

TEST REPORT

Report No.: SHE24080045-02GE

Date: 2024-11-22

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Applicant : SKYTECH USA LLC.
Address of Applicant : INCORP SERVICES, INC. 3458 LAKESHORE DRIVE
TALLAHASSEE, FL 32312 US

Product Name : ALL IN ONE
Brand Name : STGsivir & STGSivir
Model Name : SIV0323
Sample Acquisition Method : Sent by Client
Sample No. : E24080045-02#01
E24080045-02#03

FCC ID : 2BGCASIV0323

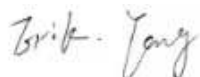
Standards : FCC CFR47 Part 15.247, Subpart C

Date of Receipt : 2024-09-10
Date of Test : 2024-09-10~ 2024-11-22
Date of Issue : 2024-11-22

Remark:

This report details the results of the testing carried out on one sample, the results contained in this report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

Prepared by:



(Erik Yang)

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Approved by:



(Authorized signatory: Echo Mu)

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1 General Information

1.1 Testing Laboratory

Company Name	ICAS Testing Technology Service (Shanghai) Co., Ltd.
Address	No.1298, Pingan Road, Minhang District, Shanghai, China
Telephone	0086 21-51682999
Fax	0086 21-54711112
Homepage	www.icasiso.com

1.2 Details of Application

Applicant Company Name	SKYTECH USA LLC.
Address	INCORP SERVICES, INC. 3458 LAKESHORE DRIVE TALLAHASSEE, FL 32312 US
Contact Person	Hu yan
Telephone	001-647-8892-868
Email	yan.hu@astsys.com
Manufacturer Company Name	SKYTECH USA LLC.
Address	INCORP SERVICES, INC. 3458 LAKESHORE DRIVE TALLAHASSEE, FL 32312 US
Factory Company Name	SKYTECH USA LLC.
Address	INCORP SERVICES, INC. 3458 LAKESHORE DRIVE TALLAHASSEE, FL 32312 US

1.3 Details of EUT

Product Name	ALL IN ONE
Brand Name	STGSivir & STGSivir
Test Model Name	SIV0323
FCC ID	2BGCASIV0323
Mode of Operation	WIFI 802.11b/g/n(HT20/40)
Maximum Conducted (average) output power	IEEE 802.11b: 12.93dBm IEEE 802.11g: 12.15dBm IEEE 802.11n(20): 11.99dBm IEEE 802.11n(40): 11.59dBm
Frequency Range	2412MHz ~ 2462MHz
Channel Separation	5 MHz
Number of channels	11
Modulation Type	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n(20M/40M): OFDM(64QAM, 16QAM, QPSK, BPSK)
Antenna Type	Internal Antenna
Antenna Gain	1.83dBi

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Extreme Temperature Range	0°C~ +70°C
Test Voltage	DC 19V by AC/DC ADAPTER(Input: AC 100-240V 50/60Hz 2.5A, Output:DC 19V 6320mA)
Hardware Version	4.6.5.4
Software Version	10.0.19045.4894
RF power setting in TEST SW	802.11b:Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_Default 802.11g:Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_43 802.11n(HT20): Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_43 802.11n(HT40): Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801_Power level setting_40

- Note:
- The above information was declared by the manufacture.
 - For more details, please refer to the User's manual of the EUT.

Channel List

Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2.412GHz	5	2.432GHz	9	2.452GHz
2	2.417GHz	6	2.437GHz	10	2.457GHz
3	2.422GHz	7	2.442GHz	11	2.462GHz
4	2.427GHz	8	2.447GHz		

- Note:
- For 20MHz bandwidth system use Channel 1 to Channel 11
- For 40MHz bandwidth system use Channel 3 to Channel 9

1.4 Test Methodology

47 CFR Part 15, Subpart C	Telecommunication-Radio Frequency Devices-Intentional Radiators
KDB Publication 558074 D01 v05r02	15.247 Meas Guidance.
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Note(s):

All test items were verified and recorded according to the standards and without any addition/deviation/exclusion during the test.

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1.5 Test Summary

Test Item	FCC Rules	Result
Antenna Requirement	FCC Part 15.247(b)(4), Part 15.203	PASS
Maximum conducted (average) output power	FCC Part 15.247(b)(3)	PASS
6dB Bandwidth and 99% Bandwidth	FCC Part 15.247(a)(2)	PASS
Maximum conducted output power spectral density	FCC Part 15.247(e)	PASS
Conducted Spurious Emission & Authorized-band band-edge	FCC Part 15.247(d)	PASS
Radiated Emission	FCC Part 15.247(d), 15.205, 15.209	PASS
Band Edge (Restricted-band band-edge)	FCC Part 15.247(d), 15.205, 15.209	PASS
Conducted Emission on AC Mains	FCC Part 15.207(a)	PASS

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2 Test Condition

2.1 Environmental conditions

Temperature (°C)	15-35
Humidity (%RH)	30-60
Barometric Pressure (mbar)	860-1060

2.2 Equipment List

Name of Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	Keysight	N9020A	MY54101709	2024-06-26	2025-06-25
Spectrum Analyzer	Rohde & Schwarz	FSV40N	101450	2024-06-04	2025-06-03
Signal Generator	Rohde & Schwarz	SMR27	100184	2024-06-26	2025-06-25
EMI Test Receiver	Rohde & Schwarz	ESPI3	100173	2024-06-05	2025-06-04
EMI Test Receiver	Rohde & Schwarz	ESR 7	101911	2024-06-04	2025-06-03
V-network	SCHWARZBECK	NSLK 8127	8127-902	2024-06-05	2025-06-04
Attenuator	SCHWARZBECK	VTSD 9561-FN	/	2024-06-05	2025-06-04
Broadband Antenna	SCHWARZBECK	VULB9163	9163-1037	2023-03-22	2025-03-21
Horn Antenna-18G	SCHWARZBECK	BBHA9120D	9120D-1775	2023-06-13	2025-06-12
Loop Antenna	SCHWARZBECK	FMZB 1513	/	2023-06-09	2025-06-08
Horn Antenna-40G	YINGLIAN	LB-180400-KF	N/A	2023-06-18	2025-06-17
Broadband Preamplifier	SCHWARZBECK	BBV 9718	346	2024-06-04	2025-06-03
EMC chamber 9*6*6(L*W*H)	CHANGNING	966	N/A	2023-06-09	2025-06-08
Shielded Enclosure 8*5*4(L*W*H)	CHANGNING	854	N/A	2023-06-09	2025-06-08
Test Software	BL	BL410_E	Version:2.1.1.436	N/A	N/A
Test Software	BL	BL410_R	Version:2.1.1.409	N/A	N/A

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2.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI. The reported uncertainty of measurement $y \pm U$, 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 95.45%.

Parameter		Uncertainty
Antenna Port Conducted Emission		$\pm 1.04\text{dB}$
Radiated Emission	< 1GHz	$\pm 5.00\text{dB}$
	> 1GHz	$\pm 5.46\text{dB}$
Conducted Emission on AC Mains	150kHz-30MHz	$\pm 3.36\text{dB}$
Occupied Channel Bandwidth		$\pm 39.26\text{KHz}$
Maximum Conducted Output Power		$\pm 1.06\text{dB}$
Maximum Conducted Output Power Spectral Density		$\pm 1.12\text{dB}$

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3 Test Set-up and Operation Modes

3.1 Details of Test Mode

Using test software to control EUT work in continuous transmit mode. Select test channel as below:
For 802.11b/g/n (HT20)

Channel	Frequency
The lowest channel (CH1)	2412MHz
The middle channel (CH6)	2437MHz
The highest channel (CH11)	2462MHz

For 802.11n(HT40)

Channel	Frequency
The lowest channel (CH3)	2422MHz
The middle channel (CH6)	2437MHz
The highest channel (CH9)	2452MHz

Through Pre-scan under all rate at lowest channel, the data rate as below table described is the worst case, so we choose these data rate for test.

Type	Data rate
802.11b	11Mbps
802.11g	48Mbps
802.11n(20M)	MCS4
802.11n(40M)	MCS6

The basic operation modes are:

- A. On
 - 1. WLAN mode
 - a. Transmitting
 - i. Low Channel
 - ii. Middle Channel
 - iii. High Channel
 - b. Receiving
- B. Standby
- C. Off

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3.2 Special Accessories and Auxiliary Equipment

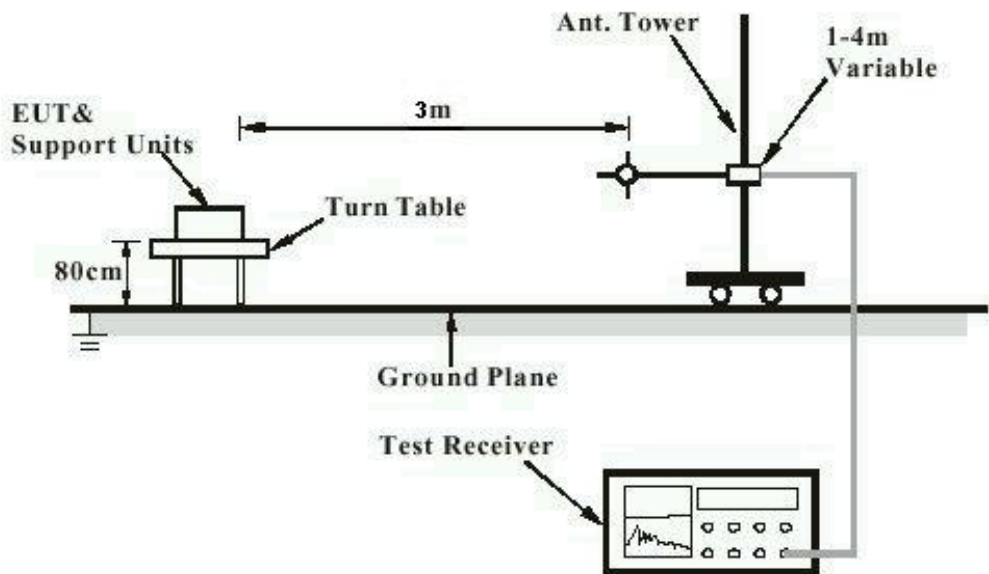
Description	Manufacturer	Model Name	Serial No.
AC/DC ADAPTER	Dongguan Jiayi Electric Co., Ltd.	K1211-1906320D	K1211-1906320D
Mouse	Dell	MS116t1	CN-065K5F-LO300-248-0VP2
Keyboard	Dell	KB216P	CN-0M4W71-73826-6C801SQ-A02

3.3 Support Software

Description	Manufacturer	Software Name
Software	N/A	Realtek 11ac 8821C PCIE WLAN MP Diagnostic Program 0.0007.00.20190801

3.4 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

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Diagram of Measurement Equipment Configuration for Conduction Measurement

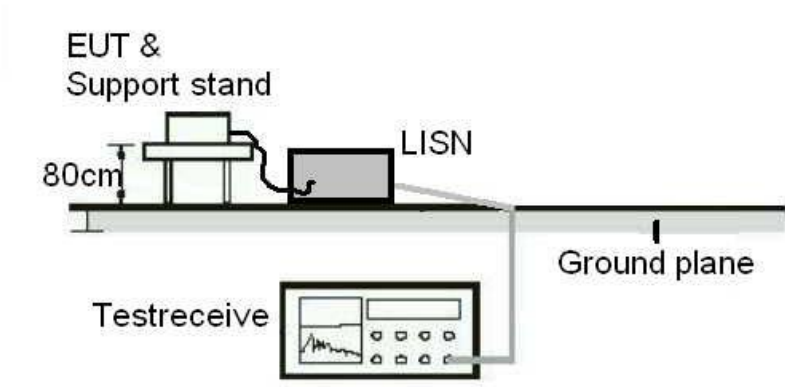
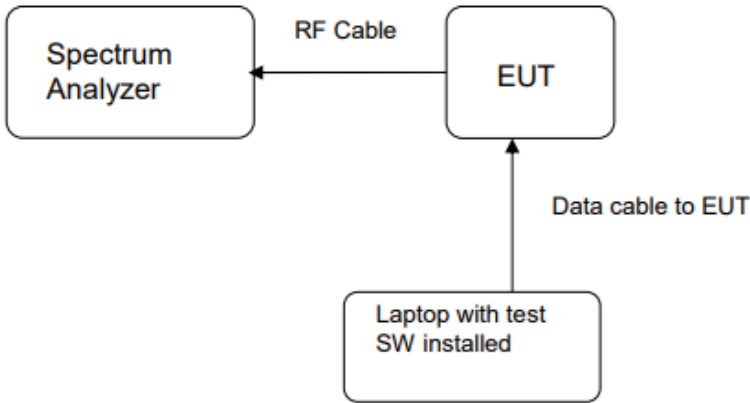


Diagram of Measurement Equipment Configuration for Transmitter Measurement



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4 Test Results

4.1 Transmitter Requirement & Test Suites

4.1.1 Antenna Requirement

RESULT:

PASS

Test standard	: FCC Part 15.247(b)(4), Part 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 shall be considered sufficient to comply with the provisions of this section. 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. In addition, If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 1.97dBi. The antenna is an internal antenna with no possibility of replacement with a non-approved antenna by the end-user.

