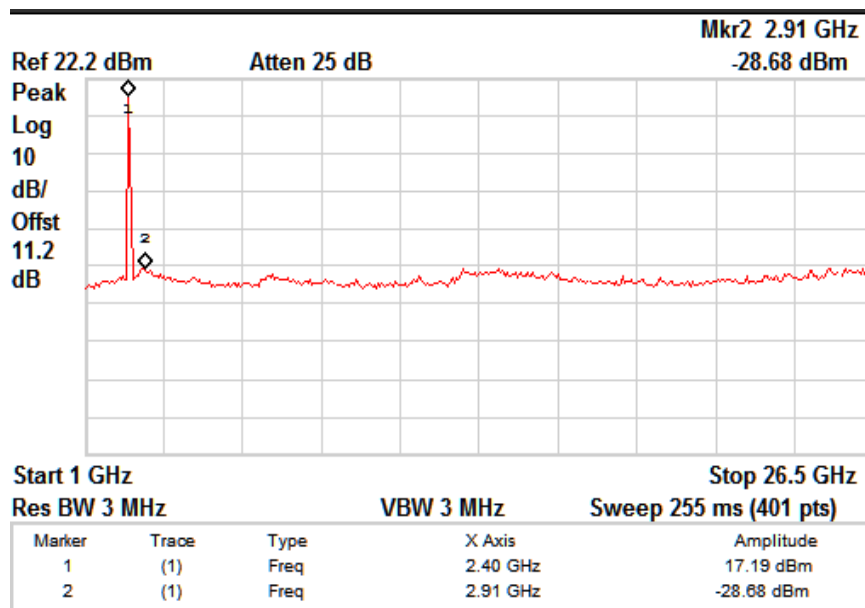
Channel frequency: 2412 MHz

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Data Rate: 1Mbps

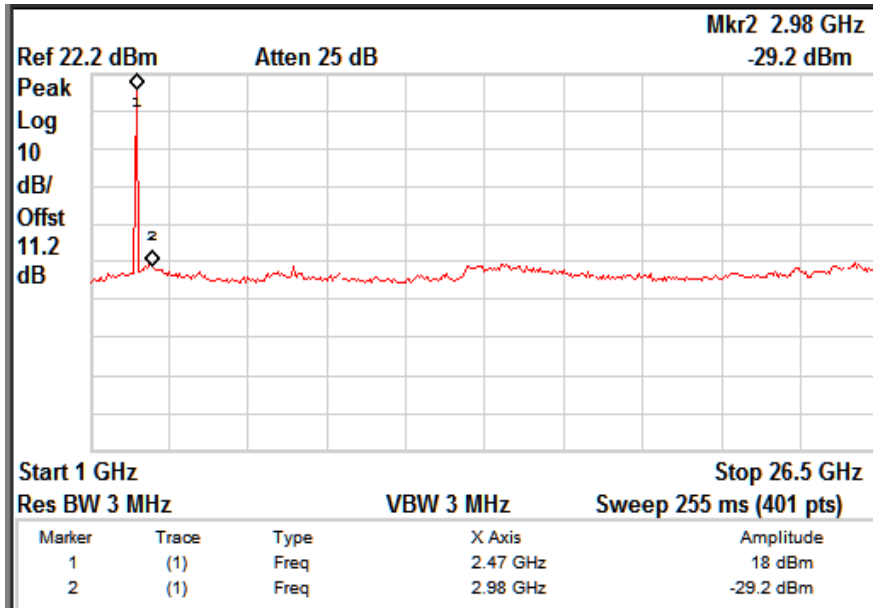
Channel frequency: 2462 MHz



Data Rate: 11Mbps

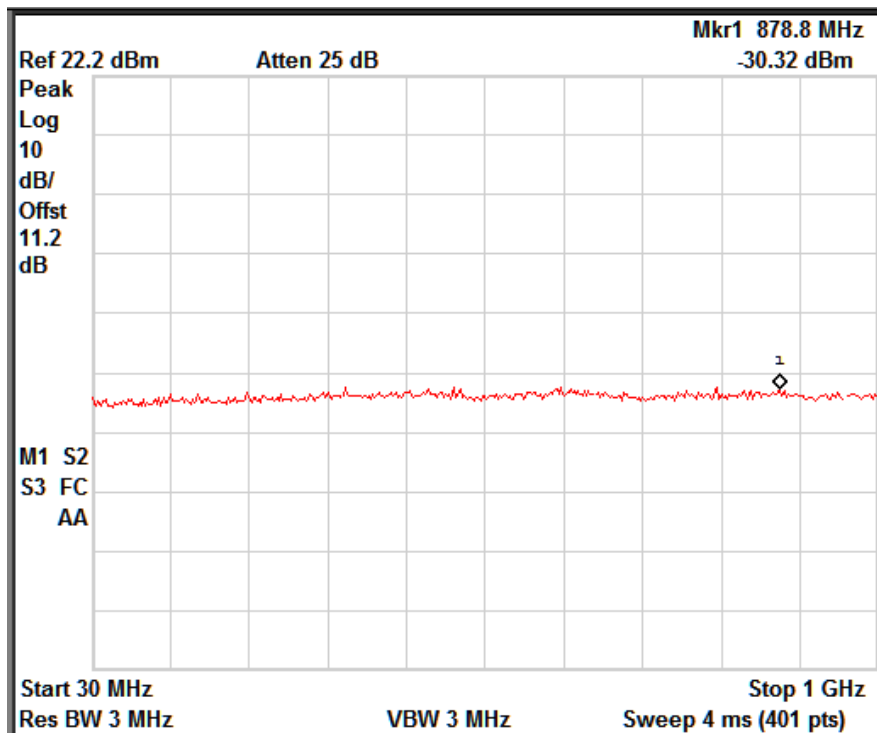
Channel frequency: 2412 MHz

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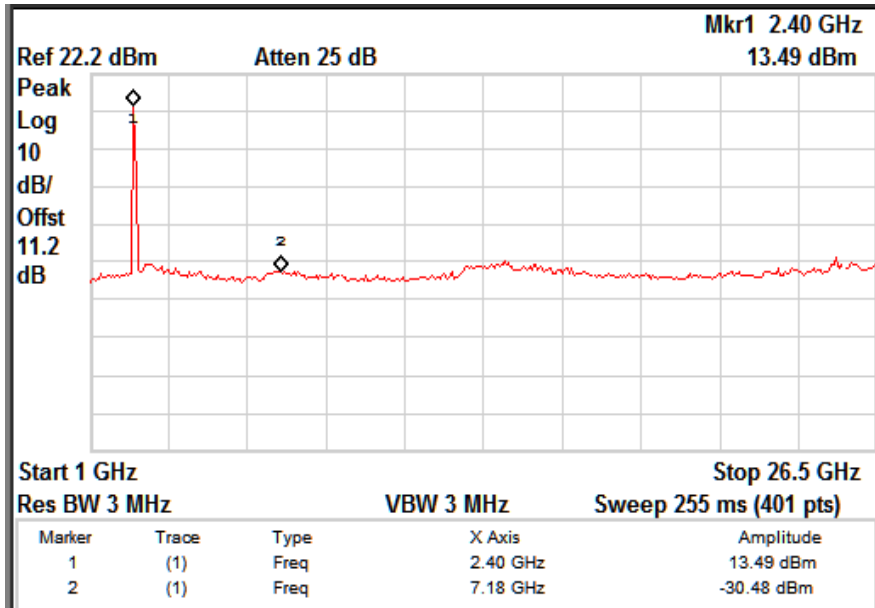


