

TEST REPORT

Report No.: SHE21100025-02CE

Date: 2021-11-08

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Applicant : Home Tech Innovation, Inc
Address of Applicant : 1035 Cambridge St, Suite 11A, Cambridge, MA 02141

Product Name : Suvie Starch Cooker
Model No. : S020S
Sample No. : E21100025-01#01
E21100025-02#01
FCC ID : 2AT2K-S020S

Standards : FCC CFR47 Part 15, Subpart C

Date of Receipt : 2021-10-25
Date of Test : 2021-10-28 ~ 2021-11-08
Date of Issue : 2021-11-08

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.

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1 General Information

1.1 Testing Laboratory

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

1.2 Details of Application

Applicant Company Name	Home Tech Innovation, Inc
Address	1035 Cambridge St, Suite 11A, Cambridge, MA 02141
Contact Person	Kevin Incorvia
Telephone	+1 617 800 5336
Email	kincorvia@suvie.com
Manufacturer Company Name	Home Tech Innovation, Inc
Address	1035 Cambridge St, Suite 11A, Cambridge, MA 02141

1.3 Details of EUT

Product Name	Suvie Starch Cooker
Brand Name	Suvie
Test Model No.	S020S
FCC ID	2AT2K-S020S
Mode of Operation	WLAN 802.11b/g/n(HT20/40)
Frequency Range	2400MHz ~ 2483.5MHz
Channel Separation	5 MHz
Modulation Type	DSSS, OFDM
Antenna Type	Internal Antenna
Antenna Gain	3.42dBi
Test Voltage	AC 120V 60Hz
Hardware version	S020S1.0.1
Software version	fw
RF power setting in TEST SW	ESP

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1.4 Test Methodology

47 CFR Part 15, Subpart C (10-1-16 Edition)	Miscellaneous Wireless Communications Services
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.

1.5 Test Summary

Test Item	FCC Rules	Result
Antenna Requirement	FCC Part 15.247(b)(4), Part 15.203	PASS
Peak Output Power	FCC Part 15.247(b)(3)	PASS
6dB Bandwidth	FCC Part 15.247(a)(2)	PASS
Power Spectral Density	FCC Part 15.247(e)	PASS
Conducted Spurious Emission & Authorized-band band-edge	FCC Part 15.247(d)	PASS
Radiated Spurious 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 Test Facility

2.2 Environmental conditions

Temperature (°C)	18-25
Humidity (%RH)	40-65
Barometric Pressure (mbar)	960-1060

2.3 Equipment List

Name of Equipment	Manufacturer	Model	Serial No.	Cal.Date	Cal. Due Date
Spectrum Analyzer	Keysight	N9020B	MY59260184	2021-08-17	2022-08-16
Spectrum Analyzer	Rohde & Schwarz	FSV40N	101450	2021-06-10	2022-06-09
EMI Test Receiver	Rohde & Schwarz	ESPI3	100173	2021-06-10	2022-06-09
EMI Test Receiver	Rohde & Schwarz	ESR 7	101911	2021-06-10	2022-06-09
V-network	SCHWARZBEC K	NSLK 8127	8127-902	2021-06-10	2022-06-09
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	100687	2021-08-13	2022-08-12
Broadband Antenna	SCHWARZBEC K	VULB9163	9163-1037	2021-06-08	2022-06-07
Horn Antenna-18G	SCHWARZBEC K	BBHA9120D	9120D-1775	2021-06-08	2022-06-07
Loop Antenna	SCHWARZBEC K	FMZB 1513	N/A	2020-11-23	2021-11-22
Horn Antenna-40G	YINGLIAN	LB-180400-KF	N/A	2021-06-12	2022-06-11
EMC chamber 9*6*6 (L*W*H)	CHANGNING	966	N/A	2020-06-09	2023-06-08
Shielded Enclosure 8*5*4 (L*W*H)	CHANGNING	854	N/A	2020-06-09	2023-06-08
Test Software	BL	BL410_E	N/A	N/A	N/A
Test Software	BL	BL410_R	N/A	N/A	N/A

2.4 Measurement Uncertainty

Parameter	Frequency	Uncertainty
Antenna Port Conducted Emission	< 1GHz	± 1.5 dB
	> 1GHz	± 1.5 dB

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Radiated Emission	30 MHz – 1 GHz	± 3.42 dB
	> 1GHz	± 4.20 dB
Conducted Emission on AC Mains	9 kHz to 30 MHz	± 1.96 dB

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3 Test Set-up and Operation Modes

3.1 Details of Test Mode

Using test software was control EUT work in continuous transmitter and receiver 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	1Mbps
802.11g	6Mbps
802.11n(20M)	MCS0
802.11n(40M)	MCS0

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 No.	Serial No.
Laptop	Lenovo	TP00083A	N/A

3.3 Support Software

Description	Manufacturer	Software Name
Software	N/A	ESP

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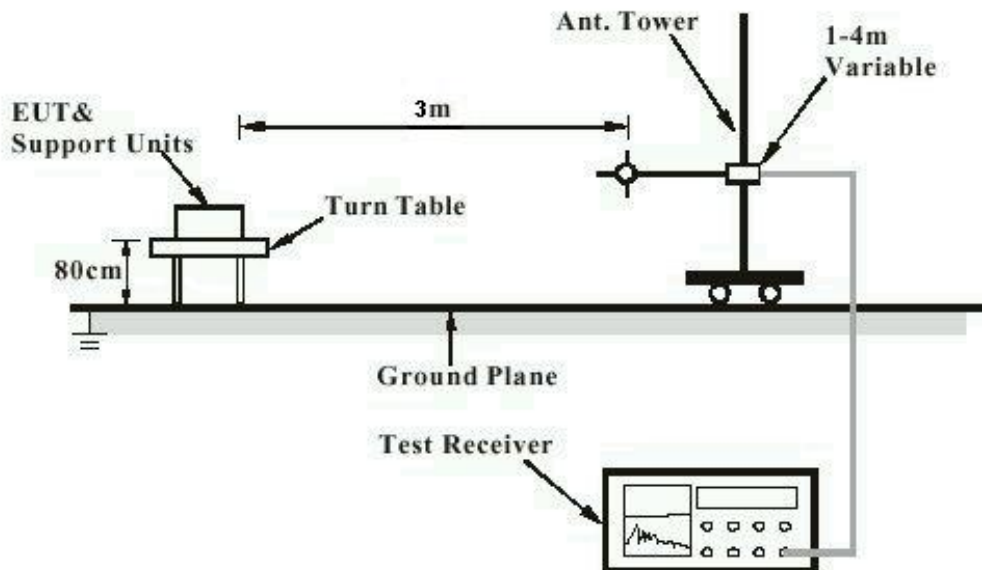
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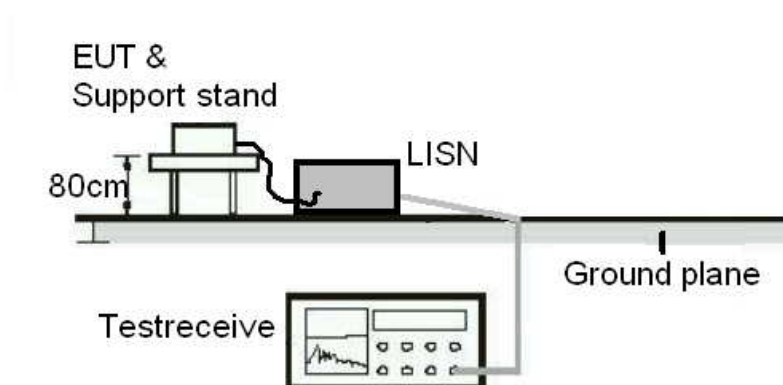
3.4 Test Setup Diagram

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.

Diagram of Measurement Equipment Configuration for Conduction Measurement



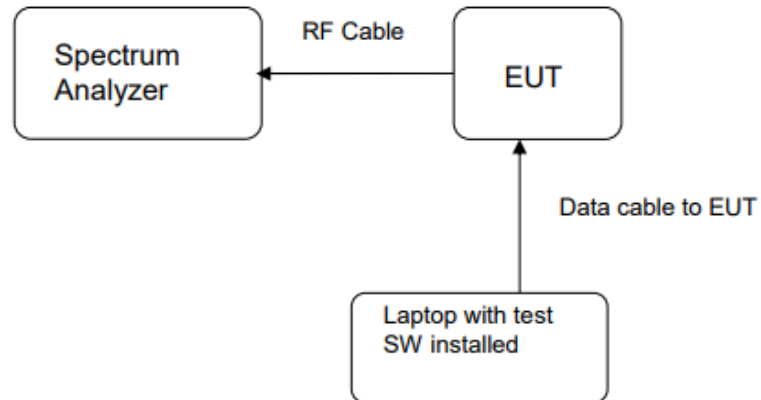
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Diagram of Measurement Equipment Configuration for Transmitter Measurement



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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	: The use of approved antennas only with directional gains that do not exceed 6dBi

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 3.42dBi. 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 Peak Output Power

RESULT:

PASS

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

Requirement : ANSI C63.10-2013, KDB 558074

Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 25°C

Relative humidity : 50%

Table 1: Peak Output Power

Test Mode	Test Channel (MHz)	Measured Peak Power	Peak Output Power		Limit (W)
		(dBm)	(dBm)	(mW)	
802.11b	2412	18.84	18.84	76.56	< 1
	2437	18.32	18.32	67.92	
	2462	17.99	17.99	62.95	
802.11g	2412	14.26	14.26	26.67	
	2437	13.44	13.44	22.08	
	2462	13.00	13.00	19.95	
802.11n(HT20)	2412	13.91	13.91	24.60	
	2437	13.09	13.09	20.37	
	2462	12.93	12.93	19.63	
802.11n(HT40)	2422	10.66	10.66	11.64	
	2437	10.34	10.34	10.81	
	2452	10.41	10.41	10.99	

Notes: the duty cycle is 100%

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4.1.3 6dB Bandwidth

RESULT:

PASS

Test standard : FCC Part 15.247(a)(2)
Requirement : ANSI C63.10-2013, KDB 558074
Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High
Operation Mode : A.1.a
Ambient temperature : 25°C
Relative humidity : 50%

Table 2: 6dB Bandwidth

Test Mode	Test Channel (MHz)	6dB Bandwidth (MHz)	6 dB Bandwidth Limit (MHz)
802.11b	2412	8.616	≥ 0.5
	2437	8.150	
	2462	8.142	
802.11g	2412	16.51	
	2437	16.48	
	2462	16.46	
802.11n(HT20)	2412	17.62	
	2437	17.62	
	2462	17.62	
802.11n(HT40)	2422	33.99	
	2437	33.26	
	2452	33.53	