Therefore, the EUT is considered to comply with this provision.

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4.1.2 Maximum conducted (average) output power

RESULT:

PASS

Test standard : FCC Part 15.247(b)(3)

Requirement : ANSI C63.10-2013, Clause 11.9.2
KDB 558074 D01 v05r02, Clause 8.3.2

Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 24.5°C

Relative humidity : 38%

Table 1: Maximum conducted (average) output power

Test Mode	Duty Cycle (%)	Test Channel (MHz)	Maximum conducted (average) output power		Limit (W)
			(dBm)	(mW)	
802.11b	100	2412	12.49	17.74	≤1
		2437	12.72	18.71	
		2462	12.93	19.63	
802.11g	100	2412	12.15	16.41	
		2437	11.90	15.49	
		2462	11.59	14.42	
802.11n(HT20)	100	2412	11.99	15.81	
		2437	11.64	14.59	
		2462	11.36	13.68	
802.11n(HT40)	100	2422	10.59	11.46	
		2437	10.53	11.30	
		2452	10.31	10.74	

Notes:

1. Add [10 log (1 / D)], where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

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4.1.3 6dB Bandwidth and 99% Bandwidth

RESULT:

PASS

Test standard : FCC Part 15.247(a)(2)
ANSI C63.10-2013, Clause 11.8.1

Requirement : KDB 558074 D01 v05r02, Clause 8.2

Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 24.5°C

Relative humidity : 38%

Table 2: 6dB Bandwidth and 99% Bandwidth

Test Mode	Test Channel (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	6dB Bandwidth Applicable Limit (MHz)
802.11b	2412	10.11	15.046	≥0.5
	2437	10.12	15.059	
	2462	10.09	15.064	
802.11g	2412	16.48	16.772	
	2437	16.49	16.750	
	2462	16.50	16.713	
802.11n(HT20)	2412	17.75	17.931	
	2437	17.70	17.848	
	2462	17.76	17.911	
802.11n(HT40)	2422	36.50	36.205	
	2437	36.50	36.172	
	2452	36.48	36.193	

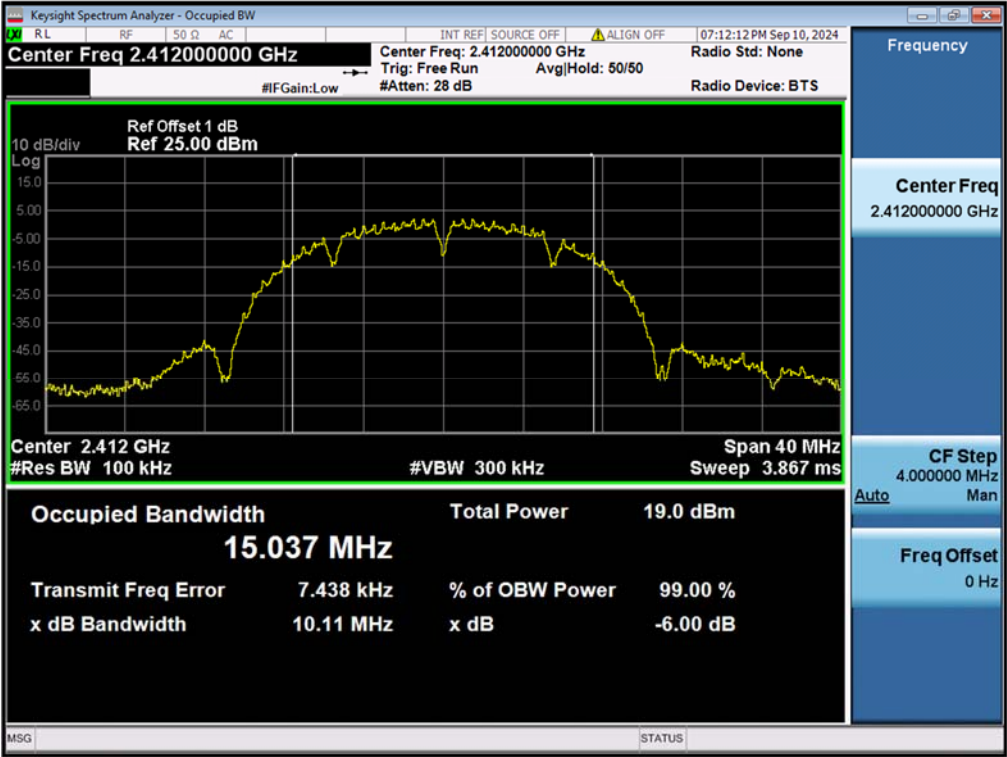
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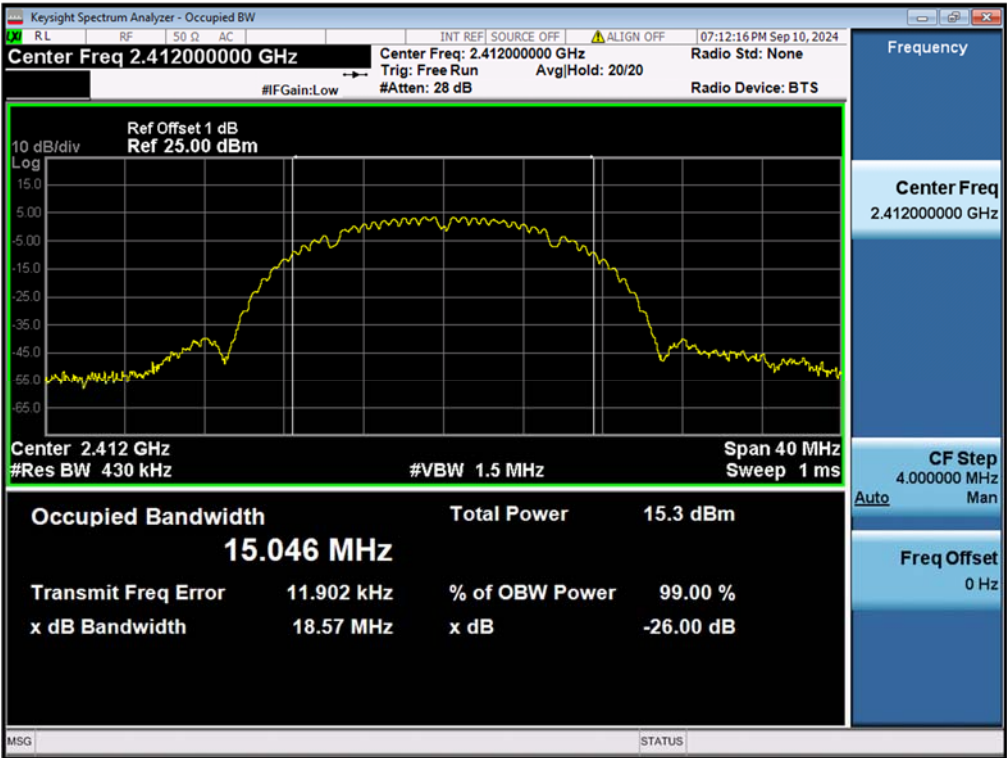
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Figure 1: 6dB Bandwidth, 802.11b, 2412MHz



99% Bandwidth, 802.11b, 2412MHz



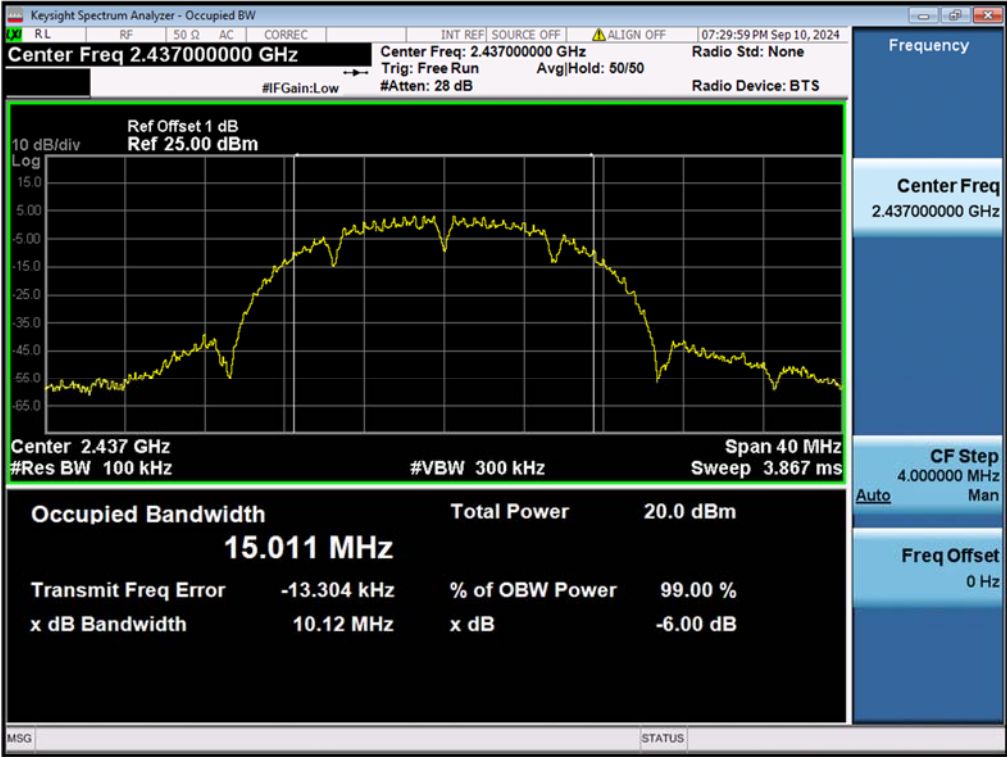
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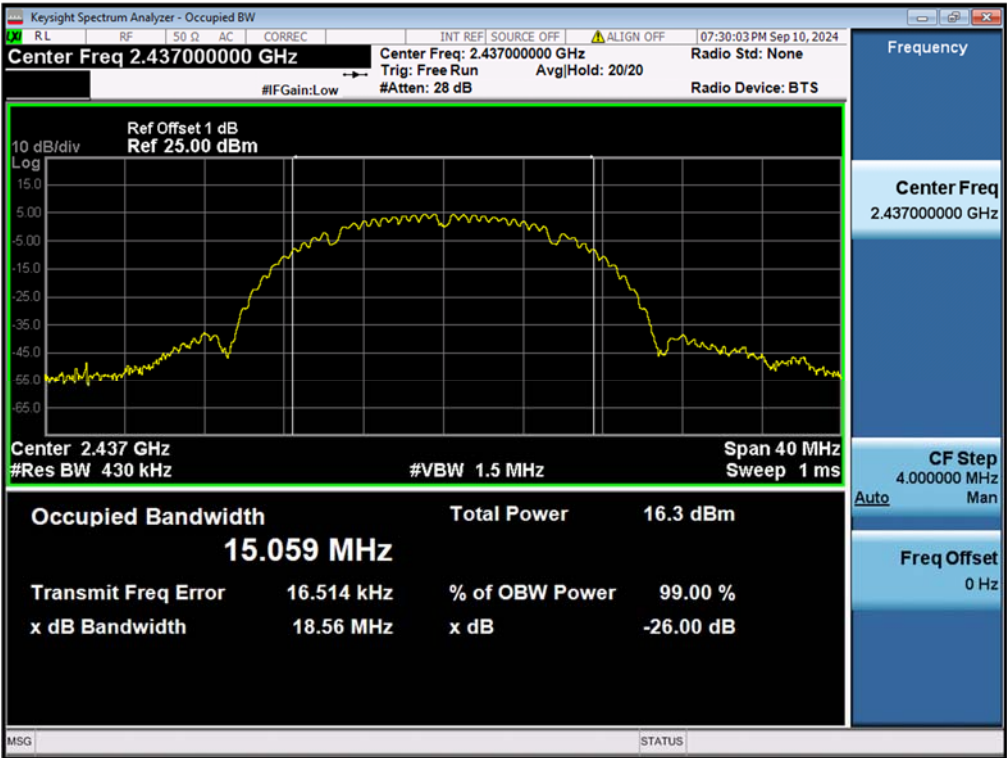
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Figure 2: 6dB Bandwidth, 802.11b, 2437MHz



