FCC Test Report

Report No.: AGC16740241101FR03

FCC ID	:	WQ8-DV2377
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	NEXT LEVEL DIAGNOSTICS & MEASUREMENT SYSTEM
BRAND NAME	:	AUTEL
MODEL NAME	:	MaxiSys Ultra S2, MaxiSys Ultra EV S2, MaxiSys Ultra S2&ADAS, MaxiSys Ultra EV S2&ADAS, MaxiSys Ultra S2 ADAS
APPLICANT	:	Autel Intelligent Technology Corp., Ltd.
DATE OF ISSUE	:	Dec. 09, 2024
STANDARD(S)	:	FCC Part 15 Subpart C §15.247
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Dec. 09, 2024	Valid	Initial Release

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1. General Information

Applicant	Autel Intelligent Technology Corp., Ltd.
Address	Floor 2, Caihong Keji Building, 36 Hi-tech North Six Road, Songpingshan Community, Xili, Nanshan, Shenzhen 518055, China
Manufacturer	Autel Intelligent Technology Corp., Ltd.
Address	Floor 2, Caihong Keji Building, 36 Hi-tech North Six Road, Songpingshan Community, Xili, Nanshan, Shenzhen 518055, China
Factory	Autel Intelligent Technology Corp., Ltd. Guangming Branch
Address	7F&6F, East Wing, Building 2, and 6F of Electronical Building, Yanxiang Industrial Zone, Gaoxin Rd, Dongzhou Community of Guangming New District, Shenzhen
Product Designation	NEXT LEVEL DIAGNOSTICS & MEASUREMENT SYSTEM
Brand Name	AUTEL
Test Model	MaxiSys Ultra S2
Series Model(s)	MaxiSys Ultra EV S2, MaxiSys Ultra S2&ADAS, MaxiSys Ultra EV S2&ADAS, MaxiSys Ultra S2 ADAS
Difference Description	The model name and software function configuration are different
Date of receipt of test item	Nov. 04, 2024
Date of Test	Nov. 04, 2024~Dec. 05, 2024
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-FCC-2.4GWLAN-V1

Note: The test results of this report relate only to the tested sample identified in this report

Prepared By

Jack Gui
(Project Engineer) Dec. 09, 2024

Reviewed By

Calvin Liu
(Reviewer) Dec. 09, 2024

Approved By

Angela Li
(Authorized Officer) Dec. 09, 2024

2. Product Information

2.1 Product Technical Description

Equipment Type	WLAN 2.4G
Frequency Band	2400MHz ~ 2483.5MHz
Operation Frequency	2412MHz ~ 2462MHz
Output Power (Average)	IEEE 802.11b:13.76dBm; IEEE 802.11g:12.71dBm; IEEE 802.11n(HT20):12.62dBm; IEEE 802.11n(HT40):12.26dBm IEEE 802.11ax (HE20):12.72dBm; IEEE 802.11ax (HE40):12.04dBm
Output Power (Peak)	IEEE 802.11b:16.14dBm; IEEE 802.11g:20.59dBm; IEEE 802.11n(HT20):20.49dBm; IEEE 802.11n(HT40):20.56dBm IEEE 802.11ax (HE20):22.94dBm; IEEE 802.11ax (HE40):21.98dBm
Output Power (MIMO- Average)	IEEE 802.11n(HT20):15.36dBm; IEEE 802.11n(HT40):14.99dBm IEEE 802.11ax (HE20):15.45dBm; IEEE 802.11ax (HE40):14.82dBm
Output Power (MIMO- Peak)	IEEE 802.11n(HT20):23.15dBm; IEEE 802.11n(HT40):23.33dBm IEEE 802.11ax (HE20):25.67dBm; IEEE 802.11ax (HE40):24.07dBm
Modulation	802.11b:(DQPSK, DBPSK, CCK) DSSS 802.11g/n:(64-QAM,16-QAM, QPSK, BPSK) OFDM 802.11ax:(1024-QAM,256-QAM,64-QAM,16-QAM,QPSK,BPSK)OFDMA
Data Rate	802.11b:1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ax: up to 574Mbps
Number of channels	11
Hardware Version	DV2377_MAIN_V2
Software Version	V01.01.00
Antenna Designation	FPC Antenna
Antenna Gain	Please refer to report section 2.9 description
Number of transmit chain	2(802.11b/g/n/ax all used two antennas,802.11n/ax support MIMO)
Power Supply	DC 3.85V by battery or DC 12V by adapter

2.2 Table of Carrier Frequency

For 2412-2462MHz:

11 channels are provided for 802.11b/g/n(HT20)/ax(HE20):

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz
04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz
10	2457 MHz	11	2462 MHz		

7 channels are provided for 802.11n(HT40)/ax(HE40):

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	--	02	--	03	2422 MHz
04	2427 MHz	05	2432 MHz	06	2437 MHz
07	2442 MHz	08	2447 MHz	09	2452 MHz
10	--	11	--		

2.3 IEEE 802.11n Modulation Scheme

MCS Index	Nss	Modulation	R	N_{BPSC}	N_{CBPS}		N_{DBPS}		Data Rate(Mbps) 800nsGI	
					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0
6	1	64-QAM	3/4	6	312	648	234	489	58.5	121.5
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPSC	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	Guard interval

2.4 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for FCC ID: WQ8-DV2377, filing to comply with Part 2, Part 15 of the Federal Communication Commission rules.

2.5 Test Methodology

The tests were performed according to following standards:

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 15	Radio Frequency Devices
3	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
4	KDB 662911	KDB 662911 D01 Multiple Transmitter Output v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band (e.g., MIMO, Smart Antenna, etc)

2.6 Special Accessories

Refer to section 4.4.

2.7 Equipment Modifications

Not available for this EUT intended for grant.

2.8 Antenna Requirement

Standard Requirement
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi
EUT Antenna:
The non-detachable antenna inside the device cannot be replaced by the user at will. For the antenna gain, please refer to the description in Chapter 2.9 of the report.

2.9 Description of Available Antennas

Antenna Type	Frequency Band (MHz)	TX Paths	Bandwidth (MHz)	Max Peak Gain (dBi)		Max Directional Gain (dBi)
				Chain A	Chain B	
2.4GWIFI FPC Antenna List (2.4GHz 2*2 MIMO)						
FPC Antenna	2400~2483.5	2	20, 40	4.2	4.0	7.11

Note 1: The EUT supports Cyclic Delay Diversity (CDD) technology for 802.11n/ax mode.

Note 2: The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on devices:

  Array Gain = 10 log (N_{ANT}/ N_{SS}) dB = 3.01;

- For power measurements on IEEE 802.1devices:

  Array Gain = 0 dB for $N_{ANT} \leq 4$;

  Array Gain = 0 dB (i.e., no array gain) for channel widths ≥40 MHz for any N_{ANT};

  Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20 MHz channel widths with $N_{ANT} \geq 5$.

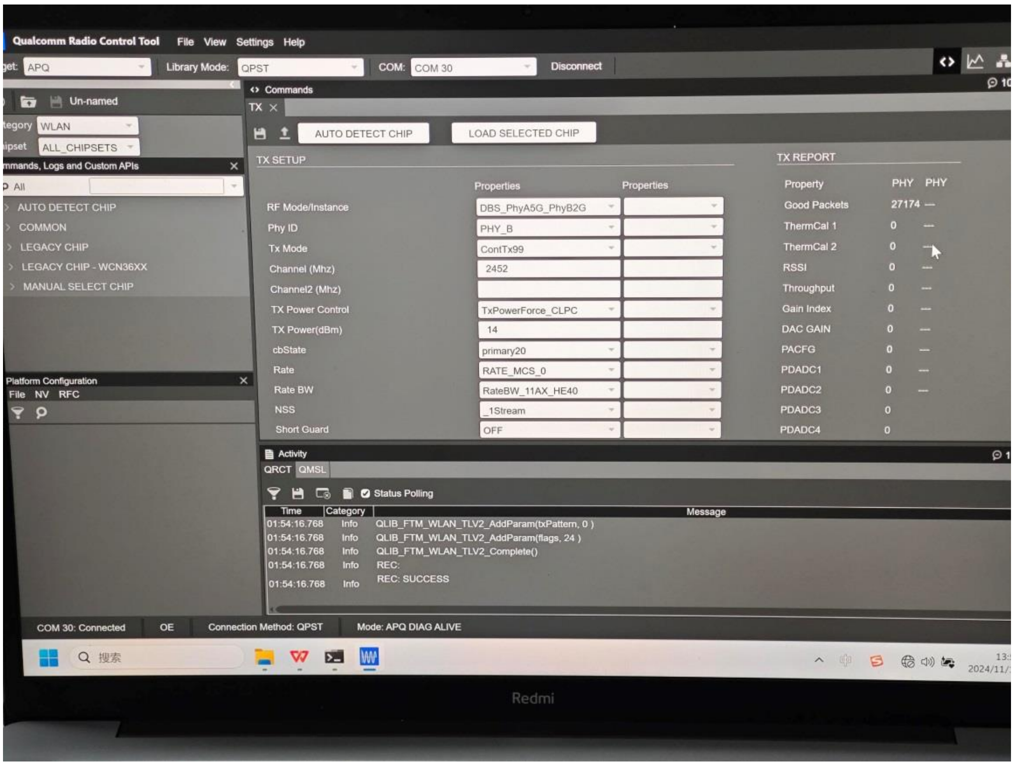
If antenna gains are not equal, Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

2.11 Description of Test Software

<u>For IEEE 802.11 mode:</u>

The test utility software used during testing was “Qualcomm Radio Control Tool”, and the version was “4.0.00132.0”.

Software Setting Diagram



Test Mode	Channel	Power Index	
		Chain A	Chain B
802.11b	L/M/H	14	14
802.11g	L/M/H	14	14
802.11n-HT20	L/M/H	14	14
802.11ax-HE20	L/M/H	14	14
802.11n-HT40	L/M/H	14	14
802.11ax-HE40	L/M/H	14	14

3. Test Environment

3.1 Address of The Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to follow CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories).

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

3.3 Environmental Conditions

	Normal Conditions
Temperature range (℃)	15 - 35
Relative humidity range	20 % - 75 %
Pressure range (kPa)	86 - 106

3.4 Measurement Uncertainty

The reported uncertainty of measurement y±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	U_c = ±2.9 dB
Uncertainty of Radiated Emission below 1GHz	U_c = ±3.9 dB
Uncertainty of Radiated Emission above 1GHz	U_c = ±4.9 dB
Uncertainty of total RF power, conducted	U_c = ±0.8 dB
Uncertainty of RF power density, conducted	U_c = ±2.6 dB
Uncertainty of spurious emissions, conducted	U_c = ±2 %
Uncertainty of Occupied Channel Bandwidth	U_c = ±2 %

3.5 List of Equipment Used

● RF Conducted Test System

Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-ER-E036	Spectrum Analyzer	Agilent	N9020A	MY49100060	2024-05-24	2025-05-23
☒	AGC-ER-E062	Power Sensor	Agilent	U2021XA	MY54110007	2024-02-01	2025-01-31
☒	AGC-ER-E063	Power Sensor	Agilent	U2021XA	MY54110009	2024-02-01	2025-01-31
☒	AGC-ER-A001	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-09-21	2025-09-20
☒	AGC-ER-E083	Signal Generator	Agilent	E4421B	US39340815	2024-05-23	2025-05-22
☒	N/A	RF Connection Cable	N/A	1#	N/A	Each time	N/A
☒	N/A	RF Connection Cable	N/A	2#	N/A	Each time	N/A

● Radiated Spurious Emission

Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☐	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2024-02-01	2025-01-31
☒	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2024-05-24	2025-05-23
☒	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2024-05-28	2025-05-27
☒	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2024-03-05	2026-03-04
☒	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2023-05-11	2025-05-10
☒	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2024-03-31	2025-03-30
☒	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2023-09-24	2025-09-23
☒	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2024-07-24	2026-07-23
☒	AGC-EM-A119	2.4G Filter	SongYi	N/A	N/A	2024-05-23	2025-05-22
☒	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2025-06-08
☐	AGC-EM-A139	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2025-06-08

● AC Power Line Conducted Emission

Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E045	EMI Test Receiver	R&S	ESPI	101206	2024-05-28	2025-05-27
☒	AGC-EM-A130	6dB Attenuator	Eeatsheep	LM-XX-6-5W	DC-6GZ	2023-06-09	2025-06-08
☒	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2024-05-28	2025-05-27

● Test Software

Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information
☒	AGC-EM-S001	CE Test System	R&S	ES-K1	V1.71
☒	AGC-EM-S003	RE Test System	FARA	EZ-EMC	VRA-03A
☐	AGC-EM-S004	RE Test System	Tonscend	TS+Ver2.1(JS32-RE)	4.0.0.0
☒	AGC-ER-S012	BT/WIFI Test System	Tonscend	JS1120-2	2.6
☒	AGC-EM-S011	RSE Test System	Tonscend	TS+-Ver2.1(JS36-RSE)	4.0.0.0

4.System Test Configuration

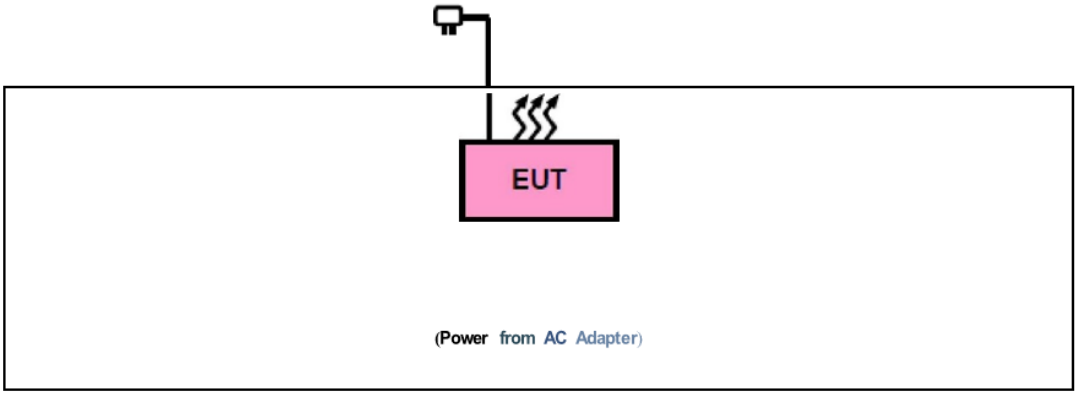
4.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

4.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

4.3 Configuration of Tested System



4.4 Equipment Used in Tested System

The following peripheral devices and interface cables were connected during the measurement:

☒ Test Accessories Come From The Laboratory

No.	Equipment	Manufacturer	Model No.	Specification Information	Cable
1	Control Box	RISYM	USB-TTL	--	--

☒ Test Accessories Come From The Manufacturer

No.	Equipment	Manufacturer	Model No.	Specification Information	Cable
1	Adapter	Dong Guan City GangOi Electronic Co..Ltd	GQ80-120600-E1	AC:100-240V 50/60Hz 1.8A DC:12V 6A	--

4.5 Summary of Test Results

Item	FCC Rules	Description of Test	Result
1	§15.203&15.247(b)(4)	Antenna Equipment	Pass
2	§15.247 (b)(1)	RF Output Power	Pass
3	§15.247 (a)(1)	6 dB Bandwidth	Pass
4	§15.247 (e)	Power Spectral Density	Pass
5	§15.247 (d)	Conducted Band Edge and Out-of-Band Emissions	Pass
6	§15.247 (d)&15.209	Radiated Spurious Emission	Pass
7	§15.207	AC Power Line Conducted Emission	Pass

5. Description of Test Modes

Summary table of Test Cases	
Test Item	Data Rate / Modulation
	2.4G WLAN – 802.11b/g/n/ax (DSSS/OFDM/OFDMA)
Radiated & Conducted Test Cases	Mode 1: 802.11b_TX CH01_2412 MHz_1 Mbps(Battery powered or AC/DC adapter) Mode 2: 802.11b_TX CH06_2437 MHz_1 Mbps(Battery powered or AC/DC adapter) Mode 3: 802.11b_TX CH11_2462 MHz_1 Mbps(Battery powered or AC/DC adapter) Mode 4: 802.11g_TX CH01_2412 MHz_6 Mbps(Battery powered or AC/DC adapter) Mode 5: 802.11g_TX CH06_2437 MHz_6 Mbps(Battery powered or AC/DC adapter) Mode 6: 802.11g_TX CH11_2462 MHz_6 Mbps (Battery powered or AC/DC adapter) Mode 7: 802.11n-HT20_TX CH01_2412 MHz_MCS0 Mbps(Battery powered or AC/DC adapter) Mode 8: 802.11n-HT20_TX CH06_2437 MHz_ MCS0 Mbps(Battery powered or AC/DC adapter) Mode 9: 802.11n-HT20_TX CH11_2462 MHz_ MCS0 Mbps(Battery powered or AC/DC adapter) Mode 10: 802.11ax-HE20_TX CH01_2412 MHz_MCS0 Mbps(Battery powered or AC/DC adapter) Mode 11: 802.11ax-HE20_TX CH06_2437 MHz_ MCS0 Mbps(Battery powered or AC/DC adapter) Mode 12: 802.11ax-HE20_TX CH11_2462 MHz_ MCS0 Mbps(Battery powered or AC/DC adapter) Mode 13: 802.11n-HT40_TX CH03_2422 MHz_MCS0 Mbps(Battery powered or AC/DC adapter) Mode 14: 802.11n-HT40_TX CH06_2437 MHz_ MCS0 Mbps(Battery powered or AC/DC adapter) Mode 15: 802.11n-HT40_TX CH09_2452 MHz_ MCS0 Mbps(Battery powered or AC/DC adapter) Mode 16: 802.11ax-HE40_TX CH03_2422 MHz_MCS0 Mbps(Battery powered or AC/DC adapter) Mode 17: 802.11ax-HE40_TX CH06_2437 MHz_ MCS0 Mbps(Battery powered or AC/DC adapter) Mode 18: 802.11ax-HE40_TX CH09_2452 MHz_ MCS0 Mbps(Battery powered or AC/DC adapter)
AC Conducted Emission	Mode 1: 2.4G WLAN Link + Battery + USB Cable (Charging from AC Adapter)

Note:
1. The battery is full-charged during the test.
2. The 802.11ax mode is only tested and evaluated at Full RU bandwidth.
3. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
4. For Conducted Test method, a temporary antenna connector is provided by the manufacture.
5. All modes and antennas in the radiation spurious test are pre-scanned. When there is no MIMO technology mode, antenna 2 is evaluated. When there is MIMO technology mode, antenna 1 + antenna 2 are evaluated as the worst data.

6. Duty Cycle Measurement

2.4GHz WLAN (DTS) operation is possible in 20MHz, and 40MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = Average. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

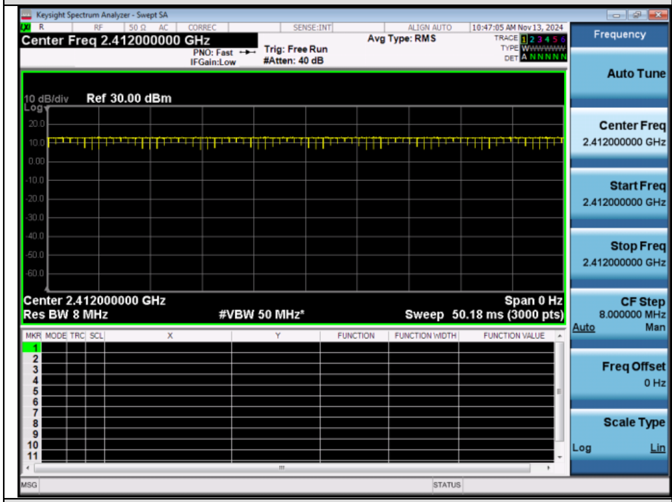
Operating mode	Data rates (Mbps)	Duty Cycle (%)	Duty Cycle Factor (dB)
IEEE 802.11b_Chain A	1	100	/
IEEE 802.11g_Chain A	6	100	/
IEEE 802.11n-HT20_Chain A	MCS0	100	/
IEEE 802.11n-HT40_Chain A	MCS0	100	/
IEEE 802.11ax-HE20_Chain A	MCS0	100	/
IEEE 802.11ax-HE40_Chain A	MCS0	100	/
IEEE 802.11b_Chain B	1	100	/
IEEE 802.11g_Chain B	6	100	/
IEEE 802.11n-HT20_Chain B	MCS0	100	/
IEEE 802.11n-HT40_Chain B	MCS0	100	/
IEEE 802.11ax-HE20_Chain B	MCS0	100	/
IEEE 802.11ax-HE40_Chain B	MCS0	100	/

Remark:

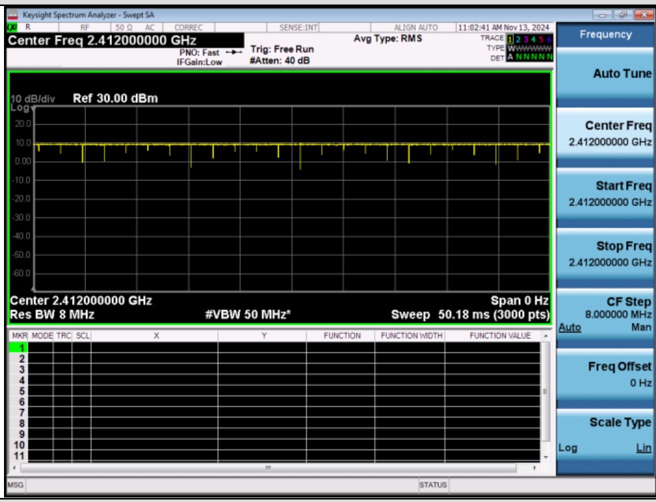
1. Duty Cycle factor = 10 * log (1/ Duty cycle)
2. The duty cycle of each frequency band mode reflects the determination requirements of the Middle channel measurement value.