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

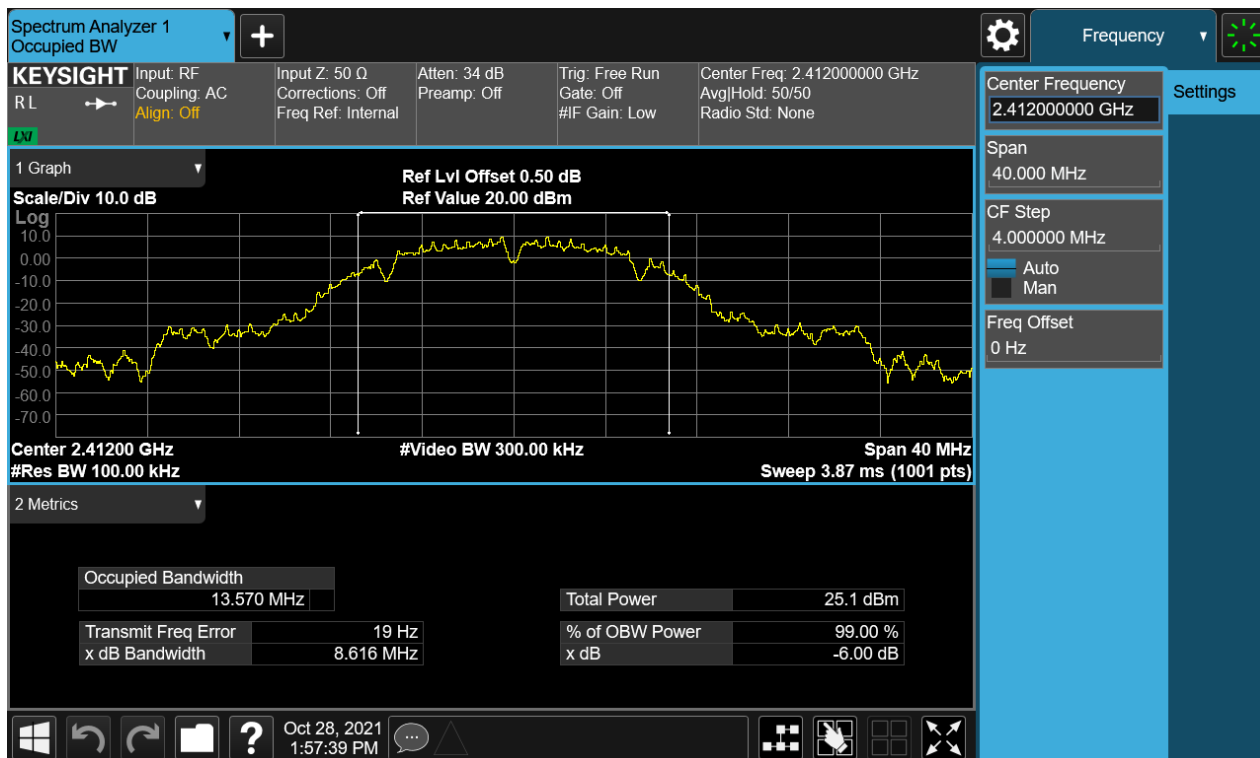


Figure 2: 6dB Bandwidth, 802.11b, 2437MHz



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

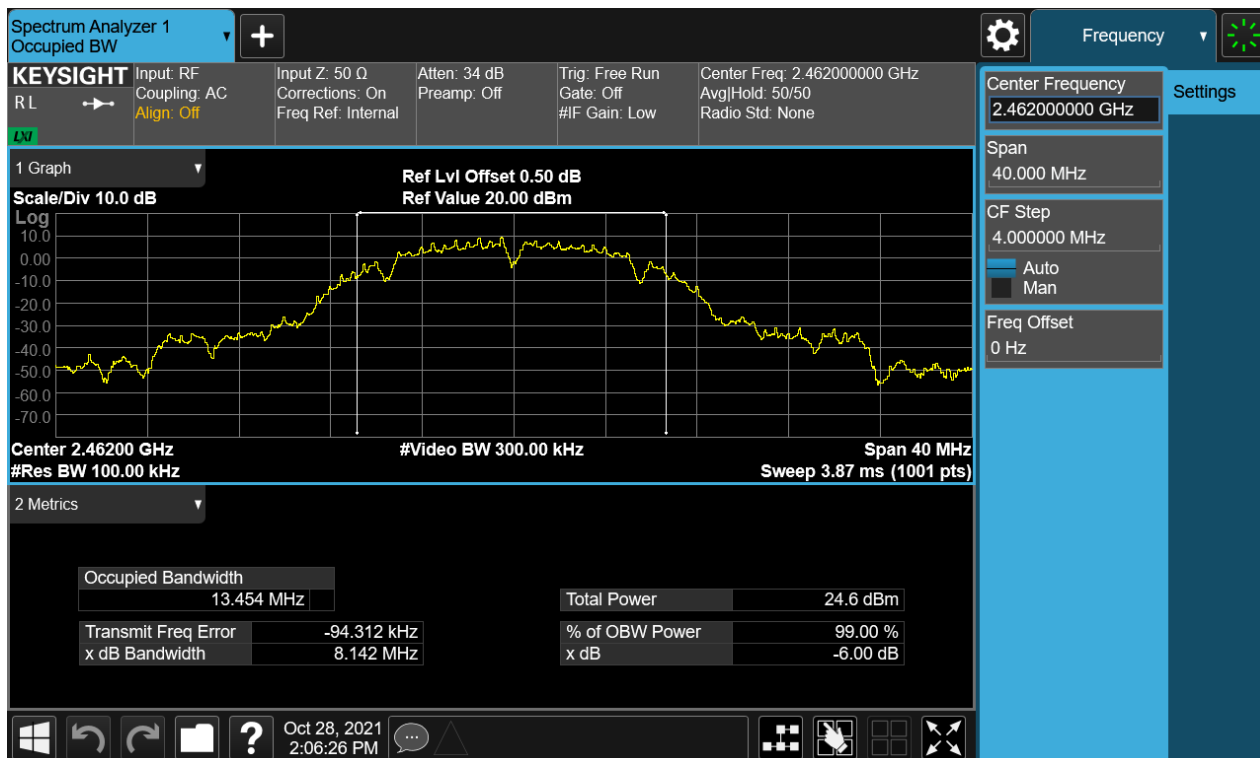
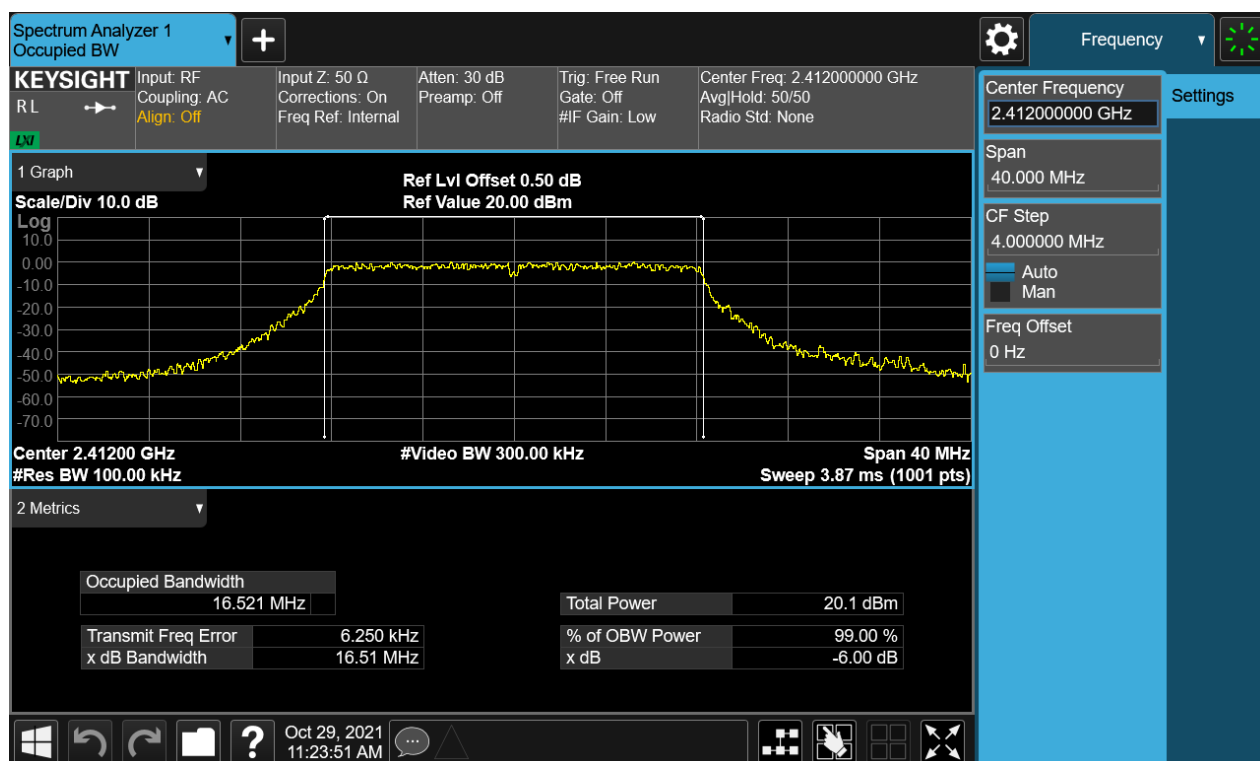


