RF TEST REPORT

Applicant	Quectel Wireless Solutions Company Limited
FCC ID	XMR2024FGS060N
Product	Wi-Fi, Bluetooth with Thread Module
Brand	Quectel
Model	FGS060N
Report No.	R2408A1041-R1V2
Issue Date	June 20, 2025

Eurofins TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15C (2024)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Prepared by: Xu Ying *Approved by: Xu Kai*

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Version	Revision Description	Issue Date
Rev.0	Initial issue of report.	June 4, 2025
Rev.1	Updated information and description.	June 17, 2025
Rev.2	Updated information.	June 20, 2025
Note: This revised report (Report No.: R2408A1041-R1V2) supersedes and replaces the previously issued report (Report No.: R2408A1041-R1V1). Please discard or destroy the previously issued report and dispose of it accordingly.		

Summary of Measurement Results

Number	Test Case	Clause in FCC rules	Verdict
1	Maximum output power	15.247(b)(3)	PASS
2	99% Bandwidth and 6dB Bandwidth	15.247(a)(2) C63.10 6.9	PASS
3	Power spectral density	15.247(e)	PASS
4	Band Edge	15.247(d)	PASS
5	Spurious RF Conducted Emissions	15.247(d)	PASS
6	Unwanted Emissions	15.247(d), 15.205, 15.209	PASS
7	Conducted Emissions	15.207	PASS
Date of Testing: September 2, 2024 ~ December 24, 2024 and March 19, 2025 Date of Sample Received: August 23, 2024			
Note: All indications of Pass/Fail in this report are opinions expressed by Eurofins TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

1. Test Laboratory

1.1. Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **Eurofins TA Technology (Shanghai) Co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test Facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

Eurofins TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform measurements.

A2LA (Certificate Number: 3857.01)

Eurofins TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform measurement.

1.3. Testing Location

Company:	Eurofins TA Technology (Shanghai) Co., Ltd.
Address:	Building 3, No.145, Jintang Rd, Pudong Shanghai, P.R.China
City:	Shanghai
Post code:	201201
Country:	P. R. China
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Website:	https://www.eurofins.com/electrical-and-electronics
E-mail:	Kain.Xu@cpt.eurofinscn.com

2. General Description of Equipment Under Test

2.1. Applicant and Manufacturer Information

Applicant	Quectel Wireless Solutions Company Limited
Applicant address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China, 200233
Manufacturer	Quectel Wireless Solutions Company Limited
Manufacturer address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China, 200233

2.2. General Information

EUT Description		
Model	FGS060N	
SN	Conducted	E1C23H816000018
Lab internal SN	Radiated	R2408A1041/S01
Hardware Version	R1.0	
Software Version	NA	
Power Supply	External power supply	
Antenna Type	PCB Antenna	
Antenna Connector	A permanently attached antenna (meet with the standard FCC Part 15.203 requirement)	
Antenna Gain	4.19 dBi	
Additional Beamforming Gain	NA	
Operating Frequency Range(s)	802.11b/g/n(HT20)/ax(HE20): 2412 ~ 2462 MHz 802.11n(HT40)/ax(HE40): 2422 ~ 2452 MHz Bluetooth LE V5.2: 2402 ~ 2480 MHz Thread: 2405 ~ 2480 MHz	
Modulation Type	802.11b: DSSS 802.11g/n: OFDM 802.11ax: OFDMA Bluetooth LE: GFSK Thread: O-QPSK	
Max. Output Power	Wi-Fi 2.4GHz: 17.64 dBm Bluetooth LE: 17.02 dBm Thread: 18.10 dBm	
Note: 1. The EUT is sent from the applicant to Eurofins TA and the information of the EUT is declared by the applicant.		

3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards:

FCC CFR47 Part 15C (2024) Radio Frequency Devices

ANSI C63.10-2013

Reference standard:

KDB 558074 D01 15.247 Meas Guidance v05r02

4. Test Configuration

Test Mode

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the loop antenna is vertical, the others are vertical and horizontal. and the worst case was recorded.

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate. Preliminary tests have been done on all the configuration for confirming worst case. Data rate below means worst-case rate of each test item.

Worst-case data rates are shown as following table.

Test Mode	Data Rate
Bluetooth(Low Energy)	1Mbps; 2Mbps
Bluetooth (Low Energy) (S=2)	500kbps
Bluetooth (Low Energy) (S=8)	125kbps
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ax HE20	MCS0
802.11ax HE40	MCS0
Thread	250kbps

5. Test Case Results

5.1. Maximum output power

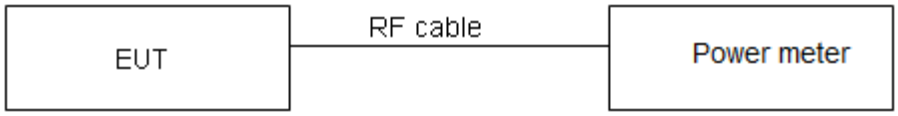
Ambient Condition

Temperature	Relative humidity
15°C ~ 35°C	20% ~ 80%

Methods of Measurement

During the process of the testing, The EUT was connected to Power meter with a known loss. The EUT is max power transmission with proper modulation.

Test Setup



Limits

Rule Part 15.247 (b) (3) specifies that " For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz: 1 Watt."

Average Output Power	≤ 1W (30dBm)

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.44 dB.

Test Results

Power Index							
Channel	802.11b	802.11g	802.11n HT20	802.11ax HE20	Channel	802.11n HT40	802.11ax HE40
CH1	16	16	14	14	CH3	14	14
CH6	16	16	14	14	CH6	14	14
CH11	16	16	14	14	CH9	14	14

Test Mode	Duty cycle	Duty cycle correction Factor (dB)
802.11b	0.999	0.00
802.11g	0.990	0.00
802.11n HT20	0.989	0.00
802.11n HT40	0.978	0.10
802.11ax HE20	0.985	0.00
802.11ax HE40	0.973	0.12
Note: when Duty cycle⩾0.98, Duty cycle correction Factor not required.		

Test Mode	Carrier frequency (MHz)/ Channel	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11b	2412/CH1	16.21	16.21	30	PASS
	2437/CH6	16.16	16.16	30	PASS
	2462/CH11	16.20	16.21	30	PASS
802.11g	2412/CH1	17.25	17.25	30	PASS
	2437/CH6	17.45	17.45	30	PASS
	2462/CH11	17.64	17.64	30	PASS
802.11n HT20	2412/CH1	14.23	14.23	30	PASS
	2437/CH6	14.43	14.43	30	PASS
	2462/CH11	14.79	14.79	30	PASS
802.11n HT40	2422/CH3	14.36	14.45	30	PASS
	2437/CH6	14.47	14.57	30	PASS
	2452/CH9	14.47	14.57	30	PASS
802.11ax HE20	2412/CH1	14.44	14.44	30	PASS
	2437/CH6	14.69	14.69	30	PASS
	2462/CH11	14.99	14.99	30	PASS
802.11ax HE40	2422/CH3	14.58	14.71	30	PASS
	2437/CH6	14.75	14.87	30	PASS
	2452/CH9	14.76	14.88	30	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

TB Mode

Network Standards	Carrier frequency (MHz)/ Channel	RU Index	Power Index
802.11ax HE20 26-Tones	2412/CH 1	0	14
	2437/CH 6	4	14
	2462/CH11	8	14
802.11ax HE20 52-Tones	2412/CH 1	37	14
	2437/CH 6	38	14
	2462/CH11	40	14
802.11ax HE20 106-Tones	2412/CH 1	53	14
	2437/CH 6	53	14
	2462/CH11	54	14
802.11ax HE20 242-Tones	2412/CH 1	61	14
	2462/CH11	61	14
802.11ax HE40 26-Tones	2422/CH3	0	15
	2452/CH9	17	15
802.11ax HE40 484-Tones	2422/CH3	65	14
	2452/CH9	65	14

Network Standards	Carrier frequency (MHz)/ Channel	RU Index	Duty cycle	Duty cycle correction Factor (dB)
802.11ax HE20 26-Tones	2412/CH 1	0	0.954	0.21
	2437/CH 6	4	0.954	0.21
	2462/CH11	8	0.954	0.21
802.11ax HE20 52-Tones	2412/CH 1	37	0.954	0.21
	2437/CH 6	38	0.954	0.21
	2462/CH11	40	0.954	0.21
802.11ax HE20 106-Tones	2412/CH 1	53	0.954	0.21
	2437/CH 6	53	0.954	0.21
	2462/CH11	54	0.954	0.21
802.11ax HE20 242-Tones	2412/CH 1	61	0.954	0.21
	2462/CH11	61	0.954	0.21
802.11ax HE40 26-Tones	2422/CH3	0	0.954	0.21
	2452/CH9	17	0.954	0.21
802.11ax HE40 484-Tones	2422/CH3	65	0.954	0.21
	2452/CH9	65	0.954	0.21

Network Standards	Carrier frequency (MHz)/ Channel	RU Index	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11ax HE20 26-Tones	2412/CH 1	0	13.92	14.13	30	PASS
	2437/CH 6	4	14.18	14.39	30	PASS
	2462/CH11	8	14.29	14.50	30	PASS
802.11ax HE20 52-Tones	2412/CH 1	37	13.81	14.02	30	PASS
	2437/CH 6	38	14.48	14.69	30	PASS
	2462/CH11	40	14.24	14.45	30	PASS
802.11ax HE20 106-Tones	2412/CH 1	53	14.08	14.29	30	PASS
	2437/CH 6	53	14.22	14.43	30	PASS
	2462/CH11	54	14.32	14.53	30	PASS
802.11ax HE20 242-Tones	2412/CH 1	61	14.01	14.22	30	PASS
	2462/CH11	61	14.49	14.70	30	PASS
802.11ax HE40 26-Tones	2422/CH3	0	13.86	14.07	30	PASS
	2452/CH9	17	14.02	14.23	30	PASS
802.11ax HE40 484-Tones	2422/CH3	65	14.10	14.31	30	PASS
	2452/CH9	65	14.27	14.48	30	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor						

ERSU Mode

Network Standards	Carrier frequency (MHz)/ Channel	RU Index	Power Index
802.11ax HE20 242-Tones	2412/CH 1	61	14
	2437/CH 6	61	14
	2462/CH11	61	14

Network Standards	Carrier frequency (MHz)/ Channel	RU Index	Duty cycle	Duty cycle correction Factor (dB)
802.11ax HE20 242-Tones	2412/CH 1	61	0.954	0.21
	2437/CH 6	61	0.954	0.21
	2462/CH11	61	0.954	0.21

Network Standards	Carrier frequency (MHz)/ Channel	RU Index	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11ax HE20 242-Tones	2412/CH 1	61	14.19	14.40	30	PASS
	2437/CH 6	61	14.15	14.36	30	PASS
	2462/CH11	61	14.48	14.69	30	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor						

Power Index				
Bluetooth (Low Energy)				
Channel	1M	2M	S=2	S=8
CH0	16	16	14	14
CH19	16	16	14	14
CH39	16	16	14	14
Thread				
CH11	18			
CH18	18			
CH26	18			

Test Mode	Duty cycle	Duty cycle correction Factor (dB)
Bluetooth LE (1M)	0.621	2.07
Bluetooth LE (2M)	0.431	3.66
Bluetooth LE (S=2)	0.853	0.69
Bluetooth LE (S=8)	0.827	0.83
Thread	0.265	5.77
Note: when Duty cycle≥0.98, Duty cycle correction Factor not required.		

Test Mode	Carrier frequency (MHz)/ Channel	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
Bluetooth (Low Energy) (1M)	2402/CH0	14.20	16.27	30	PASS
	2440/CH19	14.91	16.98	30	PASS
	2480/CH39	14.95	17.02	30	PASS
Bluetooth (Low Energy) (2M)	2402/CH0	12.16	15.82	30	PASS
	2440/CH19	12.15	15.81	30	PASS
	2480/CH39	12.10	15.76	30	PASS
Bluetooth (Low Energy) (S=2)	2402/CH0	13.95	14.64	30	PASS
	2440/CH19	14.07	14.76	30	PASS
	2480/CH39	14.01	14.70	30	PASS
Bluetooth (Low Energy) (S=8)	2402/CH0	13.78	14.61	30	PASS
	2440/CH19	14.03	14.86	30	PASS
	2480/CH39	13.83	14.66	30	PASS
Thread	2405/CH11	12.34	18.10	30	PASS
	2440/CH18	12.25	18.02	30	PASS
	2480/CH26	-5.56	0.21	30	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

5.2. 99% Bandwidth and 6dB Bandwidth

Ambient Condition

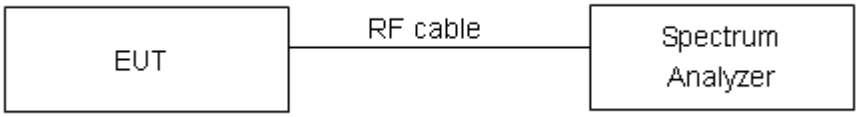
Temperature	Relative humidity
15°C ~ 35°C	20% ~ 80%

Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. RBW is set to 100 kHz; VBW is set to 300 kHz on spectrum analyzer.
Dector=Peak, Trace mode=max hold.

The EUT was connected to the spectrum analyzer through a known loss cable. The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value.

Test Setup



Limits

Rule Part 15.247 (a) (2) specifies that “Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.”

minimum 6 dB bandwidth	≥ 500 kHz

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 936 Hz.

Test Results:

Test Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11b	2412	13.456	10.041	500	PASS
	2437	13.461	10.062	500	PASS
	2462	13.450	10.060	500	PASS
802.11g	2412	16.803	16.340	500	PASS
	2437	16.812	16.355	500	PASS
	2462	16.858	16.338	500	PASS
802.11n HT20	2412	17.665	17.254	500	PASS
	2437	17.677	17.534	500	PASS
	2462	17.678	17.564	500	PASS
802.11n HT40	2422	36.204	35.321	500	PASS
	2437	36.163	35.652	500	PASS
	2452	36.188	35.205	500	PASS
802.11ax HE20	2412	18.806	18.033	500	PASS
	2437	18.779	18.099	500	PASS
	2462	18.793	18.298	500	PASS
802.11ax HE40	2422	37.587	35.994	500	PASS
	2437	37.588	36.724	500	PASS
	2452	37.546	36.353	500	PASS

TB Mode

Network Standards	Carrier frequency (MHz)/ Channel	RU Index	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11ax HE20 26-Tones	2412/CH 1	0	17.328	1.965	500	PASS
	2437/CH 6	4	15.455	2.619	500	PASS
	2462/CH11	8	17.688	1.954	500	PASS
802.11ax HE20 52-Tones	2412/CH 1	37	17.926	15.682	500	PASS
	2437/CH 6	38	16.478	12.869	500	PASS
	2462/CH11	40	17.720	15.651	500	PASS
802.11ax HE20 106-Tones	2412/CH 1	53	17.950	17.003	500	PASS
	2437/CH 6	53	18.016	16.898	500	PASS
	2462/CH11	54	17.037	17.012	500	PASS
802.11ax HE20 242-Tones	2412/CH 1	61	18.820	18.397	500	PASS
	2462/CH11	61	18.827	18.396	500	PASS
802.11ax HE40 26-Tones	2422/CH3	0	20.842	2.025	500	PASS
	2452/CH9	17	19.829	1.968	500	PASS
802.11ax HE40 484-Tones	2422/CH3	65	37.635	36.784	500	PASS
	2452/CH9	65	37.597	36.593	500	PASS

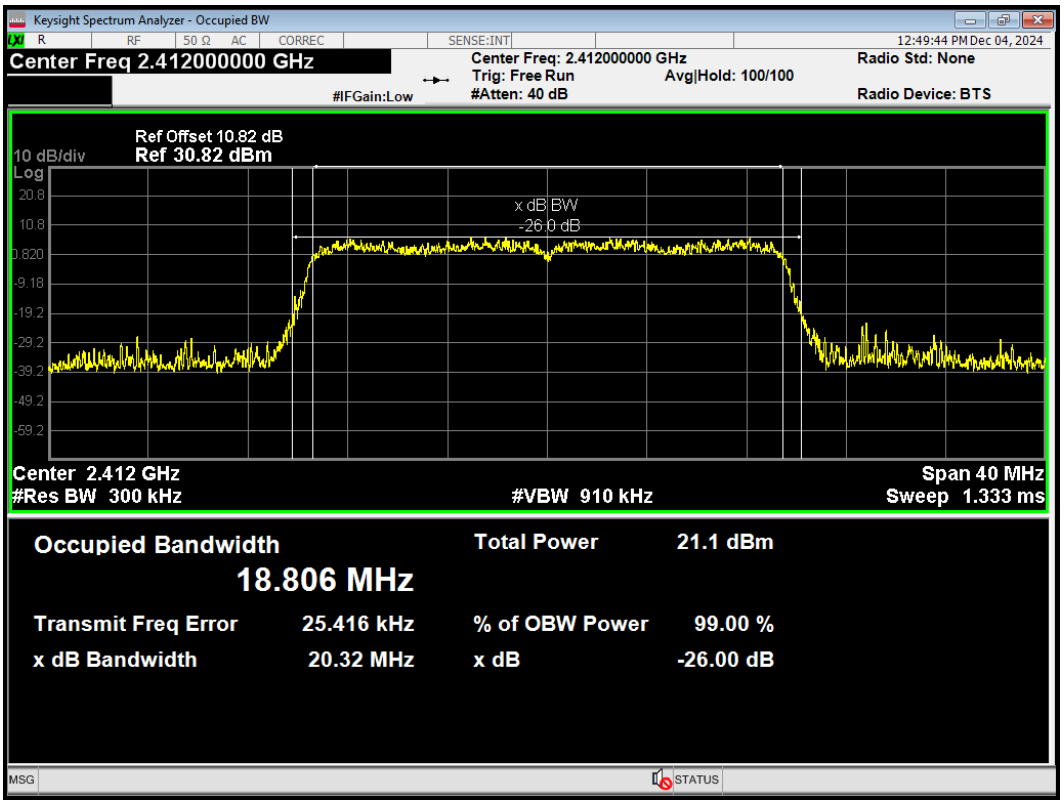
ERSU Mode

Network Standards	Carrier frequency (MHz)/ Channel	RU Index	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11ax HE20 242-Tones	2412/CH 1	61	18.826	18.090	500	PASS
	2437/CH 6	61	18.820	18.117	500	PASS
	2462/CH11	61	18.775	17.922	500	PASS

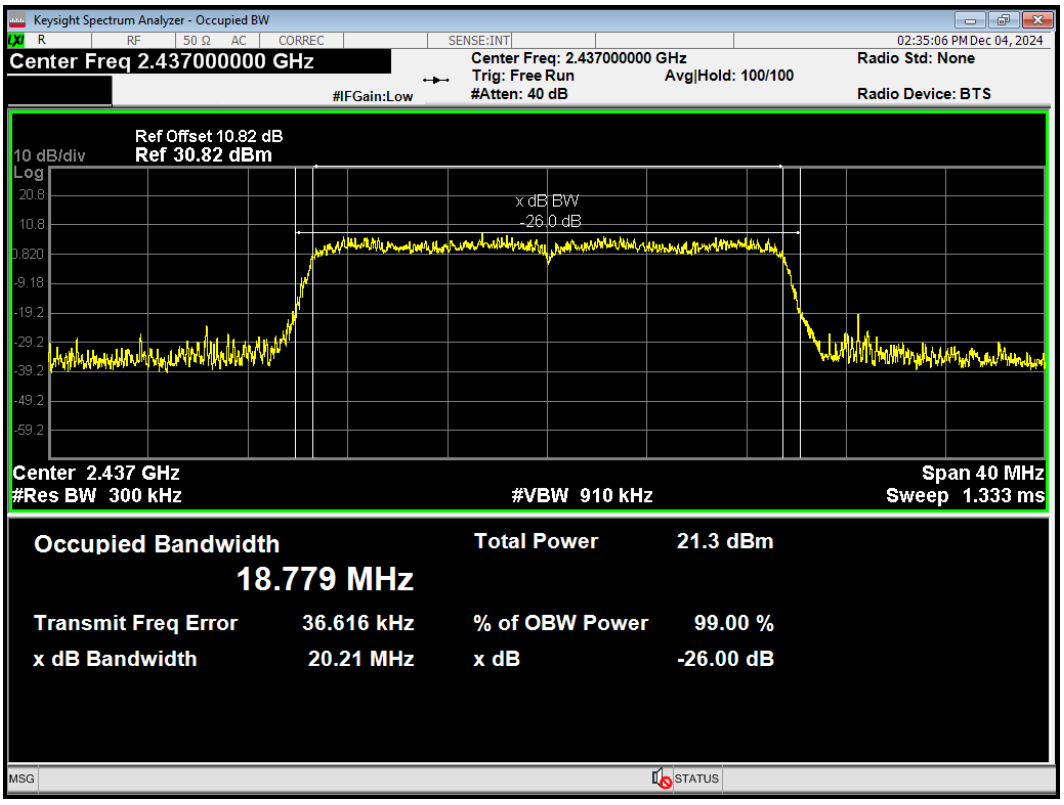
Test Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
Bluetooth (Low Energy) (1M)	2402	1.034	0.733	500	PASS
	2440	1.034	0.726	500	PASS
	2480	1.034	0.718	500	PASS
Bluetooth (Low Energy) (2M)	2402	2.038	1.179	500	PASS
	2440	2.036	1.195	500	PASS
	2480	2.043	1.308	500	PASS
Bluetooth (Low Energy) (S=2)	2402	1.028	0.682	500	PASS
	2440	1.024	0.684	500	PASS
	2480	1.026	0.735	500	PASS
Bluetooth (Low Energy) (S=8)	2402	1.058	0.667	500	PASS
	2440	1.062	0.671	500	PASS
	2480	1.060	0.662	500	PASS
Thread	2405	2.241	1.029	500	PASS
	2440	2.225	1.567	500	PASS
	2480	2.204	1.581	500	PASS