The Chain A test plots as follows:

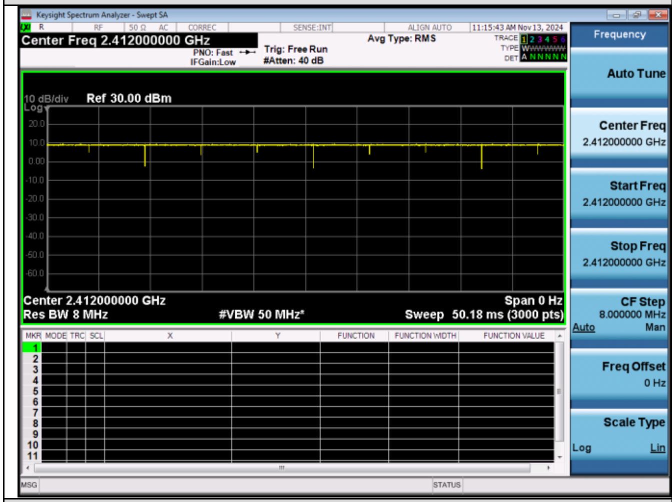
IEEE 802.11b



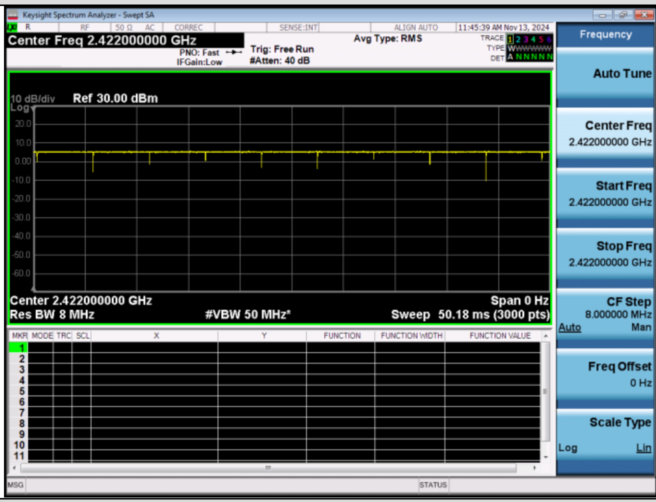
IEEE 802.11g



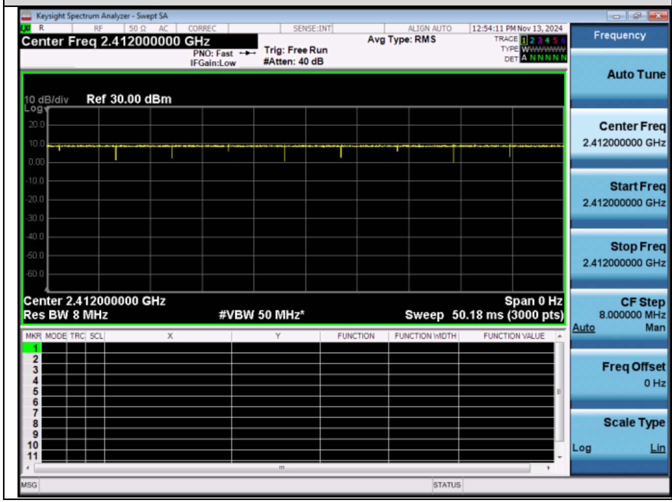
IEEE 802.11n-HT20



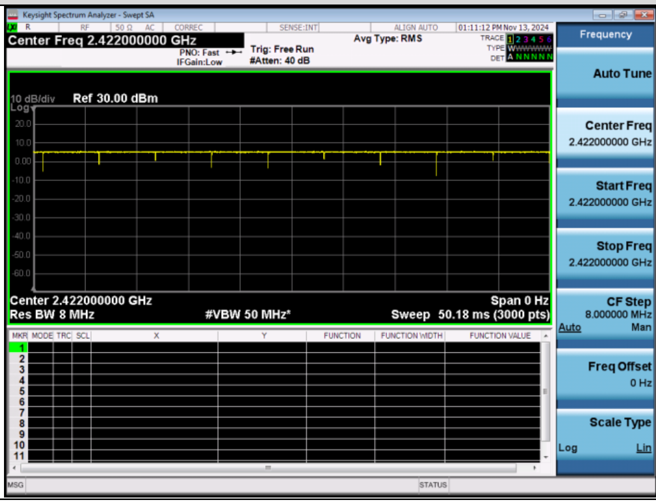
IEEE 802.11n-HT40



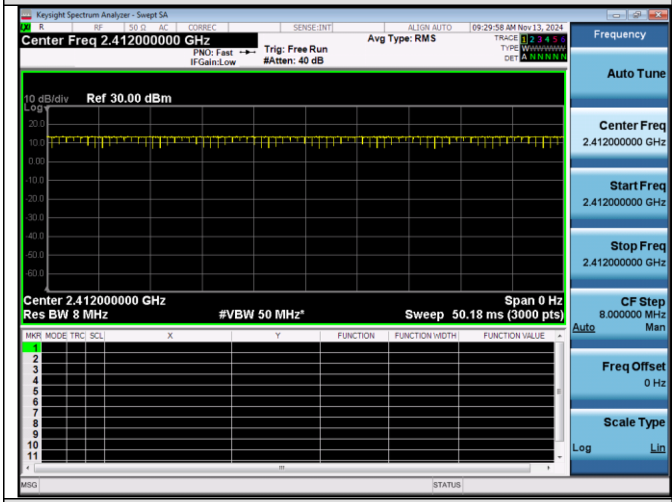
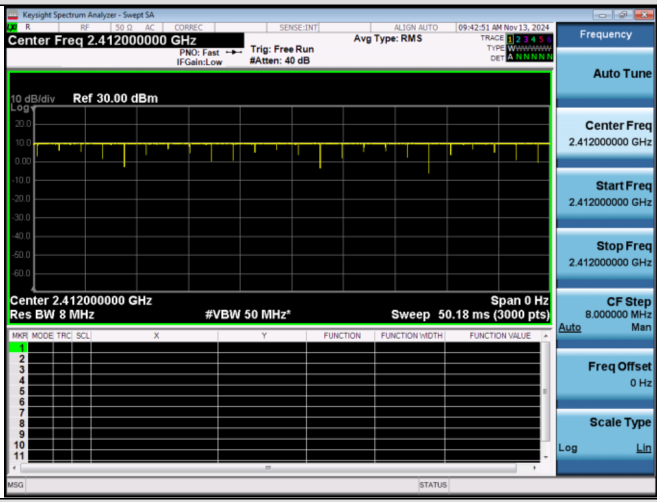
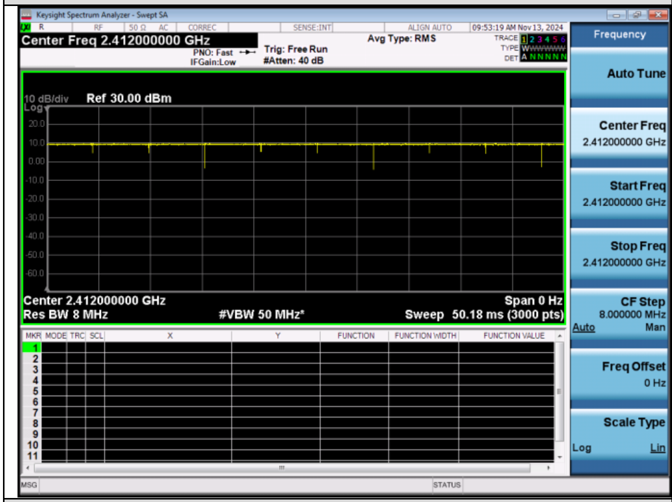
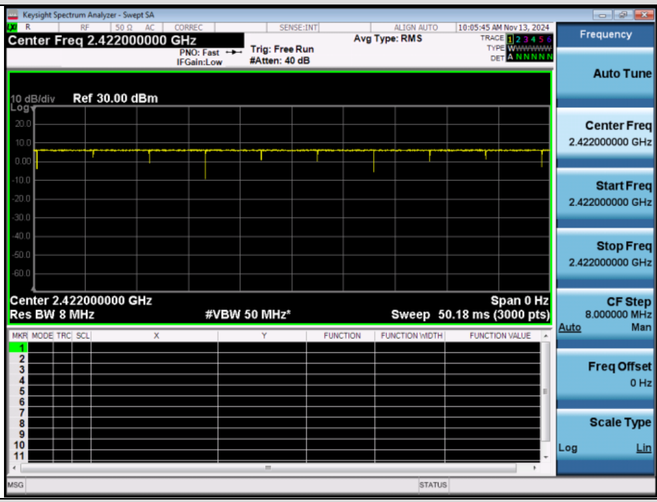
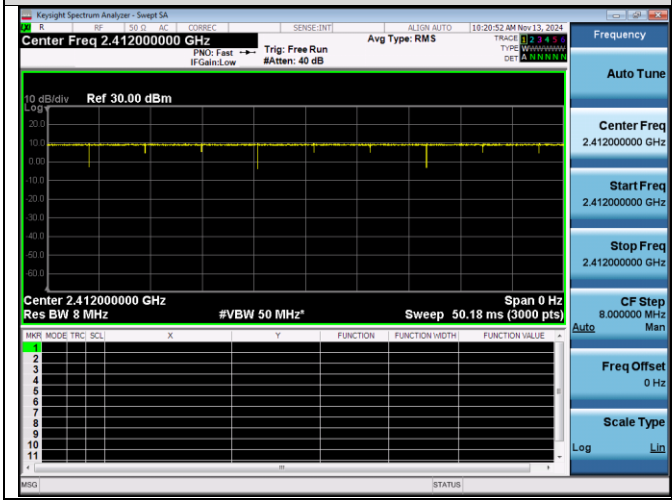
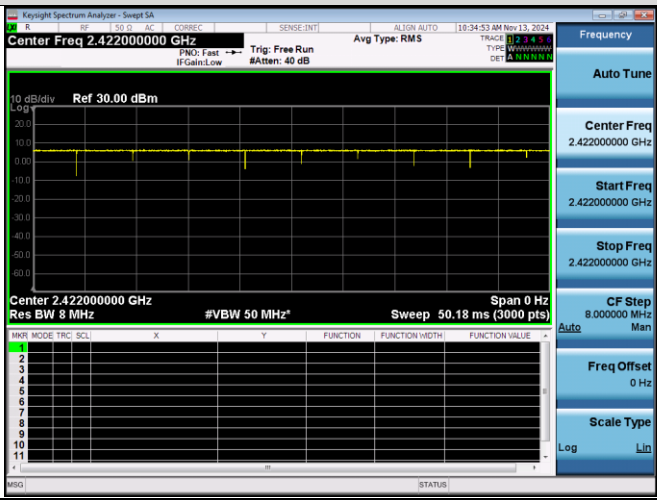
IEEE 802.11ax-HE20



IEEE 802.11ax-HE40



The Chain B test plots as follows:

IEEE 802.11b	IEEE 802.11g
	
IEEE 802.11n-HT20	IEEE 802.11n-HT40
	
IEEE 802.11ax-HE20	IEEE 802.11ax-HE40
	

7. RF Output Power Measurement

7.1 Provisions Applicable

For DTSs employing digital modulation techniques operating in the bands 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W.

7.2 Measurement Procedure

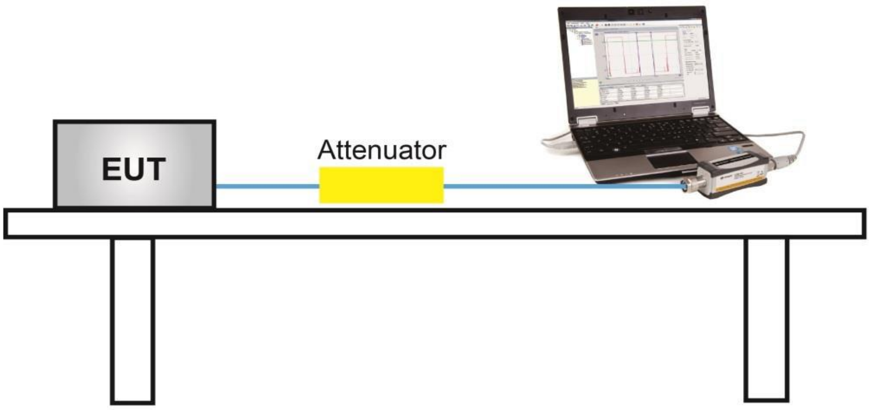
☒Method PM is Measurement using an RF Peak power meter. The procedure for this method is as follows:

1. The testing follows the ANSI C63.10 Section 11.9.1.3
2. The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

☒Method PM is Measurement using an RF average power meter. The procedure for this method is as follows:

1. The testing follows the ANSI C63.10 Section 11.9.2.3
2. Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the following conditions are satisfied:
3. The EUT is configured to transmit continuously, or to transmit with a constant duty cycle.
4. At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.
5. The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
6. Determine according to the duty cycle of the equipment: when it is less than 98%, follow the steps below.
7. Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.
8. Adjust the measurement in dBm by adding [10 log (1 / D)], where D is the duty cycle {e.g., [10 log (1 / 0.25)], if the duty cycle is 25%}.
9. Record the test results in the report.

7.3 Measurement Setup (Block Diagram of Configuration)



7.4 Measurement Result

Test Data of Conducted Output Power-Chain A					
Test Mode	Test Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Limits (dBm)	Pass or Fail
802.11b	2412	13.40	15.95	≤30	Pass
	2437	12.44	14.97	≤30	Pass
	2462	12.49	15.01	≤30	Pass
802.11g	2412	12.09	19.72	≤30	Pass
	2437	11.50	19.36	≤30	Pass
	2462	11.59	19.44	≤30	Pass
802.11n20	2412	12.06	19.76	≤30	Pass
	2437	11.47	19.81	≤30	Pass
	2462	11.44	19.73	≤30	Pass
802.11n40	2422	11.67	20.02	≤30	Pass
	2437	11.67	20.06	≤30	Pass
	2452	11.63	20.01	≤30	Pass
802.11ax20	2412	12.15	22.35	≤30	Pass
	2437	11.56	21.76	≤30	Pass
	2462	11.49	21.71	≤30	Pass
802.11ax40	2422	11.53	19.63	≤30	Pass
	2437	11.57	19.83	≤30	Pass
	2452	11.58	19.58	≤30	Pass

Test Data of Conducted Output Power-Chain B					
Test Mode	Test Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Limits (dBm)	Pass or Fail
802.11b	2412	13.76	16.14	≤30	Pass
	2437	12.83	15.31	≤30	Pass
	2462	13.04	15.48	≤30	Pass
802.11g	2412	12.71	20.59	≤30	Pass
	2437	11.78	19.63	≤30	Pass
	2462	12.10	19.97	≤30	Pass
802.11n20	2412	12.62	20.49	≤30	Pass
	2437	11.79	20.04	≤30	Pass
	2462	11.95	20.28	≤30	Pass
802.11n40	2422	12.26	20.32	≤30	Pass
	2437	12.20	20.56	≤30	Pass
	2452	12.07	20.43	≤30	Pass
802.11ax20	2412	12.72	22.94	≤30	Pass
	2437	11.77	20.81	≤30	Pass
	2462	12.01	22.21	≤30	Pass
802.11ax40	2422	12.04	21.98	≤30	Pass
	2437	12.03	22.01	≤30	Pass
	2452	11.85	21.43	≤30	Pass

Test Data of Conducted Output Power-MIMO					
Test Mode	Test Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Limits (dBm)	Pass or Fail
802.11n20	2412	15.36	23.15	≤30	Pass
	2437	14.64	22.94	≤30	Pass
	2462	14.71	23.02	≤30	Pass
802.11n40	2422	14.99	23.18	≤30	Pass
	2437	14.95	23.33	≤30	Pass
	2452	14.87	23.24	≤30	Pass
802.11ax20	2412	15.45	25.67	≤30	Pass
	2437	14.68	24.32	≤30	Pass
	2462	14.77	24.98	≤30	Pass
802.11ax40	2422	14.80	23.97	≤30	Pass
	2437	14.82	24.07	≤30	Pass
	2452	14.73	23.61	≤30	Pass

Note：

1. The Total Average Conducted Output Power (dBm) = 10*log $\{10^{(Chain\ A\ AVG\ /10)} + 10^{(Chain\ B\ AVG\ /10)}\}$.
2. The Total Peak Conducted Output Power (dBm) = 10*log $\{10^{(Chain\ A\ PK\ /10)} + 10^{(Chain\ B\ PK\ /10)}\}$.

8. 6dB Bandwidth Measurement

8.1 Provisions Applicable

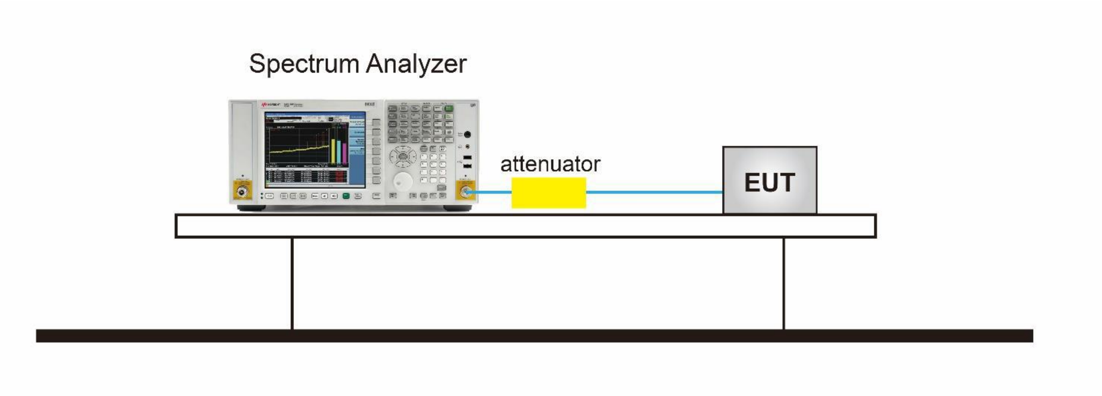
The minimum 6dB bandwidth shall be 500 kHz.

8.2 Measurement Procedure

The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).

1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. For 6dB Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement.
4. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the OBW and set the Video bandwidth (VBW) ≥ 3 * RBW.
5. Detector = peak
6. Trace mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize.
9. Measure and record the results in the test report.

8.3 Measurement Setup (Block Diagram of Configuration)

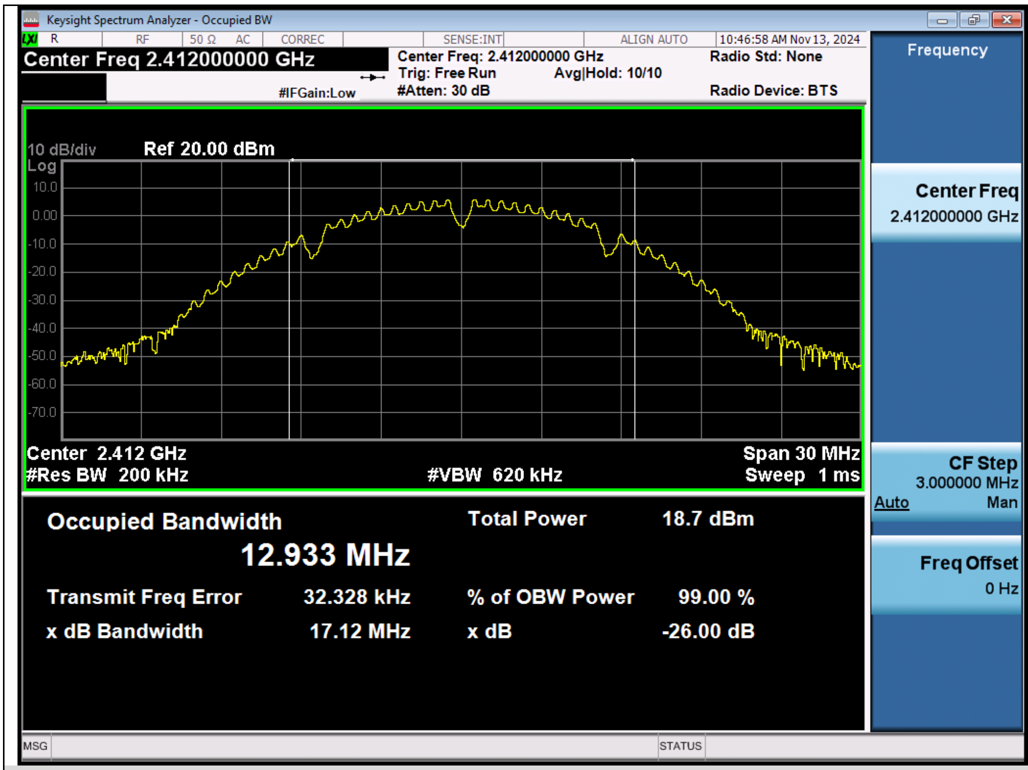


8.4 Measurement Result

Test Data of Occupied Bandwidth and DTS Bandwidth-Chain A					
Test Mode	Test Frequency (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	DTS Bandwidth Limits (MHz)	Pass or Fail
802.11b	2412	12.933	8.096	⩾0.5	Pass
	2437	13.156	8.100	⩾0.5	Pass
	2462	13.130	8.095	⩾0.5	Pass
802.11g	2412	16.316	16.352	⩾0.5	Pass
	2437	16.377	16.353	⩾0.5	Pass
	2462	16.362	16.106	⩾0.5	Pass
802.11n20	2412	17.515	17.590	⩾0.5	Pass
	2437	17.556	17.582	⩾0.5	Pass
	2462	17.522	17.222	⩾0.5	Pass
802.11n40	2422	35.963	35.293	⩾0.5	Pass
	2437	36.065	36.332	⩾0.5	Pass
	2452	35.868	35.737	⩾0.5	Pass
802.11ax20	2412	18.872	18.662	⩾0.5	Pass
	2437	18.923	18.948	⩾0.5	Pass
	2462	18.903	18.815	⩾0.5	Pass
802.11ax40	2422	37.702	35.513	⩾0.5	Pass
	2437	37.784	37.908	⩾0.5	Pass
	2452	37.639	33.639	⩾0.5	Pass

