

**ELECTROMAGNETIC EMISSIONS
COMPLIANCE REPORT**

Applicant: silex technology, Inc.
2-3-1 Hikaridai, Seika-cho, Soraku-gun, Kyoto 619-0237,
Japan

Manufacturer: silex technology, Inc.
2-3-1 Hikaridai, Seika-cho, Soraku-gun, Kyoto 619-0237,
Japan

Product Name: SX-PCEAX-AP

Brand Name: Silex Technology

Model No.: SX-PCEAX-AP

Model Difference: N/A

Report Number: TERF2310002604ER

FCC ID N6C-PCEAXAP

IC: 4908A-PCEAXAP

Date of EUT Received: October 17, 2023

Date of Test: October 17, 2023 ~ December 6, 2023

Issue Date: January 26, 2024

Approved By _____

Blue Yang

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT comply with FCC rule part §15.247, ISED RSS-247.

The results of this report relate only to the sample identified in this report.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TERF2310002604ER	00	Original.	January 26, 2024	Susan Lin	

Note:

- 1、The remark "*" indicates modification of the report upon requests from certification body.

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1 GENERAL INFORMATION

1.1 Product Description

Product Name:	SX-PCEAX-AP
Brand Name:	Silex Technology
Model No.:	SX-PCEAX-AP
Model Difference:	N/A
Hardware Version:	N/A
Firmware Version:	N/A
EUT Series No.:	ES4-21
Power Supply:	3.3Vdc
Test Software (Name/Version):	QRCT / 4.0.00203.0

1.2 RF Specification

WLAN 2.4GHz

Wi-Fi	Frequency Range	Channels	Rated Power (dBm)		Modulation Technology
			Peak	Avg.	
802.11b	2412~2462	11	23.45	20.99	DSSS
802.11g	2412~2462	11	26.78	20.99	OFDM
802.11n20	2412~2462	11	26.79	20.84	OFDM
802.11n40	2422~2452	7	25.07	17.96	OFDM
802.11ax20	2412~2462	11	27.03	20.70	OFDMA
802.11ax40	2422~2452	7	25.12	17.60	OFDMA
Modulation type:		CCK, DQPSK, DBPSK for DSSS			
		64QAM, 16QAM, QPSK, BPSK for OFDM			
		1024 QAM, 256 QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA			
Data Rate:		802.11 b: 1/2/5.5/11 Mbps			
		802.11 g: 6/9/12/18/24/36/48/54 Mbps			
		802.11 n_20MHz: up to 144.4Mbps			
		802.11 n_40MHz: up to 300Mbps			
		802.11 ax_20MHz: up to 286.8Mbps			
		802.11 ax_40MHz: up to 573.6Mbps			

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WLAN 2.4GHz for IC

Wi-Fi	Frequency Range	Channels	Rated Power (dBm)		Rated Power in dBm (EIRP)	Modulation Technology
			Peak	Avg.		
802.11b	2412~2462	11	23.45	20.99	24.16	DSSS
802.11g	2412~2462	11	26.78	20.99	24.16	OFDM
802.11n20	2412~2462	11	26.79	20.84	24.02	OFDM
802.11n40	2422~2452	7	25.07	17.96	21.13	OFDM
802.11ax20	2412~2462	11	27.03	20.70	23.87	OFDMA
802.11ax40	2422~2452	7	25.12	17.60	20.78	OFDMA
Modulation type:		CCK, DQPSK, DBPSK for DSSS				
		64QAM, 16QAM, QPSK, BPSK for OFDM				
		1024 QAM, 256 QAM , 64QAM, 16QAM, QPSK, BPSK for OFDMA				
Data Rate:		802.11 b: 1/2/5.5/11 Mbps				
		802.11 g: 6/9/12/18/24/36/48/54 Mbps				
		802.11 n_20MHz:up to 144.4Mbps				
		802.11 n_40MHz:up to 300Mbps				
		802.11 ax_20MHz:up to 286.8Mbps				
		802.11 ax_40MHz:up to 573.6Mbps				

1.3 Antenna Designation

Antenna Type	Supplier	Antenna Part No.	Freq. (MHz)	Peak Antenna Gain (dBi)	Directional Gain (dBi)
Dipole	Molex	146153	2412~2462	3.175	6.185
Dipole	Unictron Technologies Corporation	AA258	2412~2462	2.67	5.68

Note:

- Pre-scanned was done on the above antennas, measurements were demonstrated by using the antenna with the highest gain as the worst case scenarios.
- Antenna information is provided by the applicant.

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1.4 Test Methodology of Applied Standards

FCC Part 15, Subpart C §15.247

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

RSS-247 issue 3 Aug. 2023

RSS-Gen, Issue 5 April 2018, Amendment 2 (February 2021), Amendment 1 (March 2019)

ANSI C63.10:2013

1.5 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designa- tion number	IC CAB identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan.	SAC 1	TW0027	TW3702
		SAC 2		
		SAC 3		
		Conduction 1		
		Conducted 1		
		Conducted 2		
		Conducted 3		
		Conducted 4		
		Conducted 5		
		Conducted 6		
	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction C	TW0028	
		SAC C		
		SAC D		
		SAC G		
		Conducted A		
		Conducted B		
		Conducted C		
		Conducted D		
		Conducted E		
		Conducted F		
Conducted G				
Note: Test site name is remarked on the equipment list in each section of this report as an indica- tion where measurements occurred in specific test site and address.				

1.6 Special Accessories

There are no special accessories used while test was conducted.

1.7 Equipment Modifications

There was no modification incorporated into the EUT.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is placed on a table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed. The two LISNs provide 50uH/50 ohm of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Conducted Test (RF)

The active antenna port of the unlicensed wireless device is connected to the spectrum analyzer with attenuator to protect the instrumentation. If a second antenna port is available, it is tested at one operating frequency, with other port(s) appropriately terminated, to verify it has similar output characteristics as the fully tested port.

2.3.3 Radiated Emissions

The EUT is placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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2.4 Measurement Results Explanation Example

2.4.1 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

2.4.2 For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

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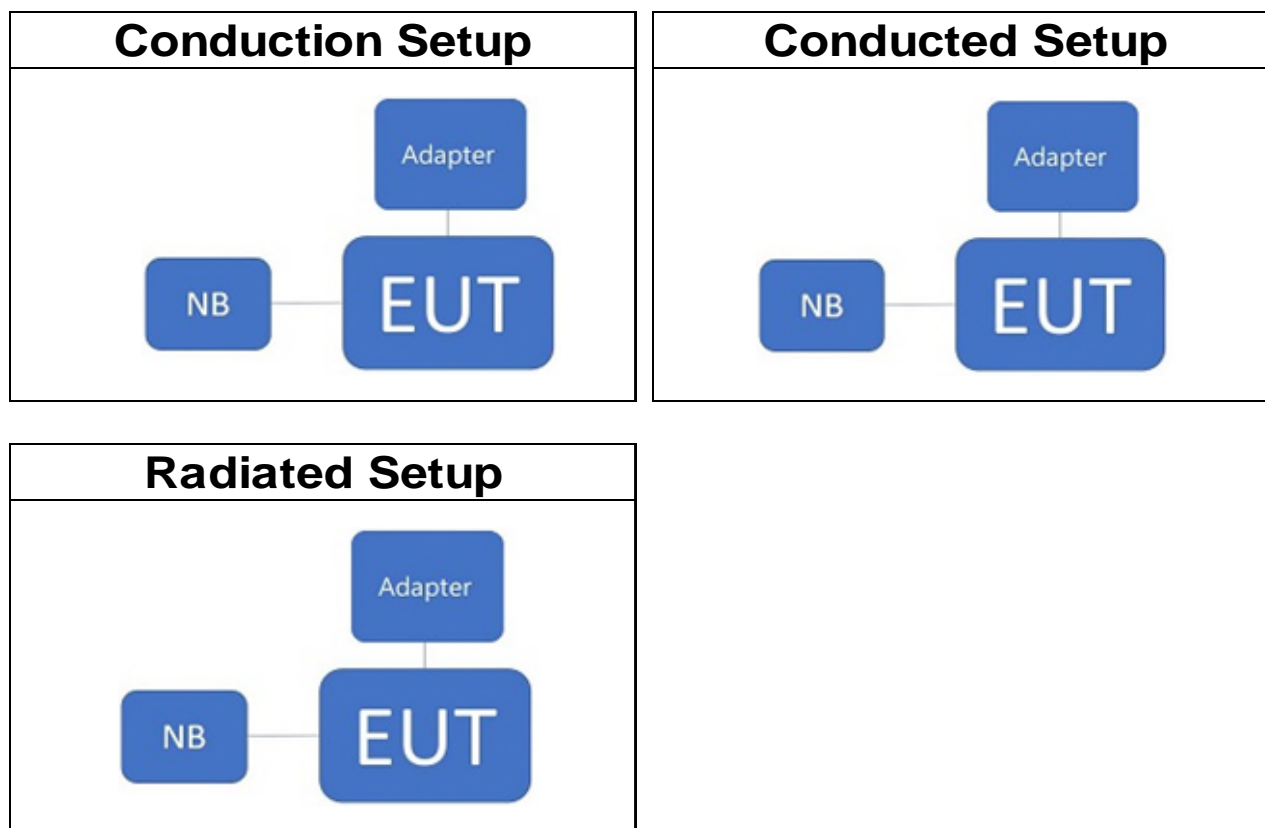
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2.5 Test Configuration



2.6 Control Unit(s)

AC Power-Line Conducted Emission Test Site: Conduction 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Notebook	Dell	Latitude 5590	BYJMN2	N/A	N/A
Adapter	EDAC	EA10682N-120	N/A	N/A	N/A

Conducted Emission Test Site: Conducted 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Notebook	Dell	Latitude 5590	BYJMN2	N/A	N/A
Adapter	EDAC	EA10682N-120	N/A	N/A	N/A

Radiated Emission Test Site: SAC 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Notebook	Dell	Latitude 5590	BYJMN2	N/A	N/A
Adapter	EDAC	EA10682N-120	N/A	N/A	N/A

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3 SUMMARY OF TEST RESULTS

FCC Rules	ISED Rules	Description Of Test	Result
§15.207(a)	RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	RSS-247 §5.4 d	Peak Output Power	Compliant
§15.247(a)(2)	RSS-247 §5.2 a RSS-Gen §6.7	Emission Bandwidth	Compliant
§15.209 §15.247(d)	RSS-247 §5.5	Conducted Band Edge and Spurious Emission	Compliant
§15.209 §15.247(d)	RSS-247 §5.5	Radiated Band Edge and Spurious Emission	Compliant
§15.205	RSS-Gen § 8.10	Restricted Bands	Compliant
§15.247(e)	RSS-247 §5.2 b	Power Spectral Density	Compliant
§15.203	N/A	Antenna Requirement	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 Operating Frequencies

2400~2483.5 MHz

20MHz		40MHz	
CH	Freq. (MHz)	CH	Freq. (MHz)
1	2412	3	2422
2	2417	4	2427
3	2422	5	2432
4	2427	6	2437
5	2432	7	2442
6	2437	8	2447
7	2442	9	2452
8	2447		
9	2452		
10	2457		
11	2462		

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4.2 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
3. Investigation has been done on all the possible configurations for searching the worst case.

The given UE is pre-scanned among below modes.

Modulation		Transmission Chain								Single Transmission Spatial		Multi Transmission Spatial	
v	802.11 b	v	Ch0	v	Ch1		Ch2		Ch3		1TX	v	2TX
v	802.11 g	v	Ch0	v	Ch1		Ch2		Ch3		1TX	v	2TX
v	802.11 n	v	Ch0	v	Ch1		Ch2		Ch3		1TX	v	2TX
	802.11 ac		Ch0		Ch1		Ch2		Ch3		1TX		2TX
v	802.11 ax	v	Ch0	v	Ch1		Ch2		Ch3		1TX	v	2TX

4. Therefore, below summary is the modes of test configuration that yield the highest reading and generate the highest emission chosen to carry out the relevantly mandatory test items.

CONDUCTED TEST					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11b	1 to 11	1,2,3,4,5,6,7,8,9,10,11	DSSS	1	2TX
802.11g	1 to 11	1,2,3,4,5,6,7,8,9,10,11	OFDM	6	2TX
802.11n (HT20)	1 to 11	1,2,3,4,5,6,7,8,9,10,11	OFDM	MCS0	2TX
802.11n (HT40)	3 to 9	3,4,5,6,7,8,9	OFDM	MCS0	2TX

CONDUCTED TEST						
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	RU CONFIGURATION	DATA RATE (Mbps)	ANTENNA PORT
802.11ax (HE20)	1 to 11	1,2,3,4,5,6,7,8,9,10,11	OFDMA	FULL RU	MCS0	2TX
802.11ax (HE40)	3 to 9	3,4,5,6,7,8,9	OFDMA	FULL RU	MCS0	2TX

TRANSMIT RADIATED EMISSION TEST (BELOW 1 GHz)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11g	1 to 11	6	OFDM	6	2TX

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TRANSMIT RADIATED EMISSION TEST (ABOVE 1 GHz)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT
802.11b	1 to 11	1,6,11	DSSS	1	2TX
802.11g	1 to 11	1,4,6,8,11	OFDM	6	2TX
802.11n_HT20	1 to 11	1,4,6,8,11	OFDM	MCS0	2TX
802.11n_HT40	3 to 9	3,5,6,7,8,9	OFDM	MCS0	2TX

TRANSMIT RADIATED EMISSION TEST (ABOVE 1 GHz)						
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	RU CONFIGURATION	DATA RATE (Mbps)	ANTENNA PORT
802.11ax_HE20	1 to 11	1,4,6,8,10,11	OFDMA	FULL RU	MCS0	2TX
802.11ax_HE40	3 to 9	3,4,5,6,7,8,9	OFDMA	FULL RU	MCS0	2TX

Note:

The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.32 dB
Output Power measurement	+/- 1 dB
Emission Bandwidth	+/- 1.53 Hz
Conducted emission measurement	+/- 1.68 dB
Peak Power Density	+/- 2.16 dB
Temperature	+/- 0.7 °C
Humidity	+/- 3 %
DC / AC Power Source	+/- 1 %

Radiated Spurious Emission Measurement Uncertainty			
Polarization: Vertical	+/-	2.8 dB	9kHz~30MHz
	+/-	4.82 dB	30MHz - 1000MHz
	+/-	4.37 dB	1GHz - 18GHz
	+/-	4.21 dB	18GHz - 40GHz
Polarization: Horizontal	+/-	2.8 dB	9kHz~30MHz
	+/-	4.54 dB	30MHz - 1000MHz
	+/-	4.37 dB	1GHz - 18GHz
	+/-	4.21 dB	18GHz - 40GHz

Note:

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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6 MEASUREMENT EQUIPMENT USED

6.1 Emission from AC power line

AC Power-Line Conducted Emission Test Site: Conduction 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Software	Audix	e3	Ver. 9.210616	N.C.R	N.C.R
LISN	SCHWARZBECK	NSLK 8127	1040	09/06/2023	09/05/2024
Coaxial Cables	EMC Instruments Corp.	EMCCFD300-BM-BM-3000	161207	06/22/2023	06/21/2024
Pulse Limiter	SCHWARZBECK	VTSD 9561F-N	793	06/22/2023	06/21/2024
EMI Test Receiver	R&S	ESCI 7	100759	08/21/2023	08/20/2024

6.2 Conducted Measurement

Conducted Emission Test Site: Conducted 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY59071571	06/07/2023	06/06/2024
Test Software	SGS	Radio Test Software	Ver. 21	N.C.R	N.C.R
Power Meter	Anritsu	ML2496A	1804001	03/16/2023	03/15/2024
Power Sensor	Anritsu	MA2411B	1726104	03/16/2023	03/15/2024
Power Sensor	Anritsu	MA2411B	1726107	03/16/2023	03/15/2024
Attenuator	Mini-Circuits	BW-S10W2+	2	12/13/2022	12/12/2023
DC Block	Mini-Circuits	BLK-18-S+	1	12/13/2022	12/12/2023

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6.3 Radiated Measurement

Radiated Emission Test Site: SAC 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Loop Antenna	ETS.LINDGREN	6502	148045	10/13/2023	10/12/2024
Horn Antenna	RF SPIN	DRH0844	LE2D05A0844	07/03/2023	07/02/2024
Horn Antenna	SCHWARZBECK	BBHA9120D	D803	12/30/2022	12/29/2023
Bi-log Antenna	TESEO	CBL 6112D	35242 & AT-N0555	12/27/2022	12/26/2023
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY60242081	10/17/2023	10/16/2024
Test Software	Audix	e3	Ver. 9.210616	N.C.R	N.C.R
EMI Test Receiver	R&S	ESR 7	102525	02/18/2023	02/17/2024
Site Cal	SGS	SAC 1	N/A	08/31/2023	08/30/2024
Pre-Amplifier	EMCI	EMC184045B	980135	08/31/2023	08/30/2024
Pre-Amplifier	HP	8447D	2944A09469	08/31/2023	08/30/2024
Pre-Amplifier	EMCI	EMC118A45SEE	980933	07/31/2023	07/30/2024
Pre-Amplifier	HP	8447D	2944A09469	12/13/2022	12/12/2023
Bandreject Filter 2400-2483.5	EWT	EWT-14-0166	M1	12/13/2022	12/12/2023
3.2GHz High Pass Filter	WI	WHKX10-2624-80SS	3	12/13/2022	12/12/2023
7GHz High Pass Filter	WI	WHKX10-6090-80SS	4	12/13/2022	12/12/2023
Coaxial Cables	Huber Suhner	SUCOFLEX 102	RX Cable 18G-40G MY2630/2+805062 /2	08/31/2023	08/30/2024
Coaxial Cable	EMCI	EMC104-SM-SM-8000+EMC106-SM-SM-7600	RX Cable 9K-18G(160125+15081 7)	09/12/2023	09/11/2024
Coaxial Cable	EMCI	EMC104-SM-SM-8000+EMC106-SM-SM-7600	RX Cable 9K-18G(160125+15081 7)	09/12/2023	09/11/2024

NOTE: N.C.R refers to Not Calibrated Required.