99%bandwidth

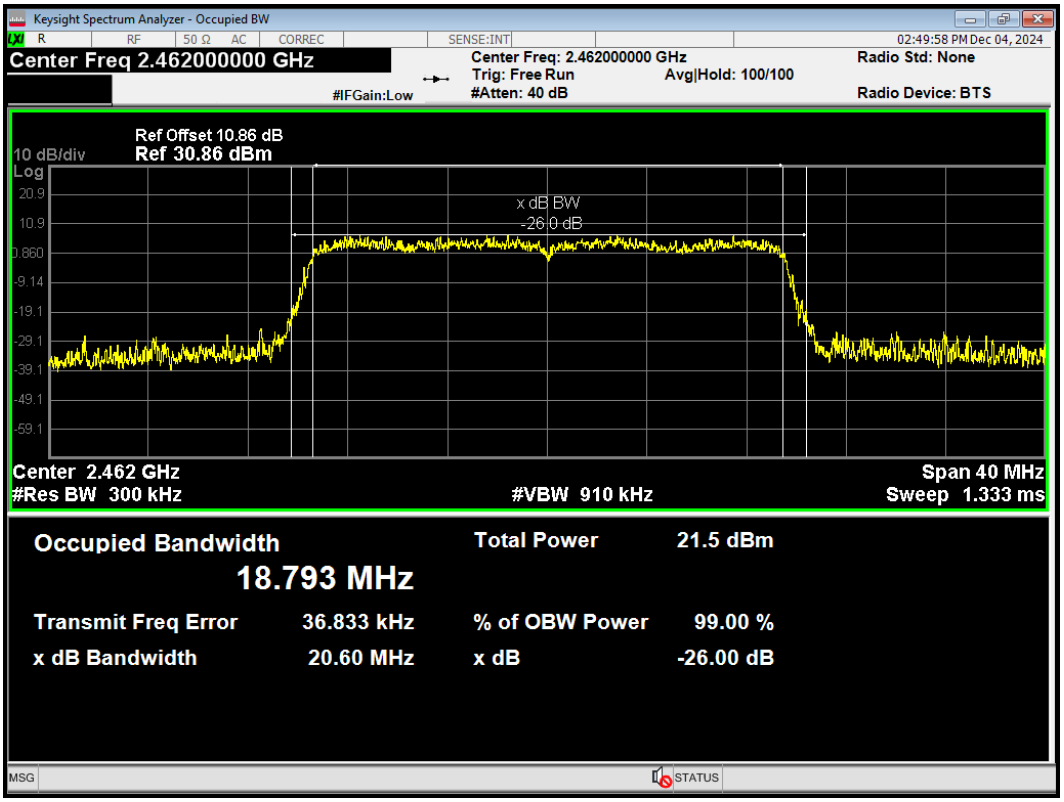
OBW 802.11ax(HE20) 2412MHz



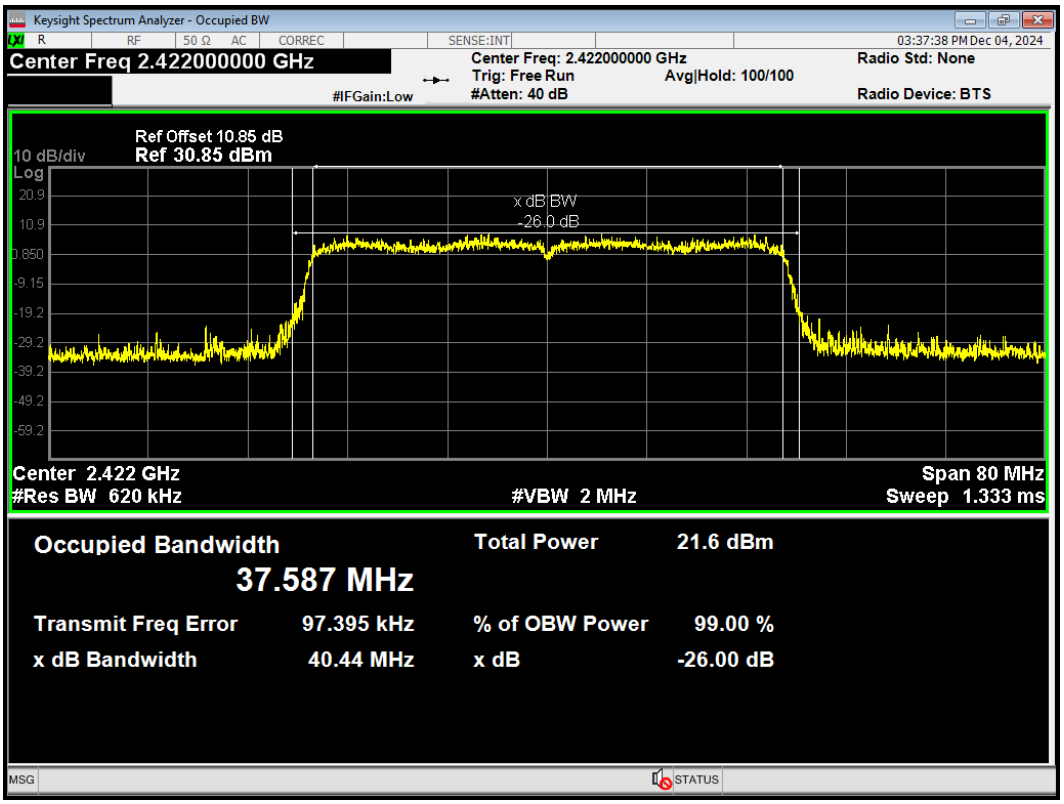
OBW 802.11ax(HE20) 2437MHz



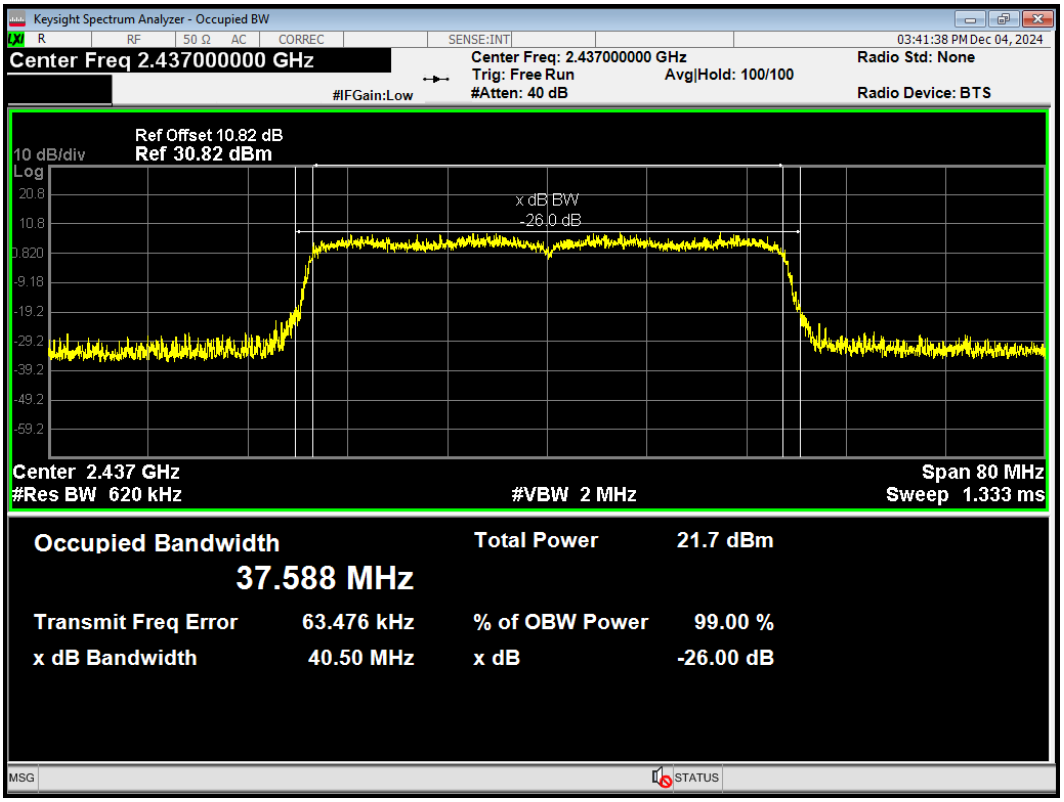
OBW 802.11ax(HE20) 2462MHz



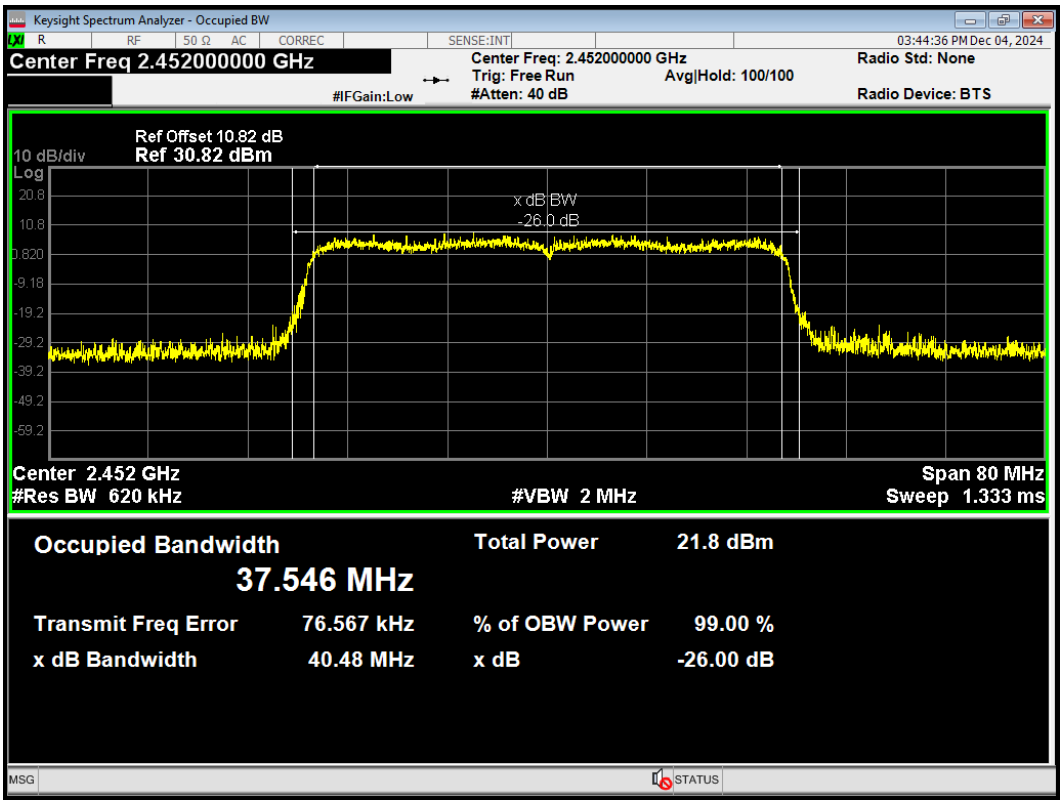
OBW 802.11ax(HE40) 2422MHz



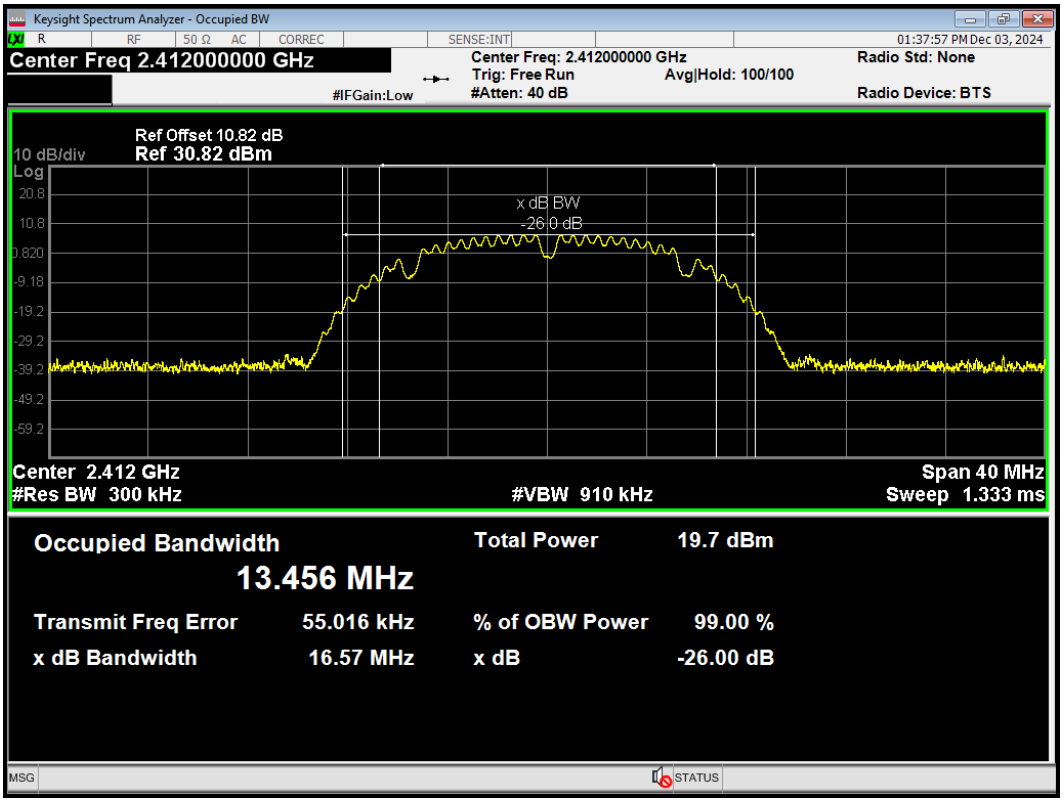
OBW 802.11ax(HE40) 2437MHz



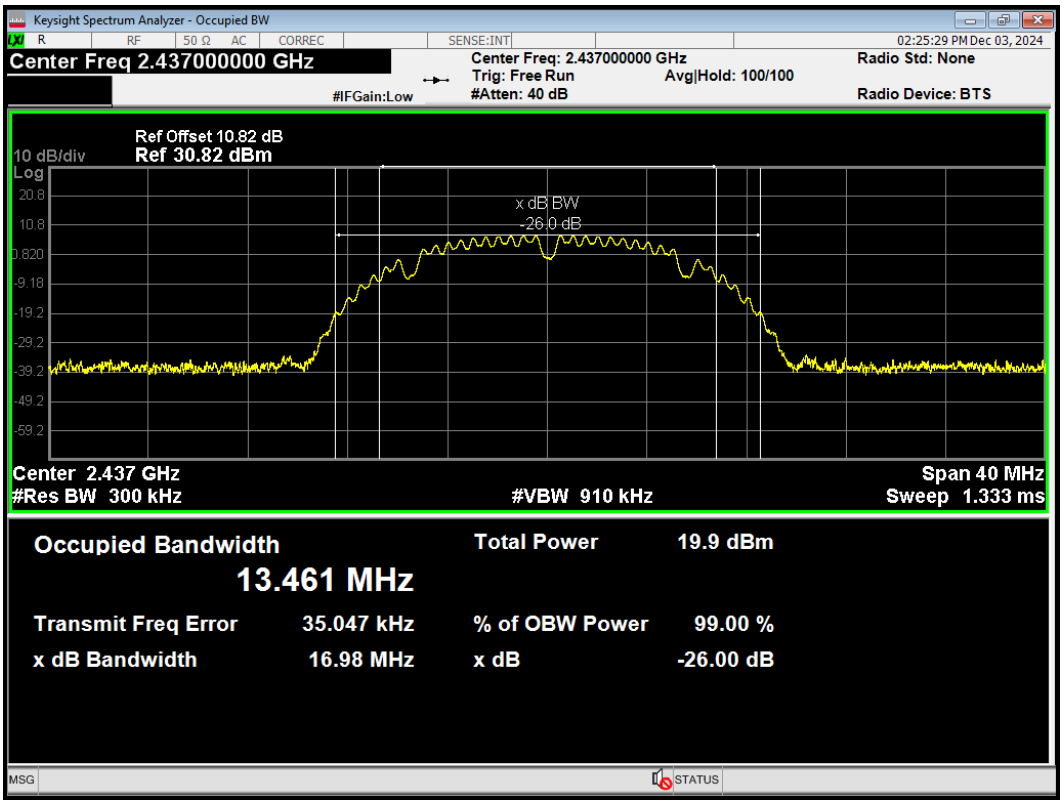
OBW 802.11ax(HE40) 2452MHz



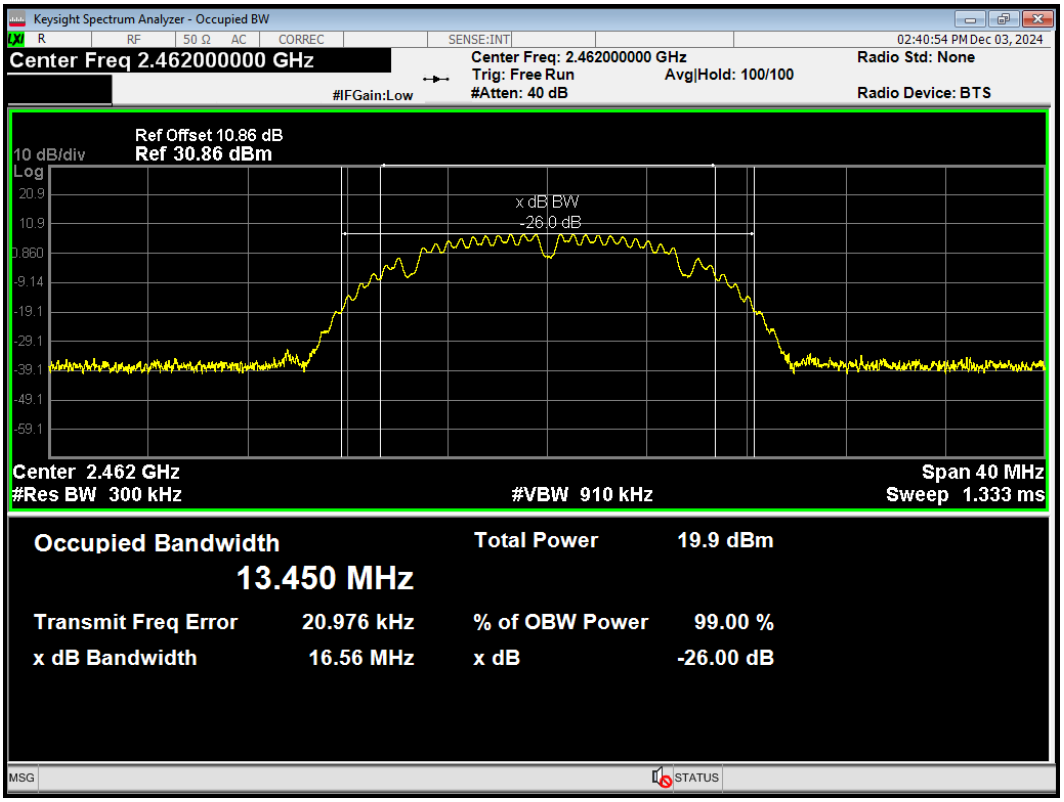
OBW 802.11b 2412MHz



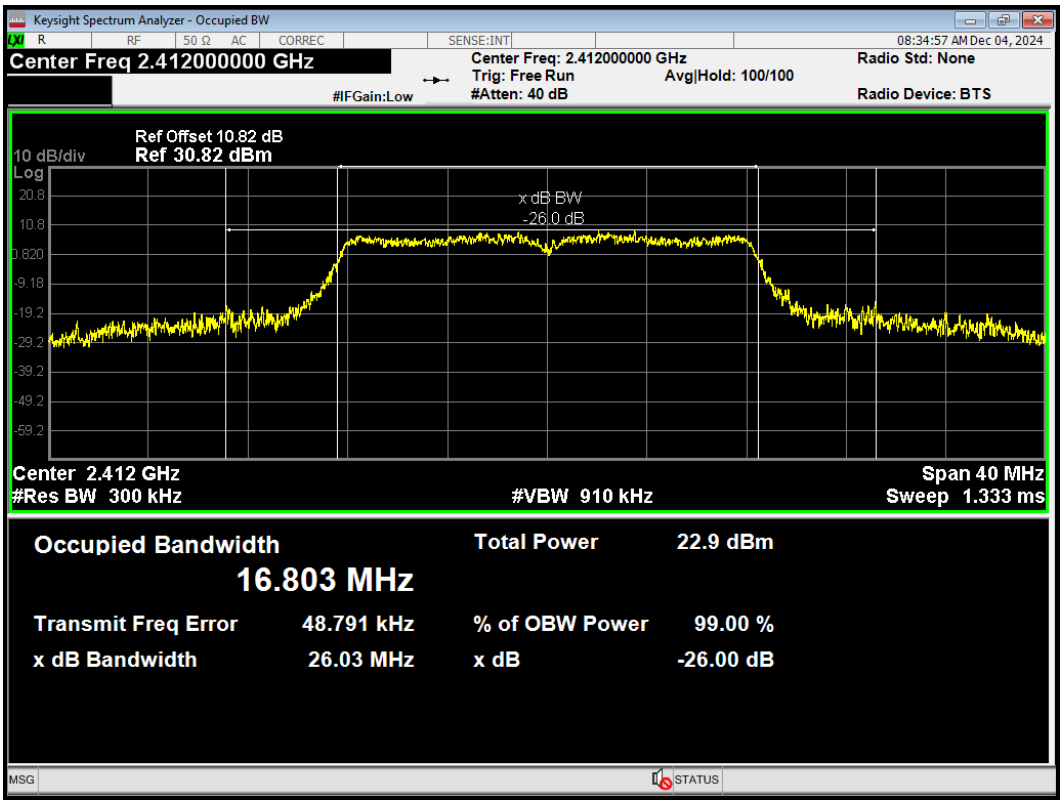
OBW 802.11b 2437MHz