99% Bandwidth, 802.11b, 2437MHz



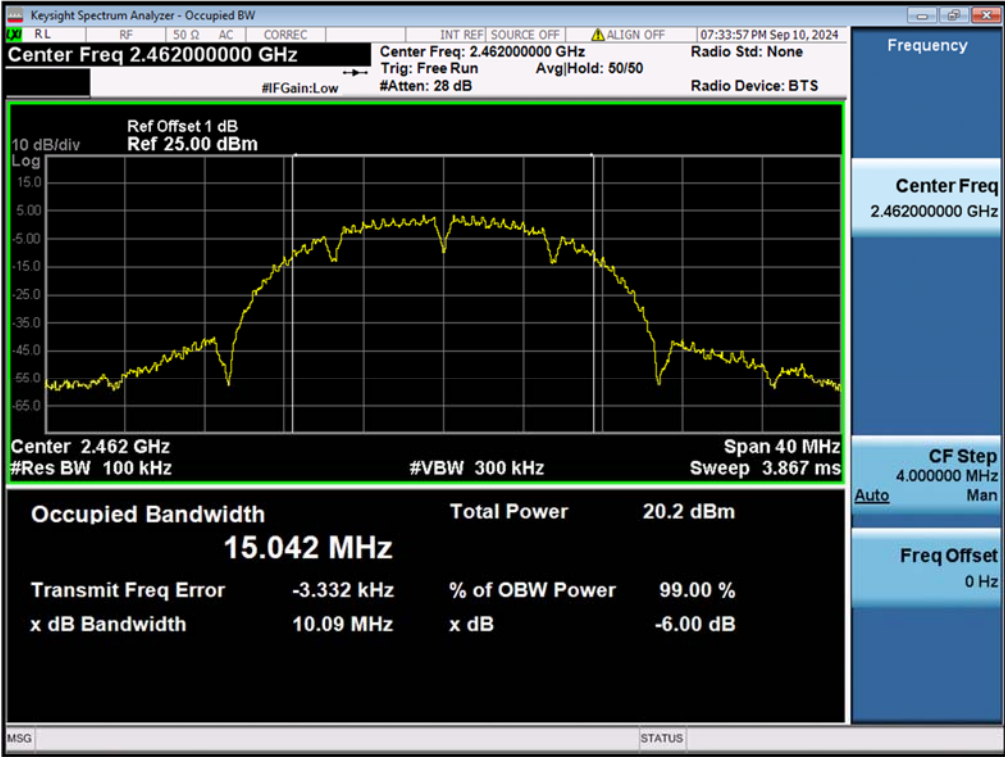
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Figure 3: 6dB Bandwidth, 802.11b, 2462MHz



99% Bandwidth, 802.11b, 2462MHz



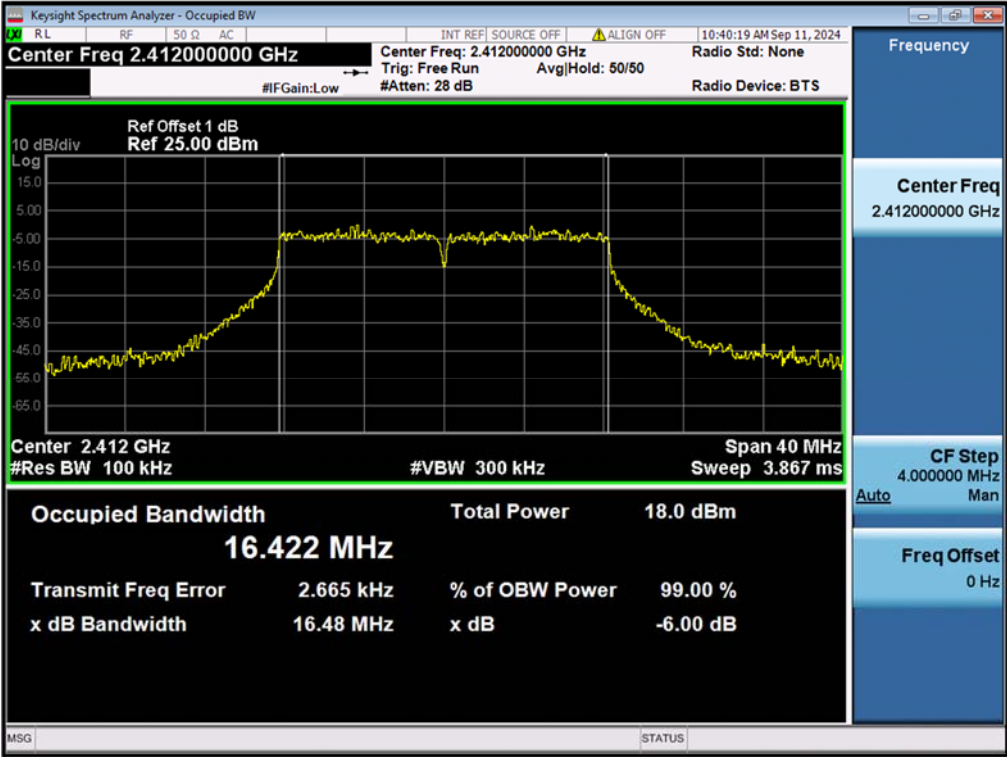
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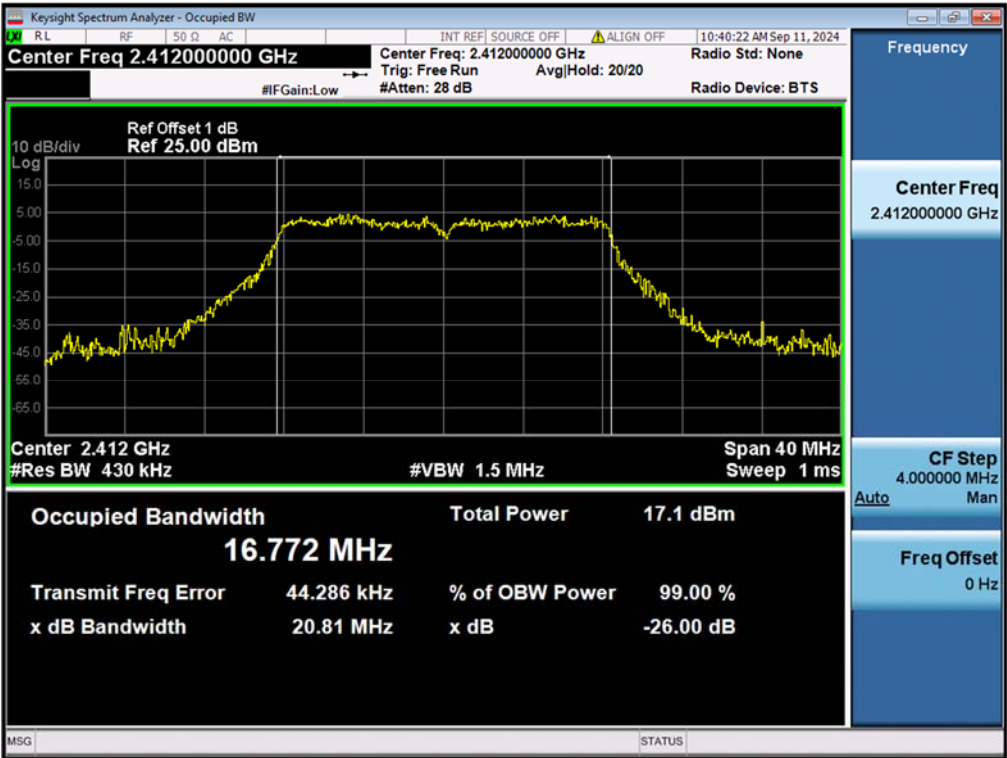
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Figure 4: 6dB Bandwidth, 802.11g, 2412MHz



99% Bandwidth, 802.11g, 2412MHz



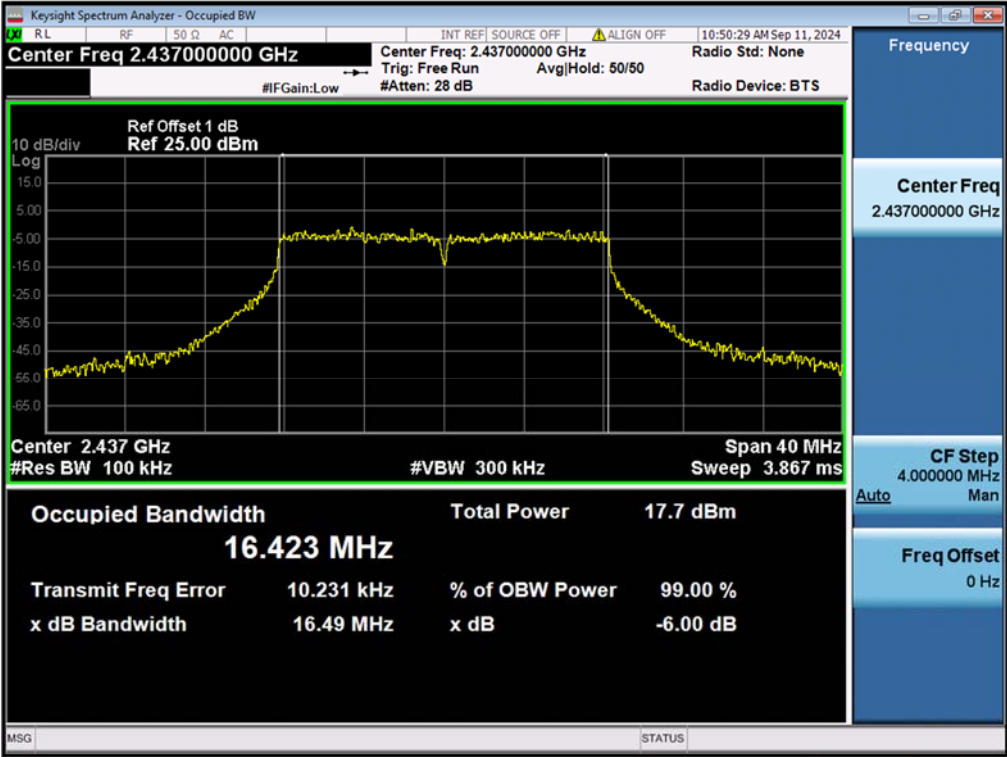
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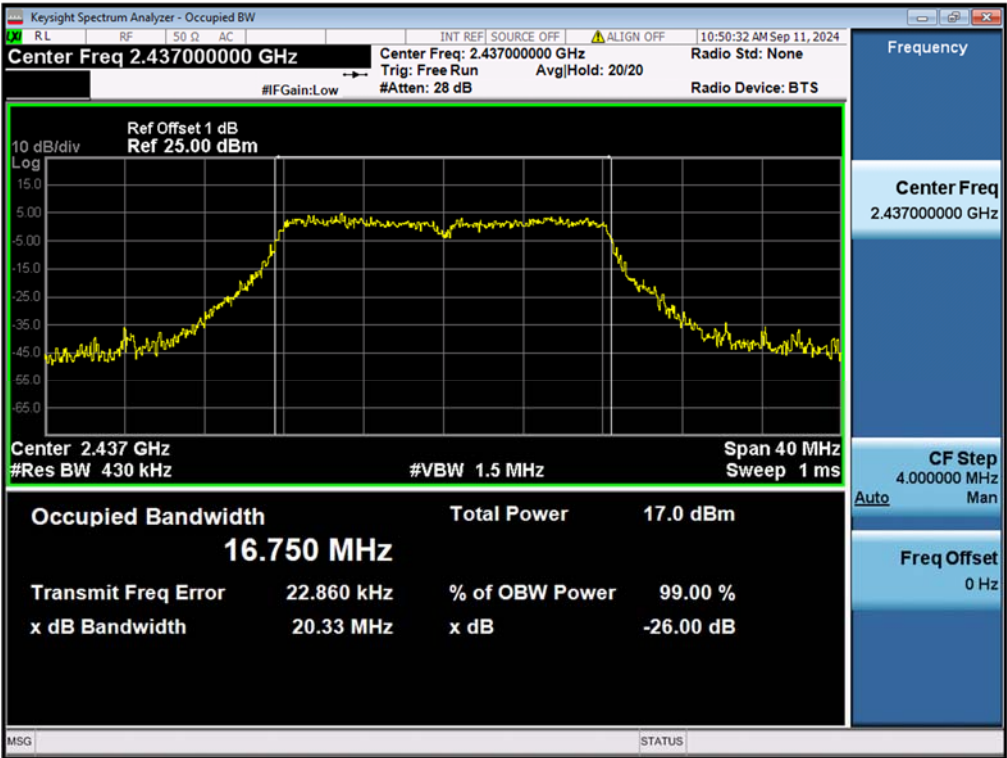
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Figure 5: 6dB Bandwidth, 802.11g, 2437MHz