Data Rate: 11Mbps

Channel frequency: 2462 MHz

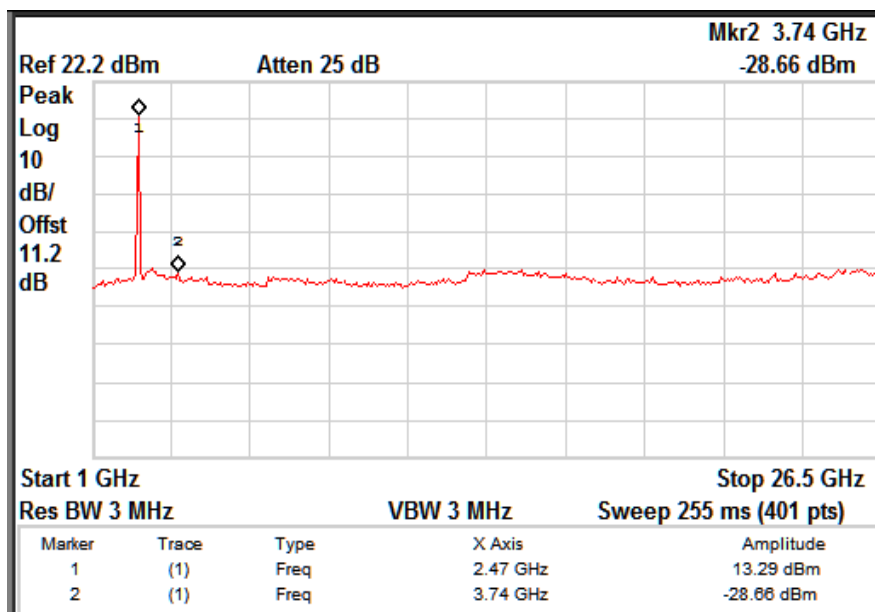


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Data Rate: 6Mbps

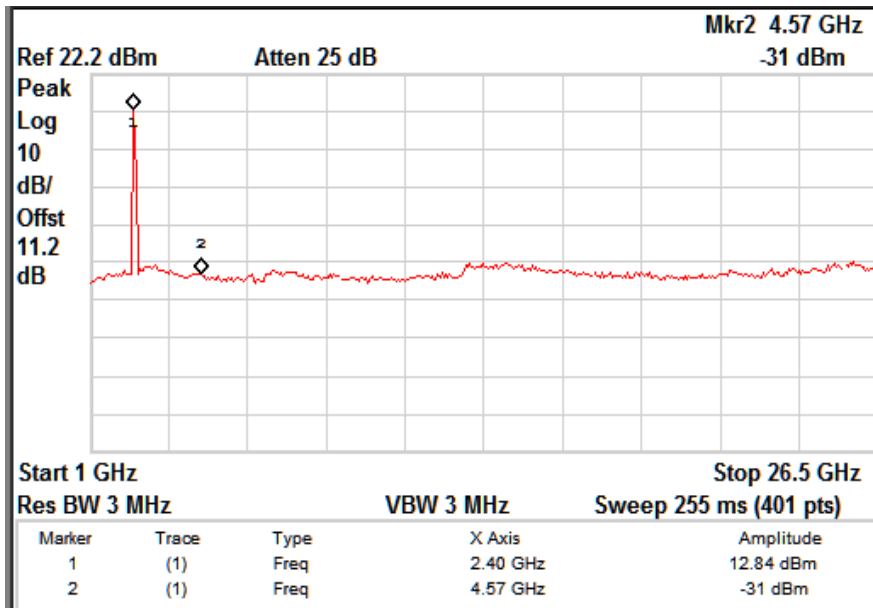
Channel frequency: 2412 MHz



Data Rate: 6Mbps

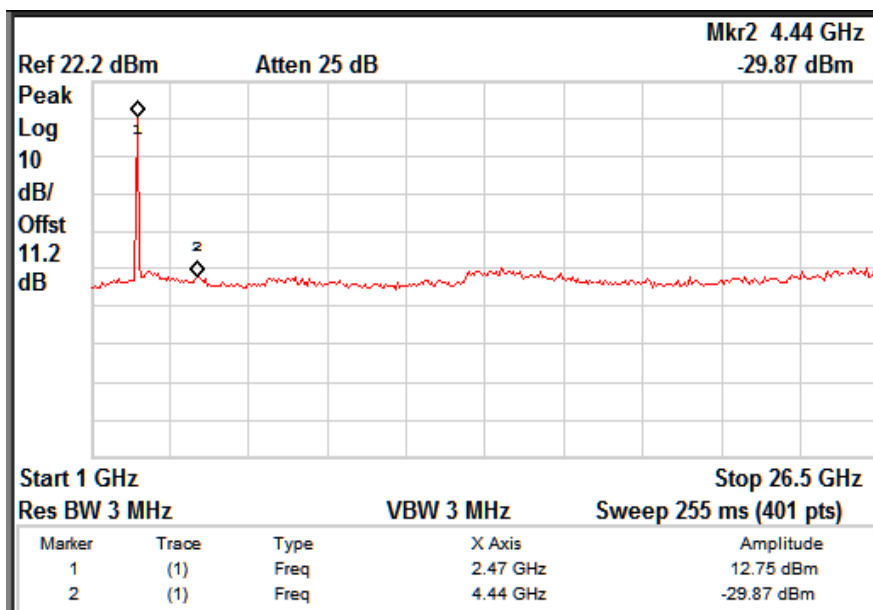
Channel frequency: 2462 MHz

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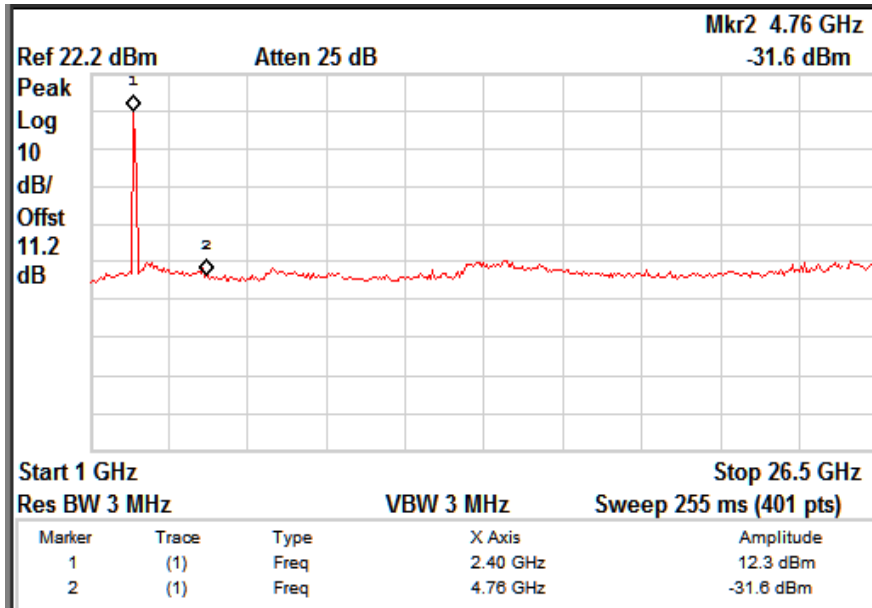
Data Rate: 24Mbps

Channel frequency: 2412 MHz



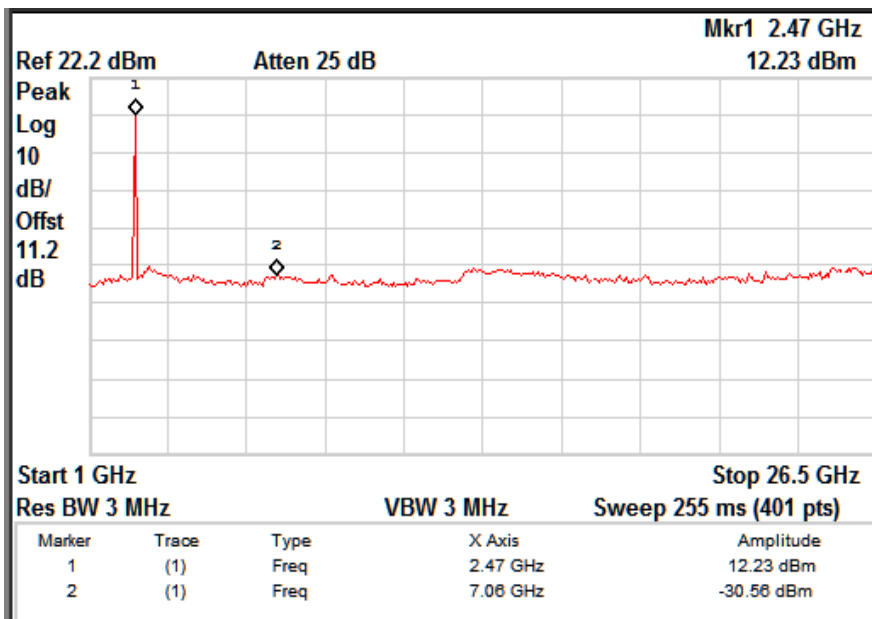
Data Rate: 24Mbps

Channel frequency: 2462 MHz



Data Rate: 54Mbps

Channel frequency: 2412 MHz

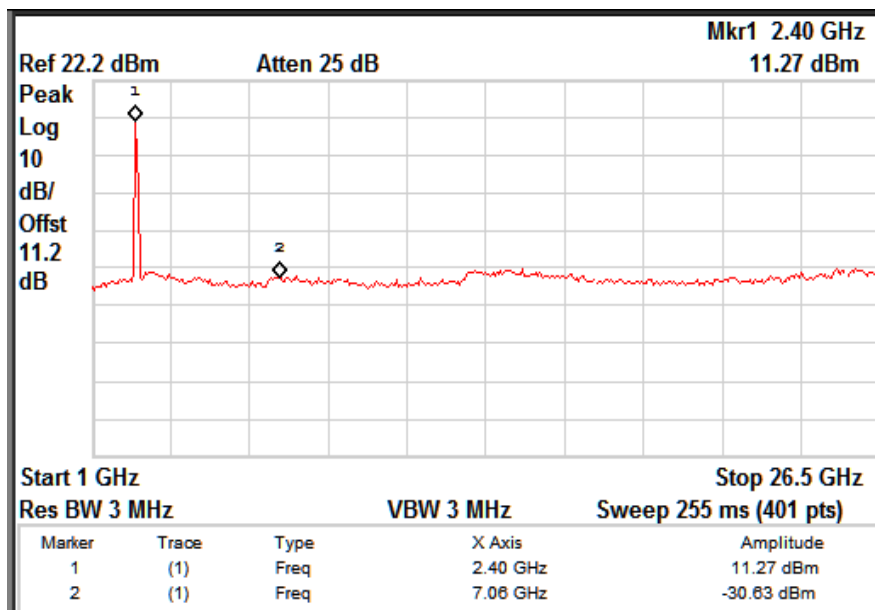
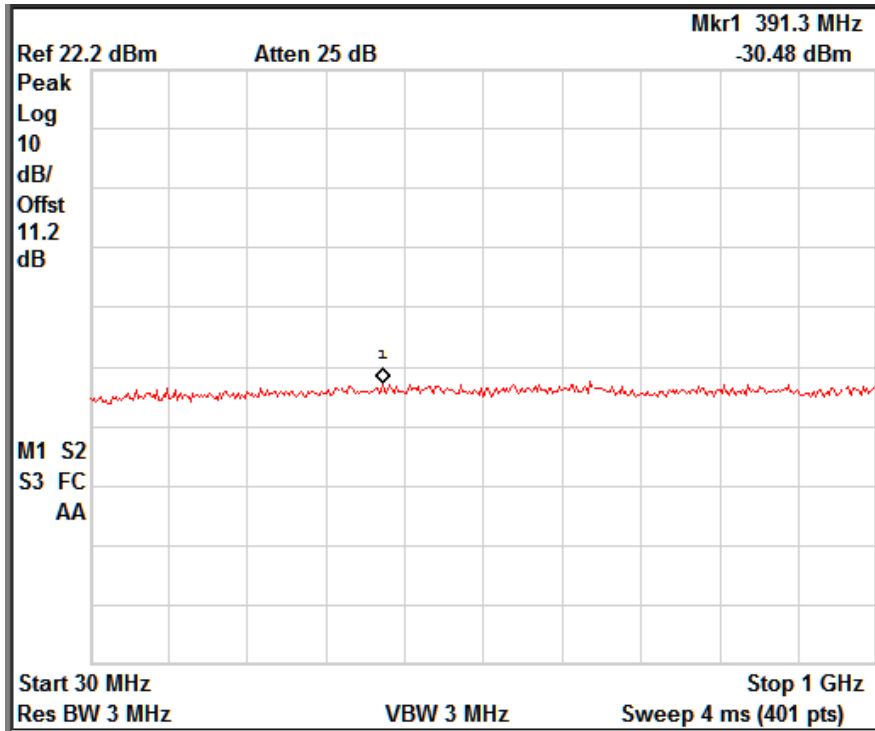