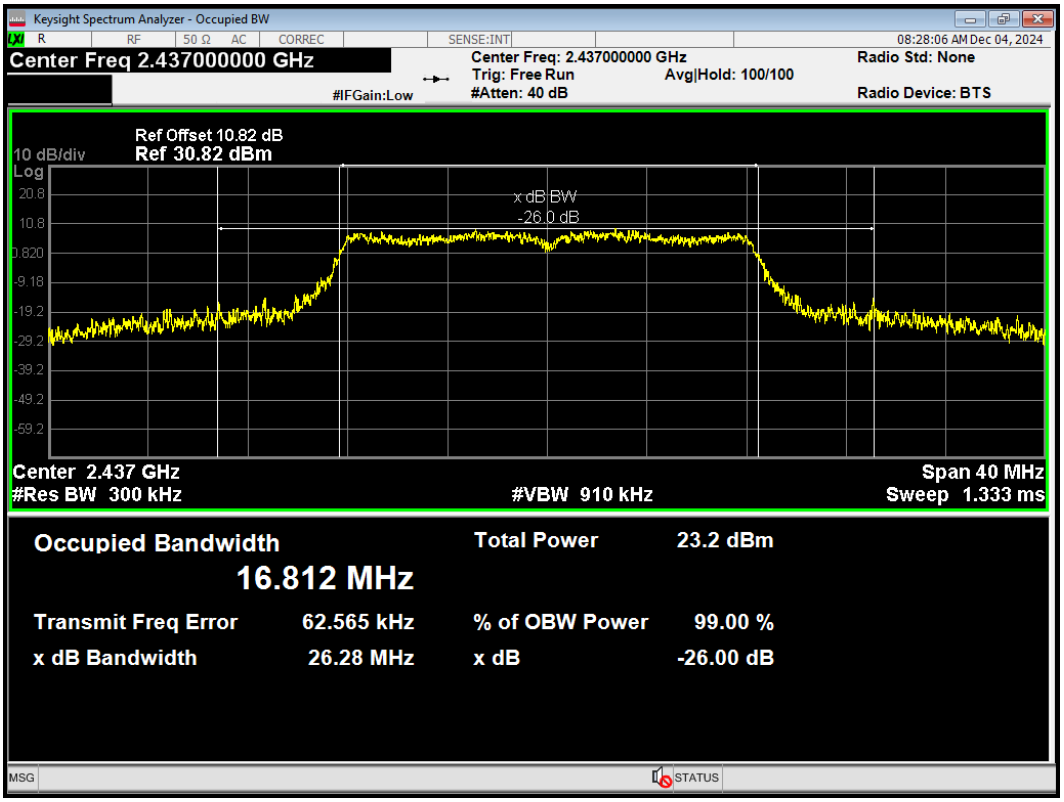
OBW 802.11b 2462MHz



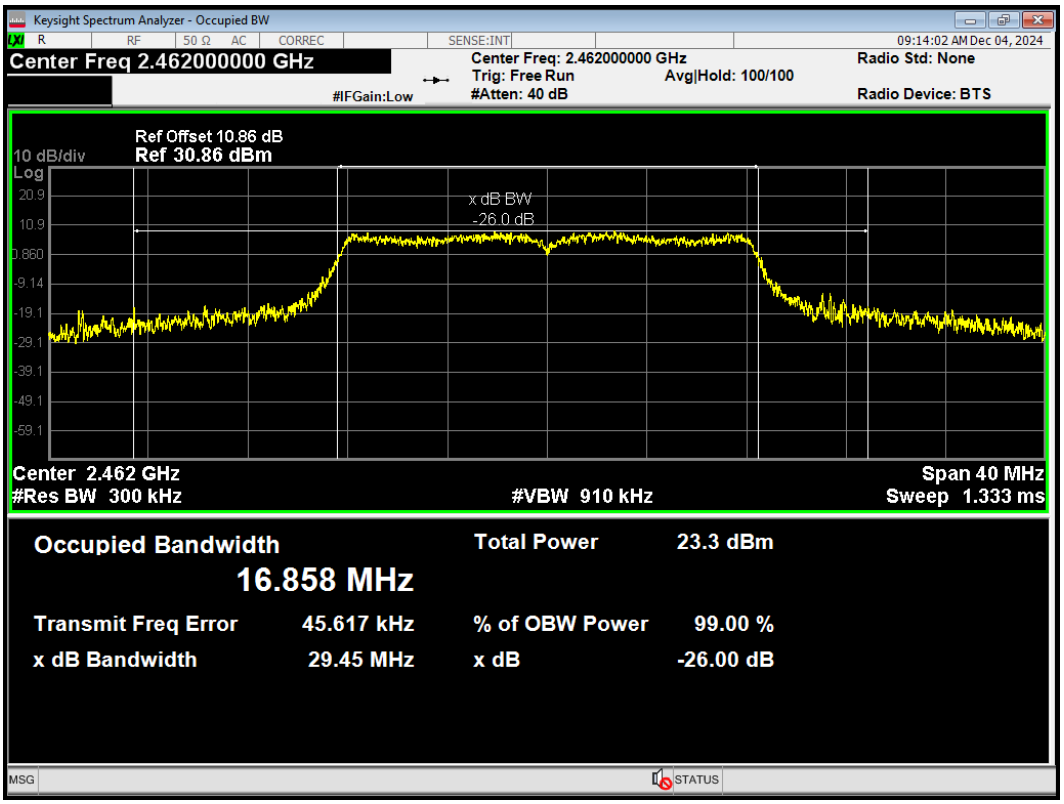
OBW 802.11g 2412MHz



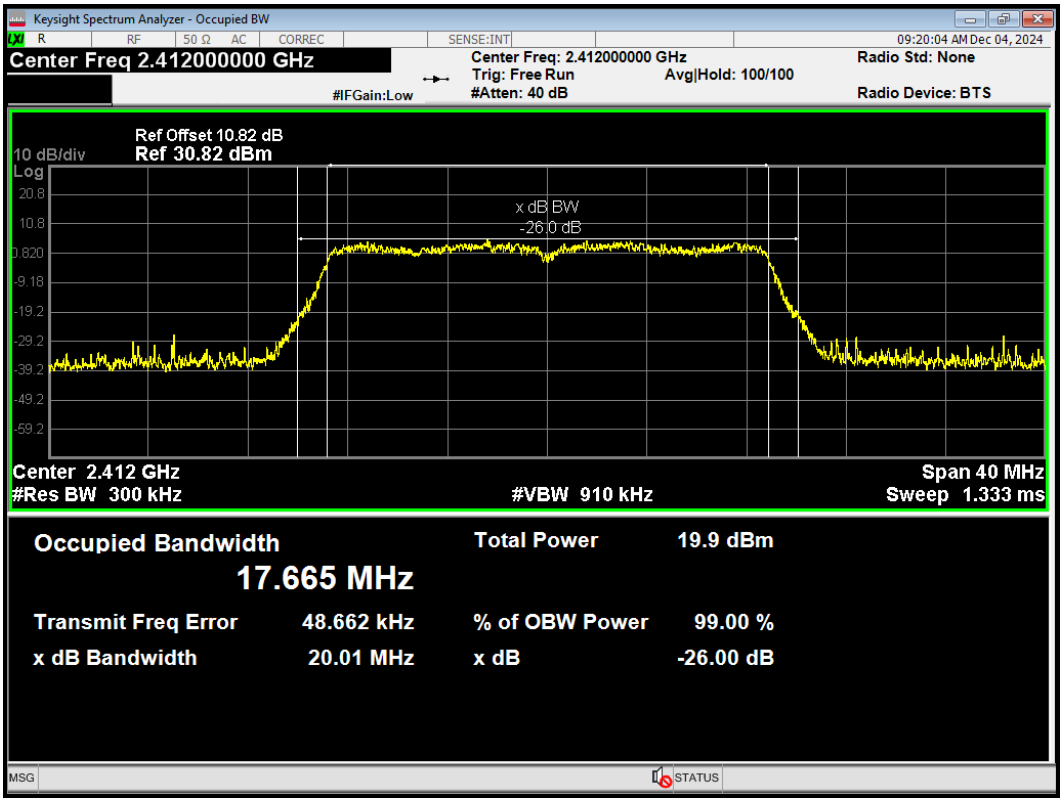
OBW 802.11g 2437MHz



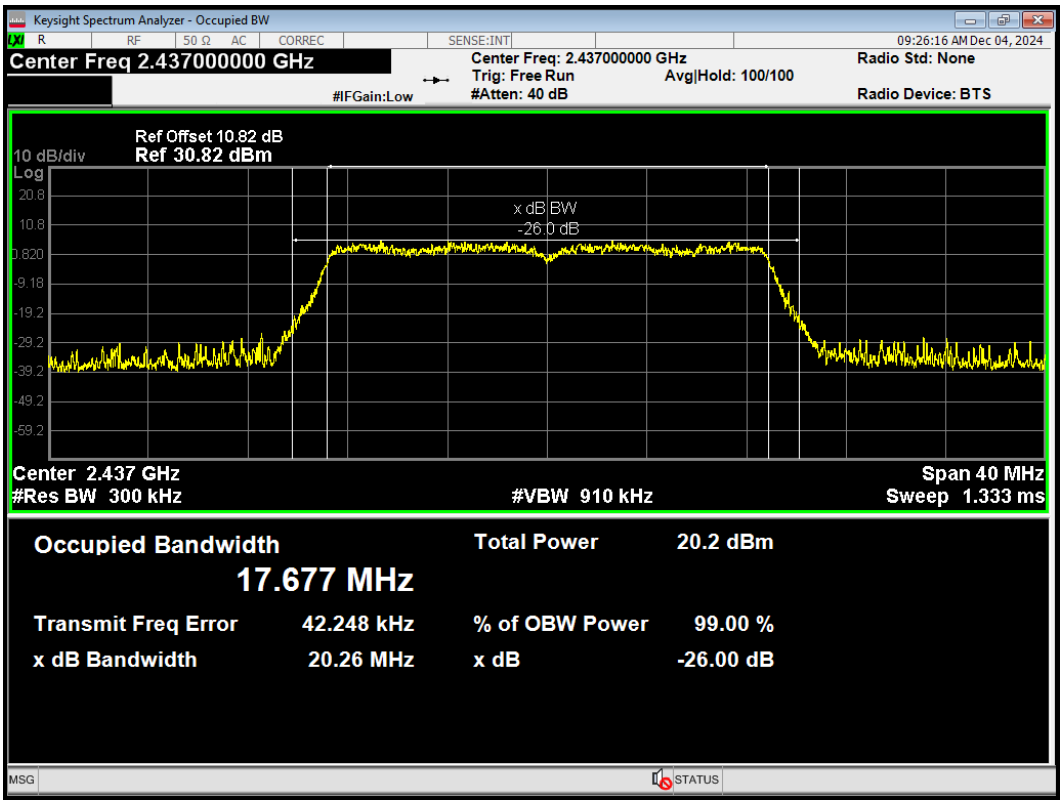
OBW 802.11g 2462MHz



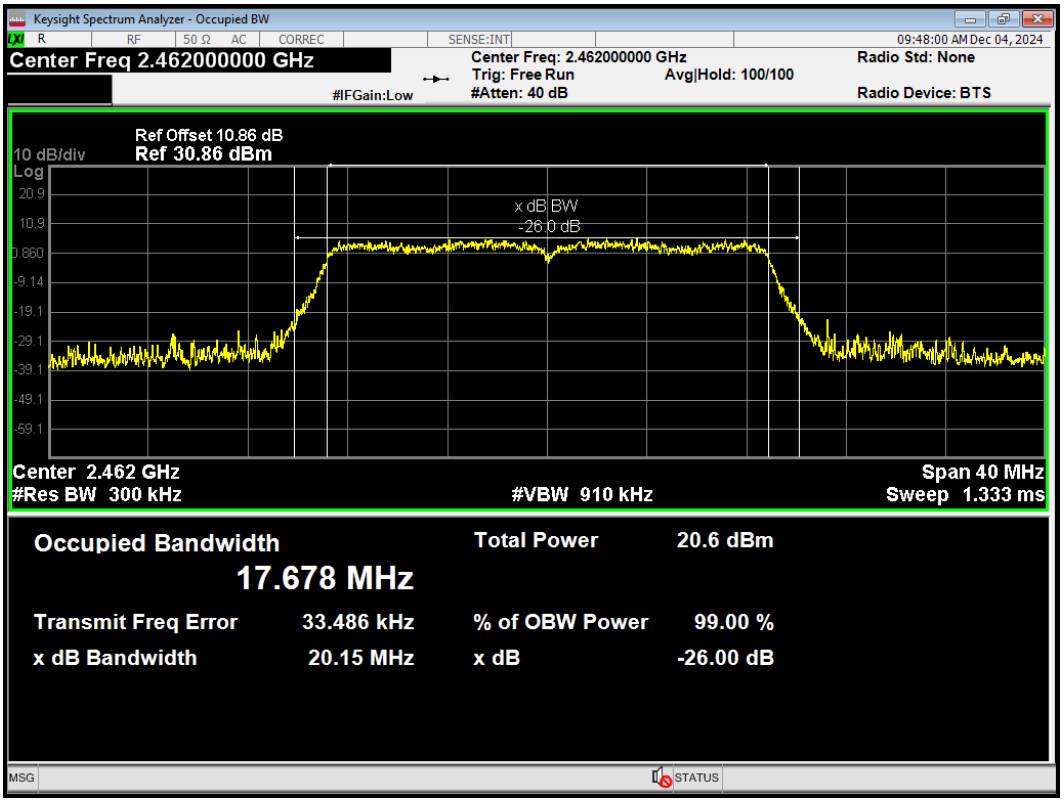
OBW 802.11n(HT20) 2412MHz



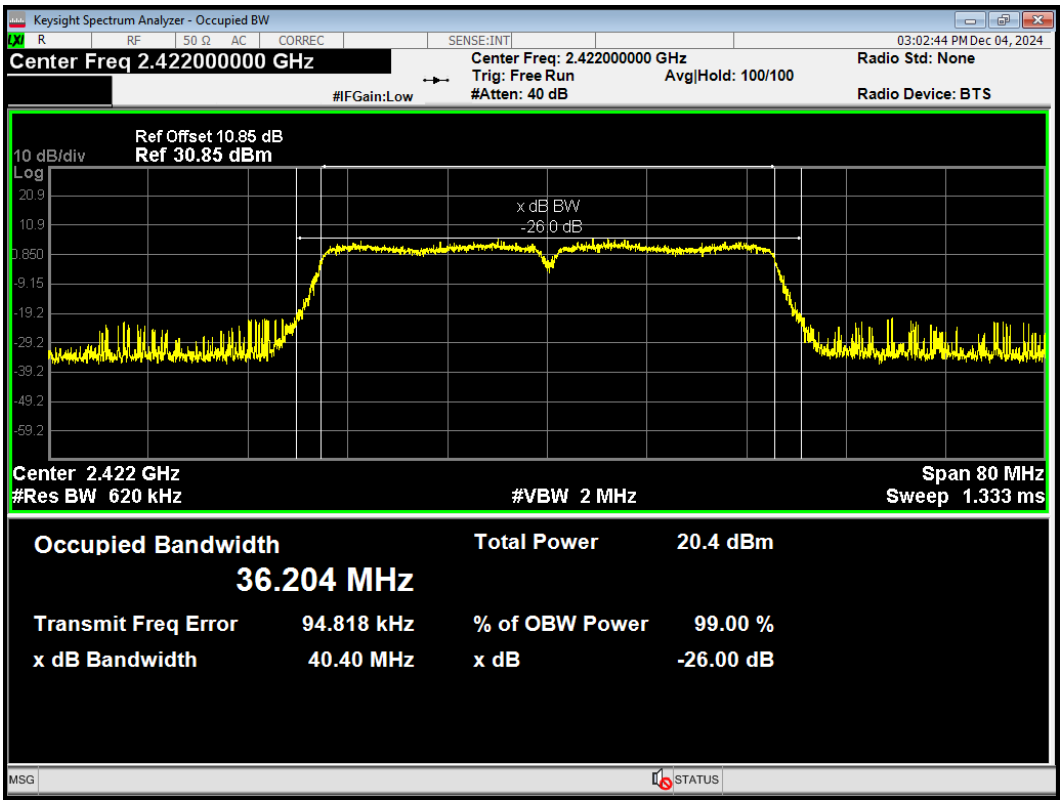
OBW 802.11n(HT20) 2437MHz



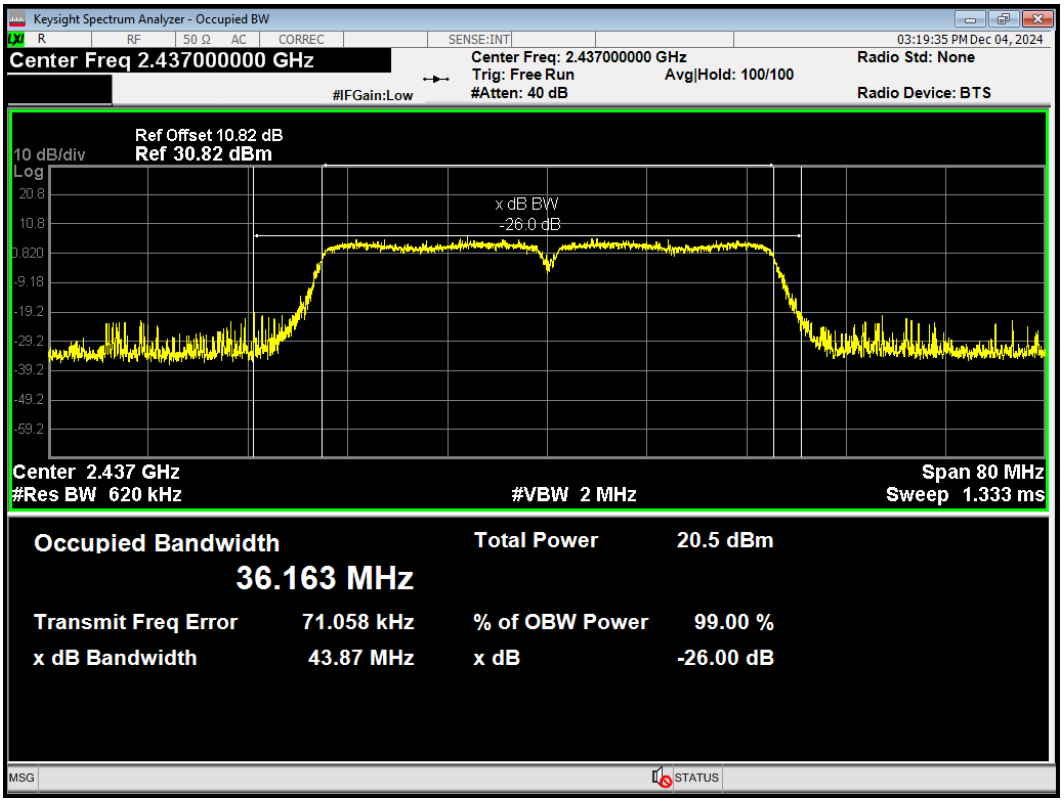
OBW 802.11n(HT20) 2462MHz



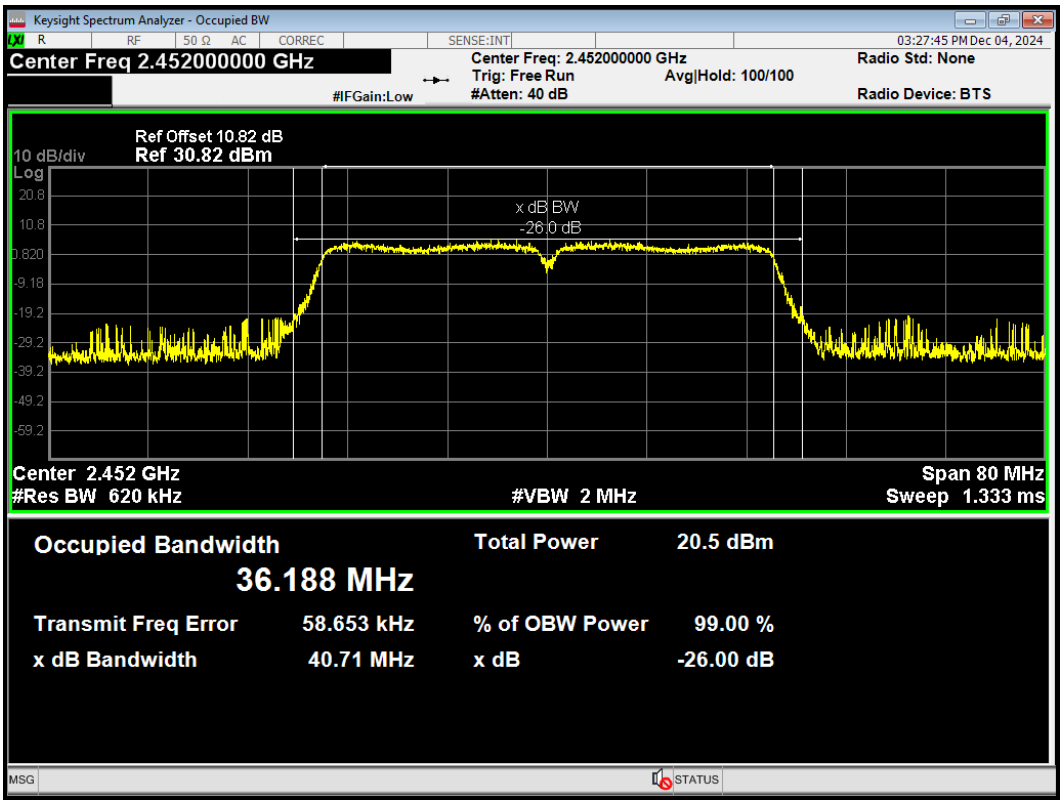
OBW 802.11n(HT40) 2422MHz



OBW 802.11n(HT40) 2437MHz

