ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

Applicant:	Murata Manufacturing Co., Ltd. 10-1, Higashikotari 1-chome Nagaokakyo-shi, Kyoto 617-8555 Japan
Manufacturer:	Murata Manufacturing Co., Ltd. 10-1, Higashikotari 1-chome Nagaokakyo-shi, Kyoto 617-8555 Japan
Product Name:	Communication Module
Brand Name:	muRata
Model No.:	LBEE6ZZ1TA
Model Difference:	N/A
Report Number:	TERF2310002626ER
FCC ID	VPYLB1TA
IC:	772C-LB1TA
Date of EUT Received:	eOctober 17, 2023
Date of Test:	October 18, 2023～November 16, 2023
Issue Date:	December 13, 2023

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
TERF2310002626ER	00	Original	December 13, 2023	Yuri Tsai	

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:	Communication module
Brand Name:	muRata
Model No.:	LBEE6ZZ1TA
Model Difference:	N/A
Hardware Version:	1.0
Firmware Version:	1.0
EUT Series No.:	1002681000005891
Power Supply:	3.3Vdc and 1.8Vdc from the motherboard
Test Software (Name/Version)	DutApiMimoApApp V 2.0.0.86

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1.2 RF Specification

WLAN 2.4GHz

Wi-Fi	Frequency Range (MHz)	Channels	Rated Power (dBm)		Modulation Technology
			Peak	Avg.	
802.11b	2412~2462	11	21.94	18.93	DSSS
802.11g	2412~2462	11	25.20	17.82	OFDM
802.11n20	2412~2462	11	25.15	16.84	OFDM
802.11n40	2422~2452	7	24.80	15.96	OFDM
802.11ac20	2412~2462	11	25.04	16.81	OFDM
802.11ac40	2422~2452	7	24.69	15.87	OFDM
802.11ax20	2412~2462	11	25.25	16.98	OFDMA
802.11ax40	2422~2452	7	24.89	15.99	OFDMA
Modulation type:		CCK, DQPSK, DBPSK for DSSS			
		256 QAM, 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 ac_20MHz:up to 173.4Mbps			
		802.11 ac_40MHz:up to 400Mbps			
		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 (MHz)	Channels	Rated Power (dBm)		Rated Power in dBm (EIRP)	Modulation Technology
			Peak	Avg.		
802.11b	2412~2462	11	21.94	18.93	18.20	DSSS
802.11g	2412~2462	11	25.20	17.82	17.09	OFDM
802.11n20	2412~2462	11	25.15	16.84	16.10	OFDM
802.11n40	2422~2452	7	24.80	15.96	15.23	OFDM
802.11ac20	2412~2462	11	25.04	16.81	16.08	OFDM
802.11ac40	2422~2452	7	24.69	15.87	15.14	OFDM
802.11ax20	2412~2462	11	25.25	16.98	16.24	OFDMA
802.11ax40	2422~2452	7	24.89	15.99	15.26	OFDMA
Modulation type:		CCK, DQPSK, DBPSK for DSSS				
		256 QAM, 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 ac_20MHz:up to 173.4Mbps				
		802.11 ac_40MHz:up to 400Mbps				
		802.11 ax_20MHz:up to 286.8Mbps				
		802.11 ax_40MHz:up to 573.6Mbps				

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1.3 Antenna Designation

Antenna Type	Supplier	Antenna Part No.	Freq. (MHz)	Peak Antenna Gain (dBi)
PIFA	TE Connectivity	PT00014349	2412-2462	-1.77
Monopole	TE Connectivity	PT00039248	2412-2462	0.105

Note:

1. Pre-scanned was done on the above antennas, measurements were demonstrated by using the antenna with the highest gain as the worst case scenarios.
2. 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
ANSI C63.10:2013

1.5 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation 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 indication 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 a 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 a 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

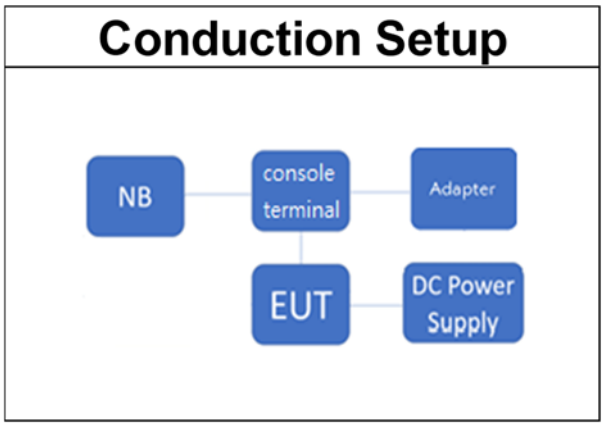
Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

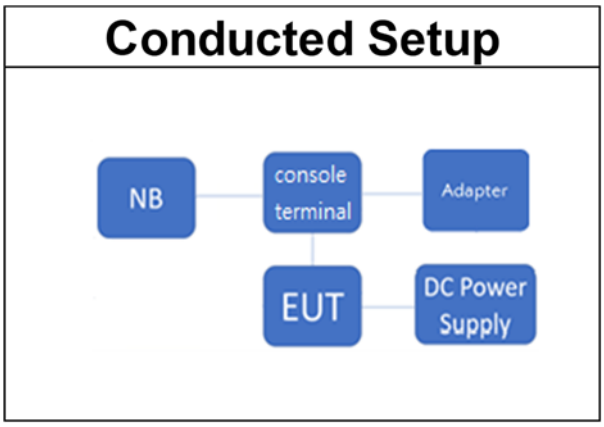
There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

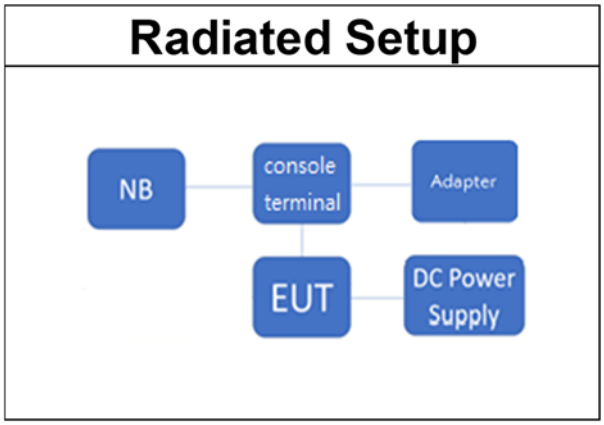
2.4.2 For all conducted test items:

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.

2.5 Test Configuration







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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	Lenovo	T440p	PB-02Y6RK 14/07	N/A	N/A
console terminal	GIGABYTE	GB-BSi7-6500	N/A	N/A	N/A
Adapter	FSP GROUP INC.	FSP065-REBN2	N/A	N/A	N/A
Conducted Emission Test Site: Conducted 2					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Notebook	Lenovo	T440p	PB-02Y6RK 14/07	N/A	N/A
console terminal	GIGABYTE	GB-BSi7-6500	N/A	N/A	N/A
Adapter	FSP GROUP INC.	FSP065-REBN2	N/A	N/A	N/A
Radiated Emission Test Site: SAC 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Notebook	Lenovo	T440p	PB-02Y6RK 14/07	N/A	N/A
console terminal	GIGABYTE	GB-BSi7-6500	N/A	N/A	N/A
Adapter	FSP GROUP INC.	FSP065-REBN2	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
§15.205 §15.209 §15.247(d)	RSS-247 §5.5 RSS-Gen §8.9 RSS-Gen §8.10 RSS-Gen §6.13	Radiated & Conducted Band Edge and Spurious Emission	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	
CH	Freq. (MHz)
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462

40MHz	
CH	Freq. (MHz)
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452

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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 gevin UE is pre-scanned among below modes.