Data Rate: 54Mbps

Channel frequency: 2462 MHz

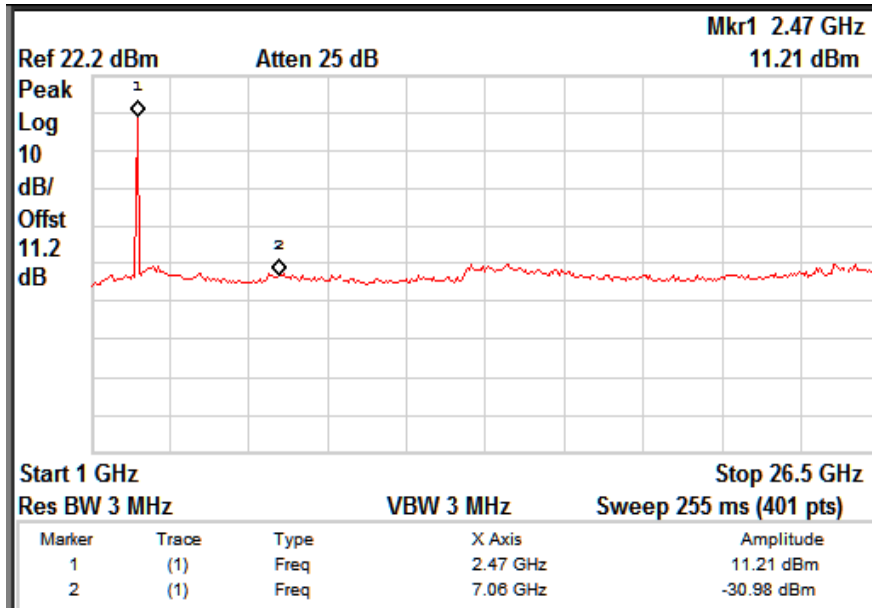


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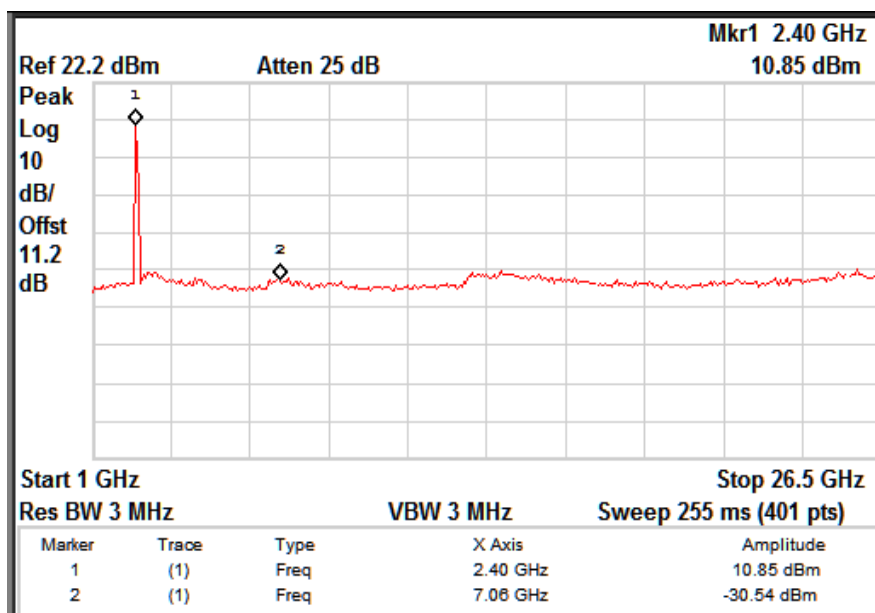
Data Rate: 6.5 Mbps