Figure 4: 6dB Bandwidth, 802.11g, 2412MHz



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

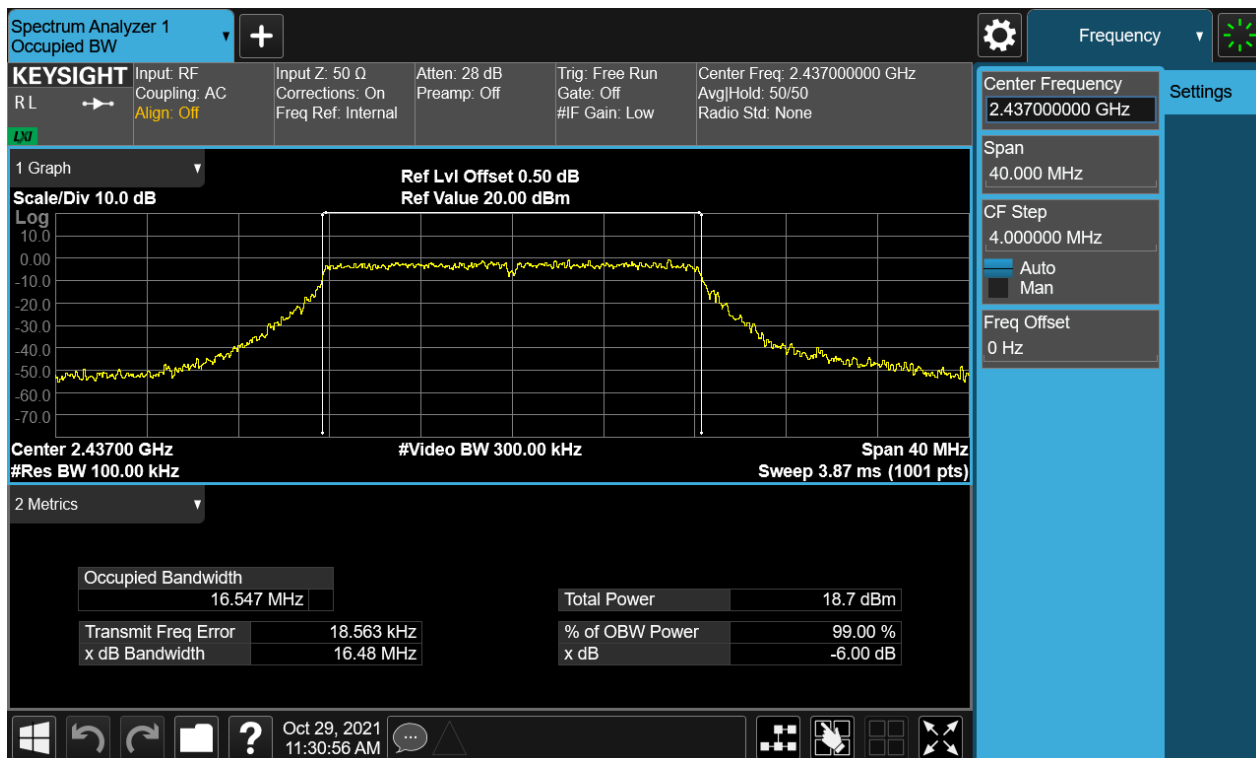
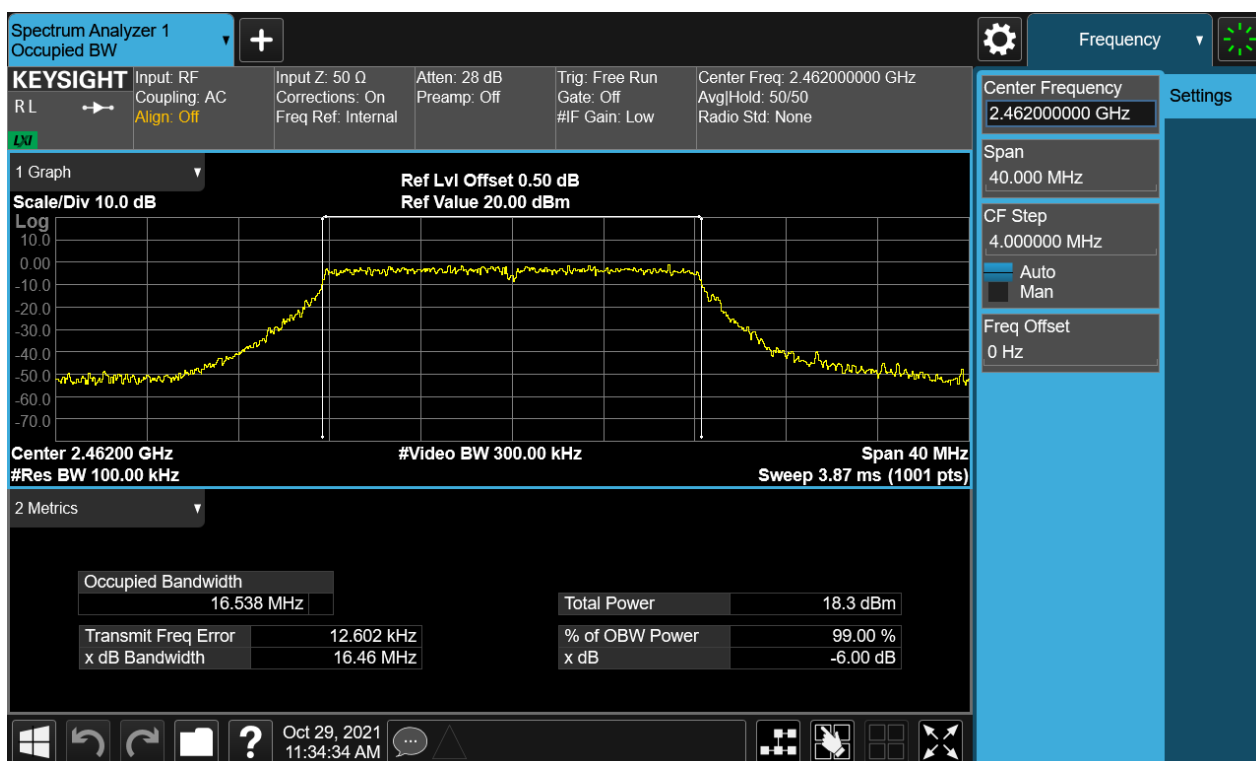


Figure 6: 6dB Bandwidth, 802.11g, 2462MHz



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

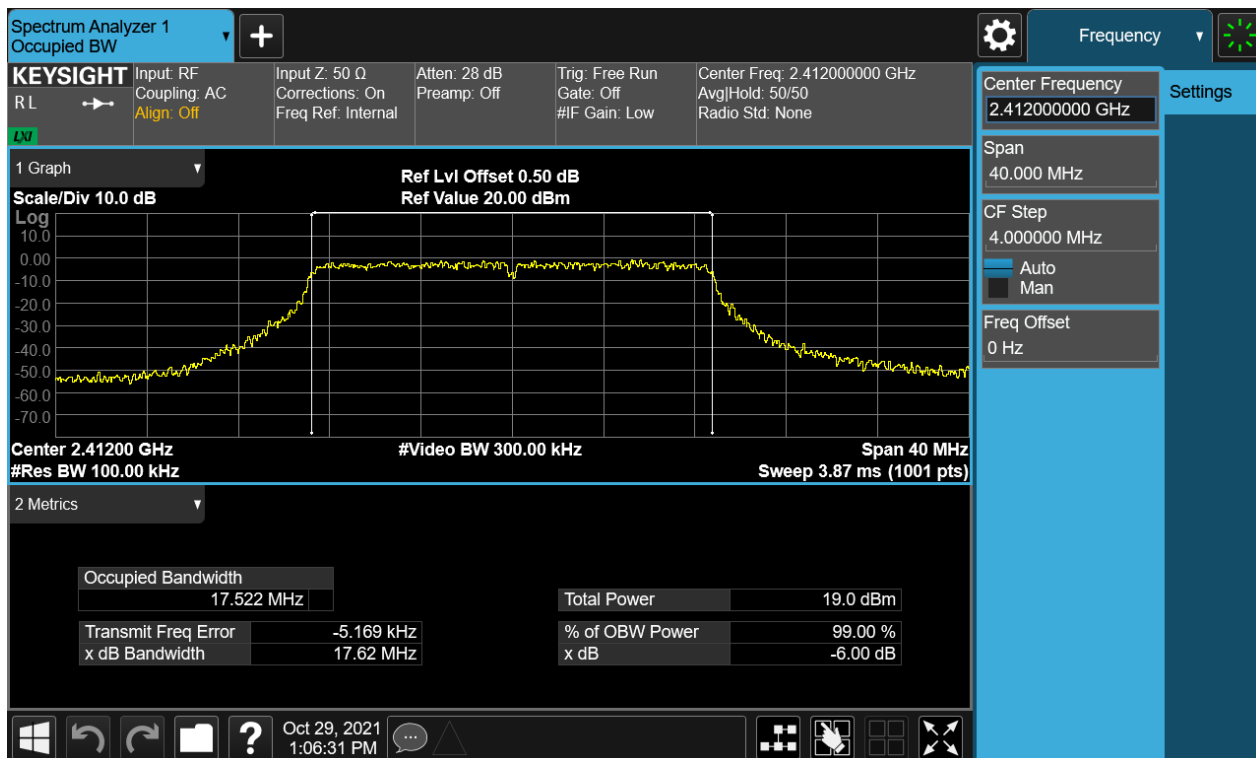
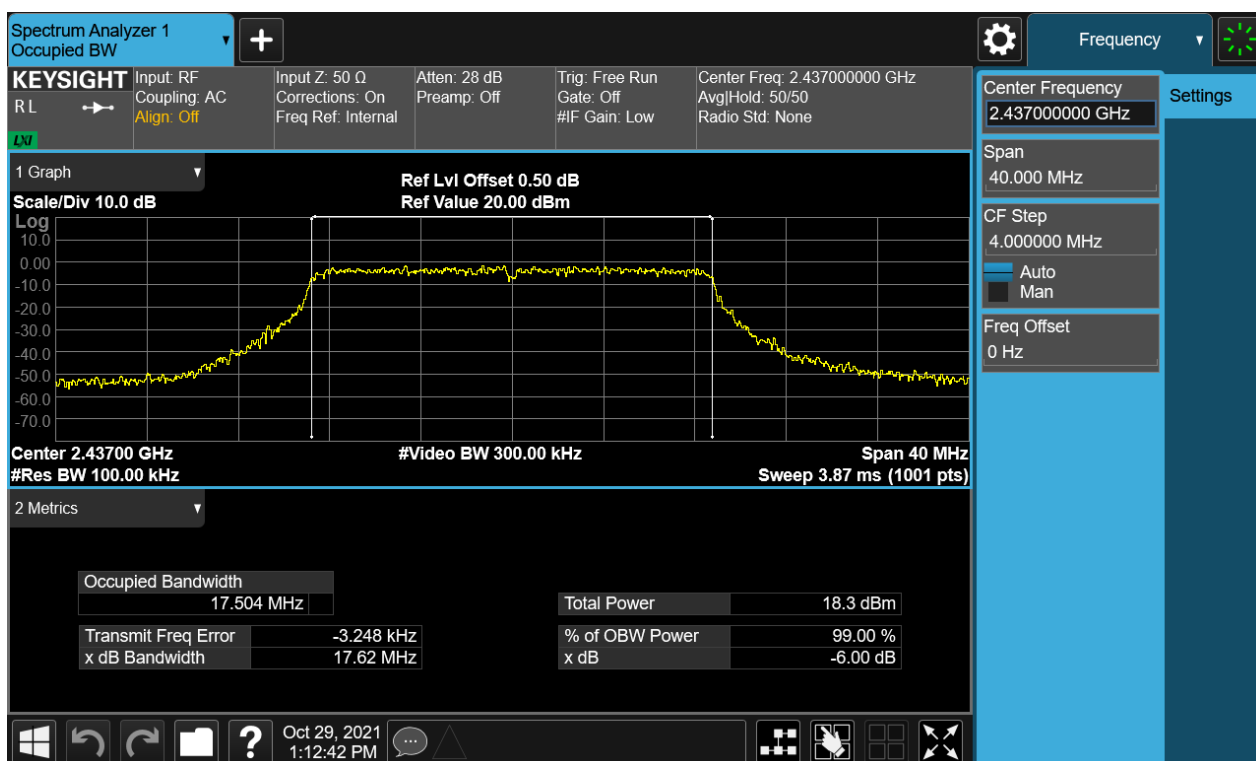