Modulation		Transmission Chain								Single Transmission Spatial		Multi Transmission Spatial	
v	802.11 b	V	WLAN1	V	WLAN2		WLAN3		WLAN4	V	1TX	V	2TX
v	802.11 g	V	WLAN1	V	WLAN2		WLAN3		WLAN4	V	1TX	V	2TX
v	802.11 n	V	WLAN1	V	WLAN2		WLAN3		WLAN4	V	1TX	V	2TX
v	802.11 ac	V	WLAN1	V	WLAN2		WLAN3		WLAN4	V	1TX	V	2TX
v	802.11 ax	V	WLAN1	V	WLAN2		WLAN3		WLAN4	V	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					
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	1,2,3,6,10,11	OFDM	6	2TX
802.11n (HT20)	1 to 11	1,2,3,6,10,11	OFDM	MCS0	2TX
802.11n (HT40)	3 to 9	3,4,5,6,7,8,9	OFDM	MCS0	2TX
802.11ax (HE20)	1 to 11	1,2,3,6,10,11	OFDMA	MCS0	2TX
802.11ax (HE40)	3 to 9	3,4,5,6,7,8,9	OFDMA	MCS0	2TX

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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

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	1,2,3,6,10,11	OFDM	6	2TX
802.11n (HT20)	1 to 11	1,2,3,6,10,11	OFDM	MCS0	2TX
802.11n (HT40)	3 to 9	3,4,5,6,7,8,9	OFDM	MCS0	2TX
802.11ax (HE20)	1 to 11	1,2,3,6,10,11	OFDMA	MCS0	2TX
802.11ax (HE40)	3 to 9	3,4,5,6,7,8,9	OFDMA	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
Undesignable radiated 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.
EMI Test Receiver	R&S	ESR 7	102525	02/18/2023	02/17/2024
DC Power Supply	HILA	DP-3003N	11233K0716024	03/17/2023	03/16/2024
Pulse Limiter	SCHWARZBECK	VTSD 9561F-N	793	06/22/2023	06/21/2024
LISN	SCHWARZBECK	NSLK 8127	01040	09/06/2023	09/05/2024
LISN	SCHWARZBECK	NSLK 8127	01041	10/26/2023	10/25/2024
Coaxial Cables	EMC Instruments Corp.	EMCCFD300-BM-BM-3000	161207	06/22/2023	06/21/2024
Test Software	audix	e3	Ver. 9 210322	N.C.R	N.C.R

Note: *Tested date for Emission from AC power line on 11/03/2023.*

6.2 Condcuted Measurement

Conducted Emission Test Site: Conducted 2					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY59071541	07/13/2023	07/12/2024
Test Software	SGS	Radio Test Software	Ver. 21	N.C.R	N.C.R
Power Meter	Anritsu	ML2496A	2132007	09/25/2023	09/24/2024
Power Sensor	Anritsu	MA2411B	1911391	09/25/2023	09/24/2024
Power Sensor	Anritsu	MA2411B	1911392	09/25/2023	09/24/2024
DC Power Supply	Agilent	E3640A	MY52410006	12/26/2022	12/25/2023
Attenuator	Mini-Circuits	BW-S10W2+	4	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 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Horn Antenna	RF SPIN	DRH0844	LE2D05A0844	07/03/2023	07/02/2024
Horn Antenna	SCHWARZBECK	BBHA9120D	1441	09/23/2023	09/22/2024
Bi-log Antenna	SCHWARZBECK	VULB9168	378	08/09/2023	08/08/2024
Loop Antenna	ETS.LINDGREN	6502	0014303	05/23/2023	05/22/2024
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY63440386	01/17/2023	01/16/2024
EMI Test Receiver	R&S	ESCI 7	100759	08/21/2023	08/20/2024
DC Power Supply	HILA	DP-3003N	11233K0716024	03/17/2023	03/16/2024
Pre-Amplifier	EMC Instruments	EMC118A45SEE	980868	08/31/2023	08/30/2024
Pre-Amplifier	EMC Instruments	EMC184045B	980135	08/31/2023	08/30/2024
Pre-Amplifier	HP	8447D	2944A07676	08/31/2023	08/30/2024
Attenuator	Mini-Circuit	BW-S10W2+	4	12/13/2022	12/12/2023
Filter 2400-2483.5 MHz	EWT	EWT-14-0166	M1	12/13/2022	12/12/2023
High Pass Filter	WI	WHKX4.0/18G-10SS	22	12/13/2022	12/12/2023
Coaxial Cables	EMCI+Huber Suhner	EMC107-SM-SM-1000+EMC107-SM-SM-1500+EMC107-SM-SM-8000+SUCOFLEX 104PEA	RX Cable 9K-18G (221110+221106+221212+MY4251/4PEA)	08/31/2023	08/30/2024
Coaxial Cables	Huber Suhner	SUCOFLEX 102	RX Cable 18G-40G MY2630/2+805062/2	08/31/2023	08/30/2024
Site Cal	SGS	SAC 3	N/A	08/31/2023	08/30/2024
Test Software	audix	e3	Ver. 9.210616	N.C.R	N.C.R

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

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7 CONDUCTED EMISSION TEST

7.1 Standard Applicable

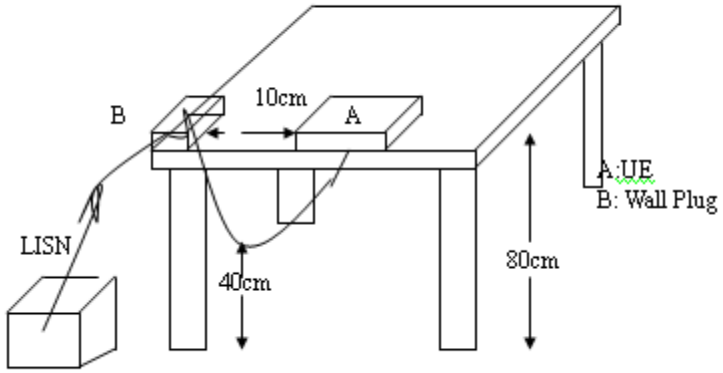
Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

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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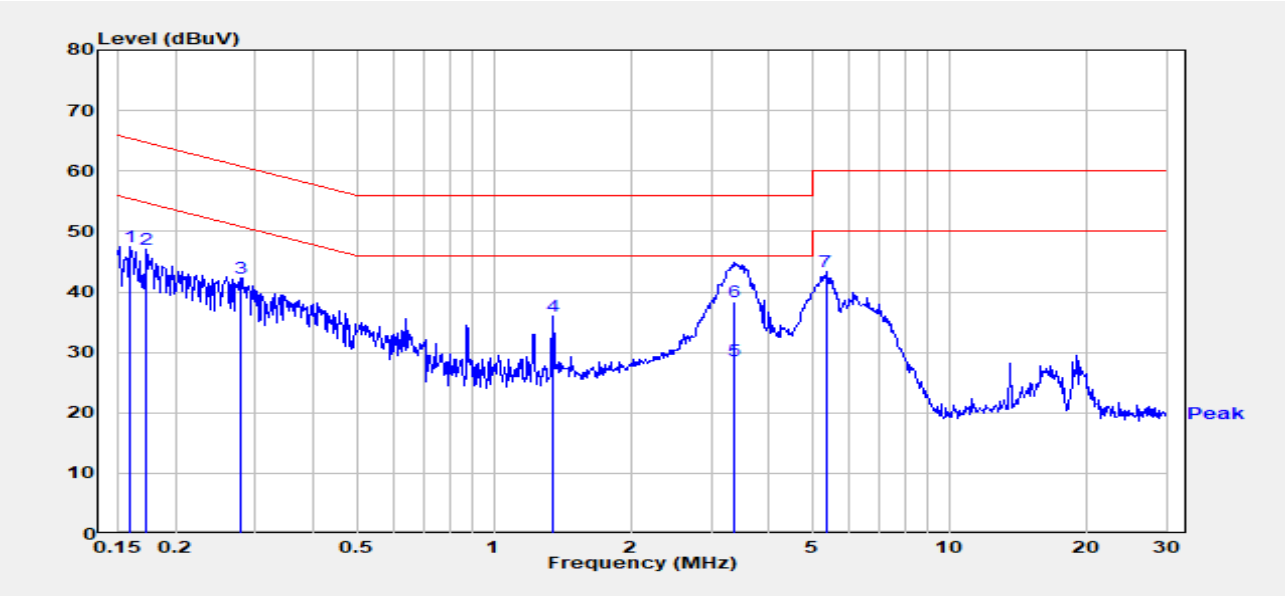
AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number	:TERF2310002626ER	Test Site	:Conduction 1
Operation Mode	:WLAN 2.4G	Test Date	:2023-11-03
Power	:120V/60Hz	Temp./Humi.	:24.9℃/63%
Probe	:L	Engineer	:Nick Lin
Note:	:		



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV	Limit dBμV	Margin dB
0.159	Peak	37.40	10.13	47.53	65.52	-17.98
0.173	Peak	36.91	10.13	47.04	64.81	-17.78
0.279	Peak	32.13	10.14	42.27	60.85	-18.58
1.352	Peak	25.82	10.20	36.02	56.00	-19.98
3.381	Average	18.26	10.27	28.53	46.00	-17.47
3.381	QP	28.03	10.27	38.30	56.00	-17.70
5.362	Peak	32.97	10.35	43.32	60.00	-16.68

