

TEST REPORT

Report No.: SHE22110054-02AE

Date: 2023-04-17

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Applicant : SIMCom Wireless Solutions Limited
Address of Applicant : SIMCom Headquarters Building, Building 3, No.289
Linhong Road, Changning District, Shanghai, China

Product Name : Wi-Fi & BT Module
Brand Name : SIMCom
Model Name : W58
Sample Acquisition Method : Sent by Client
Sample No. : E22110054-01#05
E22110054-01#08

FCC ID : 2AJYU-8PYA00C
ISED Number : 23761-8PYA010

Standards : FCC CFR47 Part 15, Subpart C
RSS-Gen (Issue 5, Amd.2-Feb 2021)
RSS-247 (Issue 2, February 2017)

Date of Receipt : 2023-02-15
Date of Test : 2023-03-13 ~ 2023-04-17
Date of Issue : 2023-04-17

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:



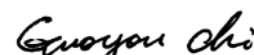
(Erik Yang)

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Approved by:



(Authorized signatory: Guoyou Chi)

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1 General Information

1.1 Testing Laboratory

ISED CAB identifier #	CN0081
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	SIMCom Wireless Solutions Limited
Address	SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai,China
Contact Person	Yongsheng Li
Telephone	+86 21 3252 3134
Email	yongsheng.li@simcom.com
Manufacturer Company Name	SIMCom Wireless Solutions Limited
Address	SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai,China
Factory Company Name	SIMCom Wireless Solutions Limited
Address	SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai,China

1.3 Details of EUT

Product Name	Wi-Fi & BT Module
Brand Name	SIMCom
Test Model Name	W58
FCC ID	2AJYU-8PYA00C
ISED Number	23761-8PYA010
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	External Antenna
Antenna Gain	2.97dBi
Test Voltage	DC 3.3V
Hardware version	W58_V2.02_PCB
Software version	LE20B01V04SIM7600G22_MIFI2

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Test SW Version	BL410_R; BL410_E
RF power setting in TEST SW	802.11b: QRCT_Power level setting_17dBm 802.11g: QRCT_Power level setting_13dBm 802.11n(HT20): QRCT_Power level setting_11dBm 802.11n(HT40): QRCT_Power level setting_10dBm

Note:

1. The above information was declared by the manufacture.
2. 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 Measure Guidance.
RSS-Gen (Issue 5, Amd.2-Feb 2021)	General Requirements for Compliance of Radio Apparatus
RSS-247 (Issue 2, February 2017)	Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices
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	ISED Rules	Result
Antenna Requirement	FCC Part 15.247(b)(4), Part 15.203	RSS-247 5.4(f) RSS-GEN 6.8	PASS
Maximum peak conducted output power and E.I.R.P	FCC Part 15.247(b)(3)	RSS-247 5.4(d)	PASS
6dB Bandwidth and 99% Bandwidth	FCC Part 15.247(a)(2)	RSS-247 5.2(a) RSS-Gen 6.7	PASS
Maximum conducted output power spectral density	FCC Part 15.247(e)	RSS-247 5.2(b)	PASS
Conducted Spurious Emission & Authorized-band band-edge	FCC Part 15.247(d)	RSS-247 5.5	PASS
Radiated Emission	FCC Part 15.247(d), 15.205, 15.209	RSS-GEN 8.9	PASS
Band Edge (Restricted-band band-edge)	FCC Part 15.247(d), 15.205, 15.209	RSS-GEN 8.10	PASS
Conducted Emission on AC Mains	FCC Part 15.207(a)	RSS-Gen 8.8	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
Spectrum Analyzer	Keysight	N9020B	MY59260184	2022-08-02	2023-08-01
Spectrum Analyzer	Keysight	N9020A	MY54101709	2022-08-02	2023-08-01
Spectrum Analyzer	Rohde & Schwarz	FSV40N	101450	2022-06-10	2023-06-09
Signal Generator	Rohde & Schwarz	SMR27	100184	2022-08-02	2023-08-01
EMI Test Receiver	Rohde & Schwarz	ESR 7	101911	2022-06-10	2023-06-09
EMI Test Receiver	Rohde & Schwarz	ESPI3	100173	2022-06-10	2023-06-09
V-network	SCHWARZBECK	NSLK8127	8127-902	2022-06-10	2023-06-09
Broadband Antenna	SCHWARZBECK	VULB9163	9163-1037	2021-06-08	2023-06-07
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1775	2021-06-08	2023-06-07
Loop Antenna	SCHWARZBECK	FMZB 1513	/	2022-06-10	2023-06-09
Broadband Preamplifier	SCHWARZBECK	BBV 9718	346	2022-06-10	2023-06-09
EMC chamber 9*6*6 (L*W*H)	CHANGNING	966	N/A	2022-06-10	2023-06-09
Shielded Enclosure 8*5*4 (L*W*H)	CHANGNING	854	N/A	2022-06-10	2023-06-09
Test Software	BL	BL410_E	Version:1.0.0.117	N/A	N/A
Test Software	BL	BL410_R	Version:2.1.1.409	N/A	N/A

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2.4 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 expanded 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	< 1GHz	± 1.5 dB
	> 1GHz	± 1.5 dB
Radiated Emission	9KHz – 30MHz	± 3.42 dB
	30 MHz – 1GHz	± 5.00 dB
	> 1GHz	± 4.88 dB
Conducted Emission on AC Mains	150kHz-30MHz	± 2.68 dB
Occupied Channel Bandwidth		± 5 %

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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	5.5Mbps
802.11g	36Mbps
802.11n(20M)	MCS4
802.11n(40M)	MCS7

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.
Laptop	Lenovo	TP00083A	PF-0PRDGN 17/03
Adapter	Something High Electric(Xiamen) Company Inc.	P-050B-050200EU	N/A
EVB Debug Board	SIMCom	8PYA00-SIMCOM-EVB_V1.02	N/A
USB Cable	SIMCom	N/A	1.00m Unshielded

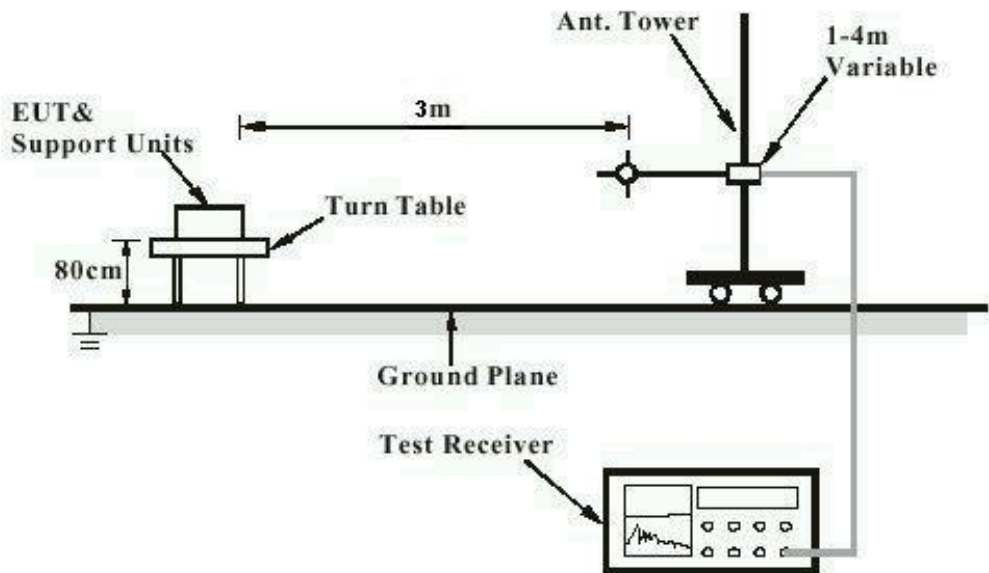
3.3 Support Software

Description	Manufacturer	Software Name
Software	Qualcomm	QRCT Version 4.0.00166.0

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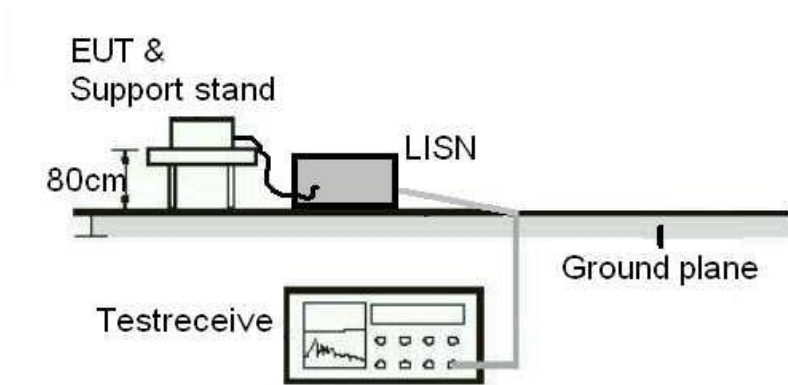
3.4 Test Setup Diagram

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

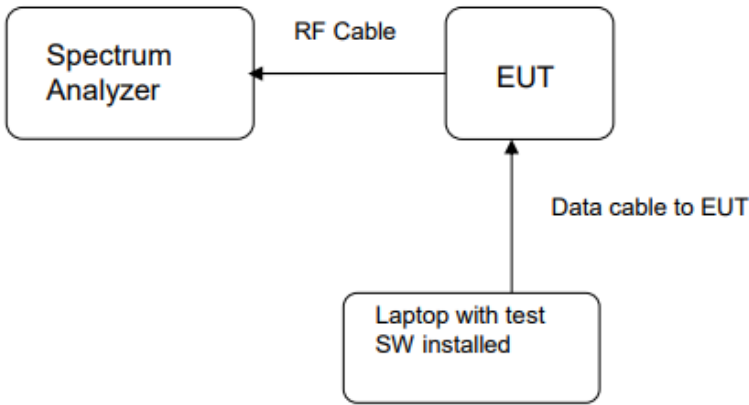
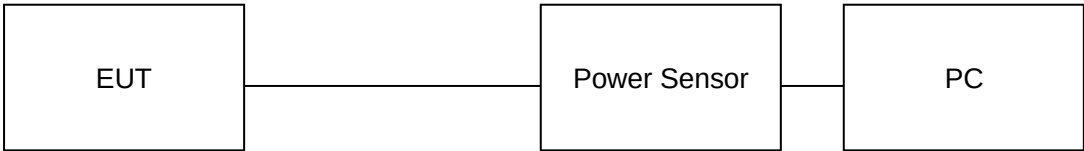


Diagram of Measurement Equipment Configuration for conducted output power setup



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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
RSS-247 5.4(f), RSS-GEN 6.8

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 2.97dBi. The antenna is an external 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 peak conducted output power and E.I.R.P

RESULT:

PASS

Test standard : FCC Part 15.247(b)(3), RSS-247 5.4(d)
Requirement : ANSI C63.10-2013 clause 11.9.1.3,
KDB 558074 clause 8.3.1.3
Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High
Operation Mode : A.1.a
Ambient temperature : 24.7°C
Relative humidity : 60%

Table 1: Maximum peak conducted output power

Test Mode	Test Channel (MHz)	Maximum peak conducted output power		Limit (W)
		(dBm)	(mW)	
802.11b	2412	16.57	45.39	< 1
	2437	16.17	41.40	
	2462	15.93	39.17	
802.11g	2412	13.52	22.49	
	2437	13.33	21.53	
	2462	12.76	18.88	
802.11n(HT20)	2412	11.29	13.46	
	2437	11.44	13.93	
	2462	11.52	14.19	
802.11n(HT40)	2422	11.39	13.77	
	2437	11.48	14.06	
	2452	11.28	13.43	

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Table 2: E.I.R.P

Test Mode	Test Channel (MHz)	E.I.R.P		Limit (W)
		(dBm)	(mW)	
802.11b	2412	19.54	89.95	< 4
	2437	19.14	82.04	
	2462	18.90	77.62	
802.11g	2412	16.49	44.57	
	2437	16.30	42.66	
	2462	15.73	37.41	
802.11n(HT20)	2412	14.26	26.67	
	2437	14.41	27.61	
	2462	14.49	28.12	
802.11n(HT40)	2422	14.36	27.29	
	2437	14.45	27.86	
	2452	14.25	26.61	

- Notes:
- 1. EIRP = Conducted output power + Antenna Gain.
 - 2. Antenna Gain is 2.97dBi.

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4.1.3 6dB Bandwidth and 99% Bandwidth

RESULT:

PASS

Test standard

: FCC Part 15.247(a)(2), RSS-247 5.2(a)
RSS-Gen 6.7

Requirement

: ANSI C63.10-2013 clause 11.8.1,
KDB 558074 clause 8.2

Kind of test site

: Shielded room

Test setup

Test Channel

: Low/Middle/High

Operation Mode

: A.1.a

Ambient temperature

: 24.7°C

Relative humidity

: 60%

Table 3: 6dB Bandwidth and 99% Bandwidth

Test Mode	Test Channel (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limit (MHz)
802.11b	2412	8.116	13.086	≥0.5
	2437	8.637	12.638	
	2462	7.430	13.051	
802.11g	2412	16.450	17.017	
	2437	16.170	16.790	
	2462	16.390	16.899	
802.11n(HT20)	2412	17.310	18.024	
	2437	17.320	17.903	
	2462	17.300	18.075	
802.11n(HT40)	2422	35.750	36.478	
	2437	35.180	36.098	
	2452	35.330	36.082	

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Figure 1: The plots of 6dB Bandwidth, 802.11b, 2412MHz

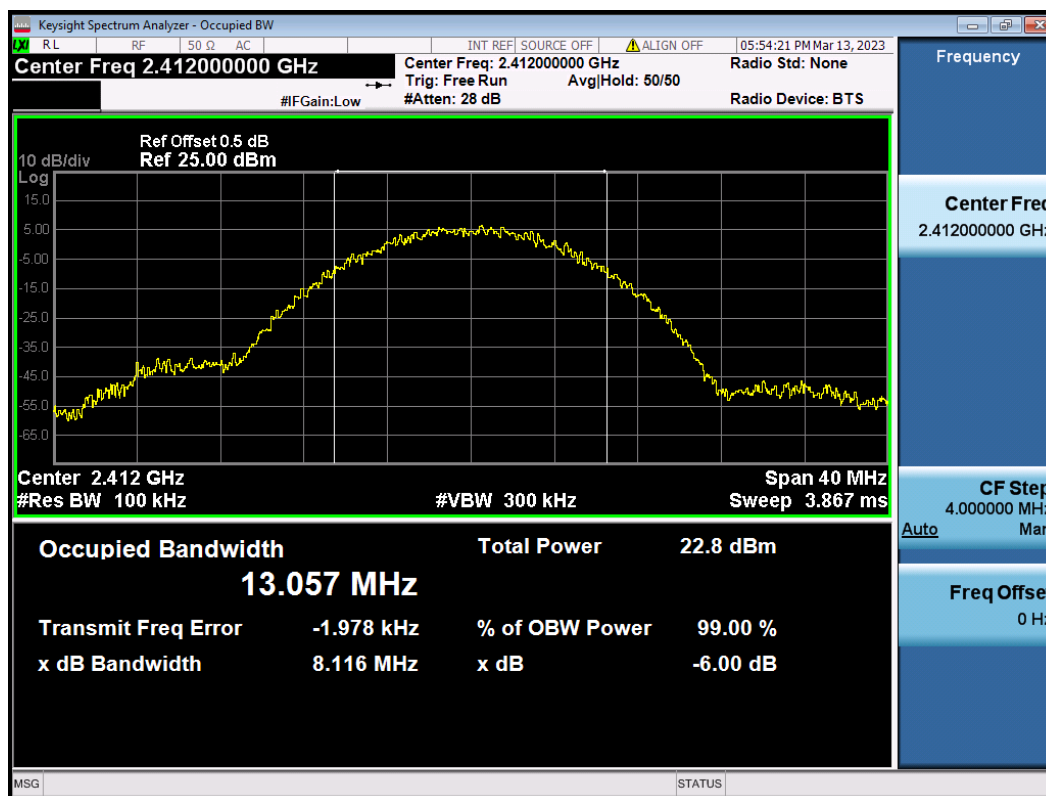


Figure 2: The plots of 99% Bandwidth, 802.11b, 2412MHz



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Figure 3: The plots of 6dB Bandwidth, 802.11b, 2437MHz

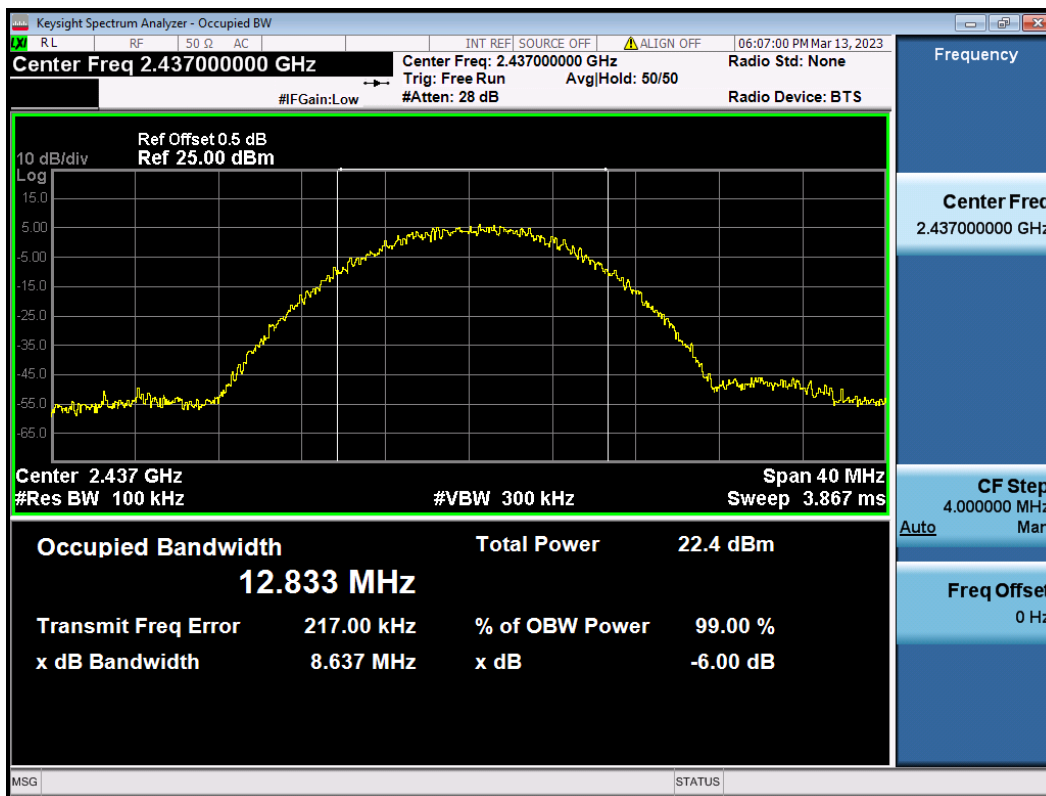
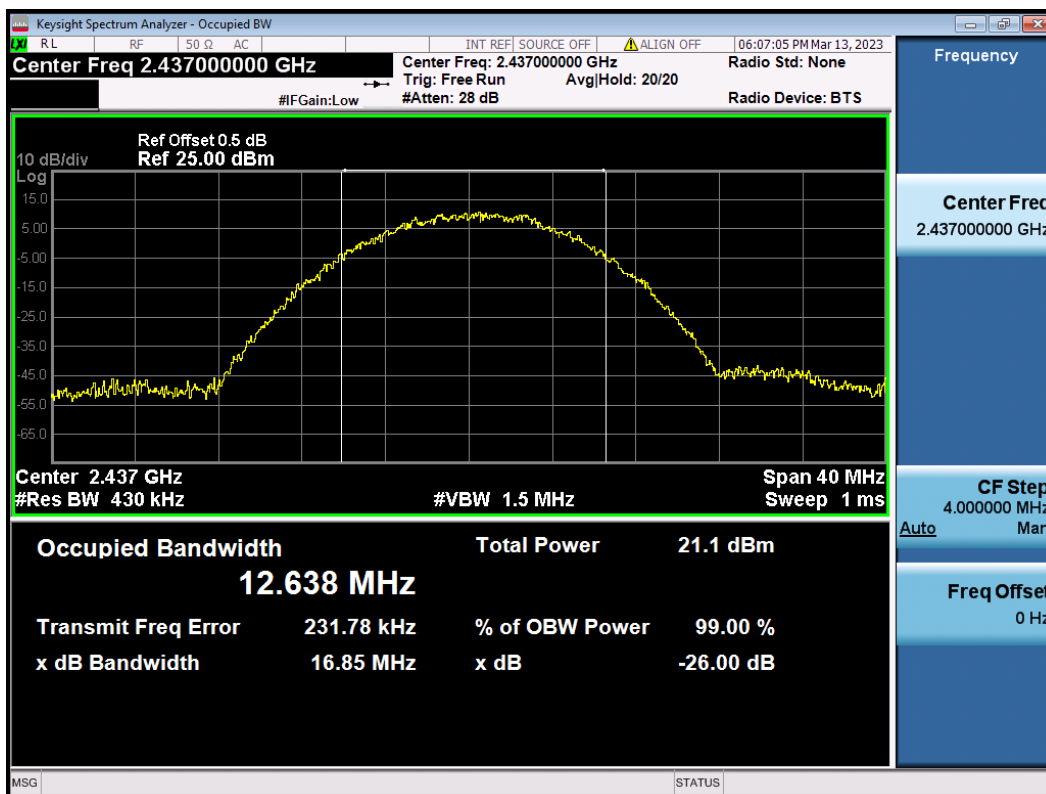


Figure 4: The plots of 99% Bandwidth, 802.11b, 2437MHz



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Figure 5: The plots of 6dB Bandwidth, 802.11b, 2462MHz

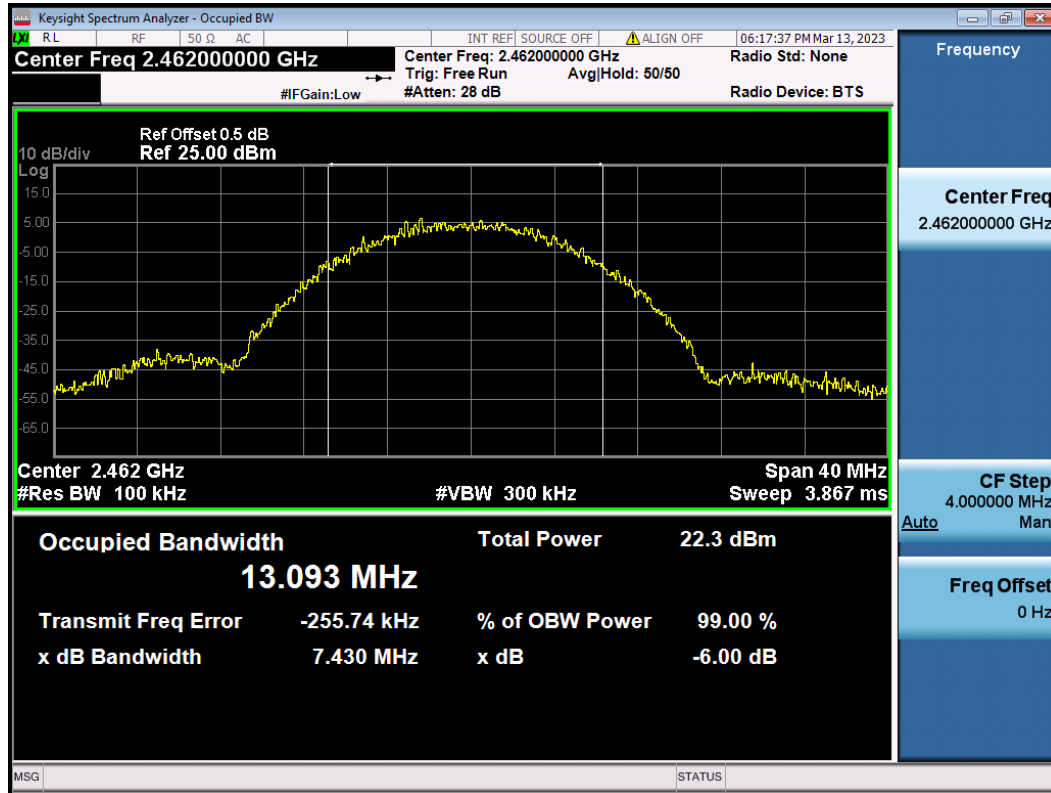


Figure 6: The plots of 99% Bandwidth, 802.11b, 2462MHz



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Figure 7: The plots of 6dB Bandwidth, 802.11g, 2412MHz

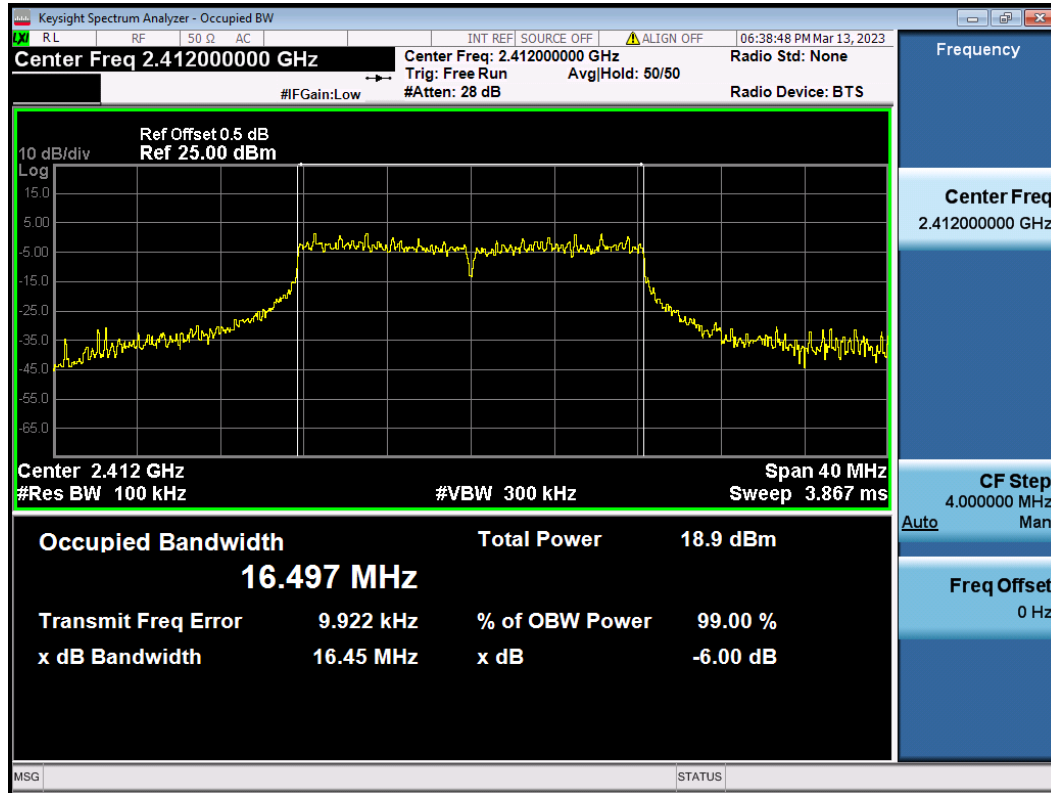
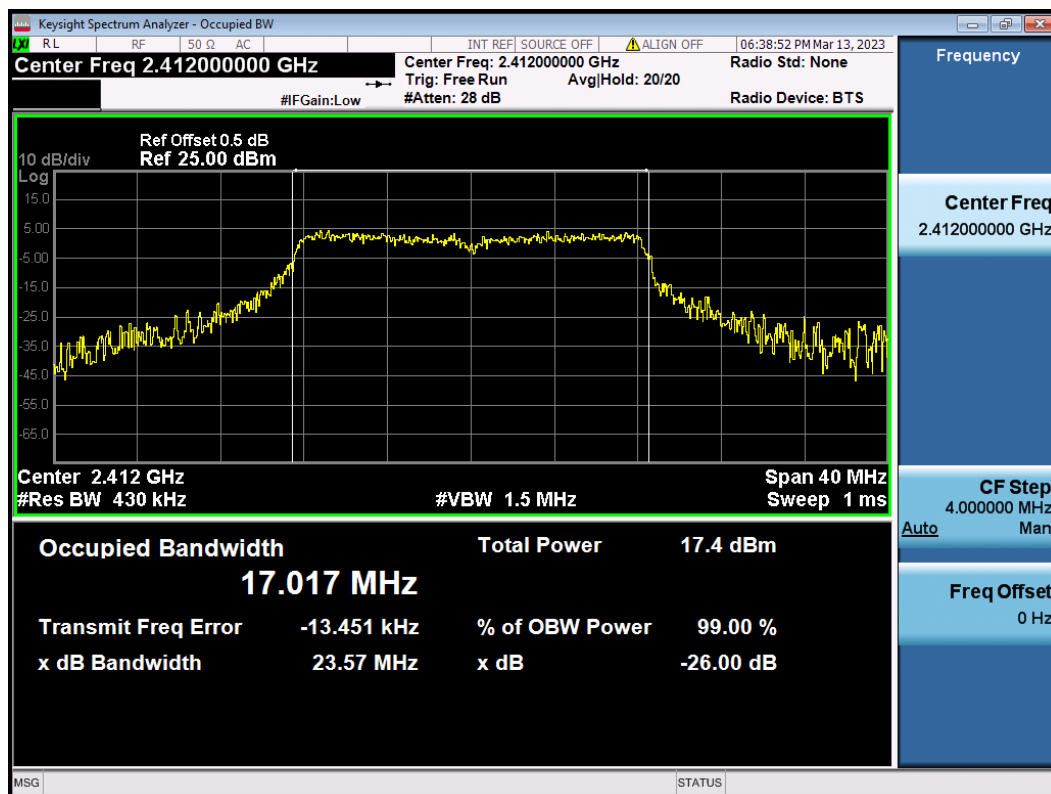


Figure 8: The plots of 99% Bandwidth, 802.11g, 2412MHz



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Figure 9: The plots of 6dB Bandwidth, 802.11g, 2437MHz

