
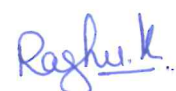


Produkte
Products

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<i>Test Report No.:</i>					
Auftraggeber: <i>Client:</i>	GE Healthcare Phase V Plot No #122, Phase II EPIP Whitefield Road, Bangalore 560066, India				
Gegenstand der Prüfung: <i>Test item:</i>	Ultrasound Scanner				
Bezeichnung: <i>Identification:</i>	Vscan Extend	Serien-Nr.: <i>Serial No.</i>	VH162525NC		
Wareneingangs-Nr.: <i>Receipt No.:</i>	166187860	Eingangsdatum: <i>Date of receipt:</i>	23.10.2019		
Prüfört: <i>Testing location:</i>	Refer Page 5 of 126 for test facilities				
Prüfgrundlage: <i>Test specification:</i>	FCC Part 15 Subpart C 15.247 ANSI C63.10-2013 & RSS 247 Issue 2 and RSS Gen Issue 5				
Prüfergebnis: <i>Test Result:</i>	Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test items passed the test specification(s).</i>				
Prüflaboratorium: <i>Testing Laboratory:</i>	TÜV Rheinland (India) Pvt. Ltd. 27/B, 2nd cross, Electronic City Phase 1 Bangalore – 560 100. India FCC Test Site Registration no.: 496599 ISED Test Site Number.: 346E-1				
geprüft / tested by:		kontrolliert / reviewed by:			
24.10.2019	Rajesh M Gowda Engineer		15.10.2019	Raghavendra G Katti Assistant Manager	
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>
Sonstiges / Other Aspects:		FCC ID :YOMVSCANEXTEND; Class 2 Permissive Change IC : 9136A-VSCANEXTEND; Class 2 Permissive Change			
Abkürzungen:	P(ass) = entspricht Prüfgrundlage	Abbreviations:	P(ass) = passed		
	F(ail) = entspricht nicht Prüfgrundlage		F(ail) = failed		
	N/A = nicht anwendbar		N/A = not applicable		
	N/T = nicht getestet		N/T = not tested		
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.					
<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>					

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TEST SUMMARY

Test Item	Clause		Result
	FCC	ISED	
Maximum conducted (average) output power	FCC 15.247(b) (3)	RSS 247 Issue 2, Section 5.4 (4)	Pass
Maximum Power Spectral Density	FCC 15.247(e)	RSS 247 Issue 2, Section 5.2 (2)	Pass
DTS Bandwidth	FCC 15.247(a) (2)	RSS 247 Issue 2, Section 5.2 (1)	Pass
Emissions in non-restricted frequency bands	FCC 15.247(d)	RSS 247 Issue 2, Section 5.5	Pass
Spurious Radiated Emissions and Restricted Bands of Operation	FCC 15.209 / FCC 15.205	RSS-Gen Issue 5, Section 8.9/8.10	Pass
Conducted Emissions on a.c Power Lines	FCC 15.207	RSS-Gen Issue 5, Section 8.8	Pass

Discipline: Electronics Testing

Group: EMC Test Facility

Note:

1. The module is originally certified for FCC with FCC ID: YOMVSCANEXTEND, and IC: 9136A-VSCANEXTEND with respect to the changes made originally certified module class 2 permissive change has been applied.
2. Conducted measurements are done according to the procedure given in KDB No 558074 D01 15.247 Measurement Guidance v05r02
3. Product uses an off-the-shelf smartphone to display the image and transferring data to DICOM, Cloud DICOM, and Windows servers using Wi-Fi connectivity. Remaining RF protocols Cellular, Bluetooth, GPS are disabled via firmware, and is declared by the client.

Legal Manufacturer Details

GE Vingmed Ultrasound, A/S
Strandpomenaden 45,
3183 Horten,
Norway

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1 GENERAL REMARKS

1.1 Complimentary Materials

All attachments are integral part of this test report.

1. TEST SETUP PHOTOS
2. EUT EXTERNAL PHOTOS
3. EUT INTERNAL PHOTOS
4. FCC LABEL AND LABEL LOCATION
5. BLOCK DIAGRAM
6. SPECIFICATION OF EUT
7. SCHEMATIC DIAGRAMS
8. BILL OF MATERIAL
9. USER MANUAL
10. Maximum Permissible Exposure Information

2 TEST SITES

2.1 Testing Facilities

1. TÜV Rheinland (India) Private Limited
108 , Beside ISBR Business School,
Electronic city Phase I
Bangalore - 560 100.

2. TÜV Rheinland (India) Pvt. Ltd.
27/B, 2nd corss, Electronic City Phase 1
Bangalore – 560 100. India

2.2 List of Test and Measurement Instruments

Table 1: Test and measurements instrument used

Equipment	Manufacturer	Model Name	Serial Number	Firmware Versions	Calibration Due Date	Periodicity	Used for Test Items
Spectrum Analyser	Agilent Technologies	E4407B	US411927 72	A.14.06	28-03-2020	Yearly	Antenna - Port Measurements
EMI Receiver	Rohde & Schwarz	ESU 40	100288	4.43 SP3	11-10-2020	Yearly	Radiated spurious emission
Active loop antenna	Schwarzbeck	FMZB 1519 B	1519B-00111	-	16/01/2020	Yearly	
Biconical Antenna	Schwarzbeck mess-elektronik	VHBB-9124 / BBA-9106	01028	-	16-01-2020	Yearly	
Log-Periodic Antenna	Schwarzbeck mess-elektronik	VUSLP-9111B	9111B-111	-	17-01-2020	Yearly	
Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1944	-	16-01-2020	Yearly	
Anechoic Chamber	Frankonia	-	-	-	-	-	
EMI Receiver	Rohde & Schwarz	ESR7	101133	-	16-01-2020	Yearly	AC Power line conducted emission
LISN	Rohde & Schwarz	ENV 216	100022	-	05-09-2020	Yearly	
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100811	-	01-08-2020	Yearly	

Table 2: Instrument application Software versions

Sl. No	Test Type	Application software	Version
1	Radiated spurious emission measurement- 3 meter Fully Anechoic Chamber	EMC 32	10.50.00

3 GENERAL PRODUCT INFORMATION

3.1 Product Function and Intended Use

Vscan Extend is a general purpose handheld diagnostic ultrasound imaging system for use by qualified and trained health care professionals enabling visualization and measurement of anatomical structures and fluid.

3.2 Ratings and System Details

Table 3: Ratings and System Details as declared by client

Frequency Range	2400MHz – 2480MHz
No. of channel	11
Channel Spacing	5MHz
Data Rate	802.11b: 1,2, 5.5,11 Mbps 802.11g: 6, 9, 12, 18, 24, 36,48, 54 Mbps 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11nHT20: 6.5, 13, 19.5, 26, 39, 52, 58.5,65Mbps 802.11nHT40: 13.5, 27, 40.5, 54, 81, 108, 121.5, 135 Mbps
Modulation	802.11b: DSSS with CCK 802.11g: OFDM with BPSK, QPSK, 16-QAM, 64-QAM 802.11n: OFDM with BPSK, QPSK, 16-QAM, 64-QAM
Number of antenna	One
Antenna Gain and Type	1.2 dBi and Internal FPC
Supply Voltage	7.4 VDC Battery
Dimensions	168 x 76 x 22 mm
Environmental Condition	Operating temperature is 0°C to 40°C

Disclaimer:

The information/data is supplied by the client and the same is considered to arrive at the final value. Any changes made apart from the specified specification, can directly impact on the tests results.

3.1 Measurement Uncertainty:

Table 4: Measurement Uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3 dB
Unwanted Emissions, conducted	±3 dB
All emissions, radiated	±6 dB
Temperature	±3 °C
Supply Voltages	±3 %
Time	±5 %

Note: The listed uncertainties are the worst case uncertainties for the entire range of measurements and are for the reporting purpose only and are not used in determining the PASS/FAIL of the results.

4 TEST SET-UP AND OPERATION MODE

4.1 Principle of Configuration Selection

Transmission was enabled with continuous transmission on low, middle and high channels.

4.2 Test Operation and Test Software

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

Test Software - v1.2.2
Hardware version - v16

4.3 Special Accessories and Auxiliary Equipment

- None

4.4 Countermeasures to achieve EMC Compliance

- None

4.5 Test modes – data rates and modulations

- For radiated spurious emissions only the worst case results and are reported in this report.

4.6 List of Frequencies and Frequency bands

Frequency Band (MHz)	Channel No.	Channel Frequency (MHz)
2400 – 2483.5	1	2412
	2	2417
	3	2422
	4	2427
	5	2432
	6	2437
	7	2442
	8	2447
	9	2452
	10	2457
	11	2462

Table 5: List of Wi-Fi center Frequencies

Protocol: Wi-Fi:

Channel Bandwidth: 20MHz

Channel Bandwidth: 40MHz

Channel low: 2412MHz

Channel low: 2422MHz

Channel mid: 2442MHz

Channel High: 2452MHz

Channel High: 2462MHz

Note:

TUV Sample Identification number: Conducted sample - A001012783-001
Radiated sample - A001012783-002

5 TEST METHODOLOGY

5.1 Radiated Emission Test

The radiated emission measurement was performed according to the procedures in ANSI C63.10-2013. The equipment under test (EUT) was placed at the middle of the 80 cm high turntable for below 1 GHz & 1.5 m height for above 1 GHz measurement, 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 1 m and 4 m, 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 1000 MHz was performed by horn antenna, The measurement below 30 MHz was performed by loop antenna, Measurement from 30 MHz to 200 MHz was performed by Baloon and Biconical Antenna, and mesurement from 200 MHz to 1 GHz was performed by Log-Periodic Antenna.

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

5.1.1 Test Setup Configuration

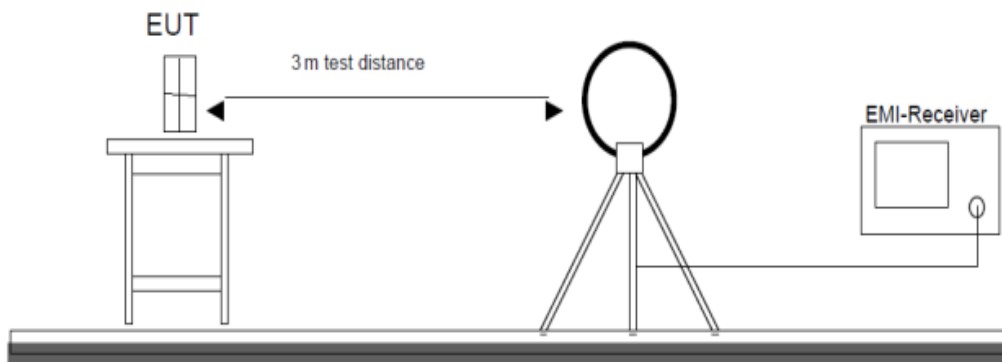


Figure 1: Frequency Range 9 kHz- 30 MHz

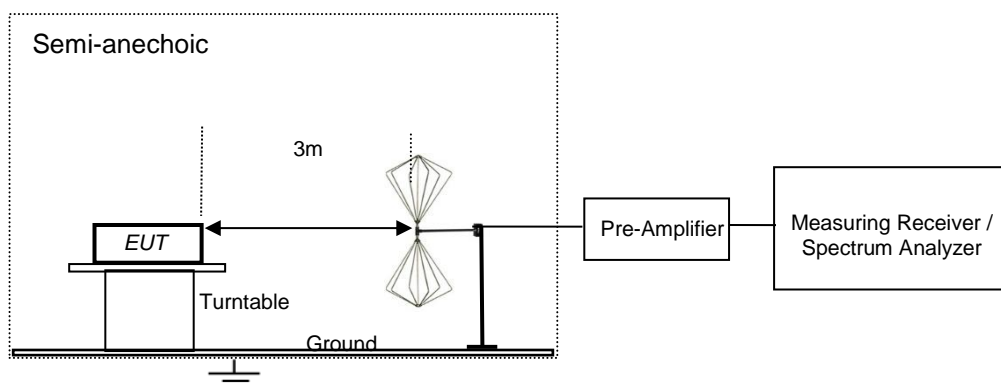


Figure 2: Frequency Range 30 MHz – 200 MHz

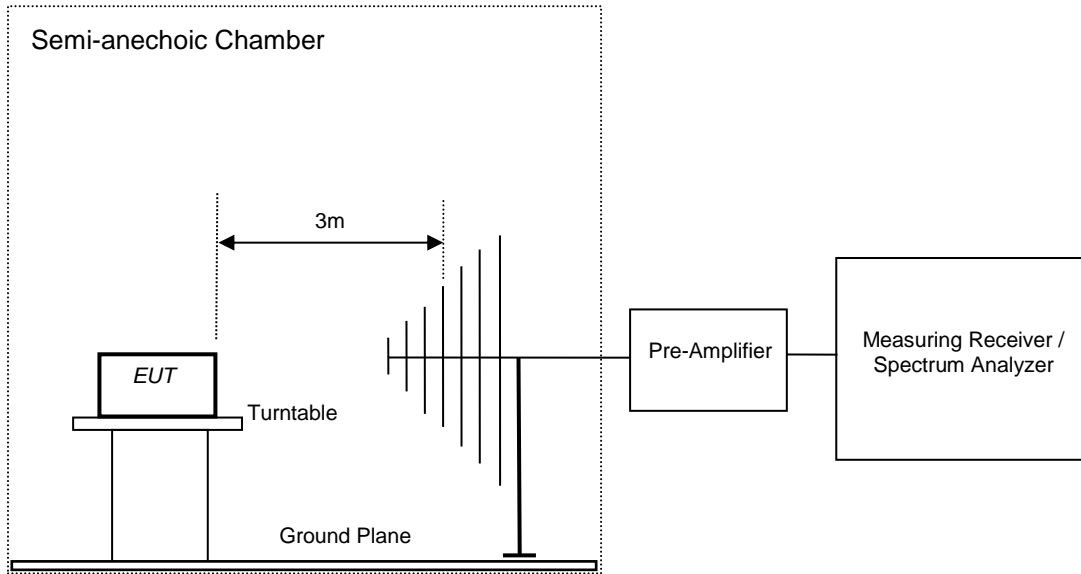


Figure 3: Frequency Range 200 MHz - 1GHz

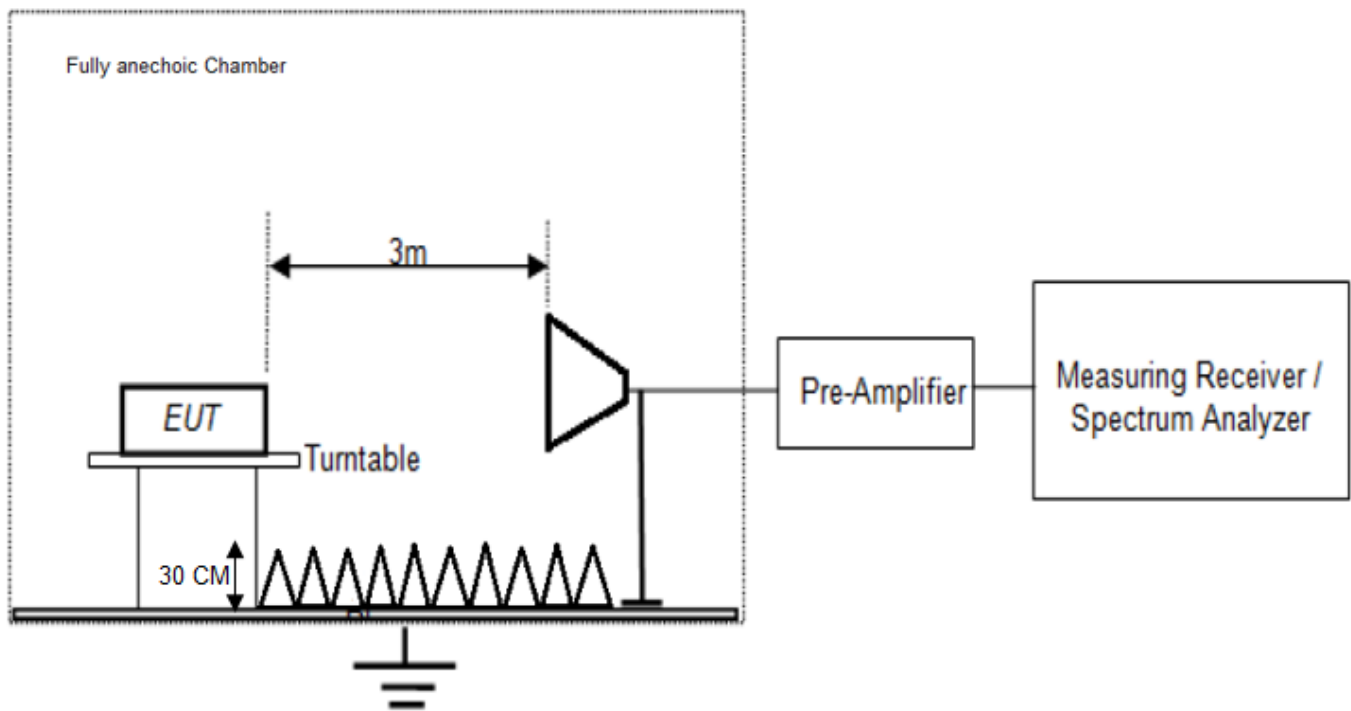


Figure 4: Frequency Range 1GHz – 26GHz

6 Test Results

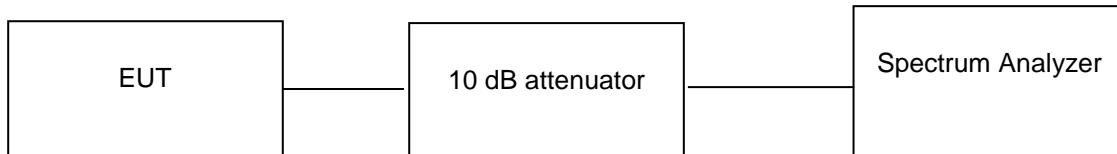
6.1 Maximum conducted output power

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (b)(3) / RSS 247 Issue 2, Section 5.4 (4)
Measurement Bandwidth	300 kHz
Detector	Average
Requirement	≤ 1 W (30 dBm)

Test Method:



Environmental and Test conditions:

Normal Temperature = +25 °C

Voltage (V norm) = 7.4 VDC

RH = 63.2 %

Test results:

10 dB attenuator + 0.6dB Cable loss = 10.6 dB offset is considered in below result

Protocol: 802.11b

Data rate (Mbps)	Channel Frequency (MHz)	Average Power (dBm)	Limit (dBm)
1	2412	12.19	30
	2442	12.44	30
	2462	12.24	30
11	2412	11.82	30
	2442	12.05	30
	2462	12.08	30

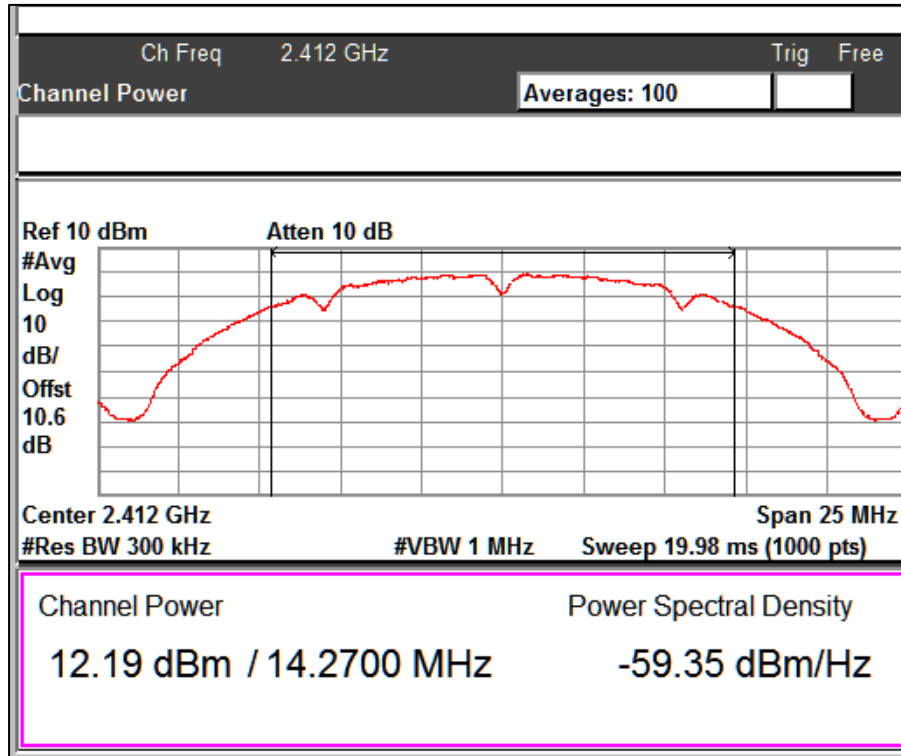
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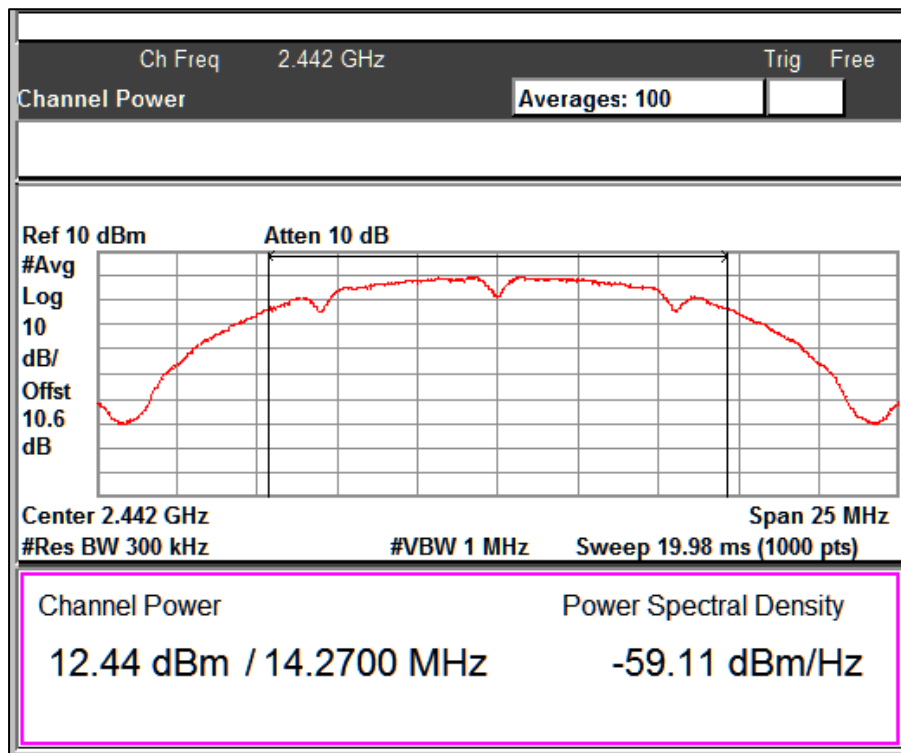
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Channel Frequency: 2412 MHz

Data Rate: 1Mbps



Channel Frequency: 2442 MHz

Data Rate: 1Mbps

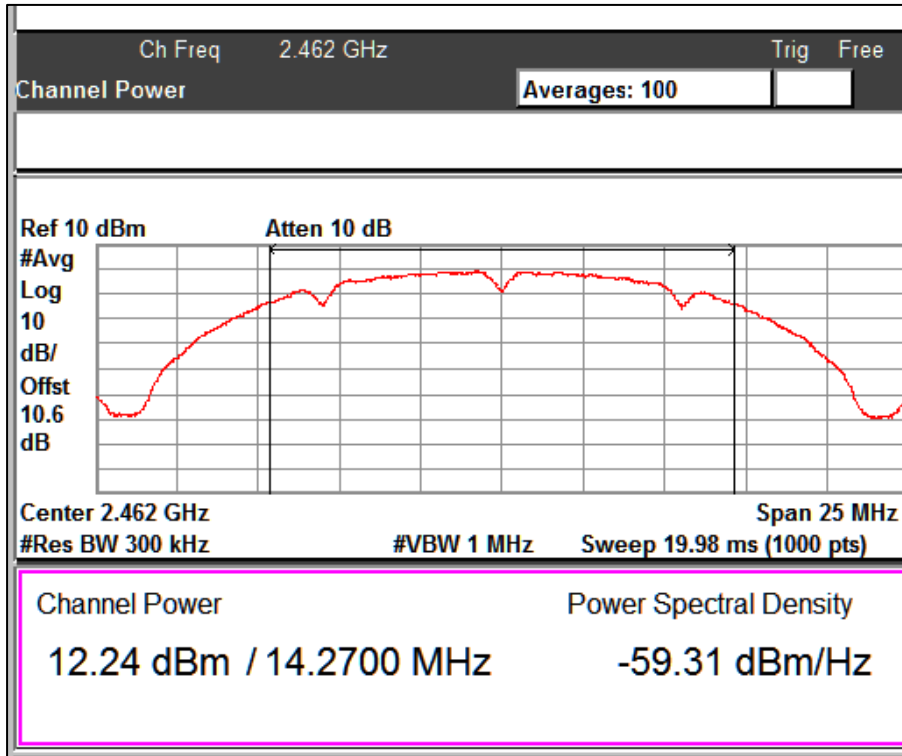
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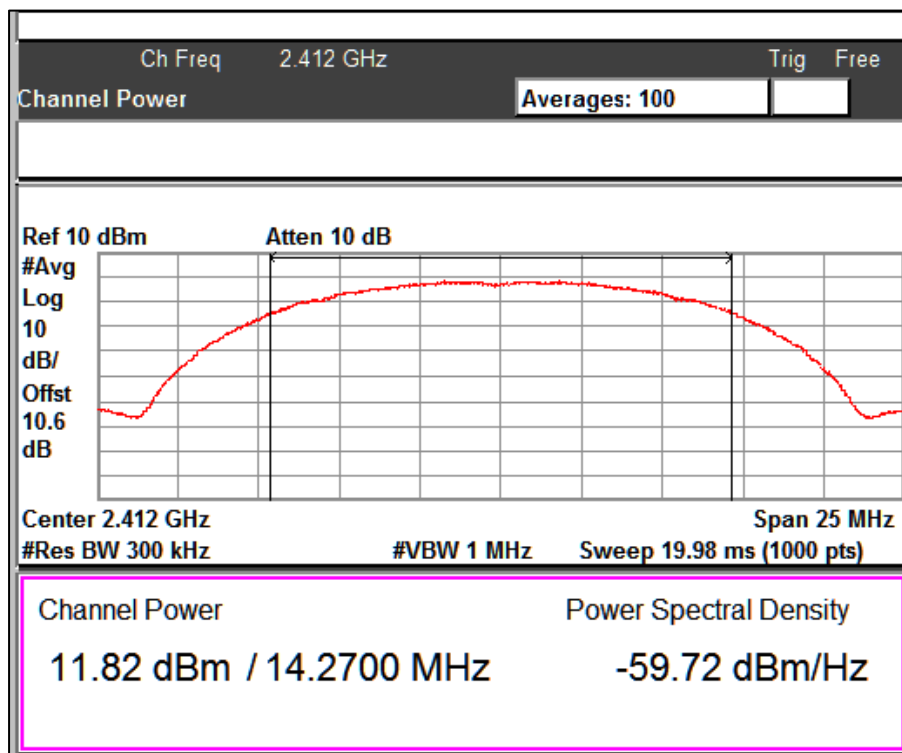
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Channel Frequency: 2462 MHz

Data Rate: 1Mbps



Channel Frequency: 2412 MHz

Data Rate: 11Mbps

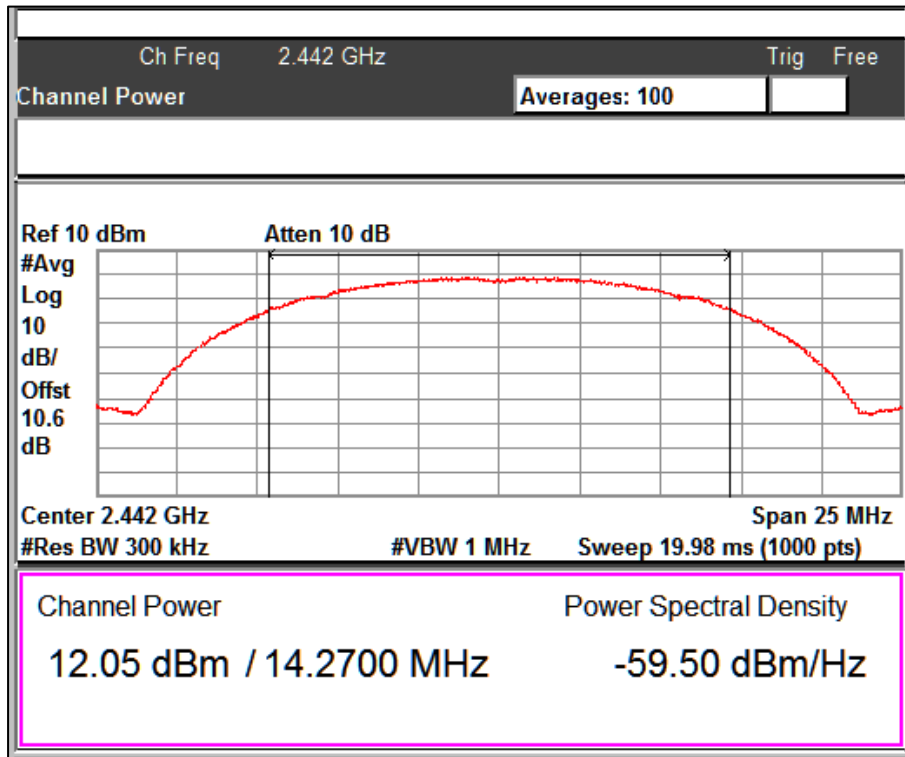
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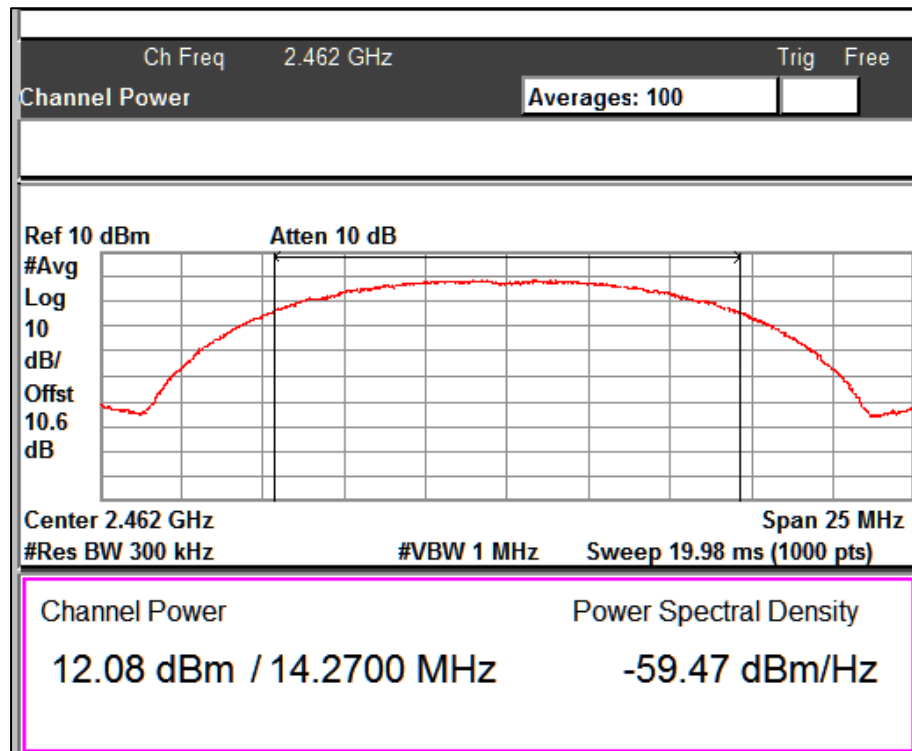
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Channel Frequency: 2442 MHz

Data Rate: 11Mbps



Channel Frequency: 2462 MHz

Data Rate: 11Mbps

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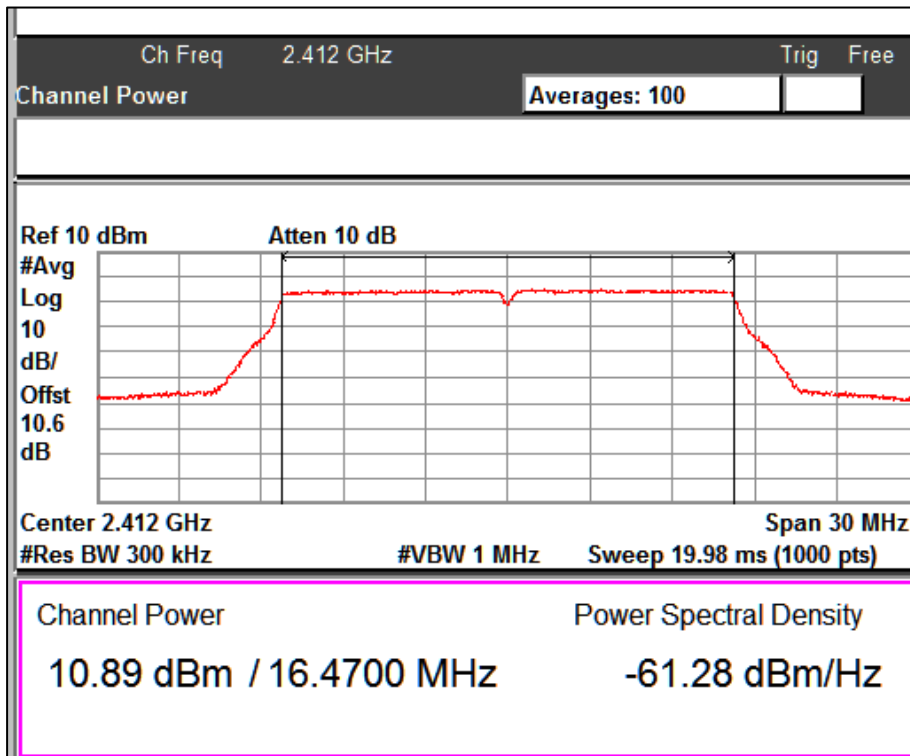
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Protocol: 802.11g

Data rate (Mbps)	Channel Frequency (MHz)	Average Power (dBm)	Limit (dBm)
6	2412	10.89	30
	2442	11.03	30
	2462	10.96	30
24	2412	10.21	30
	2442	10.80	30
	2462	10.54	30
54	2412	10.32	30
	2442	10.66	30
	2462	10.53	30



Channel Frequency: 2412 MHz

Data Rate: 6Mbps

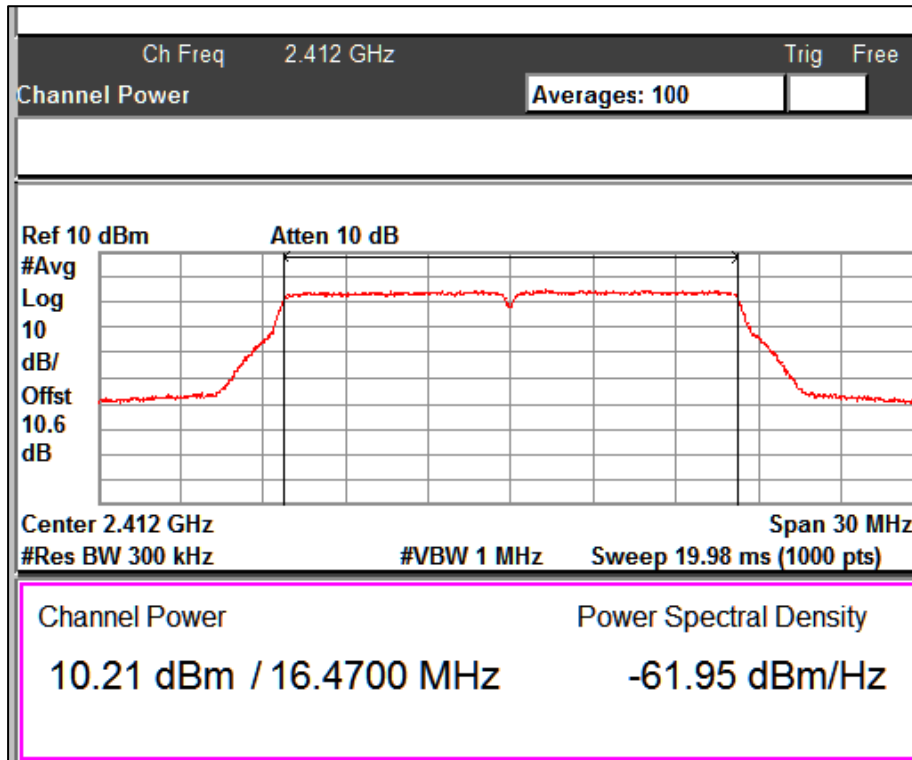
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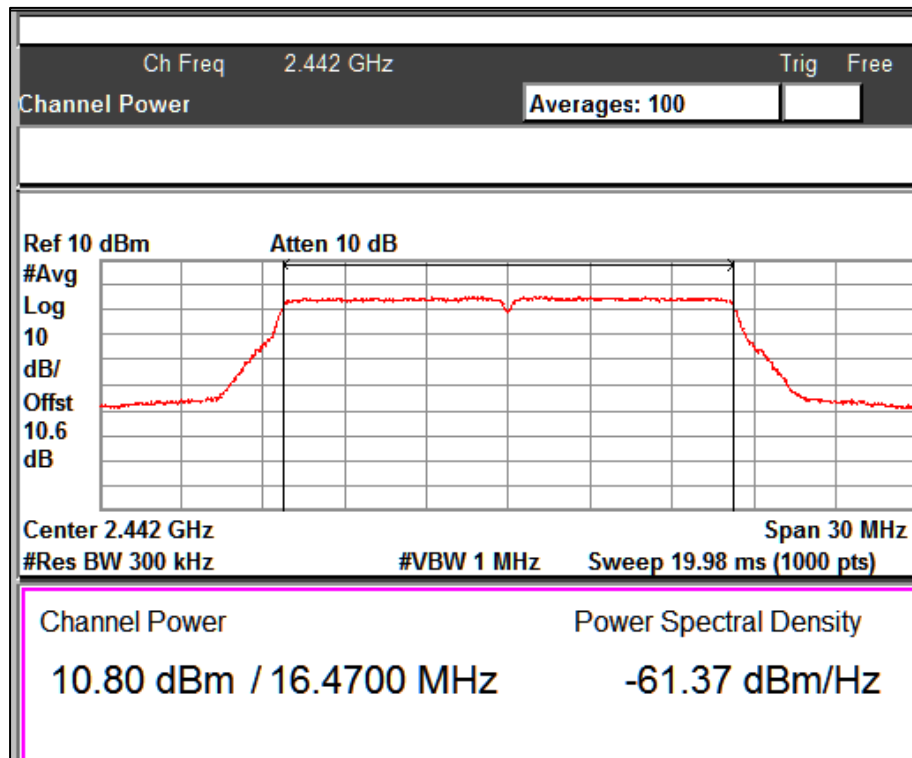
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Channel Frequency: 2412 MHz

Data Rate: 24Mbps



Channel Frequency: 2442 MHz

Data Rate: 24Mbps

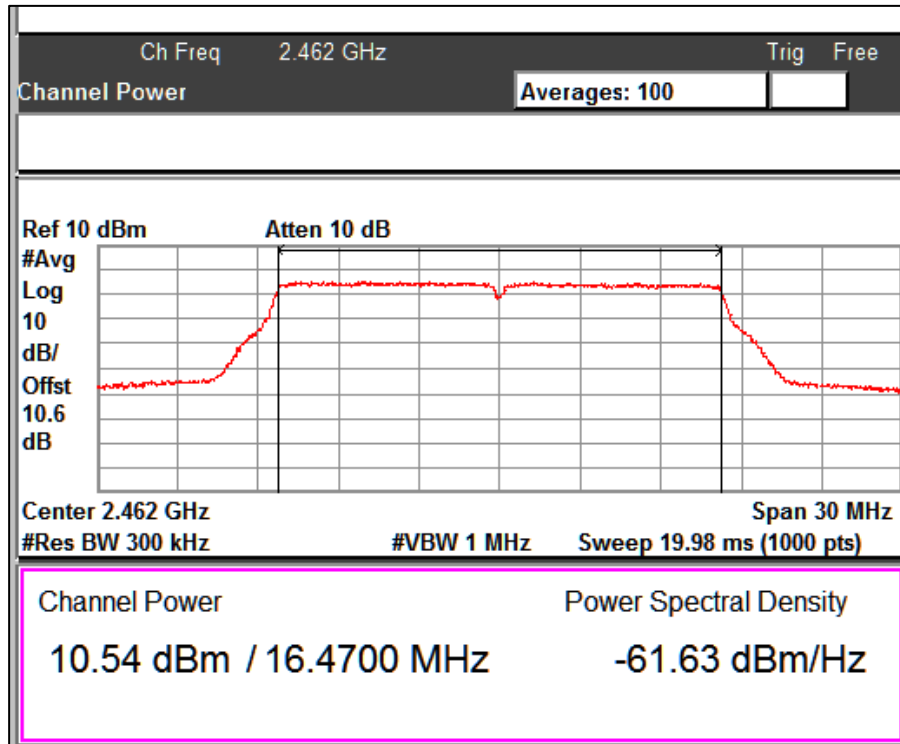
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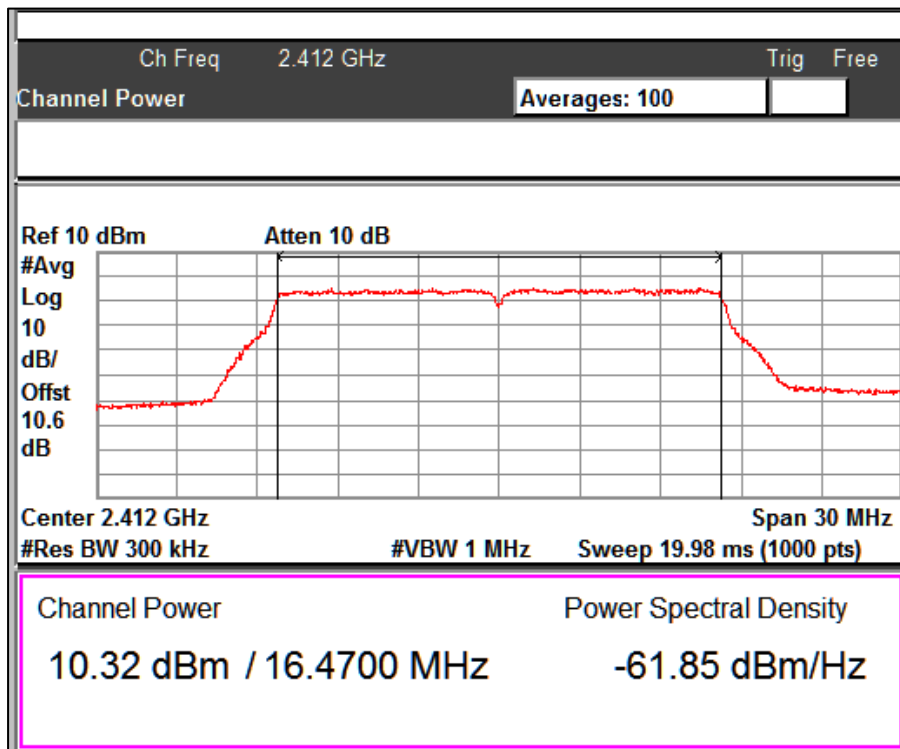
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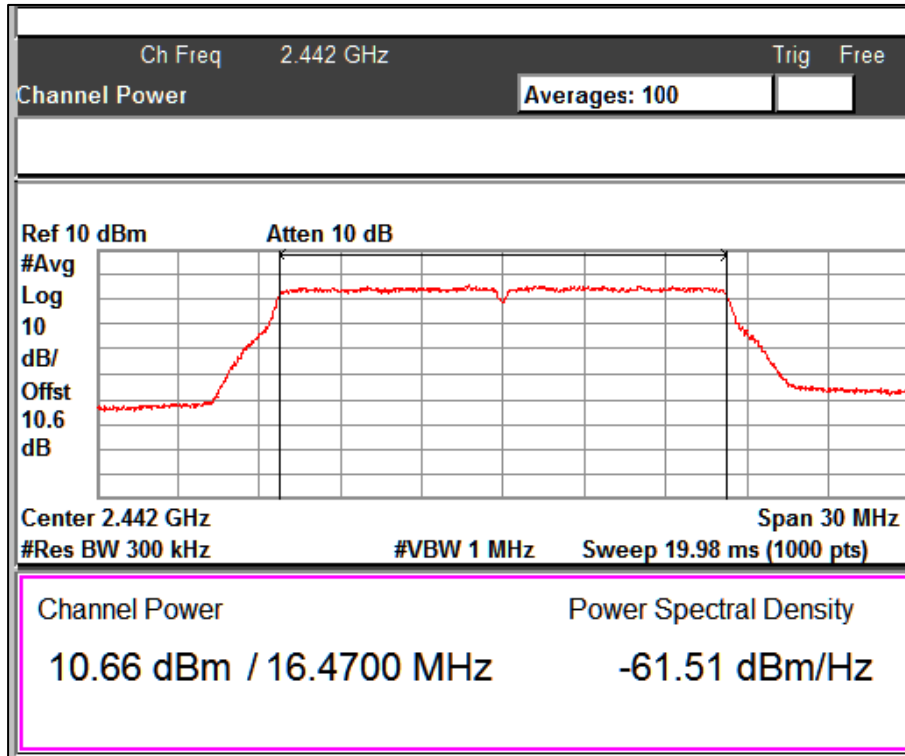
Channel Frequency: 2462 MHz

Data Rate: 24Mbps



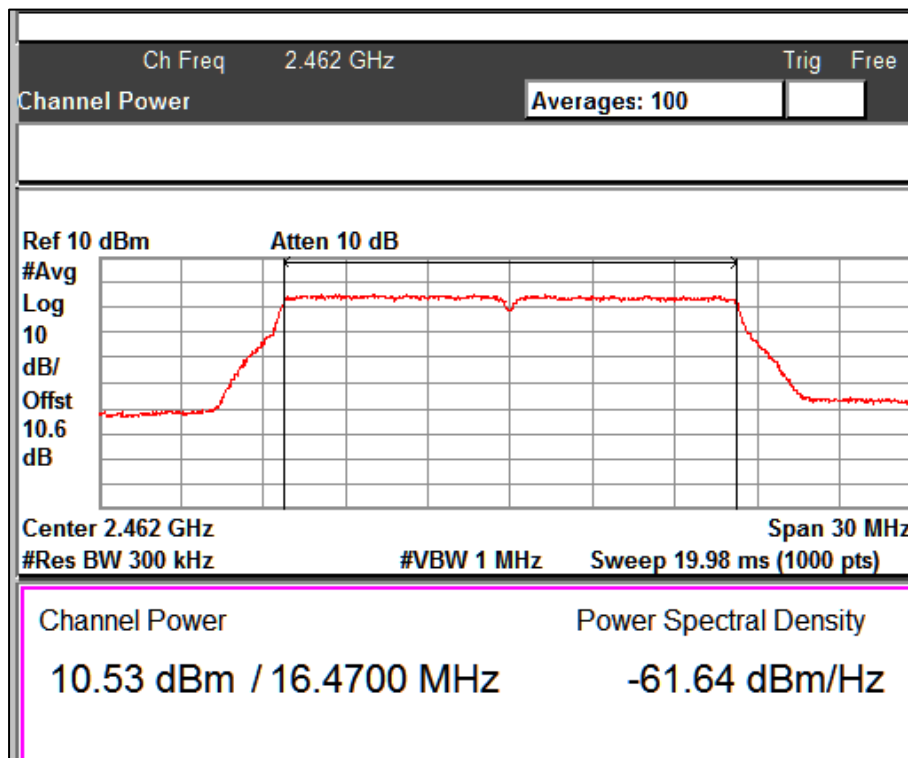
Channel Frequency: 2412 MHz

Data Rate: 54Mbps



Channel Frequency: 2442 MHz

Data Rate: 54Mbps



Channel Frequency: 2462 MHz

Data Rate: 54Mbps

Prüfbericht - Nr.:

Test Report No.:

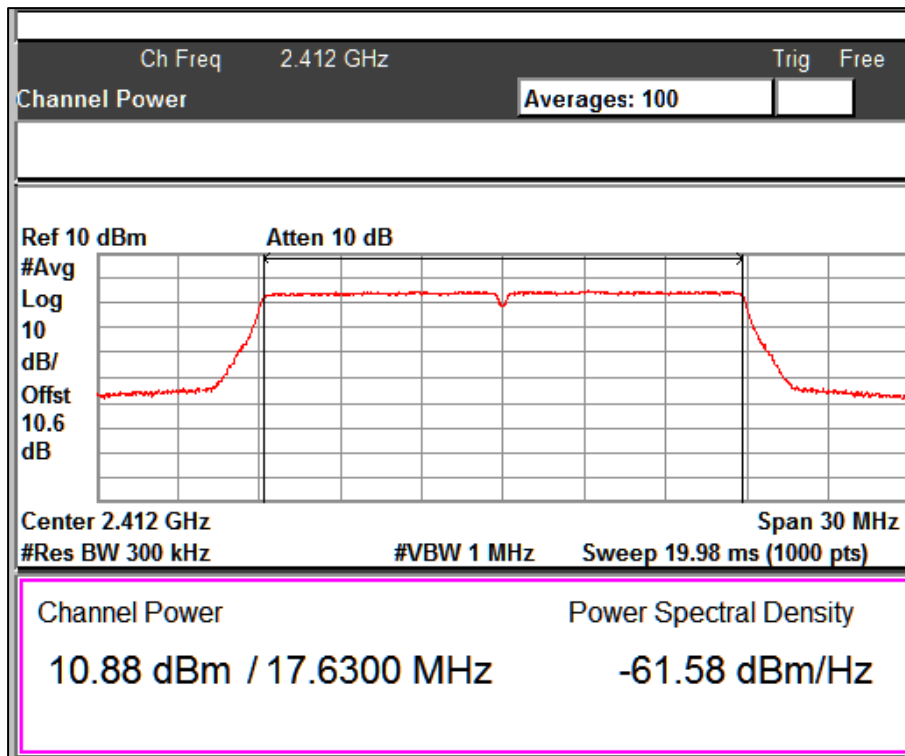
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Protocol: 802.11n_HT20

Data rate (Mbps)	Channel Frequency (MHz)	Average Power (dBm)	Limit (dBm)
MCS0	2412	10.88	30
	2442	10.74	30
	2462	10.97	30
MCS4	2412	10.53	30
	2442	10.69	30
	2462	10.58	30
MCS7	2412	9.76	30
	2442	9.89	30
	2462	9.76	30