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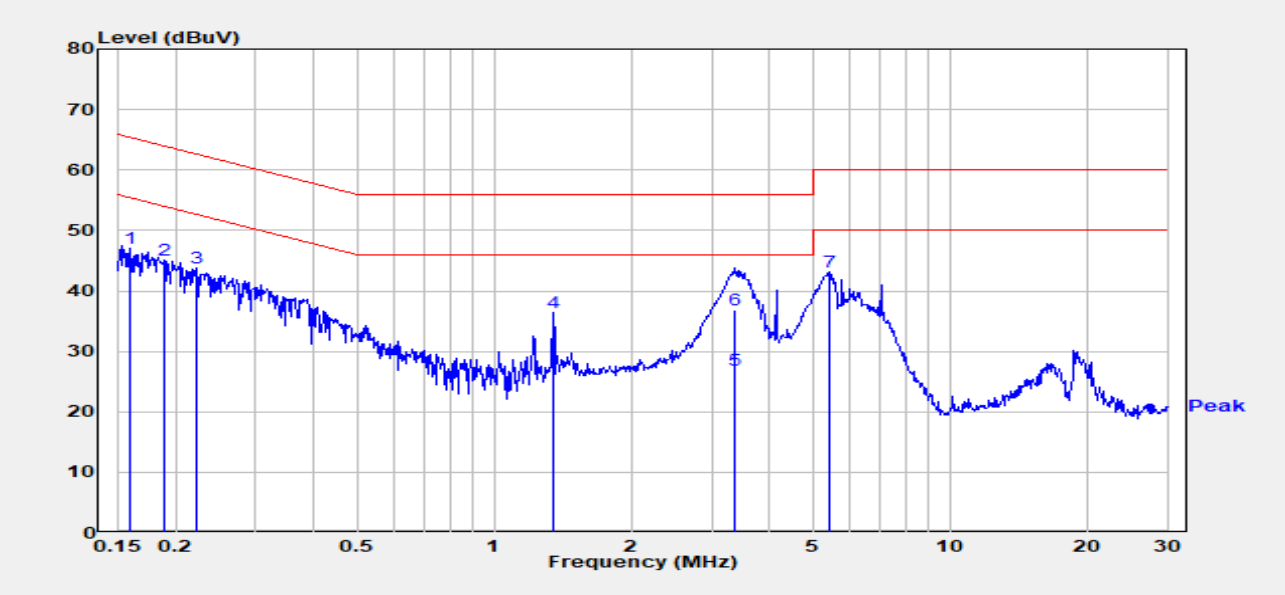
Report Number	:TERF2310002626ER	Test Site	:Conduction 1
Operation Mode	:WLAN 2.4G	Test Date	:2023-11-03
Power	:120V/60Hz	Temp./Humi.	:24.9℃/63%
Probe	:N	Engineer	:Nick Lin
Note:	:		



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV	Limit dBμV	Margin dB
0.158	Peak	36.99	10.12	47.11	65.56	-18.45
0.189	Peak	35.00	10.12	45.12	64.06	-18.94
0.223	Peak	33.60	10.12	43.73	62.70	-18.97
1.352	Peak	26.20	10.19	36.39	56.00	-19.61
3.364	Average	16.55	10.28	26.83	46.00	-19.17
3.364	QP	26.64	10.28	36.92	56.00	-19.08
5.419	Peak	32.82	10.36	43.18	60.00	-16.82

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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 form 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.

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

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

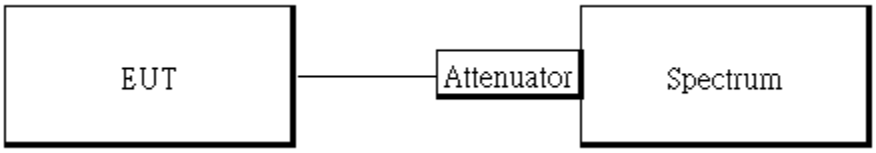
$g_{j,k} = 10^{Gk/20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

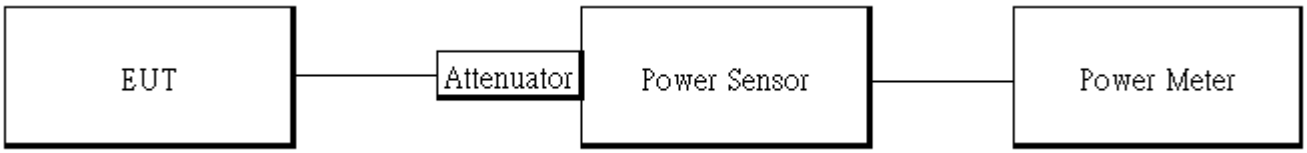
The antenna gain is not greater than 6 dBi. Therefore, reduction of power is not required.

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

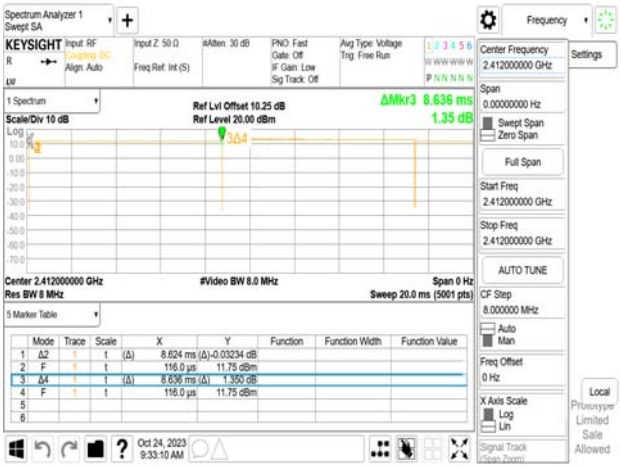
8.4.1 Duty Cycle:

Mode	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11b	99.86	0.01	0.12	0.01
802.11g	98.96	0.05	0.70	0.01
802.11n_20	98.82	0.05	0.75	0.01
802.11n_40	97.65	0.10	1.51	2.00
802.11ac_20	98.83	0.05	0.74	0.01
802.11ac_40	97.82	0.10	1.49	2.00

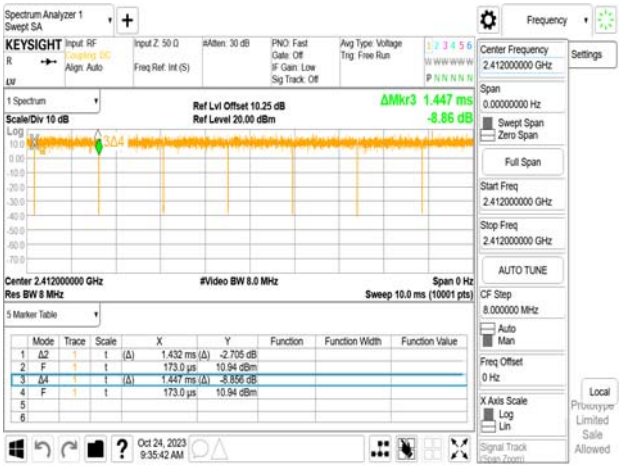
Mode	RU Config	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11ax_20	Full	98.58	0.06	0.96	0.01
	26-Tone RU	82.30	0.85	0.74	1.00
	52-Tone RU	82.30	0.85	0.74	1.00
	106-Tone RU	82.30	0.85	0.74	1.00
802.11ax_40	Full	97.18	0.12	1.81	2.00
	242-Tone RU	82.70	0.82	0.74	1.00

8.4.2 Duty Cycle test plots

802.11b_20MHz_WLAN1_2412MHz



802.11g_20MHz_WLAN1_2412MHz



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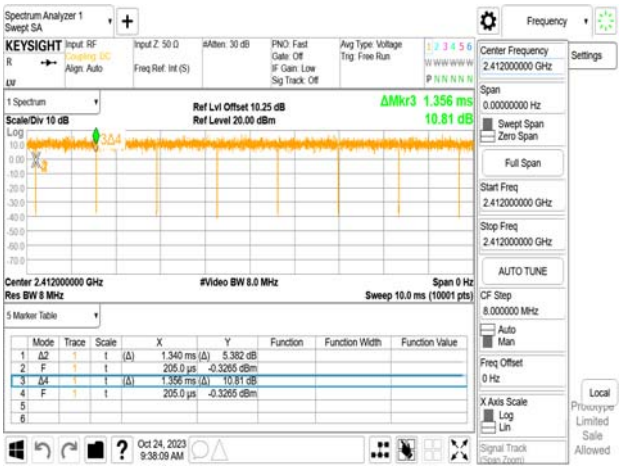
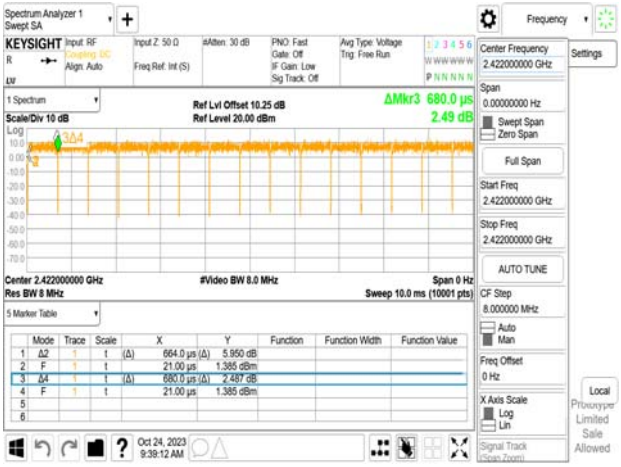
802.11n_20MHz_WLAN1_2412MHz