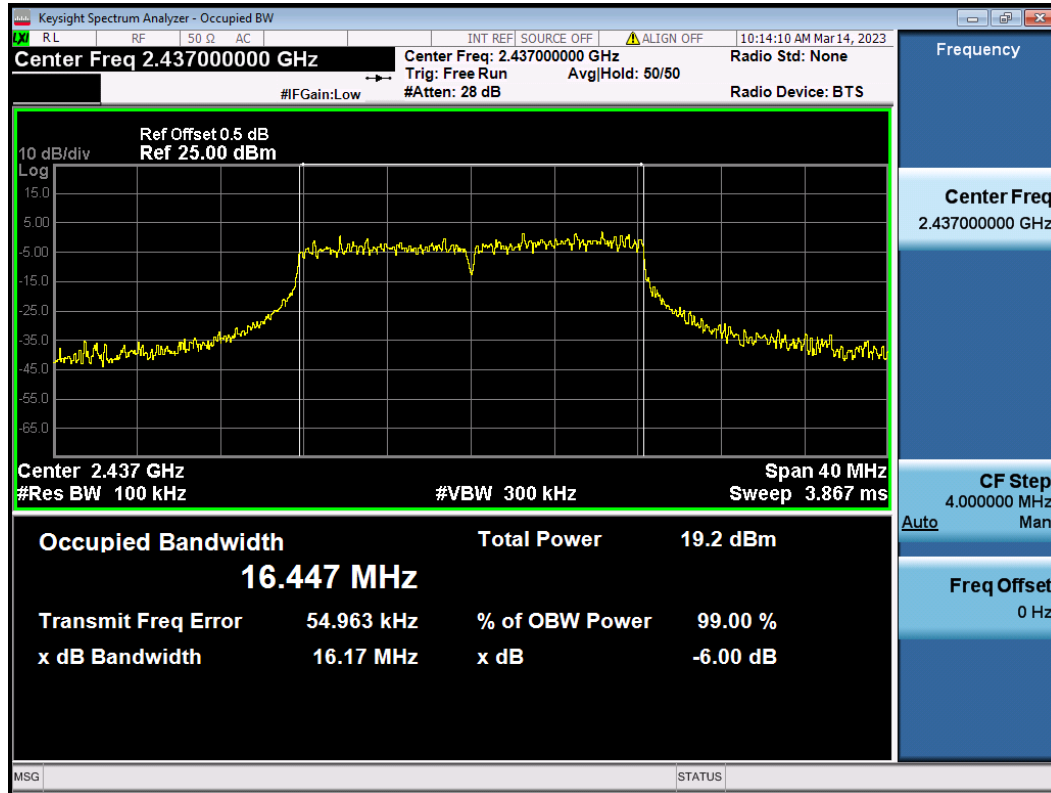
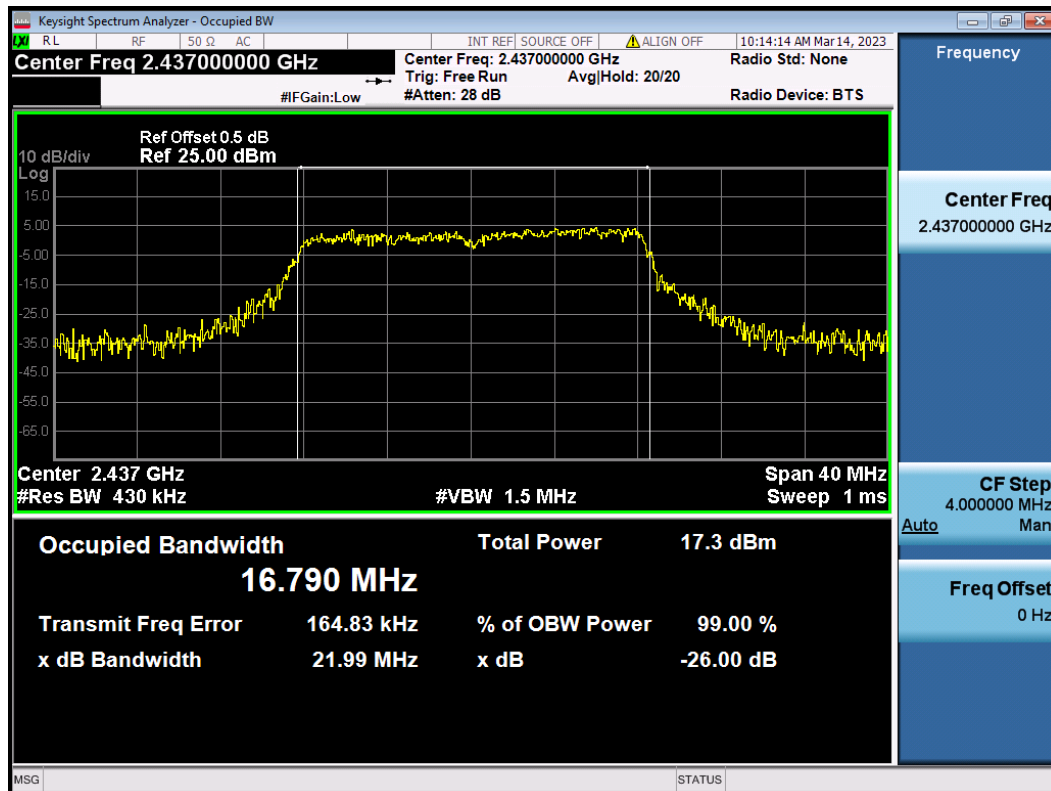


Figure10: The plots of 99% Bandwidth, 802.11g, 2437MHz



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Figure 11: The plots of 6dB Bandwidth, 802.11g, 2462MHz

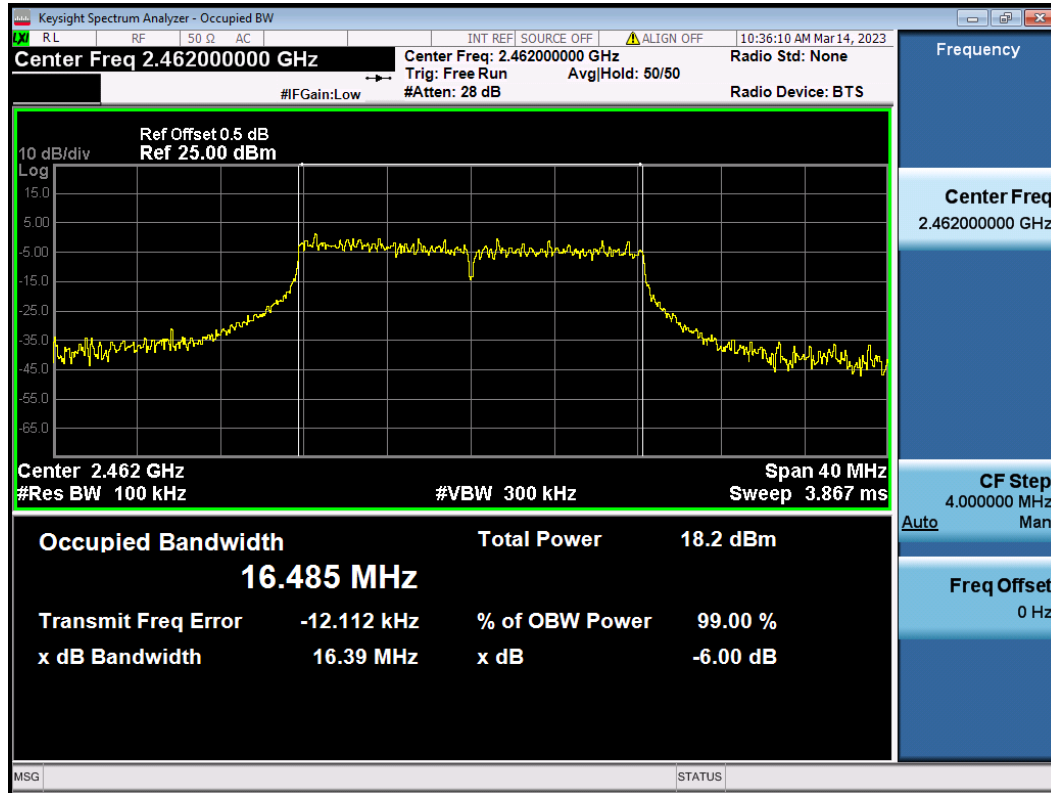
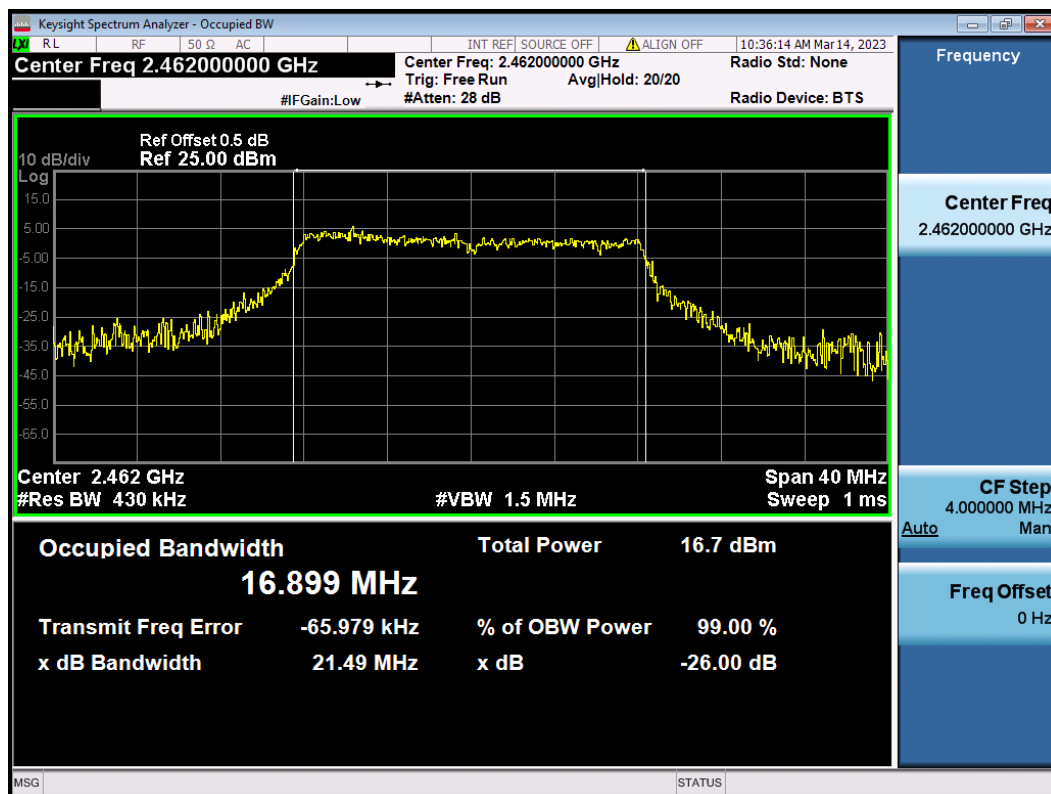


Figure 12: The plots of 99% Bandwidth, 802.11g, 2462MHz



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Figure 13: The plots of 6dB Bandwidth, 802.11n(HT20), 2412MHz

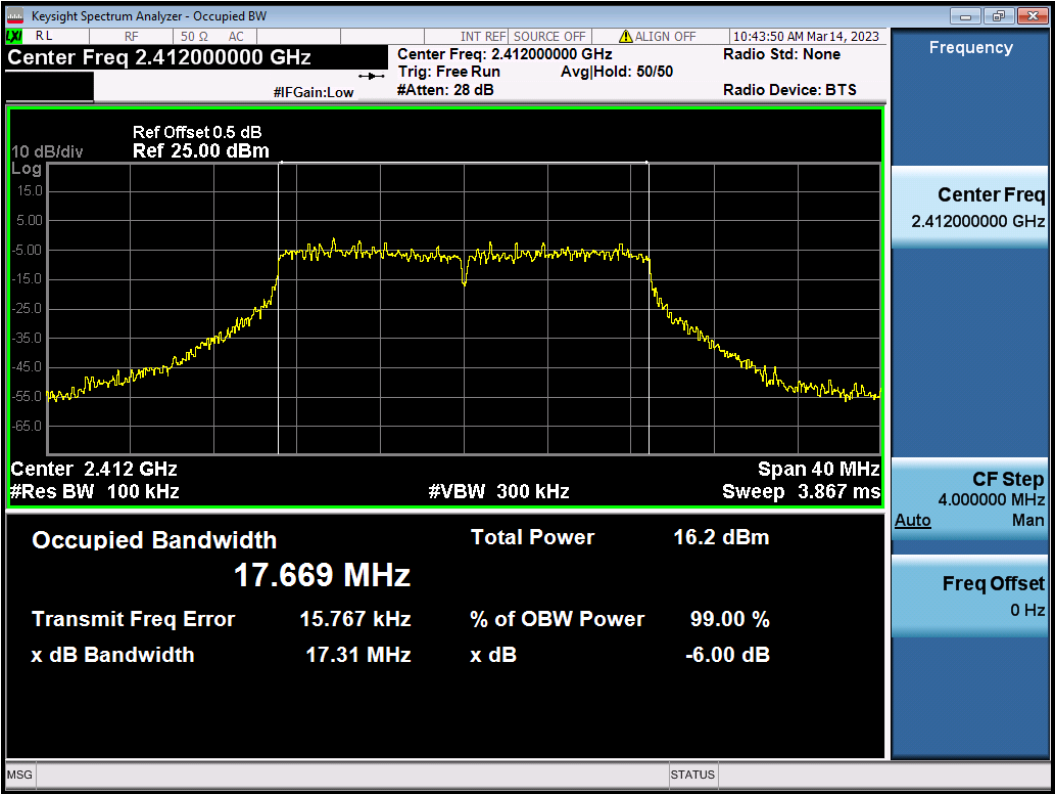
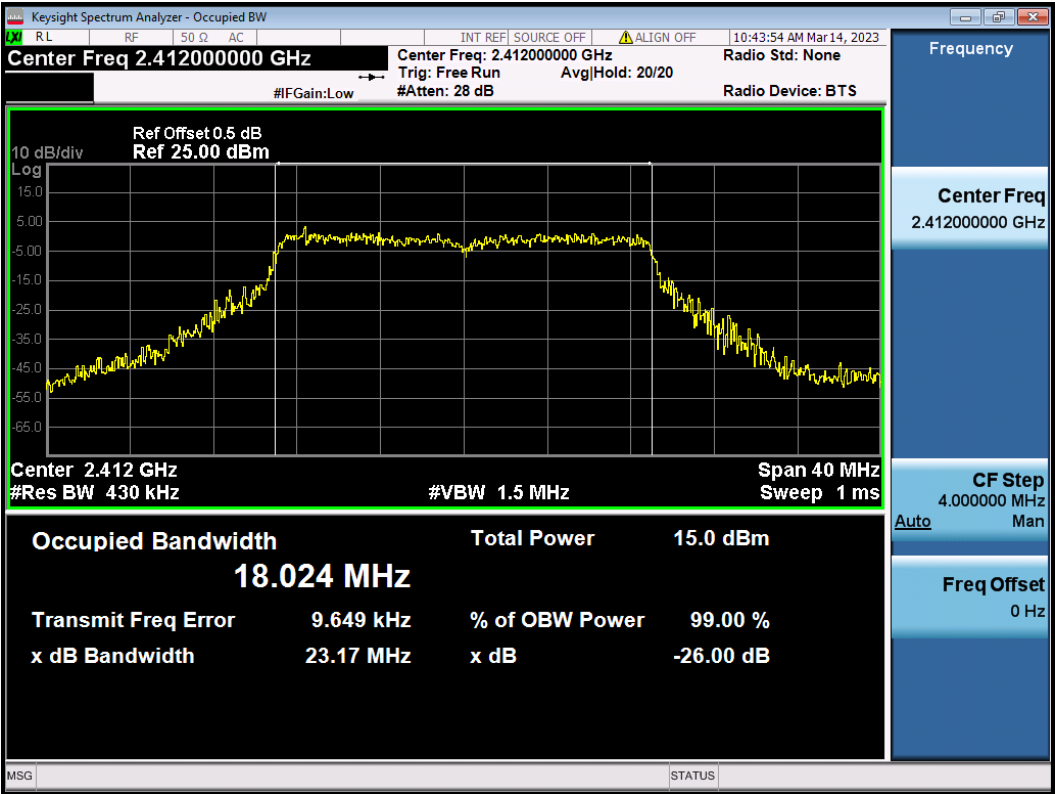


Figure 14: The plots of 99% Bandwidth, 802.11n(HT20), 2412MHz



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Figure 15: The plots of 6dB Bandwidth, 802.11n(HT20), 2437MHz

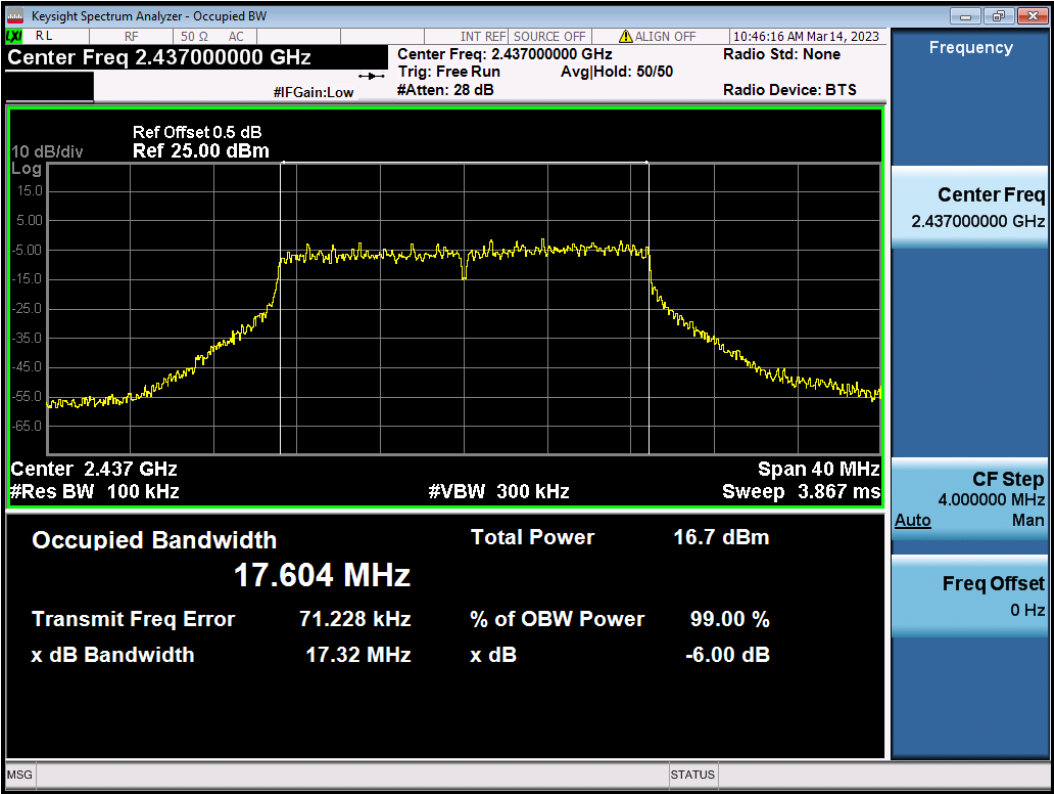
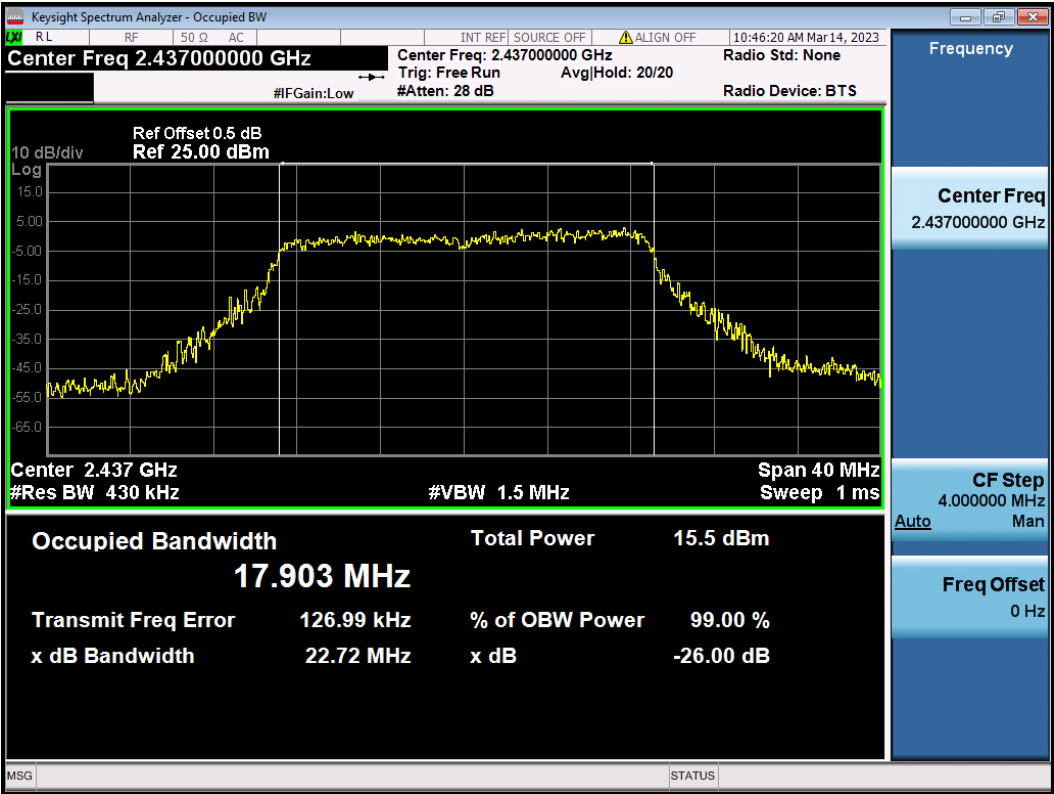


Figure 16: The plots of 99% Bandwidth, 802.11n(HT20), 2437MHz



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Figure 17: The plots of 6dB Bandwidth, 802.11n(HT20), 2462MHz

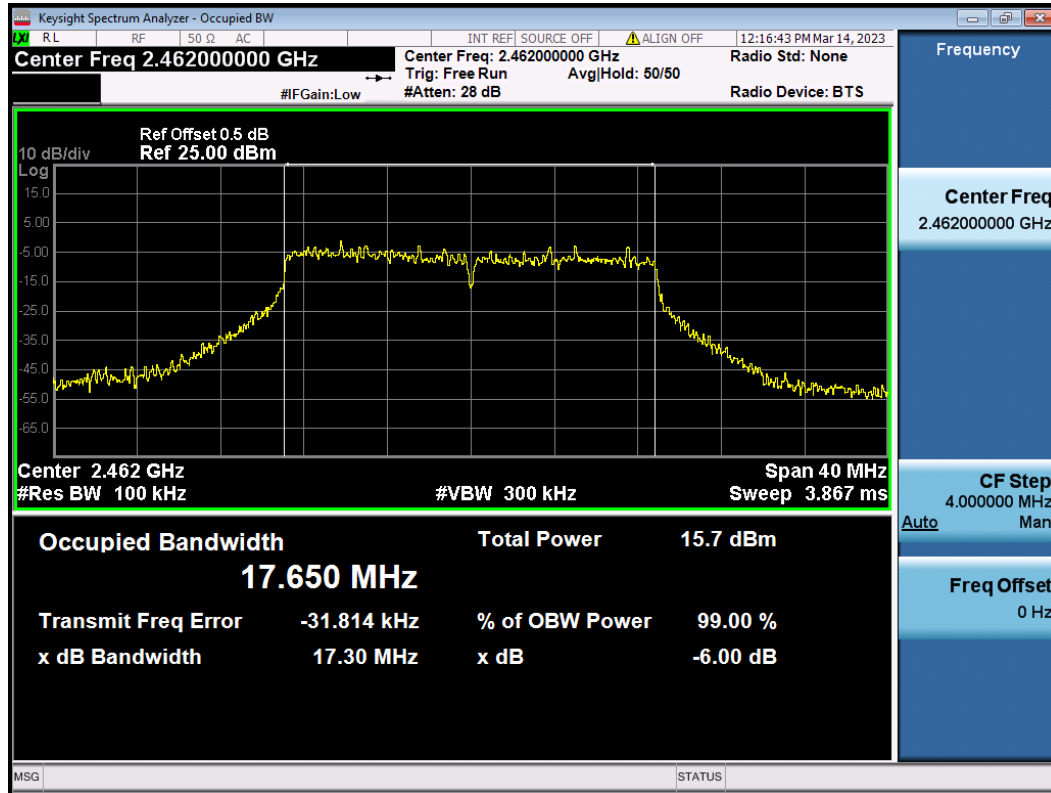
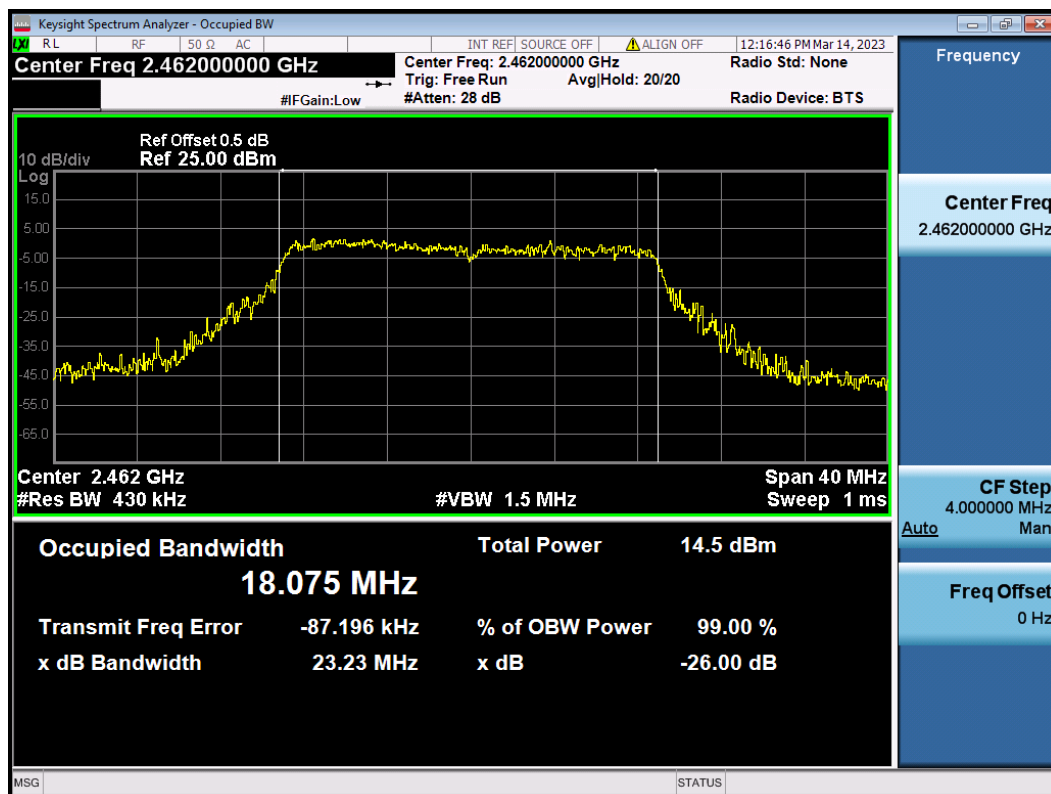


Figure 18: The plots of 99% Bandwidth, 802.11n(HT20), 2462MHz



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Figure 19: The plots of 6dB Bandwidth, 802.11n(HT40), 2422MHz

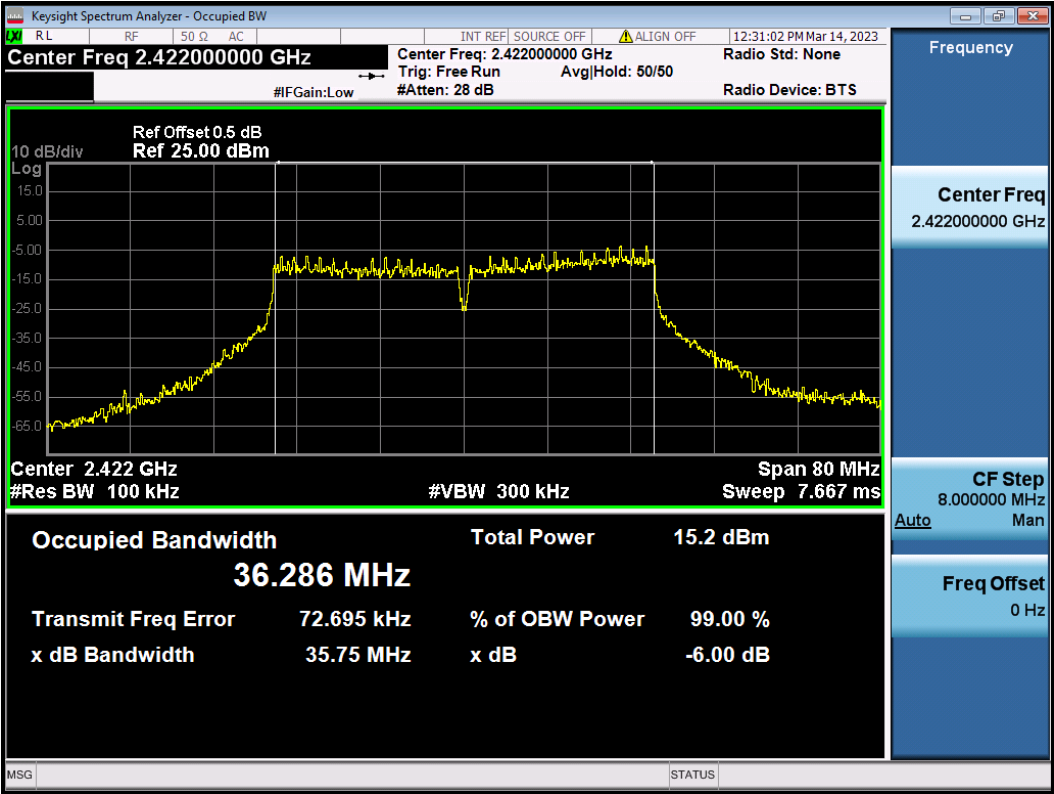
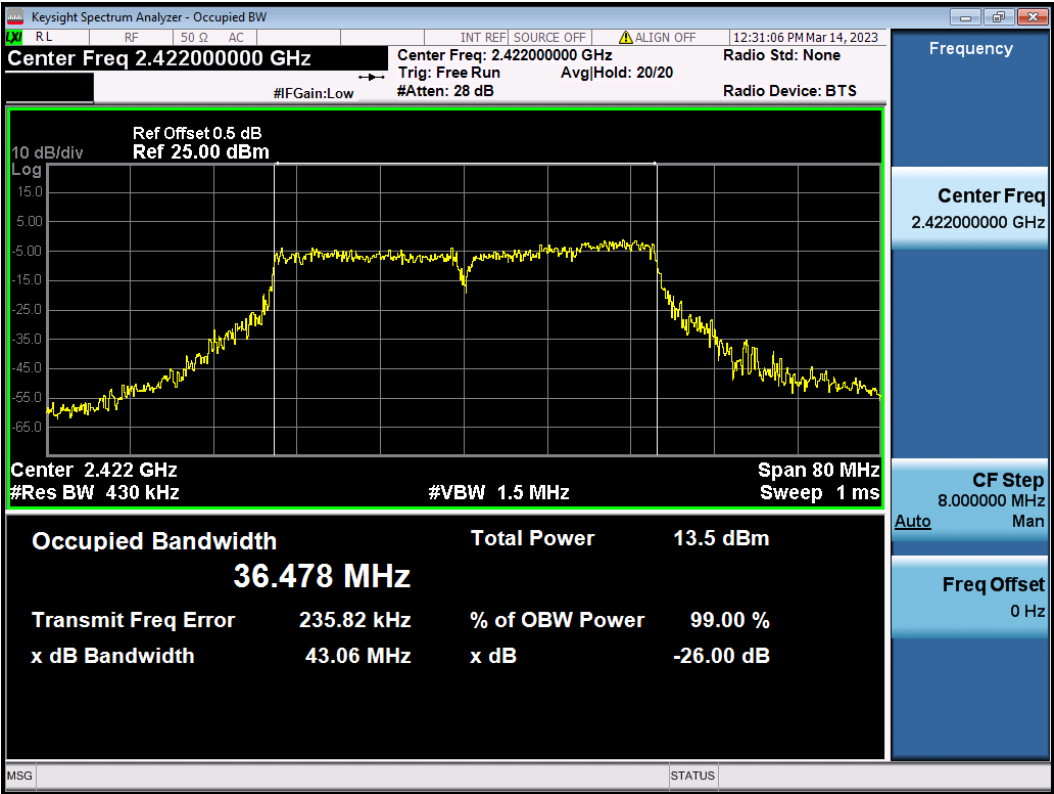