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7 CONDUCTED EMISSION TEST

7.1 Standard Applicable

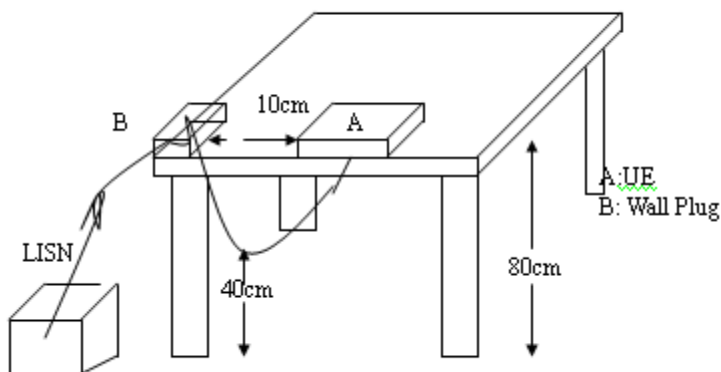
Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits (dBuV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

7.2 EUT Setup:

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

7.3 Test Setup



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7.4 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all phases of power being supplied by given UE are completed

7.5 Measurement Result

Note: Refer to next page for measurement data and plots.

Note2: The * reveals the worst-case results that closest to the limit.

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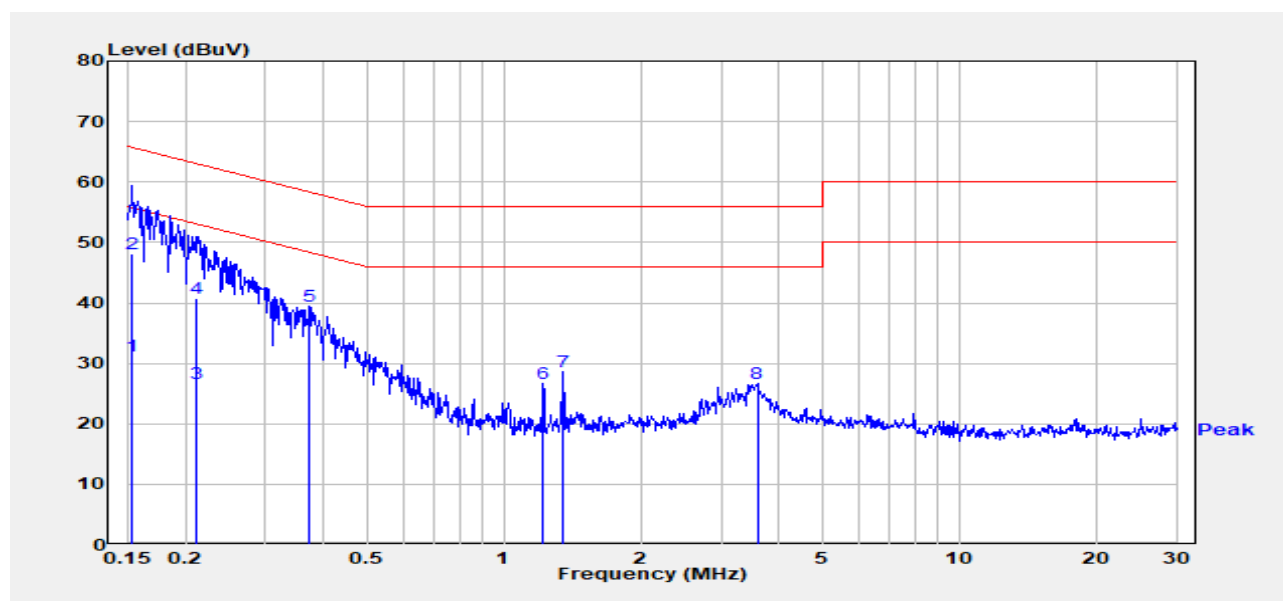
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AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number :TERF2310002604ER
Operation Mode :WLAN 2.4G
Power :120V/60Hz
Probe :L

Test Site :Conduction 1
Test Date :2023-11-21
Temp./Humi. :25.1°C/64%
Engineer :Cooper Hsu



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS		
	PK/QP/AV	dBuV	dB	dBuV	dBuV	dB
0.153	Average	21.10	10.13	31.23	55.82	-24.59
0.153	QP	38.00	10.13	48.13	65.82	-17.69
0.211	Average	16.60	10.13	26.73	53.18	-26.45
0.211	QP	30.60	10.13	40.73	63.18	-22.45
0.375	Peak	29.31	10.15	39.46	58.39	-18.92
1.223	Peak	16.46	10.20	26.65	56.00	-29.35
1.352	Peak	18.33	10.20	28.53	56.00	-27.47
3.603	Peak	16.39	10.28	26.67	56.00	-29.33

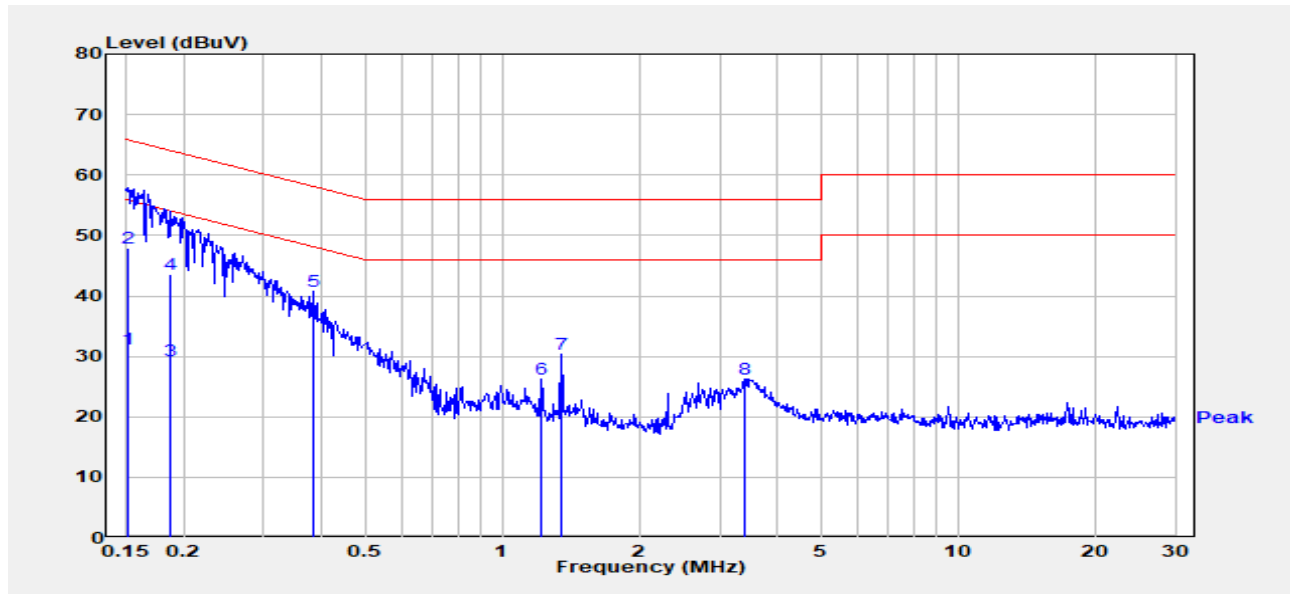
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Report Number :TERF2310002604ER
 Operation Mode :WLAN 2.4G
 Power :120V/60Hz
 Probe :N

Test Site :Conduction 1
 Test Date :2023-11-21
 Temp./Humi. :25.1°C/64%
 Engineer :Cooper Hsu



Freq.	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	Reading Level		FS		
MHz	PK/QP/AV	dB μ V	dB	dB μ V	dB μ V	dB
0.151	Average	21.00	10.12	31.12	55.96	-24.84
0.151	QP	37.80	10.12	47.92	65.96	-18.04
0.187	Average	19.20	10.12	29.32	54.15	-24.83
0.187	QP	33.40	10.12	43.52	64.15	-20.63
0.385	Peak	30.55	10.15	40.70	58.17	-17.47
1.223	Peak	15.99	10.19	26.18	56.00	-29.82
1.352	Peak	20.15	10.19	30.34	56.00	-25.66
3.417	Peak	16.06	10.28	26.33	56.00	-29.67

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8 PEAK OUTPUT POWER MEASUREMENT

8.1 Standard Applicable

8.1.1 Duty Cycle

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

8.1.2 FCC

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt.

If the transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of Antenna exceeds 6dBi.

8.1.3 ISED

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt and the e.i.r.p. shall not exceed 4 W (ISED only).

Note:

As per section F. 2). e). (ii) of FCC KDB 662911 D01

If antenna gains are not equal and each transmit antenna is driven by only one spatial stream, directional gain may be calculated by either of the following formulas.

$$\bullet \quad DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

NSS = the number of independent spatial streams of data;

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NANT = the total number of antennas

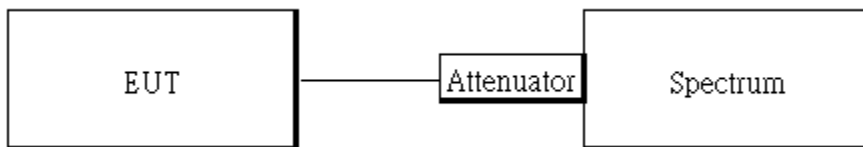
$g_{j,k} = 10^{G_k/20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

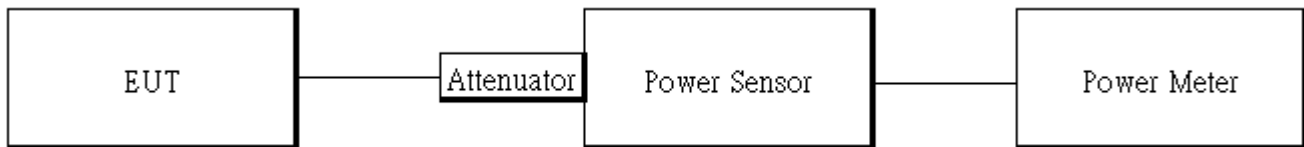
The antenna gain is greater than 6 dBi, therefore the power limit has been attenuated accordingly.

8.2 Test Setup

8.2.1 Duty Cycle



8.2.2 Output Power:



8.3 Measurement Procedure

8.3.1 Duty Cycle:

1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

8.3.2 Output Power

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance .
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.

Power Meter:

It is used as the auxiliary test equipment to conduct the output power measurement.

4. Record the max. Reading as observed from Spectrum or Power Meter.
5. MIMO mode: offset is set with “measure and add 10 Log (N)” to measurement for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna, cable loss is specified below.

*** Note: The duty cycle factor and below is compensated to obtain the maximum value of measurement in average.**

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8.4 Measurement Result

8.4.1 Duty Cycle:

	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11b	83.72	0.77	0.08	1.00
802.11g	94.46	0.25	0.51	1.00
802.11n_20	79.15	1.02	0.18	1.00
802.11n_40	79.68	0.99	0.18	1.00
802.11ax_20	79.63	0.99	0.18	1.00
802.11ax_40	79.44	1.00	0.18	1.00

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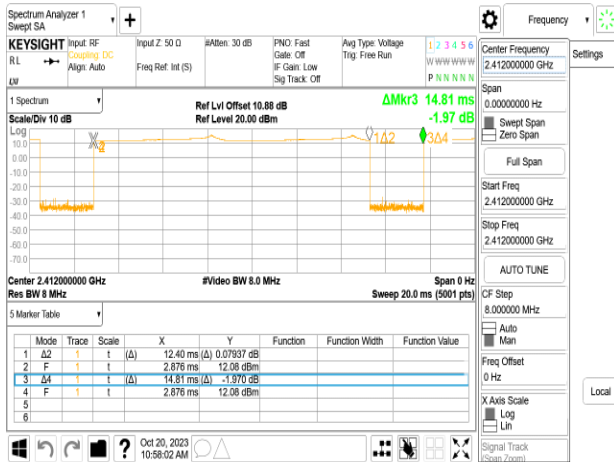
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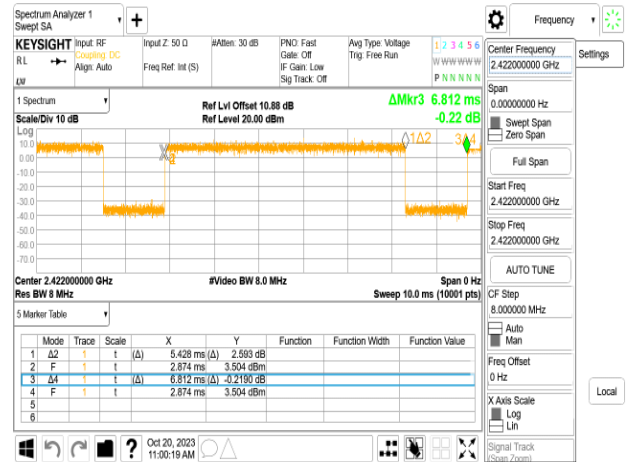
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8.4.2 Duty Cycle test plots

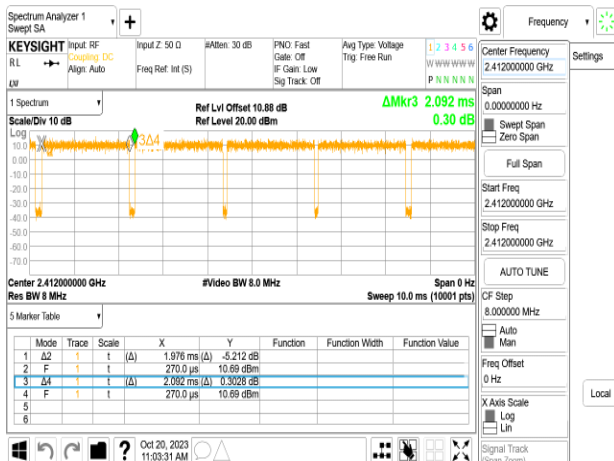
802.11b_20MHz_Chain0_2412MHz



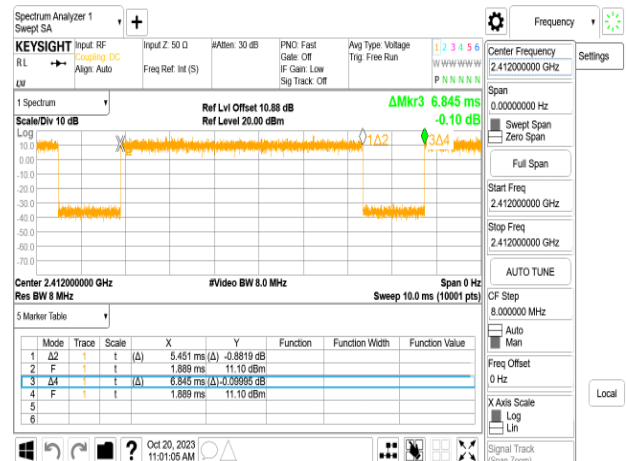
802.11n_40MHz_Chain0_2422MHz



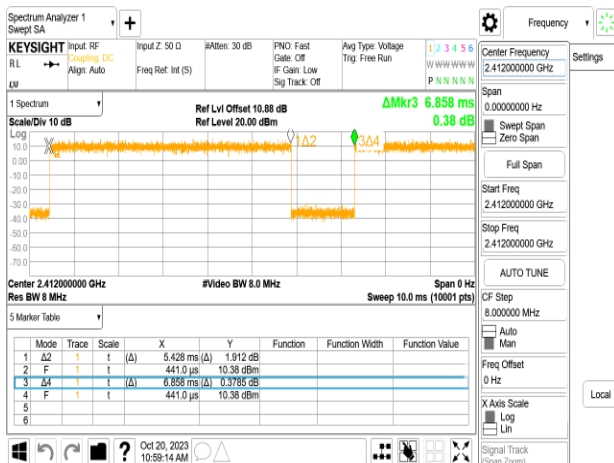
802.11g_20MHz_Chain0_2412MHz



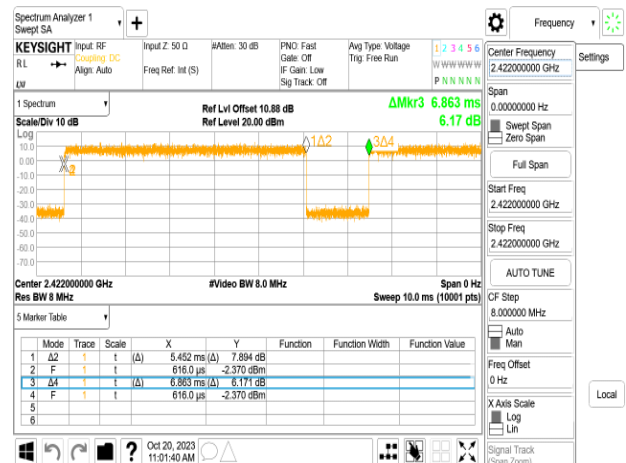
802.11ax_20MHz_Chain0_2412MHz



802.11n_20MHz_Chain0_2412MHz



802.11ax_40MHz_Chain0_2422MHz



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8.4.3 Output Power

802.11b_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
1	2412	1	18	18.86	20.38	22.70	29.81	PASS
2	2417	1	18	19.14	20.33	22.79	29.81	PASS
3	2422	1	18.5	19.87	20.94	23.45	29.81	PASS
4	2427	1	18	19.51	20.63	23.12	29.81	PASS
5	2432	1	18	19.66	20.75	23.25	29.81	PASS
6	2437	1	18	19.44	20.92	23.25	29.81	PASS
7	2442	1	18	19.33	20.87	23.18	29.81	PASS
8	2447	1	18	19.13	20.71	23.00	29.81	PASS
9	2452	1	18	18.98	20.26	22.68	29.81	PASS
10	2457	1	18	18.75	20.07	22.47	29.81	PASS
11	2462	1	18	18.82	20.20	22.57	29.81	PASS
802.11b_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
1	2412	1	18	17.07	17.95	20.54	29.81	PASS
2	2417	1	18	17.15	17.98	20.60	29.81	PASS
3	2422	1	18.5	17.58	18.34	20.99	29.81	PASS
4	2427	1	18	17.33	18.05	20.72	29.81	PASS
5	2432	1	18	17.34	18.22	20.81	29.81	PASS
6	2437	1	18	17.32	18.17	20.78	29.81	PASS
7	2442	1	18	17.35	18.24	20.83	29.81	PASS
8	2447	1	18	17.16	18.05	20.64	29.81	PASS
9	2452	1	18	17.20	17.99	20.62	29.81	PASS
10	2457	1	18	16.86	17.75	20.34	29.81	PASS
11	2462	1	18	16.94	17.78	20.39	29.81	PASS

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802.11g_2TX

CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
1	2412	6	14	19.37	20.80	23.15	29.81	PASS
2	2417	6	14	19.81	20.96	23.43	29.81	PASS
3	2422	6	14	19.89	21.18	23.59	29.81	PASS
4	2427	6	18.5	23.21	23.91	26.58	29.81	PASS
5	2432	6	18.5	23.33	24.17	26.78	29.81	PASS
6	2437	6	18	22.97	24.03	26.54	29.81	PASS
7	2442	6	18.5	22.93	24.18	26.61	29.81	PASS
8	2447	6	18.5	22.69	23.91	26.35	29.81	PASS
9	2452	6	14	19.72	21.21	23.54	29.81	PASS
10	2457	6	14.5	19.97	21.45	23.78	29.81	PASS
11	2462	6	14	19.64	21.18	23.49	29.81	PASS