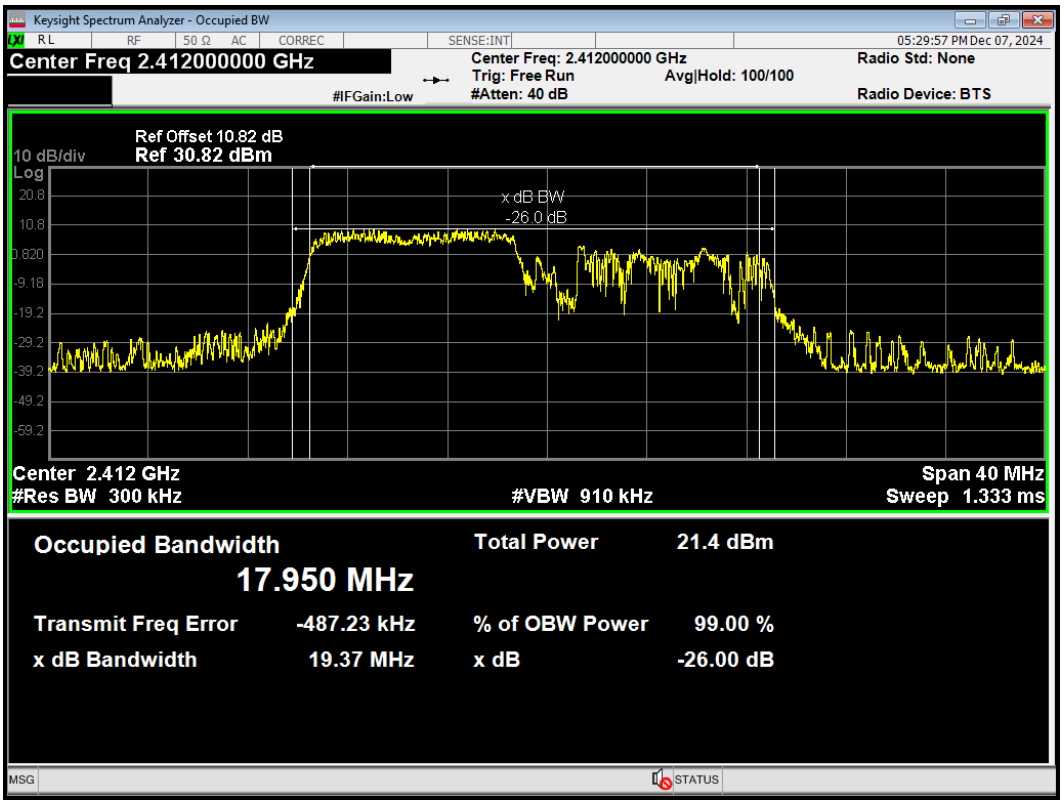


OBW 802.11n(HT40) 2452MHz

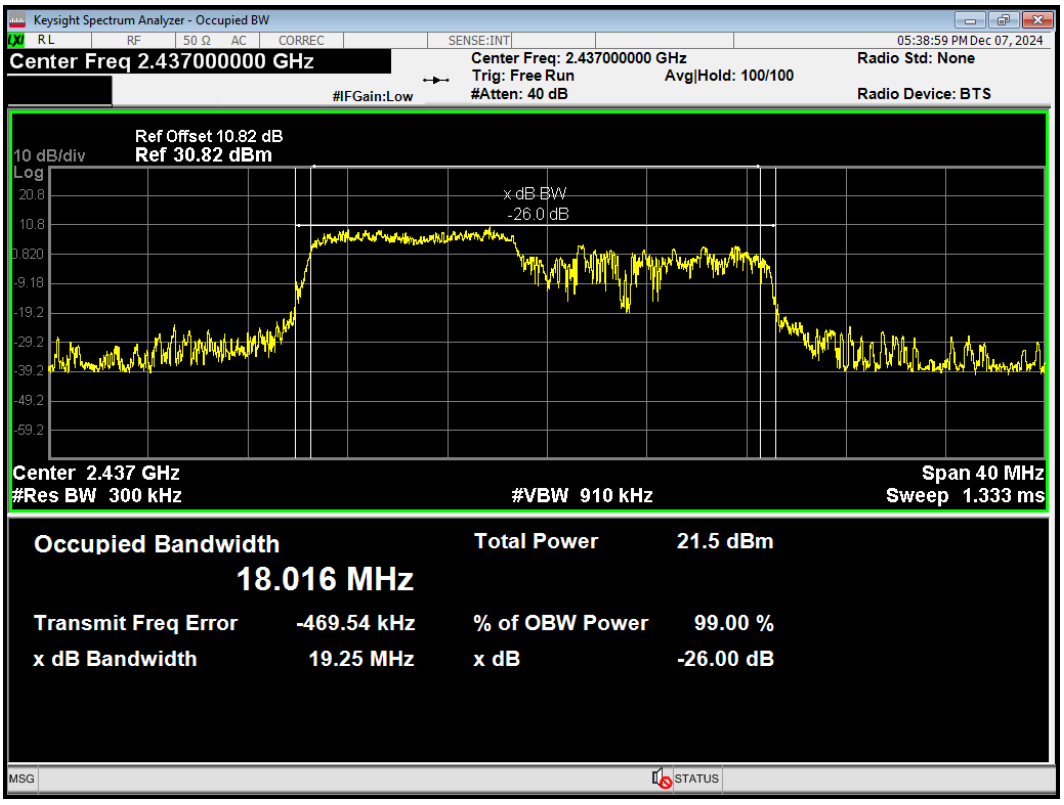


TB Mode

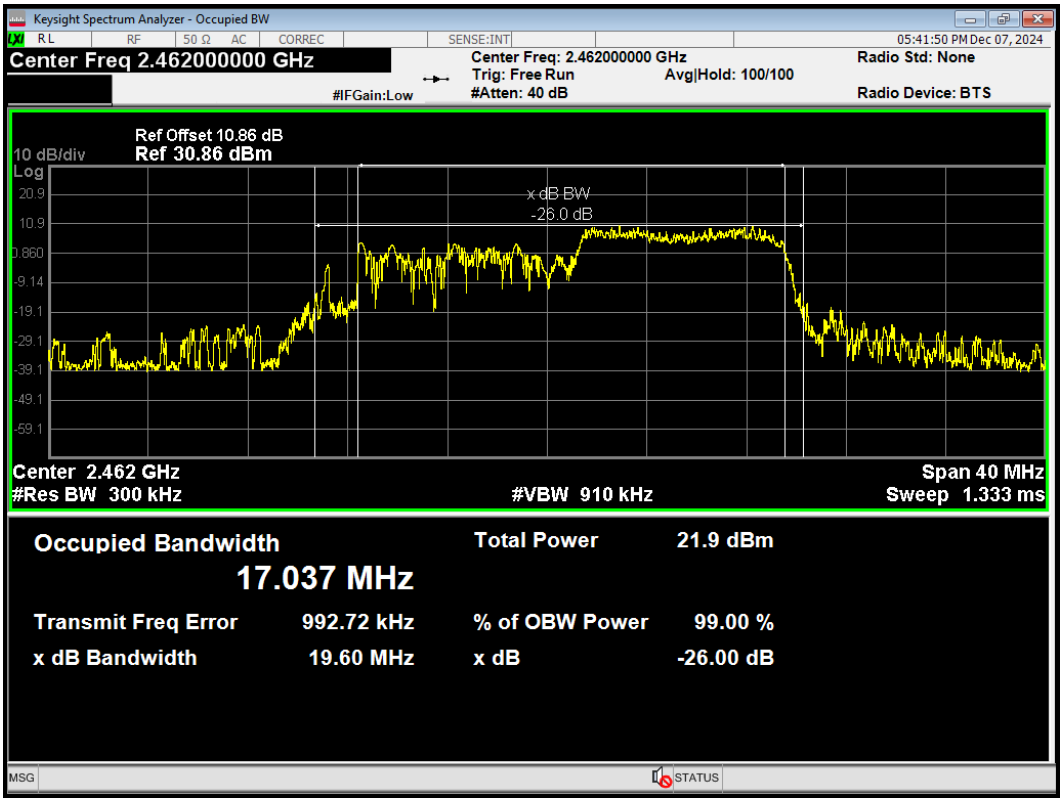
OBW 802.11ax(HE20) 106T 2412MHz



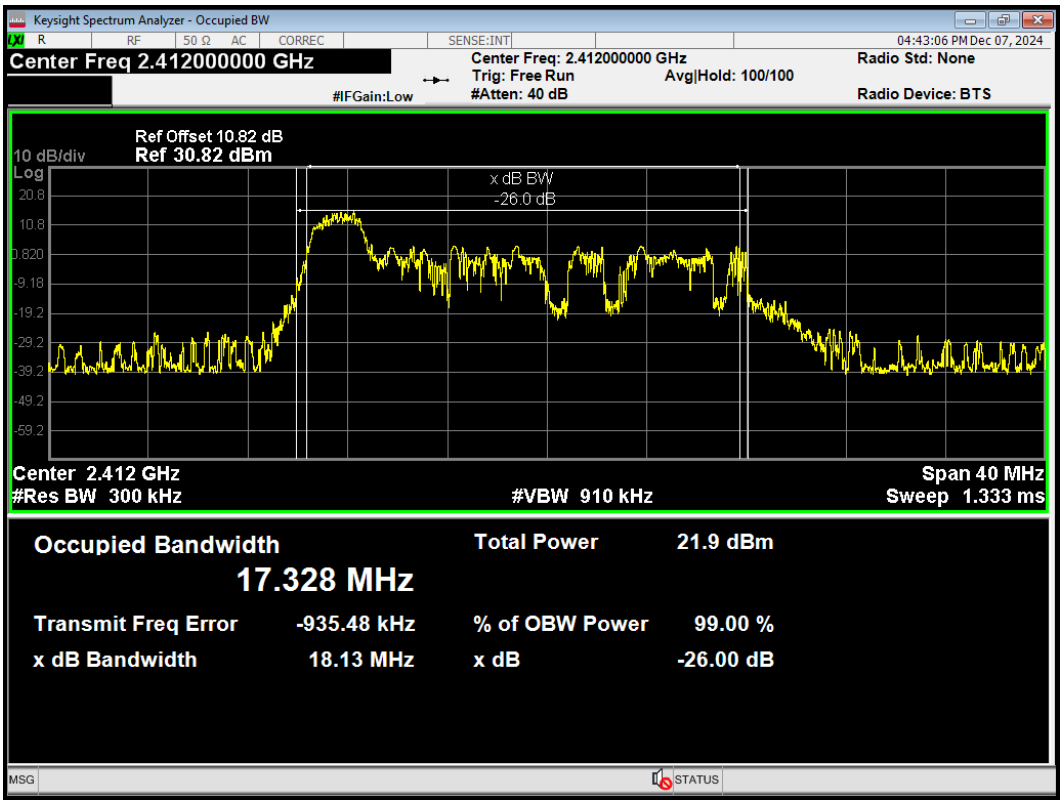
OBW 802.11ax(HE20) 106T 2437MHz



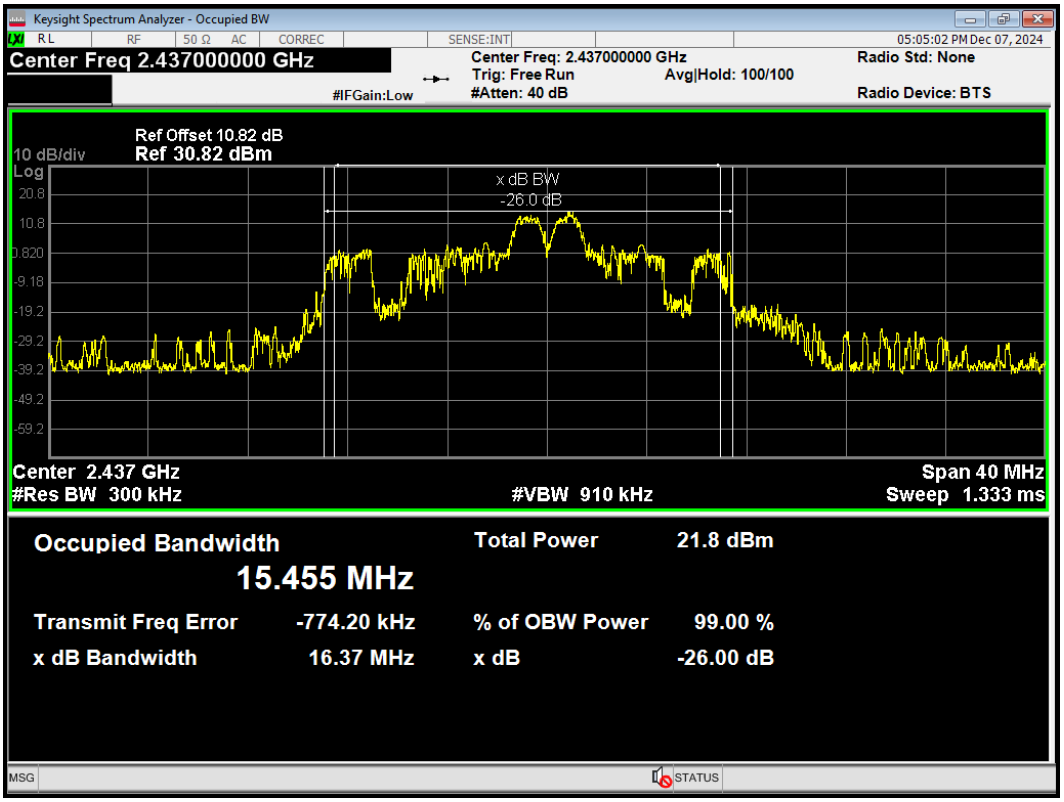
OBW 802.11ax(HE20) 106T 2462MHz



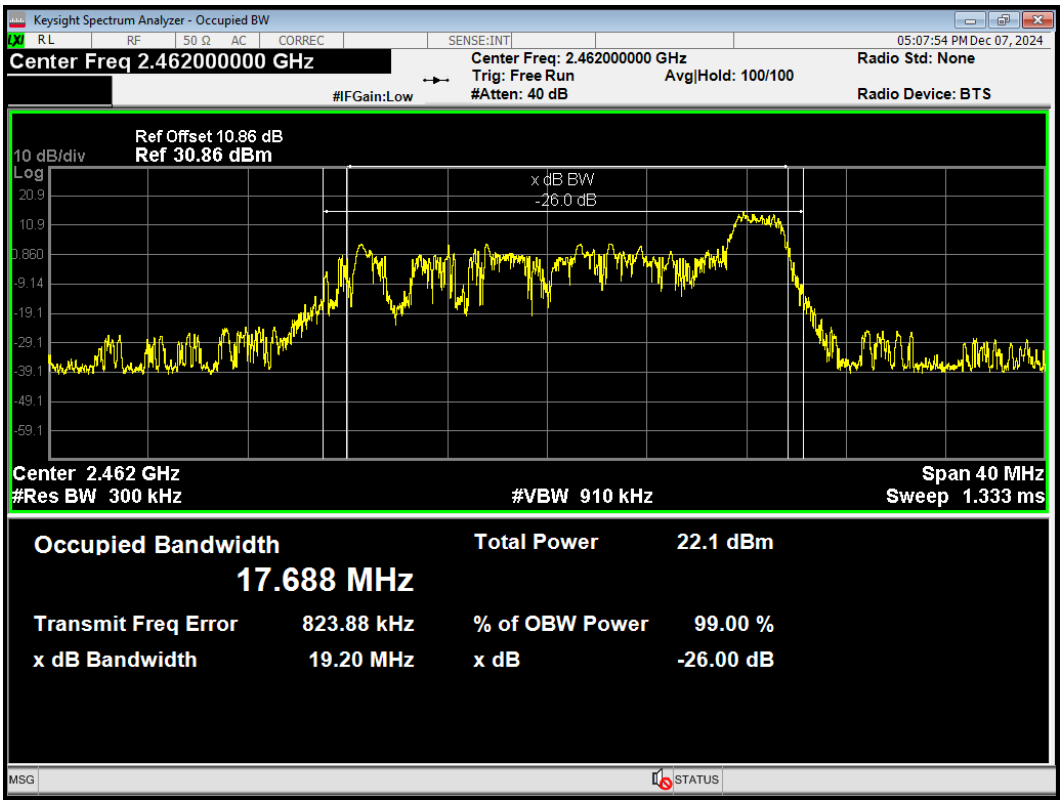
OBW 802.11ax(HE20) 26T 2412MHz



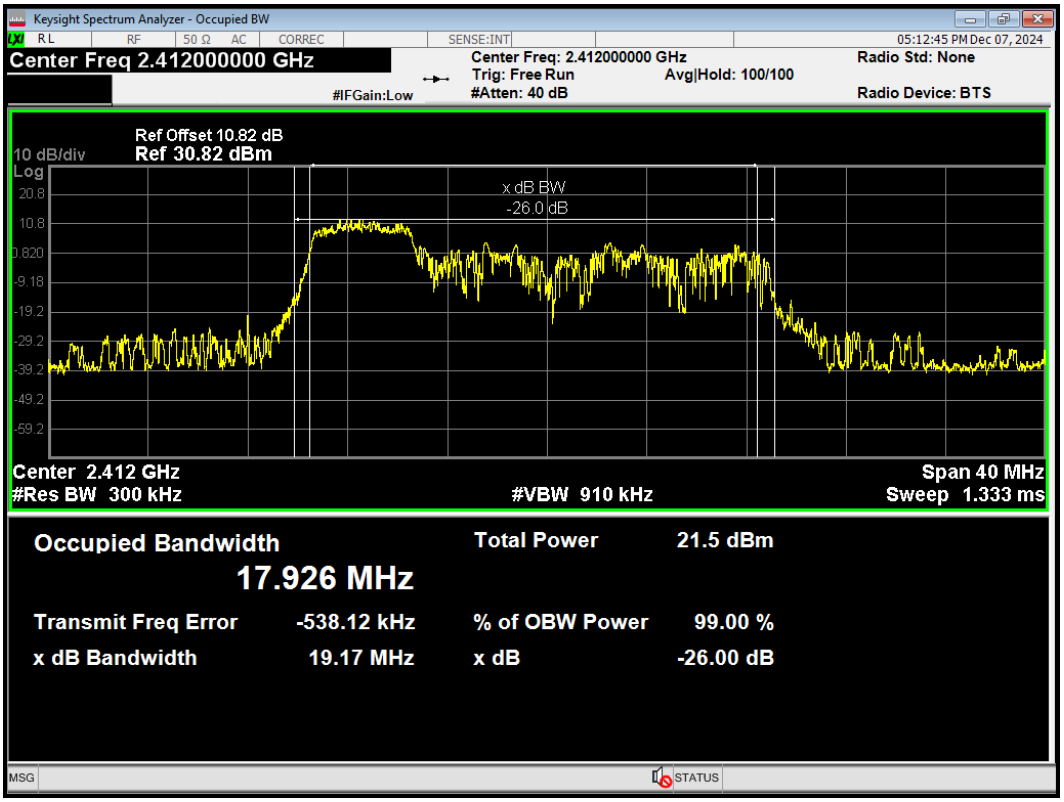
OBW 802.11ax(HE20) 26T 2437MHz



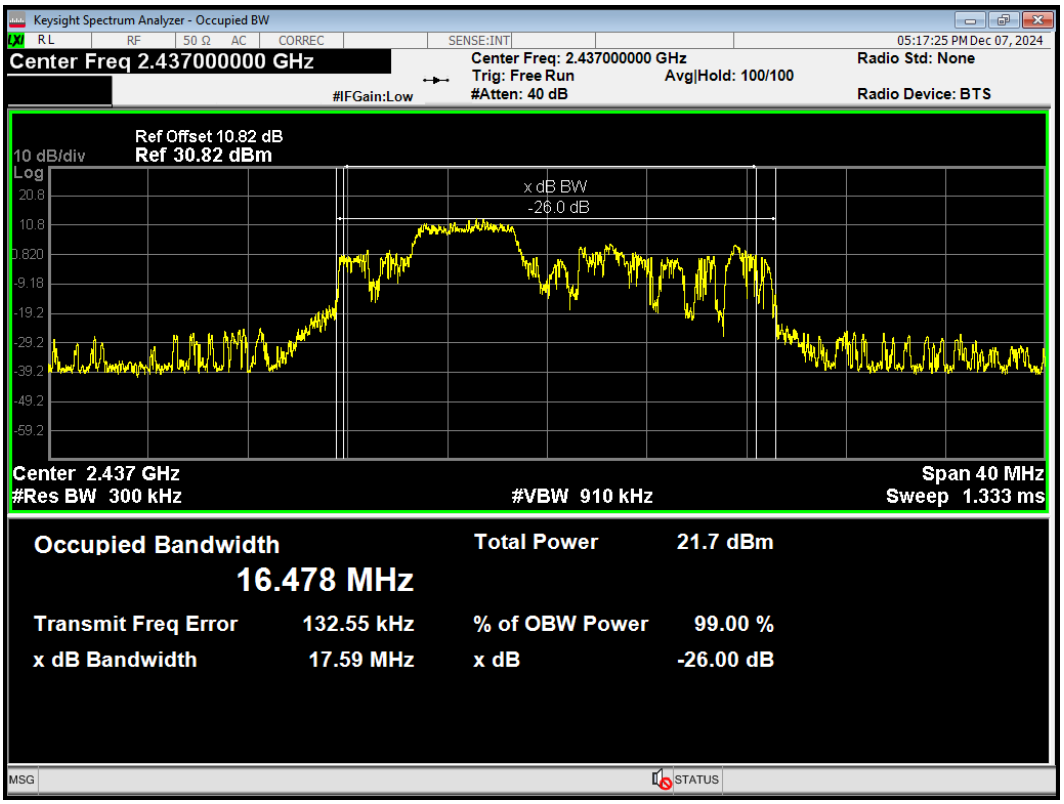
OBW 802.11ax(HE20) 26T 2462MHz



