

RF TEST REPORT

Applicant	Aava Mobile Oy
FCC ID	2ABVH-INARI10E1
Product	10" Tablet Computer
Brand	AAVA
Model	INARI-E-10-WIG-1
Report No.	R2406A0726-R1
Issue Date	September 11, 2024

Eurofins TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15C (2023)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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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: June 24, 2024 ~ August 28, 2024 Date of Sample Received: June 24, 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.
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2. General Description of Equipment Under Test

2.1. Applicant and Manufacturer Information

Applicant	Aava Mobile Oy
Applicant address	Nahkatehtaankatu 2, FI-90130 Oulu, Finland
Manufacturer	Aava Mobile Oy
Manufacturer address	Nahkatehtaankatu 2, FI-90130 Oulu, Finland

2.2. General Information

EUT Description		
Model	INARI-E-10-WIG-1	
SN	Conducted: XBBA2FC1700102 Radiated: XBBA2FC1700039	
Hardware Version	EV1	
Software Version	007	
Power Supply	Battery / AC adapter	
Antenna Type	Internal Antenna	
Antenna Connector	A permanently attached antenna (meet with the standard FCC Part 15.203 requirement)	
Antenna Gain	Antenna 1: 1.10 dBi Antenna 2: 2.60 dBi	
Additional Beamforming Gain	NA	
Direction Gain	MIMO	1.91 dBi
	Beamforming	5.61 dBi
Operating Frequency Range(s)	802.11b/g/n(HT20)/ax(HE20): 2412 ~ 2462 MHz 802.11n(HT40)/ax(HE40): 2422 ~ 2452 MHz Bluetooth LE V5.3: 2402 ~2480 MHz	
Modulation Type	802.11b: DSSS 802.11g/n: OFDM 802.11ax: OFDMA Bluetooth LE: GFSK	
Max. Output Power	Wi-Fi 2.4G: 20.09 dBm Bluetooth LE: 8.23 dBm	
EUT Accessory		
Battery	Manufacturer: Shenzhen Guangwei Electronic Technology Co., Ltd. Model: AMME5260	
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 (2023) Radio Frequency Devices

ANSI C63.10-2013

Reference standard:

KDB 558074 D01 15.247 Meas Guidance v05r02

KDB 662911 D01 Multiple Transmitter Output v02r01

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

Test Mode	Data Rate			
	Antenna 1	Antenna 2	MIMO	Beamforming
802.11b	1 Mbps	1 Mbps	1 Mbps	/
802.11g	6 Mbps	6 Mbps	6 Mbps	/
802.11n HT20	MCS0	MCS0	MCS8	MCS8
802.11n HT40	MCS0	MCS0	MCS8	MCS8
802.11ax HE20	MCS0	MCS0	MCS0	MCS0
802.11ax HE40	MCS0	MCS0	MCS0	MCS0

The worst case Antenna mode for each of the following tests for Wi-Fi:

Test Cases	Antenna 1	Antenna 2	MIMO	Beamforming
Maximum output power	O	O	O	802.11n HT20; HT40 802.11ax HE20; HE40
6dB Bandwidth	--	--	O	--
Band Edge	--	--	O	--
Power Spectral Density	O	O	O	802.11n HT20; HT40 802.11ax HE20; HE40
Spurious RF Conducted Emissions	--	--	O	--
Unwanted Emissions	--	--	O	--
Conducted Emission	--	--	802.11ax HE40	--
Note: "O": test all bands				

5. Test Case Results

5.1. Maximum output power

Ambient Condition

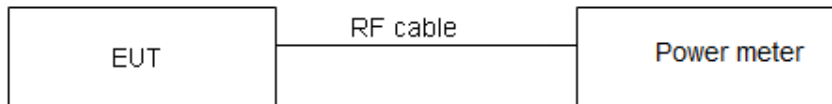
Temperature	Relative humidity
15°C ~ 35°C	20% ~ 80%

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.

The conducted Power is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

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	$\leq 1W$ (30dBm)
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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**Bluetooth LE****Antenna 1**

Power Index	
Channel	Bluetooth (Low Energy)
CH0	default
CH19	default
CH39	default

Antenna 2

Power Index	
Channel	Bluetooth (Low Energy)
CH0	default
CH19	default
CH39	default

Wi-Fi 2.4G

SISO Antenna Power Index								
Antenna	Channel	802.11b	802.11g	802.11n HT20	802.11ax HE20	Channel	802.11n HT40	802.11ax HE40
Antenna 1	CH1	21	21	21	21	CH3	21	21
	CH6	21	21	21	21	CH6	21	21
	CH11	21	21	21	21	CH9	21	21
Antenna 2	CH1	21	21	21	21	CH3	21	21
	CH6	21	21	21	21	CH6	21	21
	CH11	21	21	21	21	CH9	21	21
MIMO Power Index								
Antenna	Channel	802.11b	802.11g	802.11n HT20	802.11ax HE20	Channel	802.11n HT40	802.11ax HE40
Antenna 1	CH1	20.00	19.00	19.00	18.00	CH3	16.00	16.00
	CH2	/	/	19.50	19.50	CH4	16.00	16.00
	CH6	20.00	19.50	19.50	19.50	CH5	17.00	20.00
	CH9	/	/	/	19.00	CH6	20.00	20.00
	CH10	/	19.00	19.00	19.00	CH7	19.00	19.00
	CH11	19.50	19.00	19.50	19.00	CH8	19.00	19.00
	/	/	/	/	/	CH9	16.00	17.00
Antenna 2	CH1	20.00	19.00	19.00	18.00	CH3	16.00	16.00
	CH2	/	/	19.50	19.50	CH4	16.00	16.00
	CH6	20.00	19.50	19.50	19.50	CH5	17.00	20.00
	CH9	/	/	/	19.00	CH6	20.00	20.00
	CH10	/	19.00	19.00	19.00	CH7	19.00	19.00
	CH11	19.50	19.00	19.50	19.00	CH8	19.00	19.00
	/	/	/	/	/	CH9	16.00	17.00
Beamforming Power Index								
Antenna	Channel	802.11b	802.11g	802.11n HT20	802.11ax HE20	Channel	802.11n HT40	802.11ax HE40
Antenna 1	CH1	/	/	19.00	18.00	CH3	16.00	16.00
	CH2	/	/	19.50	19.50	CH4	16.00	16.00
	CH6	/	/	19.50	19.50	CH5	17.00	20.00
	CH9	/	/	/	19.00	CH6	20.00	20.00
	CH10	/	/	19.00	19.00	CH7	19.00	19.00
	CH11	/	/	19.50	19.00	CH8	19.00	19.00

	/	/	/	/	/	CH9	16.00	17.00
Antenna 2	CH1	/	/	19.00	18.00	CH3	16.00	16.00
	CH2	/	/	19.50	19.50	CH4	16.00	16.00
	CH6	/	/	19.50	19.50	CH5	17.00	20.00
	CH9	/	/	/	19.00	CH6	20.00	20.00
	CH10	/	/	19.00	19.00	CH7	19.00	19.00
	CH11	/	/	19.50	19.00	CH8	19.00	19.00
	/	/	/	/	/	CH9	16.00	17.00

Antenna 1

Test Mode	Duty cycle	Duty cycle correction Factor (dB)
Bluetooth LE (1M)	0.6262	2.030
Bluetooth LE (2M)	0.3301	4.810
Bluetooth LE (S=2)	0.5704	2.440
Bluetooth LE (S=8)	0.8277	0.820
Note: when Duty cycle ≥ 0.98 , Duty cycle correction Factor not required.		

Antenna 2

Test Mode	Duty cycle	Duty cycle correction Factor (dB)
Bluetooth LE (1M)	0.6250	2.040
Bluetooth LE (2M)	0.3333	4.770
Bluetooth LE (S=2)	0.5704	2.440
Bluetooth LE (S=8)	0.8277	0.820
Note: when Duty cycle ≥ 0.98 , Duty cycle correction Factor not required.		

Test Mode	Duty cycle	Duty cycle correction Factor (dB)
802.11b	1.00	0.00
802.11g	1.00	0.00
802.11n HT20	1.00	0.00
802.11n HT40	1.00	0.00
802.11ax HE20	1.00	0.00
802.11ax HE40	1.00	0.00
Note: when Duty cycle ≥ 0.98 , Duty cycle correction Factor not required.		

Antenna 1

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	5.83	7.86	30	PASS
	2440/CH19	6.02	8.05	30	PASS
	2480/CH39	4.81	6.84	30	PASS
Bluetooth (Low Energy) (2M)	2402/CH0	3.04	7.85	30	PASS
	2440/CH19	3.27	8.08	30	PASS
	2480/CH39	2.05	6.86	30	PASS
Bluetooth (Low Energy) (S=2)	2402/CH0	5.49	7.93	30	PASS
	2440/CH19	5.63	8.07	30	PASS
	2480/CH39	4.51	6.95	30	PASS
Bluetooth (Low Energy) (S=8)	2402/CH0	7.07	7.89	30	PASS
	2440/CH19	7.41	8.23	30	PASS
	2480/CH39	6.19	7.01	30	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

Antenna 2

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	5.43	7.47	30	PASS
	2440/CH19	5.83	7.87	30	PASS
	2480/CH39	4.86	6.90	30	PASS
Bluetooth (Low Energy) (2M)	2402/CH0	2.61	7.38	30	PASS
	2440/CH19	2.96	7.73	30	PASS
	2480/CH39	2.20	6.97	30	PASS
Bluetooth (Low Energy) (S=2)	2402/CH0	5.05	7.49	30	PASS
	2440/CH19	5.54	7.98	30	PASS
	2480/CH39	4.74	7.18	30	PASS
Bluetooth (Low Energy) (S=8)	2402/CH0	6.74	7.56	30	PASS
	2440/CH19	7.14	7.96	30	PASS
	2480/CH39	6.05	6.87	30	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

Antenna 1

Test Mode	Carrier frequency (MHz)/ Channel	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11b	2412/CH 1	18.99	18.99	30	PASS
	2437/CH 6	19.86	19.86	30	PASS
	2462/CH11	19.88	19.88	30	PASS
802.11g	2412/CH 1	18.18	18.18	30	PASS
	2437/CH 6	18.60	18.60	30	PASS
	2462/CH11	18.82	18.82	30	PASS
802.11n HT20	2412/CH 1	18.01	18.01	30	PASS
	2437/CH 6	18.61	18.61	30	PASS
	2462/CH11	18.67	18.67	30	PASS
802.11n HT40	2422/CH3	18.68	18.68	30	PASS
	2437/CH6	19.07	19.07	30	PASS
	2452/CH9	18.55	18.55	30	PASS
802.11ax HE20	2412/CH 1	17.98	17.98	30	PASS
	2437/CH 6	18.67	18.67	30	PASS
	2462/CH11	18.78	18.78	30	PASS
802.11ax HE40	2422/CH3	18.59	18.59	30	PASS
	2437/CH6	19.05	19.05	30	PASS
	2452/CH9	18.53	18.53	30	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

Antenna 2

Test Mode	Carrier frequency (MHz)/ Channel	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11b	2412/CH 1	18.16	18.16	30	PASS
	2437/CH 6	18.61	18.61	30	PASS
	2462/CH11	18.94	18.94	30	PASS
802.11g	2412/CH 1	18.10	18.10	30	PASS
	2437/CH 6	18.25	18.25	30	PASS
	2462/CH11	18.49	18.49	30	PASS
802.11n HT20	2412/CH 1	17.92	17.92	30	PASS
	2437/CH 6	18.27	18.27	30	PASS
	2462/CH11	18.37	18.37	30	PASS
802.11n HT40	2422/CH3	17.74	17.74	30	PASS
	2437/CH6	17.60	17.60	30	PASS
	2452/CH9	17.18	17.18	30	PASS
802.11ax HE20	2412/CH 1	18.01	18.01	30	PASS
	2437/CH 6	18.16	18.16	30	PASS
	2462/CH11	17.70	17.70	30	PASS
802.11ax HE40	2422/CH3	17.58	17.58	30	PASS
	2437/CH6	17.59	17.59	30	PASS
	2452/CH9	17.16	17.16	30	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

MIMO

Test Mode	Carrier frequency (MHz) / Channel	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11b	2412/CH 1	16.76	16.76	16.74	16.74	19.76	30	PASS
	2437/CH 6	17.26	17.26	16.11	16.11	19.74	30	PASS
	2462/CH11	16.13	16.13	15.76	15.76	18.96	30	PASS
802.11g	2412/CH 1	16.00	16.00	16.77	16.77	19.41	30	PASS
	2437/CH 6	16.45	16.45	16.35	16.35	19.41	30	PASS
	2457/CH 10	16.06	16.06	16.31	16.31	19.20	30	PASS
	2462/CH 11	16.02	16.02	16.39	16.39	19.22	30	PASS
802.11n HT20	2412/CH 1	15.77	15.77	16.68	16.68	19.26	30	PASS
	2417/CH 2	15.99	15.99	16.66	16.66	19.35	30	PASS
	2437/CH 6	16.39	16.39	16.28	16.28	19.35	30	PASS
	2457/CH 10	16.02	16.02	16.19	16.19	19.12	30	PASS
802.11n HT40	2462/CH11	16.28	16.28	16.65	16.65	19.48	30	PASS
	2422/CH 3	14.62	14.62	14.66	14.66	17.65	30	PASS
	2427/CH 4	14.42	14.42	14.64	14.64	17.54	30	PASS
	2432/CH 5	15.37	15.37	14.77	14.77	18.09	30	PASS
	2437/CH 6	17.12	17.12	17.04	17.04	20.09	30	PASS
	2442/CH 7	15.71	15.71	15.84	15.84	18.79	30	PASS
	2447/CH 8	15.64	15.64	15.39	15.39	18.53	30	PASS
802.11ax HE20	2452/CH 9	14.46	14.46	14.30	14.30	17.39	30	PASS
	2412/CH 1	14.95	14.95	16.60	16.60	18.86	30	PASS
	2417/CH 2	16.04	16.04	16.63	16.63	19.36	30	PASS
	2437/CH 6	16.50	16.50	16.36	16.36	19.44	30	PASS
	2452/CH 9	16.11	16.11	16.35	16.35	19.24	30	PASS
	2457/CH 10	16.03	16.03	16.30	16.30	19.18	30	PASS
802.11ax HE40	2462/CH11	16.02	16.02	16.25	16.25	19.15	30	PASS
	2422/CH 3	14.48	14.48	14.51	14.51	17.50	30	PASS
	2427/CH 4	14.27	14.27	14.43	14.43	17.36	30	PASS
	2432/CH 5	16.66	16.66	17.06	17.06	19.87	30	PASS
	2437/CH 6	16.97	16.97	16.88	16.88	19.93	30	PASS
	2442/CH 7	15.73	15.73	15.70	15.70	18.72	30	PASS
	2447/CH 8	15.48	15.48	15.34	15.34	18.42	30	PASS
	2452/CH 9	14.44	14.44	15.15	15.15	17.82	30	PASS

Note: 1. Average Power with duty factor = Average Power Measured +Duty cycle correction factor

2. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power = $10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)})$

3. Direction gain calculation according to KDB662911 D01 Multiple Transmitter Output v02r01 F)2d(ii): If antenna gains are not equal, If all transmit signals are completely uncorrelated, then

Directional gain = $10\log[(10^{G1/10} + 10^{G2/10})/N_{ANT}]$ dBi = $10\log[(10^{G1/10} + 10^{G2/10})/2]$ = 2.91 dBi < 6dBi. So the limit is 30 dBm.

Beamforming

Test Mode	Carrier frequency (MHz) / Channel	Beamforming Antenna 1		Beamforming Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11n HT20	2412/CH 1	15.52	15.52	16.63	16.63	19.12	30	PASS
	2417/CH 2	15.86	15.86	16.46	16.46	19.18	30	PASS
	2437/CH 6	16.12	16.12	16.15	16.15	19.14	30	PASS
	2457/CH 10	15.83	15.83	16.01	16.01	18.93	30	PASS
	2462/CH11	16.10	16.10	16.46	16.46	19.29	30	PASS
802.11n HT40	2422/CH 3	14.55	14.55	14.54	14.54	17.56	30	PASS
	2427/CH 4	14.30	14.30	14.47	14.47	17.40	30	PASS
	2432/CH 5	15.19	15.19	14.69	14.69	17.96	30	PASS
	2437/CH 6	16.96	16.96	16.85	16.85	19.92	30	PASS
	2442/CH 7	15.60	15.60	15.72	15.72	18.67	30	PASS
	2447/CH 8	15.43	15.43	15.32	15.32	18.39	30	PASS
	2452/CH 9	14.36	14.36	14.18	14.18	17.28	30	PASS
802.11ax HE20	2412/CH 1	14.92	14.92	16.44	16.44	18.76	30	PASS
	2417/CH 2	15.88	15.88	16.46	16.46	19.19	30	PASS
	2437/CH 6	16.21	16.21	16.09	16.09	19.16	30	PASS
	2452/CH 9	15.87	15.87	16.21	16.21	19.06	30	PASS
	2457/CH 10	15.90	15.90	16.07	16.07	19.00	30	PASS
	2462/CH11	15.90	15.90	16.13	16.13	19.03	30	PASS
802.11ax HE40	2422/CH 3	14.49	14.49	14.47	14.47	17.49	30	PASS
	2427/CH 4	14.11	14.11	14.31	14.31	17.22	30	PASS
	2432/CH 5	16.57	16.57	16.96	16.96	19.78	30	PASS
	2437/CH 6	16.89	16.89	16.72	16.72	19.82	30	PASS
	2442/CH 7	15.54	15.54	15.54	15.54	18.55	30	PASS
	2447/CH 8	15.40	15.40	15.14	15.14	18.28	30	PASS
	2452/CH 9	14.35	14.35	15.01	15.01	17.71	30	PASS

Note: 1.Average Power with duty factor = Average Power Measured +Duty cycle correction factor

2. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power = $10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)})$.

3. Direction gain calculation according to KDB662911 D01 Multiple Transmitter Output v02r01 F)2)e)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream: 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.

Directional gain = $G_{ANT \text{ MAX}} + 10 \log(N_{ANT}/N_{ss}) = 2.60 + 10\log(2/N_{ss}) = 5.61 \text{ dBi} > 6 \text{ dBi}$. So the limit is 30 dBm.

5.2. 99% Bandwidth and 6dB Bandwidth

Ambient Condition

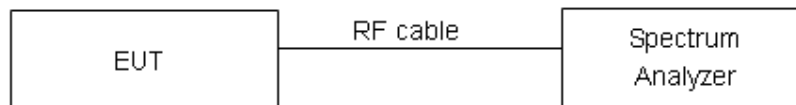
Temperature	Relative humidity
15°C ~ 35°C	20% ~ 80%

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
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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:
Antenna 1

Test Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
Bluetooth (Low Energy) (1M)	2402	1.025	0.657	500	PASS
	2440	1.017	0.659	500	PASS
	2480	1.020	0.660	500	PASS
Bluetooth (Low Energy) (2M)	2402	2.011	1.106	500	PASS
	2440	2.012	1.151	500	PASS
	2480	2.005	1.129	500	PASS
Bluetooth (Low Energy) (S=2)	2402	1.008	0.650	500	PASS
	2440	1.011	0.661	500	PASS
	2480	1.013	0.668	500	PASS
Bluetooth (Low Energy) (S=8)	2402	1.041	0.640	500	PASS
	2440	1.043	0.637	500	PASS
	2480	1.042	0.624	500	PASS

Antenna 2

Test Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
Bluetooth (Low Energy) (1M)	2402	1.025	0.653	500	PASS
	2440	1.026	0.666	500	PASS
	2480	1.025	0.656	500	PASS
Bluetooth (Low Energy) (2M)	2402	2.012	1.158	500	PASS
	2440	2.012	1.131	500	PASS
	2480	2.010	1.142	500	PASS
Bluetooth (Low Energy) (S=2)	2402	1.012	0.699	500	PASS
	2440	1.006	0.638	500	PASS
	2480	1.014	0.654	500	PASS
Bluetooth (Low Energy) (S=8)	2402	1.043	0.630	500	PASS
	2440	1.042	0.621	500	PASS
	2480	1.041	0.620	500	PASS

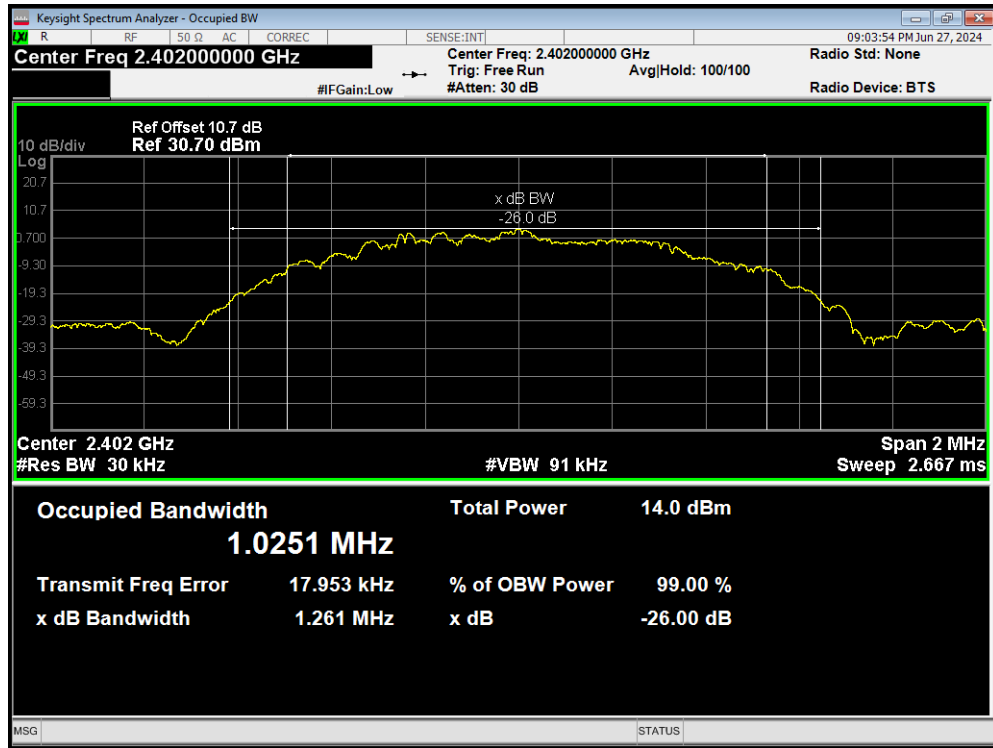
Test Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11b	2412	12.692	7.208	500	PASS
	2437	13.231	7.506	500	PASS
	2462	12.978	7.524	500	PASS
802.11g	2412	16.375	15.906	500	PASS
	2437	16.473	16.355	500	PASS
	2457	16.445	16.035	500	PASS
	2462	16.439	16.304	500	PASS
802.11n HT20	2412	17.548	17.169	500	PASS
	2417	17.584	17.585	500	PASS
	2437	17.670	17.193	500	PASS
	2457	17.598	17.202	500	PASS
	2462	17.603	16.934	500	PASS
802.11n HT40	2422	35.875	34.989	500	PASS
	2427	36.026	34.458	500	PASS
	2432	36.126	35.706	500	PASS
	2437	36.223	36.335	500	PASS
	2442	36.171	35.927	500	PASS
	2447	36.089	35.964	500	PASS
	2452	36.022	35.715	500	PASS
802.11ax HE20	2412	18.866	18.422	500	PASS
	2417	18.898	18.923	500	PASS
	2437	19.017	18.839	500	PASS
	2452	18.919	18.350	500	PASS
	2457	18.913	18.712	500	PASS
	2462	18.964	18.825	500	PASS
802.11ax HE40	2422	37.588	37.504	500	PASS
	2427	37.709	37.303	500	PASS
	2432	37.848	37.807	500	PASS
	2437	37.881	38.058	500	PASS
	2442	37.793	38.073	500	PASS
	2447	37.788	37.411	500	PASS
	2452	37.660	37.715	500	PASS