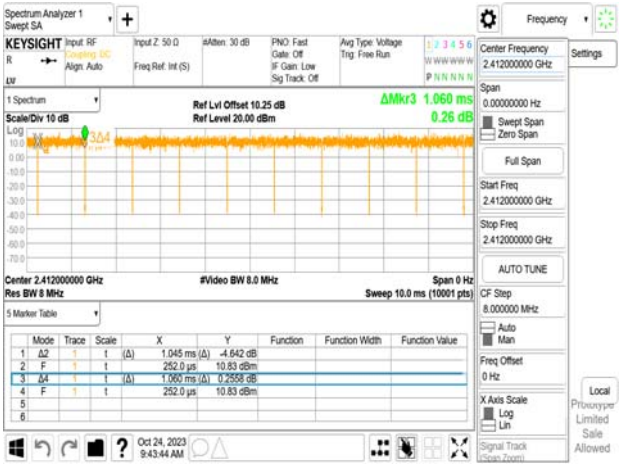


802.11ac_40MHz_WLAN1_2422MHz

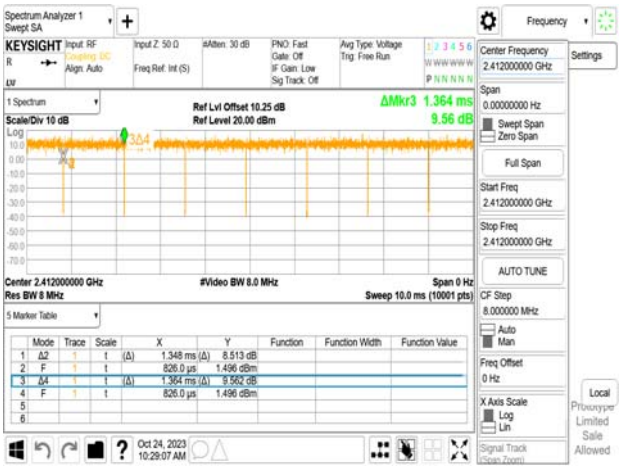
802.11n_40MHz_WLAN1_2422MHz



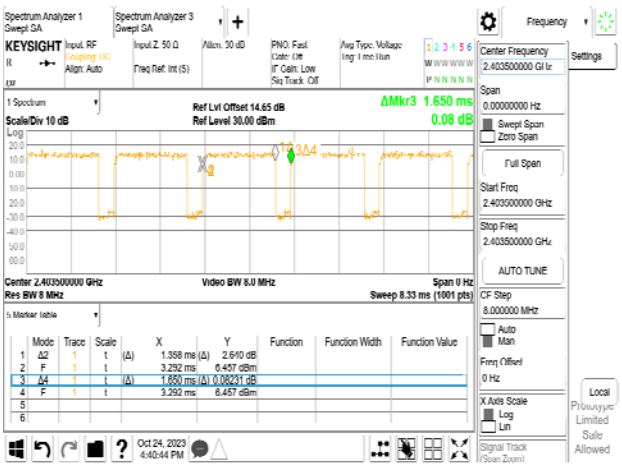
802.11ax_20MHz_WLAN1_2412MHz



802.11ac_20MHz_WLAN1_2412MHz



802.11ax_20MHz_WLAN1_2412MHz_26RU



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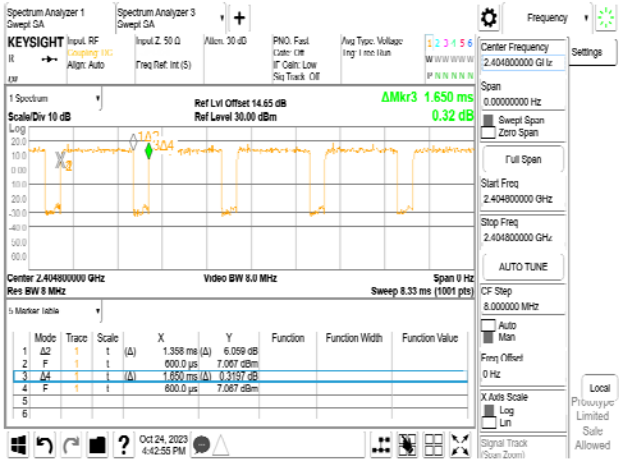
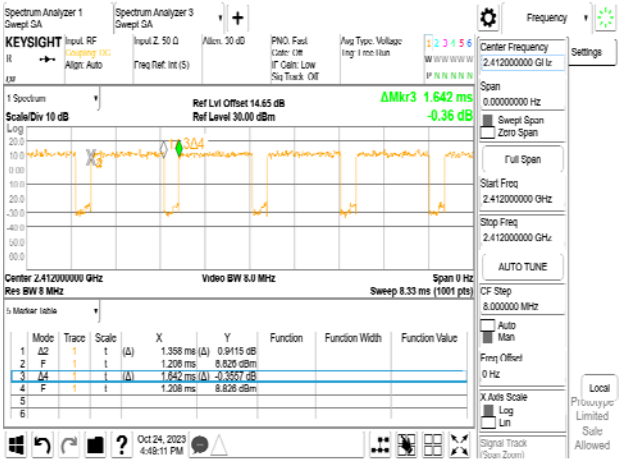
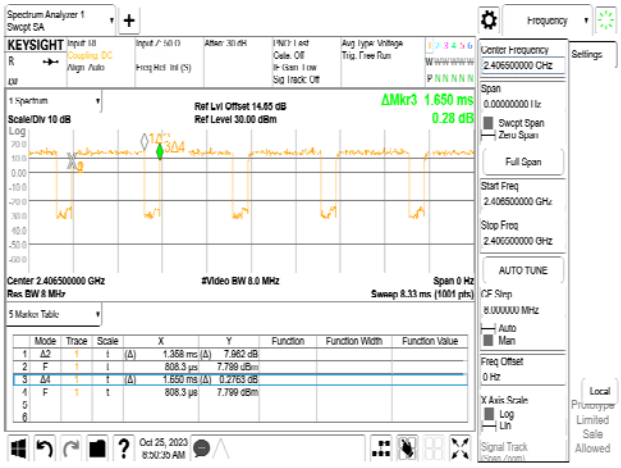
802.11ax_20MHz_WLAN1_2412MHz_52RU



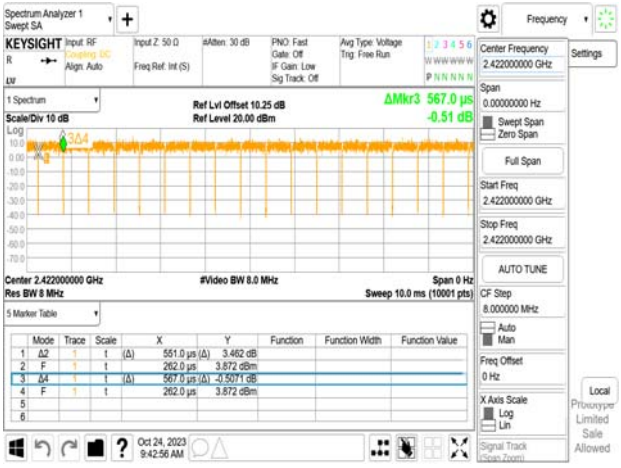
802.11ax_40MHz_WLAN1_2422MHz_242RU



802.11ax_20MHz_WLAN1_2412MHz_106RU



802.11ax_40MHz_WLAN1_2422MHz



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8.4.3 Output Power

802.11b WLAN1						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	16.5	18.29	30.00	PASS
6	2437	1	16.5	18.04	30.00	PASS
11	2462	1	17	18.46	30.00	PASS
802.11b WLAN1						
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	16.5	15.64	30.00	PASS
6	2437	1	16.5	15.54	30.00	PASS
11	2462	1	17	15.62	30.00	PASS

802.11b WLAN2						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	16	18.61	30.00	PASS
6	2437	1	16.5	18.29	30.00	PASS
11	2462	1	17.5	18.56	30.00	PASS
802.11b WLAN2						
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	1	16	15.69	30.00	PASS
6	2437	1	16.5	15.63	30.00	PASS
11	2462	1	17.5	15.67	30.00	PASS

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802.11b_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				WLAN1	WLAN2			
1	2412	1	16.5	18.51	19.31	21.94	30.00	PASS
6	2437	1	17	18.41	18.89	21.67	30.00	PASS
11	2462	1	17.5	18.48	18.93	21.72	30.00	PASS

802.11b_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				WLAN1	WLAN2			
1	2412	1	16.5	15.70	16.12	18.92	30.00	PASS
6	2437	1	17	15.59	16.04	18.83	30.00	PASS
11	2462	1	17.5	15.65	16.19	18.93	30.00	PASS