802.11g_2TX

CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
1	2412	6	14	13.11	13.98	16.57	29.81	PASS
2	2417	6	14	13.15	14.04	16.63	29.81	PASS
3	2422	6	14	13.24	13.95	16.62	29.81	PASS
4	2427	6	18.5	17.46	18.38	20.95	29.81	PASS
5	2432	6	18.5	17.48	18.43	20.99	29.81	PASS
6	2437	6	18	17.06	17.89	20.50	29.81	PASS
7	2442	6	18.5	17.37	18.29	20.86	29.81	PASS
8	2447	6	18.5	17.29	18.23	20.79	29.81	PASS
9	2452	6	14	13.07	13.94	16.53	29.81	PASS
10	2457	6	14.5	13.29	14.21	16.78	29.81	PASS
11	2462	6	14	13.06	13.95	16.54	29.81	PASS

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802.11n_HT20M_2TX

CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
1	2412	MCS0	15	20.31	21.19	23.78	29.81	PASS
2	2417	MCS0	15	20.41	21.17	23.82	29.81	PASS
3	2422	MCS0	15	20.54	21.29	23.94	29.81	PASS
4	2427	MCS0	18.5	23.30	23.85	26.59	29.81	PASS
5	2432	MCS0	18.5	23.43	24.11	26.79	29.81	PASS
6	2437	MCS0	18.5	23.31	24.21	26.79	29.81	PASS
7	2442	MCS0	18.5	22.78	23.88	26.38	29.81	PASS
8	2447	MCS0	18.5	22.57	23.81	26.24	29.81	PASS
9	2452	MCS0	14.5	20.23	21.44	23.89	29.81	PASS
10	2457	MCS0	14.5	20.08	21.28	23.73	29.81	PASS
11	2462	MCS0	12	17.87	18.84	21.39	29.81	PASS

802.11n_HT20M_2TX

CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
1	2412	MCS0	15	13.49	14.31	16.93	29.81	PASS
2	2417	MCS0	15	13.54	14.18	16.88	29.81	PASS
3	2422	MCS0	15	13.46	14.08	16.79	29.81	PASS
4	2427	MCS0	18.5	17.28	17.97	20.64	29.81	PASS
5	2432	MCS0	18.5	17.36	18.00	20.70	29.81	PASS
6	2437	MCS0	18.5	17.25	18.03	20.66	29.81	PASS
7	2442	MCS0	18.5	17.38	18.25	20.84	29.81	PASS
8	2447	MCS0	18.5	17.17	18.03	20.63	29.81	PASS
9	2452	MCS0	14.5	13.35	14.28	16.85	29.81	PASS
10	2457	MCS0	14.5	13.27	14.13	16.73	29.81	PASS
11	2462	MCS0	12	10.46	11.31	13.91	29.81	PASS

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802.11n_HT40M_2TX

CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
3	2422	MCS0	12.5	19.48	19.89	22.70	29.81	PASS
4	2427	MCS0	13.5	20.39	20.95	23.69	29.81	PASS
5	2432	MCS0	15.5	21.72	22.38	25.07	29.81	PASS
6	2437	MCS0	15	21.27	22.03	24.68	29.81	PASS
7	2442	MCS0	13.5	20.05	20.74	23.42	29.81	PASS
8	2447	MCS0	11.5	18.14	18.66	21.42	29.81	PASS
9	2452	MCS0	9.5	15.92	16.80	19.39	29.81	PASS

802.11n_HT40M_2TX

CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				Ch0	Ch1			
3	2422	MCS0	12.5	11.96	12.17	15.07	29.81	PASS
4	2427	MCS0	13.5	13.07	13.28	16.18	29.81	PASS
5	2432	MCS0	15.5	14.57	15.30	17.96	29.81	PASS
6	2437	MCS0	15	14.05	14.86	17.48	29.81	PASS
7	2442	MCS0	13.5	12.85	13.17	16.02	29.81	PASS
8	2447	MCS0	11.5	10.76	11.09	13.93	29.81	PASS
9	2452	MCS0	9.5	8.48	9.14	11.83	29.81	PASS

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802.11ax_HE20M_2TX

CH	Freq. (MHz)	Data Rate	RU Config	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
					Ch0	Ch1			
1	2412	MCS0	full	14.5	20.72	21.62	24.20	29.81	PASS
2	2417	MCS0	full	14	20.73	21.54	24.16	29.81	PASS
3	2422	MCS0	full	14	20.85	21.70	24.31	29.81	PASS
4	2427	MCS0	full	18	23.45	23.99	26.74	29.81	PASS
5	2432	MCS0	full	18	23.65	24.26	26.98	29.81	PASS
6	2437	MCS0	full	18	23.51	24.40	26.99	29.81	PASS
7	2442	MCS0	full	18	23.56	24.44	27.03	29.81	PASS
8	2447	MCS0	full	18	23.08	24.01	26.58	29.81	PASS
9	2452	MCS0	full	14	20.78	21.64	24.24	29.81	PASS
10	2457	MCS0	full	14.5	21.17	22.02	24.63	29.81	PASS
11	2462	MCS0	full	11.5	18.35	19.25	21.83	29.81	PASS

802.11ax_HE20M_2TX

CH	Freq. (MHz)	Data Rate	RU Config	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
					Ch0	Ch1			
1	2412	MCS0	full	14.5	13.61	14.31	16.98	29.81	PASS
2	2417	MCS0	full	14	13.26	14.00	16.66	29.81	PASS
3	2422	MCS0	full	14	13.18	14.06	16.65	29.81	PASS
4	2427	MCS0	full	18	16.99	17.57	20.30	29.81	PASS
5	2432	MCS0	full	18	17.26	17.75	20.52	29.81	PASS
6	2437	MCS0	full	18	17.10	17.92	20.54	29.81	PASS
7	2442	MCS0	full	18	17.23	18.10	20.70	29.81	PASS
8	2447	MCS0	full	18	16.92	17.76	20.37	29.81	PASS
9	2452	MCS0	full	14	13.20	14.09	16.68	29.81	PASS
10	2457	MCS0	full	14.5	13.56	14.34	16.98	29.81	PASS
11	2462	MCS0	full	11.5	10.44	11.26	13.88	29.81	PASS

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802.11ax_HE40M_2TX

CH	Freq. (MHz)	Data Rate	RU Config	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
					Ch0	Ch1			
3	2422	MCS0	full	12.5	19.70	20.66	23.22	29.81	PASS
4	2427	MCS0	full	13.5	20.57	21.48	24.06	29.81	PASS
5	2432	MCS0	full	15	21.56	22.43	25.03	29.81	PASS
6	2437	MCS0	full	15	21.66	22.51	25.12	29.81	PASS
7	2442	MCS0	full	13.5	20.49	21.31	23.93	29.81	PASS
8	2447	MCS0	full	11	18.08	19.03	21.59	29.81	PASS
9	2452	MCS0	full	9.5	15.93	16.82	19.41	29.81	PASS

802.11ax_HE40M_2TX

CH	Freq. (MHz)	Data Rate	RU Config	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
					Ch0	Ch1			
3	2422	MCS0	full	12.5	11.94	12.73	15.36	29.81	PASS
4	2427	MCS0	full	13.5	13.01	13.86	16.47	29.81	PASS
5	2432	MCS0	full	15	14.10	14.98	17.57	29.81	PASS
6	2437	MCS0	full	15	14.97	14.18	17.60	29.81	PASS
7	2442	MCS0	full	13.5	12.62	13.54	16.11	29.81	PASS
8	2447	MCS0	full	11	10.16	11.06	13.64	29.81	PASS
9	2452	MCS0	full	9.5	8.45	9.13	11.81	29.81	PASS

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802.11b_2TX

CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			Ch0	Ch1					
1	2412	1	17.07	17.95	20.54	3.175	23.72	36	PASS
2	2417	1	17.15	17.98	20.60	3.175	23.77	36	PASS
3	2422	1	17.58	18.34	20.99	3.175	24.16	36	PASS
4	2427	1	17.33	18.05	20.72	3.175	23.89	36	PASS
5	2432	1	17.34	18.22	20.81	3.175	23.99	36	PASS
6	2437	1	17.32	18.17	20.78	3.175	23.95	36	PASS
7	2442	1	17.35	18.24	20.83	3.175	24.00	36	PASS
8	2447	1	17.16	18.05	20.64	3.175	23.81	36	PASS
9	2452	1	17.20	17.99	20.62	3.175	23.80	36	PASS
10	2457	1	16.86	17.75	20.34	3.175	23.51	36	PASS
11	2462	1	16.94	17.78	20.39	3.175	23.57	36	PASS

802.11g_2TX

CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			Ch0	Ch1					
1	2412	6	13.11	13.98	16.57	3.175	19.75	36	PASS
2	2417	6	13.15	14.04	16.63	3.175	19.80	36	PASS
3	2422	6	13.24	13.95	16.62	3.175	19.79	36	PASS
4	2427	6	17.46	18.38	20.95	3.175	24.13	36	PASS
5	2432	6	17.48	18.43	20.99	3.175	24.16	36	PASS
6	2437	6	17.06	17.89	20.50	3.175	23.68	36	PASS
7	2442	6	17.37	18.29	20.86	3.175	24.04	36	PASS
8	2447	6	17.29	18.23	20.79	3.175	23.97	36	PASS
9	2452	6	13.07	13.94	16.53	3.175	19.71	36	PASS
10	2457	6	13.29	14.21	16.78	3.175	19.96	36	PASS
11	2462	6	13.06	13.95	16.54	3.175	19.71	36	PASS

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802.11n_HT20M_2TX

CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			Ch0	Ch1					
1	2412	MCS0	13.49	14.31	16.93	3.175	20.10	36	PASS
2	2417	MCS0	13.54	14.18	16.88	3.175	20.05	36	PASS
3	2422	MCS0	13.46	14.08	16.79	3.175	19.96	36	PASS
4	2427	MCS0	17.28	17.97	20.64	3.175	23.82	36	PASS
5	2432	MCS0	17.36	18.00	20.70	3.175	23.87	36	PASS
6	2437	MCS0	17.25	18.03	20.66	3.175	23.84	36	PASS
7	2442	MCS0	17.38	18.25	20.84	3.175	24.02	36	PASS
8	2447	MCS0	17.17	18.03	20.63	3.175	23.80	36	PASS
9	2452	MCS0	13.35	14.28	16.85	3.175	20.02	36	PASS
10	2457	MCS0	13.27	14.13	16.73	3.175	19.90	36	PASS
11	2462	MCS0	10.46	11.31	13.91	3.175	17.09	36	PASS

802.11n_HT40M_2TX

CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			Ch0	Ch1					
3	2422	MCS0	11.96	12.17	15.07	3.175	18.25	36	PASS
4	2427	MCS0	13.07	13.28	16.18	3.175	19.36	36	PASS
5	2432	MCS0	14.57	15.30	17.96	3.175	21.13	36	PASS
6	2437	MCS0	14.05	14.86	17.48	3.175	20.66	36	PASS
7	2442	MCS0	12.85	13.17	16.02	3.175	19.19	36	PASS
8	2447	MCS0	10.76	11.09	13.93	3.175	17.11	36	PASS
9	2452	MCS0	8.48	9.14	11.83	3.175	15.00	36	PASS

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802.11ax_HE20M_2TX

CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
				Ch0	Ch1					
1	2412	MCS0	full	13.61	14.31	16.98	3.175	20.16	36	PASS
2	2417	MCS0	full	13.26	14.00	16.66	3.175	19.83	36	PASS
3	2422	MCS0	full	13.18	14.06	16.65	3.175	19.83	36	PASS
4	2427	MCS0	full	16.99	17.57	20.30	3.175	23.47	36	PASS
5	2432	MCS0	full	17.26	17.75	20.52	3.175	23.70	36	PASS
6	2437	MCS0	full	17.10	17.92	20.54	3.175	23.71	36	PASS
7	2442	MCS0	full	17.23	18.10	20.70	3.175	23.87	36	PASS
8	2447	MCS0	full	16.92	17.76	20.37	3.175	23.54	36	PASS
9	2452	MCS0	full	13.20	14.09	16.68	3.175	19.85	36	PASS
10	2457	MCS0	full	13.56	14.34	16.98	3.175	20.15	36	PASS
11	2462	MCS0	full	10.44	11.26	13.88	3.175	17.05	36	PASS

802.11ax_HE40M_2TX

CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
				Ch0	Ch1					
3	2422	MCS0	full	11.94	12.73	15.36	3.175	18.54	36	PASS
4	2427	MCS0	full	13.01	13.86	16.47	3.175	19.64	36	PASS
5	2432	MCS0	full	14.10	14.98	17.57	3.175	20.75	36	PASS
6	2437	MCS0	full	14.97	14.18	17.60	3.175	20.78	36	PASS
7	2442	MCS0	full	12.62	13.54	16.11	3.175	19.29	36	PASS
8	2447	MCS0	full	10.16	11.06	13.64	3.175	16.82	36	PASS
9	2452	MCS0	full	8.45	9.13	11.81	3.175	14.99	36	PASS

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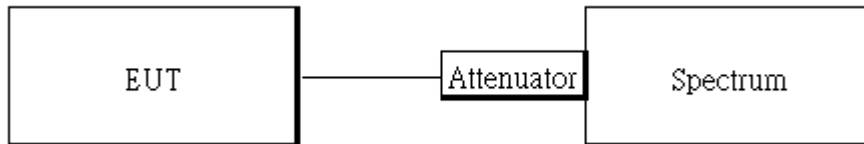
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9 EMISSION BANDWIDTH MEASUREMENT

9.1 Standard Applicable

The minimum 6 dB bandwidth shall be at least 500 kHz.

9.2 Test Setup



9.3 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

9.3.1 6dB BW measurements

1. The testing follows the Measurement Procedure of the KDB 558074 D01.
2. Set the spectrum analyzer as
RBW= 100 kHz ,
VBW = 3 X RBW,
Span= 2 to 5 times of the OBW,
Sweep=auto, Detector = Peak, and Max hold.
3. Mark the upper and lower frequencies of -6dB.
4. Repeat above procedures until all test default channel is completed.

9.3.2 99% BW measurements

1. The testing follows the Measurement Procedure of the RSS-Gen section 6.7.
2. Set the spectrum analyzer as
RBW= 1 % to 5% of 99%,
VBW \geq 3 X RBW,
Span= large enough to capture all products of the modulation process
Sweep=auto, Detector = Peak, and Max hold.
3. Mark the upper and lower frequencies of 99%.
4. Repeat above procedures until all test default channel is completed.

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9.4 Measurement Result:

9.4.1 6dB BW measurements

802.11b Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	8118.00	≥ 500	PASS
2437	7638.00	≥ 500	PASS
2462	8035.00	≥ 500	PASS

802.11b Ch1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	8135.00	≥ 500	PASS
2437	7640.00	≥ 500	PASS
2462	8023.00	≥ 500	PASS

802.11g Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	16330.00	≥ 500	PASS
2437	15610.00	≥ 500	PASS
2462	16320.00	≥ 500	PASS

802.11g Ch1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	15970.00	≥ 500	PASS
2437	15540.00	≥ 500	PASS
2462	16070.00	≥ 500	PASS

802.11n_HT_20M Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	16510.00	≥ 500	PASS
2437	16460.00	≥ 500	PASS
2462	16470.00	≥ 500	PASS

802.11n_HT_20M Ch1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	16470.00	≥ 500	PASS
2437	16470.00	≥ 500	PASS
2462	16490.00	≥ 500	PASS

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802.11n_HT_40M Ch0

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2422	35710.00	≥ 500	PASS
2437	35090.00	≥ 500	PASS
2452	35530.00	≥ 500	PASS

802.11n_HT_40M Ch1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2422	36370.00	≥ 500	PASS
2437	35190.00	≥ 500	PASS
2452	33850.00	≥ 500	PASS

802.11ax_HE_20M Ch0

Freq. (MHz)	RU Config	6dB BW (kHz)	Limit (kHz)	Result
2412	full	18960.00	≥ 500	PASS
2437	full	18290.00	≥ 500	PASS
2462	full	18810.00	≥ 500	PASS

802.11ax_HE_20M Ch1

Freq. (MHz)	RU Config	6dB BW (kHz)	Limit (kHz)	Result
2412	full	18590.00	≥ 500	PASS
2437	full	18240.00	≥ 500	PASS
2462	full	18740.00	≥ 500	PASS

802.11ax_HE_40M Ch0

Freq. (MHz)	RU Config	6dB BW (kHz)	Limit (kHz)	Result
2422	full	37820.00	≥ 500	PASS
2437	full	37220.00	≥ 500	PASS
2452	full	37930.00	≥ 500	PASS

802.11ax_HE_40M Ch1

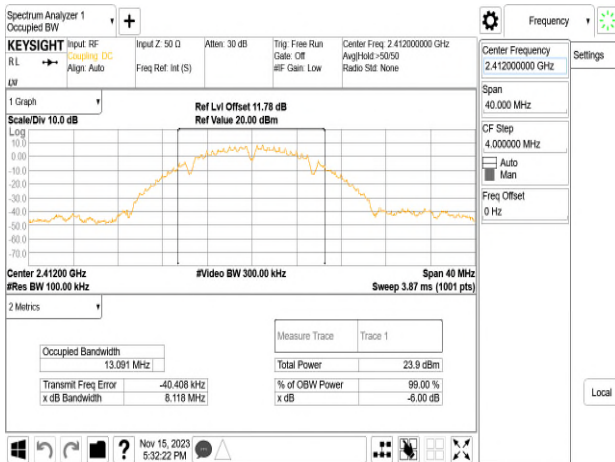
Freq. (MHz)	RU Config	6dB BW (kHz)	Limit (kHz)	Result
2422	full	38070.00	≥ 500	PASS
2437	full	36470.00	≥ 500	PASS
2452	full	35720.00	≥ 500	PASS