99%bandwidth

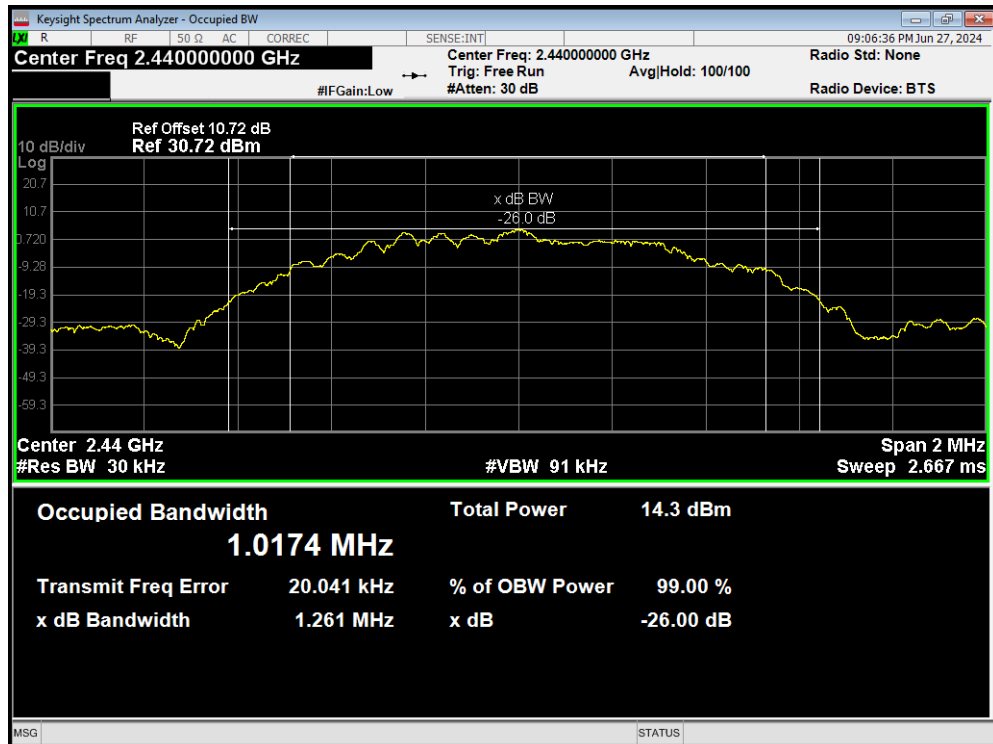
Bluetooth LE

Antenna 1

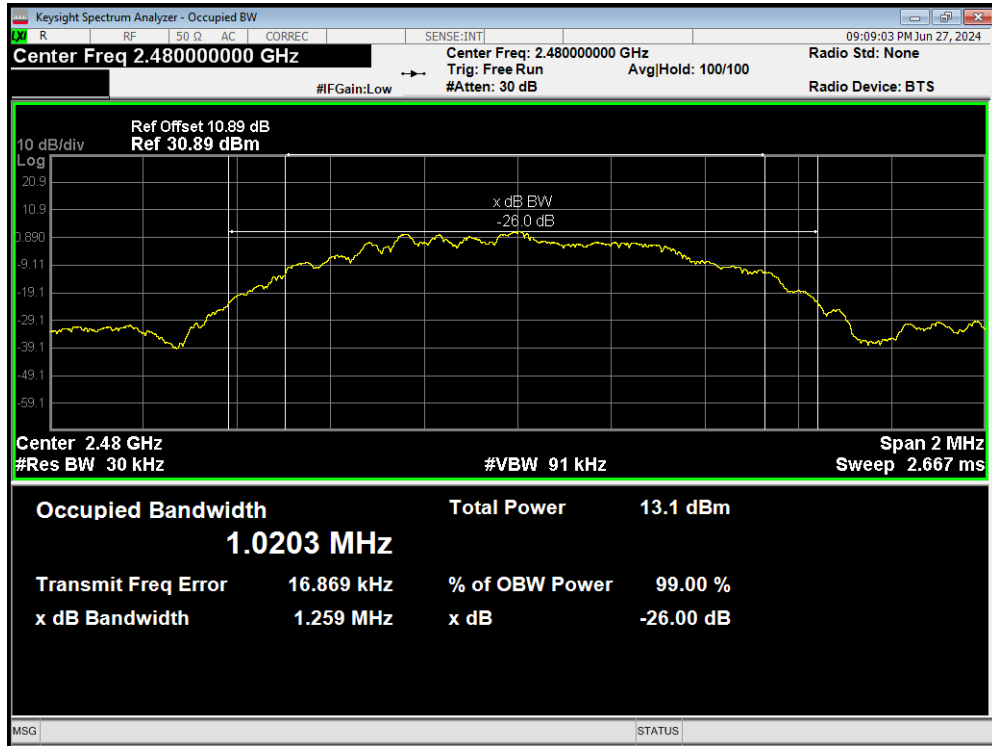
OBW BLE (1M) 2402MHz



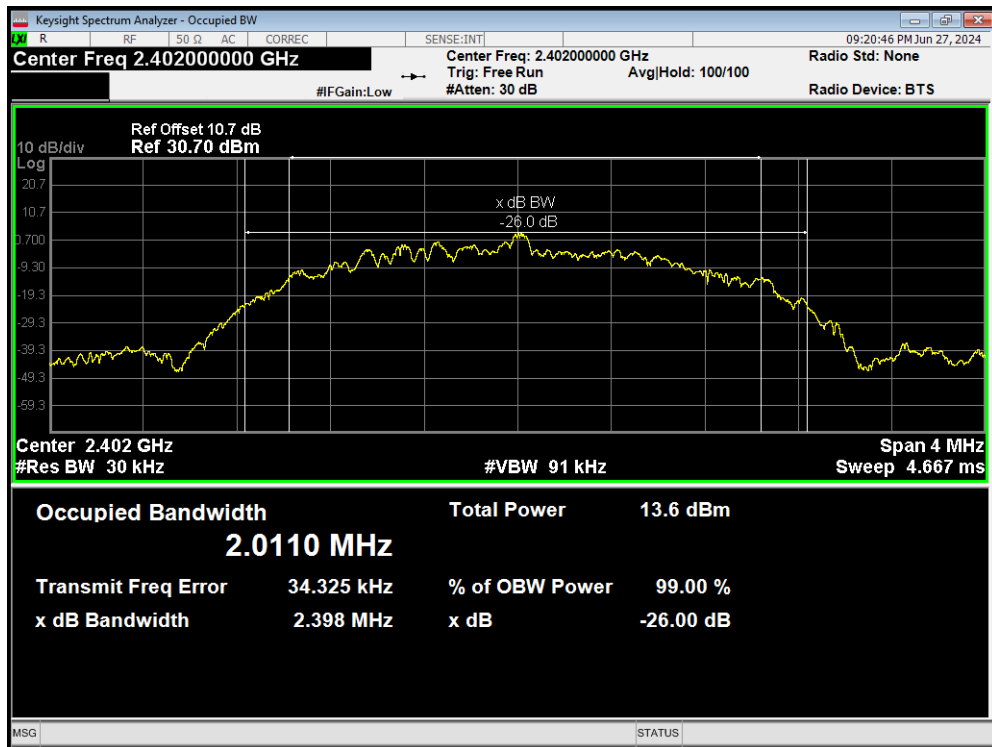
OBW BLE (1M) 2440MHz



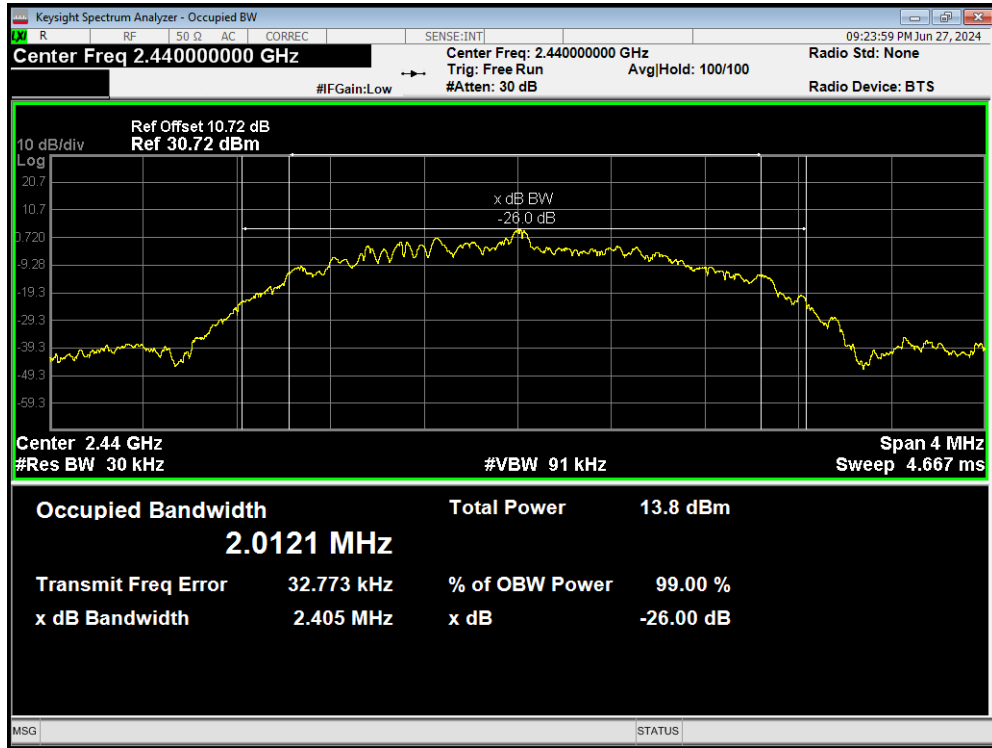
OBW BLE (1M) 2480MHz



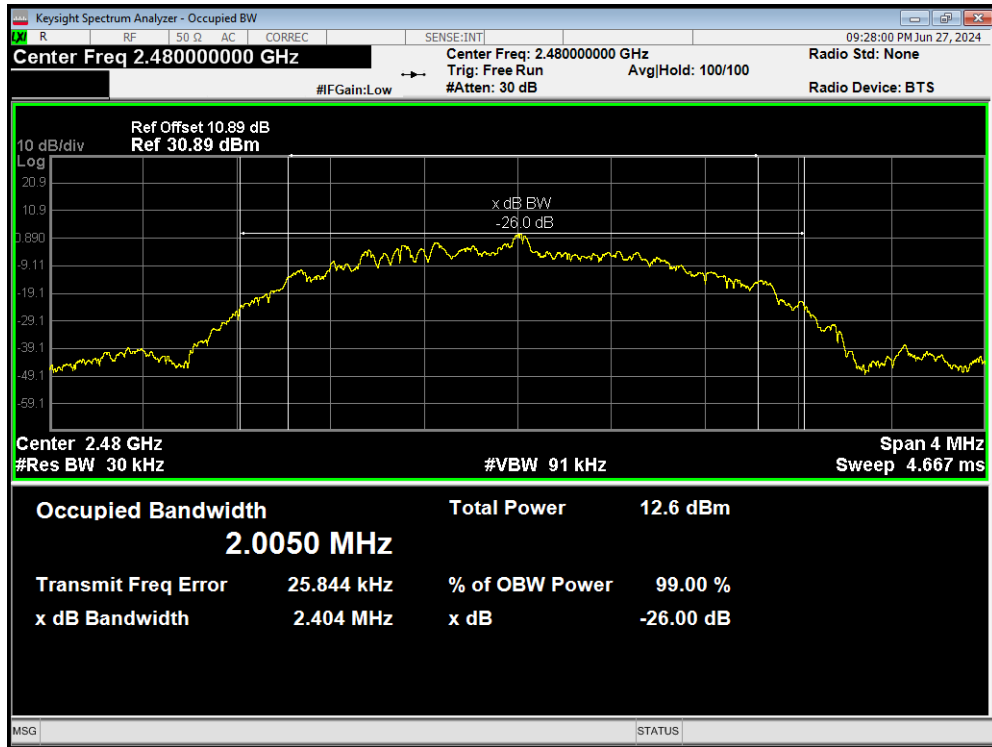
OBW BLE (2M) 2402MHz



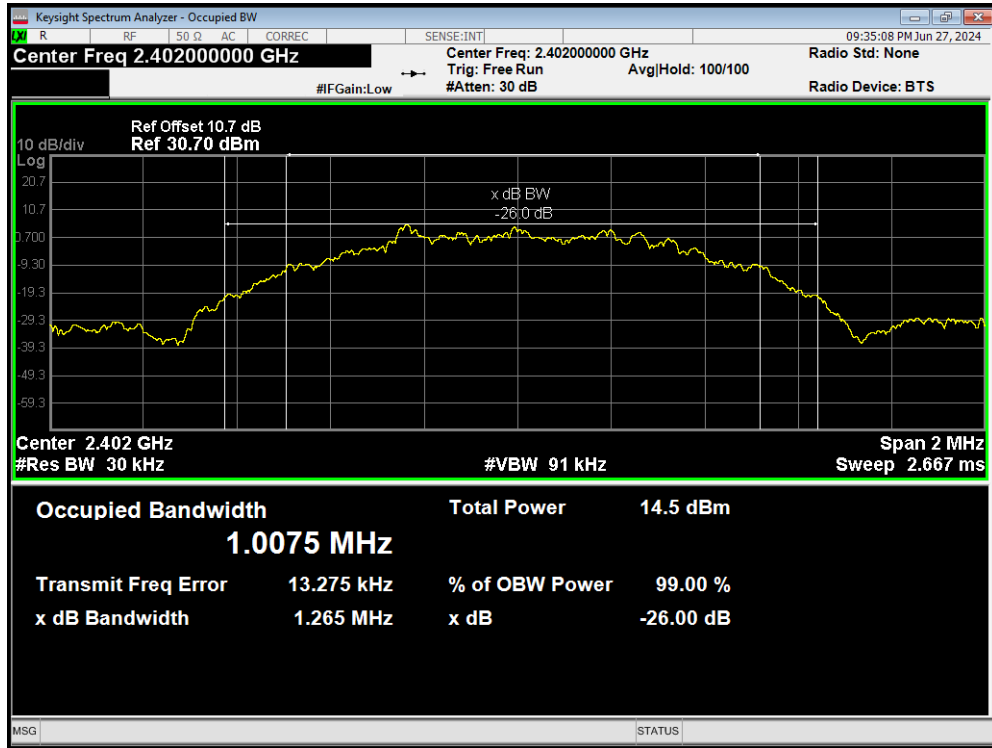
OBW BLE (2M) 2440MHz



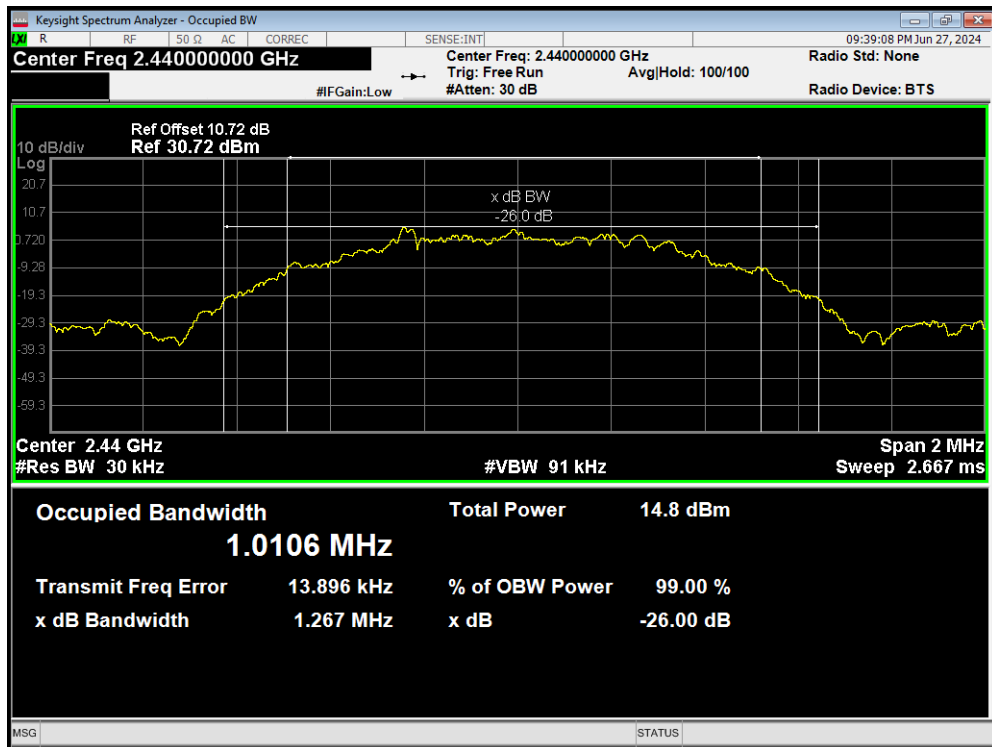
OBW BLE (2M) 2480MHz



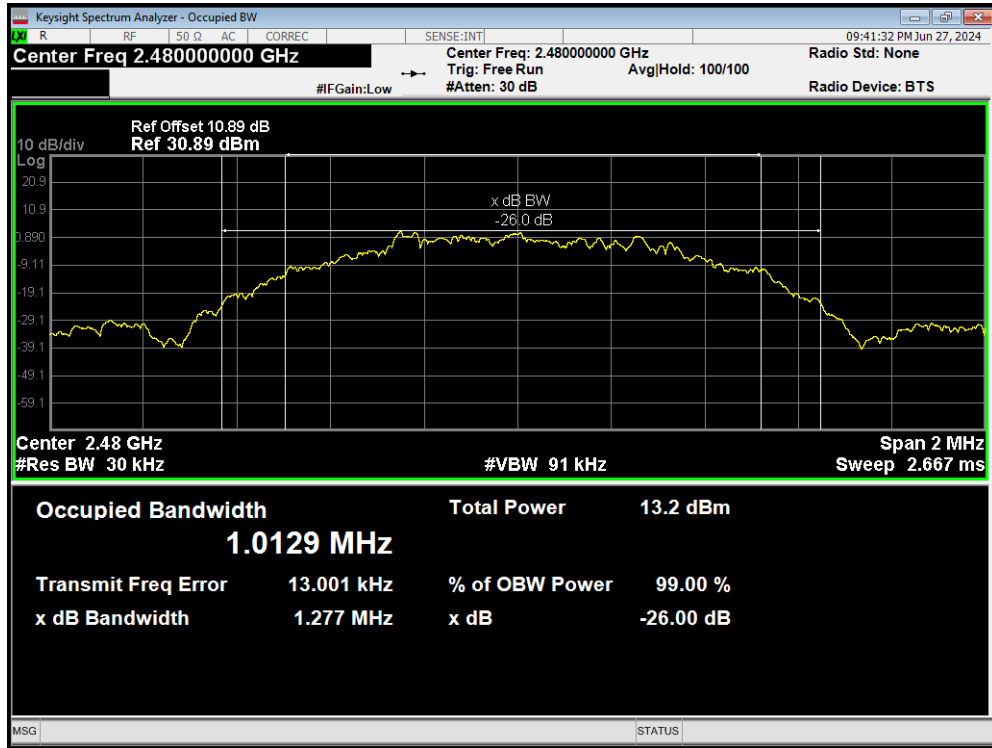
OBW S=2 2402MHz



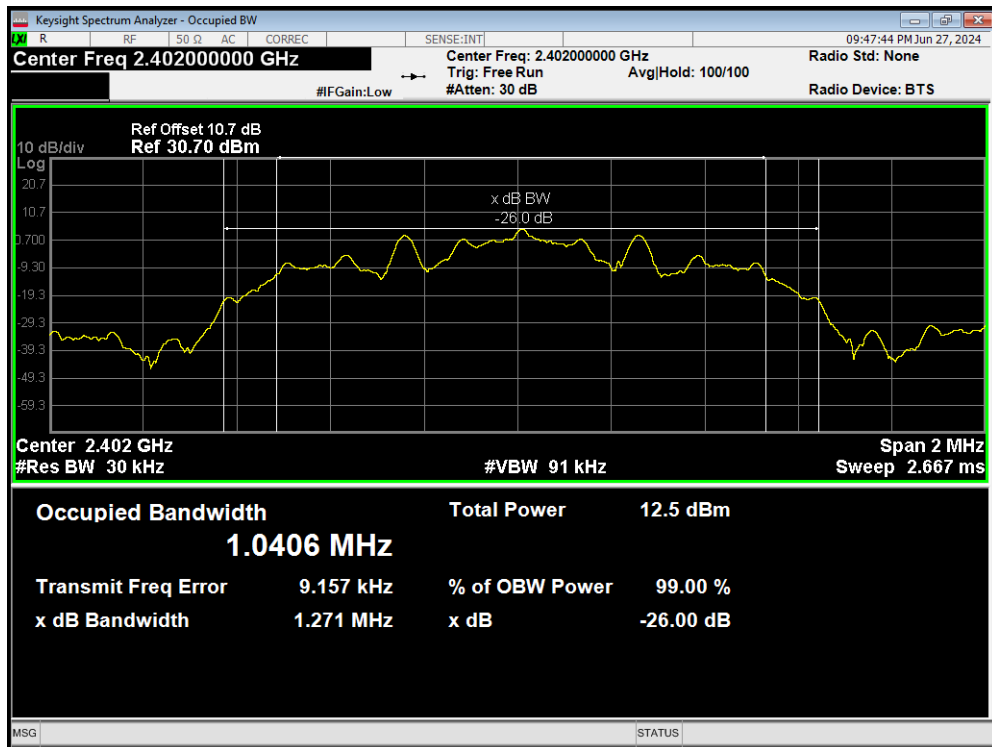
OBW S=2 2440MHz



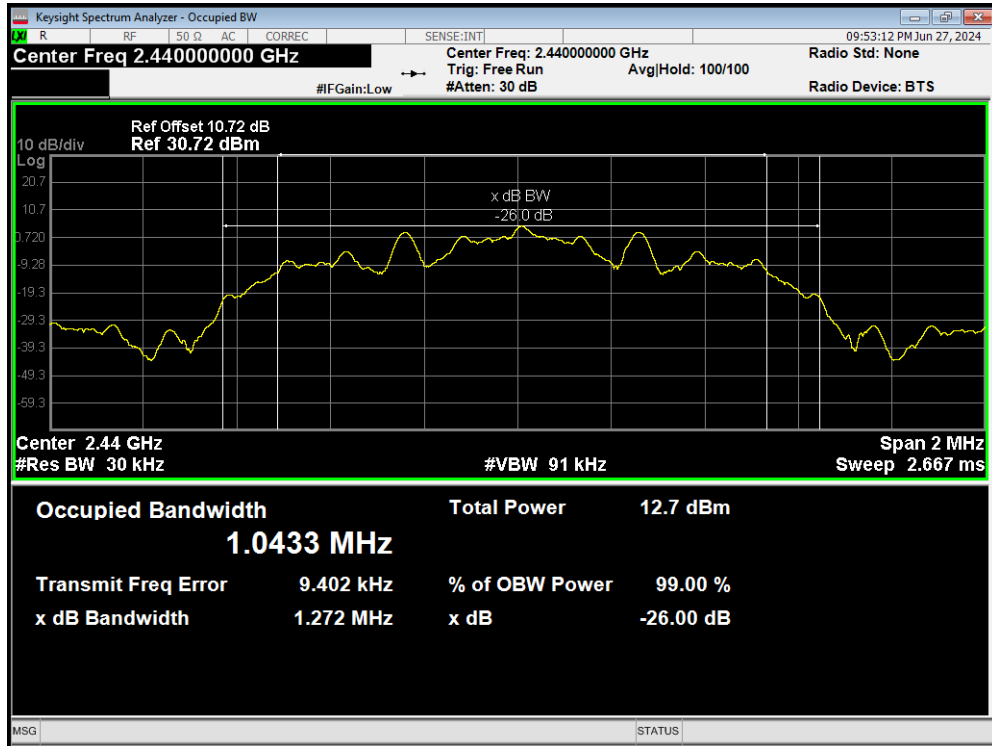
OBW S=2 2480MHz



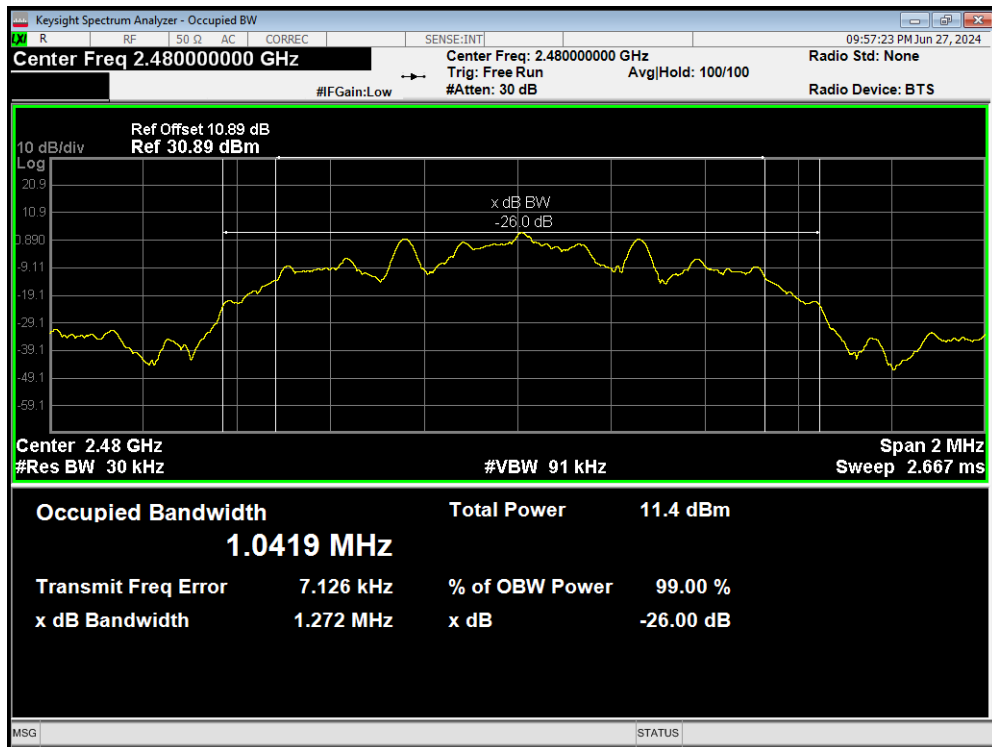
OBW S=8 2402MHz



OBW S=8 2440MHz

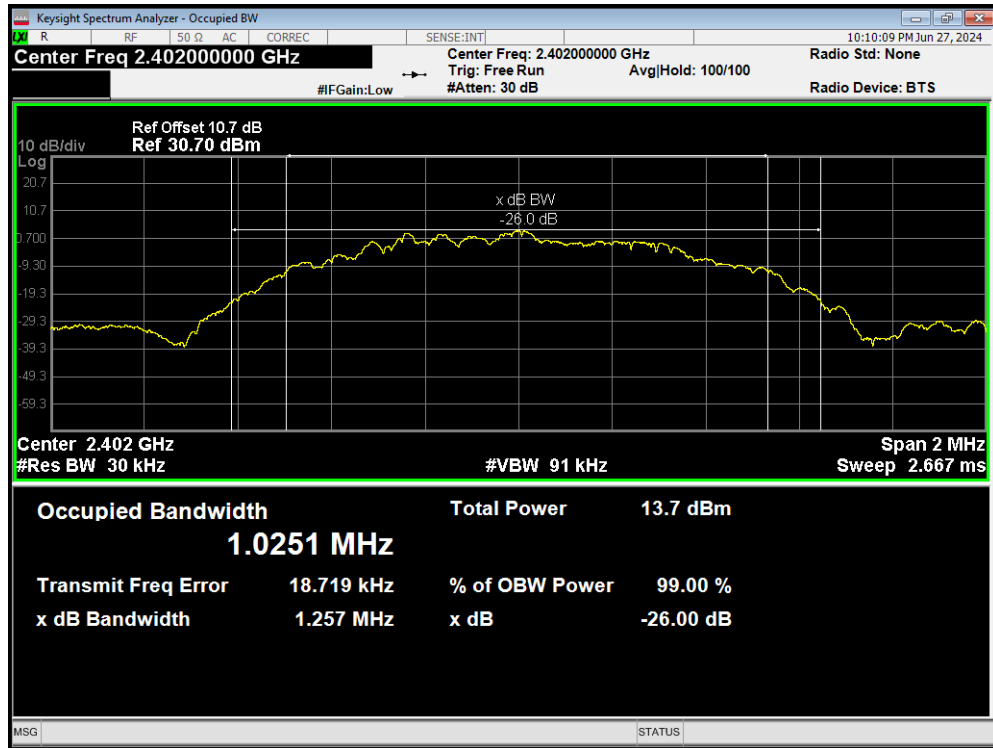


OBW S=8 2480MHz

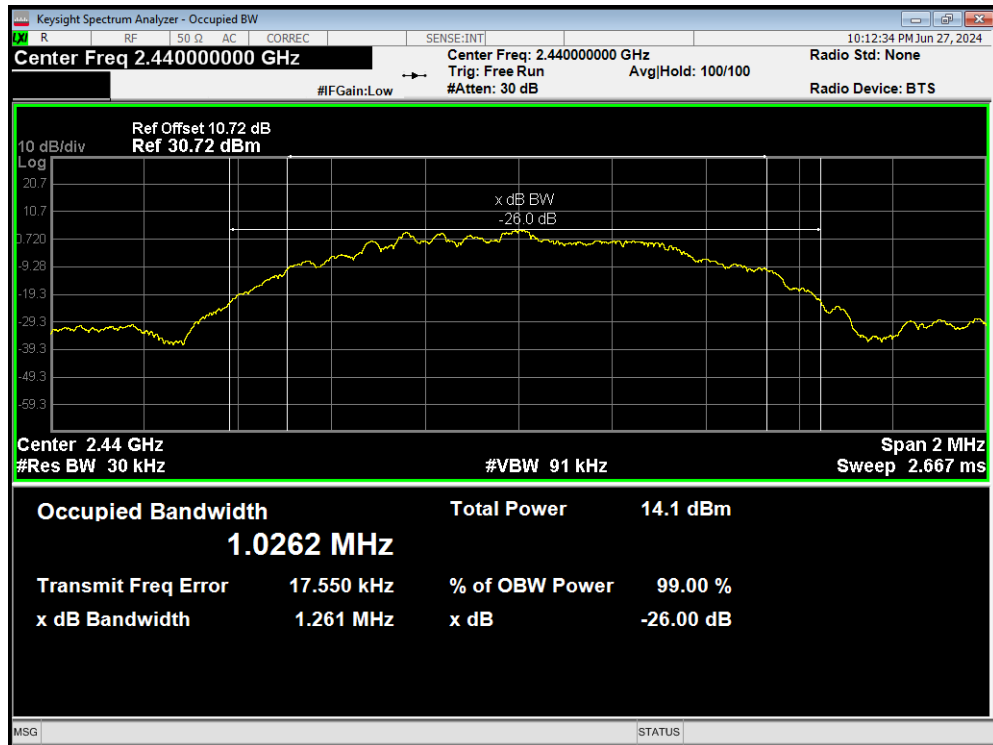


Antenna 2

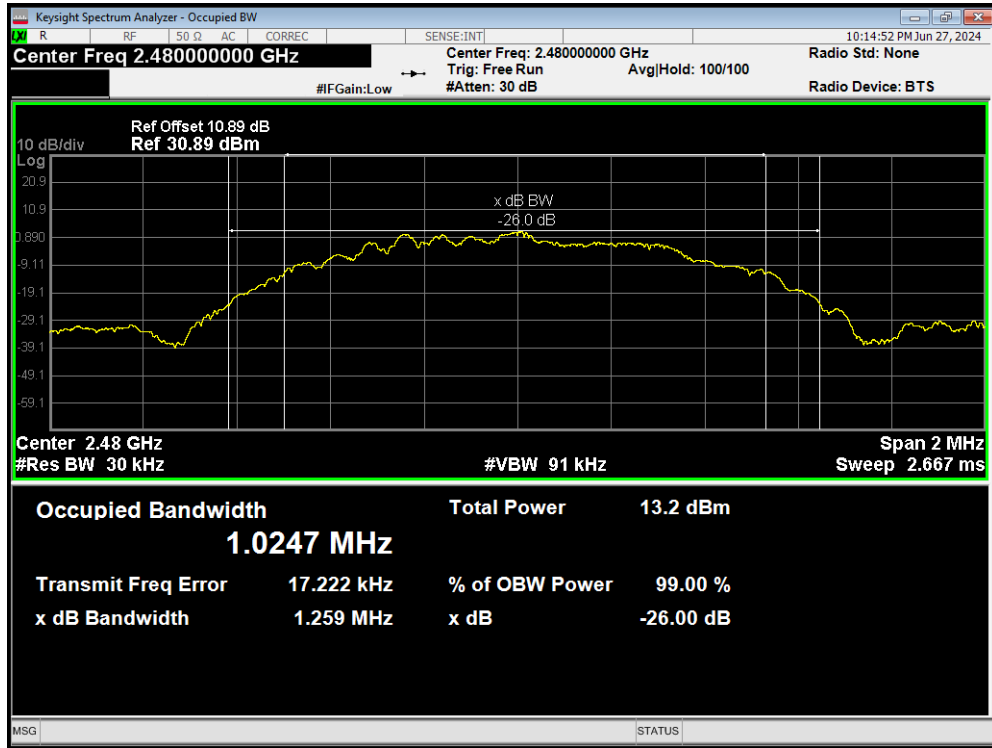
OBW BLE (1M) 2402MHz



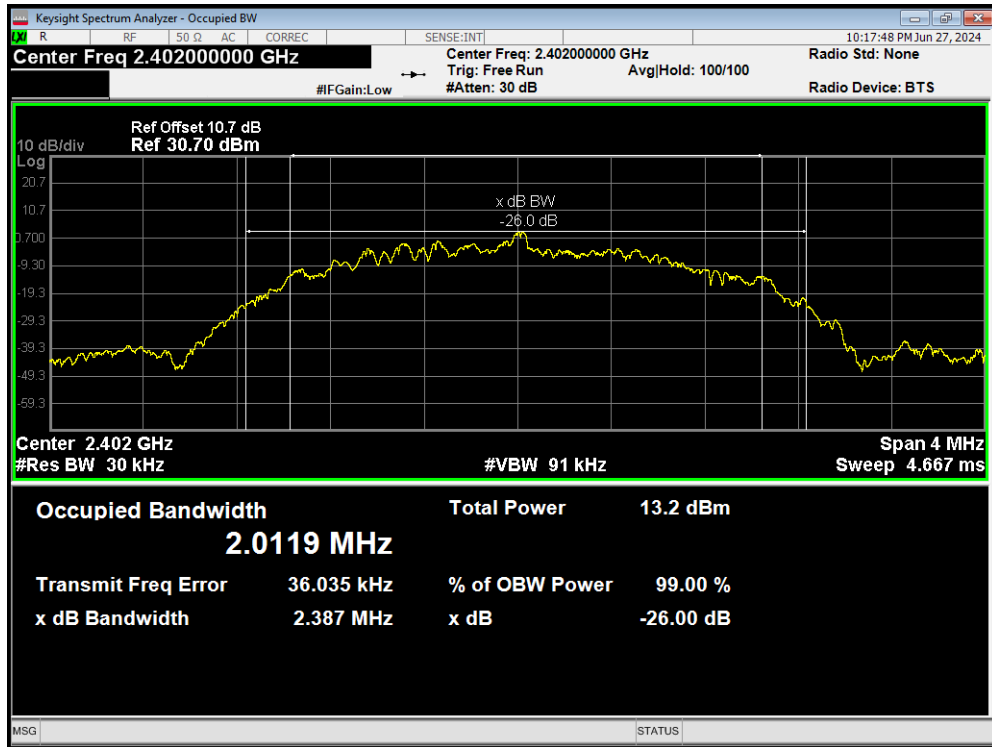
OBW BLE (1M) 2440MHz



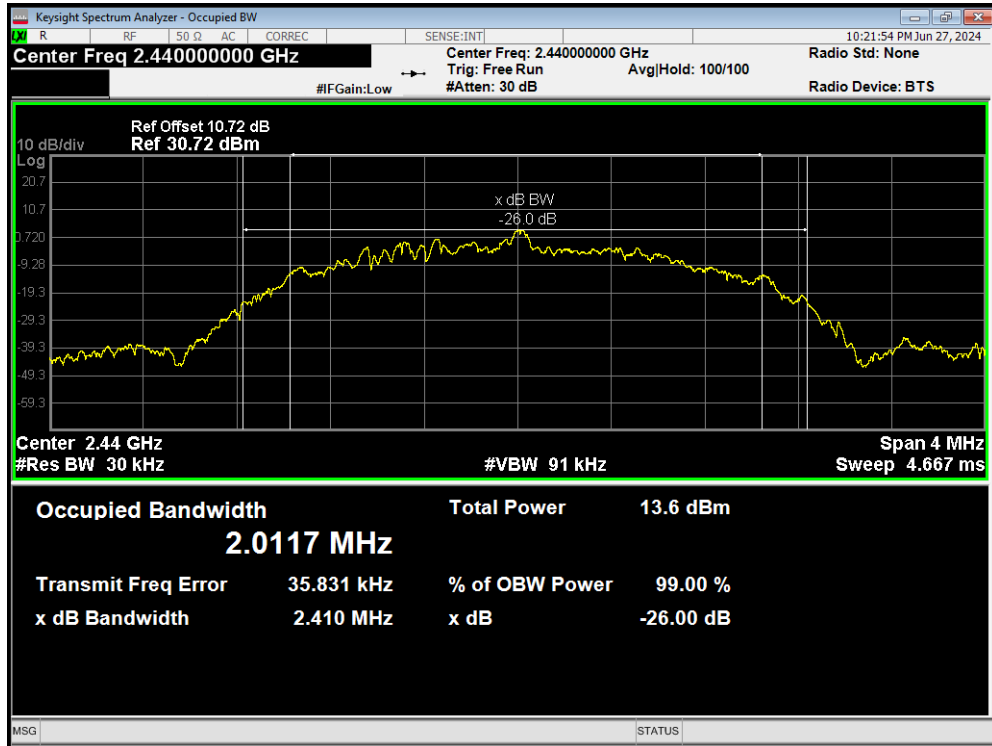
OBW BLE (1M) 2480MHz



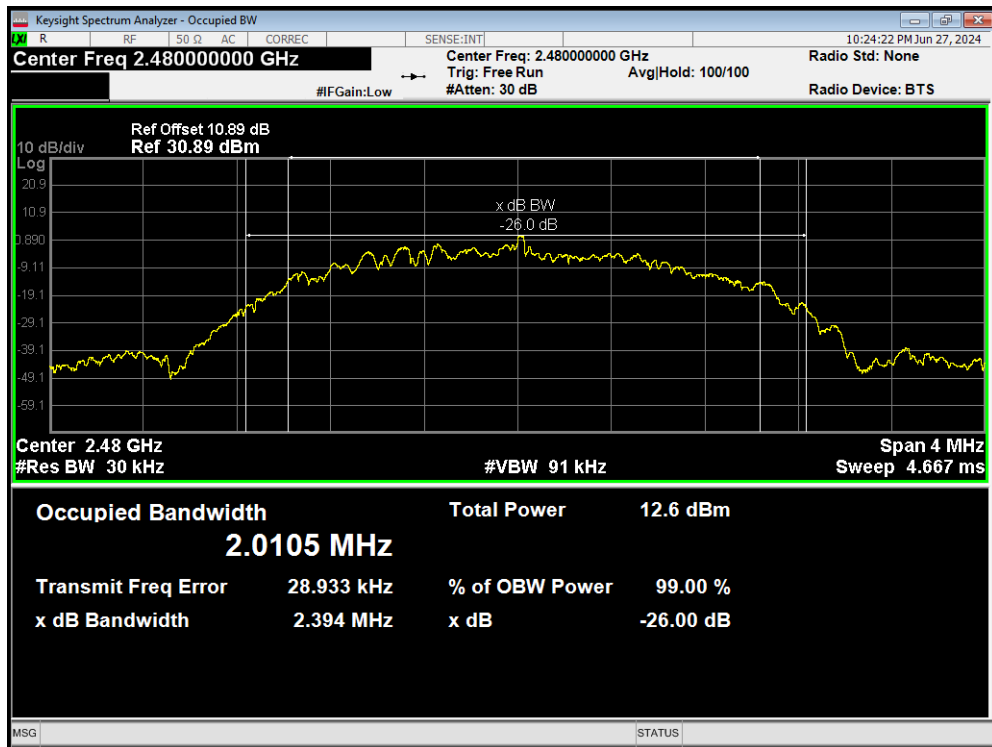
OBW BLE (2M) 2402MHz



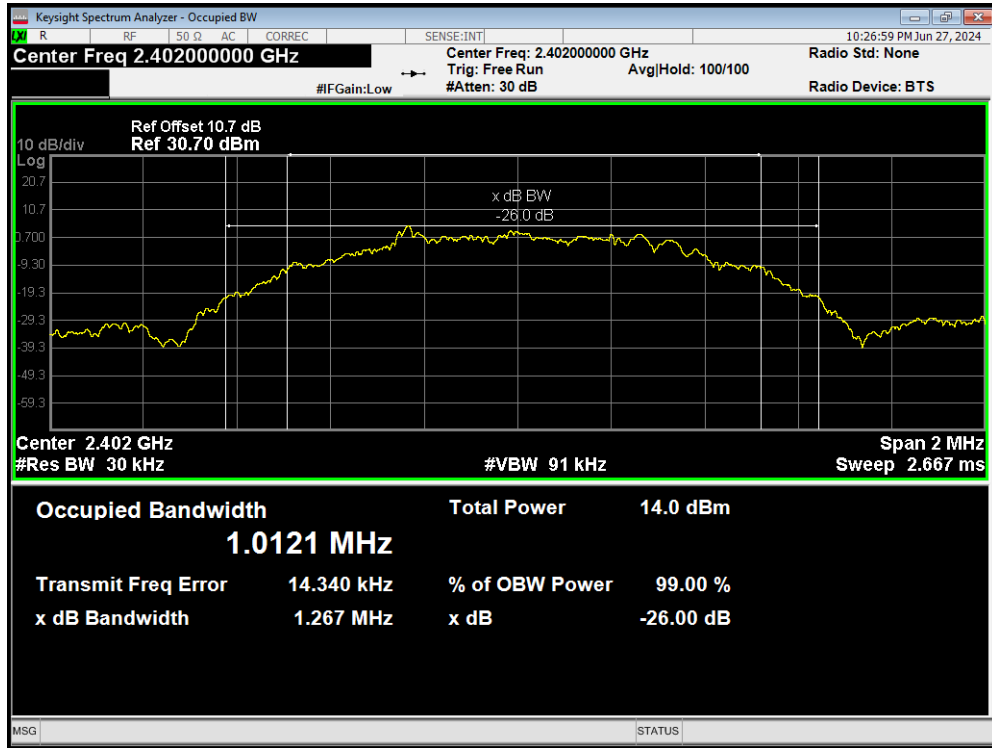
OBW BLE (2M) 2440MHz



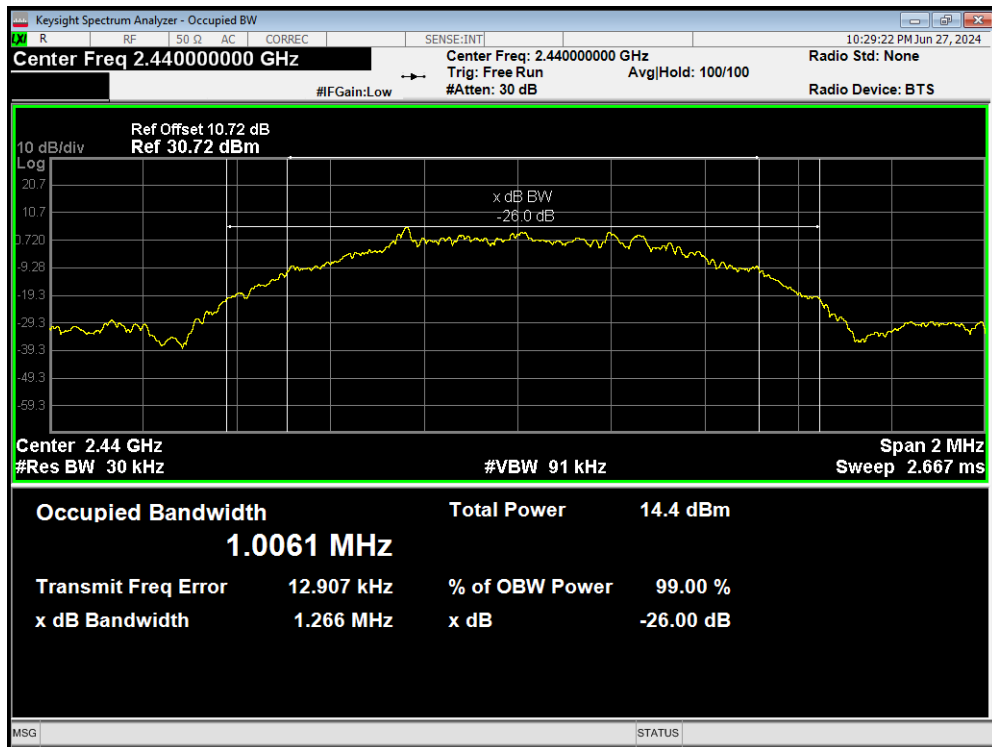
OBW BLE (2M) 2480MHz



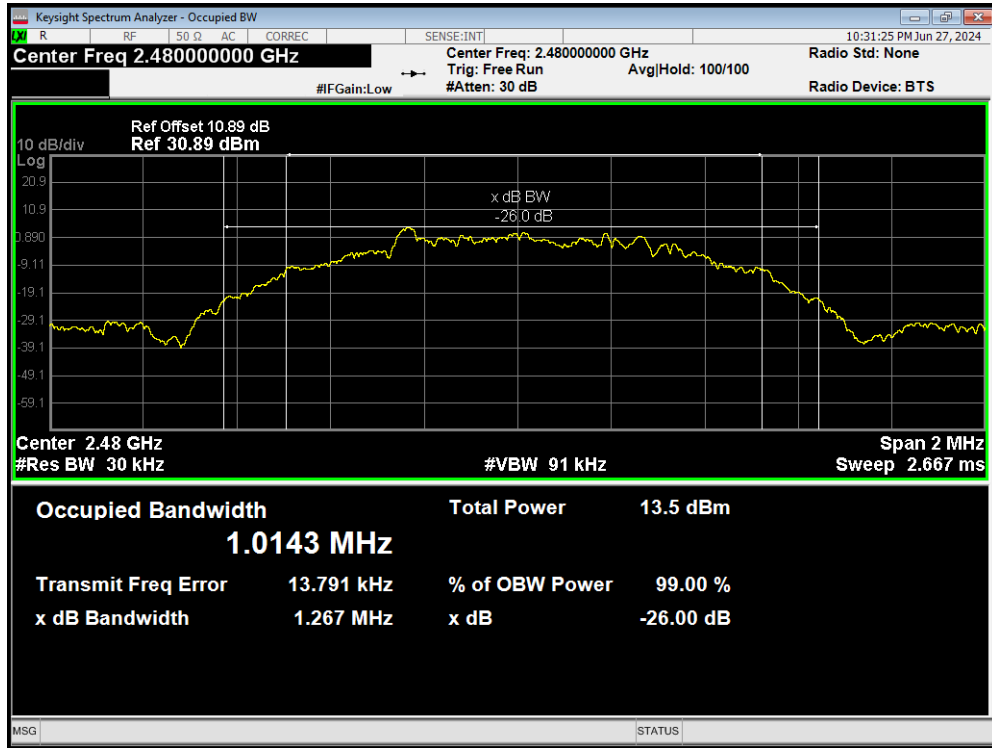
OBW S=2 2402MHz