Channel Frequency: 2412 MHz

Data Rate: MCS0

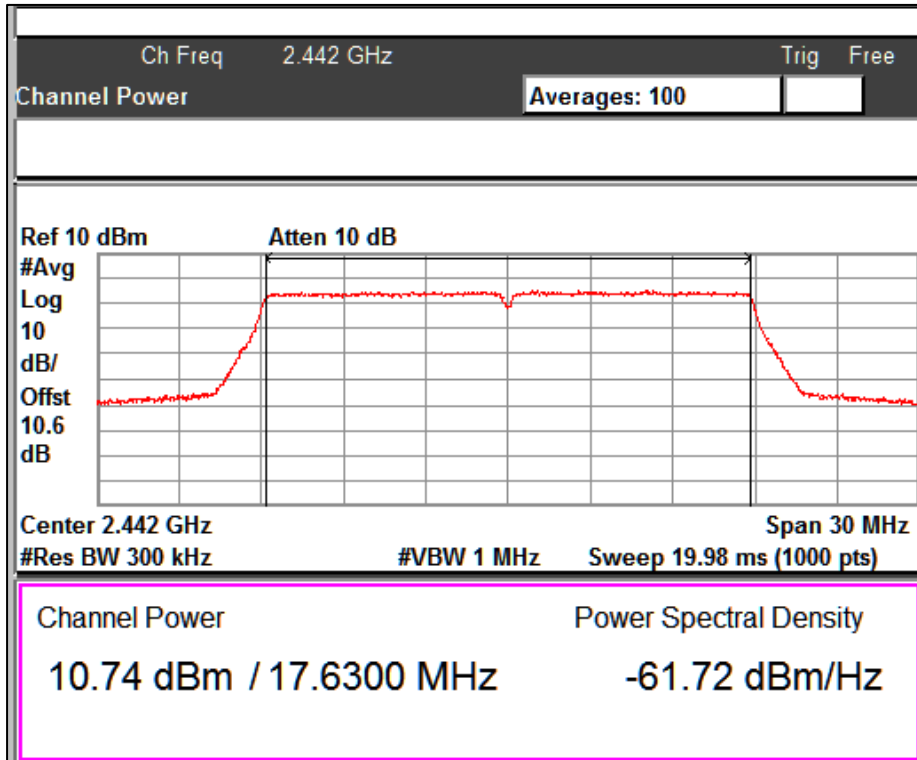
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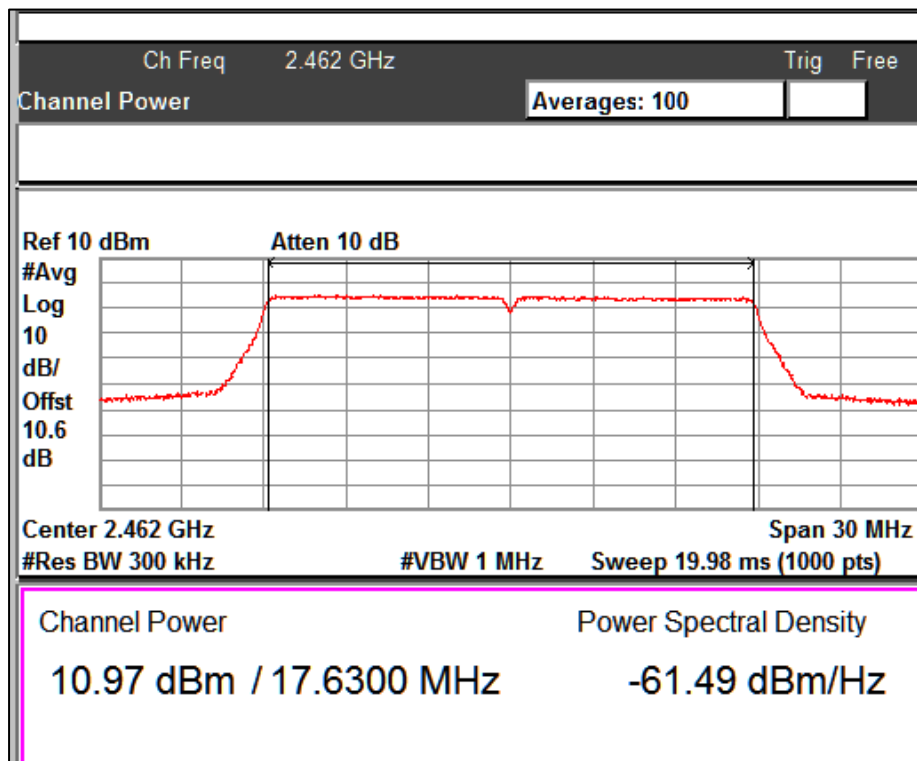
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Channel Frequency: 2442 MHz

Data Rate: MCS0



Channel Frequency: 2462 MHz

Data Rate: MCS0

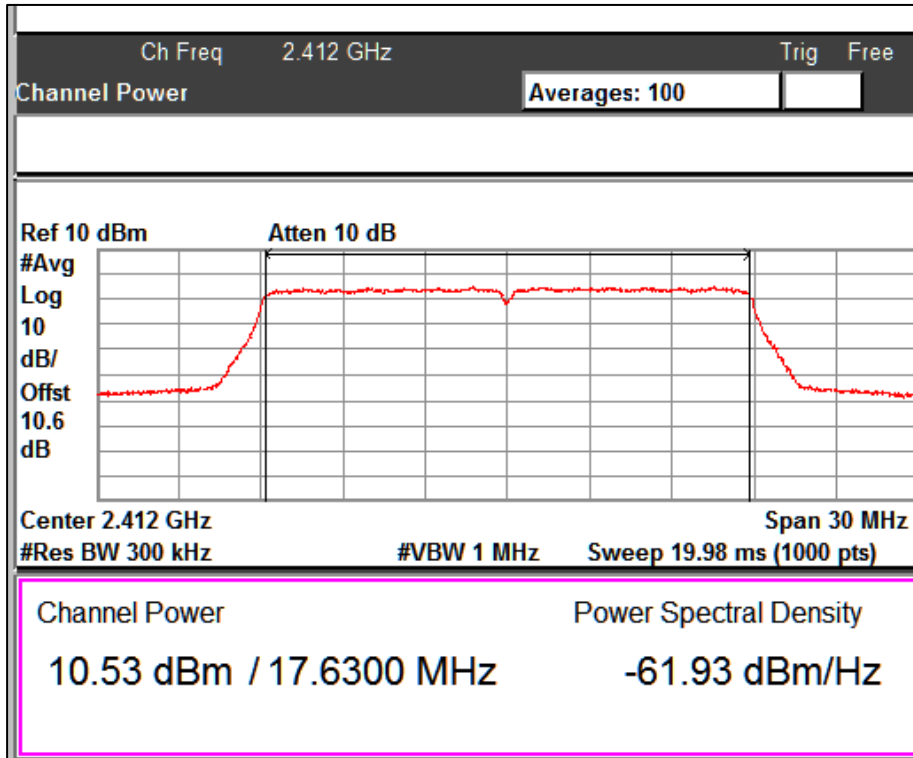
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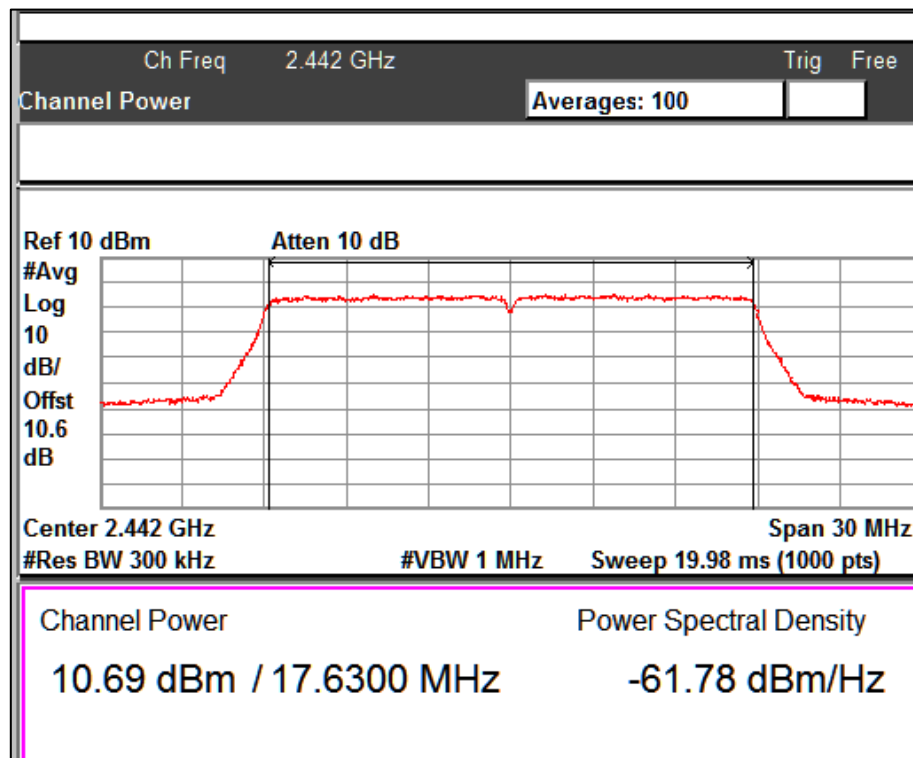
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Channel Frequency: 2412 MHz

Data Rate: MCS4



Channel Frequency: 2442 MHz

Data Rate: MCS4

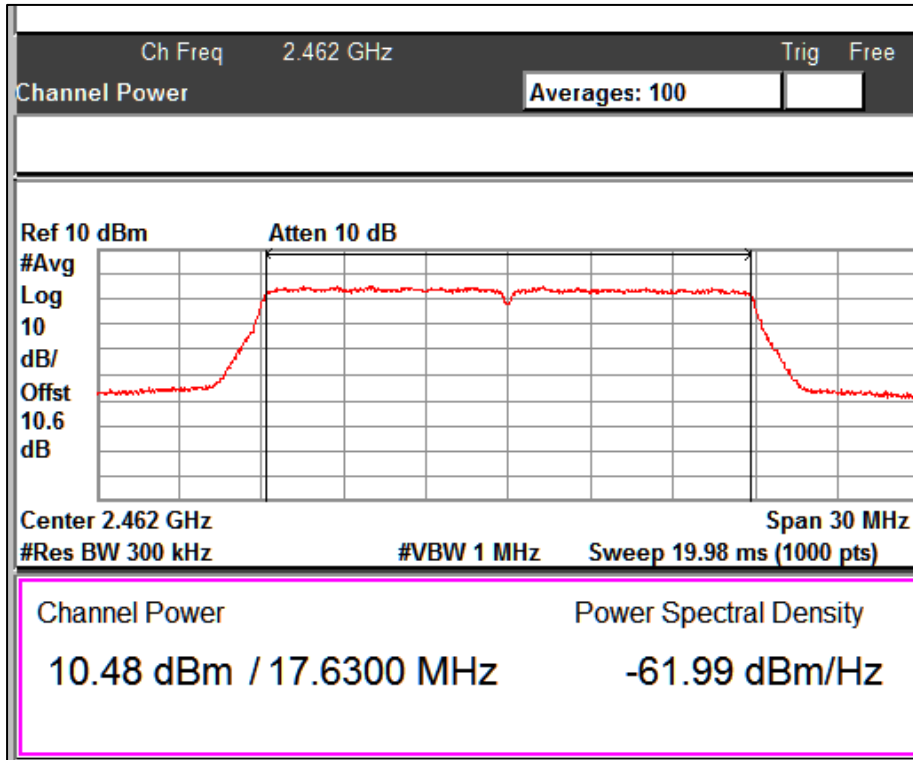
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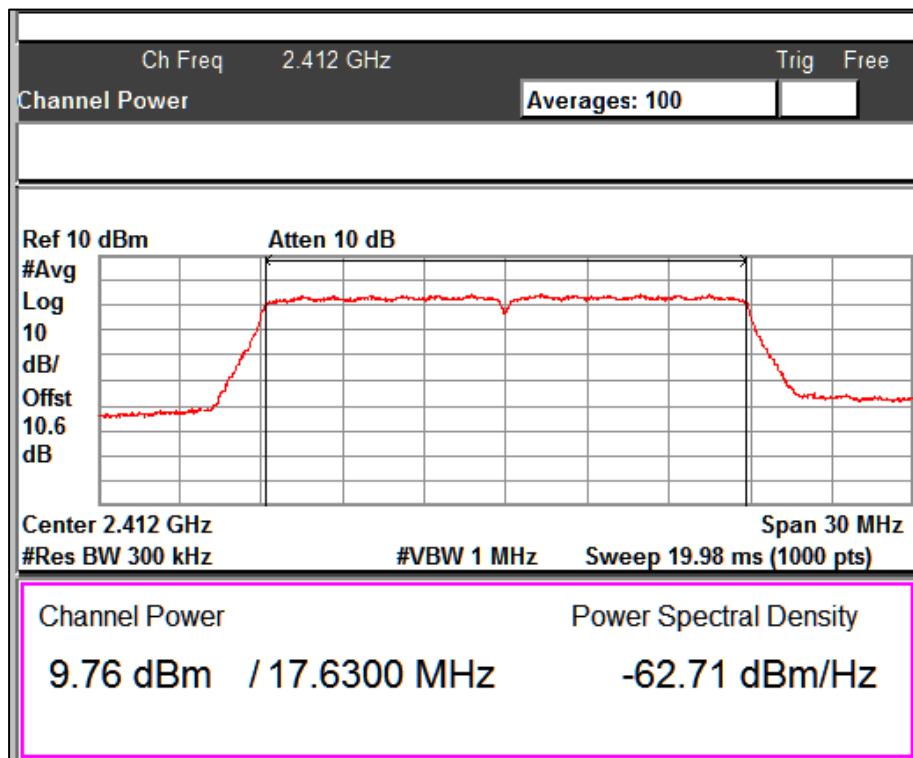
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Channel Frequency: 2462 MHz

Data Rate: MCS4



Channel Frequency: 2412 MHz

Data Rate: MCS7

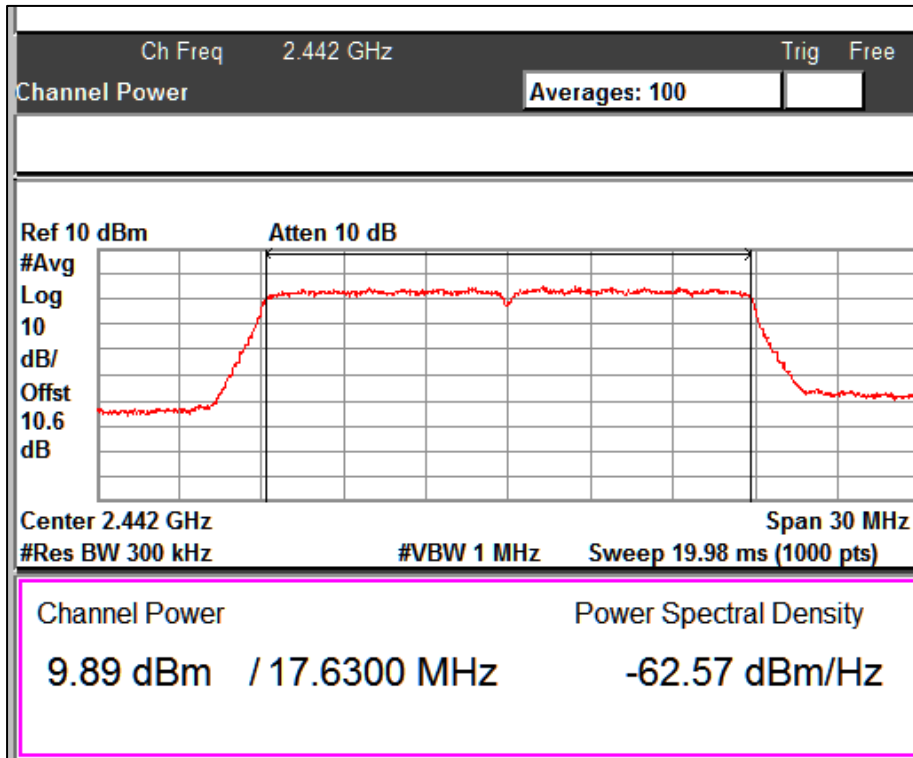
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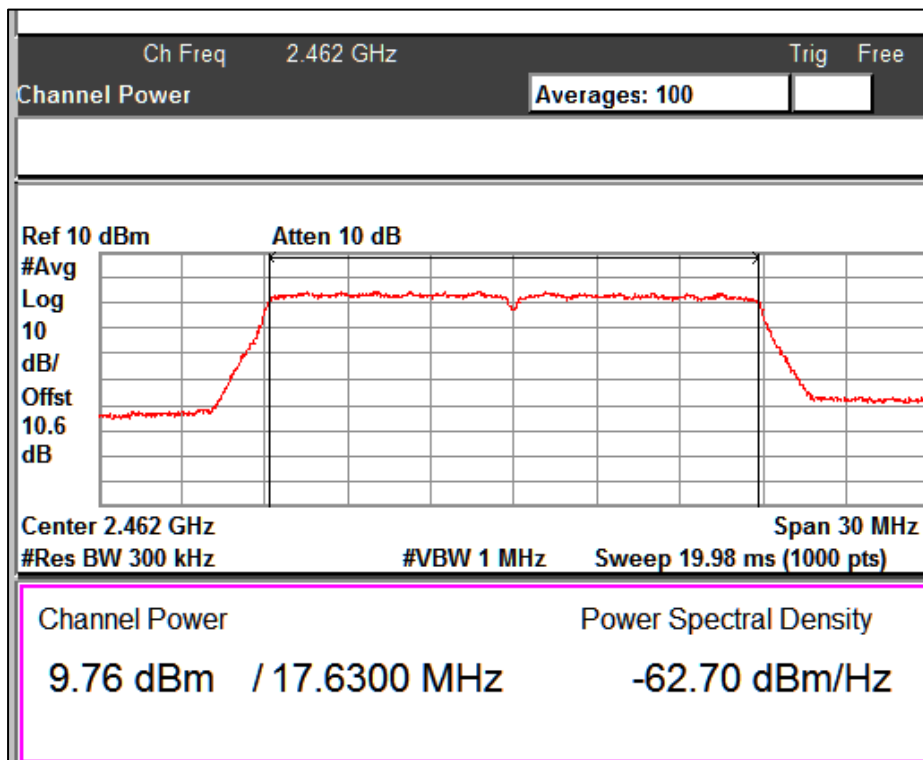
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Channel Frequency: 2442 MHz

Data Rate: MCS7



Channel Frequency: 2462 MHz

Data Rate: MCS7

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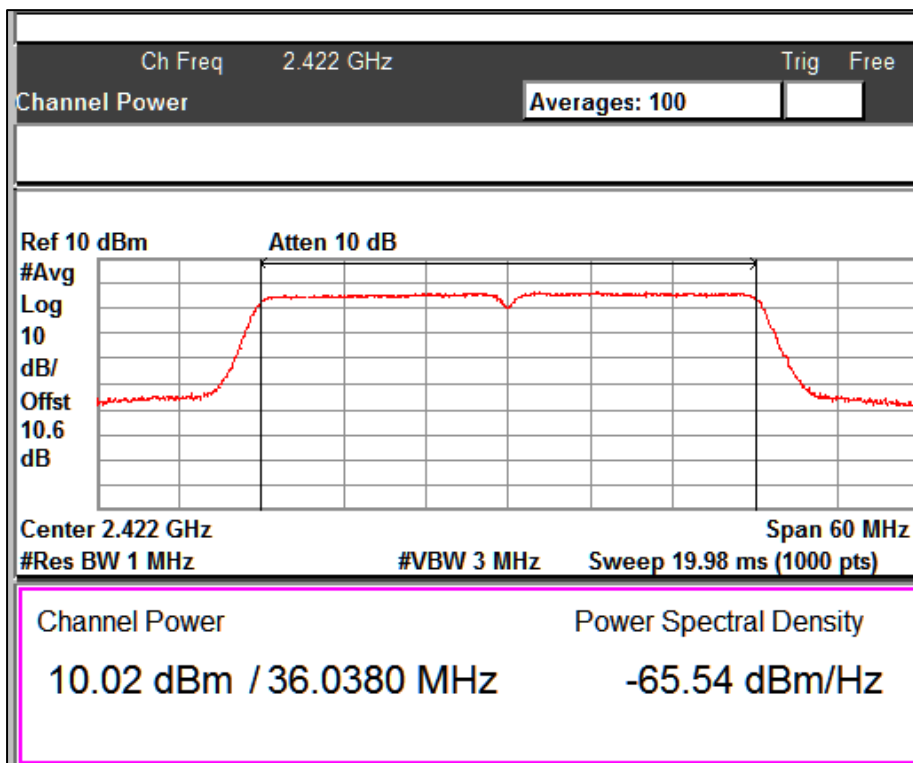
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Protocol: 802.11n_HT40

Data rate (Mbps)	Channel Frequency (MHz)	Average Power (dBm)	Limit (dBm)
MCS0	2422	10.02	30
	2442	9.99	30
	2452	9.98	30
MCS4	2422	9.04	30
	2442	9.27	30
	2452	9.17	30
MCS7	2422	8.10	30
	2442	8.09	30
	2452	8.06	30



Channel Frequency: 2422 MHz

Data Rate: MCS0

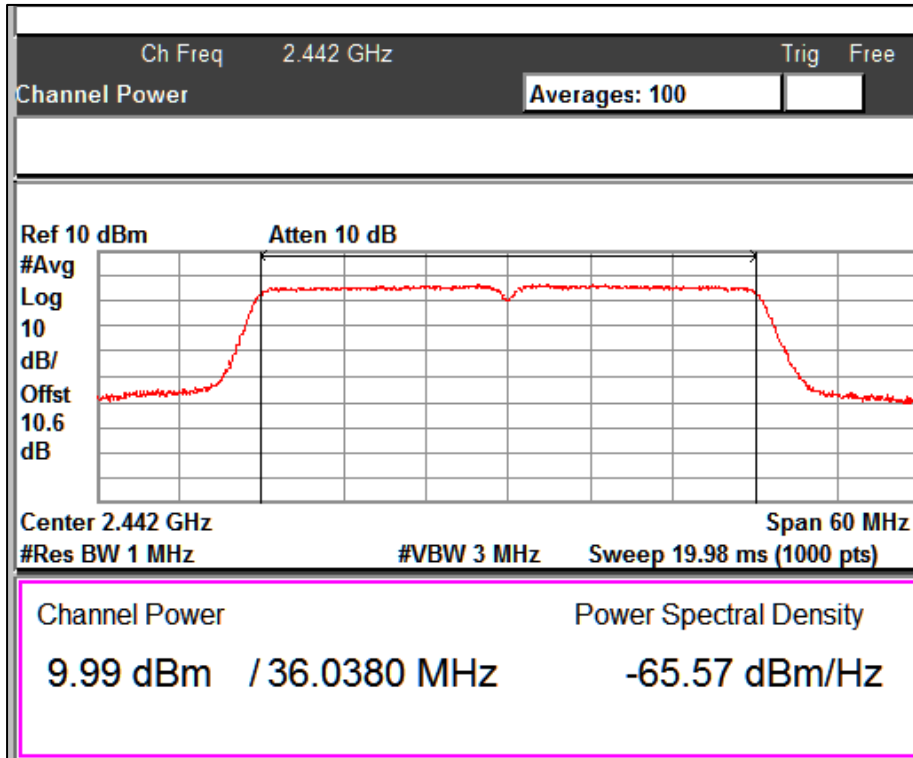
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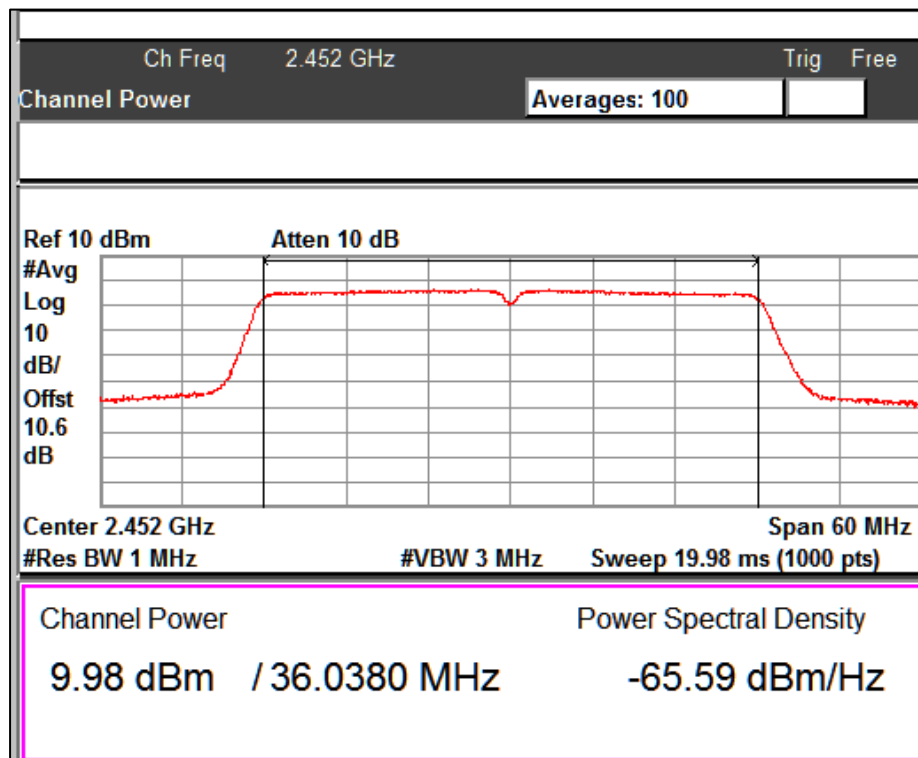
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Channel Frequency: 2442 MHz

Data Rate: MCS0



Channel Frequency: 2452 MHz

Data Rate: MCS0

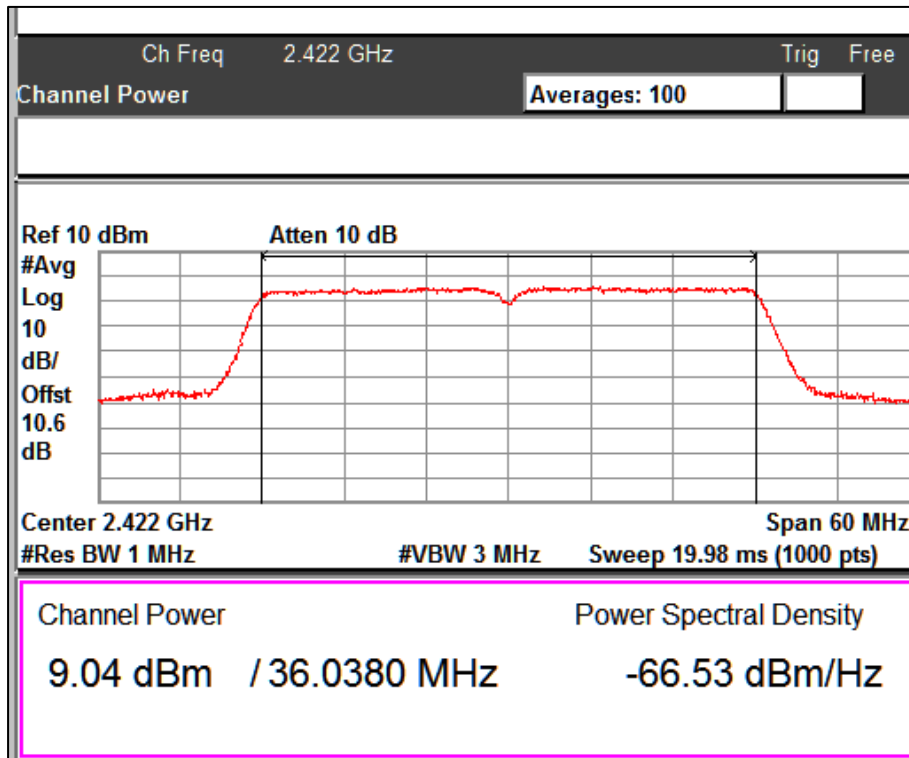
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Test Report No.:

ULR-TC568819300000069F

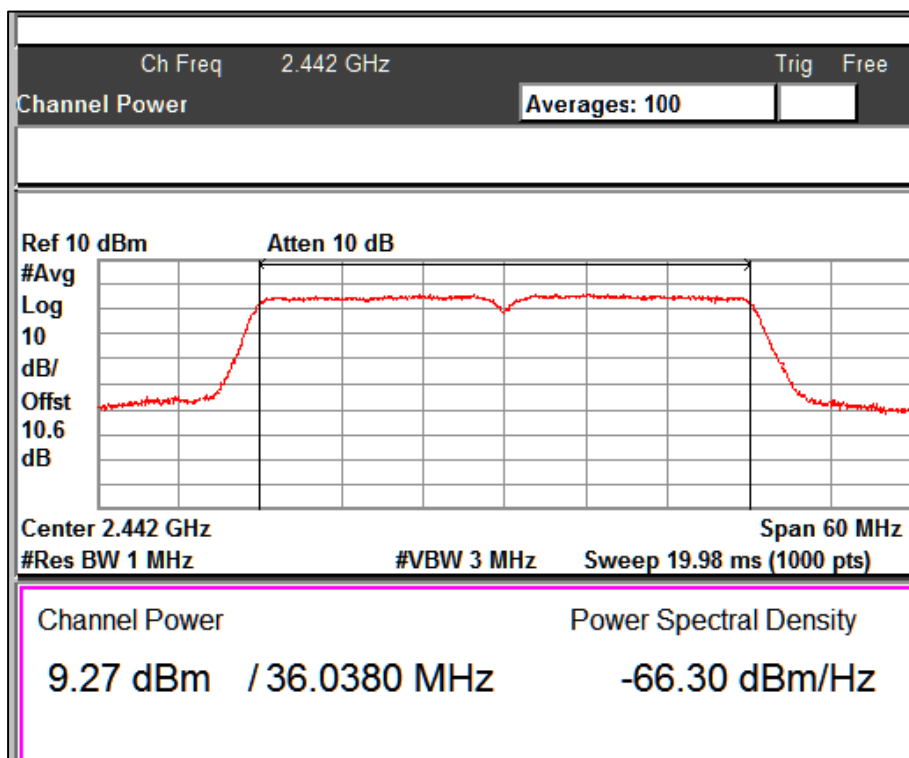
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Channel Frequency: 2422 MHz

Data Rate: MCS4



Channel Frequency: 2442 MHz

Data Rate: MCS4

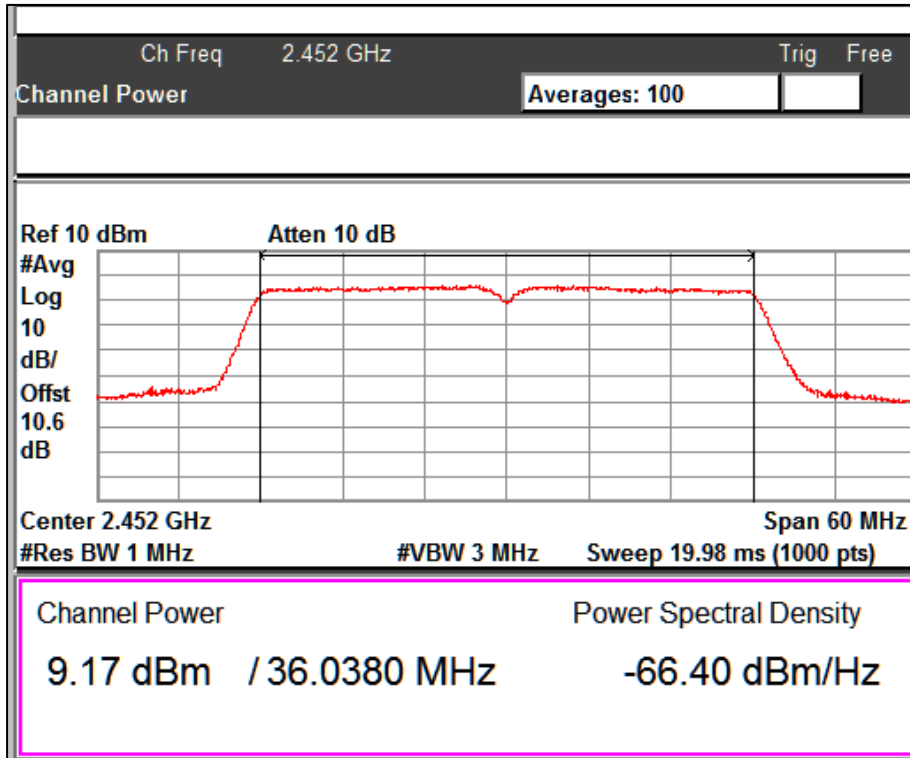
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000069F

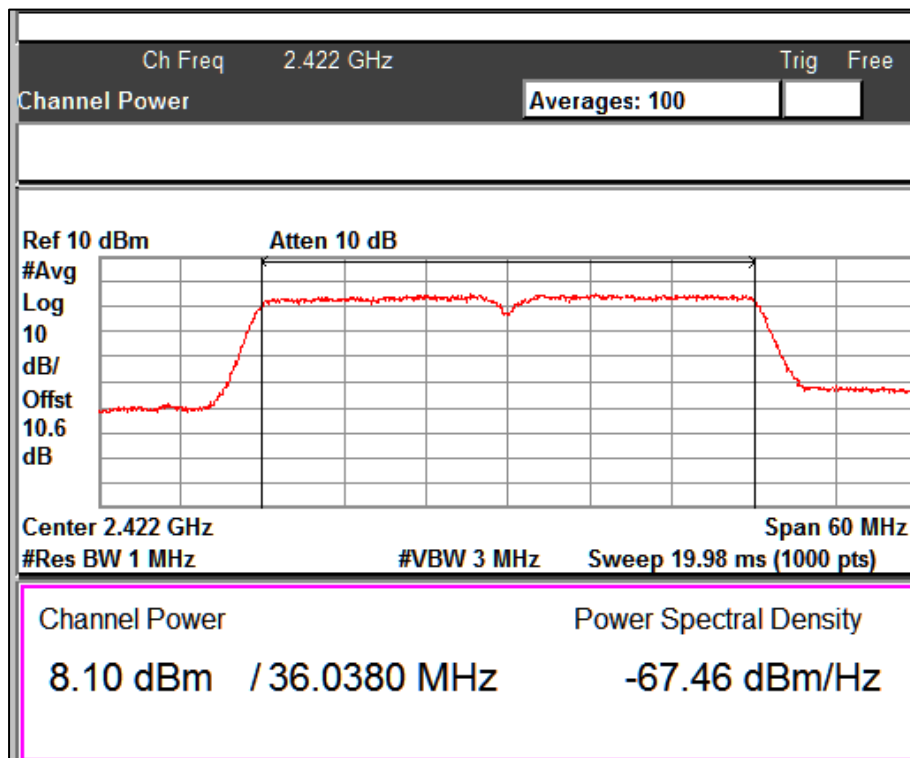
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Channel Frequency: 2452 MHz

Data Rate: MCS4



Channel Frequency: 2422 MHz

Data Rate: MCS7

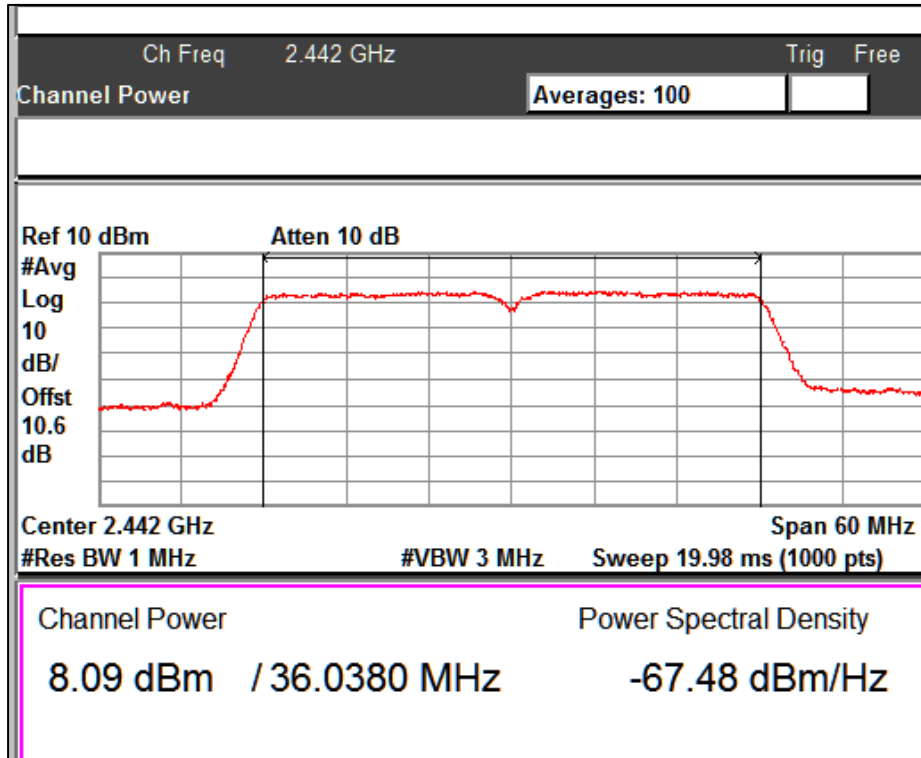
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000069F

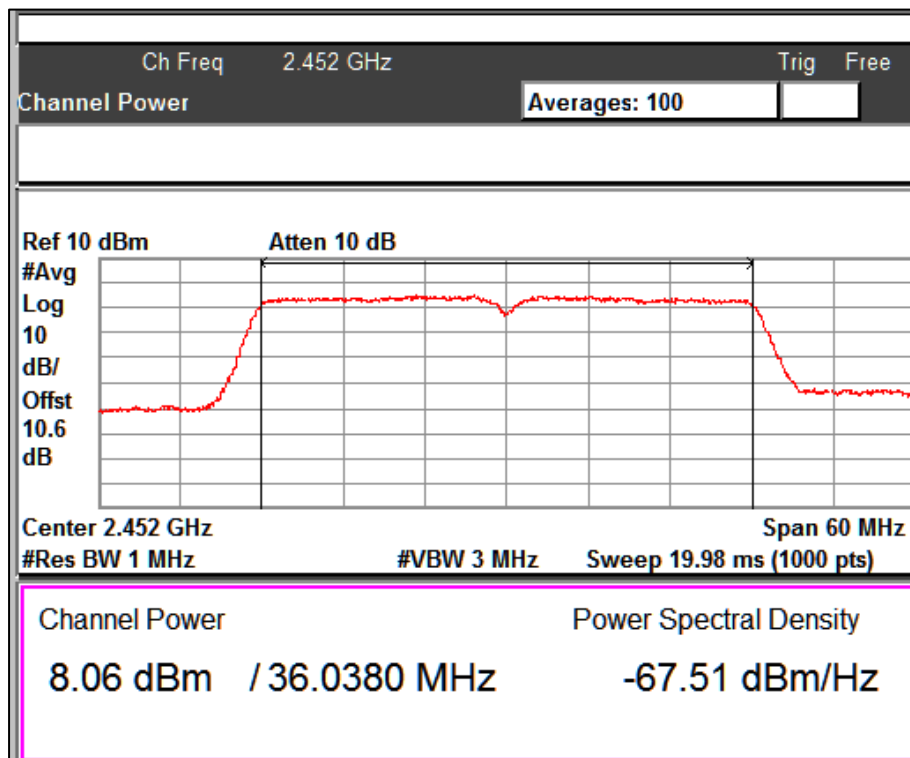
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Channel Frequency: 2442 MHz

Data Rate: MCS7



Channel Frequency: 2452 MHz

Data Rate: MCS7

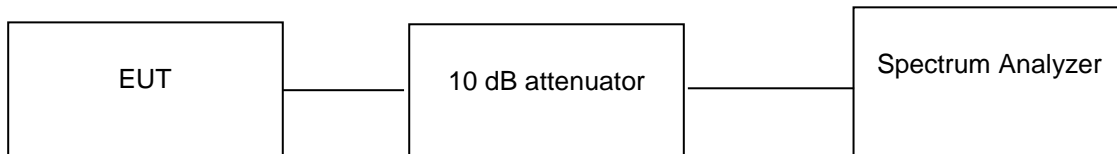
6.2 Maximum Power Spectral Density

Result

Pass

Test Specification	FCC Part 15 Subpart C Section 15.247 (e) / RSS 247 Issue 2, Section 5.2 (2)
Detector Function	Average
Port of testing	Antenna port
Requirement	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm.

Test Method:



Environmental and Test conditions:

Normal Temperature = +25 °C

Voltage (V norm) = 7.4 VDC

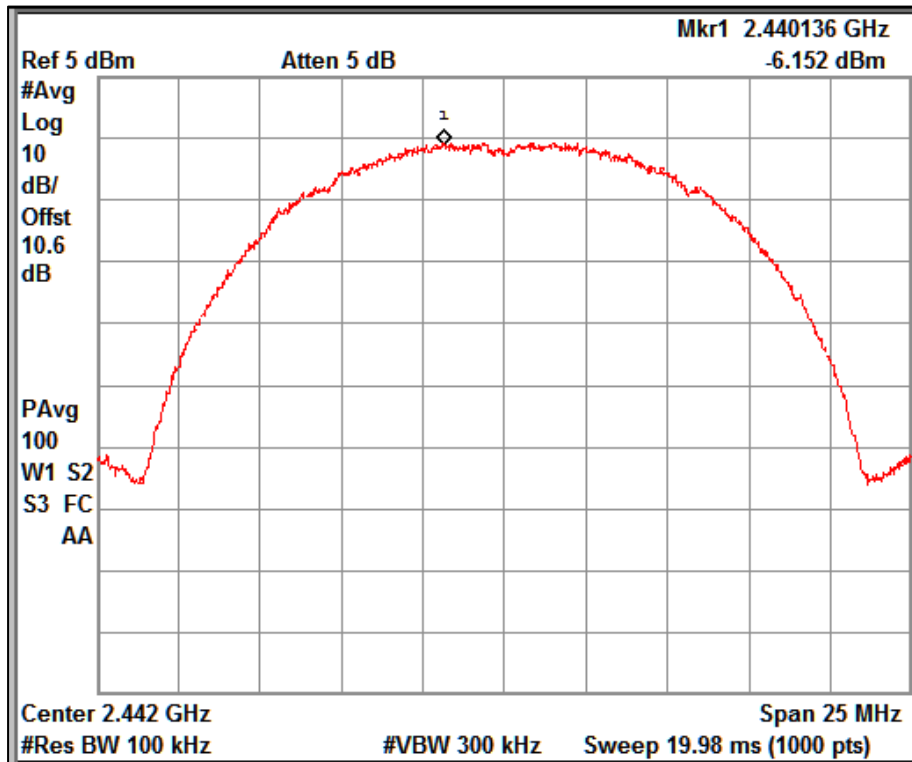
RH = 63.2 %

Test results:

10 dB attenuator + 0.6 dB Cable loss = 10.6 dB offset is considered in below result

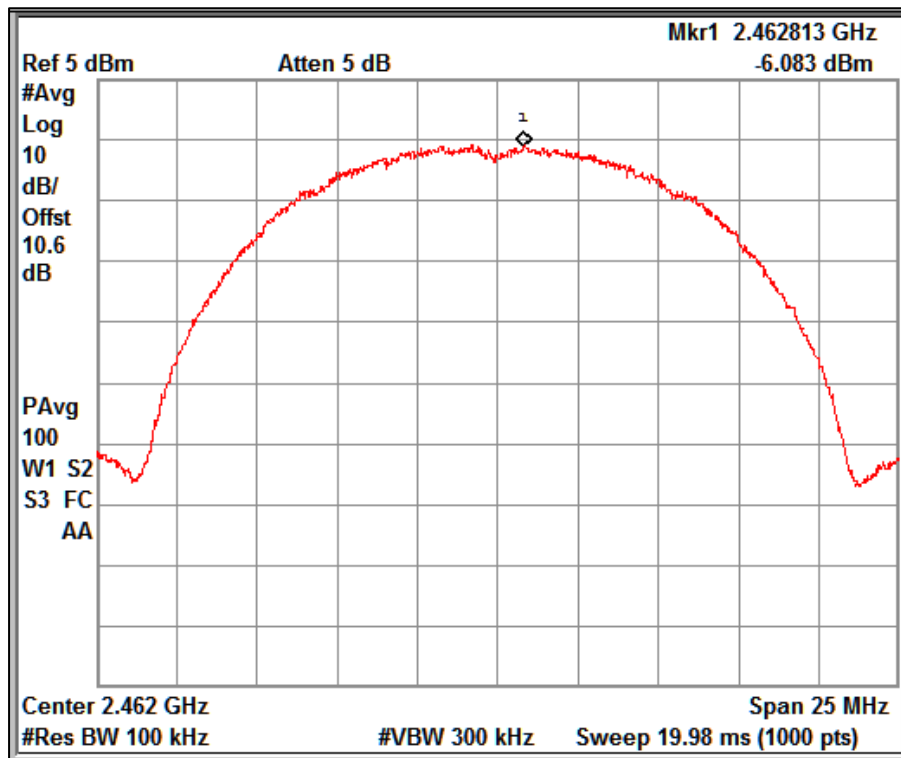
Protocol: 802.11b

Data Rate (Mbps)	Channel Frequency (MHz)	Total PSD (dBm)	Limit (dBm)
1	2412	-5.37	8
	2442	-5.24	8
	2462	-5.32	8
11	2412	-6.18	8
	2442	-6.52	8
	2462	-6.08	8



Channel Frequency: 2442 MHz

Data Rate: 11Mbps



Channel Frequency: 2462 MHz

Data Rate: 11Mbps

Prüfbericht - Nr.:

Test Report No.:

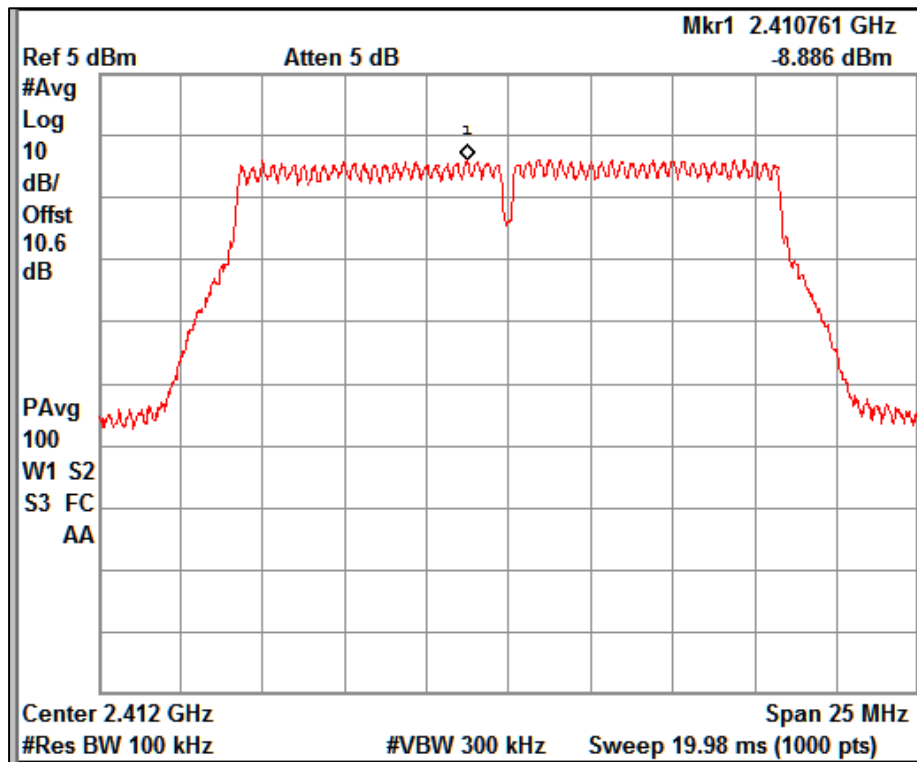
ULR-TC568819300000069F

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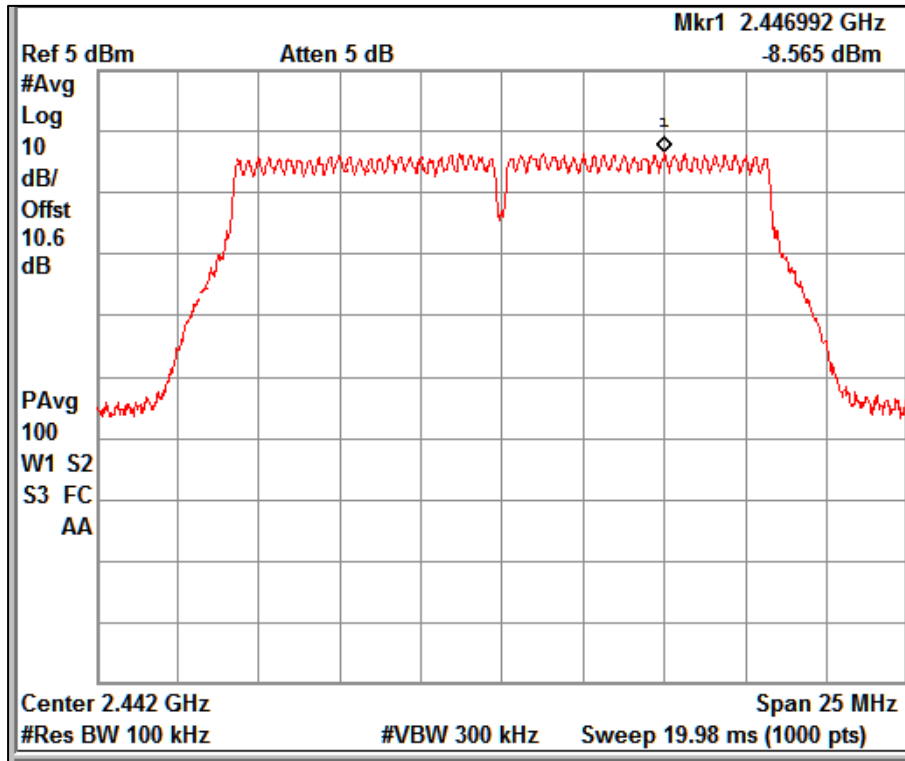
Protocol: 802.11g

Data Rate (Mbps)	Channel Frequency (MHz)	Total PSD (dBm)	Limit (dBm)
6	2412	-8.88	8
	2442	-8.56	8
	2462	-8.64	8
24	2412	-9.30	8
	2442	-8.15	8
	2462	-8.75	8
54	2412	-8.79	8
	2442	-8.24	8
	2462	-8.18	8



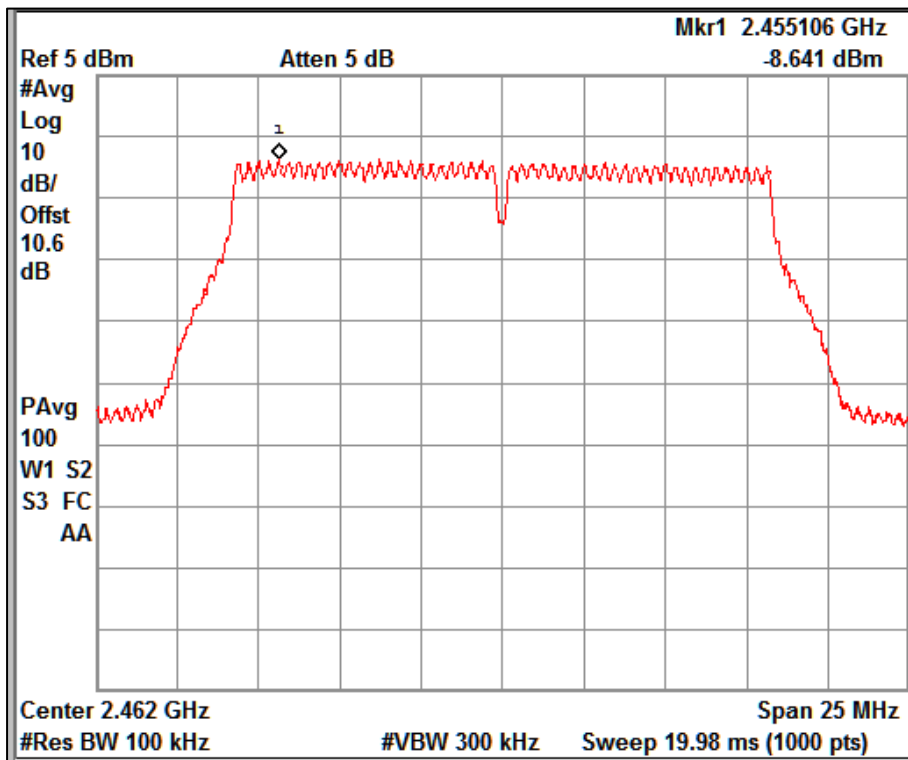
Channel Frequency: 2412 MHz

Data Rate: 6Mbps



Channel Frequency: 2442 MHz

Data Rate: 6Mbps



Channel Frequency: 2462 MHz

Data Rate: 6Mbps

Prüfbericht - Nr.:

Test Report No.:

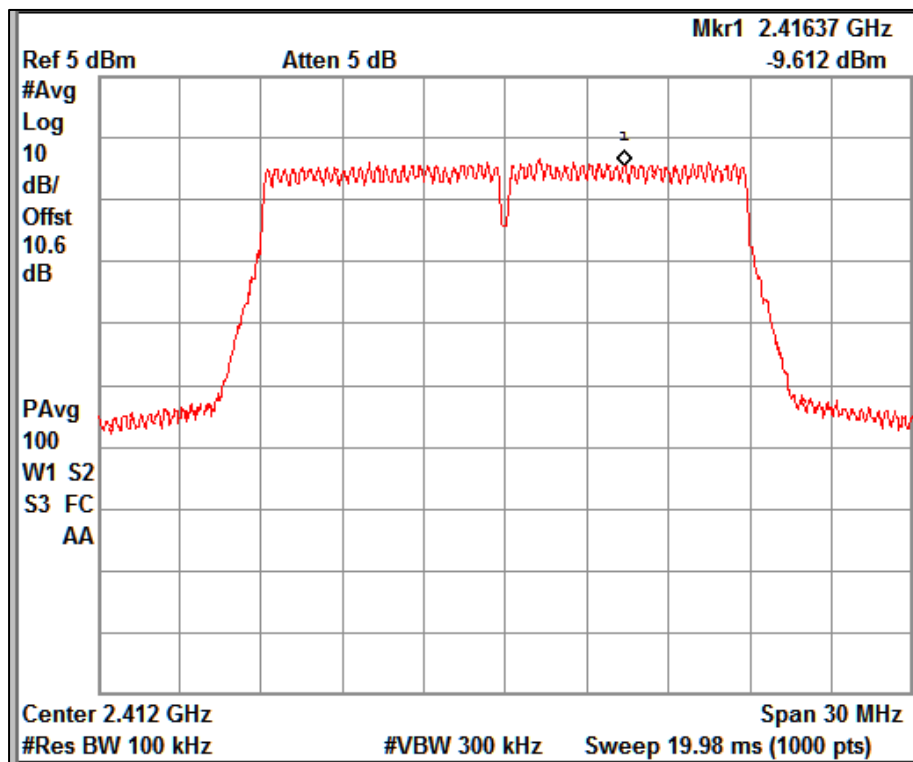
ULR-TC568819300000069F

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Protocol: 802.11n_HT20

Data Rate (Mbps)	Channel Frequency (MHz)	Total PSD (dBm)	Limit (dBm)
MCS0	2412	-9.61	8
	2442	-9.16	8
	2462	-8.84	8
MCS4	2412	-8.66	8
	2442	-8.49	8
	2462	-8.99	8
MCS7	2412	-9.00	8
	2442	-8.22	8
	2462	-8.73	8



Channel Frequency: 2412 MHz

Data Rate: MCS0

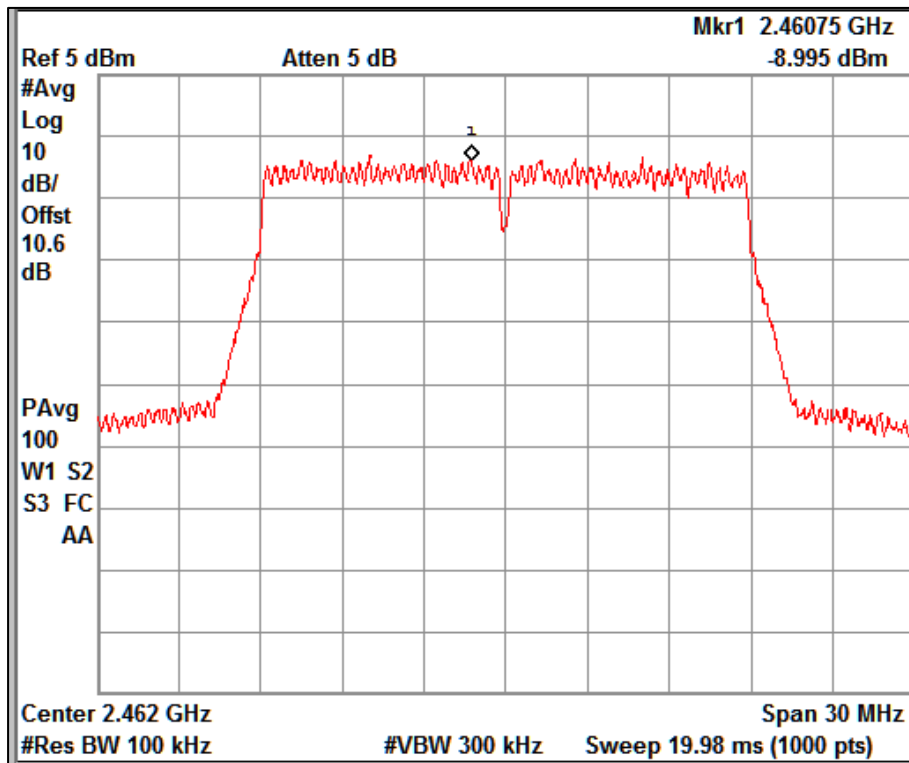
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000069F

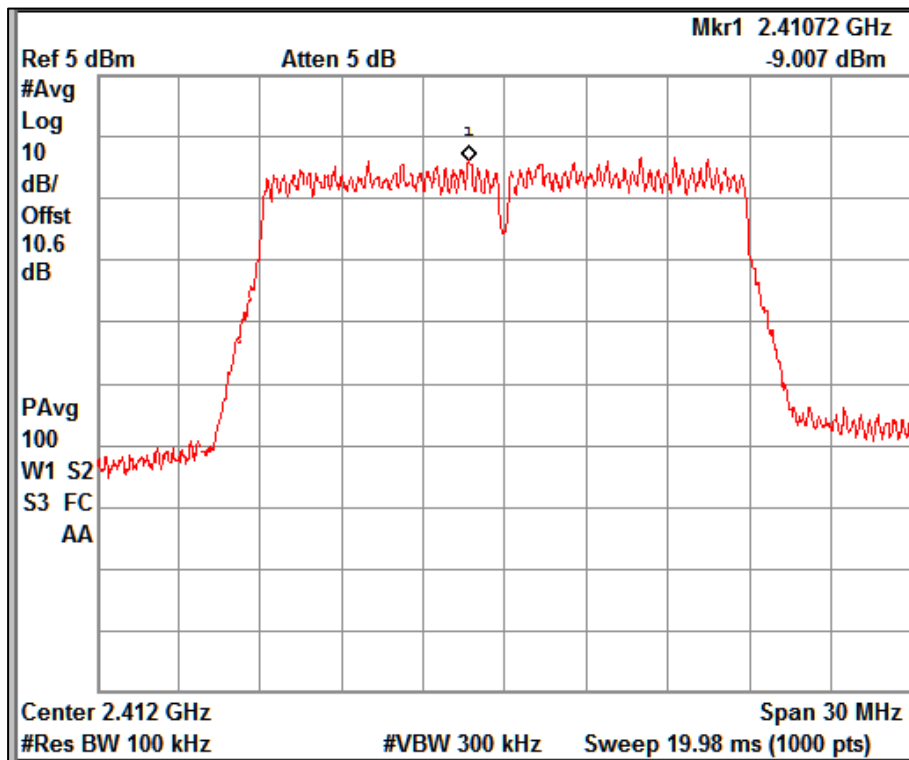
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Channel Frequency: 2462 MHz

Data Rate: MCS4



Channel Frequency: 2412 MHz

Data Rate: MCS7

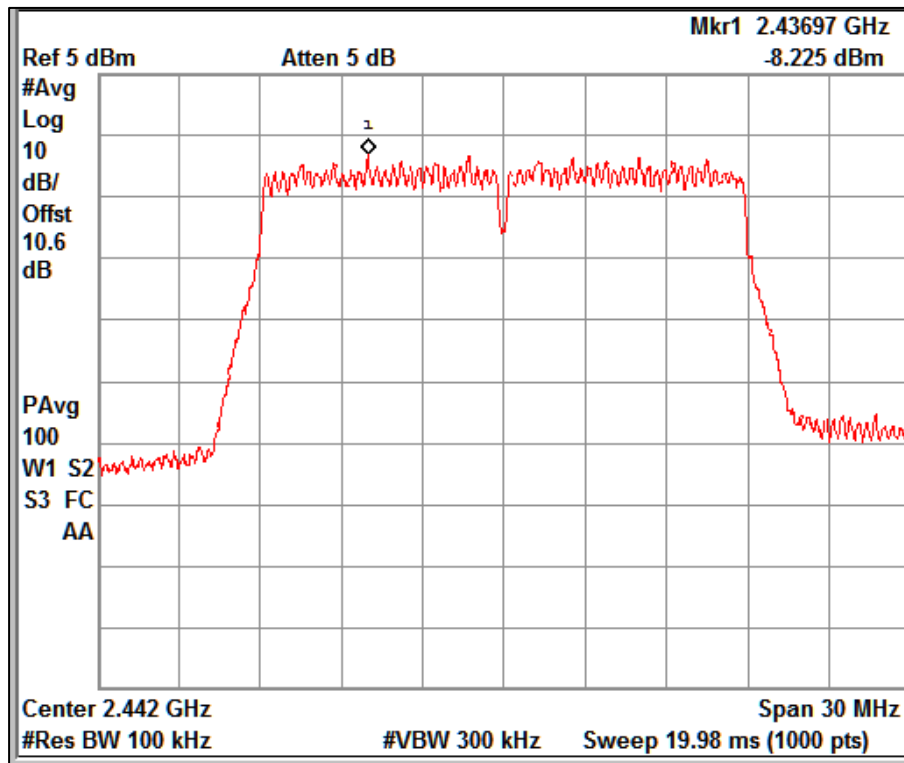
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000069F

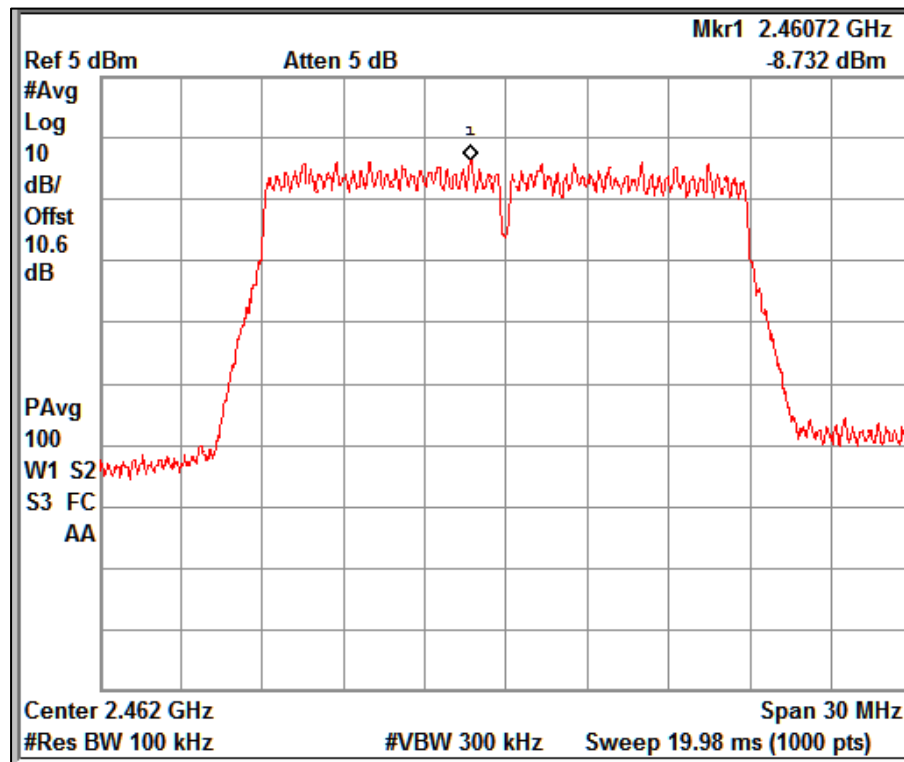
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Channel Frequency: 2442 MHz

Data Rate: MCS7



Channel Frequency: 2462 MHz

Data Rate: MCS7

Prüfbericht - Nr.:

Test Report No.:

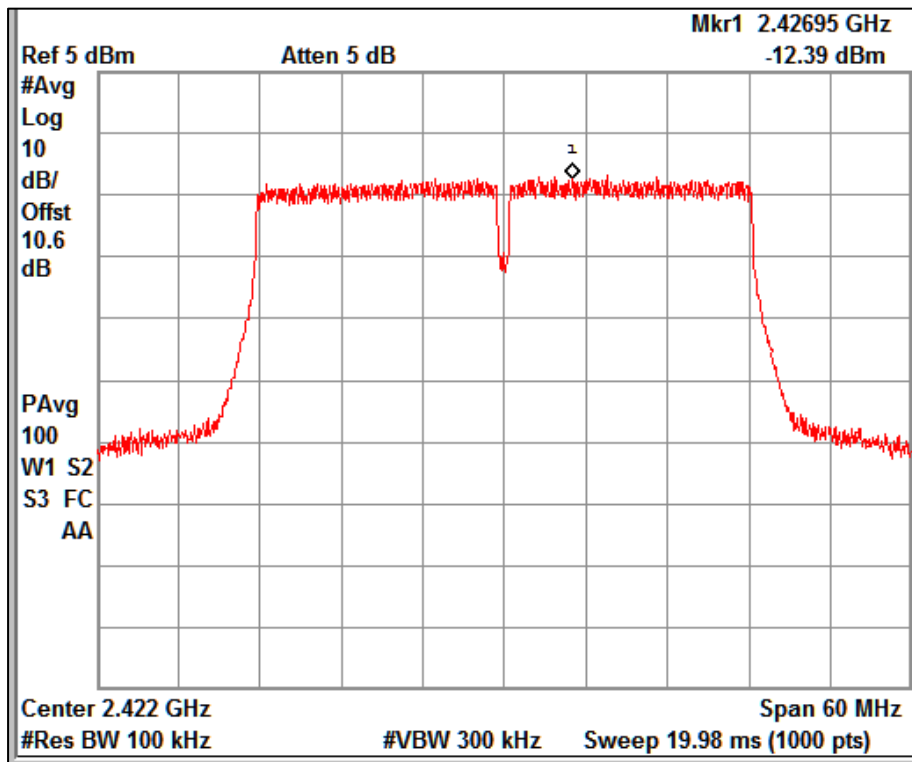
ULR-TC568819300000069F

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Protocol: 802.11n_HT40

Data Rate (Mbps)	Channel Frequency (MHz)	Total PSD (dBm)	Limit (dBm)
MCS0	2422	-12.39	8
	2442	-12.34	8
	2452	-12.07	8
MCS4	2422	-11.17	8
	2442	-10.88	8
	2452	-10.76	8
MCS7	2422	-12.02	8
	2442	-12.90	8
	2452	-11.68	8



Channel Frequency: 2422 MHz

Data Rate: MCS0

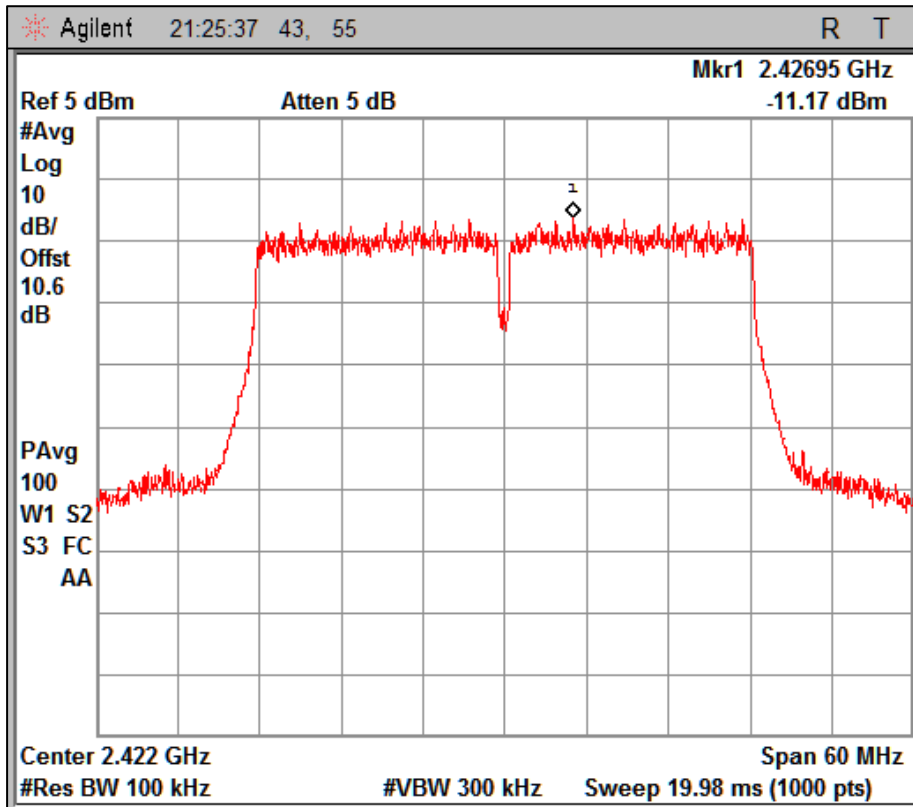
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000069F

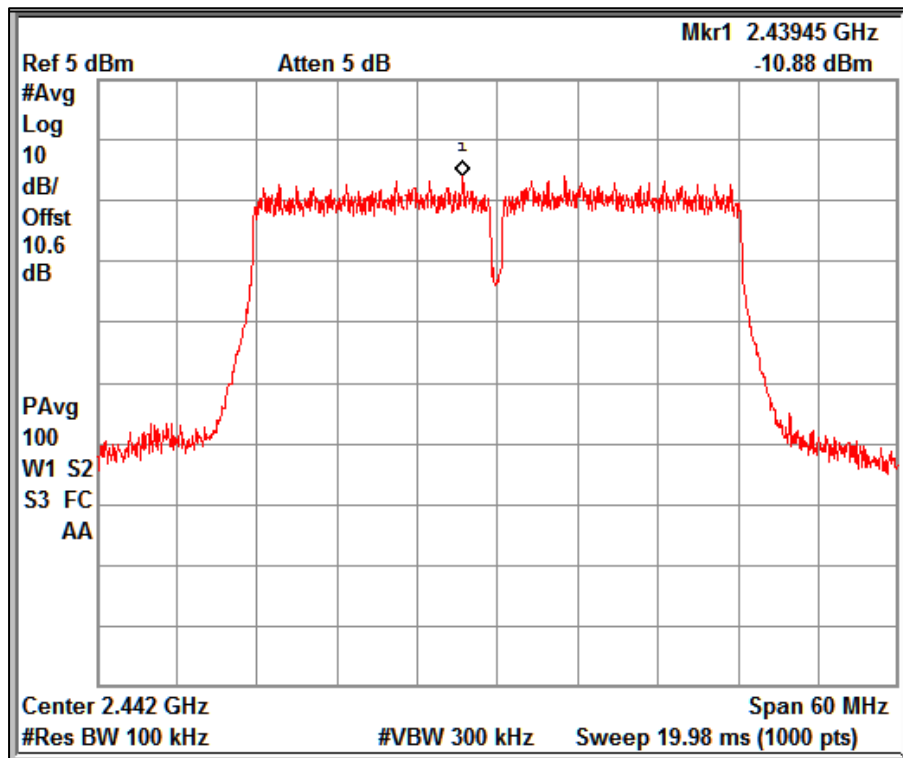
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Channel Frequency: 2422 MHz

Data Rate: MCS4



Channel Frequency: 2442 MHz

Data Rate: MCS4

Prüfbericht - Nr.:

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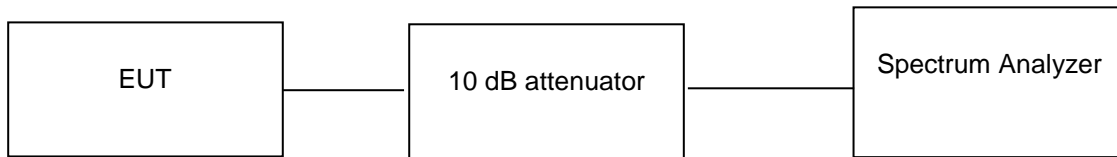
6.3 DTS Bandwidth

Result

Pass

Test Specification	FCC part 15 Subpart C Section 15.247 (a)(2) / RSS 247 Issue 2, Section 5.2 (1)
Detector	Peak
Port of testing	Antenna Port
Requirement	The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Method:



Test results for 802.11b

Environmental and Test conditions:

Normal Temperature = +25 °C

Voltage (V norm) = 7.4 VDC

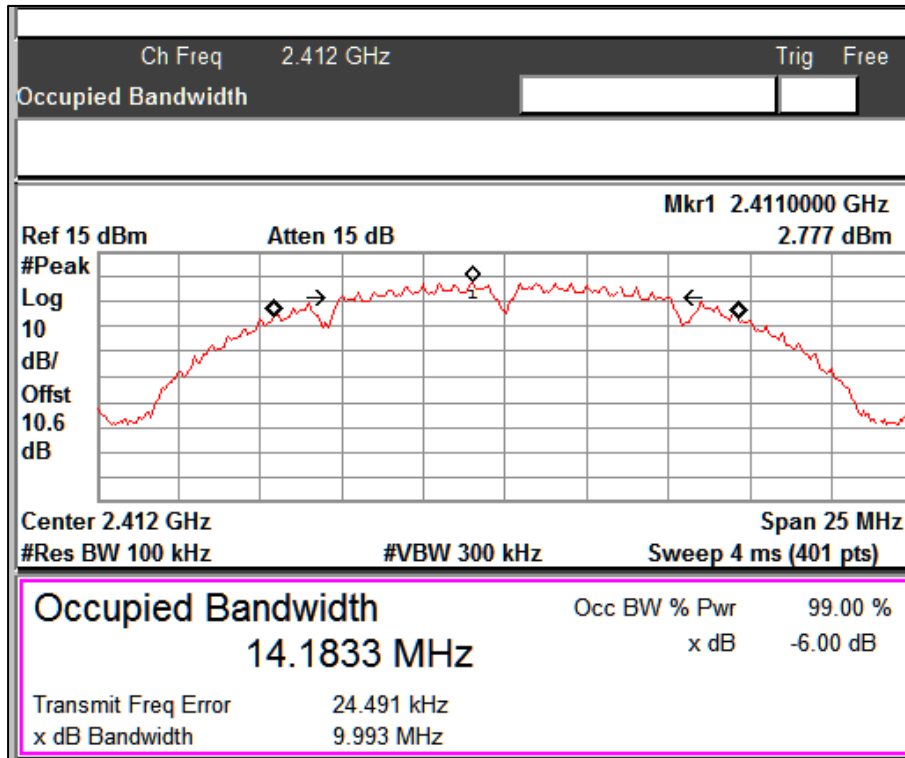
RH = 63.2 %

Test results:

10 dB attenuator + 0.6 dB Cable loss = 10.6 dB offset is considered in below result

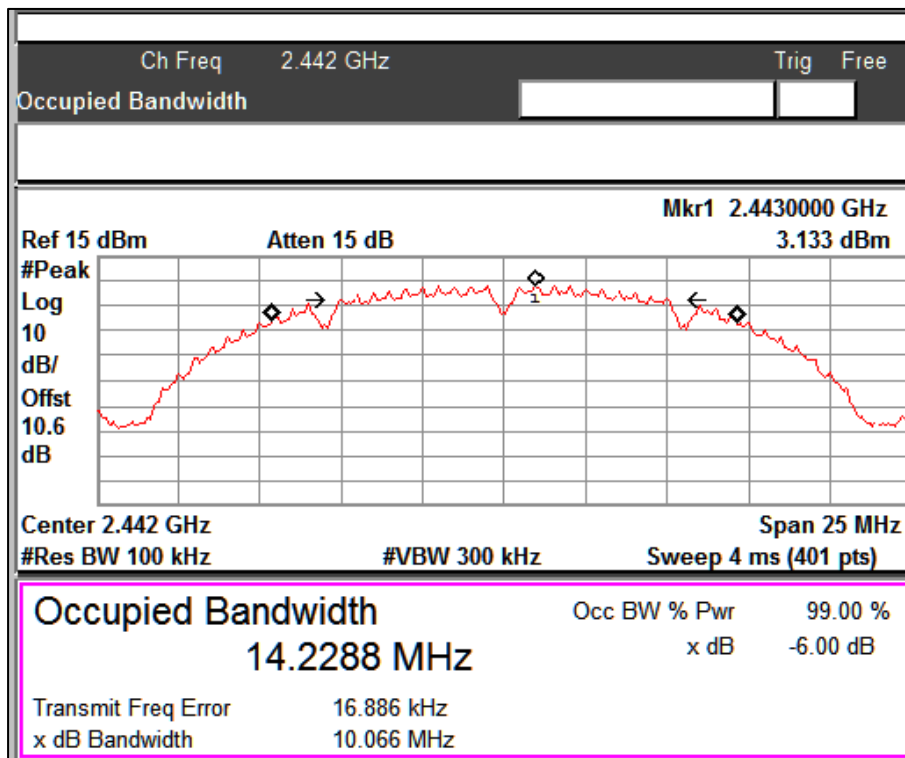
Protocol: 802.11b

Data Rate (Mbps)	Channel Frequency (MHz)	6dB Bandwidth (MHz)	99% OBW (MHz)
1	2412	9.99	14.18
	2442	10.06	14.22
	2462	10.08	14.27
11	2412	10.17	14.05
	2442	10.07	14.13
	2462	9.71	14.11



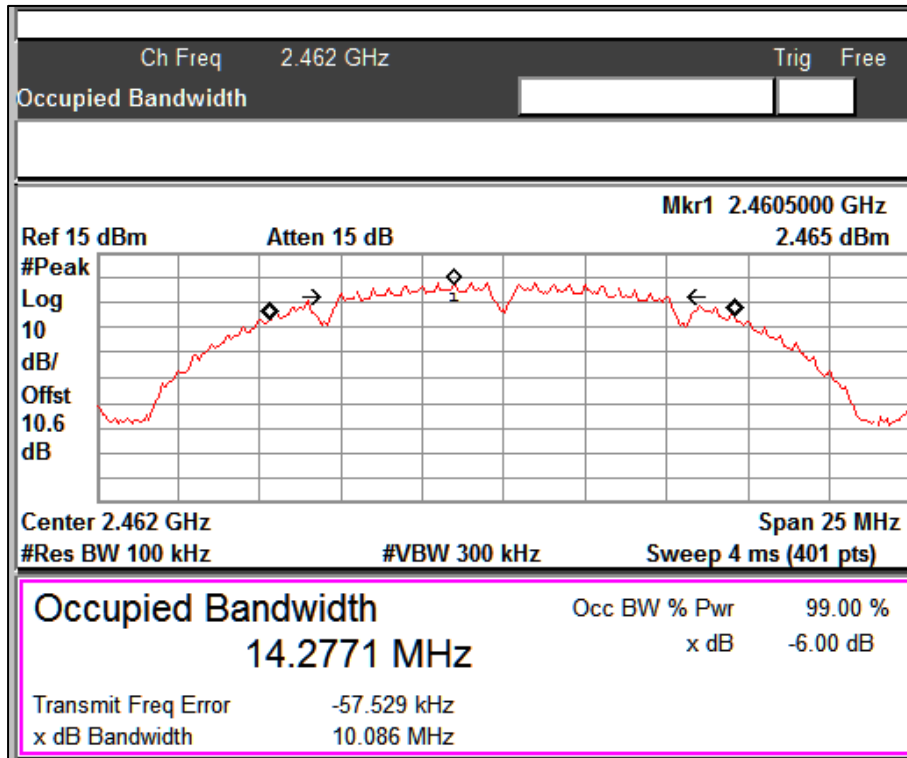
Channel Frequency: 2412 MHz

Data Rate: 1Mbps



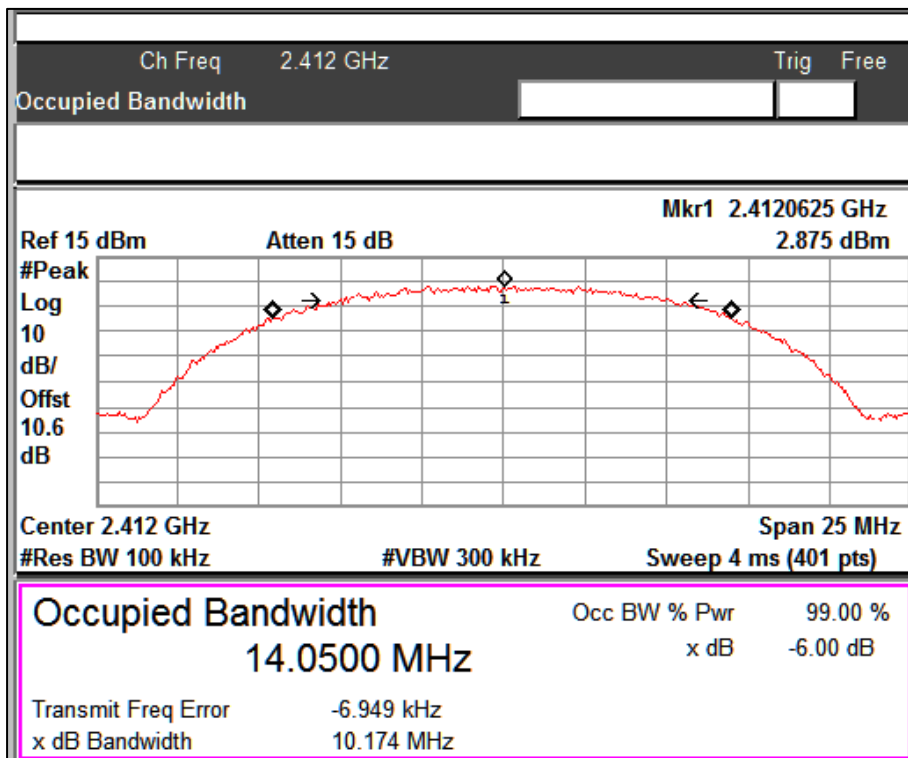
Channel Frequency: 2442 MHz

Data Rate: 1Mbps



Channel Frequency: 2462 MHz

Data Rate: 1Mbps



Channel Frequency: 2412 MHz

Data Rate: 11Mbps

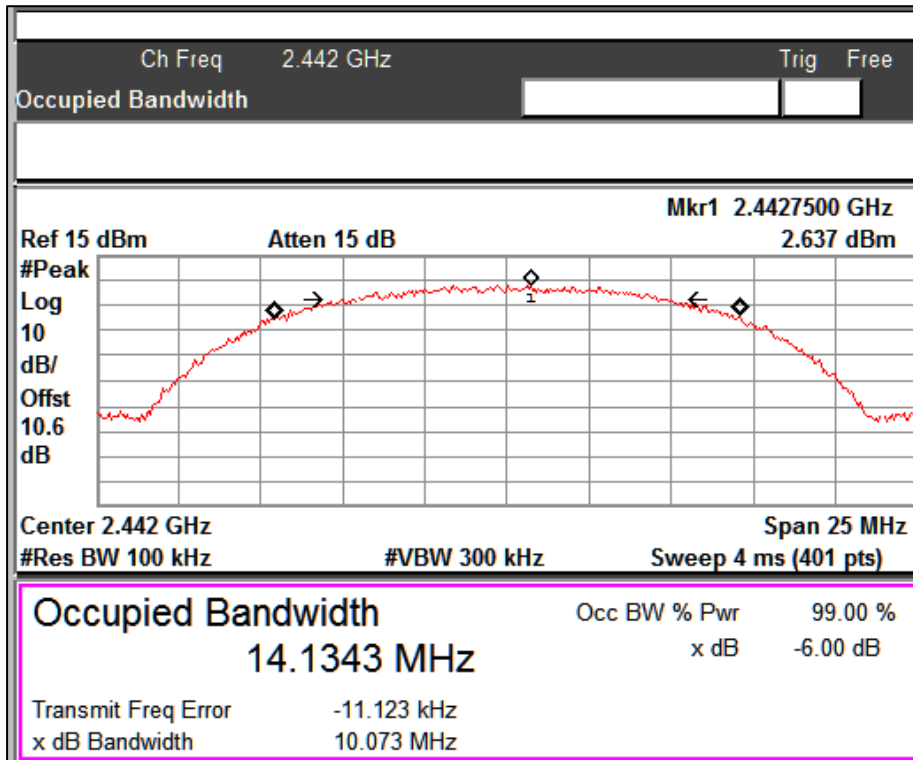
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000069F

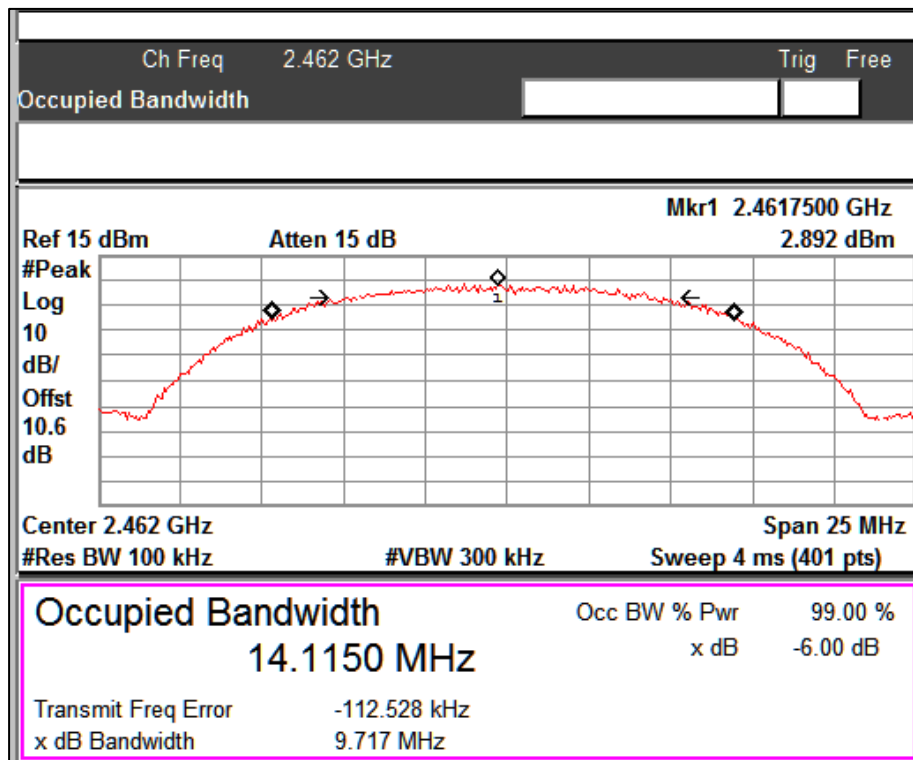
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Channel Frequency: 2442 MHz

Data Rate: 11Mbps



Channel Frequency: 2462 MHz

Data Rate: 11Mbps

Prüfbericht - Nr.:

Test Report No.:

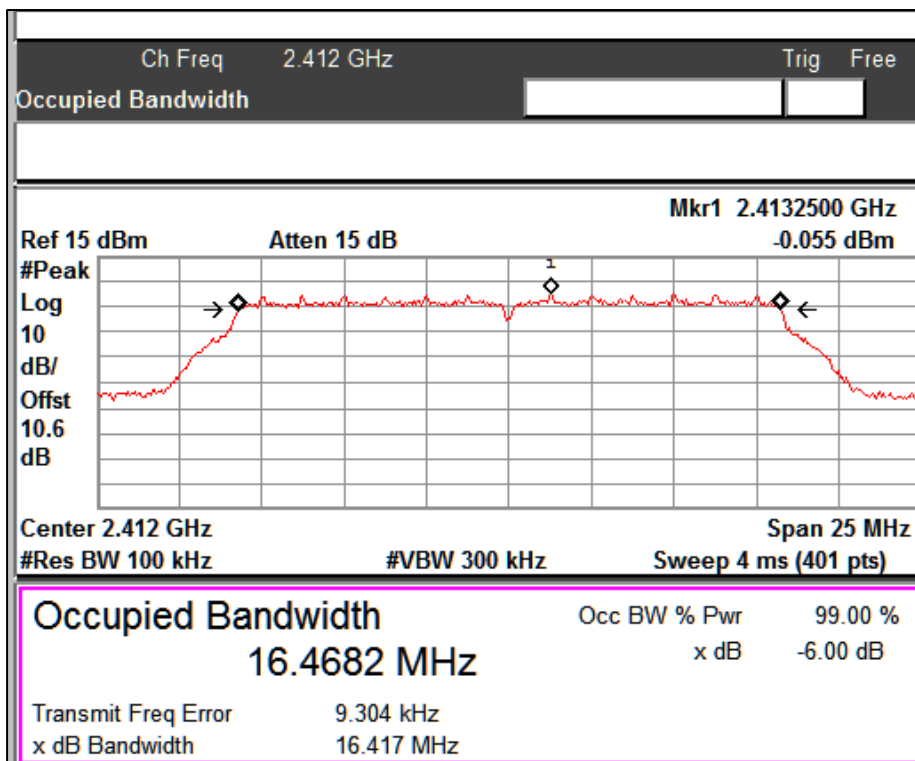
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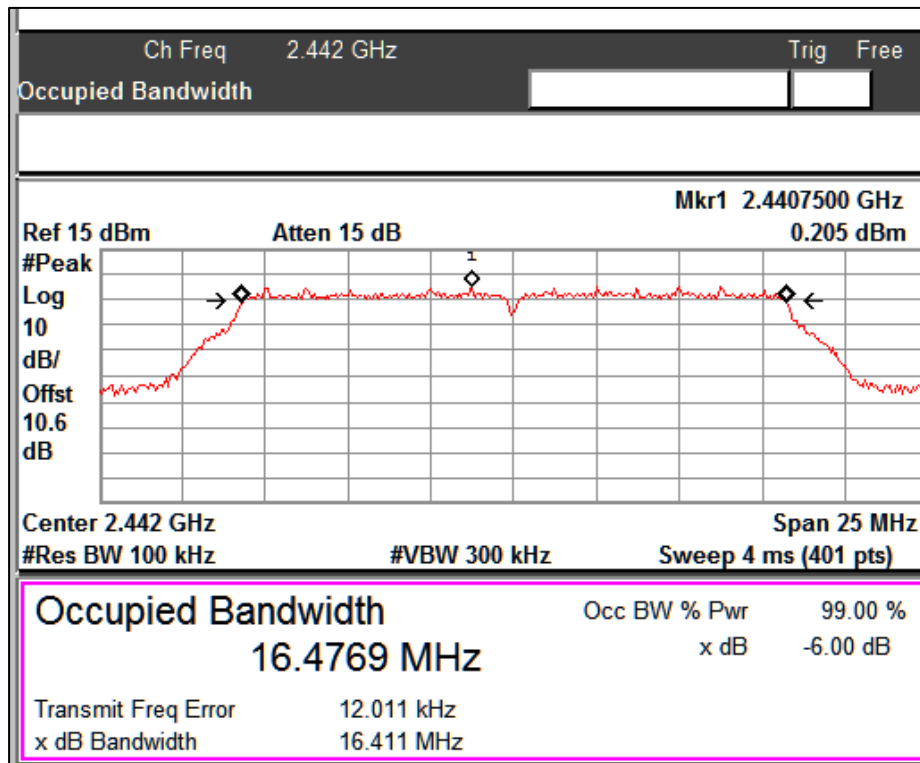
Protocol: 802.11g

Data Rate (Mbps)	Channel Frequency (MHz)	6dB Bandwidth (MHz)	99% OBW (MHz)
6	2412	16.41	16.46
	2442	16.41	16.47
	2462	16.39	16.47
24	2412	16.53	16.42
	2442	16.51	16.42
	2462	16.51	16.43
54	2412	16.53	16.43
	2442	16.53	16.43
	2462	16.53	16.43



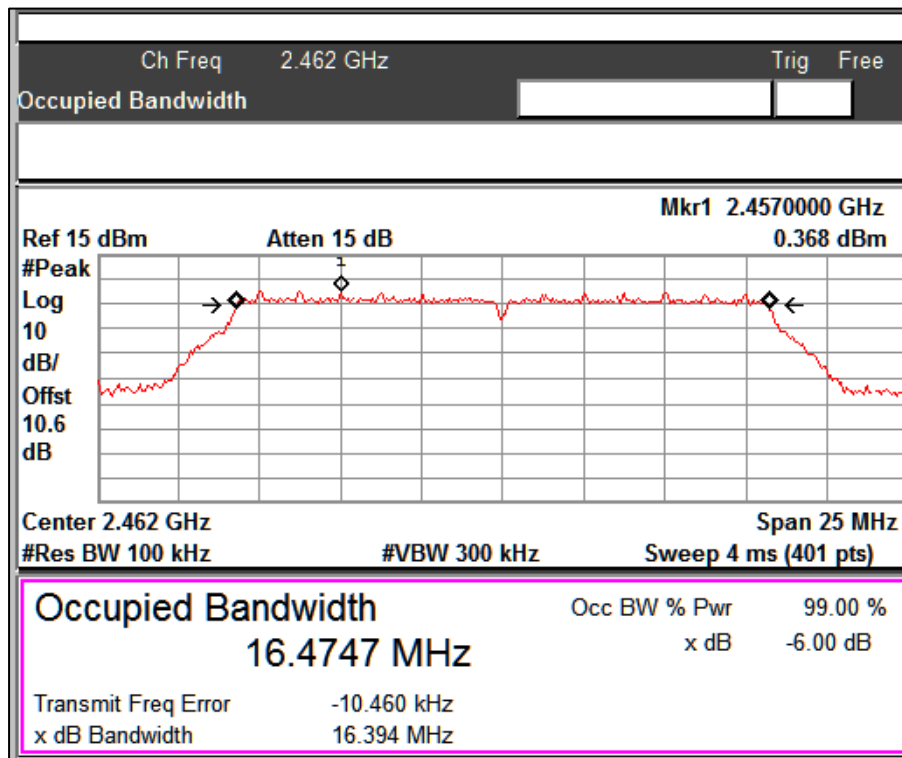
Channel Frequency: 2412 MHz

Data Rate: 6Mbps



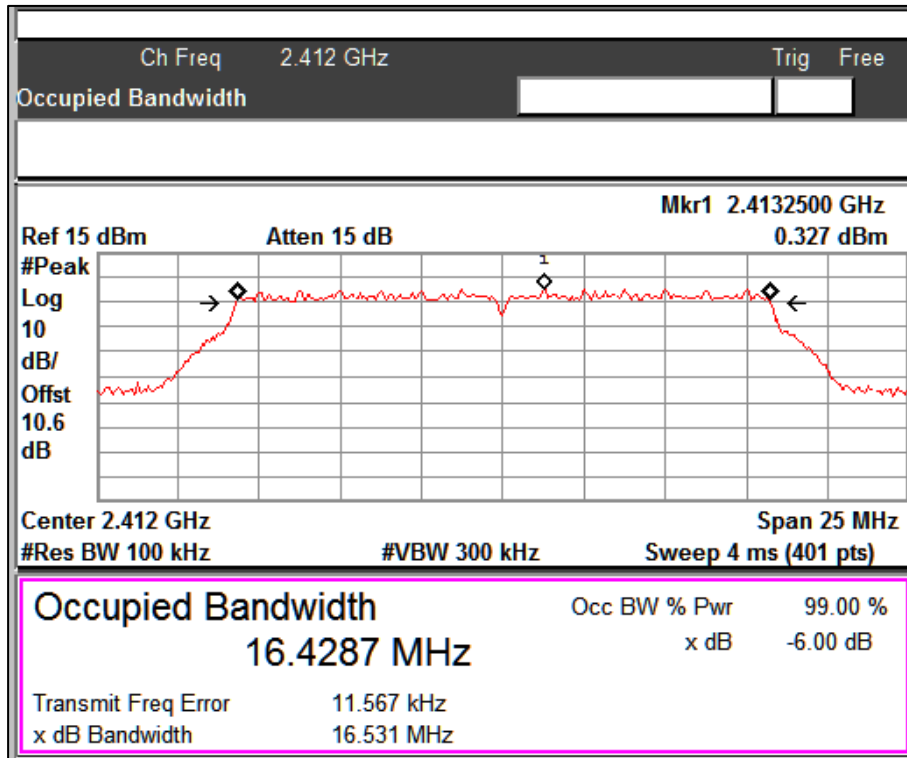
Channel Frequency: 2442 MHz

Data Rate: 6Mbps



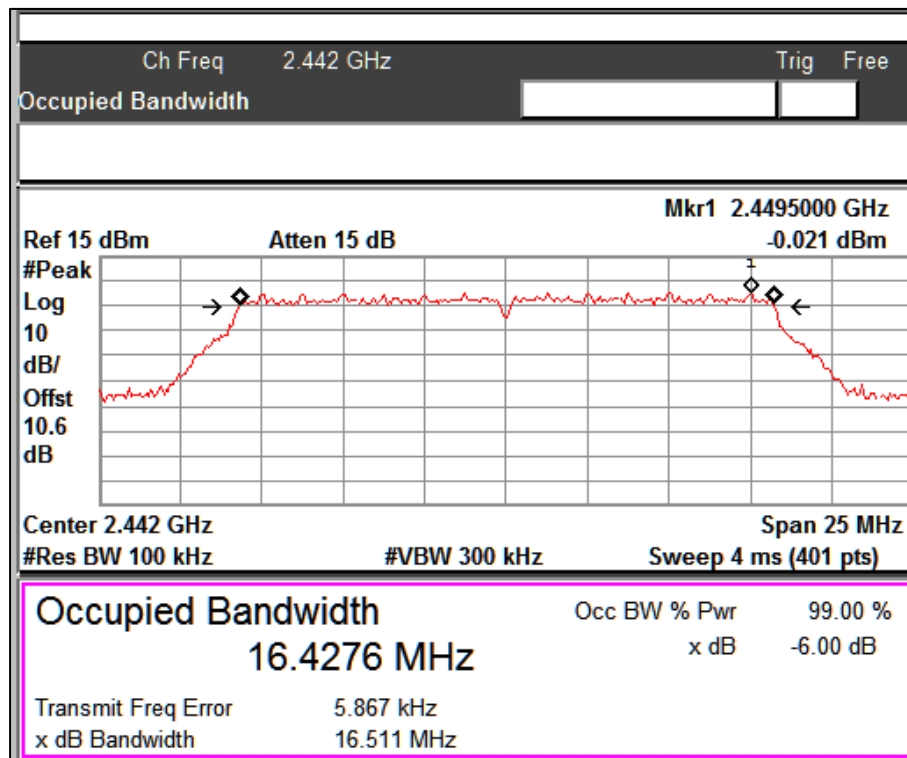
Channel Frequency: 2462 MHz

Data Rate: 6Mbps



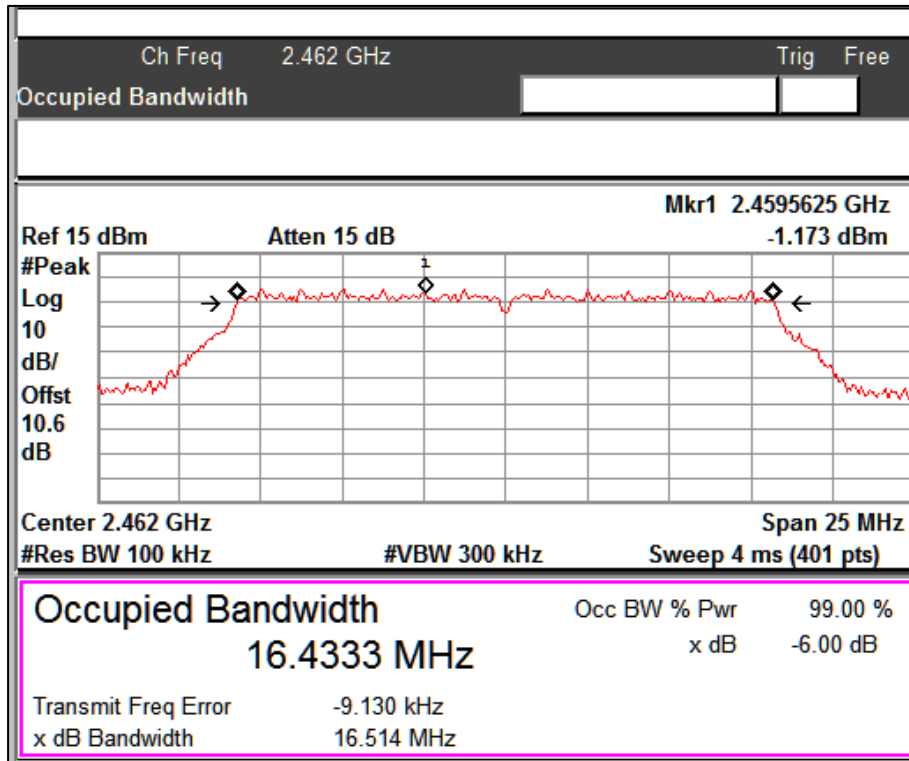
Channel Frequency: 2412 MHz

Data Rate: 24Mbps



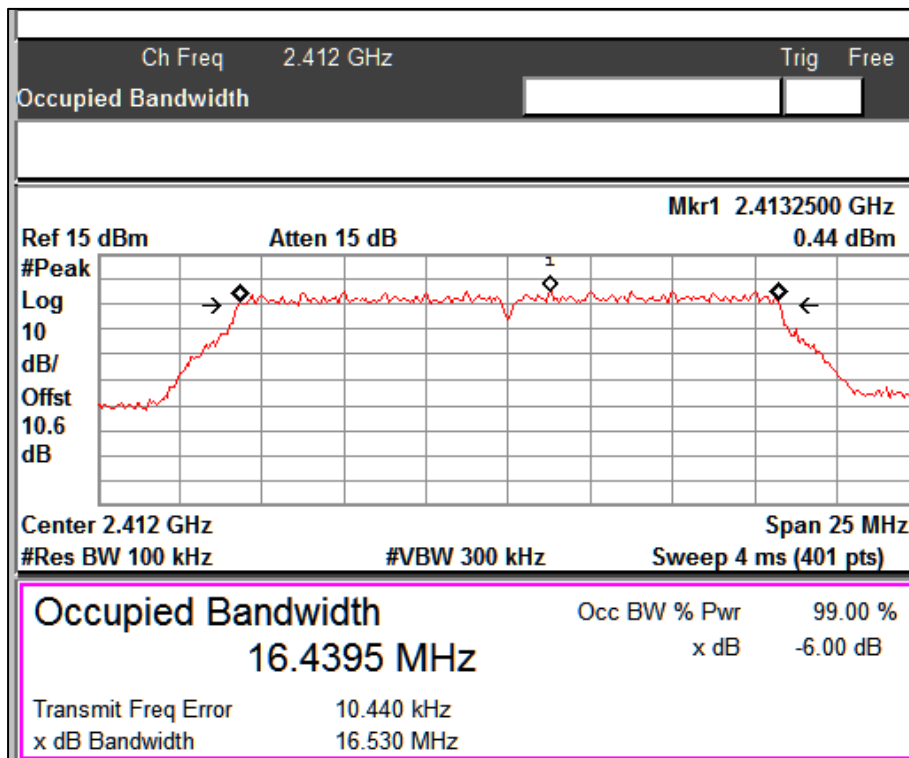
Channel Frequency: 2442 MHz

Data Rate: 24Mbps



Channel Frequency: 2462 MHz

Data Rate: 24Mbps



Channel Frequency: 2412 MHz

Data Rate: 54Mbps

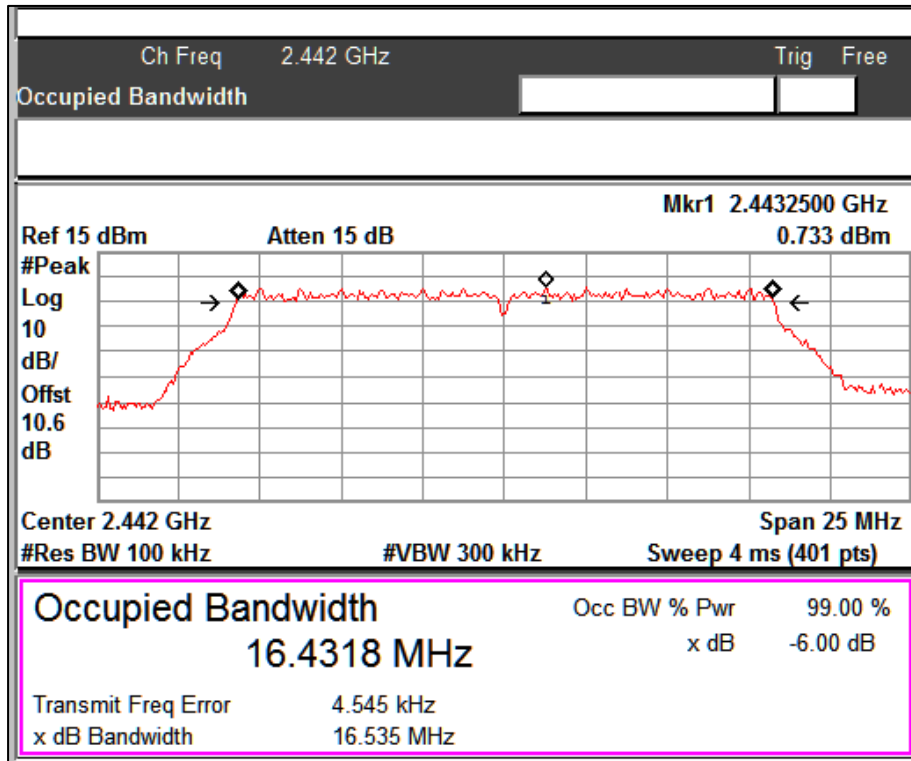
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000069F