Test Data of Occupied Bandwidth and DTS Bandwidth-Chain B					
Test Mode	Test Frequency (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	DTS Bandwidth Limits (MHz)	Pass or Fail
802.11b	2412	13.093	7.627	⩾0.5	Pass
	2437	13.172	8.070	⩾0.5	Pass
	2462	12.918	7.606	⩾0.5	Pass
802.11g	2412	16.374	16.388	⩾0.5	Pass
	2437	16.368	16.354	⩾0.5	Pass
	2462	16.298	15.957	⩾0.5	Pass
802.11n20	2412	17.567	17.320	⩾0.5	Pass
	2437	17.558	17.361	⩾0.5	Pass
	2462	17.470	17.168	⩾0.5	Pass
802.11n40	2422	35.900	35.174	⩾0.5	Pass
	2437	36.070	36.315	⩾0.5	Pass
	2452	35.940	35.522	⩾0.5	Pass
802.11ax20	2412	18.907	18.818	⩾0.5	Pass
	2437	18.941	18.993	⩾0.5	Pass
	2462	18.841	18.694	⩾0.5	Pass
802.11ax40	2422	37.602	37.524	⩾0.5	Pass
	2437	37.760	38.052	⩾0.5	Pass
	2452	37.700	37.399	⩾0.5	Pass

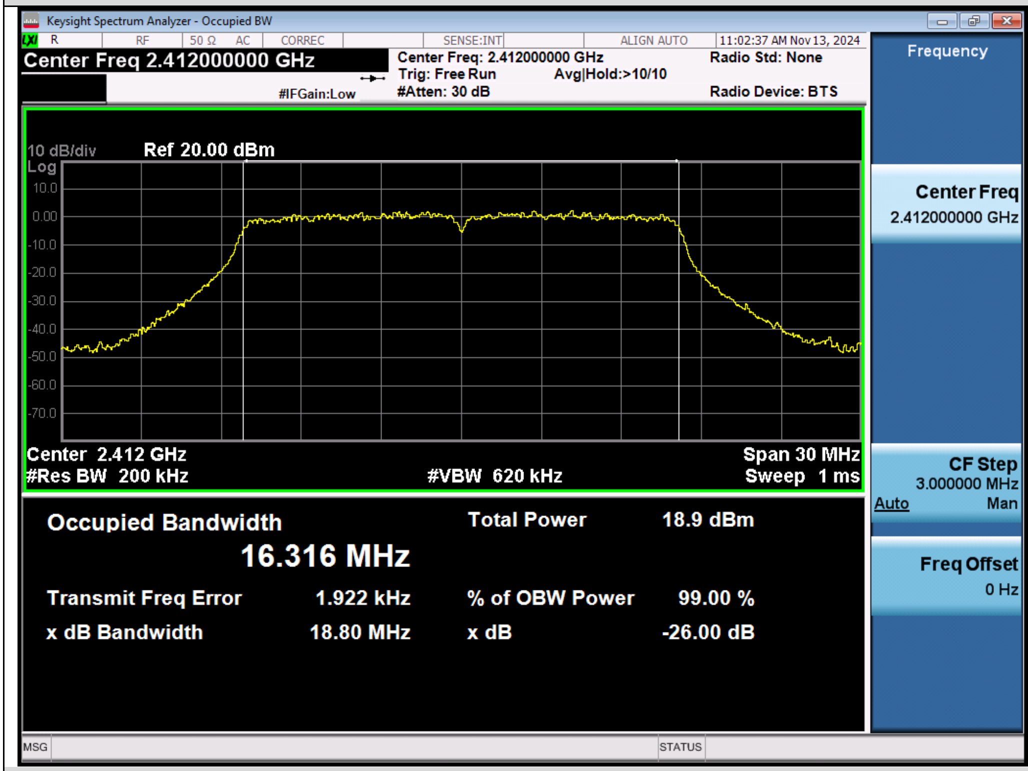
Test Graphs of Occupied Bandwidth



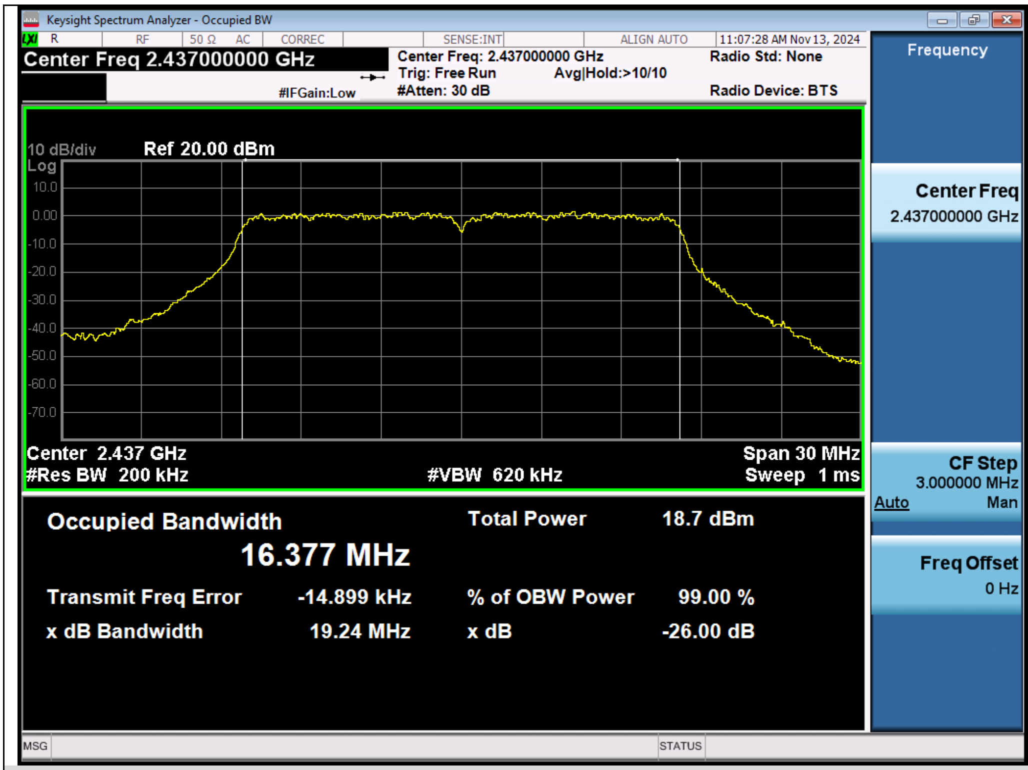
Test_Graph_802.11b_Chain A_2412_1Mbps_OBW

Test_Graph_802.11b_Chain A_2437_1Mbps_OBW

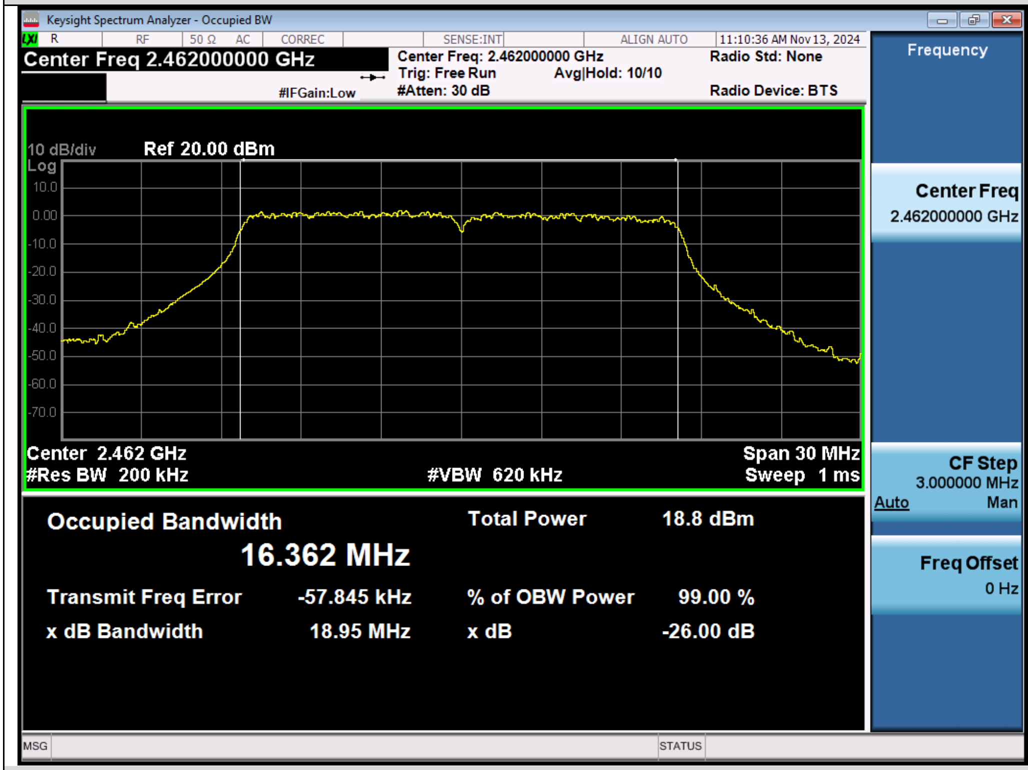
Test_Graph_802.11b_Chain A_2462_1Mbps_OBW



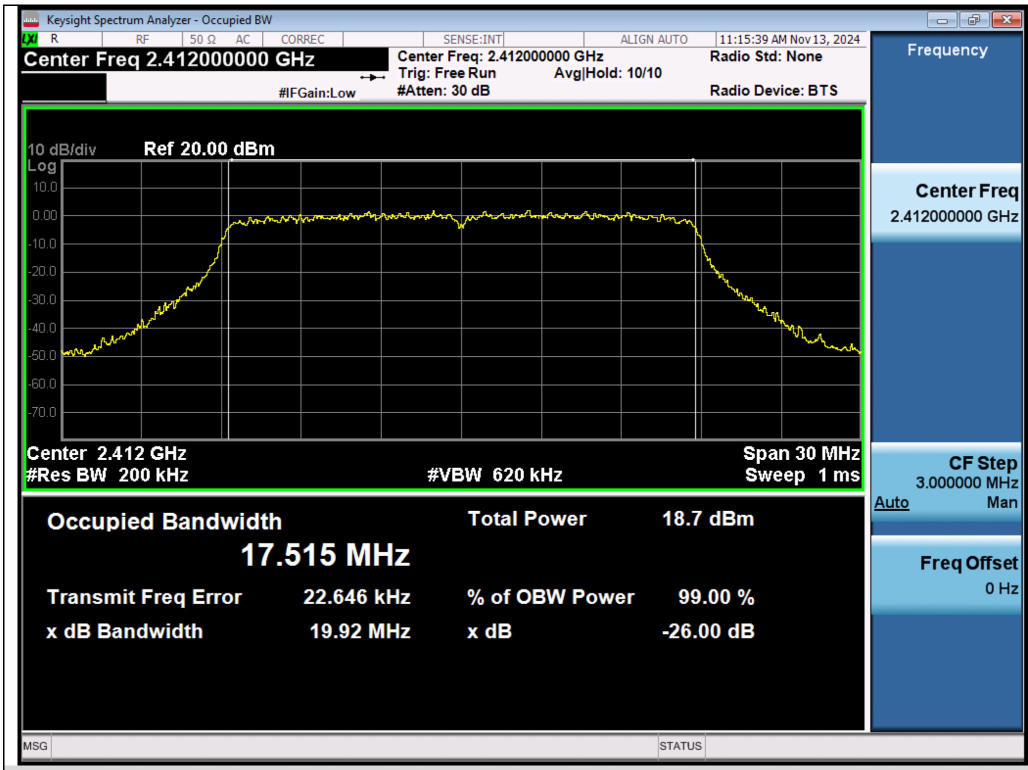
Test_Graph_802.11g_Chain A_2412_6Mbps_OBW



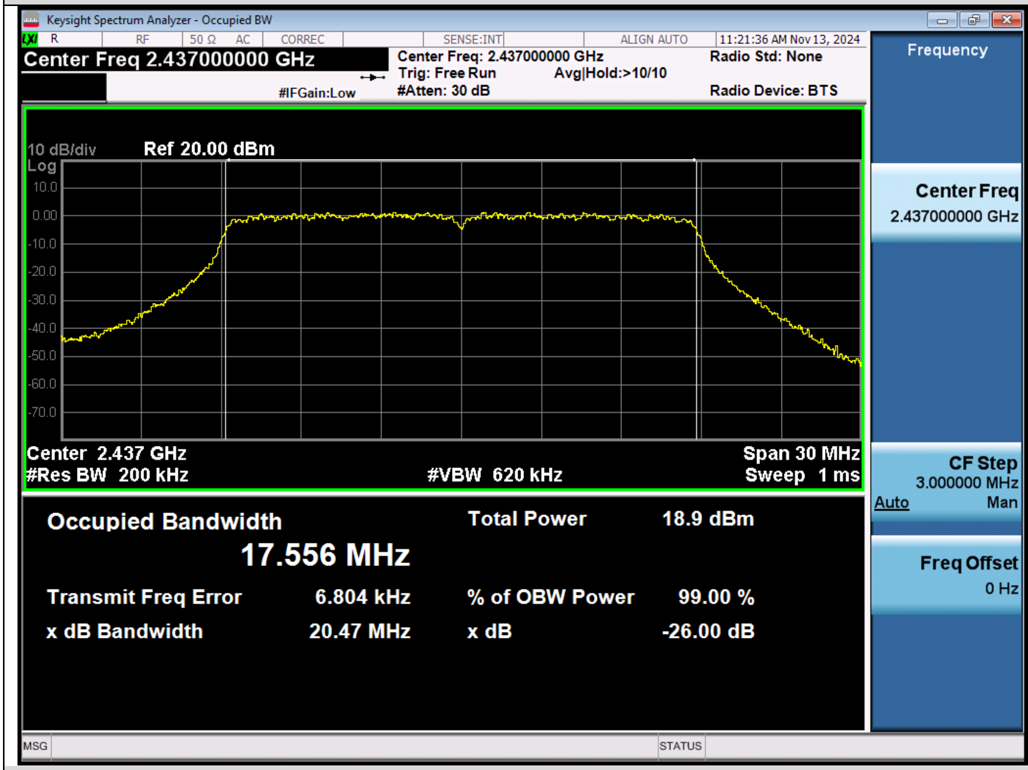
Test_Graph_802.11g_Chain A_2437_6Mbps_OBW



Test_Graph_802.11g_Chain A_2462_6Mbps_OBW



Test_Graph_802.11n20_Chain A_2412_MCS0_OBW



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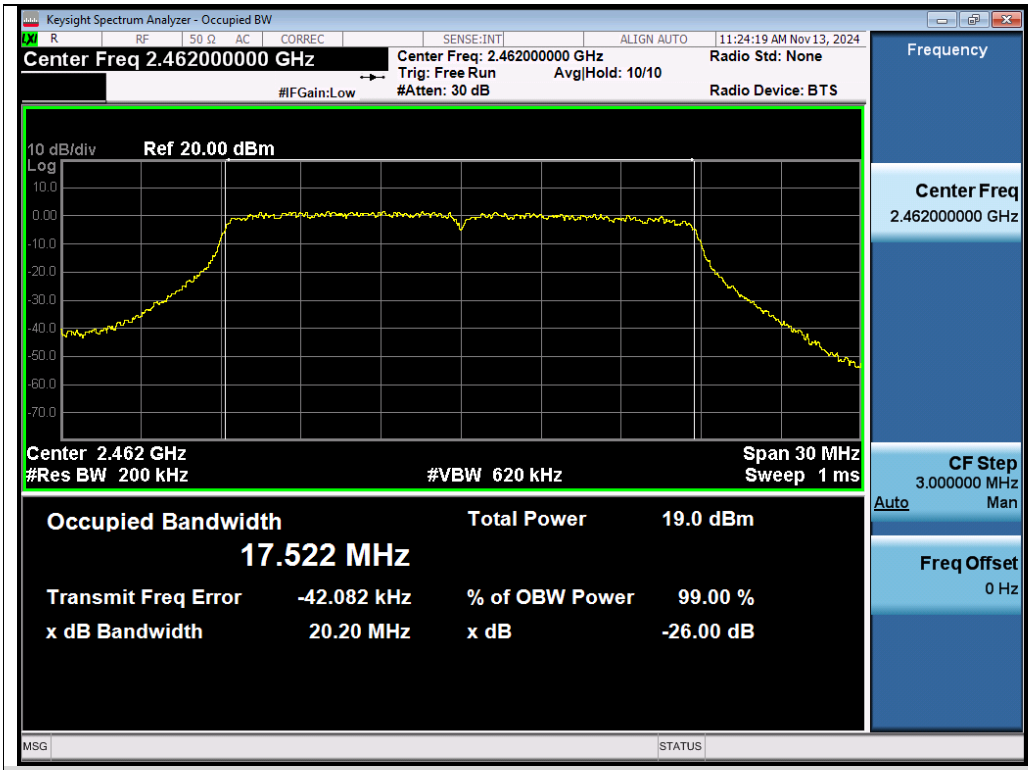

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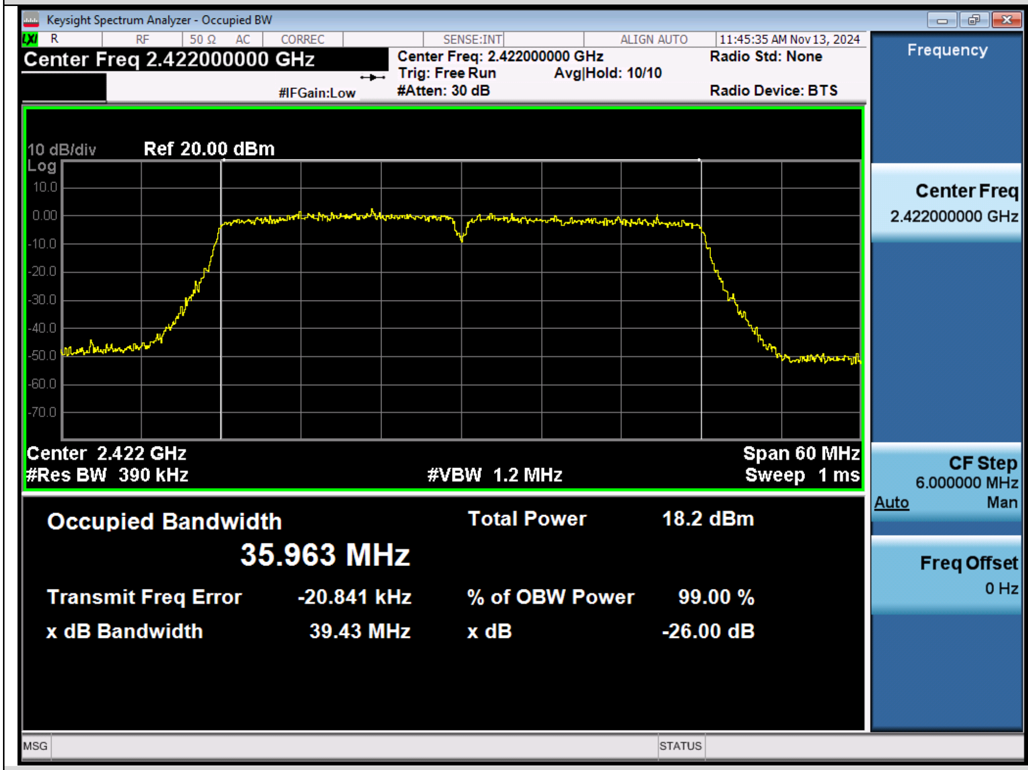