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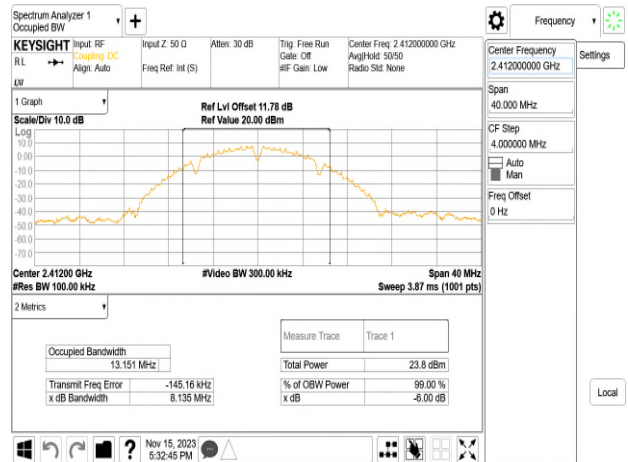
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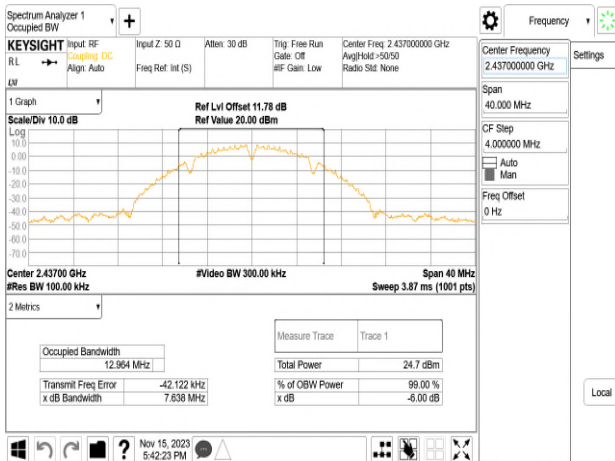
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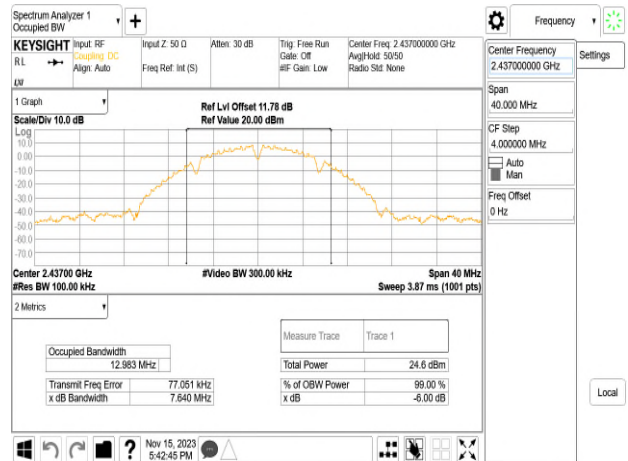
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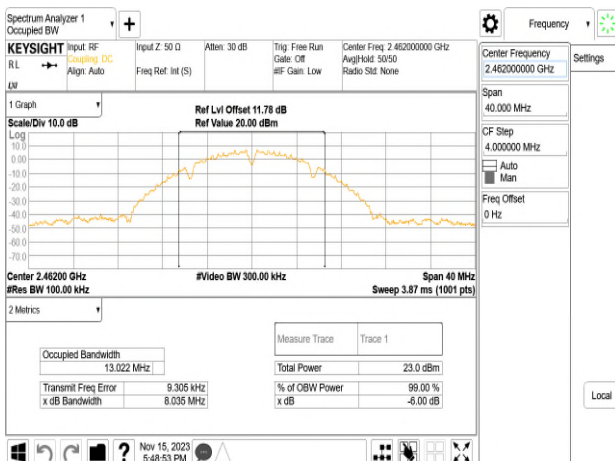
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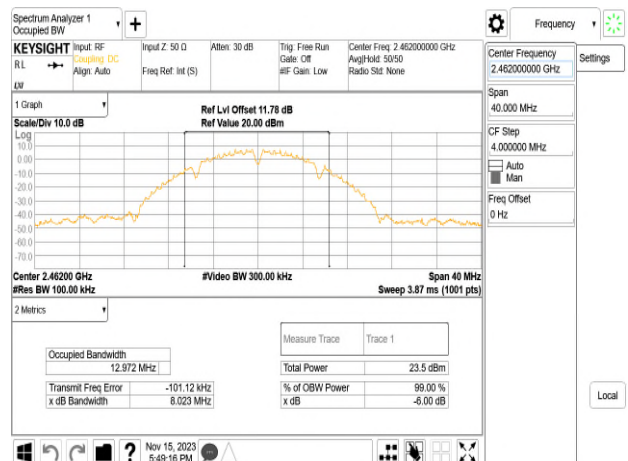
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802.11b_20MHz_Chain0_2462MHz



802.11b_20MHz_Chain1_2462MHz

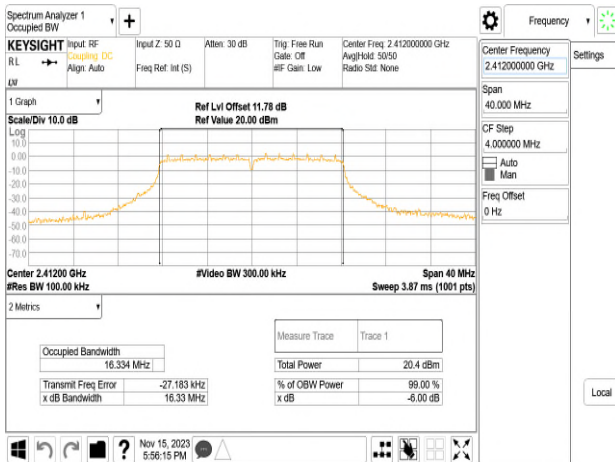


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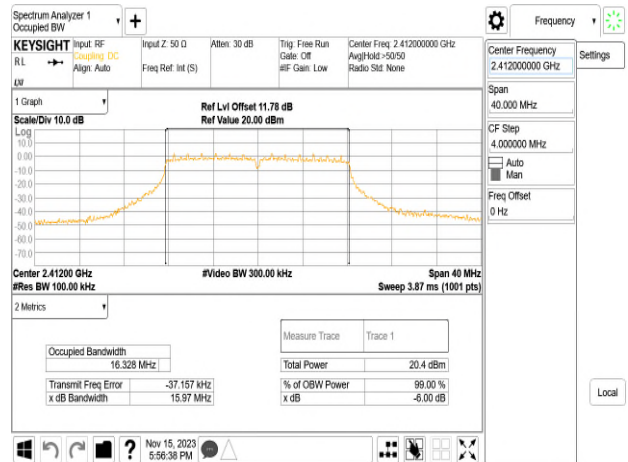
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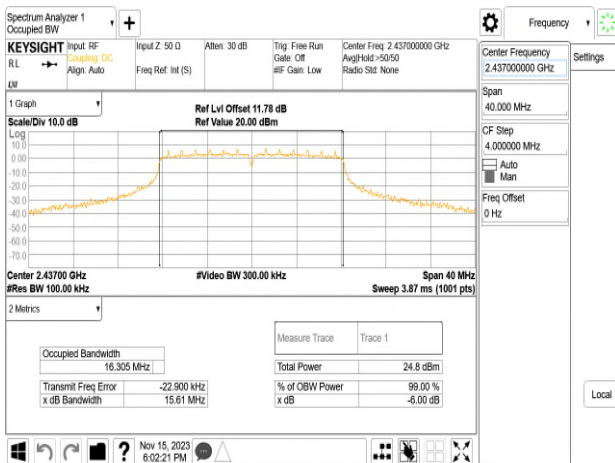
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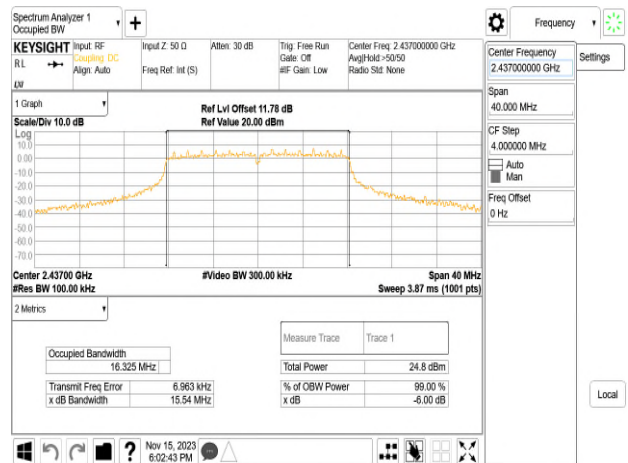
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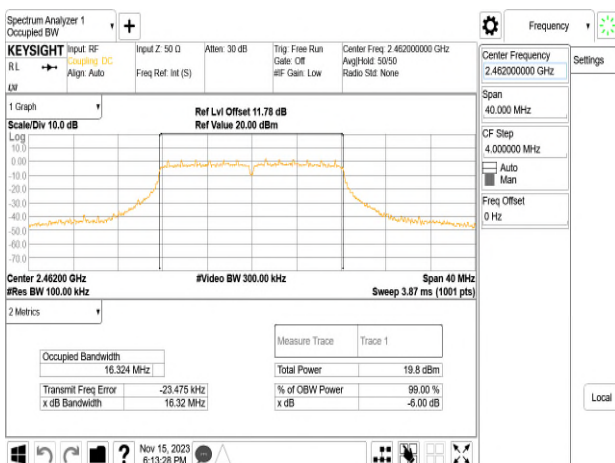
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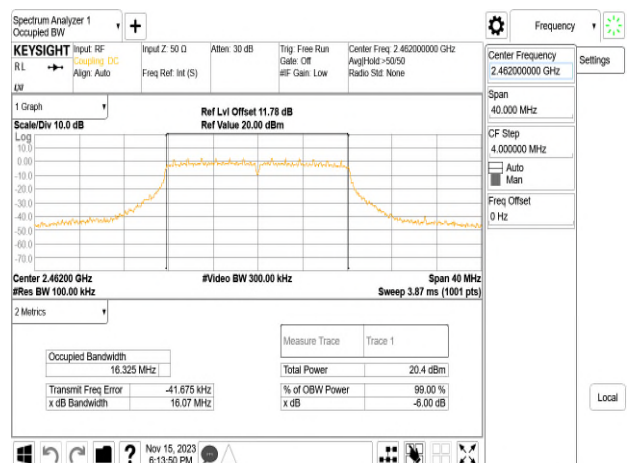
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802.11g_20MHz_Chain1_2462MHz

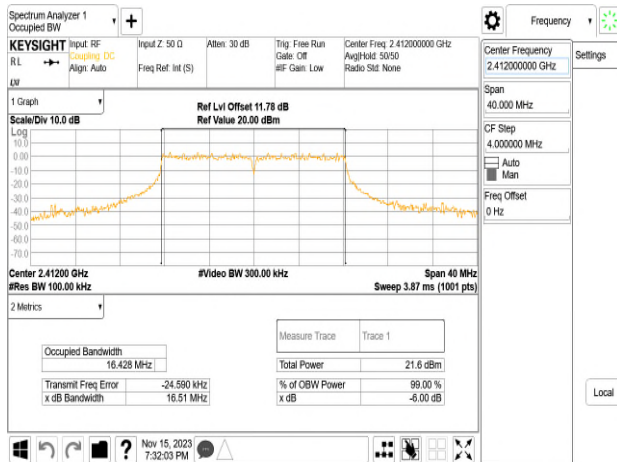


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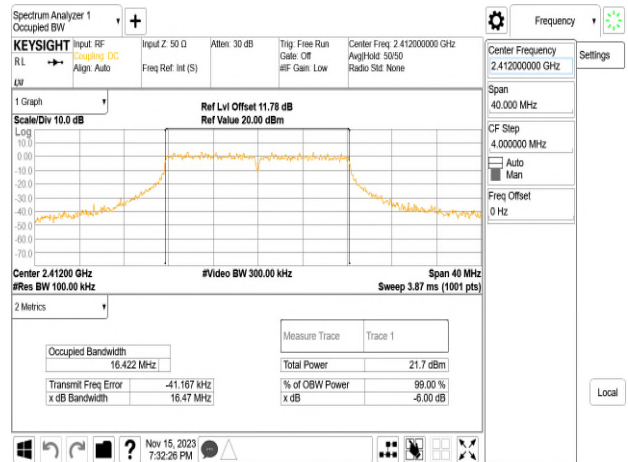
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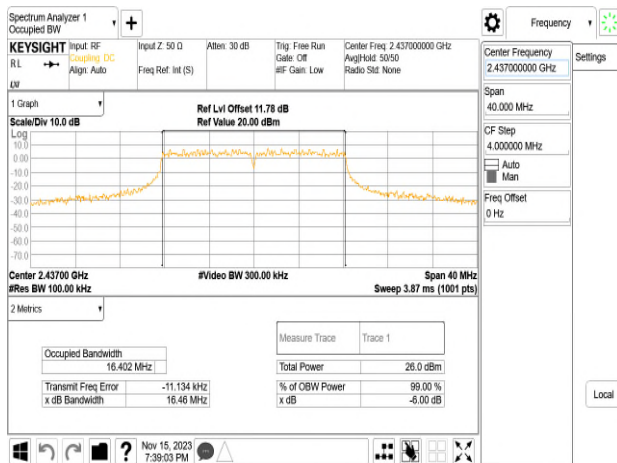
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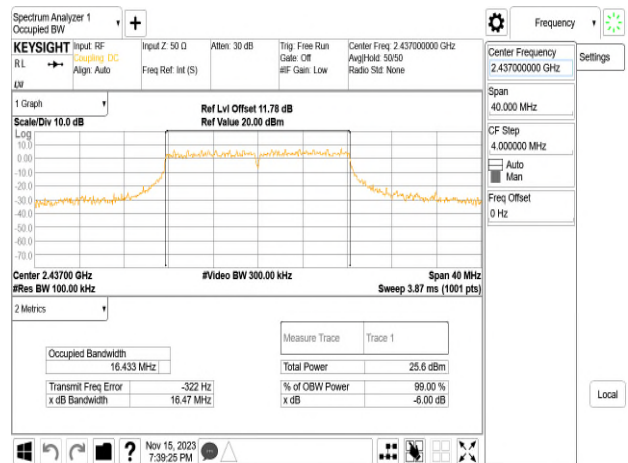
802.11n_20MHz_Chain1_2412MHz



802.11n_20MHz_Chain0_2437MHz



802.11n_20MHz_Chain1_2437MHz



802.11n_20MHz_Chain0_2462MHz



802.11n_20MHz_Chain1_2462MHz

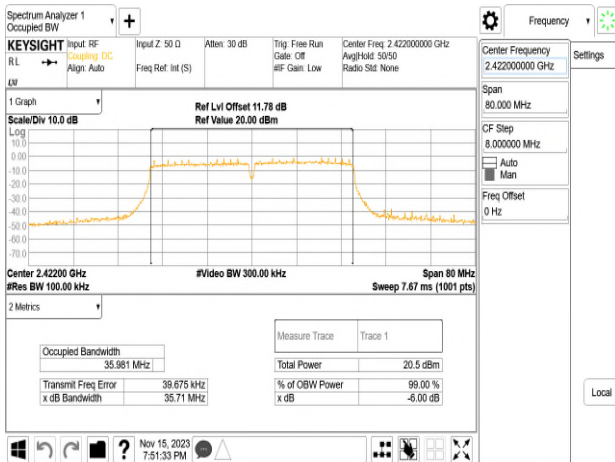


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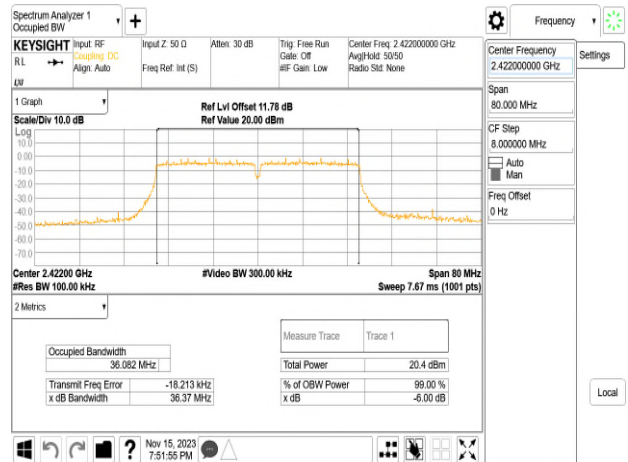
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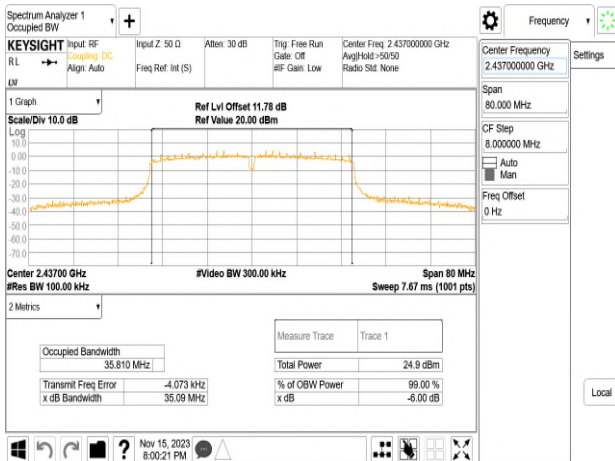
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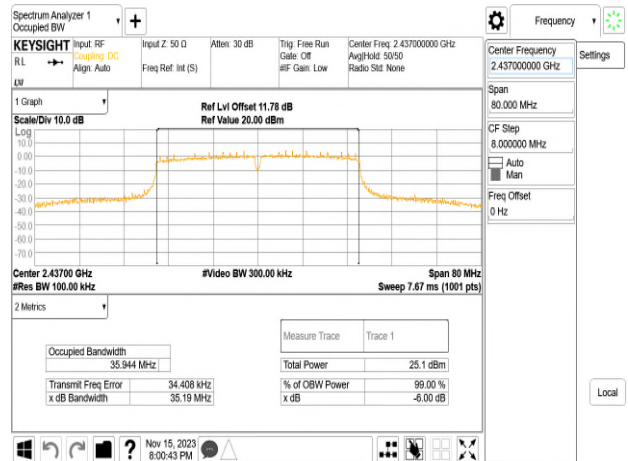
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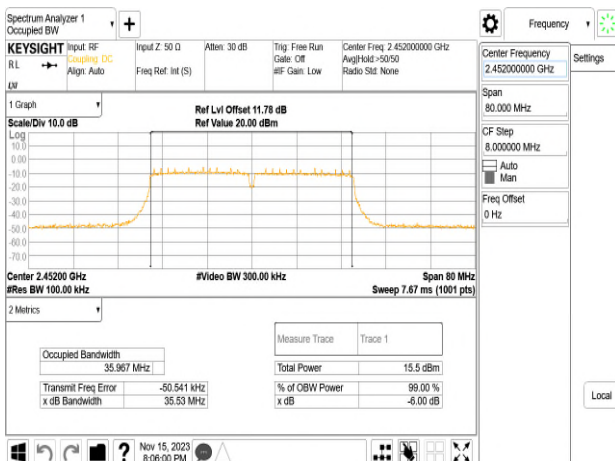
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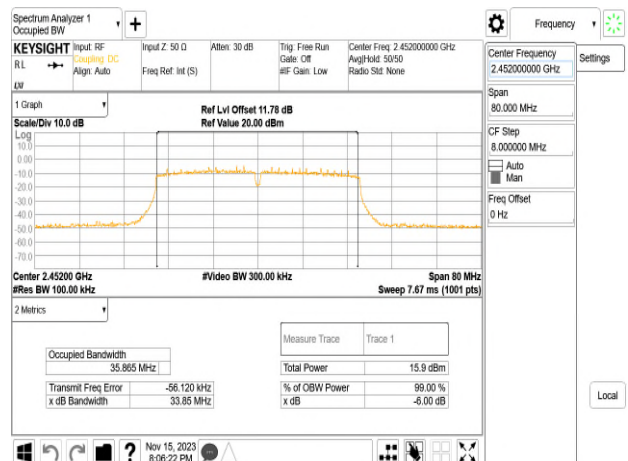
802.11n_40MHz_Chain1_2437MHz