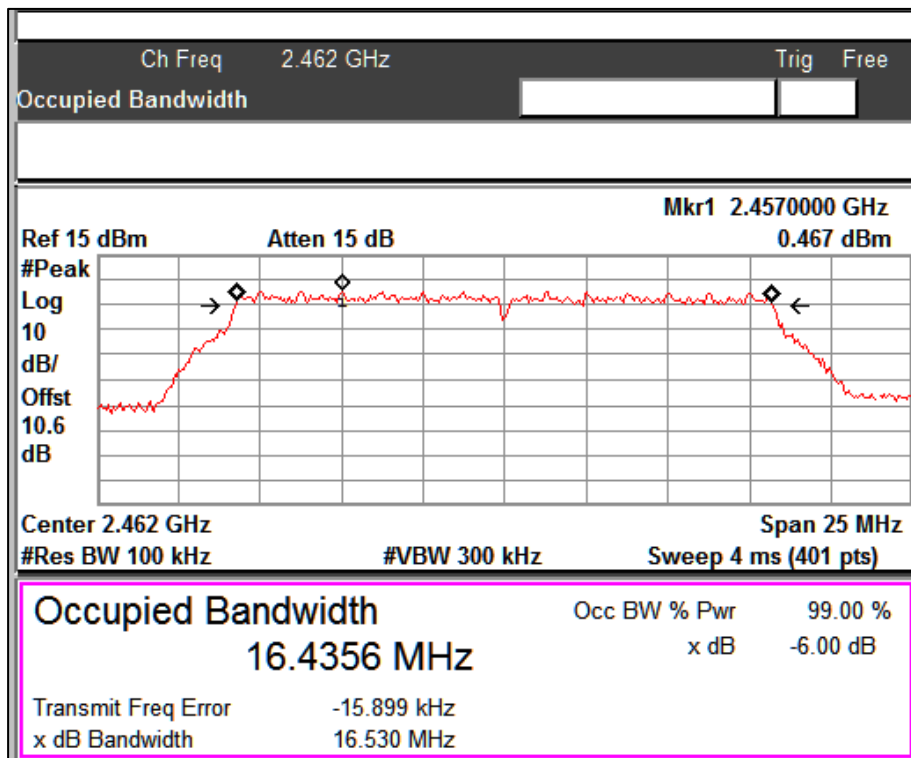
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Channel Frequency: 2442 MHz

Data Rate: 54Mbps



Channel Frequency: 2462 MHz

Data Rate: 54Mbps

Prüfbericht - Nr.:

Test Report No.:

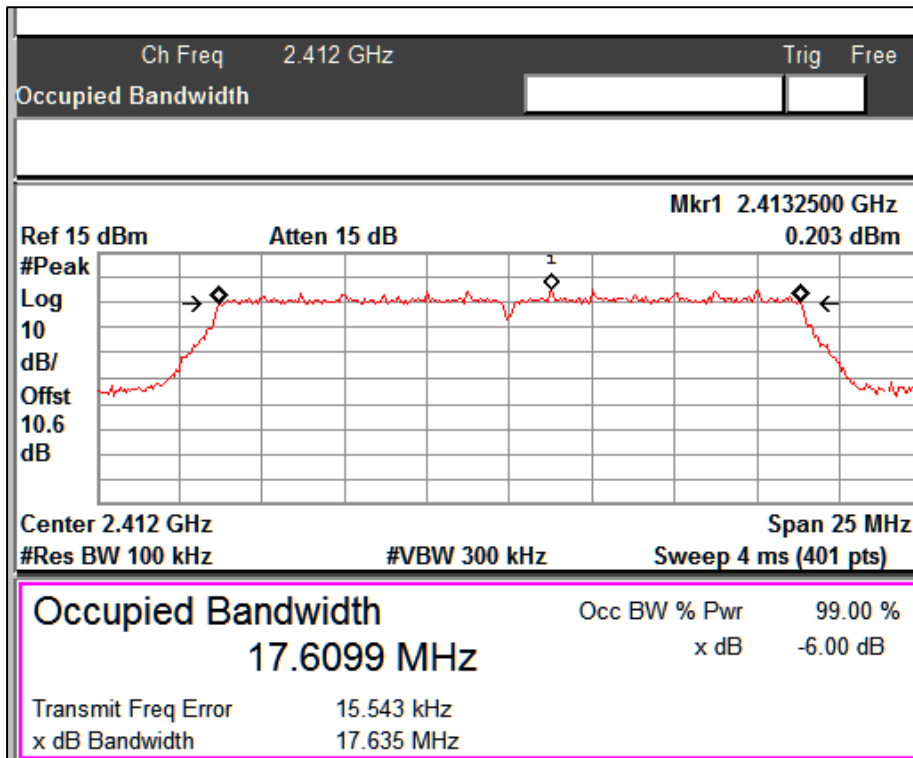
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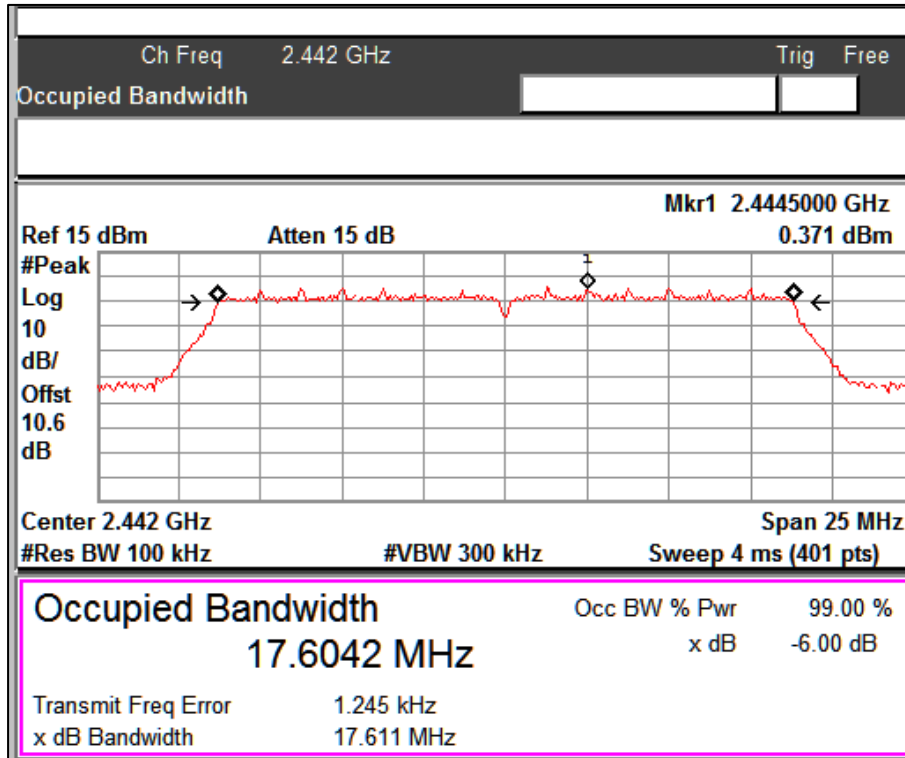
Protocol: 802.11n_HT20

Data Rate (Mbps)	Channel Frequency (MHz)	6dB Bandwidth (MHz)	99% OBW (MHz)
MCS0	2412	17.63	17.60
	2442	17.61	17.60
	2462	17.62	17.63
MCS4	2412	17.52	17.60
	2442	17.74	17.61
	2462	17.73	17.61
MCS7	2412	17.73	17.59
	2442	17.72	17.60
	2462	17.77	17.62



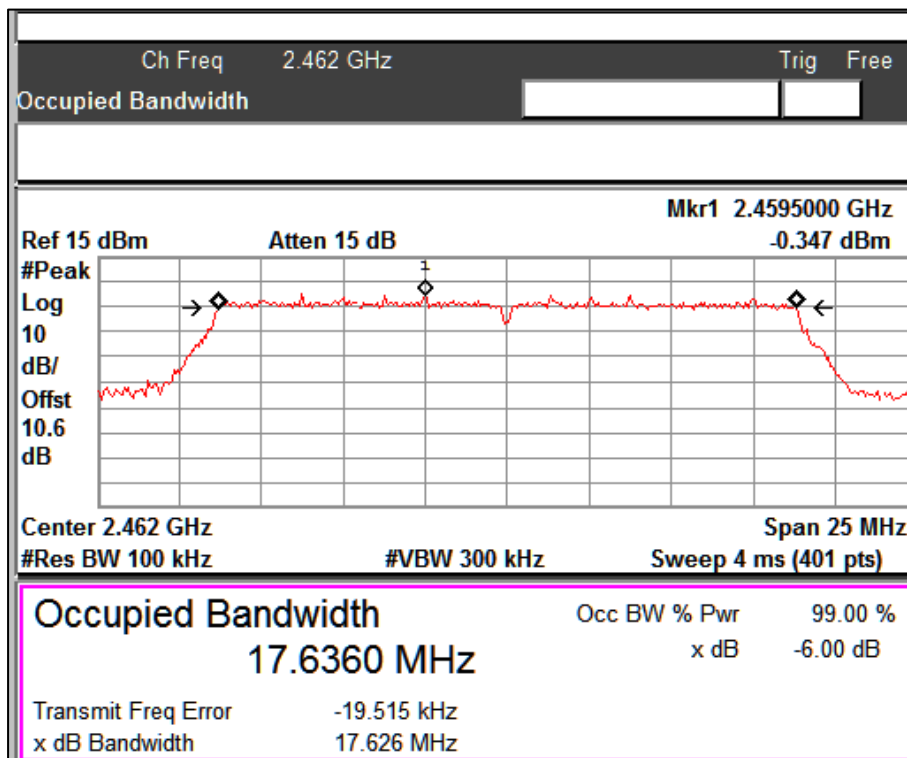
Channel Frequency: 2412 MHz

Data Rate: MCS0



Channel Frequency: 2442 MHz

Data Rate: MCS0



Channel Frequency: 2462 MHz

Data Rate: MCS0

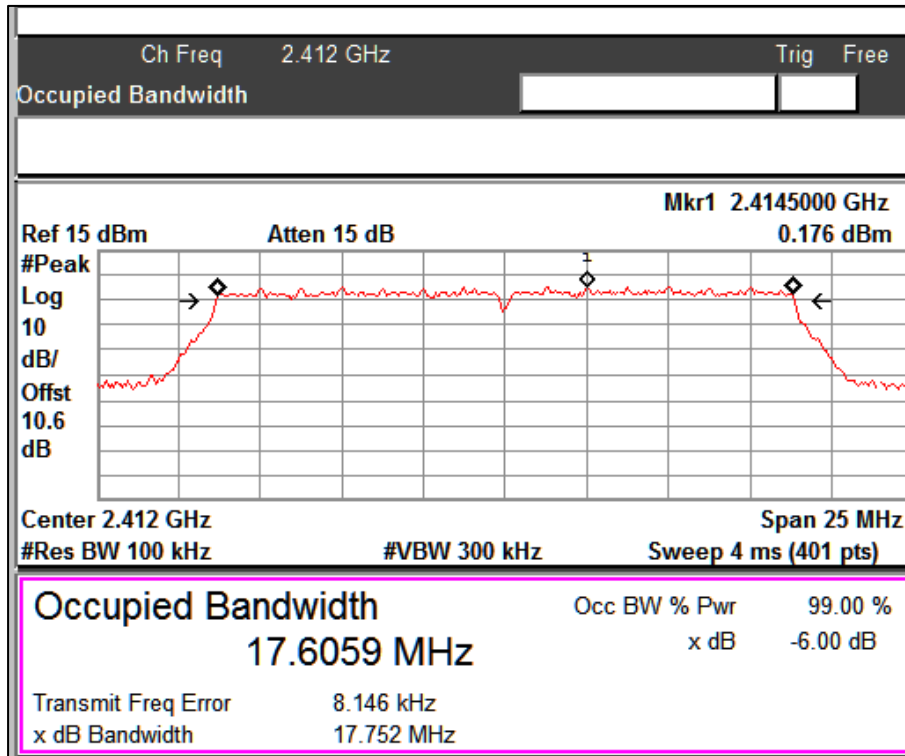
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000069F

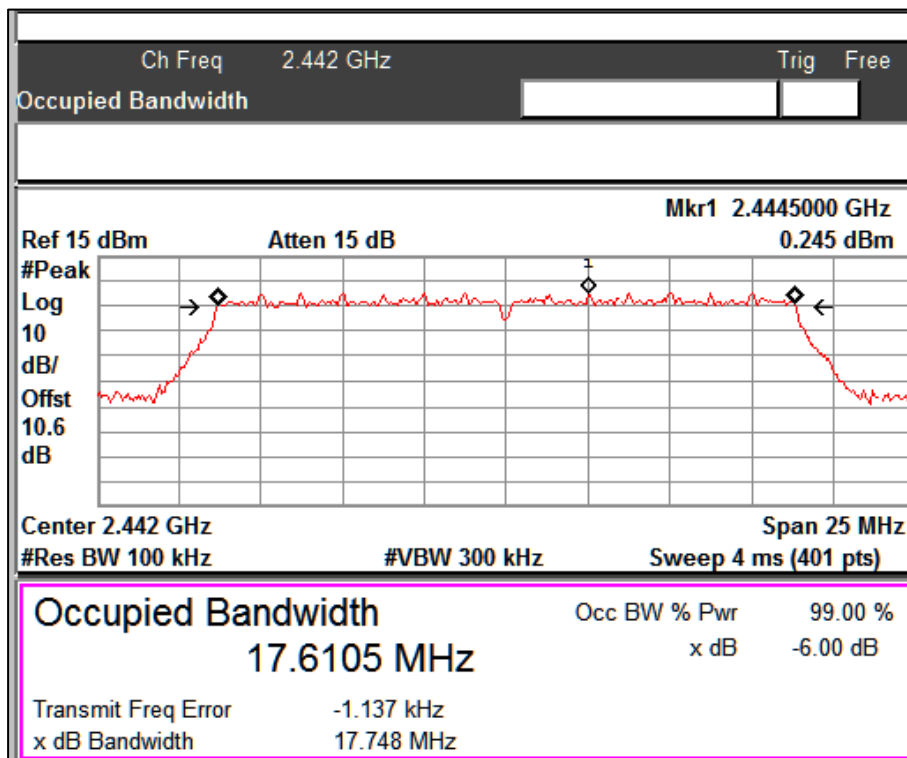
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Channel Frequency: 2412 MHz

Data Rate: MCS4



Channel Frequency: 2442 MHz

Data Rate: MCS4

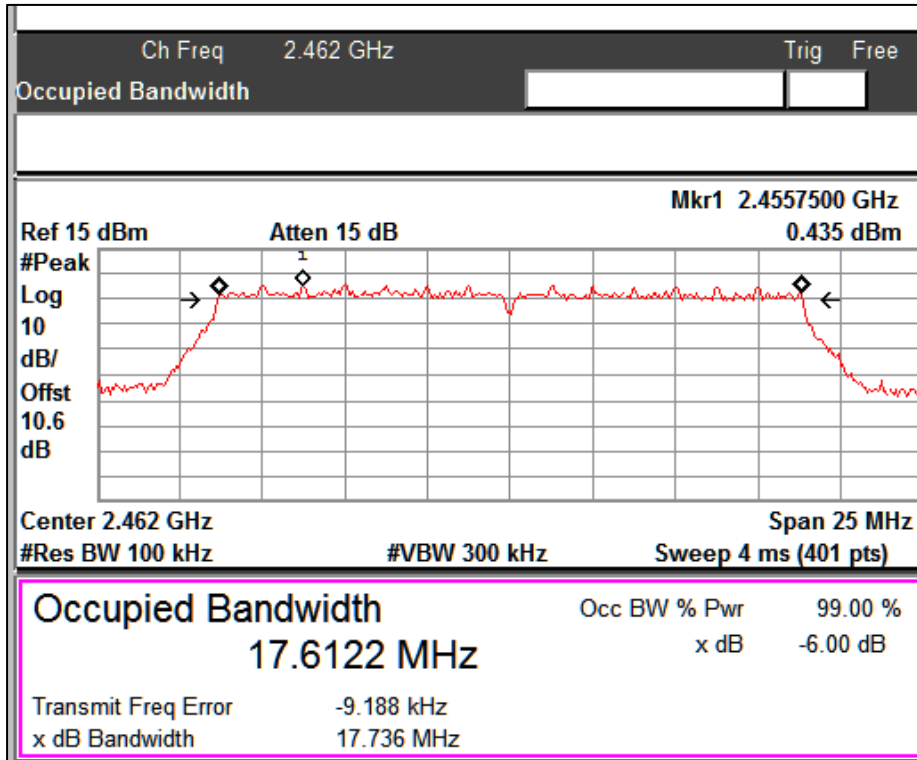
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000069F

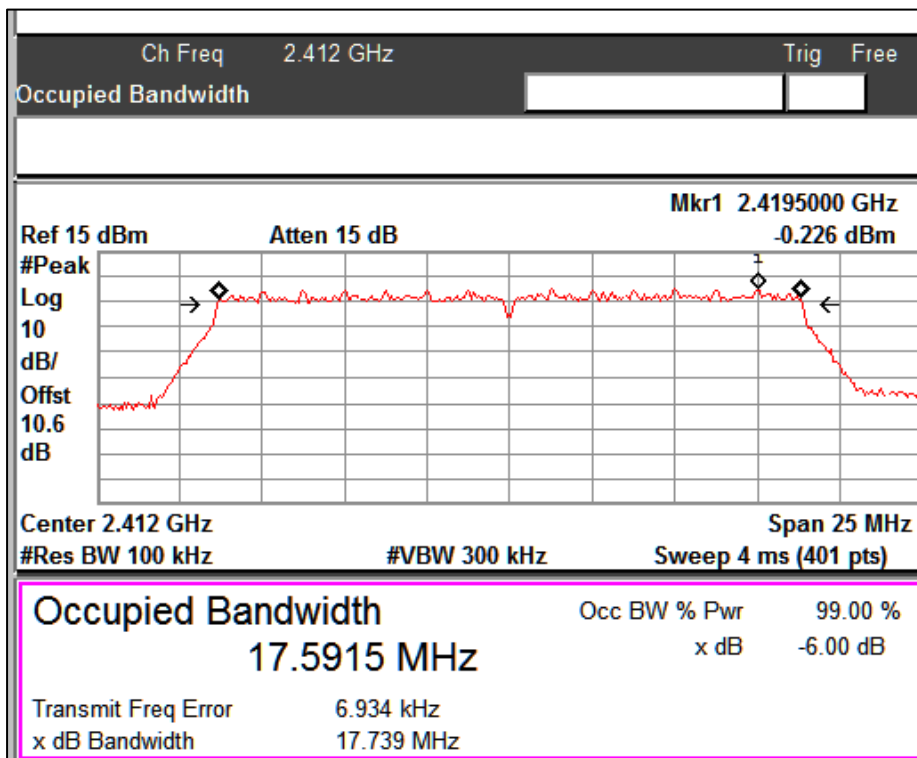
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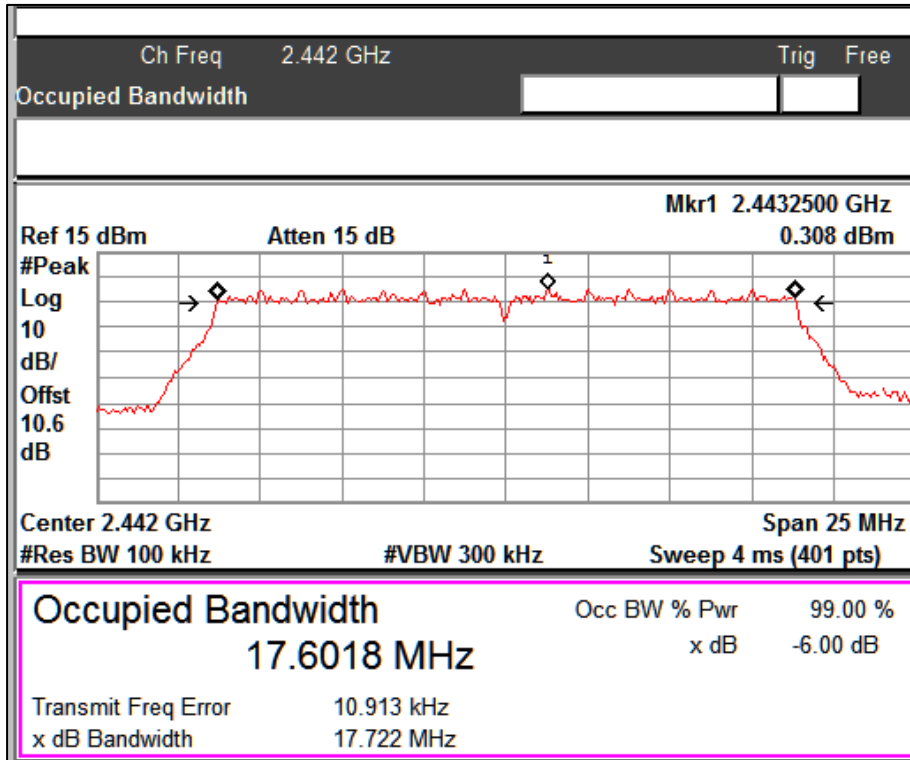
Channel Frequency: 2462 MHz

Data Rate: MCS4



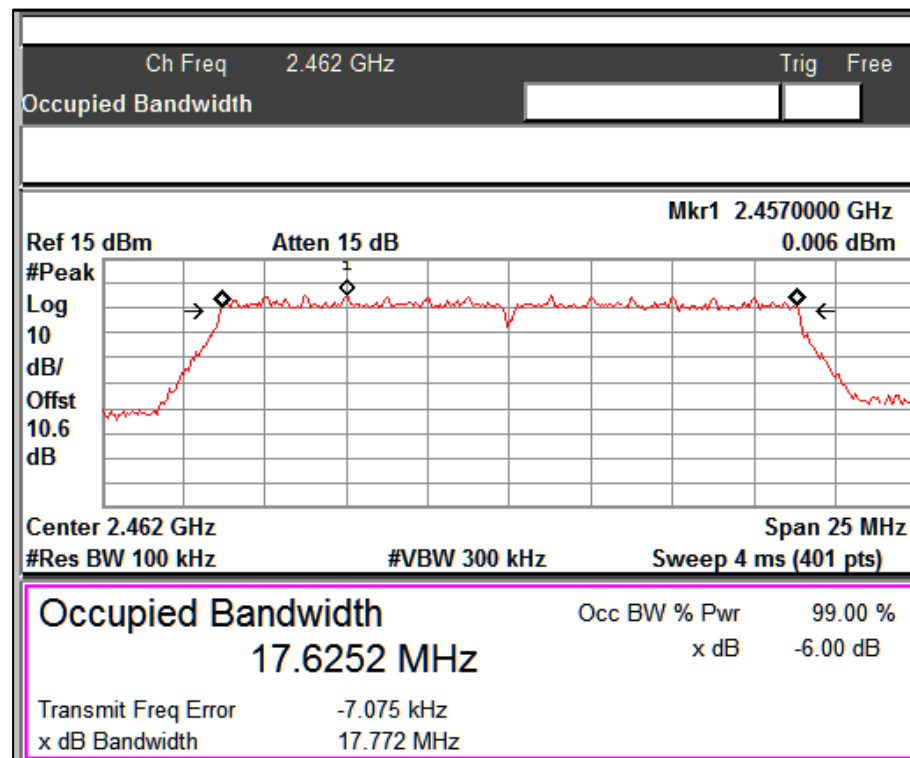
Channel Frequency: 2412 MHz

Data Rate: MCS7



Channel Frequency: 2442 MHz

Data Rate: MCS7



Channel Frequency: 2462 MHz

Data Rate: MCS7

Prüfbericht - Nr.:

Test Report No.:

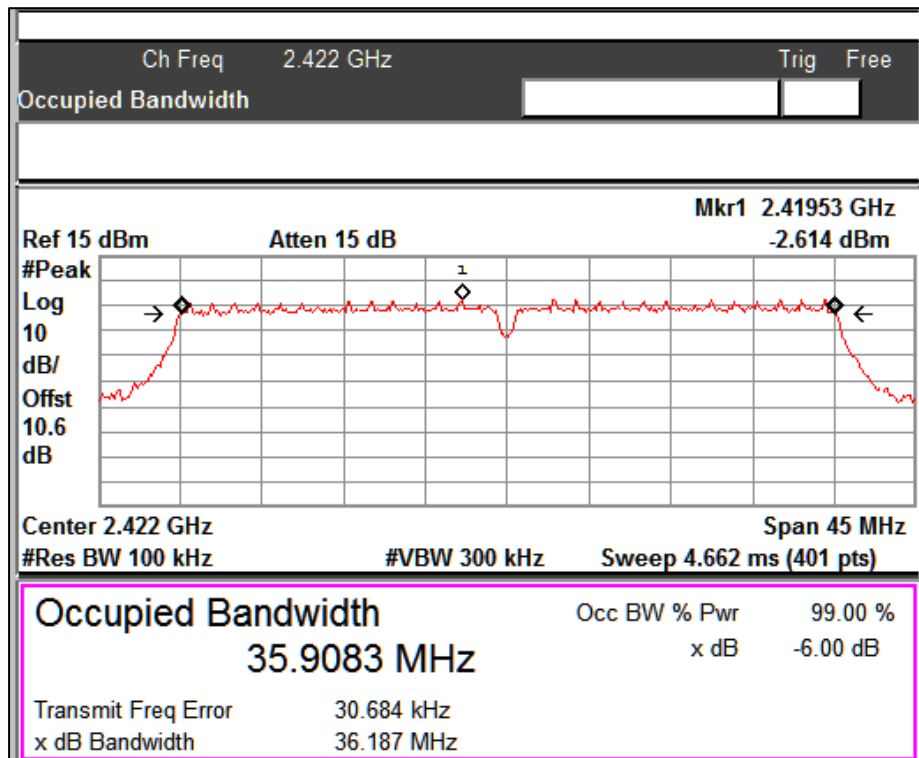
ULR-TC568819300000069F

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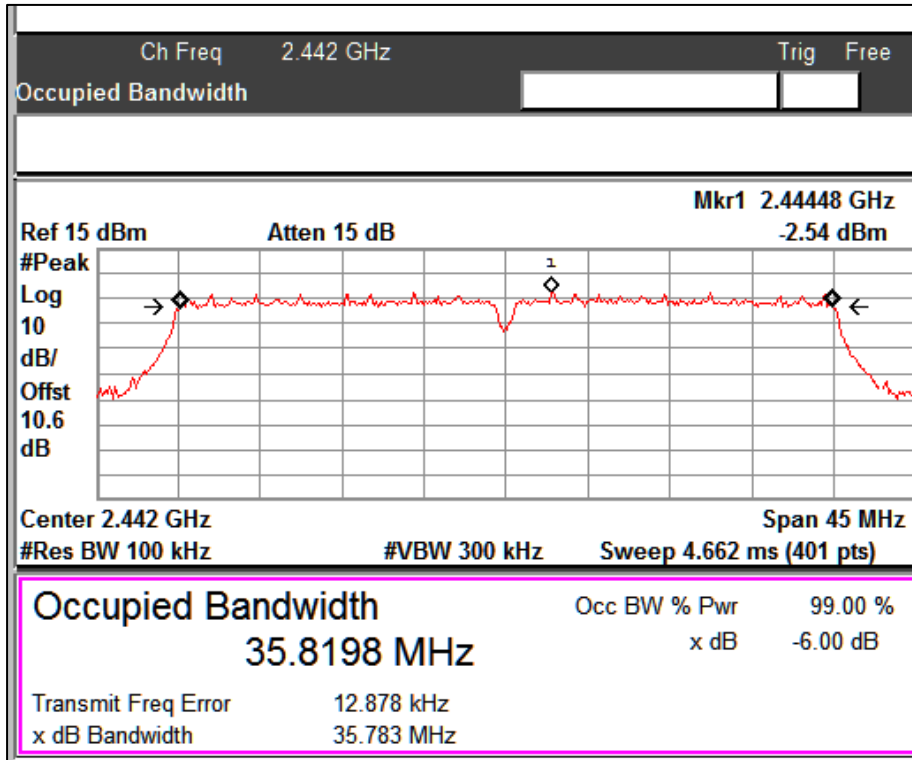
Protocol: 802.11n_HT40

Data Rate (Mbps)	Channel Frequency (MHz)	6dB Bandwidth (MHz)	99% OBW (MHz)
MCS0	2422	36.18	35.90
	2442	35.78	35.81
	2452	35.61	35.86
MCS4	2422	36.46	36.00
	2442	36.22	35.97
	2452	36.32	35.97
MCS7	2422	36.44	35.98
	2442	36.29	35.92
	2452	36.37	35.96



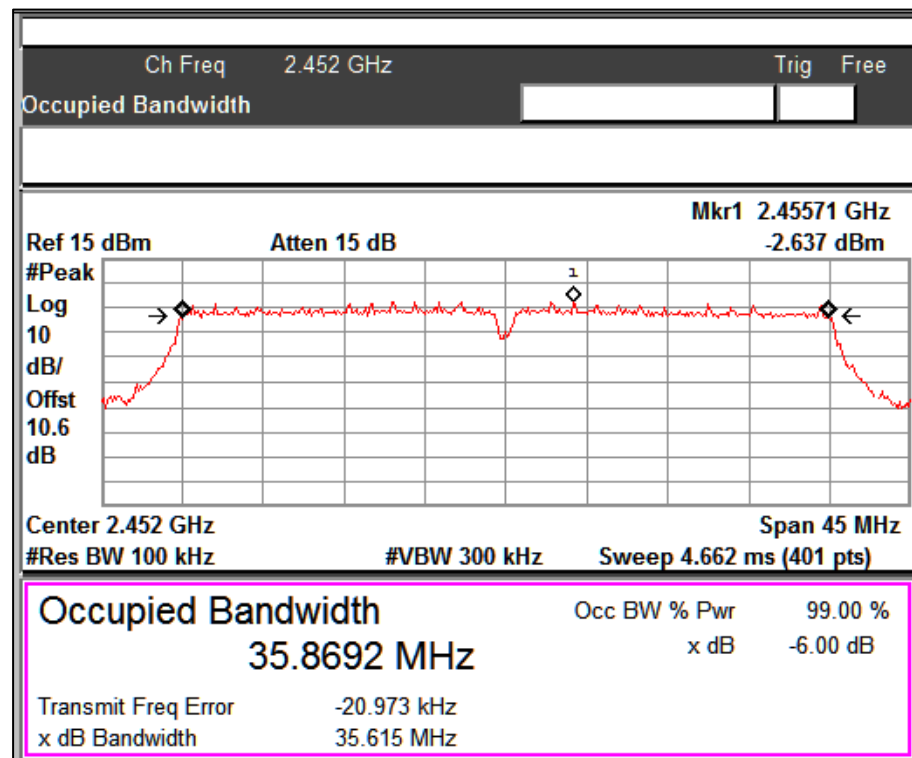
Channel Frequency: 2422 MHz

Data Rate: MCS0



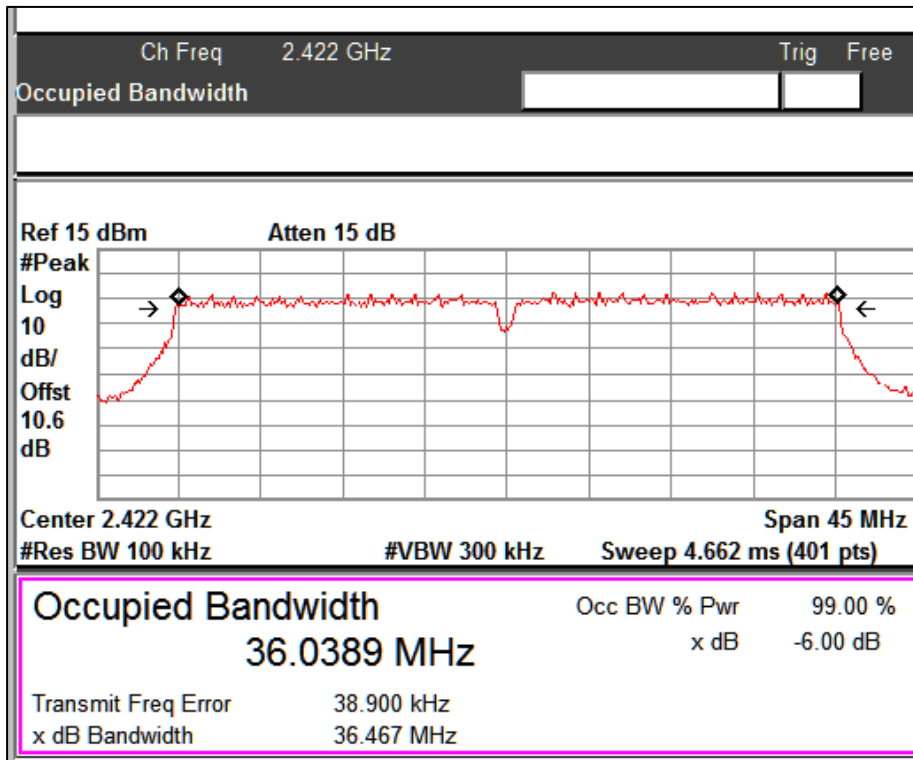
Channel Frequency: 2442 MHz

Data Rate: MCS0



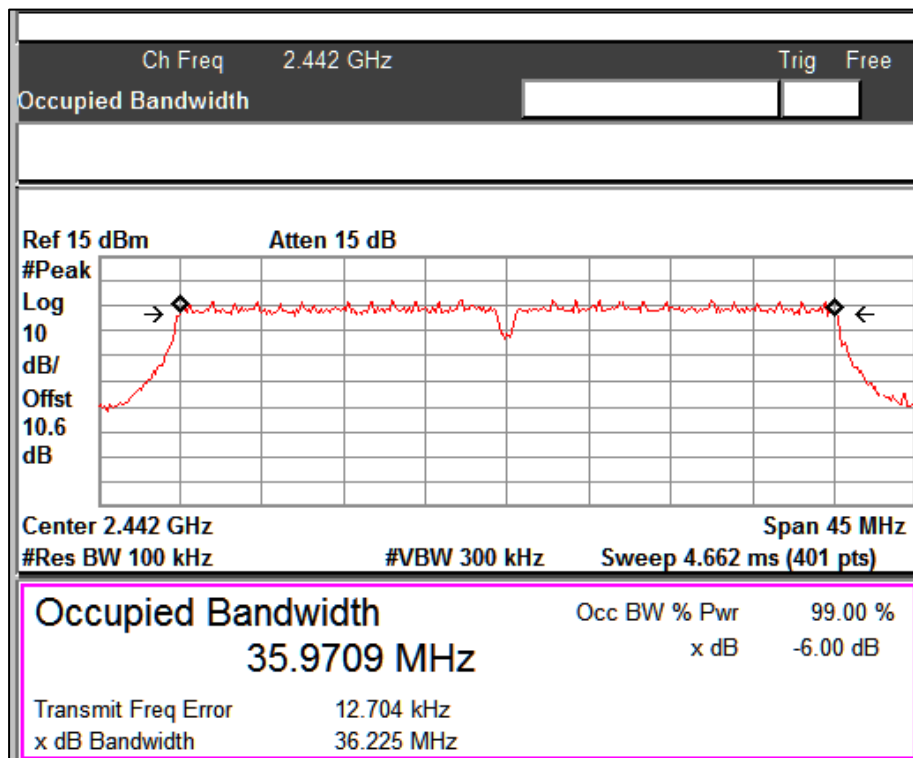
Channel Frequency: 2452 MHz

Data Rate: MCS0



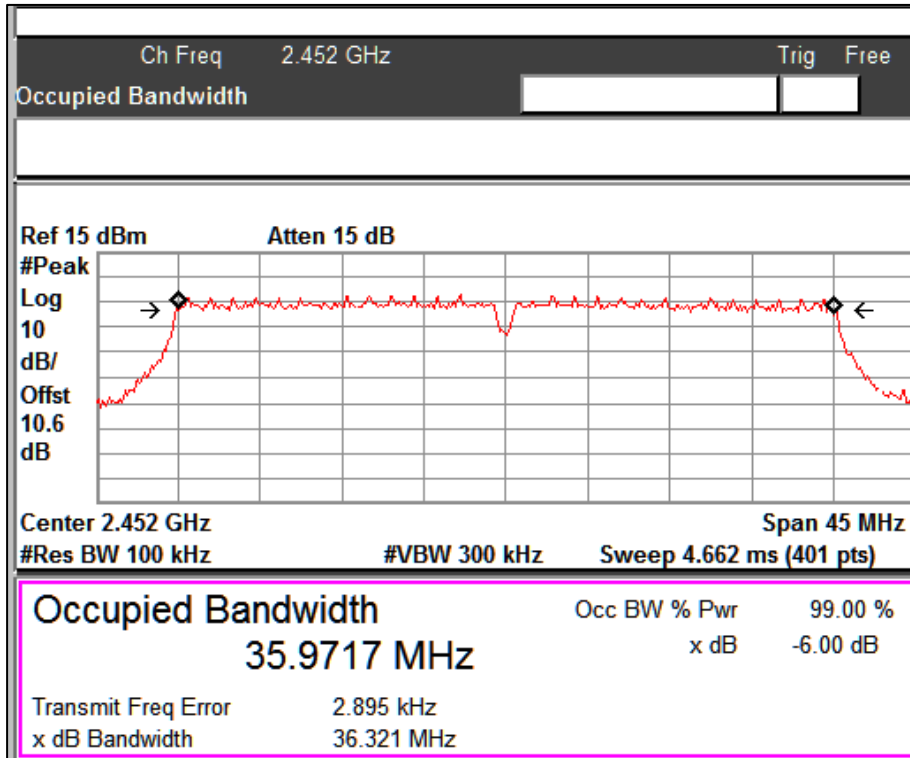
Channel Frequency: 2422 MHz

Data Rate: MCS4



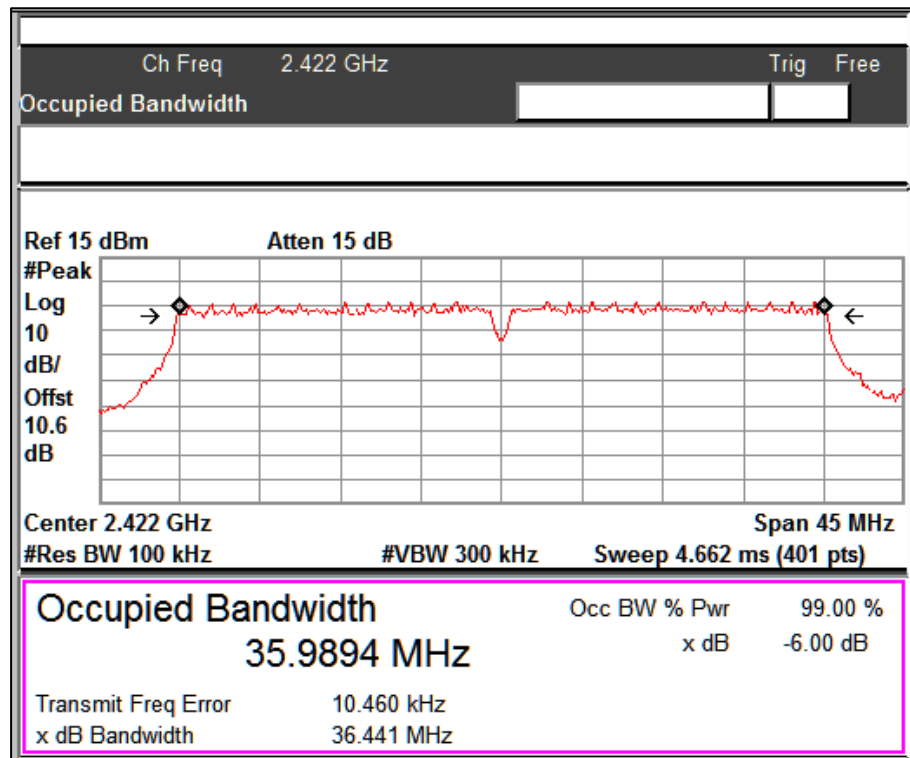
Channel Frequency: 2442 MHz

Data Rate: MCS4



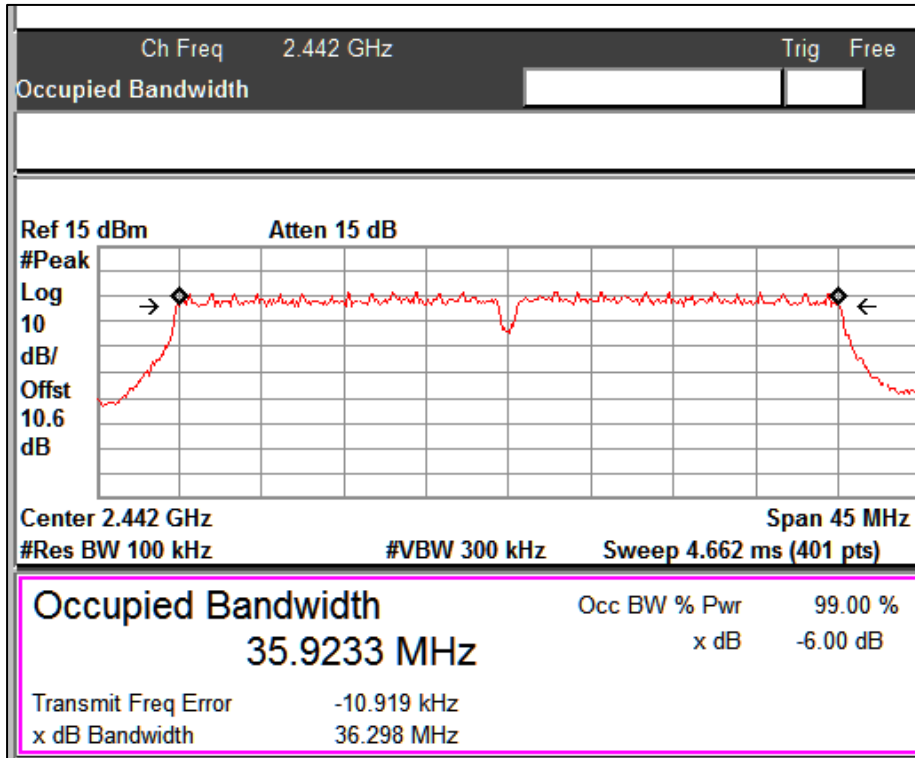
Channel Frequency: 2452 MHz

Data Rate: MCS4



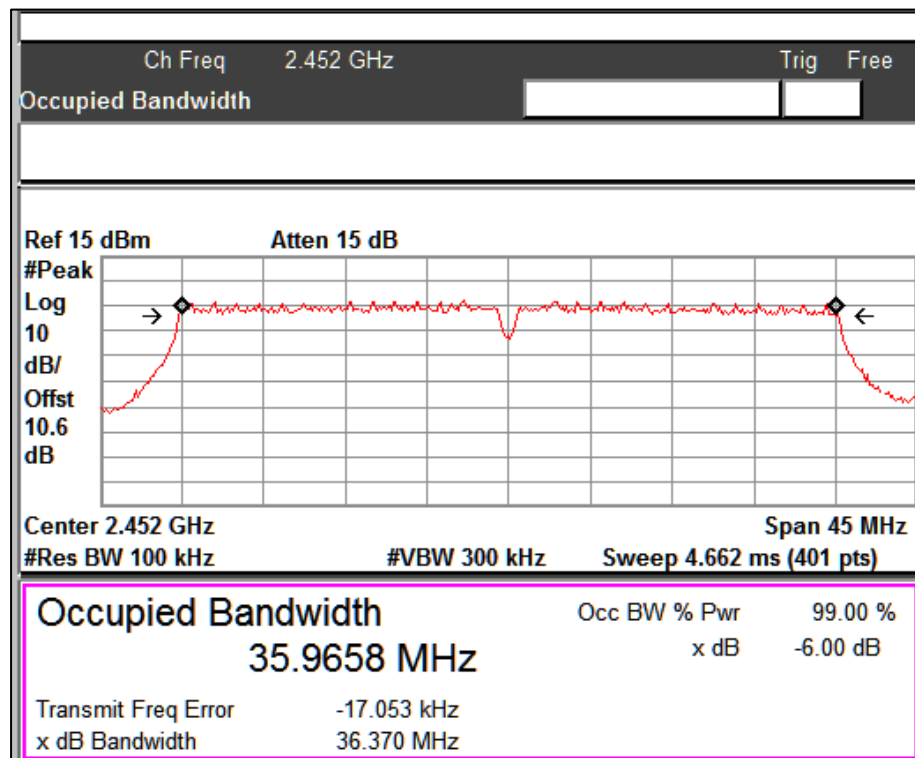
Channel Frequency: 2422 MHz

Data Rate: MCS7



Channel Frequency: 2442 MHz

Data Rate: MCS7



Channel Frequency: 2452 MHz

Data Rate: MCS7

6.4 Emissions in non-restricted frequency bands and conducted spurious emission

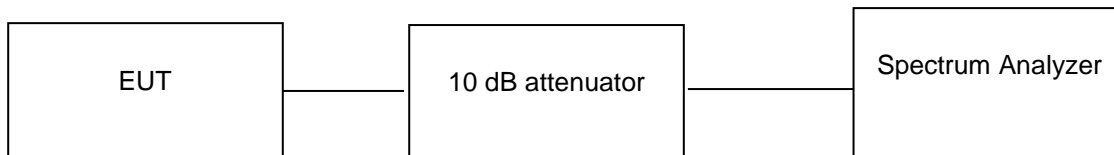
6.4.1 Emissions in non-restricted frequency bands

Result

Pass

Test Specification FCC Part 15 Subpart C Section 15.247 (d) / RSS 247 Issue 2, Section 5.5
 Detector Function Peak
 Port of testing Antenna port
 Requirement In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the Highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Method:



Environmental and Test conditions:

Normal Temperature = +25 °C Voltage (V norm) = 7.4 VDC RH = 63.2 %

Test results:

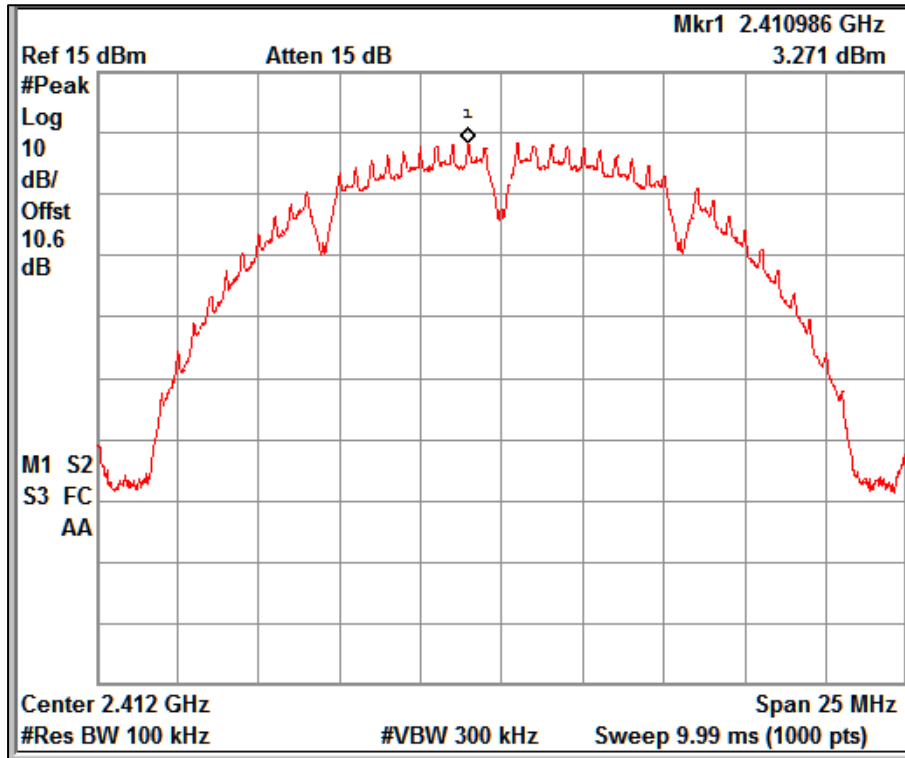
10 dB attenuator + 0.6 dB Cable loss = 10.6 dB offset is considered in below result

Test Results:

Protocol: 802.11b

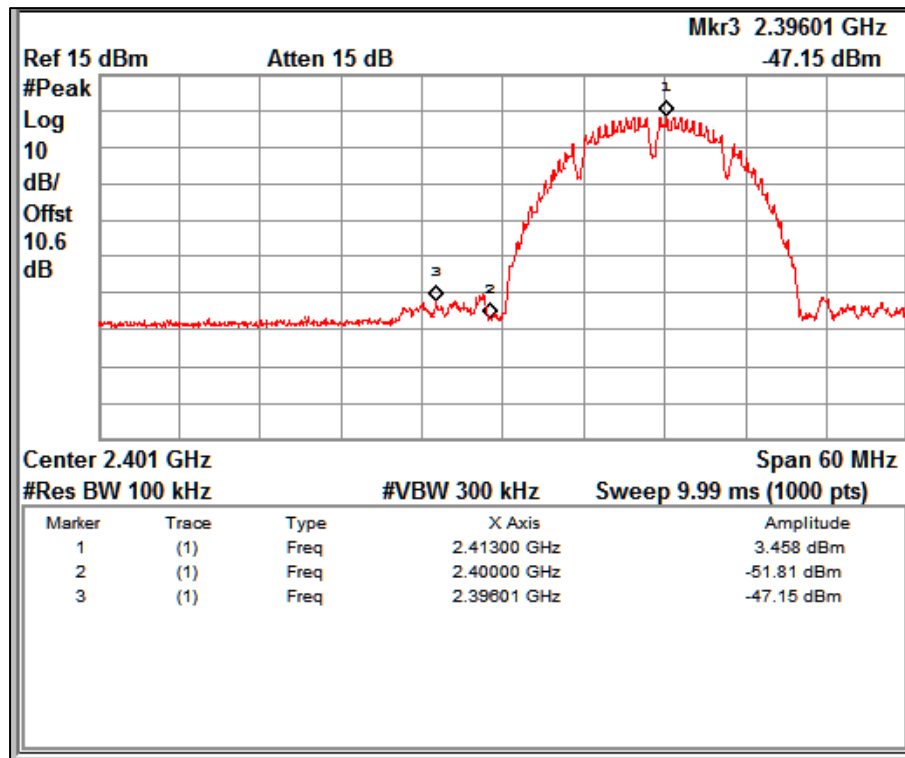
Data Rate (Mbps)	Channel Frequency (MHz)	Value of Band edge		Reference value B (dBm)	Band Edge Value A~B (dBm)	Limit (dBm)
		Frequency (MHz)	Value A (dBm)			
1	2412	2400	-51.81	3.27	-55.08	-30
	2462	2483.5	-51.69	3.02	-54.71	-30
11	2412	2400	-46.97	3.15	-50.12	-30
	2462	2483.5	-52.39	3.29	-55.68	-30