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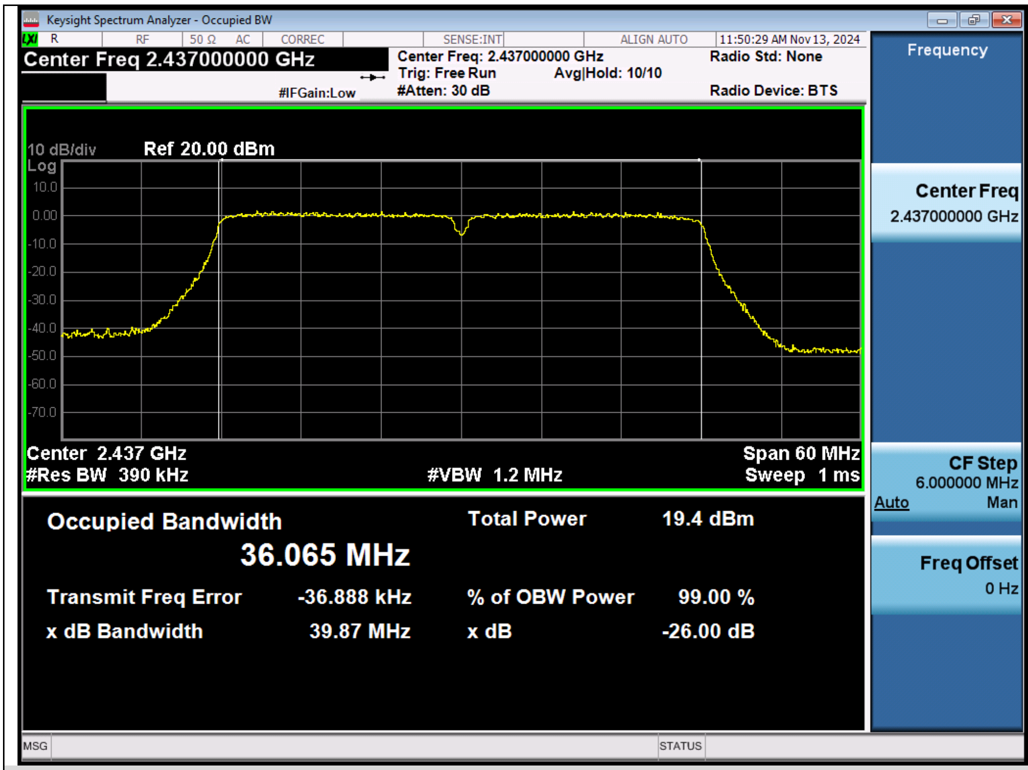
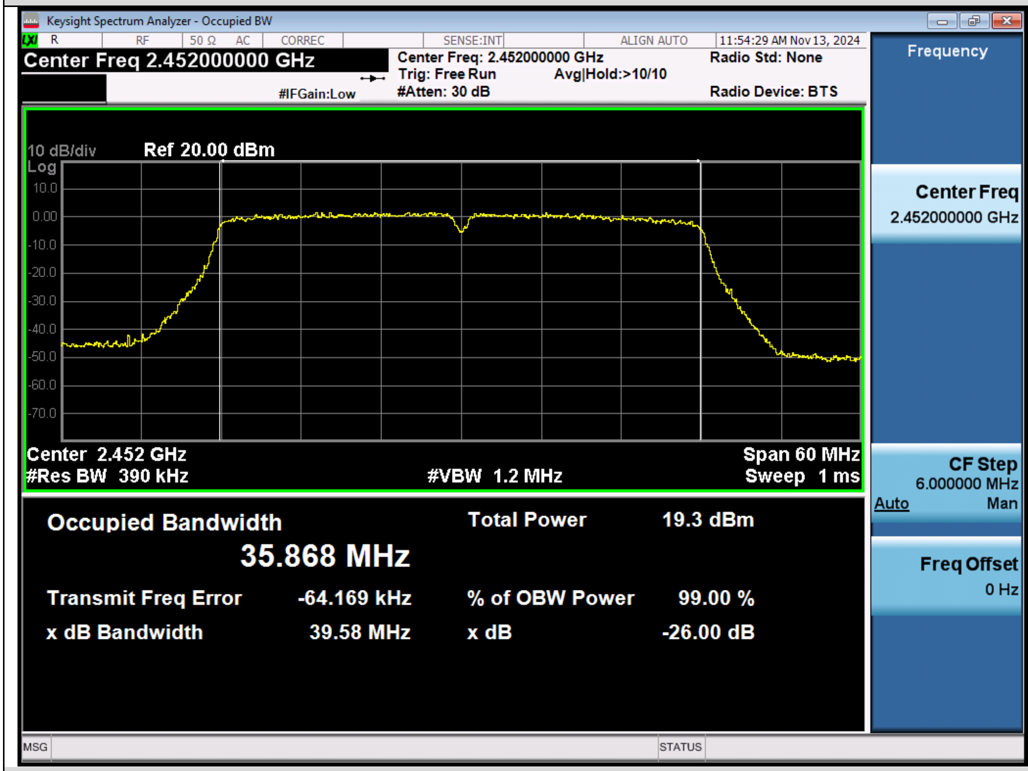
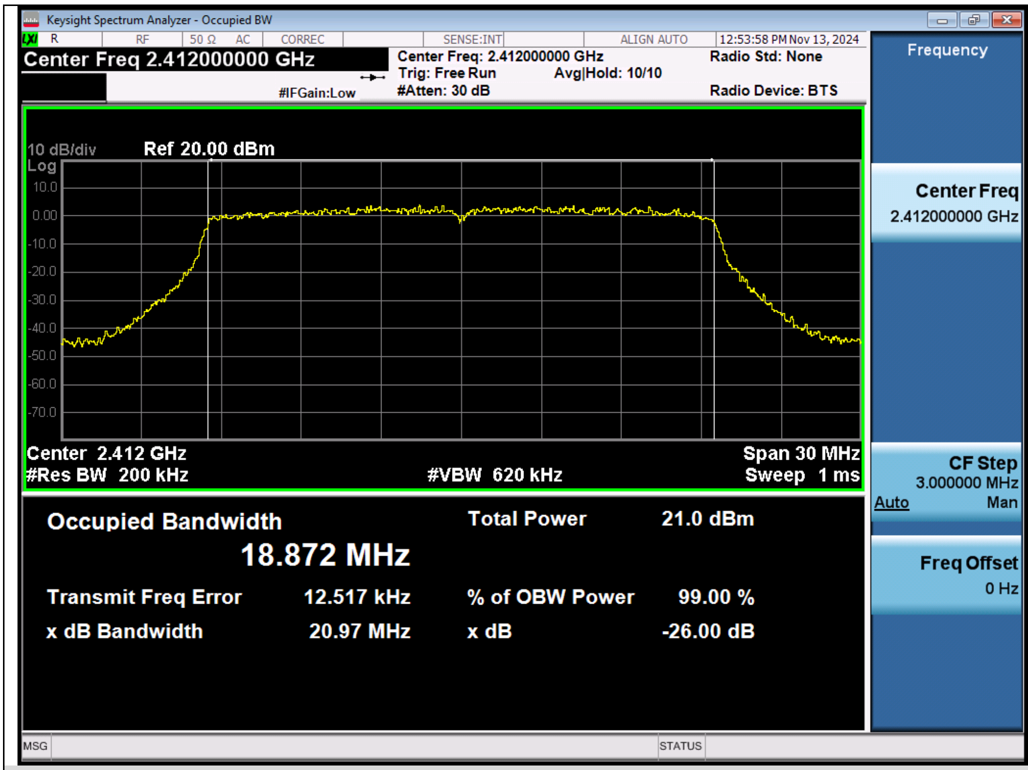


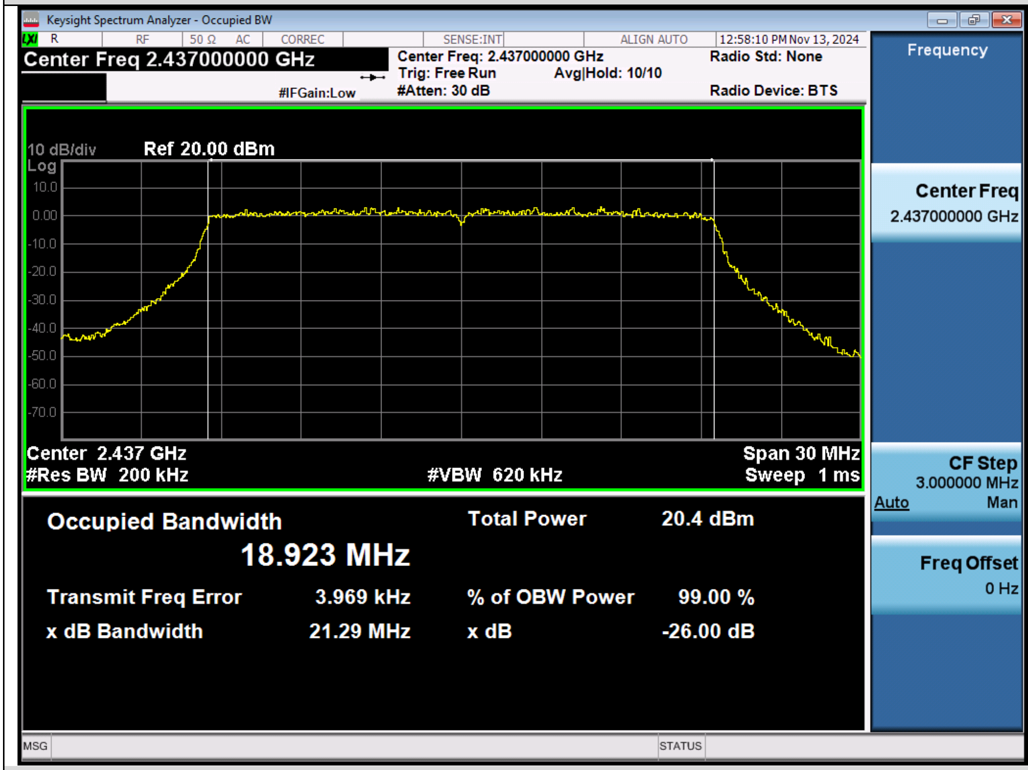
Test_Graph_802.11n40_Chain A_2437_MCS0_OBW



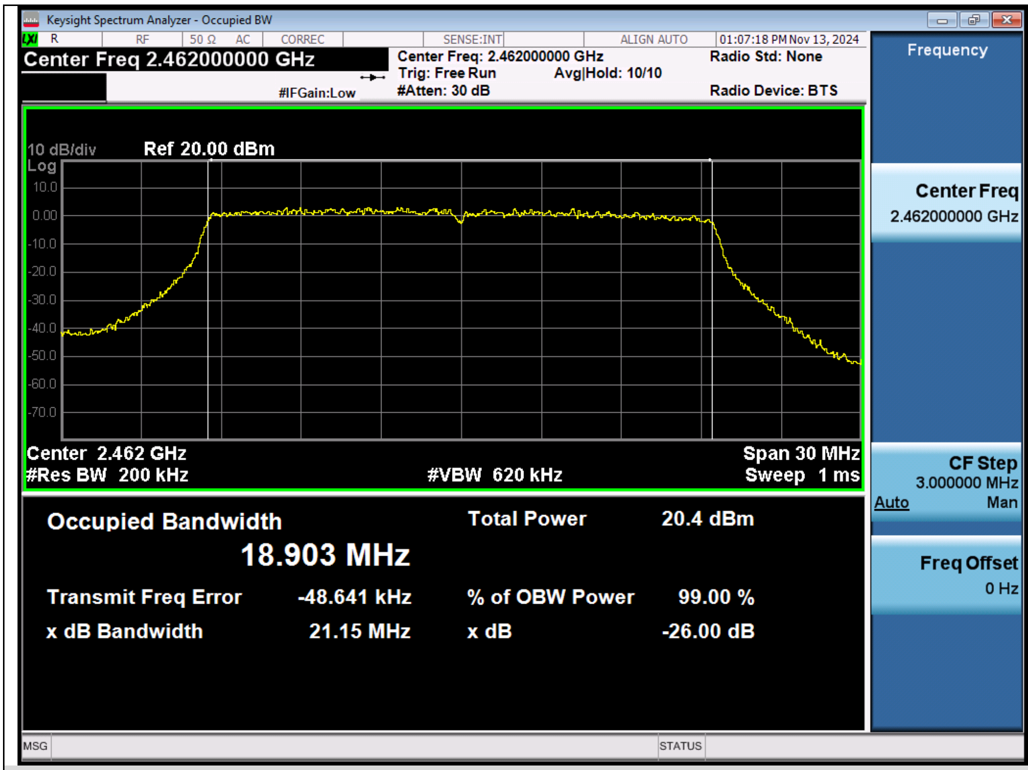
Test_Graph_802.11n40_Chain A_2452_MCS0_OBW



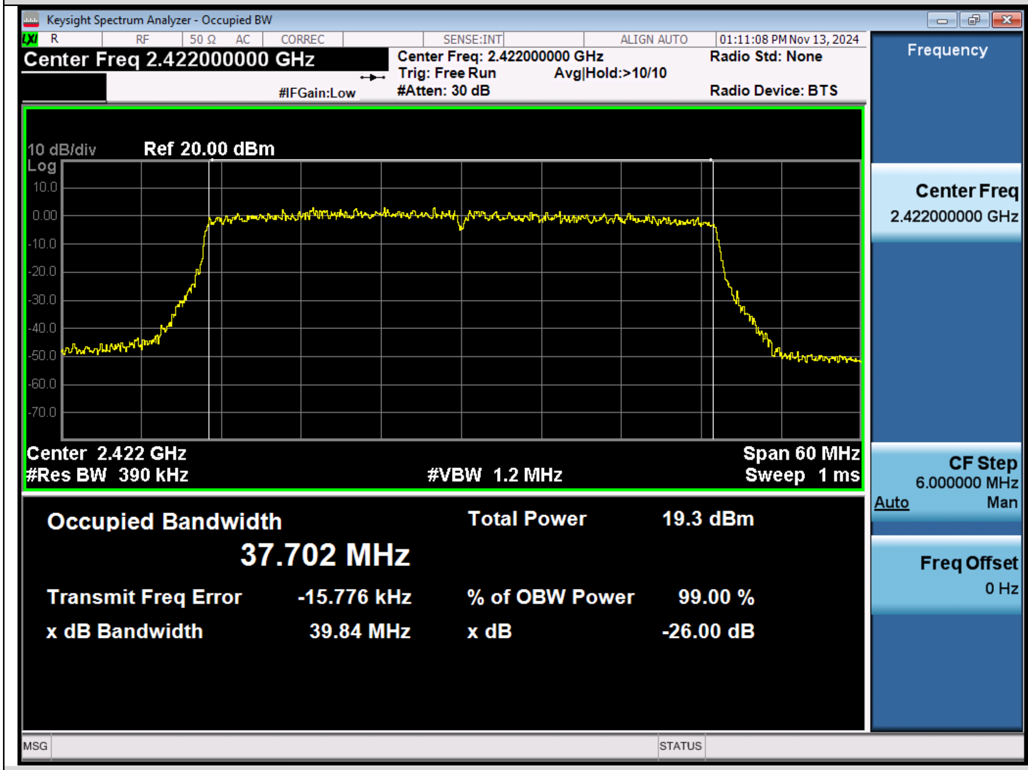
Test_Graph_802.11ax20_Chain A_2412_MCS0_OBW



Test_Graph_802.11ax20_Chain A_2437_MCS0_OBW



Test_Graph_802.11ax20_Chain A_2462_MCS0_OBW



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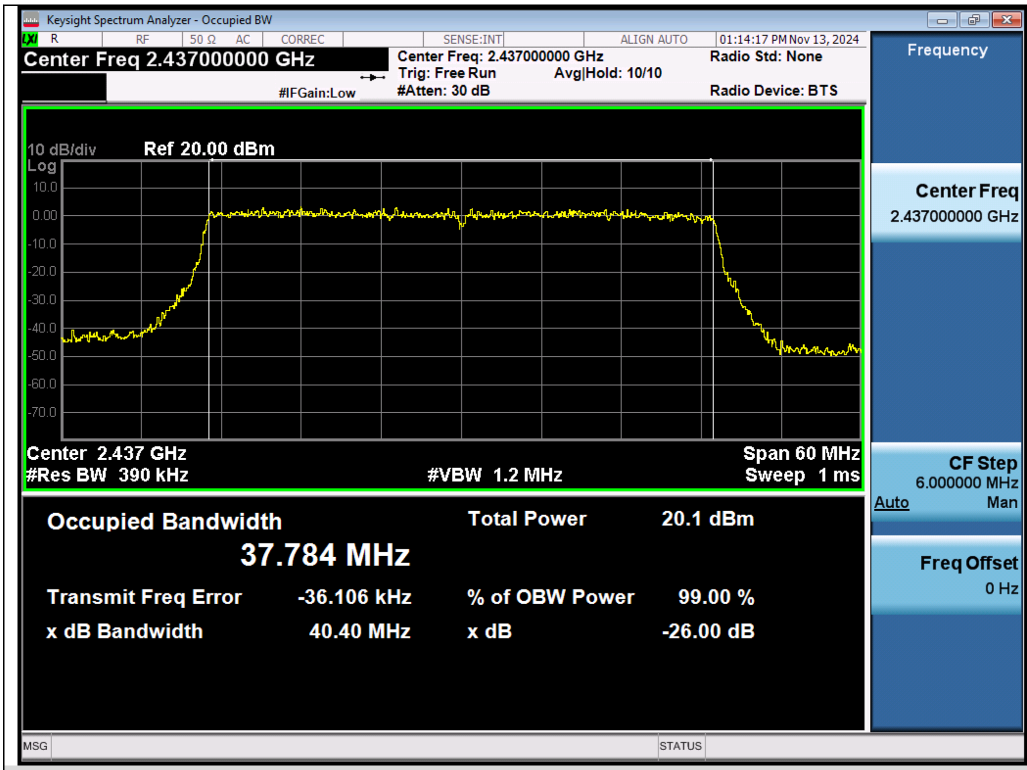
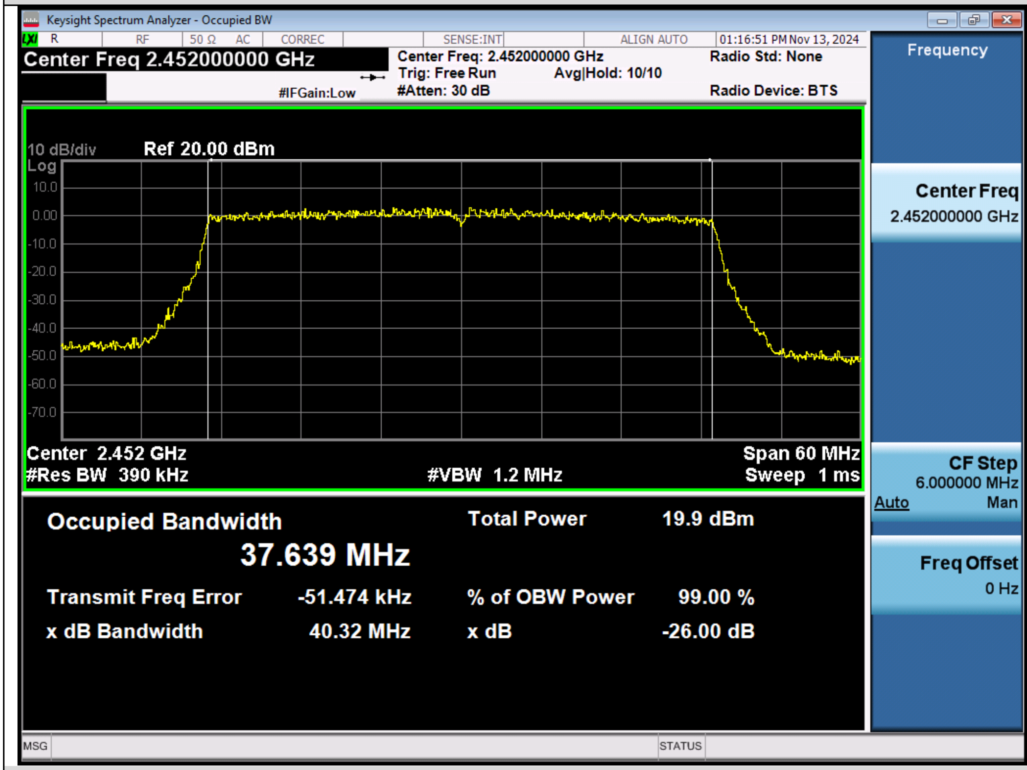
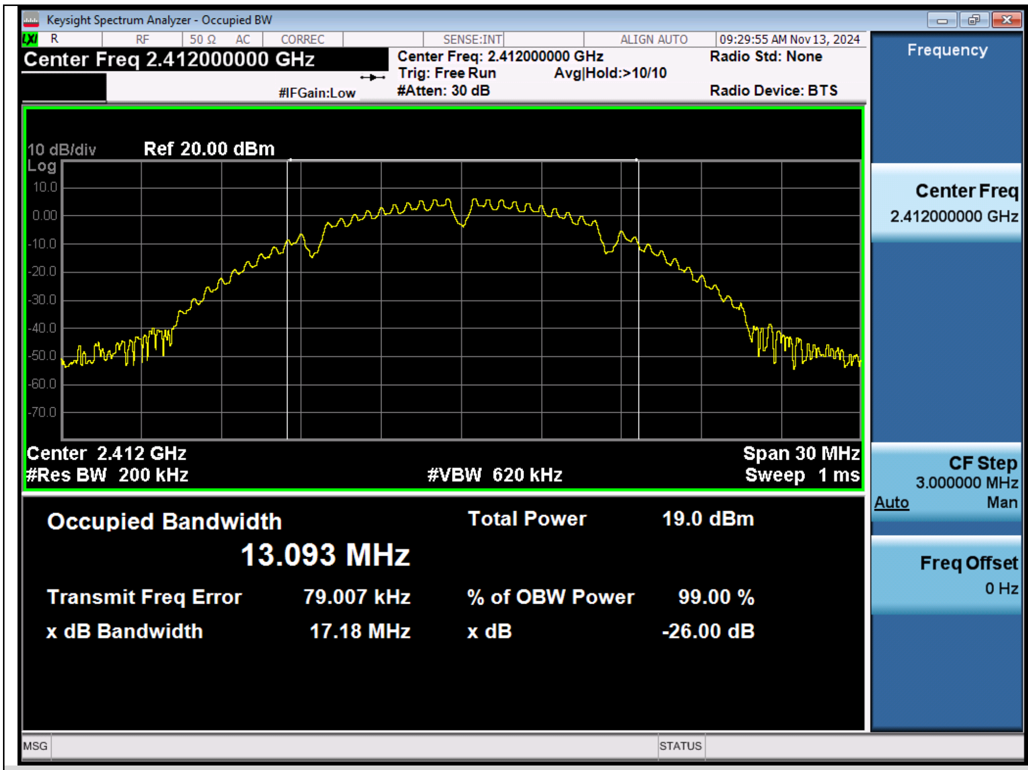


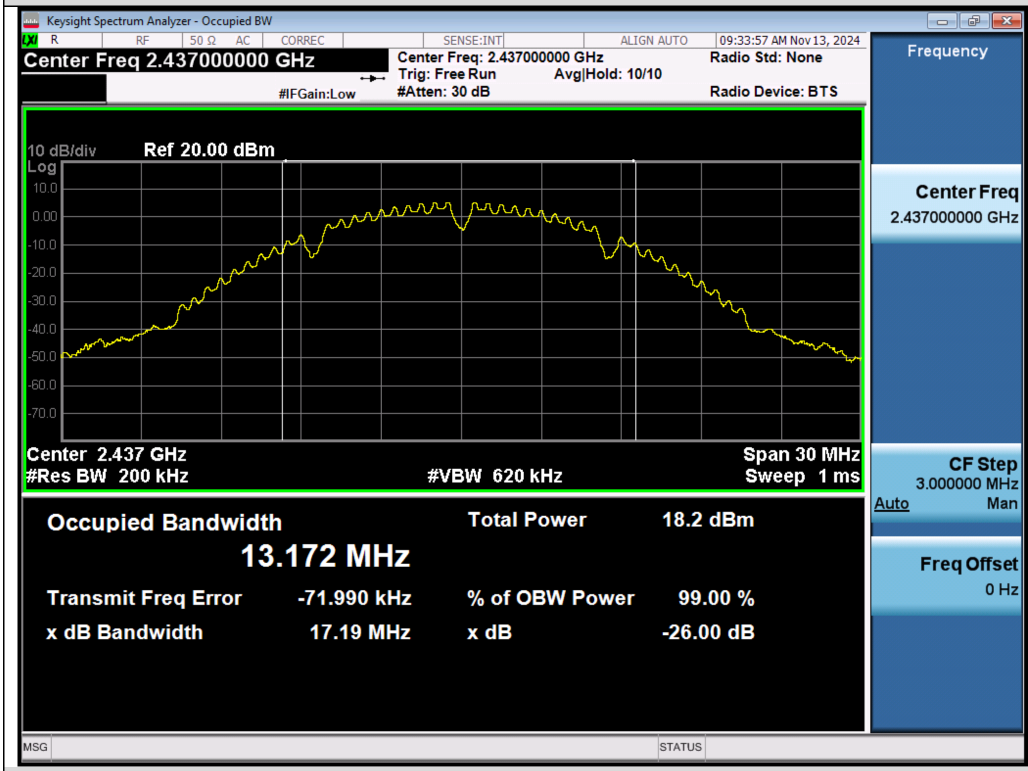
Test_Graph_802.11ax40_Chain A_2437_MCS0_OBW