Channel frequency: 2412 MHz



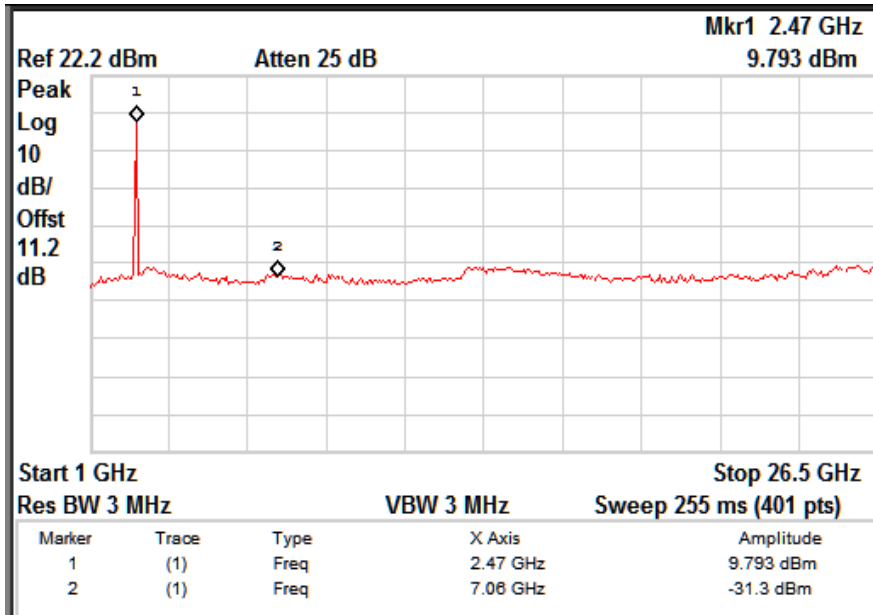
Data Rate: 6.5 Mbps

Channel frequency: 2462 MHz



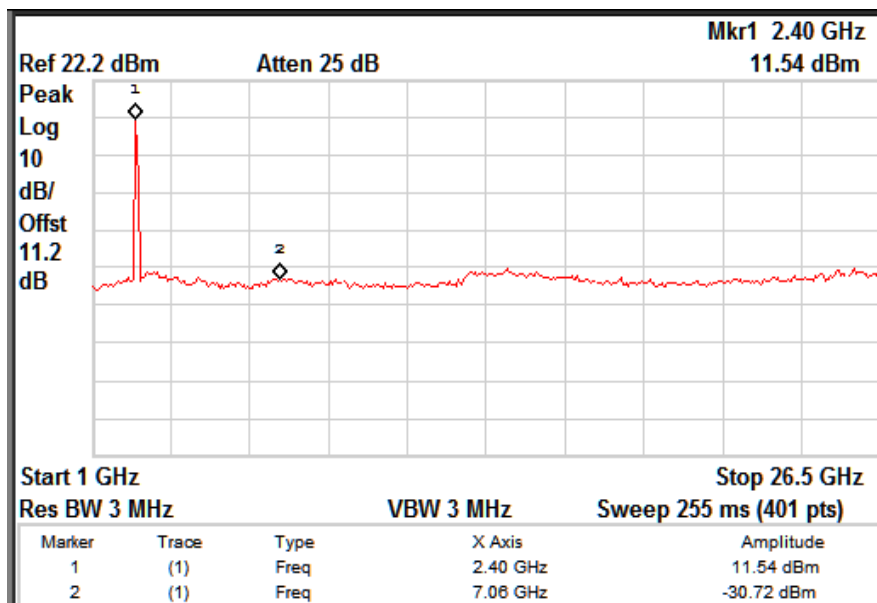
Data Rate: 39 Mbps

Channel frequency: 2412 MHz



Data Rate: 39 Mbps

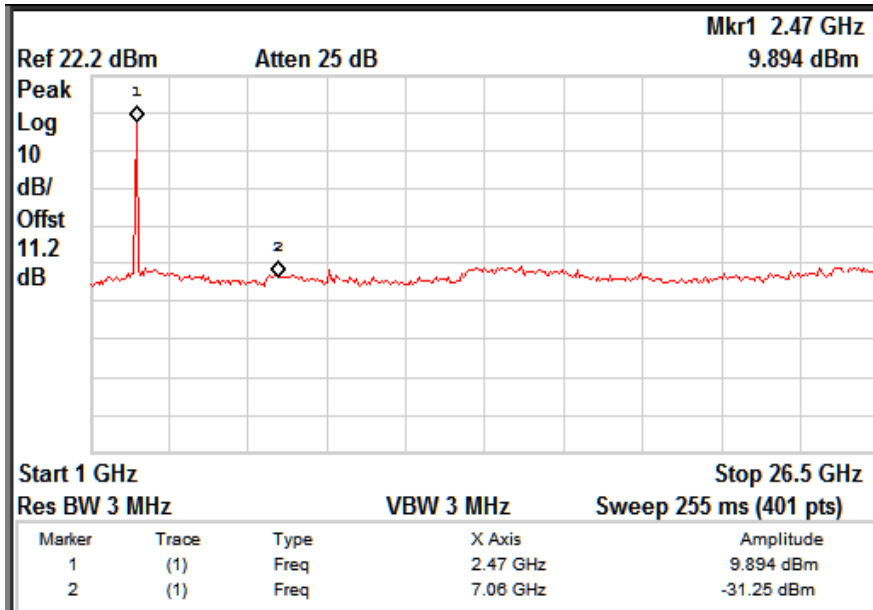
Channel frequency: 2462 MHz



Data Rate: 65 Mbps

Channel frequency: 2412 MHz

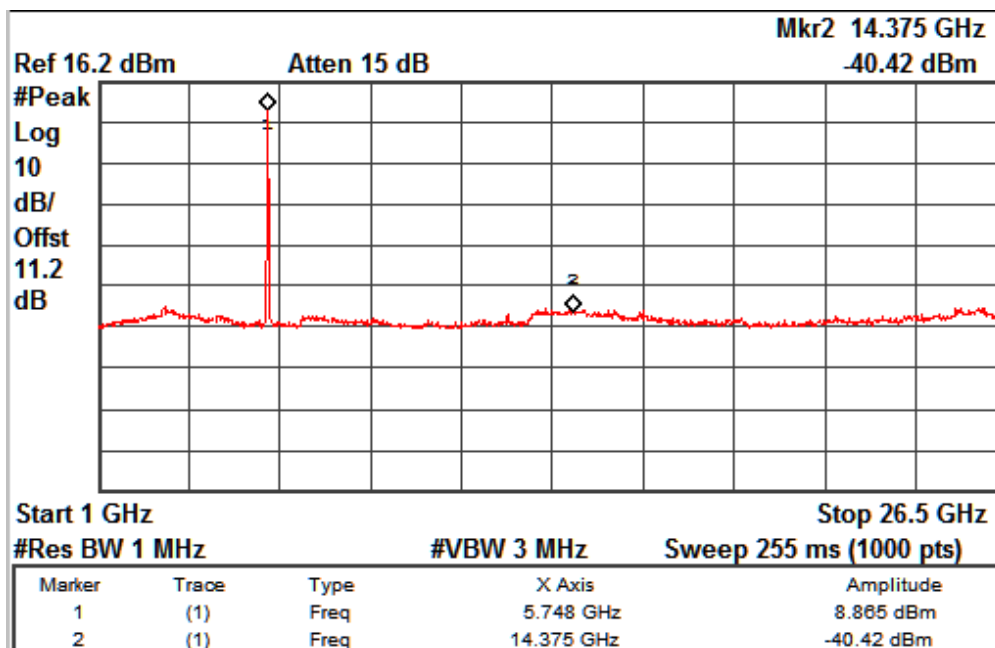
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Data Rate: 65 Mbps