Figure 20: The plots of 99% Bandwidth, 802.11n(HT40), 2422MHz



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Figure 21: The plots of 6dB Bandwidth, 802.11n(HT40), 2437MHz

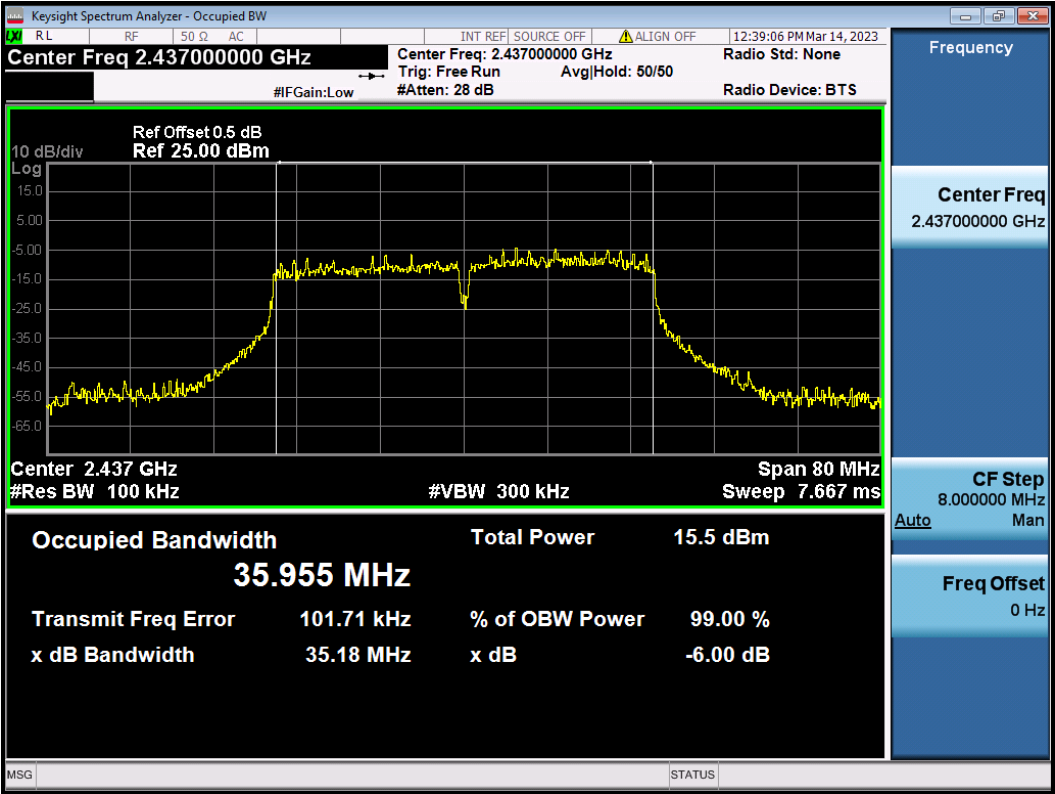
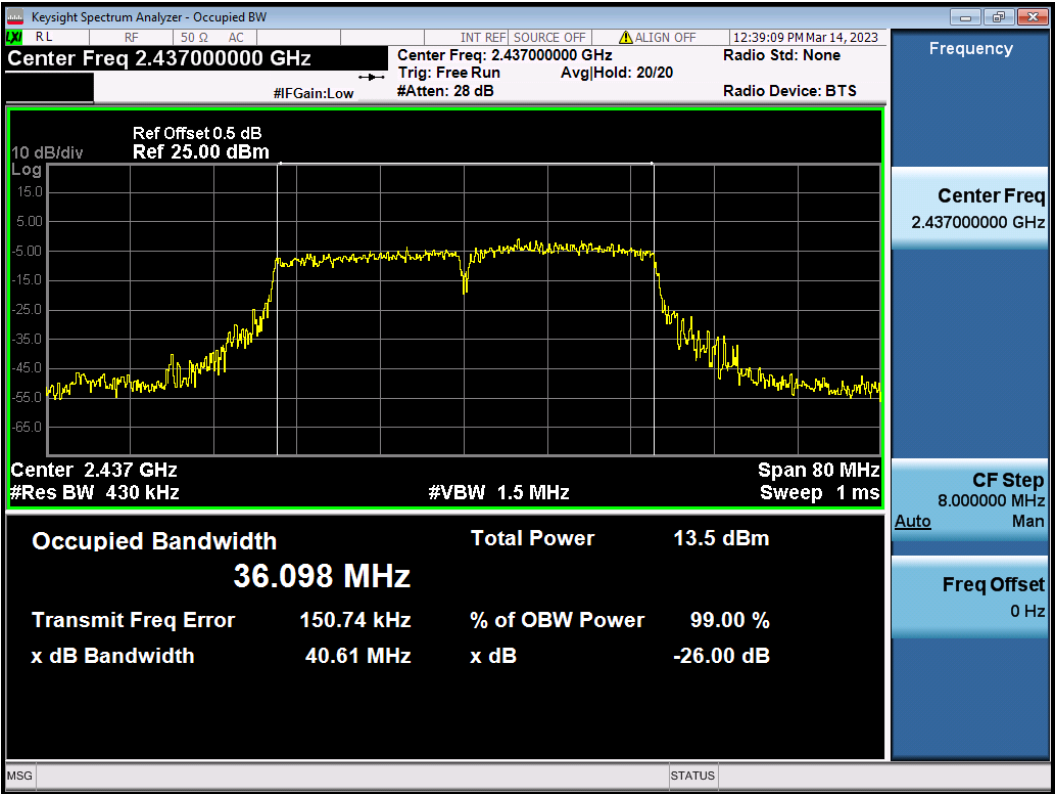


Figure 22: The plots of 99% Bandwidth, 802.11n(HT40), 2437MHz



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Figure 23: The plots of 6dB Bandwidth, 802.11n(HT40), 2452MHz

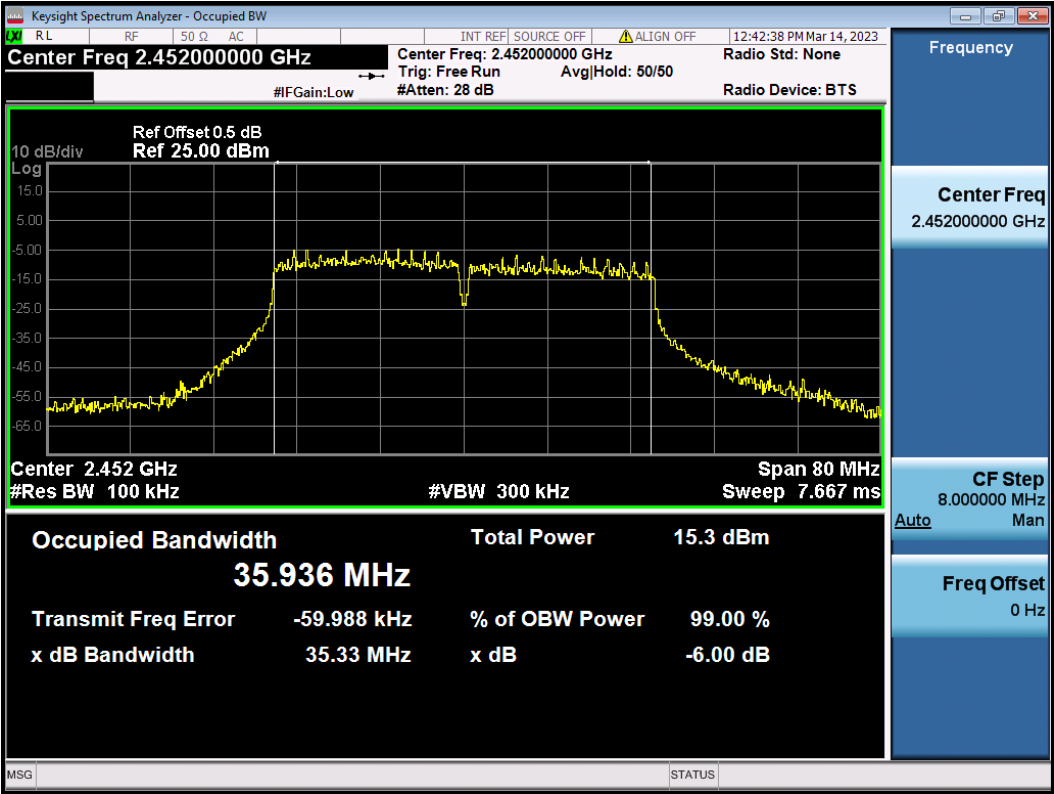
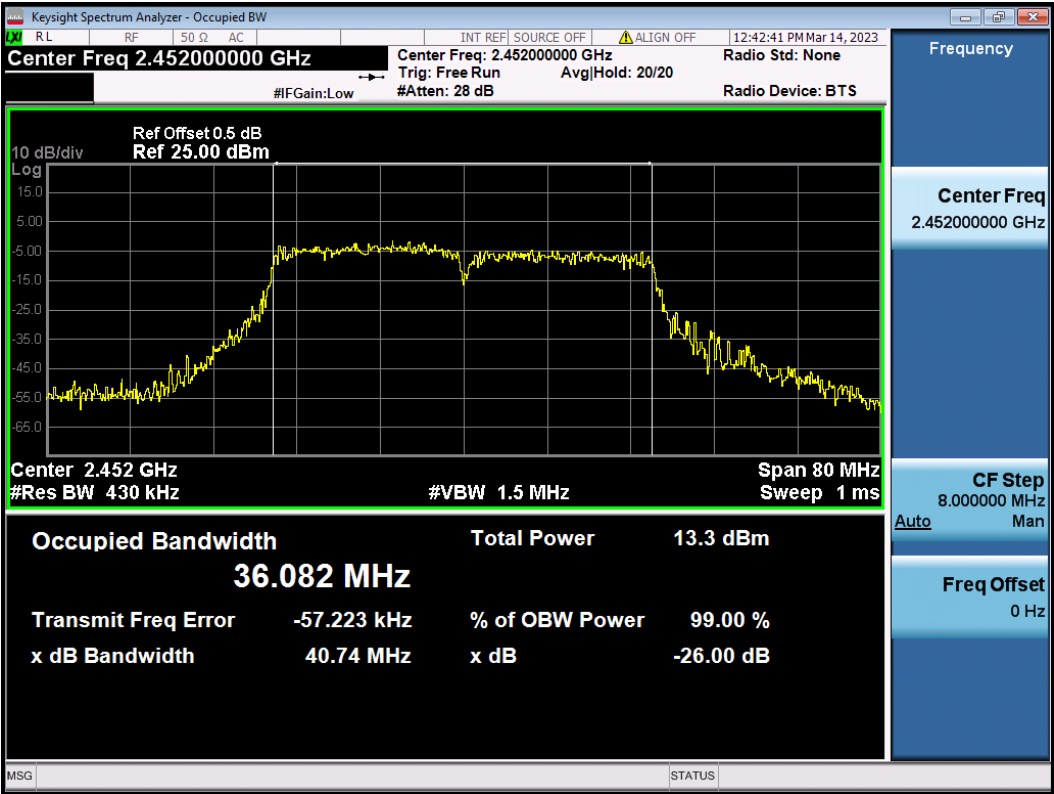


Figure 24: The plots of 99% Bandwidth, 802.11n(HT40), 2452MHz



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4.1.4 Maximum conducted output power spectral density

RESULT:

PASS

Test standard : FCC Part 15.247(e), RSS-247 5.2(b)

Requirement : ANSI C63.10-2013 clause 11.10.2,
KDB 558074 clause 8.4

Kind of test site : Shielded room

Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 24.7°C

Relative humidity : 60%

Table 4: Power Spectral Density

Test Mode	Test Channel (MHz)	Measured Result (dBm/3kHz)	Limit (dBm/3kHz)
802.11b	2412	-7.018	8
	2437	-6.003	
	2462	-7.796	
802.11g	2412	-13.010	
	2437	-12.523	
	2462	-13.929	
802.11n(HT20)	2412	-17.286	
	2437	-15.865	
	2462	-16.594	
802.11n(HT40)	2422	-18.459	
	2437	-20.013	
	2452	-20.230	

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Figure 25: The plots of Power Spectral Density, 802.11b, 2412MHz

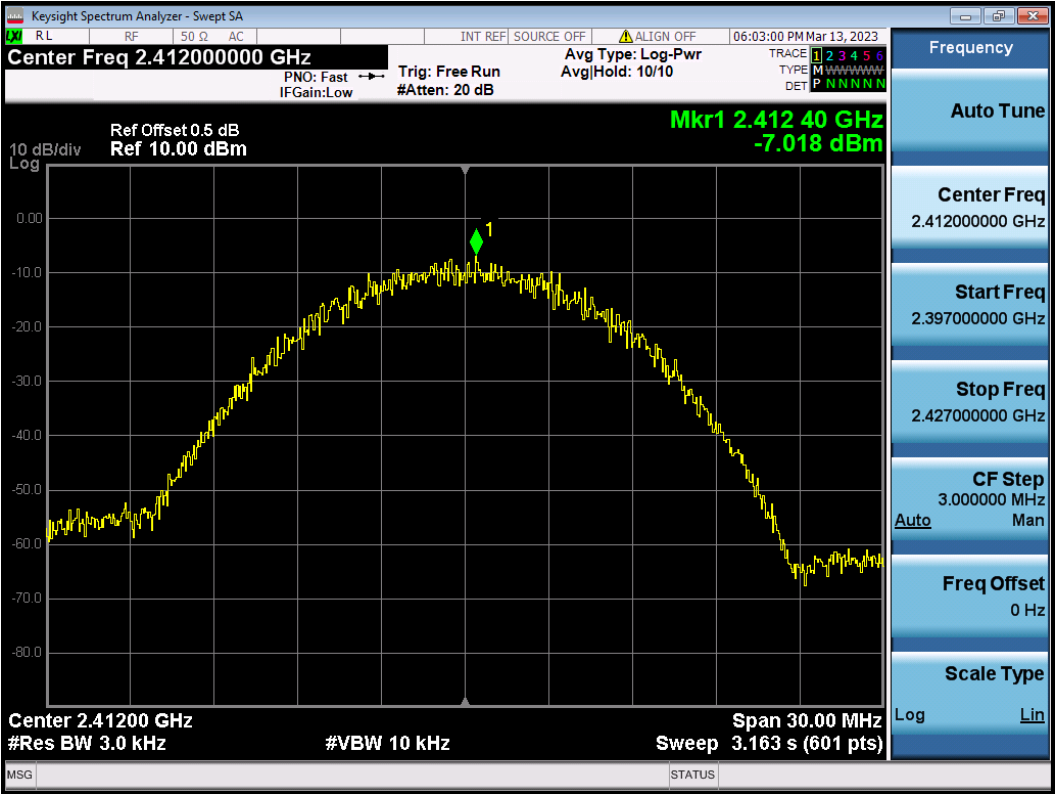
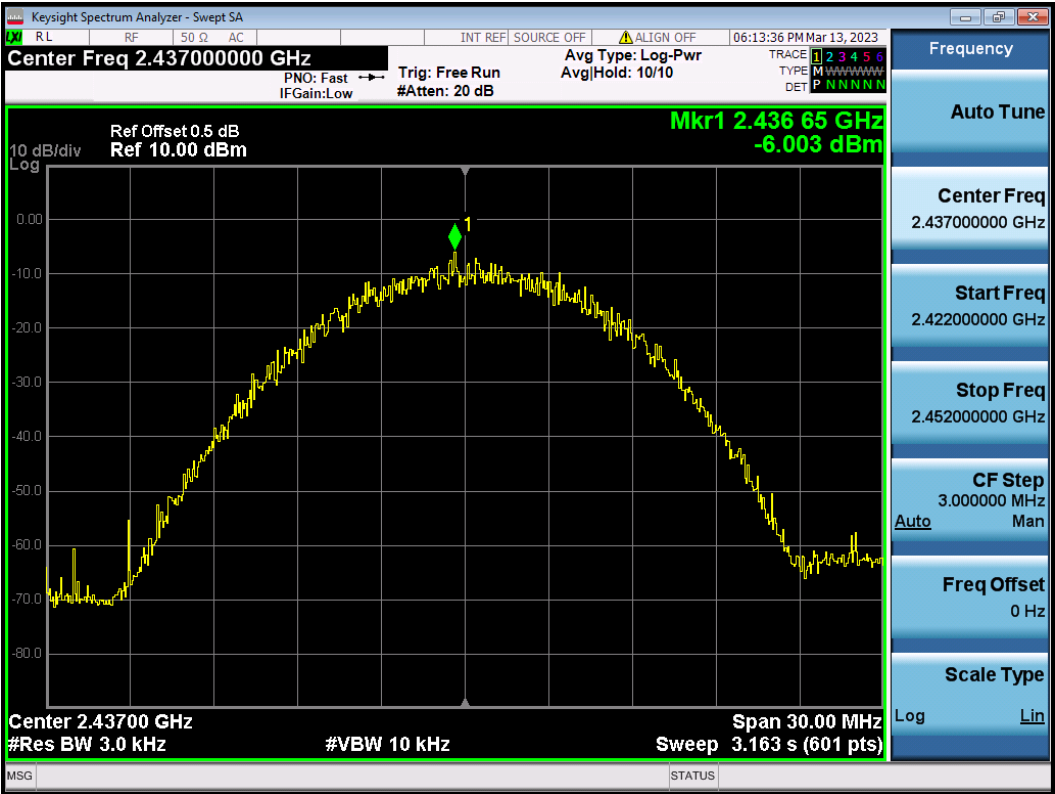


Figure 26: The plots of Power Spectral Density, 802.11b, 2437MHz



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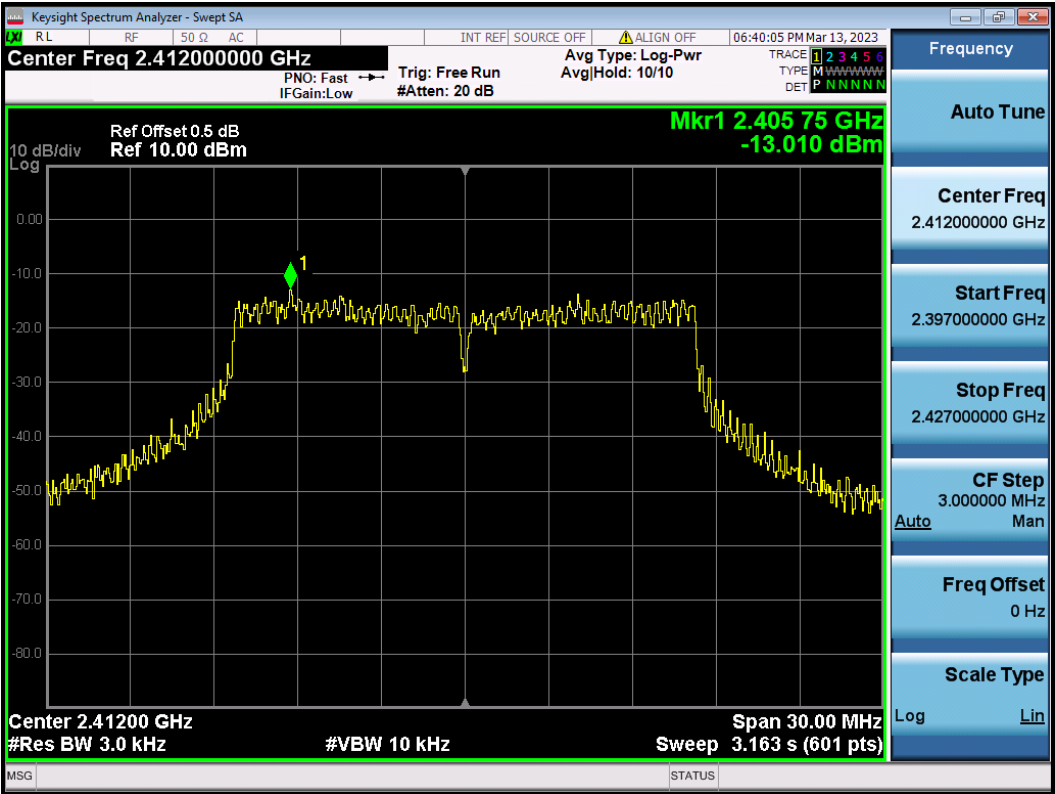
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Figure 27: The plots of Power Spectral Density, 802.11b, 2462MHz



Figure 28: The plots of Power Spectral Density, 802.11g, 2412MHz



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Figure 29: The plots of Power Spectral Density, 802.11g, 2437MHz

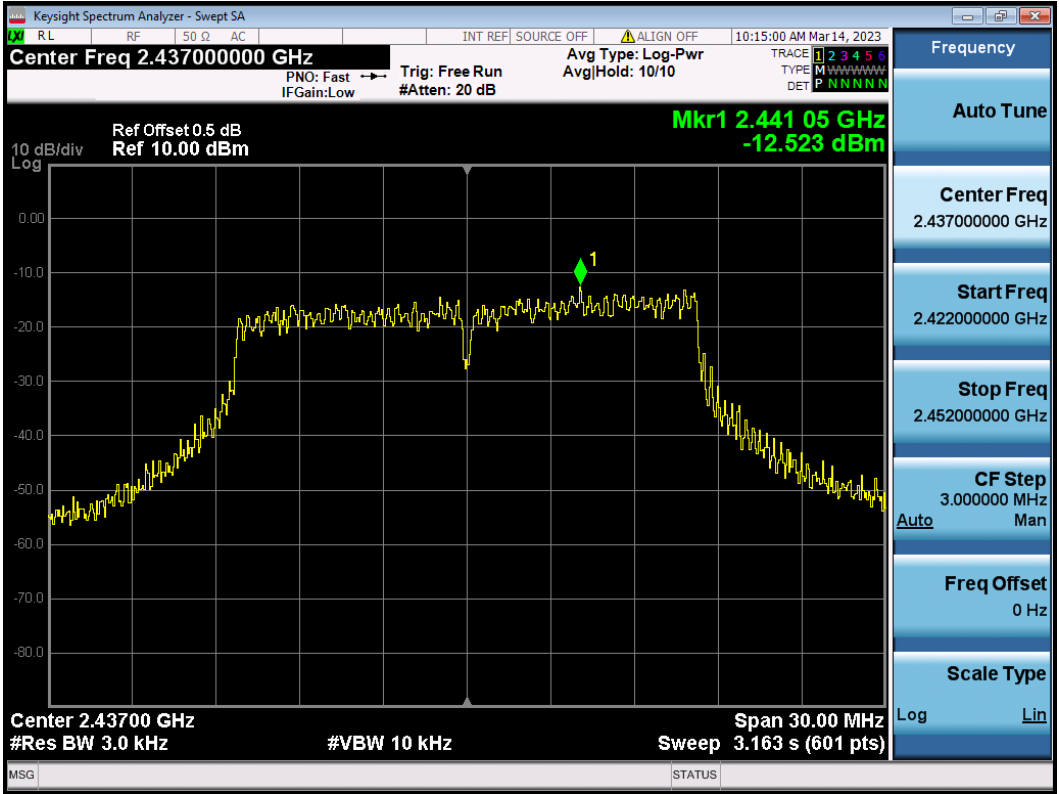
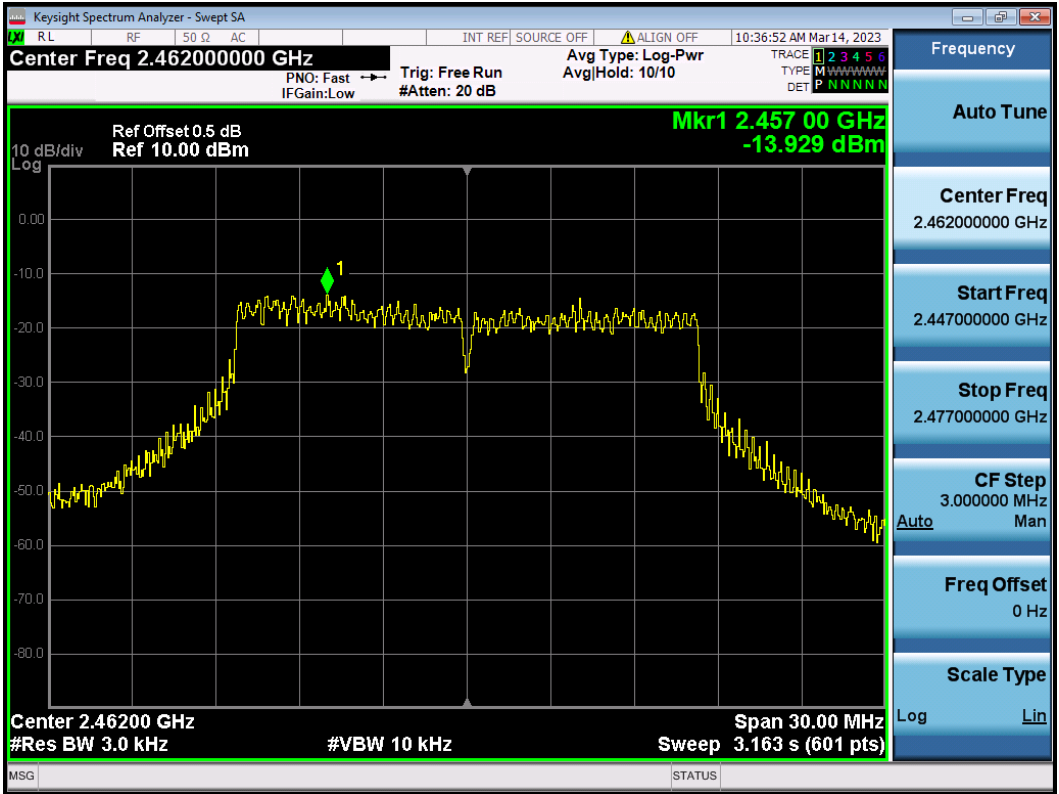


Figure 30: The plots of Power Spectral Density, 802.11g, 2462MHz



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Figure 31: The plots of Power Spectral Density, 802.11n(HT20), 2412MHz

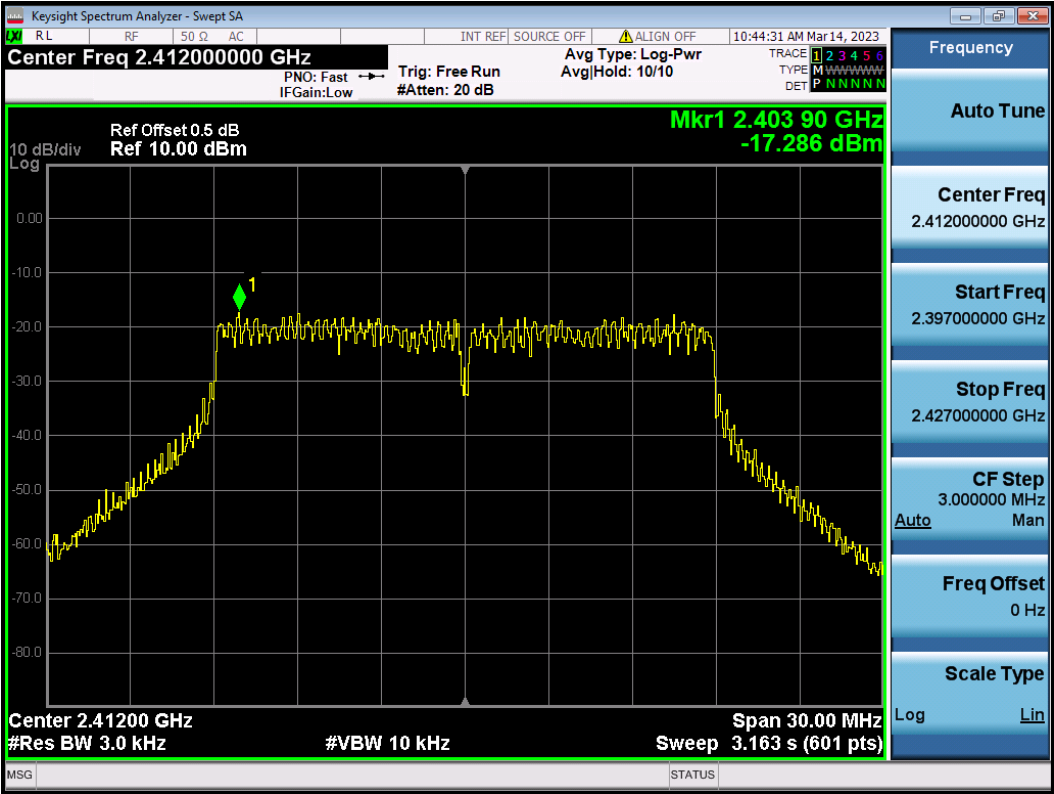
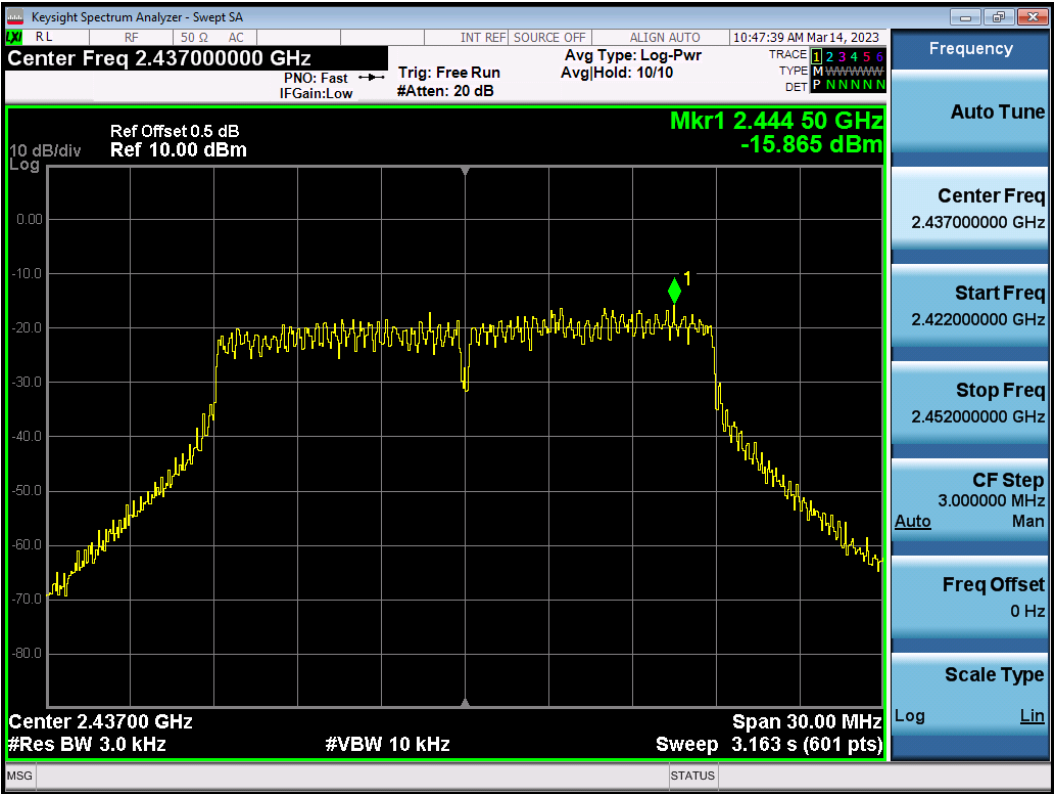