Figure 8: 6dB Bandwidth, 802.11n(HT20), 2437MHz



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

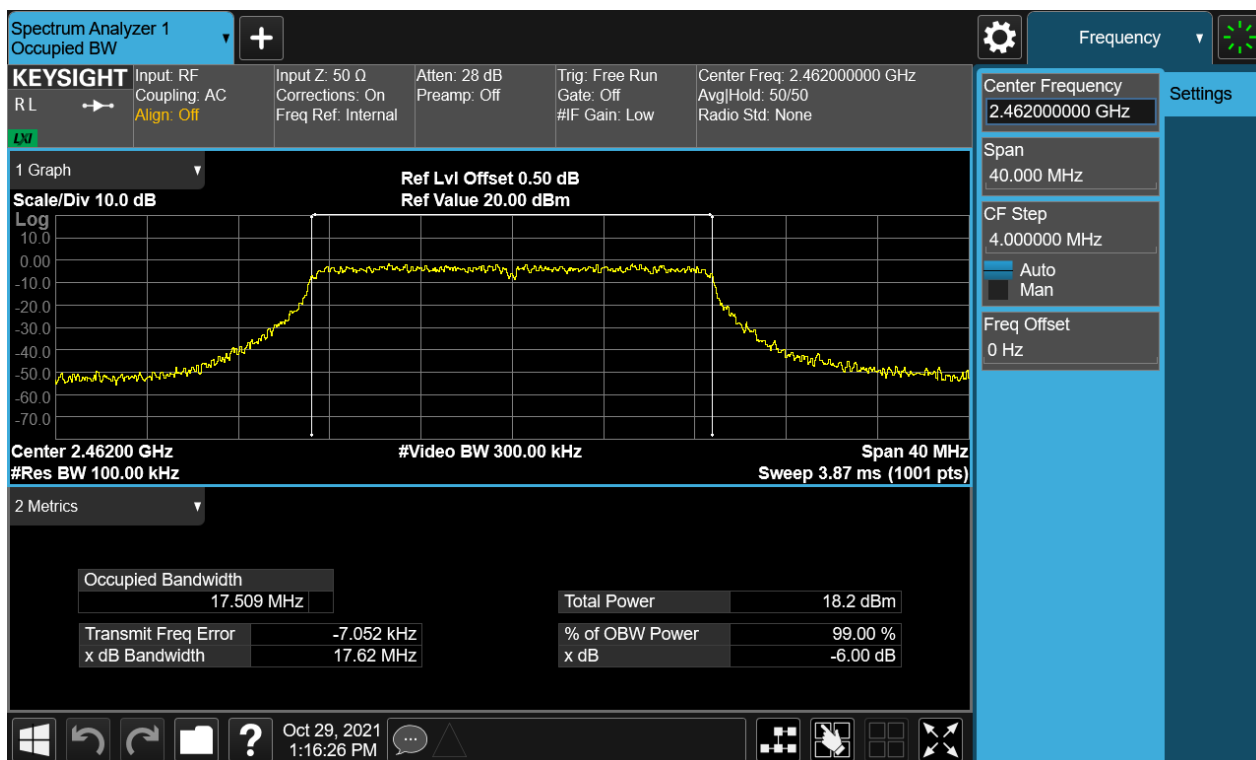
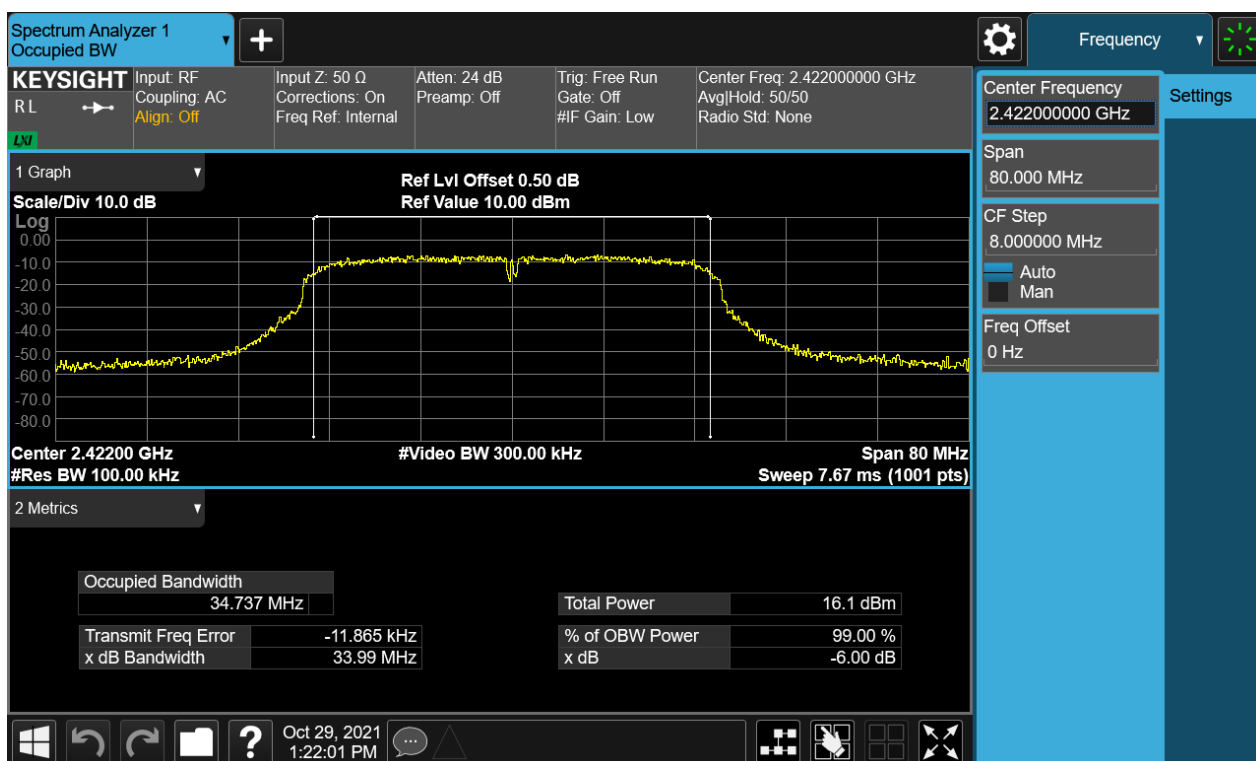


Figure 10: 6dB Bandwidth, 802.11n(HT40), 2422MHz



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Figure 11: 6dB Bandwidth, 802.11n(HT40), 2437MHz

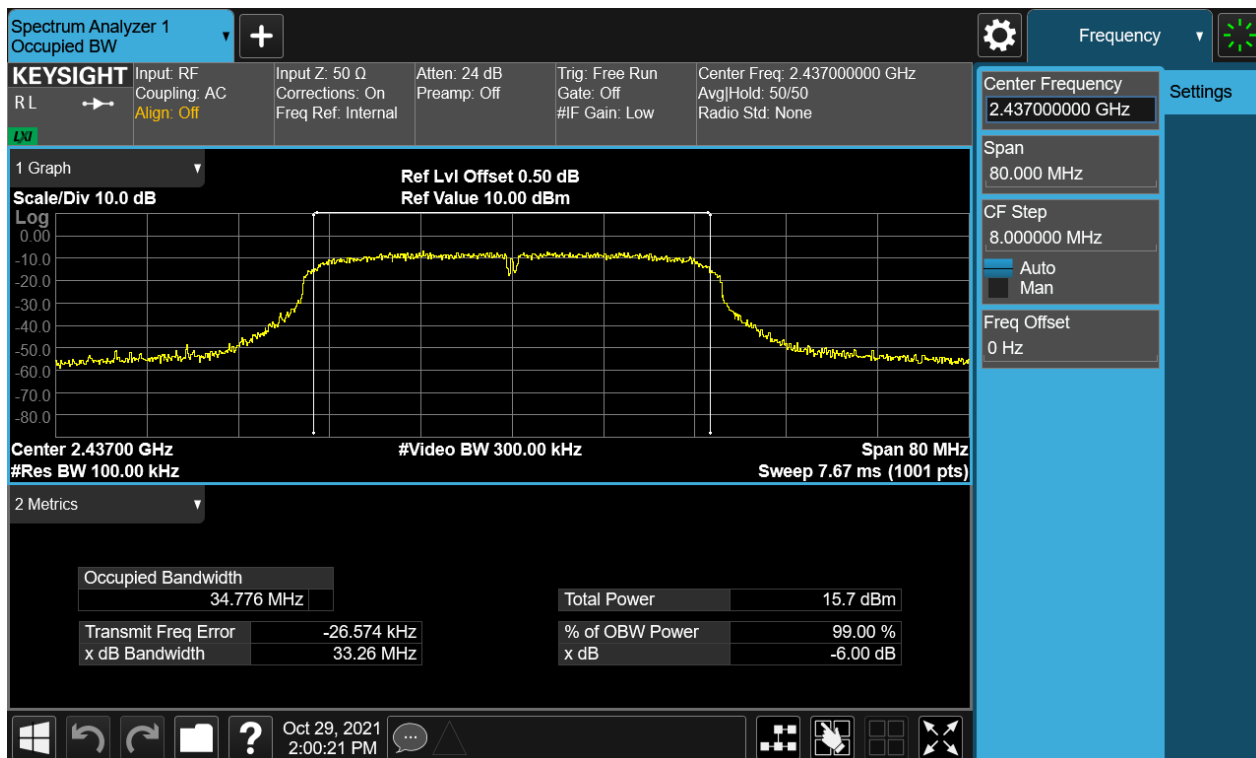
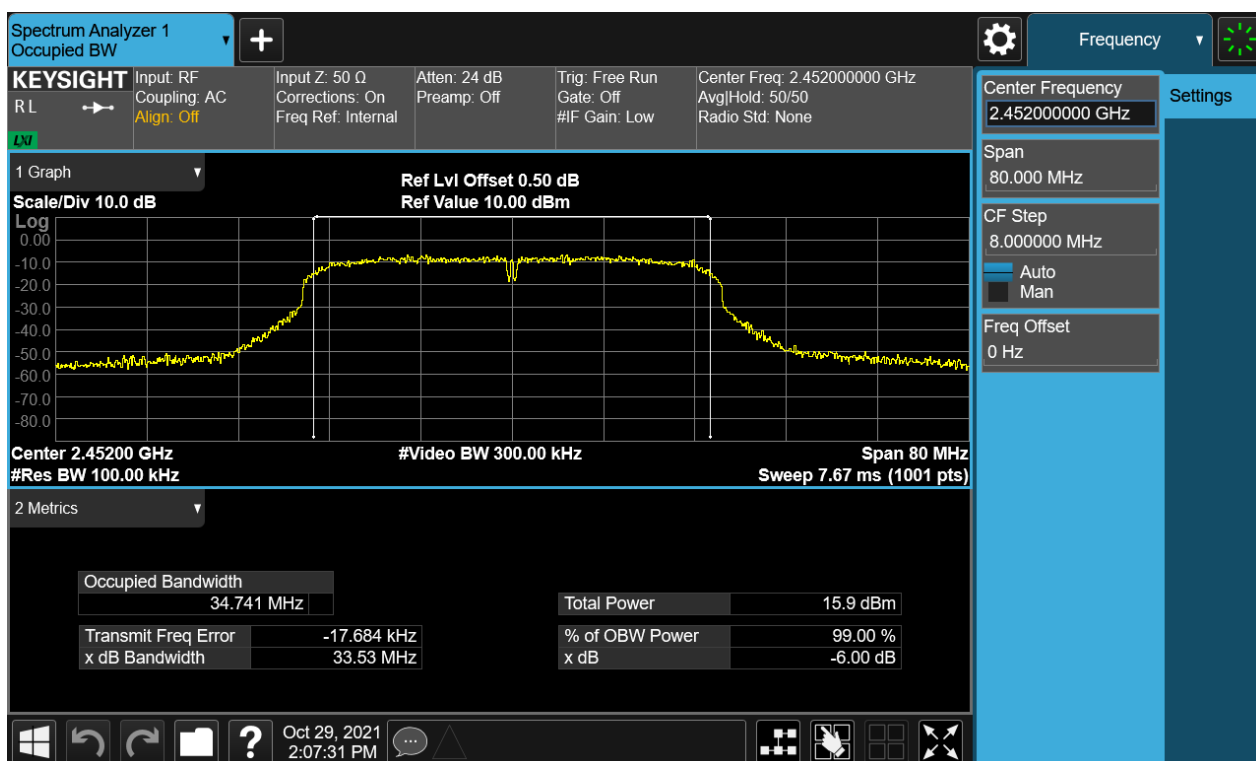