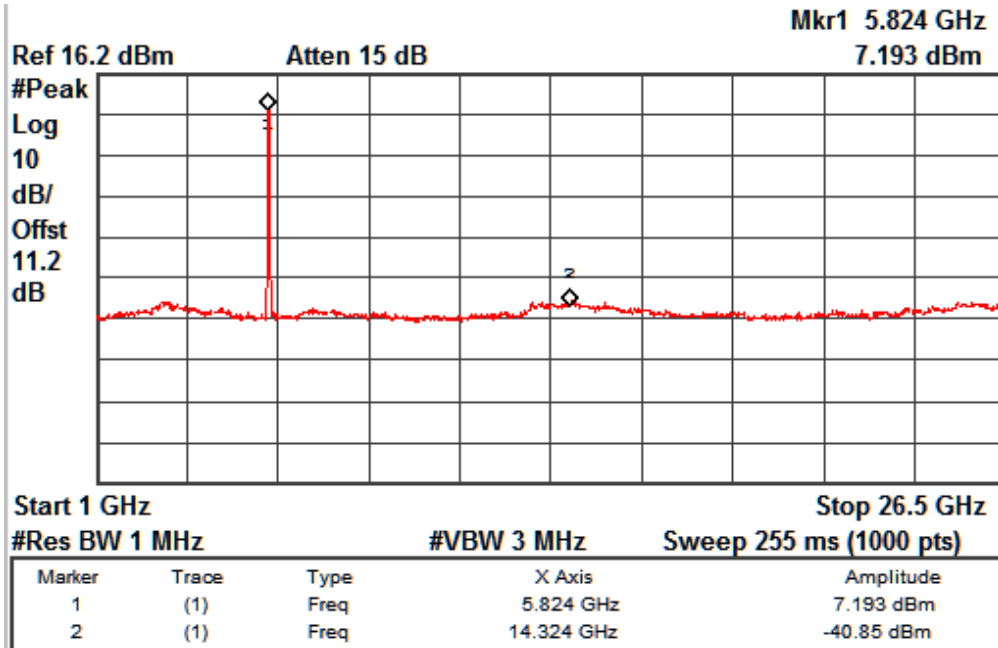
Channel frequency: 2462 MHz

### 5GHz Band



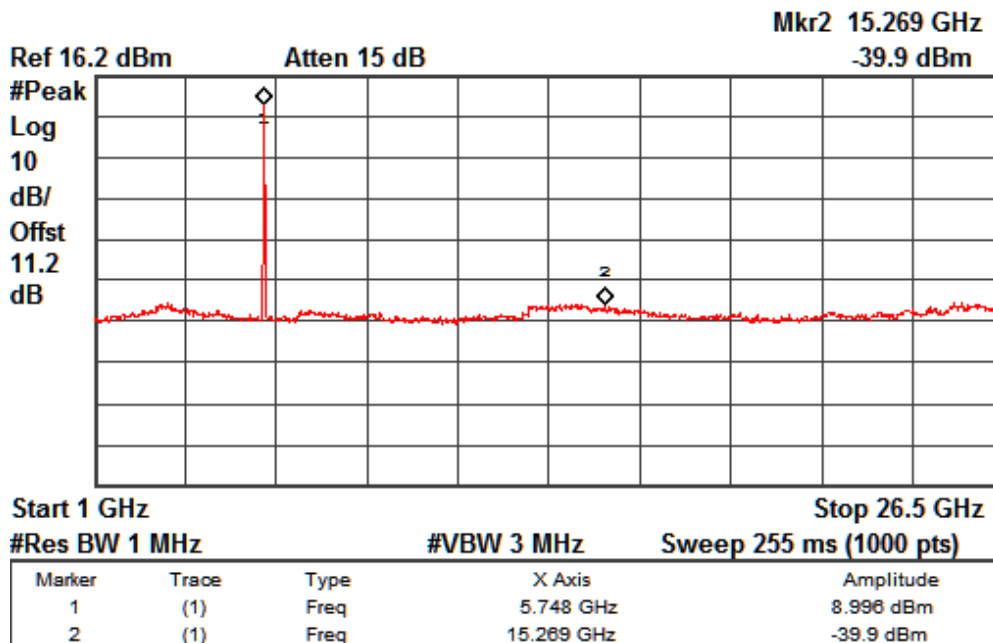
Data Rate: 6 Mbps

Channel Frequency: 5745 MHz



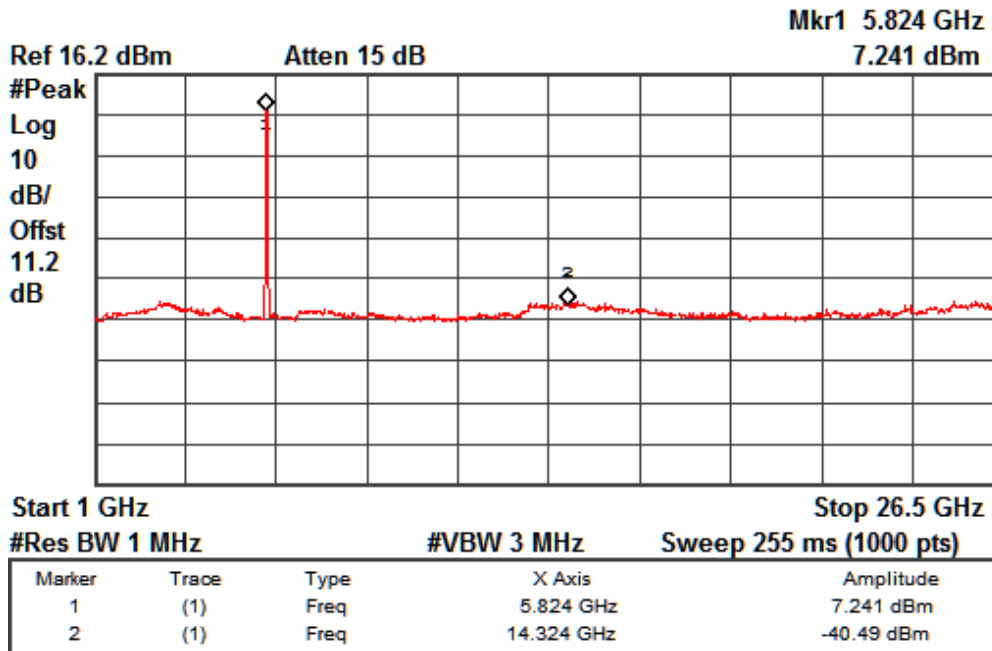
**Data Rate: 6 Mbps**

**Channel Frequency: 5825 MHz**



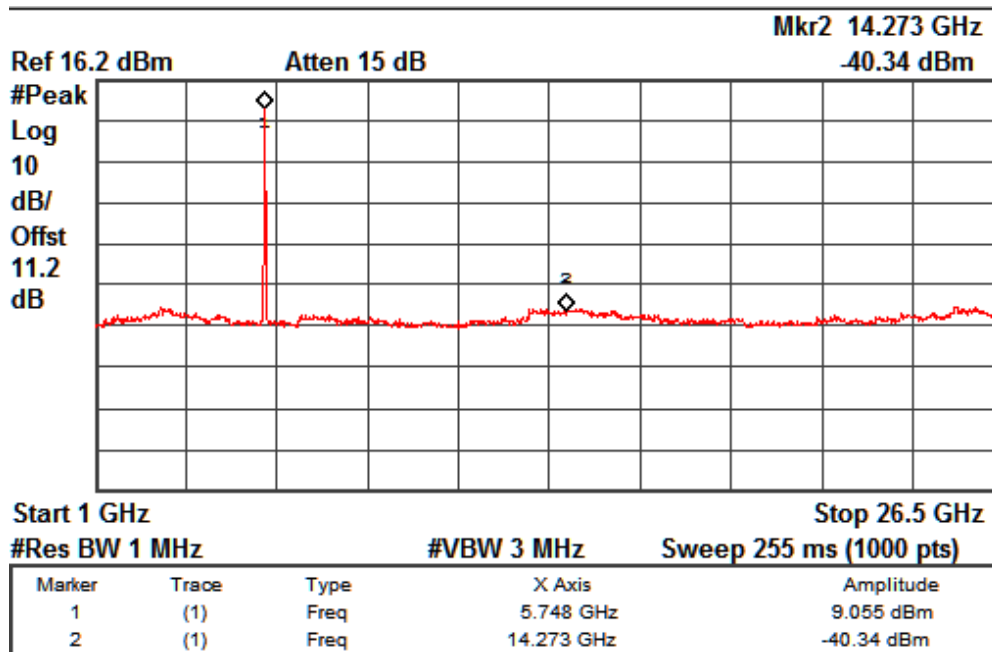
**Data Rate: 24 Mbps**

**Channel Frequency: 5745 MHz**



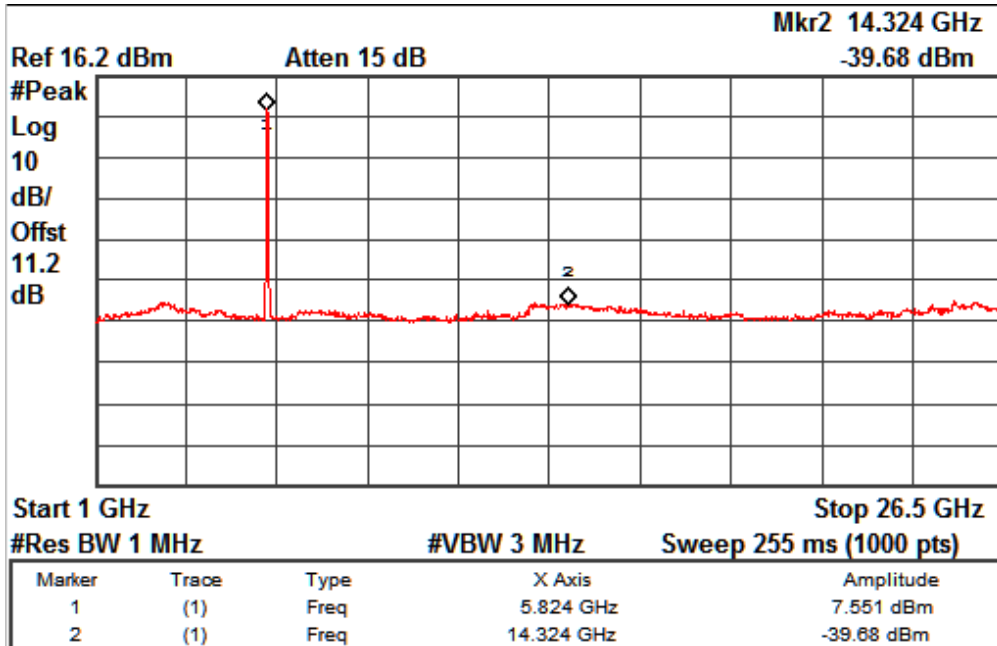
**Data Rate: 24 Mbps**

**Channel Frequency: 5825 MHz**



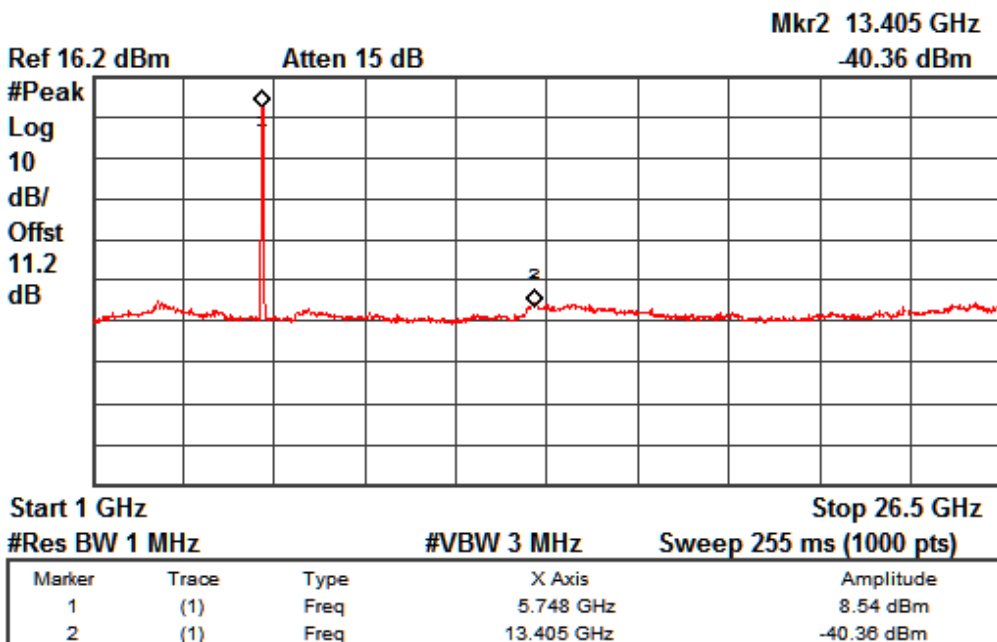