802.11n_40MHz_Chain0_2452MHz



802.11n_40MHz_Chain1_2452MHz

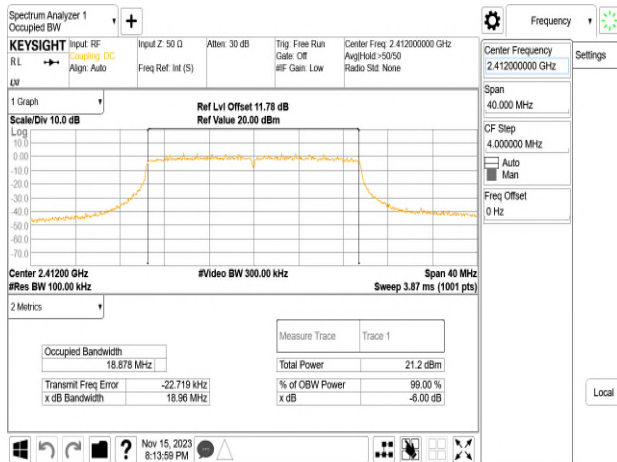


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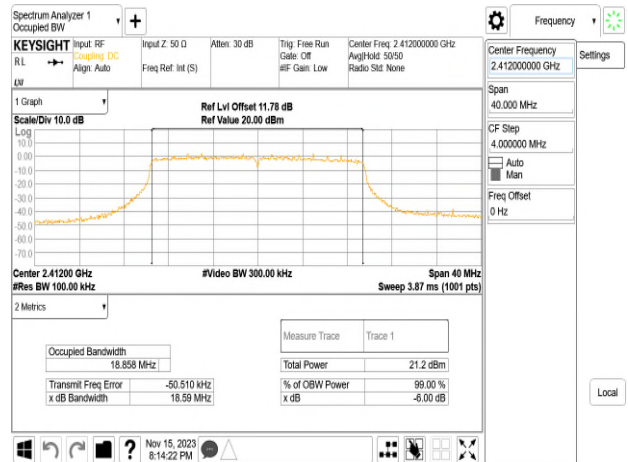
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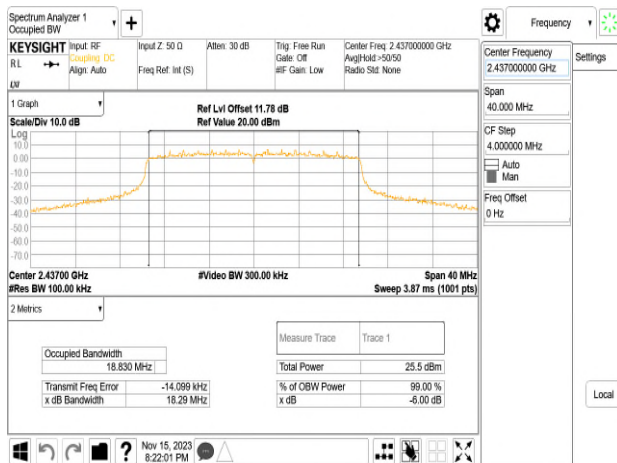
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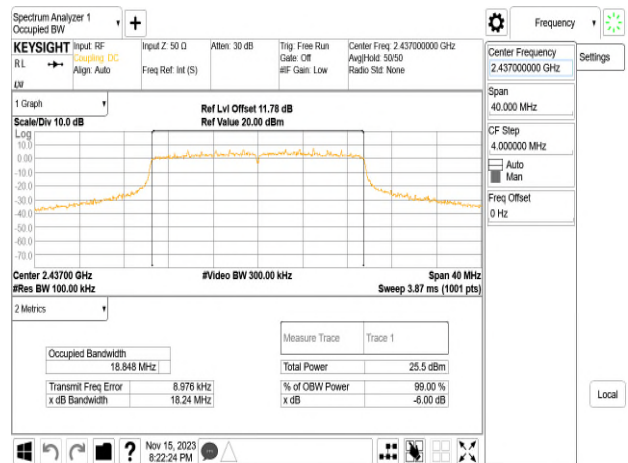
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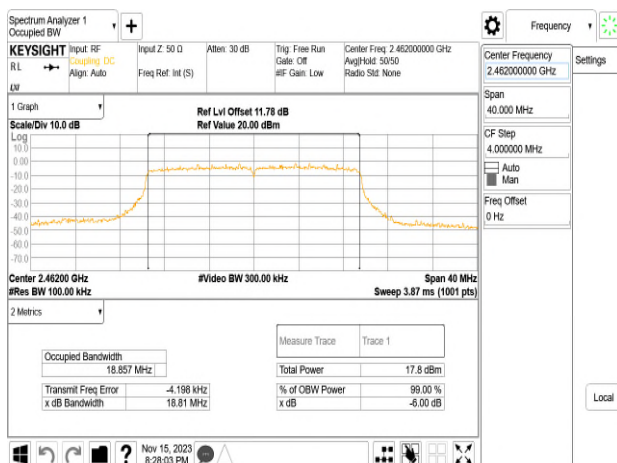
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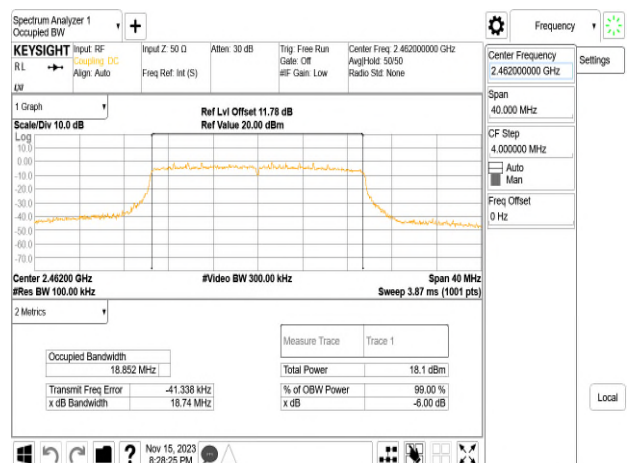
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802.11ax_20MHz_Chain0_2462MHz



802.11ax_20MHz_Chain1_2462MHz

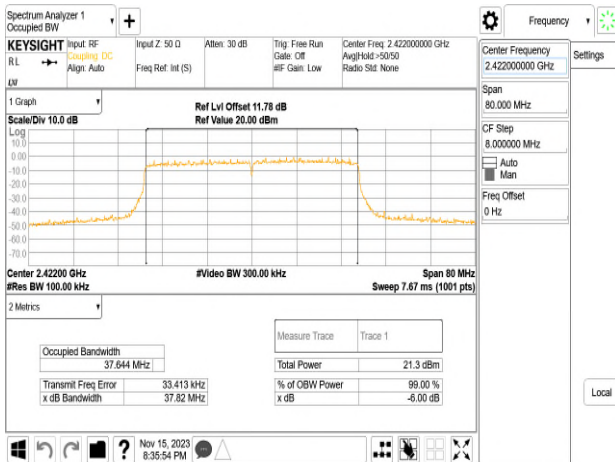


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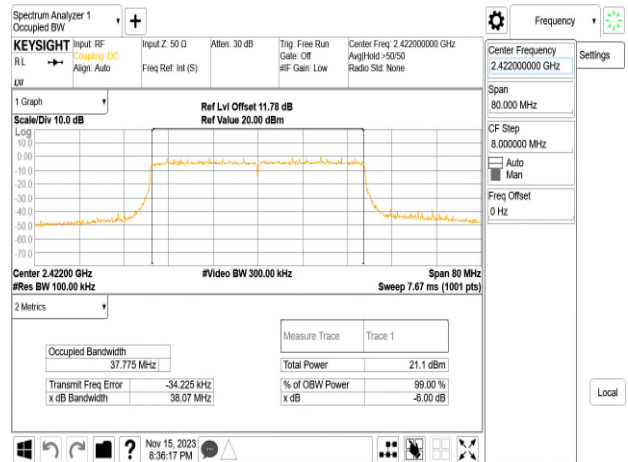
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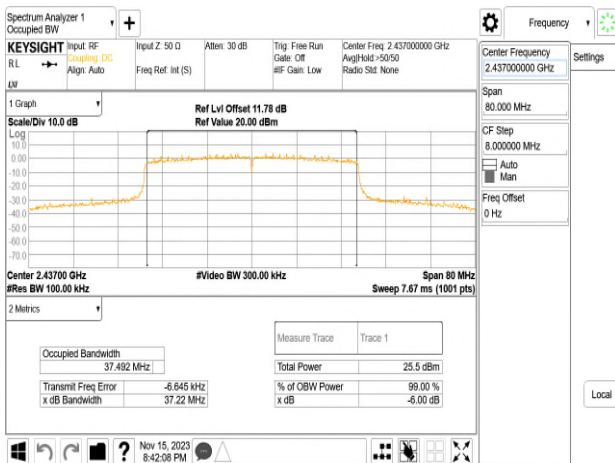
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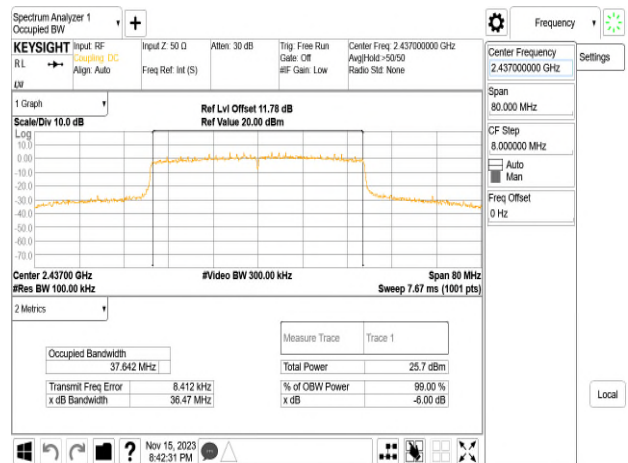
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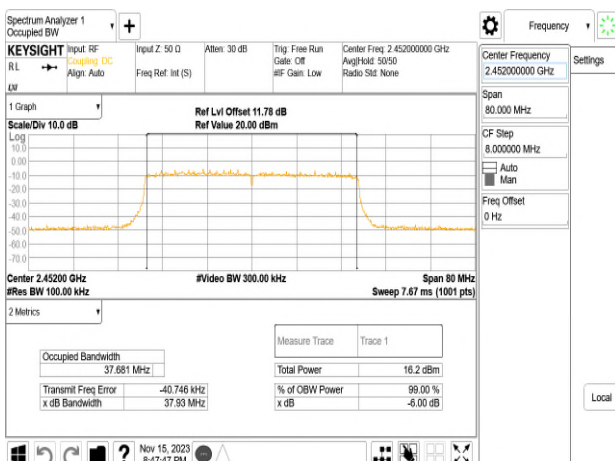
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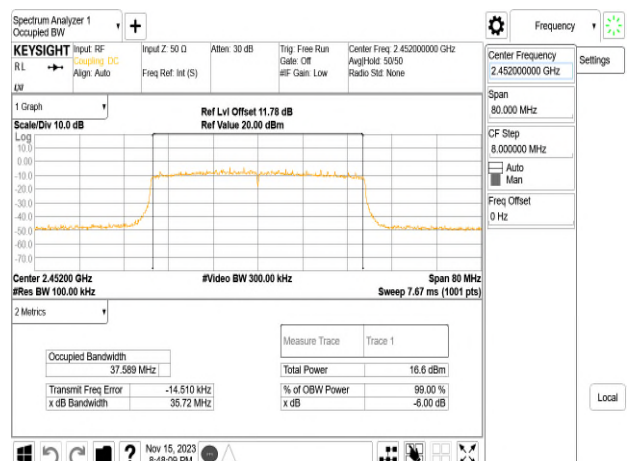
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802.11ax_40MHz_Chain0_2452MHz



802.11ax_40MHz_Chain1_2452MHz



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9.4.2 99% Bandwidth

802.11b Ch0

Freq. (MHz)	99% BW (MHz)
2412	13.24
2437	12.984
2462	13.044

802.11b Ch1

Freq. (MHz)	99% BW (MHz)
2412	13.247
2437	13.002
2462	13.06

802.11g Ch0

Freq. (MHz)	99% BW (MHz)
2412	16.423
2437	16.382
2462	16.388

802.11g Ch1

Freq. (MHz)	99% BW (MHz)
2412	16.382
2437	16.386
2462	16.366

802.11n_HT20M Ch0

Freq. (MHz)	99% BW (MHz)
2412	16.67
2437	16.622
2462	16.654

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802.11n_HT20M Ch1

Freq. (MHz)	99% BW (MHz)
2412	16.638
2437	16.705
2462	16.678

802.11n_HT40M Ch0

Freq. (MHz)	99% BW (MHz)
2422	36.009
2437	35.85
2452	36.045

802.11n_HT40M Ch1

Freq. (MHz)	99% BW (MHz)
2422	36.117
2437	35.98
2452	35.87

802.11ax_HE20M Ch0

Freq. (MHz)	RU Config	99% BW (MHz)
2412	full	18.924
2437	full	18.887
2462	full	18.913

802.11ax_HE20M Ch1

Freq. (MHz)	RU Config	99% BW (MHz)
2412	full	18.904
2437	full	18.874
2462	full	18.872

802.11ax_HE40M Ch0

Freq. (MHz)	RU Config	99% BW (MHz)
2422	full	37.705
2437	full	37.572
2452	full	37.695

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802.11ax_HE40M Ch1

Freq. (MHz)	RU Config	99% BW (MHz)
2422	full	37.819
2437	full	37.649
2452	full	37.59

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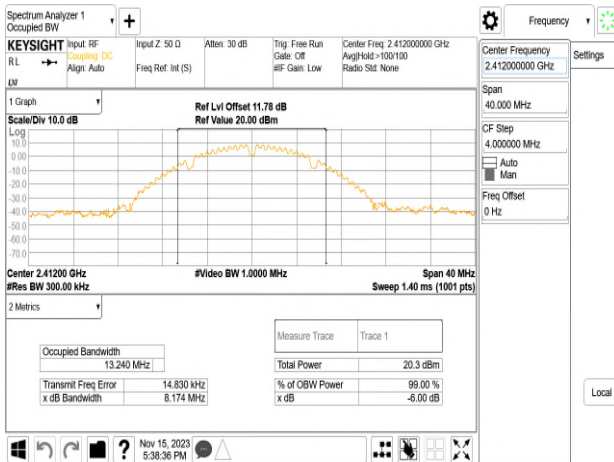
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f (886-2) 2298-0488

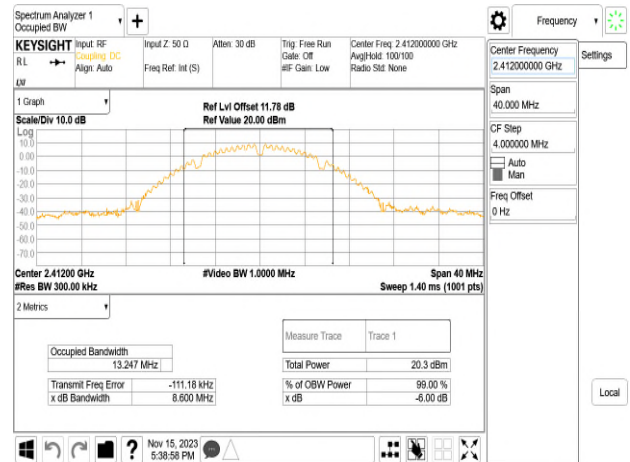
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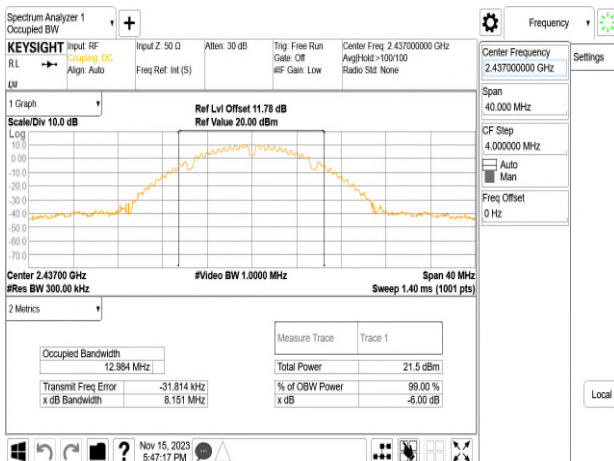
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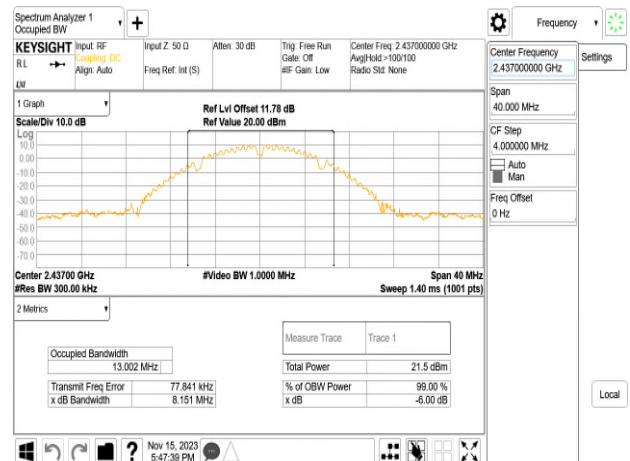
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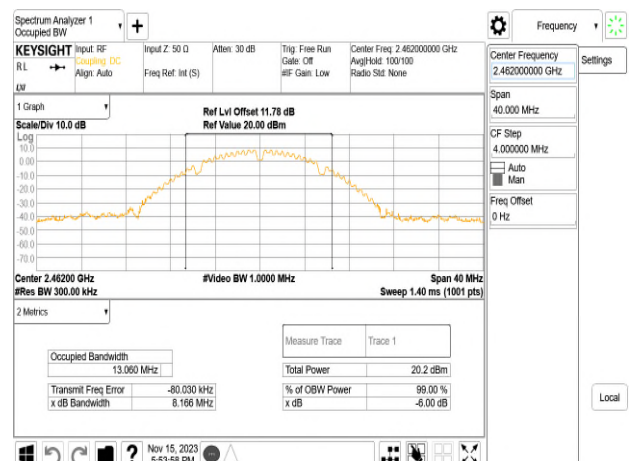
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802.11b_20MHz_Chain0_2462MHz