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802.11g WLAN1						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	6	12.25	20.96	30.00	PASS
2	2417	6	15.5	22.30	30.00	PASS
3	2422	6	16.5	22.44	30.00	PASS
6	2437	6	15.5	21.91	30.00	PASS
10	2457	6	16.25	22.38	30.00	PASS
11	2462	6	13.5	21.76	30.00	PASS
802.11g WLAN1						
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	6	12.25	10.92	30.00	PASS
2	2417	6	15.5	13.92	30.00	PASS
3	2422	6	16.5	14.86	30.00	PASS
6	2437	6	15.5	14.57	30.00	PASS
10	2457	6	16.25	14.55	30.00	PASS
11	2462	6	13.5	11.91	30.00	PASS

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802.11g WLAN2						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	6	12	21.52	30.00	PASS
2	2417	6	14.5	22.31	30.00	PASS
3	2422	6	15.5	22.46	30.00	PASS
6	2437	6	15.5	22.41	30.00	PASS
10	2457	6	16	22.43	30.00	PASS
11	2462	6	13.25	21.87	30.00	PASS

802.11g WLAN2						
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	6	12	10.98	30.00	PASS
2	2417	6	14.5	13.98	30.00	PASS
3	2422	6	15.5	14.98	30.00	PASS
6	2437	6	15.5	14.58	30.00	PASS
10	2457	6	16	14.56	30.00	PASS
11	2462	6	13.25	11.98	30.00	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
				WLAN1	WLAN2			
1	2412	6	12	20.45	21.56	24.05	30.00	PASS
2	2417	6	15	21.55	22.38	25.00	30.00	PASS
3	2422	6	16	21.78	22.47	25.15	30.00	PASS
6	2437	6	15.5	21.93	22.43	25.20	30.00	PASS
10	2457	6	16	21.85	22.45	25.17	30.00	PASS
11	2462	6	13	21.19	21.91	24.58	30.00	PASS

802.11g_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				WLAN1	WLAN2			
1	2412	6	12	10.20	11.63	13.98	30.00	PASS
2	2417	6	15	13.16	14.25	16.74	30.00	PASS
3	2422	6	16	14.41	15.18	17.82	30.00	PASS
6	2437	6	15.5	14.58	14.87	17.73	30.00	PASS
10	2457	6	16	14.43	14.61	17.53	30.00	PASS
11	2462	6	13	11.53	12.37	14.98	30.00	PASS

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802.11n_HT_20M WLAN1						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	12.5	20.57	30.00	PASS
2	2417	MCS0	13	21.37	30.00	PASS
3	2422	MCS0	15.5	22.01	30.00	PASS
6	2437	MCS0	14.5	22.11	30.00	PASS
10	2457	MCS0	15	22.19	30.00	PASS
11	2462	MCS0	12.25	21.03	30.00	PASS

802.11n_HT_20M WLAN1						
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	12.5	10.87	30.00	PASS
2	2417	MCS0	13	11.52	30.00	PASS
3	2422	MCS0	15.5	13.88	30.00	PASS
6	2437	MCS0	14.5	13.60	30.00	PASS
10	2457	MCS0	15	13.68	30.00	PASS
11	2462	MCS0	12.25	10.78	30.00	PASS

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802.11n_HT_20M WLAN2						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	11.5	21.15	30.00	PASS
2	2417	MCS0	12	21.53	30.00	PASS
3	2422	MCS0	14.5	22.28	30.00	PASS
6	2437	MCS0	14.5	22.34	30.00	PASS
10	2457	MCS0	14.5	22.39	30.00	PASS
11	2462	MCS0	11.5	21.17	30.00	PASS

802.11n_HT_20M WLAN2						
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	11.5	10.93	30.00	PASS
2	2417	MCS0	12	11.53	30.00	PASS
3	2422	MCS0	14.5	13.99	30.00	PASS
6	2437	MCS0	14.5	13.82	30.00	PASS
10	2457	MCS0	14.5	13.71	30.00	PASS
11	2462	MCS0	11.5	10.92	30.00	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
				WLAN1	WLAN2			
1	2412	MCS0	12	20.28	21.70	24.06	30.00	PASS
2	2417	MCS0	12	20.61	21.56	24.12	30.00	PASS
3	2422	MCS0	15	21.69	22.36	25.05	30.00	PASS
6	2437	MCS0	14.5	21.67	22.41	25.07	30.00	PASS
10	2457	MCS0	15	21.82	22.43	25.15	30.00	PASS
11	2462	MCS0	12	20.21	21.37	23.84	30.00	PASS

802.11n_HT20M_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				WLAN1	WLAN2			
1	2412	MCS0	12	10.31	11.44	13.92	30.00	PASS
2	2417	MCS0	12	10.24	11.59	13.98	30.00	PASS
3	2422	MCS0	15	13.39	14.22	16.84	30.00	PASS
6	2437	MCS0	14.5	13.62	13.98	16.82	30.00	PASS
10	2457	MCS0	15	13.43	13.79	16.63	30.00	PASS
11	2462	MCS0	12	10.43	11.36	13.93	30.00	PASS

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802.11n_HT_40M WLAN1						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	10.5	19.29	30.00	PASS
4	2427	MCS0	14.25	21.20	30.00	PASS
5	2432	MCS0	14.25	21.21	30.00	PASS
6	2437	MCS0	14.5	21.85	30.00	PASS
7	2442	MCS0	14.25	21.71	30.00	PASS
8	2447	MCS0	13	21.29	30.00	PASS
9	2452	MCS0	11.75	20.95	30.00	PASS
802.11n_HT_40M WLAN1						
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	10.5	8.80	30.00	PASS
4	2427	MCS0	14.25	12.62	30.00	PASS
5	2432	MCS0	14.25	12.84	30.00	PASS
6	2437	MCS0	14.5	13.53	30.00	PASS
7	2442	MCS0	14.25	12.79	30.00	PASS
8	2447	MCS0	13	11.56	30.00	PASS
9	2452	MCS0	11.75	10.79	30.00	PASS

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802.11n_HT_40M WLAN2						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	9.5	19.56	30.00	PASS
4	2427	MCS0	13.25	21.61	30.00	PASS
5	2432	MCS0	13.25	21.75	30.00	PASS
6	2437	MCS0	14	22.25	30.00	PASS
7	2442	MCS0	13.5	21.76	30.00	PASS
8	2447	MCS0	12	21.58	30.00	PASS
9	2452	MCS0	11	21.13	30.00	PASS

802.11n_HT_40M WLAN2						
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	9.5	8.89	30.00	PASS
4	2427	MCS0	13.25	12.63	30.00	PASS
5	2432	MCS0	13.25	12.86	30.00	PASS
6	2437	MCS0	14	13.59	30.00	PASS
7	2442	MCS0	13.5	12.81	30.00	PASS
8	2447	MCS0	12	11.58	30.00	PASS
9	2452	MCS0	11	10.83	30.00	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
				WLAN1	WLAN2			
3	2422	MCS0	9.75	18.61	19.58	22.13	30.00	PASS
4	2427	MCS0	12.5	20.59	21.68	24.18	30.00	PASS
5	2432	MCS0	13	21.20	21.93	24.59	30.00	PASS
6	2437	MCS0	13.25	21.19	22.31	24.80	30.00	PASS
7	2442	MCS0	13	20.87	21.81	24.38	30.00	PASS
8	2447	MCS0	11.25	20.43	21.65	24.09	30.00	PASS
9	2452	MCS0	11	20.12	21.67	23.97	30.00	PASS

802.11n_HT40M_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				WLAN1	WLAN2			
3	2422	MCS0	9.75	8.33	9.35	11.88	30.00	PASS
4	2427	MCS0	12.5	10.98	12.77	14.98	30.00	PASS
5	2432	MCS0	13	11.74	13.29	15.60	30.00	PASS
6	2437	MCS0	13.25	12.05	13.69	15.96	30.00	PASS
7	2442	MCS0	13	11.84	13.34	15.67	30.00	PASS
8	2447	MCS0	11.25	10.11	11.65	13.96	30.00	PASS
9	2452	MCS0	11	9.86	11.21	13.60	30.00	PASS

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802.11ac_VHT_20M WLAN1						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	12.25	20.54	30.00	PASS
2	2417	MCS0	12.75	21.34	30.00	PASS
3	2422	MCS0	15.5	21.95	30.00	PASS
6	2437	MCS0	14.5	21.87	30.00	PASS
10	2457	MCS0	15	22.16	30.00	PASS
11	2462	MCS0	12.5	20.99	30.00	PASS