99% Bandwidth, 802.11g, 2437MHz



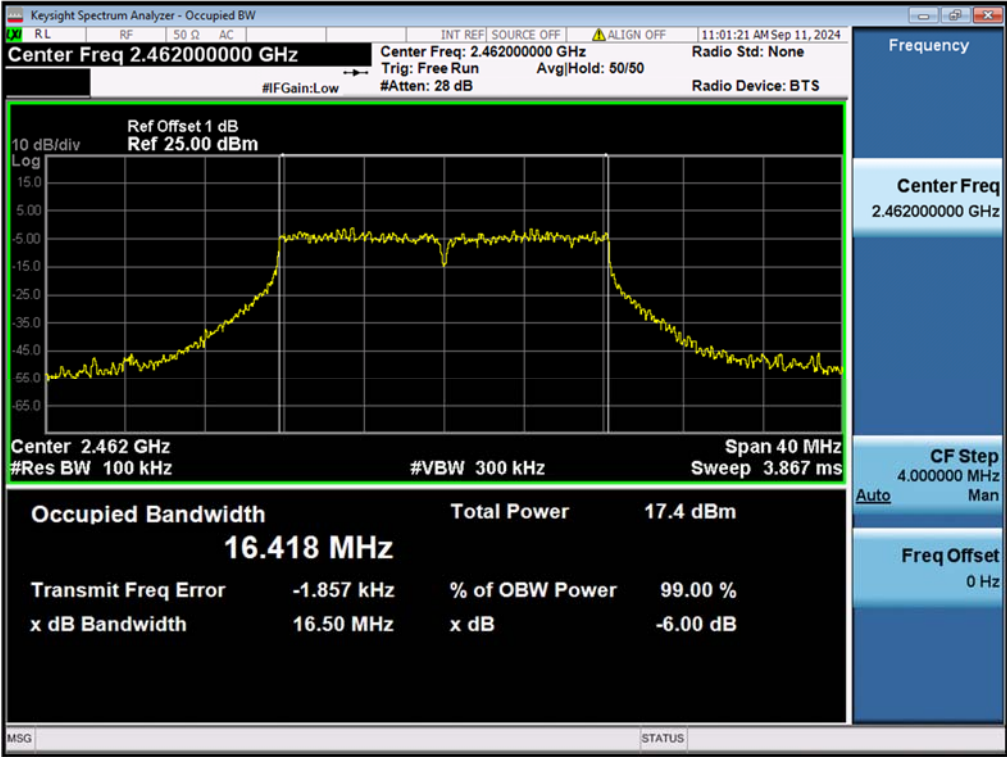
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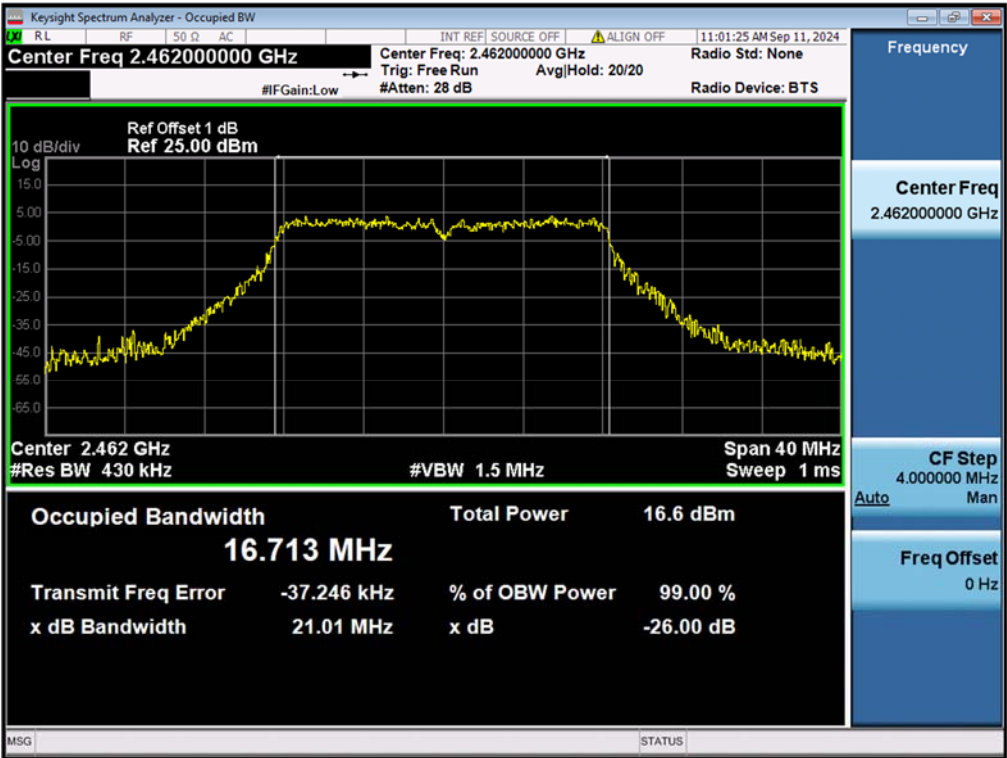
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Figure 6: 6dB Bandwidth, 802.11g, 2462MHz



99% Bandwidth, 802.11g, 2462MHz



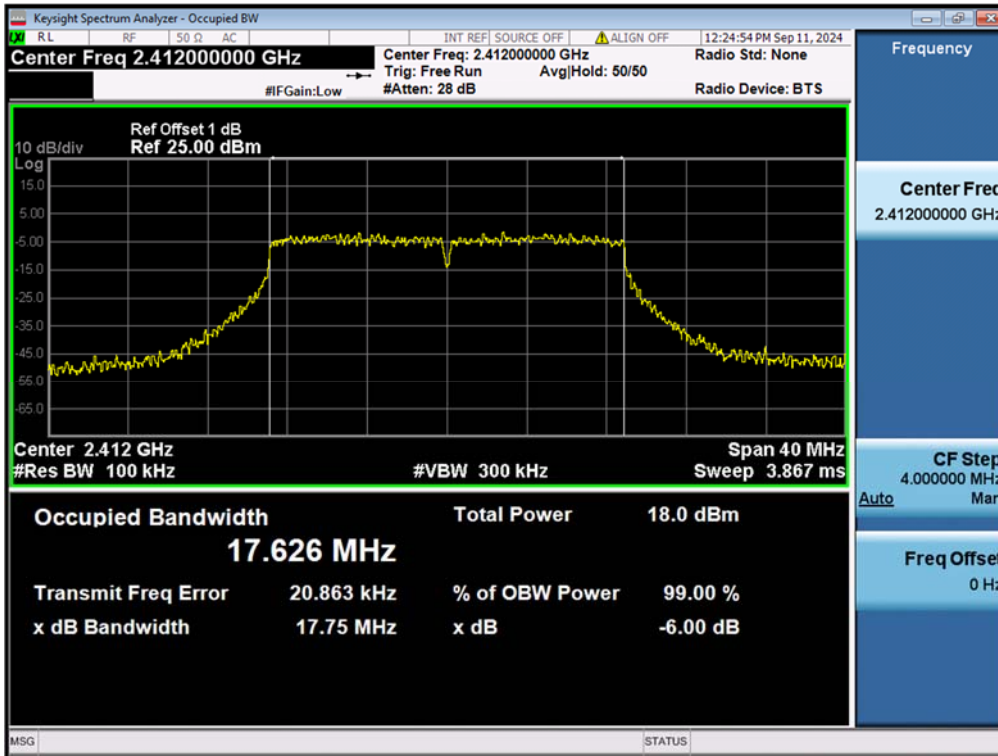
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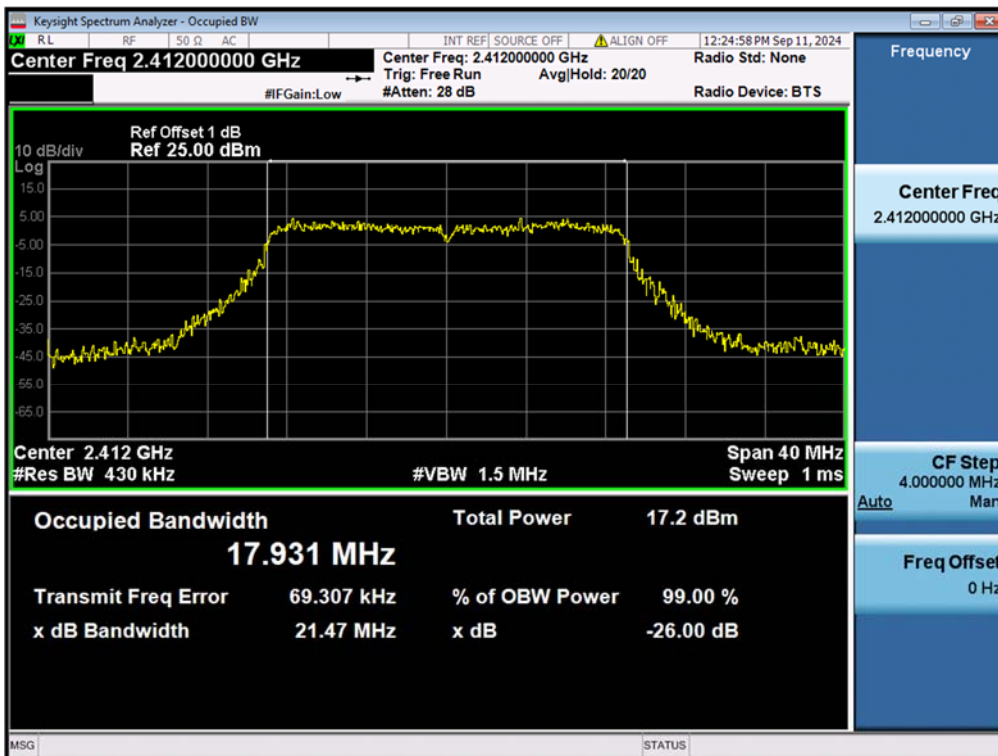
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Figure 7: 6dB Bandwidth, 802.11n(HT20), 2412MHz



99% Bandwidth, 802.11n(HT20), 2412MHz



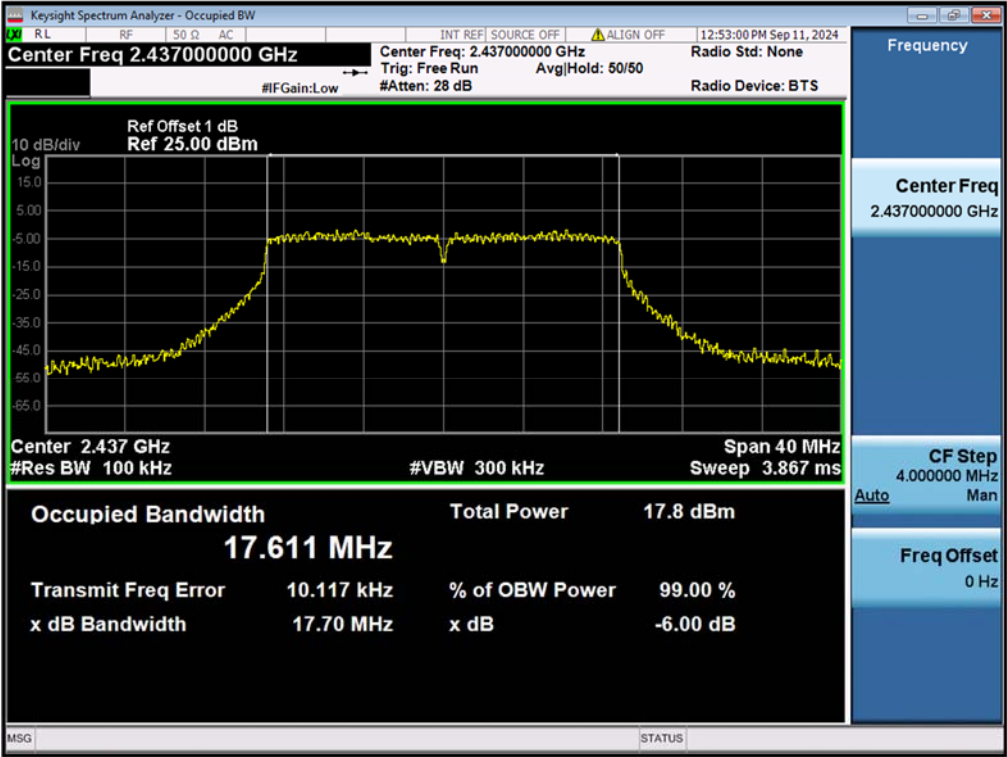
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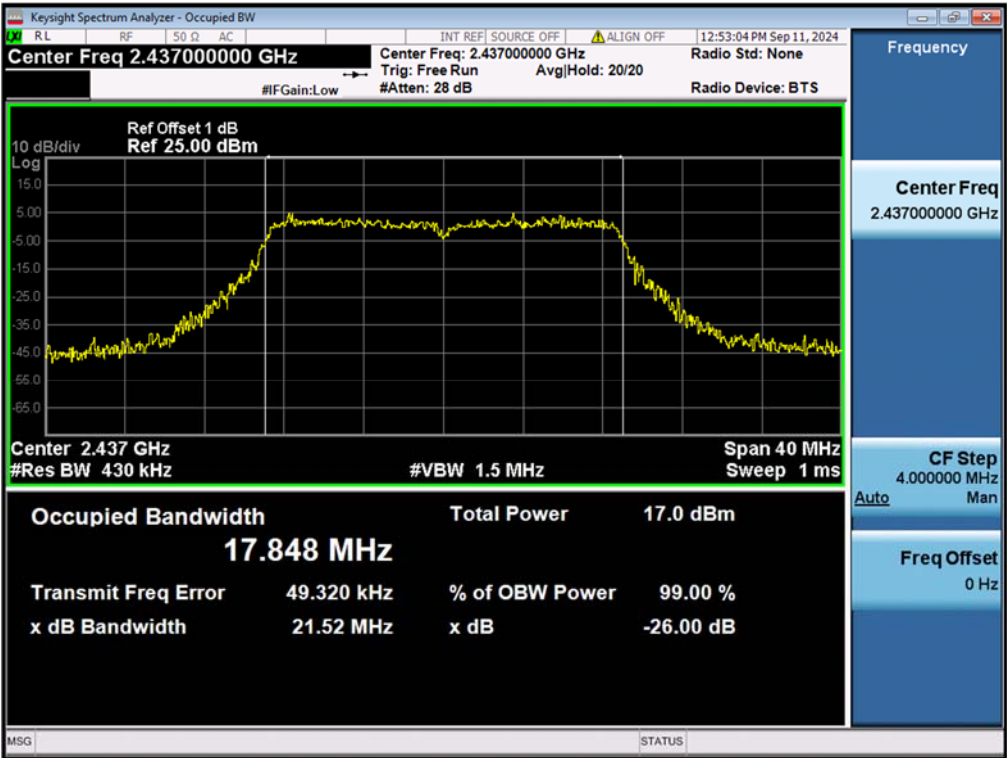
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Figure 8: 6dB Bandwidth, 802.11n(HT20), 2437MHz