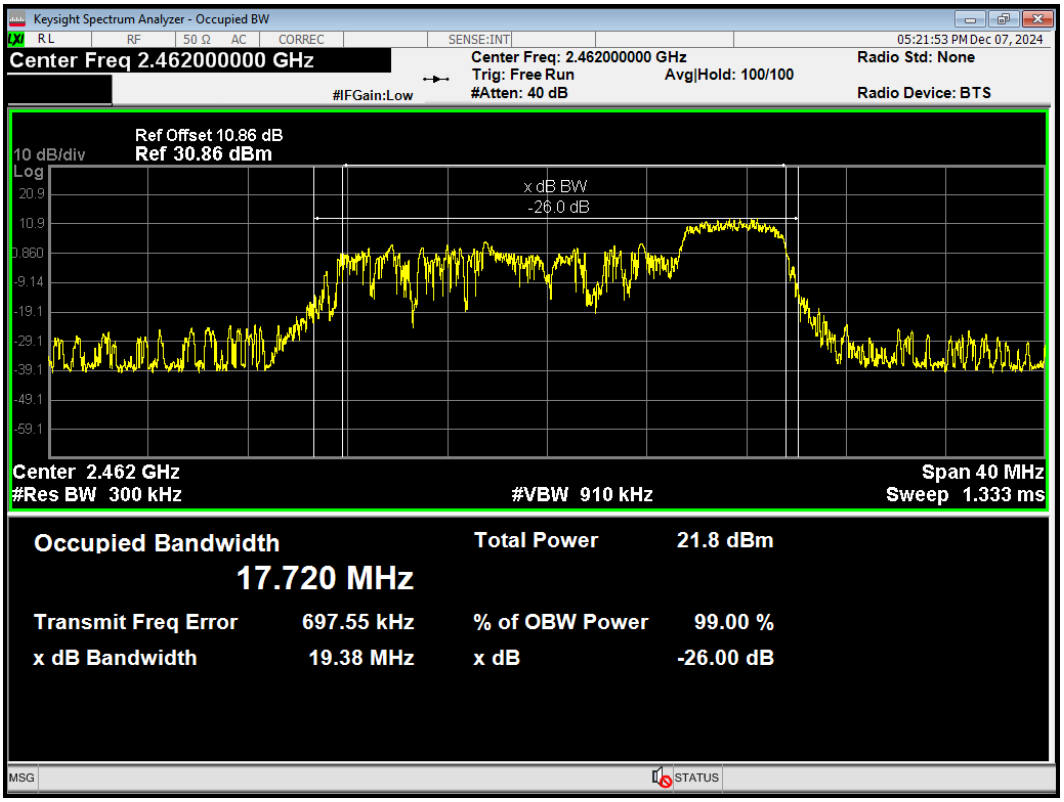
OBW 802.11ax(HE20) 52T 2412MHz



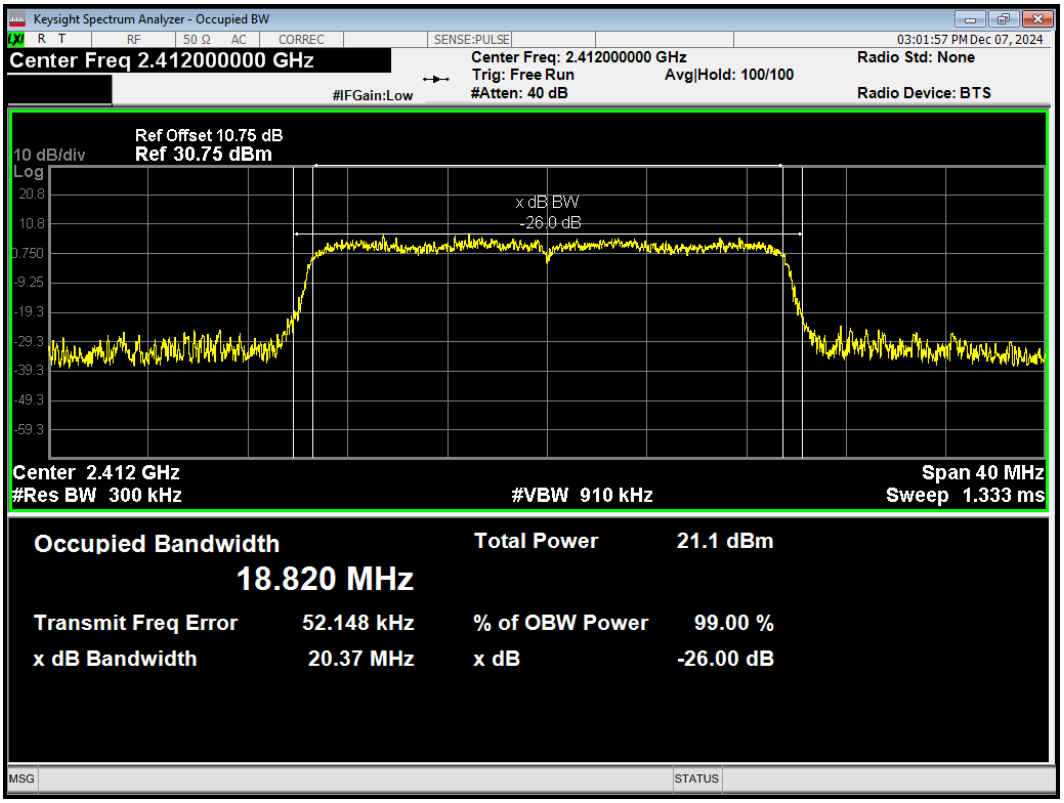
OBW 802.11ax(HE20) 52T 2437MHz



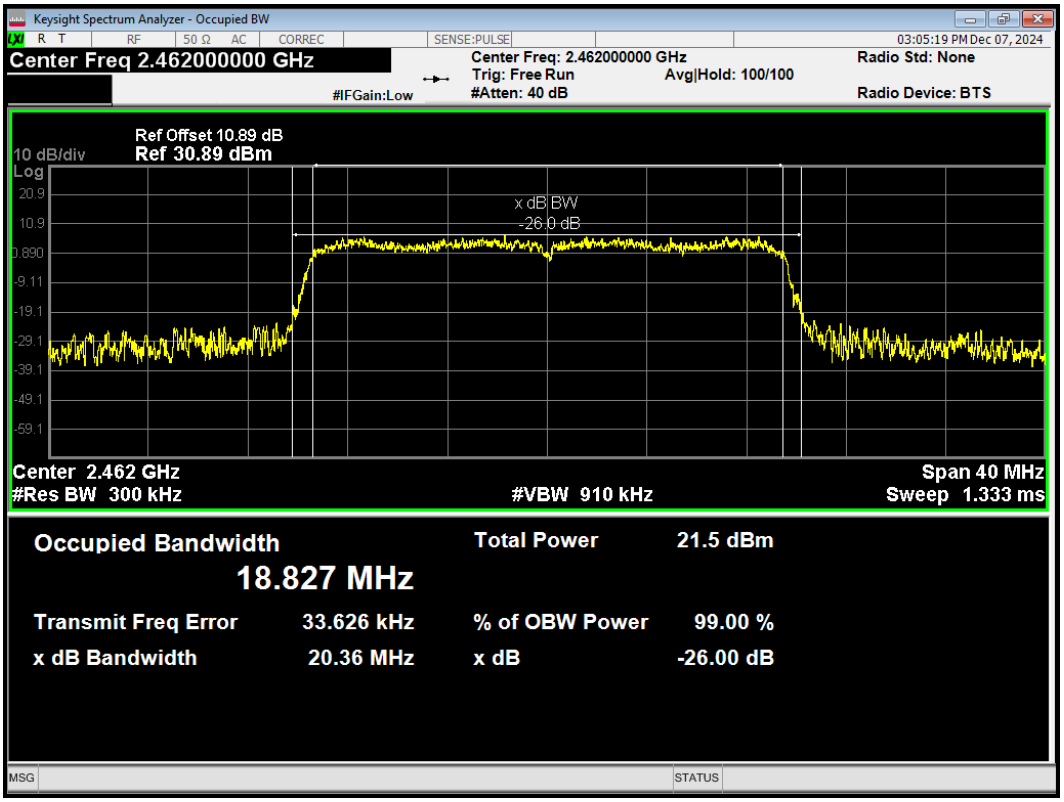
OBW 802.11ax(HE20) 52T 2462MHz



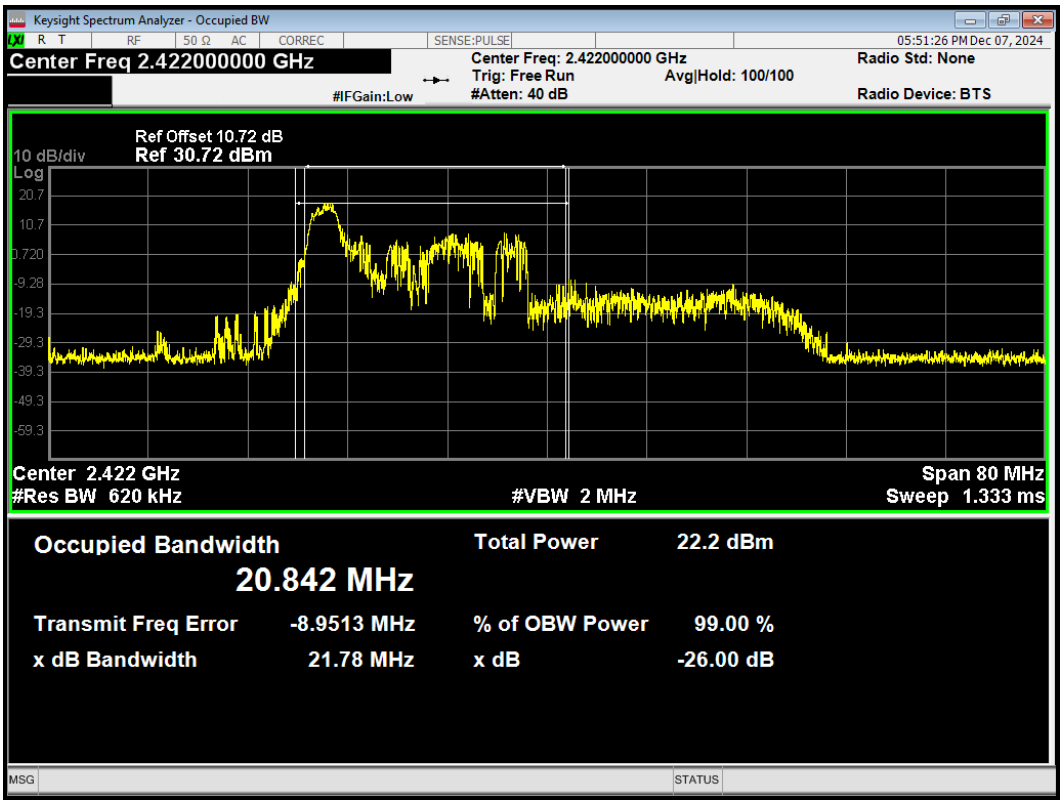
OBW 802.11ax(HE20) 242T 2412MHz



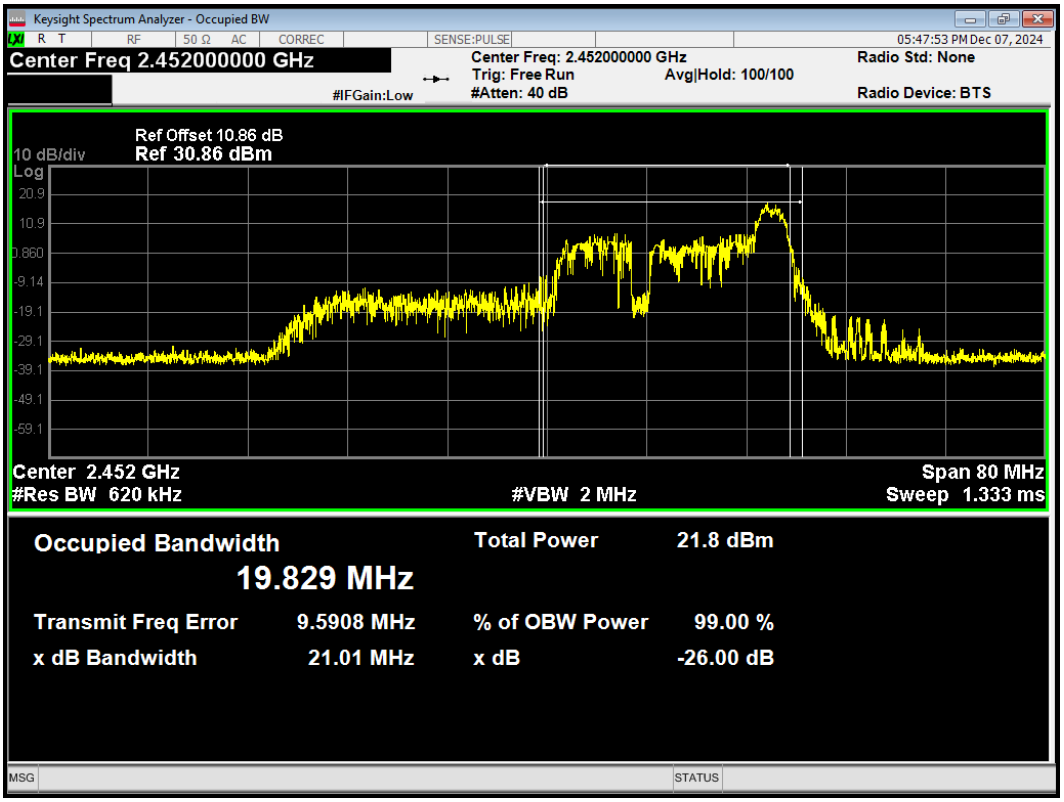
OBW 802.11ax(HE20) 242T 2462MHz



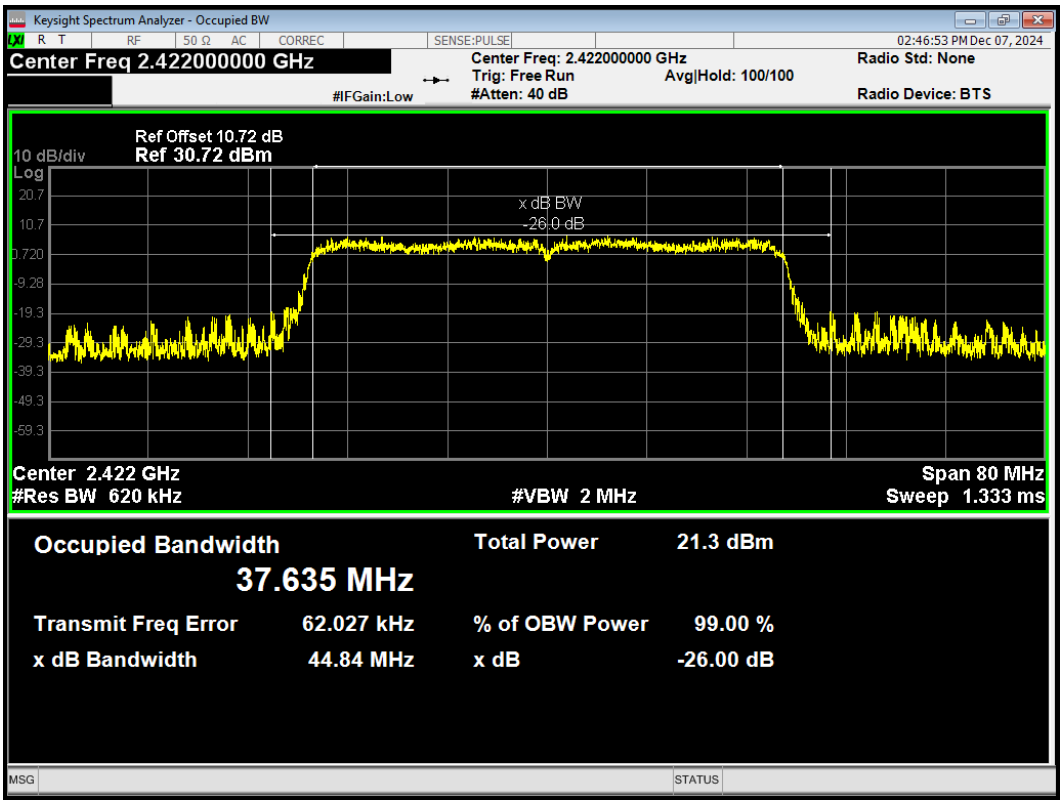
OBW 802.11ax(HE40) 26T 2422MHz



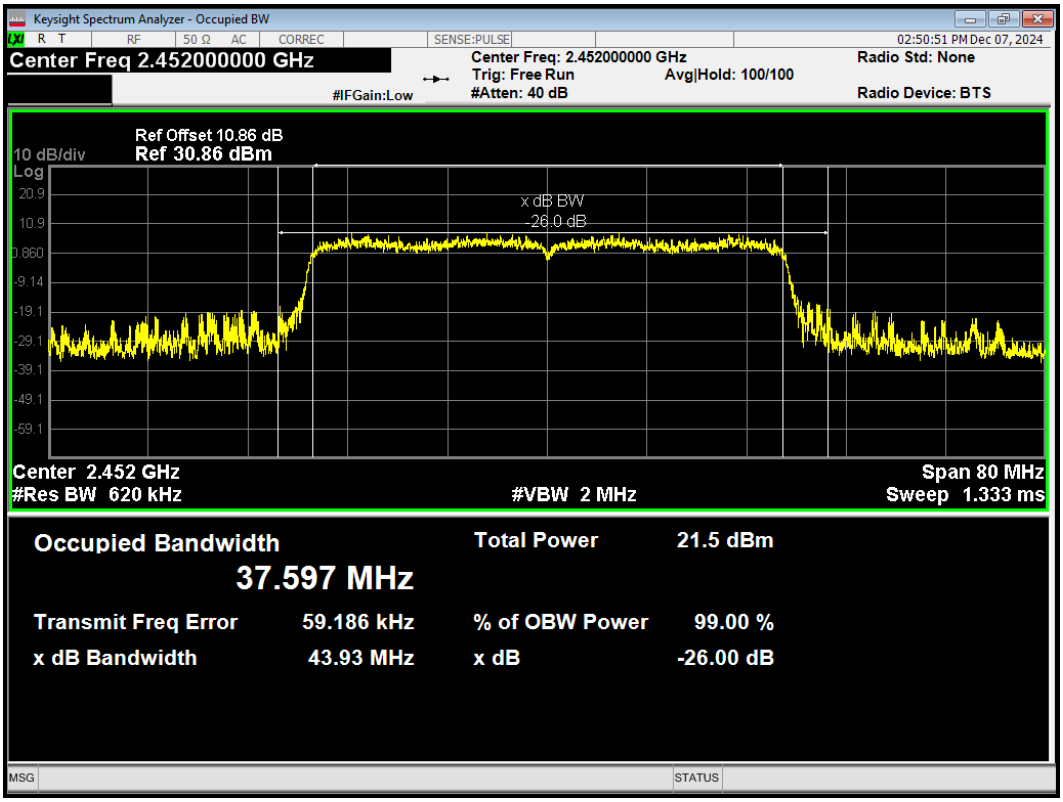
OBW 802.11ax(HE40) 26T 2452MHz



OBW 802.11ax(HE40) 484T 2422MHz