**Data Rate: 54 Mbps**

**Channel Frequency: 5745 MHz**



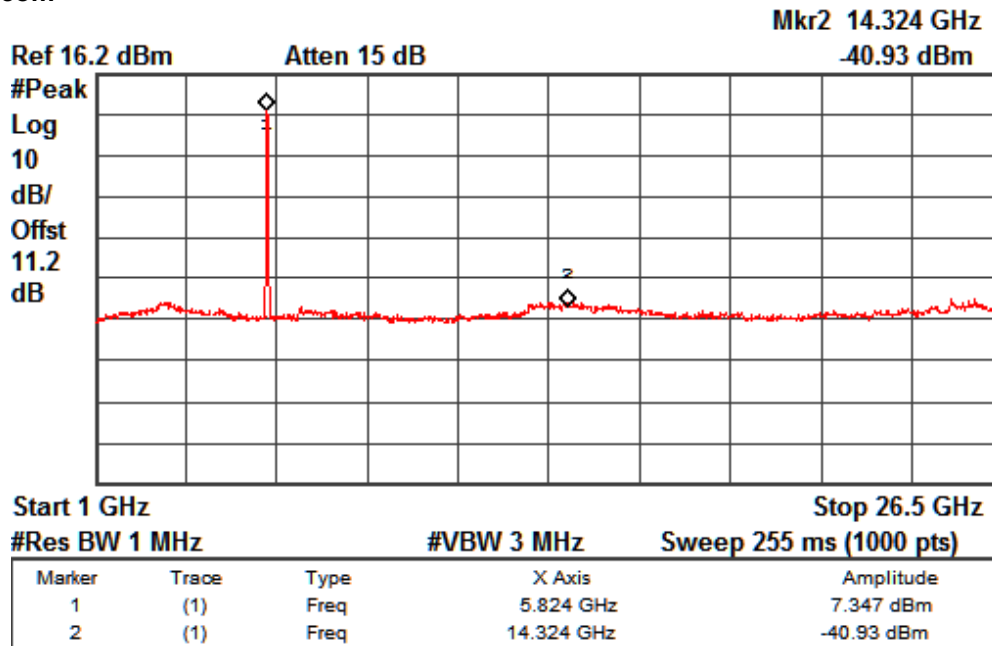
Data Rate: 54 Mbps

Channel Frequency: 5825 MHz



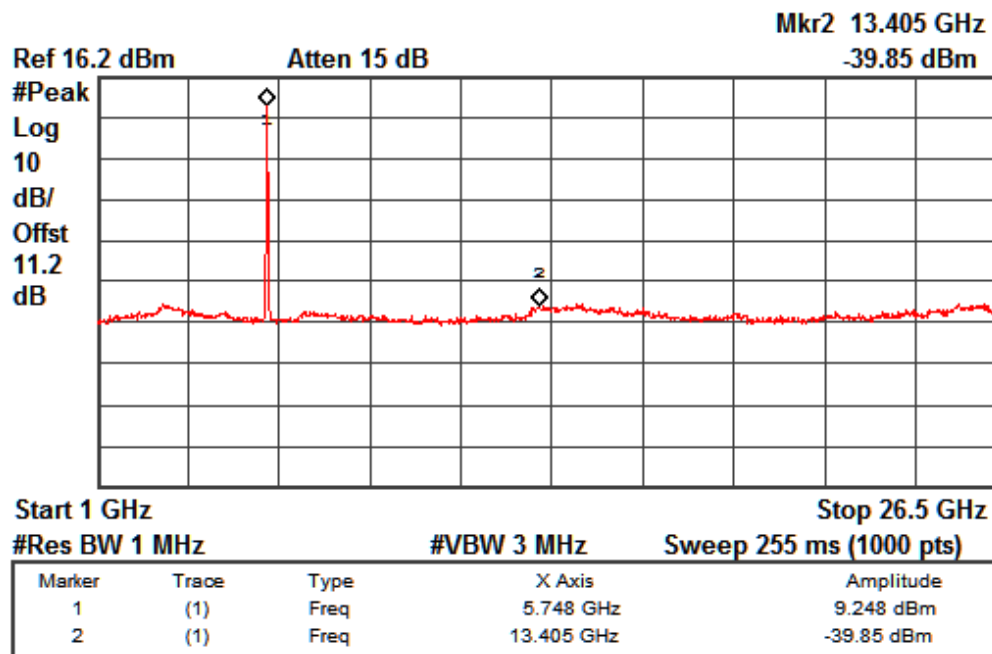
Data Rate: 6.5 Mbps

Channel Frequency: 5745 MHz



Data Rate: 6.5 Mbps

Channel Frequency: 5825 MHz

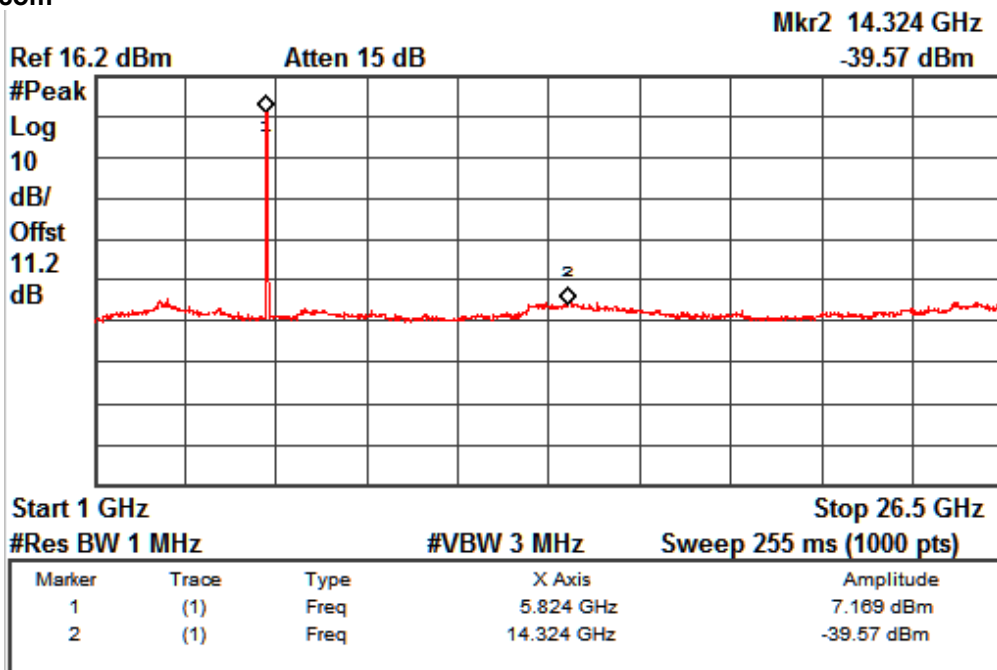


Data Rate: 39 Mbps

Channel Frequency: 5745 MHz

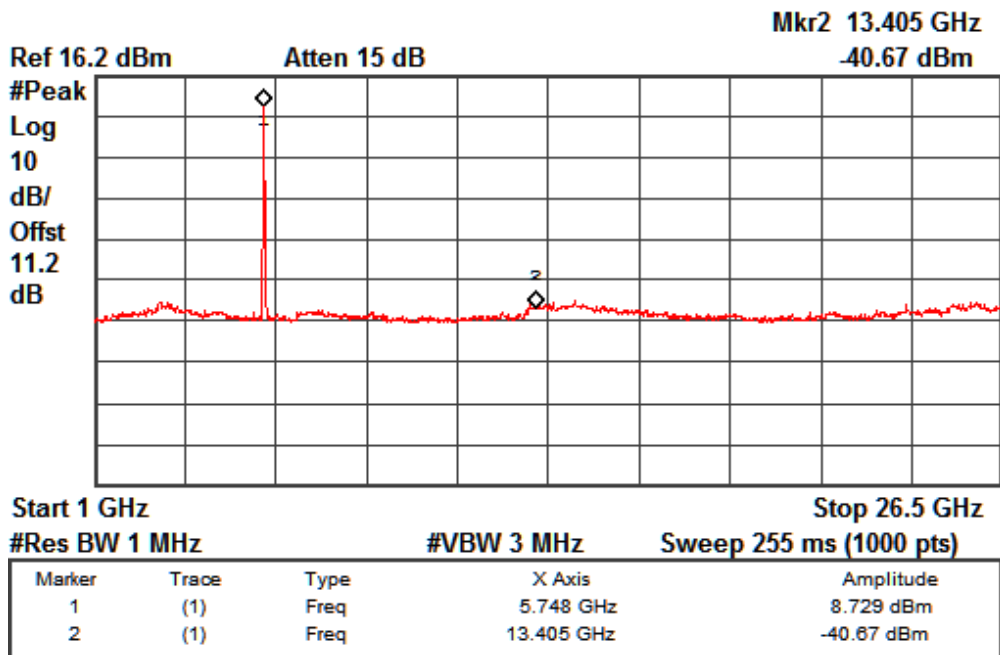


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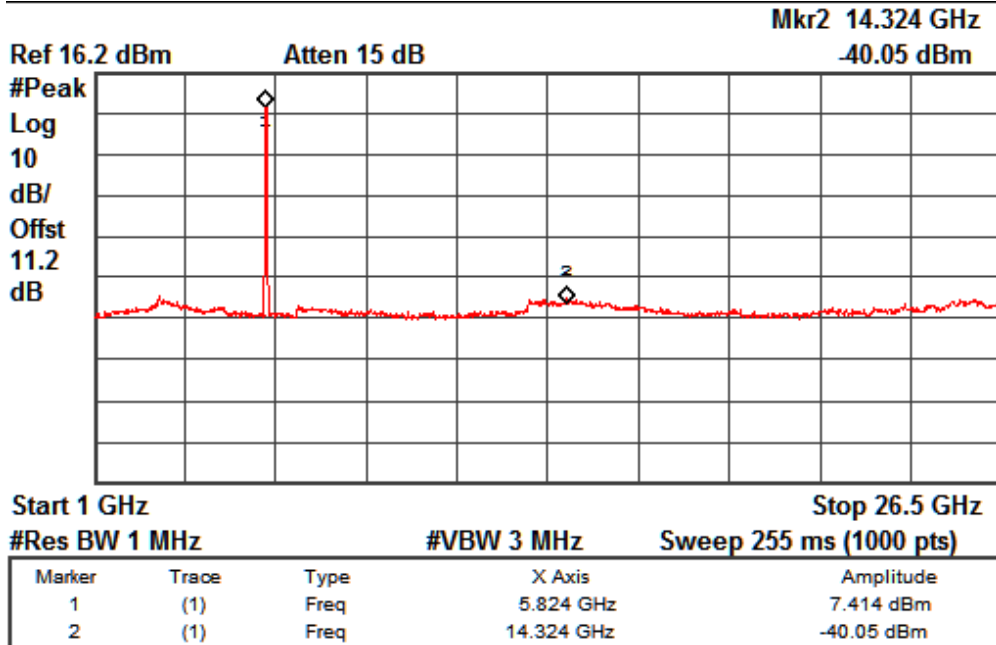
Data Rate: 39 Mbps