Figure 32: The plots of Power Spectral Density, 802.11n(HT20), 2437MHz



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Figure 33: The plots of Power Spectral Density, 802.11n(HT20), 2462MHz

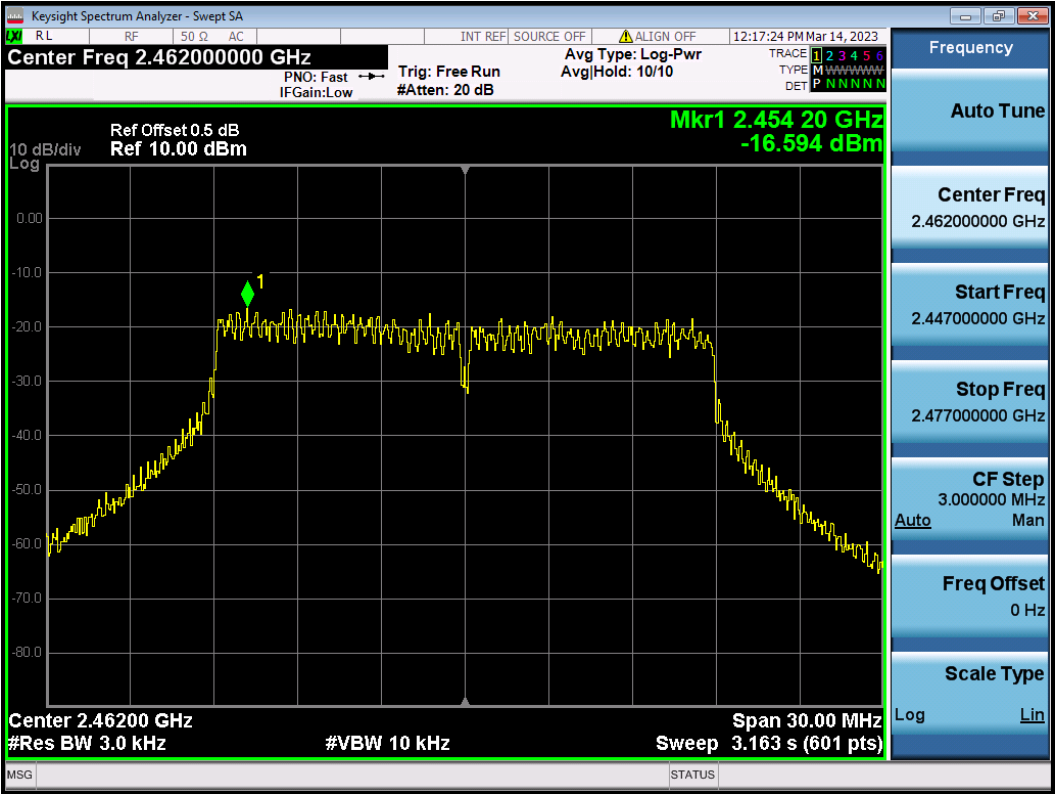
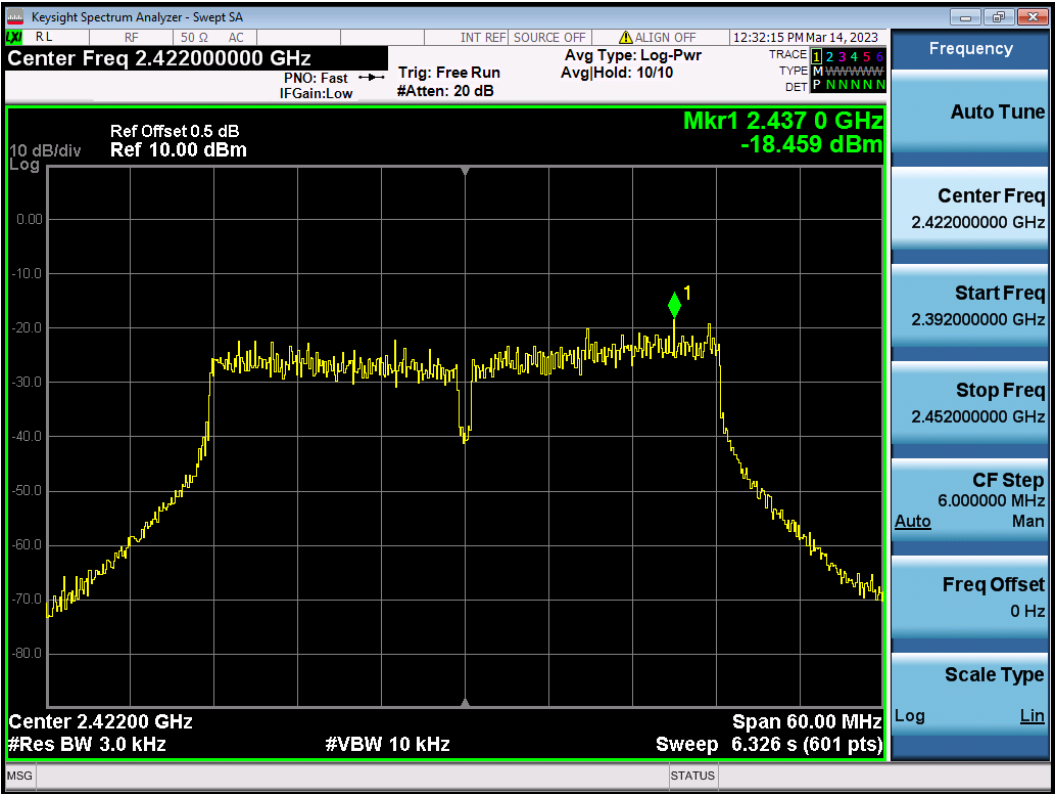


Figure 34: The plots of Power Spectral Density, 802.11n(HT40), 2422M



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Figure 35: The plots of Power Spectral Density, 802.11n(HT40), 2437MHz

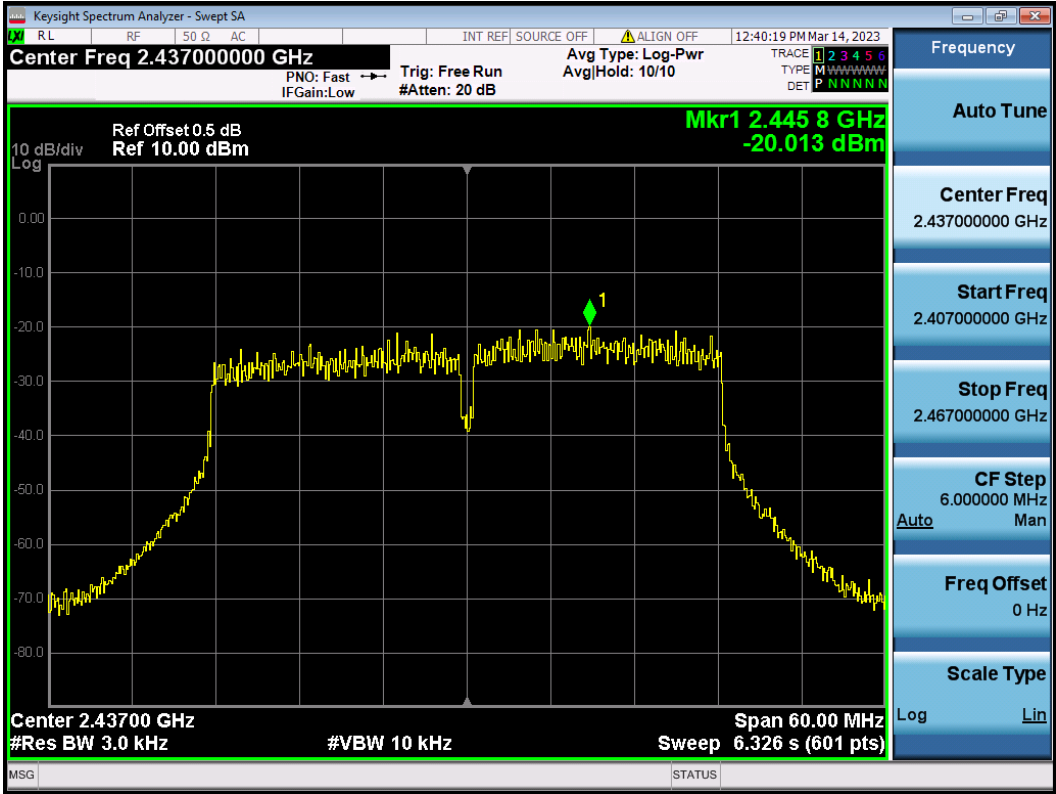
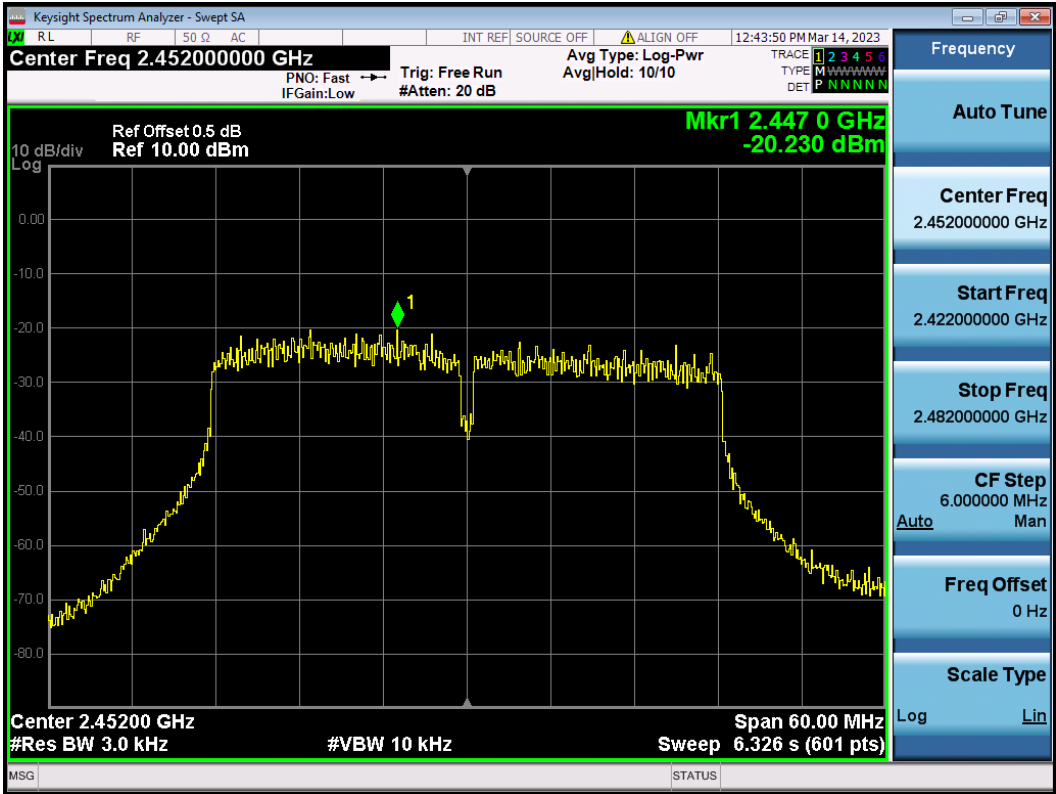


Figure 36: The plots of Power Spectral Density, 802.11n(HT40), 2452MHz



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4.1.5 Conducted Spurious Emission & Authorized-band band-edge

RESULT:

PASS

Test standard	: FCC Part 15.247(d), RSS-247 5.5
Requirement	: ANSI C63.10-2013 clause 11.11, KDB 558074 clause 8.5
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	: 24.7°C
Relative humidity	: 60%

For details refer to following test plot.

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Figure 37: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2412MHz Carrier Level

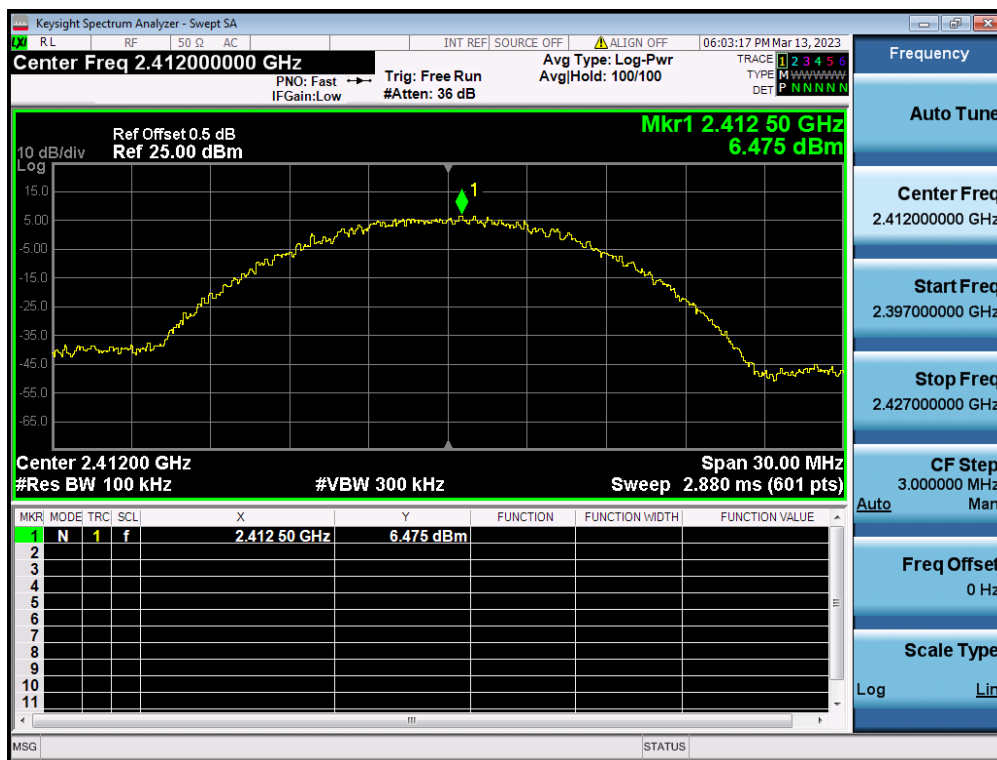
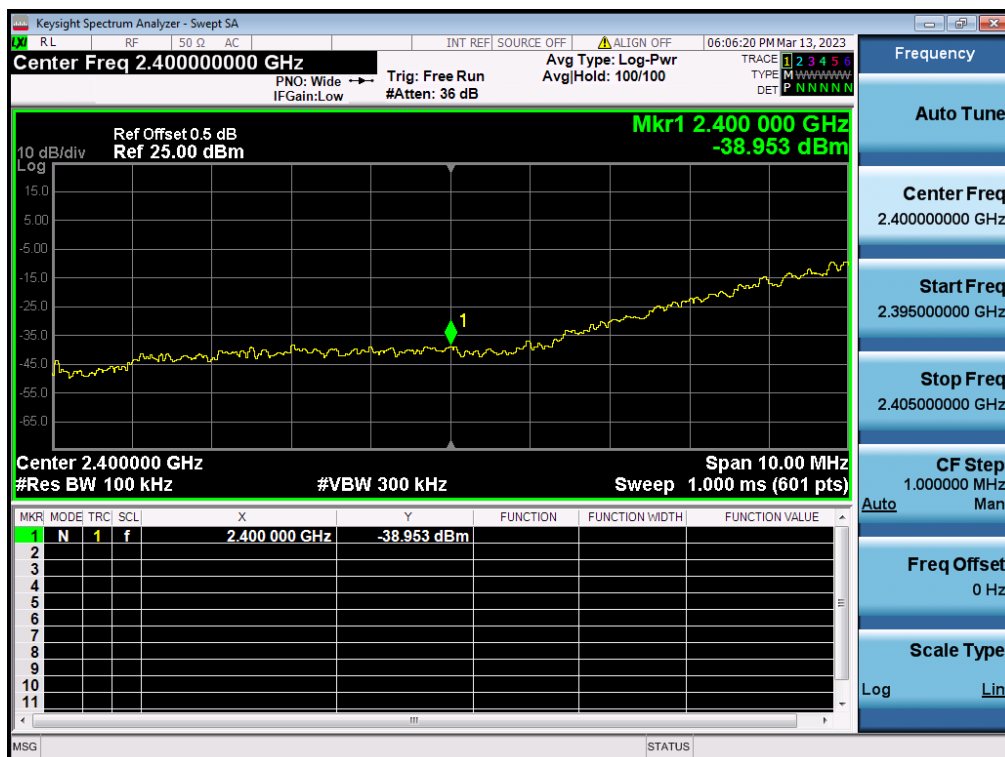


Figure 38: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2412MHz Band Edge



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Figure 39: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2412MHz
Conducted spurious emissions 30MHz-3GHz

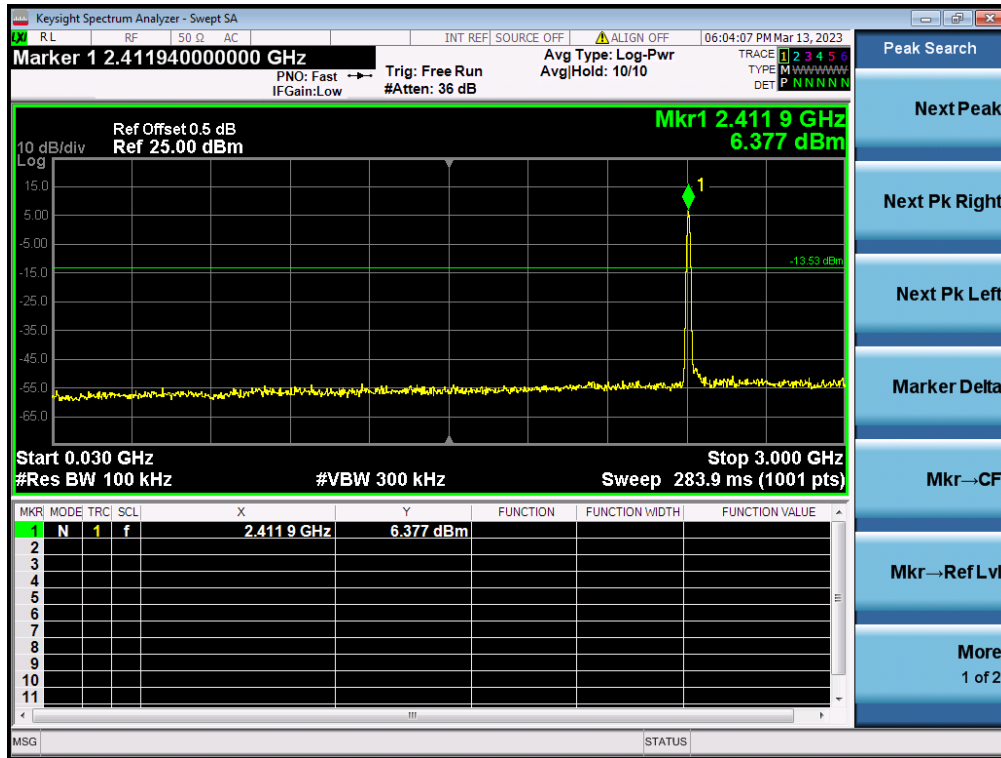
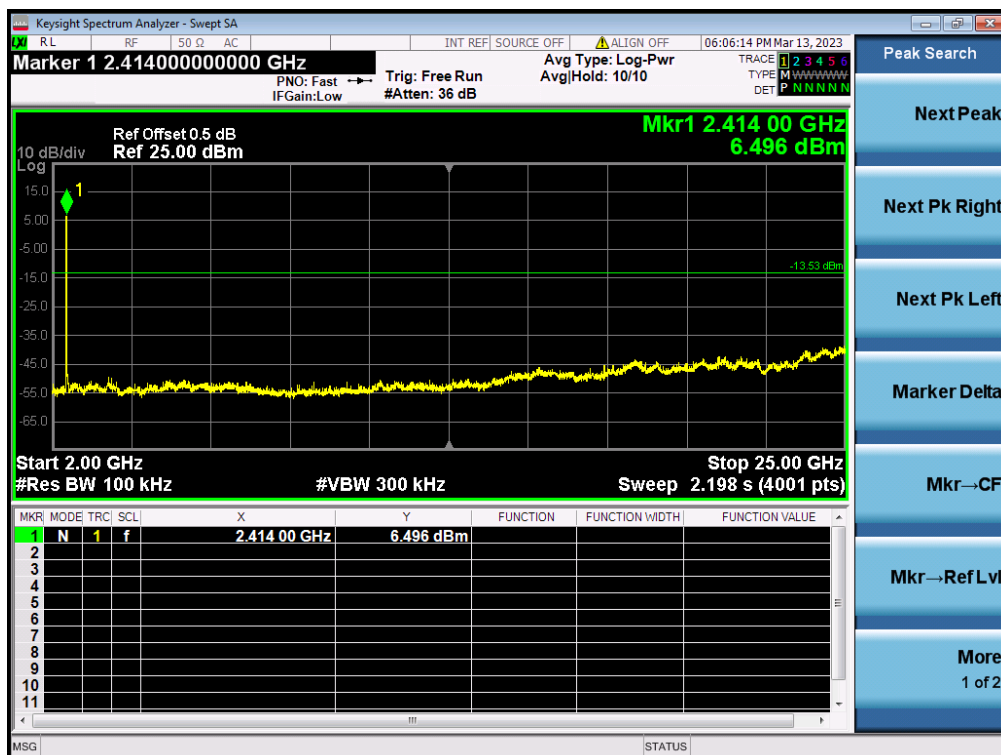


Figure 40: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2412MHz
Conducted spurious emissions 2GHz-25GHz



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Figure 41: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2437MHz Carrier Level

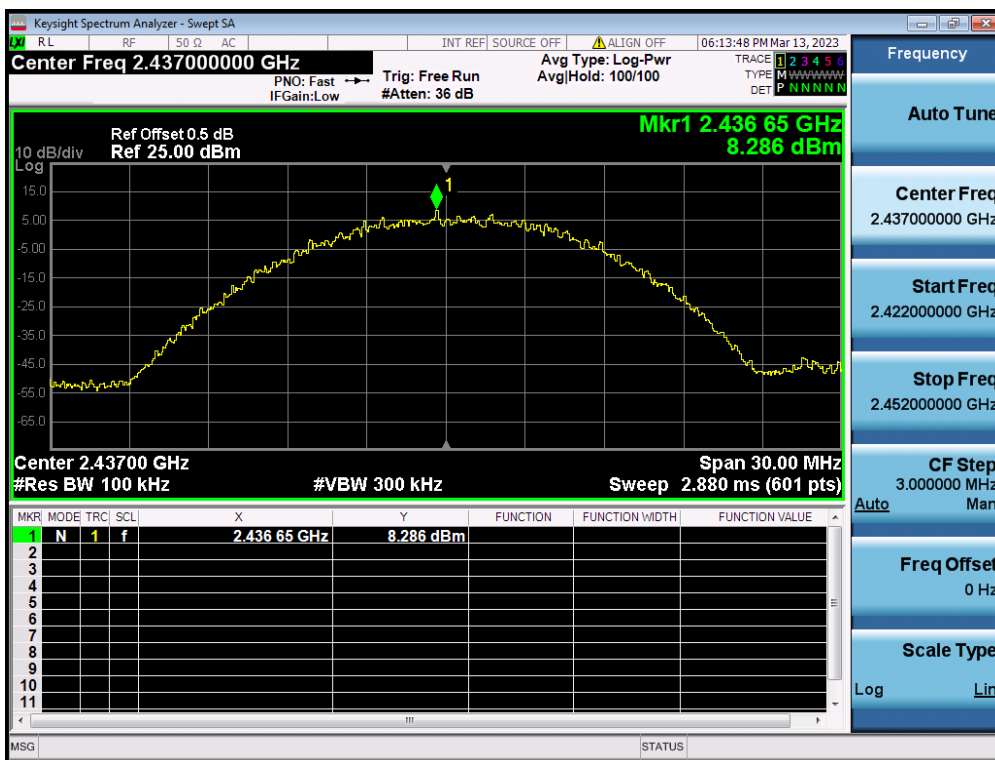
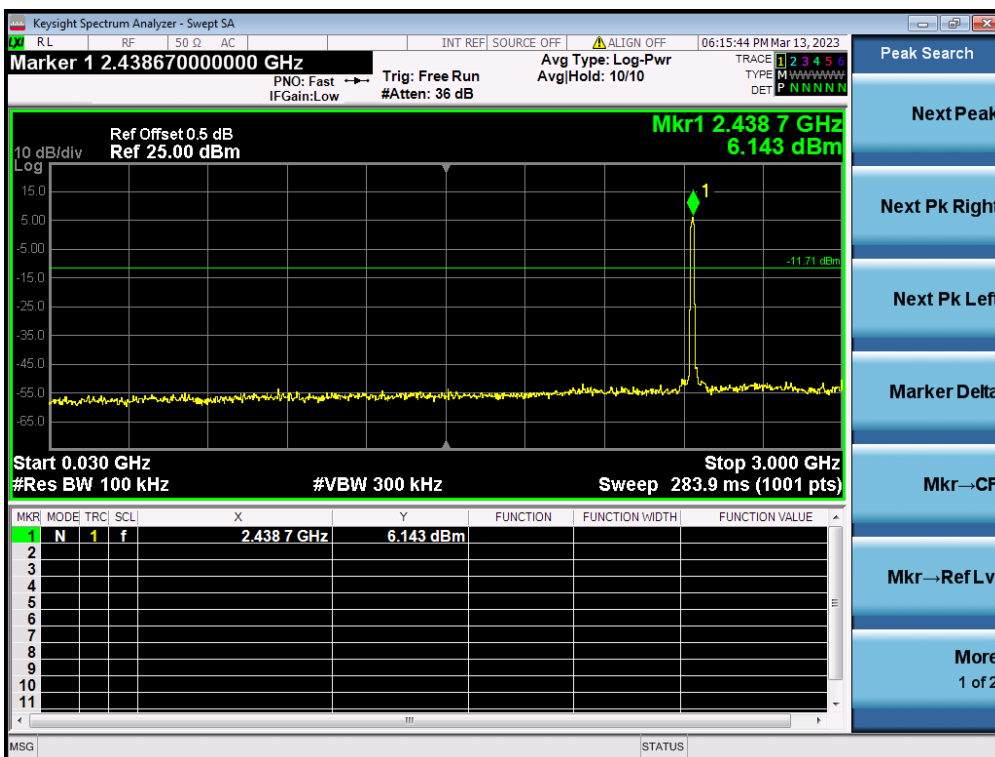


Figure 42: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2437MHz
Conducted spurious emissions 30MHz-3GHz



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Figure 43: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2437MHz
Conducted spurious emissions 2GHz-25GHz

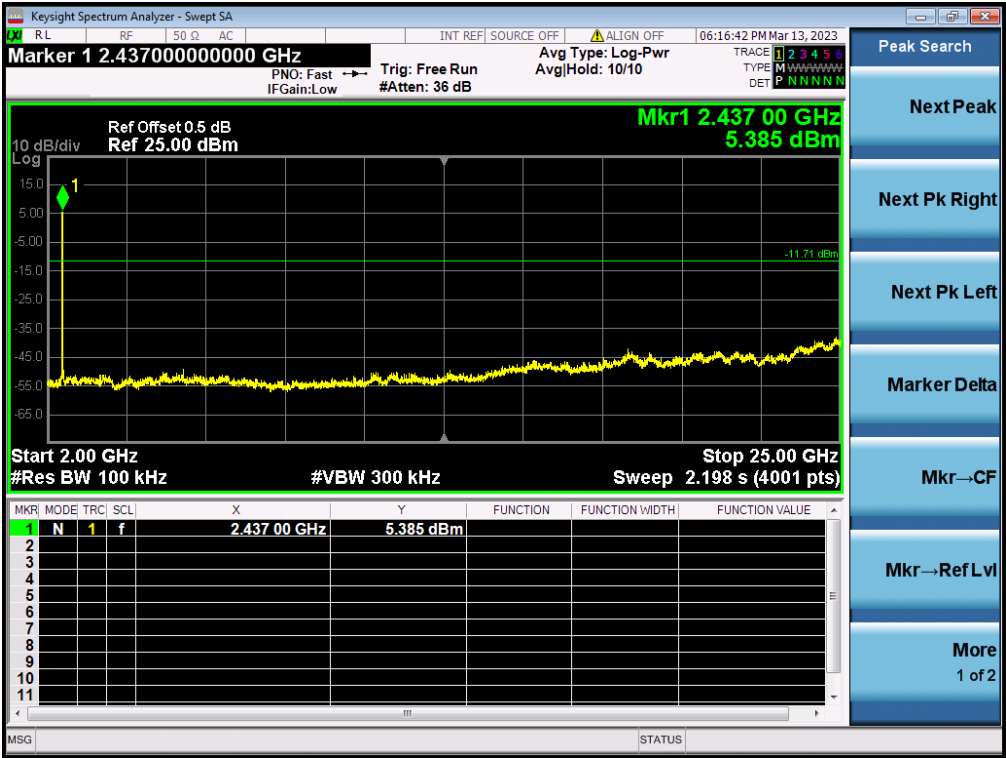
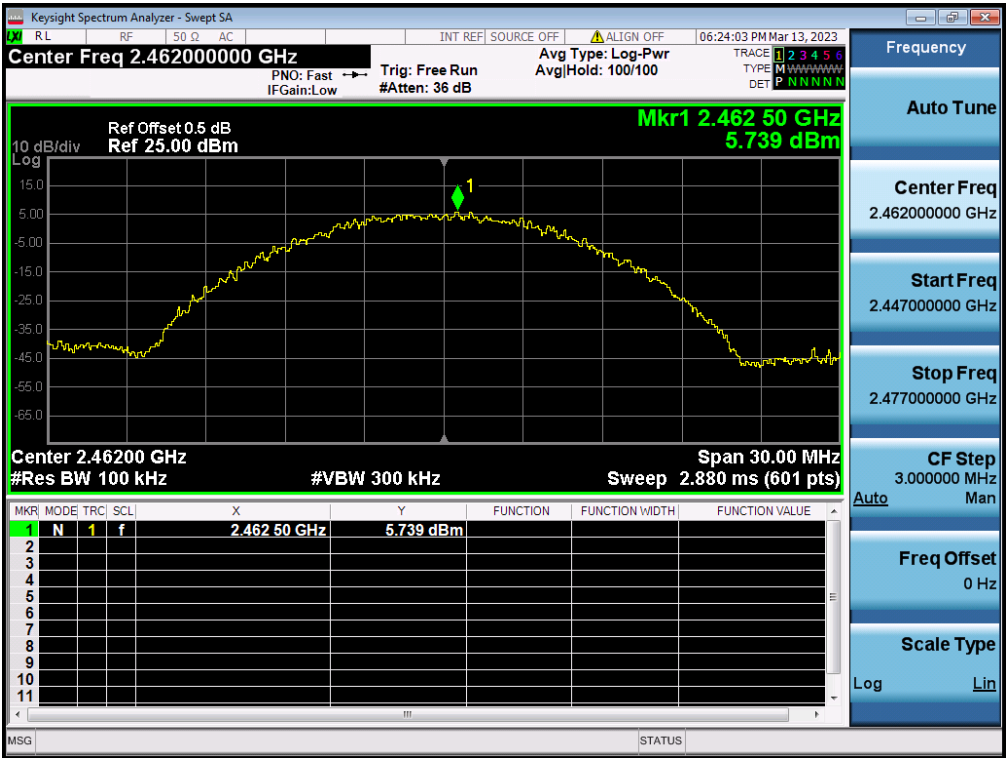