802.11ac_VHT_20M WLAN1						
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	12.25	10.80	30.00	PASS
2	2417	MCS0	12.75	11.51	30.00	PASS
3	2422	MCS0	15.5	13.89	30.00	PASS
6	2437	MCS0	14.5	13.49	30.00	PASS
10	2457	MCS0	15	13.50	30.00	PASS
11	2462	MCS0	12.5	10.76	30.00	PASS

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802.11ac_VHT_20M WLAN2						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	11.5	20.97	30.00	PASS
2	2417	MCS0	11.75	21.51	30.00	PASS
3	2422	MCS0	15	22.27	30.00	PASS
6	2437	MCS0	14.25	22.24	30.00	PASS
10	2457	MCS0	14.5	22.35	30.00	PASS
11	2462	MCS0	11.5	21.02	30.00	PASS
802.11ac_VHT_20M WLAN2						
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	11.5	10.82	30.00	PASS
2	2417	MCS0	11.75	11.52	30.00	PASS
3	2422	MCS0	15	13.99	30.00	PASS
6	2437	MCS0	14.25	13.80	30.00	PASS
10	2457	MCS0	14.5	13.71	30.00	PASS
11	2462	MCS0	11.5	10.89	30.00	PASS

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802.11ac_VHT20M_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				WLAN1	WLAN2			
1	2412	MCS0	12	20.20	21.62	23.98	30.00	PASS
2	2417	MCS0	12	20.41	21.56	24.03	30.00	PASS
3	2422	MCS0	15	21.71	22.32	25.04	30.00	PASS
6	2437	MCS0	14.5	21.63	22.25	24.96	30.00	PASS
10	2457	MCS0	15	21.61	22.37	25.02	30.00	PASS
11	2462	MCS0	12	19.95	21.08	23.56	30.00	PASS

802.11ac_VHT20M_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				WLAN1	WLAN2			
1	2412	MCS0	12	10.30	11.43	13.91	30.00	PASS
2	2417	MCS0	12	10.23	11.58	13.97	30.00	PASS
3	2422	MCS0	15	13.38	14.15	16.79	30.00	PASS
6	2437	MCS0	14.5	13.63	13.96	16.81	30.00	PASS
10	2457	MCS0	15	13.39	13.73	16.57	30.00	PASS
11	2462	MCS0	12	10.56	11.06	13.83	30.00	PASS

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802.11ac_VHT_40M WLAN1						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	10.5	19.18	30.00	PASS
4	2427	MCS0	14	21.11	30.00	PASS
5	2432	MCS0	14.25	21.19	30.00	PASS
6	2437	MCS0	15	21.82	30.00	PASS
7	2442	MCS0	14.5	21.69	30.00	PASS
8	2447	MCS0	13	21.21	30.00	PASS
9	2452	MCS0	11.75	20.76	30.00	PASS
802.11ac_VHT_40M WLAN1						
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	10.5	8.79	30.00	PASS
4	2427	MCS0	14	12.59	30.00	PASS
5	2432	MCS0	14.25	12.74	30.00	PASS
6	2437	MCS0	15	13.52	30.00	PASS
7	2442	MCS0	14.5	12.77	30.00	PASS
8	2447	MCS0	13	11.55	30.00	PASS
9	2452	MCS0	11.75	10.63	30.00	PASS

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802.11ac_VHT_40M WLAN2						
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	9.5	19.51	30.00	PASS
4	2427	MCS0	13	21.59	30.00	PASS
5	2432	MCS0	13.25	21.72	30.00	PASS
6	2437	MCS0	14.5	22.21	30.00	PASS
7	2442	MCS0	13.5	21.71	30.00	PASS
8	2447	MCS0	12	21.54	30.00	PASS
9	2452	MCS0	11	21.05	30.00	PASS

802.11ac_VHT_40M WLAN2						
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	9.5	8.88	30.00	PASS
4	2427	MCS0	13	12.61	30.00	PASS
5	2432	MCS0	13.25	12.78	30.00	PASS
6	2437	MCS0	14.5	13.56	30.00	PASS
7	2442	MCS0	13.5	12.79	30.00	PASS
8	2447	MCS0	12	11.56	30.00	PASS
9	2452	MCS0	11	10.81	30.00	PASS

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802.11ac_VHT40M_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Peak Output Power (dBm)		Total Peak Output Power (dBm)	Limit (dBm)	RESULT
				WLAN1	WLAN2			
3	2422	MCS0	9.75	18.49	19.53	22.05	30.00	PASS
4	2427	MCS0	12.5	20.51	21.71	24.16	30.00	PASS
5	2432	MCS0	13	21.15	21.90	24.55	30.00	PASS
6	2437	MCS0	13.25	21.01	22.26	24.69	30.00	PASS
7	2442	MCS0	13	20.93	21.75	24.37	30.00	PASS
8	2447	MCS0	11.25	20.38	21.63	24.06	30.00	PASS
9	2452	MCS0	11	20.07	21.67	23.95	30.00	PASS

802.11ac_VHT40M_2TX								
CH	Freq. (MHz)	Data Rate	Power set	Avg. Output Power (dBm)		Total Avg. Output Power (dBm)	Limit (dBm)	RESULT
				WLAN1	WLAN2			
3	2422	MCS0	9.75	8.32	9.21	11.79	30.00	PASS
4	2427	MCS0	12.5	11.04	12.68	14.94	30.00	PASS
5	2432	MCS0	13	11.70	13.27	15.56	30.00	PASS
6	2437	MCS0	13.25	11.97	13.61	15.87	30.00	PASS
7	2442	MCS0	13	11.77	13.33	15.63	30.00	PASS
8	2447	MCS0	11.25	10.10	11.64	13.94	30.00	PASS
9	2452	MCS0	11	9.83	11.20	13.57	30.00	PASS

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802.11ax_HE_20M WLAN1							
CH	Freq. (MHz)	Data Rate	RU Config	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	full	12.25	20.96	30.00	PASS
			26/0	9	17.76	30.00	PASS
			52/37	9	17.83	30.00	PASS
			106/53	9	17.67	30.00	PASS
2	2417	MCS0	full	12.75	21.79	30.00	PASS
3	2422	MCS0	full	15	22.05	30.00	PASS
6	2437	MCS0	full	14.5	22.12	30.00	PASS
10	2457	MCS0	full	15	22.25	30.00	PASS
11	2462	MCS0	full	12	21.07	30.00	PASS
			26/8	9	18.01	30.00	PASS
			52/40	9	18.11	30.00	PASS
			106/54	9	18.08	30.00	PASS

802.11ax_HE_20M WLAN1							
CH	Freq. (MHz)	Data Rate	RU Config	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	full	12.25	10.89	30.00	PASS
			26/0	9	7.26	30.00	PASS
			52/37	9	6.98	30.00	PASS
			106/53	9	7.45	30.00	PASS
2	2417	MCS0	full	12.75	11.54	30.00	PASS
3	2422	MCS0	full	15	13.70	30.00	PASS
6	2437	MCS0	full	14.5	13.68	30.00	PASS
10	2457	MCS0	full	15	13.72	30.00	PASS
11	2462	MCS0	full	12	10.84	30.00	PASS
			26/8	9	7.40	30.00	PASS
			52/40	9	7.50	30.00	PASS
			106/54	9	7.67	30.00	PASS

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802.11ax_HE_20M WLAN2							
CH	Freq. (MHz)	Data Rate	RU Config	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	full	11.25	21.53	30.00	PASS
			26/0	9	18.74	30.00	PASS
			52/37	9	18.80	30.00	PASS
			106/53	9	18.87	30.00	PASS
2	2417	MCS0	full	11.75	21.95	30.00	PASS
3	2422	MCS0	full	14.5	22.31	30.00	PASS
6	2437	MCS0	full	14.5	22.39	30.00	PASS
10	2457	MCS0	full	14.5	22.52	30.00	PASS
11	2462	MCS0	full	11	21.19	30.00	PASS
			26/8	9	18.28	30.00	PASS
			52/40	9	18.27	30.00	PASS
			106/54	9	18.28	30.00	PASS