Channel Frequency: 5825 MHz



Data Rate: 65 Mbps

Channel Frequency: 5745 MHz

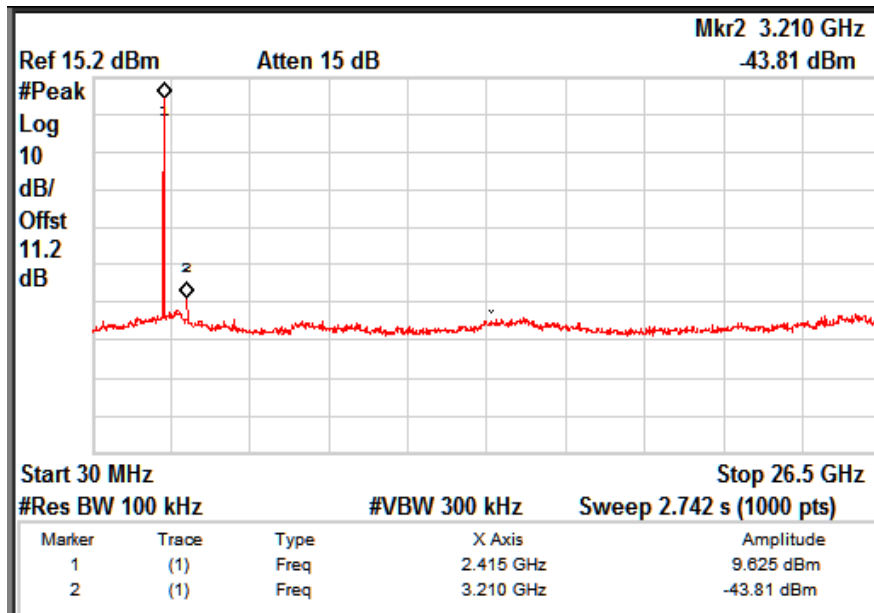


**Data Rate: 65 Mbps**

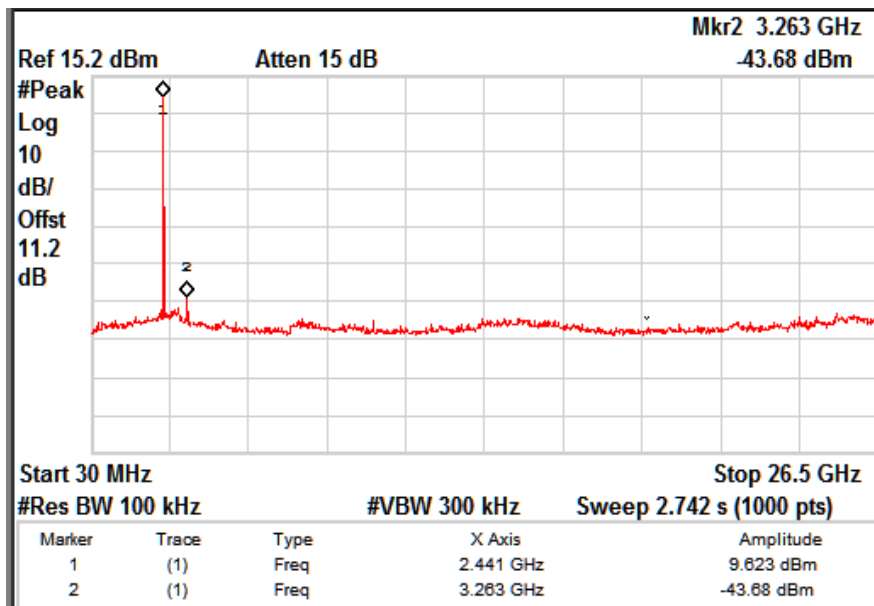
**Channel Frequency: 5825 MHz**

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ZigBee

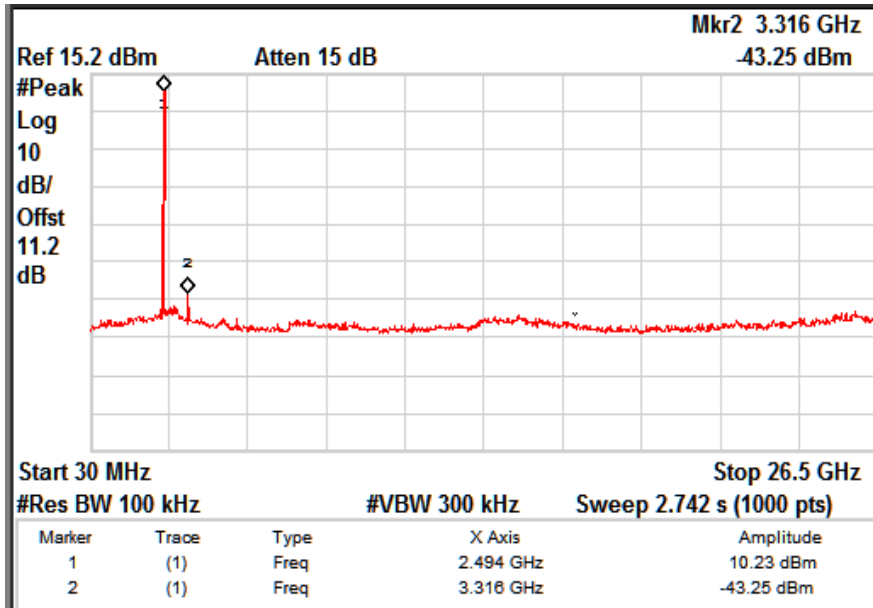


Channel Frequency 2405 MHz



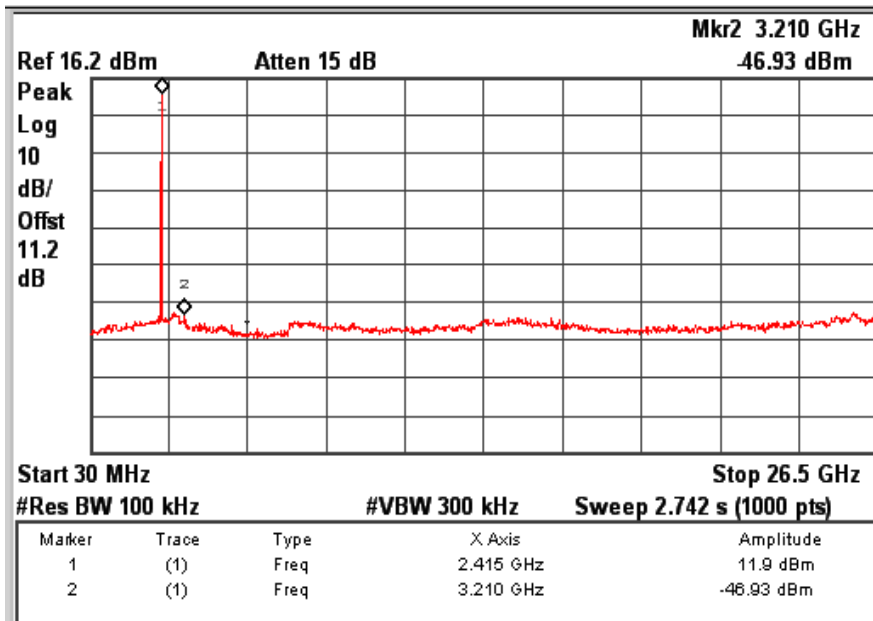
Channel Frequency 2440 MHz

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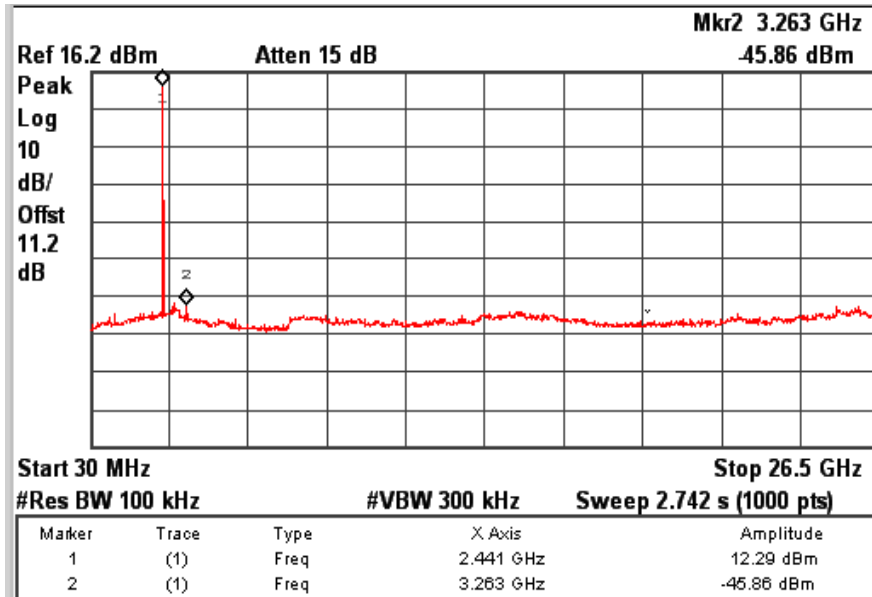


**Channel Frequency 2480 MHz**

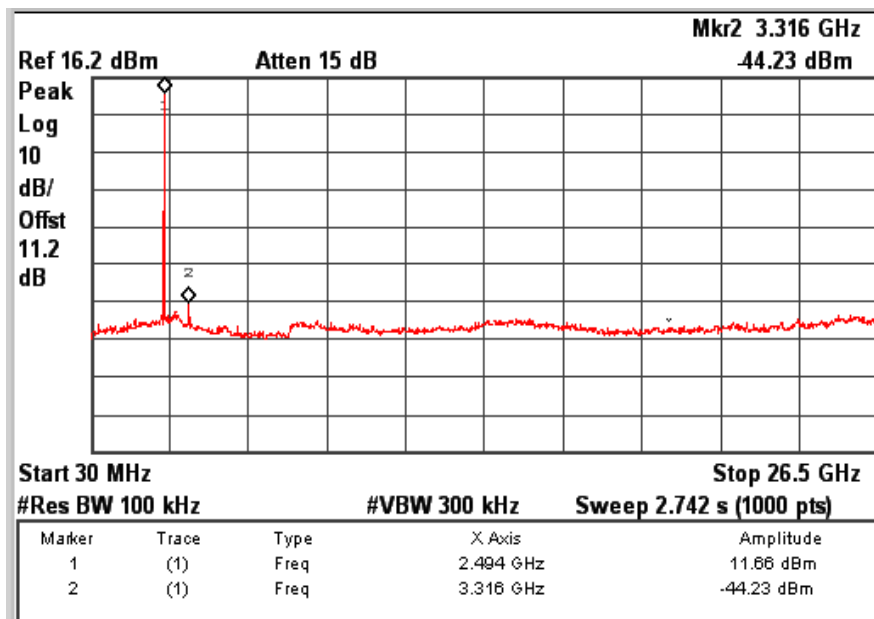
Bluetooth LE



**Channel Frequency 2402 MHz**



**Channel Frequency 2442 MHz**



**Channel Frequency 2480 MHz**

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**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 ( $\mu\text{V/m}$ ) | Field strength ( $\text{dB}\mu\text{V/m}$ ) | 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 49.5dB $\mu\text{V/m}$  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.