Figure 44: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2462MHz
Carrier Level



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Figure 45: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2462MHz Band Edge

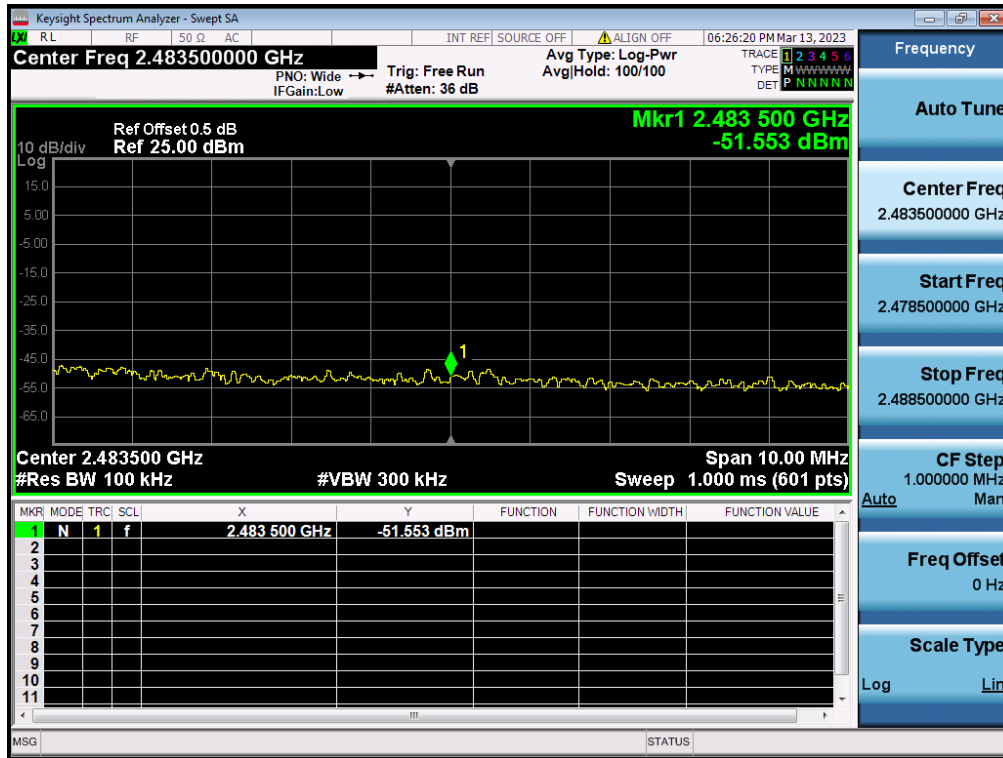
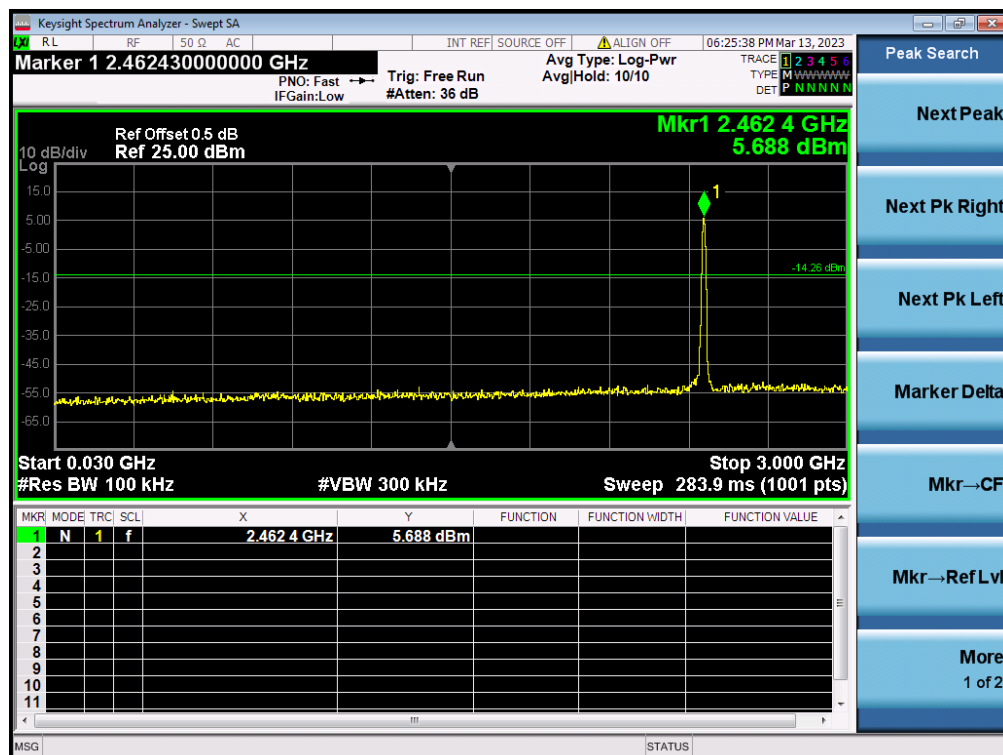


Figure 46: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2462MHz
Conducted spurious emissions 30MHz-3GHz



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Figure 47: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11b, 2462MHz
Conducted spurious emissions 2GHz-25GHz

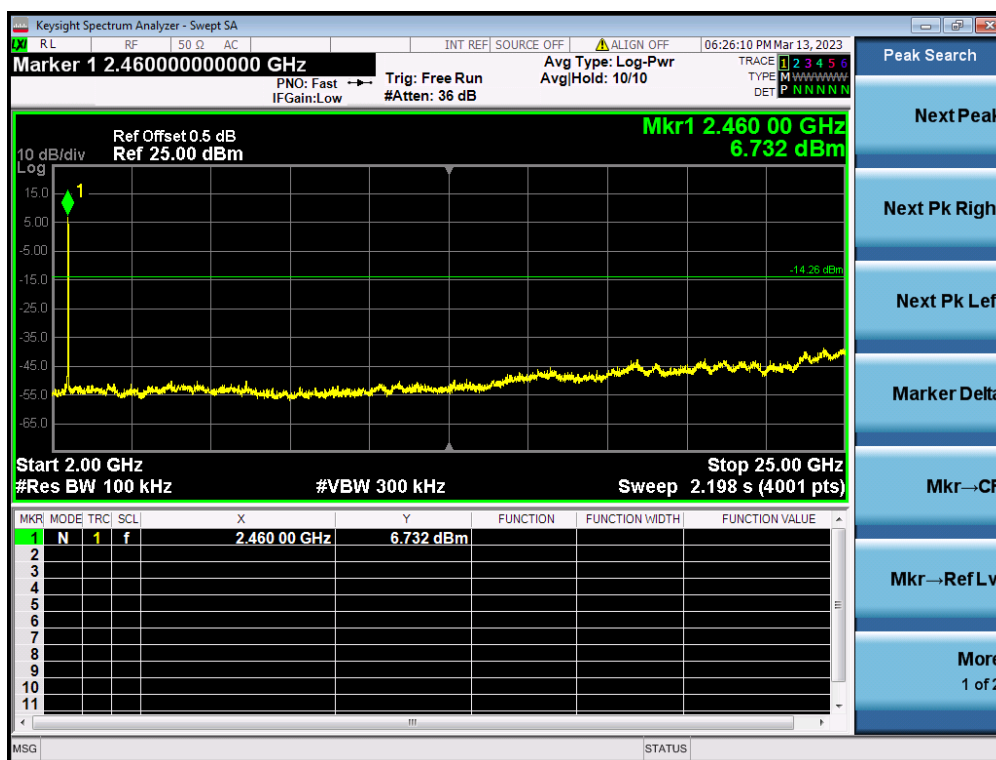
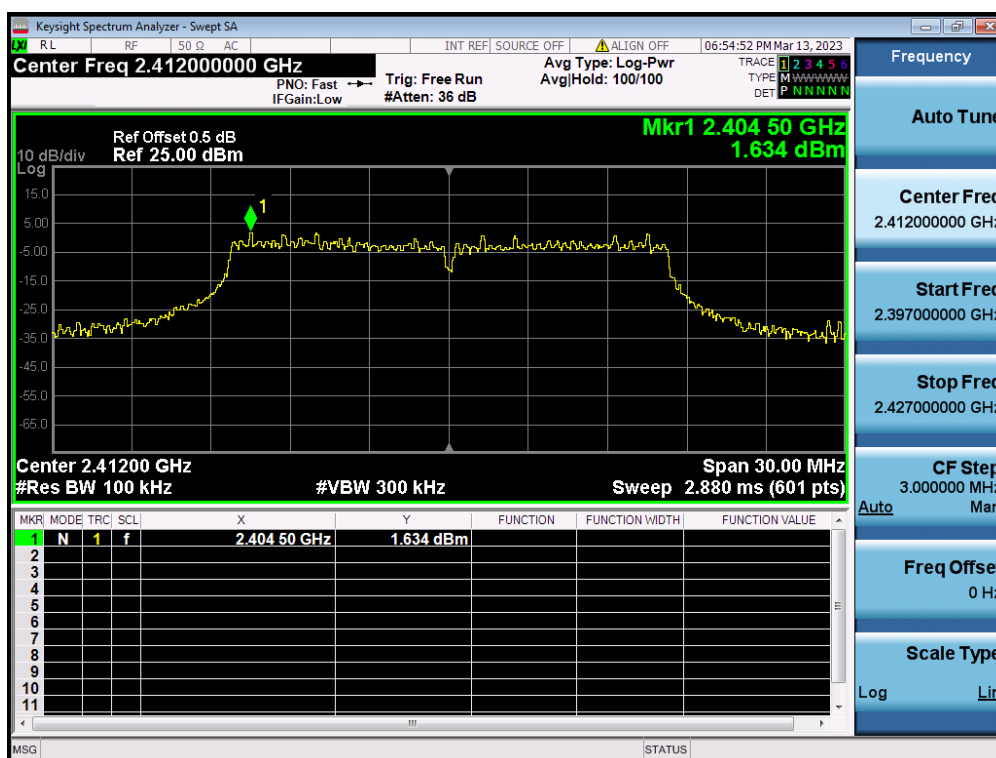


Figure 48: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2412MHz Carrier Level



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Figure 49: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2412MHz Band Edge

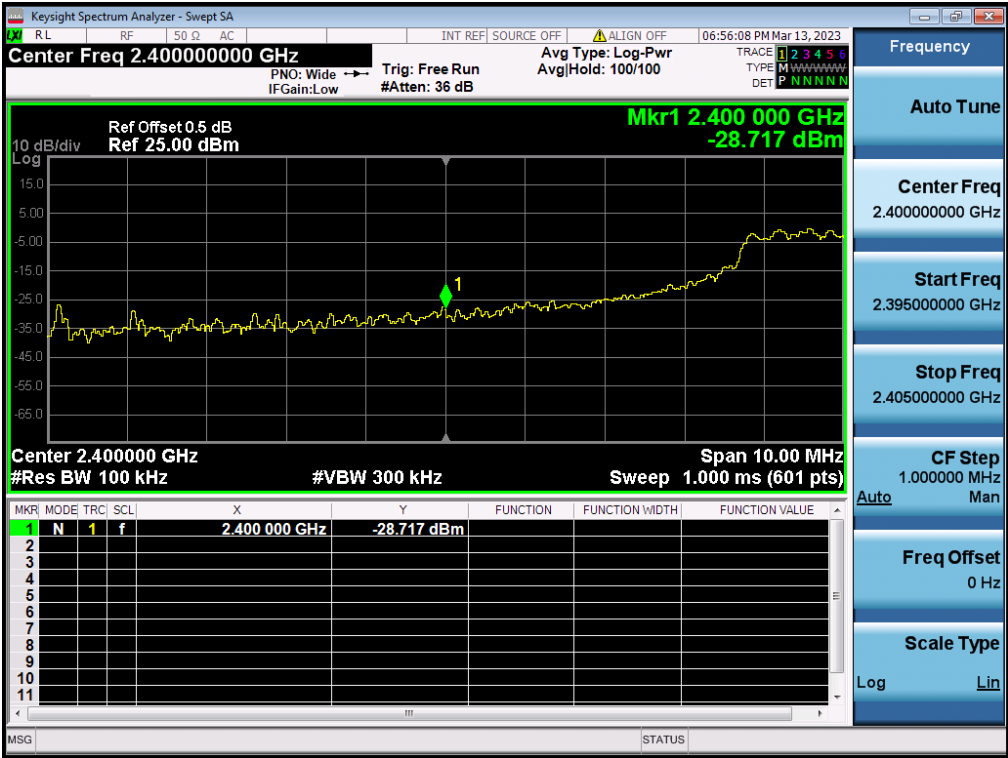
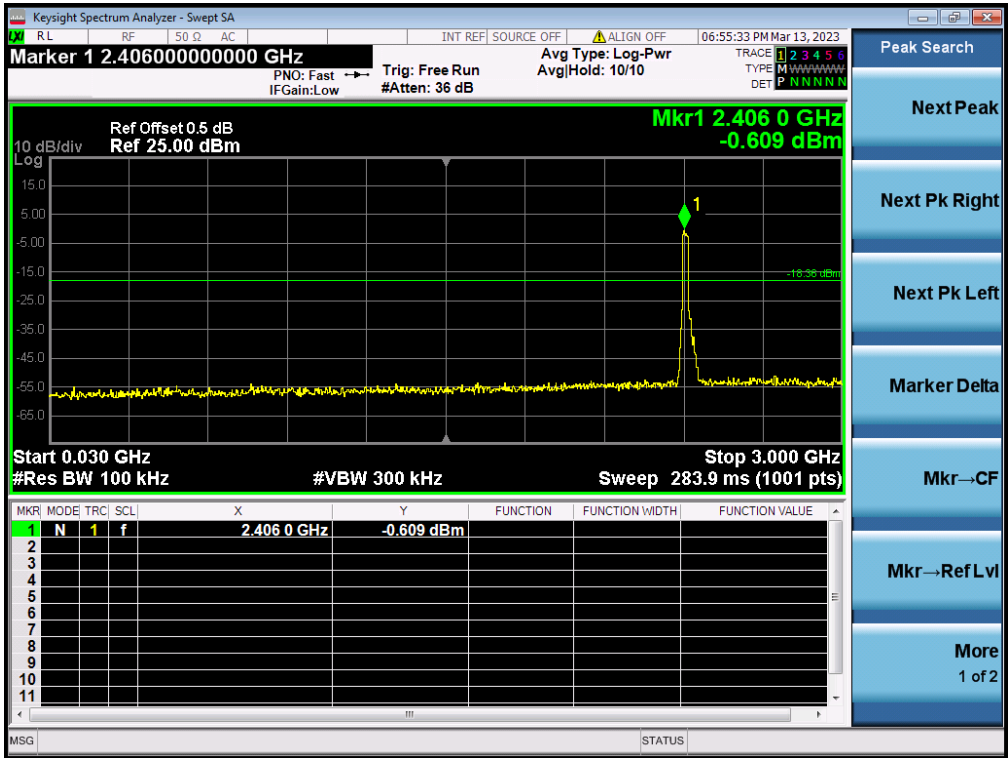


Figure 50: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2412MHz Conducted spurious emissions 30MHz-3GHz



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Figure 51: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2412MHz
Conducted spurious emissions 2GHz-25GHz

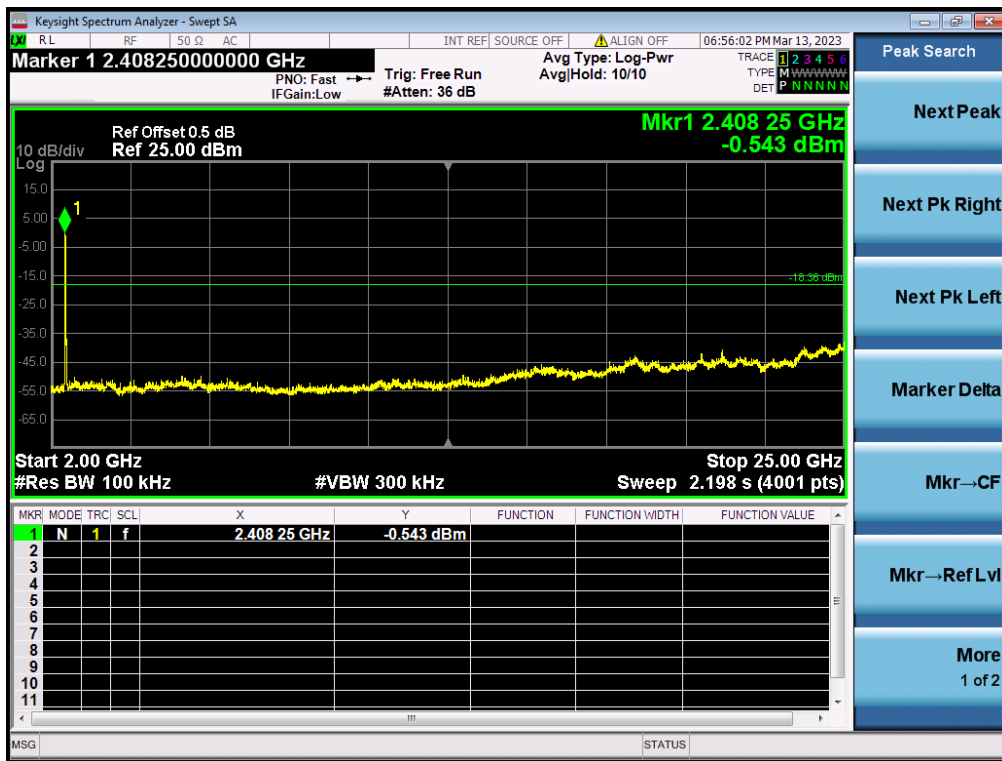
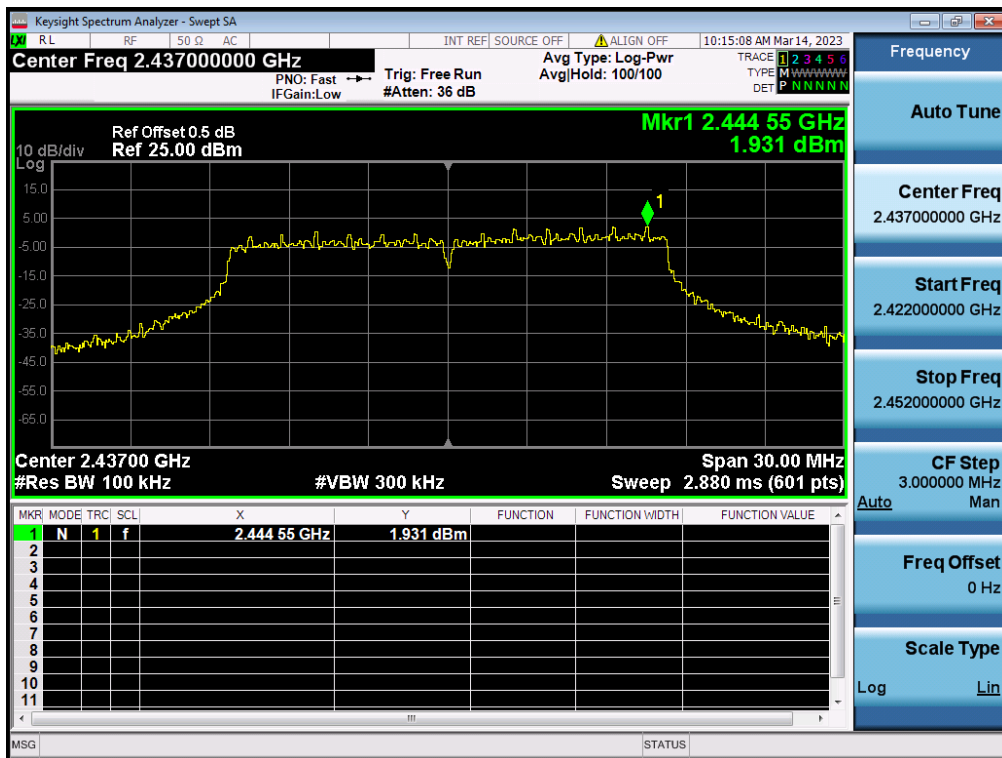


Figure 52: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2437MHz Carrier Level



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Figure 53: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2437MHz
Conducted spurious emissions 30MHz-3GHz

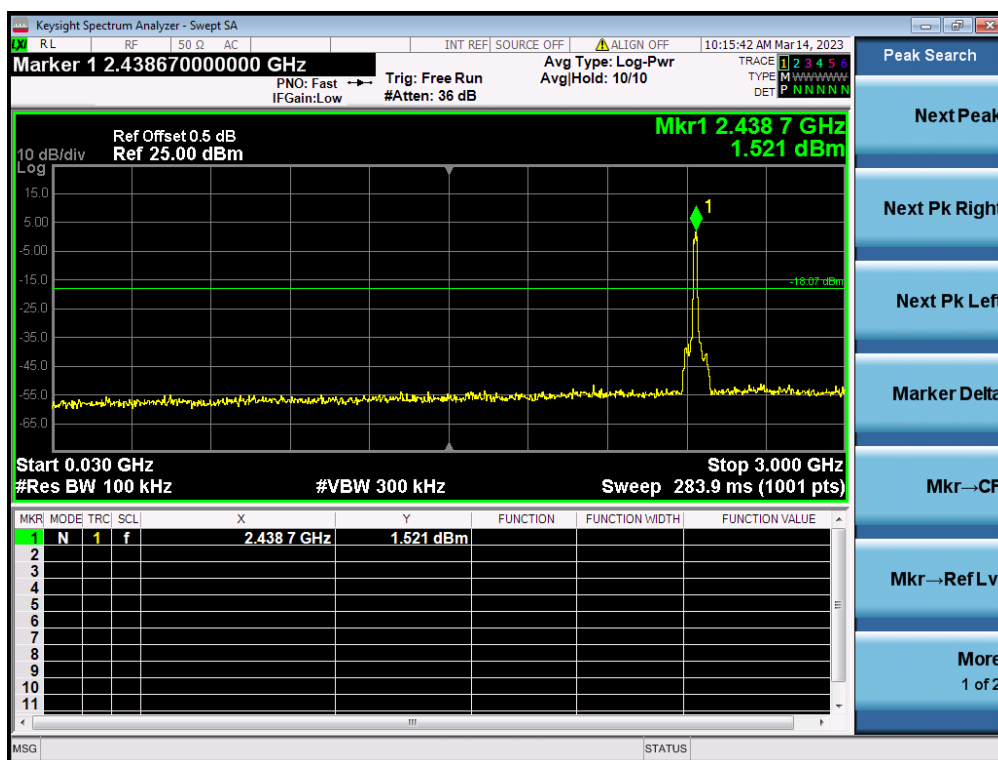
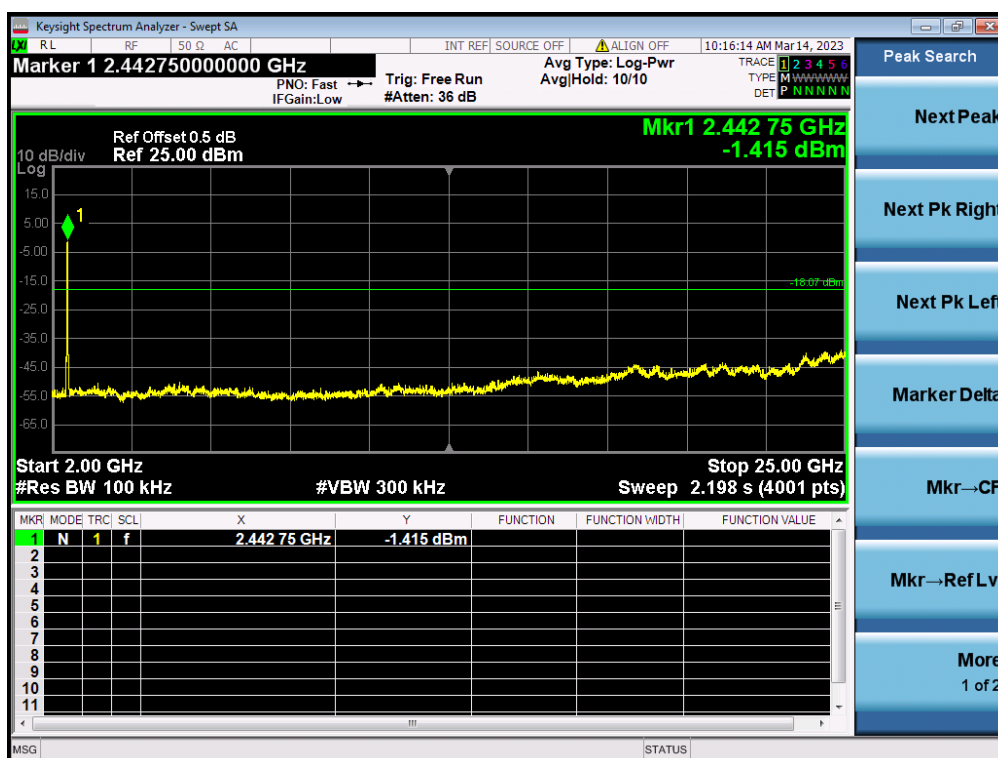


Figure 54: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2437MHz
Conducted spurious emissions 2GHz-25GHz



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Keysight Spectrum Analyzer - Swept SA

RL RF 50 Ω AC INT REF SOURCE OFF ALIGN OFF 10:36:59 AM Mar 14, 2023

Center Freq 2.46200000 GHz PNO: Fast → Trg: Free Run Avg Type: Log-Pwr Avg/Hold: 100/100

IF Gain: Low #Atten: 36 dB TYPE: M N N N N N N N DET: P N N N N N N N

Ref Offset 0.5 dB Ref 25.00 dB Mkr1 2.455 80 GHz 2.201 dBm

10 dB/div Log

Center 2.46200 GHz Span 30.00 MHz
#Res BW 100 kHz #VBW 300 kHz Sweep 2.880 ms (601 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.455 80 GHz	2.201 dBm			
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

Frequency

Auto Tune

Center Freq
2.46200000 GHz

Start Freq
2.44700000 GHz

Stop Freq
2.47700000 GHz

CF Step
3.000000 MHz

Auto Man

Freq Offset
0 Hz

Scale Type
Lin

Log

Keysight Spectrum Analyzer - Swept SA

RL RF 50 Ω AC INT REF SOURCE OFF ALIGN OFF 10:38:23 AM Mar 14, 2023

Center Freq 2.48350000 GHz PNO: Wide IF Gain: Low Trig: Free Run Avg Type: Log-Pwr Avg Hold: 100/100

Ref Offset 0.5 dB Ref 25.00 dBm Mkr1 2.483 500 GHz -43.247 dBm

10 dB/div Log

Center 2.483500 GHz Span 10.00 MHz
#Res BW 100 kHz #VBW 300 kHz Sweep 1.000 ms (601 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.483 500 GHz	-43.247 dBm			
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

Frequency

Auto Tune

Center Freq
2.48350000 GHz

Start Freq
2.47850000 GHz

Stop Freq
2.48850000 GHz

CF Step
1.000000 MHz

Auto

Freq Offset
0 Hz

Scale Type
Log Lin

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Figure 57: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2462MHz
Conducted spurious emissions 30MHz-3GHz