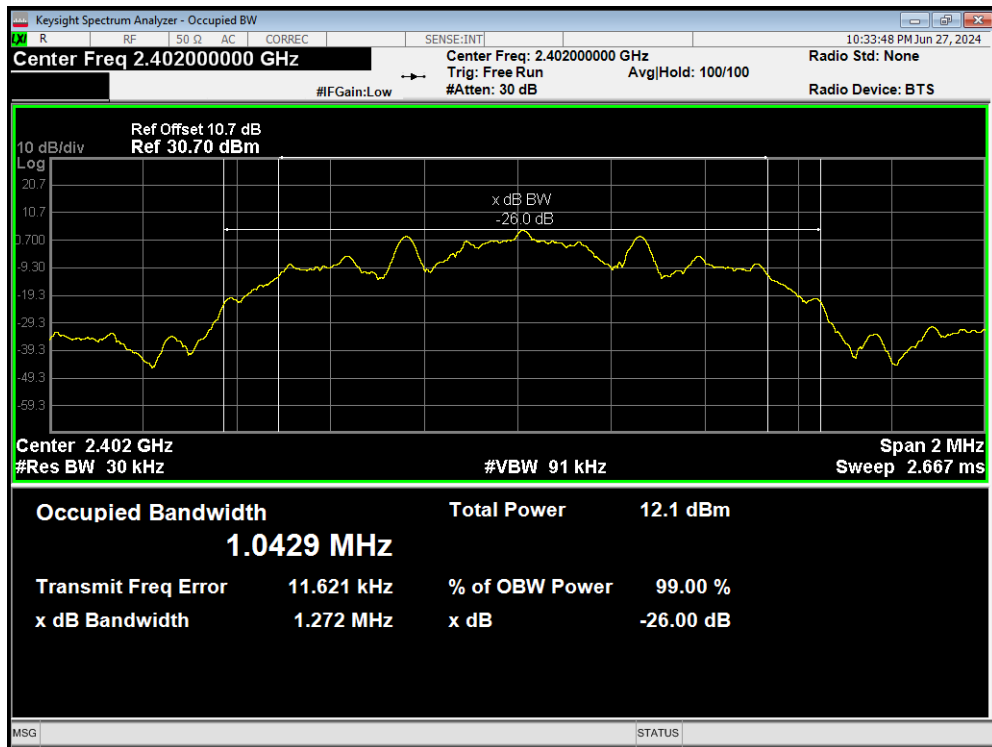
OBW S=2 2440MHz



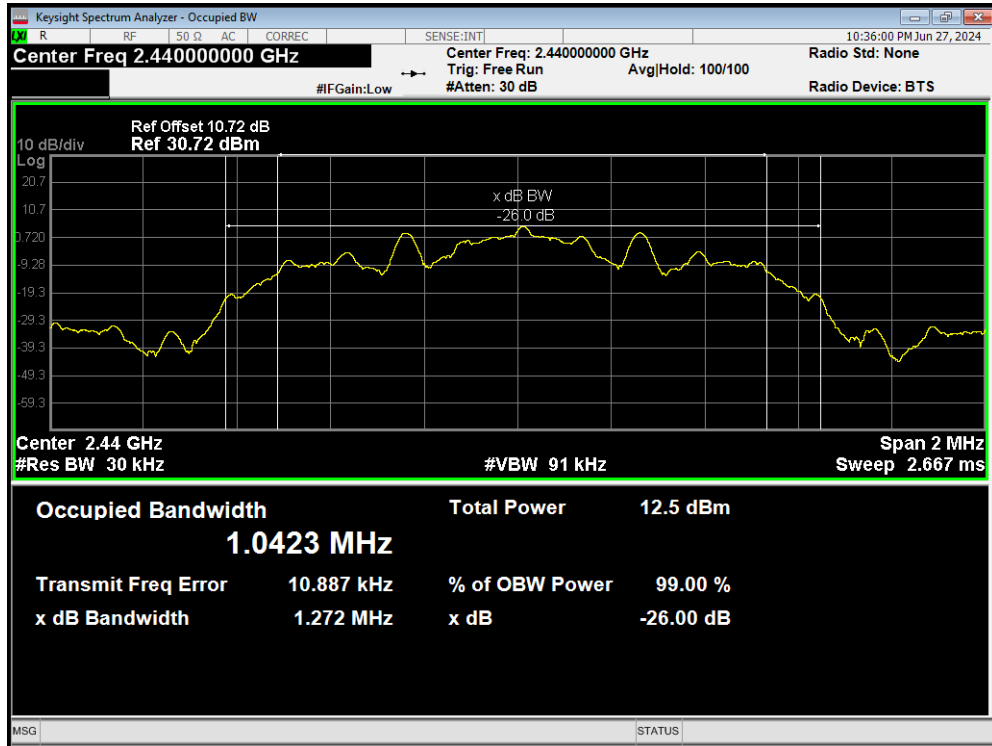
OBW S=2 2480MHz



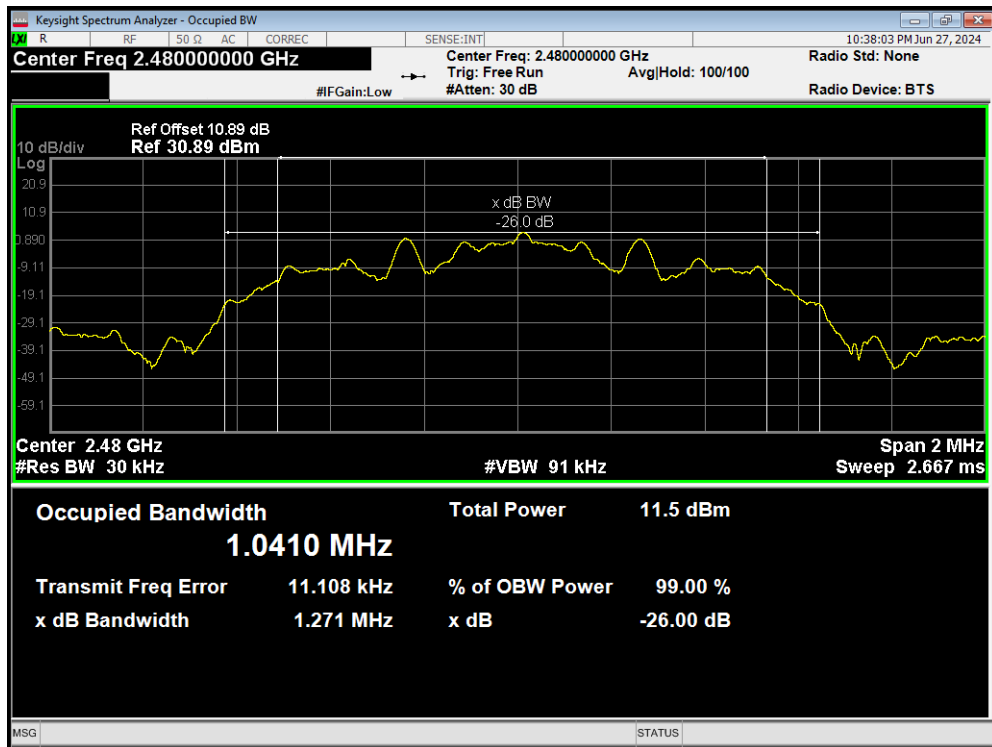
OBW S=8 2402MHz



OBW S=8 2440MHz

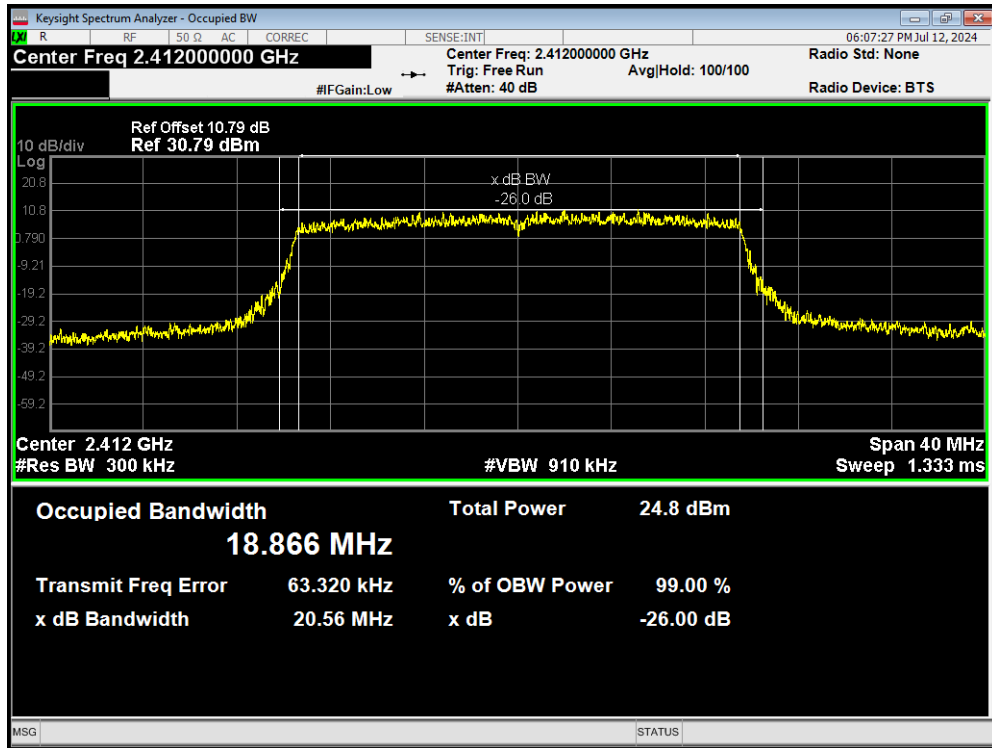


OBW S=8 2480MHz

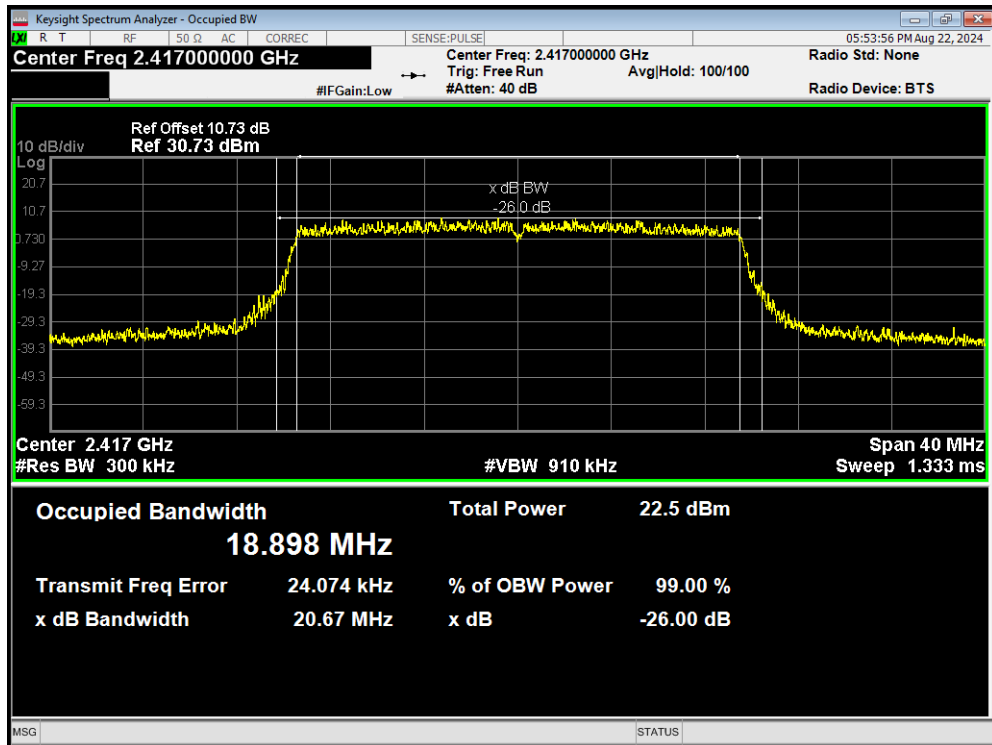


Wi-Fi 2.4G

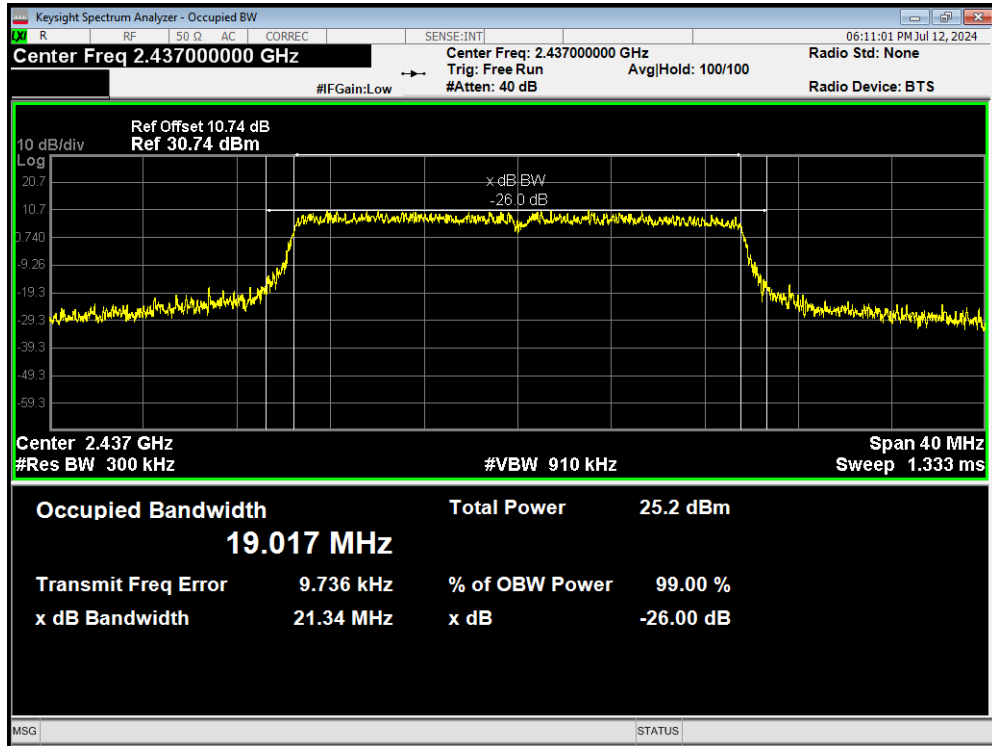
OBW 802.11ax(HE20) 2412MHz



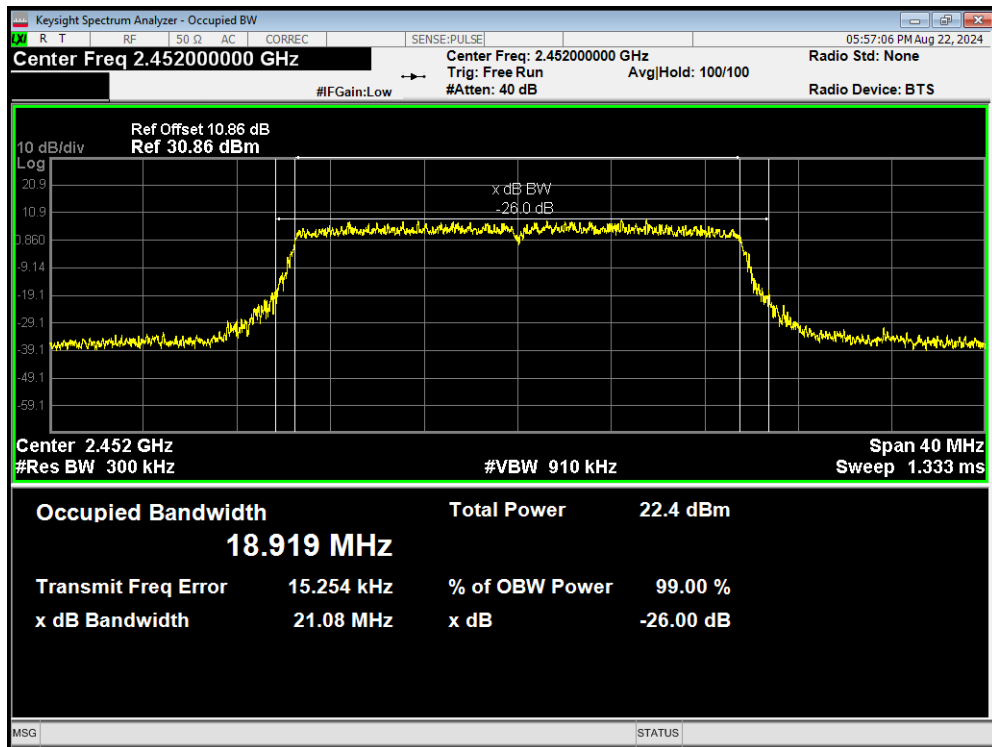
OBW 802.11ax(HE20) 2417MHz



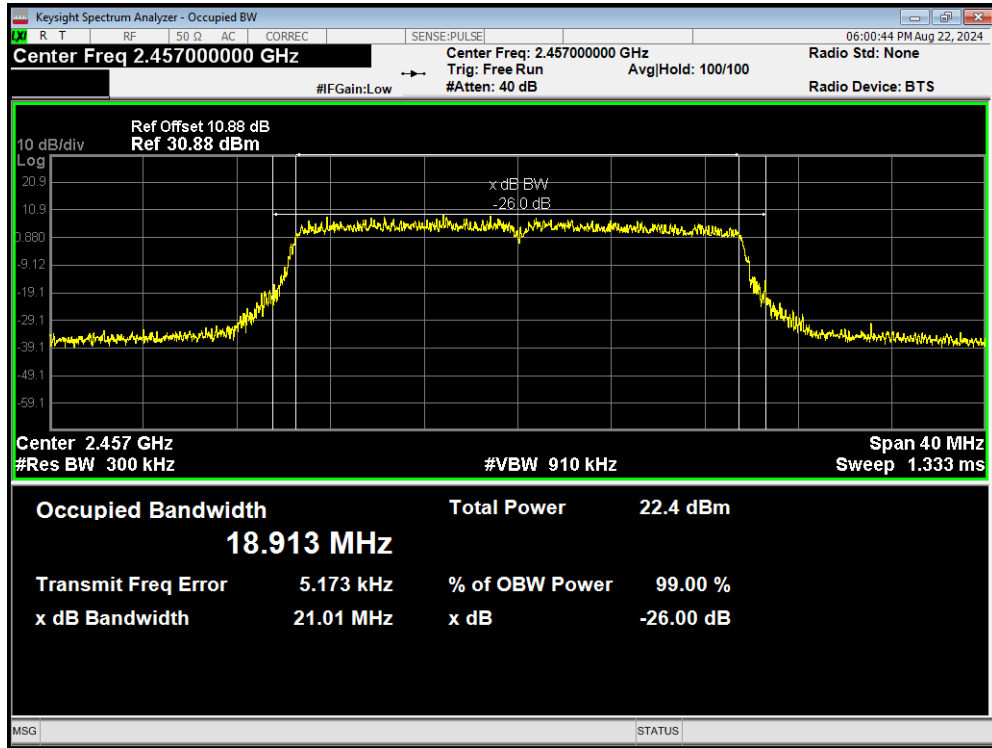
OBW 802.11ax(HE20) 2437MHz



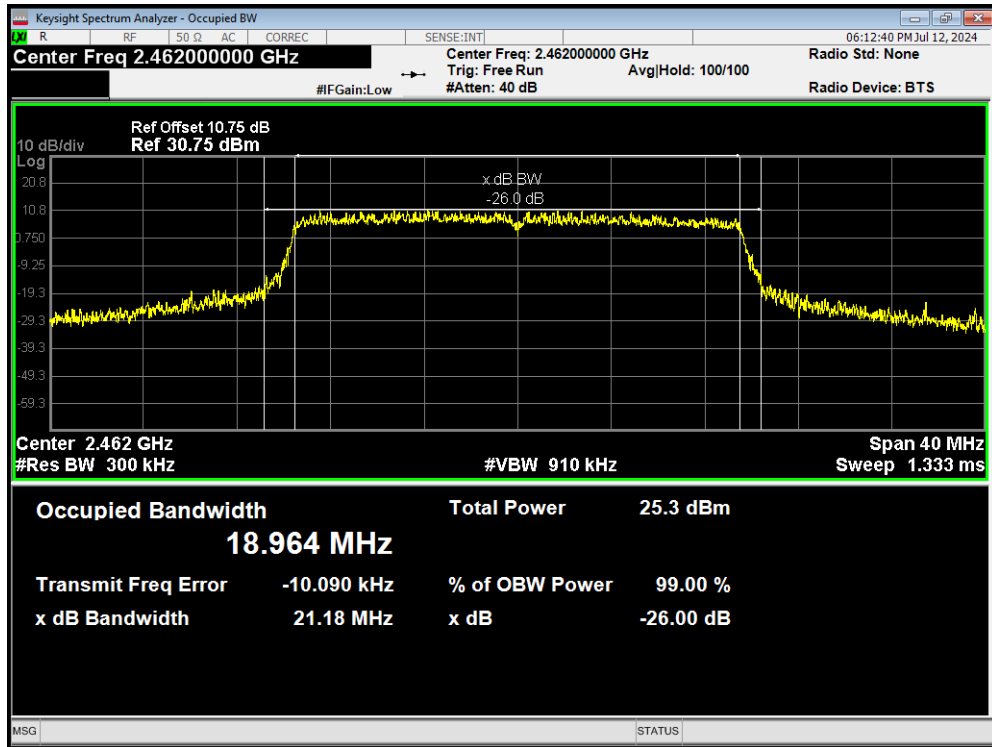
OBW 802.11ax(HE20) 2452MHz



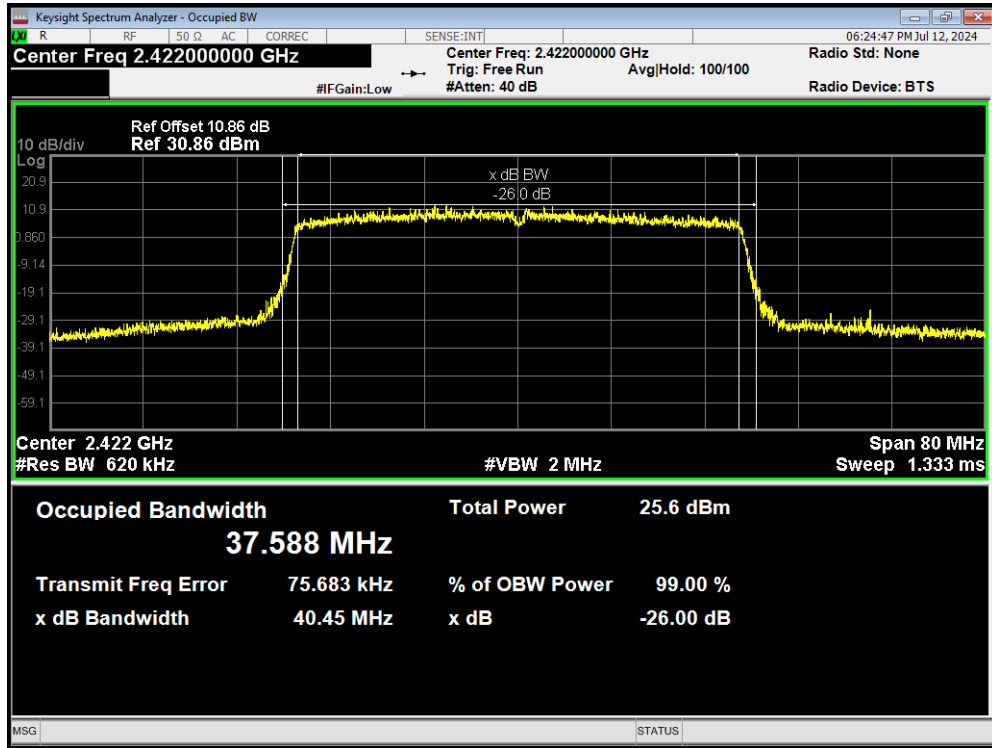
OBW 802.11ax(HE20) 2457MHz



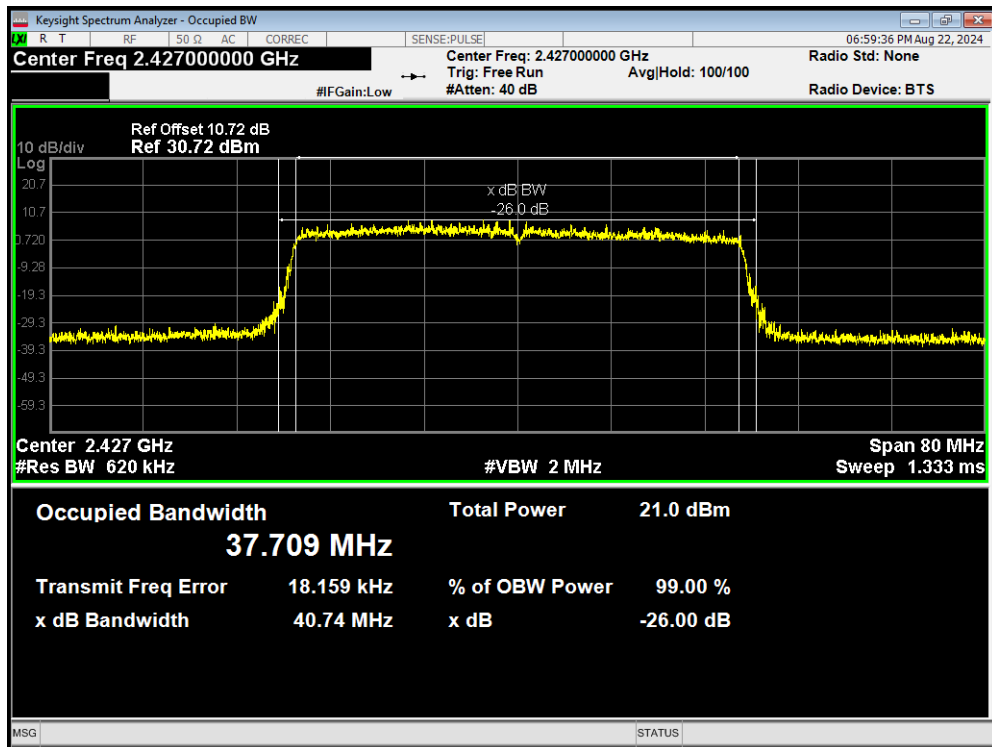
OBW 802.11ax(HE20) 2462MHz



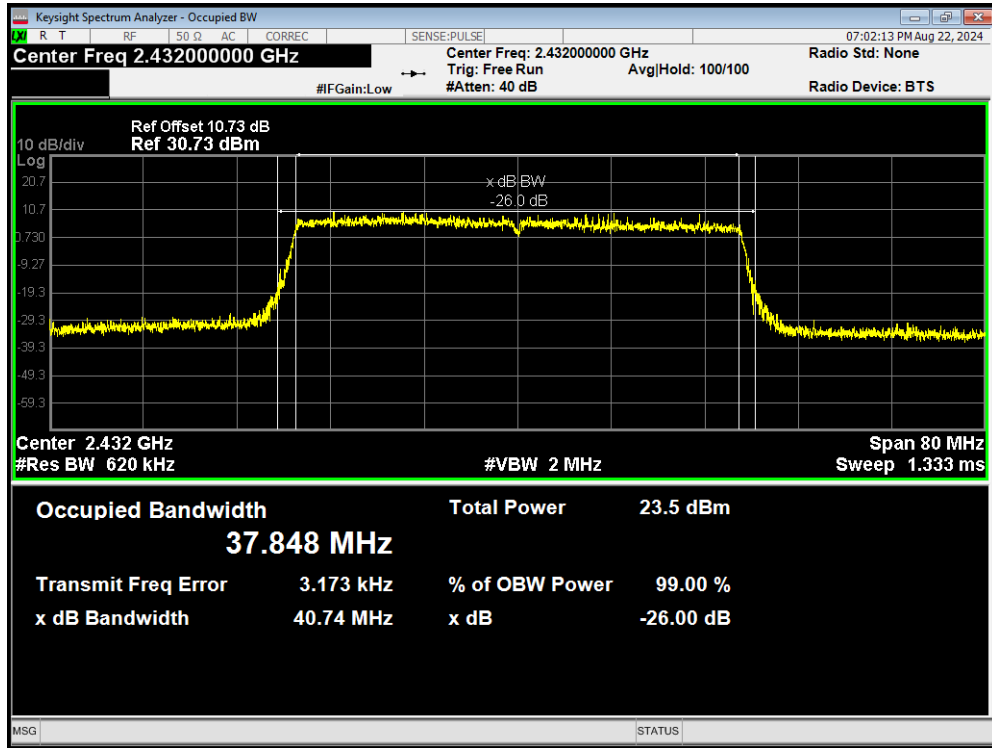
OBW 802.11ax(HE40) 2422MHz



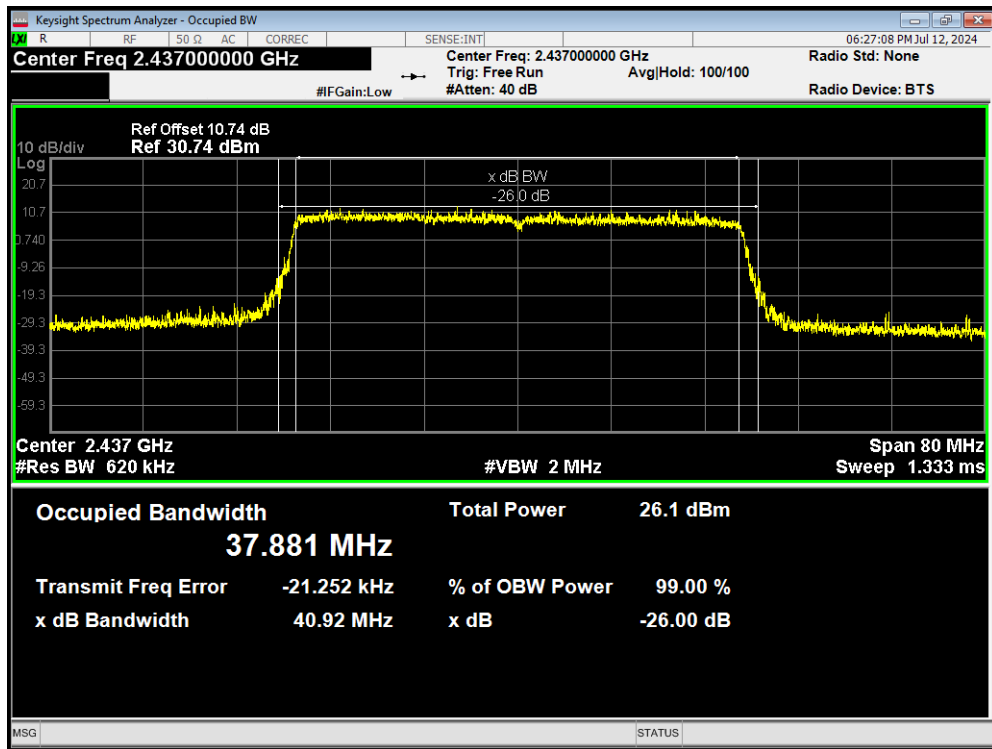
OBW 802.11ax(HE40) 2427MHz



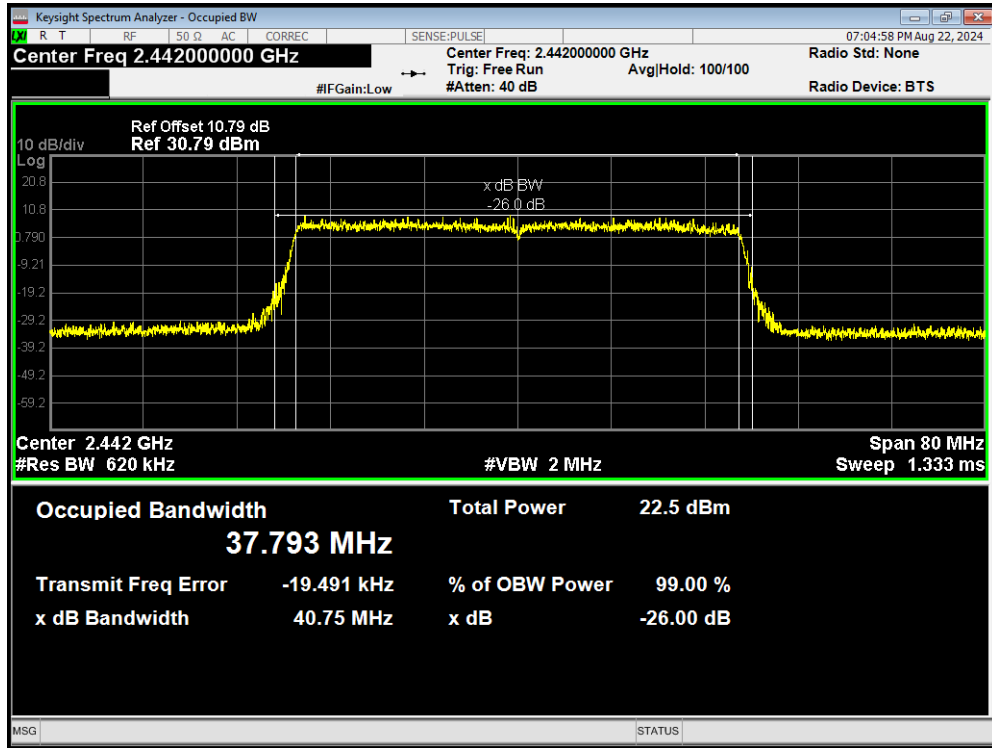
OBW 802.11ax(HE40) 2432MHz



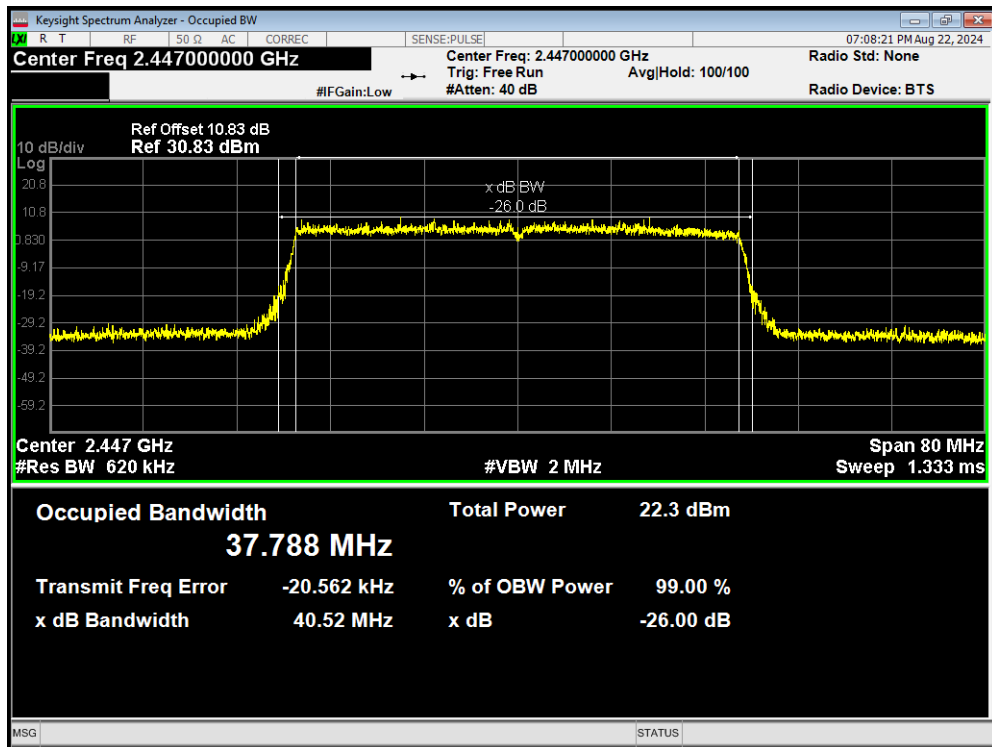
OBW 802.11ax(HE40) 2437MHz



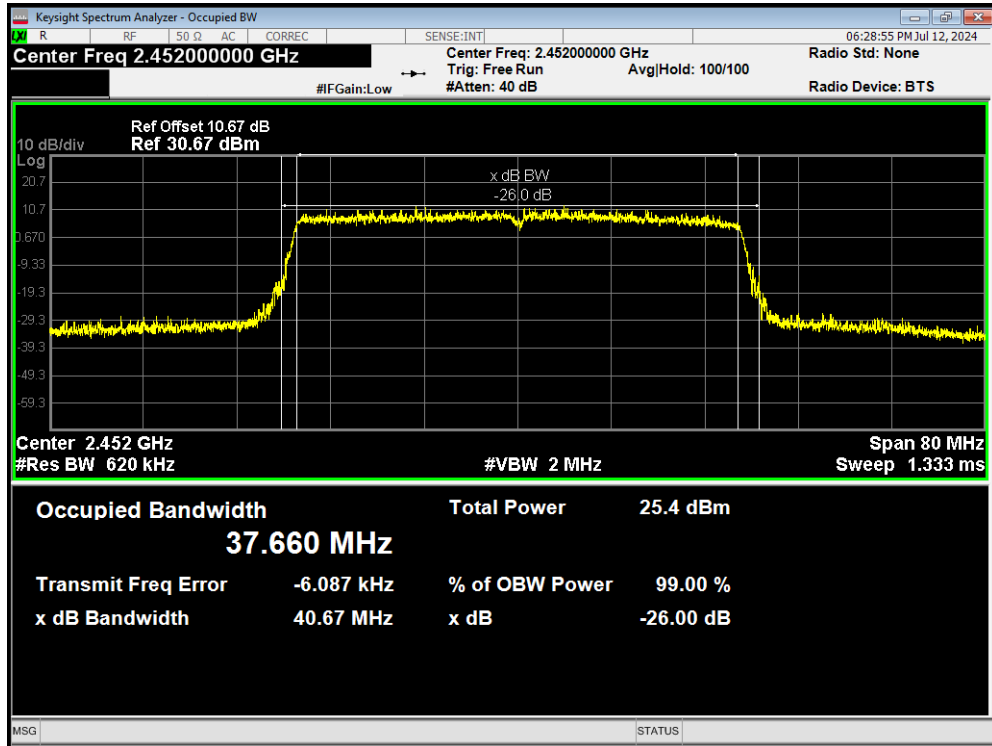
OBW 802.11ax(HE40) 2442MHz



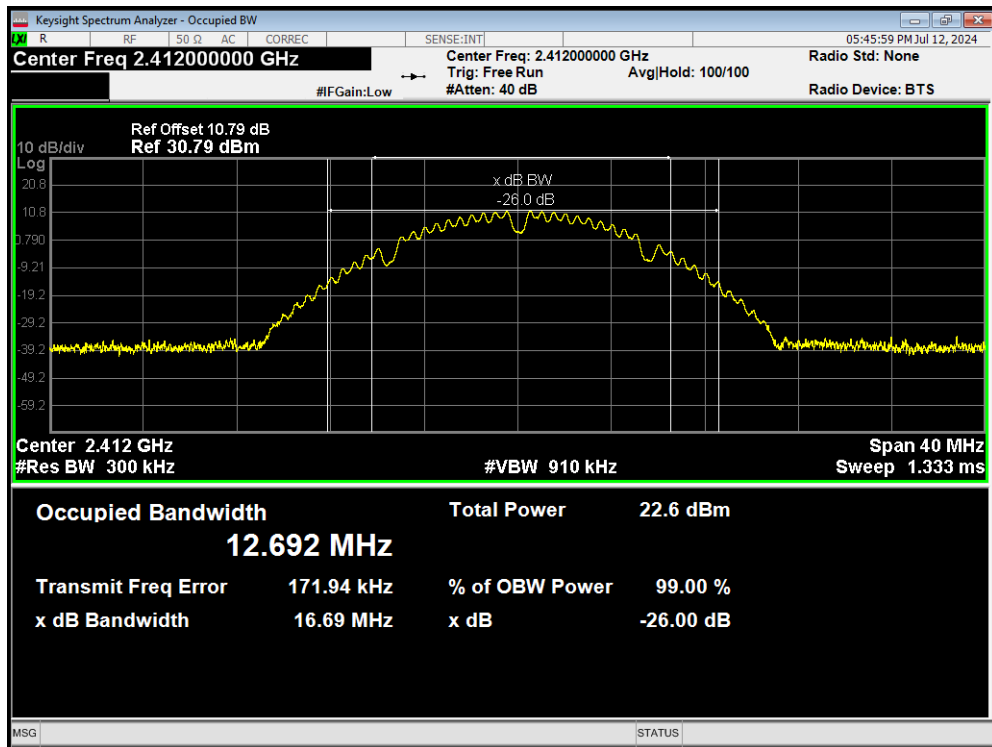
OBW 802.11ax(HE40) 2447MHz



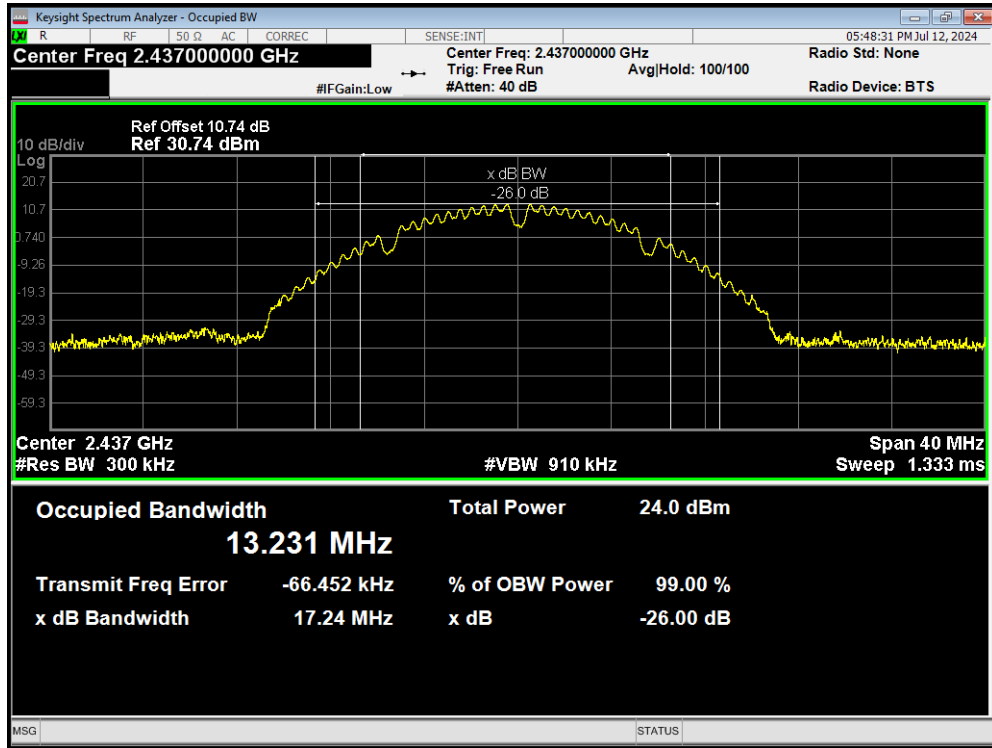
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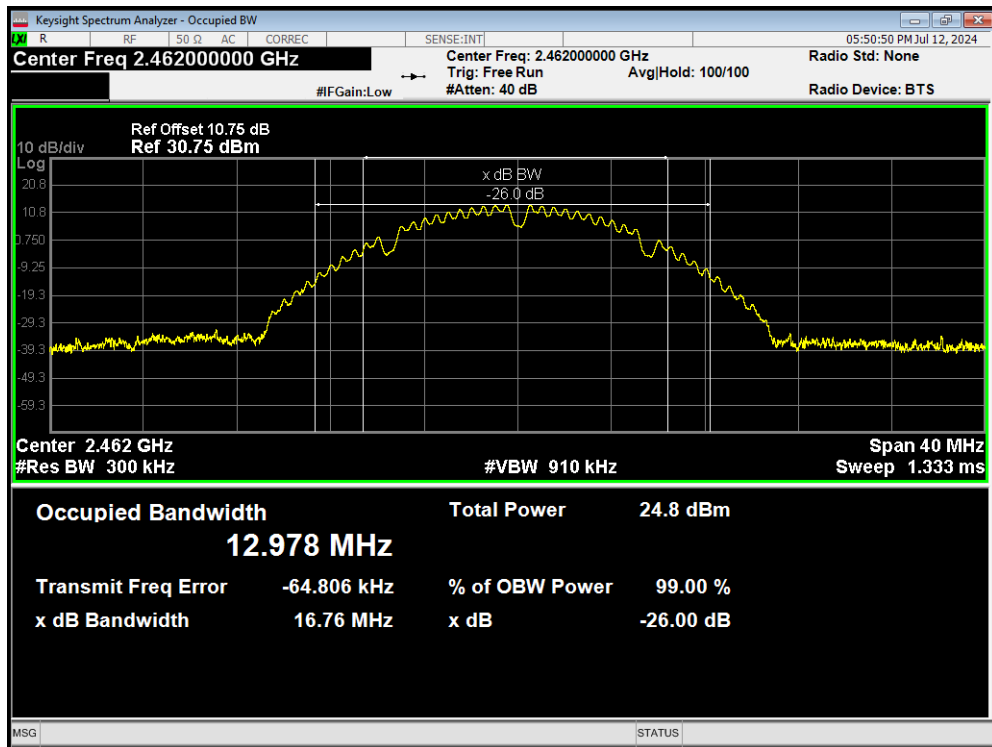
OBW 802.11b 2412MHz