Figure 12: 6dB Bandwidth, 802.11n(HT40), 2452MHz



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4.1.4 Power Spectral Density

RESULT:

PASS

Test standard : FCC Part 15.247(e)
Requirement : ANSI C63.10-2013, KDB 558074
Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High
Operation Mode : A.1.a
Ambient temperature : 25°C
Relative humidity : 50%

Table 3: Power Spectral Density

Test Mode	Test Channel (MHz)	Measured Result (dBm/3kHz)	Limit (dBm/3kHz)
802.11b	2412	-6.76	≤ 8
	2437	-6.79	
	2462	-7.78	
802.11g	2412	-11.65	
	2437	-12.32	
	2462	-12.03	
802.11n(HT20)	2412	-12.27	
	2437	-11.82	
	2462	-11.90	
802.11n(HT40)	2422	-11.24	
	2437	-11.68	
	2452	-11.58	

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

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



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

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

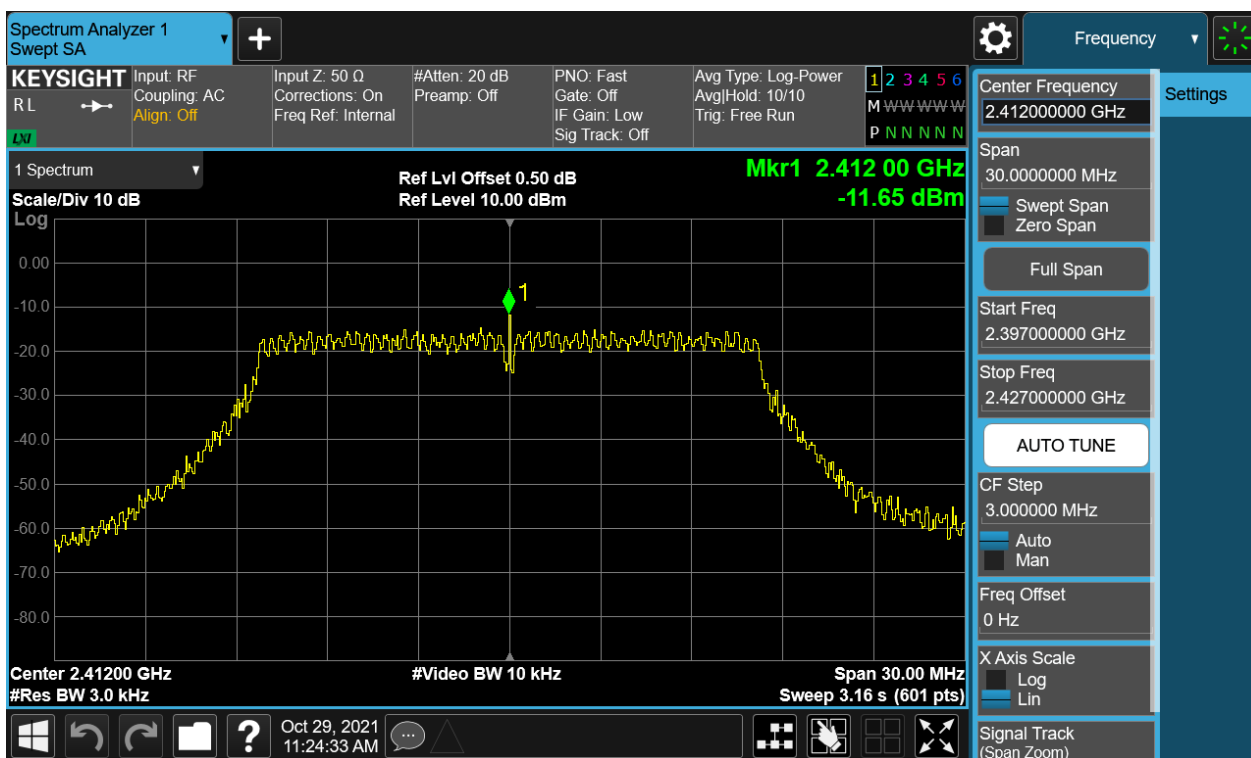


Figure 17: Power Spectral Density, 802.11g, 2437MHz

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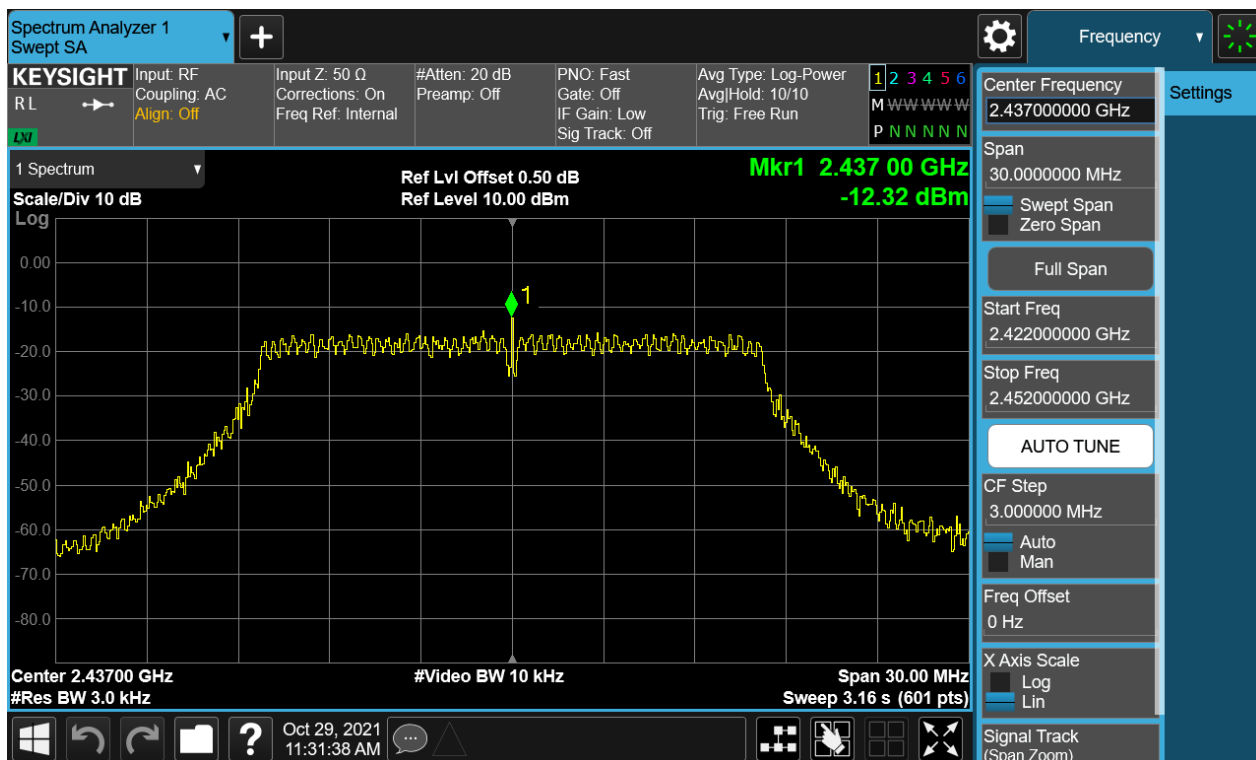