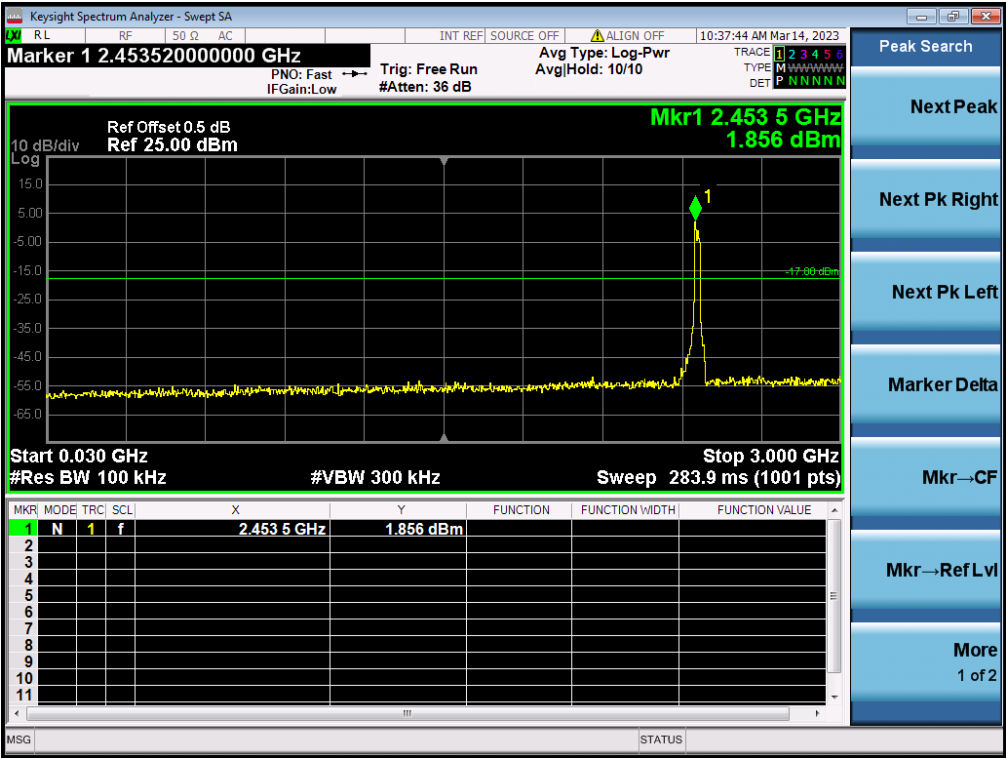
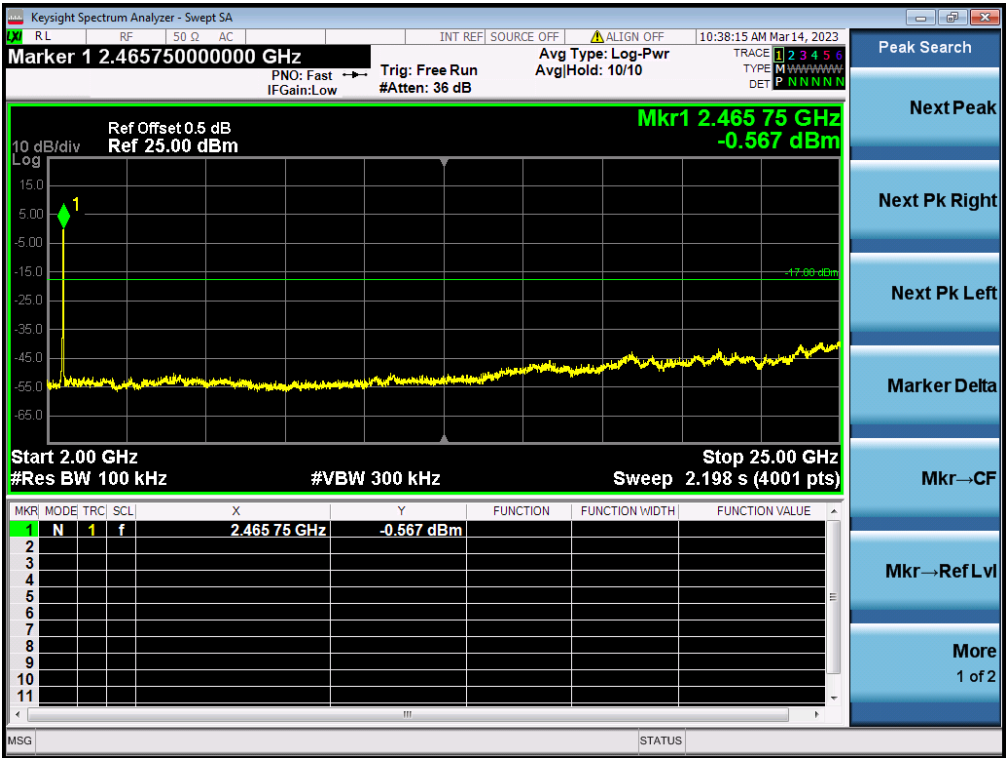


Figure 58: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11g, 2462MHz
Conducted spurious emissions 2GHz-25GHz



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Figure 59: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2412MHz Carrier Level

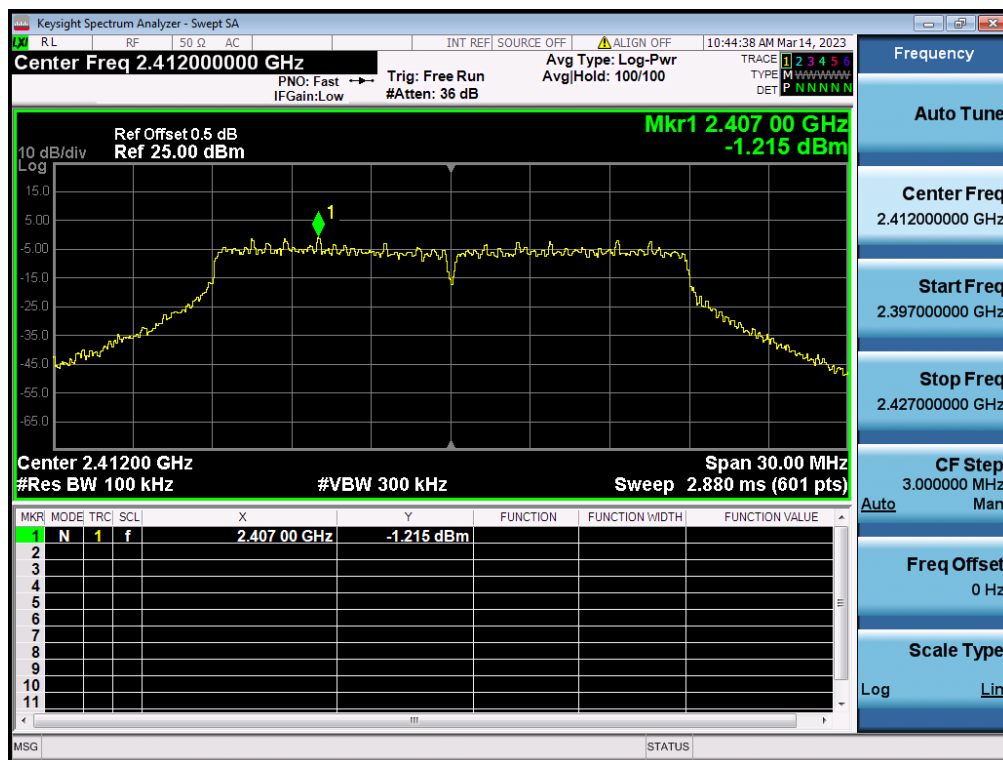
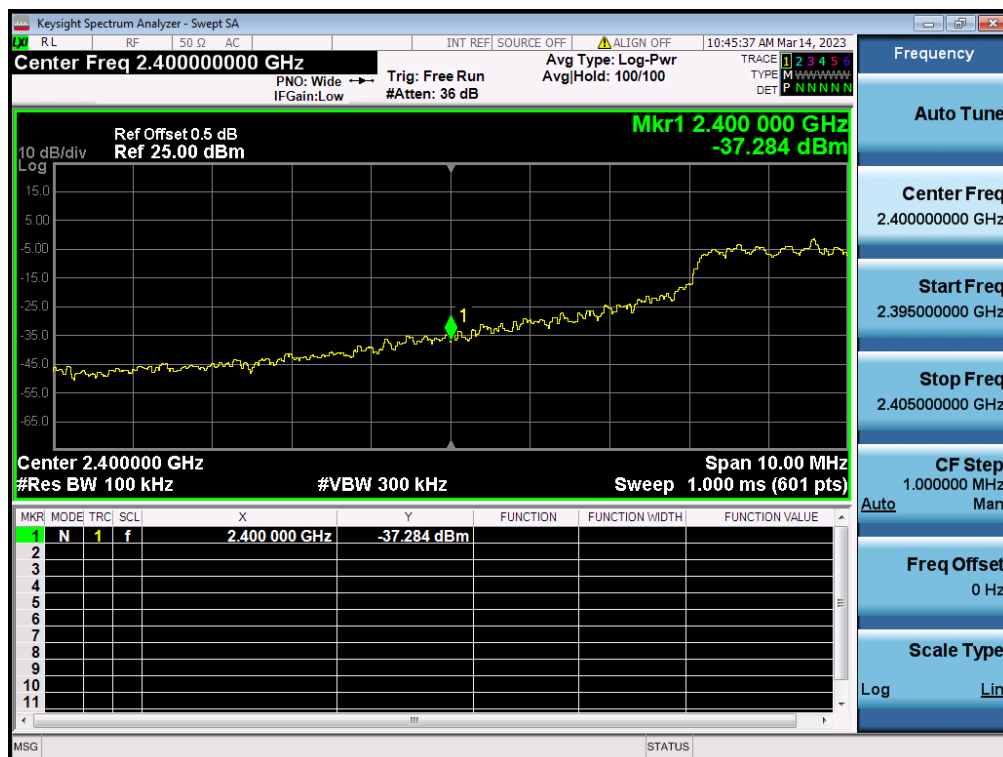


Figure 60: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2412MHz Band Edge



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Figure 61: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2412MHz
Conducted spurious emissions 30MHz-3GHz

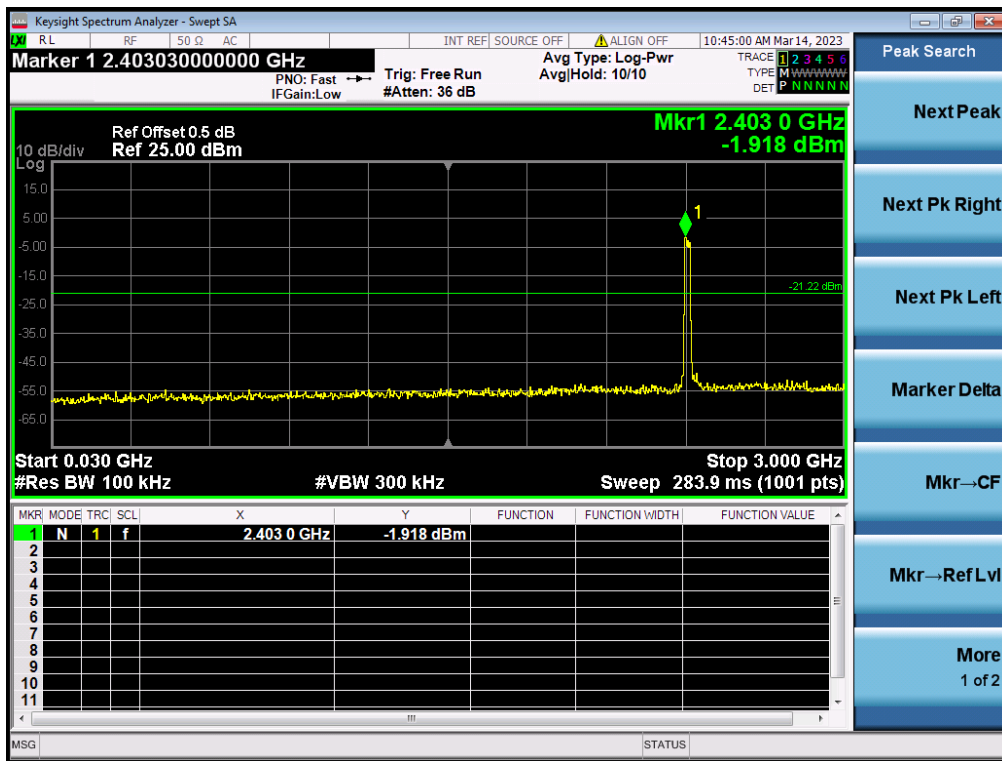
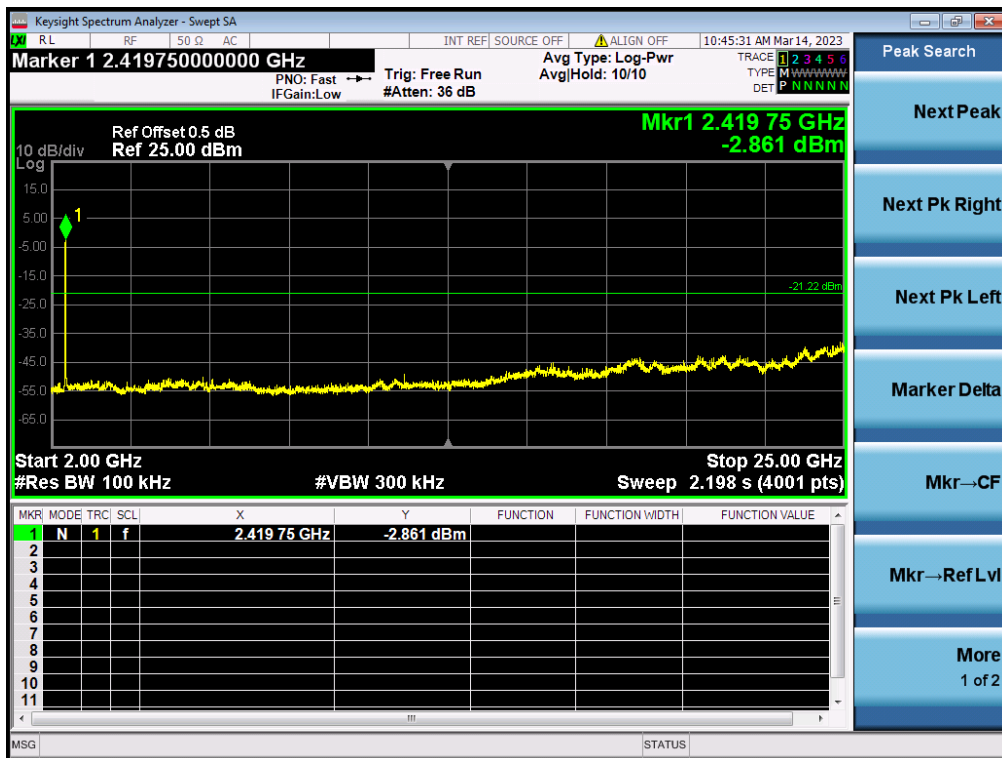


Figure 62: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2412MHz
Conducted spurious emissions 2GHz-25GHz



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Figure 63: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2437MHz Carrier Level

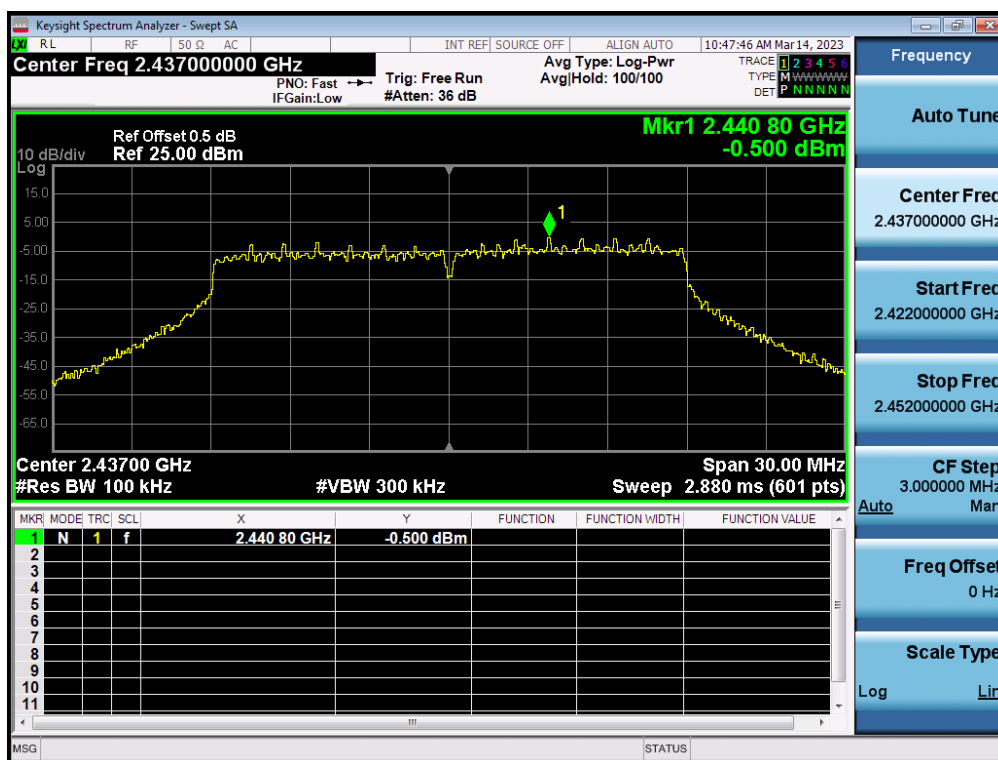
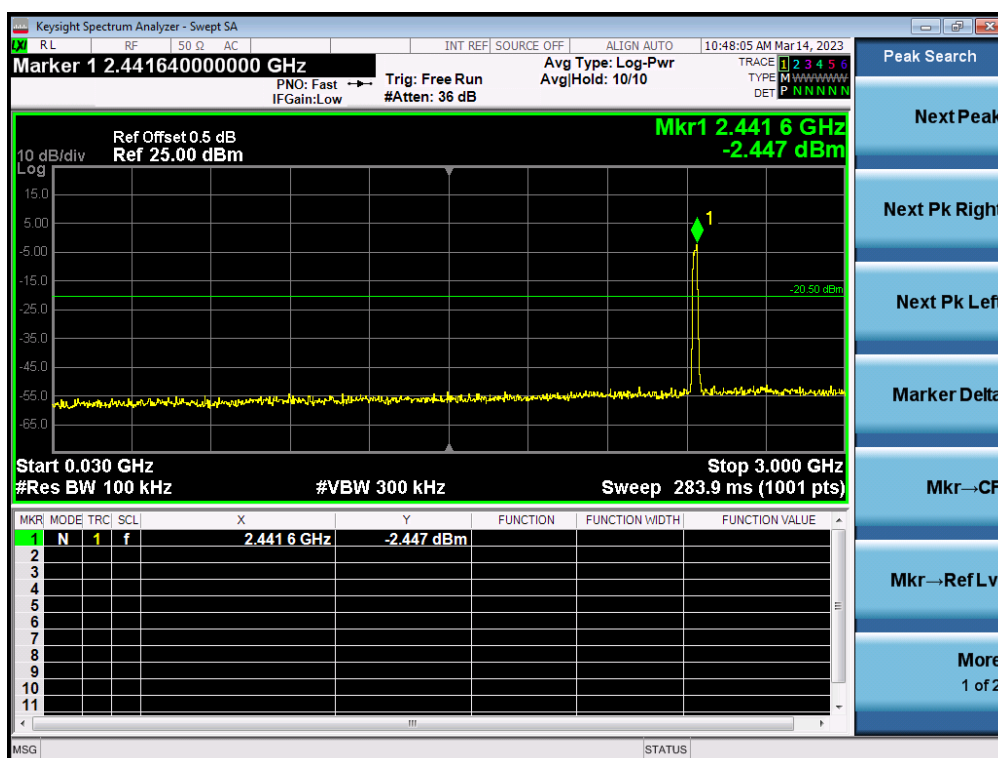


Figure 64: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2437MHz
Conducted spurious emissions 30MHz-3GHz



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Figure 65: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2437MHz
Conducted spurious emissions 2GHz-25GHz

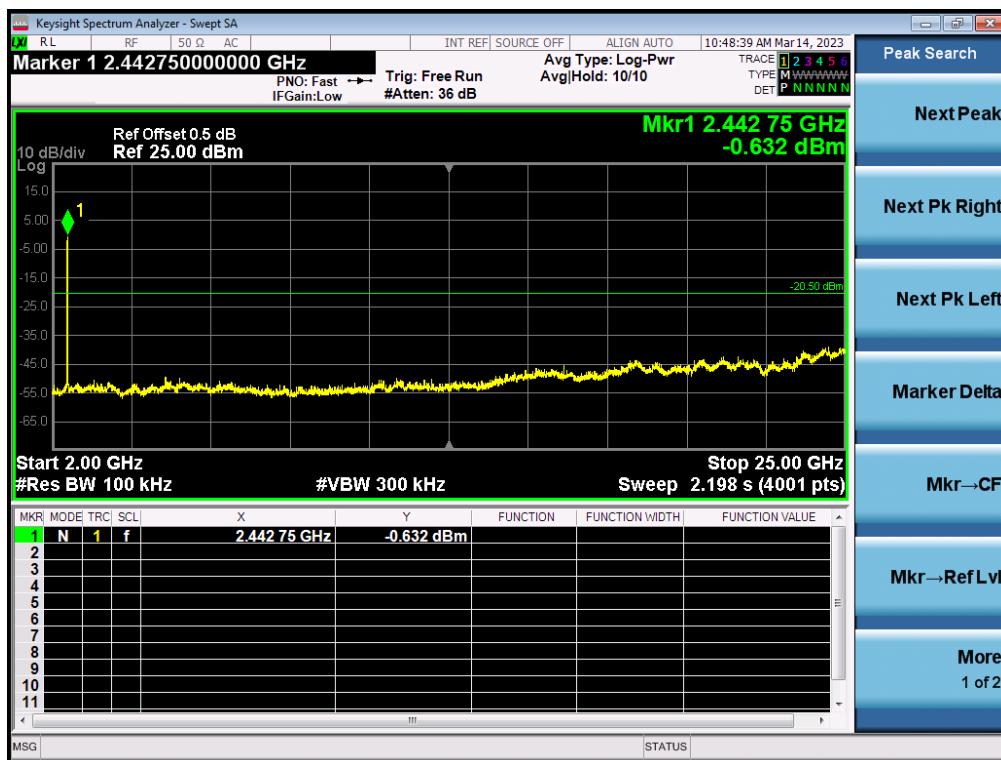
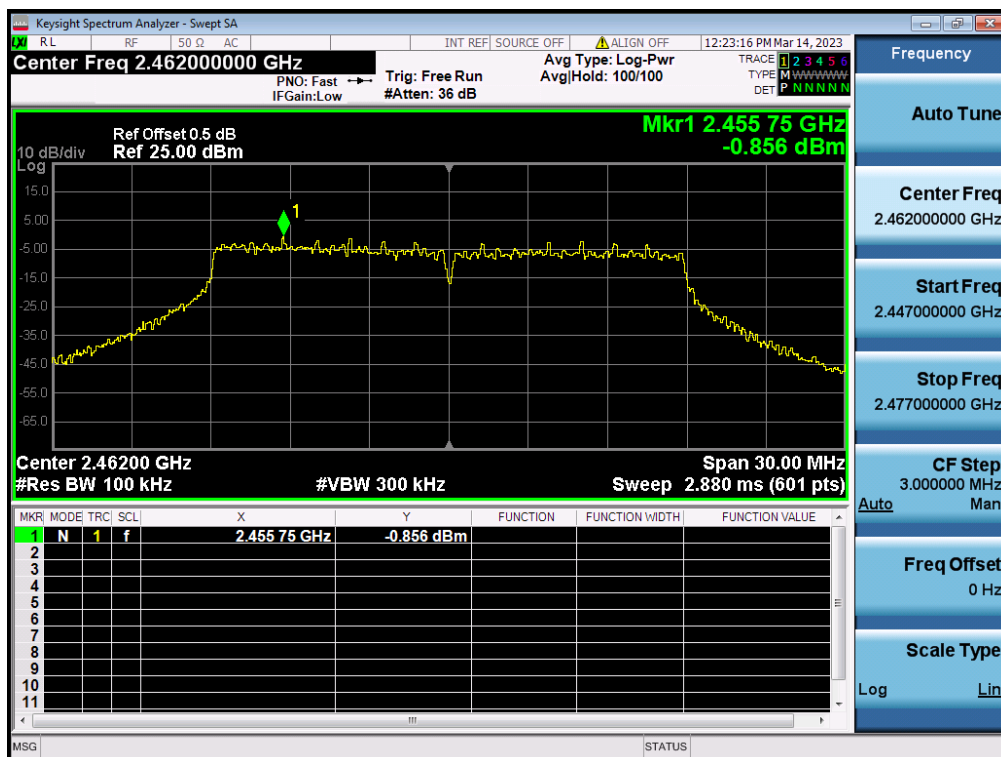


Figure 66: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2462MHz Carrier Level



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Figure 67: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2462MHz Band Edge

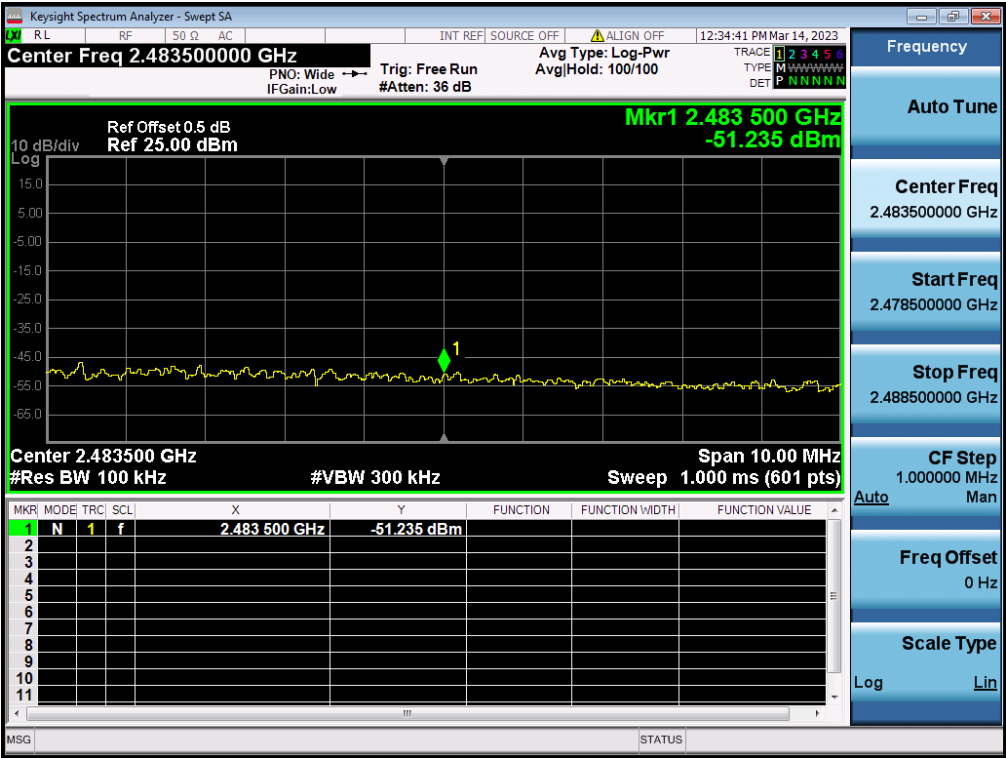
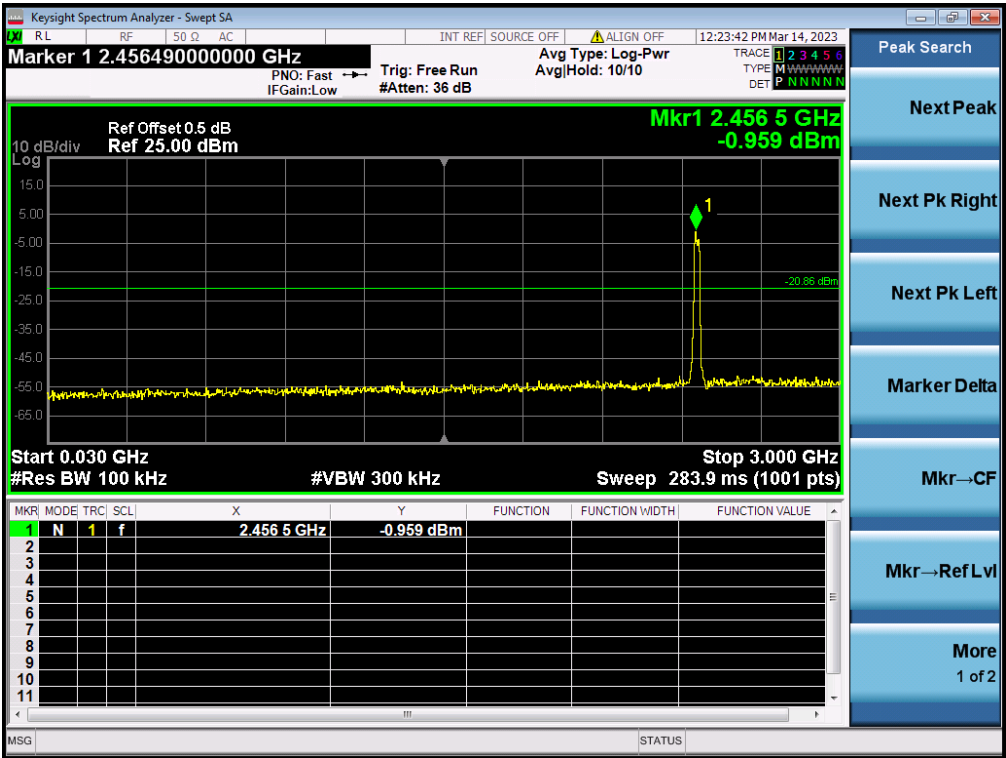


Figure 68: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2462MHz Conducted spurious emissions 30MHz-3GHz



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Figure 69: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT20), 2462MHz
Conducted spurious emissions 2GHz-25GHz