Reference Plot



Channel Frequency: 2412 MHz

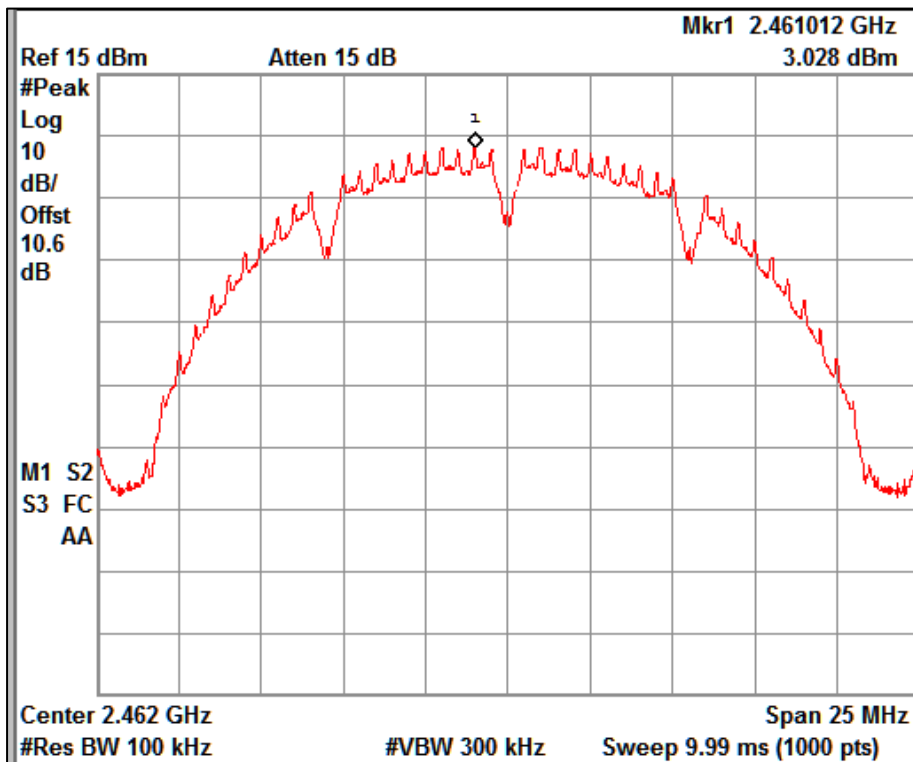
Data rate: 1Mbps



Channel Frequency: 2412 MHz

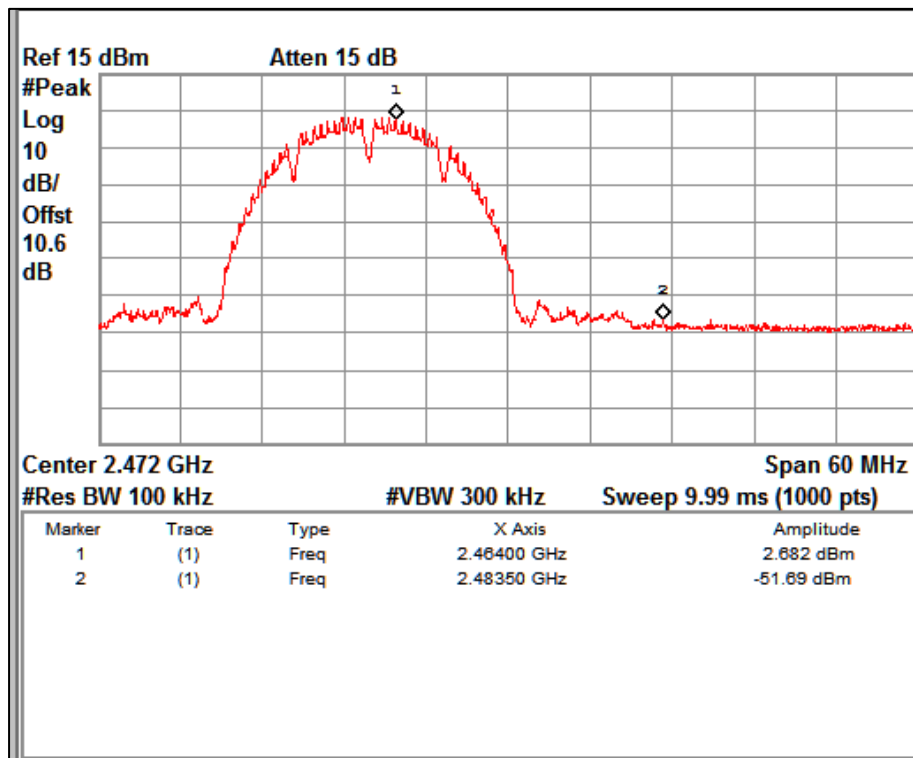
Data rate: 1Mbps

Reference Plot



Channel Frequency: 2462 MHz

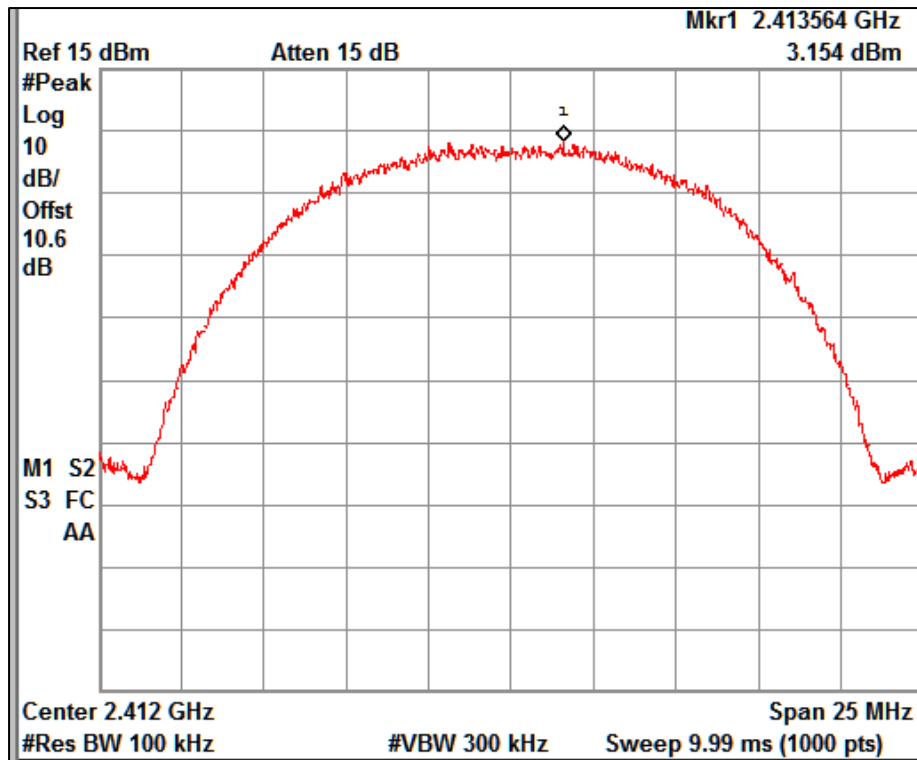
Data rate: 1Mbps



Channel Frequency: 2462 MHz

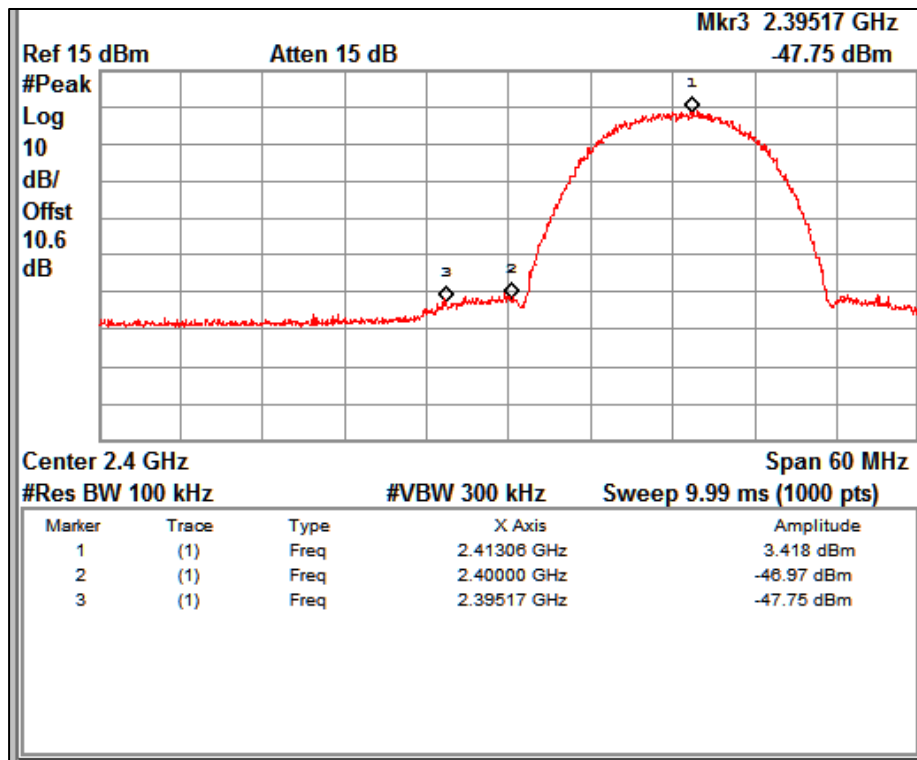
Data rate: 1Mbps

Reference Plot



Channel Frequency: 2412 MHz

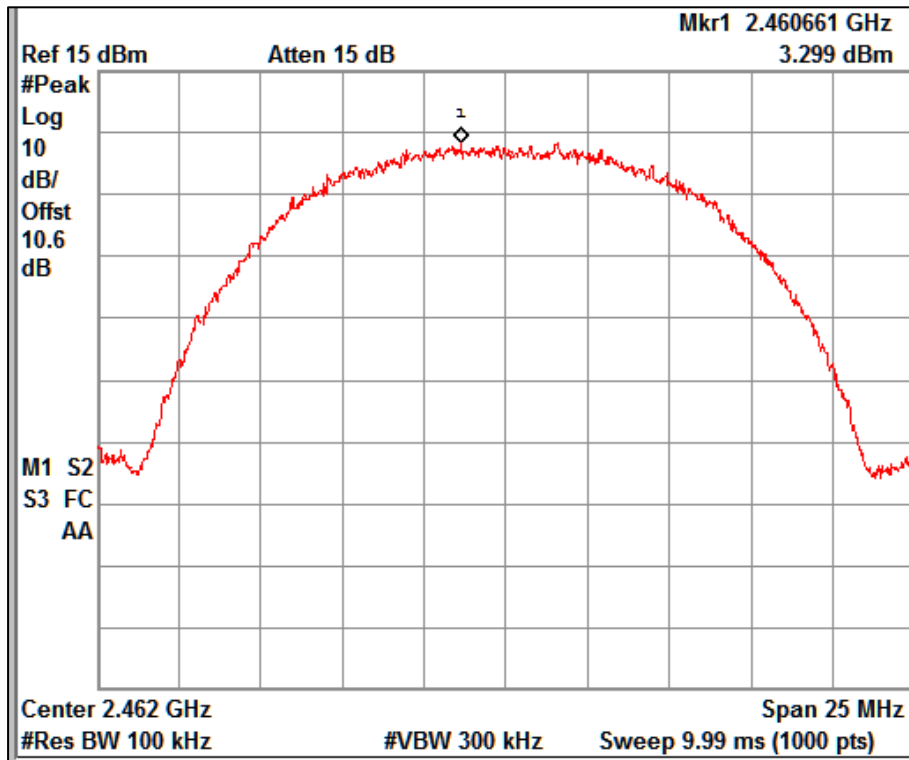
Data rate: 11Mbps



Channel Frequency: 2412 MHz

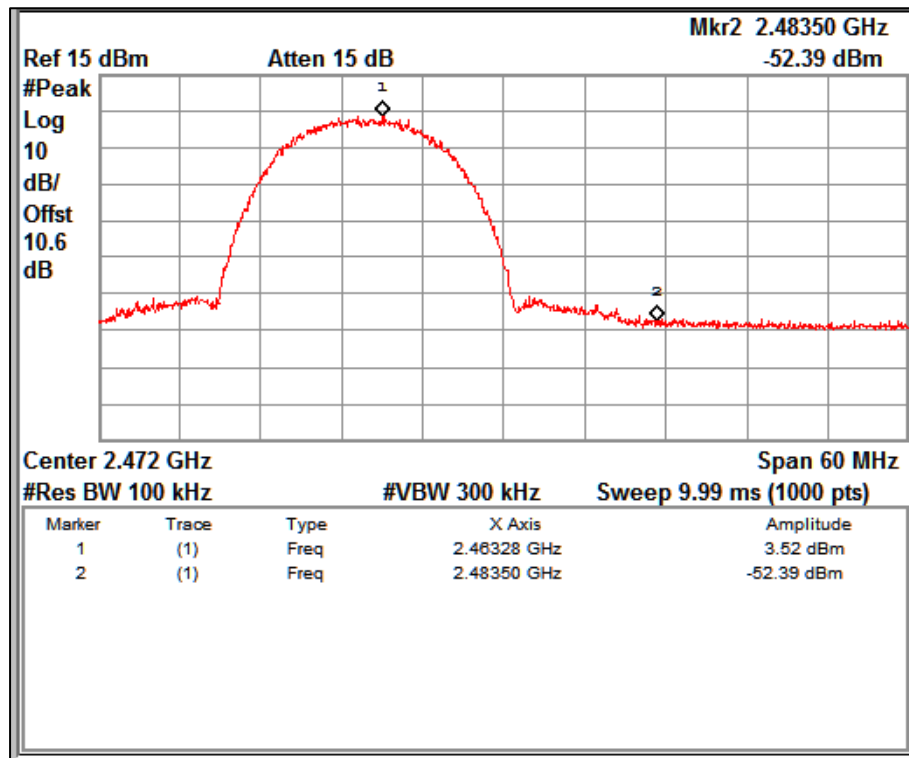
Data rate: 11Mbps

Reference Plot



Channel Frequency: 2462 MHz

Data rate: 11Mbps



Channel Frequency: 2462 MHz

Data rate: 11Mbps

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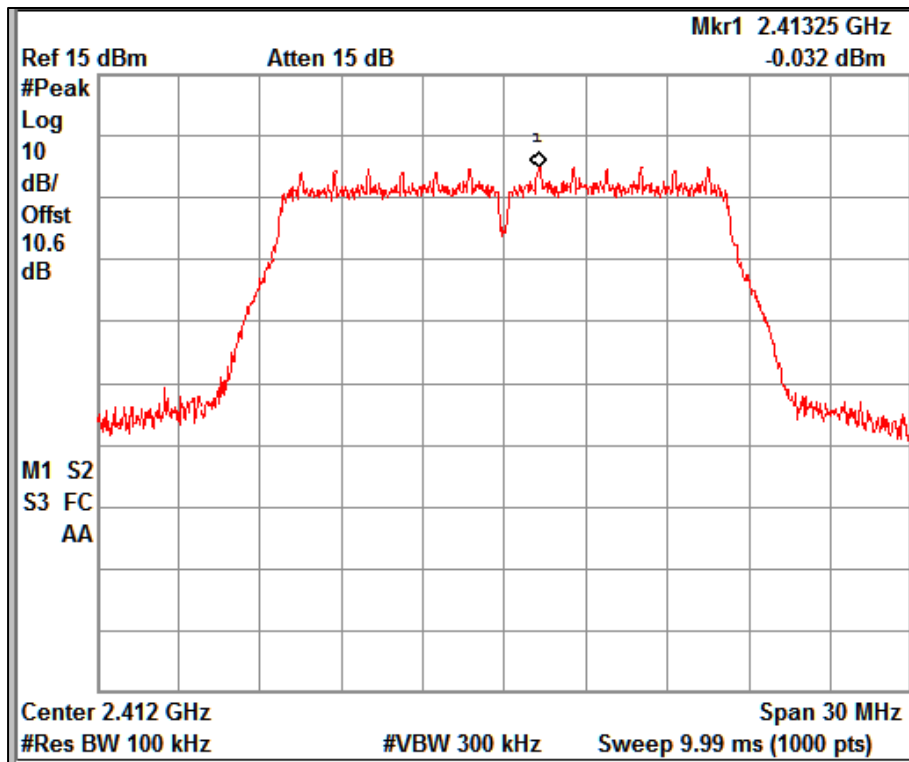
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Protocol: 802.11g

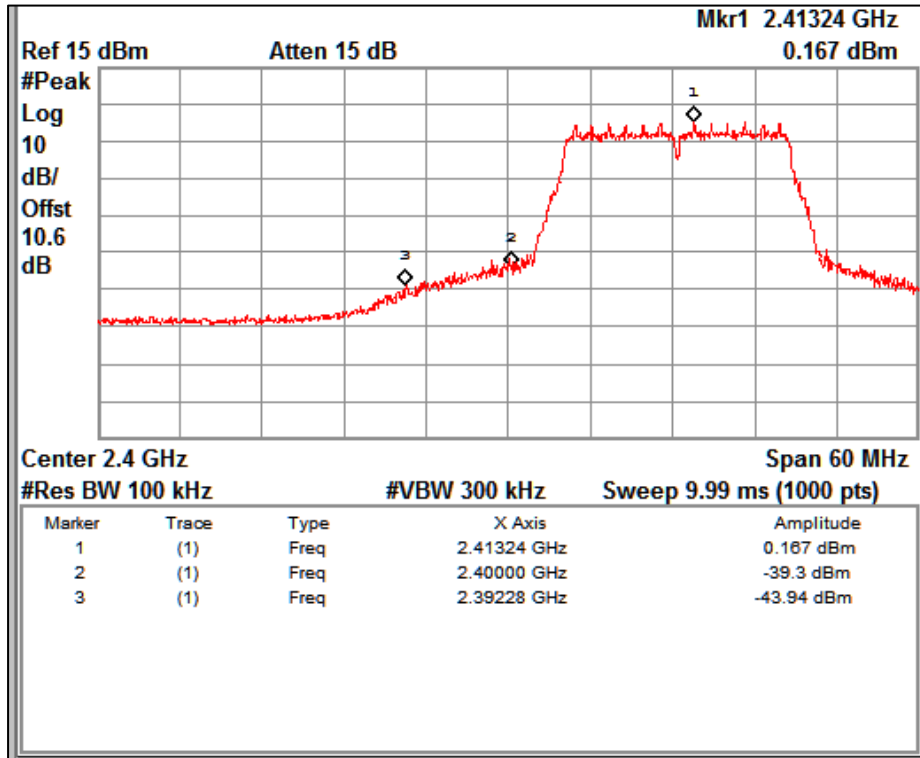
Data Rate (Mbps)	Channel Frequency (MHz)	Value of Band edge		Reference value B (dBm)	Band Edge Value A-B (dBm)	Limit (dBm)
		Frequency (MHz)	Value A (dBm)			
6	2412	2400	-39.3	-0.03	-39.27	-30
	2462	2483.5	-48.73	0.18	-48.91	-30
24	2412	2400	-42.37	0.06	-42.43	-30
	2462	2483.5	-49.13	0.01	-49.14	-30
54	2412	2400	-45.82	0.00	-45.82	-30
	2462	2483.5	-46.22	0.54	-46.76	-30

Reference Plot



Channel Frequency: 2412 MHz

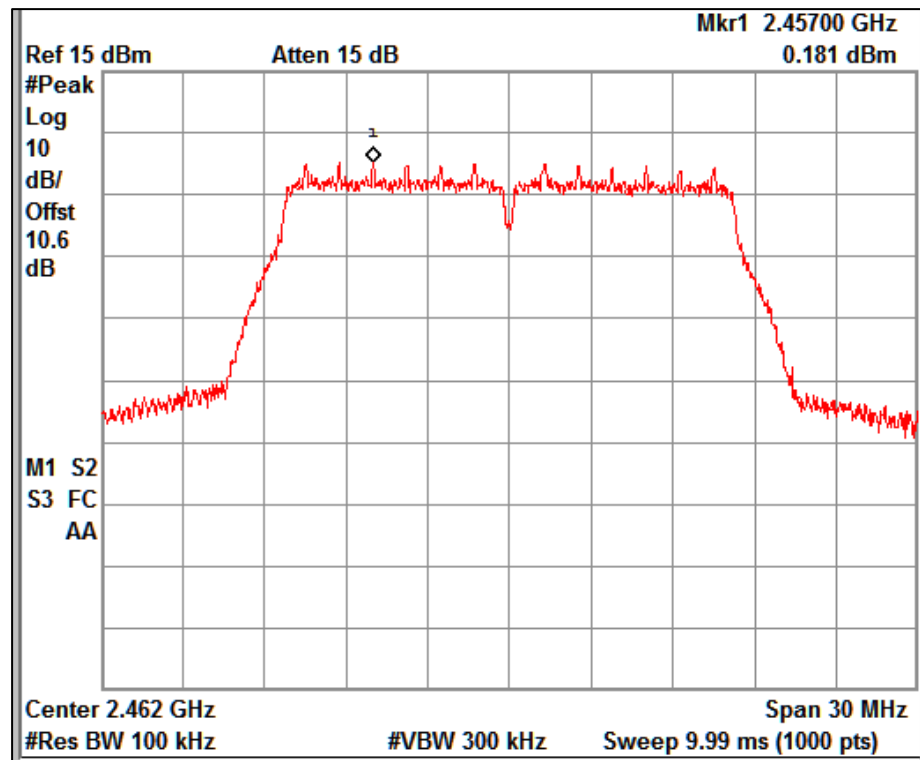
Data rate: 6Mbps



Channel Frequency: 2412 MHz

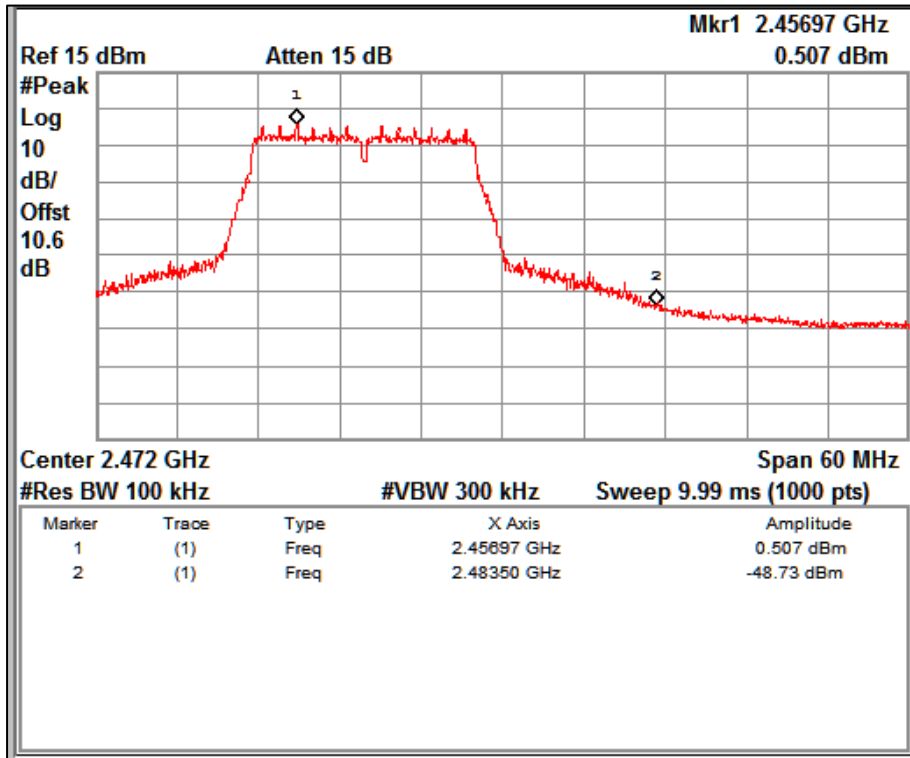
Data rate: 6Mbps

Reference Plot



Channel Frequency: 2462 MHz

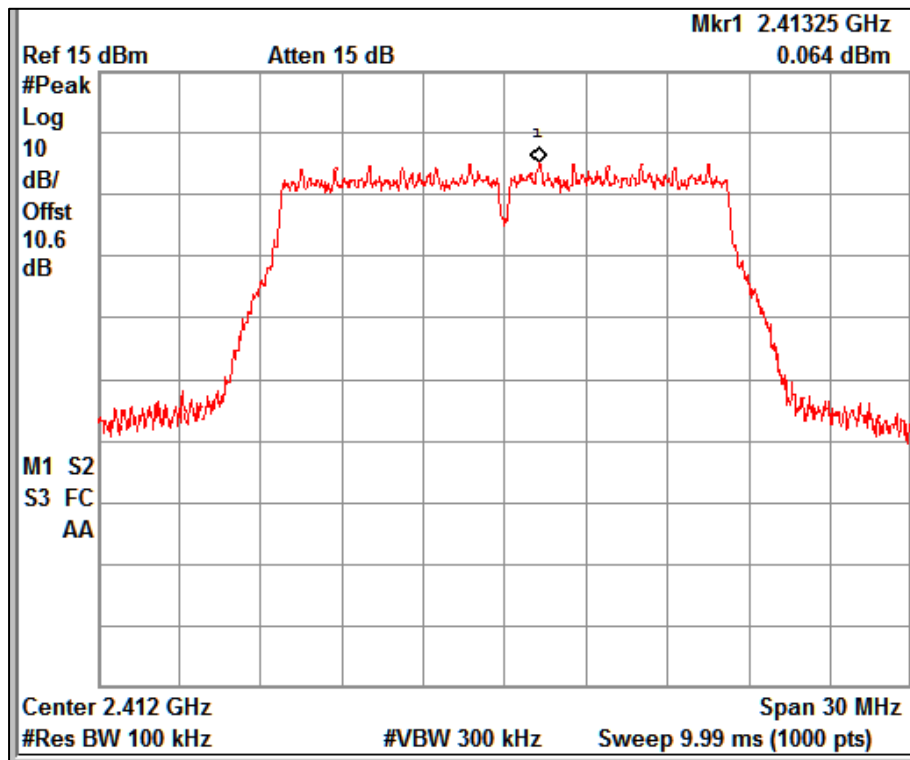
Data rate: 6Mbps



Channel Frequency: 2462 MHz

Data rate: 6Mbps

Reference Plot



Channel Frequency: 2412 MHz

Data rate: 24Mbps

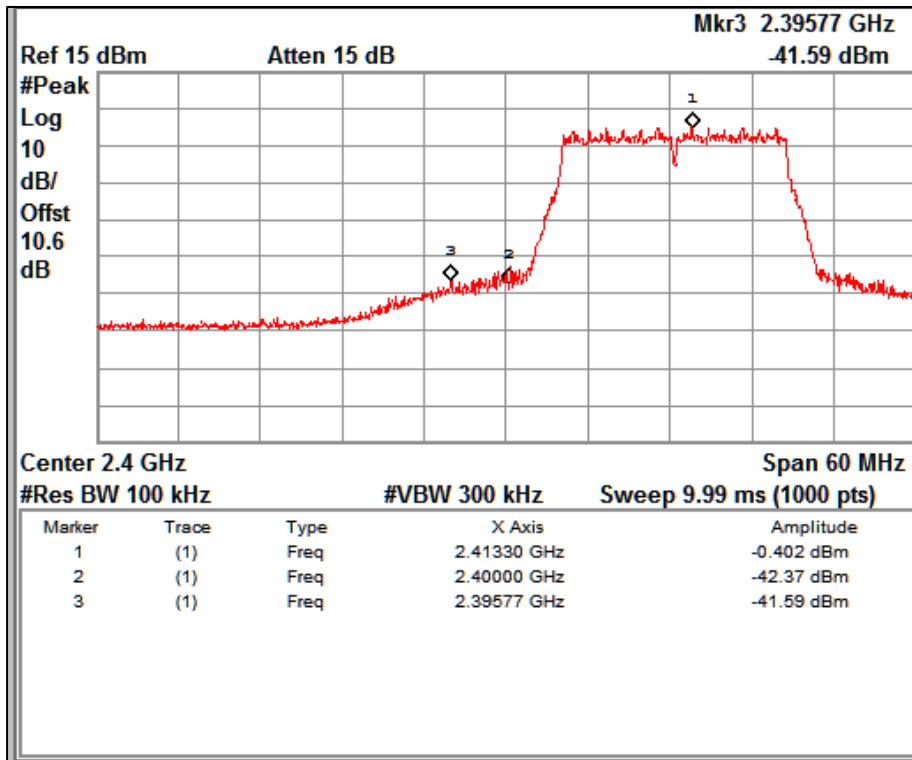
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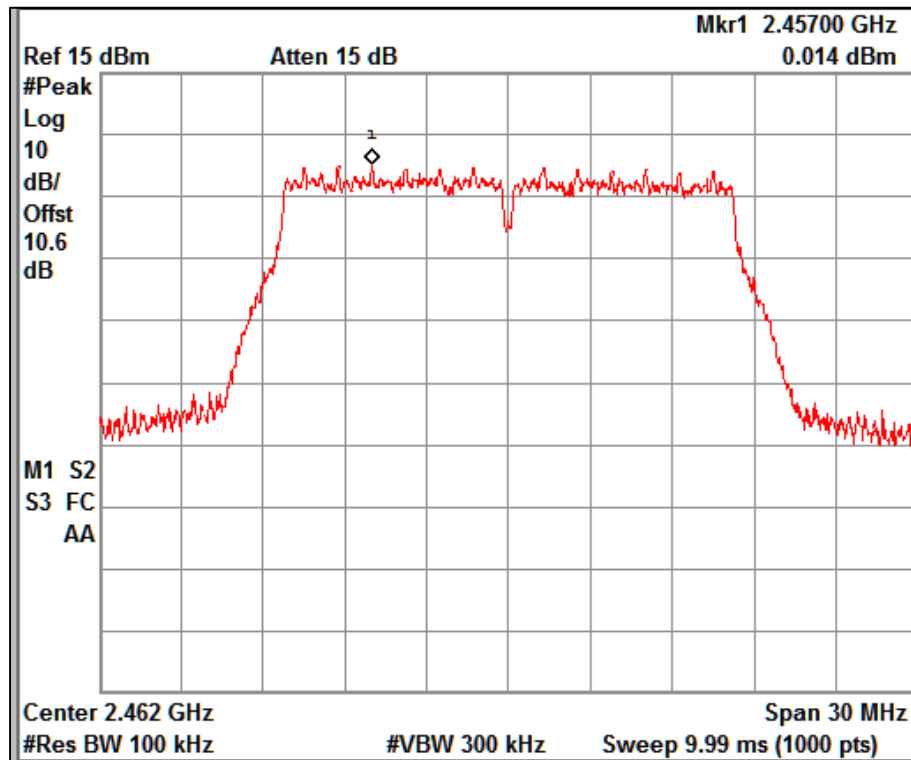
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Channel Frequency: 2412 MHz

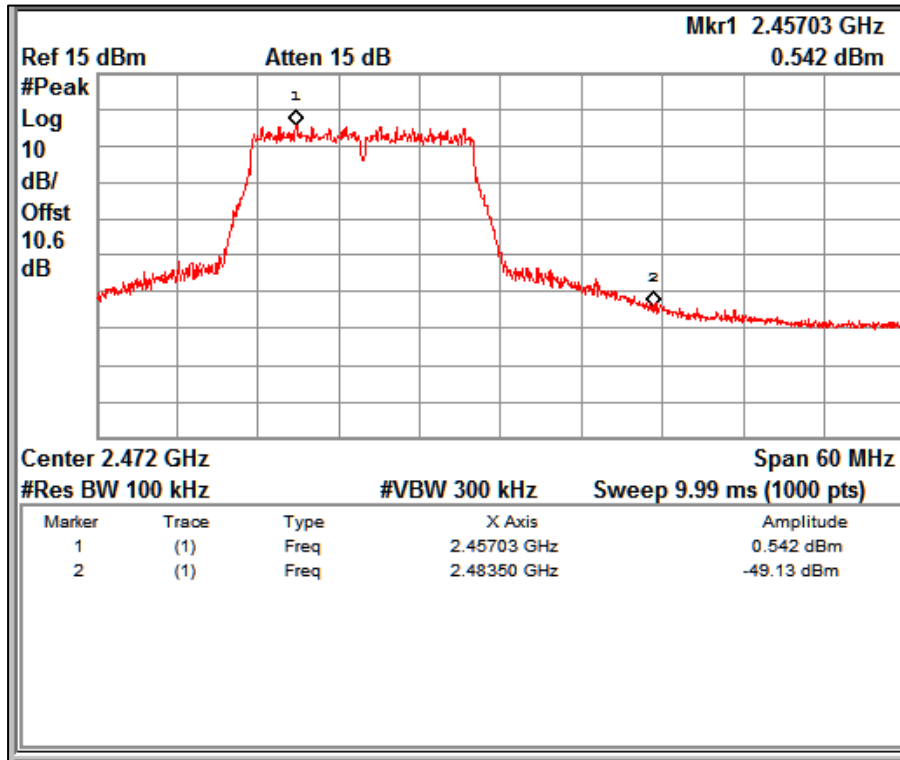
Data rate: 24Mbps

Reference Plot



Channel Frequency: 2462 MHz

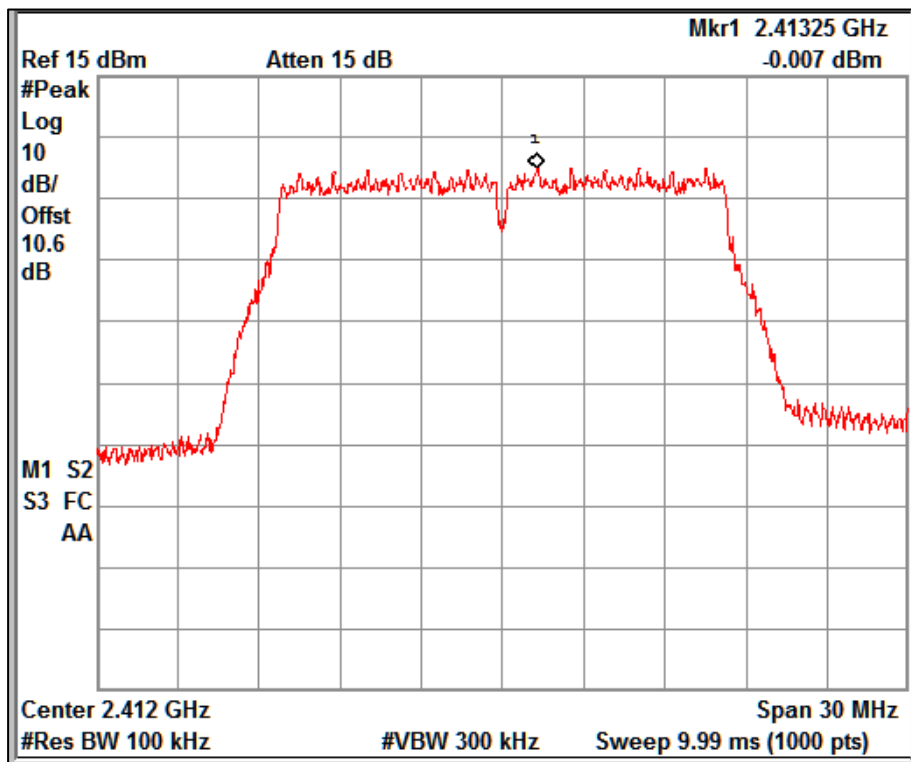
Data rate: 24Mbps



Channel Frequency: 2462 MHz

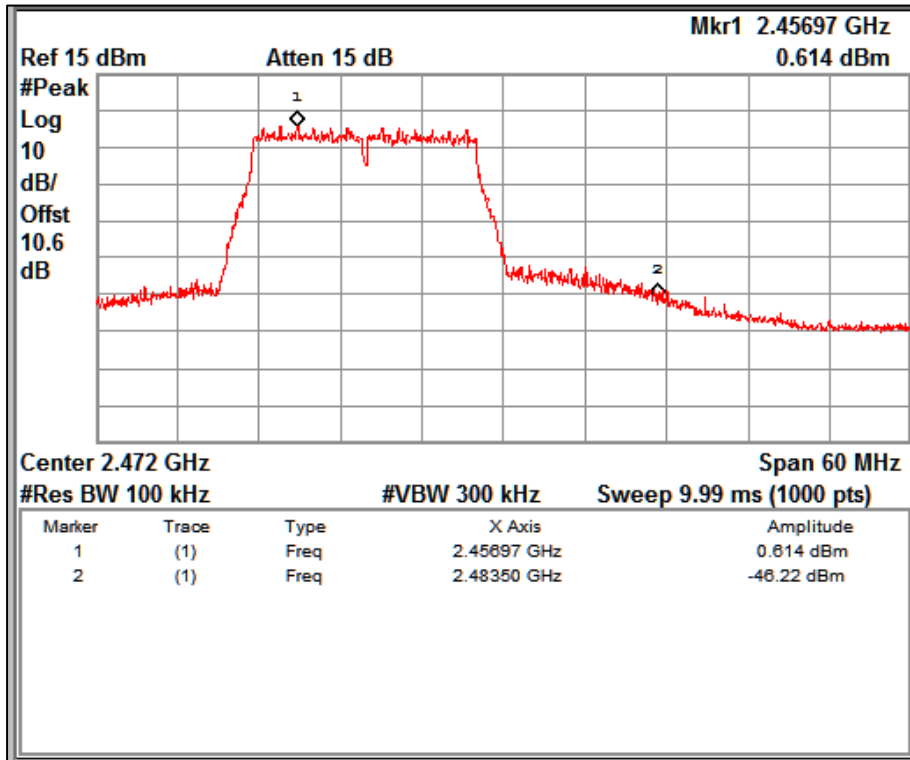
Data rate: 24Mbps

Reference Plot



Channel Frequency: 2412 MHz

Data rate: 54Mbps



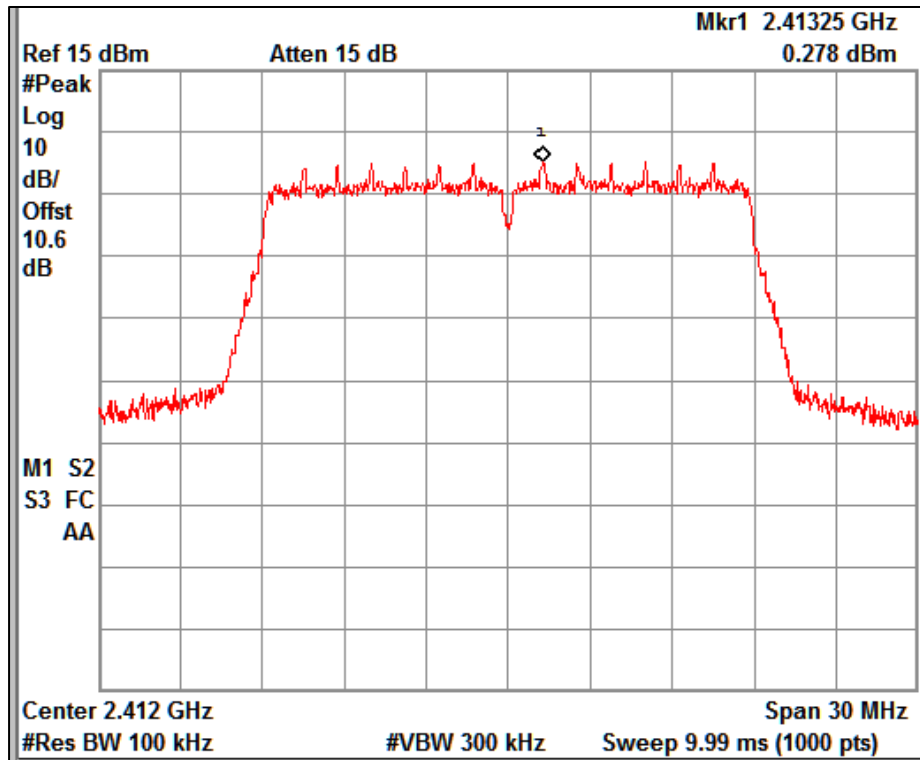
Channel Frequency: 2462 MHz

Data rate: 54Mbps

Protocol: 802.11 n mode HT20

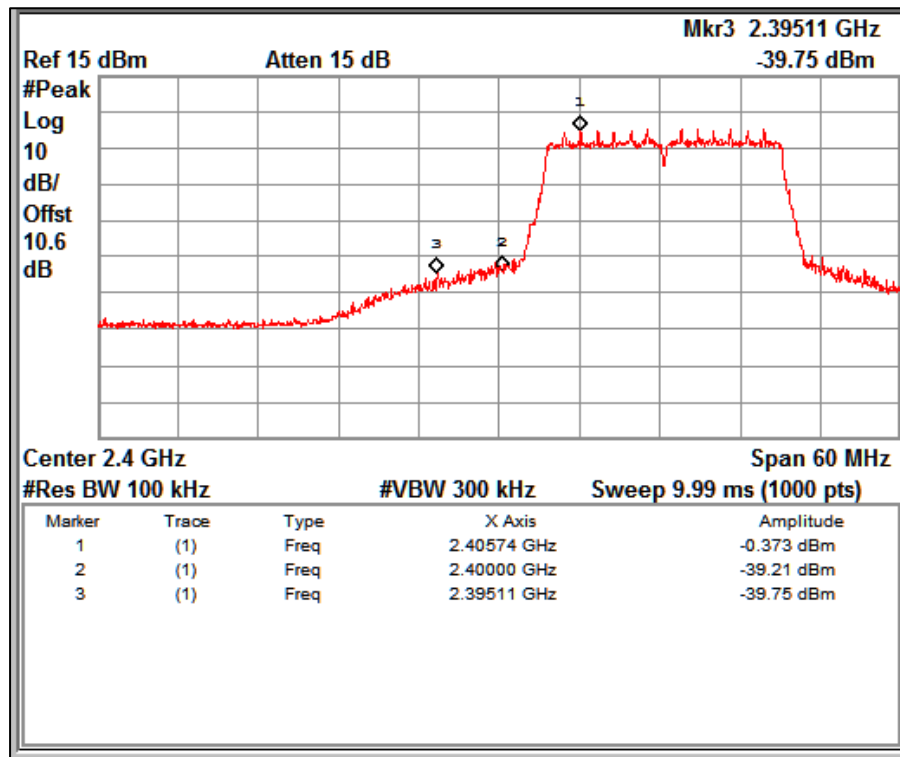
Data Rate (Mbps)	Channel Frequency (MHz)	Value of Band edge		Reference value B (dBm)	Band Edge Value A~B (dBm)	Limit (dBm)
		Frequency (MHz)	Value A (dBm)			
MCS0	2412	2400	-39.21	0.27	-39.48	-30
	2462	2483.5	-47.21	0.02	-47.23	-30
MCS4	2412	2400	-41.77	0.34	-42.11	-30
	2462	2483.5	-48.27	0.08	-48.35	-30
MCS7	2412	2400	-47.4	-0.52	-46.88	-30
	2462	2483.5	-45.54	-0.23	-45.31	-30