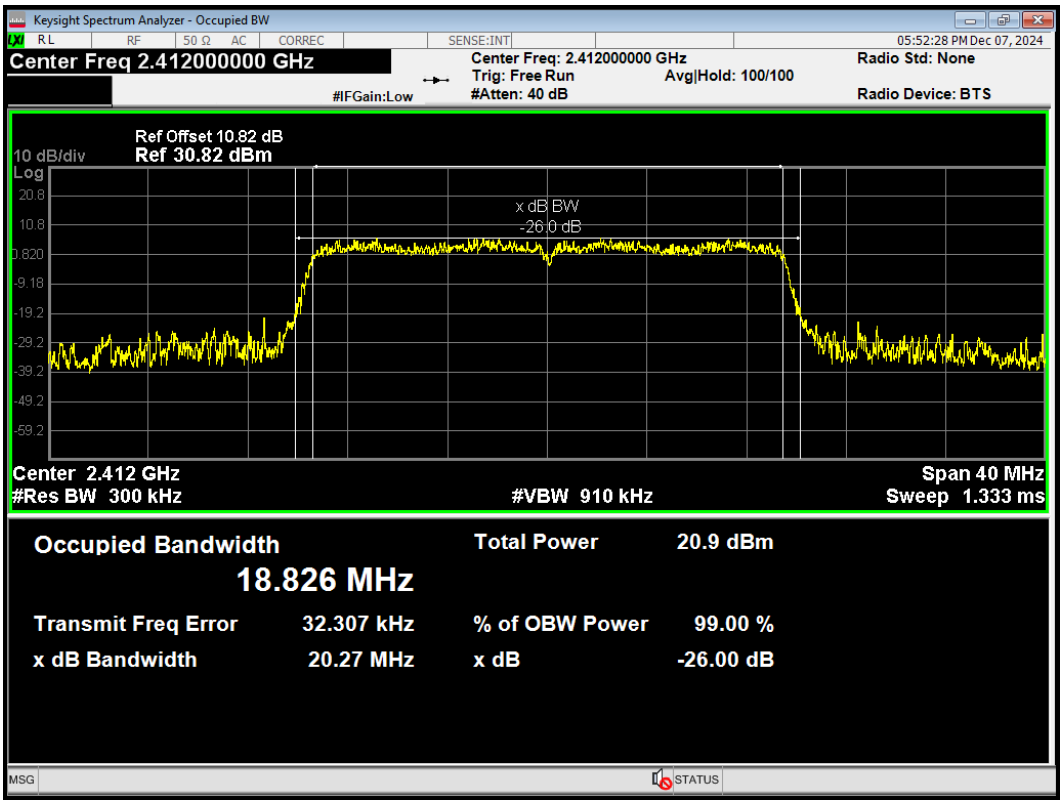


OBW 802.11ax(HE40) 484T 2452MHz

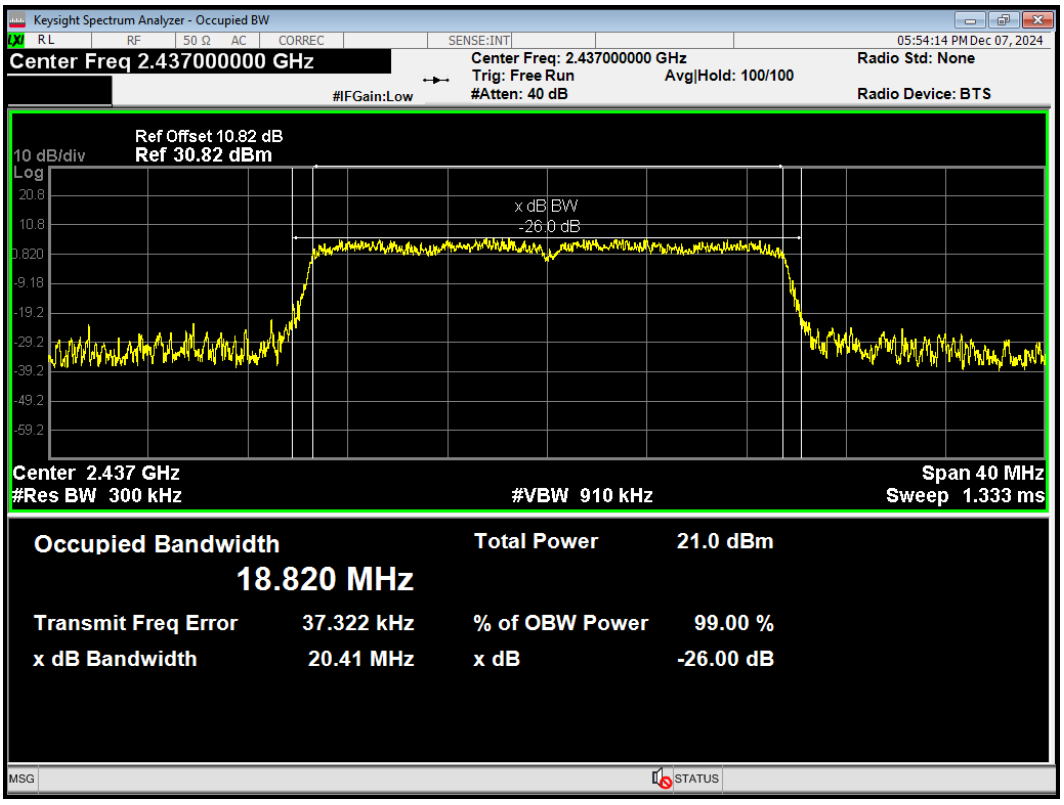


ERSU Mode

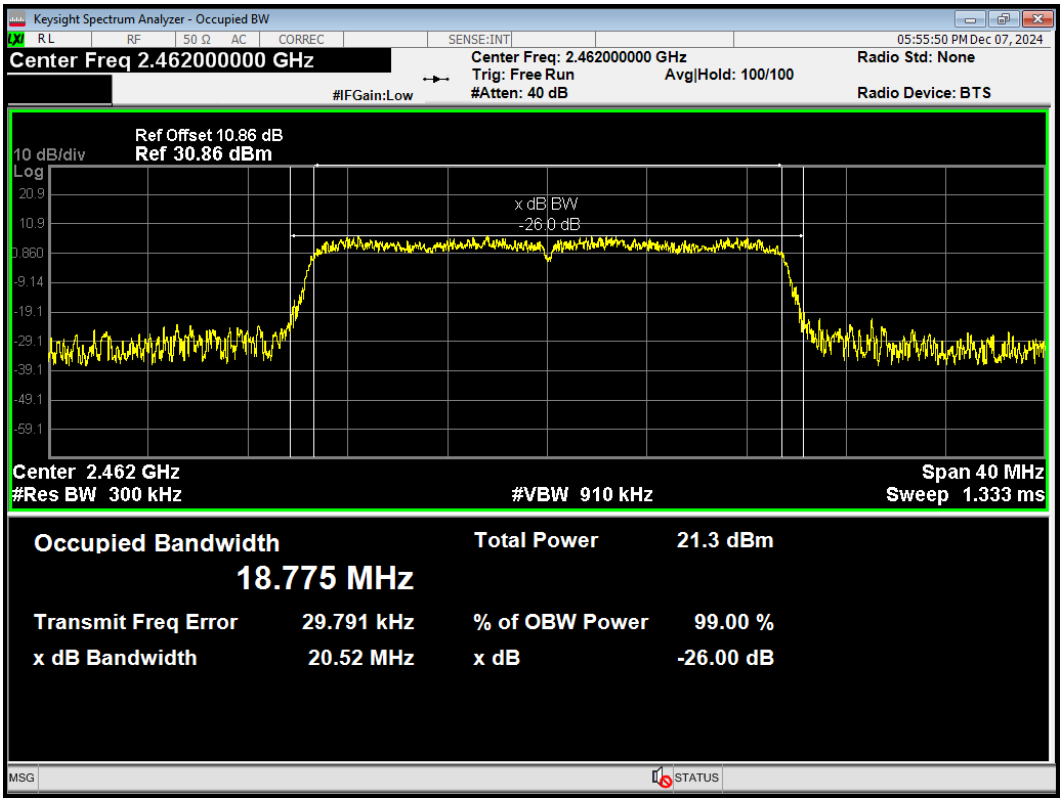
OBW 802.11ax(HE20) 242T 2412MHz



OBW 802.11ax(HE20) 242T 2437MHz

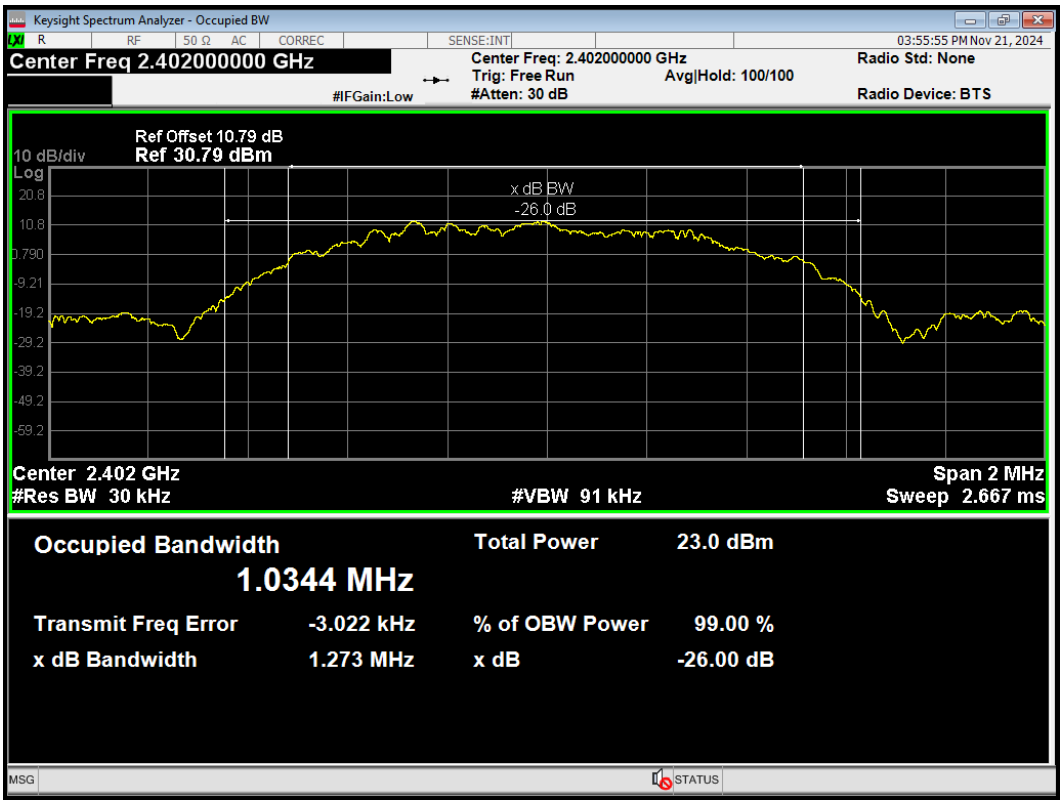


OBW 802.11ax(HE20) 242T 2462MHz

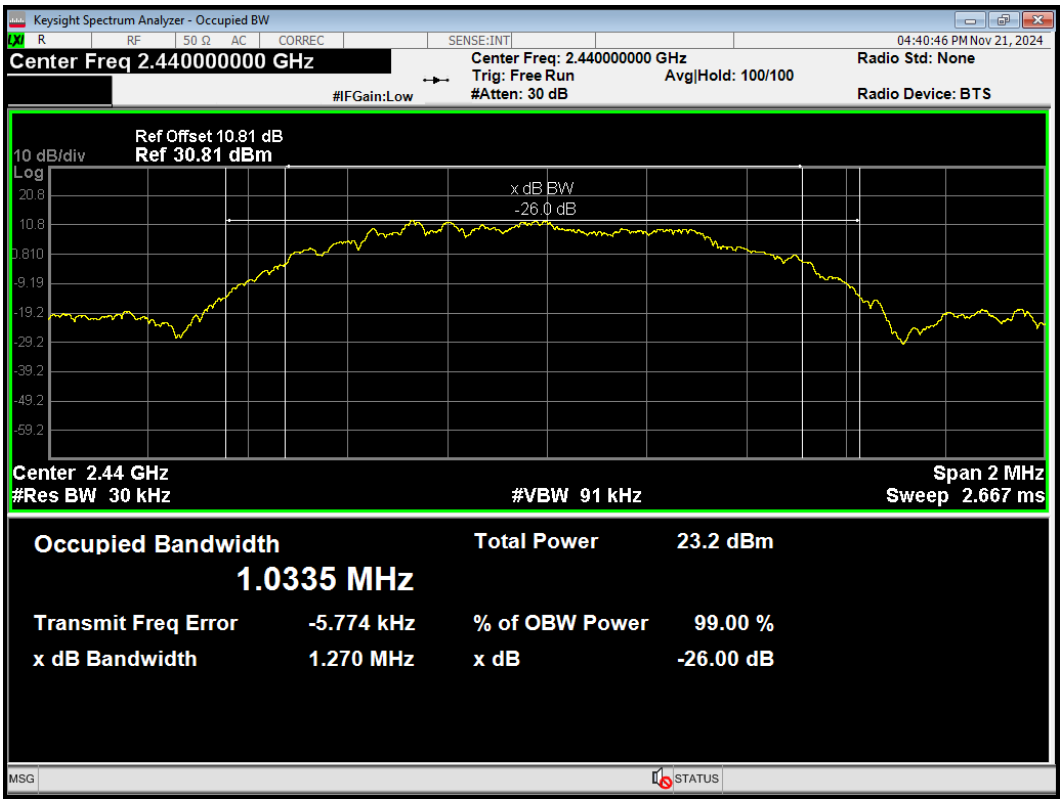


Bluetooth LE

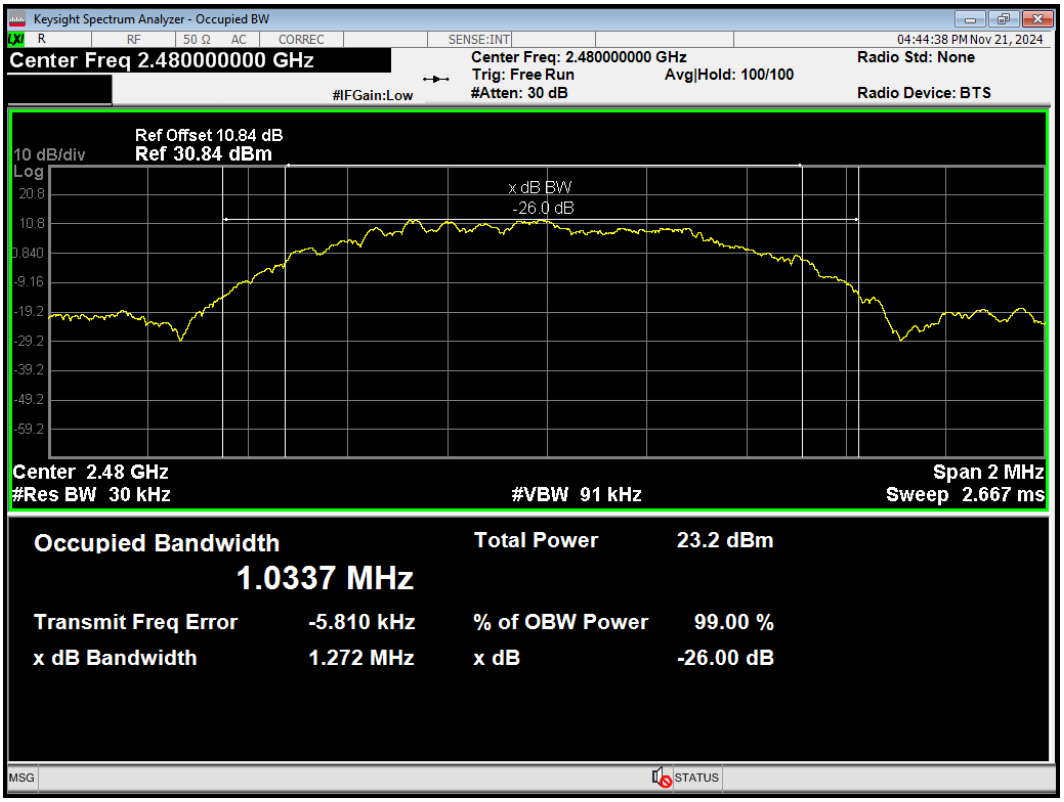
OBW Bluetooth LE (1M) 2402MHz



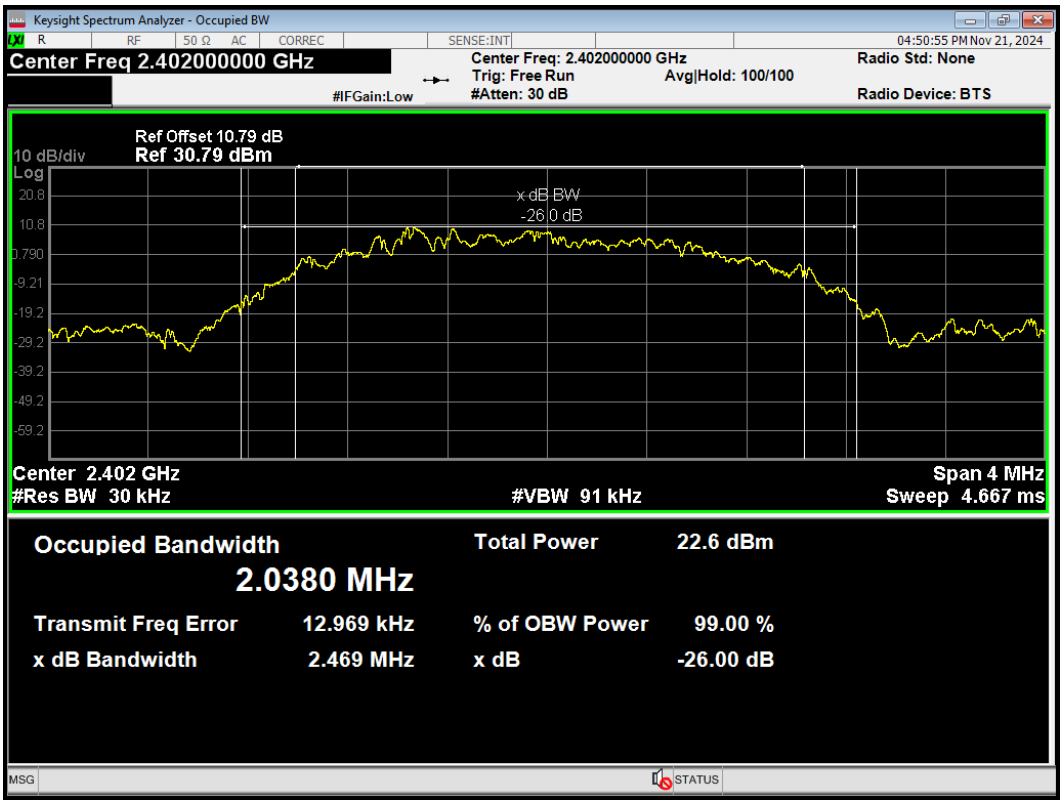
OBW Bluetooth LE (1M) 2440MHz



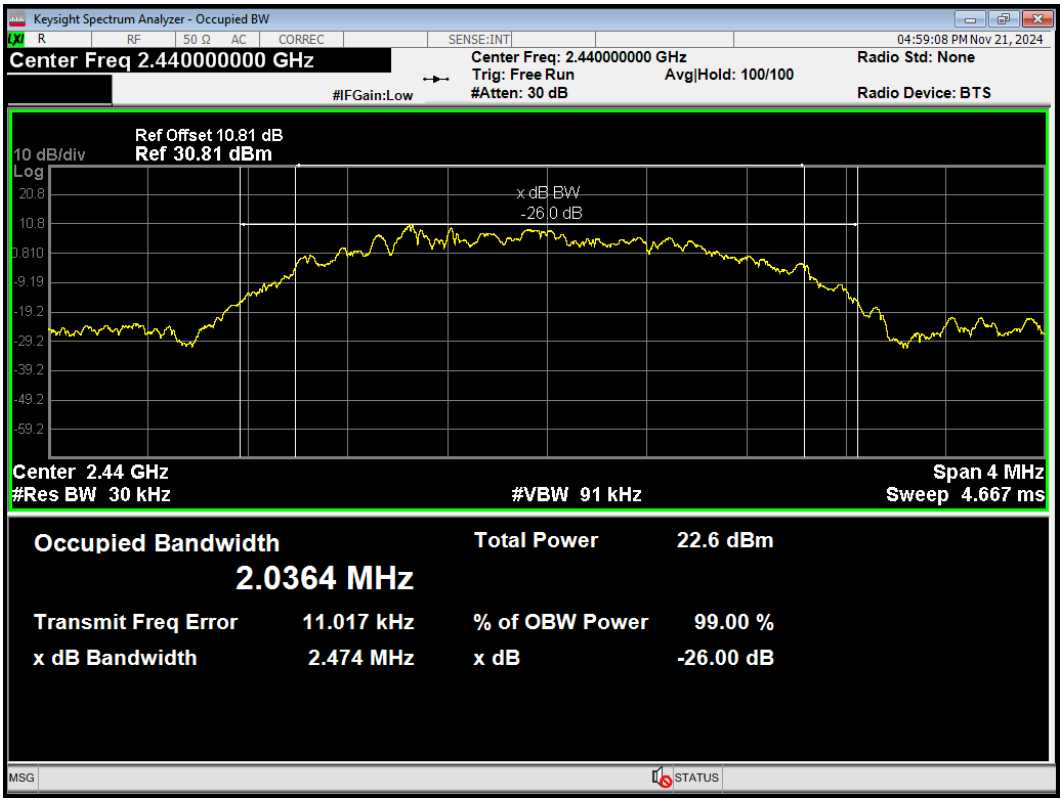