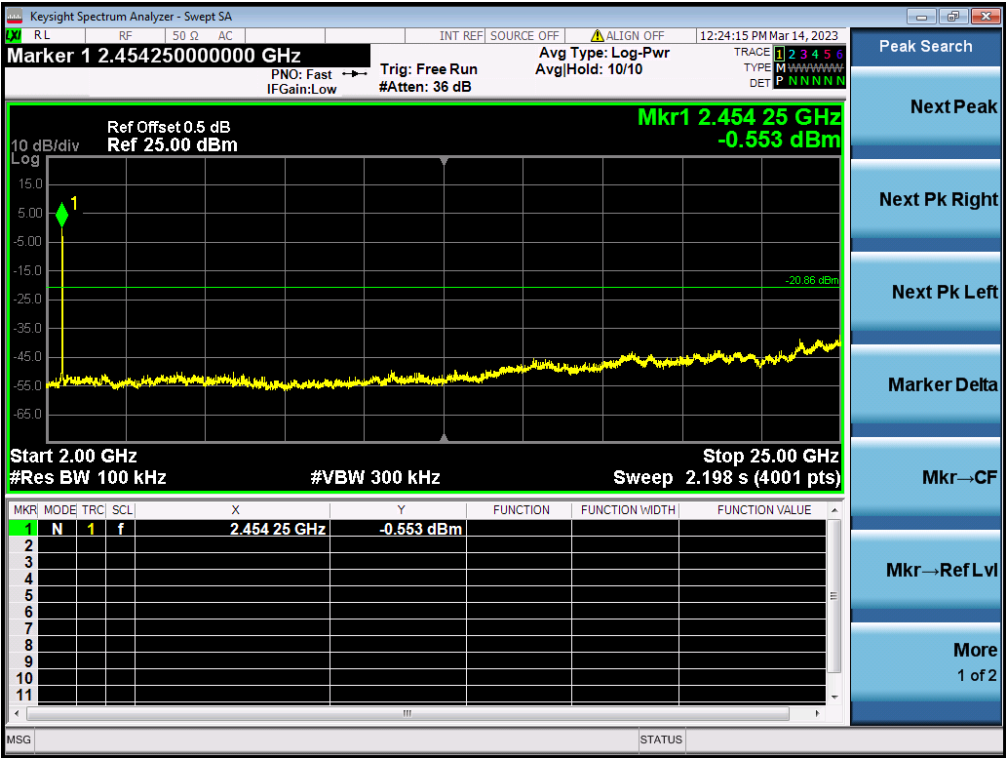
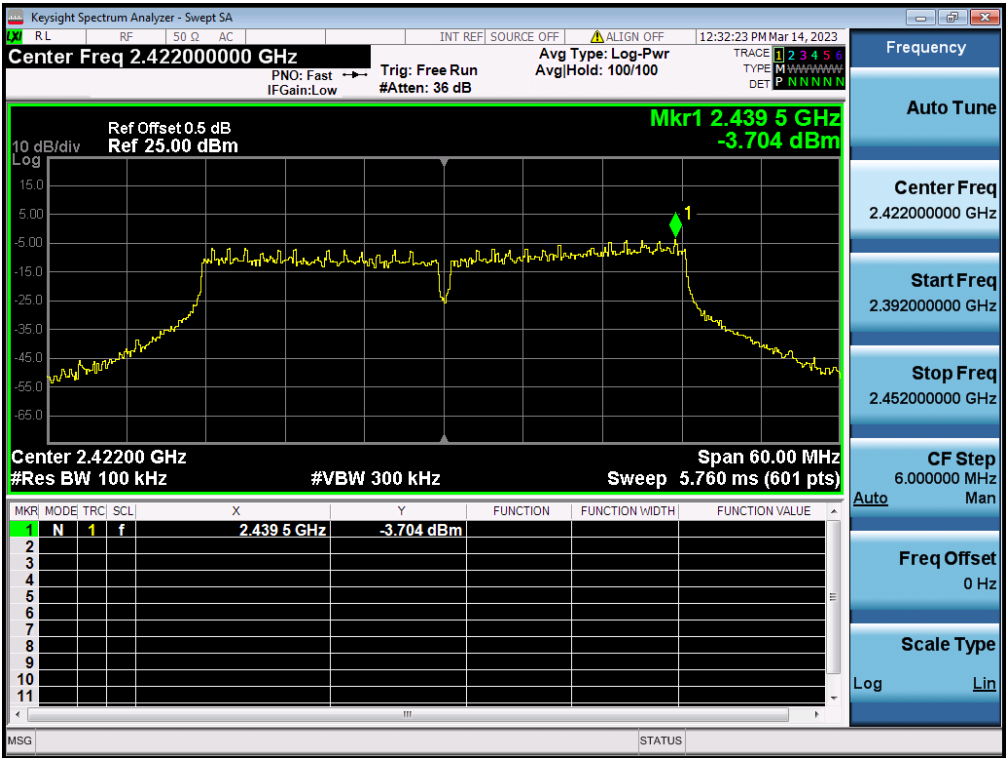


Figure 70: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2422MHz
Carrier Level



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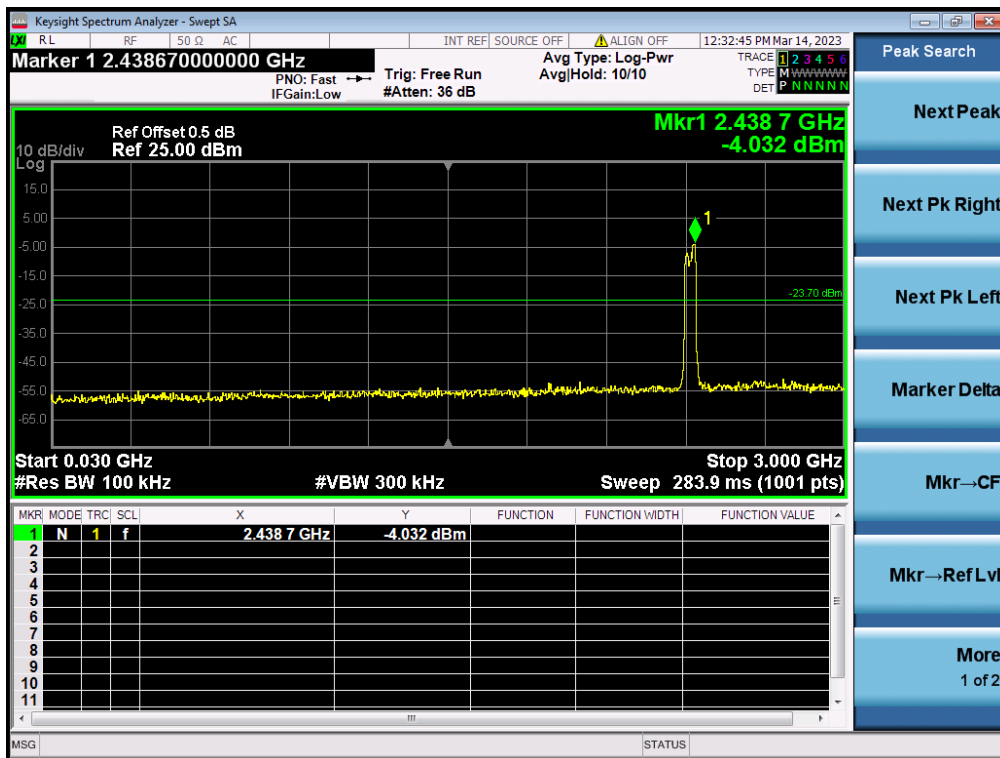
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Figure 71: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2422MHz Band Edge



Figure 72: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2422MHz
Conducted spurious emissions 30MHz-3GHz



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Figure 73: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2422MHz
Conducted spurious emissions 2GHz-25GHz

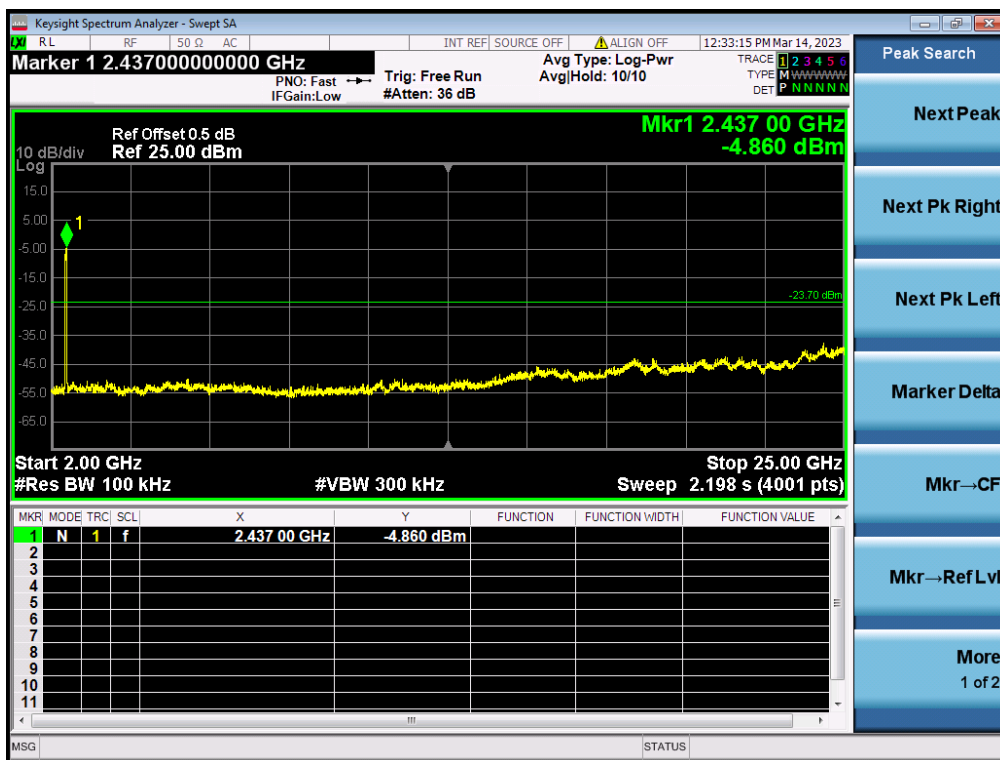


Figure 74: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2437MHz Carrier Level

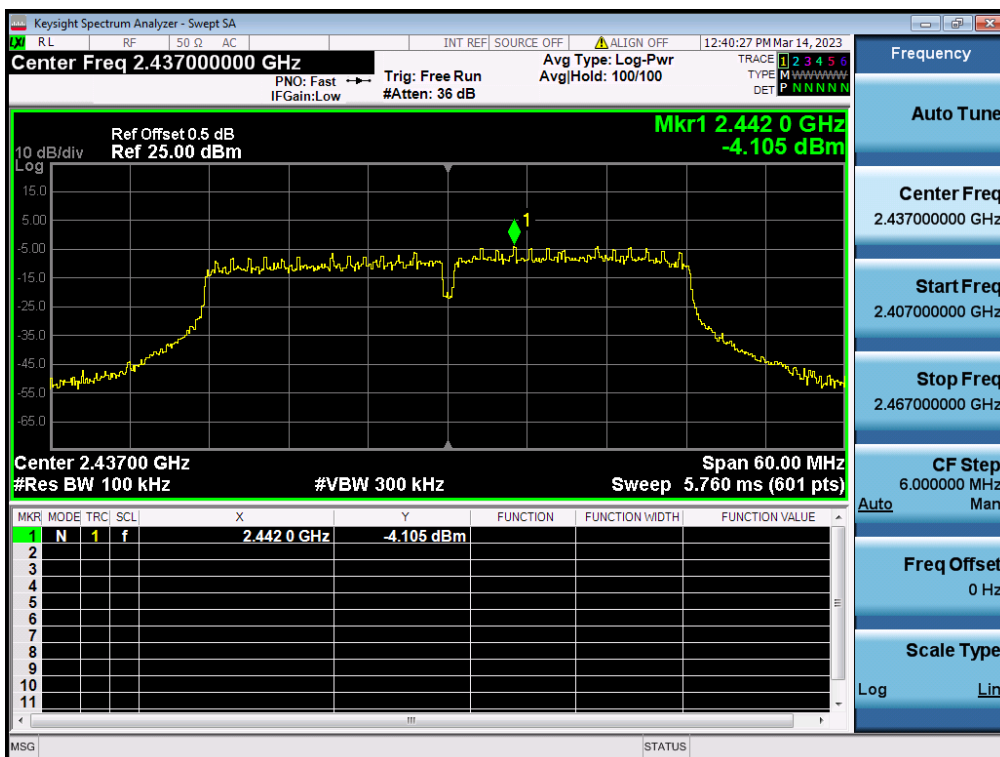


Figure 75: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2437MHz
Conducted spurious emissions 30MHz-3GHz

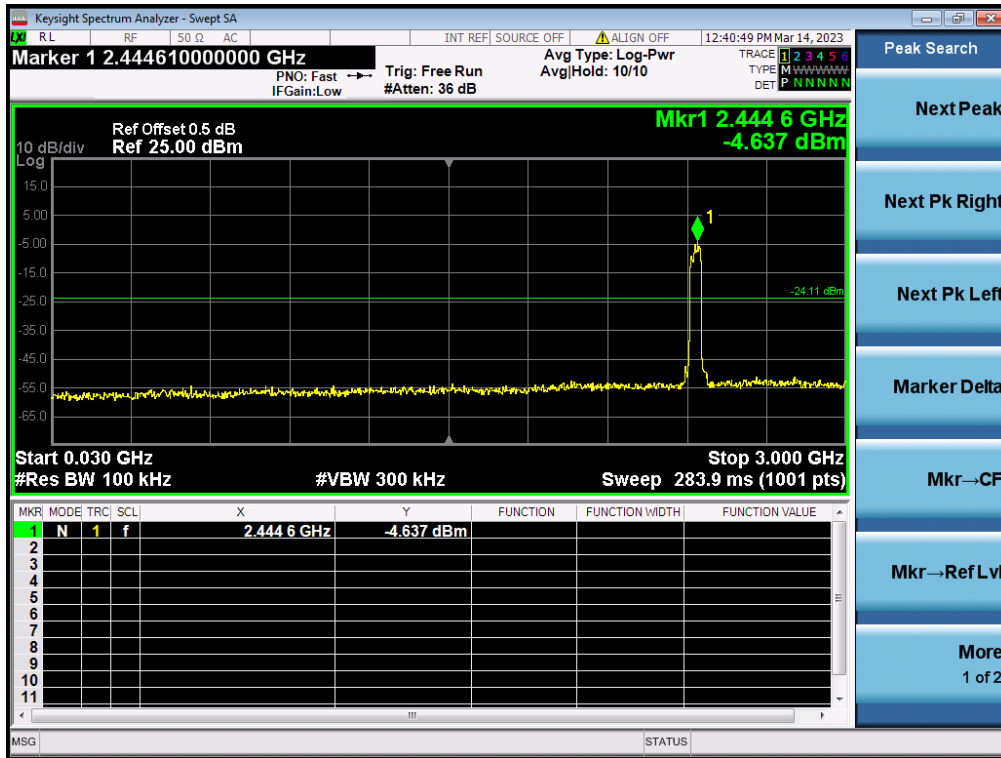
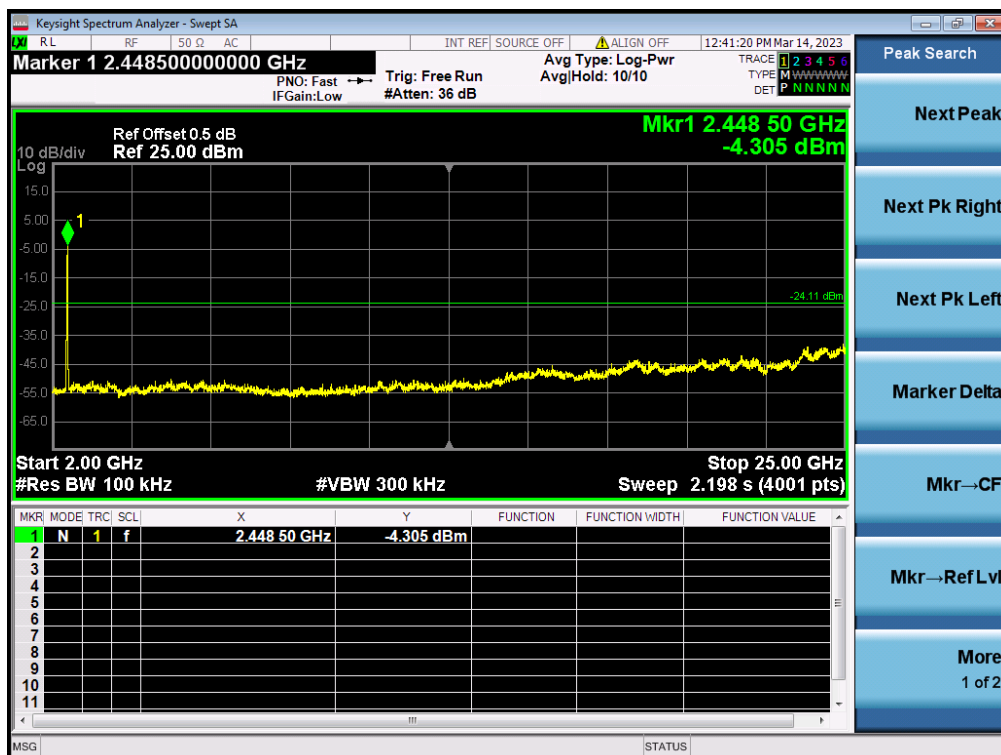


Figure 76: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2437MHz
Conducted spurious emissions 2GHz-25GHz



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Figure 77: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2452MHz Carrier Level

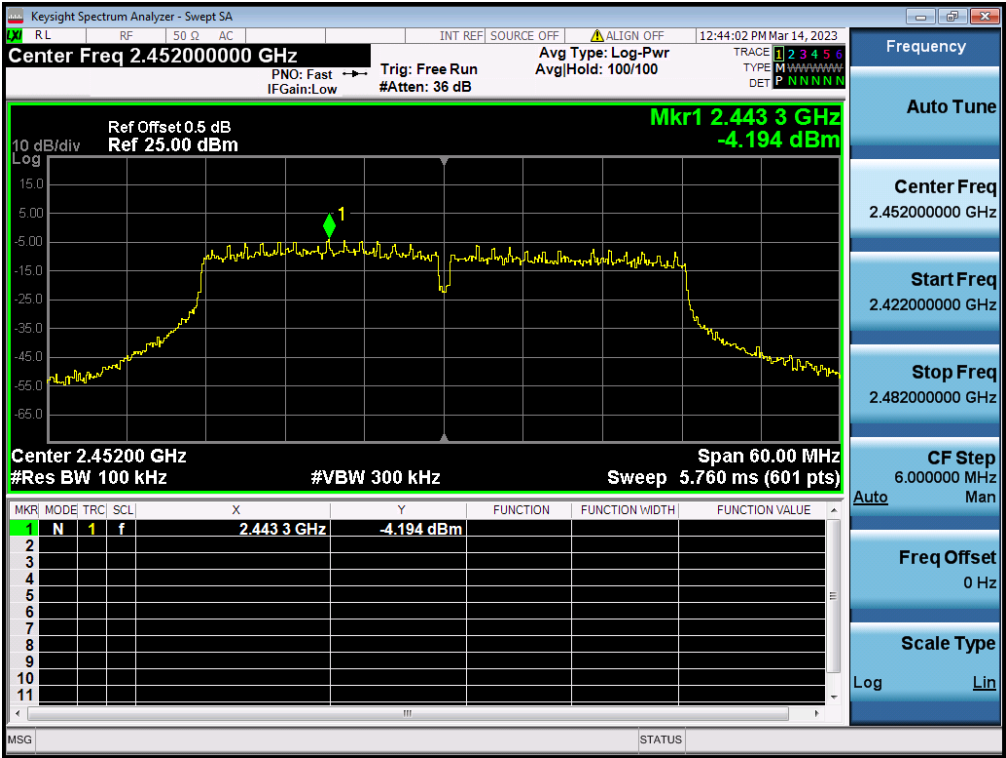
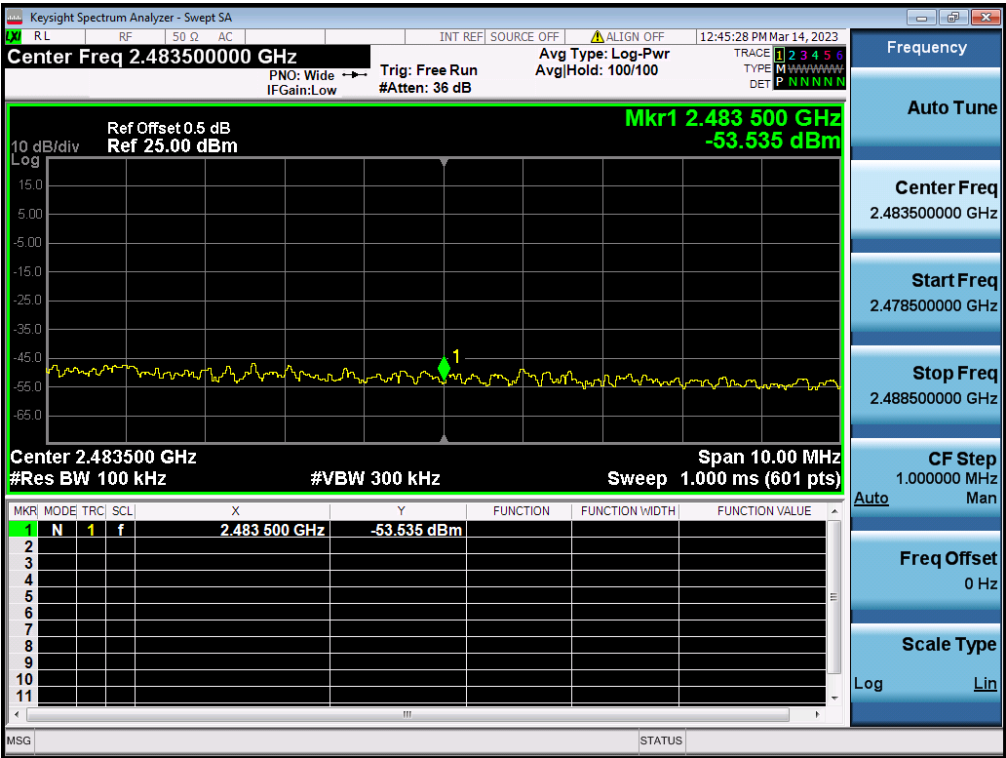


Figure 78: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2452MHz Band Edge



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Figure 79: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2452MHz
Conducted spurious emissions 30MHz-3GHz

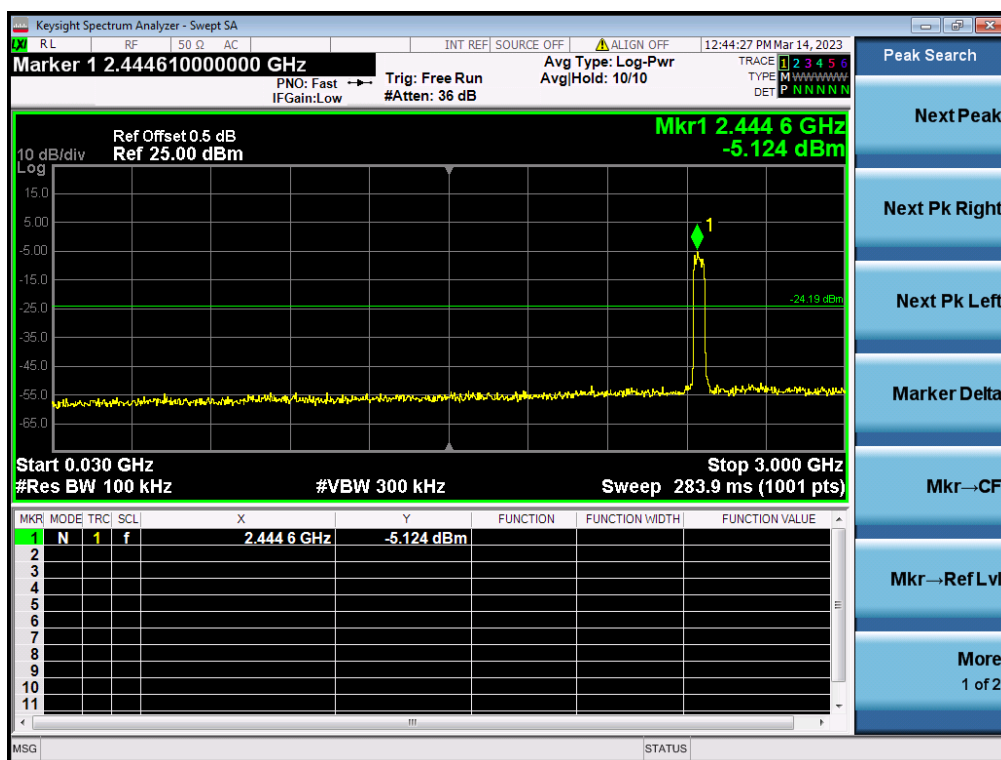
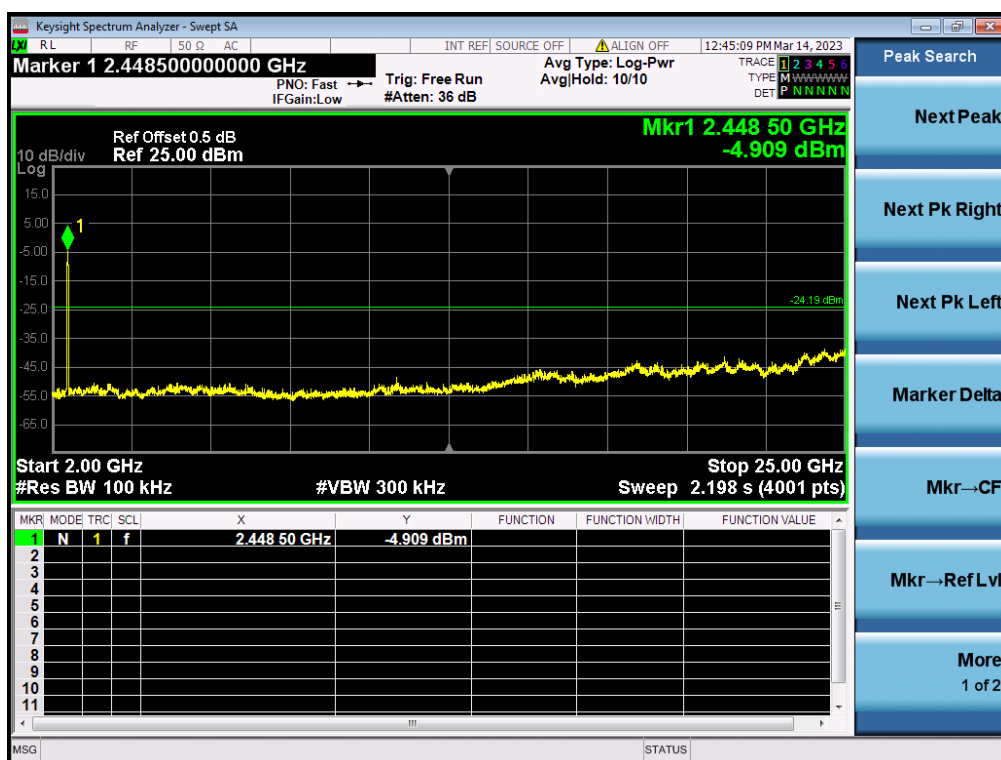


Figure 80: The plots of Conducted Spurious Emission & Authorized-band band-edge, 802.11n(HT40), 2452MHz
Conducted spurious emissions 2GHz-25GHz



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4.1.6 Radiated Spurious Emission

RESULT:

PASS

Test standard	: FCC Part 15.247(d), 15.205, 15.209 RSS-GEN 8.9
Requirement	: ANSI C63.10-2013 clause 11.12, KDB 558074 clause 8.6
Kind of test site	: 3m Semi-Anechoic Chamber

Test setup

Test Channel	: Low/Middle/High
Operation Mode	: A.1.a
Ambient temperature	: 23.2°C
Relative humidity	: 42%

Notes

Test plots please refer to the annex document "SHE2211054-02AE DATA WIFI 2.4GHz-TX EXHIBIT A".

1. For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.
2. The spurious above 18GHz is noise only and 20dB below the limit. The value has no need to be reported.
3. The EUT is working in the Normal link mode below 1 GHz.
4. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

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4.1.7 Band Edge (Restricted-band band-edge)

RESULT:

PASS

Test standard	: FCC Part 15.247(d), 15.205, 15.209 RSS-GEN 8.10
Requirement	: ANSI C63.10-2013 clause 11.13, KDB 558074 clause 8.7
Kind of test site	: 3m Semi-Anechoic Chamber

Test setup

Test Channel	: Low/Middle/High
Operation Mode	: A.1.a
Ambient temperature	: 24°C
Relative humidity	: 49%

Notes:

Test plots please refer to the annex document "SHE22110054-02AE DATA WIFI 2.4GHz-TX EXHIBIT A".

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4.2 Mains Emissions

4.2.1 Conducted Emission on AC Mains

RESULT:

PASS

Test standard	: FCC Part 15.207(a), RSS-Gen 8.8
Requirement	: ANSI C63.10-2013 clause 6.2
Kind of test site	: Shielded room

Test setup

Input Voltage	: which received AC 120V, 60Hz Power
Operation Mode	: A.1.a
Earthing	: Not Connected
Ambient temperature	: 23.2°C
Relative humidity	: 52%

For details refer to following test plot.

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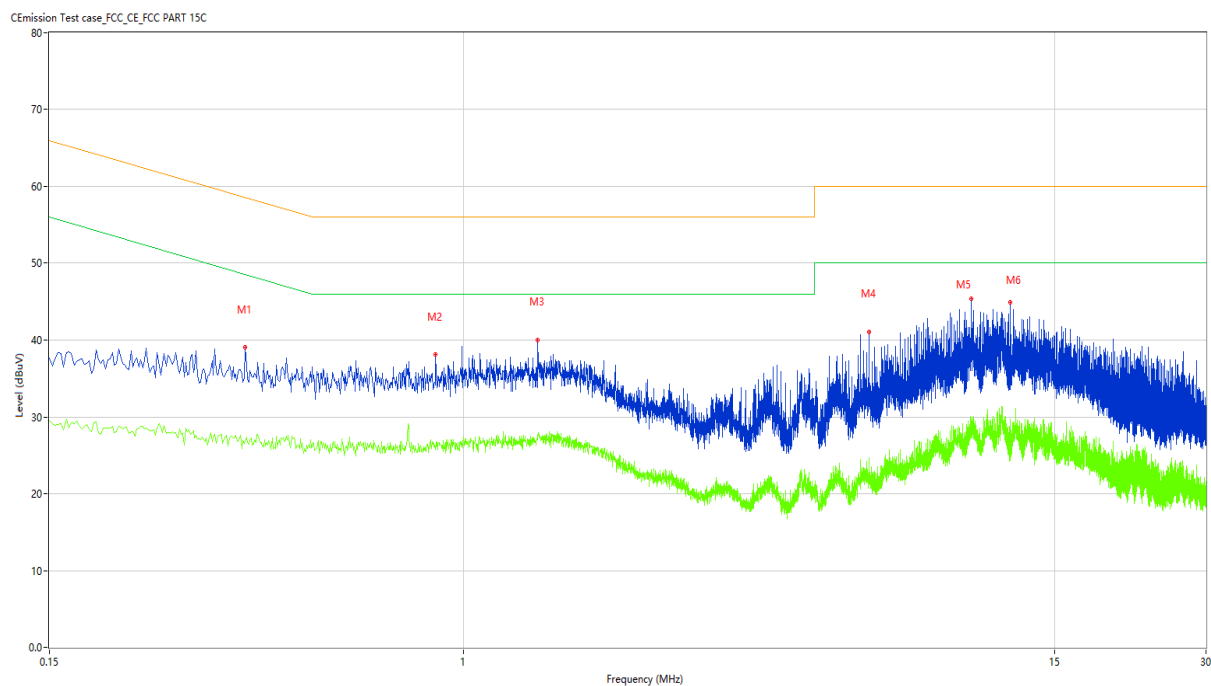
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Note: The all configurations were tested respectively, but only the worst configuration shown here.