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## 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      |

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|  |   |           |             |        |        |        |
|--|---|-----------|-------------|--------|--------|--------|
|  |   | 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      |        |



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|  |   |             |        |       |        |
|--|---|-------------|--------|-------|--------|
|  |   | 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       |
| 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                   | -              | *           |

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|  |   |             |        |       |        |
|--|---|-------------|--------|-------|--------|
|  |   | 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                  | -              | *           |

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|  |             |       |       |        |
|--|-------------|-------|-------|--------|
|  | 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 (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
|----------|------------------|-------------------------|--------------|-------------------|--|----------------------|-------------|
| 802.11a  | 6                | 5745                    | V            | 5745 (Pk)         | 98.13                                  | -                    | *           |
|          |                  |                         |              | 5745 (Av)         | 87.98                                  | -                    | *           |
|          |                  |                         |              | 11490 (Pk)        | No Harmonic Found                      |                      |             |
|          |                  |                         |              | 11490 (Av)        | No Harmonic Found                      |                      |             |
|          |                  |                         | H            | 5745 (Pk)         | 108.27                                 | -                    | *           |
|          |                  |                         |              | 5745 (Av)         | 100.02                                 | -                    | *           |
|          |                  |                         |              | 11490 (Pk)        | No Harmonic Found                      |                      |             |
|          |                  |                         |              | 11490 (Av)        | No Harmonic Found                      |                      |             |
|          |                  | 5825                    | V            | 5825 (Pk)         | 97.45                                  | -                    | *           |
|          |                  |                         |              | 5825 (Av)         | 87.56                                  | -                    | *           |
|          |                  |                         |              | 11650 (Pk)        | No Harmonic Found                      |                      |             |
|          |                  |                         |              | 11650 (Av)        | No Harmonic Found                      |                      |             |
|          |                  |                         | H            | 5825 (Pk)         | 107.89                                 | -                    | *           |
|          |                  |                         |              | 5825 (Av)         | 99.67                                  | -                    | *           |
|          |                  |                         | 11650 (Pk)   | No Harmonic Found |  |                      |             |
|          |                  |                         | 11650 (Av)   | No Harmonic Found |  |                      |             |

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

**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       |

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|           |   |             |        |        |        |
|-----------|---|-------------|--------|--------|--------|
| High      | 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  |
|           | 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      |

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|      |   |             |        |       |        |
|------|---|-------------|--------|-------|--------|
| 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 |

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

**Section 15.207**

**Result**

**Pass**

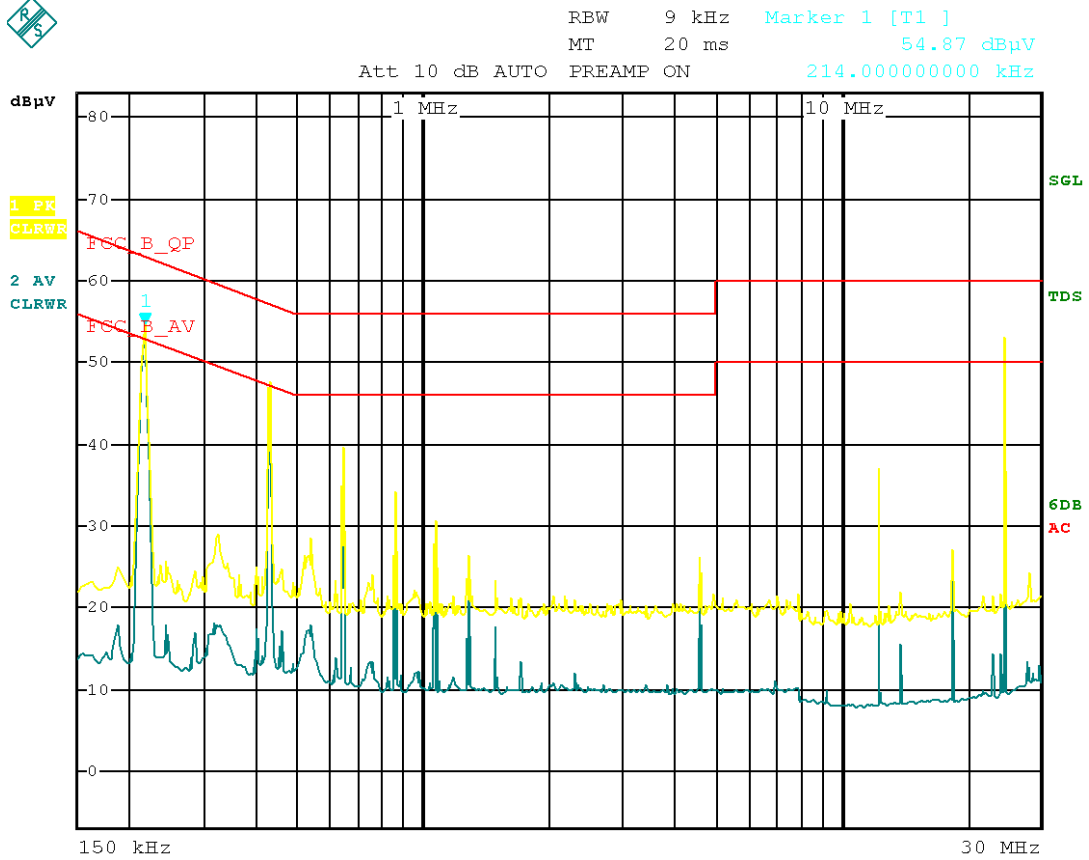
Test Specification : FCC Part 15 Section 15.207  
Test Method : ANSI C63.4-2009  
Testing Location : Screened room  
Measurement Bandwidth : 9kHz  
Frequency Range : 150kHz – 30MHz  
Supply Voltage : 120VAC,60Hz

**Limit of section 15.207**

| <b>Frequency of emission (MHz)</b> | <b>QP Limit (dB<math>\mu</math>V)</b> | <b>AV Limit (dB<math>\mu</math>V/m)</b> |
|------------------------------------|---------------------------------------|---|
| 0.15 – 0.5                         | 66 – 56*                              | 56 – 46*                                |
| 0.5 – 5                            | 56                                    | 46                                      |
| 5 – 30                             | 60                                    | 50                                      |

\* Decreases with the logarithm of the frequency

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**Test Result:**



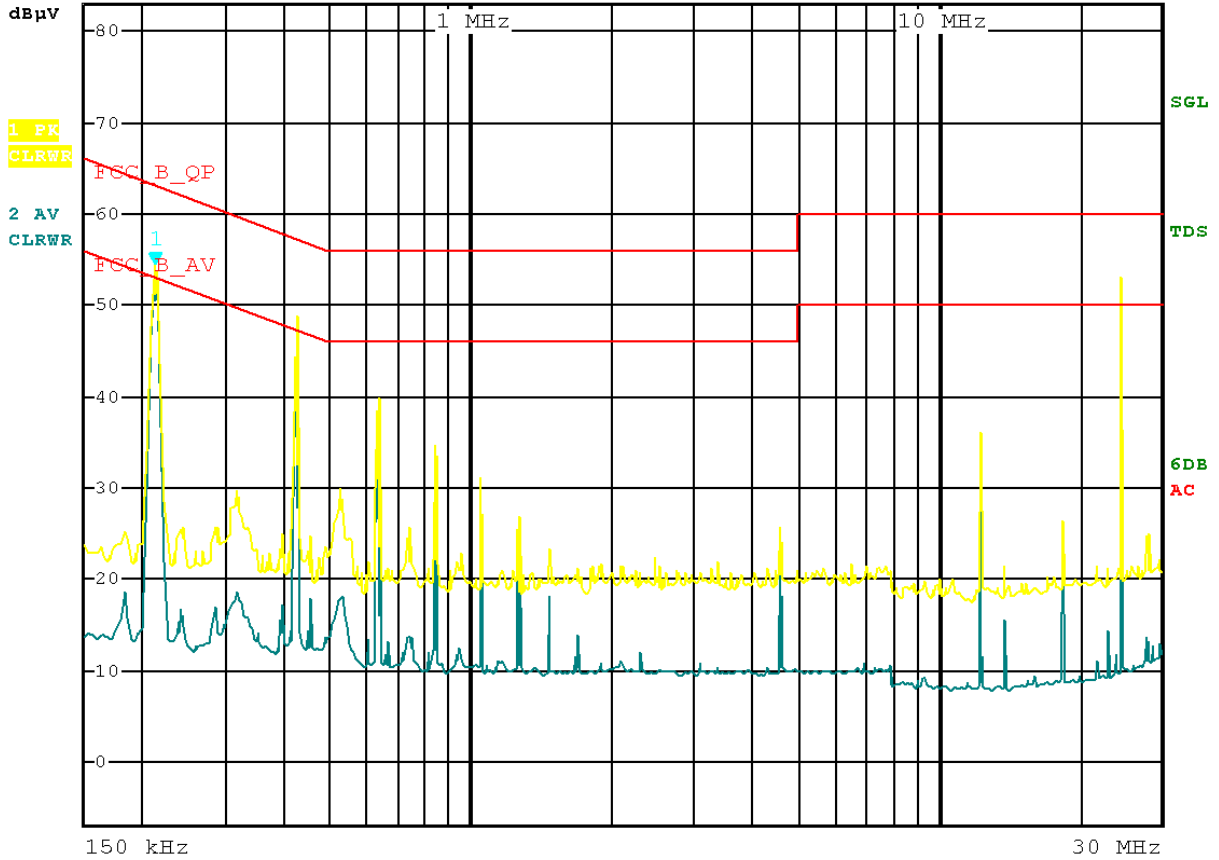


| EDIT PEAK LIST (Final Measurement Results) |            |                  |    |                |
|--|------------|------------------|----|----------------|
| Trace1:                                    | FCC_B_QP   |                  |    |                |
| Trace2:                                    | FCC_B_AV   |                  |    |                |
| Trace3:                                    | ---        |                  |    |                |
| TRACE                                      | FREQUENCY  | LEVEL dB $\mu$ V |    | 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**



RBW 9 kHz Marker 1 [T1 ]  
 MT 20 ms 54.59 dBµV  
 Att 10 dB AUTO PREAMP ON 210.00000000 kHz



Neutral: Graph

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| EDIT PEAK LIST (Final Measurement Results) |            |                  |   |                |
|--|------------|------------------|---|----------------|
| Trace1:                                    | FCC_B_QP   |                  |   |                |
| Trace2:                                    | FCC_B_AV   |                  |   |                |
| Trace3:                                    | ---        |                  |   |                |
| TRACE                                      | FREQUENCY  | LEVEL dB $\mu$ V |   | 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

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**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   |