Reference Plot



Channel Frequency: 2412 MHz

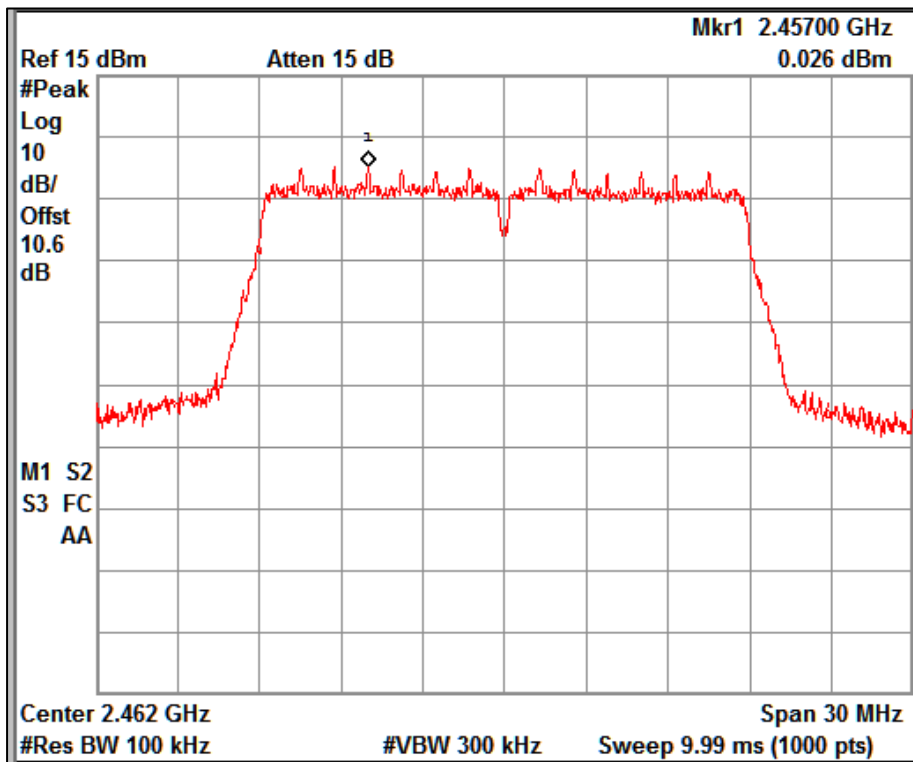
Data rate: MCS0



Channel Frequency: 2412 MHz

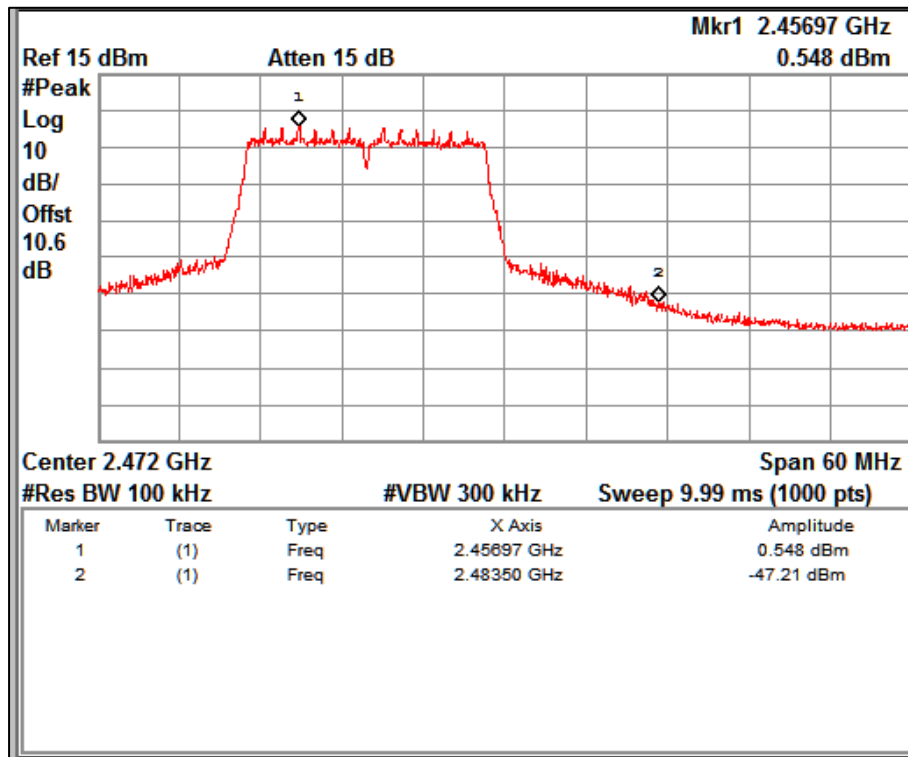
Data rate: MCS0

Reference Plot



Channel Frequency: 2462 MHz

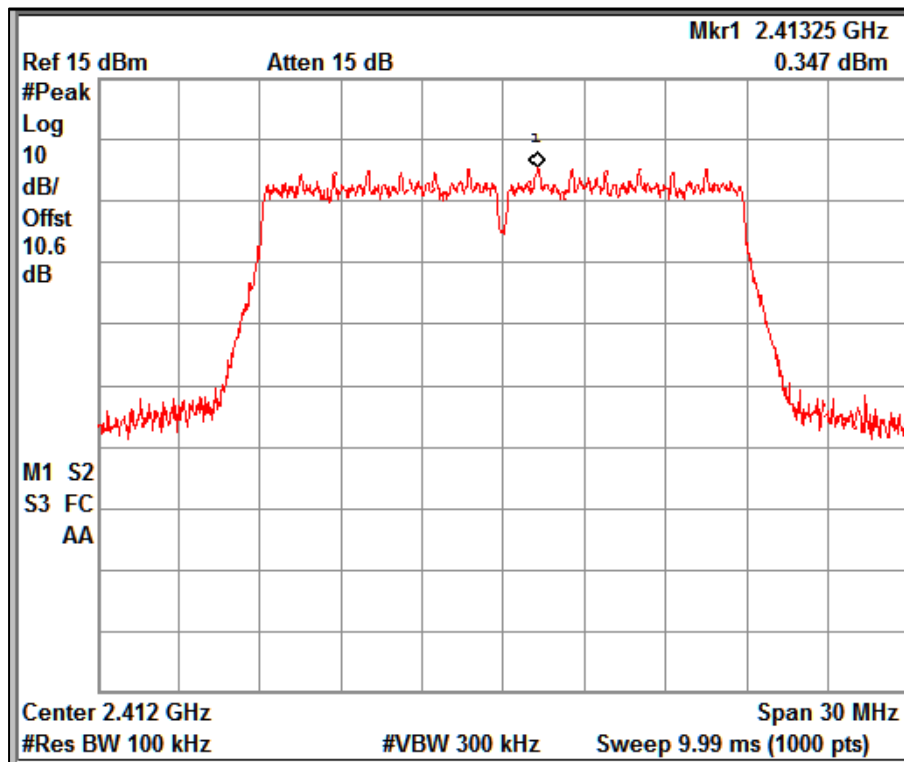
Data rate: MCS0



Channel Frequency: 2462 MHz

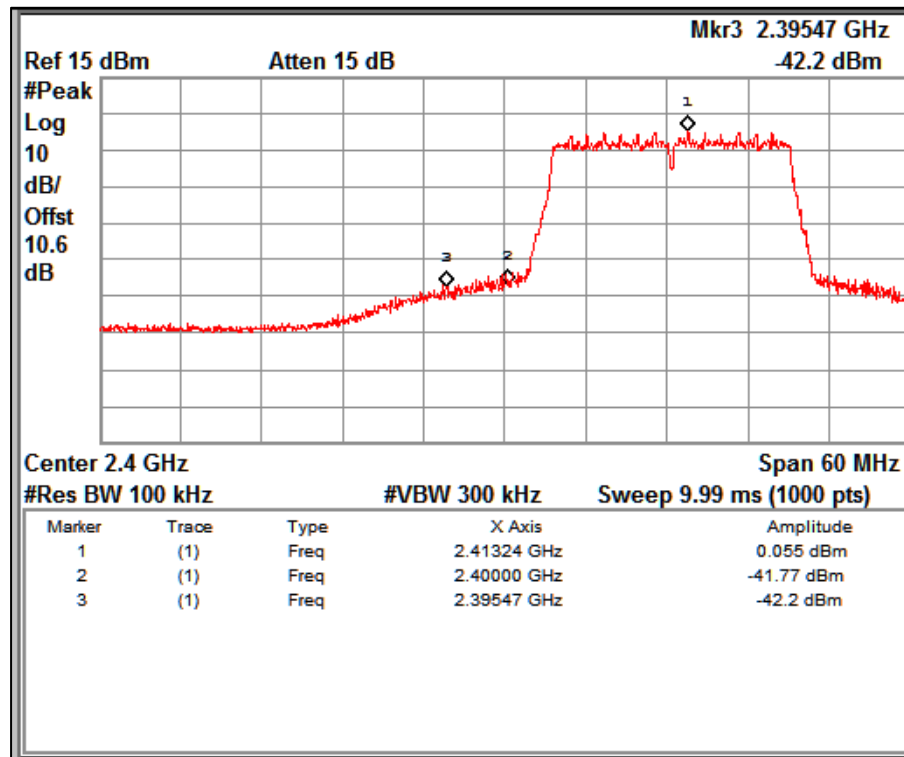
Data rate: MCS0

Reference Plot



Channel Frequency: 2412 MHz

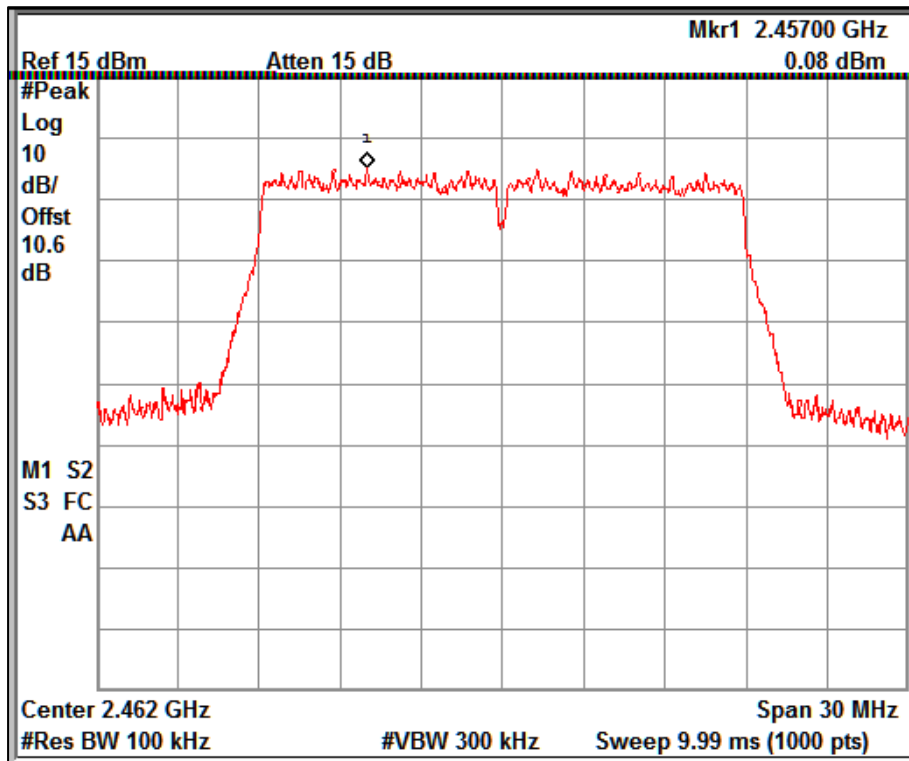
Data rate: MCS4



Channel Frequency: 2412 MHz

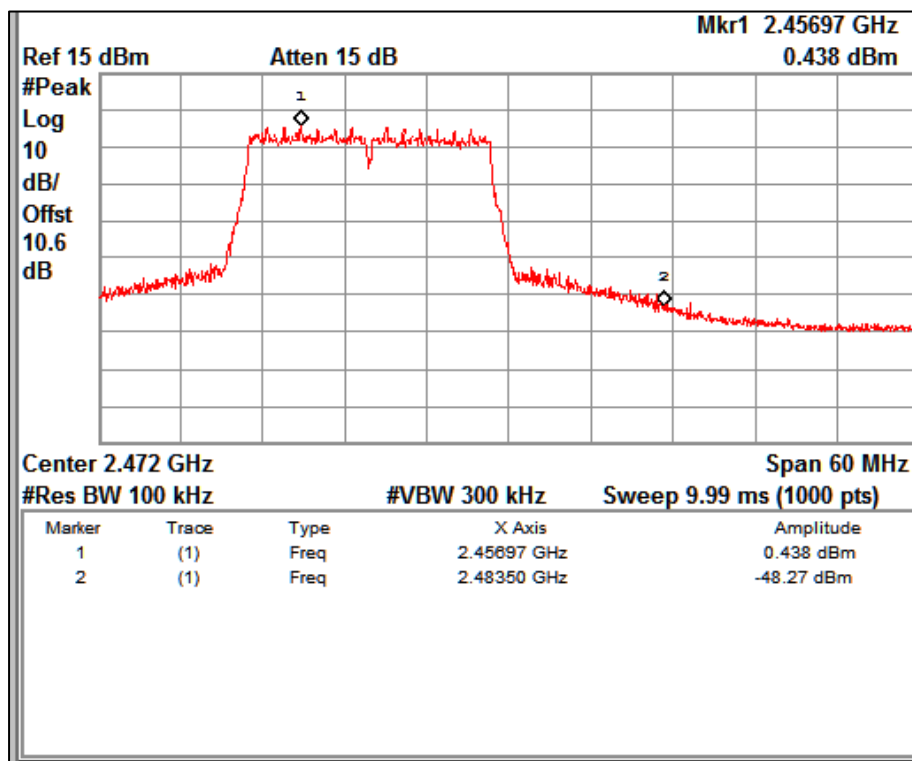
Data rate: MCS4

Reference Plot



Channel Frequency: 2462 MHz

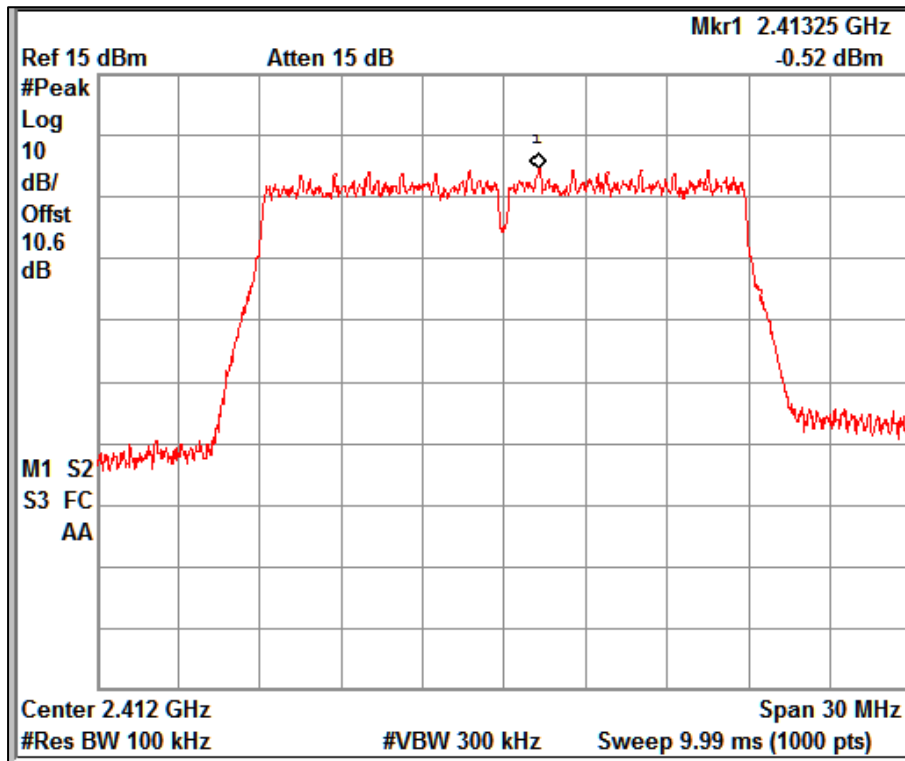
Data rate: MCS4



Channel Frequency: 2462 MHz

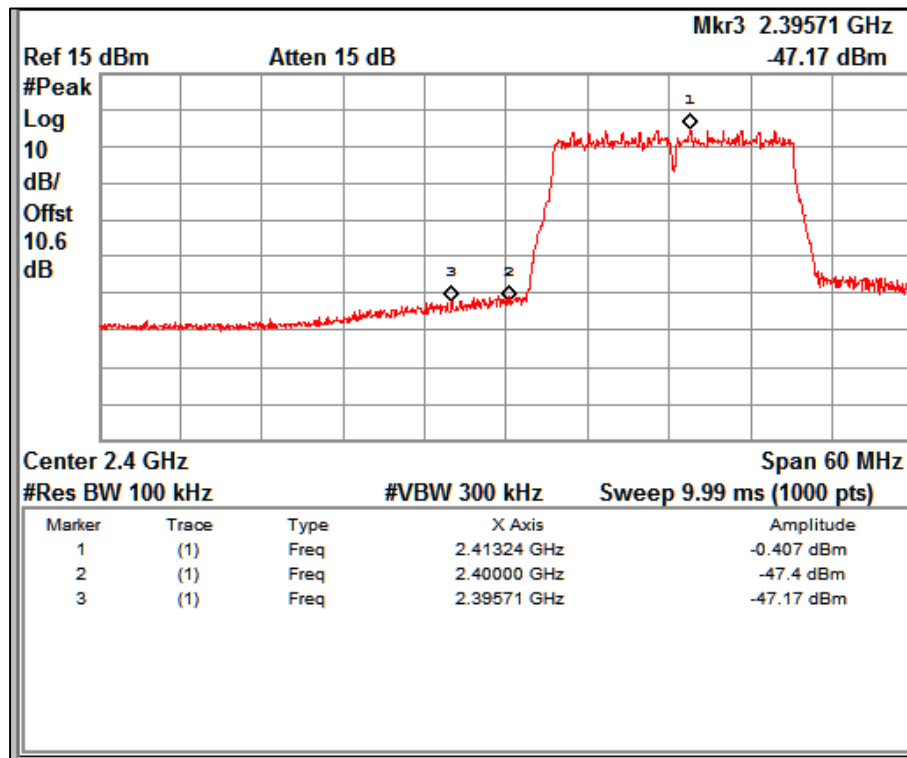
Data rate: MCS4

Reference Plot



Channel Frequency: 2412 MHz

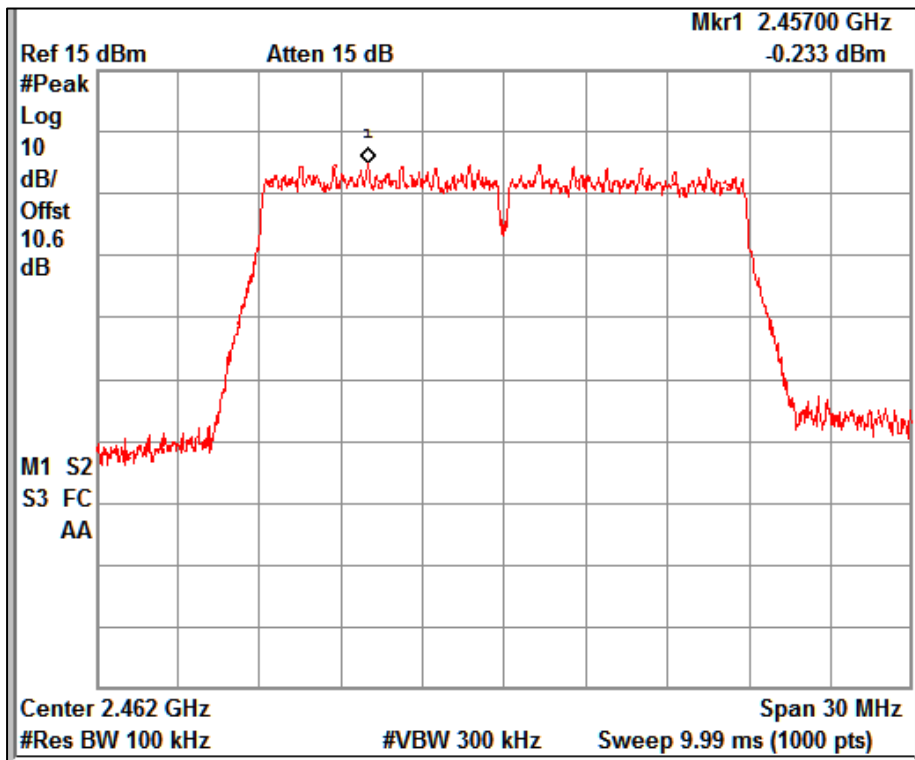
Data rate: MCS7



Channel Frequency: 2412 MHz

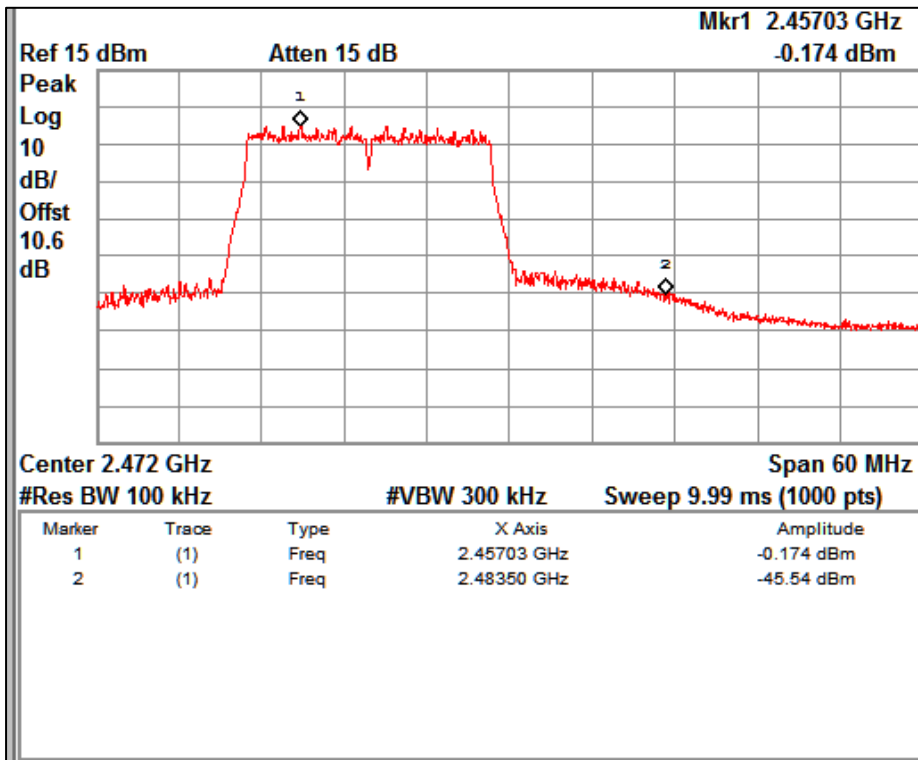
Data rate: MCS7

Reference Plot



Channel Frequency: 2462 MHz

Data rate: MCS7



Channel Frequency: 2462 MHz

Data rate: MCS7

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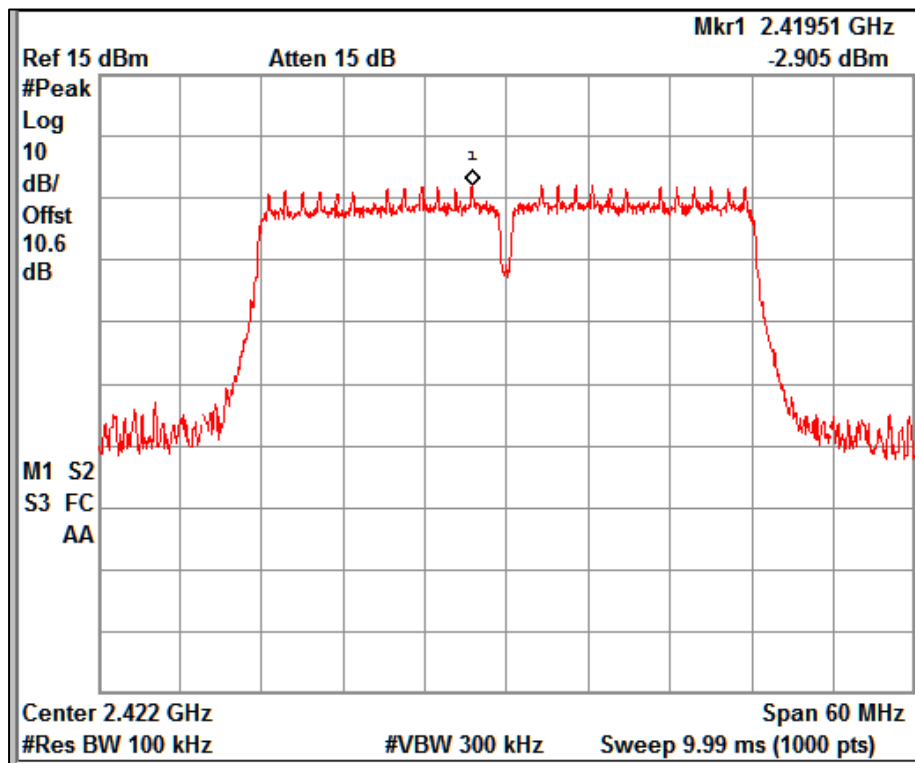
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Protocol: 802.11 n mode HT40

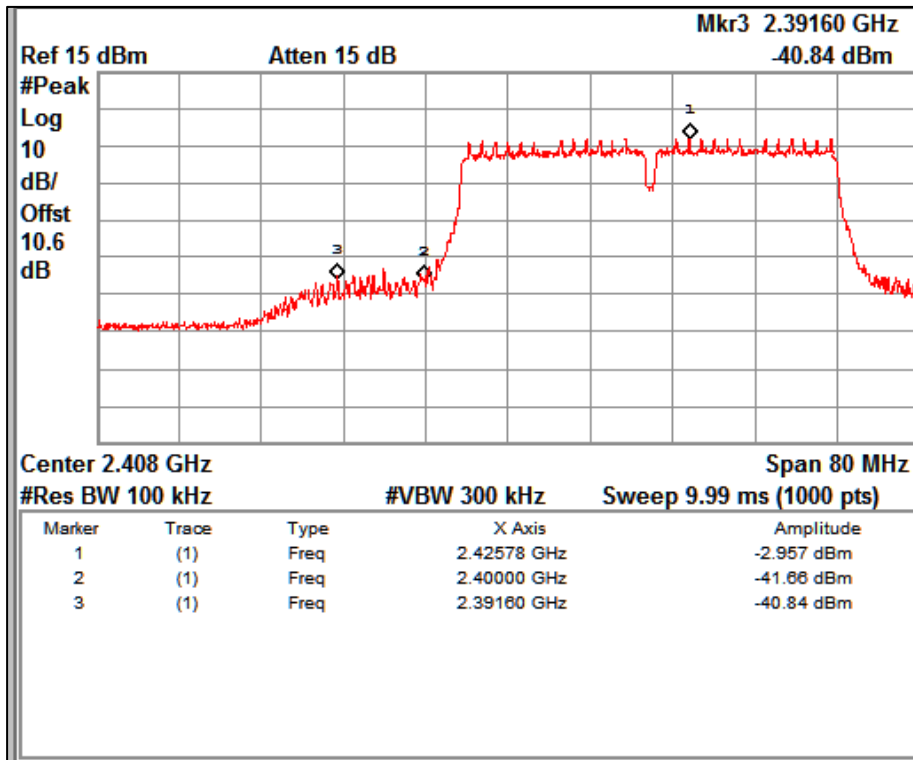
Data Rate (Mbps)	Channel Frequency (MHz)	Value of Band edge		Reference value B (dBm)	Band Edge Value A~B (dBm)	Limit (dBm)
		Frequency (MHz)	Value A (dBm)			
MCS0	2422	2400	-41.66	-2.90	-38.76	-30
	2452	2483.5	-47.34	-2.81	-44.53	-30
MCS4	2422	2400	-46.01	-3.29	-42.72	-30
	2452	2483.5	-49.25	-2.60	-46.65	-30
MCS7	2422	2400	-46.55	-3.24	-43.31	-30
	2452	2483.5	-42.58	-2.97	-39.61	-30

Reference Plot



Channel Frequency: 2422 MHz

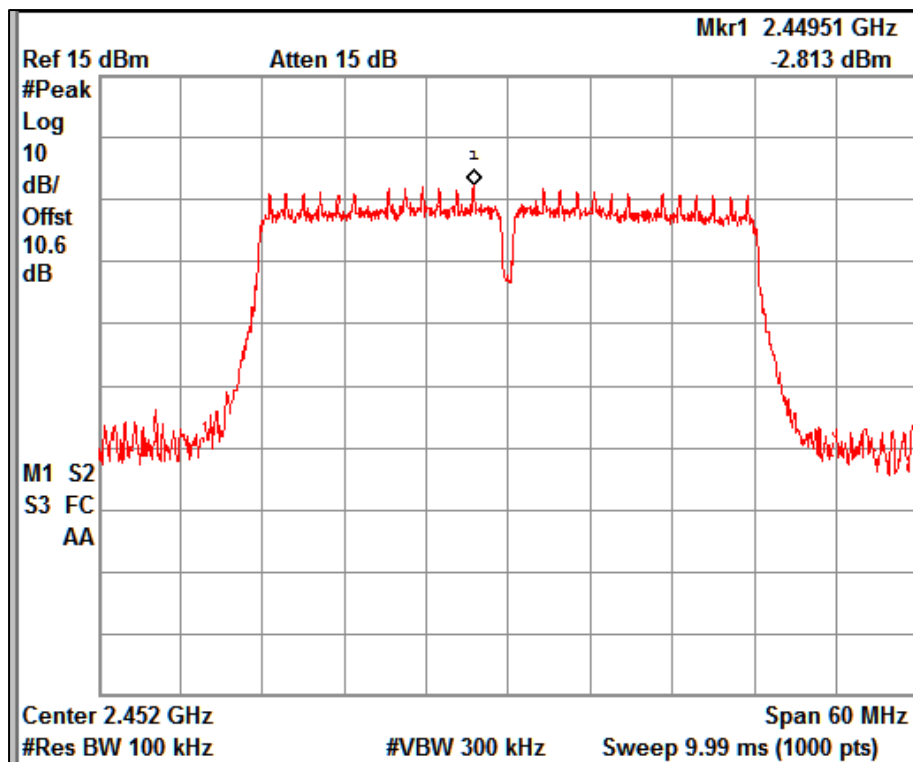
Data rate: MCS0



Channel Frequency: 2422 MHz

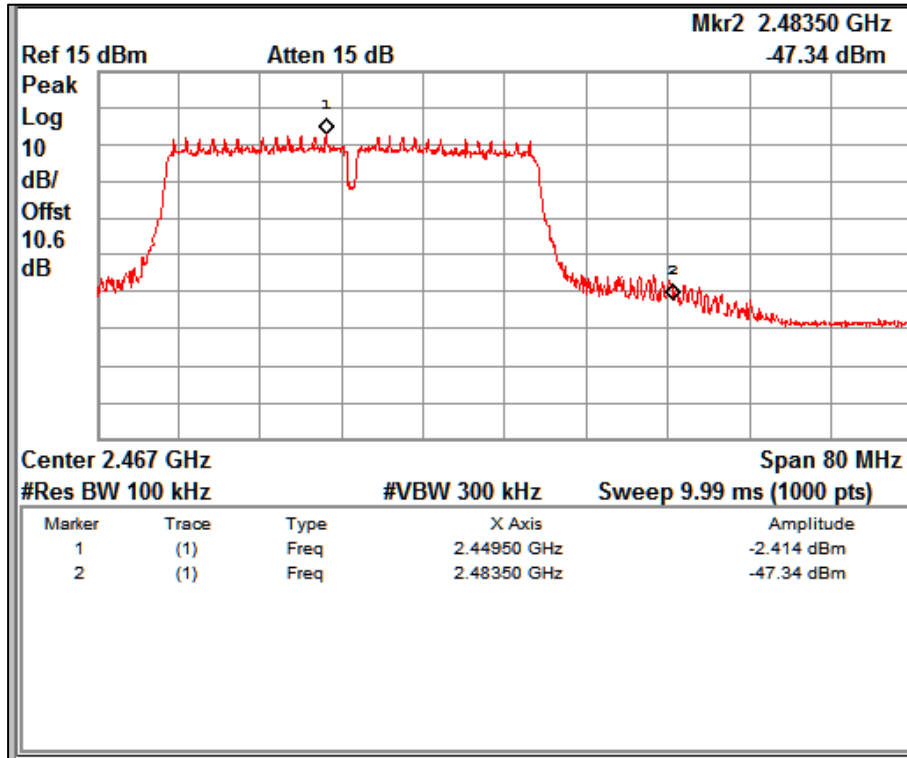
Data rate: MCS0

Reference Plot



Channel Frequency: 2452 MHz

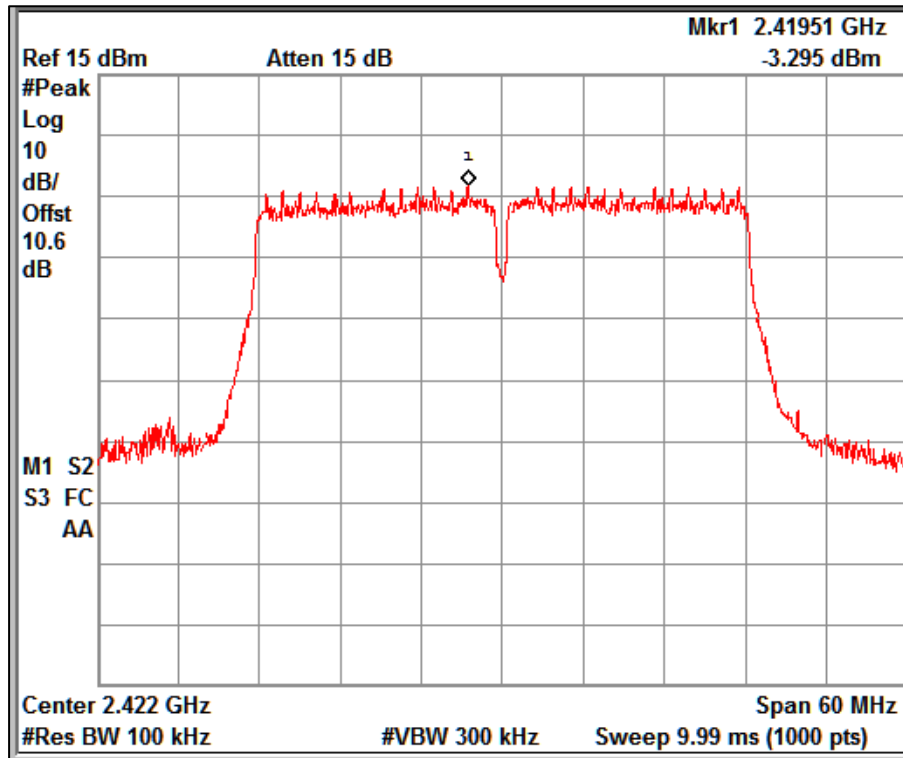
Data rate: MCS0



Channel Frequency: 2452 MHz

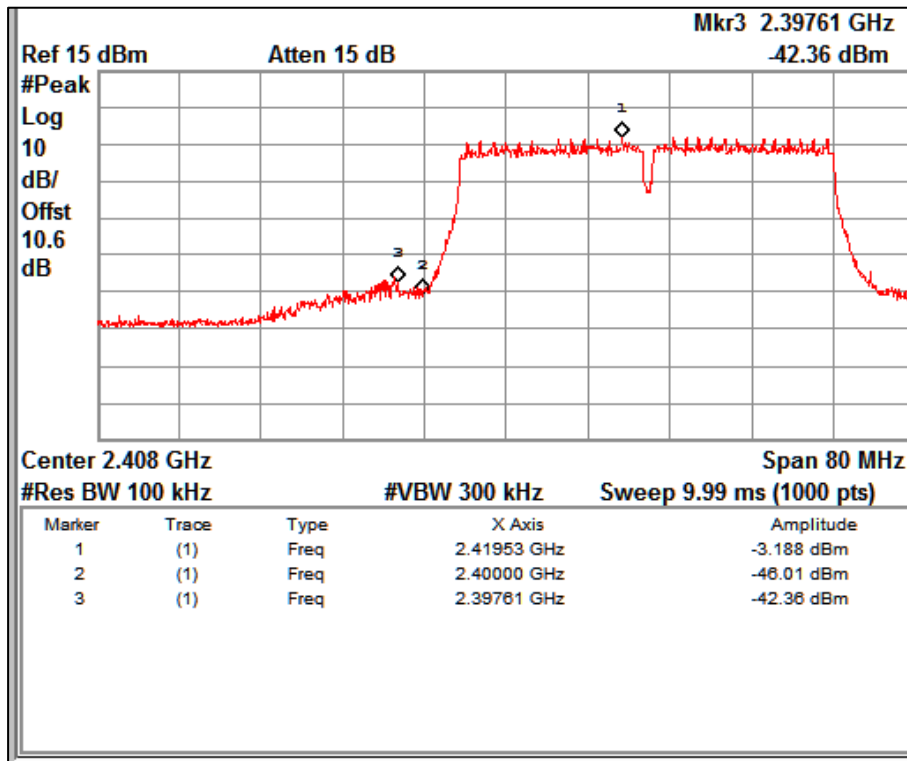
Data rate: MCS0

Reference Plot



Channel Frequency: 2422 MHz

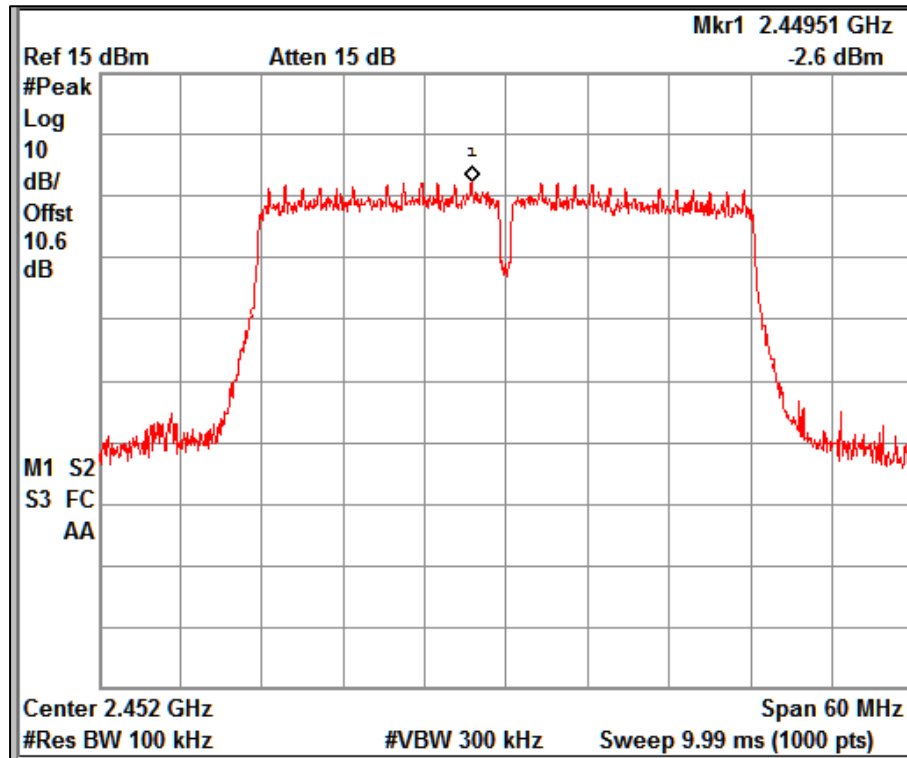
Data rate: MCS4



Channel Frequency: 2422 MHz

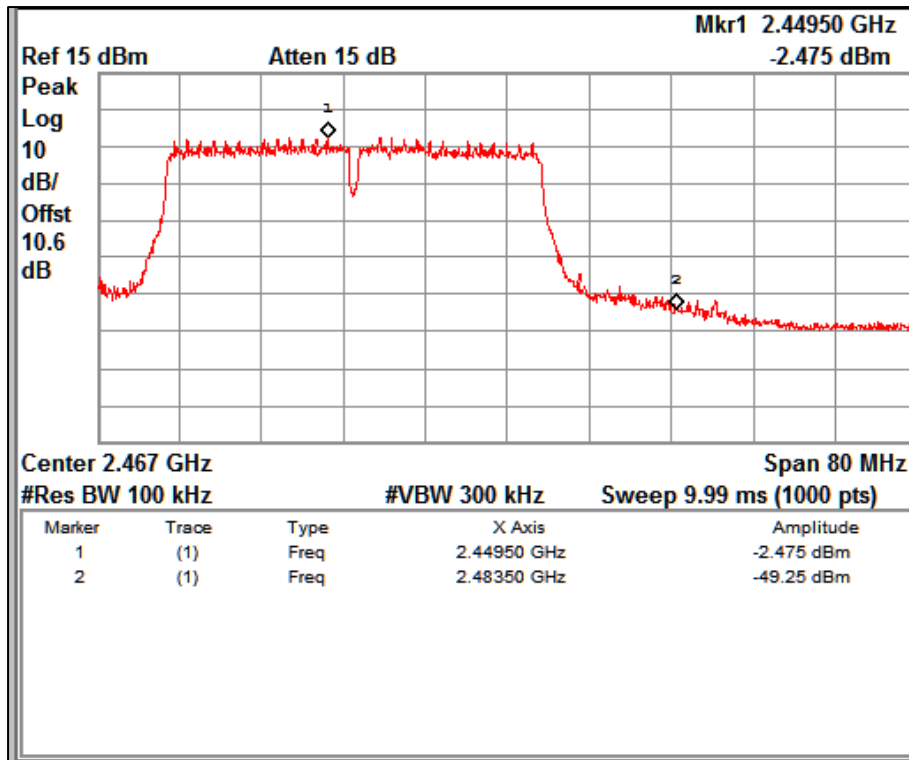
Data rate: MCS4

Reference Plot



Channel Frequency: 2452 MHz

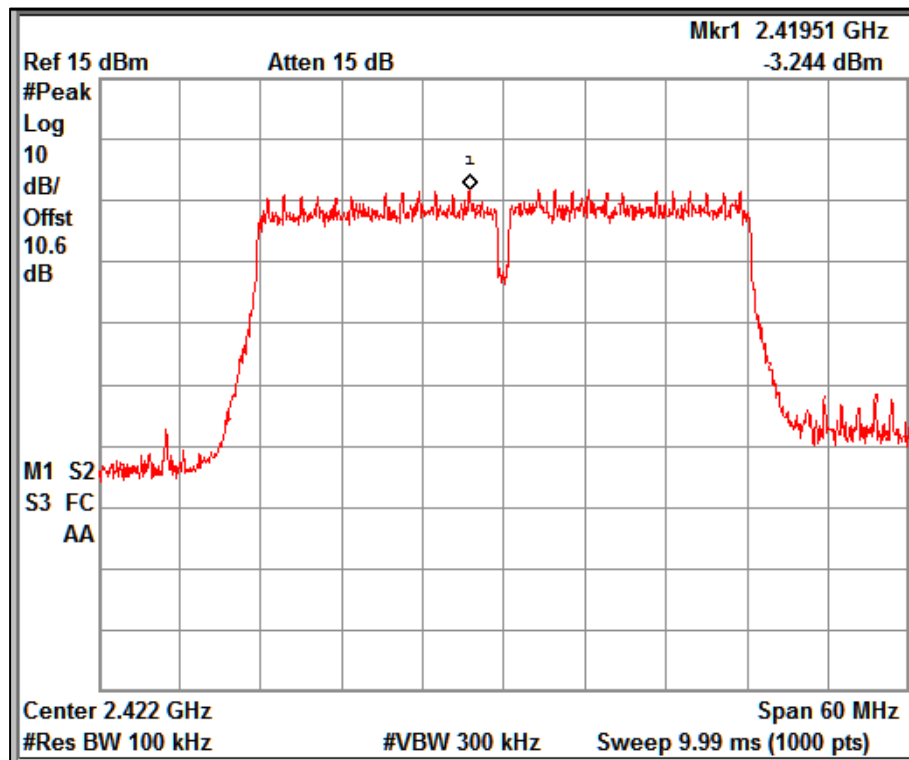
Data rate: MCS4



Channel Frequency: 2452 MHz

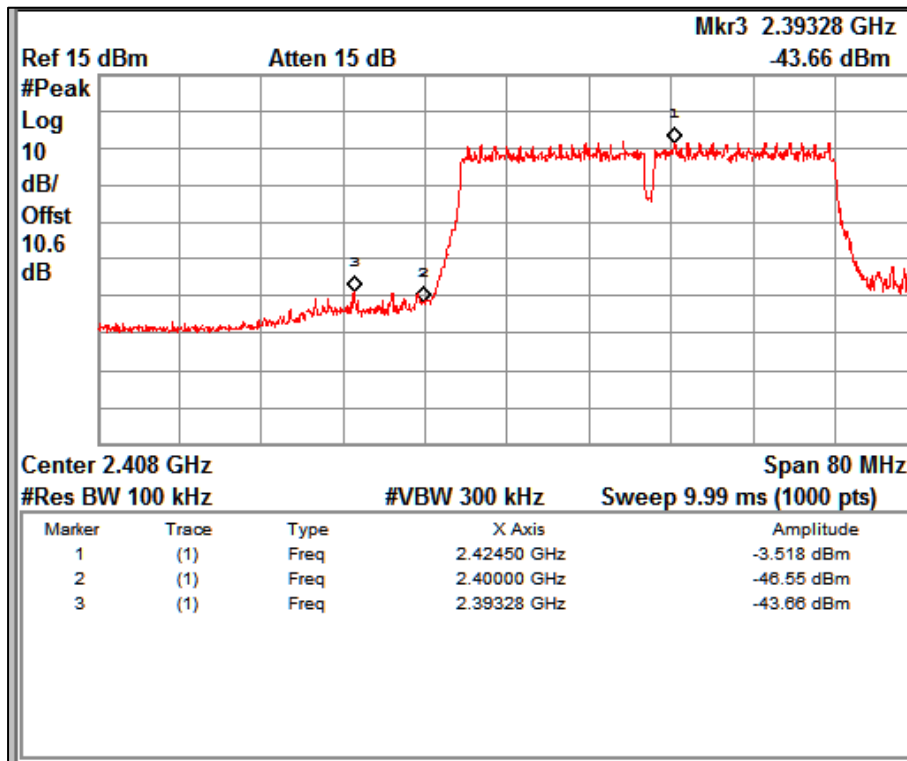
Data rate: MCS4

Reference Plot



Channel Frequency: 2422 MHz

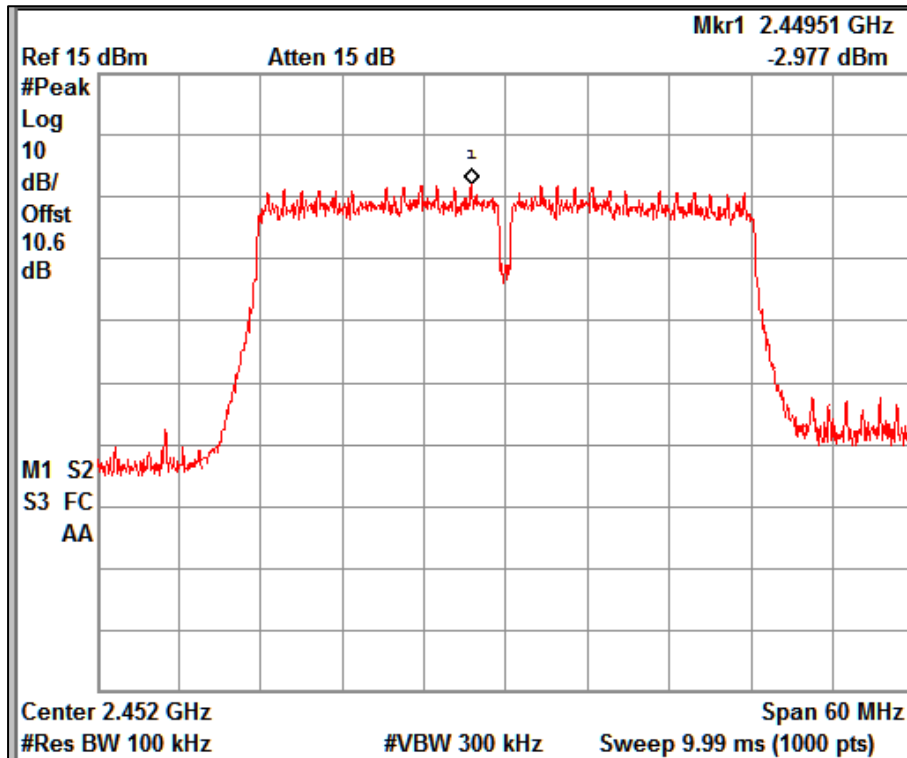
Data rate: MCS7



Channel Frequency: 2422 MHz

Data rate: MCS7

Reference Plot



Channel Frequency: 2452 MHz

Data rate: MCS7

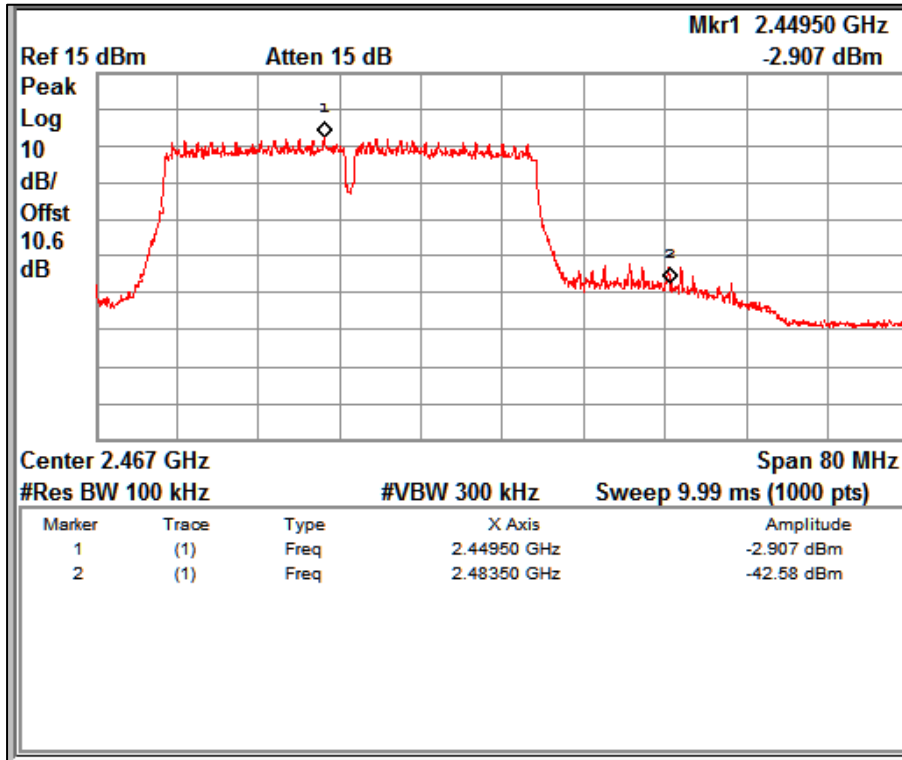
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Channel Frequency: 2452 MHz

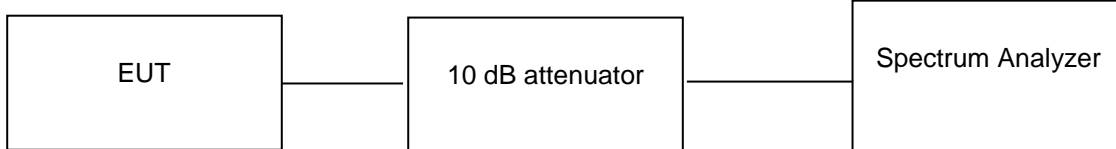
Data rate: MCS7

6.4.2 Conducted Spurious Emission

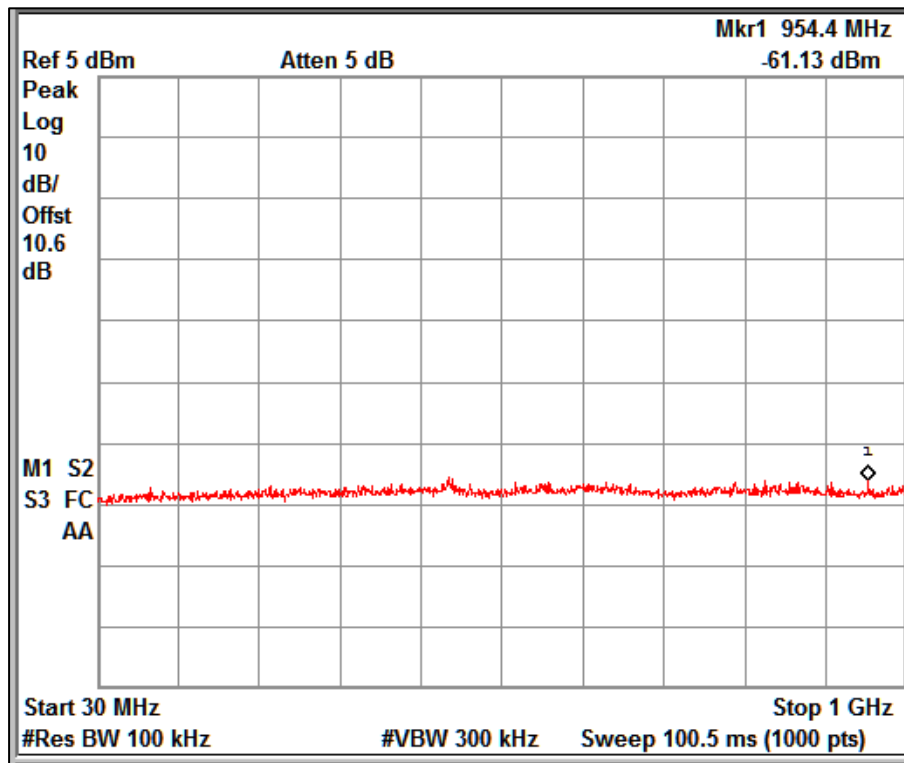
Result

Pass

Test Method:



Test results:



30MHz-1GHz

Prüfbericht - Nr.:

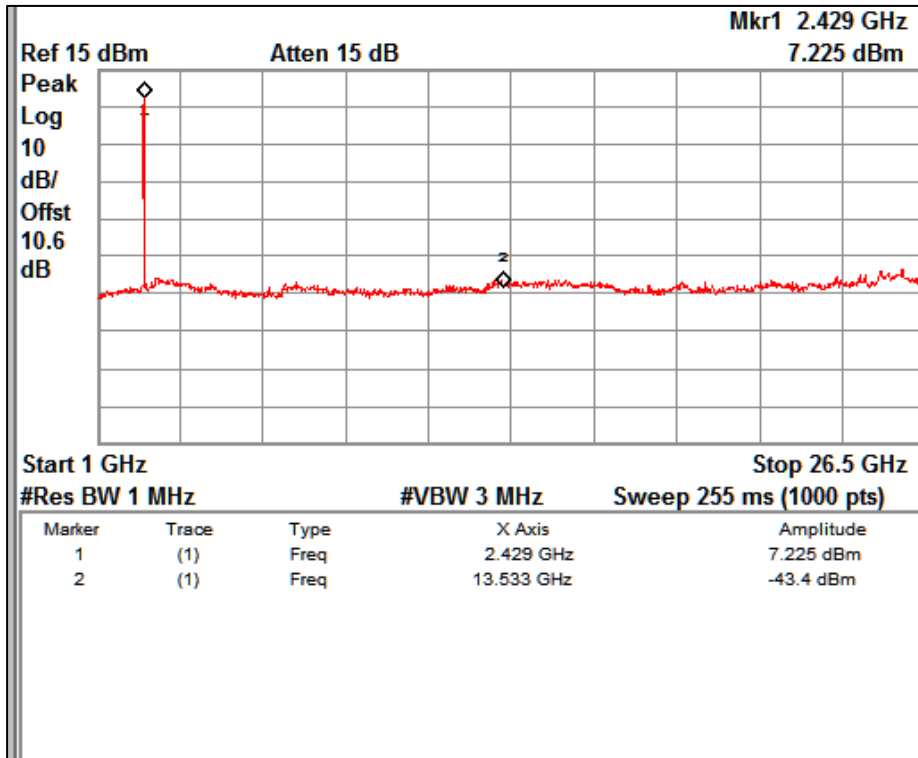
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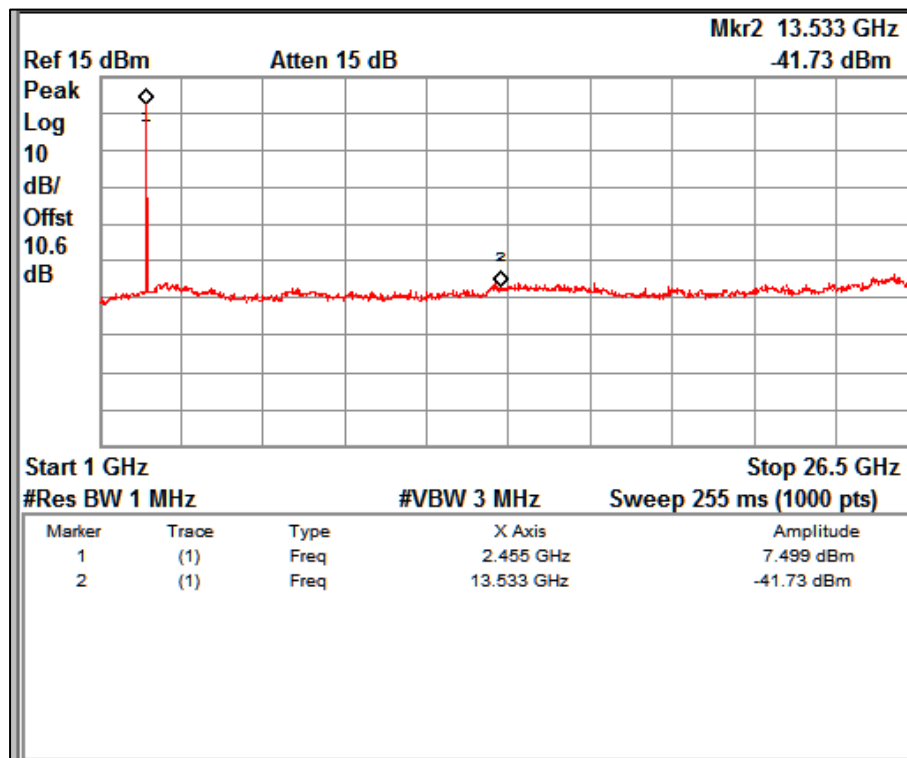
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Protocol: 802.11b
1GHz-26.5GHz