802.11b_20MHz_Chain1_2462MHz

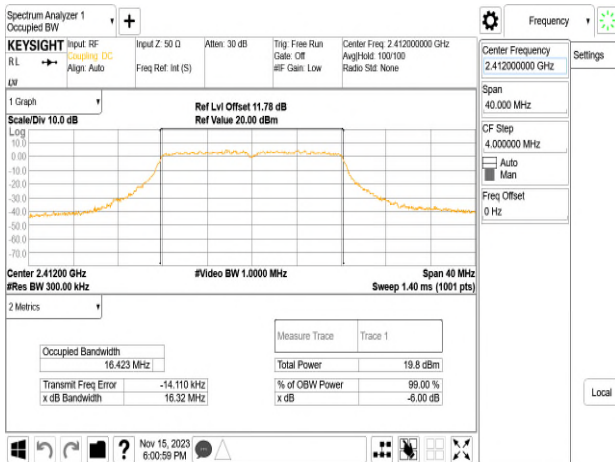


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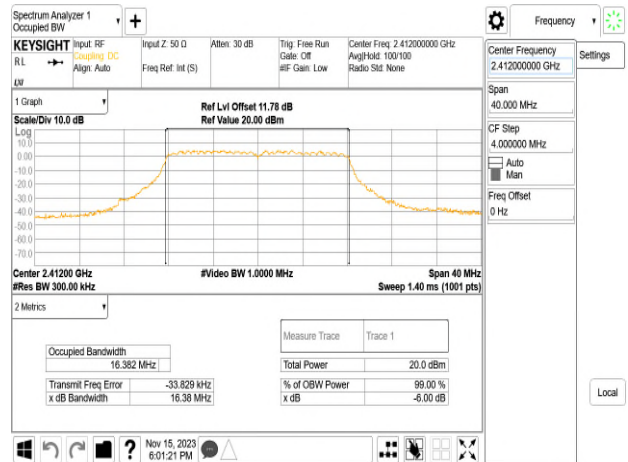
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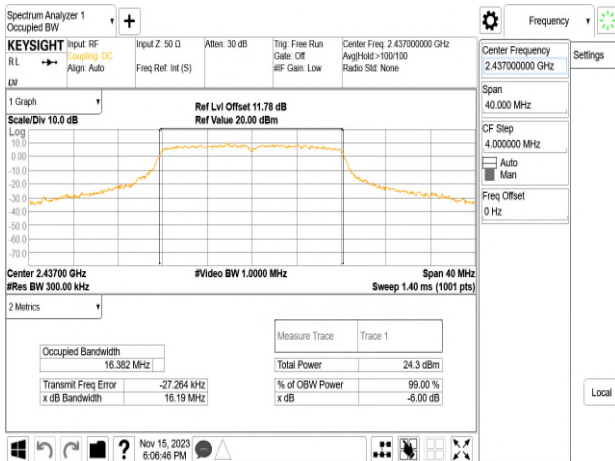
802.11g_20MHz_Chain0_2412MHz



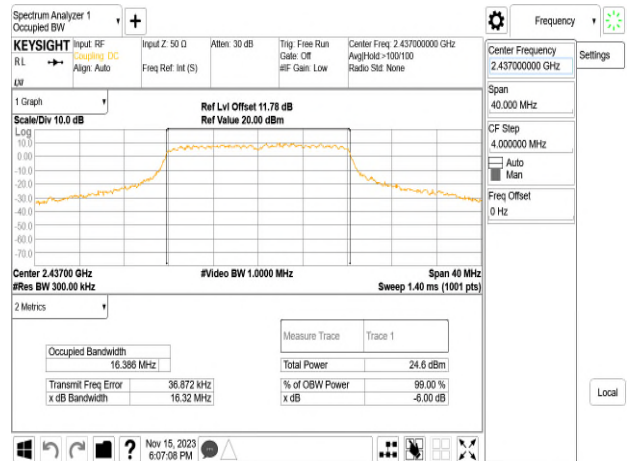
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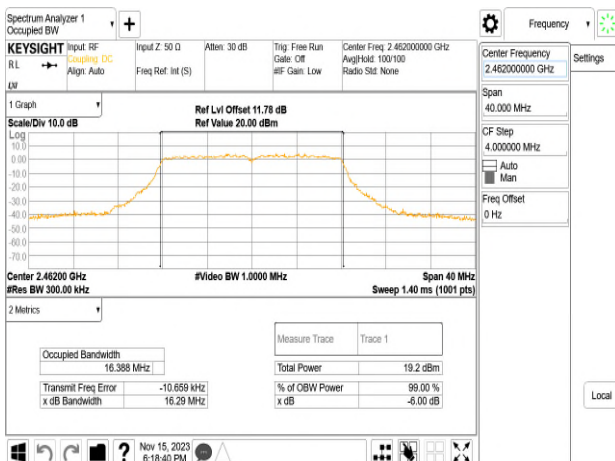
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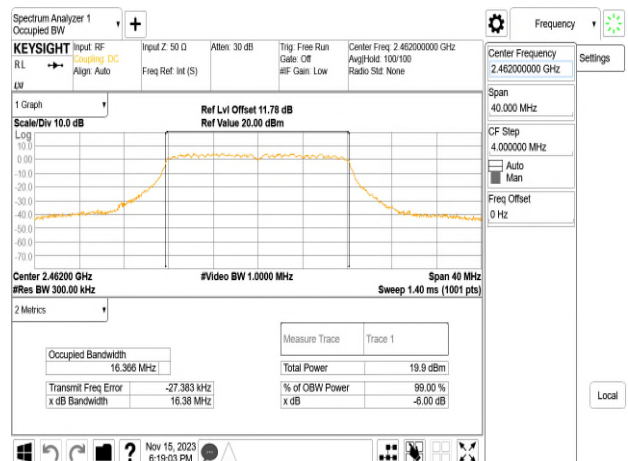
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802.11g_20MHz_Chain0_2462MHz



802.11g_20MHz_Chain1_2462MHz

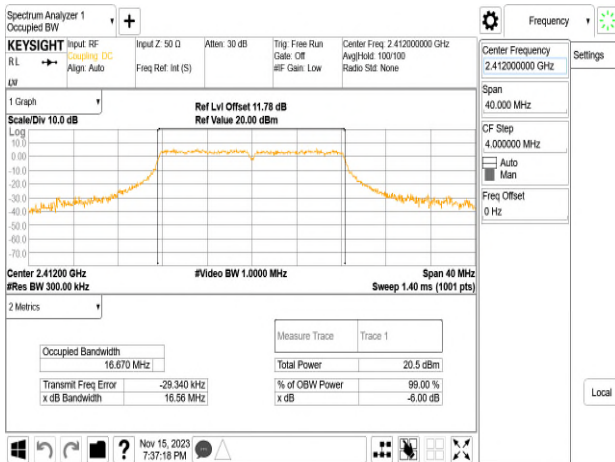


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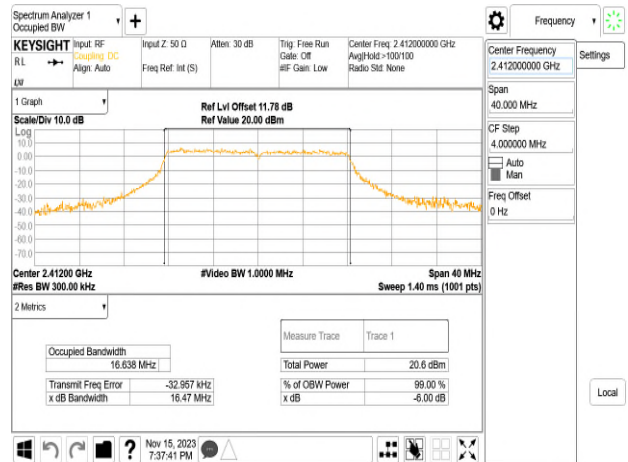
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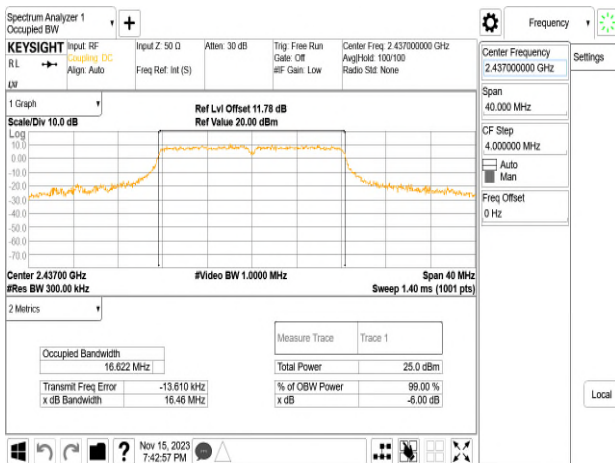
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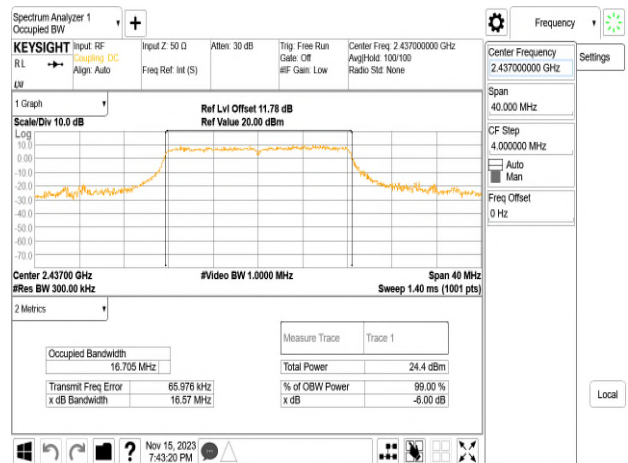
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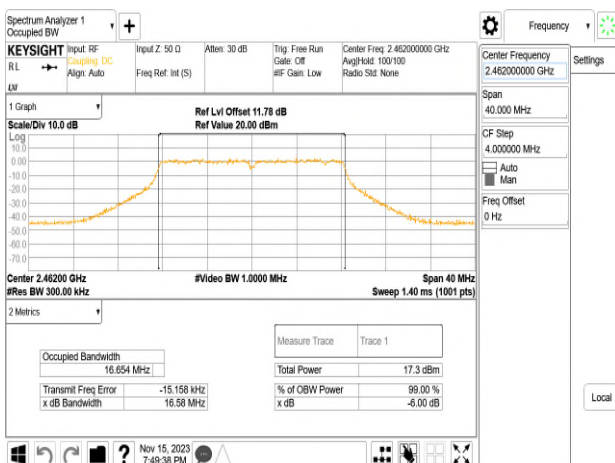
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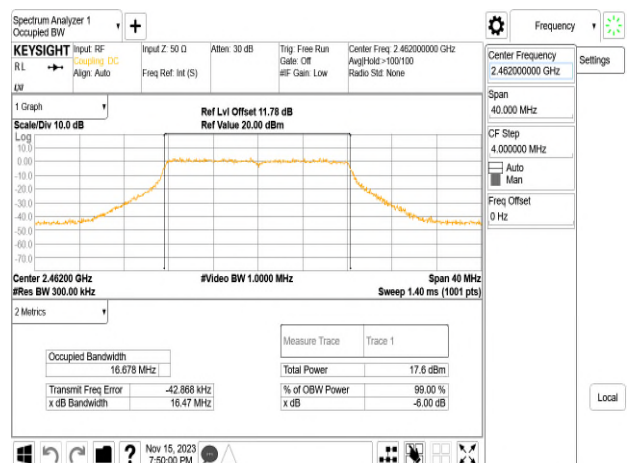
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802.11n_20MHz_Chain0_2462MHz



802.11n_20MHz_Chain1_2462MHz

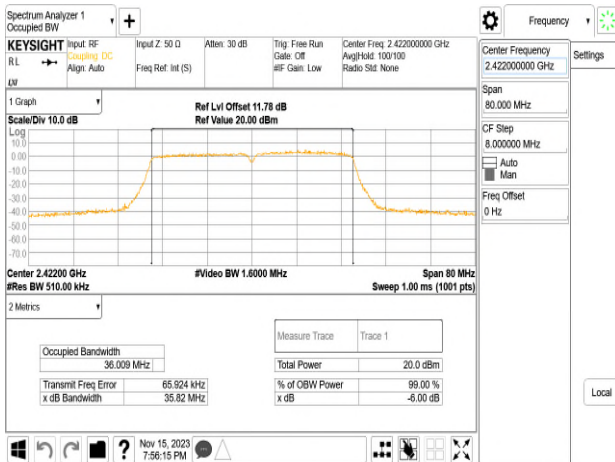


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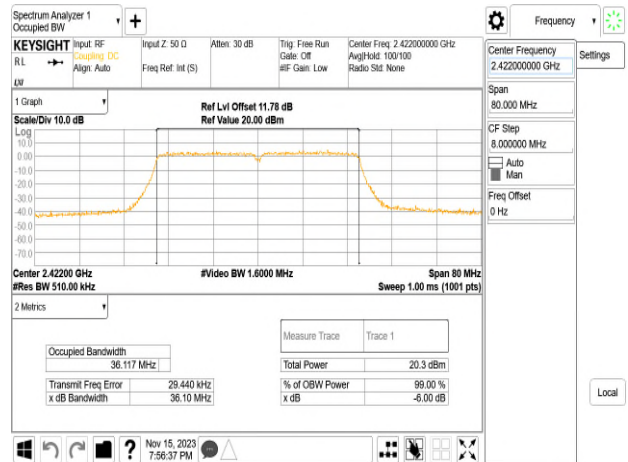
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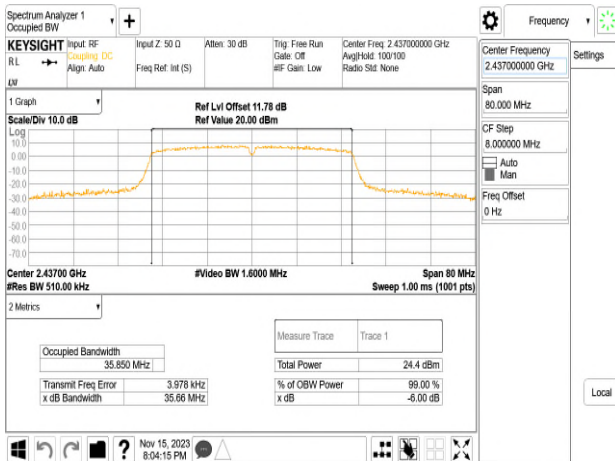
802.11n_40MHz_Chain0_2422MHz



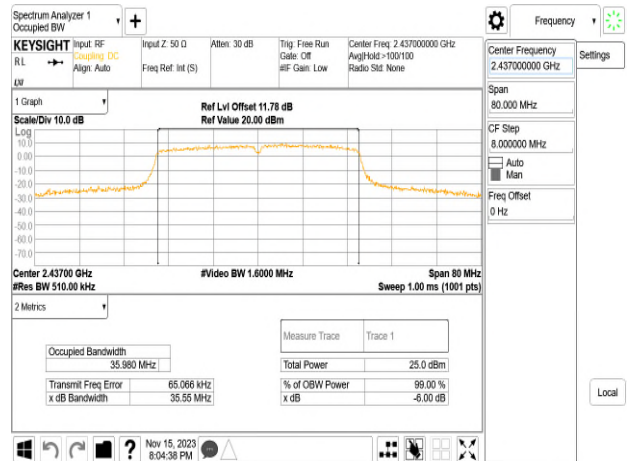
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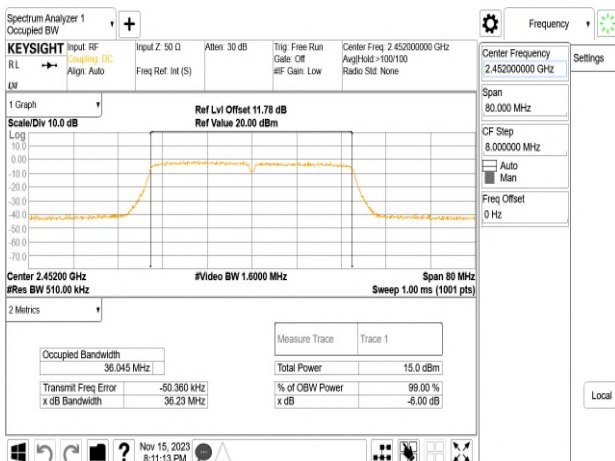
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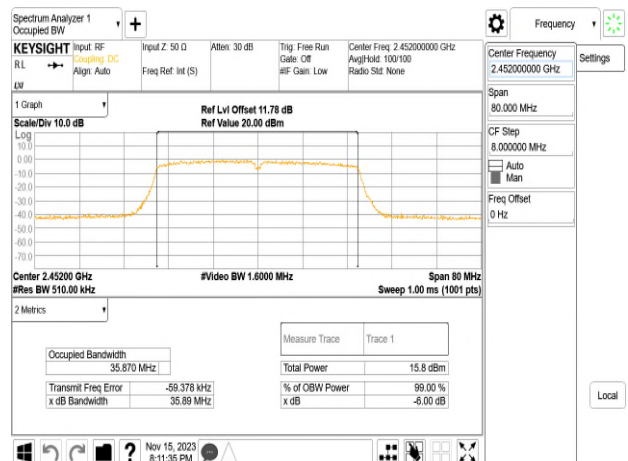
802.11n_40MHz_Chain1_2437MHz