802.11ax_HE_20M WLAN2							
CH	Freq. (MHz)	Data Rate	RU Config	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	full	11.25	10.97	30.00	PASS
			26/0	9	8.34	30.00	PASS
			52/37	9	8.47	30.00	PASS
			106/53	9	8.59	30.00	PASS
2	2417	MCS0	full	11.75	11.56	30.00	PASS
3	2422	MCS0	full	14.5	13.90	30.00	PASS
6	2437	MCS0	full	14.5	13.89	30.00	PASS
10	2457	MCS0	full	14.5	13.97	30.00	PASS
11	2462	MCS0	full	11	10.95	30.00	PASS
			26/8	9	8.45	30.00	PASS
			52/40	9	8.40	30.00	PASS
			106/54	9	8.58	30.00	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
					WLAN1	WLAN2			
1	2412	MCS0	full	11.75	20.41	21.69	24.11	30.00	PASS
			26/0	9	17.82	18.83	21.36	30.00	PASS
			52/37	9	17.93	18.83	21.41	30.00	PASS
			106/53	9	17.68	18.95	21.37	30.00	PASS
2	2417	MCS0	full	11.75	20.54	21.98	24.33	30.00	PASS
3	2422	MCS0	full	14.5	21.67	22.41	25.07	30.00	PASS
6	2437	MCS0	full	14.5	21.79	22.42	25.13	30.00	PASS
10	2457	MCS0	full	15	21.84	22.61	25.25	30.00	PASS
11	2462	MCS0	full	12	20.42	21.25	23.87	30.00	PASS
			26/8	9	18.06	18.33	21.21	30.00	PASS
			52/40	9	18.19	18.28	21.25	30.00	PASS
			106/54	9	18.09	18.30	21.21	30.00	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
					WLAN1	WLAN2			
1	2412	MCS0	full	11.75	10.35	11.44	13.94	30.00	PASS
			26/0	9	7.28	8.39	10.88	30.00	PASS
			52/37	9	7.35	8.48	10.96	30.00	PASS
			106/53	9	7.55	8.66	11.15	30.00	PASS
2	2417	MCS0	full	11.75	10.24	11.61	13.99	30.00	PASS
3	2422	MCS0	full	14.5	13.54	14.35	16.98	30.00	PASS
6	2437	MCS0	full	14.5	13.81	14.01	16.92	30.00	PASS
10	2457	MCS0	full	15	13.62	13.98	16.82	30.00	PASS
11	2462	MCS0	full	12	10.69	11.25	13.99	30.00	PASS
			26/8	9	7.48	8.51	11.03	30.00	PASS
			52/40	9	7.55	8.48	11.05	30.00	PASS
			106/54	9	7.73	8.62	11.20	30.00	PASS

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802.11ax_HE_40M WLAN1							
CH	Freq. (MHz)	Data Rate	RU Config	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	full	9.75	19.31	30.00	PASS
			242/61	9	17.87	30.00	PASS
4	2427	MCS0	full	13.75	21.26	30.00	PASS
5	2432	MCS0	full	14	21.51	30.00	PASS
6	2437	MCS0	full	14.75	21.93	30.00	PASS
7	2442	MCS0	full	14	21.72	30.00	PASS
8	2447	MCS0	full	12.5	21.35	30.00	PASS
9	2452	MCS0	full	11.75	20.96	30.00	PASS
			242/62	9	18.54	30.00	PASS

802.11ax_HE_40M WLAN1							
CH	Freq. (MHz)	Data Rate	RU Config	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	full	9.75	8.83	30.00	PASS
			242/61	9	7.57	30.00	PASS
4	2427	MCS0	full	13.75	12.64	30.00	PASS
5	2432	MCS0	full	14	12.91	30.00	PASS
6	2437	MCS0	full	14.75	13.58	30.00	PASS
7	2442	MCS0	full	14	12.95	30.00	PASS
8	2447	MCS0	full	12.5	11.58	30.00	PASS
9	2452	MCS0	full	11.75	10.84	30.00	PASS
			242/62	9	8.11	30.00	PASS

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802.11ax_HE_40M WLAN2

CH	Freq. (MHz)	Data Rate	RU Config	Power set	Peak Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	full	9.25	19.62	30.00	PASS
			242/61	9	18.86	30.00	PASS
4	2427	MCS0	full	12.5	21.64	30.00	PASS
5	2432	MCS0	full	13	21.87	30.00	PASS
6	2437	MCS0	full	13.75	22.30	30.00	PASS
7	2442	MCS0	full	13	21.79	30.00	PASS
8	2447	MCS0	full	11.5	21.63	30.00	PASS
9	2452	MCS0	full	10.75	21.15	30.00	PASS
			242/62	9	20.73	30.00	PASS

802.11ax_HE_40M WLAN2

CH	Freq. (MHz)	Data Rate	RU Config	Power set	Avg. Output Power (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	full	9.25	8.91	30.00	PASS
			242/61	9	8.80	30.00	PASS
4	2427	MCS0	full	12.5	12.66	30.00	PASS
5	2432	MCS0	full	13	12.94	30.00	PASS
6	2437	MCS0	full	13.75	13.61	30.00	PASS
7	2442	MCS0	full	13	12.97	30.00	PASS
8	2447	MCS0	full	11.5	11.60	30.00	PASS
9	2452	MCS0	full	10.75	10.88	30.00	PASS
			242/62	9	9.47	30.00	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
					WLAN1	WLAN2			
3	2422	MCS0	full	9.5	18.56	19.65	22.15	30.00	PASS
			242/61	9	17.86	18.87	21.40	30.00	PASS
4	2427	MCS0	full	12	20.62	21.68	24.19	30.00	PASS
5	2432	MCS0	full	13	21.24	21.94	24.61	30.00	PASS
6	2437	MCS0	full	13	21.28	22.41	24.89	30.00	PASS
7	2442	MCS0	full	13	21.04	21.82	24.46	30.00	PASS
8	2447	MCS0	full	11	20.41	21.69	24.11	30.00	PASS
9	2452	MCS0	full	10.5	20.16	21.65	23.98	30.00	PASS
			242/62	9	18.55	20.83	22.85	30.00	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
					WLAN1	WLAN2			
3	2422	MCS0	full	9.5	8.66	9.23	11.97	30.00	PASS
			242/61	9	7.63	8.88	11.32	30.00	PASS
4	2427	MCS0	full	12	11.15	12.67	14.99	30.00	PASS
5	2432	MCS0	full	13	12.05	13.59	15.90	30.00	PASS
6	2437	MCS0	full	13	12.09	13.68	15.97	30.00	PASS
7	2442	MCS0	full	13	12.16	13.66	15.99	30.00	PASS
8	2447	MCS0	full	11	10.18	11.61	13.97	30.00	PASS
9	2452	MCS0	full	10.5	10.08	11.65	13.95	30.00	PASS
			242/62	9	8.13	9.67	11.98	30.00	PASS

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802.11b WLAN1							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	1	15.64	-1.77	13.87	36	PASS
6	2437	1	15.54	-1.77	13.77	36	PASS
11	2462	1	15.62	-1.77	13.85	36	PASS

802.11b WLAN2							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	1	15.69	0.105	15.79	36	PASS
6	2437	1	15.63	0.105	15.73	36	PASS
11	2462	1	15.67	0.105	15.77	36	PASS

802.11b_2TX									
CH	Freq. (MHz)	Data Rate	Avg. Output Power		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			WLAN1	WLAN2					
1	2412	1	15.70	16.12	18.92	-0.732	18.19	36	PASS
6	2437	1	15.59	16.04	18.83	-0.732	18.10	36	PASS
11	2462	1	15.65	16.19	18.93	-0.732	18.20	36	PASS

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802.11g WLAN1							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	6	10.92	-1.77	9.15	36	PASS
2	2417	6	13.92	-1.77	12.15	36	PASS
3	2422	6	14.86	-1.77	13.09	36	PASS
6	2437	6	14.57	-1.77	12.80	36	PASS
10	2457	6	14.55	-1.77	12.78	36	PASS
11	2462	6	11.91	-1.77	10.14	36	PASS

802.11g WLAN2							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	6	10.98	0.105	11.08	36	PASS
2	2417	6	13.98	0.105	14.08	36	PASS
3	2422	6	14.98	0.105	15.08	36	PASS
6	2437	6	14.58	0.105	14.68	36	PASS
10	2457	6	14.56	0.105	14.66	36	PASS
11	2462	6	11.98	0.105	12.08	36	PASS

802.11g_2TX									
CH	Freq. (MHz)	Data Rate	Avg. Output Power		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			WLAN1	WLAN2					
1	2412	6	10.20	11.63	13.98	-0.732	13.25	36	PASS
2	2417	6	13.16	14.25	16.74	-0.732	16.01	36	PASS
3	2422	6	14.41	15.18	17.82	-0.732	17.09	36	PASS
6	2437	6	14.58	14.87	17.73	-0.732	17.00	36	PASS
10	2457	6	14.43	14.61	17.53	-0.732	16.79	36	PASS
11	2462	6	11.53	12.37	14.98	-0.732	14.24	36	PASS

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802.11n_HT_20M WLAN1							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	10.87	-1.77	9.10	36	PASS
2	2417	MCS0	11.52	-1.77	9.75	36	PASS
3	2422	MCS0	13.88	-1.77	12.11	36	PASS
6	2437	MCS0	13.60	-1.77	11.83	36	PASS
10	2457	MCS0	13.68	-1.77	11.91	36	PASS
11	2462	MCS0	10.78	-1.77	9.01	36	PASS