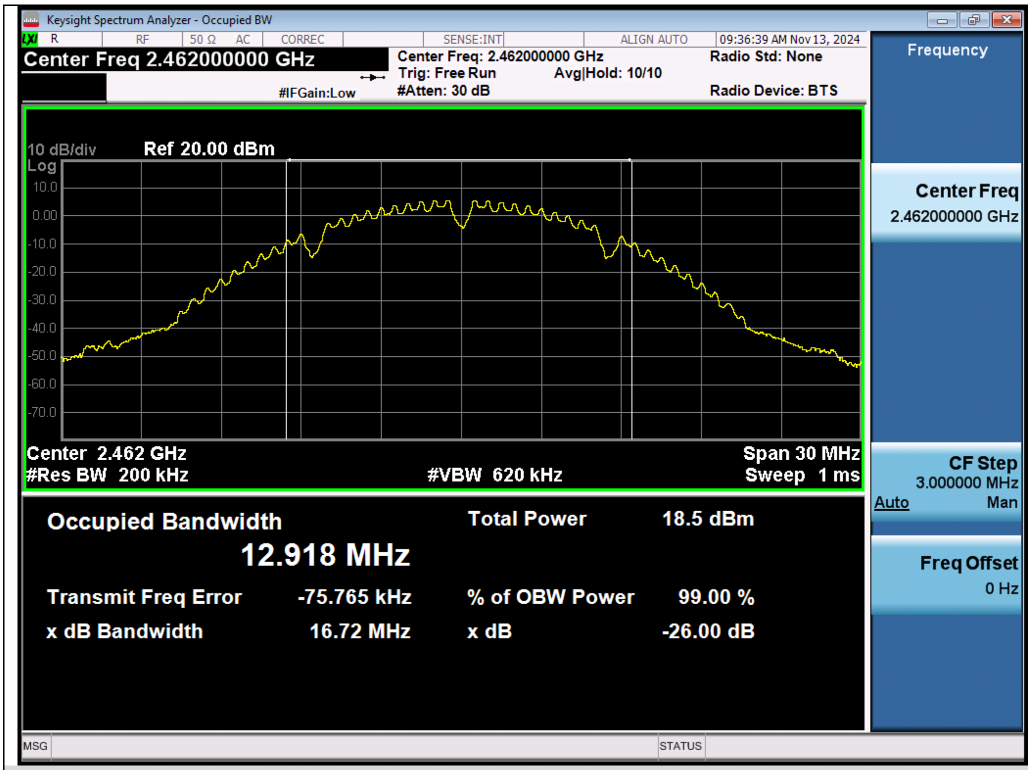
Test_Graph_802.11ax40_Chain A_2452_MCS0_OBW



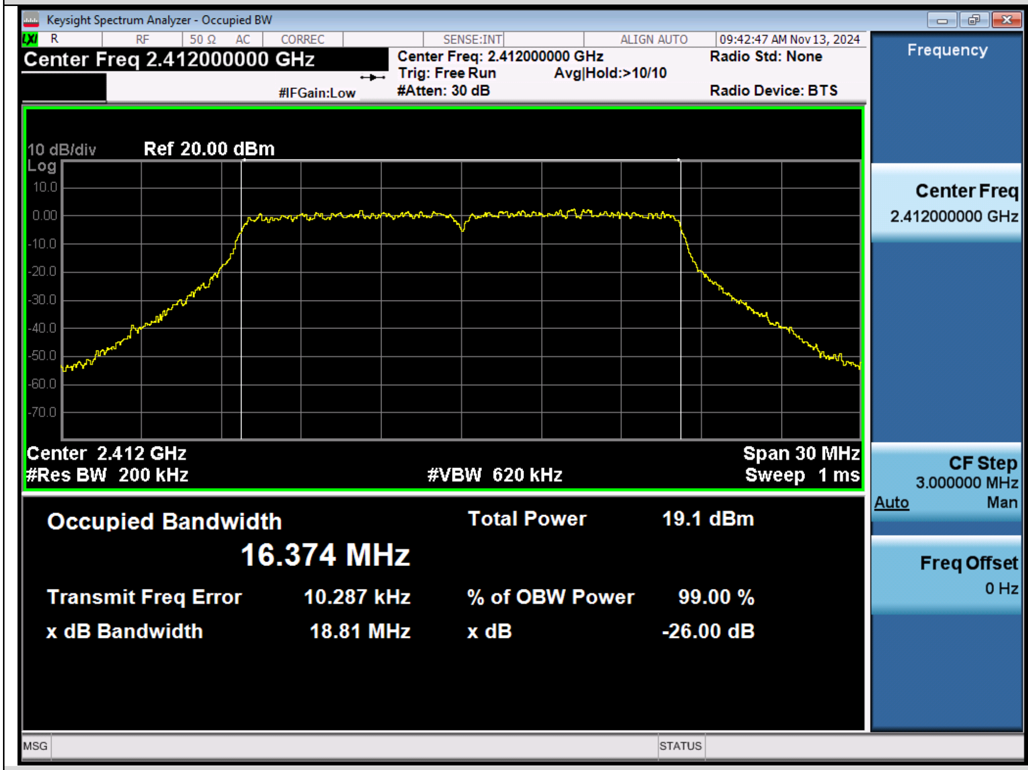
Test_Graph_802.11b_Chain B_2412_1Mbps_OBW



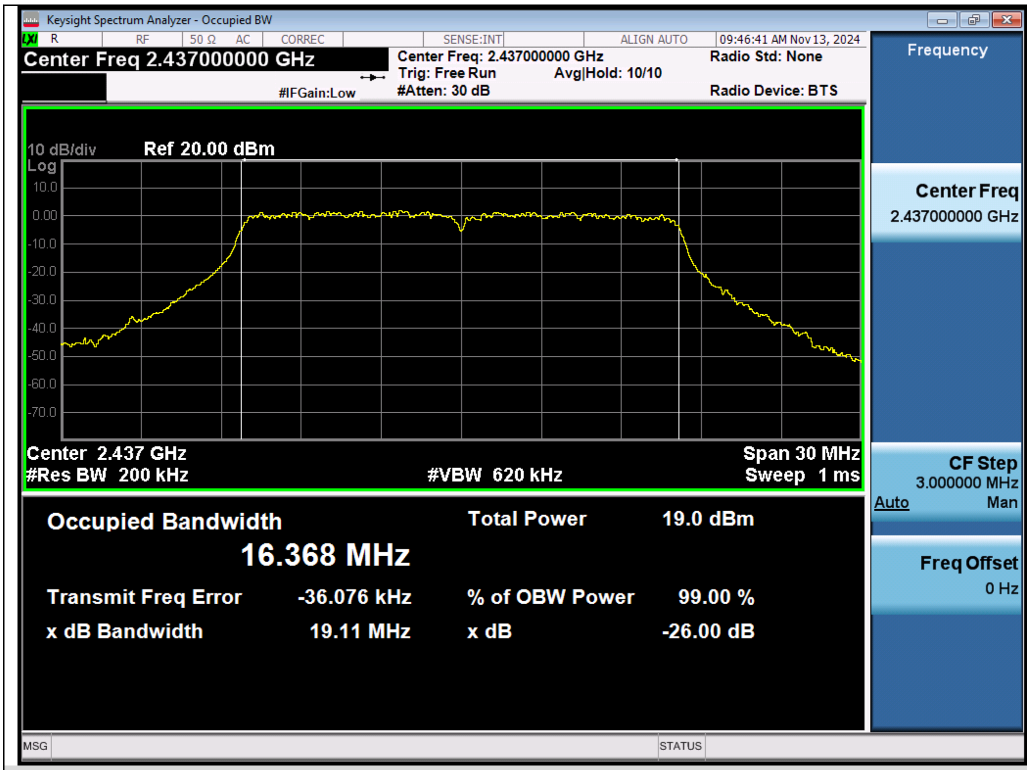
Test_Graph_802.11b_Chain B_2437_1Mbps_OBW



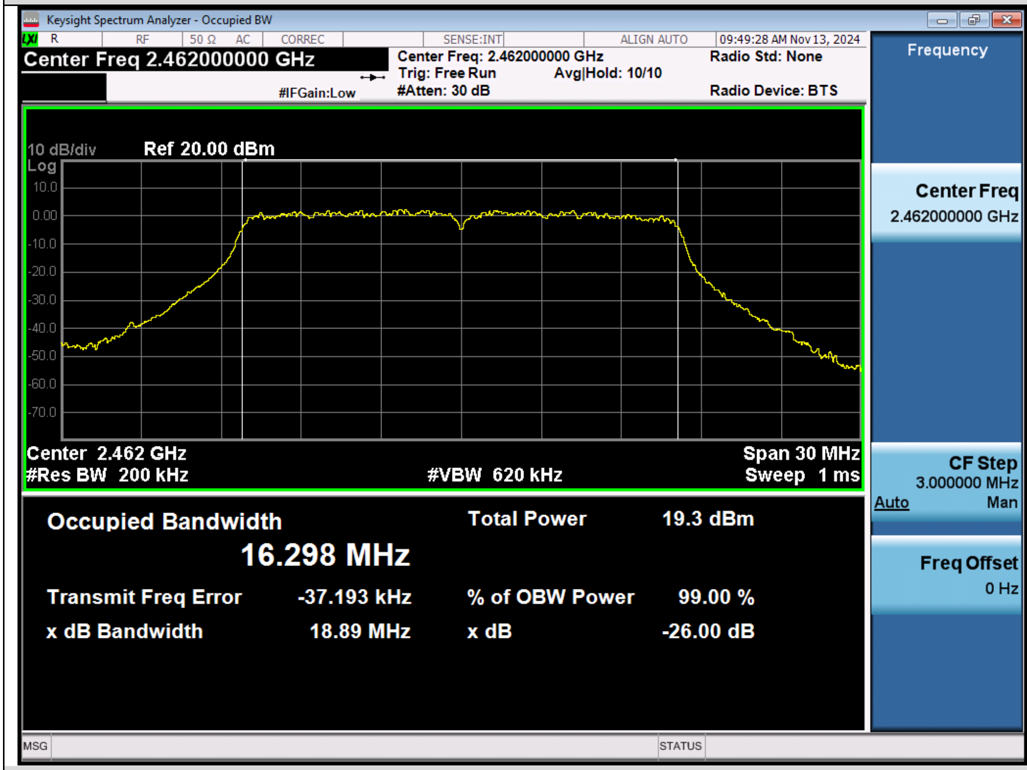
Test_Graph_802.11b_Chain B_2462_1Mbps_OBW



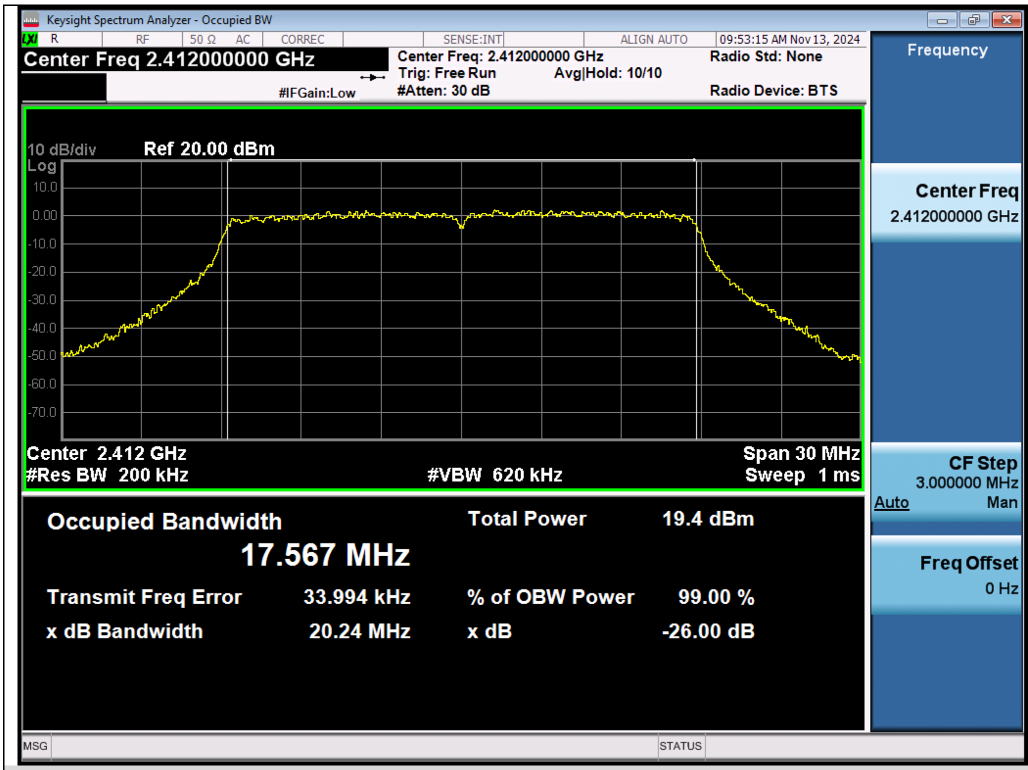
Test_Graph_802.11g_Chain B_2412_6Mbps_OBW



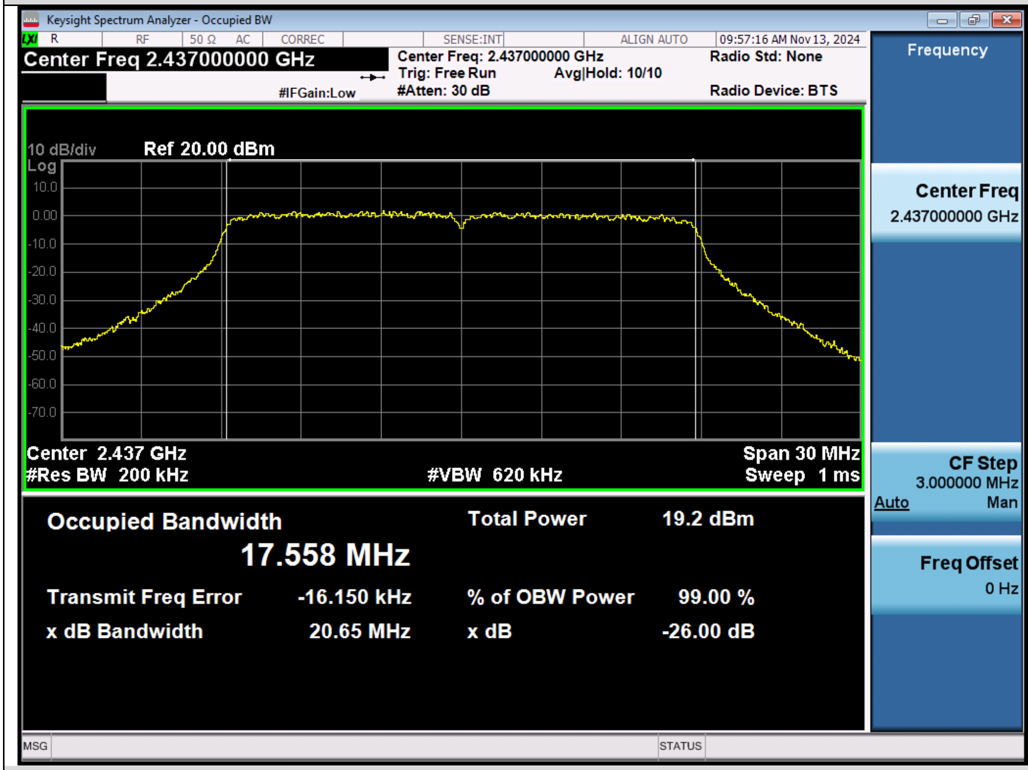
Test_Graph_802.11g_Chain B_2437_6Mbps_OBW



Test_Graph_802.11g_Chain B_2462_6Mbps_OBW

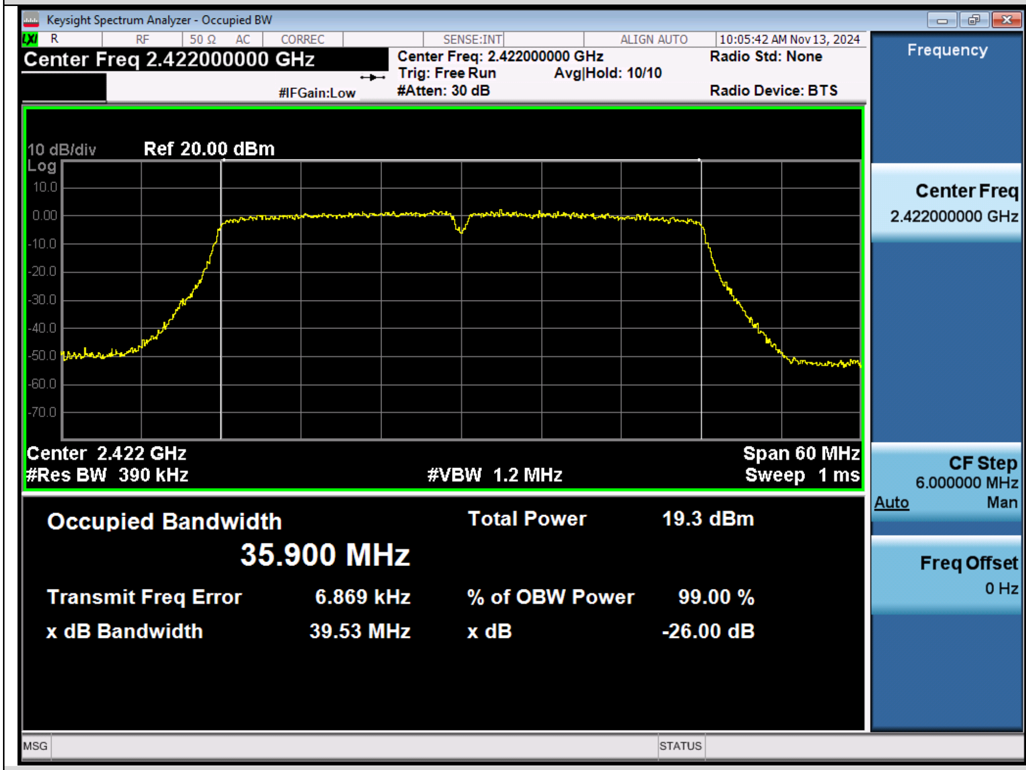


Test_Graph_802.11n20_Chain B_2412_MCS0_OBW

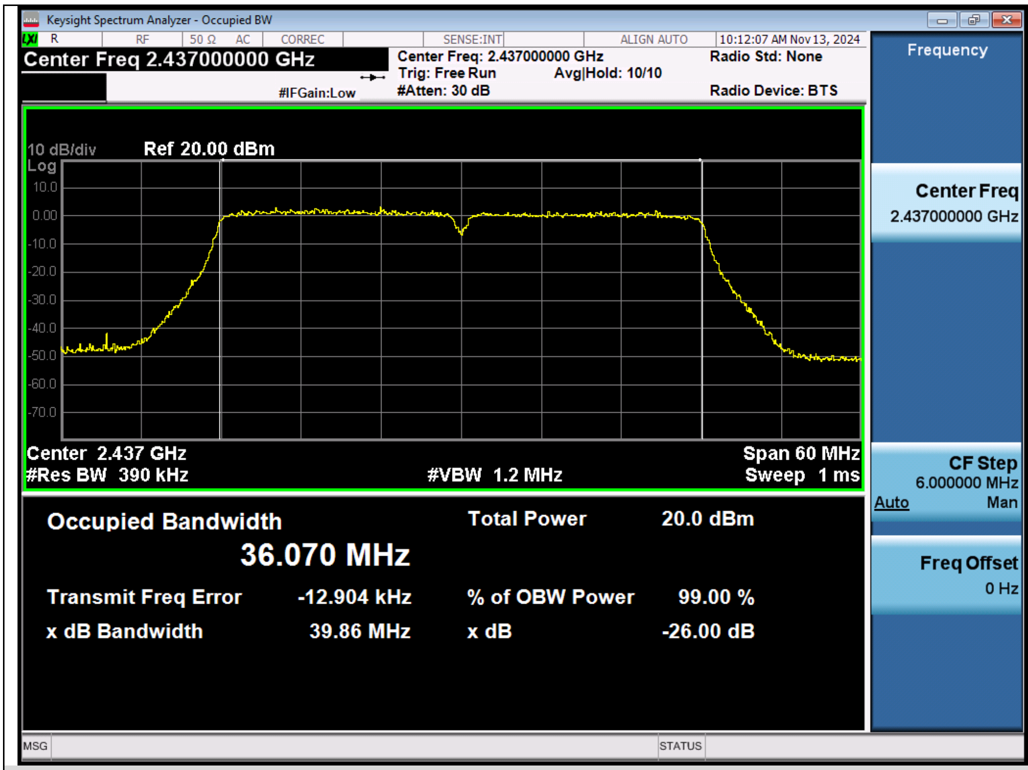


Test_Graph_802.11n20_Chain B_2437_MCS0_OBW

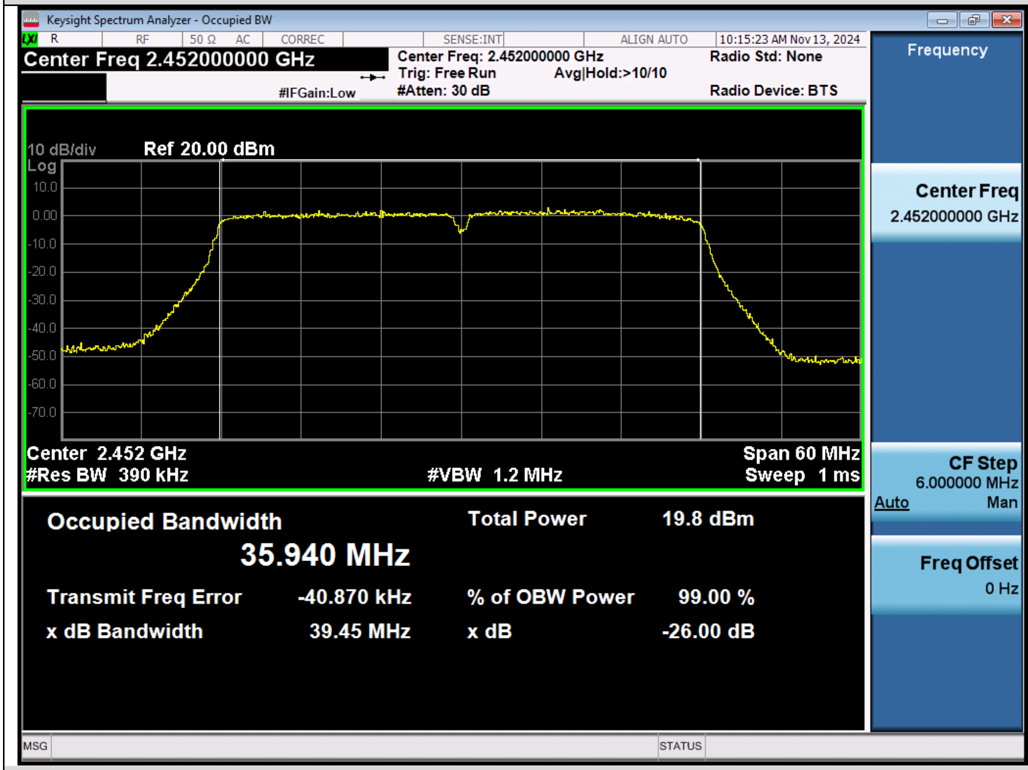
Test_Graph_802.11n20_Chain B_2462_MCS0_OBW