802.11n_40MHz_Chain0_2452MHz



802.11n_40MHz_Chain1_2452MHz

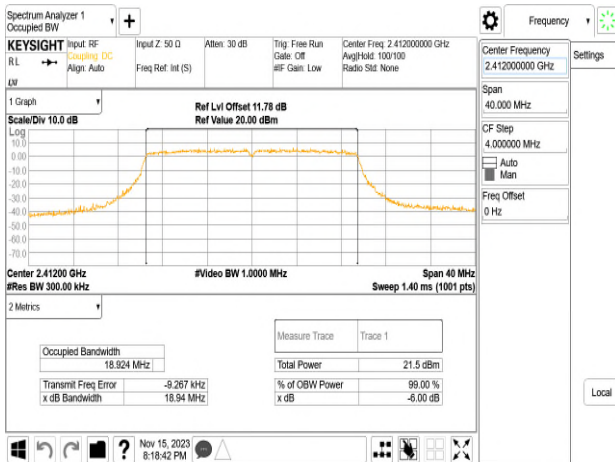


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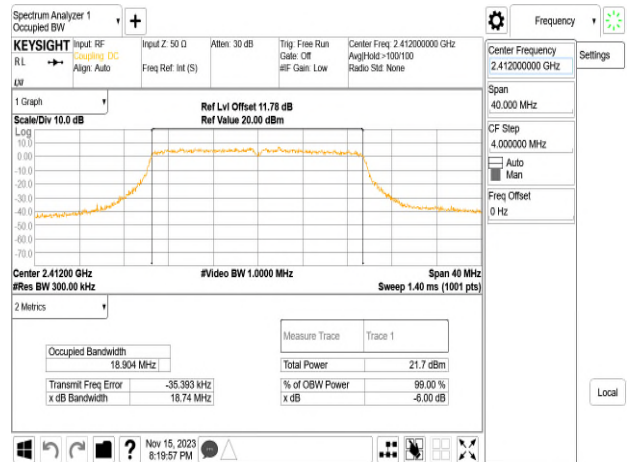
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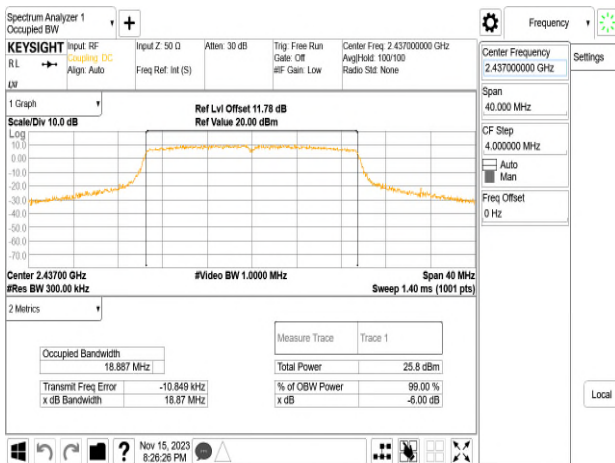
802.11ax_20MHz_Chain0_2412MHz



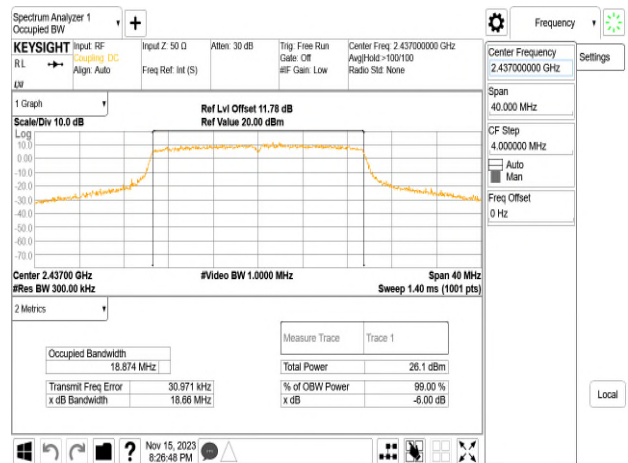
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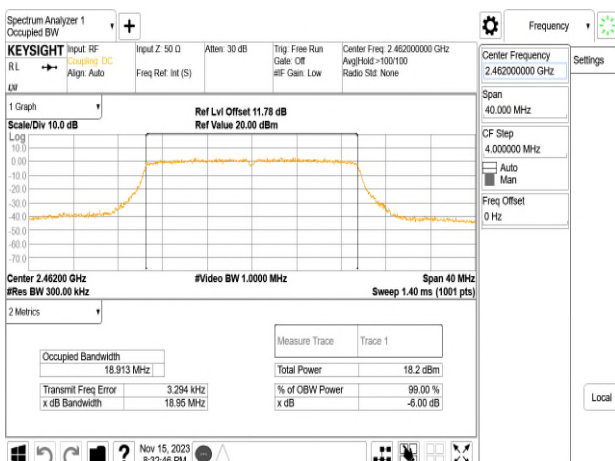
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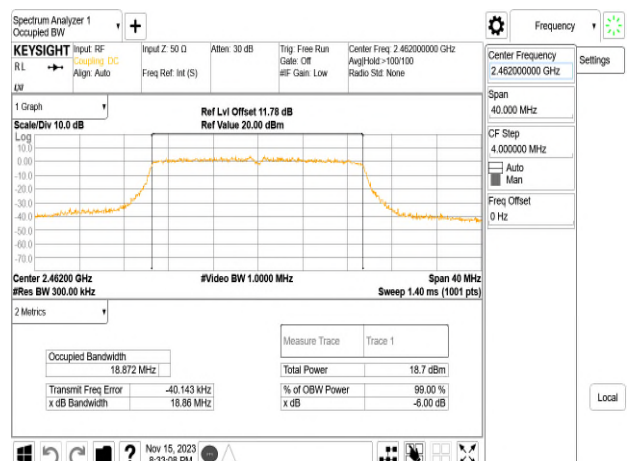
802.11ax_20MHz_Chain1_2437MHz



802.11ax_20MHz_Chain0_2462MHz



802.11ax_20MHz_Chain1_2462MHz

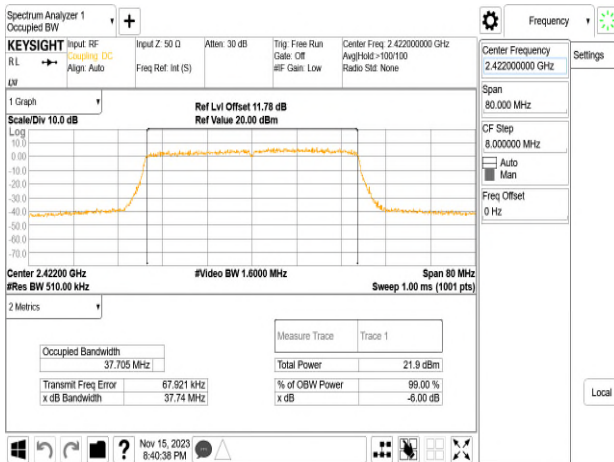


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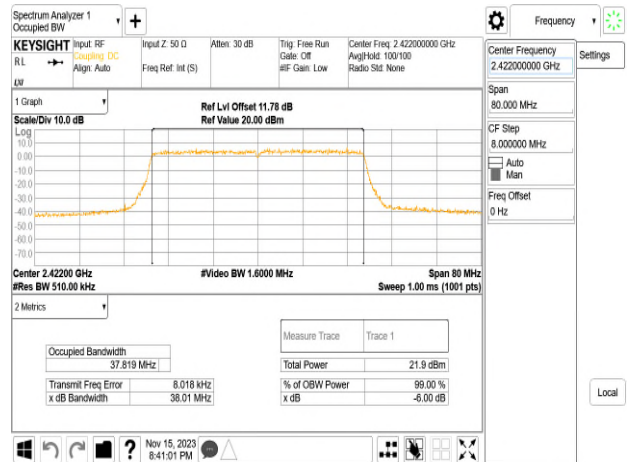
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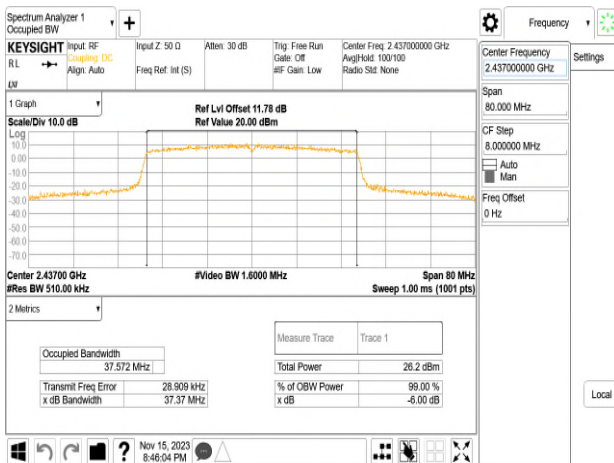
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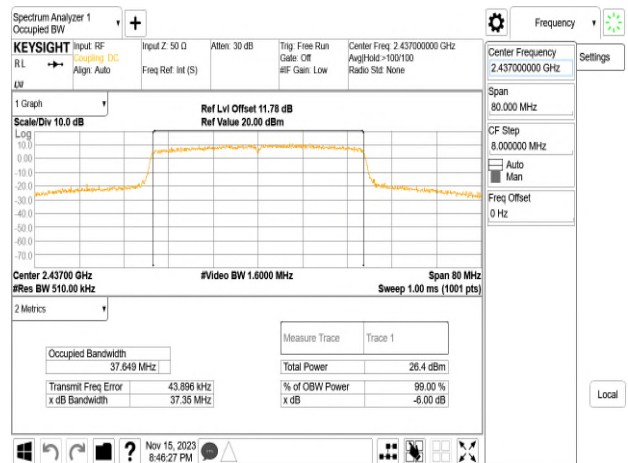
802.11ax_40MHz_Chain1_2422MHz



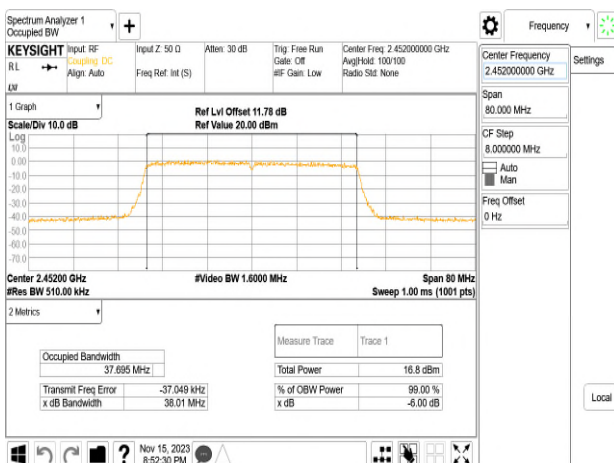
802.11ax_40MHz_Chain0_2437MHz



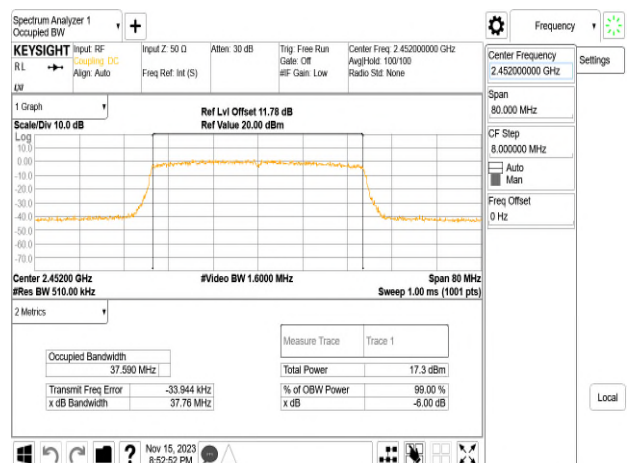
802.11ax_40MHz_Chain1_2437MHz



802.11ax_40MHz_Chain0_2452MHz



802.11ax_40MHz_Chain1_2452MHz



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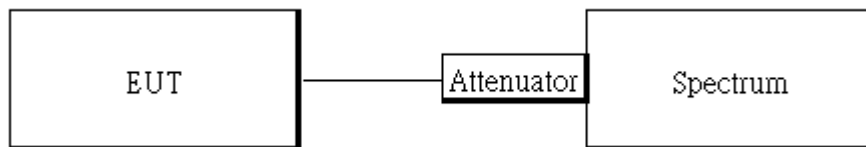
10 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

10.1 Standard Applicable

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.

In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) & RSS-Gen §8.10, must also comply with the radiated emission limits specified in §15.209(a) & RSS-Gen §8.9.

10.2 Test Setup



10.3 Measurement Procedure

10.3.1 Reference Level of Emission Limit:

1. Set analyzer center frequency to DTS channel center frequency.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
3. Set the span to 1.5 times the DTS channel bandwidth.
4. Set the RBW = 100kHz & VBW = 300 kHz.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. MIMO mode: offset is set following “measure and add 10 Log (N)” on spectrum to measure for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna.

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10.3.2 Conducted Band Edge:

1. To connect Antenna Port of EUT to Spectrum.
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
4. Set start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
5. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Detector = Peak, Sweep = auto
6. Mark the highest reading of the emission as the reference level measurement.
7. Set DL as the limit = reading on marker of reference level measurement -20 dBm
8. Mark the highest readings of the emissions outside of 2400MHz~2483.5MHz.
9. Repeat above procedures until all default test channel (low, middle, and high) was complete.
10. MIMO mode: offset is set following "measure and add 10 Log (N)" on spectrum to measure for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna.

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Conducted Spurious Emission:

1. To connect Antenna Port of EUT to Spectrum
2. The testing follows the Measurement Procedure of FCC KDB 558074 D01 DTS Meas. Guidance.
3. Set RBW = 100 kHz & VBW= 300 kHz, Detector =Peak, Sweep = Auto.
4. Allow trace to fully stabilize.
5. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. Repeat above procedures until all default test channel measured were complete.
7. MIMO mode: offset is set following “measure and add 10 Log (N)” on spectrum to measure for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna.

Note:

For test of MIMO mode, the highest emission of worst case employing Measure and add 10 log (N) technical is reported on this report after the comparison between Main Antenna at single transmitting mode and Aux that yields the higher value. The MIMO transmitting mode produces higher value of outcome.

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10.4 Measurement Result

802.11b Ch0

Reference Level of Limit			Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)	Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	8.71	-11.29	2412	7.80	-12.20
2437	9.92	-10.08	2437	9.12	-10.88
2462	7.02	-12.98	2462	7.28	-12.72

802.11b Ch1

802.11g Ch0

Reference Level of Limit			Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)	Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	2.26	-17.74	2412	2.28	-17.72
2437	6.64	-13.36	2437	7.15	-12.85
2462	1.72	-18.28	2462	2.11	-17.89

802.11g Ch1

802.11n_HT_20M Ch0

Reference Level of Limit			Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)	Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	2.91	-17.09	2412	3.51	-16.49
2437	7.23	-12.77	2437	7.48	-12.52
2462	-0.67	-20.67	2462	0.22	-19.78

802.11n_HT_20M Ch1

802.11n_HT_40M Ch0

Reference Level of Limit			Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)	Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2422	-0.47	-20.47	2422	-0.98	-20.98
2437	4.11	-15.89	2437	4.36	-15.64
2452	-5.94	-25.94	2452	-5.06	-25.06

802.11n_HT_40M Ch1

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802.11ax_HE_20M Ch0

Reference Level of Limit			Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)	Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	2.36	-17.64	2412	2.29	-17.71
2437	7.05	-12.95	2437	7.18	-12.82
2462	-0.92	-20.92	2462	-0.88	-20.88

802.11ax_HE_20M Ch1

802.11ax_HE_40M Ch0

Reference Level of Limit			Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)	Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2422	-0.07	-20.07	2422	-0.88	-20.88
2437	4.09	-15.91	2437	4.42	-15.58
2452	-5.82	-25.82	2452	-4.51	-24.51

802.11ax_HE_40M Ch1

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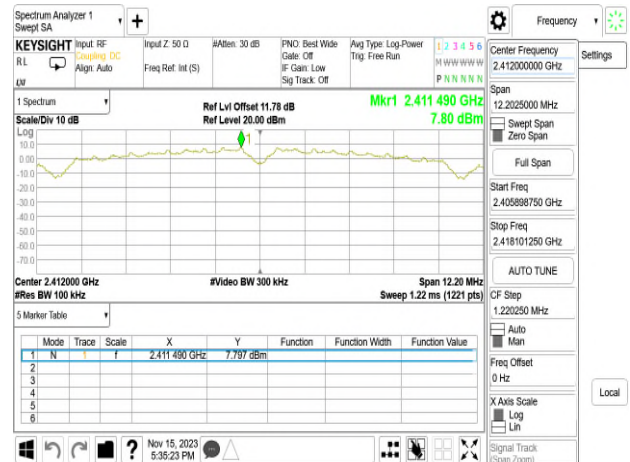
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802.11b_20MHz_Chain0_2412MHz



802.11b_20MHz_Chain1_2412MHz



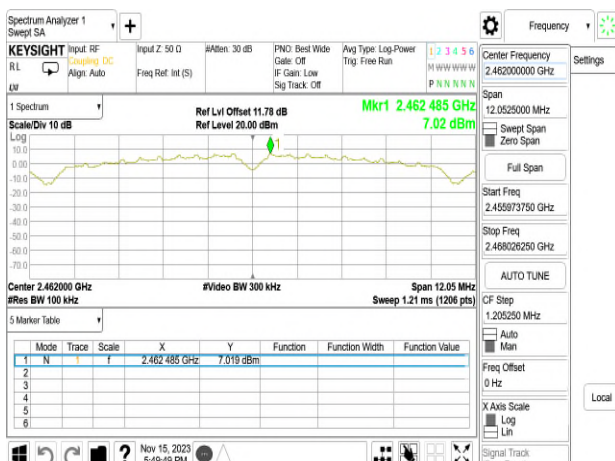
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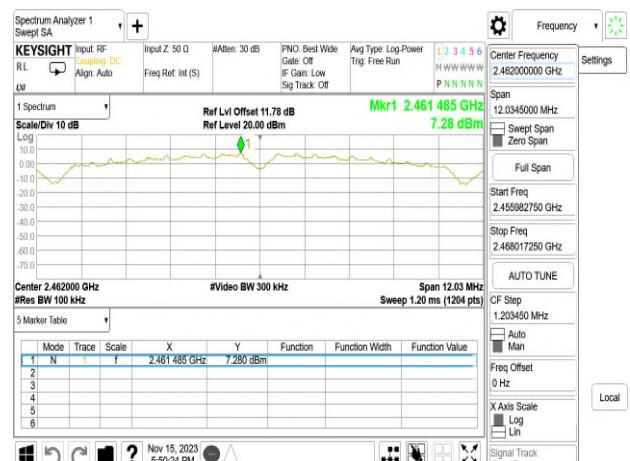
802.11b_20MHz_Chain1_2437MHz