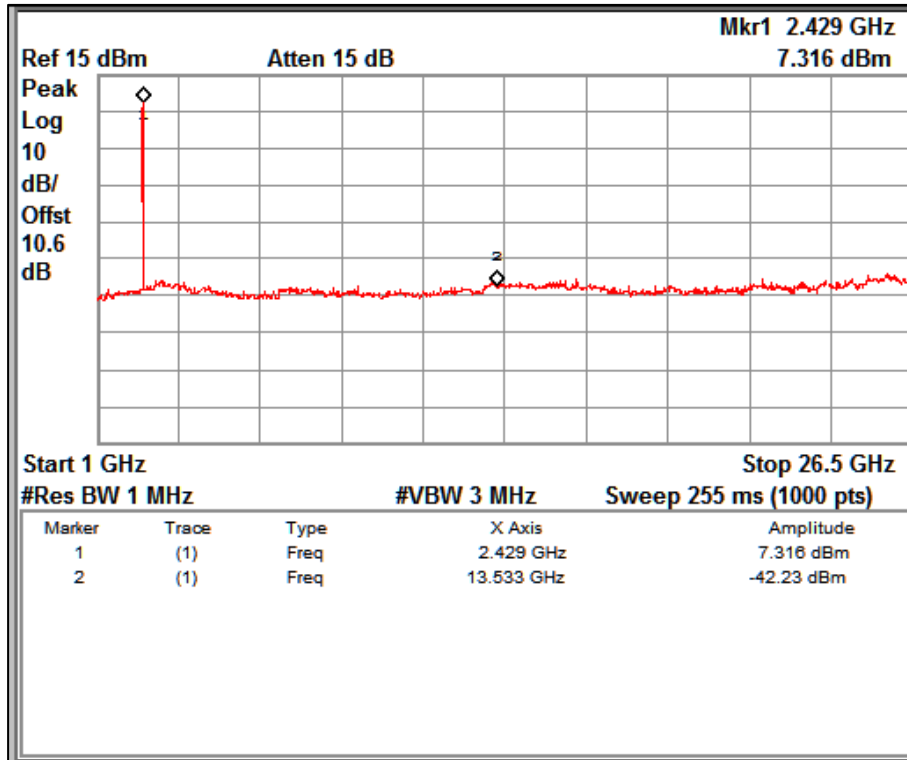
Channel Frequency: 2412 MHz

Data rate: 1Mbps



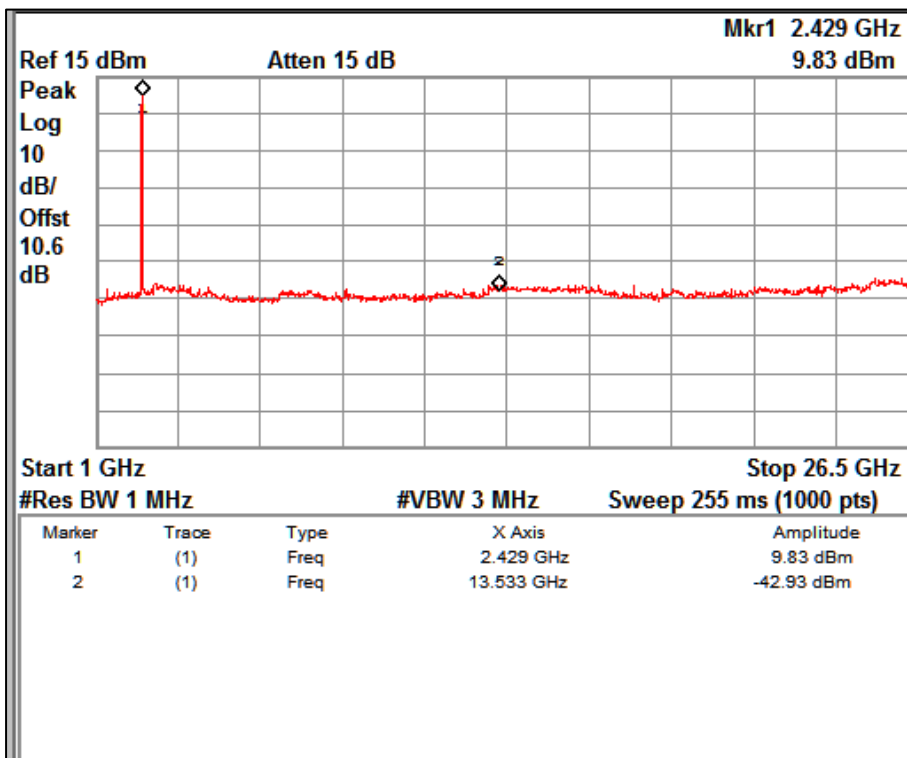
Channel Frequency: 2442 MHz

Data rate: 1Mbps



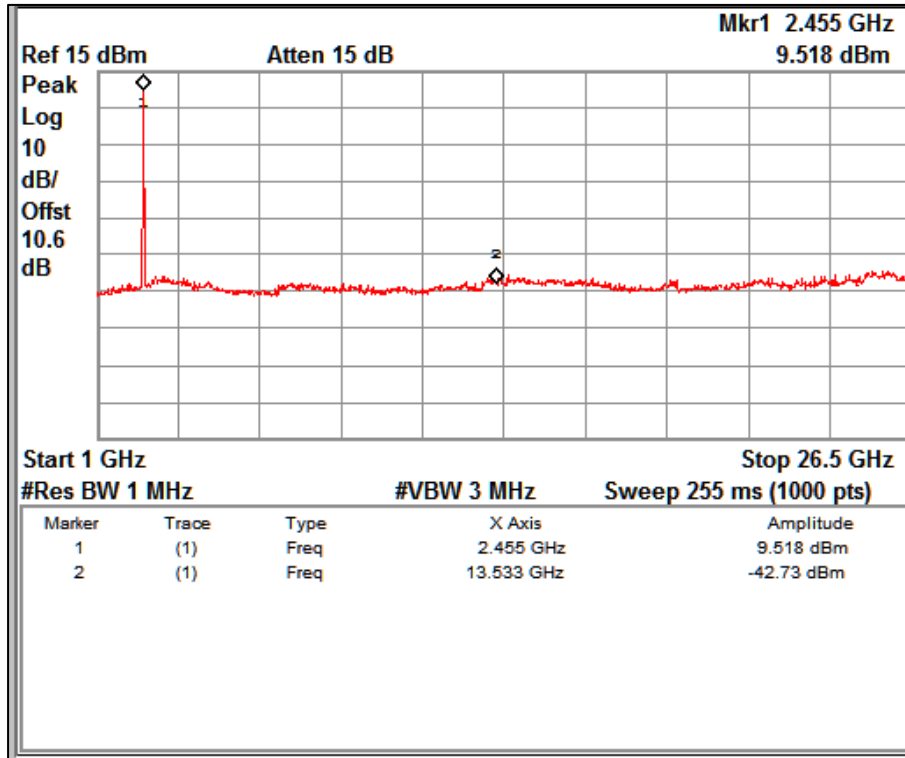
Channel Frequency: 2462 MHz

Data rate: 1Mbps



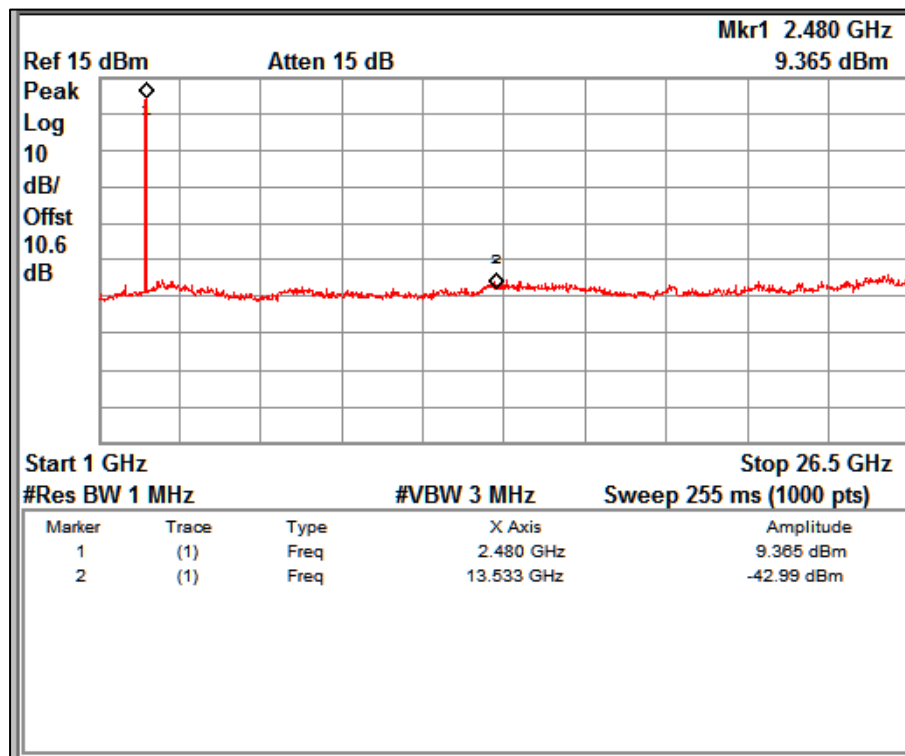
Channel Frequency: 2412 MHz

Data rate: 11Mbps



Channel Frequency: 2442 MHz

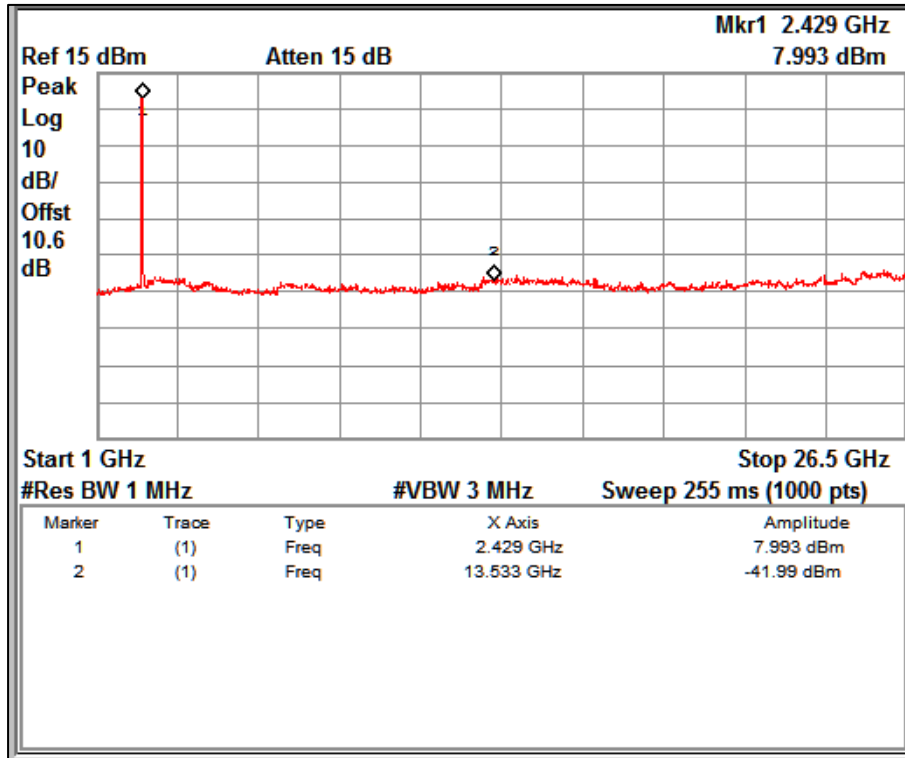
Data rate: 11Mbps



Channel Frequency: 2462 MHz

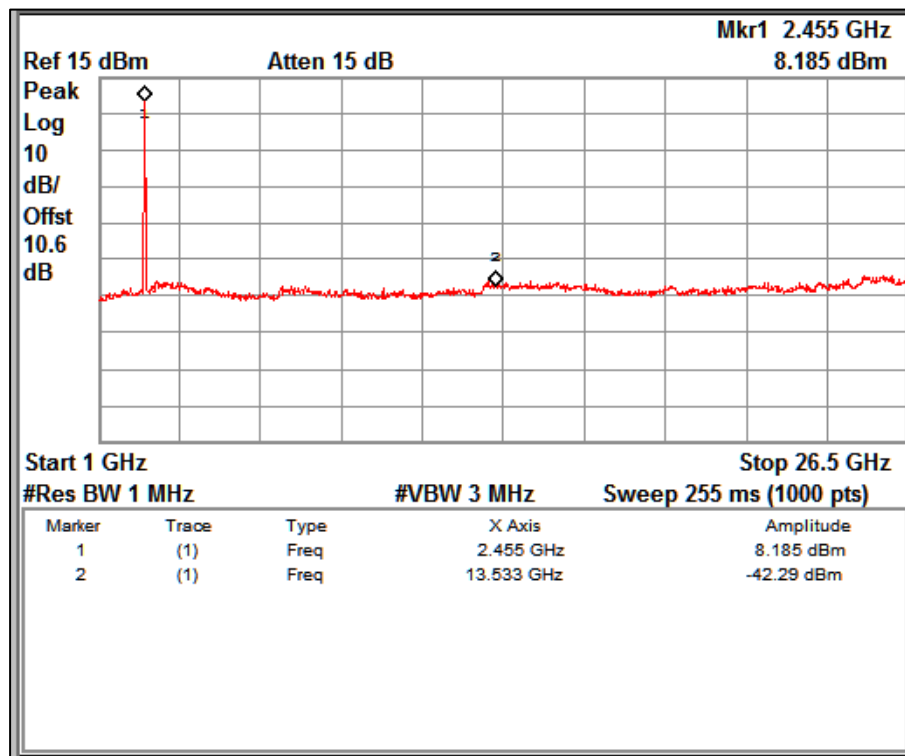
Data rate: 11Mbps

Protocol: 802.11b



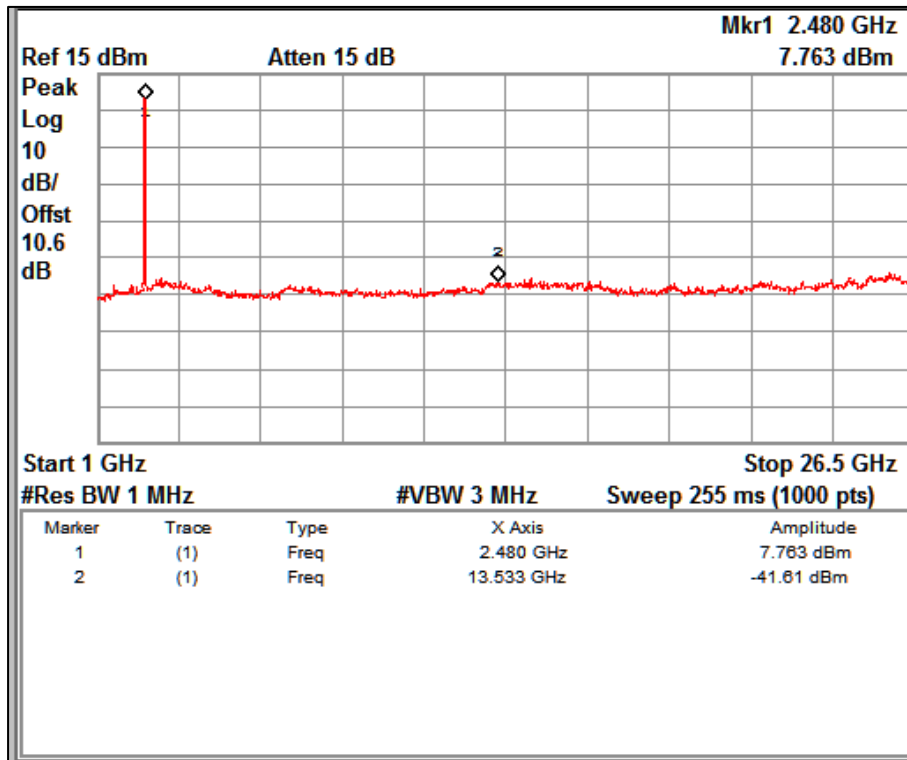
Channel Frequency: 2412 MHz

Data rate: 6Mbps



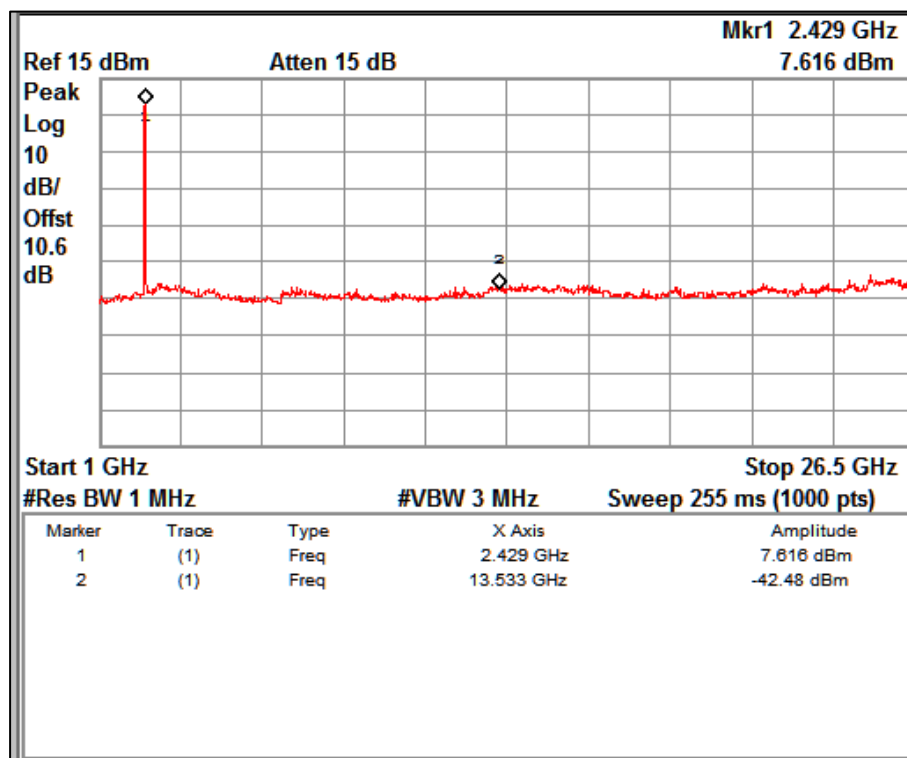
Channel Frequency: 2442 MHz

Data rate: 6Mbps



Channel Frequency: 2462 MHz

Data rate: 6Mbps



Channel Frequency: 2412 MHz

Data rate: 24Mbps

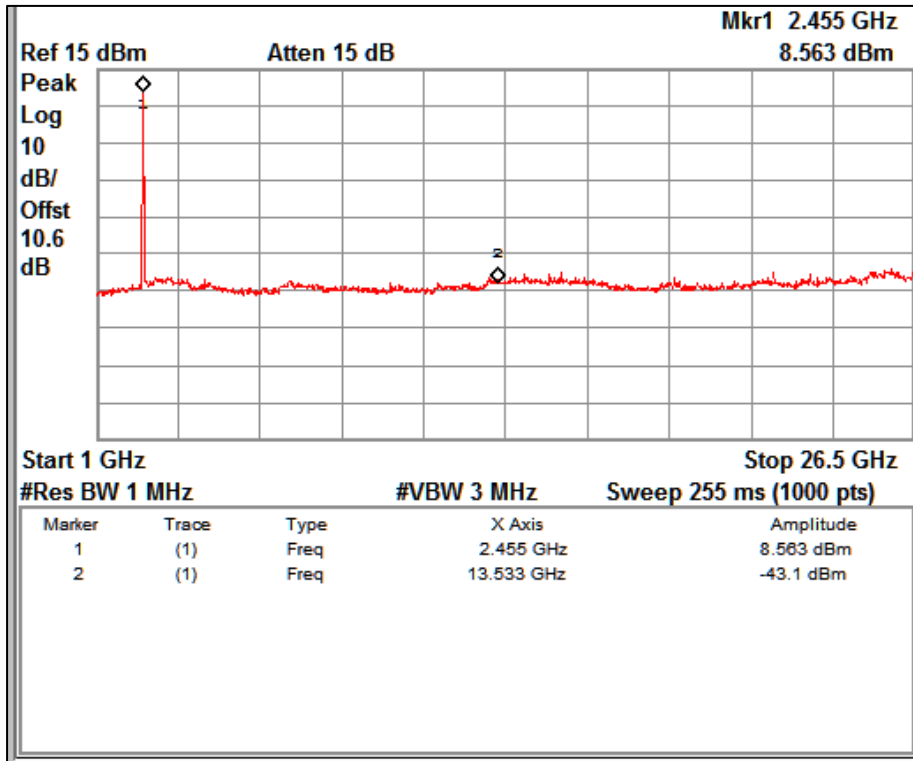
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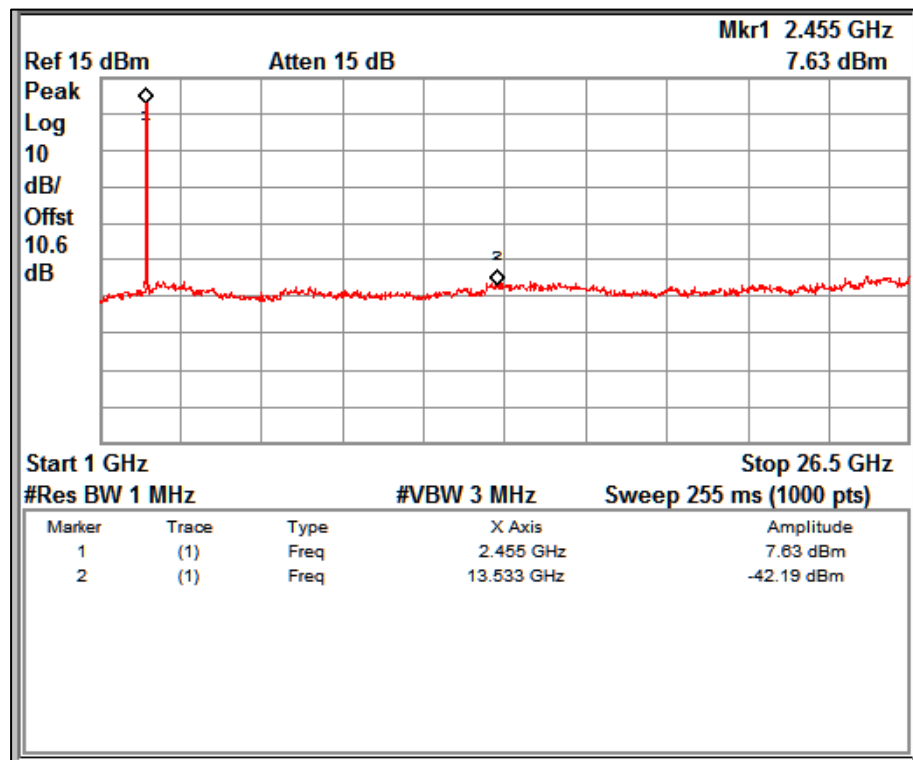
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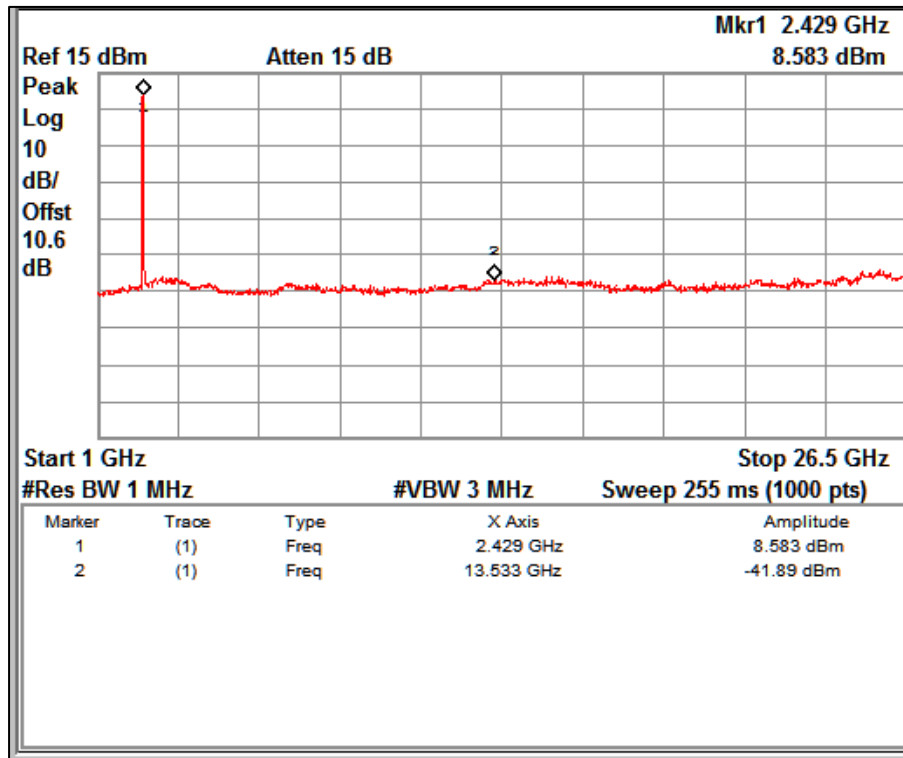
Channel Frequency: 2442 MHz

Data rate: 24Mbps



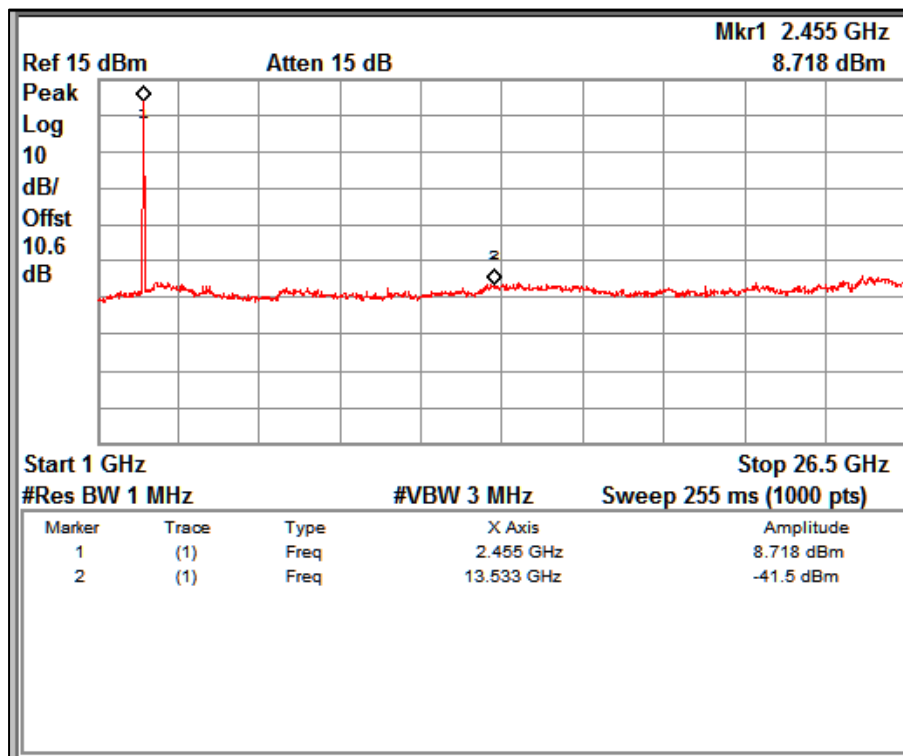
Channel Frequency: 2462 MHz

Data rate: 24Mbps



Channel Frequency: 2412 MHz

Data rate: 54Mbps



Channel Frequency: 2442 MHz

Data rate: 54Mbps

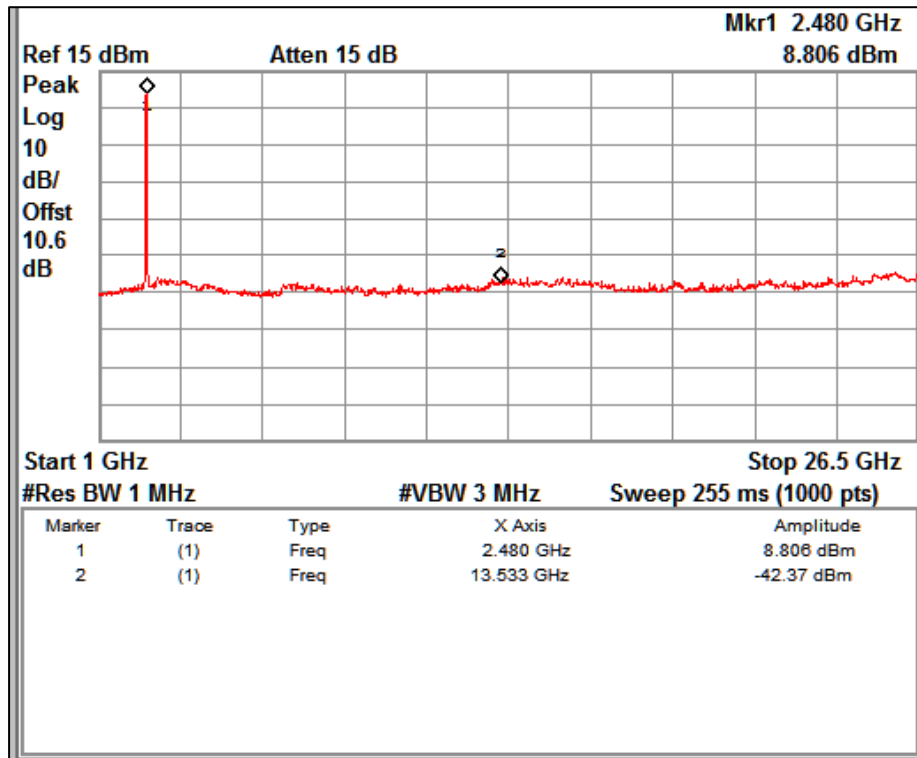
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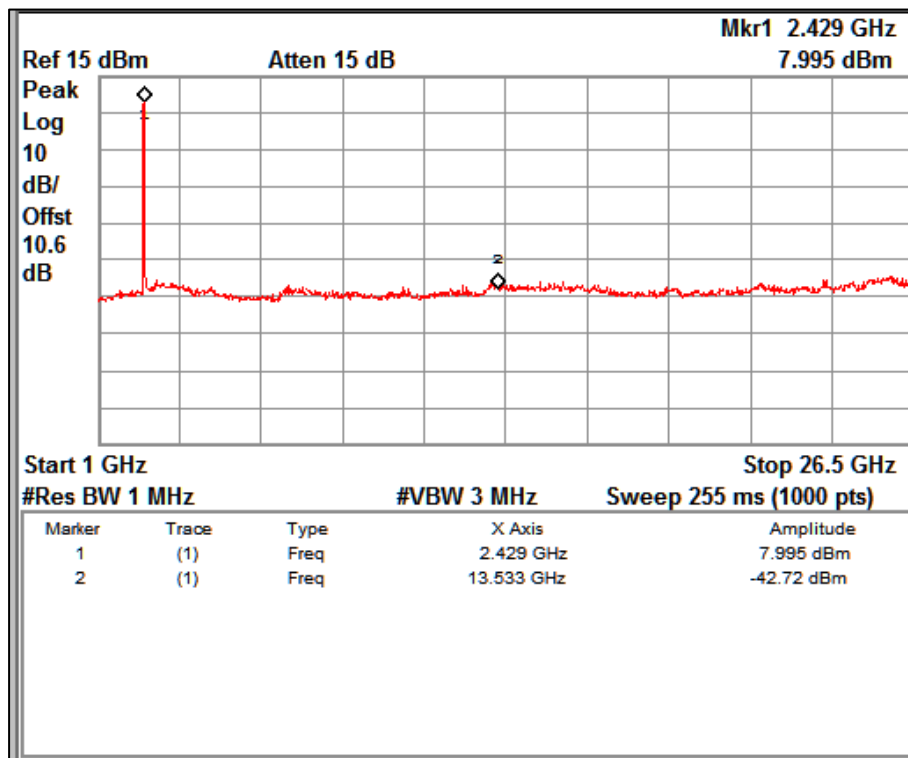
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Channel Frequency: 2462 MHz

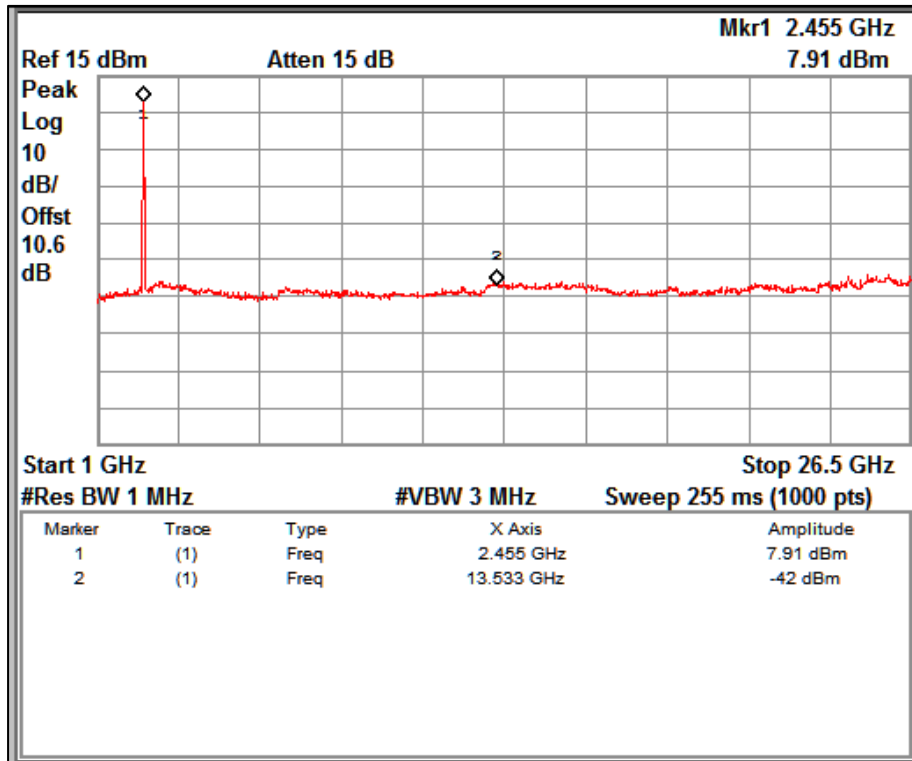
Data rate: 54Mbps

Protocol: 802.11 n mode HT20



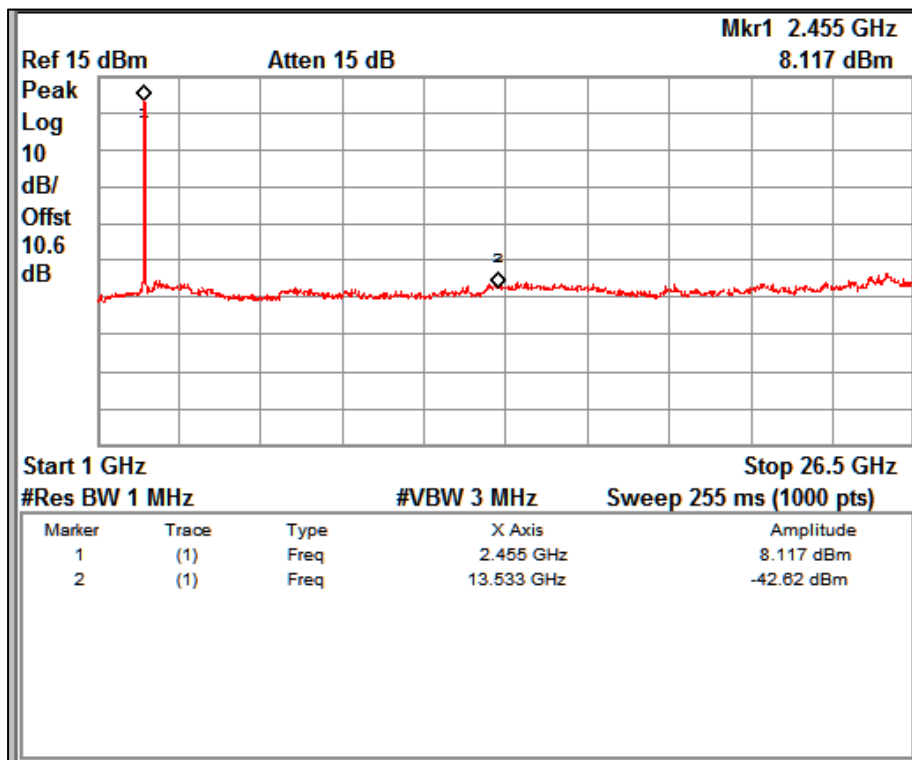
Channel Frequency: 2412 MHz

Data rate: MCS0



Channel Frequency: 2442 MHz

Data rate: MCS0



Channel Frequency: 2462 MHz

Data rate: MCS0

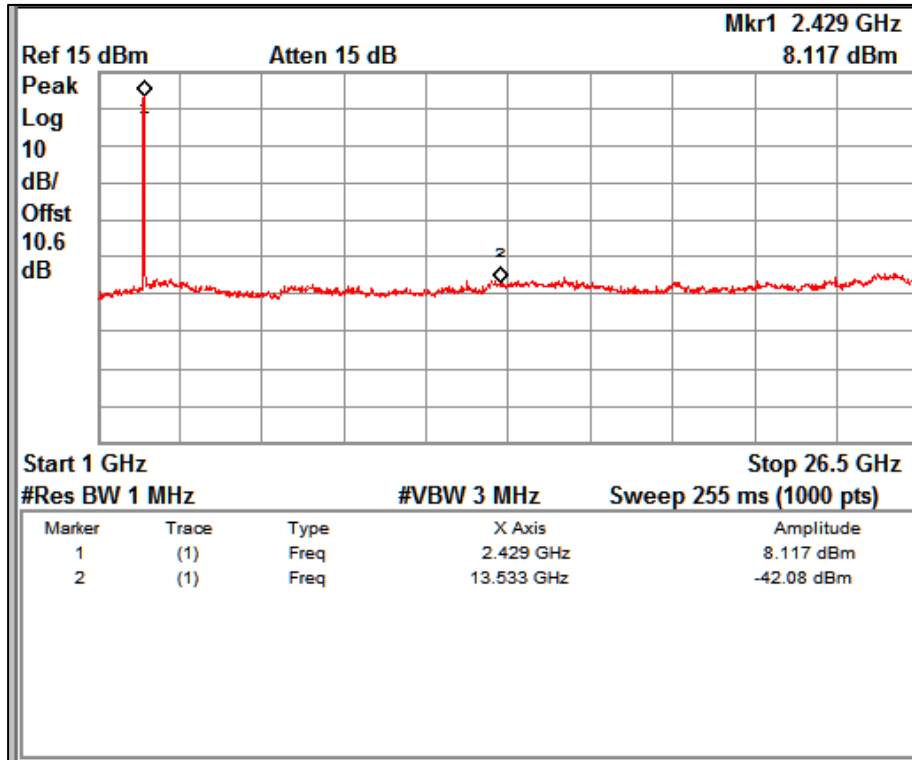
Prüfbericht - Nr.:

Test Report No.:

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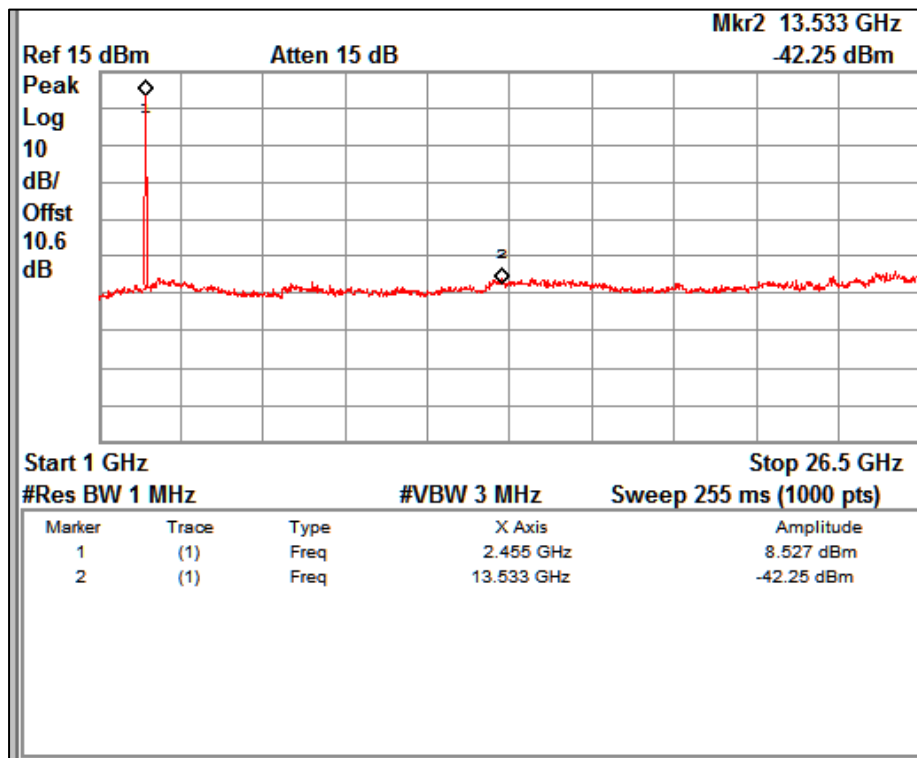
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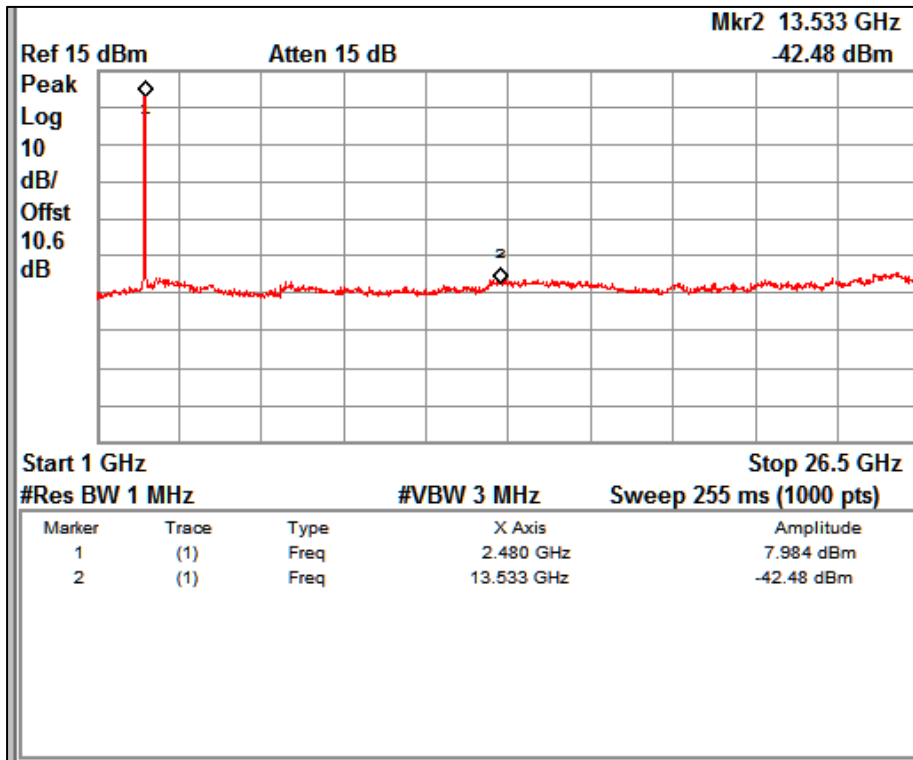
Channel Frequency: 2412 MHz

Data rate: MCS4



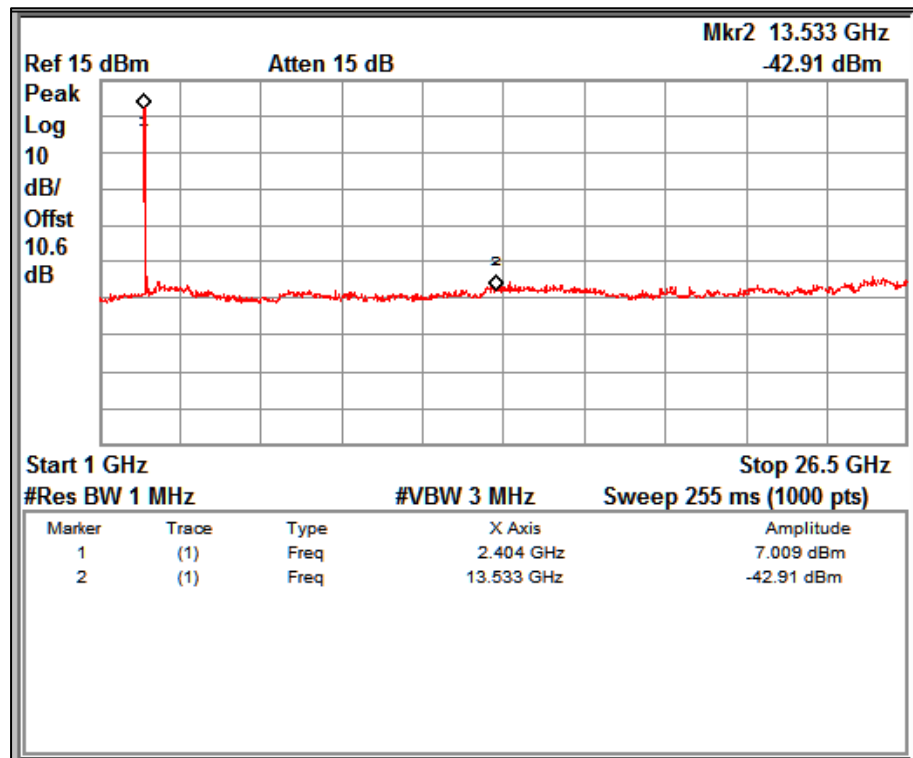
Channel Frequency: 2442 MHz

Data rate: MCS4



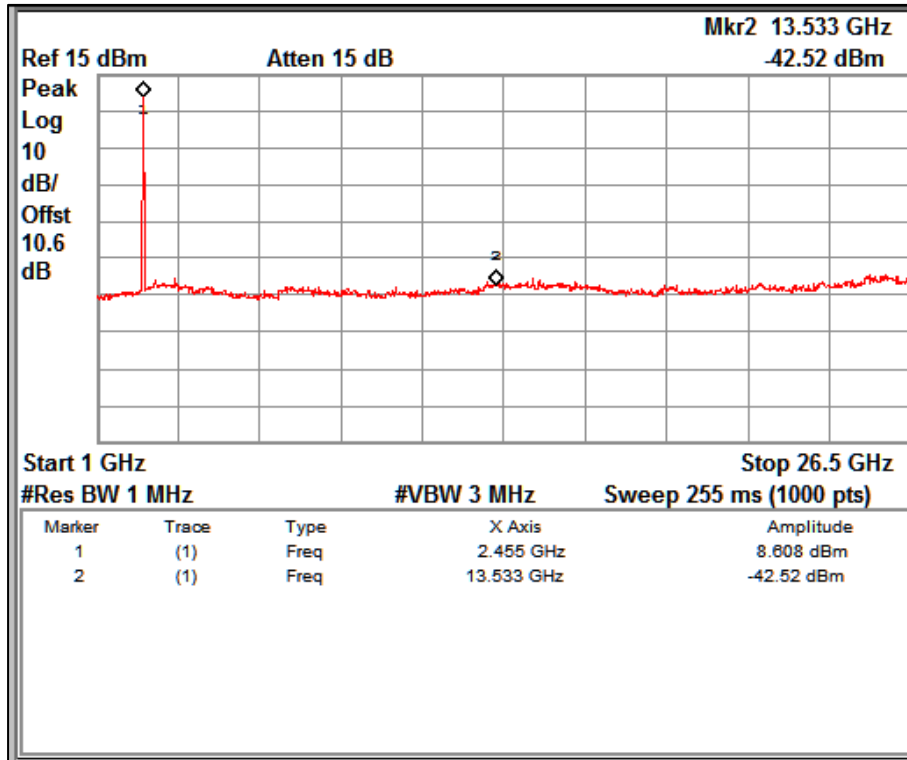
Channel Frequency: 2462 MHz

Data rate: MCS4



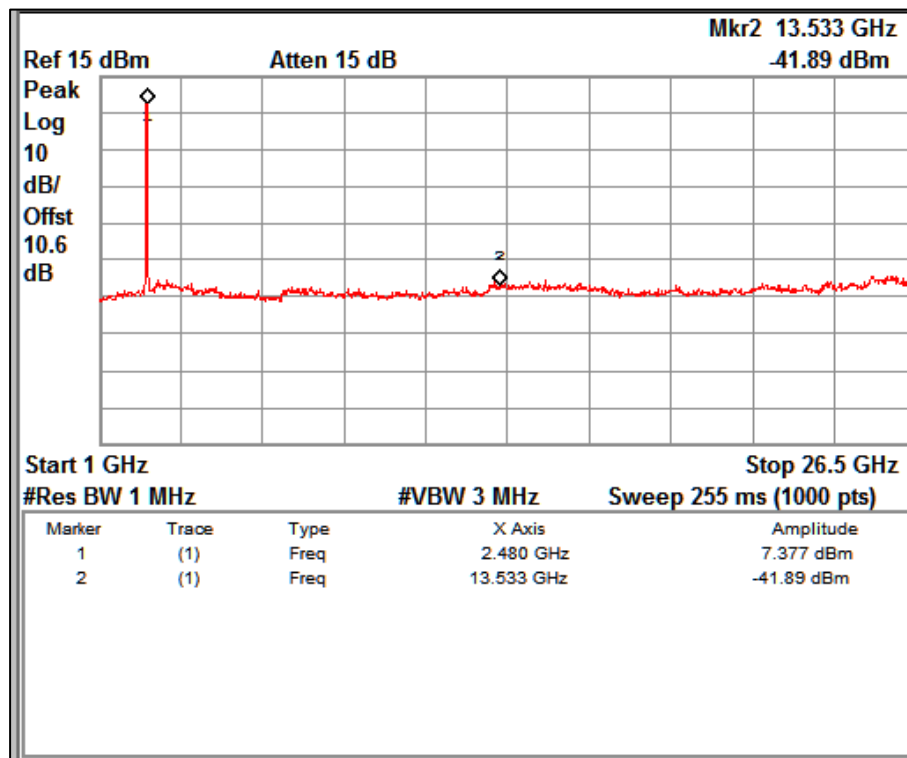
Channel Frequency: 2412 MHz

Data rate: MCS7



Channel Frequency: 2442 MHz

Data rate: MCS7



Channel Frequency: 2462 MHz

Data rate: MCS7

Prüfbericht - Nr.:

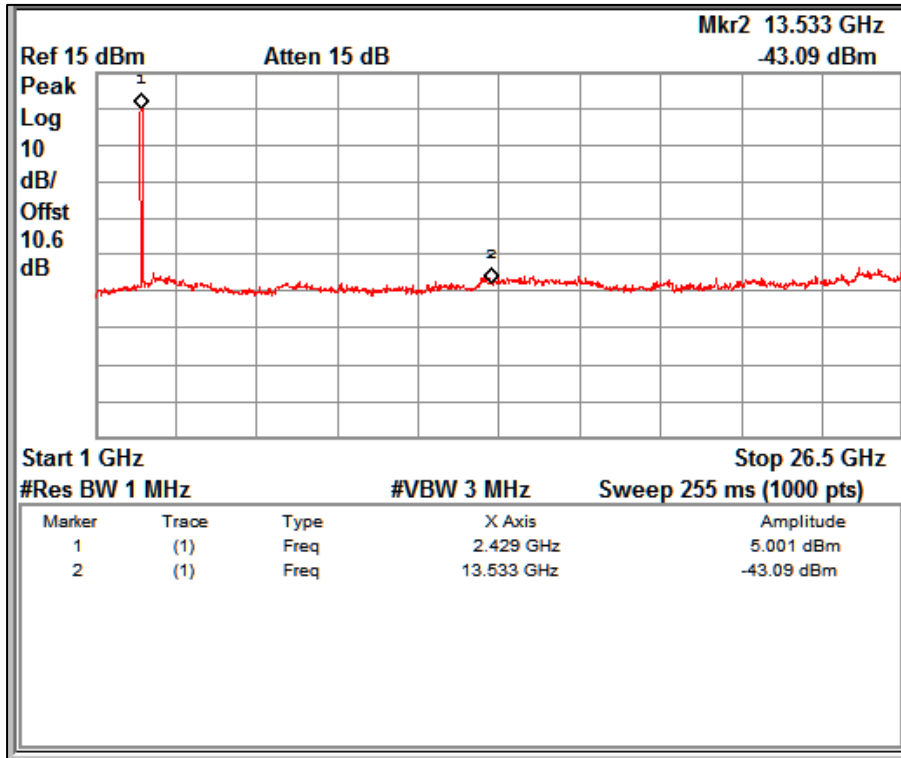
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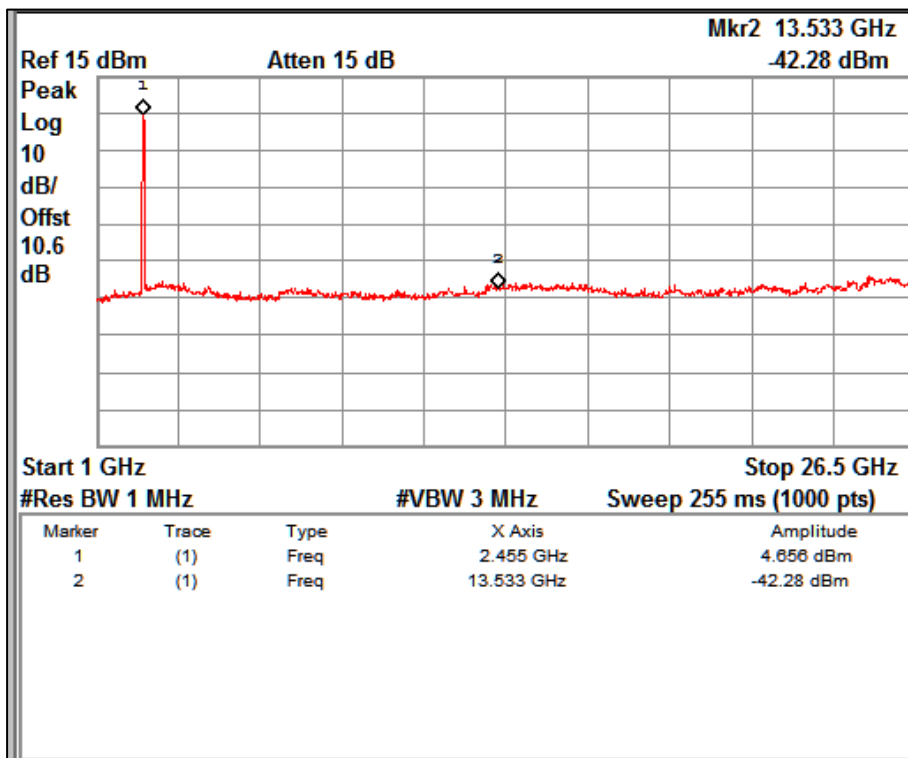
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Protocol: 802.11n_HT40