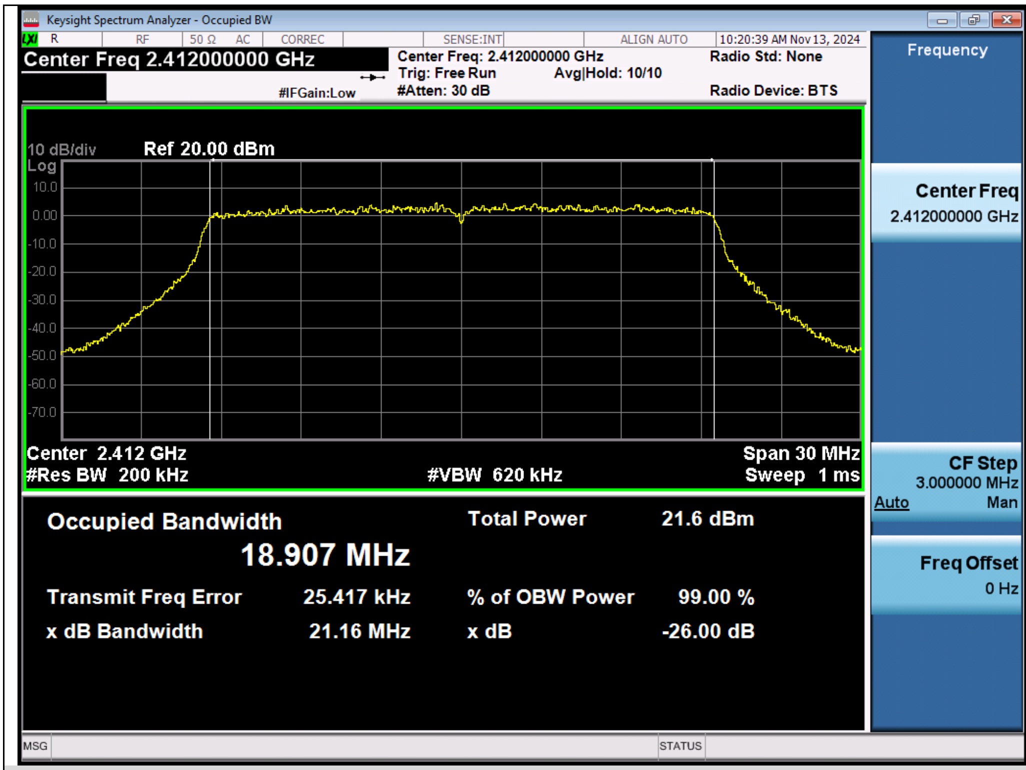
Test_Graph_802.11n40_Chain B_2422_MCS0_OBW



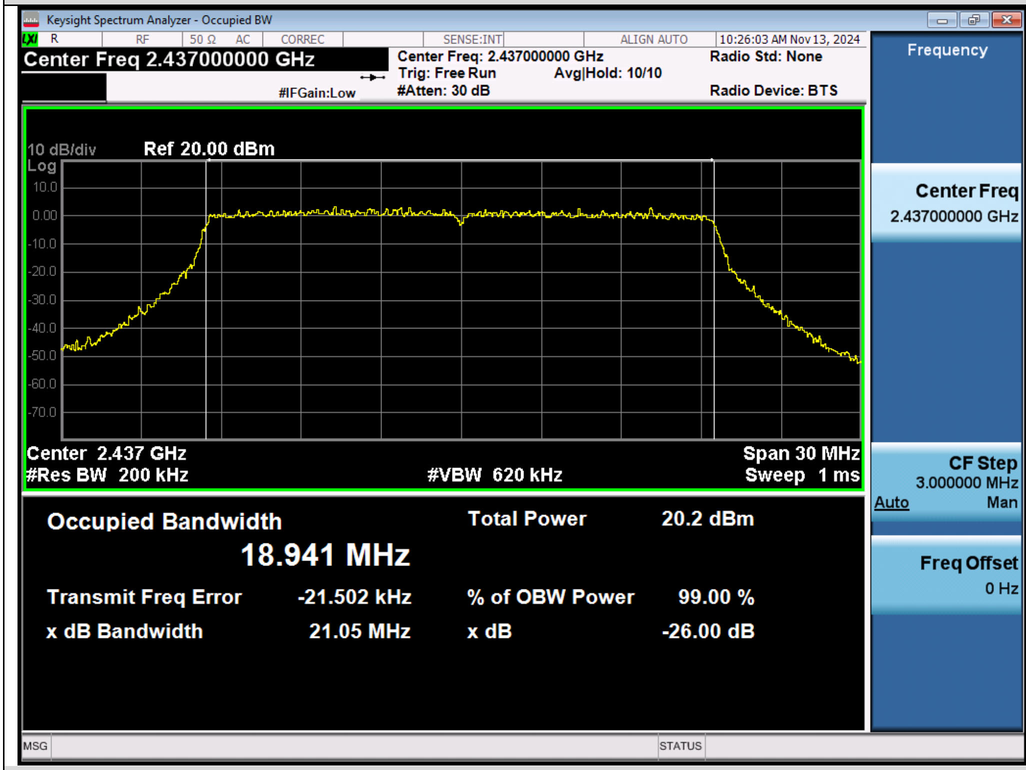
Test_Graph_802.11n40_Chain B_2437_MCS0_OBW



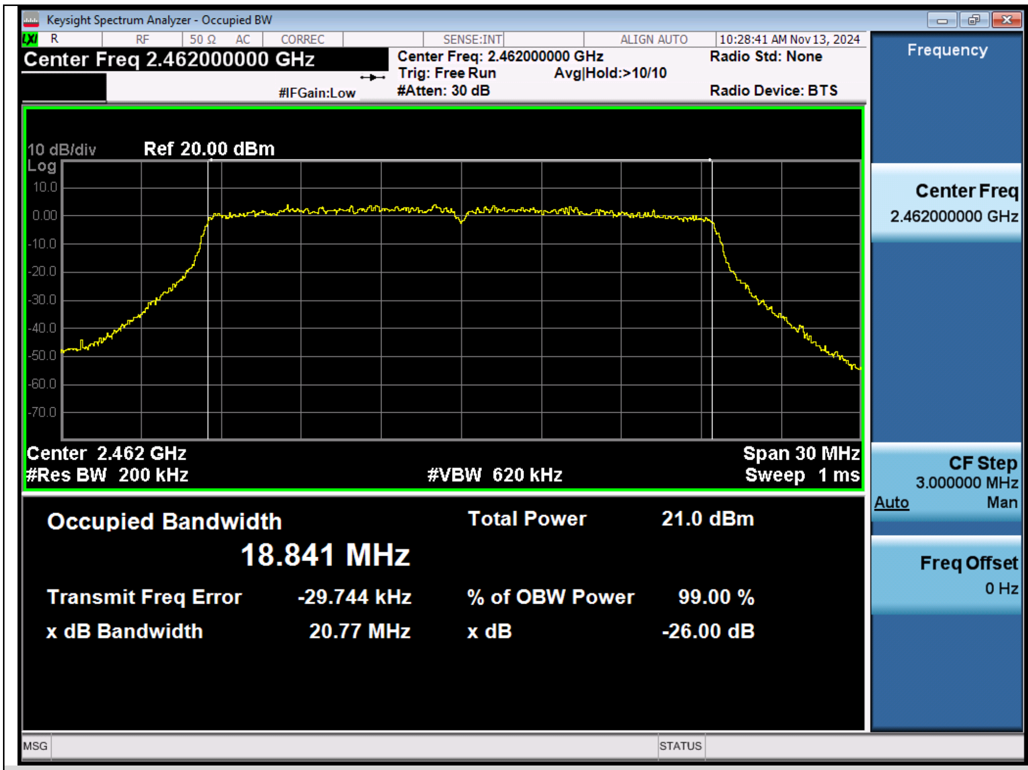
Test_Graph_802.11n40_Chain B_2452_MCS0_OBW



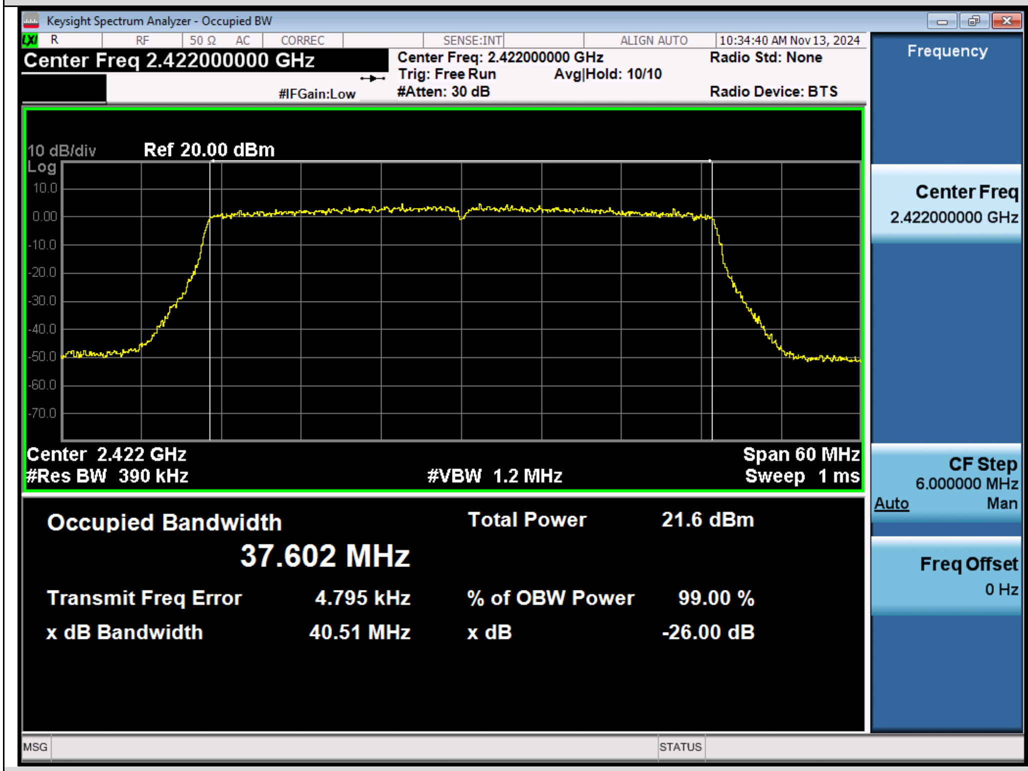
Test_Graph_802.11ax20_Chain B_2412_MCS0_OBW



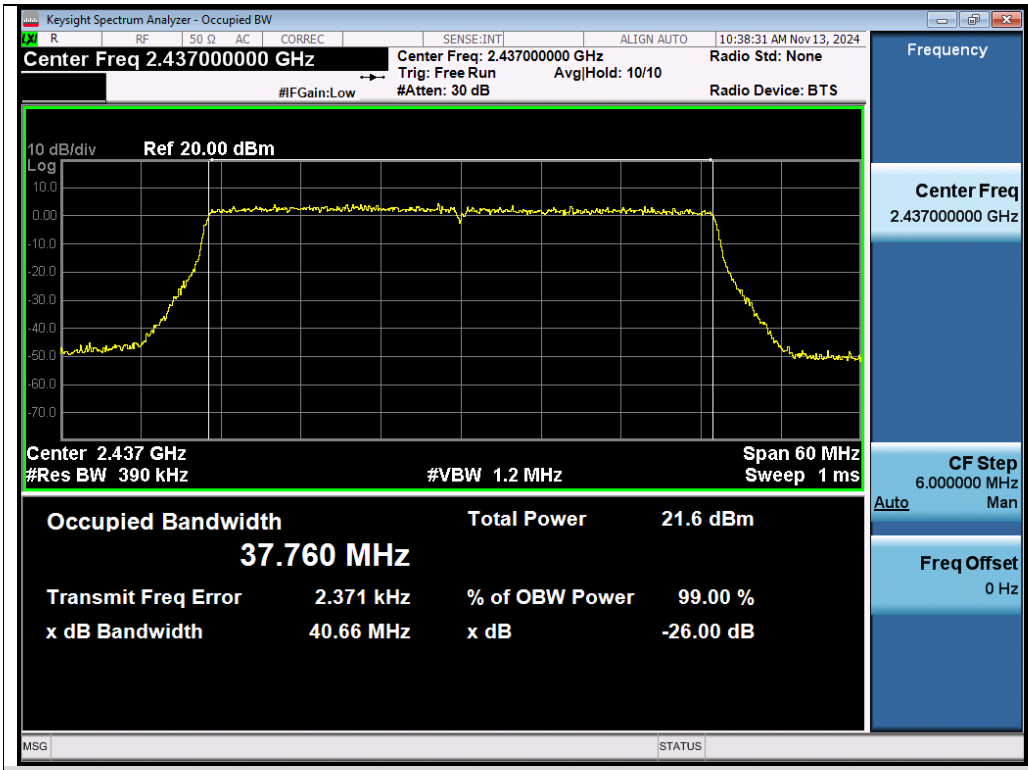
Test_Graph_802.11ax20_Chain B_2437_MCS0_OBW



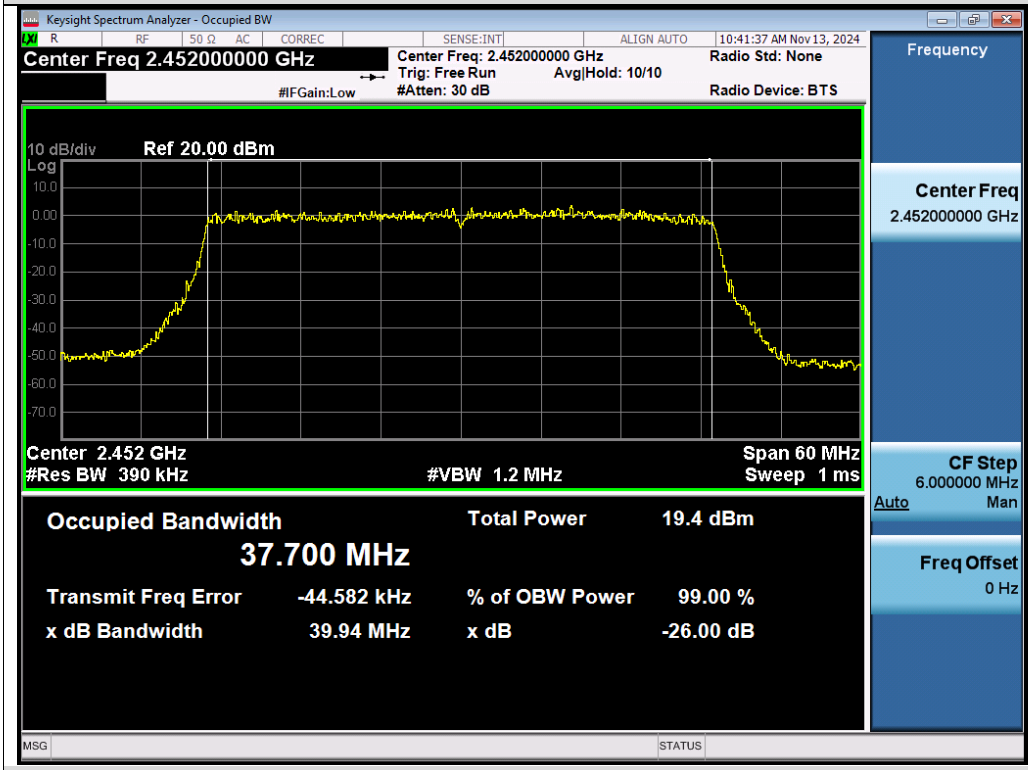
Test_Graph_802.11ax20_Chain B_2462_MCS0_OBW



Test_Graph_802.11ax40_Chain B_2422_MCS0_OBW

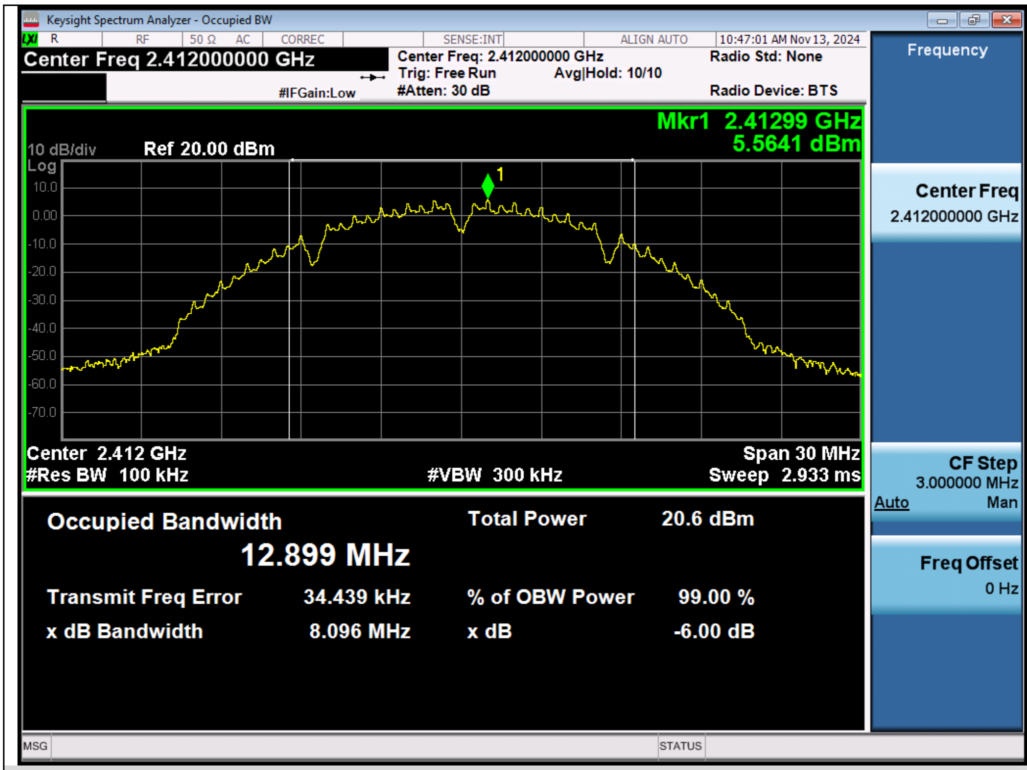


Test_Graph_802.11ax40_Chain B_2437_MCS0_OBW



Test_Graph_802.11ax40_Chain B_2452_MCS0_OBW

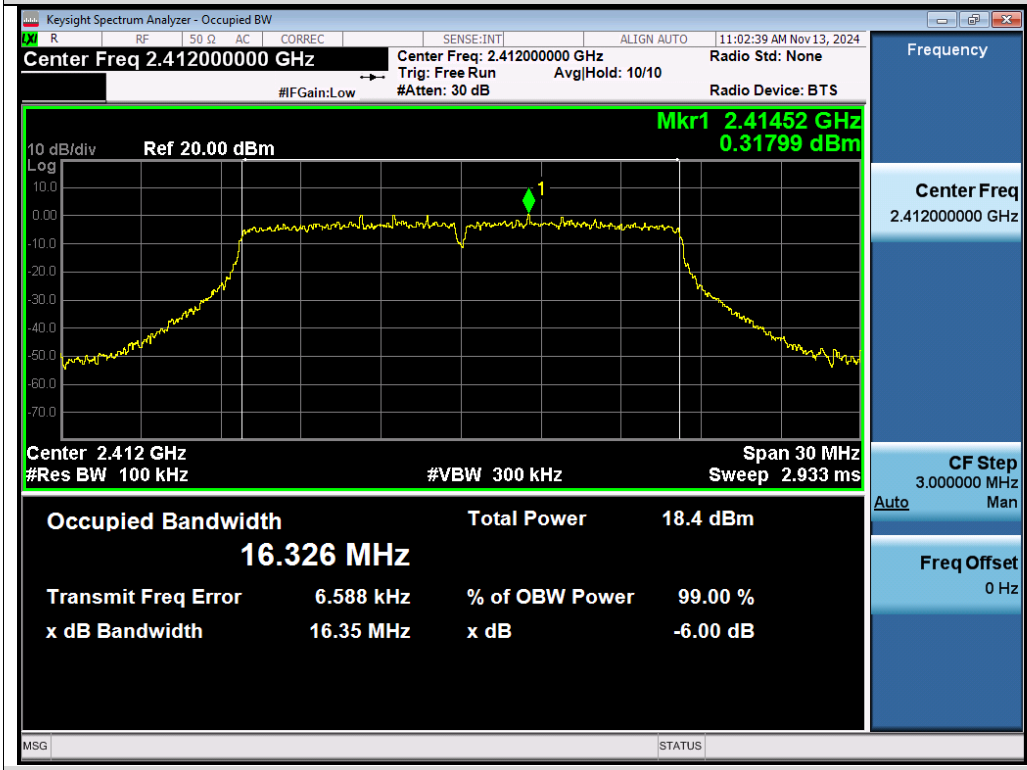
Test Graphs of DTS Bandwidth



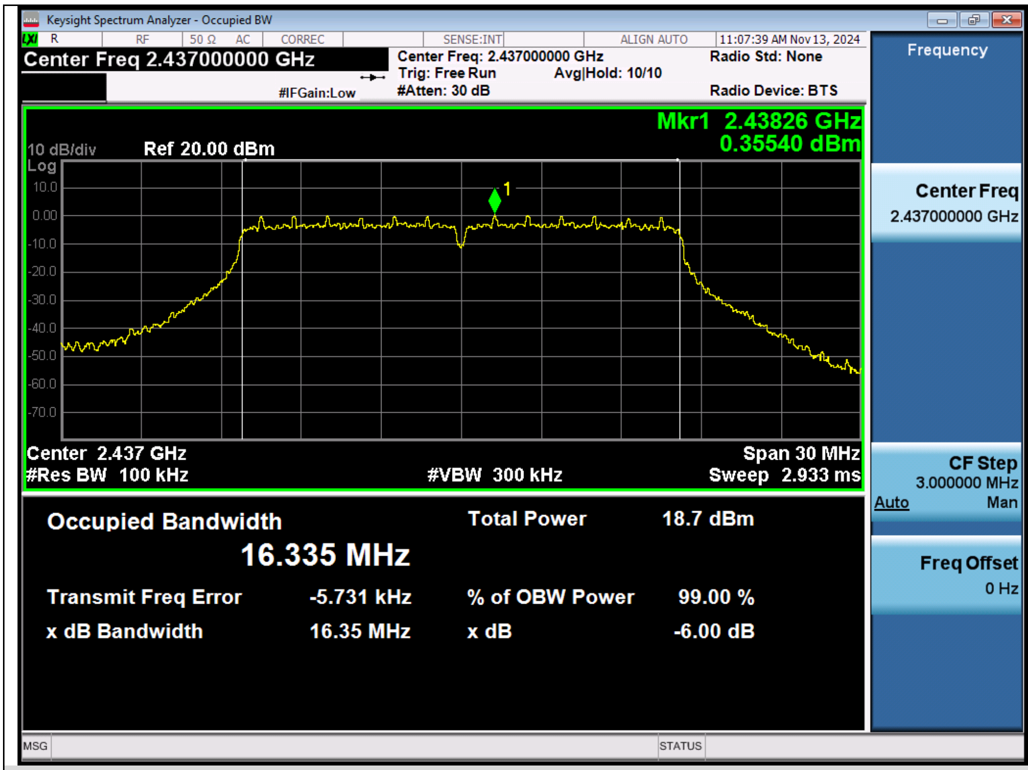
Test_Graph_802.11b_Chain A_2412_1Mbps_DTSBW