OBW Bluetooth LE (1M) 2480MHz



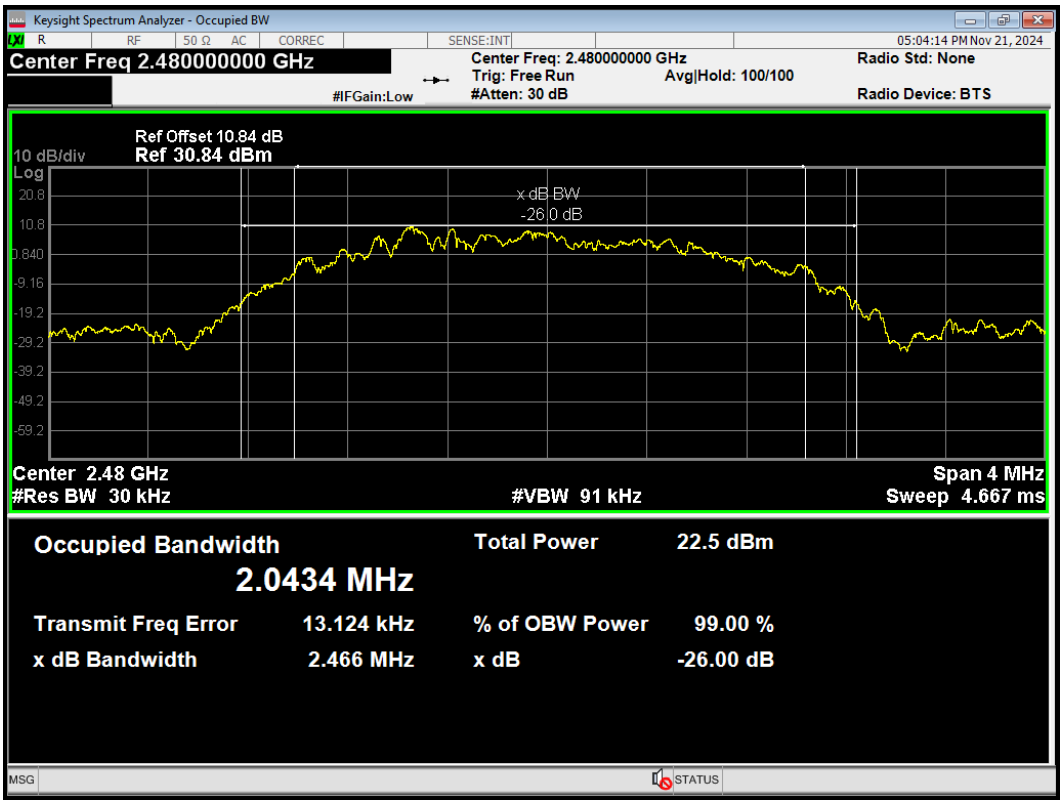
OBW Bluetooth LE (2M) 2402MHz



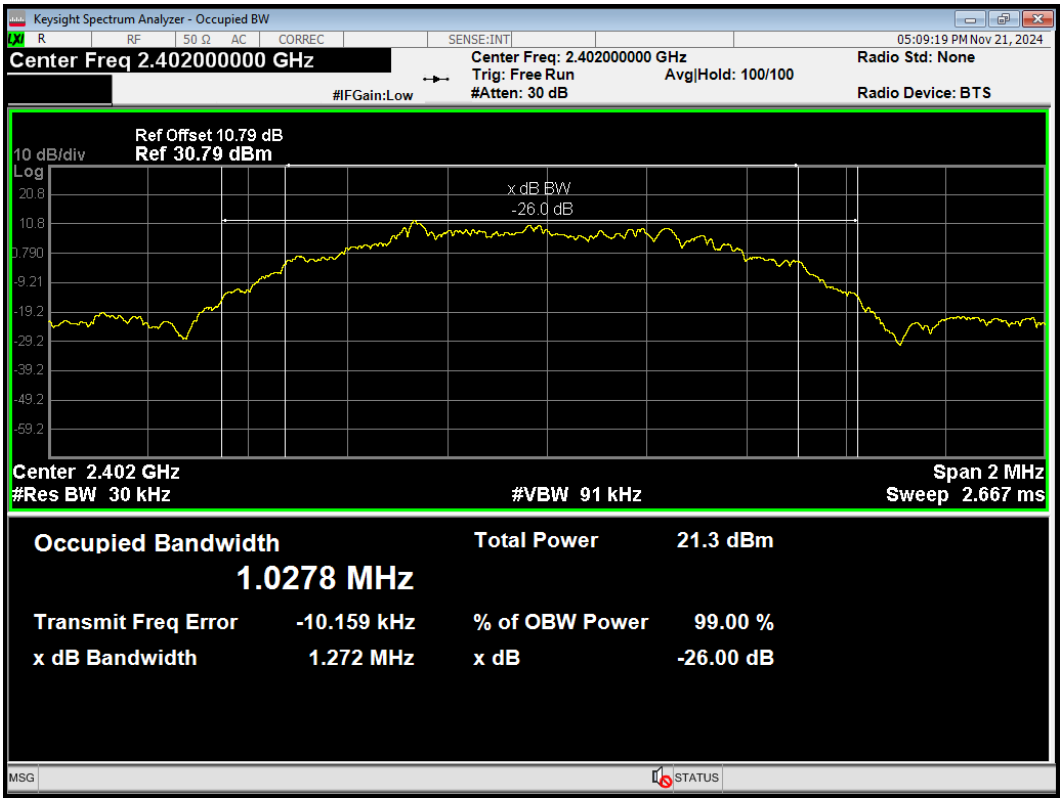
OBW Bluetooth LE (2M) 2440MHz



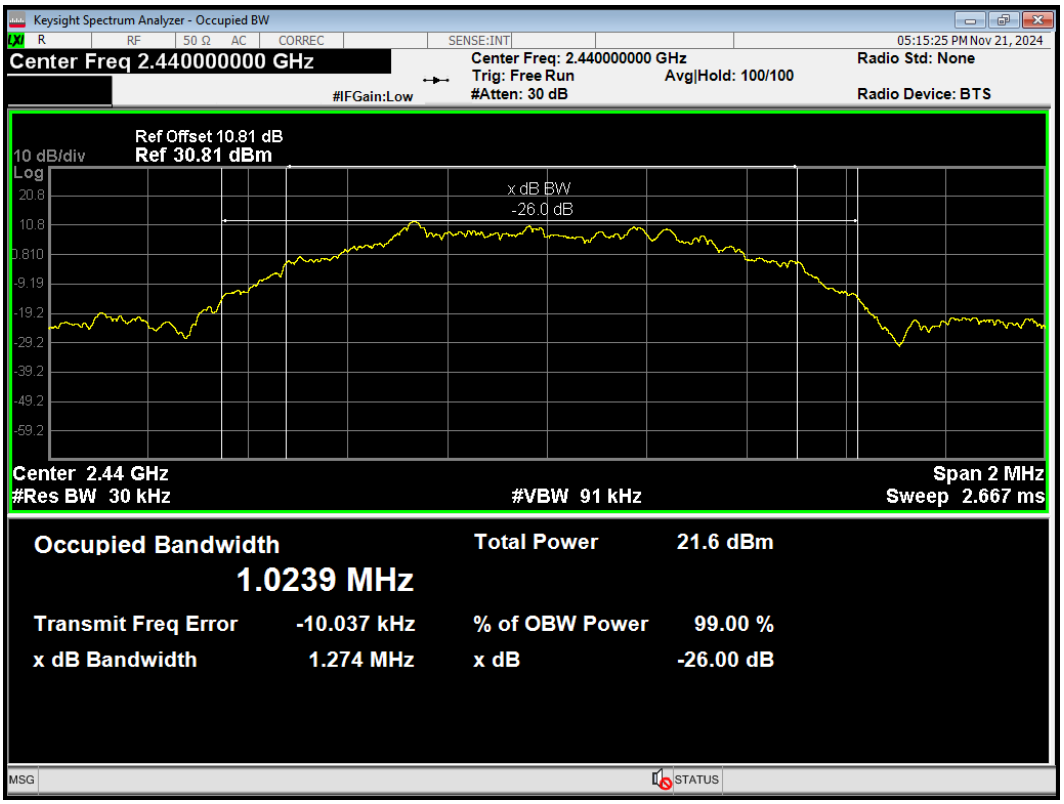
OBW Bluetooth LE (2M) 2480MHz



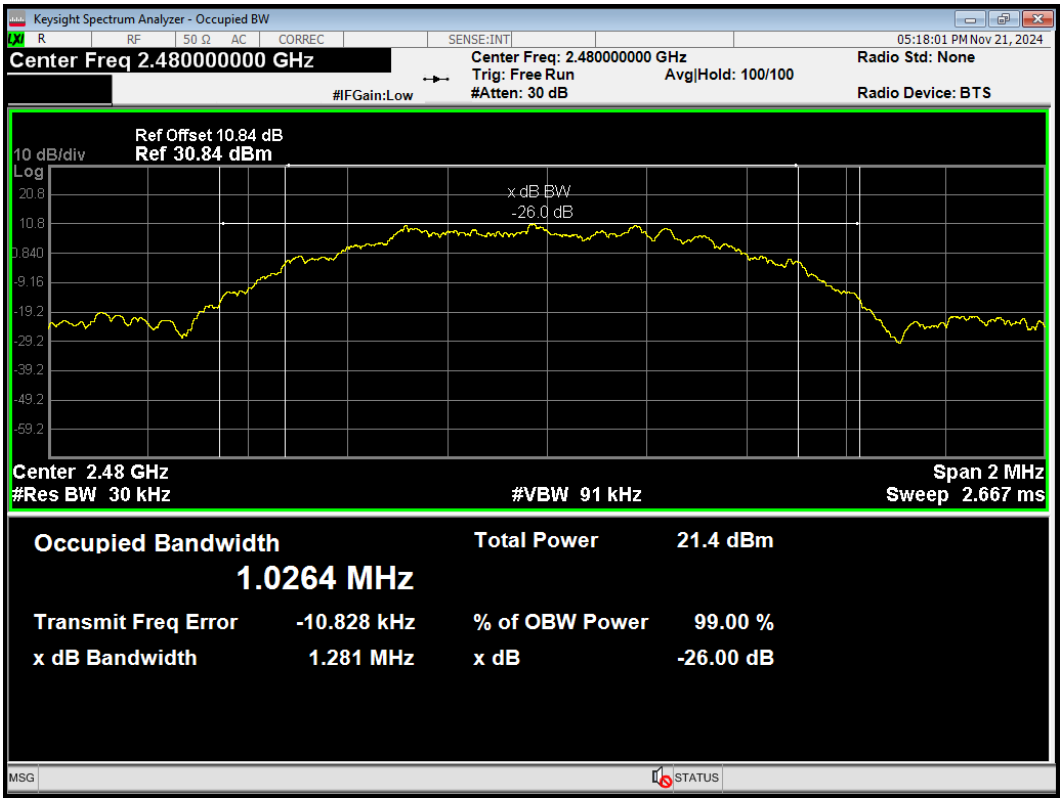
OBW Bluetooth LE (S=2) 2402MHz



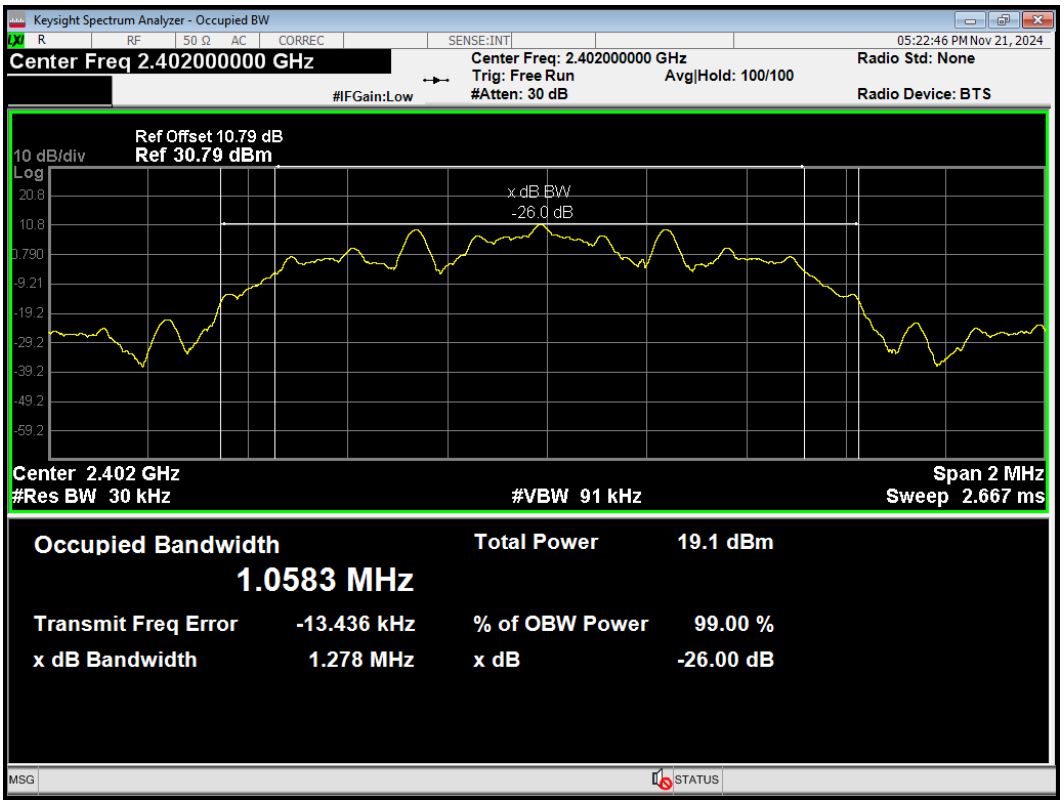
OBW Bluetooth LE (S=2) 2440MHz



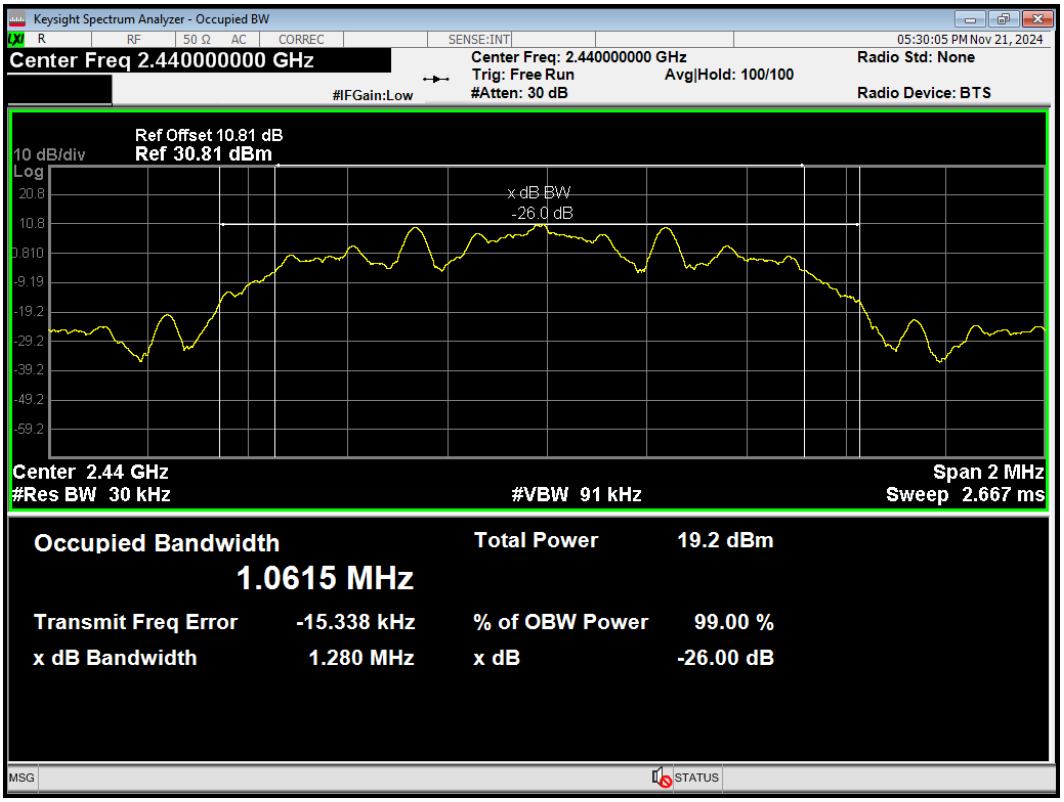
OBW Bluetooth LE (S=2) 2480MHz



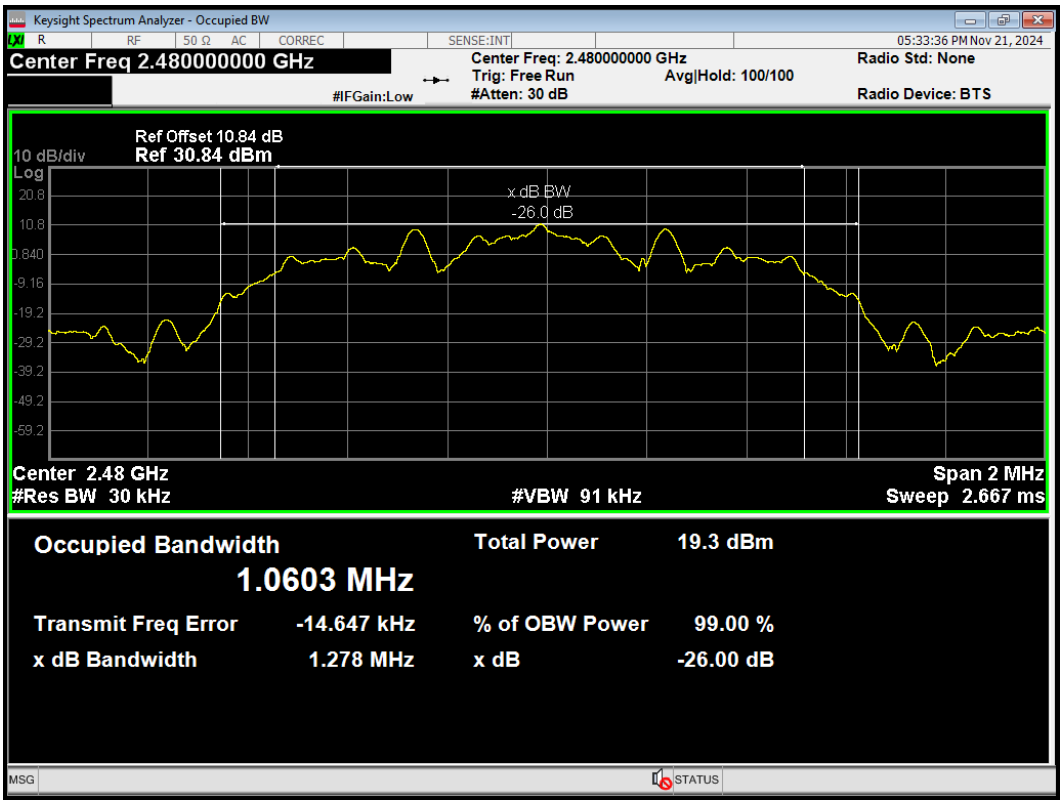
OBW Bluetooth LE (S=8) 2402MHz