Figure 81: Conducted Emission on AC Mains, L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.368	39.01	10.23	58.55	19.54	Peak	L	Pass
1**	0.368	26.82	10.23	48.55	21.73	AV	L	Pass
2	0.880	38.10	10.21	56.00	17.90	Peak	L	Pass
2**	0.880	25.67	10.21	46.00	20.33	AV	L	Pass
3	1.406	40.02	10.15	56.00	15.98	Peak	L	Pass
3**	1.406	27.56	10.15	46.00	18.44	AV	L	Pass
4	6.418	41.06	10.41	60.00	18.94	Peak	L	Pass
4**	6.418	24.64	10.41	50.00	25.36	AV	L	Pass
5	10.226	45.38	10.50	60.00	14.62	Peak	L	Pass
5**	10.226	29.80	10.50	50.00	20.20	AV	L	Pass
6	12.240	44.88	10.60	60.00	15.12	Peak	L	Pass
6**	12.240	29.75	10.60	50.00	20.25	AV	L	Pass

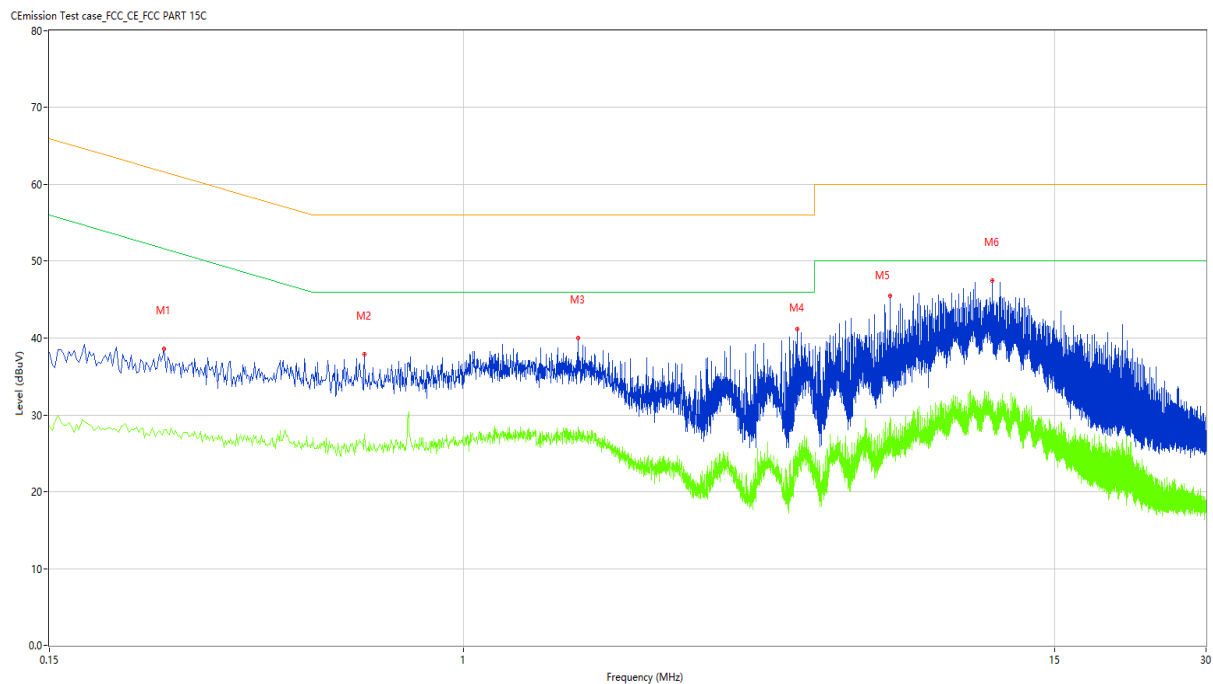
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Figure 82: Conducted Emission on AC Mains, N Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.254	38.64	10.27	61.63	22.99	Peak	N	Pass
1**	0.254	28.12	10.27	51.63	23.51	AV	N	Pass
2	0.636	37.91	10.35	56.00	18.09	Peak	N	Pass
2**	0.636	27.45	10.35	46.00	18.55	AV	N	Pass
3	1.690	39.99	10.20	56.00	16.01	Peak	N	Pass
3**	1.690	28.44	10.20	46.00	17.56	AV	N	Pass
4	4.622	41.16	10.27	56.00	14.84	Peak	N	Pass
4**	4.622	25.20	10.27	46.00	20.80	AV	N	Pass
5	7.068	45.53	10.35	60.00	14.47	Peak	N	Pass
5**	7.068	29.70	10.35	50.00	20.30	AV	N	Pass
6	11.262	47.54	10.42	60.00	12.46	Peak	N	Pass
6**	11.262	30.30	10.42	50.00	19.70	AV	N	Pass

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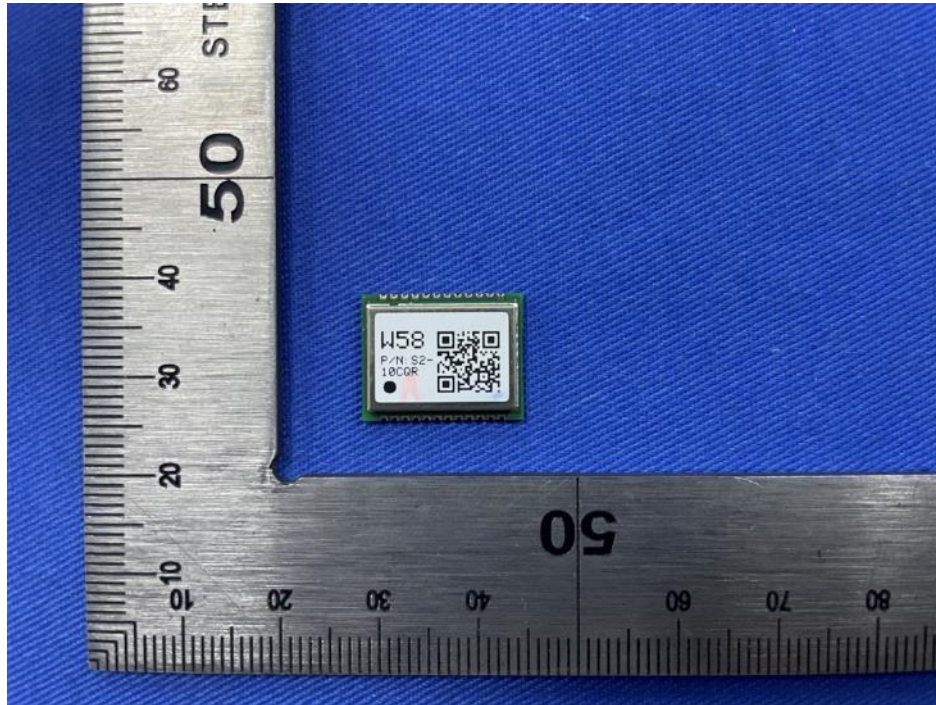
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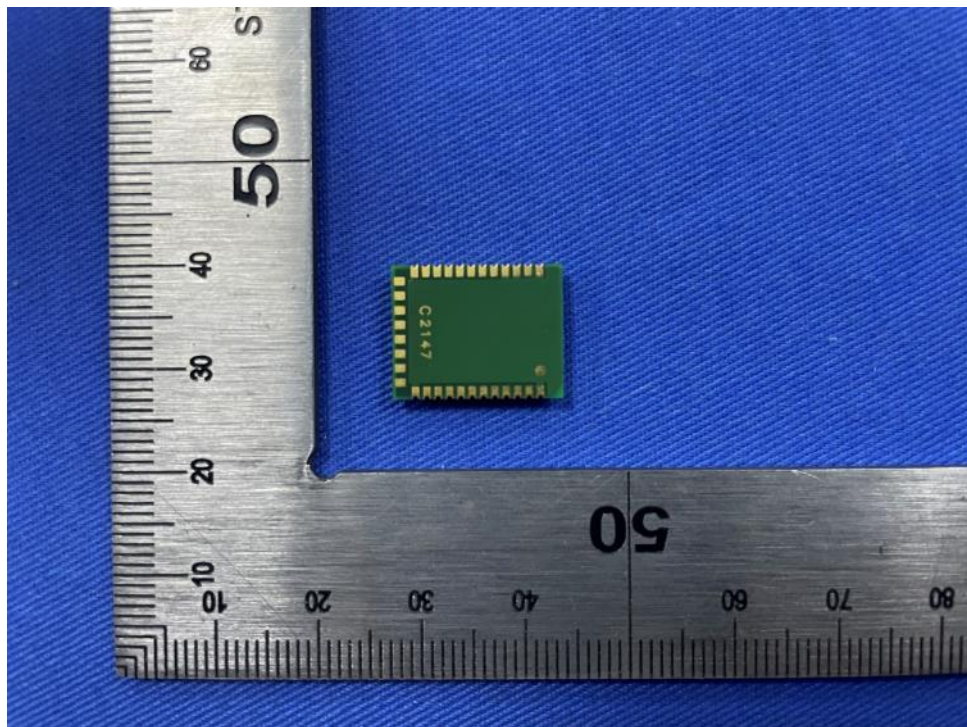
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5 Appendixes

5.1 Photographs of the Sample



Front of the sample



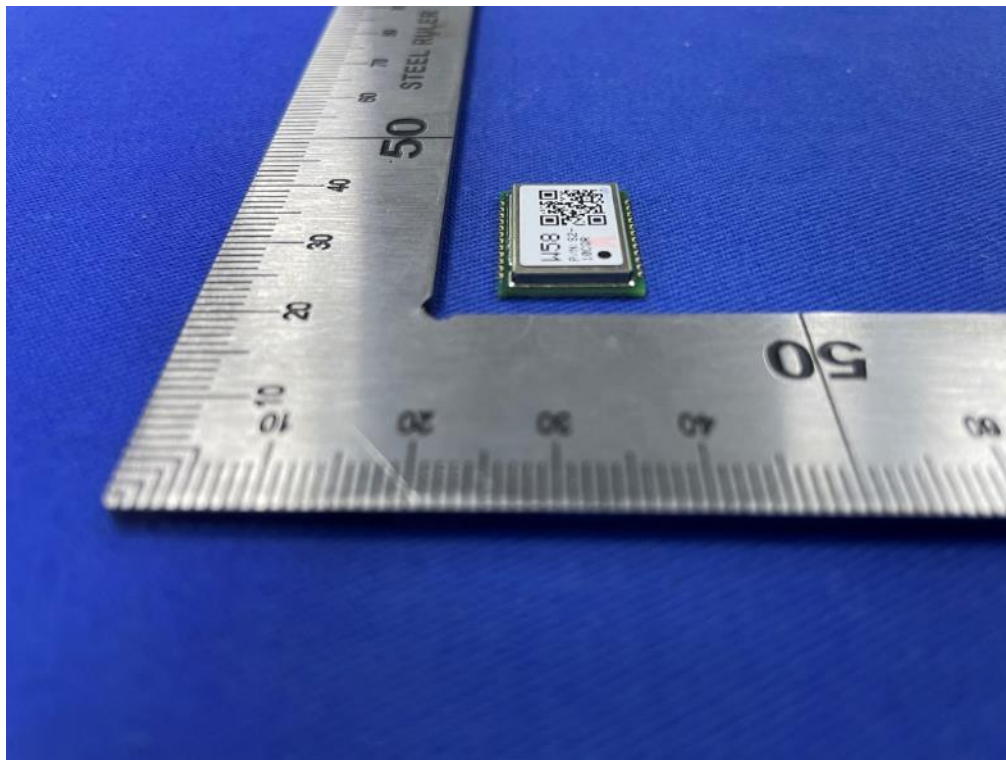
Back of the sample

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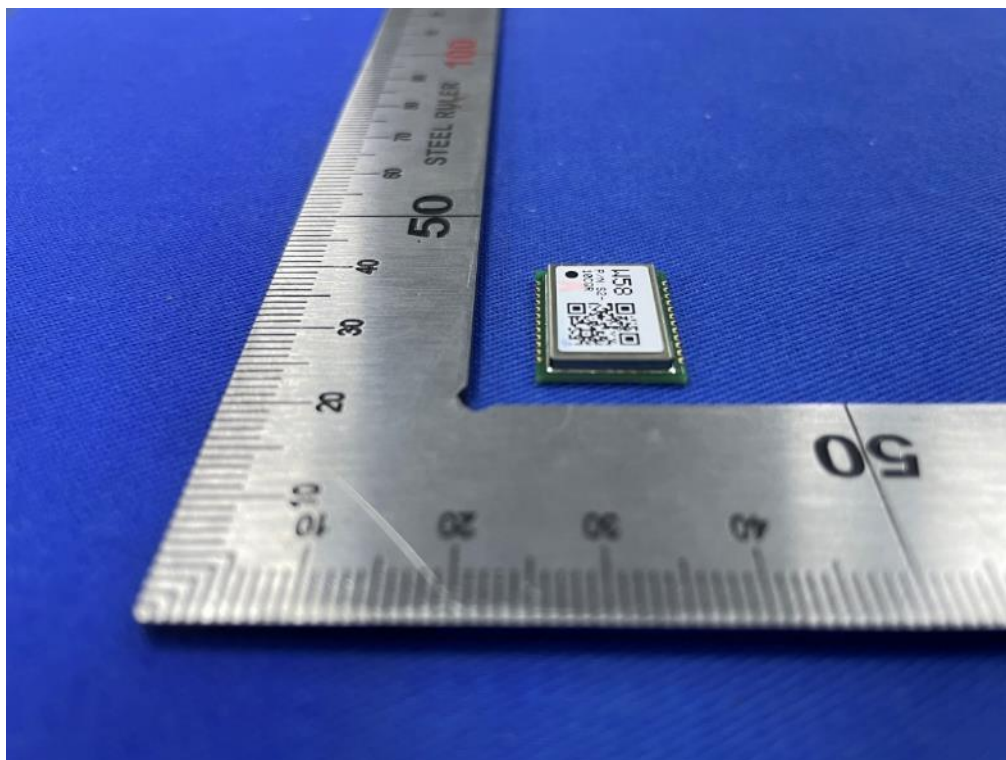
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Left of the sample



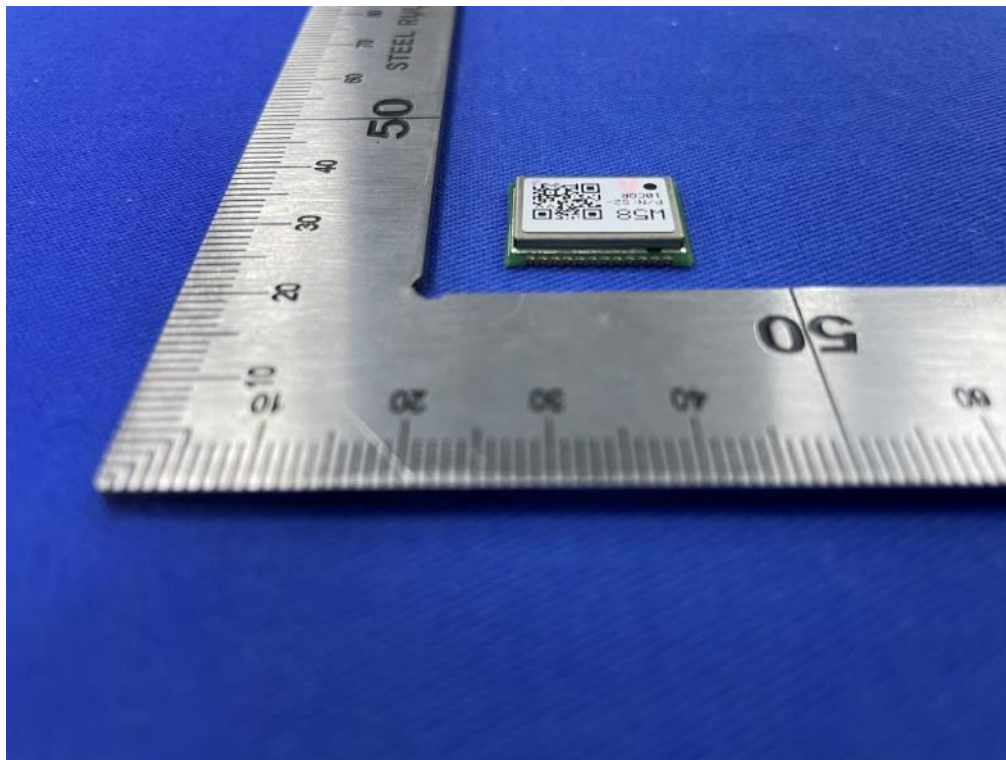
Right of the sample

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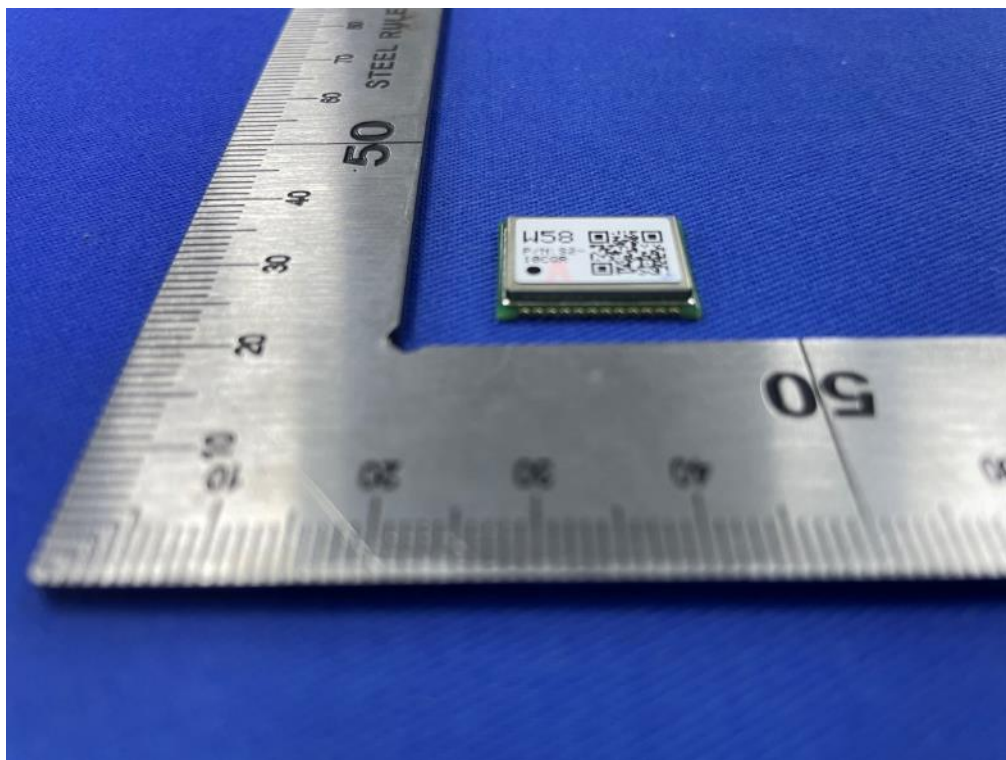
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Top of the sample



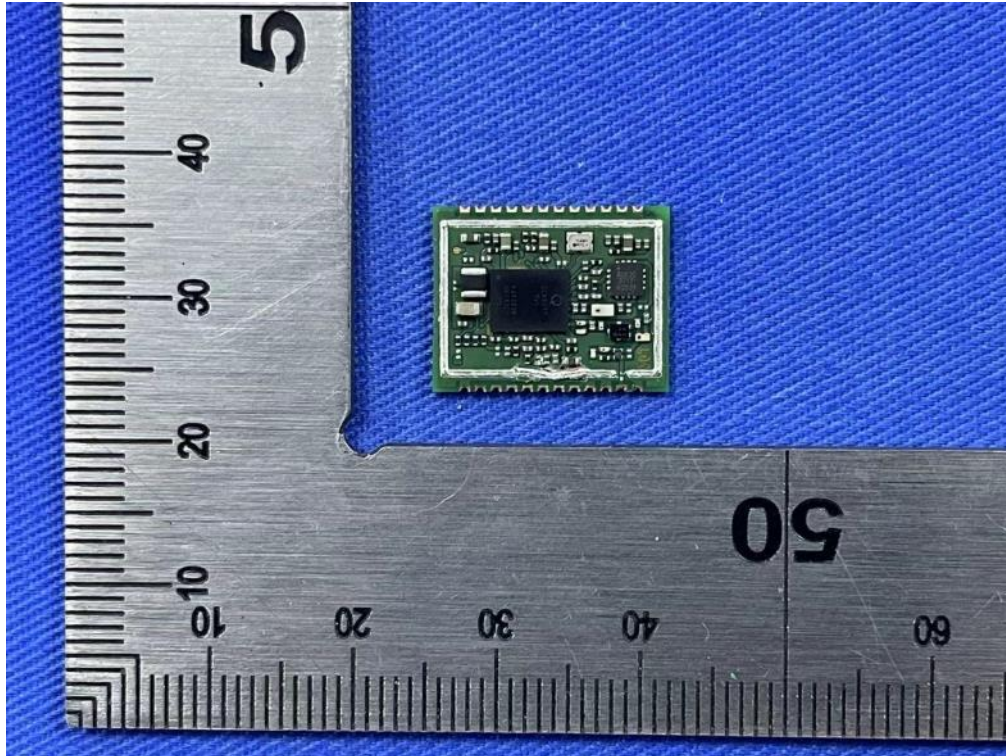
Bottom of the sample

TEST REPORT

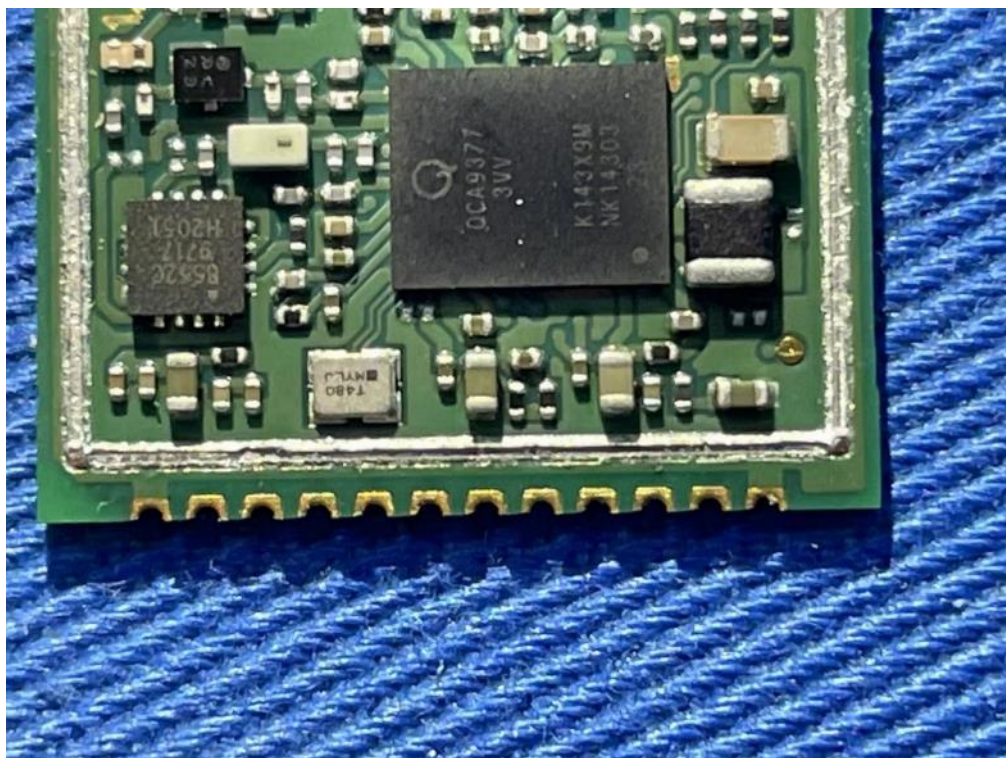
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Internal-1 of the sample



Internal-2 of the sample

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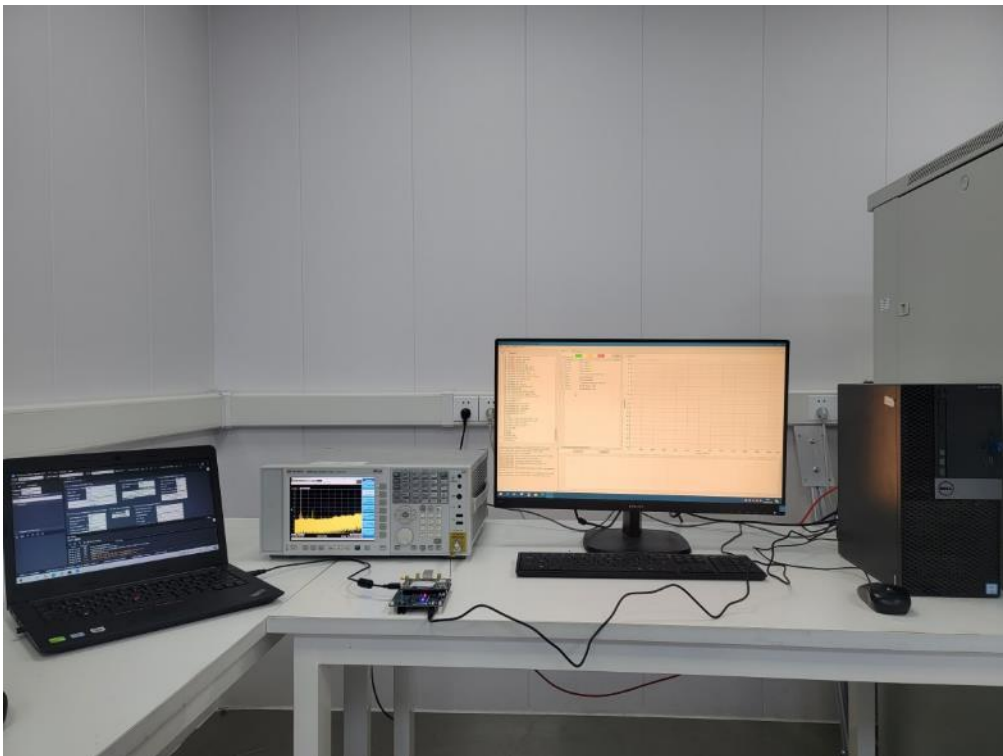
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5.2 Set-up for Conducted Emissions



5.3 Set-up for Conducted RF test at Antenna Port



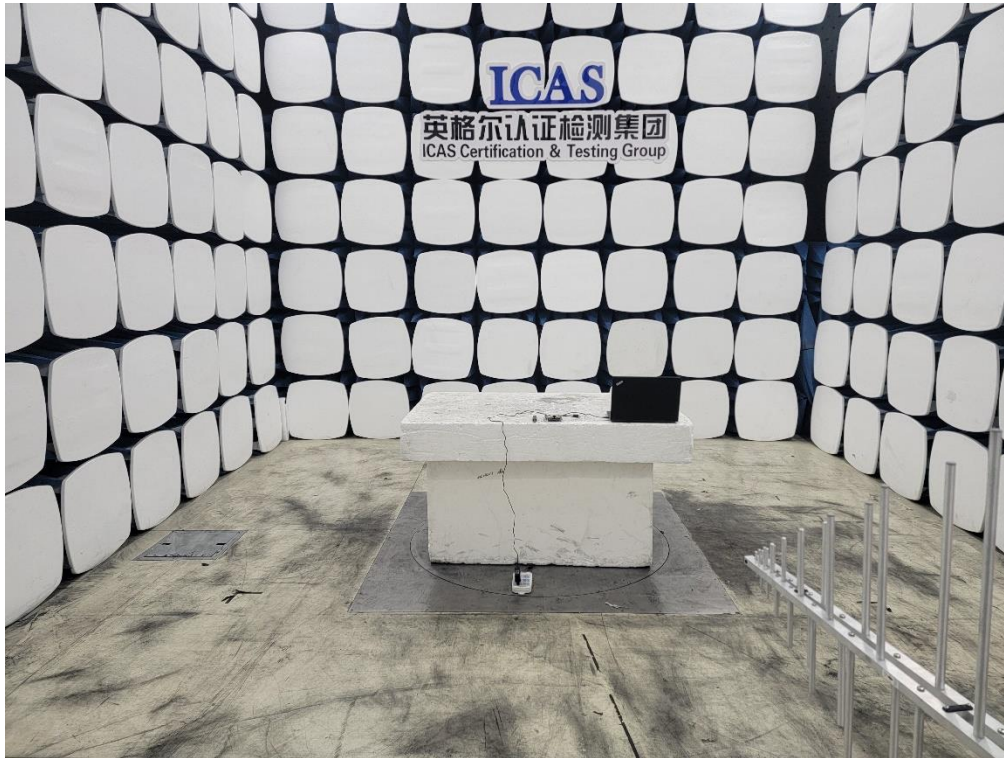
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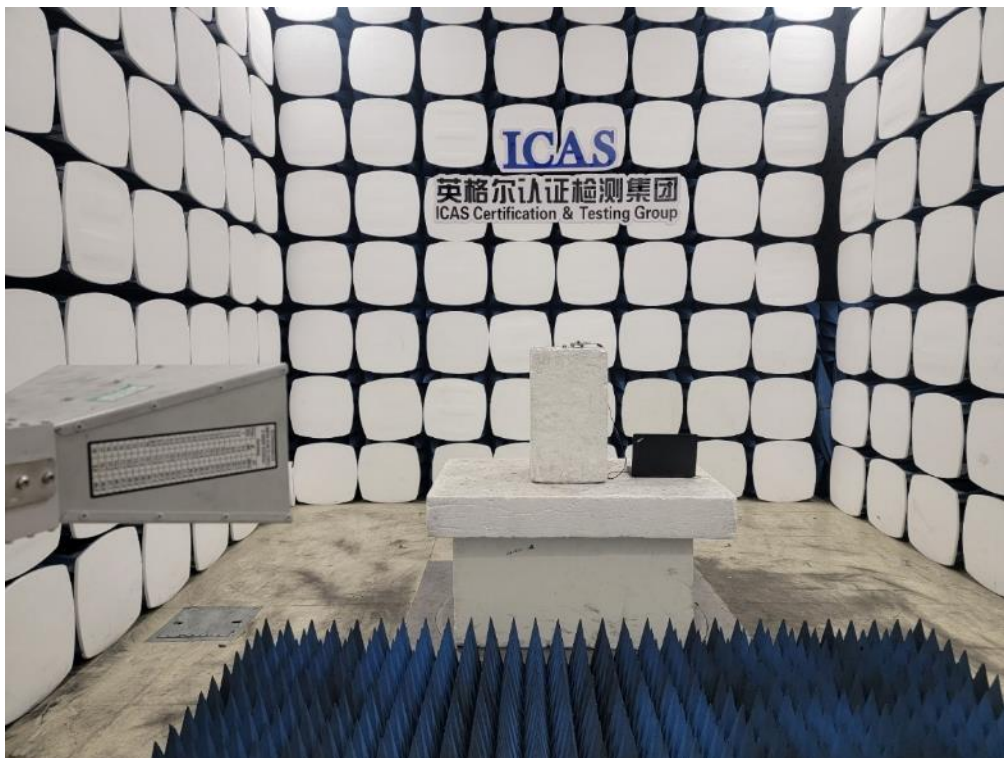
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5.4 Set-up for Spurious Emissions below 1GHz



5.5 Set-up for Spurious Emissions above 1GHz



End of the report