Figure 18: Power Spectral Density, 802.11g, 2462MHz

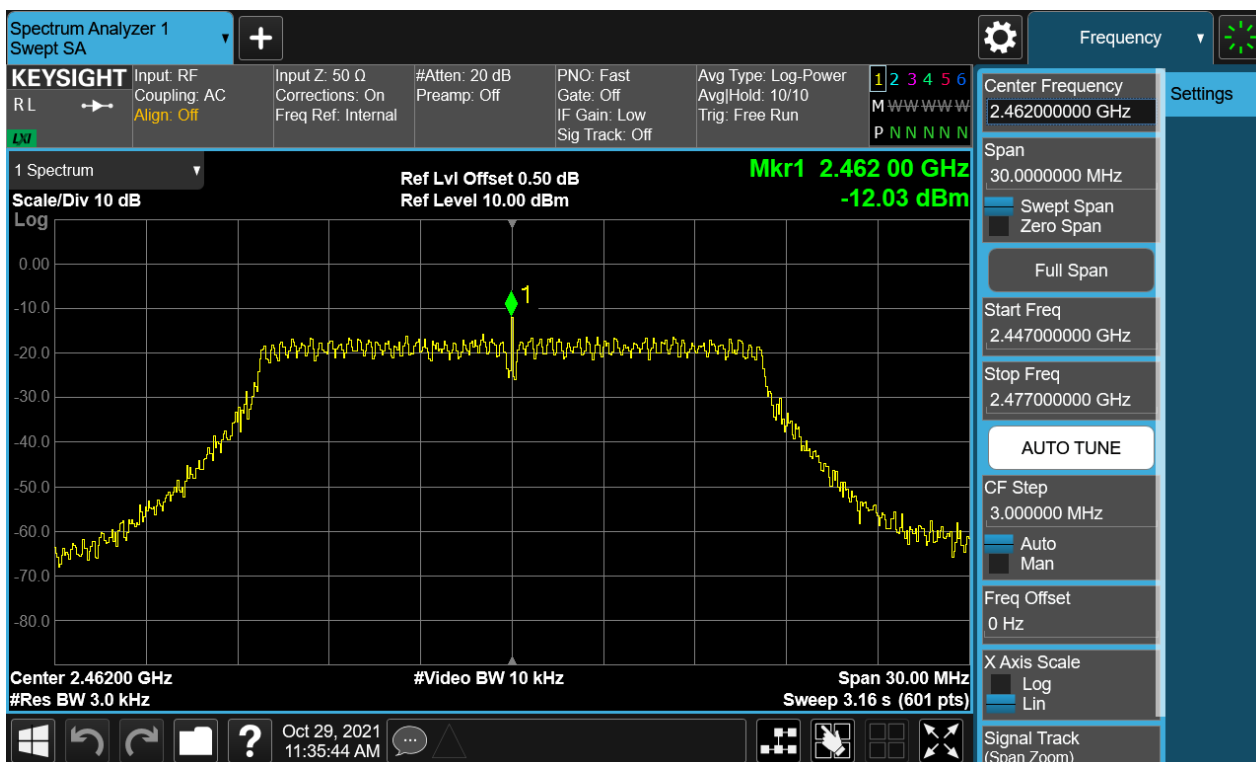


Figure 19: Power Spectral Density, 802.11n(HT20), 2412MHz

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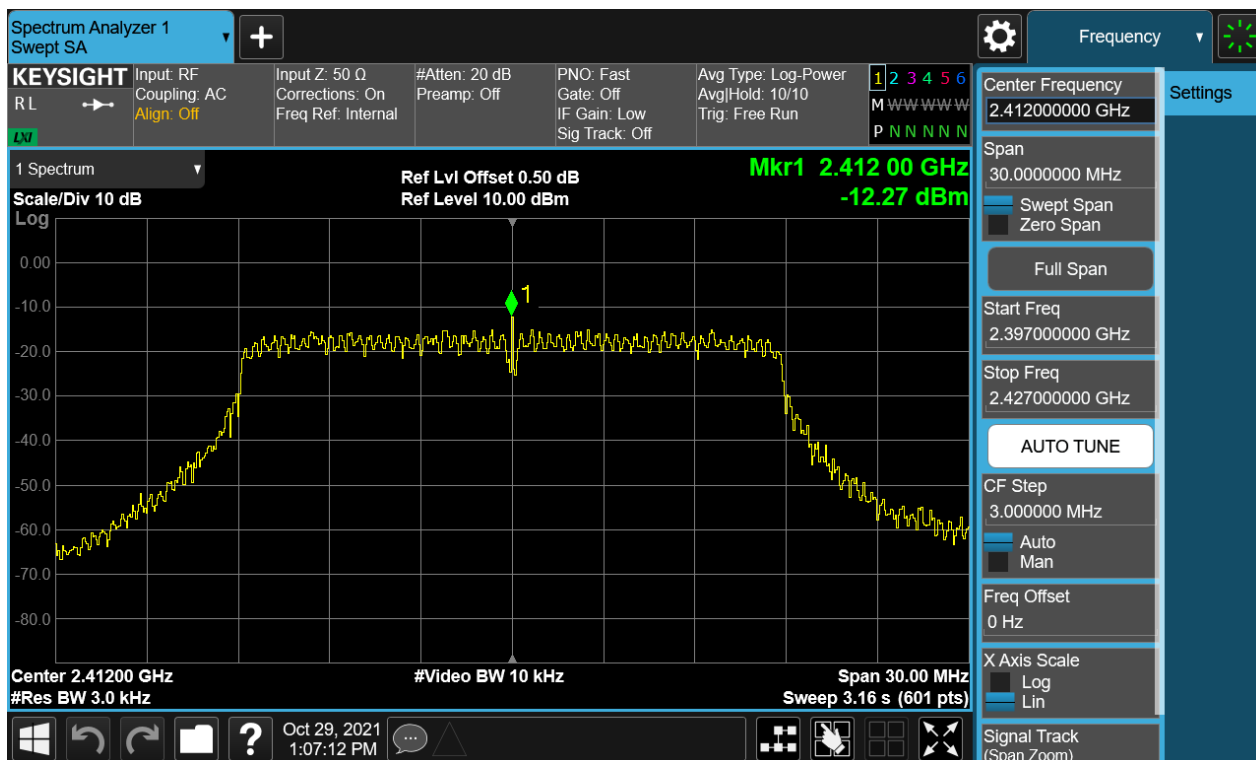


Figure 20: Power Spectral Density, 802.11n(HT20), 2437MHz

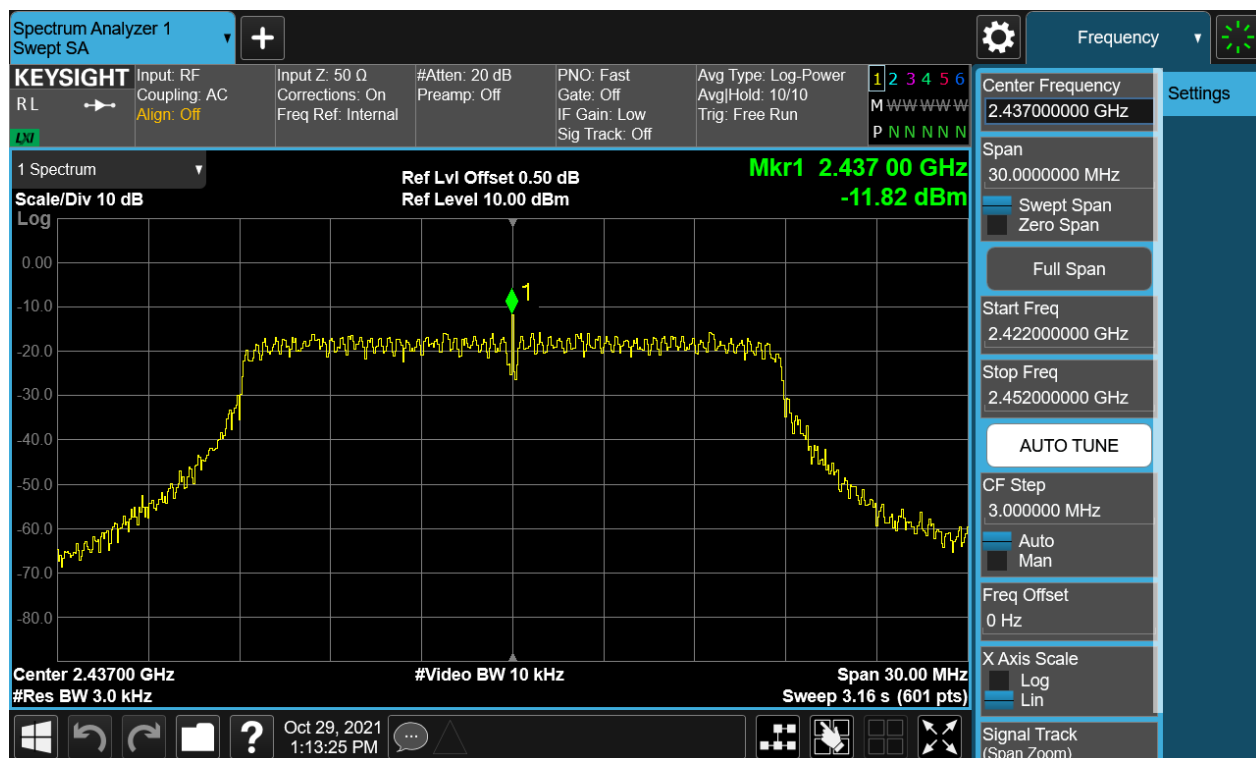


Figure 21: Power Spectral Density, 802.11n(HT20), 2462MHz

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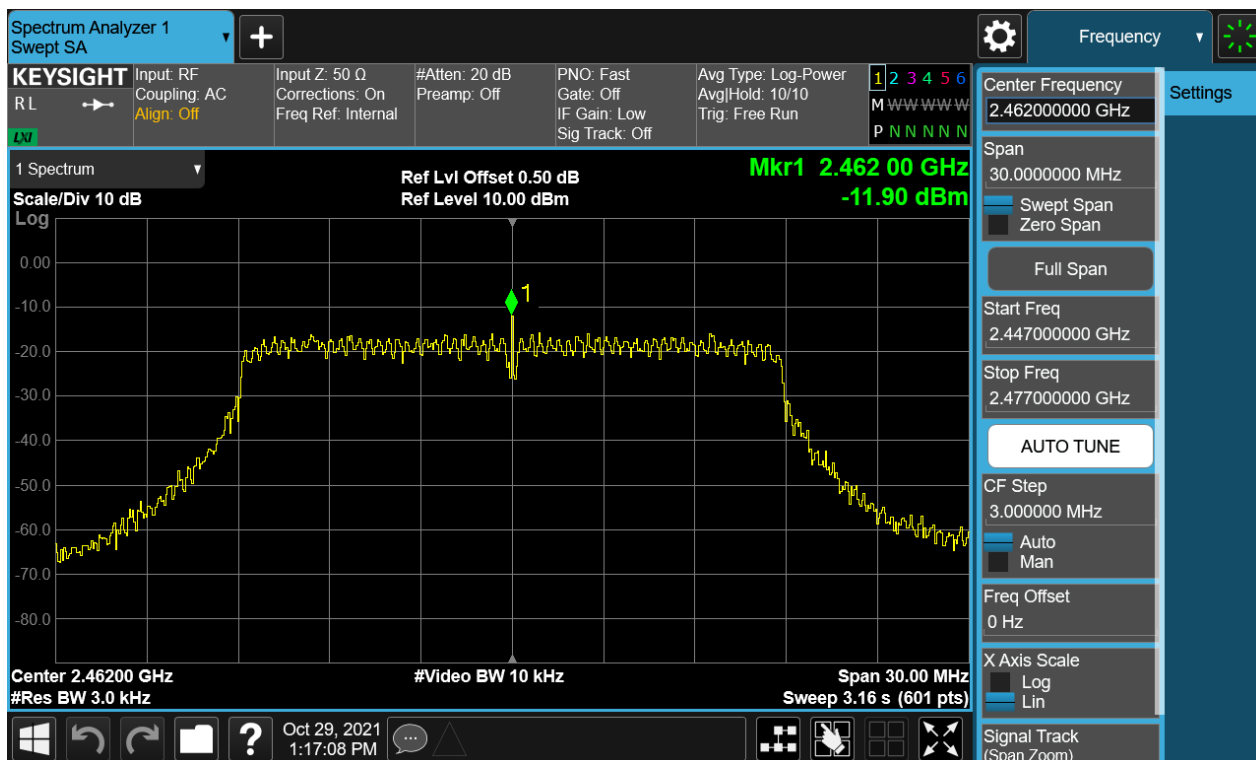