Test_Graph_802.11b_Chain A_2437_1Mbps_DTSBW

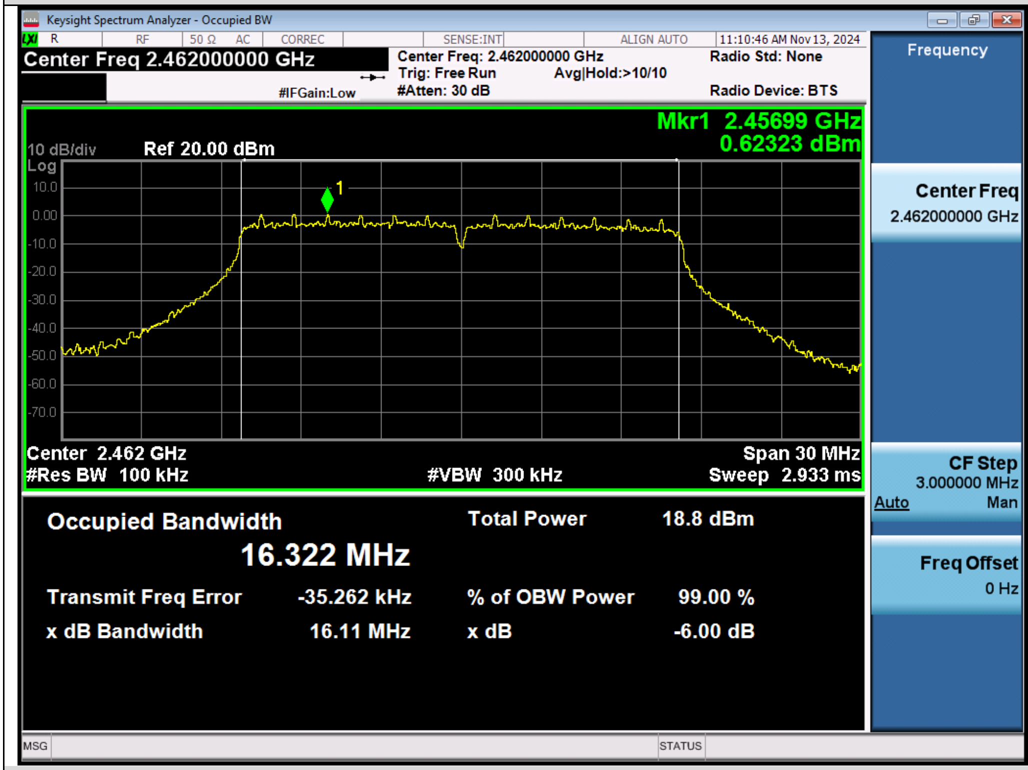
Test_Graph_802.11b_Chain A_2462_1Mbps_DTSBW



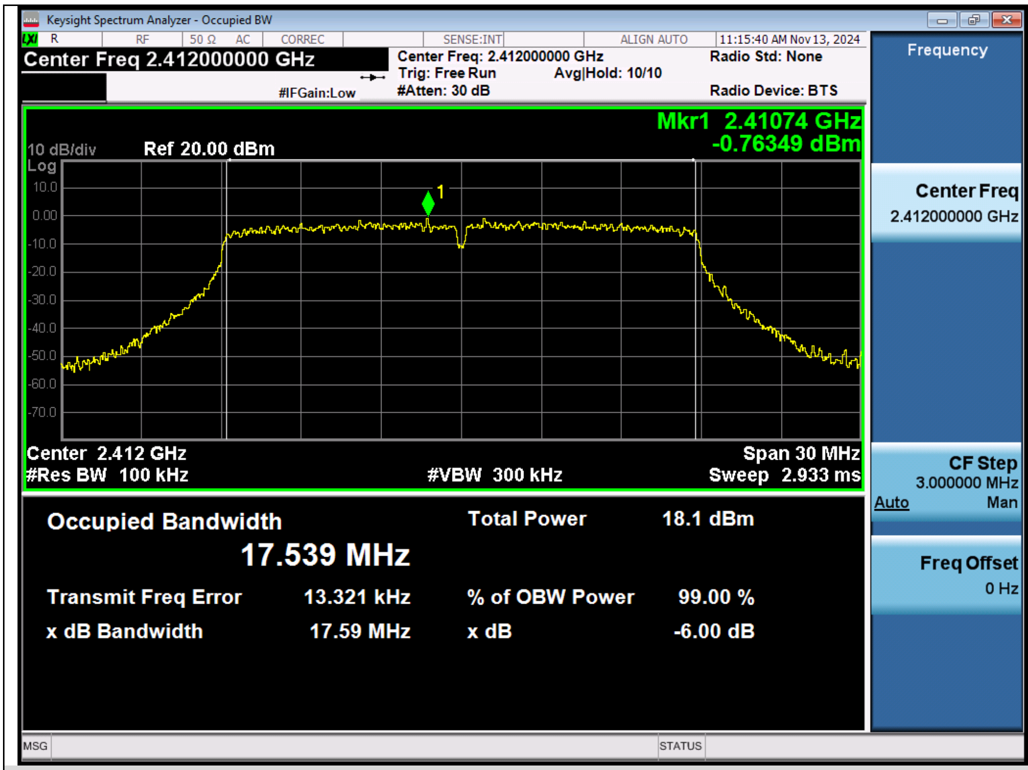
Test_Graph_802.11g_Chain A_2412_6Mbps_DTSBW



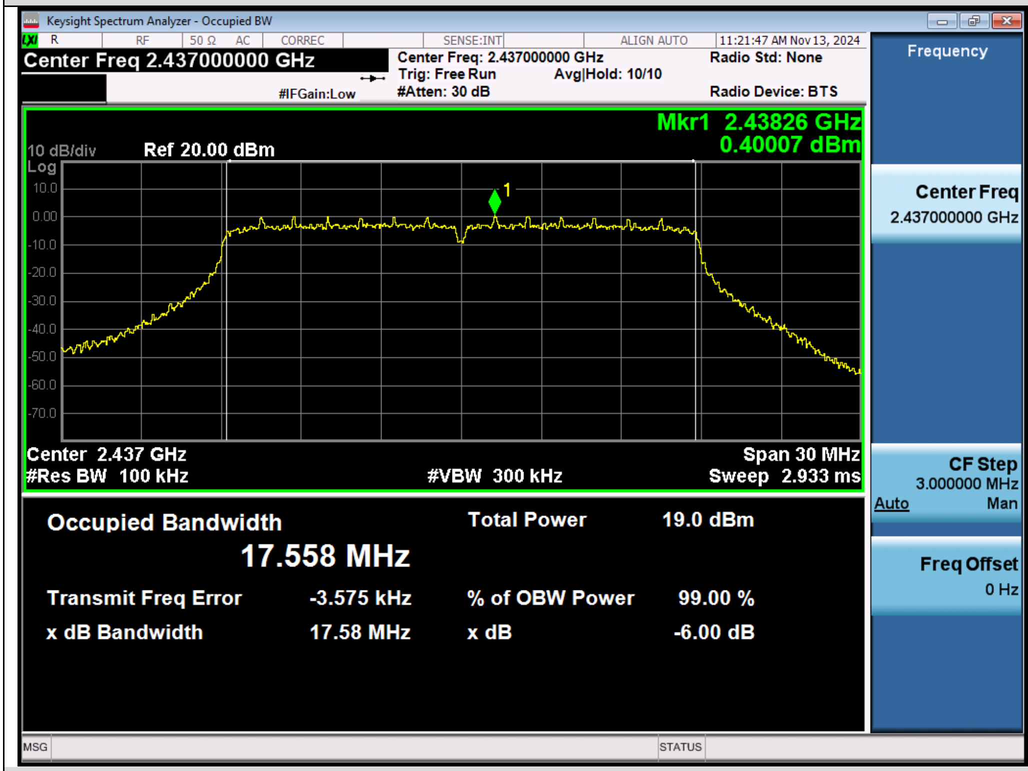
Test_Graph_802.11g_Chain A_2437_6Mbps_DTSBW



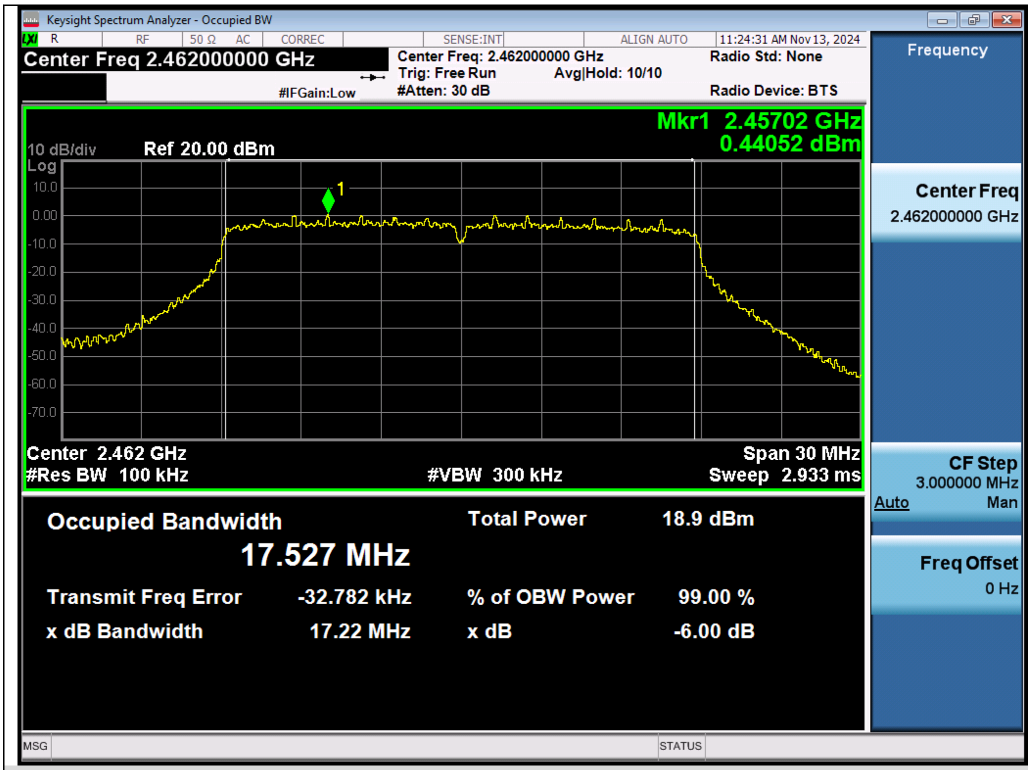
Test_Graph_802.11g_Chain A_2462_6Mbps_DTSBW



Test_Graph_802.11n20_Chain A_2412_MCS0_DTSBW



Test_Graph_802.11n20_Chain A_2437_MCS0_DTSBW



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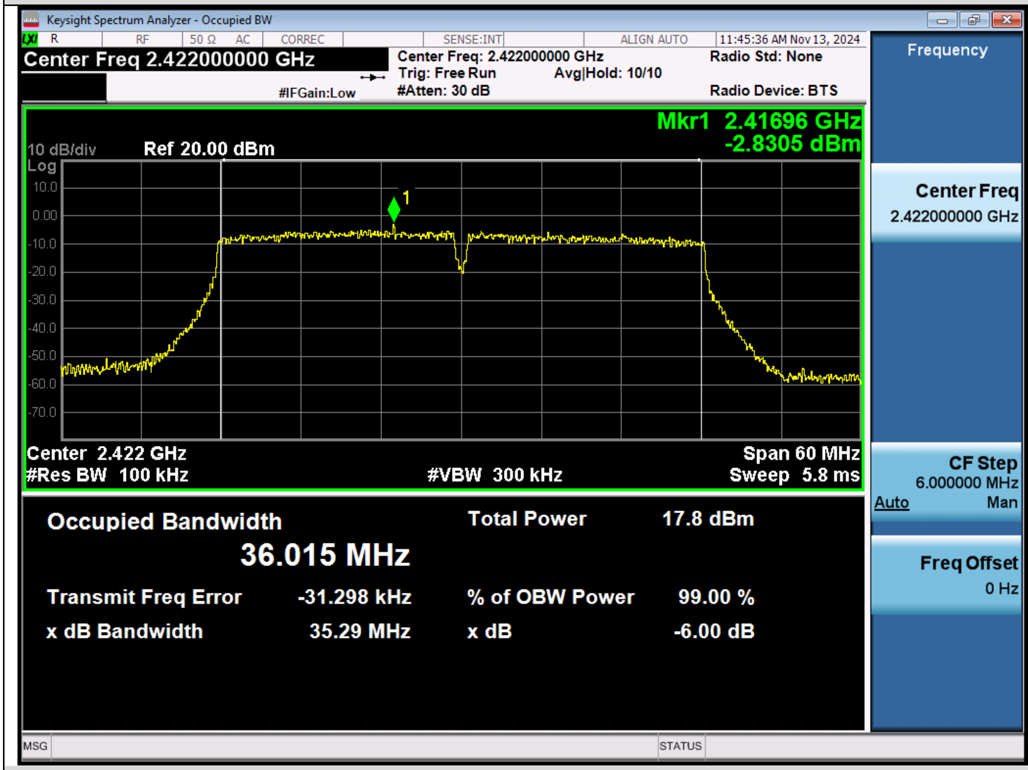
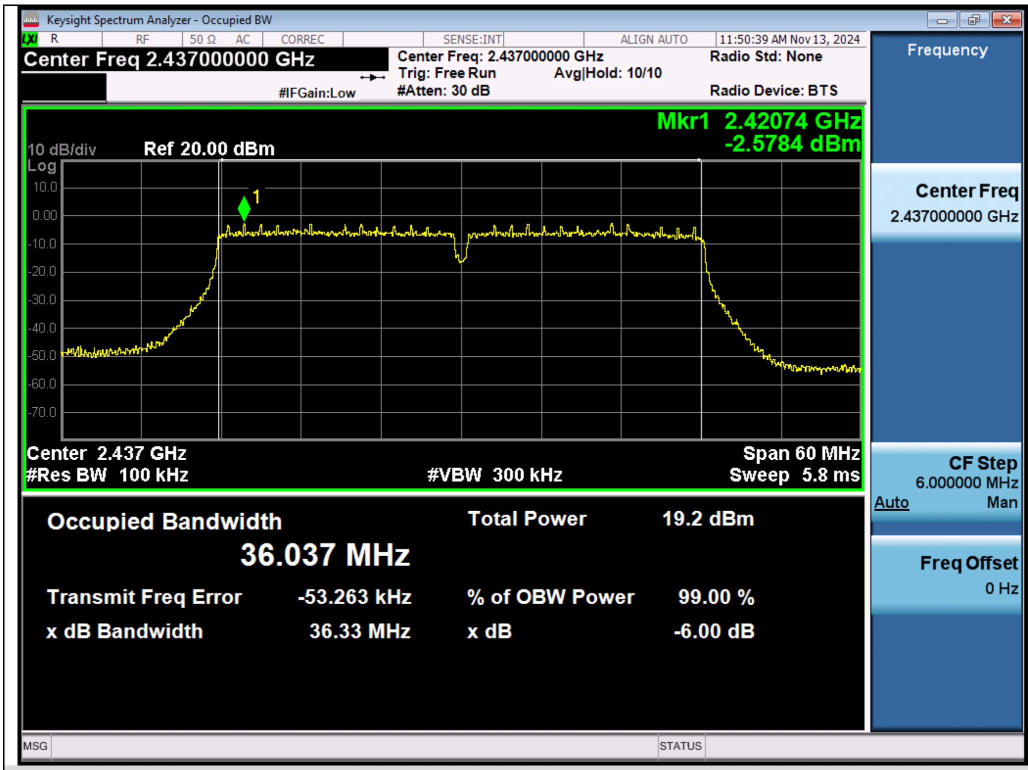
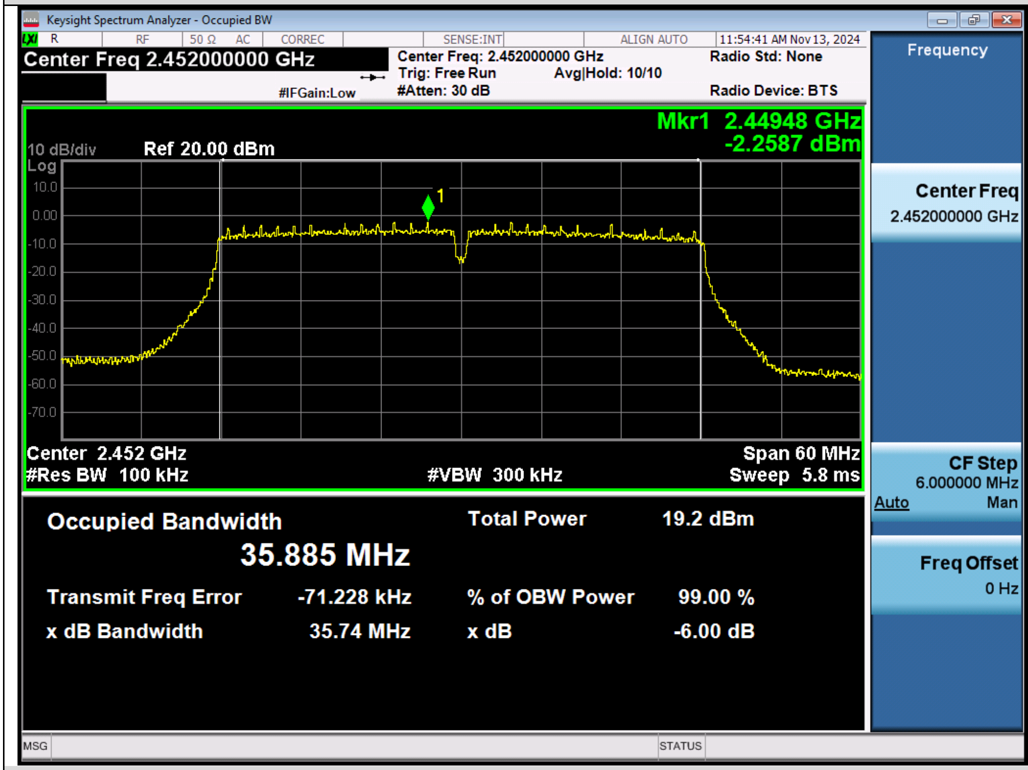