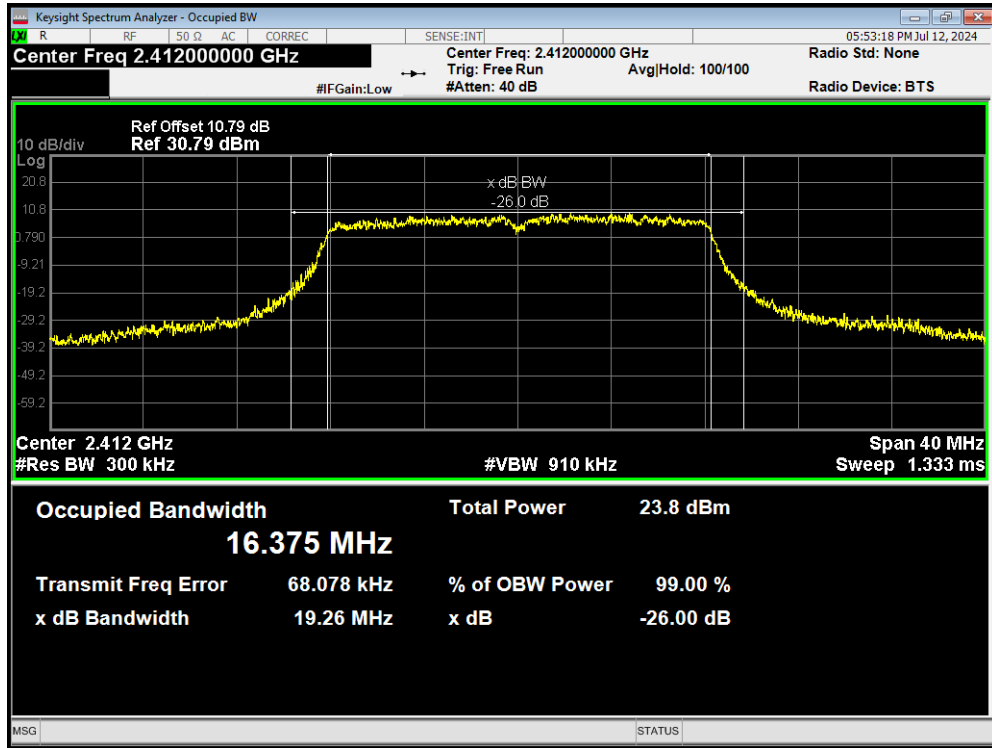
OBW 802.11b 2437MHz



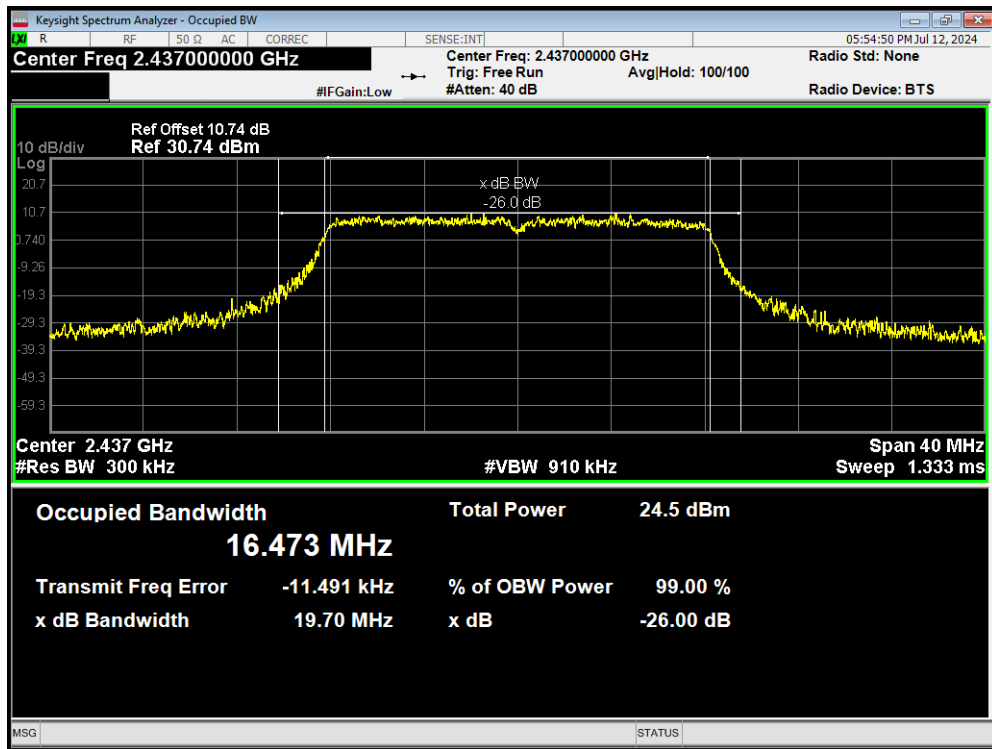
OBW 802.11b 2462MHz



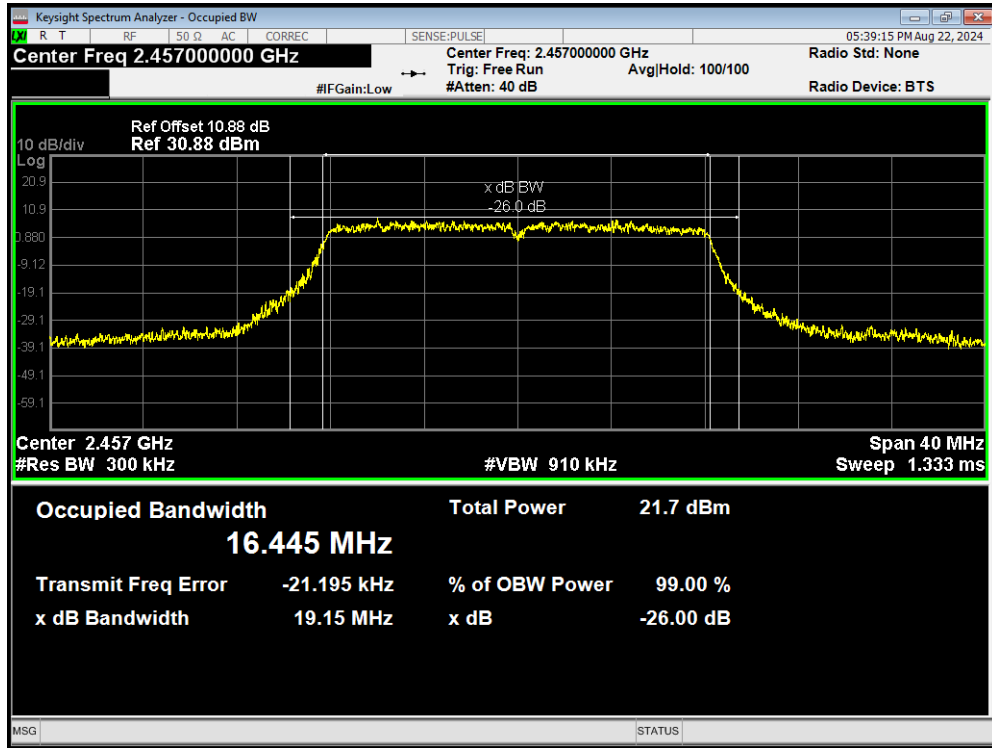
OBW 802.11g 2412MHz



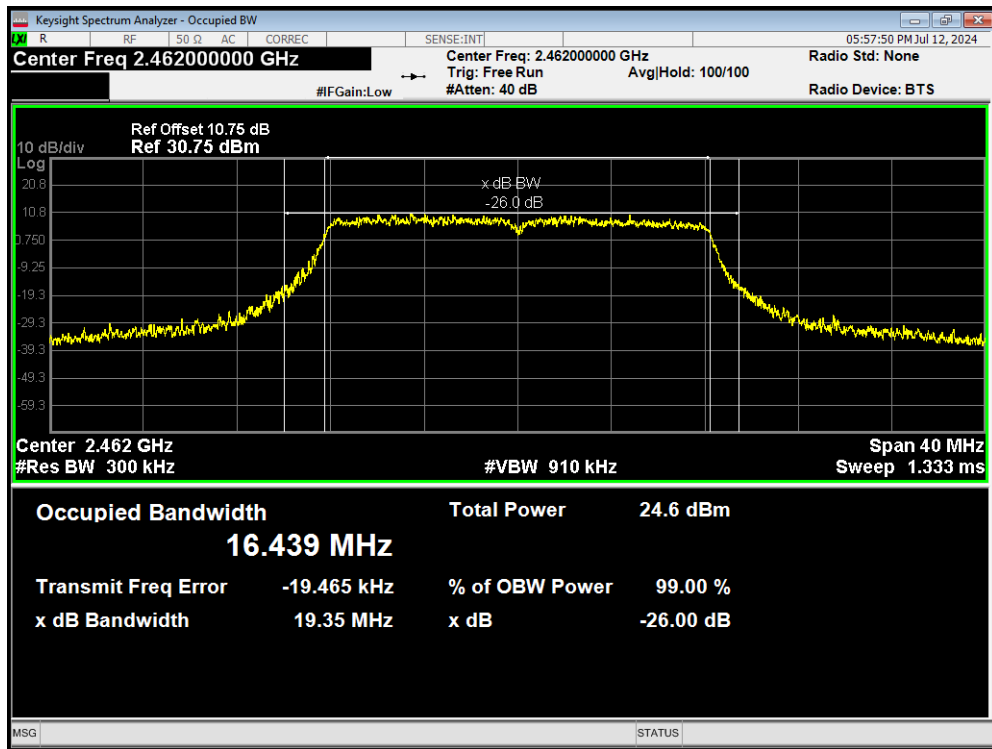
OBW 802.11g 2437MHz



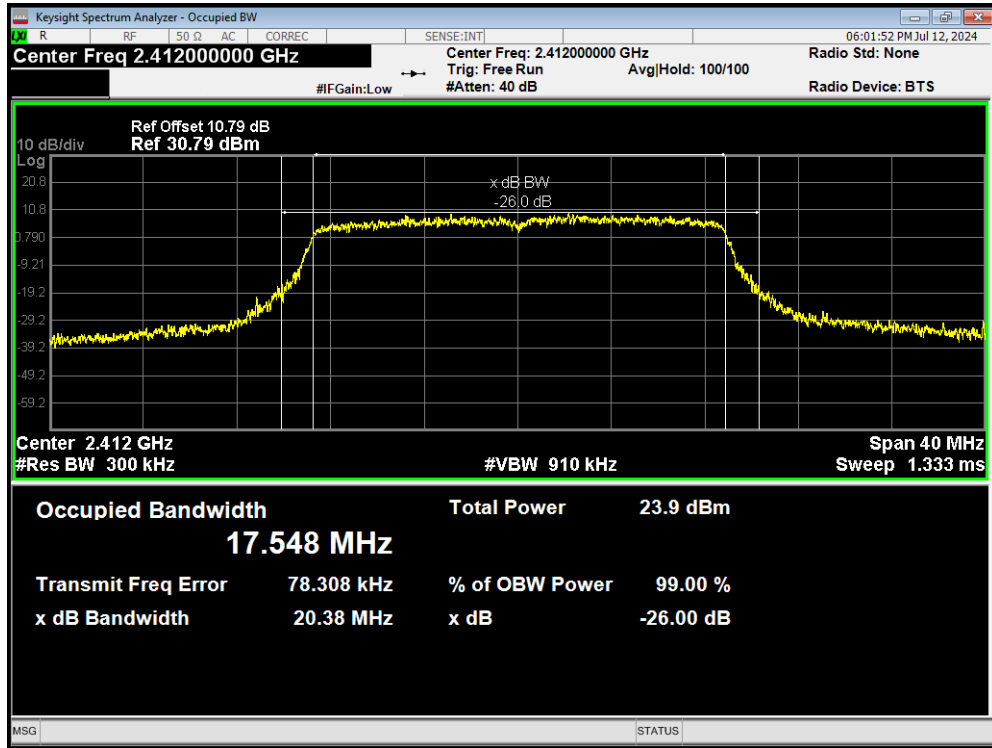
OBW 802.11g 2457MHz



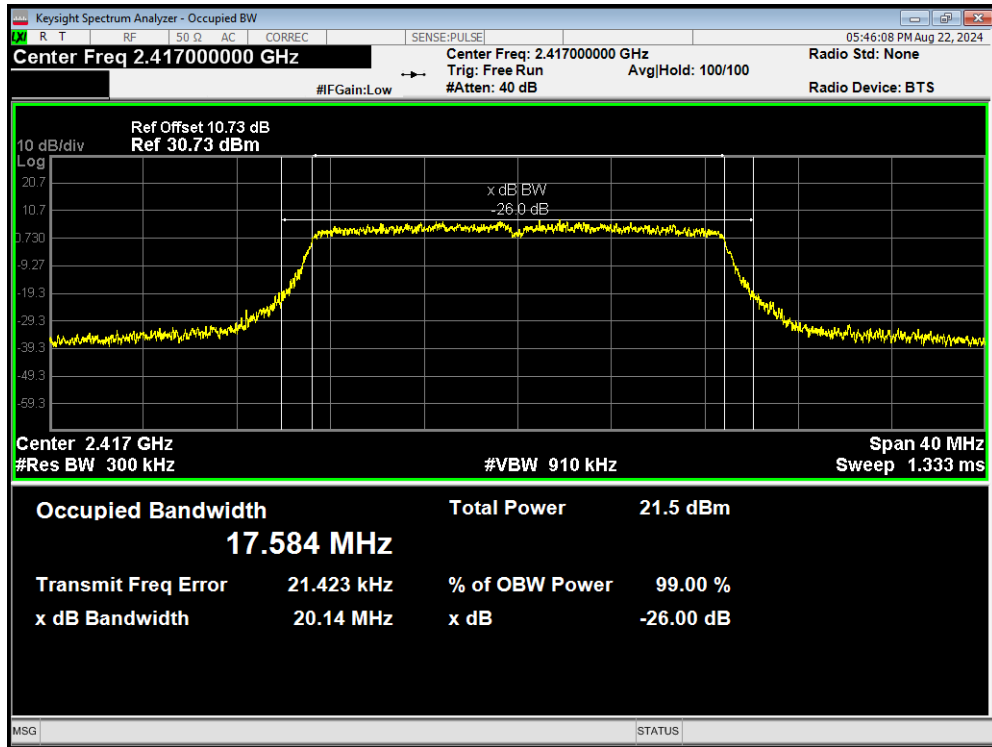
OBW 802.11g 2462MHz



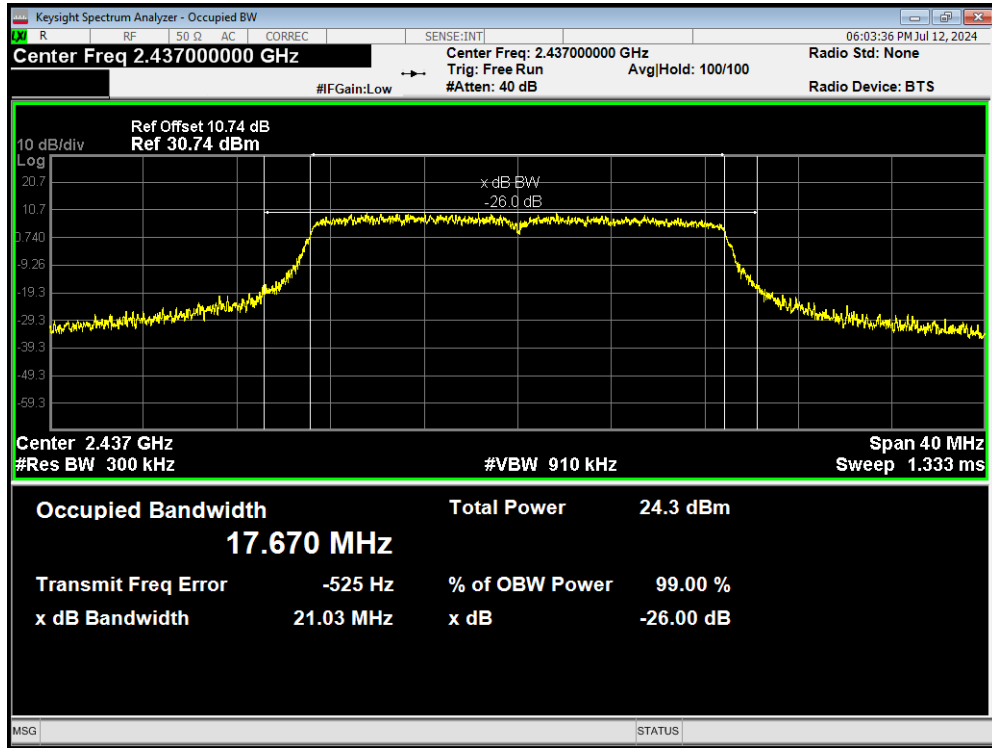
OBW 802.11n(HT20) 2412MHz



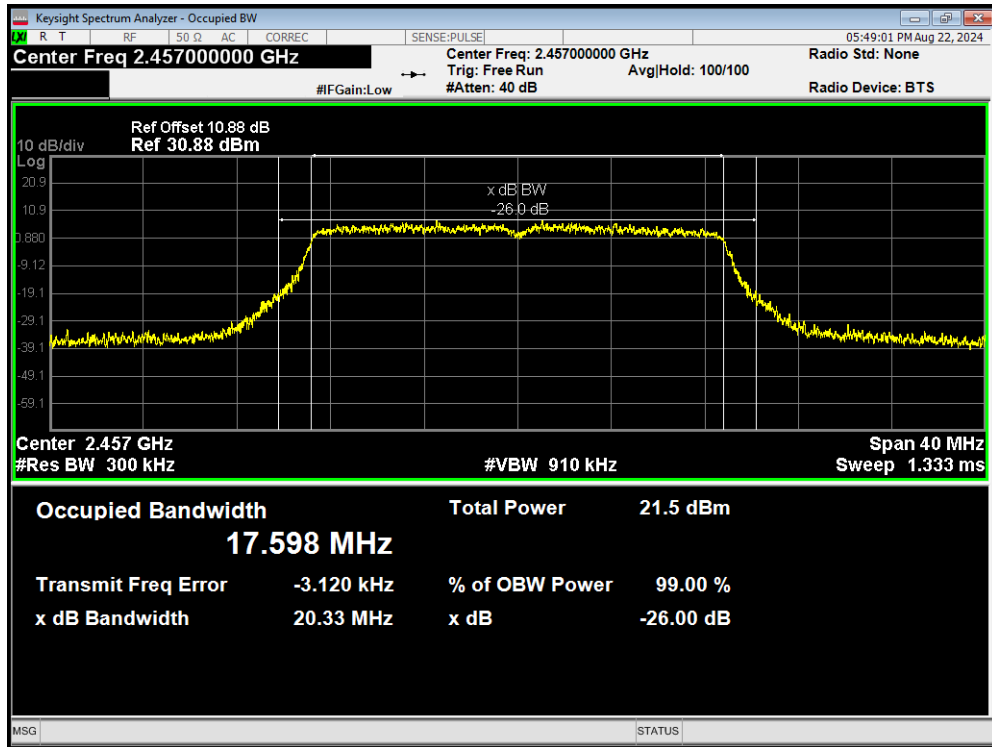
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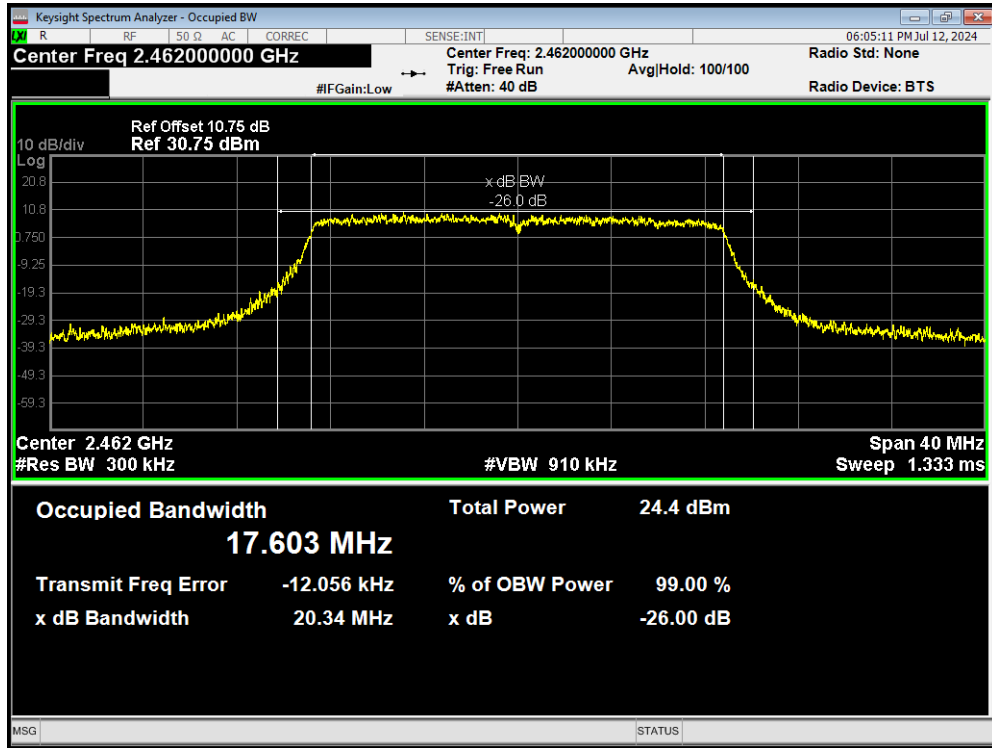
OBW 802.11n(HT20) 2437MHz



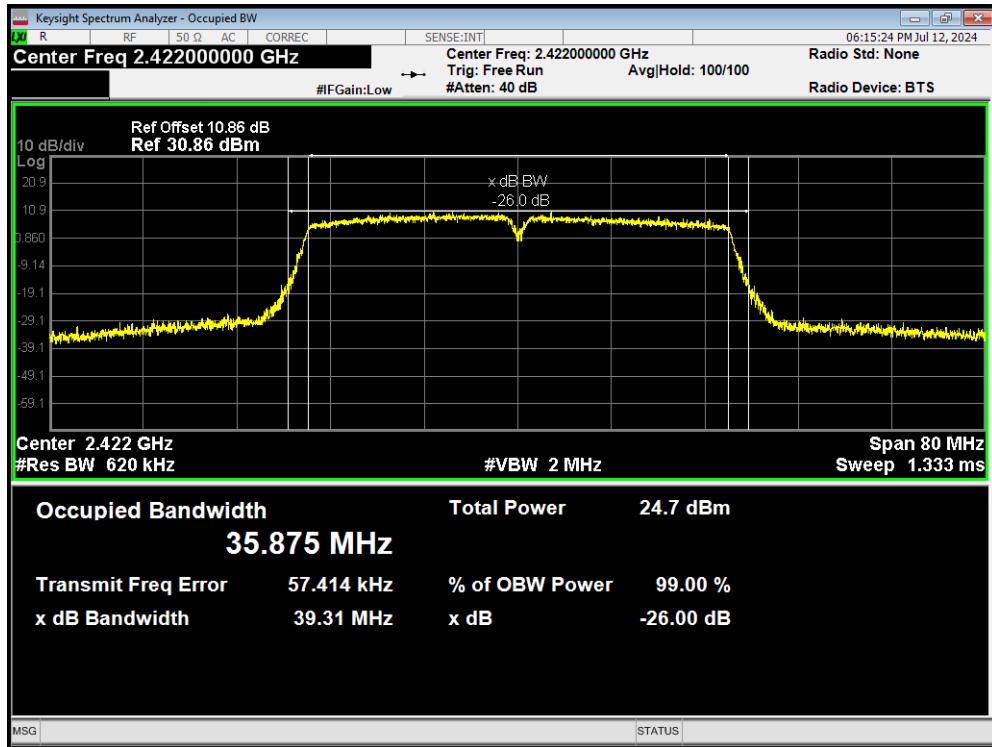
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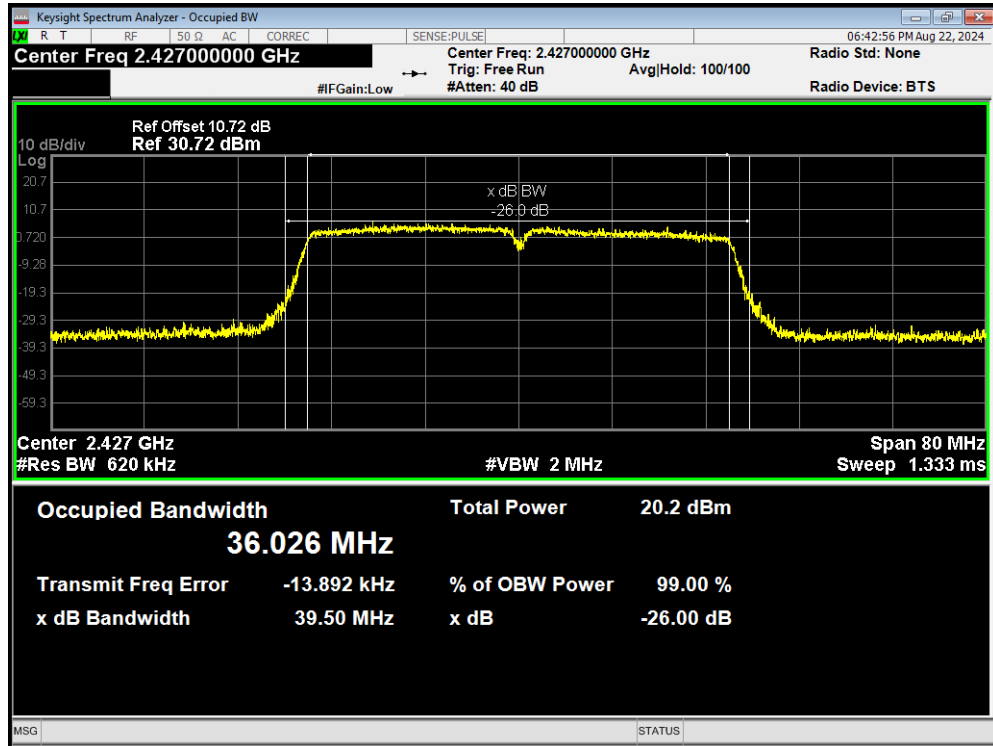
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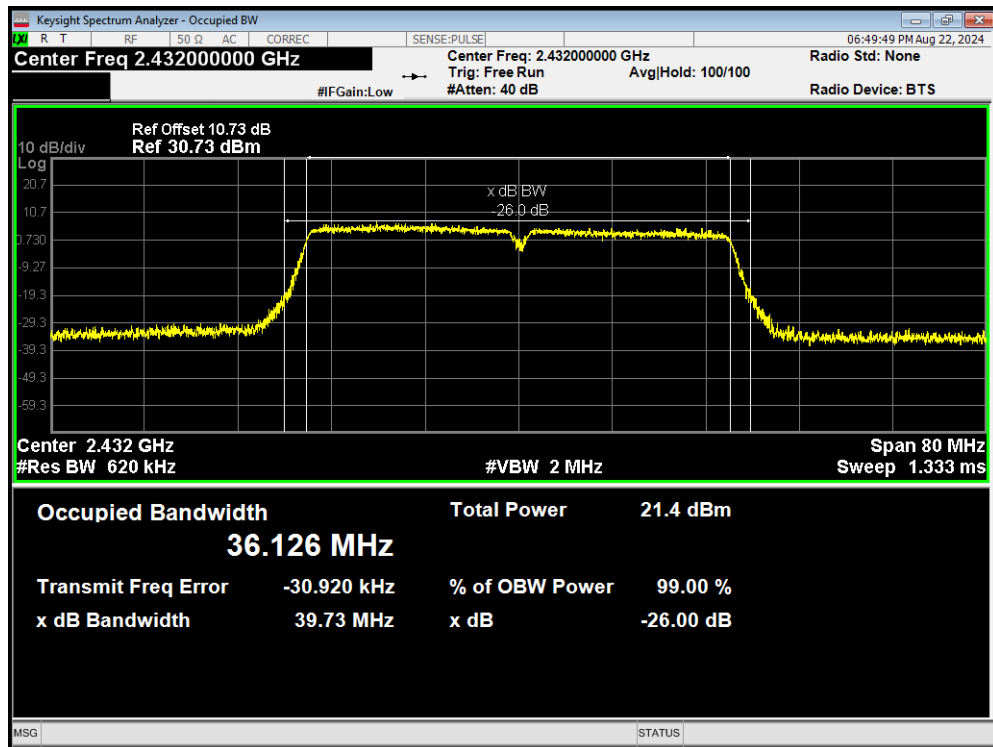
OBW 802.11n(HT40) 2422MHz



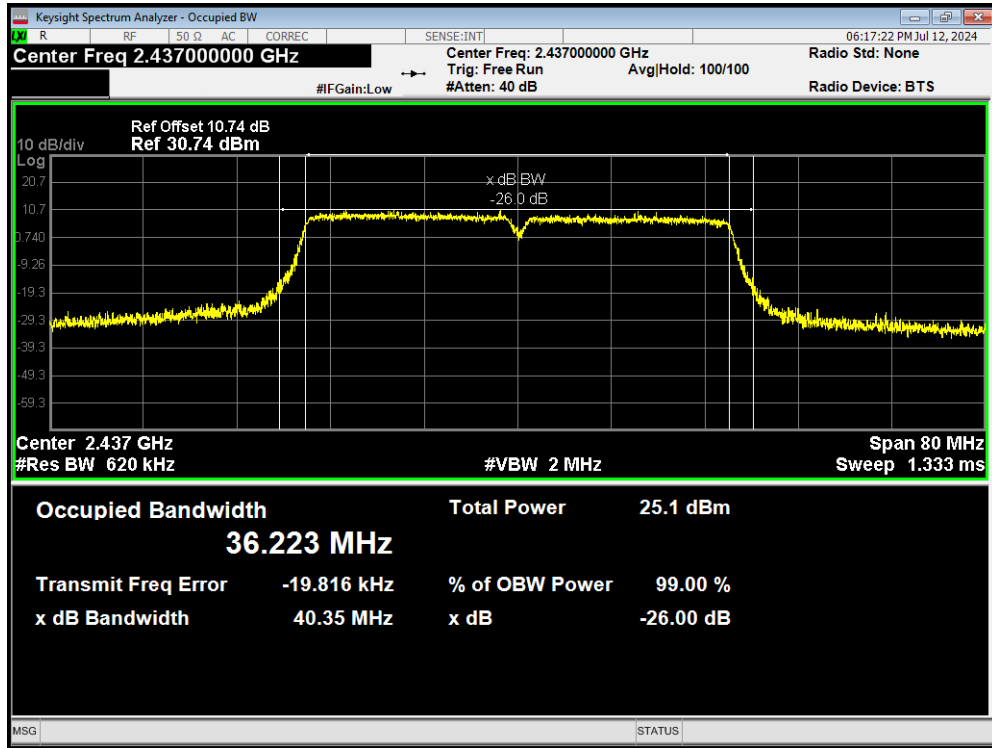
OBW 802.11n(HT40) 2427MHz



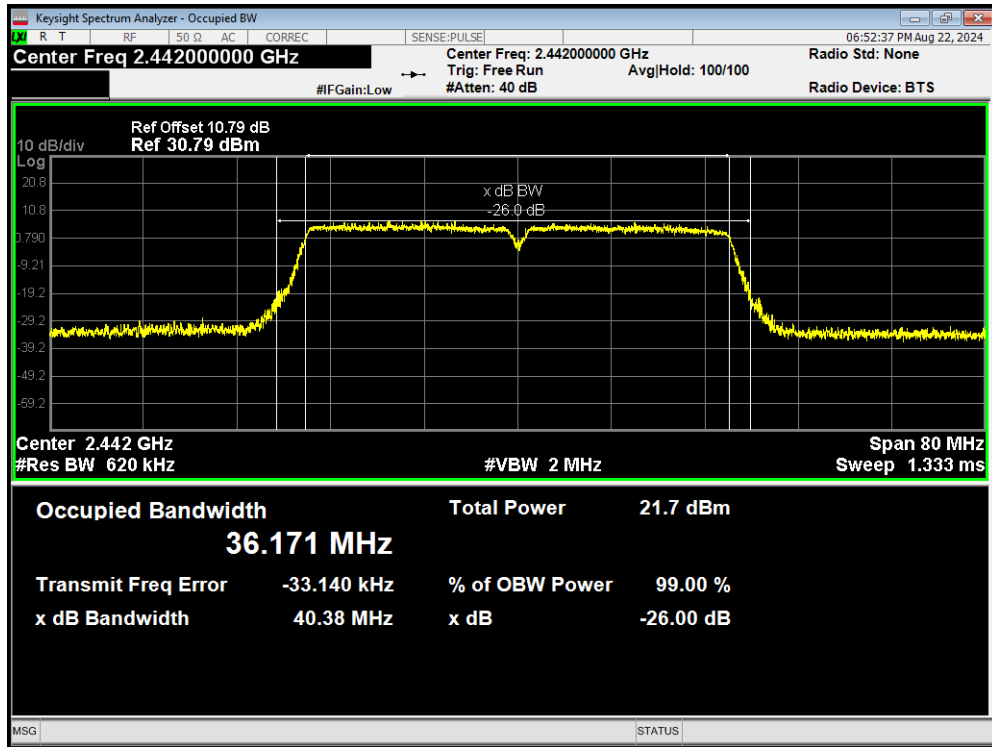
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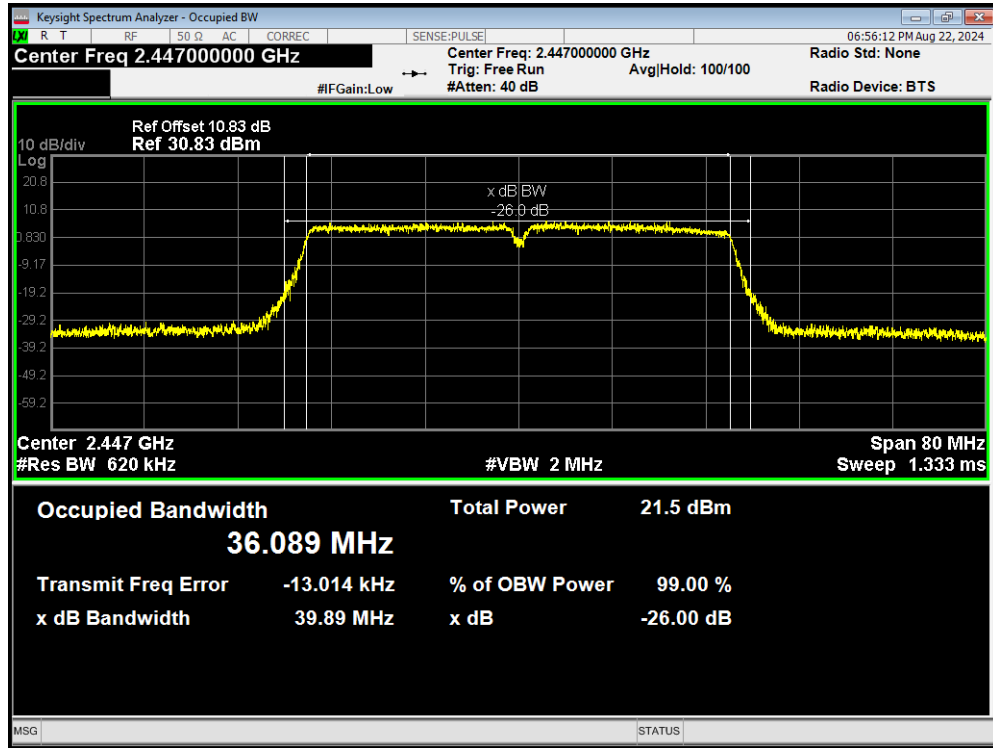
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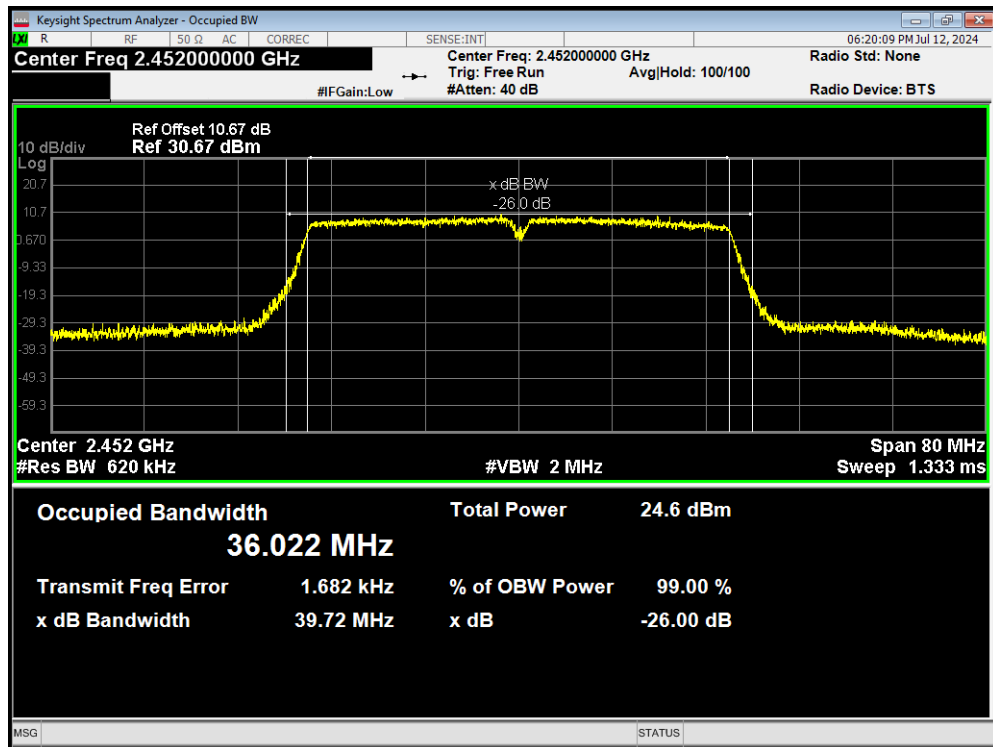
OBW 802.11n(HT40) 2442MHz