99% Bandwidth, 802.11n(HT20), 2437MHz



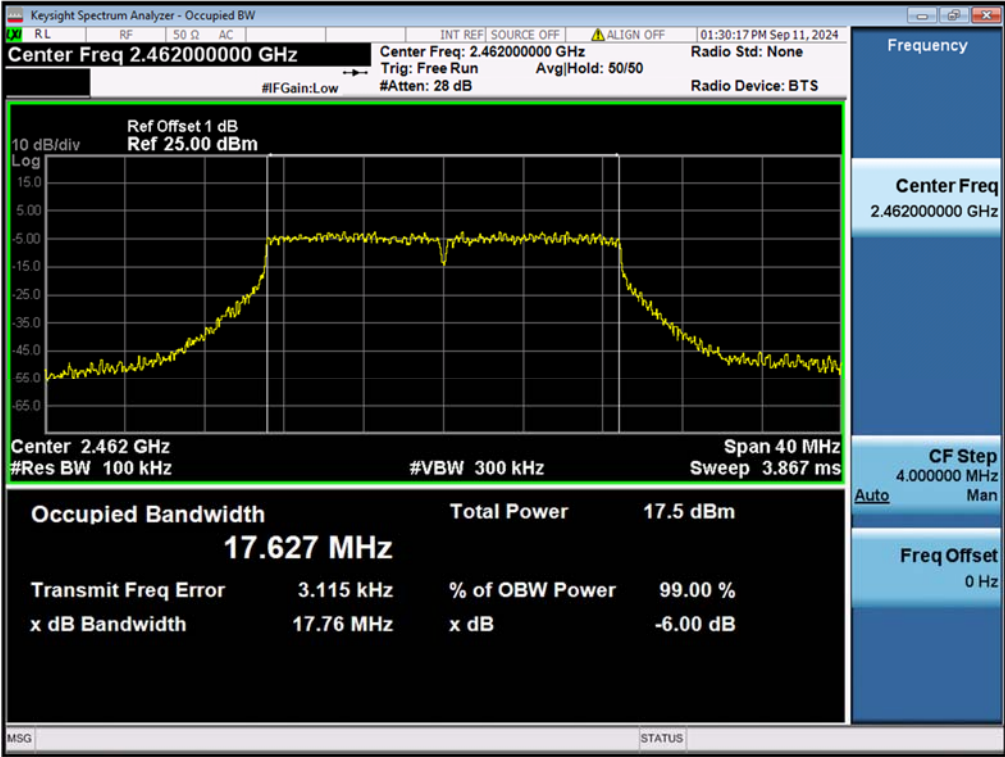
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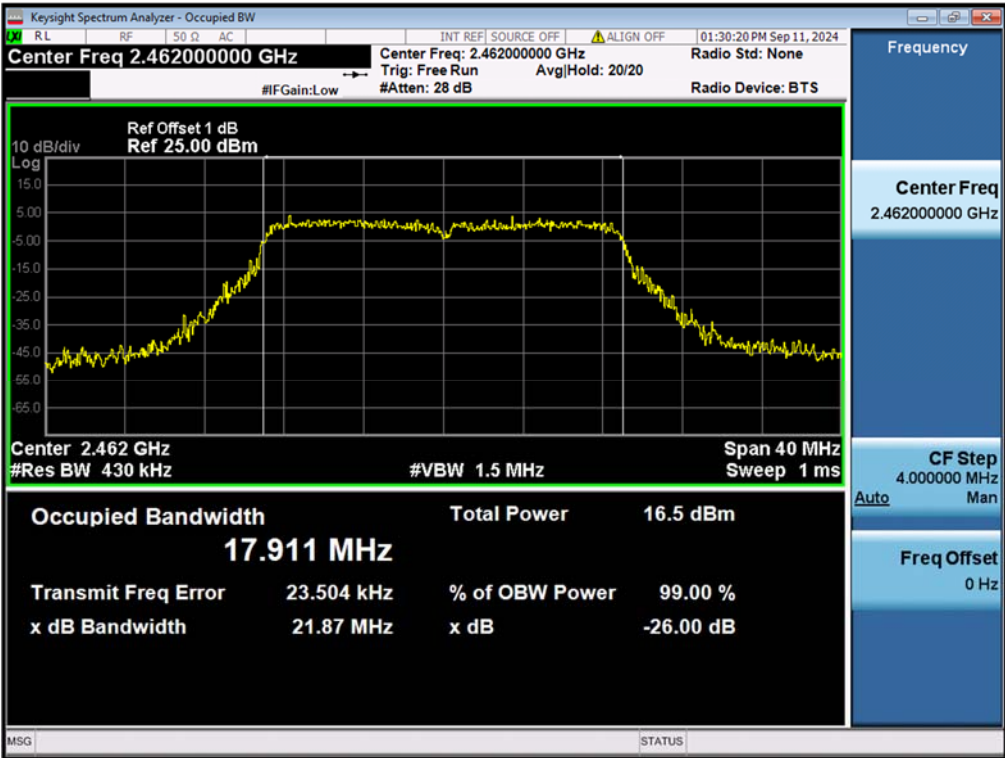
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Figure 9: 6dB Bandwidth, 802.11n(HT20), 2462MHz



99% Bandwidth, 802.11n(HT20), 2462MHz



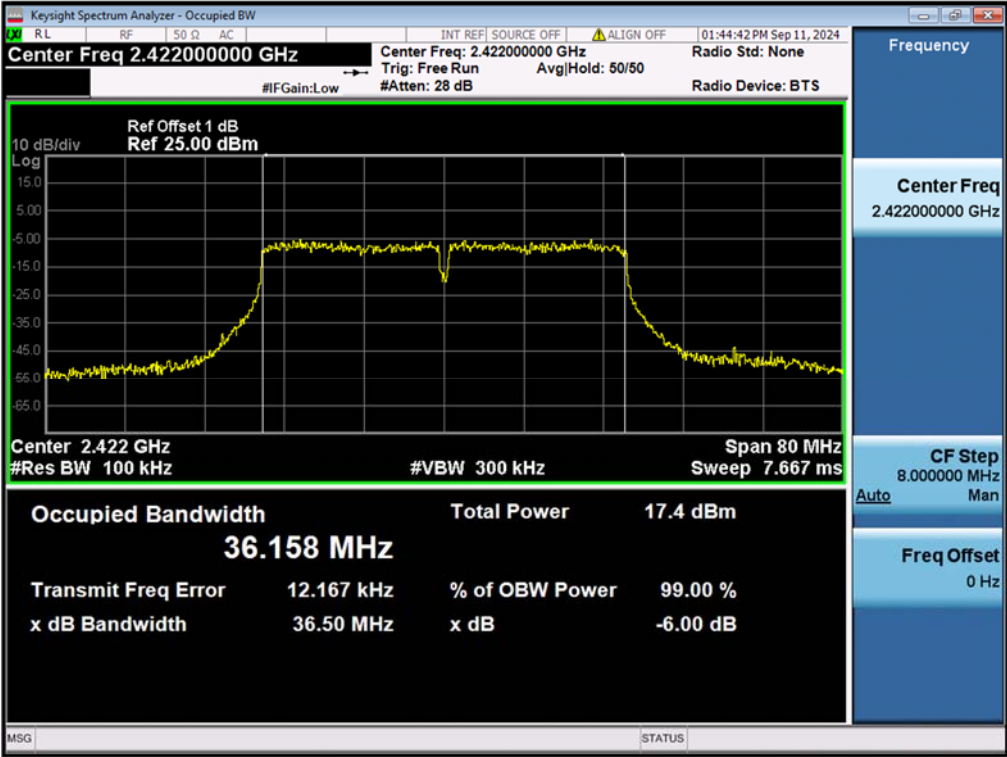
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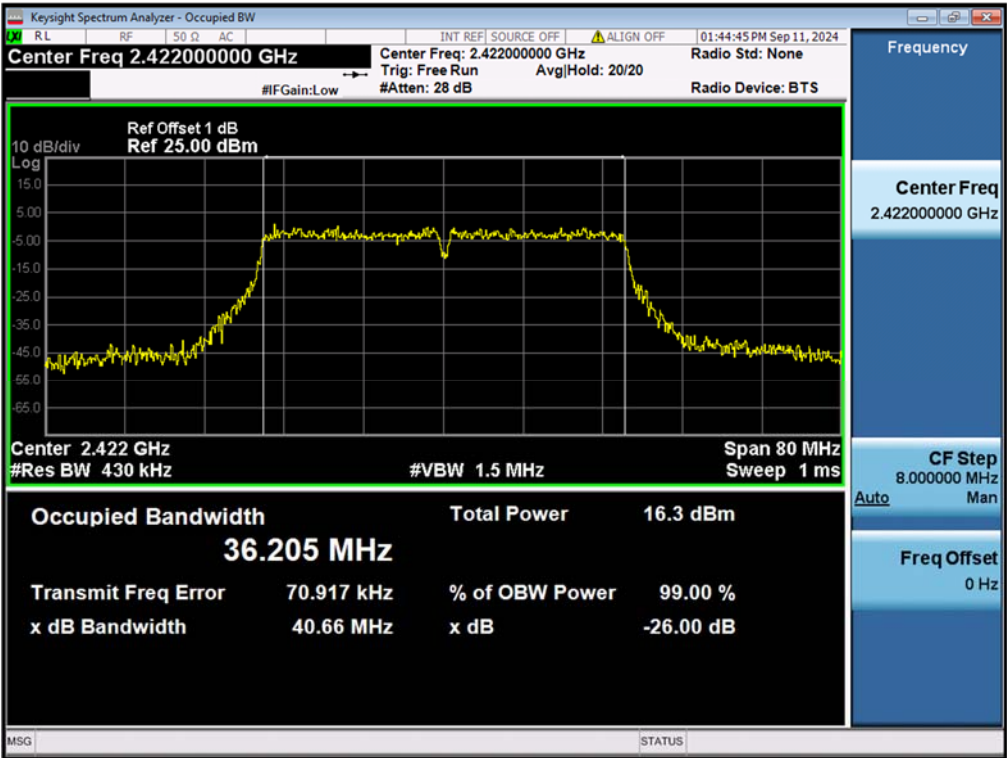
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Figure 10: 6dB Bandwidth, 802.11n(HT40), 2422MHz