Figure 22: Power Spectral Density, 802.11n(HT40), 2422M

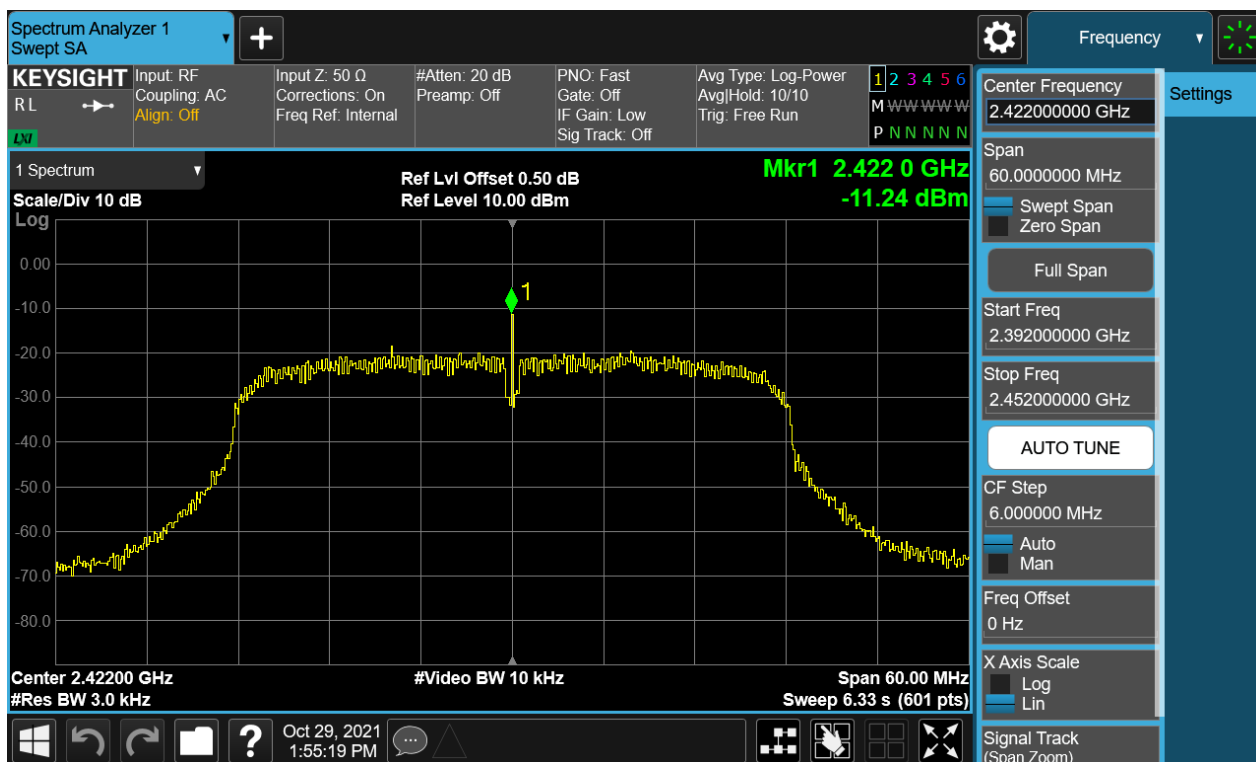


Figure 23: Power Spectral Density, 802.11n(HT40), 2437MHz

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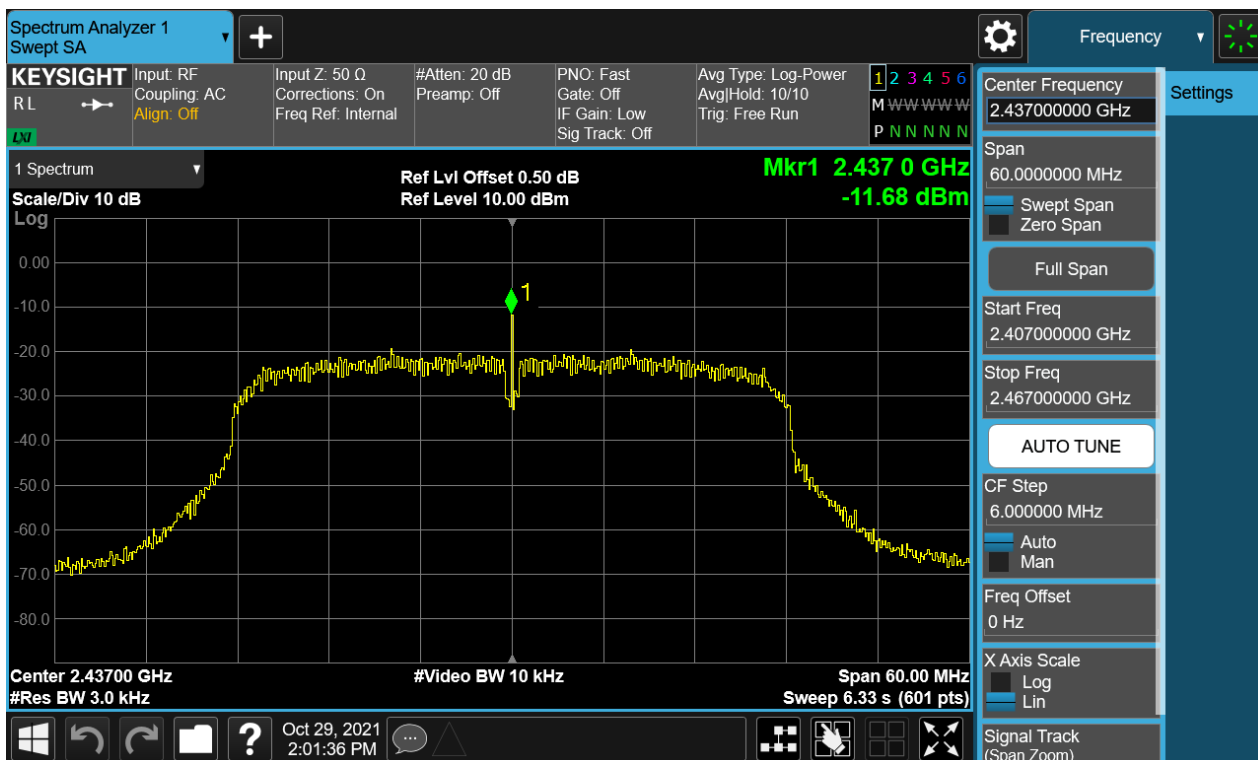
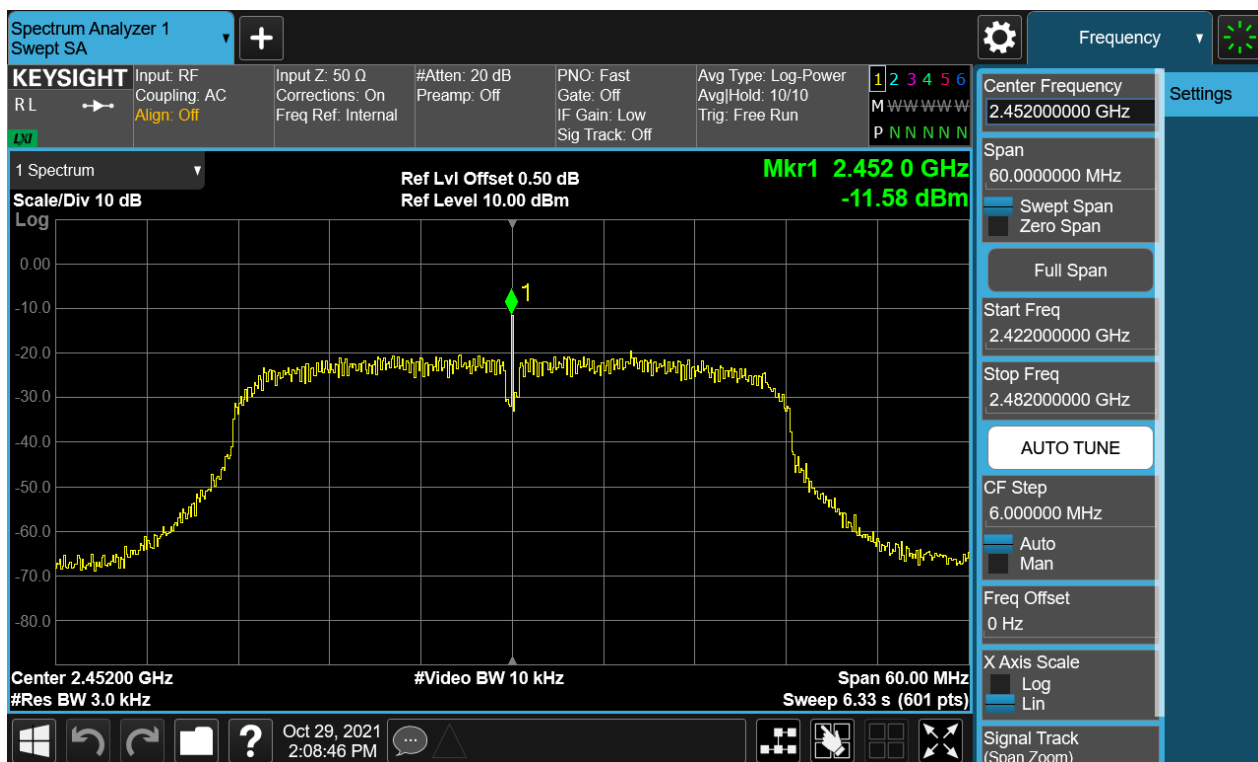


Figure 24: Power Spectral Density, 802.11n(HT40), 2452MHz



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4.1.5 Conducted Spurious Emission & Authorized-band band-edge

RESULT:

PASS

Test standard	: FCC Part 15.247(d), 15.209
Requirement	: ANSI C63.10-2013, KDB 558074
Kind of test site	: Shielded room

Test setup

Test Channel	: Low/Middle/High for spurious, Low/High for Band Edge
Operation Mode	: A.1.a
Ambient temperature	: 25°C
Relative humidity	: 50%

For details refer to following test plot.