OBW 802.11n(HT40) 2447MHz



OBW 802.11n(HT40) 2452MHz

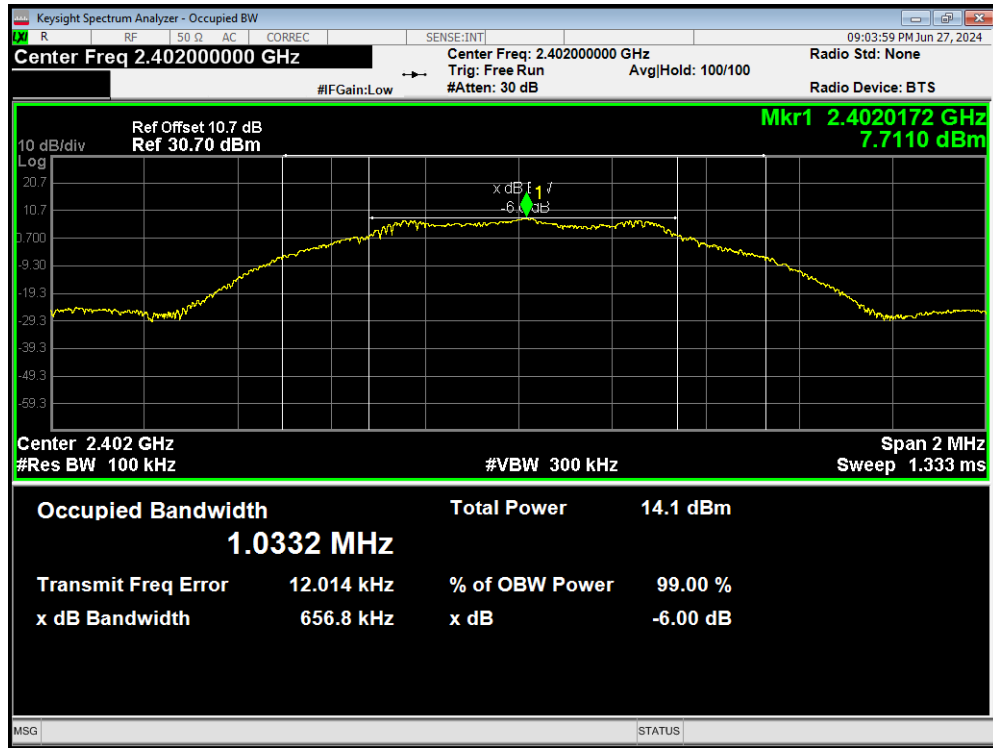


6 dB bandwidth

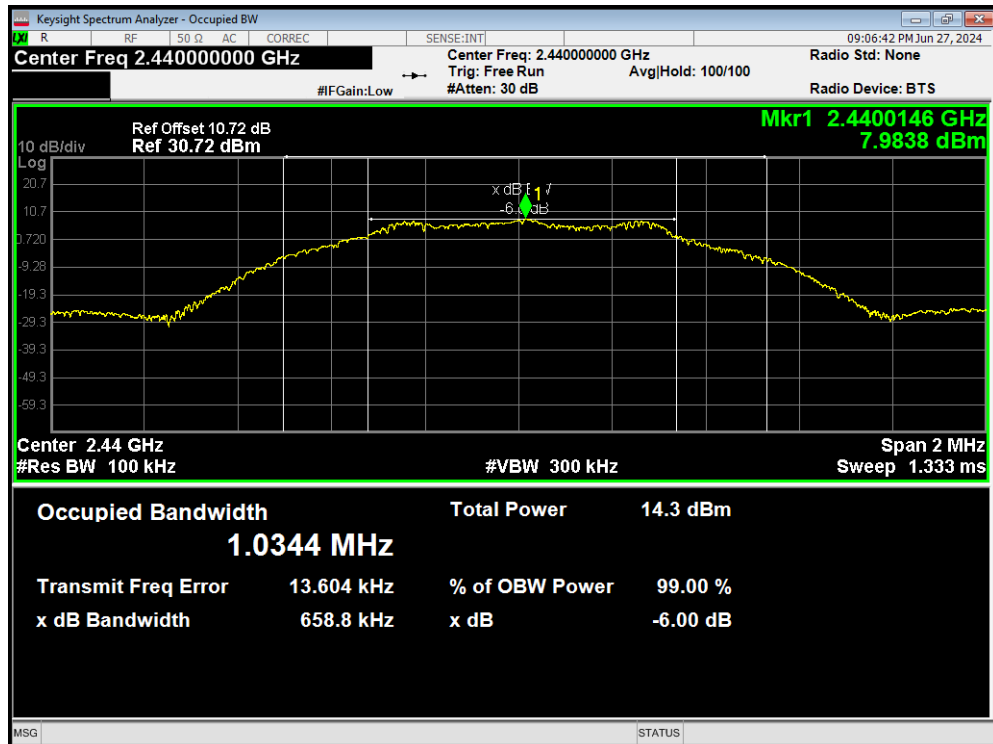
Bluetooth LE

Antenna 1

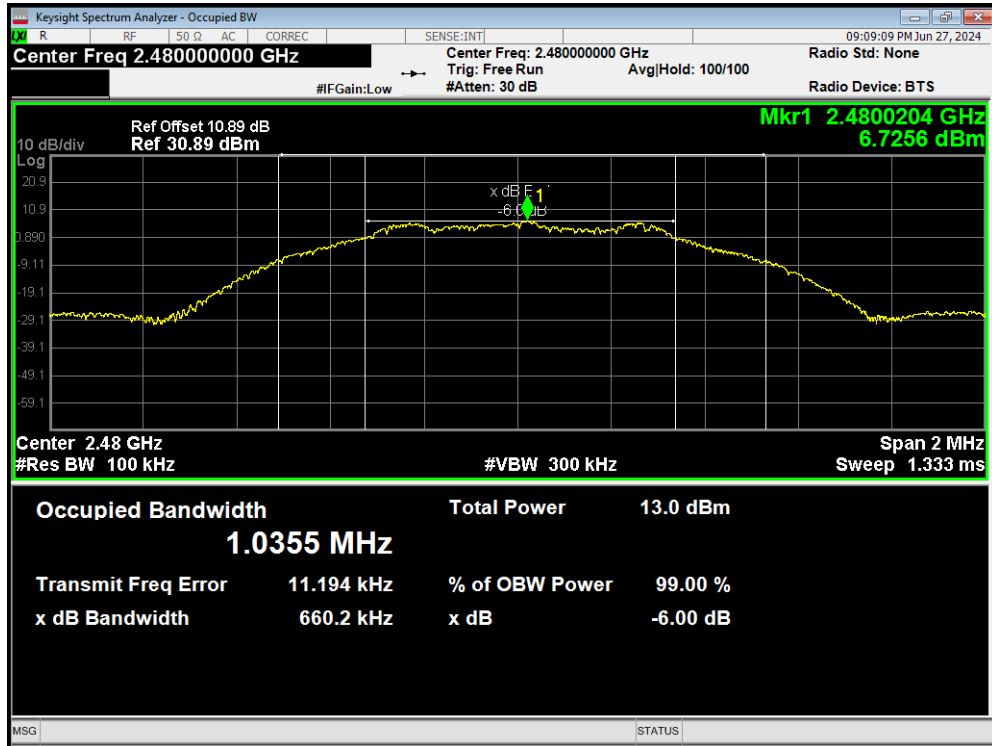
-6dB Bandwidth BLE (1M) 2402MHz



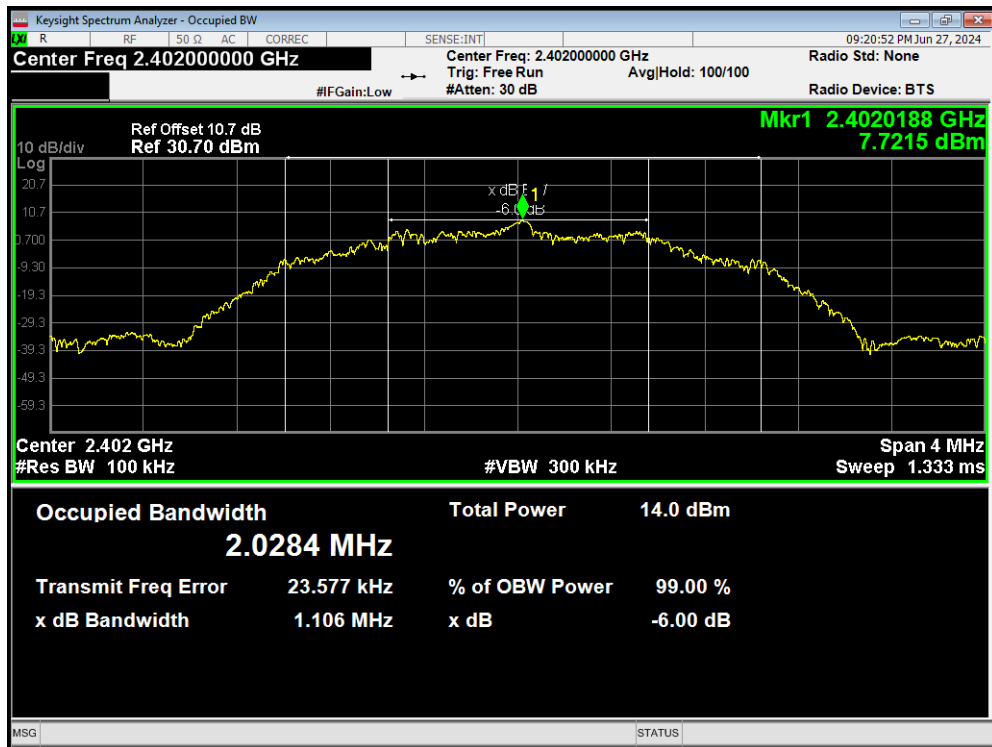
-6dB Bandwidth BLE (1M) 2440MHz



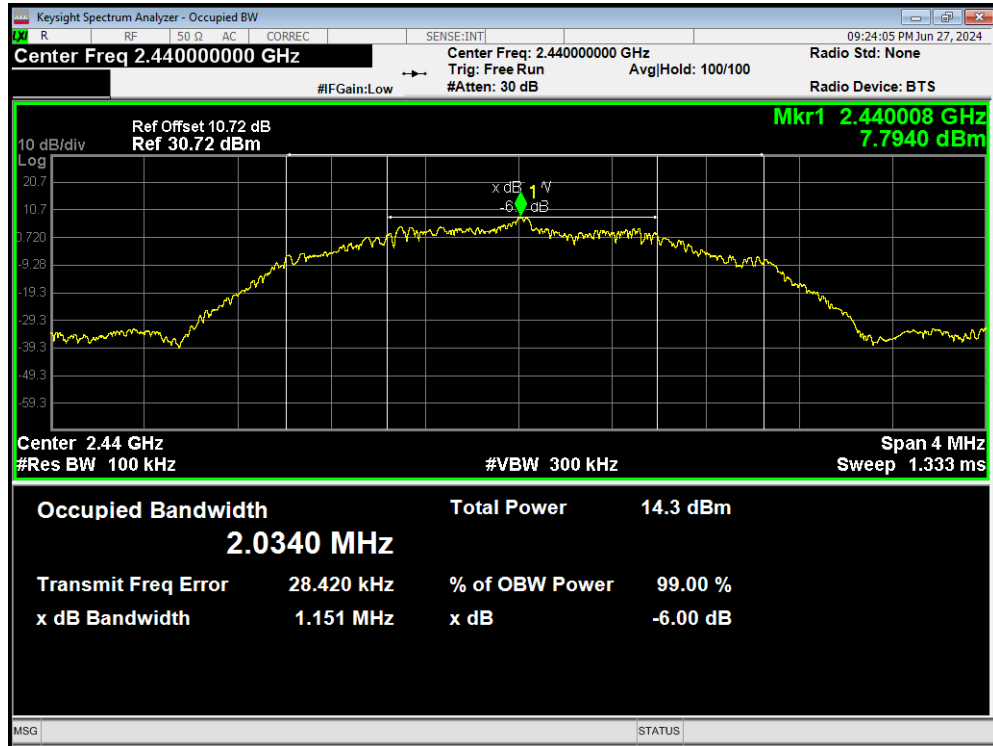
-6dB Bandwidth BLE (1M) 2480MHz



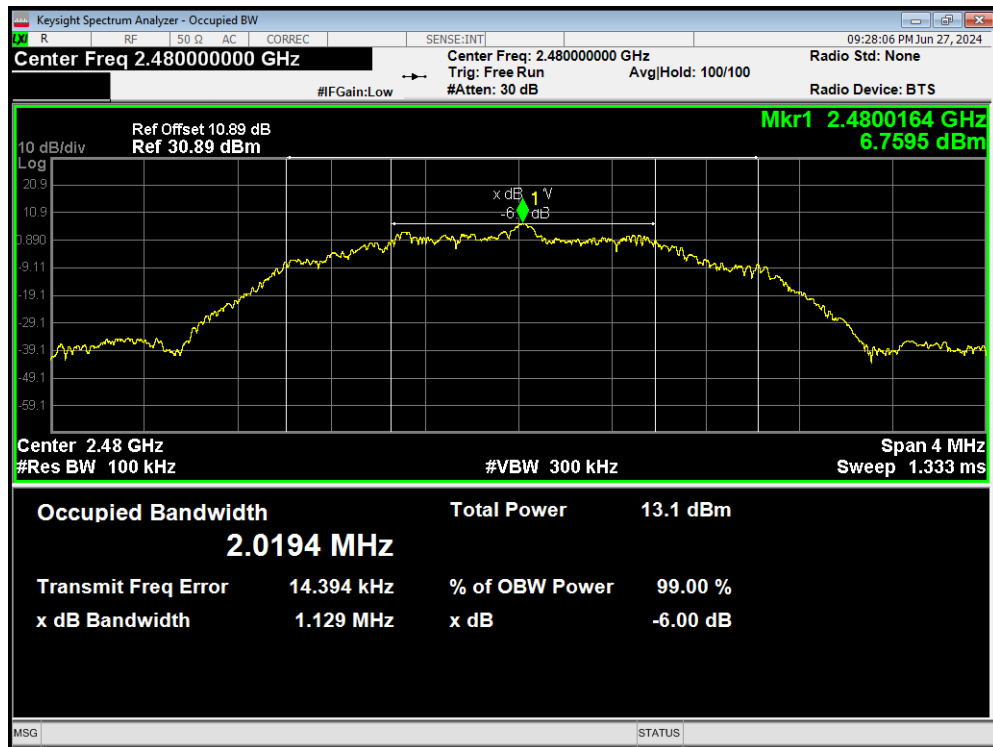
-6dB Bandwidth BLE (2M) 2402MHz



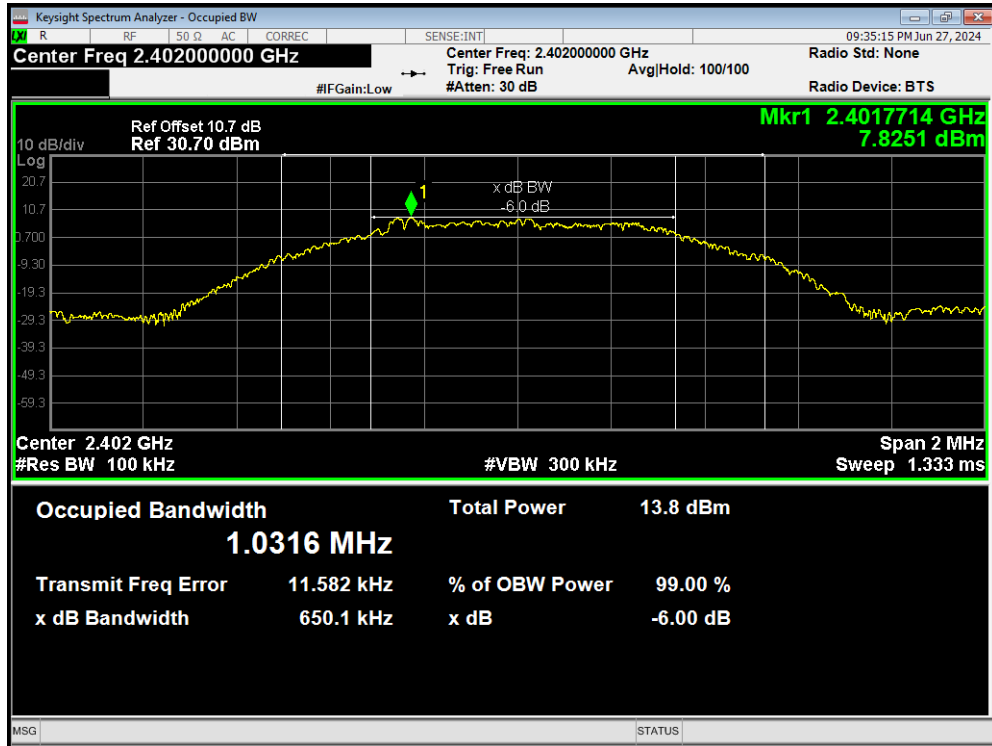
-6dB Bandwidth BLE (2M) 2440MHz



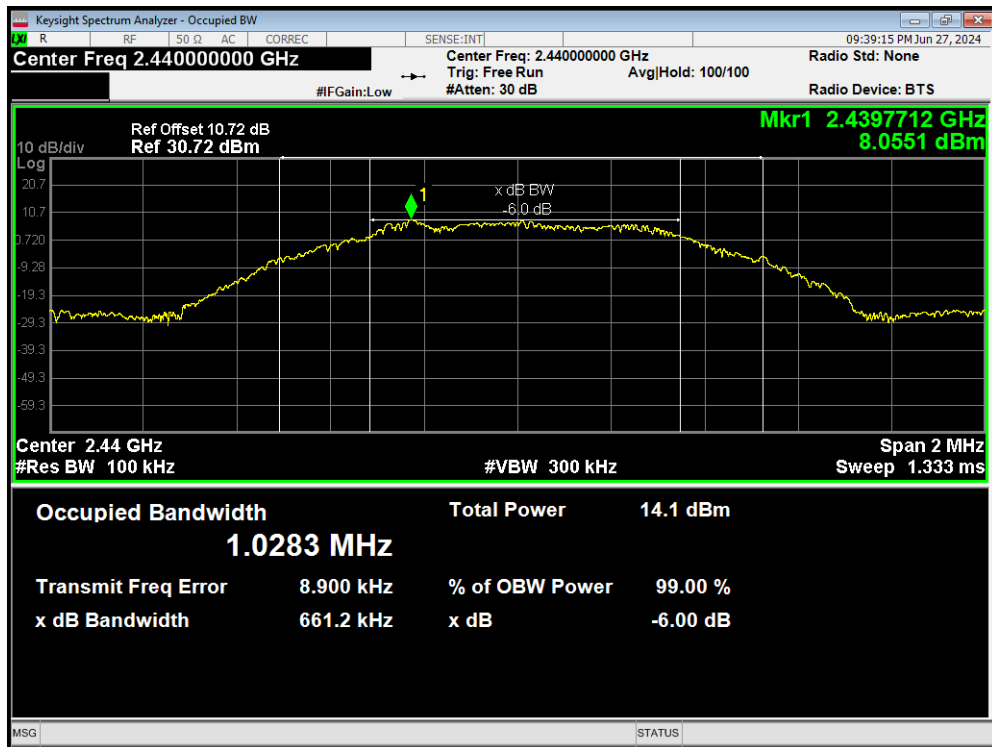
-6dB Bandwidth BLE (2M) 2480MHz



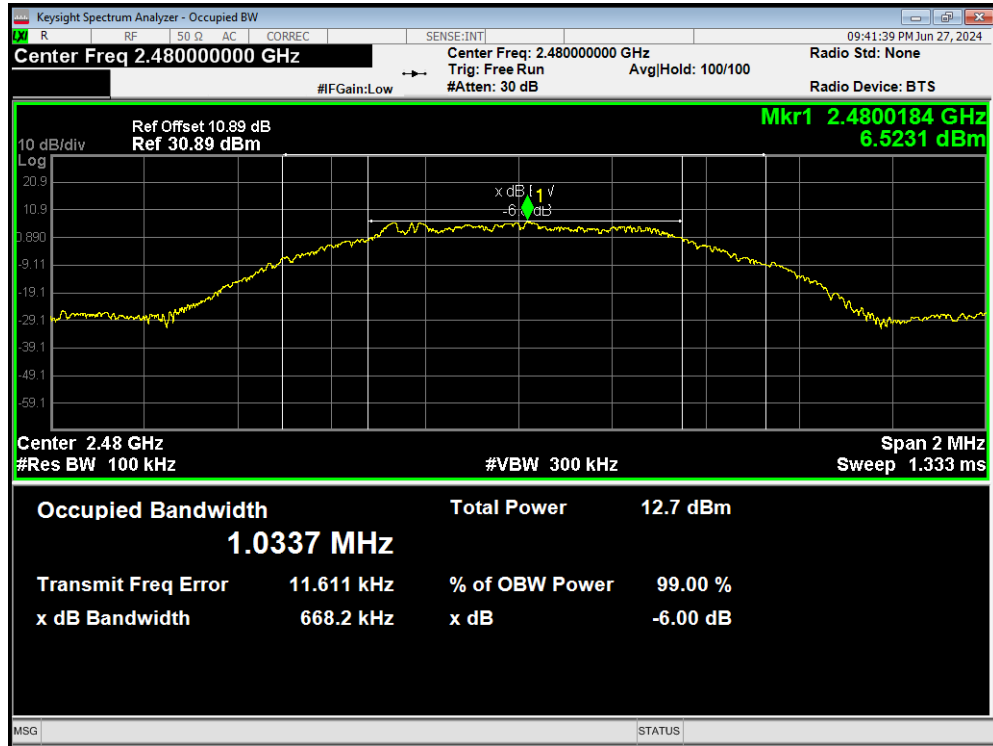
-6dB Bandwidth S=2 2402MHz



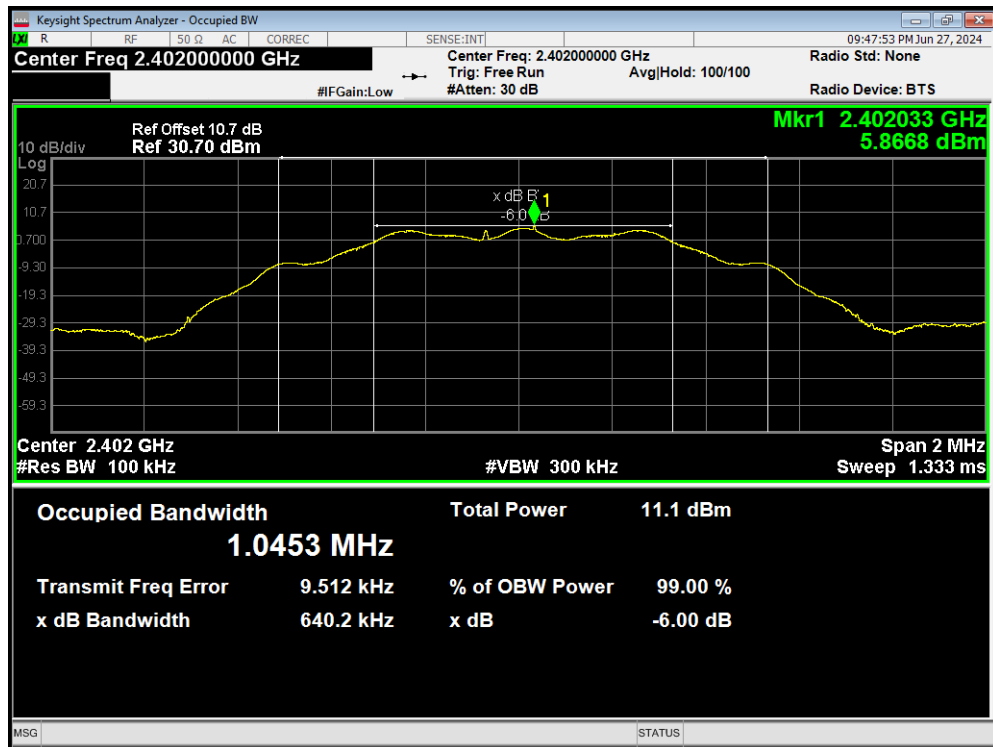
-6dB Bandwidth S=2 2440MHz



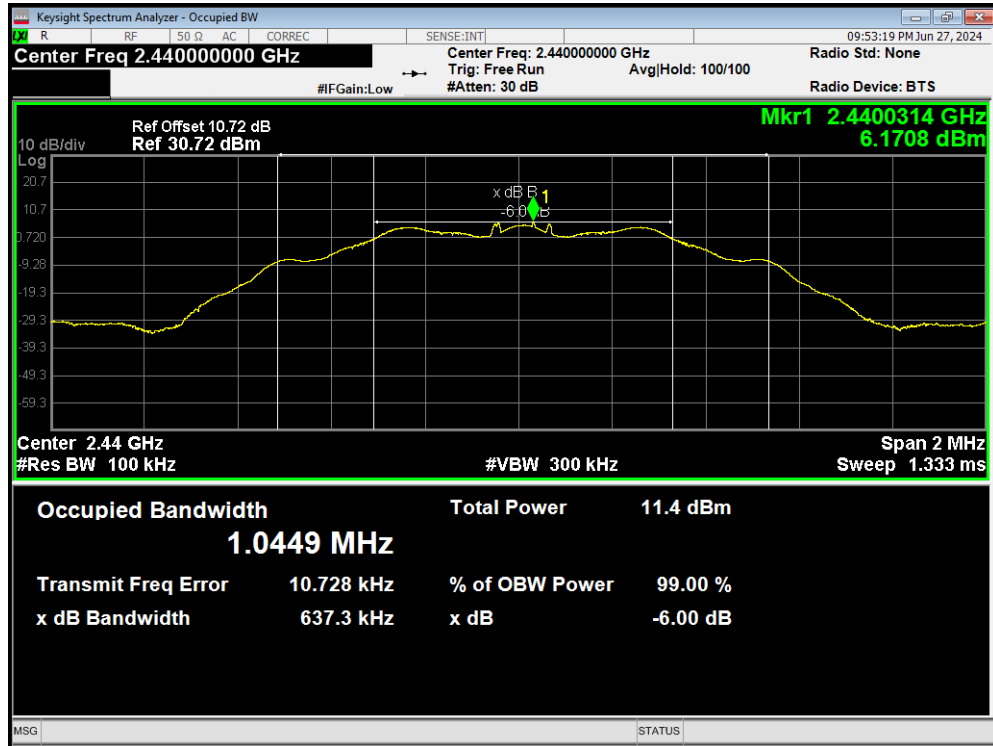
-6dB Bandwidth S=2 2480MHz



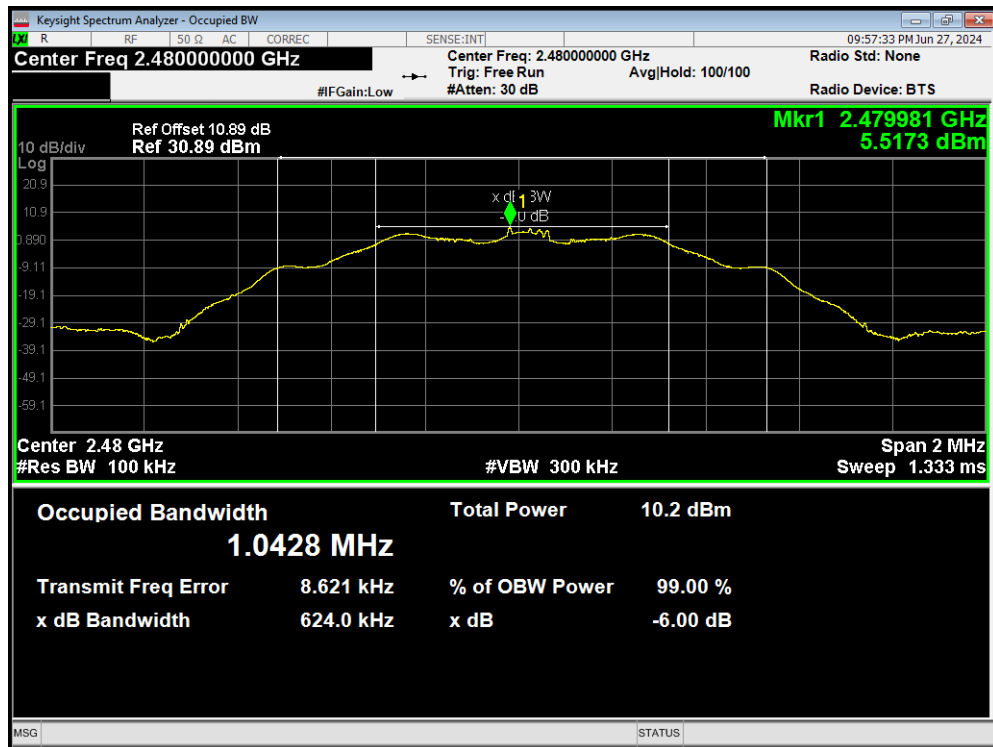
-6dB Bandwidth S=8 2402MHz



-6dB Bandwidth S=8 2440MHz

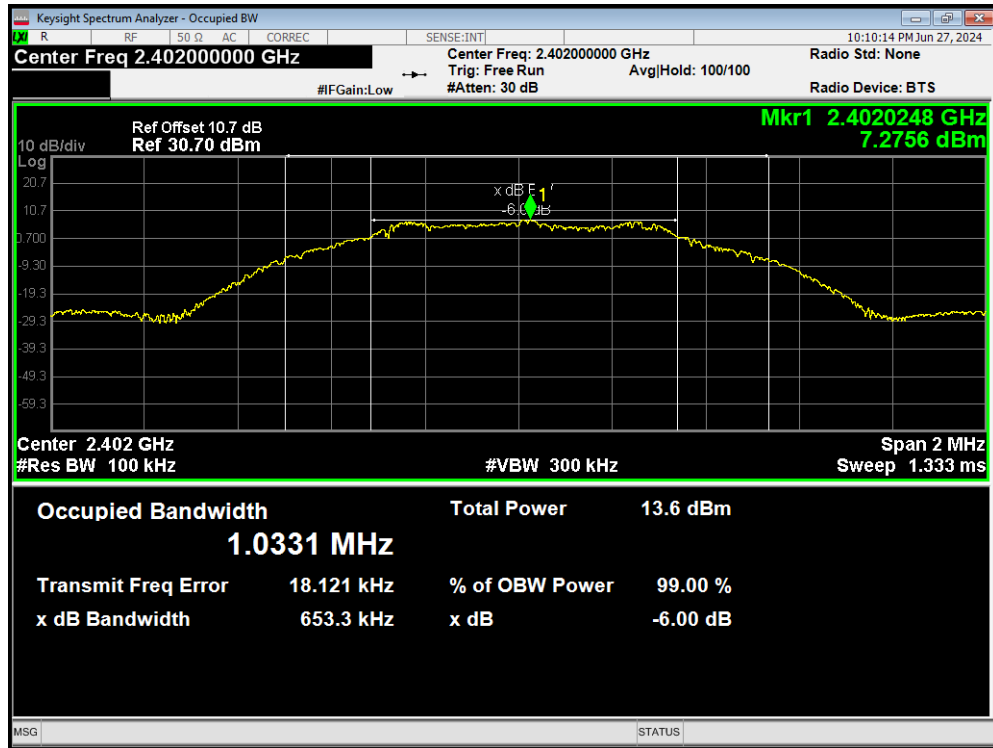


-6dB Bandwidth S=8 2480MHz

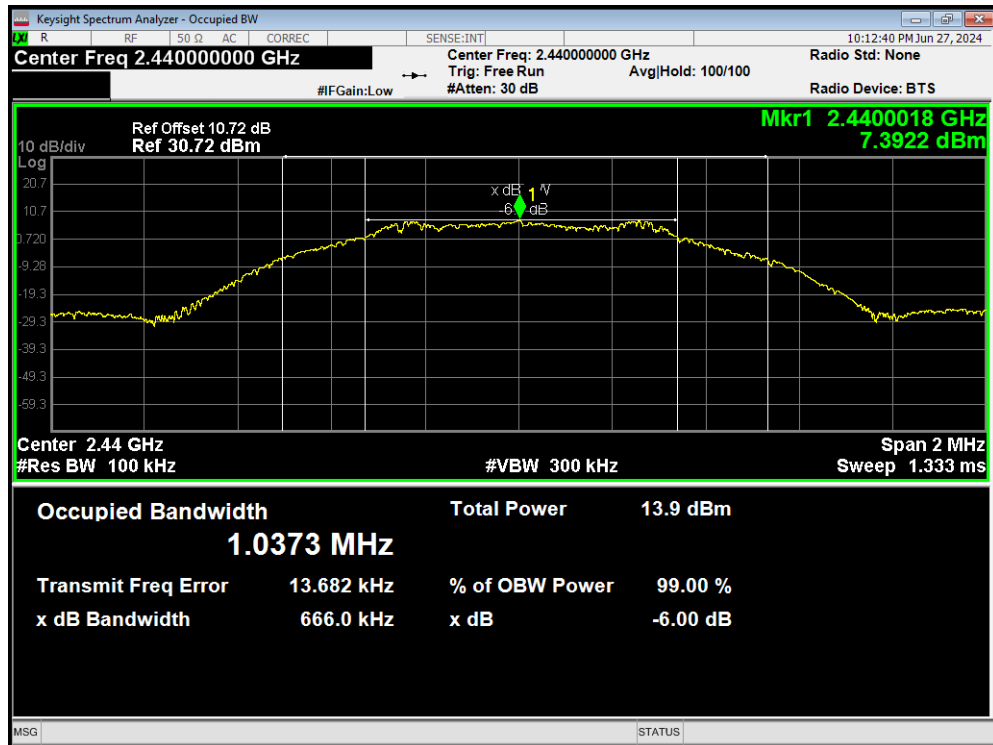


Antenna 2

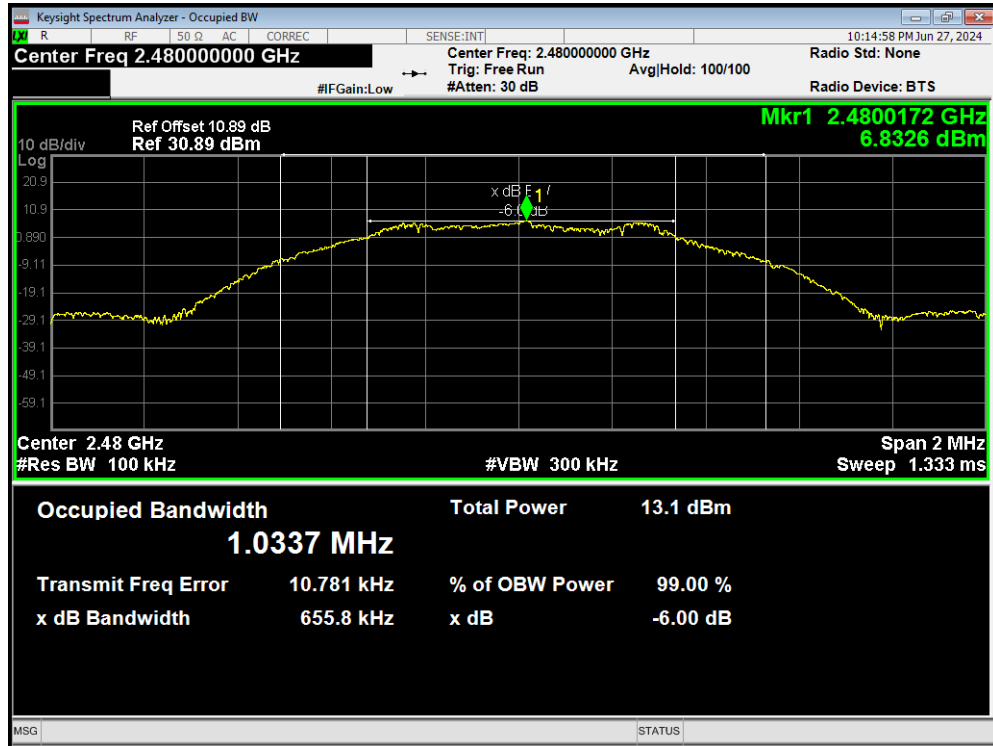
-6dB Bandwidth BLE (1M) 2402MHz



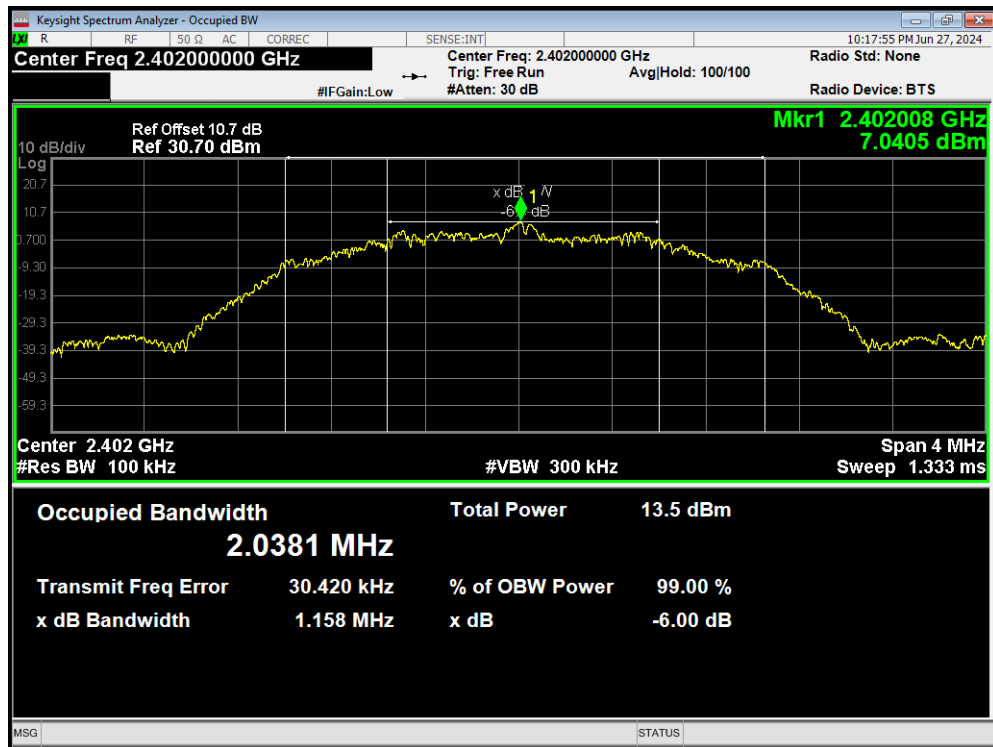
-6dB Bandwidth BLE (1M) 2440MHz



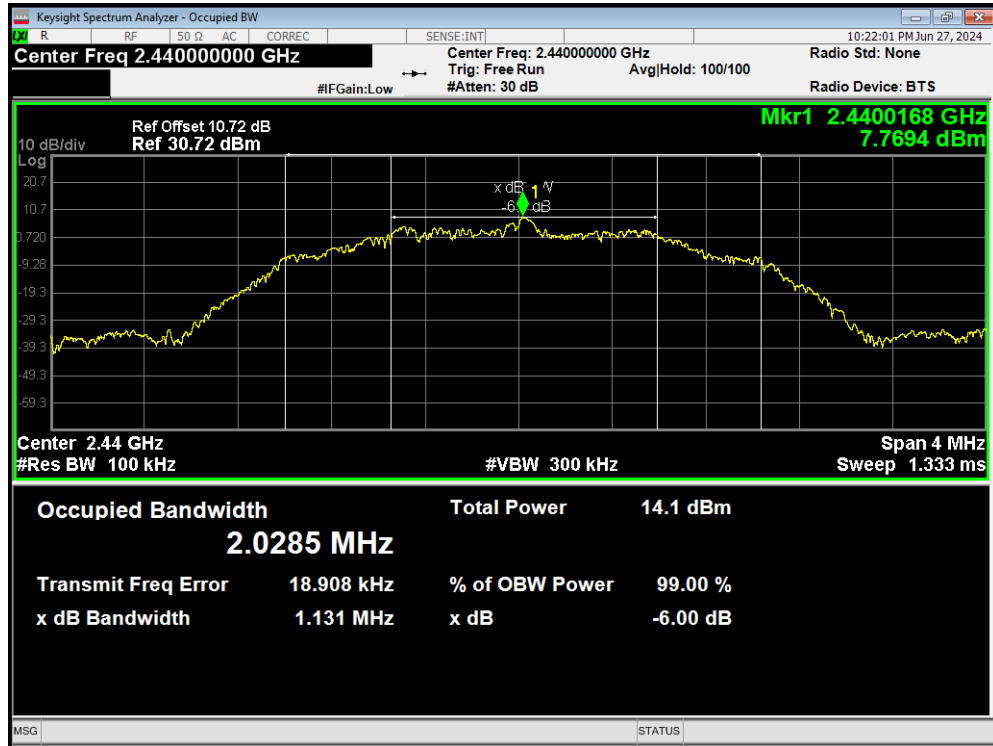
-6dB Bandwidth BLE (1M) 2480MHz



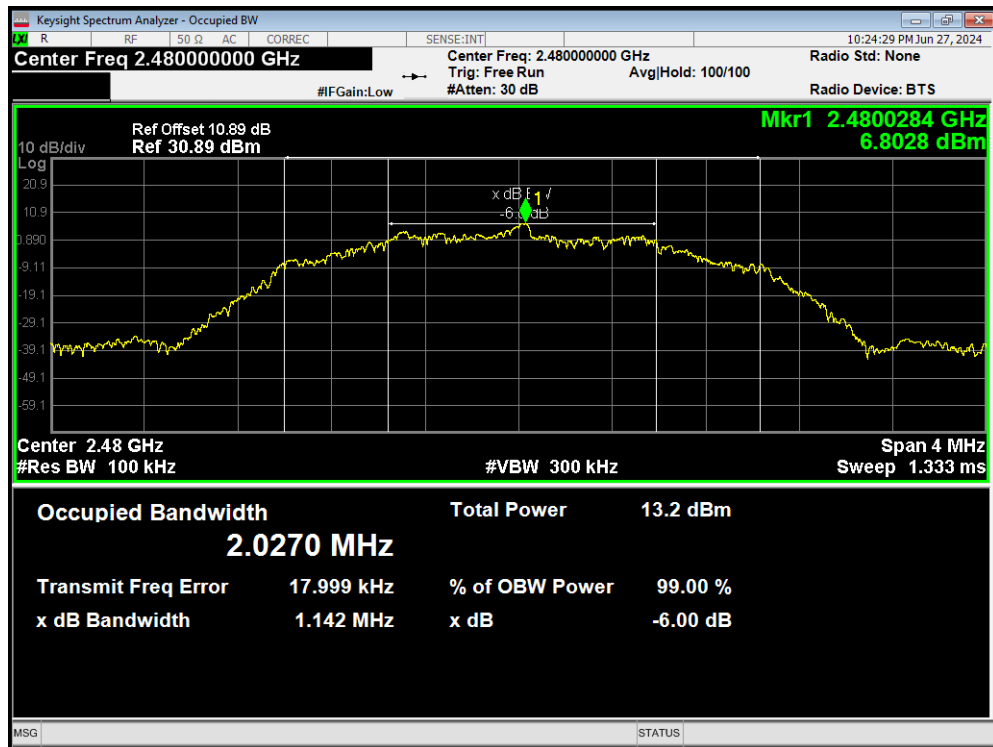
-6dB Bandwidth BLE (2M) 2402MHz



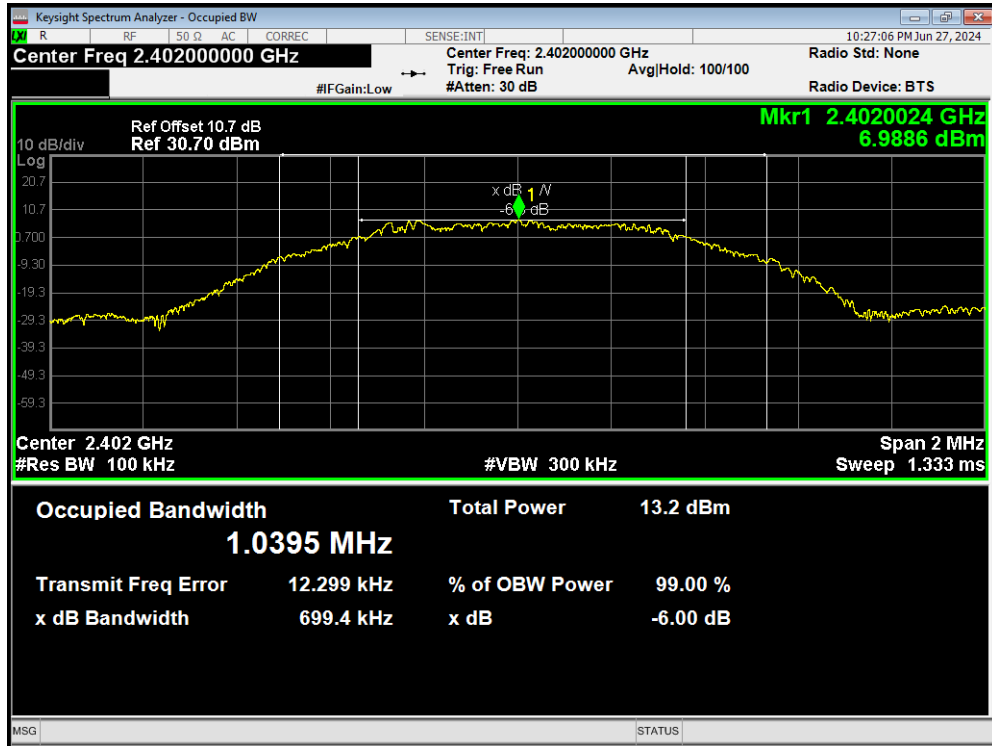