99% Bandwidth, 802.11n(HT40), 2422MHz



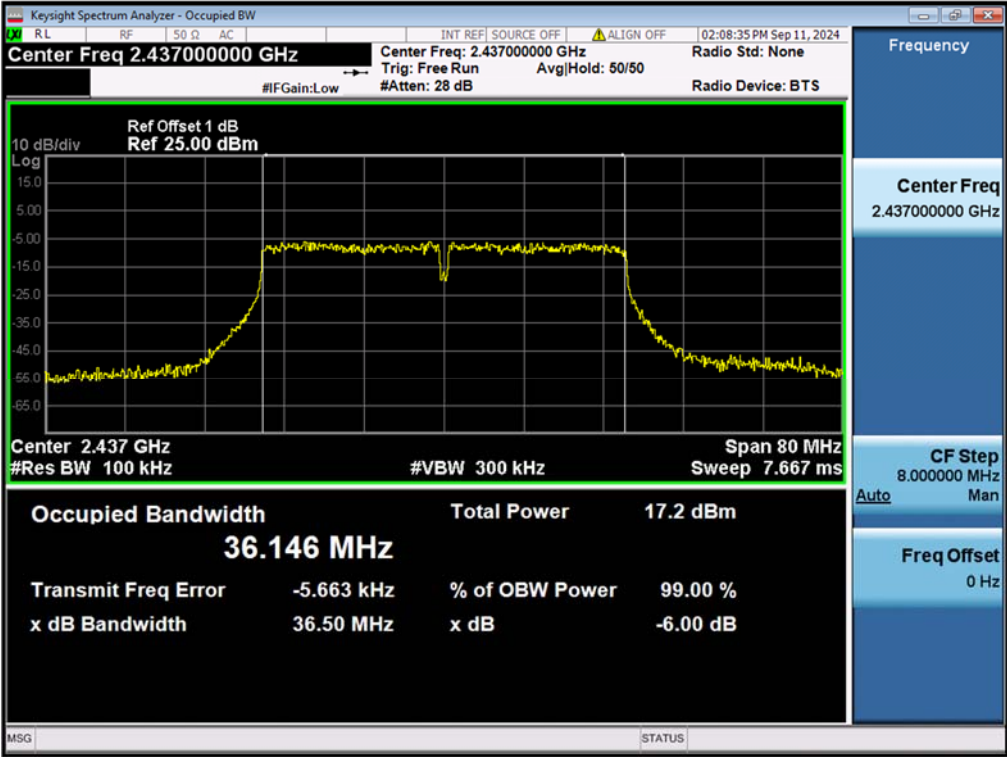
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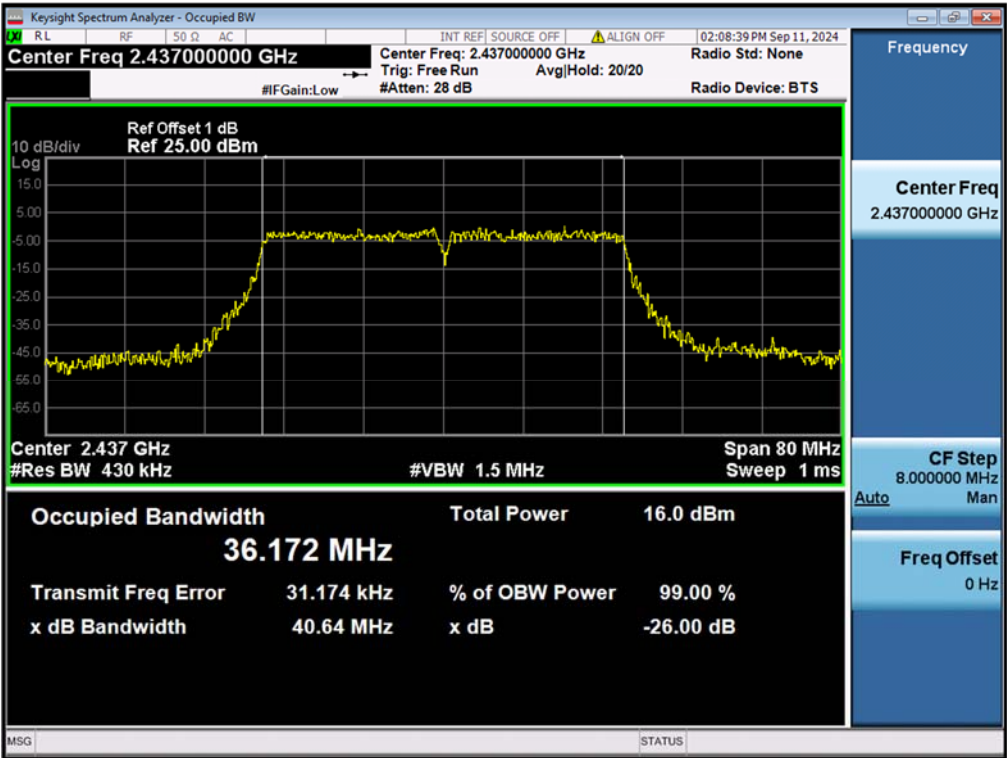
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Figure11: 6dB Bandwidth, 802.11n(HT40), 2437MHz



99% Bandwidth, 802.11n(HT40), 2437MHz



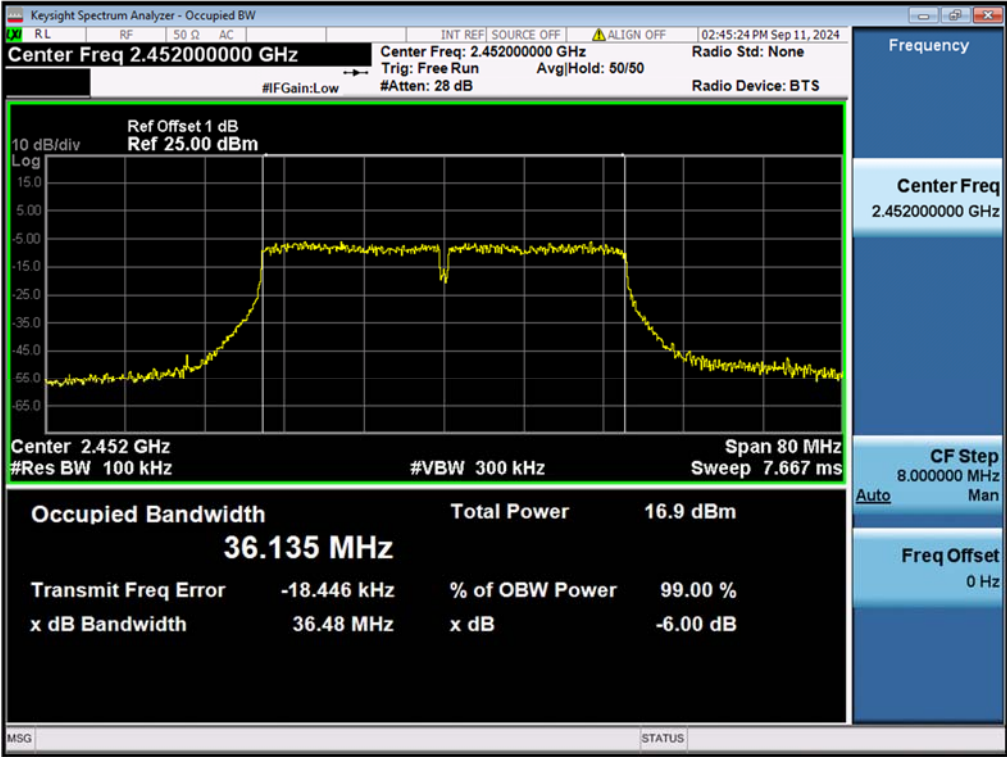
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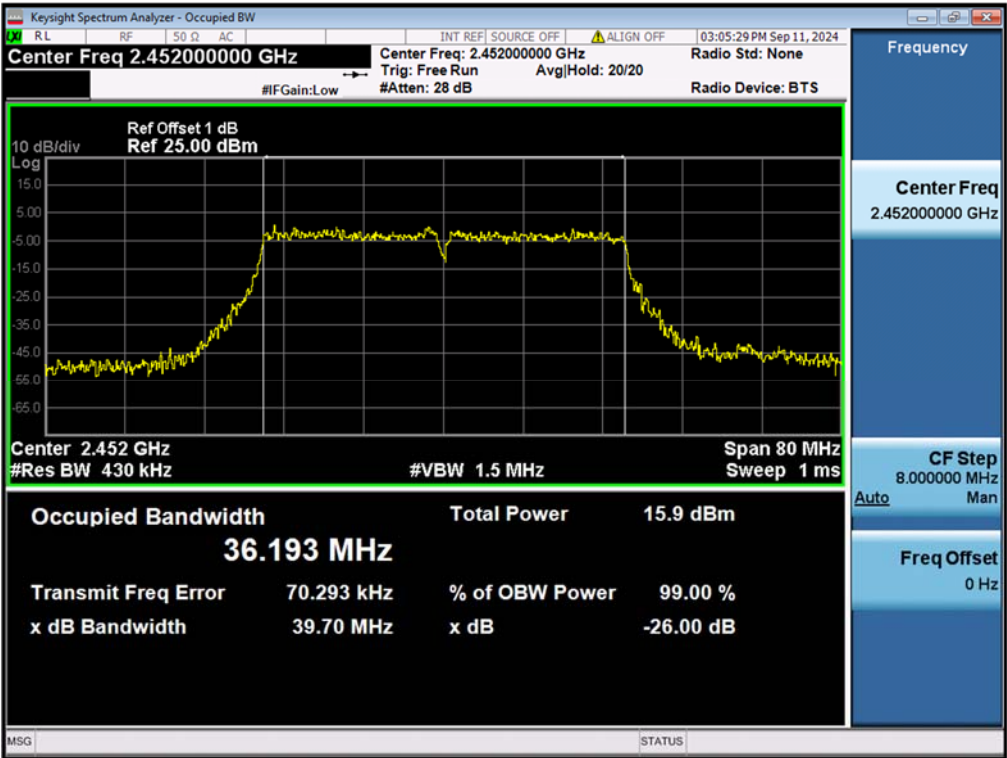
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Figure12: 6dB Bandwidth, 802.11n(HT40), 2452MHz



99% Bandwidth, 802.11n(HT40), 2452MHz



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4.1.4 Maximum conducted output power spectral density

RESULT:

PASS

Test standard : FCC Part 15.247(e)

Requirement : ANSI C63.10-2013, Clause 11.10.2
KDB 558074 D01 v05r02, Clause 8.4

Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 24.6°C

Relative humidity : 37%

Table 3: Maximum conducted output power spectral density

Test Mode	Test Channel (MHz)	Maximum conducted output power spectral density (dBm/3kHz)	Limit (dBm/3kHz)
802.11b	2412	-18.71	≤8
	2437	-18.68	
	2462	-18.66	
802.11g	2412	-16.17	
	2437	-16.31	
	2462	-16.89	
802.11n(HT20)	2412	-16.30	
	2437	-16.44	
	2462	-16.77	
802.11n(HT40)	2422	-18.79	
	2437	-19.90	
	2452	-20.01	

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Figure 13: Power Spectral Density, 802.11b, 2412MHz