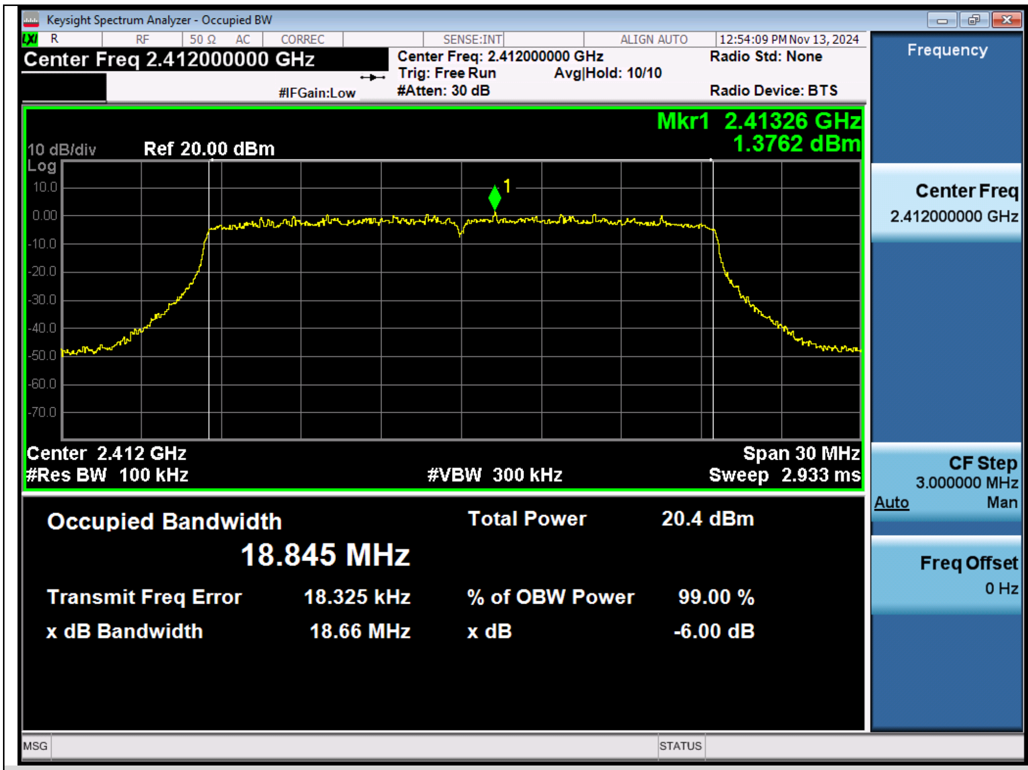
Test_Graph_802.11n40_Chain A_2422_MCS0_DTSBW



Test_Graph_802.11n40_Chain A_2437_MCS0_DTSBW



Test_Graph_802.11n40_Chain A_2452_MCS0_DTSBW



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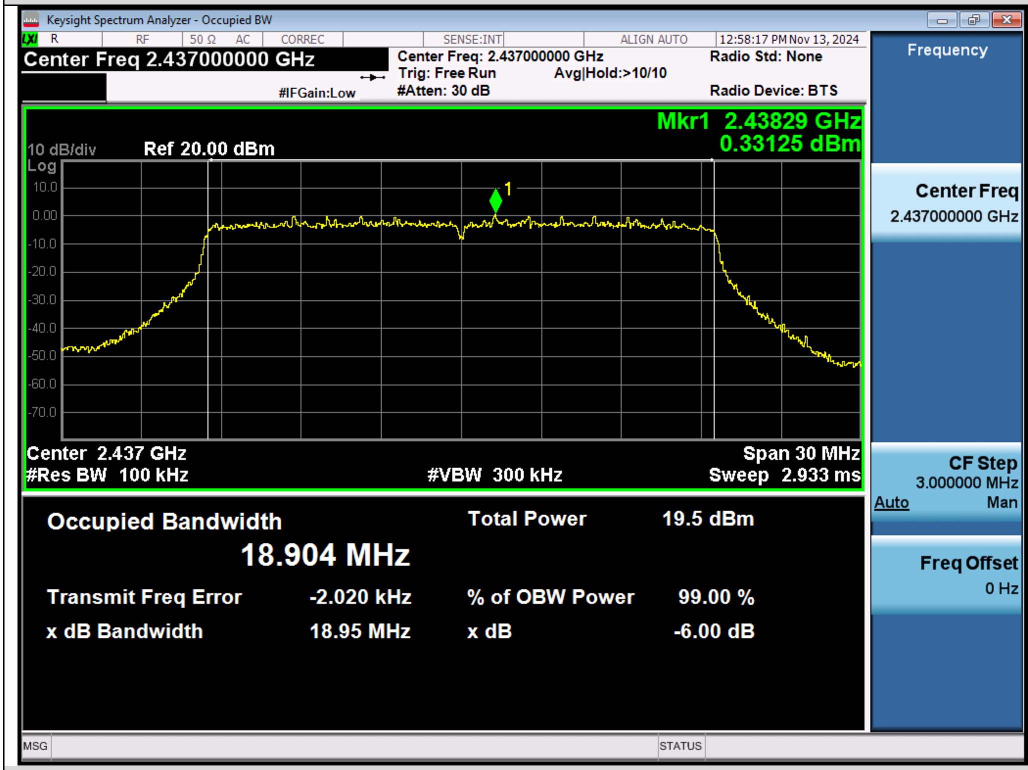

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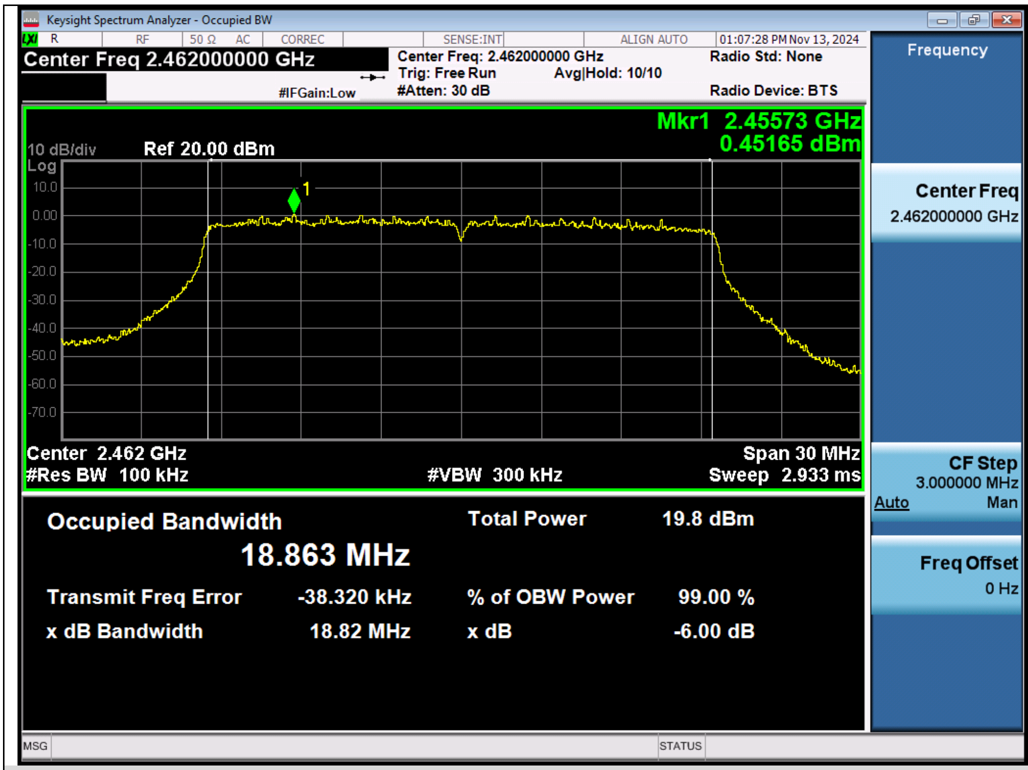

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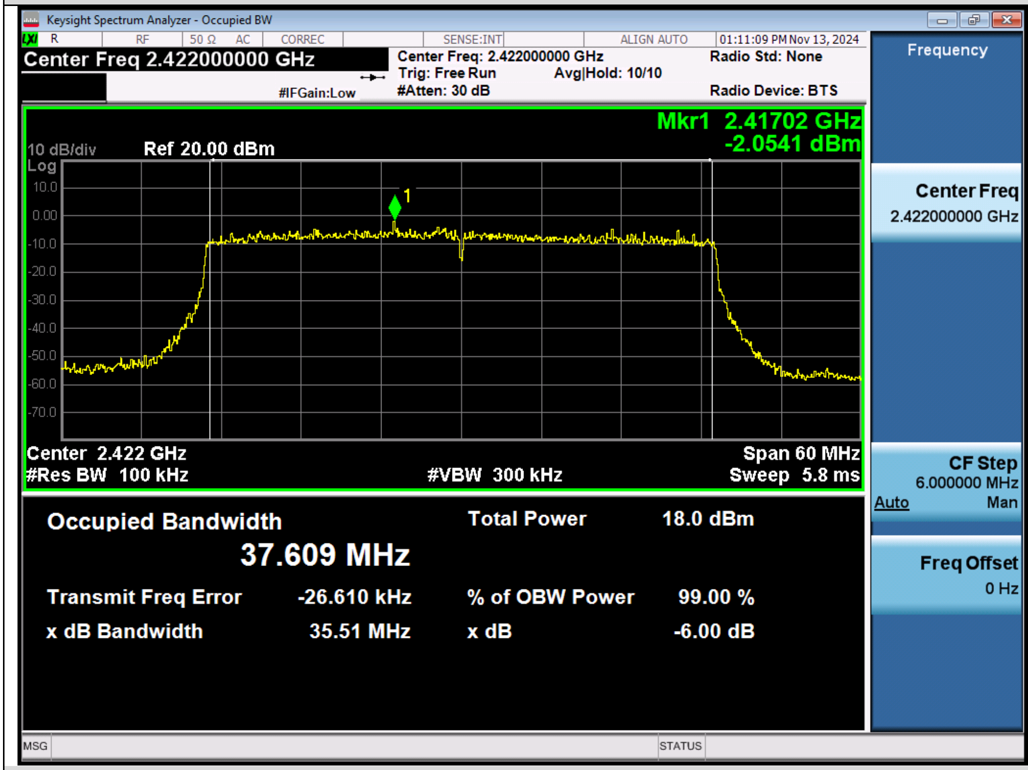
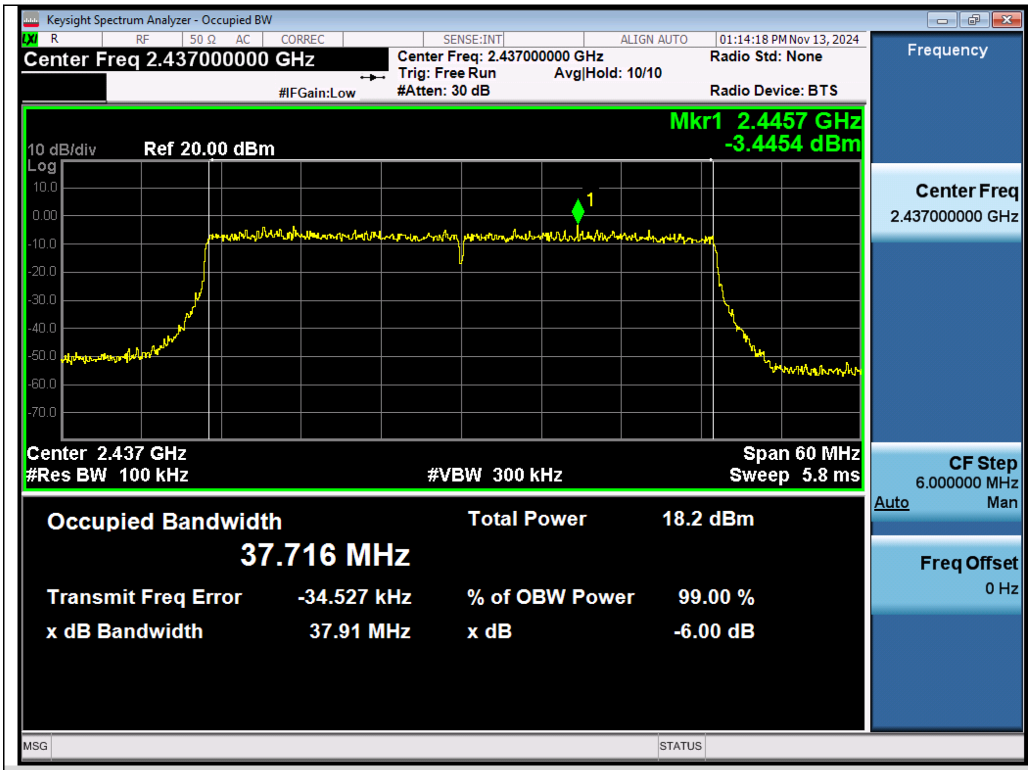


Test_Graph_802.11ax40_Chain A_2422_MCS0_DTSBW



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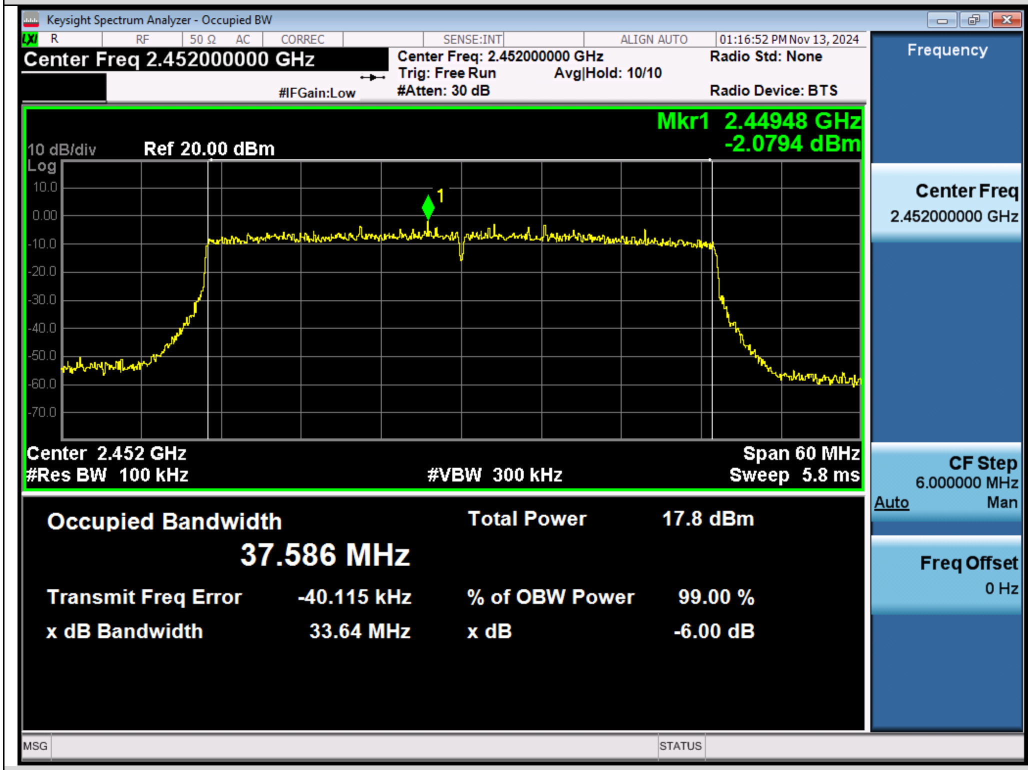

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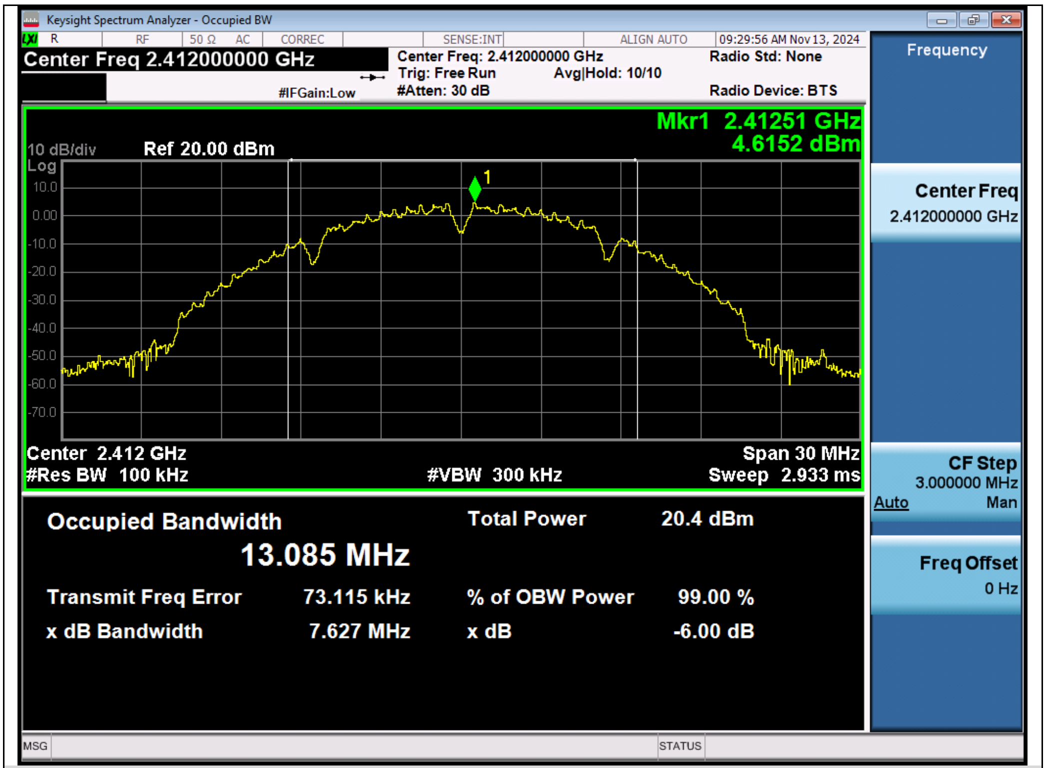
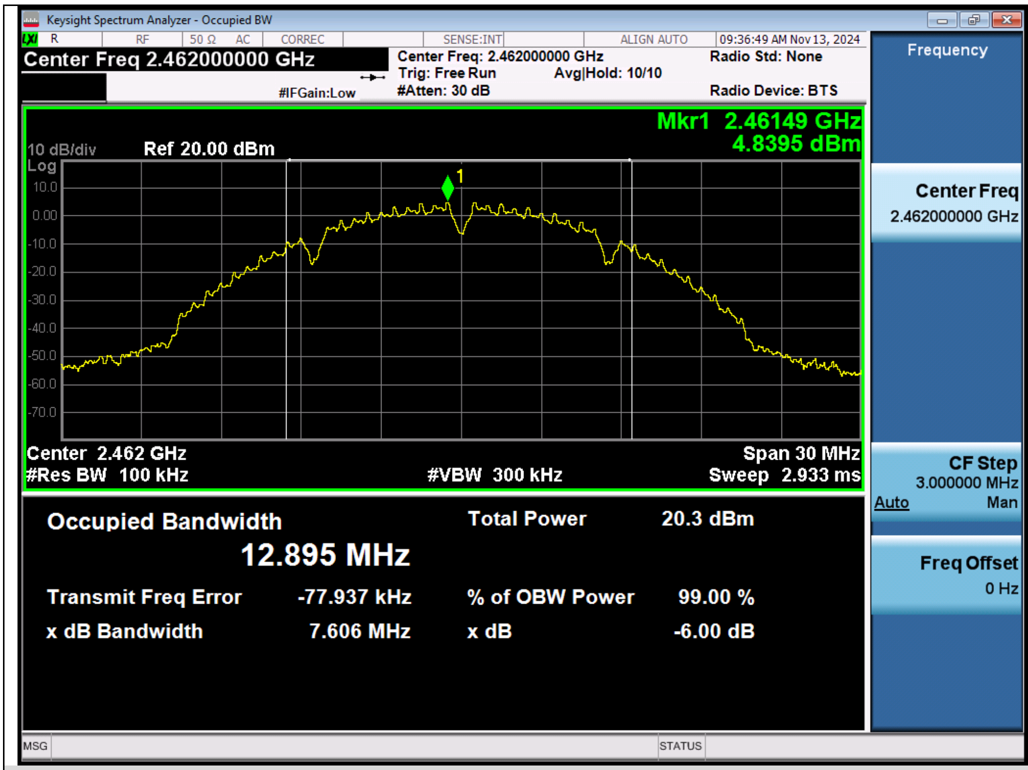
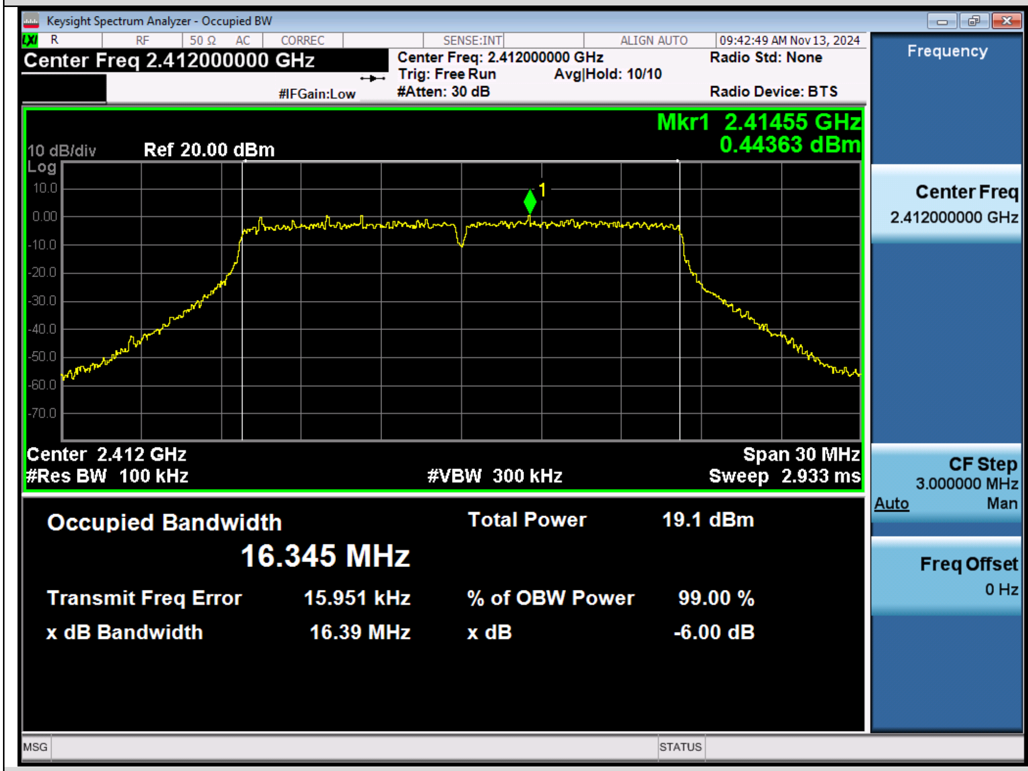


Test_Graph_802.11b_Chain B_2412_1Mbps_DTSBW

Test_Graph_802.11b_Chain B_2437_1Mbps_DTSBW



Test_Graph_802.11b_Chain B_2462_1Mbps_DTSBW



Test_Graph_802.11g_Chain B_2412_6Mbps_DTSBW