-6dB Bandwidth BLE (2M) 2440MHz



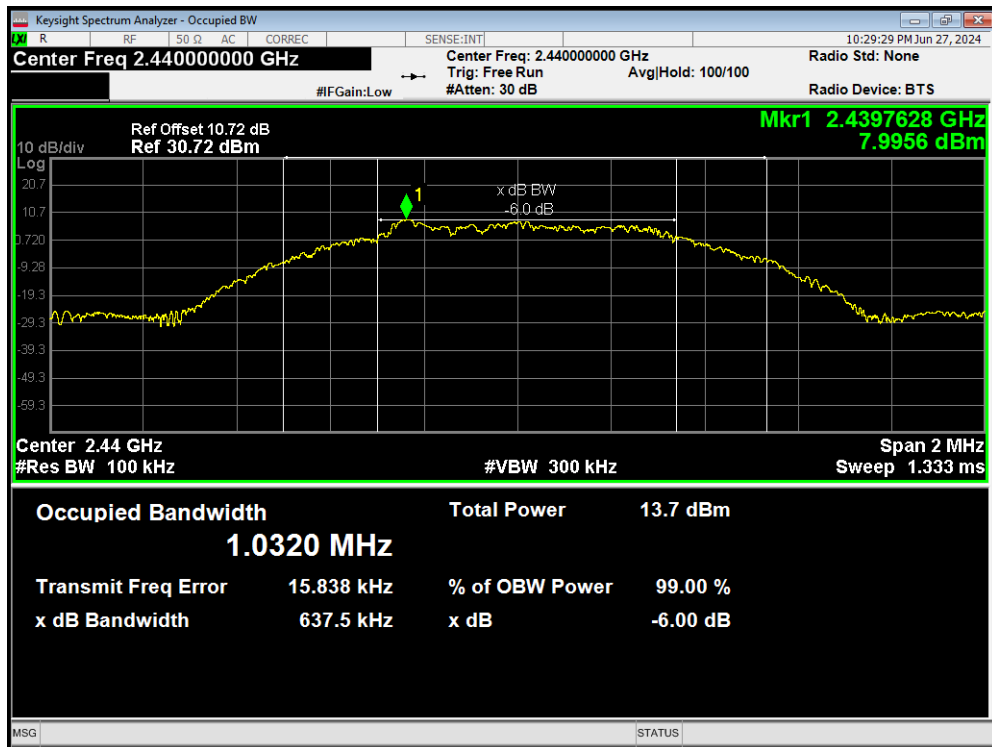
-6dB Bandwidth BLE (2M) 2480MHz



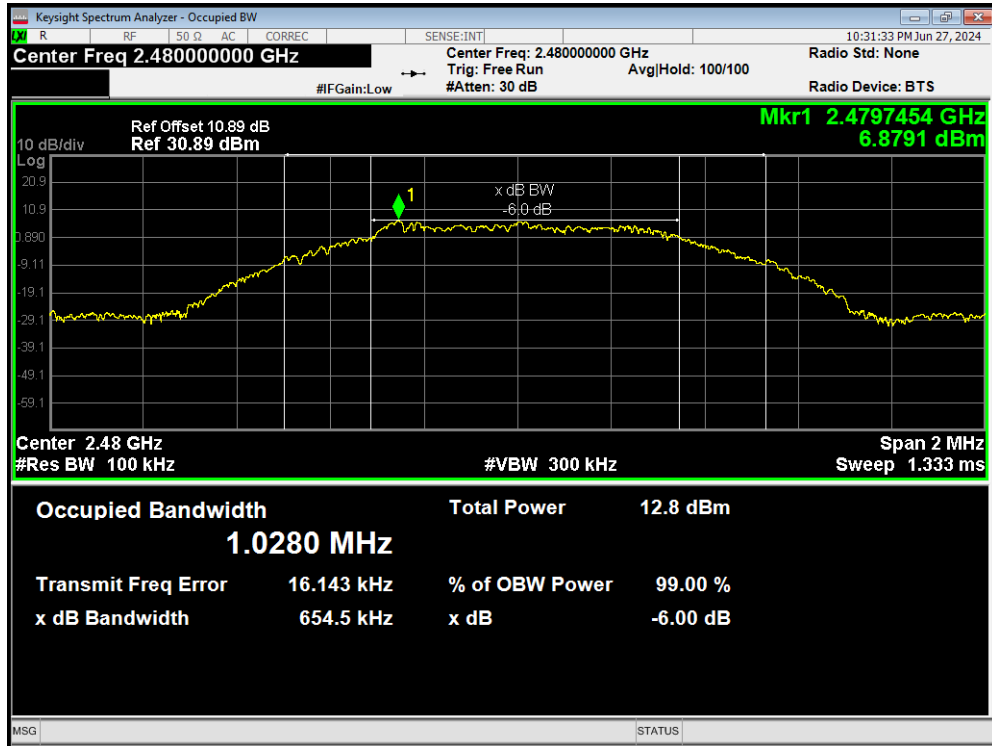
-6dB Bandwidth S=2 2402MHz



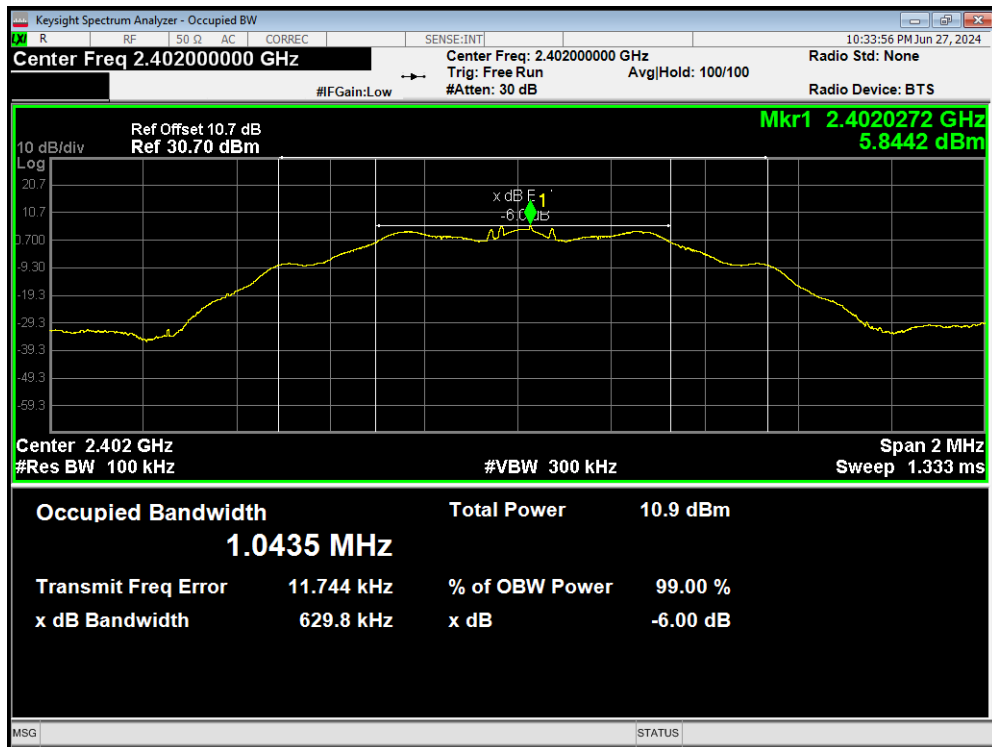
-6dB Bandwidth S=2 2440MHz



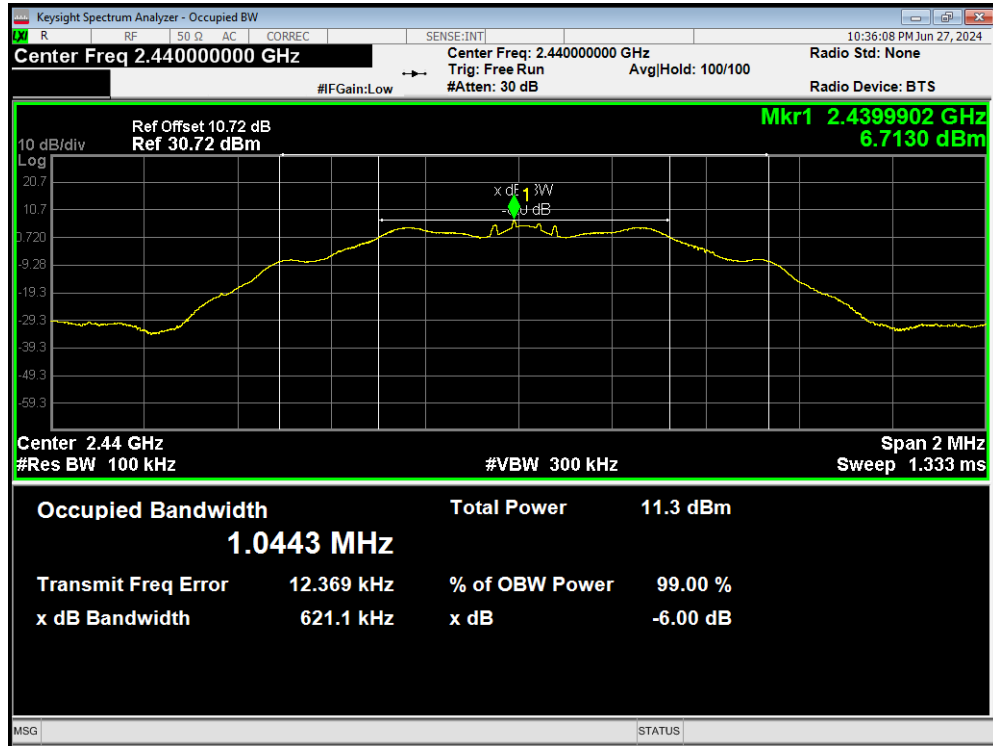
-6dB Bandwidth S=2 2480MHz



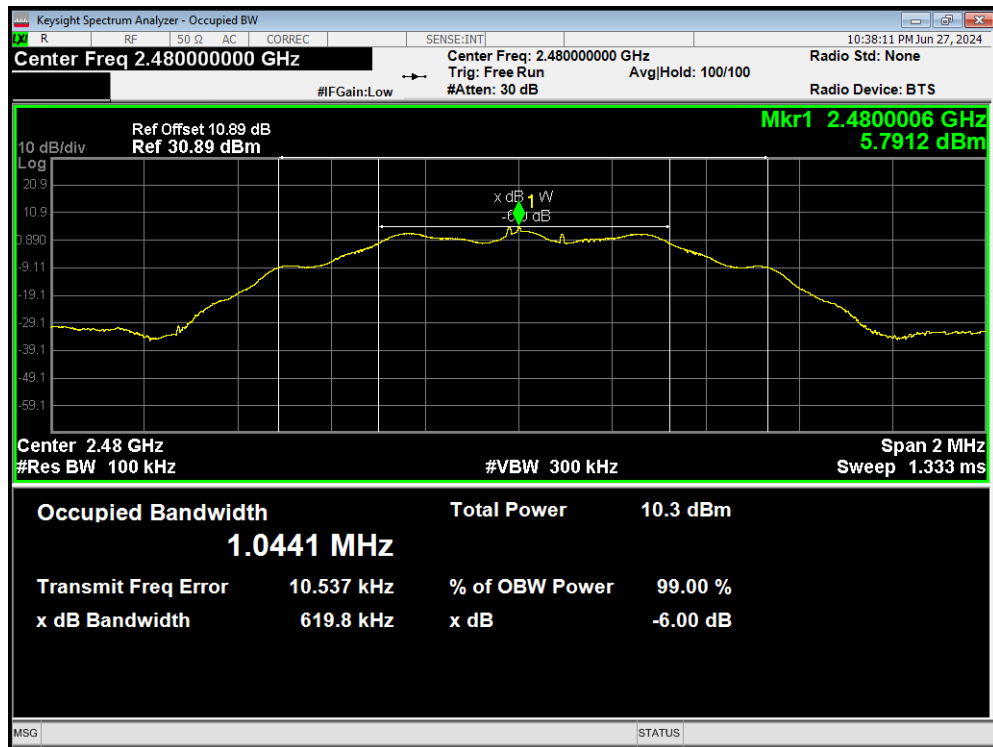
-6dB Bandwidth S=8 2402MHz



-6dB Bandwidth S=8 2440MHz

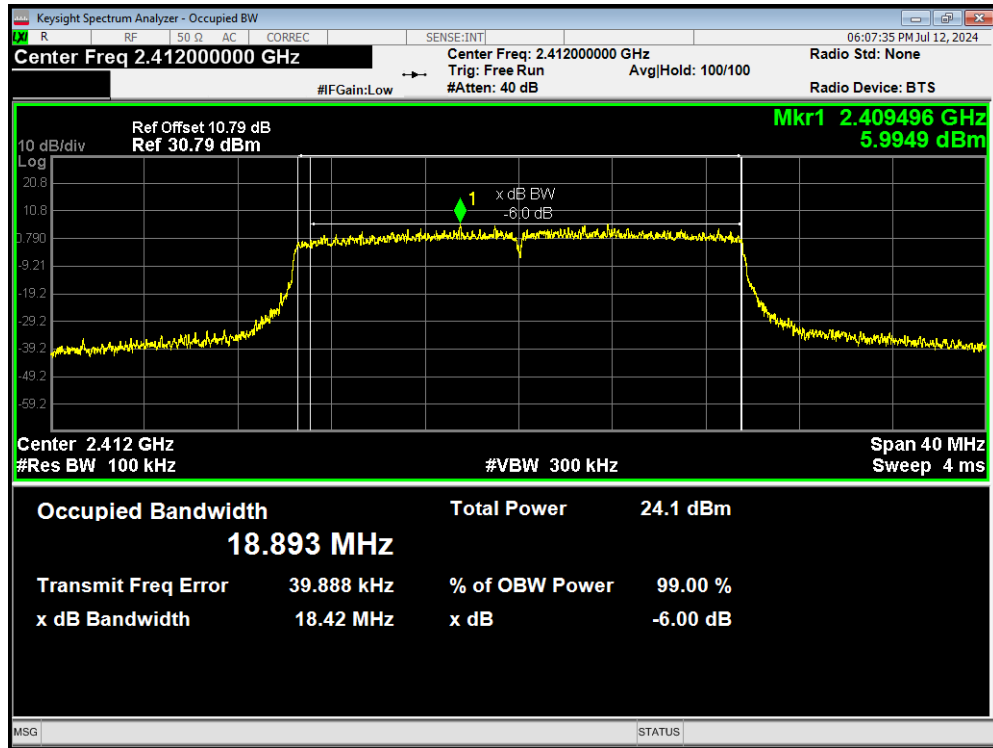


-6dB Bandwidth S=8 2480MHz

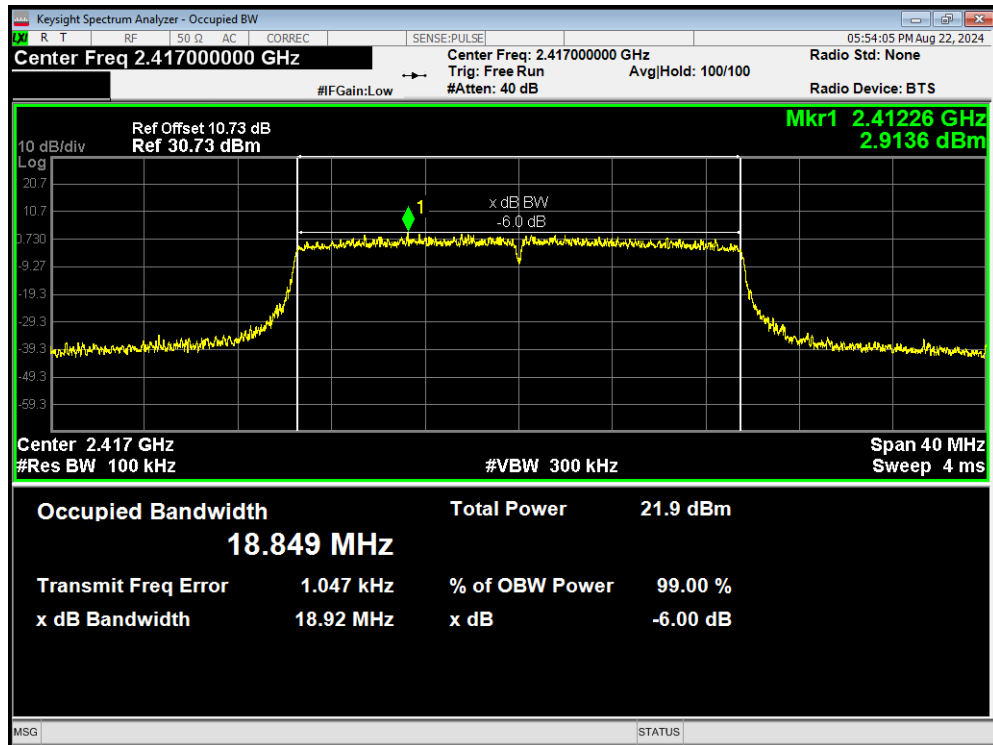


Wi-Fi 2.4G

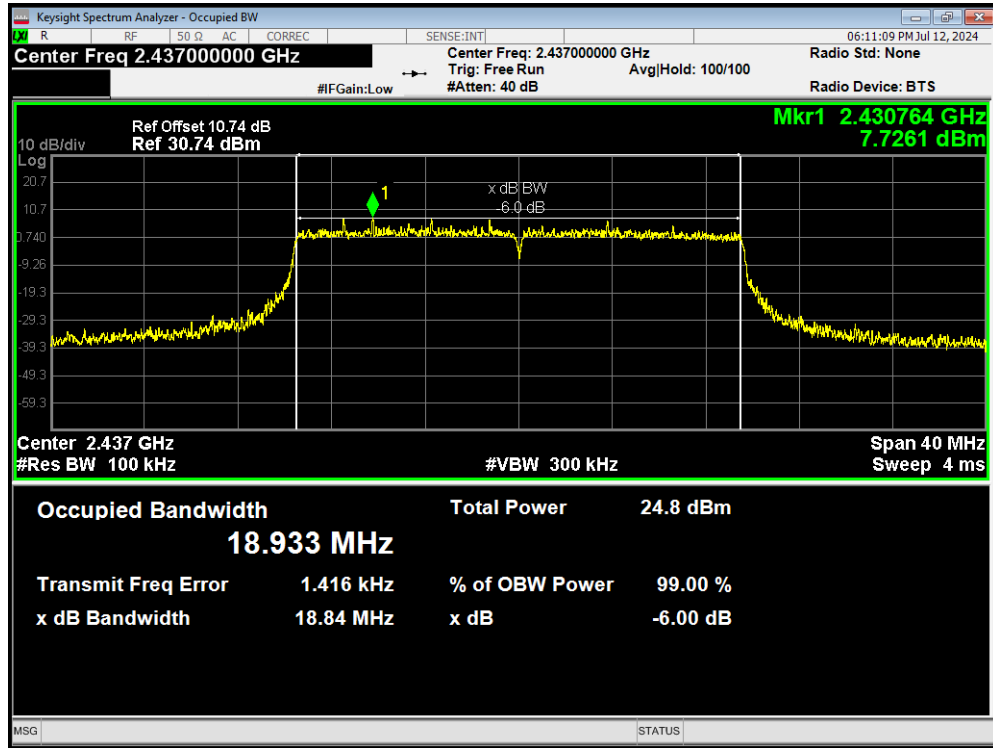
-6dB Bandwidth 802.11ax(HE20) 2412MHz



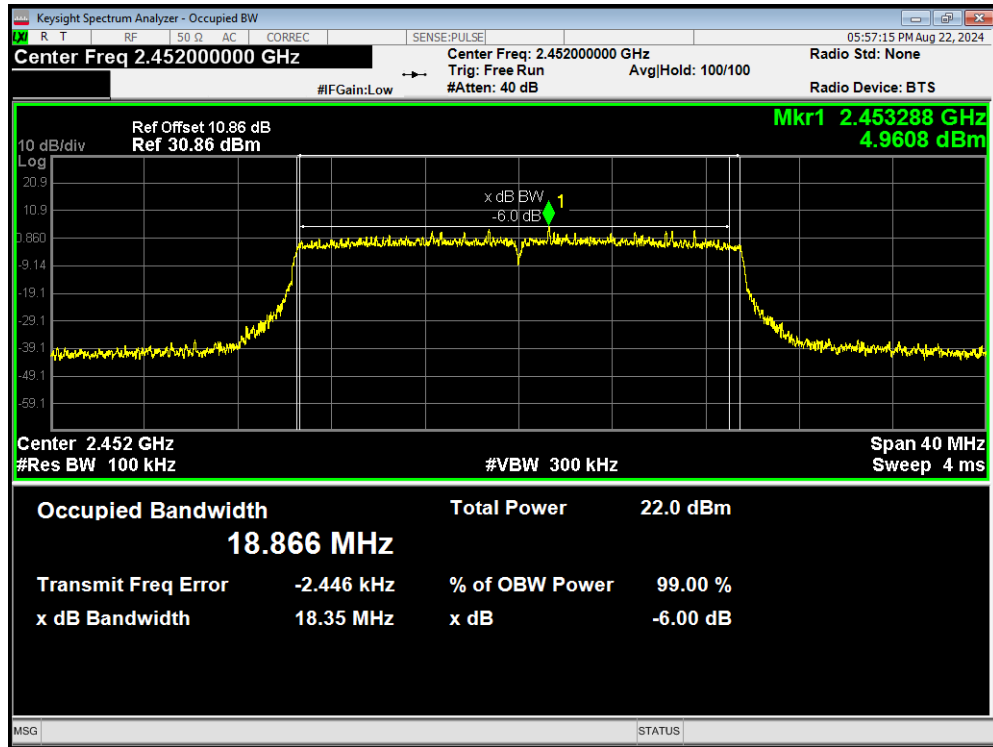
-6dB Bandwidth 802.11ax(HE20) 2417MHz



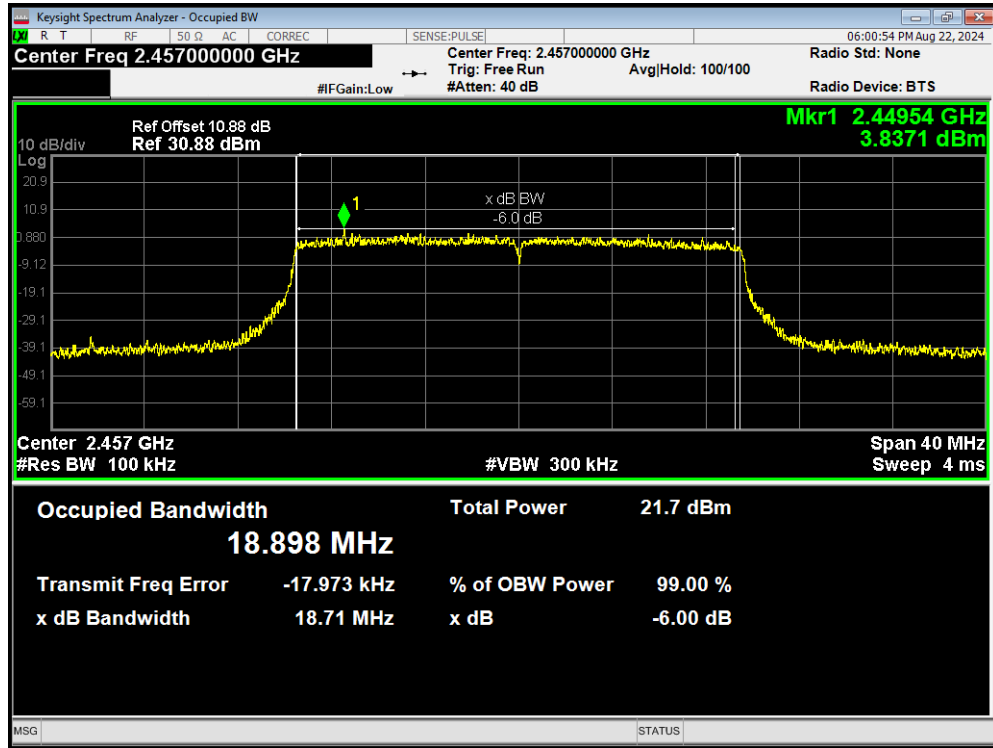
-6dB Bandwidth 802.11ax(HE20) 2437MHz



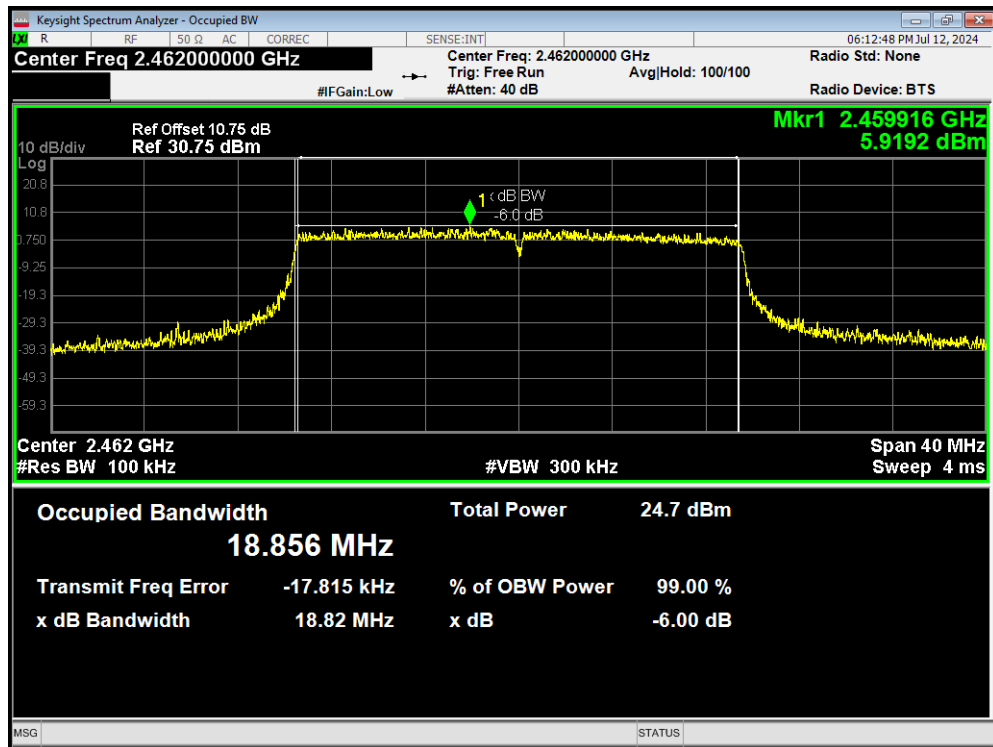
-6dB Bandwidth 802.11ax(HE20) 2452MHz



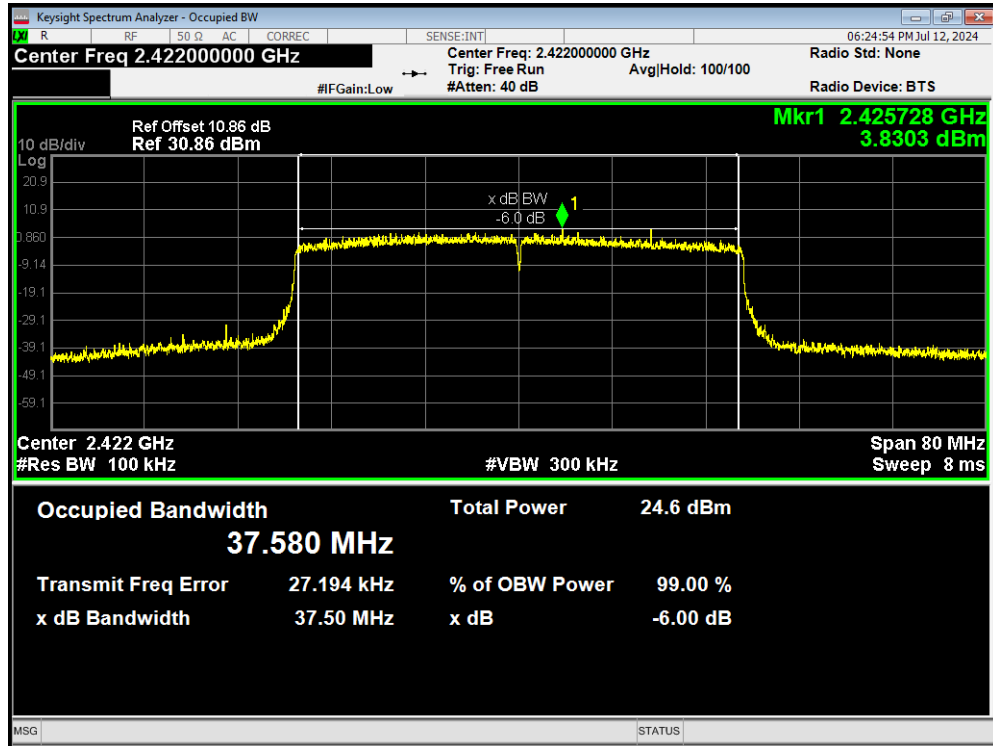
-6dB Bandwidth 802.11ax(HE20) 2457MHz



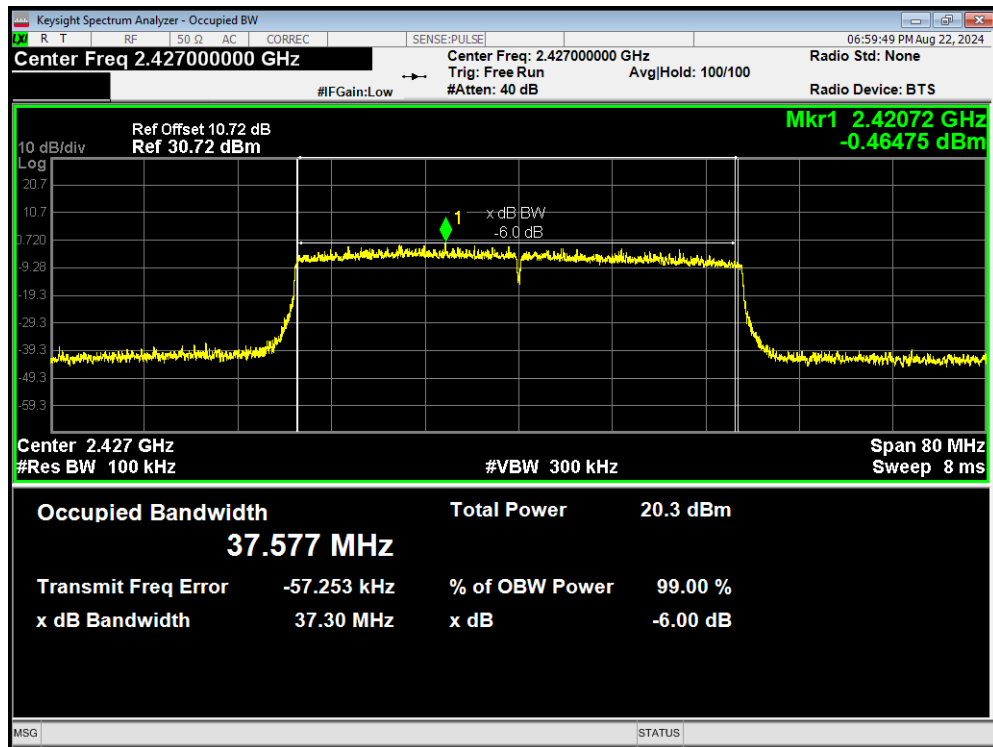
-6dB Bandwidth 802.11ax(HE20) 2462MHz



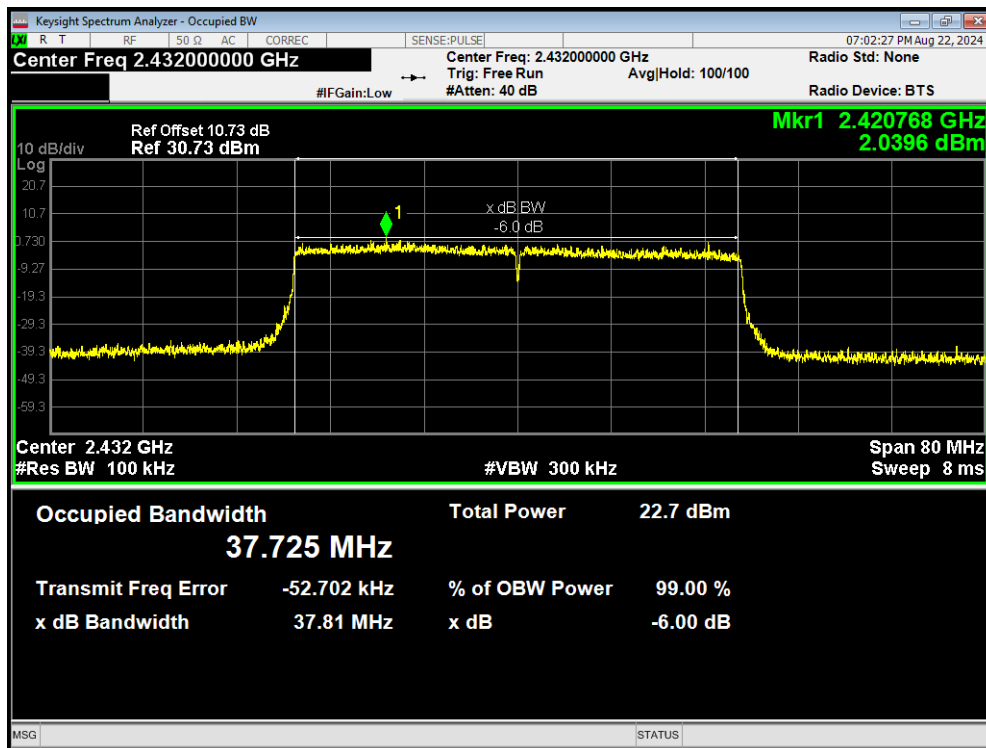
-6dB Bandwidth 802.11ax(HE40) 2422MHz



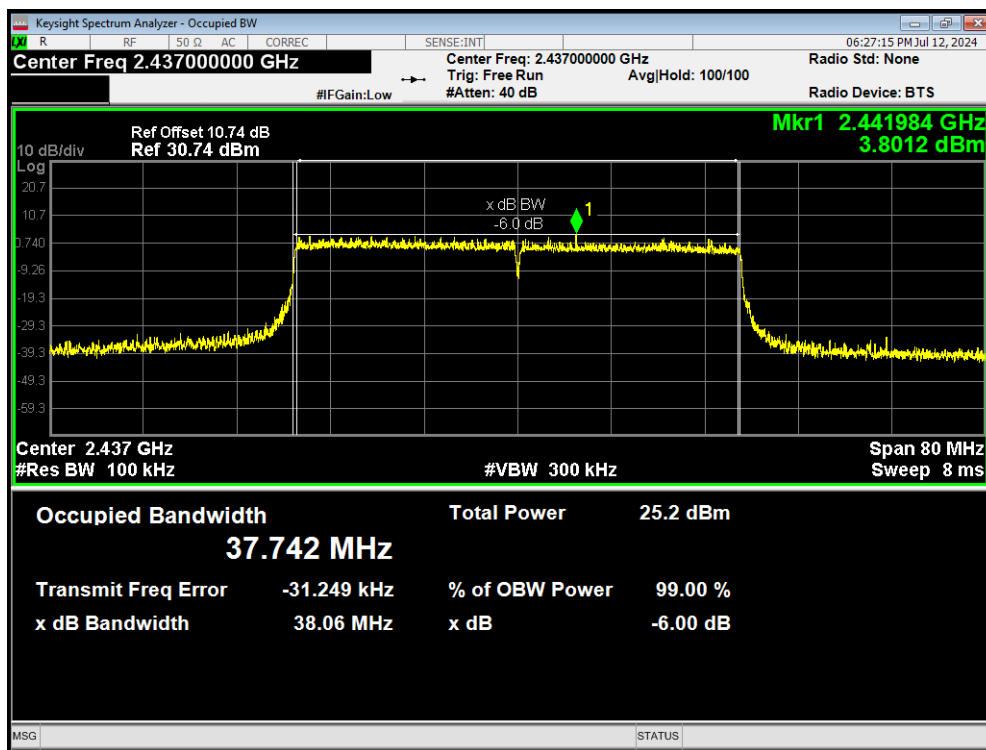
-6dB Bandwidth 802.11ax(HE40) 2427MHz



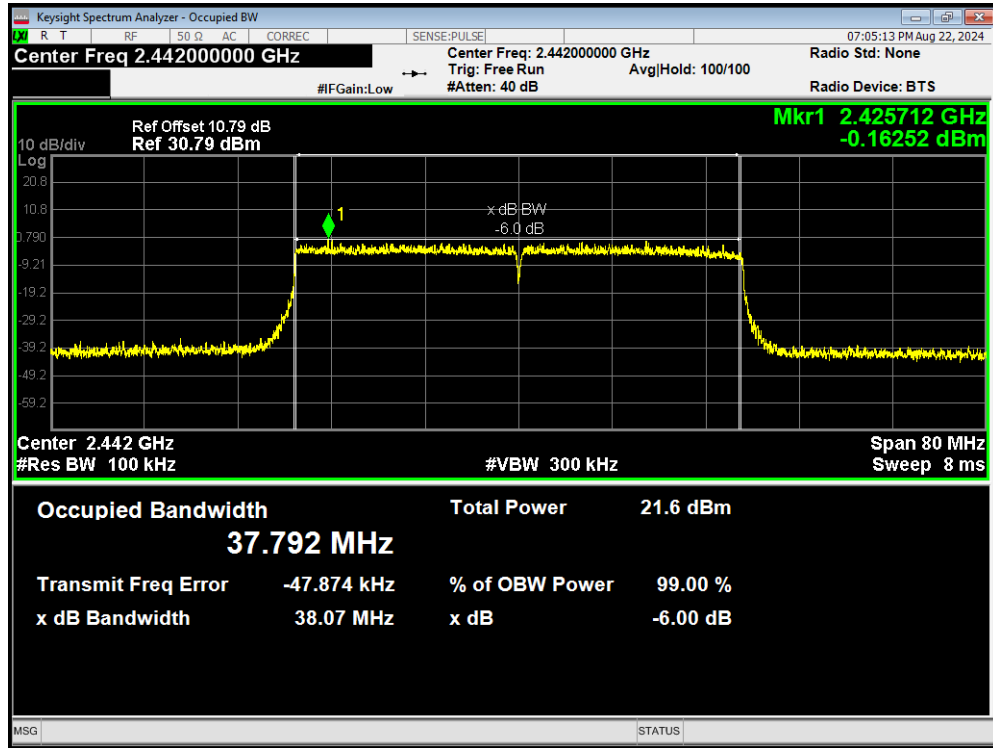
-6dB Bandwidth 802.11ax(HE40) 2432MHz



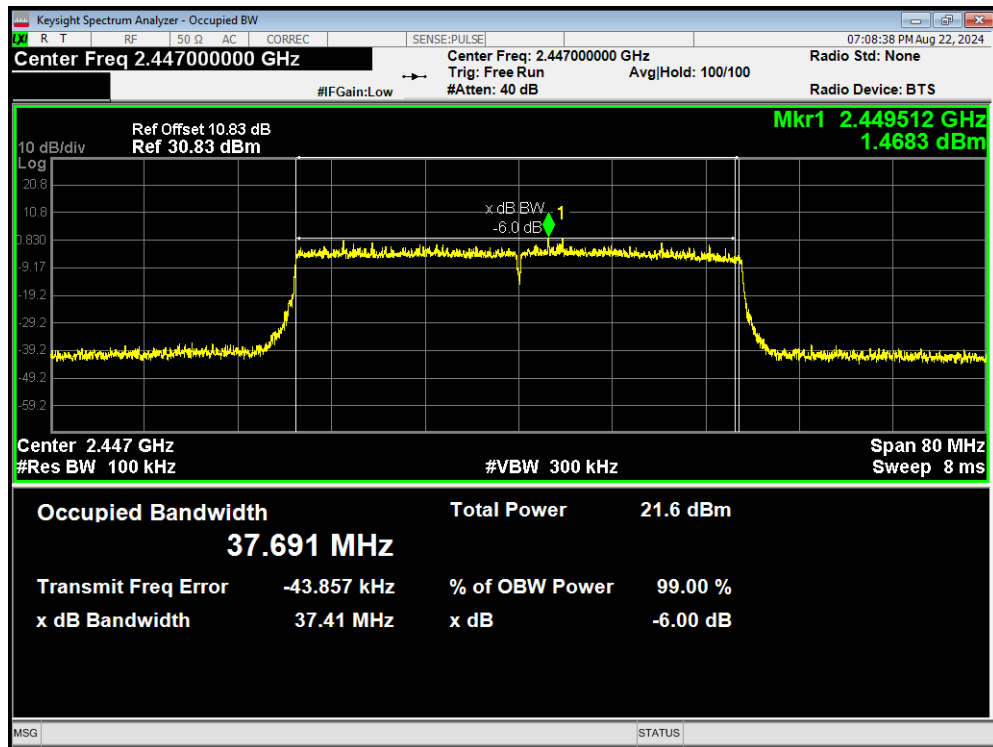
-6dB Bandwidth 802.11ax(HE40) 2437MHz