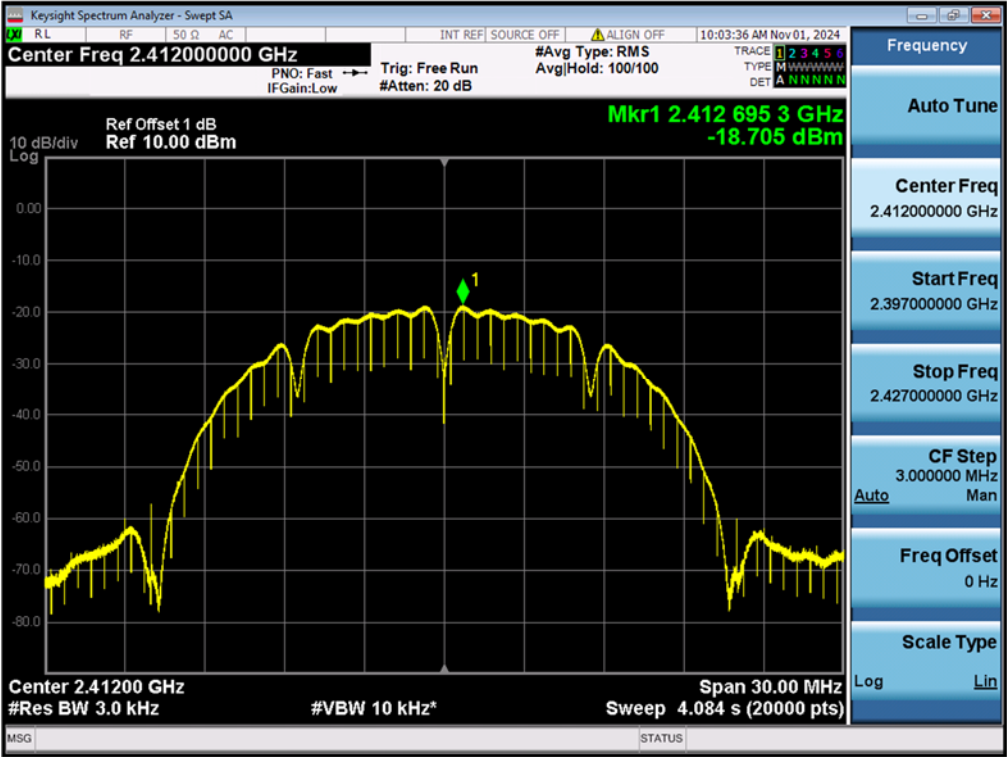
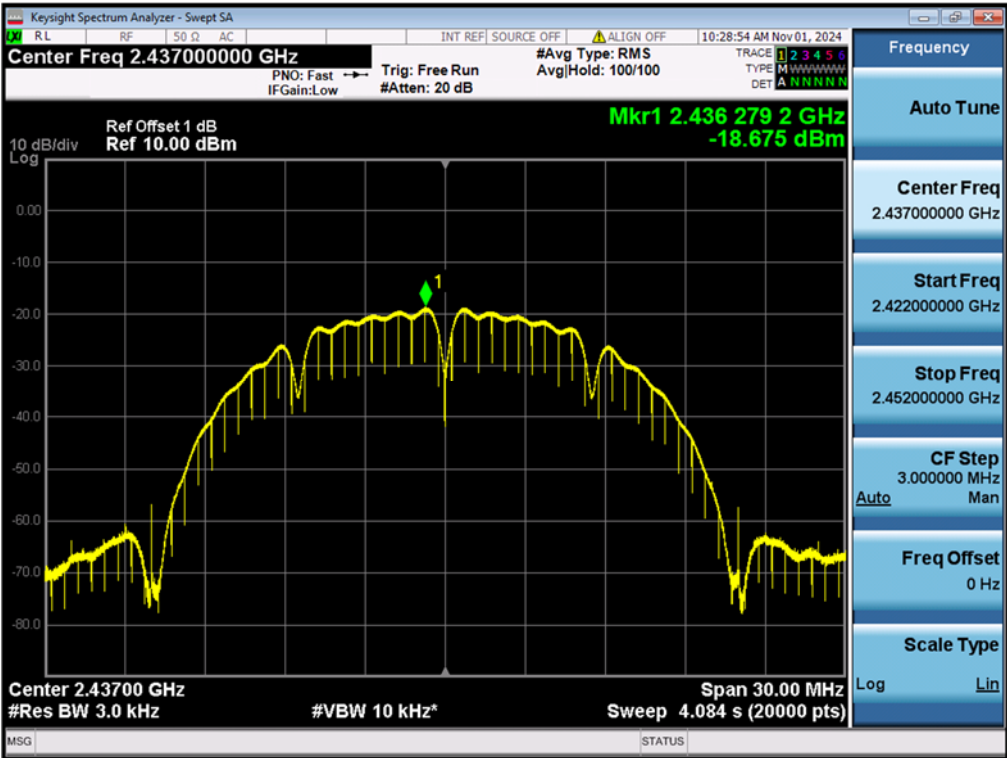


Figure 14: Power Spectral Density, 802.11b, 2437MHz



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Figure 15: Power Spectral Density, 802.11b, 2462MHz

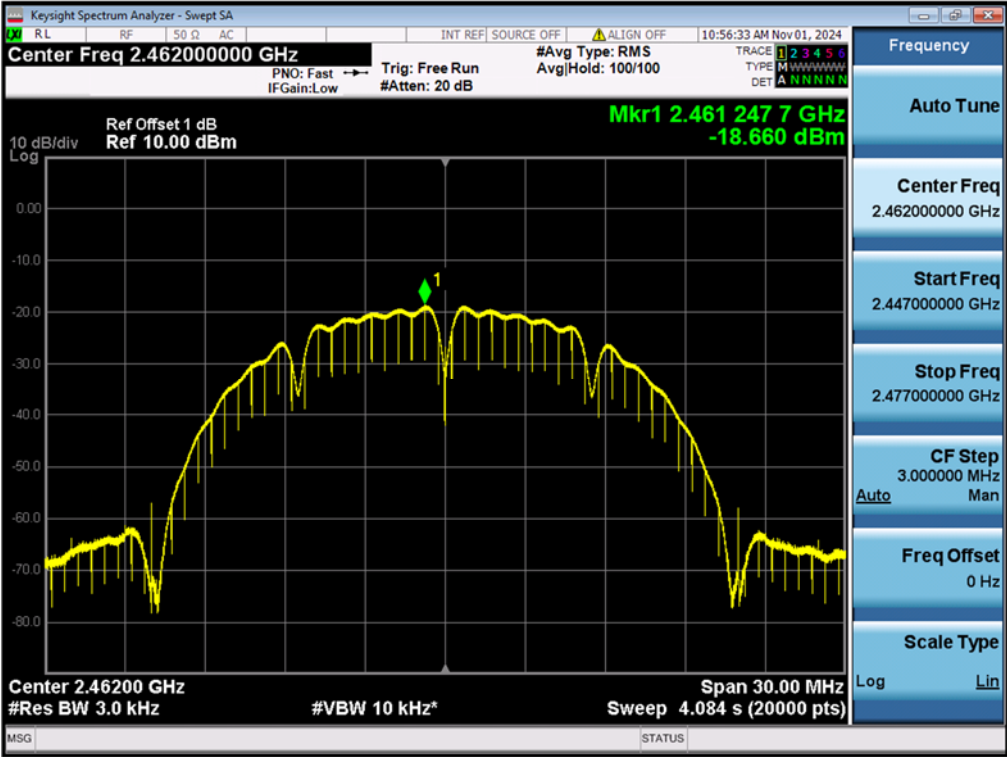
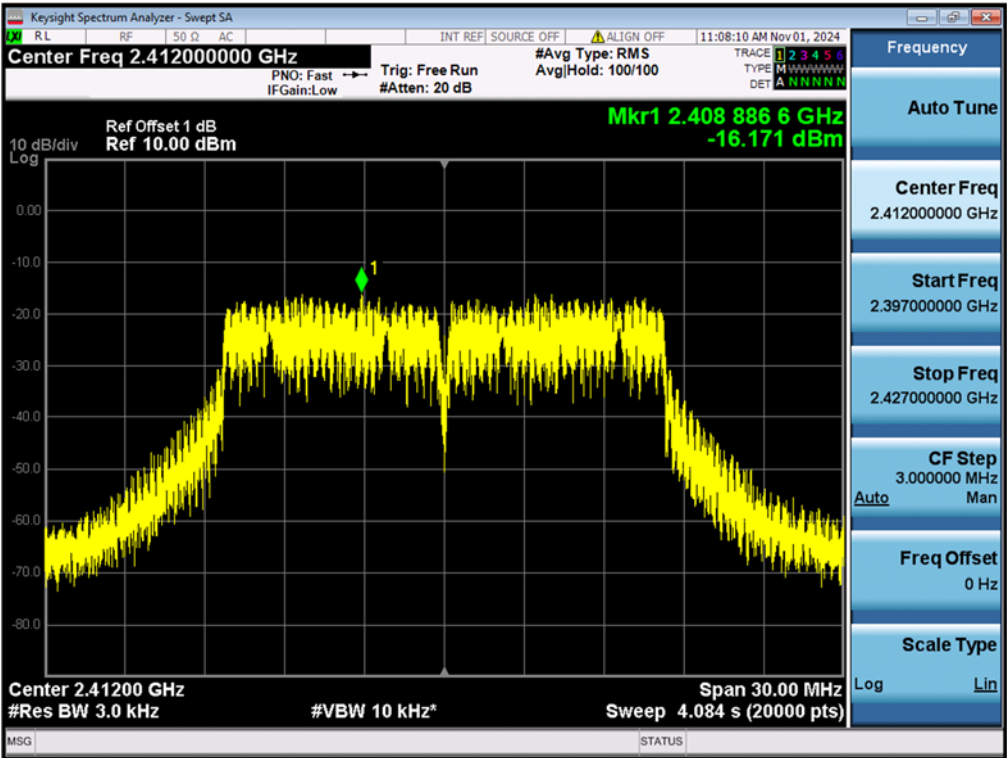


Figure 16: Power Spectral Density, 802.11g, 2412MHz



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Figure 17: Power Spectral Density, 802.11g, 2437MHz

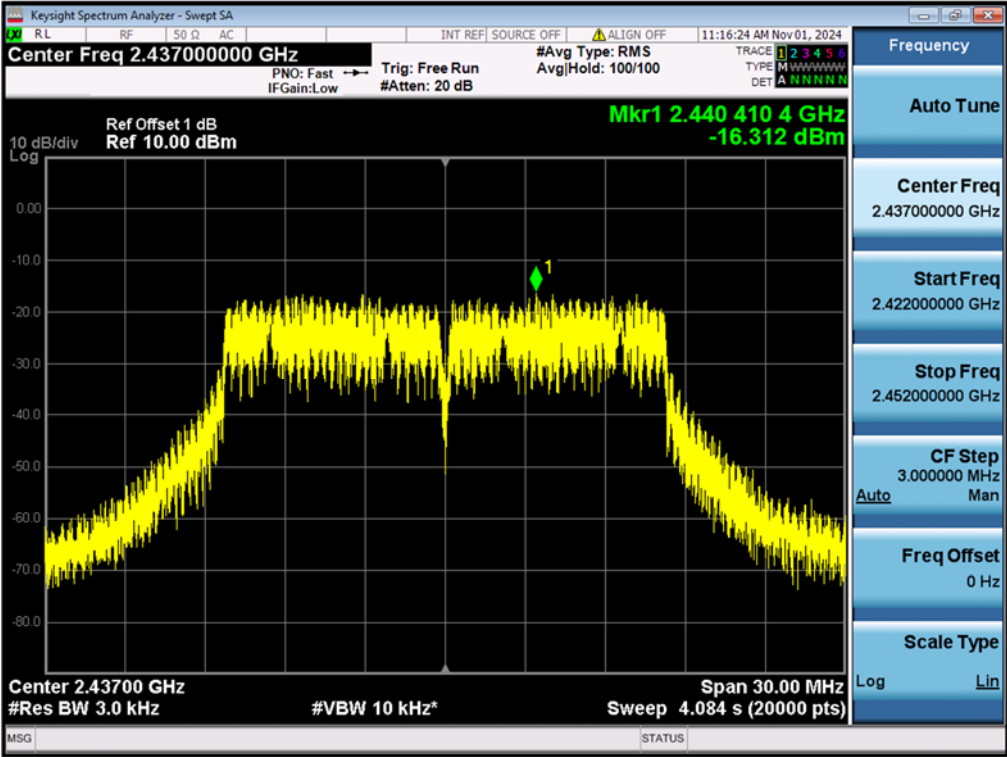
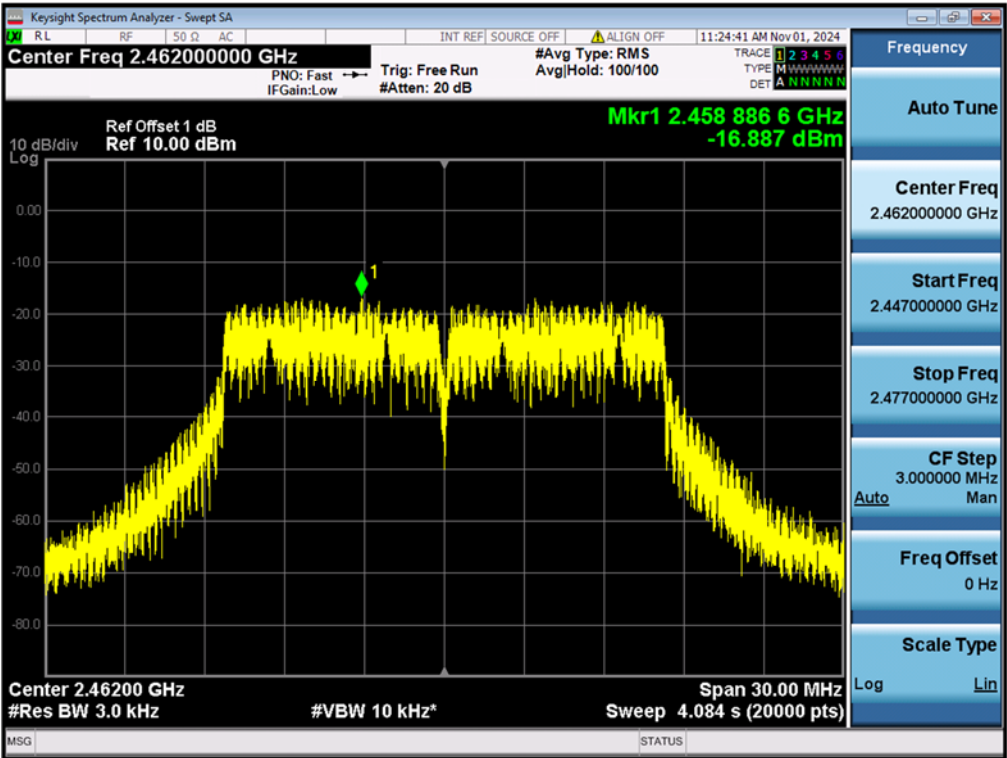


Figure 18: Power Spectral Density, 802.11g, 2462MHz



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Figure 19: Power Spectral Density, 802.11n(HT20), 2412MHz