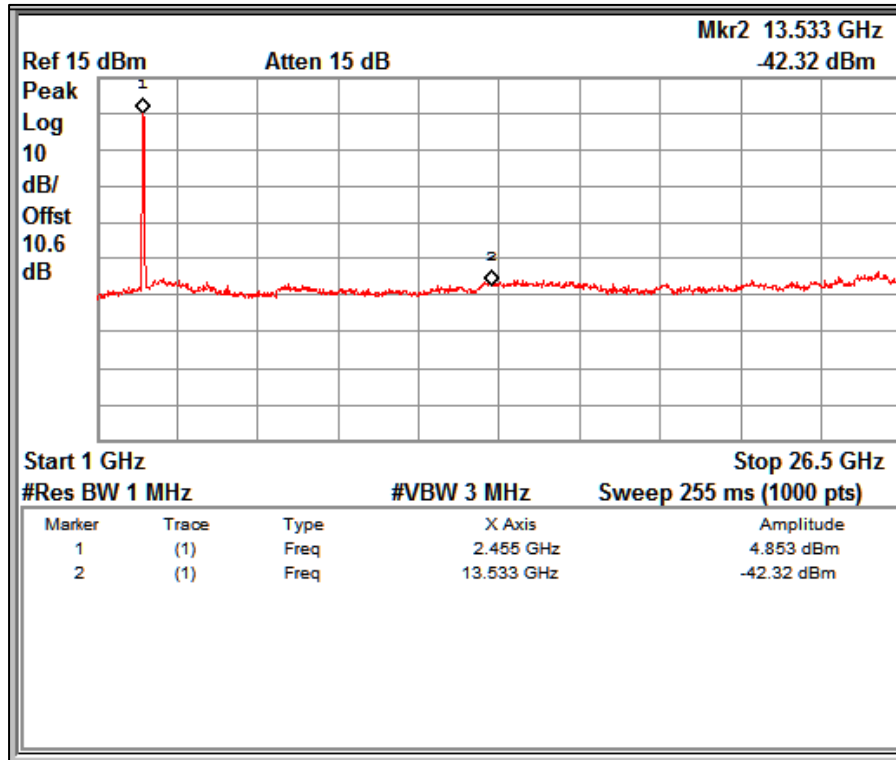
Channel Frequency: 2422 MHz

Data rate: MCS0



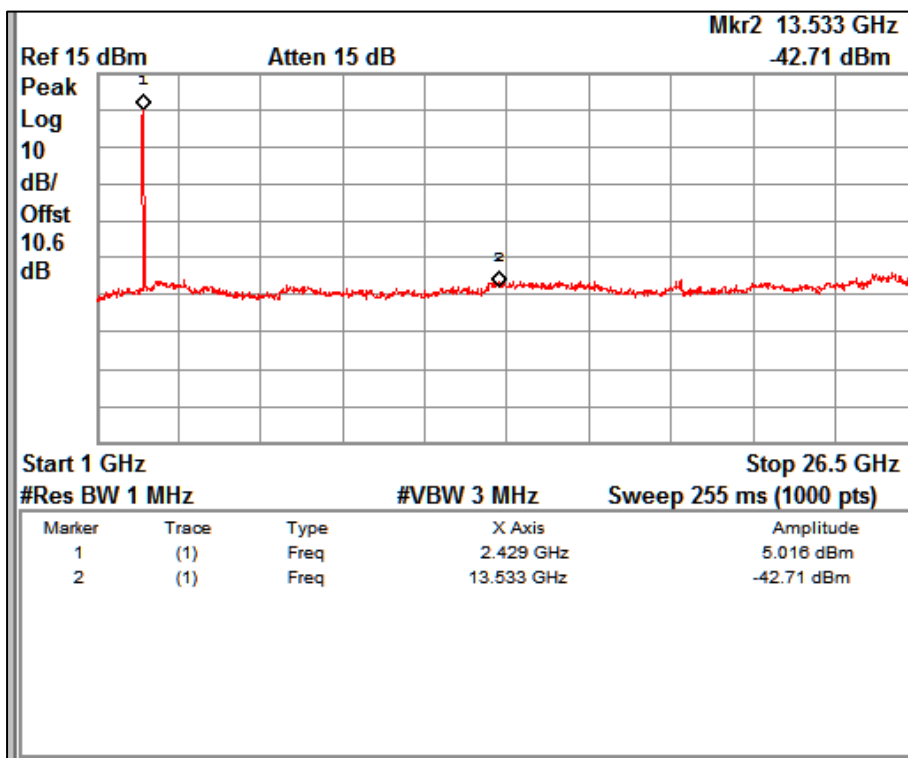
Channel Frequency: 2442 MHz

Data rate: MCS0



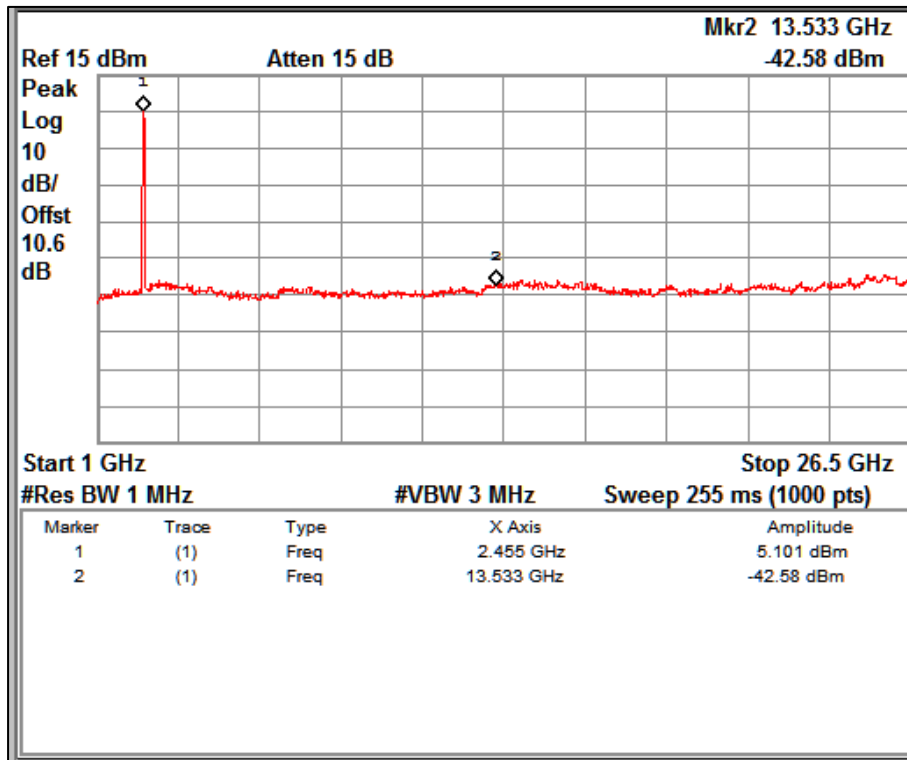
Channel Frequency: 2452 MHz

Data rate: MCS0



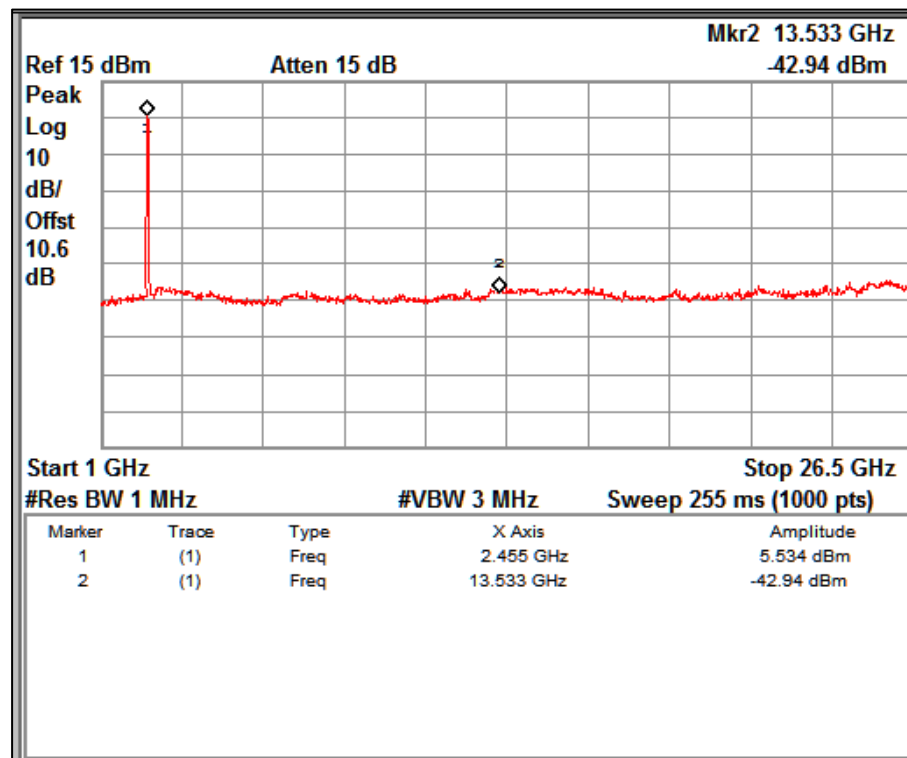
Channel Frequency: 2422 MHz

Data rate: MCS4



Channel Frequency: 2442 MHz

Data rate: MCS4



Channel Frequency: 2452 MHz

Data rate: MCS4

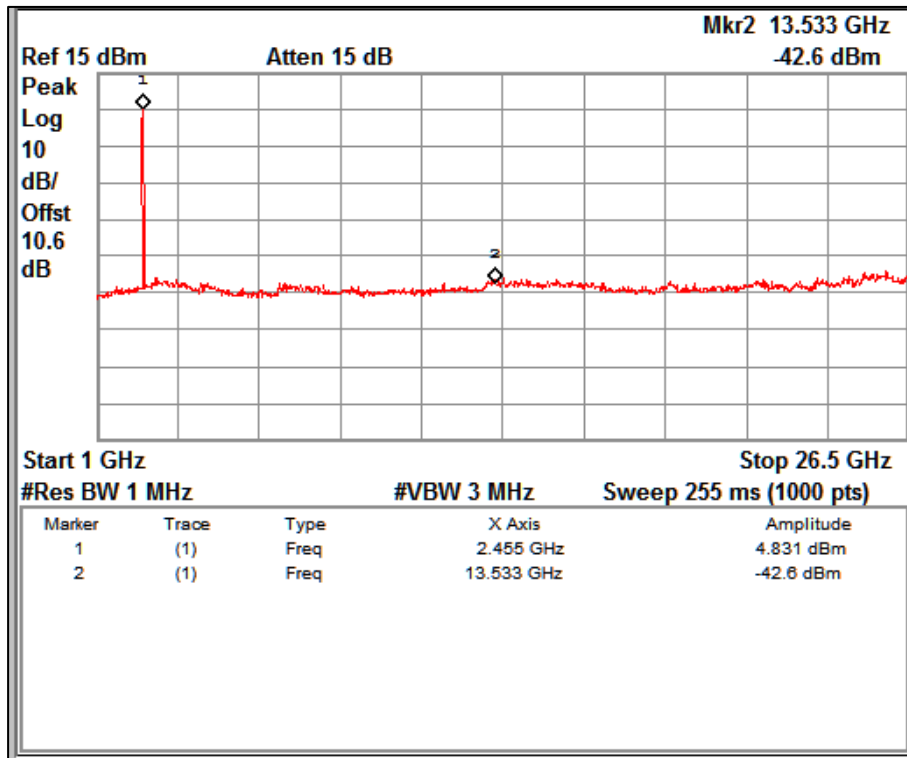
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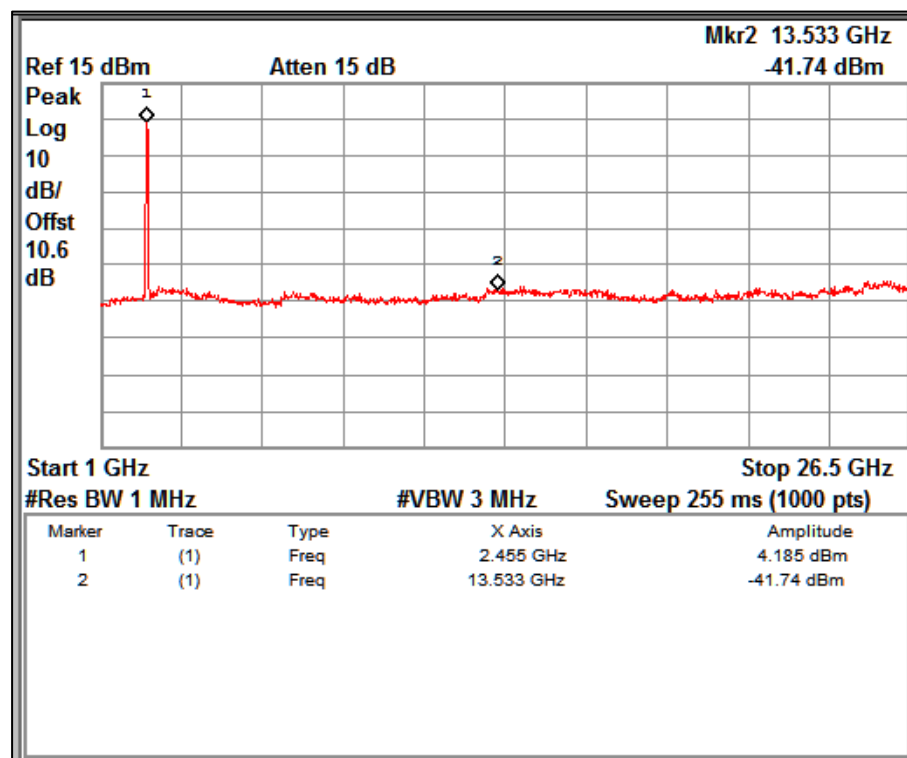
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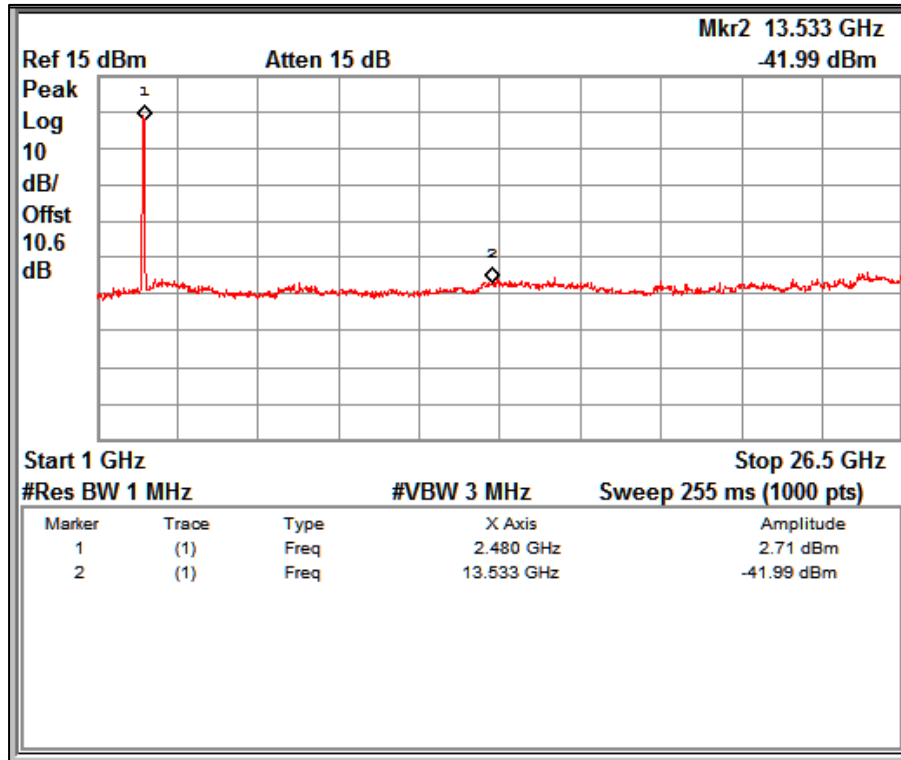
Channel Frequency: 2422 MHz

Data rate: MCS7



Channel Frequency: 2442 MHz

Data rate: MCS7



Channel Frequency: 2452 MHz

Data rate: MCS7

6.5 Radiated spurious emission and emissions in restricted bands of operation

Result

Pass

Test Specification FCC part 15 Subpart C Section 15.247 (d) / (15.209 & 15.205)/ RSS-Gen Issue 4, Section 8.9/8.10
 Test Method ANSI C 63.10 – 2013
 Measurement Location Fully Anechoic Chamber
 Measuring Distance 3 m
 Detector QP for frequency below 1 GHz, Average for frequency above 1 GHz
 Requirement As per the limits mentioned in the below table

Limits for Radiated Emission of Section 15.209:

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

Remark: * the limit shows in the table above of frequency range 0.009 – 0.490, 0.490 – 1.705 MHz and 1.705-30MHz is at 300 meter, 30 meter and 30 meter range respectively, which corresponds to 128-93.8, 73.80-62.95, 69.54 dBµV/m at 3m range by extrapolation calculation and the measurement of loop antenna.

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

Test Conditions:

Supply Voltage: 7.4 VDC Battery

Environmental conditions:

Temperature: +23.6°C RH: 64.6 %

Note:

Measurements were made as per section 8.6 in KDB 558074 D01 15.247 Measurement Guidance v05r02

Test results:

No emissions found in frequency 9 kHz to 30 MHz

Test results for the frequencies in range between 30MHz-1GHz (Charging Mode)

Polarization	Frequency (MHz)	Field strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Vertical	51.08	32.17	40.00	-7.83
	63.03	32.00	40.00	-8.00
	124.78	26.83	43.50	-16.67
	324.02	29.29	46.00	-16.71
	486.05	26.02	46.00	-19.98
	972.05	31.32	54.00	-22.68
Horizontal	51.13	25.22	40.00	-14.78
	124.72	28.27	43.50	-15.23
	194.75	32.42	43.50	-11.08
	204.1	21.99	43.50	-21.51
	243.01	18.17	46.00	-27.83
	899.81	33.22	46.00	-12.78

Test results for the frequencies in range between 30MHz-1GHz (Battery Mode)

Polarization	Frequency (MHz)	Field strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Vertical	87.42	17.18	40.00	-22.82
	142.57	19.55	43.50	-23.95
	180.06	19.91	43.50	-23.59
	480.02	27.66	46.00	-18.34
	560.00	29.68	46.00	-16.32
	810.05	33.56	46.00	-12.44
Horizontal	125.08	26.45	43.50	-17.05
	162.25	29.15	43.50	-14.35
	180.05	37.10	43.50	-6.40
	280.02	24.32	46.00	-21.68
	559.89	26.48	46.00	-19.52
	810.80	30.20	46.00	-15.80

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Test results for the frequencies in range between 1GHz-26.5GHz

Protocol: 802.11b

Data rate: 1Mbps

Channel	Polarization	Frequency (MHz)	Field strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Low	Vertical	2390(Pk)	39.91	74	-34.09
		2390(Av)	27.14	54	-26.86
		2412(Pk)	87.65	*	-
		2412(Av)	84.94	*	-
		4824(Pk)	43.03	74	-30.64
		4824(Av)	29.15	54	-24.63
		7236(Pk)	No Harmonics Found		
	7236(Av)	No Harmonics Found			
	Horizontal	2390(Pk)	41.63	74	-32.37
		2390(Av)	28.13	54	-25.87
		2412(Pk)	90.98	*	-
		2412(Av)	88.53	*	-
		4824(Pk)	43.36	74	-30.64
		4824(Av)	29.37	54	-24.63
7236(Pk)		No Harmonics Found			
7236(Av)	No Harmonics Found				
Mid	Vertical	2442(Av)	87.71	*	-
		2442(Av)	85.17	*	-
		4884(Pk)	43.58	74	-30.42
		4884(Av)	29.51	54	-24.49
		7326(Pk)	No Harmonics Found		
	7326(Av)	No Harmonics Found			
	Horizontal	2442(Pk)	91.25	*	-
		2442(Av)	88.69	*	-
		4884(Pk)	43.48	74	-30.52
		4884(Av)	29.60	54	-24.40
7326(Pk)		No Harmonics Found			
7326(Av)	No Harmonics Found				
High	Vertical	2462(Pk)	86.86	*	-
		2462(Av)	84.38	*	-
		2483.5(Pk)	38.26	74	-35.74
		2483.5(Av)	26.16	54	-27.84
		4924(Pk)	43.27	74	-30.73
		4924(Av)	29.31	54	-24.69
		7386(Pk)	No Harmonics Found		
	7386(Av)	No Harmonics Found			
	Horizontal	2462(Pk)	90.34	*	-
		2462(Av)	87.82	*	-
		2483.5(Pk)	39.76	74	-34.24
		2483.5(Av)	27.77	54	-26.23
		4924(Pk)	43.71	74	-30.29
4924(Av)		29.31	54	-24.69	
7386(Pk)	No Harmonics Found				
7386(Av)	No Harmonics Found				

*- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

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Data rate: 11Mbps

Channel	Polarization	Frequency (MHz)	Field strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low	Vertical	2390(Pk)	41.11	74	-32.89
		2390(Av)	27.19	54	-26.81
		2412(Pk)	92.98	*	-
		2412(Av)	84.68	*	-
		4824(Pk)	43.69	74	-30.65
		4824(Av)	29.42	54	-24.59
		7236(Pk)	No Harmonics Found		
	7236(Av)	No Harmonics Found			
	Horizontal	2390(Pk)	41.69	74	-32.31
		2390(Av)	27.95	54	-26.05
		2412(Pk)	95.90	*	-
		2412(Av)	87.46	*	-
		4824(Pk)	43.35	74	-30.65
		4824(Av)	29.41	54	-24.59
7236(Pk)		No Harmonics Found			
7236(Av)	No Harmonics Found				
Mid	Vertical	2442(Av)	92.64	*	-
		2442(Av)	84.74	*	-
		4884(Pk)	43.85	74	-30.15
		4884(Av)	29.57	54	-24.43
		7326(Pk)	49.05	74	-24.95
		7326(Av)	35.07	54	-18.93
	Horizontal	2442(Pk)	96.08	*	-
		2442(Av)	88.15	*	-
		4884(Pk)	43.70	74	-30.30
		4884(Av)	29.54	54	-24.46
		7326(Pk)	48.99	74	-25.01
		7326(Av)	35.11	54	-18.89
High	Vertical	2462(Pk)	92.37	*	-
		2462(Av)	84.15	*	-
		2483.5(Pk)	39.02	74	-34.98
		2483.5(Av)	26.00	54	-28.00
		4924(Pk)	43.58	74	-30.42
		4924(Av)	29.25	54	-24.75
		7386(Pk)	No Harmonics Found		
	7386(Av)	No Harmonics Found			
	Horizontal	2462(Pk)	95.67	*	-
		2462(Av)	87.46	*	-
		2483.5(Pk)	40.69	74	-33.31
		2483.5(Av)	27.31	54	-26.69
		4924(Pk)	43.50	74	-30.50
		4924(Av)	29.25	54	-24.75
7386(Pk)		No Harmonics Found			
7386(Av)	No Harmonics Found				

*- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

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Protocol: 802.11 g

Data rate: 6Mbps

Channel	Polarization	Frequency (MHz)	Field strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Low	Vertical	2390(Pk)	52.67	74	-21.33
		2390(Av)	33.66	54	-20.34
		2412(Pk)	91.52	*	-
		2412(Av)	81.16	*	-
		4824(Pk)	43.37	74	-30.62
		4824(Av)	29.54	54	-24.47
		7236(Pk)	No Harmonics Found		
	7236(Av)	No Harmonics Found			
	Horizontal	2390(Pk)	52.67	74	-21.33
		2390(Av)	34.33	54	-19.67
		2412(Pk)	94.33	*	-
		2412(Av)	83.79	*	-
		4824(Pk)	43.38	74	-30.62
		4824(Av)	29.53	54	-24.47
7236(Pk)		No Harmonics Found			
7236(Av)	No Harmonics Found				
Mid	Vertical	2442(Av)	91.43	*	-
		2442(Av)	81.17	*	-
		4884(Pk)	43.75	74	-30.25
		4884(Av)	29.43	54	-24.57
		7326(Pk)	No Harmonics Found		
	7326(Av)	No Harmonics Found			
	Horizontal	2442(Pk)	94.34	*	-
		2442(Av)	84.37	*	-
		4884(Pk)	43.28	74	-30.72
		4884(Av)	29.56	54	-24.44
7326(Pk)		No Harmonics Found			
7326(Av)	No Harmonics Found				
High	Vertical	2462(Pk)	90.44	*	-
		2462(Av)	79.92	*	-
		2483.5(Pk)	48.71	74	-25.29
		2483.5(Av)	30.80	54	-23.20
		4924(Pk)	43.34	74	-30.66
		4924(Av)	29.34	54	-24.66
		7386(Pk)	No Harmonics Found		
	7386(Av)	No Harmonics Found			
	Horizontal	2462(Pk)	93.77	*	-
		2462(Av)	83.26	*	-
		2483.5(Pk)	49.85	74	-24.15
		2483.5(Av)	32.89	54	-21.11
		4924(Pk)	43.10	74	-30.90
4924(Av)		29.32	54	-24.68	
7386(Pk)	No Harmonics Found				
7386(Av)	No Harmonics Found				

*- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

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Data rate: 24Mbps

Channel	Polarization	Frequency (MHz)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)	
Low	Vertical	2390(Pk)	50.95	74	-23.05	
		2390(Av)	33.46	54	-20.54	
		2412(Pk)	92.61	*	-	
		2412(Av)	80.80	*	-	
		4824(Pk)	43.60	74	-30.17	
		4824(Av)	29.46	54	-24.46	
		7236(Pk)	No Harmonics Found			
		7236(Av)	No Harmonics Found			
	Horizontal	2390(Pk)	51.55	74	-22.45	
		2390(Av)	34.33	54	-19.67	
		2412(Pk)	94.93	*	-	
		2412(Av)	83.64	*	-	
		4824(Pk)	43.83	74	-30.17	
		4824(Av)	29.54	54	-24.46	
		7236(Pk)	No Harmonics Found			
		7236(Av)	No Harmonics Found			
Mid	Vertical	2442(Av)	93.97	*	-	
		2442(Av)	80.87	*	-	
		4884(Pk)	44.24	74	-29.76	
		4884(Av)	29.53	54	-24.47	
		7326(Pk)	No Harmonics Found			
		7326(Av)	No Harmonics Found			
	Horizontal	2442(Pk)	96.27	*	-	
		2442(Av)	84.31	*	-	
		4884(Pk)	44.13	74	-29.87	
		4884(Av)	29.55	54	-24.45	
7326(Pk)	No Harmonics Found					
7326(Av)	No Harmonics Found					
High	Vertical	2462(Pk)	91.92	*	-	
		2462(Av)	79.71	*	-	
		2483.5(Pk)	46.59	74	-27.41	
		2483.5(Av)	90.75	54	36.75	
		4924(Pk)	43.35	74	-30.65	
		4924(Av)	29.39	54	-24.61	
		7386(Pk)	No Harmonics Found			
		7386(Av)	No Harmonics Found			
	Horizontal	2462(Pk)	94.76	*	-	
		2462(Av)	83.10	*	-	
		2483.5(Pk)	48.44	74	-25.56	
		2483.5(Av)	32.81	54	-21.19	
		4924(Pk)	43.28	74	-30.72	
		4924(Av)	29.36	54	-24.64	
7386(Pk)	No Harmonics Found					
7386(Av)	No Harmonics Found					

*- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

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Data rate: 54Mbps

Channel	Polarization	Frequency (MHz)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)	
Low	Vertical	2390(Pk)	47.51	74	-26.49	
		2390(Av)	32.60	54	-21.40	
		2412(Pk)	92.66	*	-	
		2412(Av)	80.29	*	-	
		4824(Pk)	43.62	74	-30.76	
		4824(Av)	29.51	54	-24.55	
		7236(Pk)	No Harmonics Found			
		7236(Av)	No Harmonics Found			
	Horizontal	2390(Pk)	49.11	74	-24.89	
		2390(Av)	33.01	54	-20.99	
		2412(Pk)	95.22	*	-	
		2412(Av)	82.89	*	-	
		4824(Pk)	43.24	74	-30.76	
		4824(Av)	29.45	54	-24.55	
		7236(Pk)	No Harmonics Found			
		7236(Av)	No Harmonics Found			
Mid	Vertical	2442(Av)	93.50	*	-	
		2442(Av)	80.45	*	-	
		4884(Pk)	43.56	74	-30.44	
		4884(Av)	29.63	54	-24.37	
		7326(Pk)	No Harmonics Found			
	7326(Av)	No Harmonics Found				
	Horizontal	2442(Pk)	96.26	*	-	
		2442(Av)	83.59	*	-	
		4884(Pk)	43.44	74	-30.56	
		4884(Av)	29.59	54	-24.41	
7326(Pk)		No Harmonics Found				
7326(Av)	No Harmonics Found					
High	Vertical	2462(Pk)	92.42	*	-	
		2462(Av)	79.59	*	-	
		2483.5(Pk)	54.60	74	-19.40	
		2483.5(Av)	35.36	54	-18.64	
		4924(Pk)	43.46	74	-30.54	
		4924(Av)	29.33	54	-24.67	
		7386(Pk)	No Harmonics Found			
		7386(Av)	No Harmonics Found			
	Horizontal	2462(Pk)	95.01	*	-	
		2462(Av)	82.45	*	-	
		2483.5(Pk)	56.76	74	-17.24	
		2483.5(Av)	37.36	54	-16.64	
		4924(Pk)	43.72	74	-30.28	
		4924(Av)	29.37	54	-24.63	
7386(Pk)	No Harmonics Found					
7386(Av)	No Harmonics Found					

* - : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

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Protocol: 802.11 n HT20

Data rate: MCS0

Channel	Polarization	Frequency (MHz)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Low	Vertical	2390(Pk)	57.68	74	-16.32
		2390(Av)	36.01	54	-17.99
		2412(Pk)	91.99	*	-
		2412(Av)	81.51	*	-
		4824(Pk)	43.52	74	-30.35
		4824(Av)	29.36	54	-24.66
		7236(Pk)	No Harmonics Found		
	7236(Av)	No Harmonics Found			
	Horizontal	2390(Pk)	57.83	74	-16.17
		2390(Av)	36.73	54	-17.27
		2412(Pk)	94.24	*	-
		2412(Av)	84.03	*	-
		4824(Pk)	43.65	74	-30.35
		4824(Av)	29.34	54	-24.66
7236(Pk)		No Harmonics Found			
7236(Av)	No Harmonics Found				
Mid	Vertical	2442(Av)	91.89	*	-
		2442(Av)	81.36	*	-
		4884(Pk)	43.48	74	-30.52
		4884(Av)	29.50	54	-24.50
		7326(Pk)	No Harmonics Found		
	7326(Av)	No Harmonics Found			
	Horizontal	2442(Pk)	94.66	*	-
		2442(Av)	84.50	*	-
		4884(Pk)	42.92	74	-31.08
		4884(Av)	29.49	54	-24.51
7326(Pk)		No Harmonics Found			
7326(Av)	No Harmonics Found				
High	Vertical	2462(Pk)	90.67	*	-
		2462(Av)	80.28	*	-
		2483.5(Pk)	52.74	74	-21.26
		2483.5(Av)	32.84	54	-21.16
		4924(Pk)	43.43	74	-30.57
		4924(Av)	29.30	54	-24.70
		7386(Pk)	No Harmonics Found		
	7386(Av)	No Harmonics Found			
	Horizontal	2462(Pk)	93.20	*	-
		2462(Av)	83.13	*	-
		2483.5(Pk)	55.14	74	-18.86
		2483.5(Av)	34.60	54	-19.40
		4924(Pk)	43.33	74	-30.67
		4924(Av)	29.42	54	-24.58
7386(Pk)		No Harmonics Found			
7386(Av)	No Harmonics Found				

*- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

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Data rate: MCS4

Channel	Polarization	Frequency (MHz)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Low	Vertical	2390(Pk)	54.25	74	-19.75
		2390(Av)	34.58	54	-19.42
		2412(Pk)	92.58	*	-
		2412(Av)	79.91	*	-
		4824(Pk)	44.06	74	-31.48
		4824(Av)	29.40	54	-24.59
		7236(Pk)	No Harmonics Found		
	7236(Av)				
	Horizontal	2390(Pk)	53.79	74	-20.21
		2390(Av)	35.45	54	-18.55
		2412(Pk)	94.50	*	-
		2412(Av)	82.99	*	-
		4824(Pk)	42.52	74	-31.48
		4824(Av)	29.41	54	-24.59
7236(Pk)		No Harmonics Found			
7236(Av)					
Mid	Vertical	2442(Av)	92.45	*	-
		2442(Av)	80.03	*	-
		4884(Pk)	43.30	74	-30.70
		4884(Av)	29.52	54	-24.48
		7326(Pk)	No Harmonics Found		
	7326(Av)				
	Horizontal	2442(Pk)	95.47	*	-
		2442(Av)	83.50	*	-
		4884(Pk)	43.57	74	-30.43
		4884(Av)	29.45	54	-24.55
7326(Pk)		No Harmonics Found			
7326(Av)					
High	Vertical	2462(Pk)	90.46	*	-
		2462(Av)	78.35	*	-
		2483.5(Pk)	47.62	74	-26.38
		2483.5(Av)	30.58	54	-23.42
		4924(Pk)	42.88	74	-31.12
		4924(Av)	29.32	54	-24.68
		7386(Pk)	No Harmonics Found		
	7386(Av)				
	Horizontal	2462(Pk)	94.20	*	-
		2462(Av)	82.37	*	-
		2483.5(Pk)	50.50	74	-23.50
		2483.5(Av)	33.03	54	-20.97
		4924(Pk)	43.20	74	-30.80
		4924(Av)	29.34	54	-24.66
7386(Pk)		No Harmonics Found			
7386(Av)					

*- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

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Data rate: MCS7

Channel	Polarization	Frequency (MHz)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Low	Vertical	2390(Pk)	48.85	74	-25.15
		2390(Av)	31.77	54	-22.23
		2412(Pk)	91.86	*	-
		2412(Av)	78.87	*	-
		4824(Pk)	44.13	74	-28.86
		4824(Av)	29.51	54	-24.52
		7236(Pk)	No Harmonics Found		
	7236(Av)				
	Horizontal	2390(Pk)	49.57	74	-24.43
		2390(Av)	33.30	54	-20.70
		2412(Pk)	94.90	*	-
		2412(Av)	82.14	*	-
		4824(Pk)	45.14	74	-28.86
		4824(Av)	29.48	54	-24.52
7236(Pk)		No Harmonics Found			
7236(Av)					
Mid	Vertical	2442(Av)	91.04	*	-
		2442(Av)	78.70	*	-
		4884(Pk)	43.78	74	-30.22
		4884(Av)	29.53	54	-24.47
		7326(Pk)	No Harmonics Found		
	7326(Av)				
	Horizontal	2442(Pk)	94.65	*	-
		2442(Av)	82.75	*	-
		4884(Pk)	43.40	74	-30.60
		4884(Av)	29.46	54	-24.54
7326(Pk)		No Harmonics Found			
7326(Av)					
High	Vertical	2462(Pk)	90.17	*	-
		2462(Av)	77.43	*	-
		2483.5(Pk)	50.07	74	-23.93
		2483.5(Av)	33.99	54	-20.01
		4924(Pk)	43.92	74	-30.08
		4924(Av)	29.31	54	-24.69
		7386(Pk)	No Harmonics Found		
	7386(Av)				
	Horizontal	2462(Pk)	93.78	*	-
		2462(Av)	81.59	*	-
		2483.5(Pk)	53.86	74	-20.14
		2483.5(Av)	36.46	54	-17.54
		4924(Pk)	43.84	74	-30.16
4924(Av)		29.31	54	-24.69	
7386(Pk)	No Harmonics Found				
7386(Av)					

*- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

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Protocol: 802.11n_HT40

Data rate: MCS0

Channel	Polarization	Frequency (MHz)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Low	Vertical	2390(Pk)	53.86	74	-20.14
		2390(Av)	33.79	54	-20.21
		2422(Pk)	88.67	*	-
		2422(Av)	77.76	*	-
		4844(Pk)	43.35	74	-30.66
		4844(Av)	29.57	54	-24.47
		7266(Pk)	NHF		
	7266(Av)				
	Horizontal	2390(Pk)	54.65	74	-19.35
		2390(Av)	34.96	54	-19.04
		2422(Pk)	92.20	*	-
		2422(Av)	81.50	*	-
		4844(Pk)	43.34	74	-30.66
		4844(Av)	29.53	54	-24.47
7266(Pk)		No Harmonics Found			
7266(Av)					
Mid	Vertical	2442(Av)	88.70	*	-
		2442(Av)	77.82	*	-
		4884(Pk)	43.35	74	-30.65
		4884(Av)	29.57	54	-24.43
		7326(Pk)	No Harmonics Found		
	7326(Av)				
	Horizontal	2442(Pk)	91.66	*	-
		2442(Av)	81.08	*	-
		4884(Pk)	43.34	74	-30.66
		4884(Av)	29.53	54	-24.47
7326(Pk)		No Harmonics Found			
7326(Av)					
High	Vertical	2452(Pk)	88.25	*	-
		2452(Av)	78.02	*	-
		2483.5(Pk)	50.41	74	-23.59
		2483.5(Av)	30.32	54	-23.68
		4904(Pk)	43.03	74	-30.97
		4904(Av)	29.31	54	-24.69
		7356(Pk)	No Harmonics Found		
	7356(Av)				
	Horizontal	2452(Pk)	90.98	*	-
		2452(Av)	81.14	*	-
		2483.5(Pk)	52.53	74	-21.47
		2483.5(Av)	31.99	54	-22.01
		4904(Pk)	43.07	74	-30.93
4904(Av)		29.37	54	-24.63	
7356(Pk)	No Harmonics Found				
7356(Av)					

* : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

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Data rate: MCS4

Channel	Polarization	Frequency (MHz)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)	
Low	Vertical	2390(Pk)	49.16	74	-24.84	
		2390(Av)	32.61	54	-21.39	
		2422(Pk)	90.00	*	-	
		2422(Av)	76.67	*	-	
		4844(Pk)	43.92	74	-30.22	
		4844(Av)	29.58	54	-24.40	
		7266(Pk)	No Harmonics Found			
		7266(Av)	No Harmonics Found			
	Horizontal	2390(Pk)	49.00	74	-25.00	
		2390(Av)	33.60	54	-20.40	
		2422(Pk)	92.99	*	-	
		2422(Av)	80.05	*	-	
		4844(Pk)	43.78	74	-30.22	
		4844(Av)	29.60	54	-24.40	
		7266(Pk)	No Harmonics Found			
		7266(Av)	No Harmonics Found			
Mid	Vertical	2442(Av)	93.30	*	-	
		2442(Av)	80.54	*	-	
		4884(Pk)	43.92	74	-30.08	
		4884(Av)	29.58	54	-24.42	
		7326(Pk)	No Harmonics Found			
		7326(Av)	No Harmonics Found			
	Horizontal	2442(Pk)	93.89	*	-	
		2442(Av)	80.67	*	-	
		4884(Pk)	43.59	74	-30.22	
		4884(Av)	29.42	54	-24.40	
7326(Pk)	No Harmonics Found					
7326(Av)	No Harmonics Found					
High	Vertical	2452(Pk)	90.13	*	-	
		2452(Av)	77.01	*	-	
		2483.5(Pk)	44.50	74	-29.5	
		2483.5(Av)	29.06	54	-24.94	
		4904(Pk)	42.87	74	-31.13	
		4904(Av)	29.31	54	-24.69	
		7356(Pk)	No Harmonics Found			
		7356(Av)	No Harmonics Found			
	Horizontal	2452(Pk)	93.17	*	-	
		2452(Av)	79.95	*	-	
		2483.5(Pk)	48.39	74	-25.61	
		2483.5(Av)	31.11	54	-22.89	
		4904(Pk)	43.59	74	-30.41	
		4904(Av)	29.42	54	-24.58	
7356(Pk)	No Harmonics Found					
7356(Av)	No Harmonics Found					

*- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

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Data rate: MCS7

Channel	Polarization	Frequency (MHz)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)	
Low	Vertical	2390(Pk)	48.85	74	-25.15	
		2390(Av)	31.77	54	-22.23	
		2422(Pk)	91.86	*	-	
		2422(Av)	78.87	*	-	
		4844(Pk)	44.13	74	-28.86	
		4844(Av)	29.51	54	-24.52	
		7266(Pk)	No Harmonics Found			
		7266(Av)	No Harmonics Found			
	Horizontal	2390(Pk)	49.57	74	-24.43	
		2390(Av)	33.30	54	-20.70	
		2422(Pk)	94.90	*	-	
		2422(Av)	82.14	*	-	
		4844(Pk)	45.14	74	-28.86	
		4844(Av)	29.48	54	-24.52	
		7266(Pk)	No Harmonics Found			
		7266(Av)	No Harmonics Found			
Mid	Vertical	2442(Av)	91.04	*	-	
		2442(Av)	78.70	*	-	
		4884(Pk)	43.78	74	-30.22	
		4884(Av)	29.53	54	-24.47	
		7326(Pk)	No Harmonics Found			
		7326(Av)	No Harmonics Found			
	Horizontal	2442(Pk)	94.65	*	-	
		2442(Av)	82.75	*	-	
		4884(Pk)	43.40	74	-30.60	
		4884(Av)	29.46	54	-24.54	
		7326(Pk)	No Harmonics Found			
		7326(Av)	No Harmonics Found			
High	Vertical	2452(Pk)	90.17	*	-	
		2452(Av)	77.43	*	-	
		2483.5(Pk)	50.07	74	-23.93	
		2483.5(Av)	33.99	54	-20.01	
		4904(Pk)	43.92	74	-30.08	
		4904(Av)	29.31	54	-24.69	
		7356(Pk)	No Harmonics Found			
		7356(Av)	No Harmonics Found			
	Horizontal	2452(Pk)	93.78	*	-	
		2452(Av)	81.59	*	-	
		2483.5(Pk)	53.86	74	-20.14	
		2483.5(Av)	36.46	54	-17.54	
		4904(Pk)	43.84	74	-30.16	
		4904(Av)	29.31	54	-24.69	
7356(Pk)	No Harmonics Found					
7356(Av)	No Harmonics Found					

*- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

Note: Field strength (dBµV/m) = Measured value (dBµV) +Cable loss (dB) +antenna factor (dB)-preamplifier gain (dB)

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7 Conducted Emission Test on A.C. Power Line

Result

Pass

Test Specification : FCC Part 15 Section 15.207
 Test Method : ANSI C63.10-2013
 Testing Location : Screened room
 Measurement Bandwidth : 9kHz
 Frequency Range : 150kHz – 30MHz
 Supply Voltage : 110VAC,60Hz

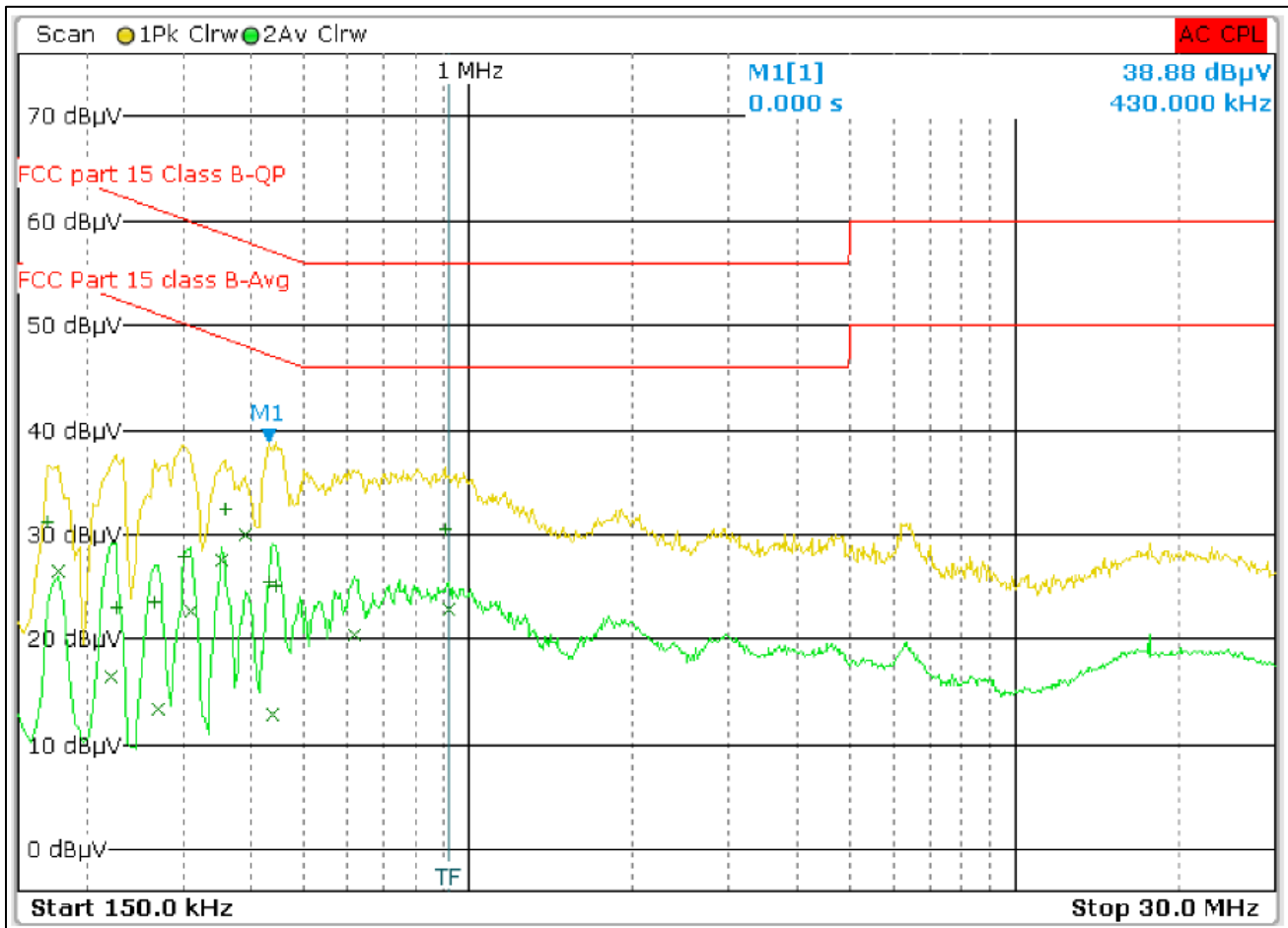
Limit of section 15.207

Frequency of emission (MHz)	QP Limit (dB μ V)	AV Limit (dB μ V/m)
0.15 – 0.5	66 – 56*	56 – 46*
0.5 – 5	56	46
5 – 30	60	50

* Decreases with the logarithm of the frequency

Test Result: LINE Graphs and Tables

110v AC , 60Hz



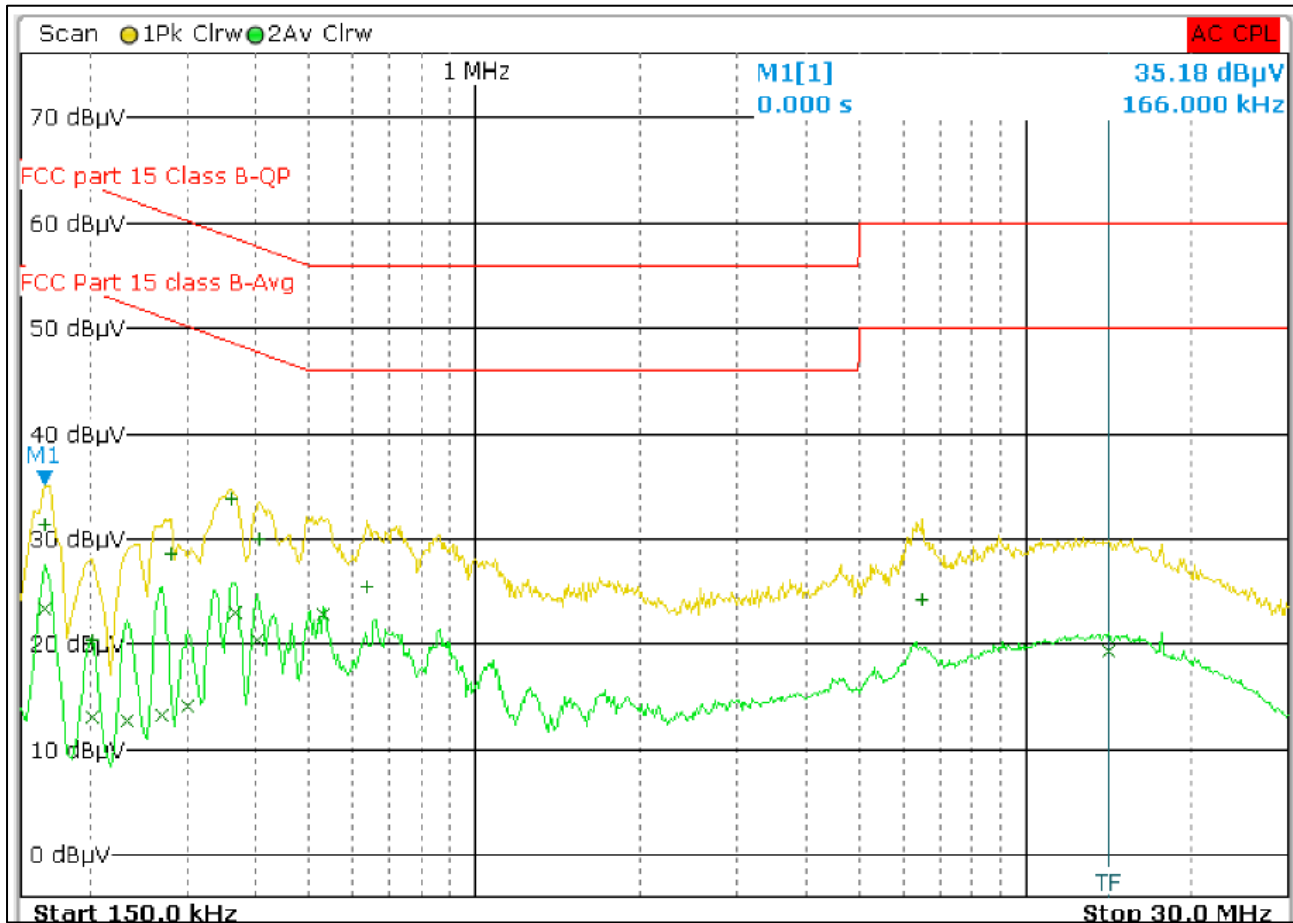
Line Graph

Trace	Frequency	Level (dBµV)	Phase	Detector	Delta Limit/dB
2	390.00000000 kHz	30.04		Average	-18.02
2	354.00000000 kHz	27.49		Average	-21.38
2	922.00000000 kHz	22.91		Average	-23.09
1	906.00000000 kHz	30.52		Quasi Peak	-25.48
2	618.00000000 kHz	20.37		Average	-25.63
1	358.00000000 kHz	32.43		Quasi Peak	-26.34
2	310.00000000 kHz	22.61		Average	-27.36
2	178.00000000 kHz	26.55		Average	-28.03
1	430.00000000 kHz	25.41		Quasi Peak	-31.84
1	446.00000000 kHz	25.07		Quasi Peak	-31.88
1	302.00000000 kHz	27.82		Quasi Peak	-32.37
1	170.00000000 kHz	31.24		Quasi Peak	-33.72
2	438.00000000 kHz	12.97		Average	-34.13
2	222.00000000 kHz	16.45		Average	-36.29
1	266.00000000 kHz	23.53		Quasi Peak	-37.71
2	270.00000000 kHz	13.40		Average	-37.72
1	226.00000000 kHz	22.95		Quasi Peak	-39.65

Line Table

Test Result: Neutral Graphs and Tables

110v AC , 60Hz



Neutral Graph

Trace	Frequency	Level (dBµV)	Phase	Detector	Delta Limit/dB
2	530.000000000 kHz	22.86		Average	-23.14
1	362.000000000 kHz	33.86		Quasi Peak	-24.82
2	366.000000000 kHz	23.07		Average	-25.52
2	402.000000000 kHz	20.34		Average	-27.47
1	406.000000000 kHz	30.04		Quasi Peak	-27.69
1	638.000000000 kHz	25.48		Quasi Peak	-30.52
2	14.114000000 MHz	19.34		Average	-30.66
2	166.000000000 kHz	23.41		Average	-31.75
1	282.000000000 kHz	28.58		Quasi Peak	-32.18
1	166.000000000 kHz	31.34		Quasi Peak	-33.82
1	6.490000000 MHz	24.29		Quasi Peak	-35.71
2	302.000000000 kHz	14.12		Average	-36.07
2	270.000000000 kHz	13.22		Average	-37.90
2	234.000000000 kHz	12.68		Average	-39.63
2	202.000000000 kHz	13.09		Average	-40.44
1	202.000000000 kHz	20.36		Quasi Peak	-43.17

Neutral Table

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Power Level settings used during the test

Mode	Rate	Max Transmitted Power
b	1Mbps	14.5 ± 1 dBm
	2Mbps	14.5 ± 1 dBm
	5.5Mbps	14.5 ± 1 dBm
	11Mbps	14.5 ± 1 dBm
g	6Mbps	13.5 ± 1 dBm
	9Mbps	13.5 ± 1 dBm
	12Mbps	13.5 ± 1 dBm
	18Mbps	13.5 ± 1 dBm
	24Mbps	13.5 ± 1 dBm
	36Mbps	13.5 ± 1 dBm
	48Mbps	13.5 ± 1 dBm
	54Mbps	13.5 ± 1 dBm
n (20MHz/40MHz)	MCS0	13.5 ± 1 dBm
	MCS1	13.5 ± 1 dBm
	MCS2	13.5 ± 1 dBm
	MCS3	13.5 ± 1 dBm
	MCS4	13.5 ± 1 dBm
	MCS5	13 ± 1 dBm
	MCS6	13 ± 1 dBm
	MCS7	13 ± 1 dBm

END OF TEST REPORT