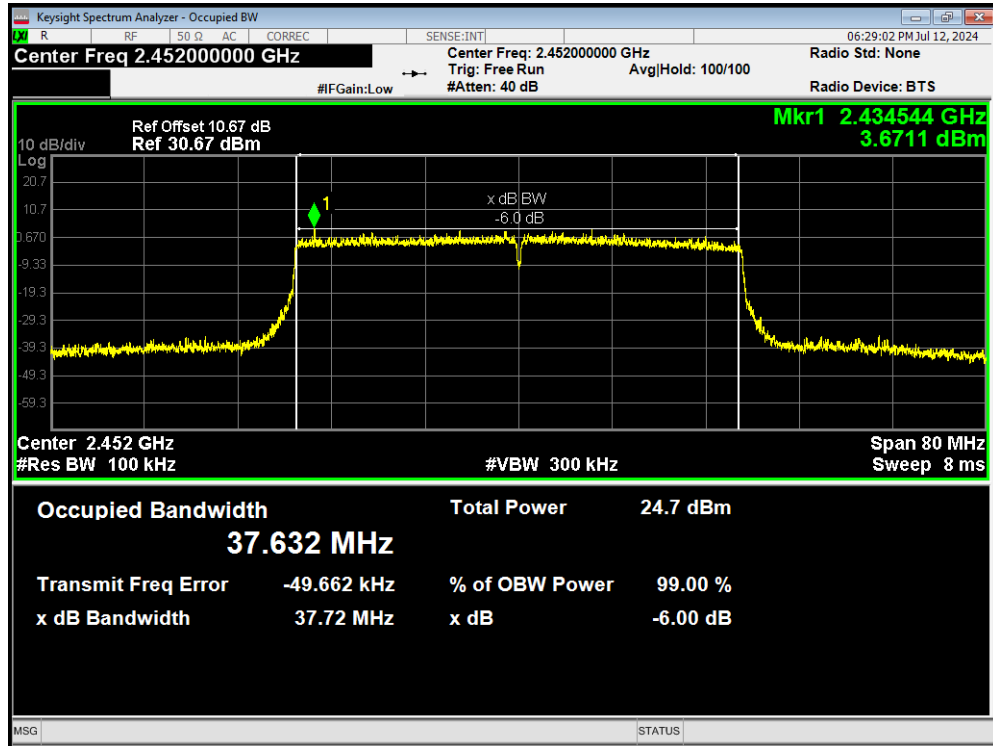
-6dB Bandwidth 802.11ax(HE40) 2442MHz



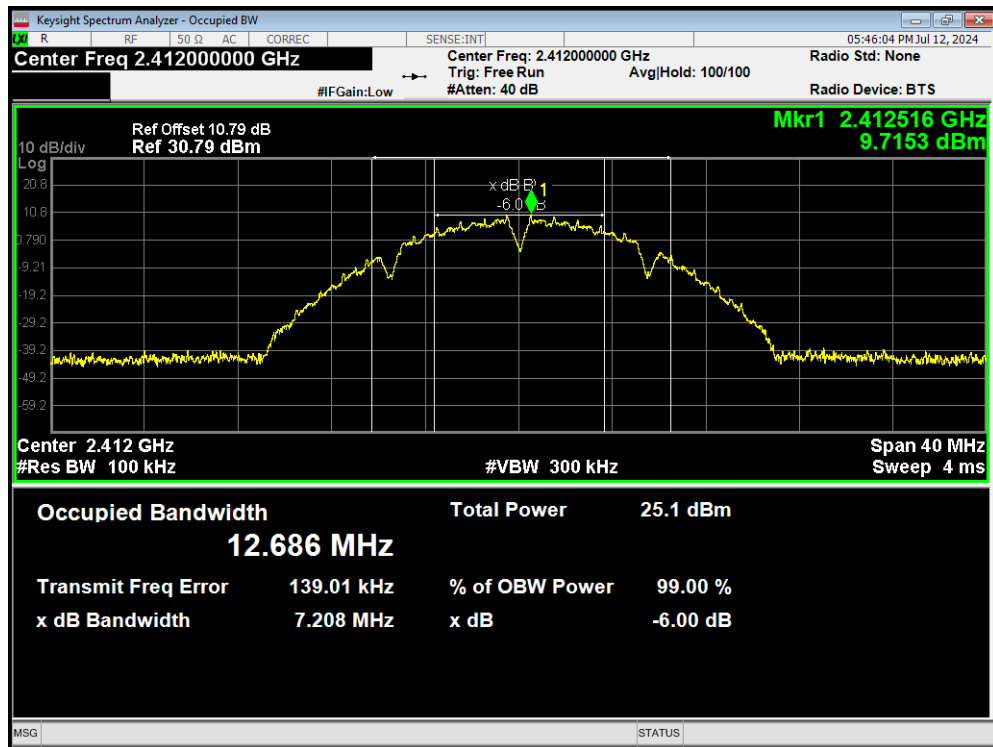
-6dB Bandwidth 802.11ax(HE40) 2447MHz



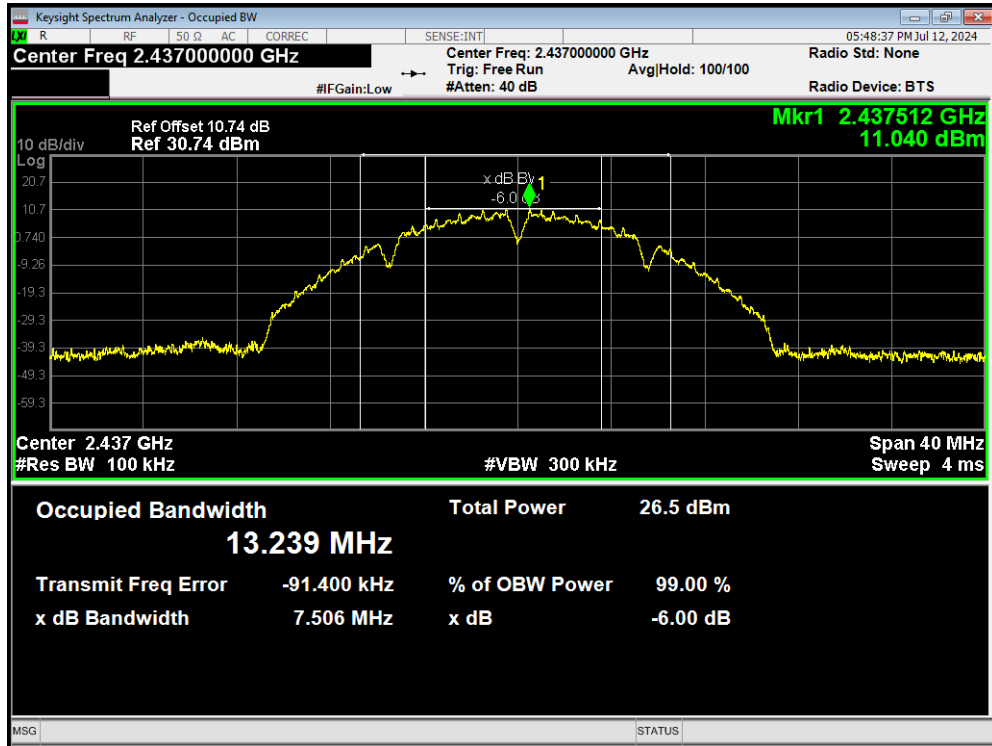
-6dB Bandwidth 802.11ax(HE40) 2452MHz



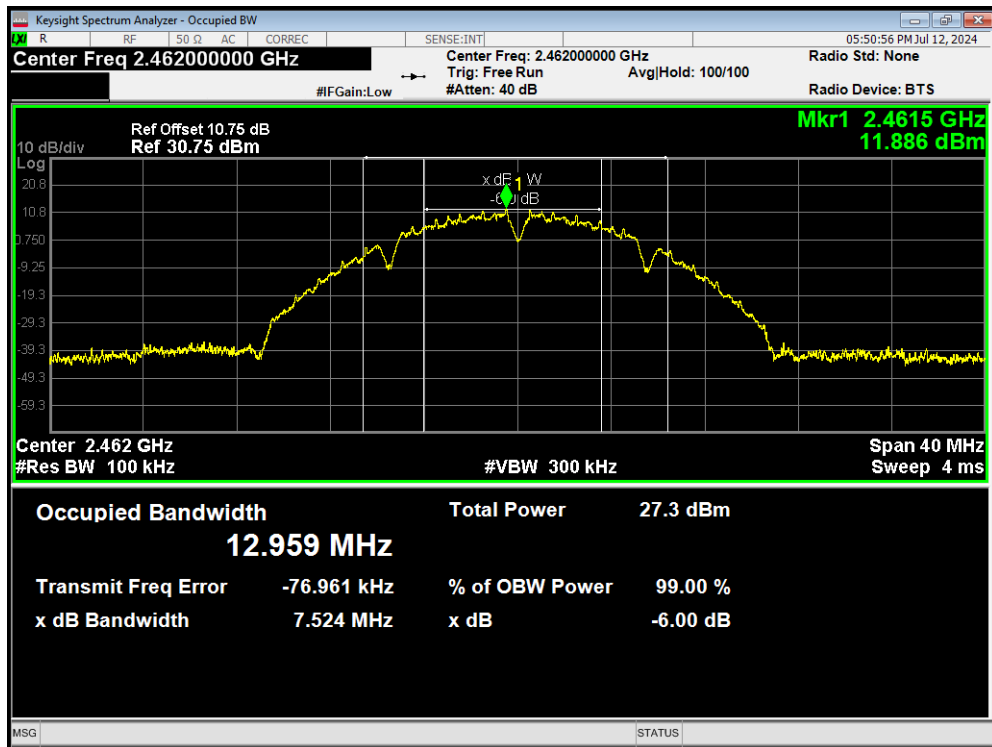
-6dB Bandwidth 802.11b 2412MHz



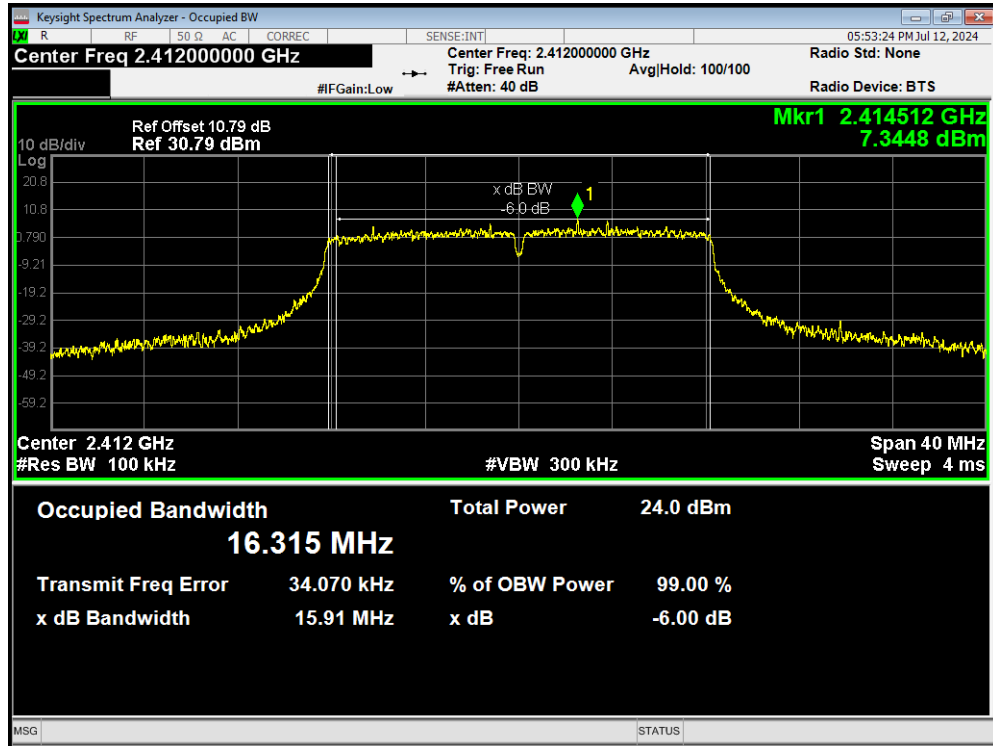
-6dB Bandwidth 802.11b 2437MHz



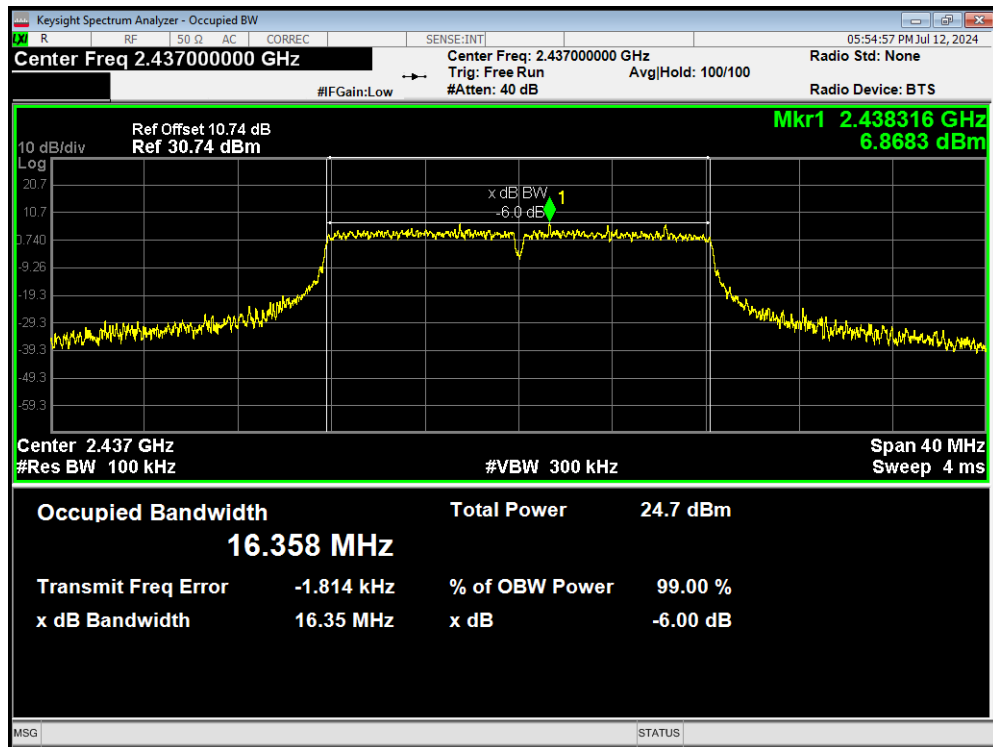
-6dB Bandwidth 802.11b 2462MHz



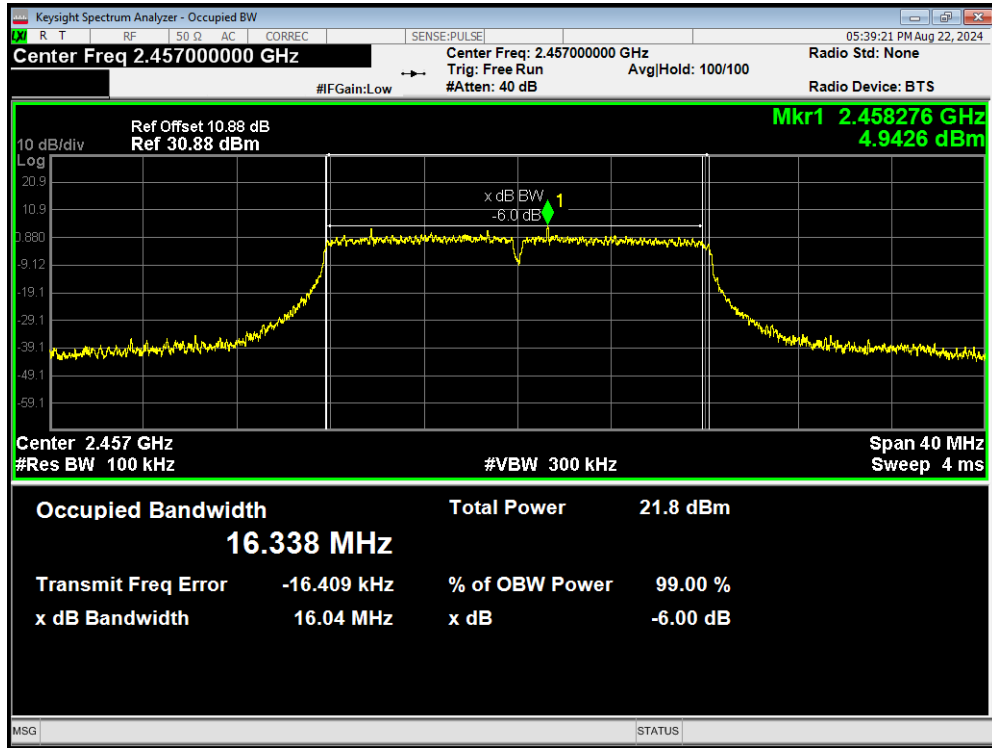
-6dB Bandwidth 802.11g 2412MHz



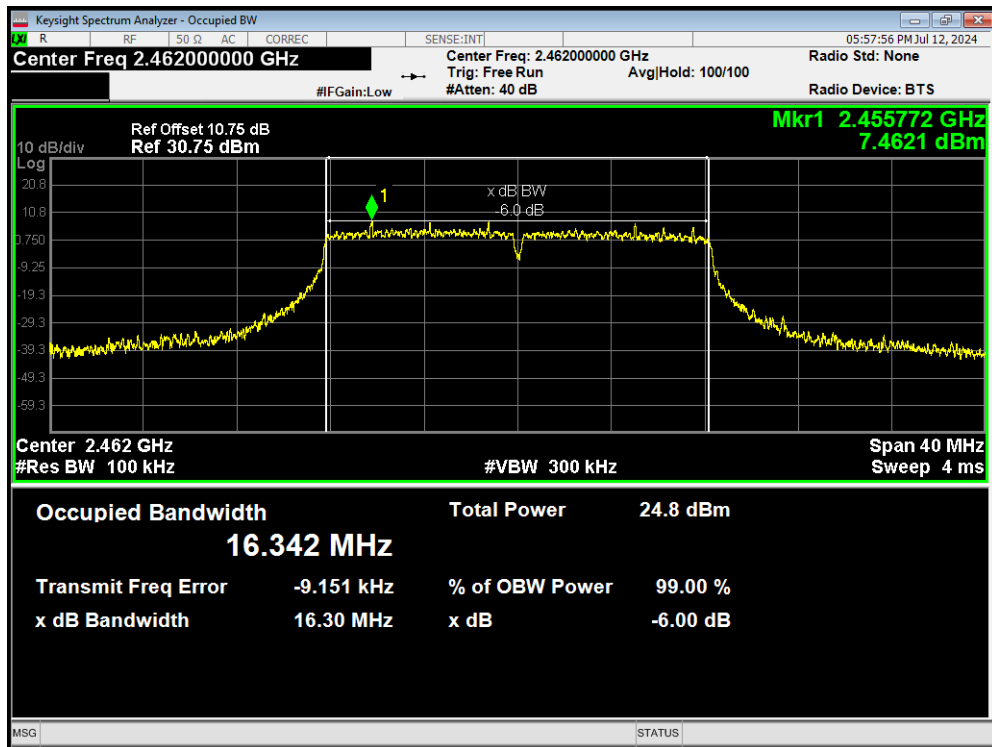
-6dB Bandwidth 802.11g 2437MHz



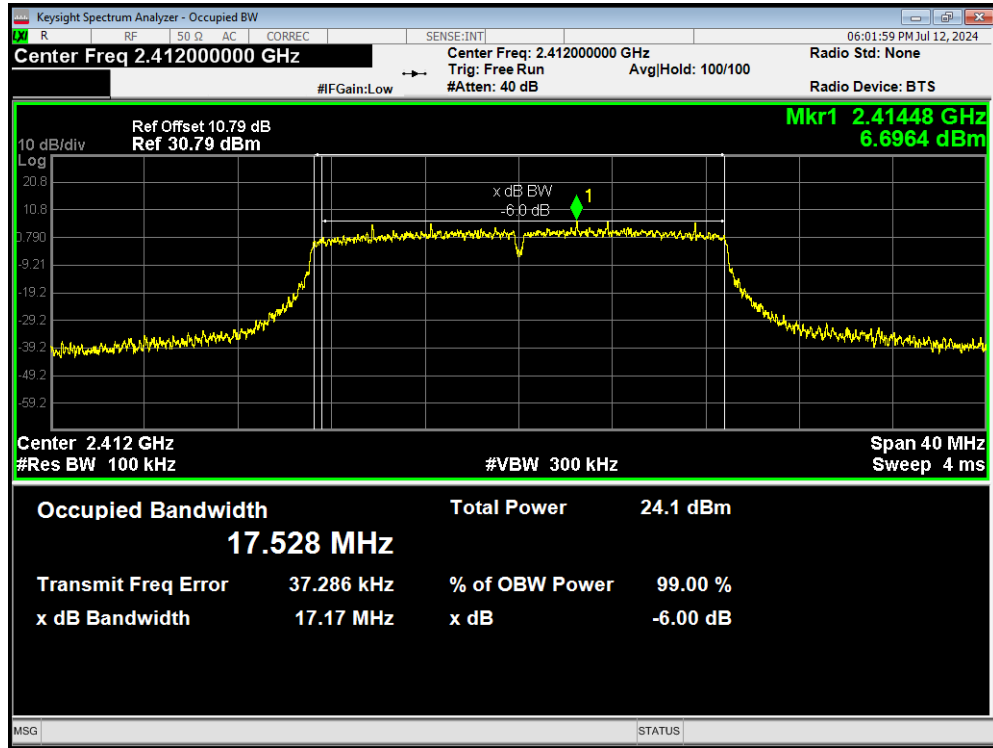
-6dB Bandwidth 802.11g 2457MHz



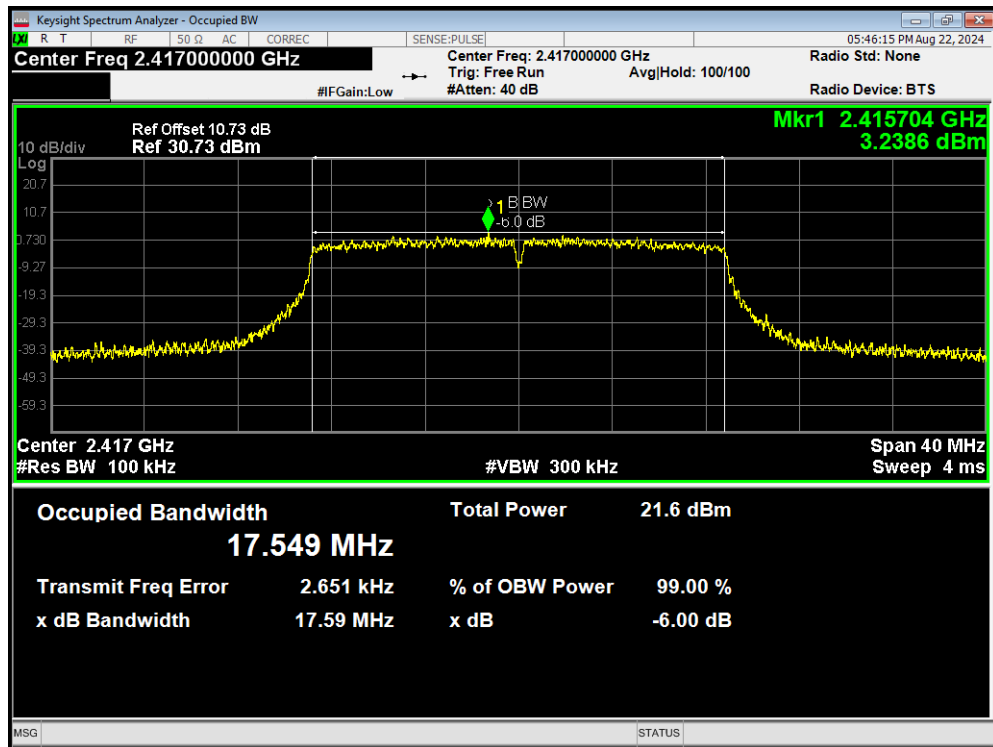
-6dB Bandwidth 802.11g 2462MHz



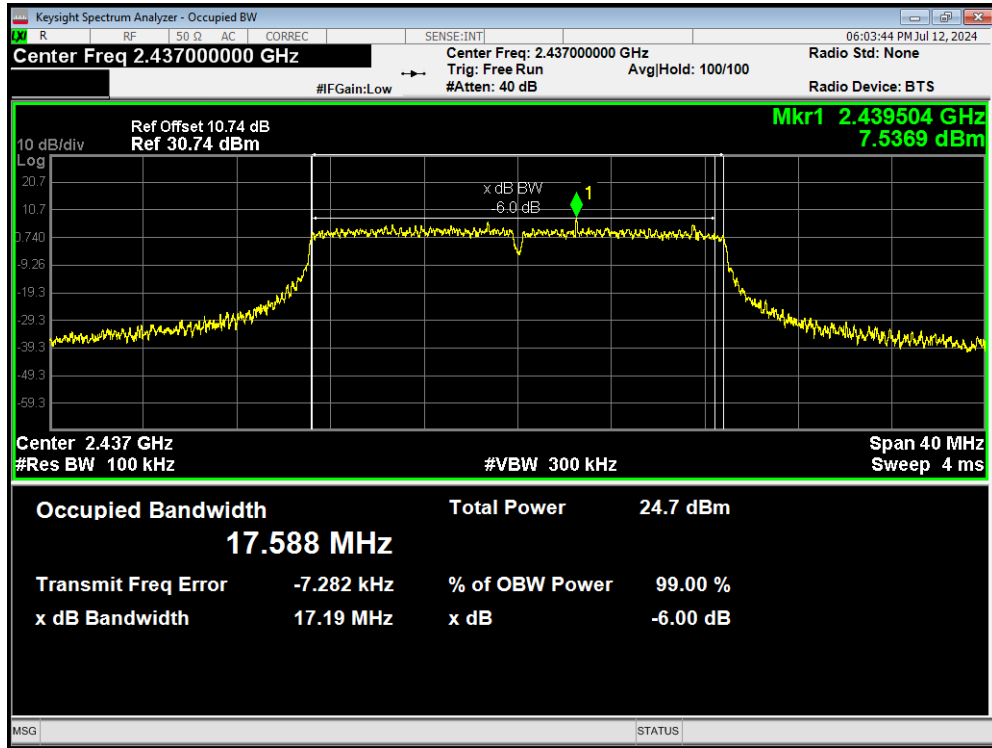
-6dB Bandwidth 802.11n(HT20) 2412MHz



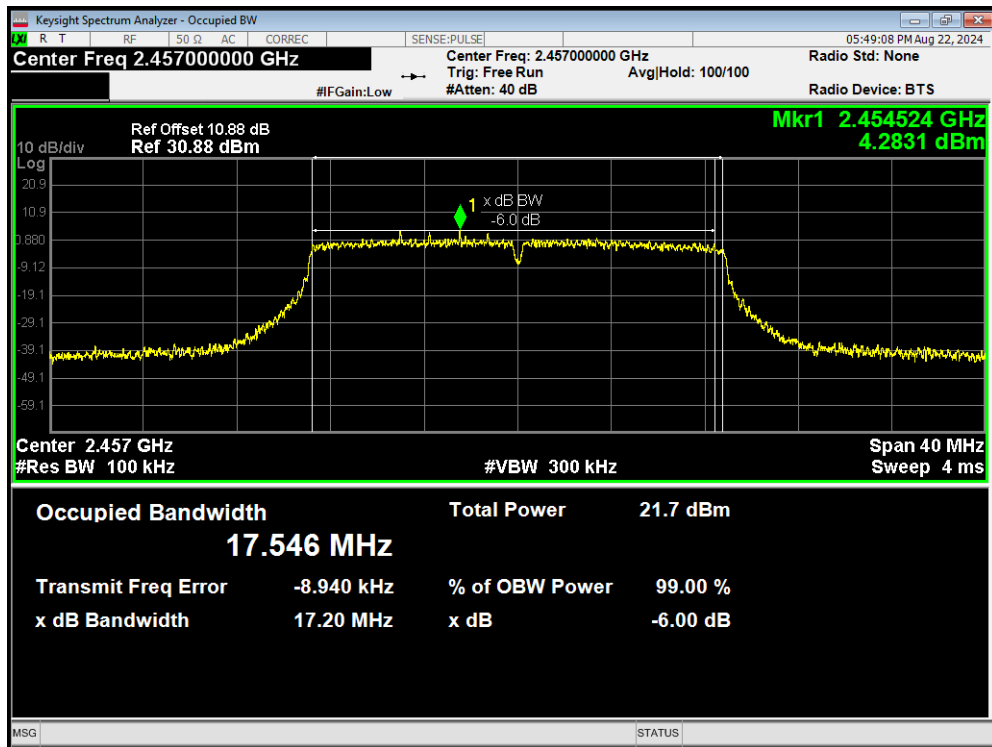
-6dB Bandwidth 802.11n(HT20) 2417MHz



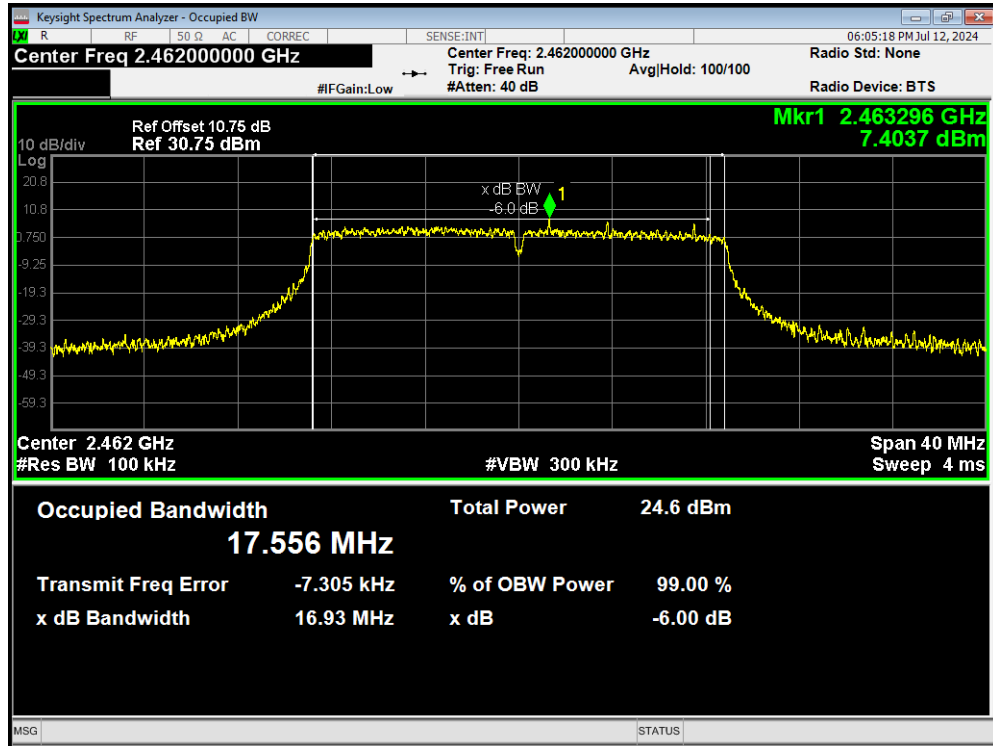
-6dB Bandwidth 802.11n(HT20) 2437MHz



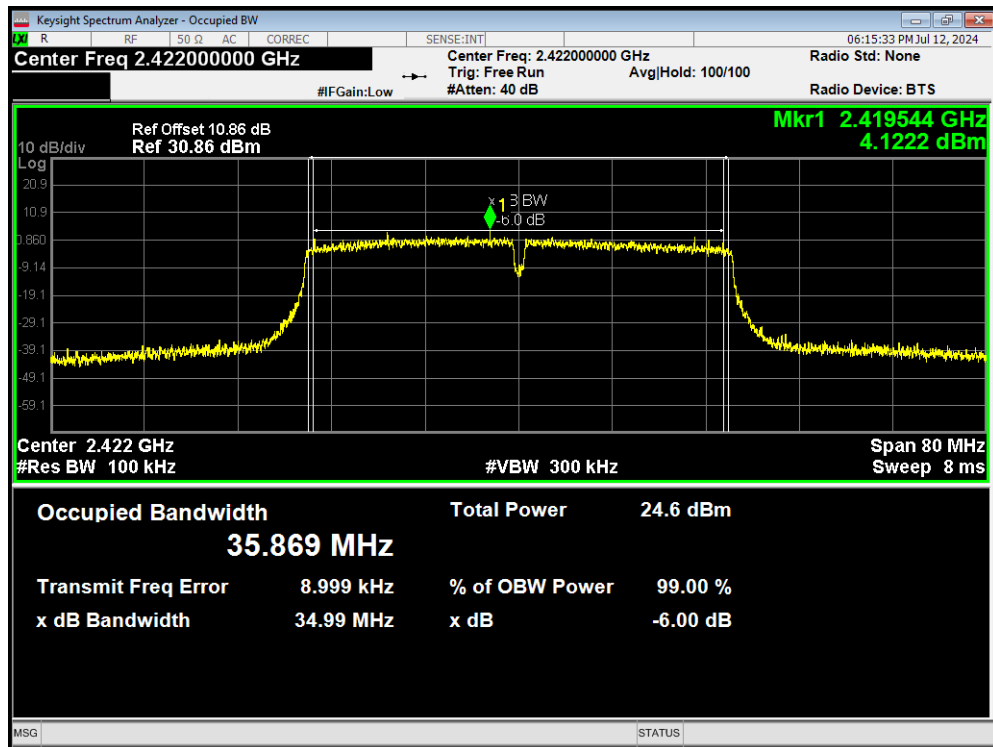
-6dB Bandwidth 802.11n(HT20) 2457MHz



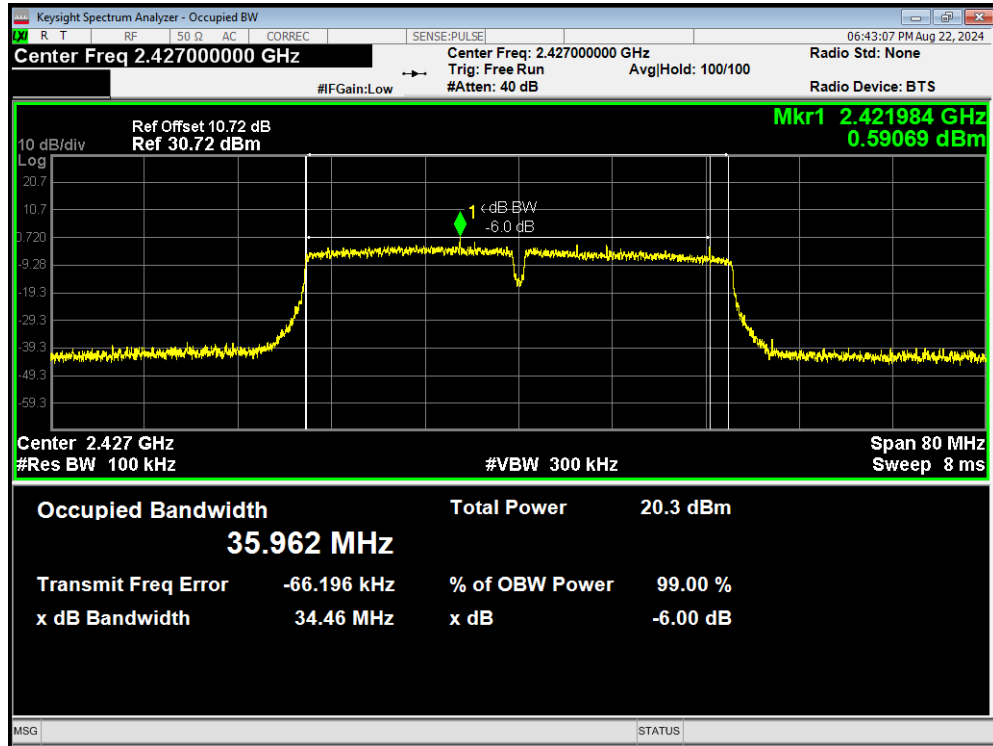
-6dB Bandwidth 802.11n(HT20) 2462MHz



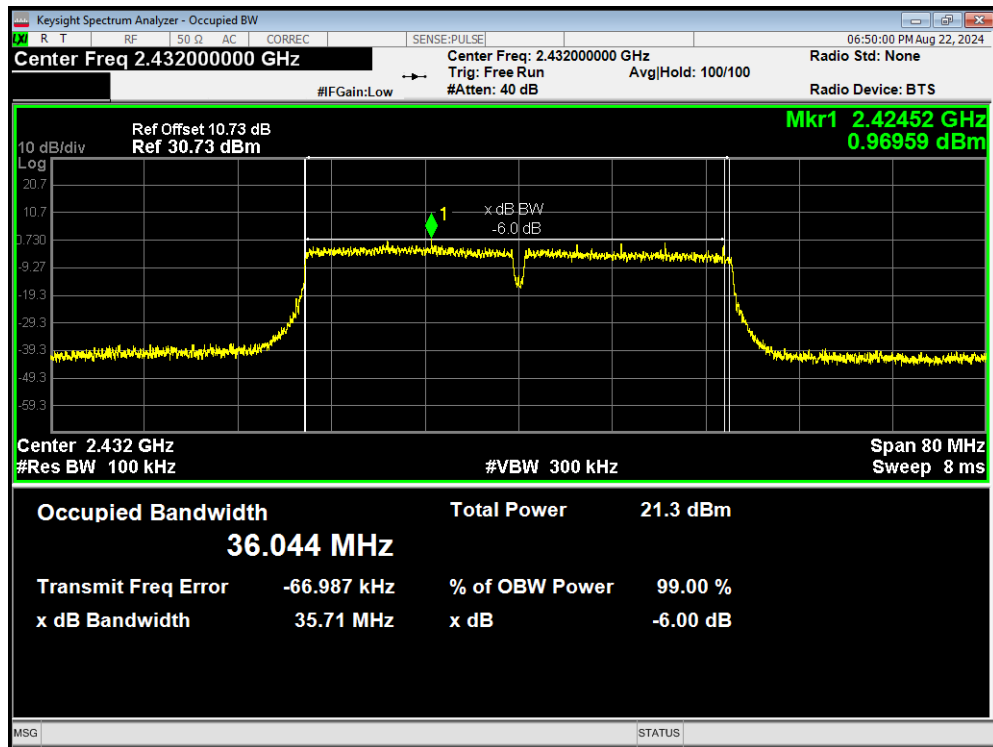
-6dB Bandwidth 802.11n(HT40) 2422MHz



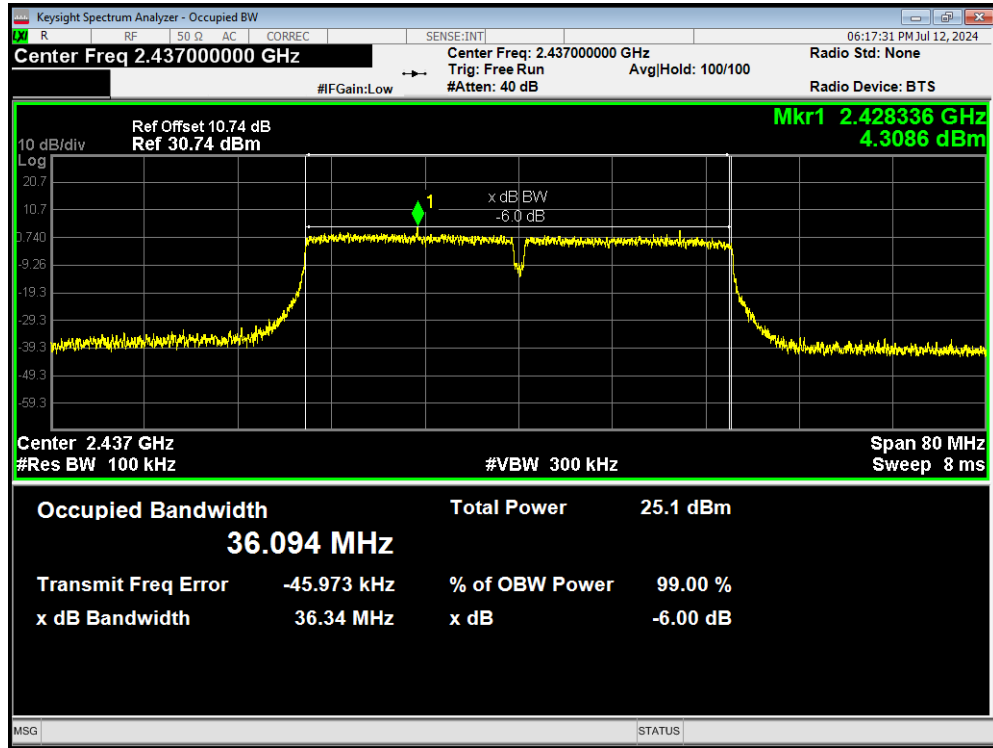
-6dB Bandwidth 802.11n(HT40) 2427MHz



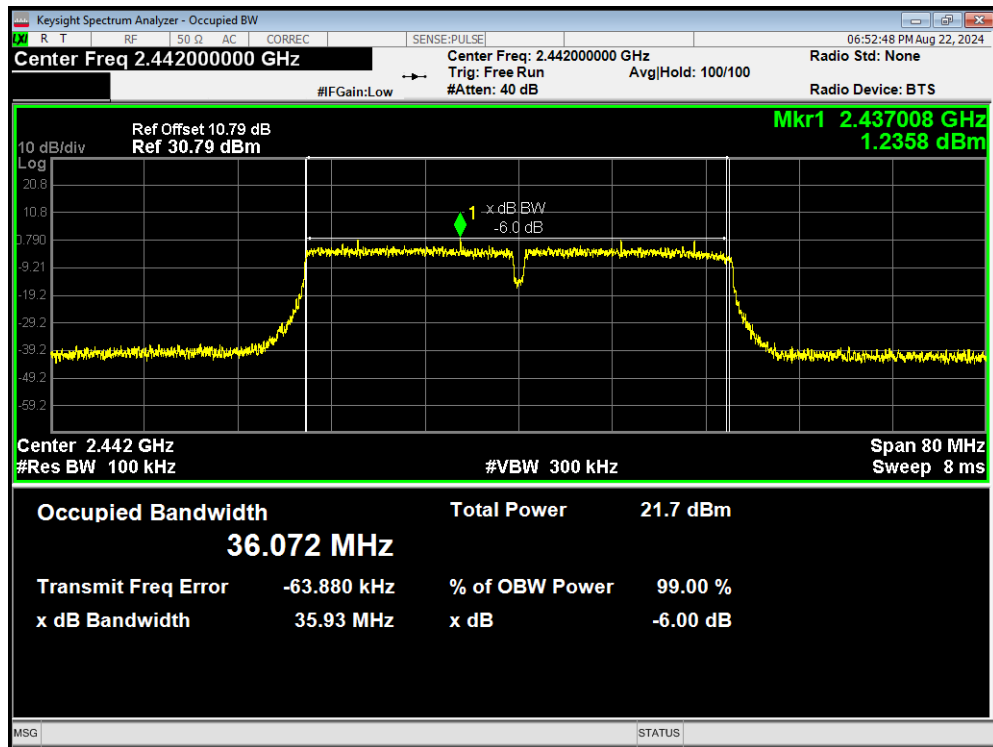
-6dB Bandwidth 802.11n(HT40) 2432MHz