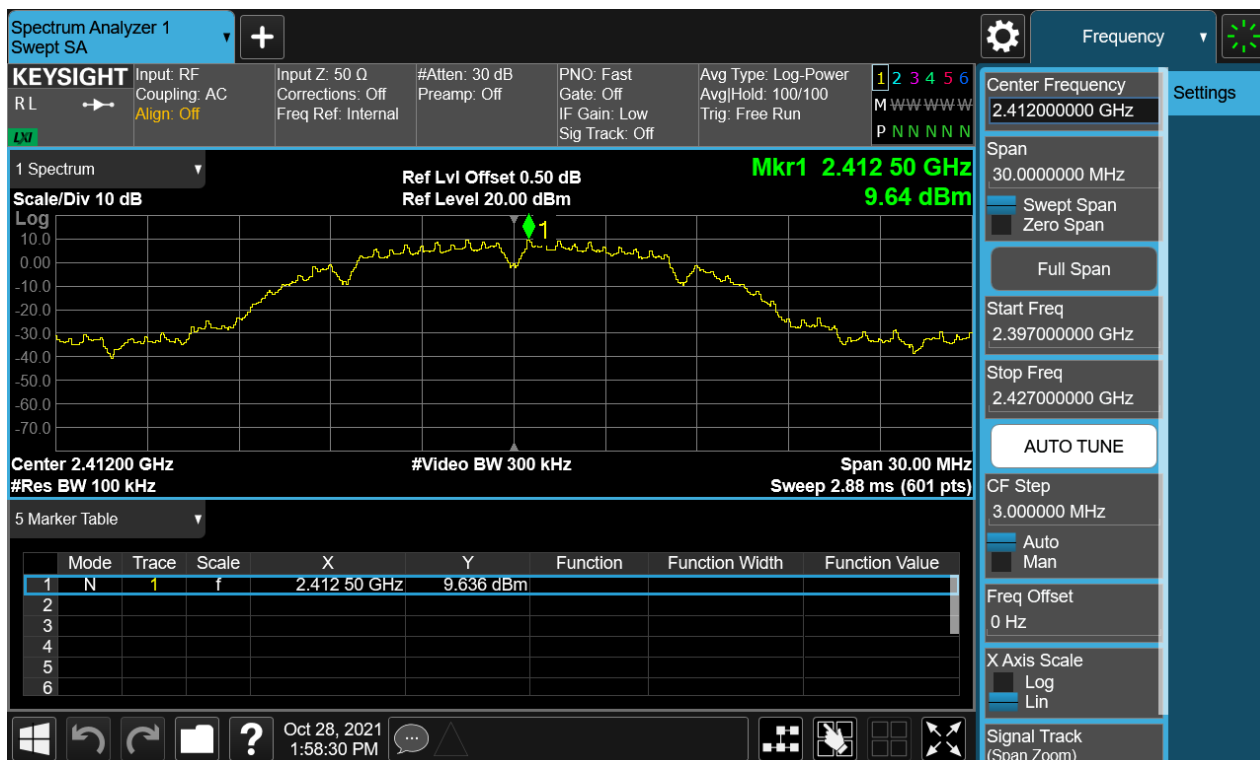
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Figure 25: Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2412MHz
Carrier Level



Band Edge



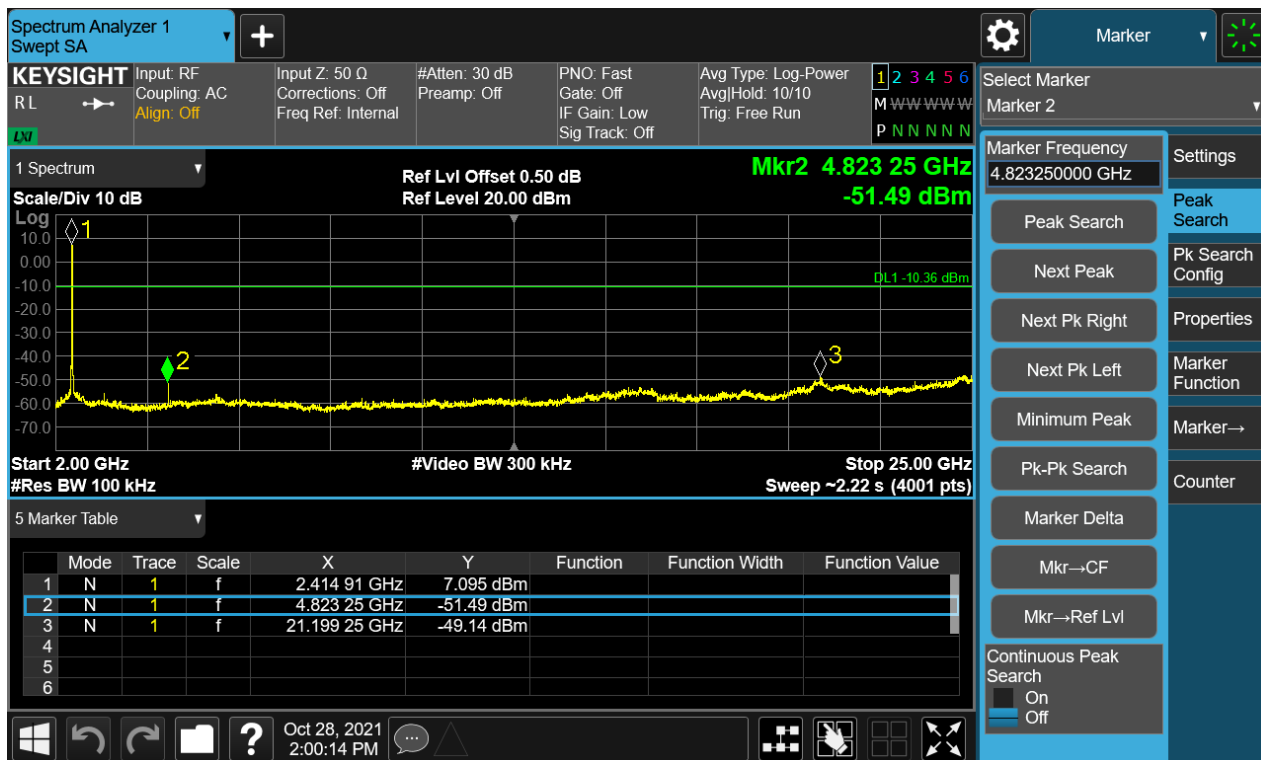
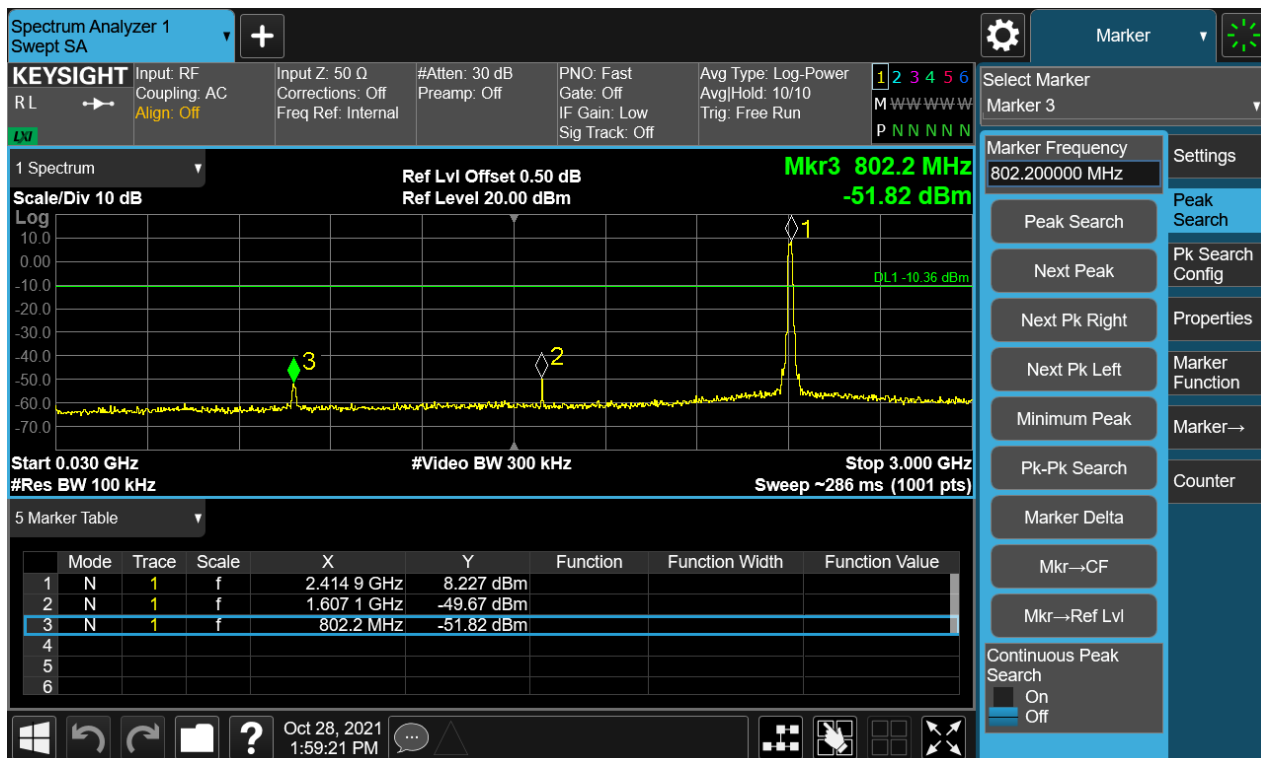
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Conducted spurious emissions 30MHz-25GHz



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Figure 26: Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2437MHz
Carrier Level



Conducted spurious emissions 30MHz-25GHz