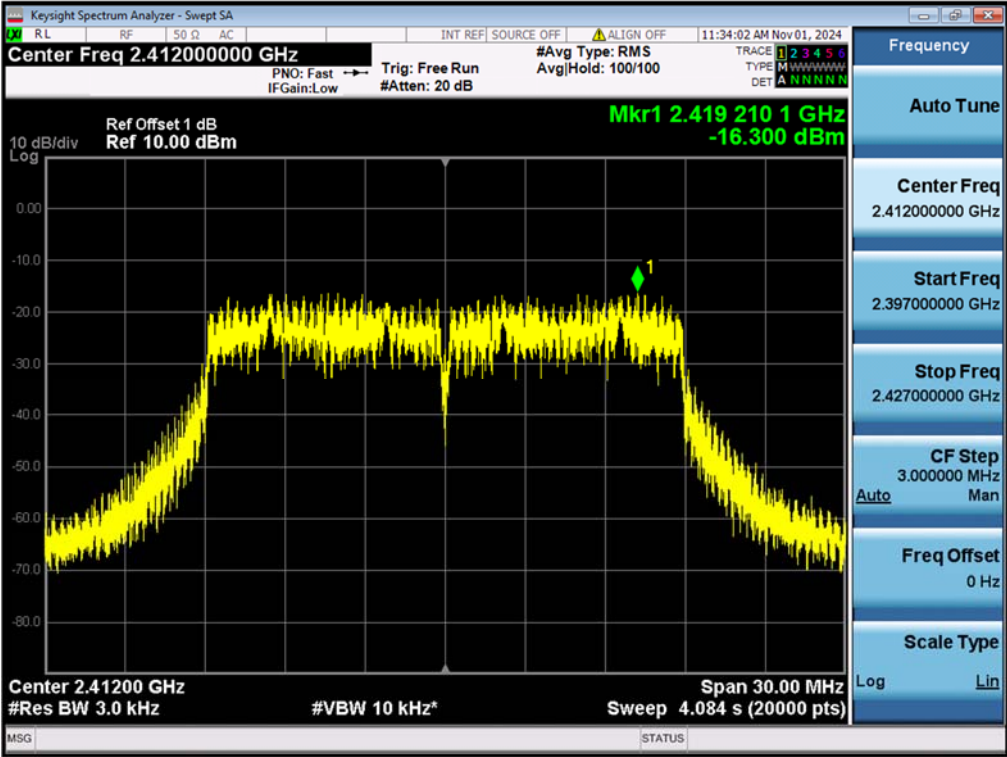
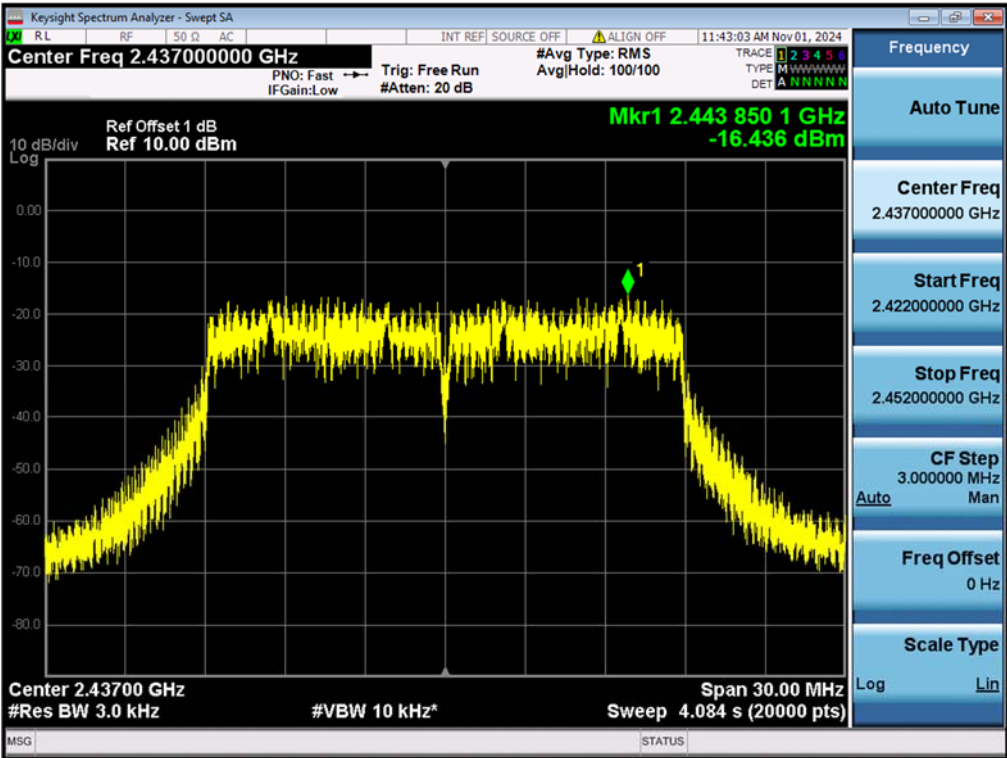


Figure 20: Power Spectral Density, 802.11n(HT20), 2437MHz



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Figure 21: Power Spectral Density, 802.11n(HT20), 2462MHz

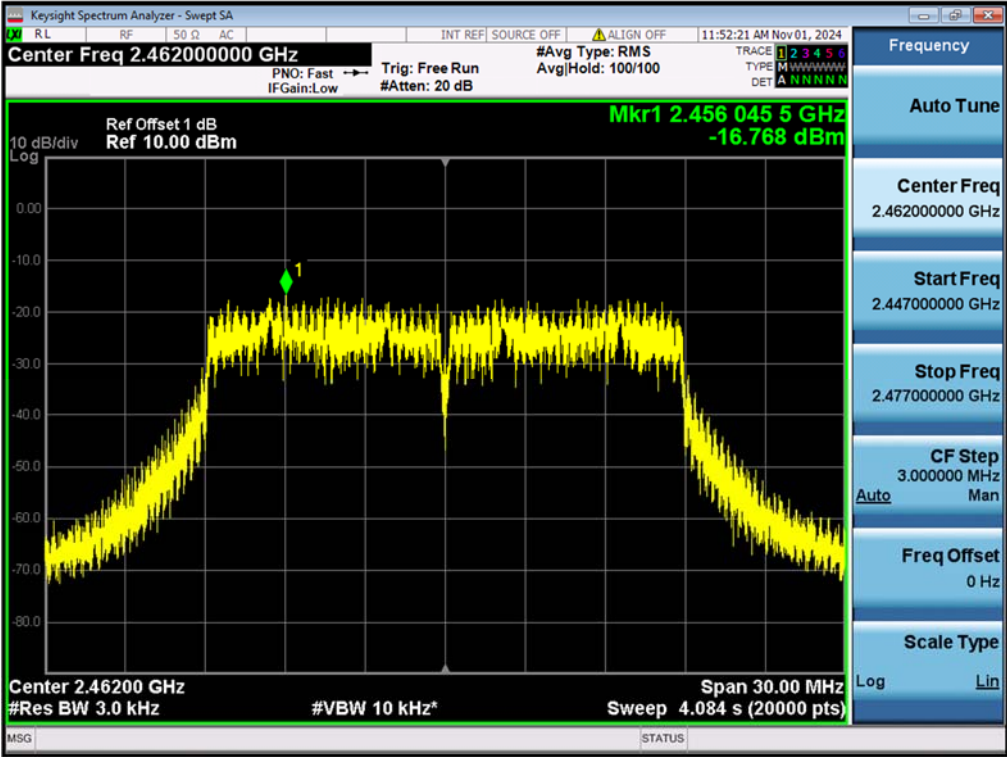
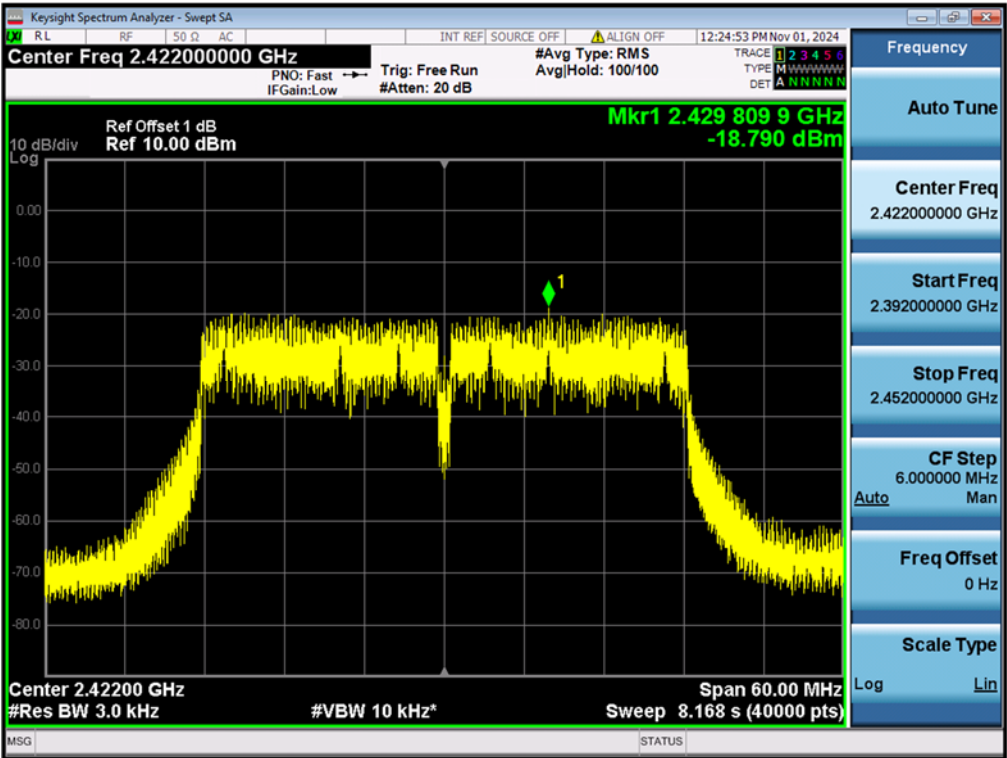


Figure 22: Power Spectral Density, 802.11n(HT40), 2422MHz



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Figure 23: Power Spectral Density, 802.11n(HT40), 2437MHz

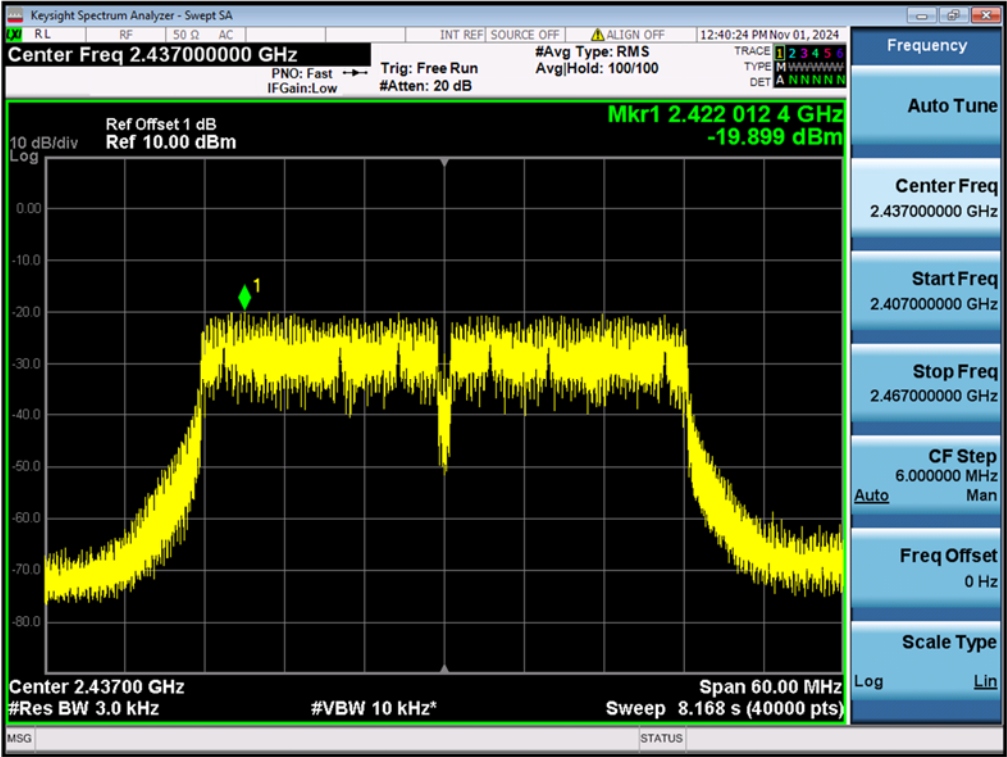


Figure 24: Power Spectral Density, 802.11n(HT40), 2452MHz