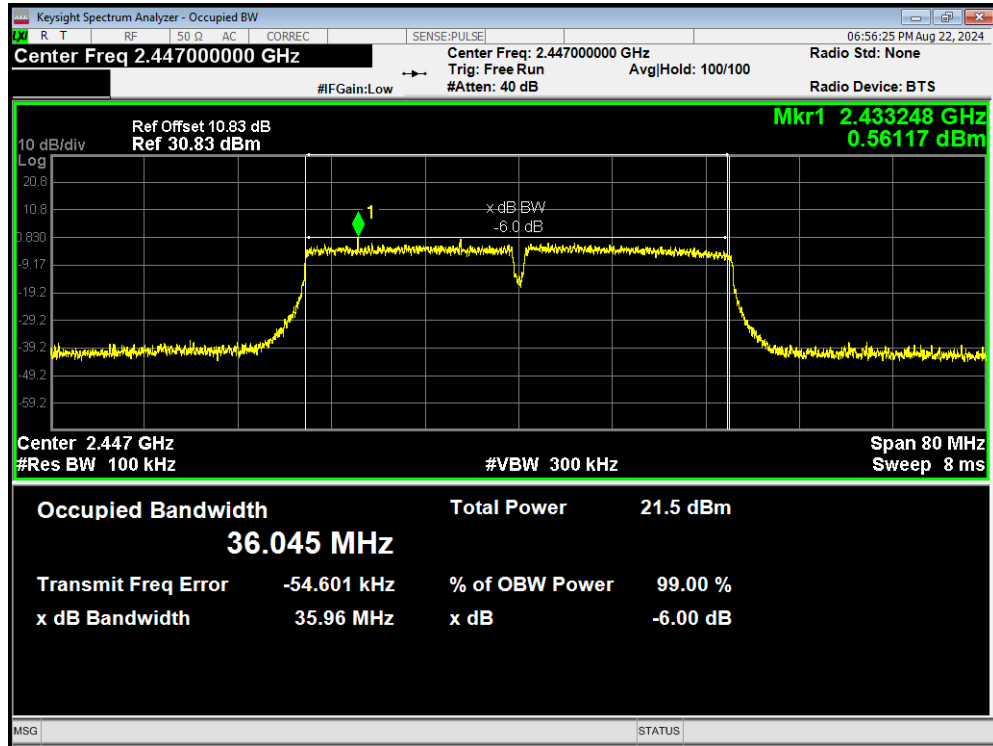
-6dB Bandwidth 802.11n(HT40) 2437MHz



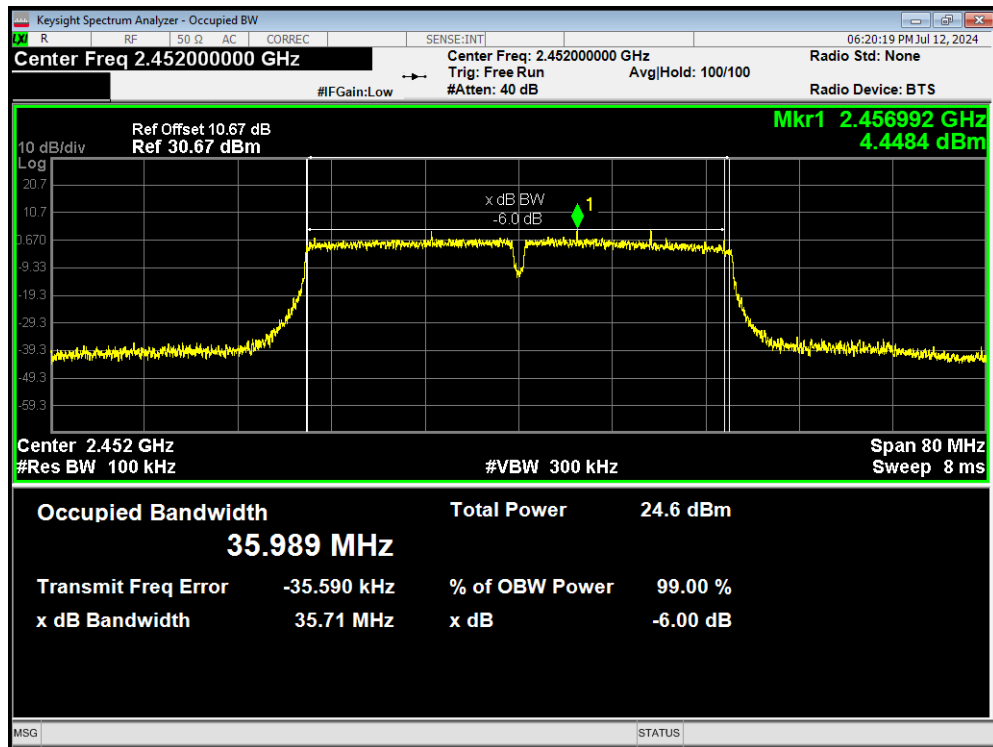
-6dB Bandwidth 802.11n(HT40) 2442MHz



-6dB Bandwidth 802.11n(HT40) 2447MHz



-6dB Bandwidth 802.11n(HT40) 2452MHz



5.3. Band Edge

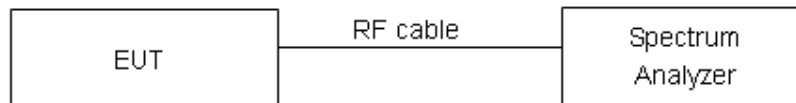
Ambient Condition

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 the band edge of the lowest and highest channels were measured. The peak detector is used and RBW is set to 100 kHz and VBW is set to 300 kHz on spectrum analyzer. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

Rule Part 15.247(d) specifies that “In any 100 kHz 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 20 dB below that in the 100 kHz 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.” If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.”

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

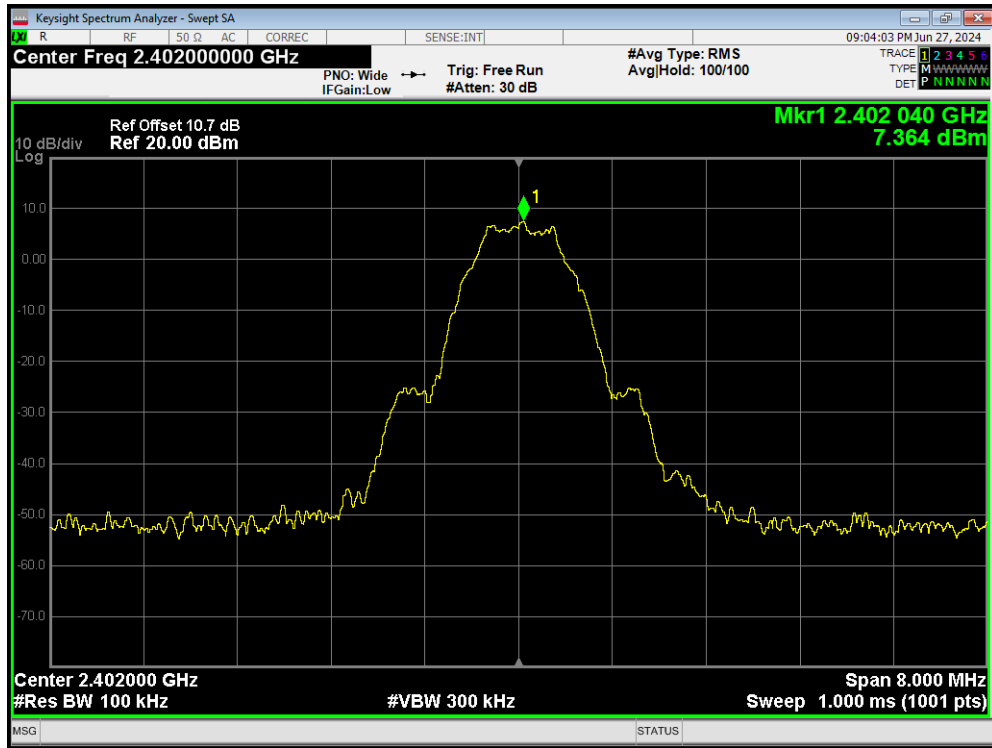
Frequency	Uncertainty
2GHz-3GHz	1.407 dB

Test Results: PASS

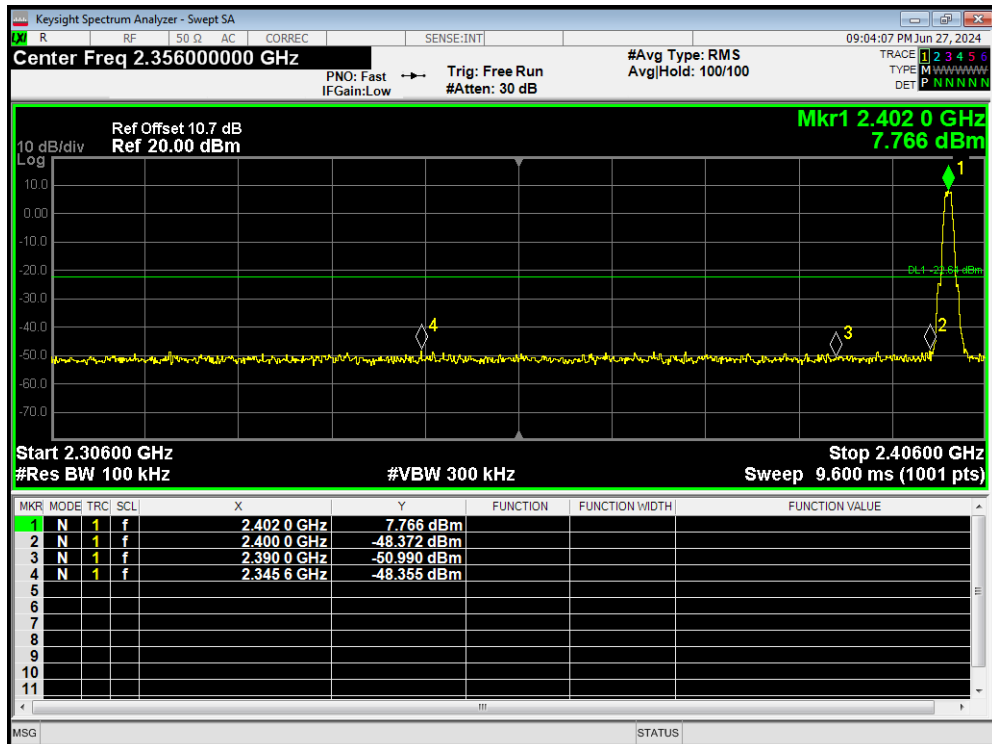
Bluetooth LE

Antenna 1

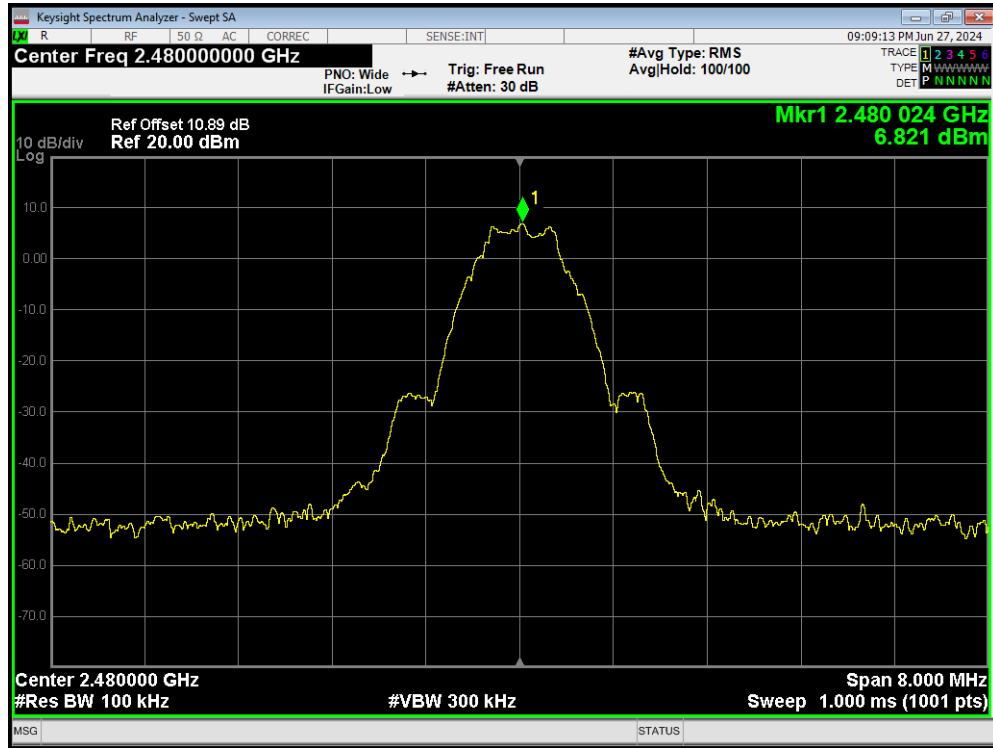
Band Edge BLE (1M) 2402MHz Ref



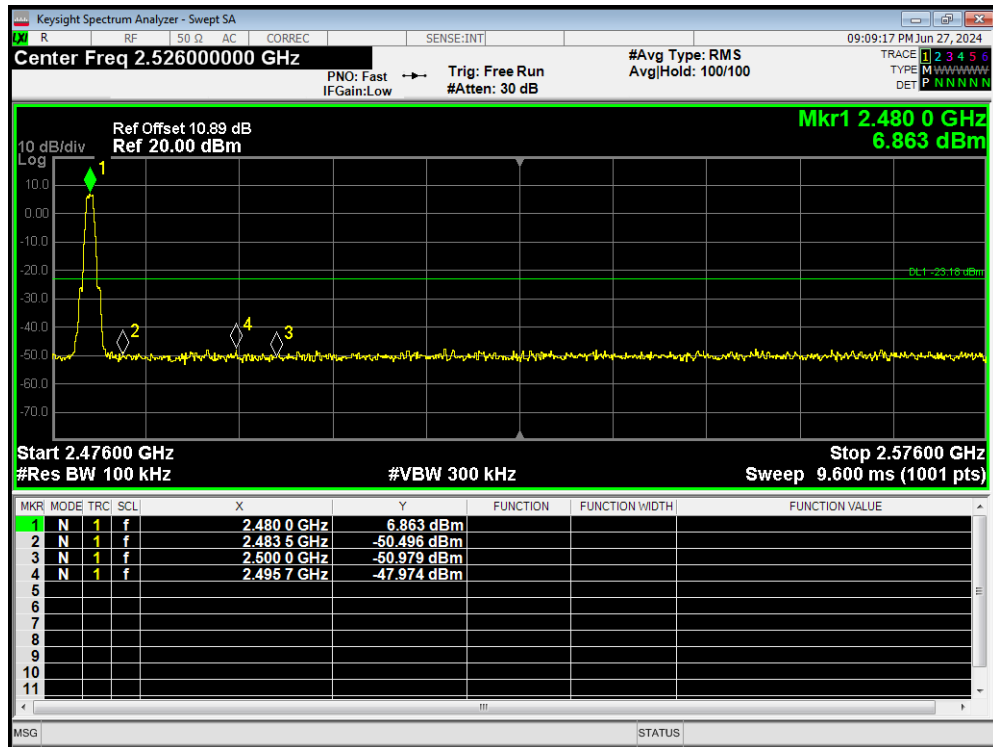
Band Edge BLE (1M) 2402MHz Emission



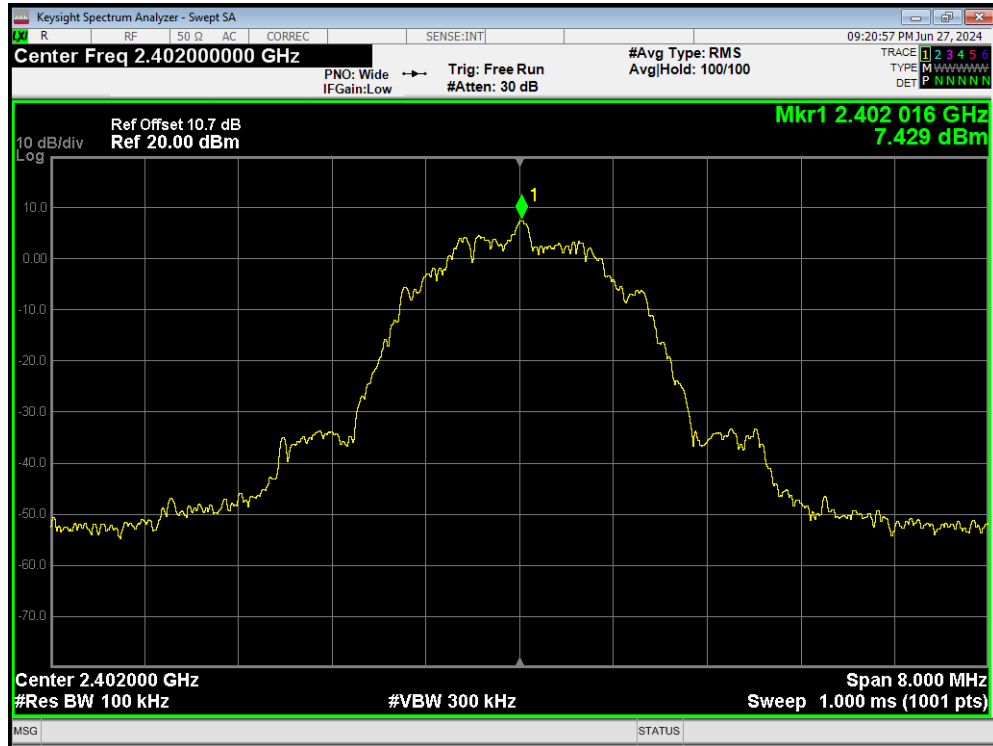
Band Edge BLE (1M) 2480MHz Ref



Band Edge BLE (1M) 2480MHz Emission



Band Edge BLE (2M) 2402MHz Ref



Band Edge BLE (2M) 2402MHz Emission