802.11b_20MHz_Chain0_2462MHz



802.11b_20MHz_Chain1_2462MHz

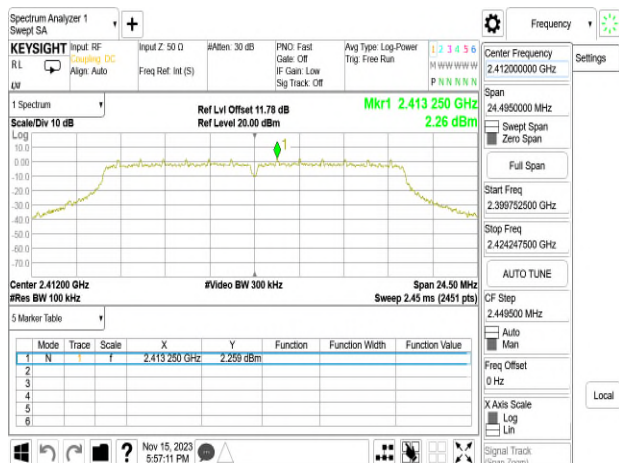


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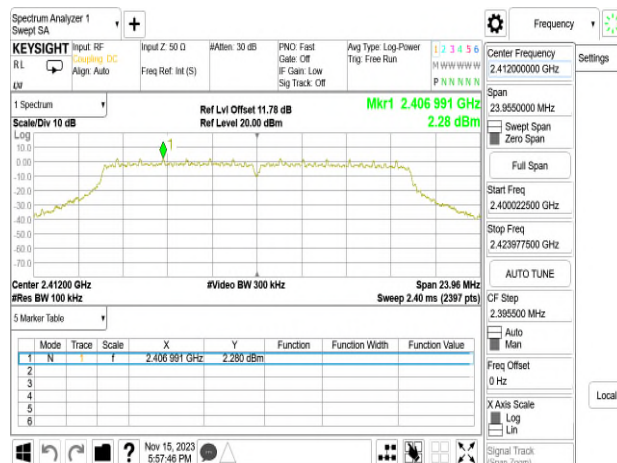
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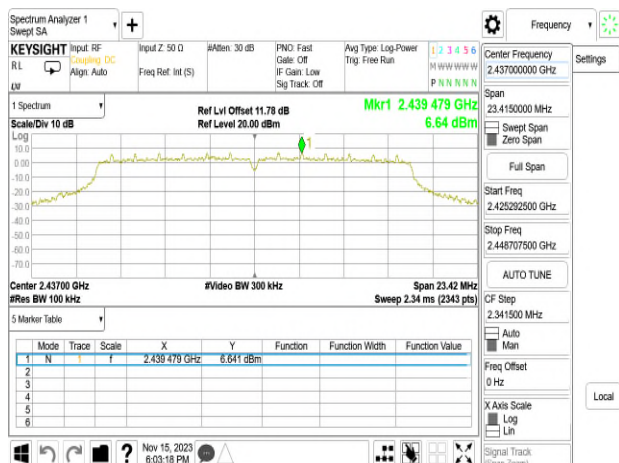
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802.11g_20MHz_Chain1_2412MHz



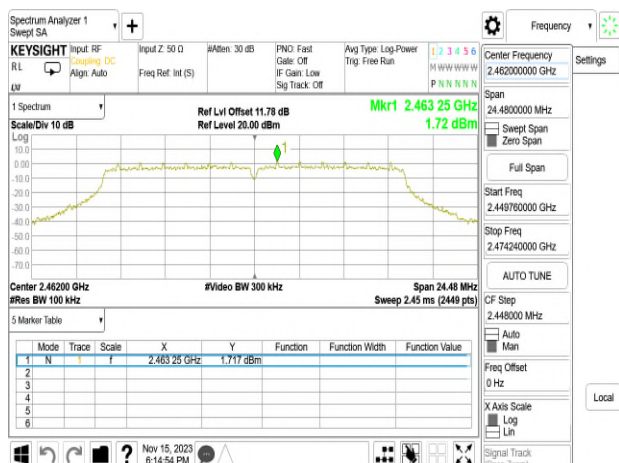
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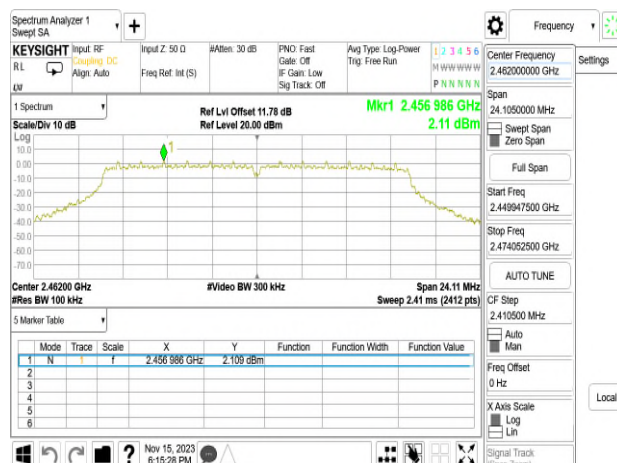
802.11g_20MHz_Chain1_2437MHz



802.11g_20MHz_Chain0_2462MHz



802.11g_20MHz_Chain1_2462MHz

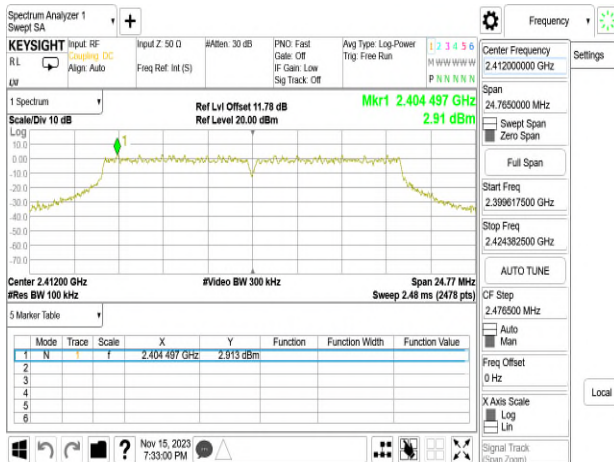


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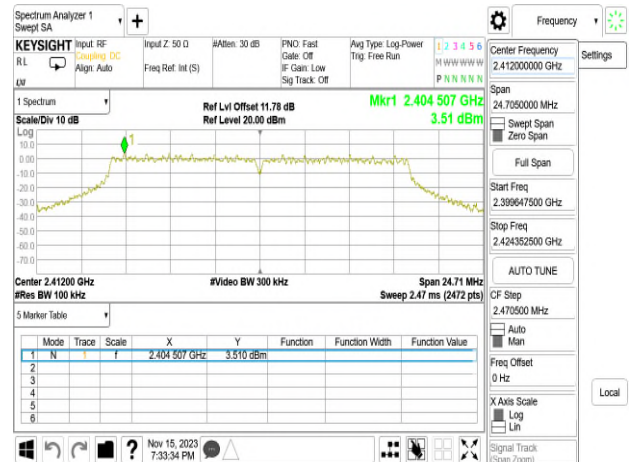
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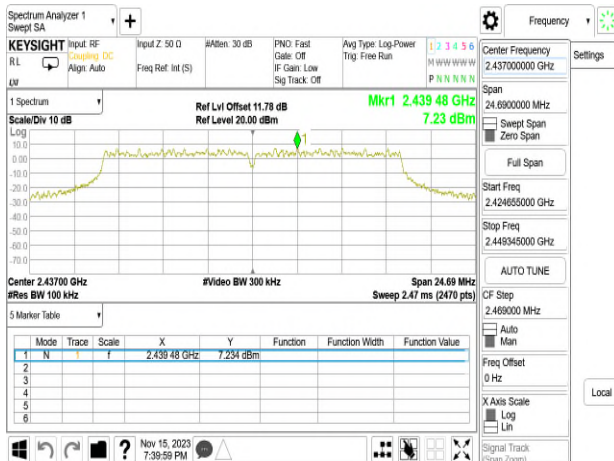
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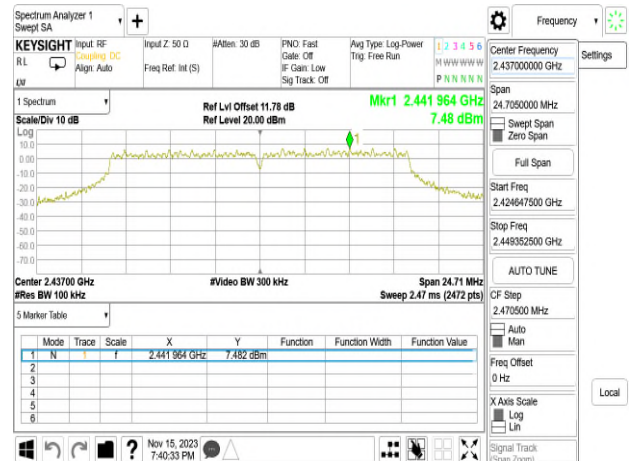
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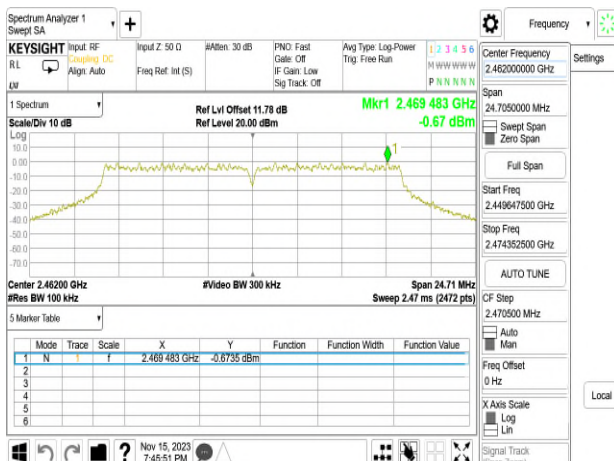
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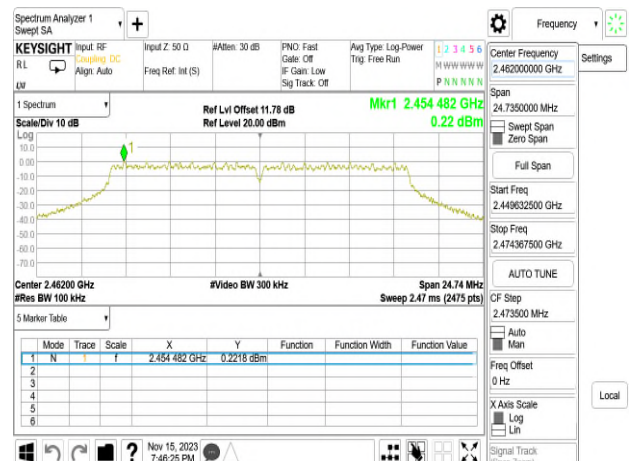
802.11n_20MHz_Chain1_2437MHz



802.11n_20MHz_Chain0_2462MHz



802.11n_20MHz_Chain1_2462MHz

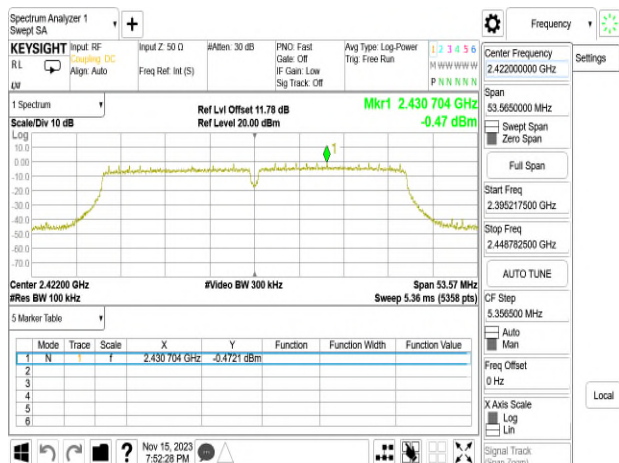


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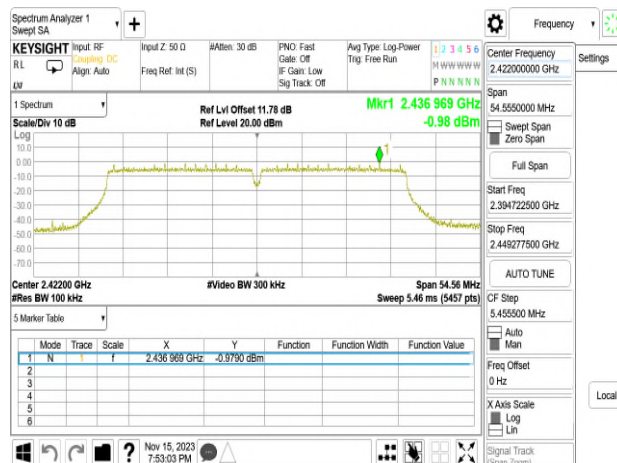
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802.11n_40MHz_Chain0_2422MHz



802.11n_40MHz_Chain1_2422MHz



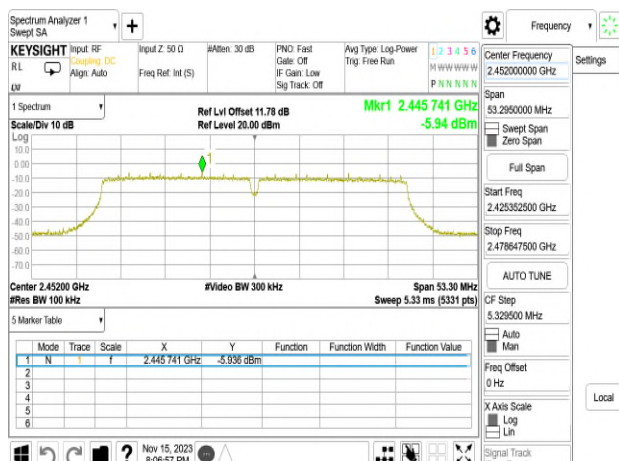
802.11n_40MHz_Chain0_2437MHz



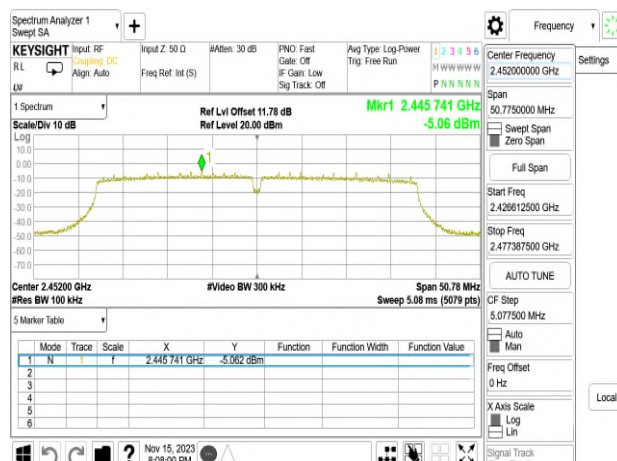
802.11n_40MHz_Chain1_2437MHz



802.11n_40MHz_Chain0_2452MHz



802.11n_40MHz_Chain1_2452MHz

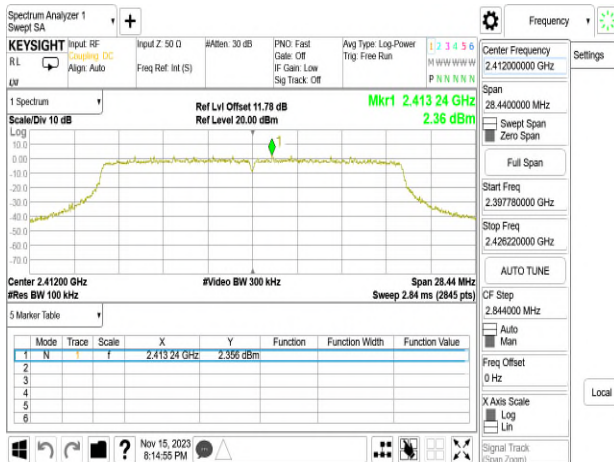


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802.11ax_20MHz_Chain0_2412MHz



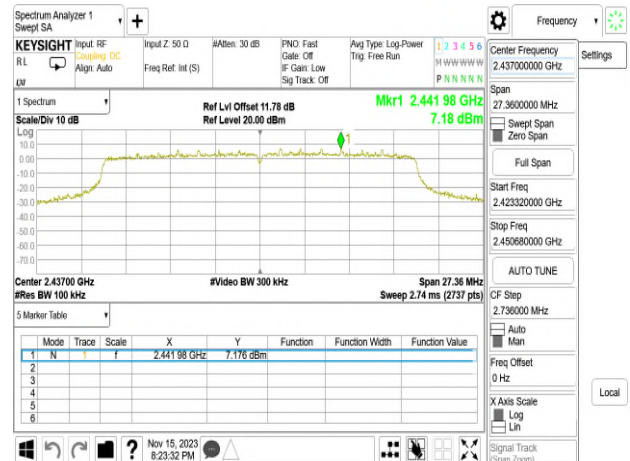
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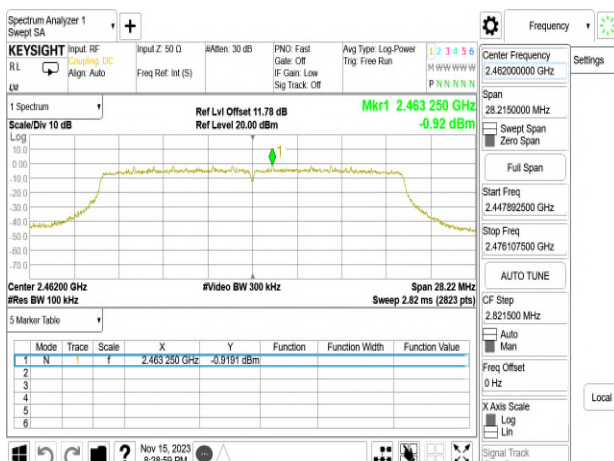
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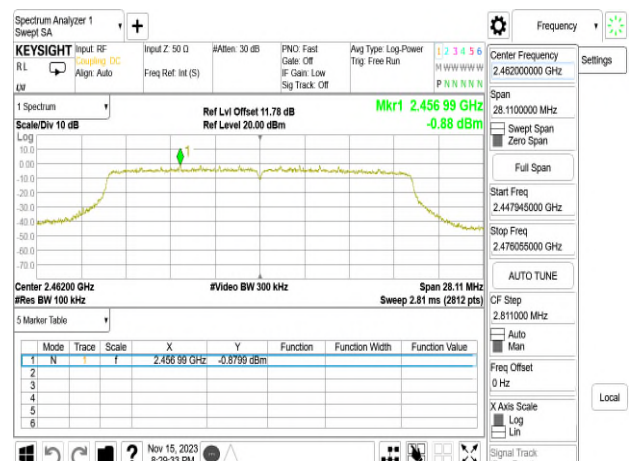
802.11ax_20MHz_Chain1_2437MHz



802.11ax_20MHz_Chain0_2462MHz



802.11ax_20MHz_Chain1_2462MHz



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