OBW Bluetooth LE (S=8) 2440MHz

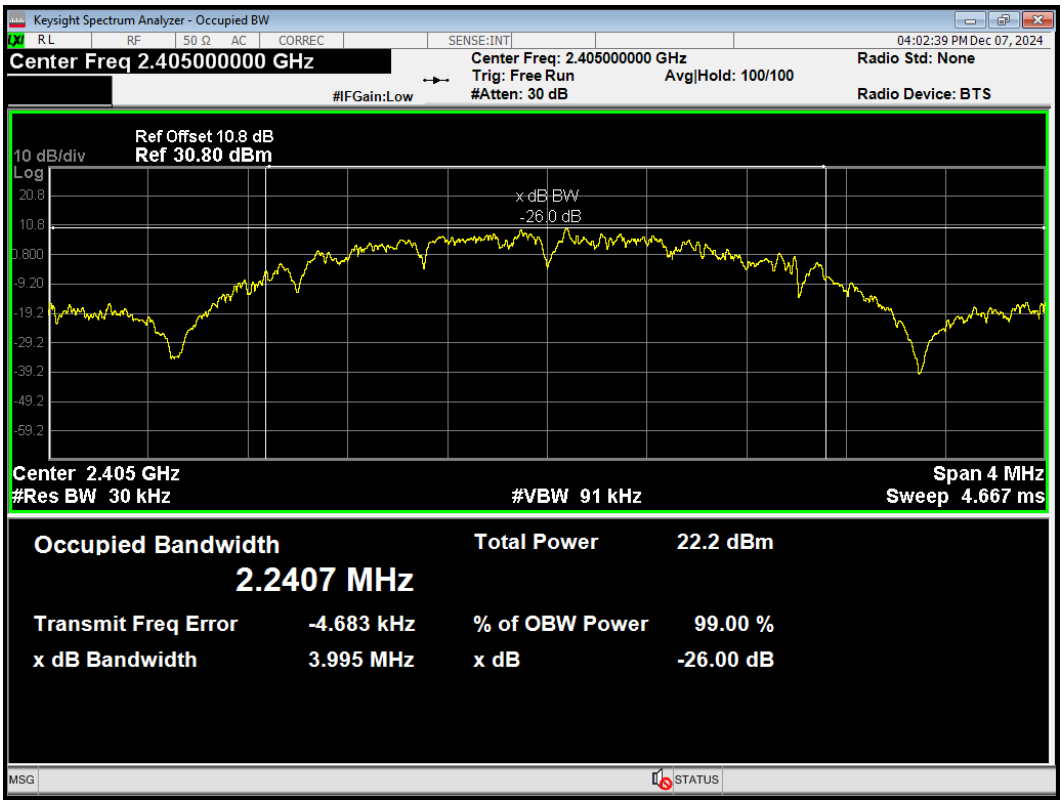


OBW Bluetooth LE (S=8) 2480MHz

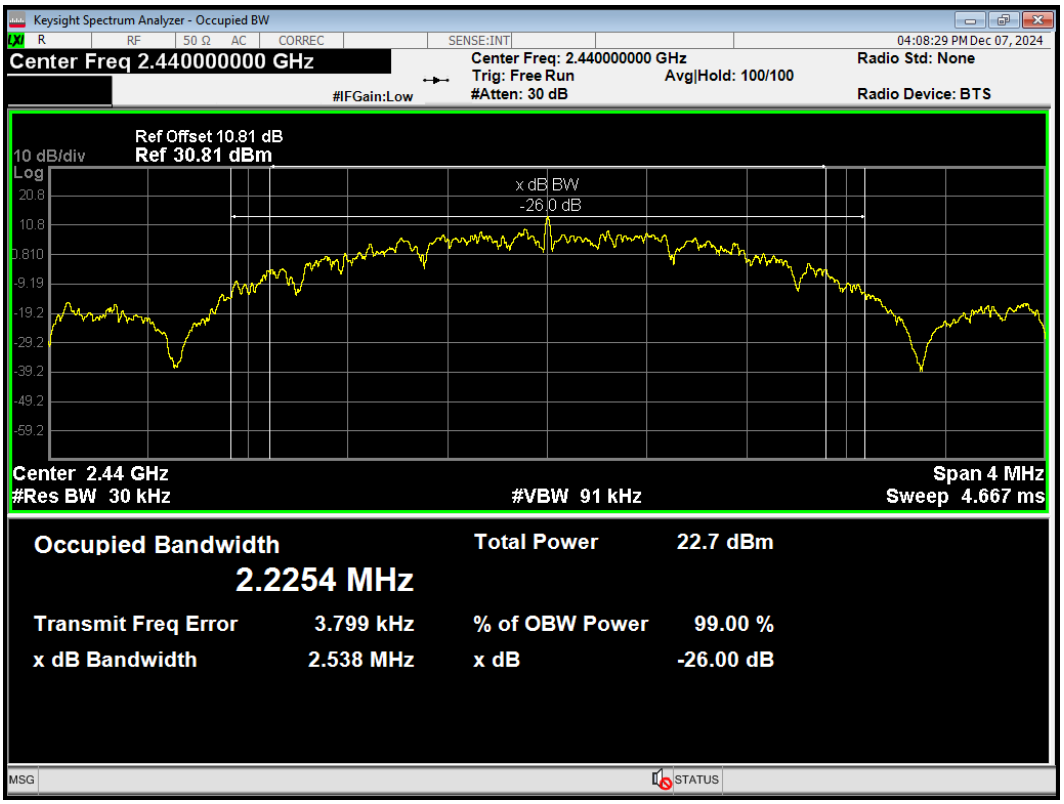


Thread

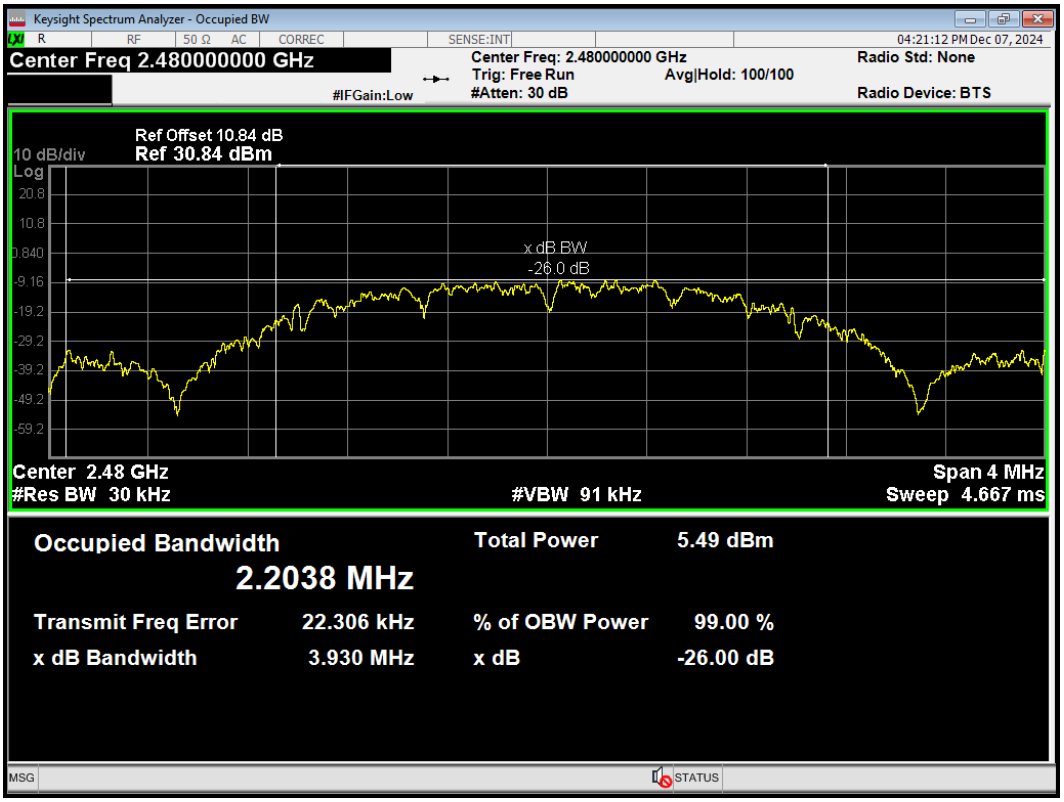
OBW Thread 2405MHz



OBW Thread 2440MHz

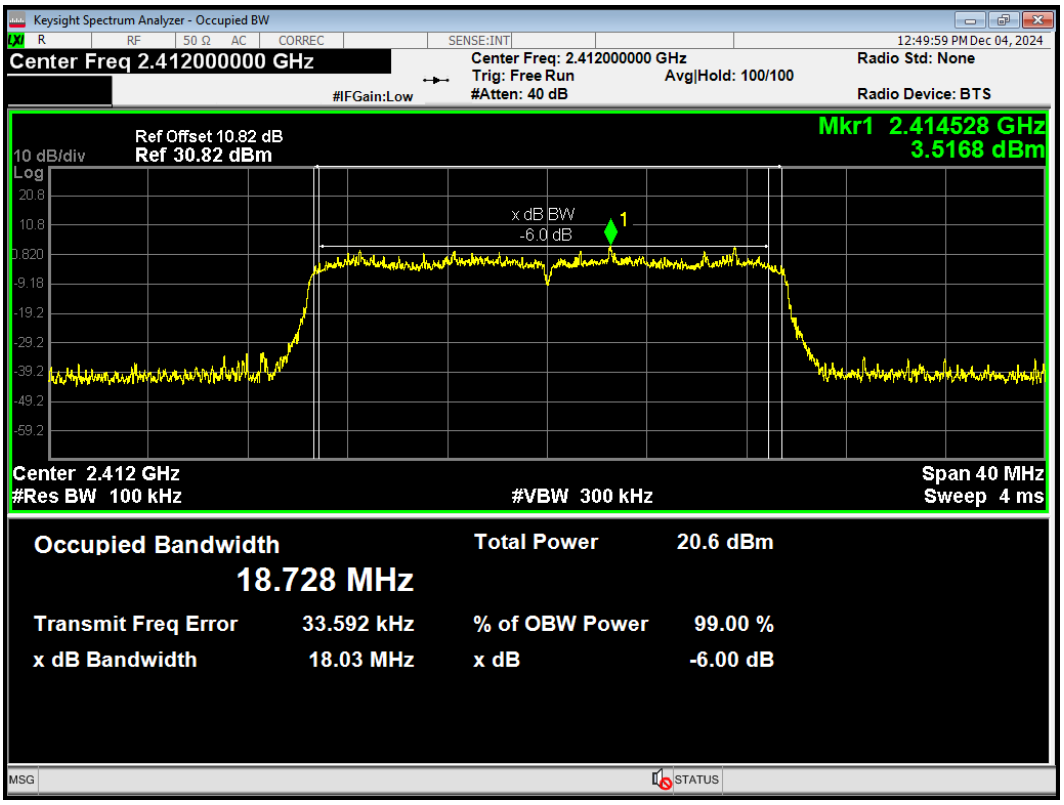


OBW Thread 2480MHz

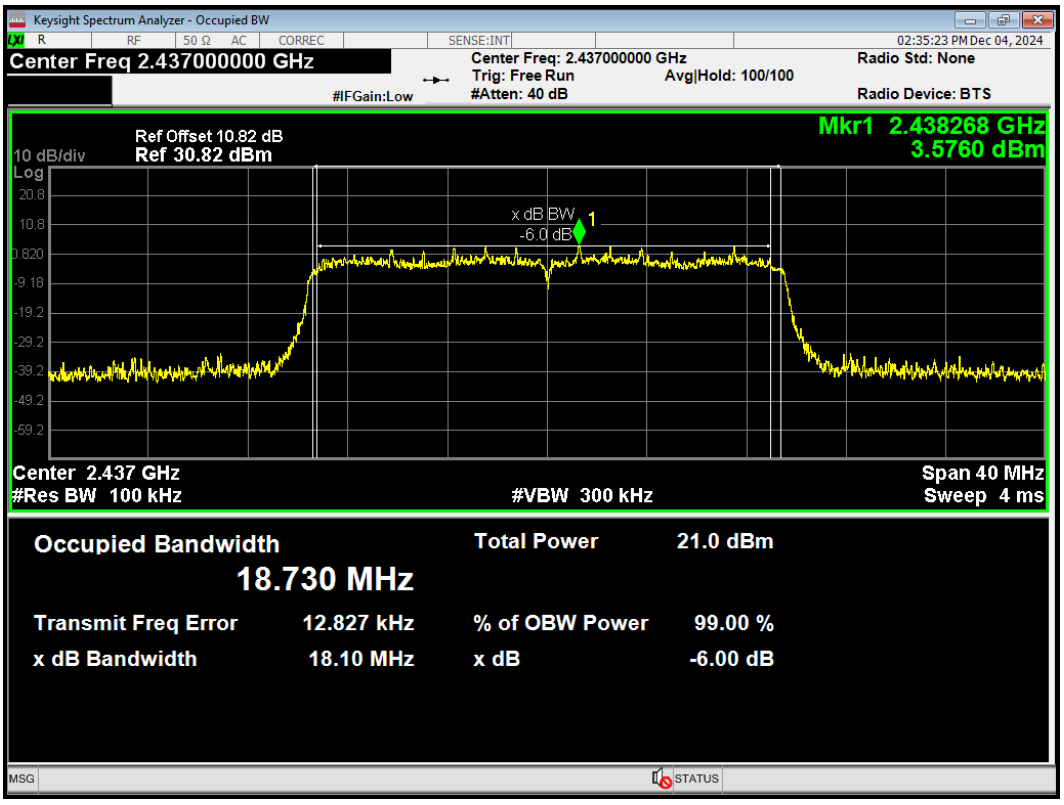


6 dB bandwidth

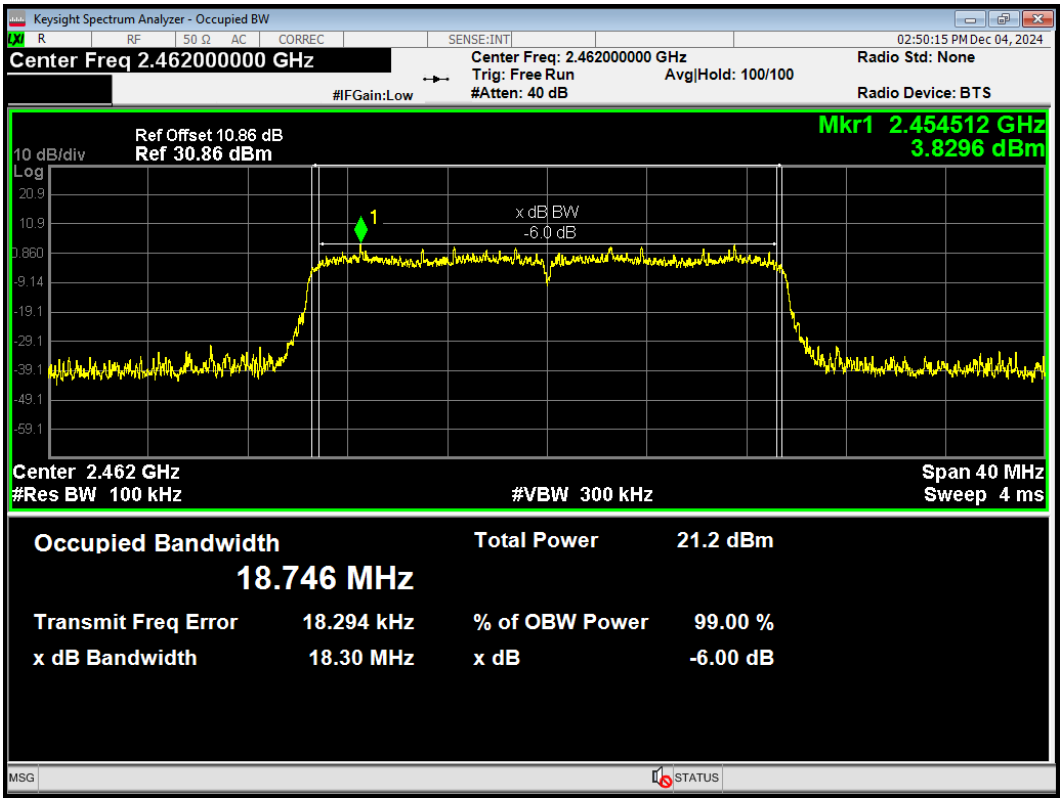
-6dB Bandwidth 802.11ax(HE20) 2412MHz



-6dB Bandwidth 802.11ax(HE20) 2437MHz



-6dB Bandwidth 802.11ax(HE20) 2462MHz



-6dB Bandwidth 802.11ax(HE40) 2422MHz