802.11n_HT_20M WLAN2							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	10.93	0.105	11.04	36	PASS
2	2417	MCS0	11.53	0.105	11.64	36	PASS
3	2422	MCS0	13.99	0.105	14.10	36	PASS
6	2437	MCS0	13.82	0.105	13.93	36	PASS
10	2457	MCS0	13.71	0.105	13.82	36	PASS
11	2462	MCS0	10.92	0.105	11.03	36	PASS

802.11n_HT20M_2TX									
CH	Freq. (MHz)	Data Rate	Avg. Output Power		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			WLAN1	WLAN2					
1	2412	MCS0	10.31	11.44	13.92	-0.732	13.19	36	PASS
2	2417	MCS0	10.24	11.59	13.98	-0.732	13.25	36	PASS
3	2422	MCS0	13.39	14.22	16.84	-0.732	16.10	36	PASS
6	2437	MCS0	13.62	13.98	16.82	-0.732	16.08	36	PASS
10	2457	MCS0	13.43	13.79	16.63	-0.732	15.89	36	PASS
11	2462	MCS0	10.43	11.36	13.93	-0.732	13.20	36	PASS

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802.11n_HT_40M WLAN1							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	8.80	-1.77	7.03	36	PASS
4	2427	MCS0	12.62	-1.77	10.85	36	PASS
5	2432	MCS0	12.84	-1.77	11.07	36	PASS
6	2437	MCS0	13.53	-1.77	11.76	36	PASS
7	2442	MCS0	12.79	-1.77	11.02	36	PASS
8	2447	MCS0	11.56	-1.77	9.79	36	PASS
9	2452	MCS0	10.79	-1.77	9.02	36	PASS

802.11n_HT_40M WLAN2							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	8.89	0.105	9.00	36	PASS
4	2427	MCS0	12.63	0.105	12.74	36	PASS
5	2432	MCS0	12.86	0.105	12.97	36	PASS
6	2437	MCS0	13.59	0.105	13.70	36	PASS
7	2442	MCS0	12.81	0.105	12.92	36	PASS
8	2447	MCS0	11.58	0.105	11.69	36	PASS
9	2452	MCS0	10.83	0.105	10.94	36	PASS

802.11n_HT40M_2TX									
CH	Freq. (MHz)	Data Rate	Avg. Output Power		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			WLAN1	WLAN2					
3	2422	MCS0	8.33	9.35	11.88	-0.732	11.15	36	PASS
4	2427	MCS0	10.98	12.77	14.98	-0.732	14.25	36	PASS
5	2432	MCS0	11.74	13.29	15.60	-0.732	14.87	36	PASS
6	2437	MCS0	12.05	13.69	15.96	-0.732	15.23	36	PASS
7	2442	MCS0	11.84	13.34	15.67	-0.732	14.94	36	PASS
8	2447	MCS0	10.11	11.65	13.96	-0.732	13.23	36	PASS
9	2452	MCS0	9.86	11.21	13.60	-0.732	12.87	36	PASS

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802.11ac_VHT_20M WLAN1							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	10.80	-1.77	9.03	36	PASS
2	2417	MCS0	11.51	-1.77	9.74	36	PASS
3	2422	MCS0	13.89	-1.77	12.12	36	PASS
6	2437	MCS0	13.49	-1.77	11.72	36	PASS
10	2457	MCS0	13.50	-1.77	11.73	36	PASS
11	2462	MCS0	10.76	-1.77	8.99	36	PASS

802.11ac_VHT_20M WLAN2							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
1	2412	MCS0	10.82	0.105	10.93	36	PASS
2	2417	MCS0	11.52	0.105	11.63	36	PASS
3	2422	MCS0	13.99	0.105	14.10	36	PASS
6	2437	MCS0	13.80	0.105	13.91	36	PASS
10	2457	MCS0	13.71	0.105	13.82	36	PASS
11	2462	MCS0	10.89	0.105	11.00	36	PASS

802.11ac_VHT20M_2TX									
CH	Freq. (MHz)	Data Rate	Avg. Output Power		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			WLAN1	WLAN2					
1	2412	MCS0	10.30	11.43	13.91	-0.732	13.18	36	PASS
2	2417	MCS0	10.23	11.58	13.97	-0.732	13.24	36	PASS
3	2422	MCS0	13.38	14.15	16.79	-0.732	16.06	36	PASS
6	2437	MCS0	13.63	13.96	16.81	-0.732	16.08	36	PASS
10	2457	MCS0	13.39	13.73	16.57	-0.732	15.84	36	PASS
11	2462	MCS0	10.56	11.06	13.83	-0.732	13.10	36	PASS

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802.11ac_VHT_40M WLAN1							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	8.79	-1.77	7.02	36	PASS
4	2427	MCS0	12.59	-1.77	10.82	36	PASS
5	2432	MCS0	12.74	-1.77	10.97	36	PASS
6	2437	MCS0	13.52	-1.77	11.75	36	PASS
7	2442	MCS0	12.77	-1.77	11.00	36	PASS
8	2447	MCS0	11.55	-1.77	9.78	36	PASS
9	2452	MCS0	10.63	-1.77	8.86	36	PASS

802.11ac_VHT_40M WLAN2							
CH	Freq. (MHz)	Data Rate	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
3	2422	MCS0	8.88	0.105	8.99	36	PASS
4	2427	MCS0	12.61	0.105	12.72	36	PASS
5	2432	MCS0	12.78	0.105	12.89	36	PASS
6	2437	MCS0	13.56	0.105	13.67	36	PASS
7	2442	MCS0	12.79	0.105	12.90	36	PASS
8	2447	MCS0	11.56	0.105	11.67	36	PASS
9	2452	MCS0	10.81	0.105	10.92	36	PASS

802.11ac_VHT40M_2TX									
CH	Freq. (MHz)	Data Rate	Avg. Output Power		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	RESULT
			WLAN1	WLAN2					
3	2422	MCS0	8.32	9.21	11.79	-0.732	11.06	36	PASS
4	2427	MCS0	11.04	12.68	14.94	-0.732	14.21	36	PASS
5	2432	MCS0	11.70	13.27	15.56	-0.732	14.83	36	PASS
6	2437	MCS0	11.97	13.61	15.87	-0.732	15.14	36	PASS
7	2442	MCS0	11.77	13.33	15.63	-0.732	14.89	36	PASS
8	2447	MCS0	10.10	11.64	13.94	-0.732	13.21	36	PASS
9	2452	MCS0	9.83	11.20	13.57	-0.732	12.84	36	PASS

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802.11ax_HE_20M WLAN1								
CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
1	2412	MCS0	full	10.89	-1.77	9.12	36	PASS
			26/0	7.26	-1.77	5.49	36	PASS
			52/37	6.98	-1.77	5.21	36	PASS
			106/53	7.45	-1.77	5.68	36	PASS
2	2417	MCS0	full	11.54	-1.77	9.77	36	PASS
3	2422	MCS0	full	13.70	-1.77	11.93	36	PASS
6	2437	MCS0	full	13.68	-1.77	11.91	36	PASS
10	2457	MCS0	full	13.72	-1.77	11.95	36	PASS
11	2462	MCS0	full	10.84	-1.77	9.07	36	PASS
			26/8	7.40	-1.77	5.63	36	PASS
			52/40	7.50	-1.77	5.73	36	PASS
			106/54	7.67	-1.77	5.90	36	PASS

802.11ax_HE_20M WLAN2								
CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
1	2412	MCS0	full	10.97	0.105	11.08	36	PASS
			26/0	8.34	0.105	8.44	36	PASS
			52/37	8.47	0.105	8.57	36	PASS
			106/53	8.59	0.105	8.69	36	PASS
2	2417	MCS0	full	11.56	0.105	11.67	36	PASS
3	2422	MCS0	full	13.90	0.105	14.01	36	PASS
6	2437	MCS0	full	13.89	0.105	14.00	36	PASS
10	2457	MCS0	full	13.97	0.105	14.08	36	PASS
11	2462	MCS0	full	10.95	0.105	11.06	36	PASS
			26/8	8.45	0.105	8.55	36	PASS
			52/40	8.40	0.105	8.50	36	PASS
			106/54	8.58	0.105	8.68	36	PASS

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802.11ax_HE20M_2TX										
CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
				WLAN1	WLAN2					
1	2412	MCS0	full	10.35	11.44	13.94	-0.732	13.21	36	PASS
			26/0	7.28	8.39	10.88	-0.732	10.14	36	PASS
			52/37	7.35	8.48	10.96	-0.732	10.23	36	PASS
			106/53	7.55	8.66	11.15	-0.732	10.41	36	PASS
2	2417	MCS0	full	10.24	11.61	13.99	-0.732	13.26	36	PASS
3	2422	MCS0	full	13.54	14.35	16.98	-0.732	16.24	36	PASS
6	2437	MCS0	full	13.81	14.01	16.92	-0.732	16.19	36	PASS
10	2457	MCS0	full	13.62	13.98	16.82	-0.732	16.08	36	PASS
11	2462	MCS0	full	10.69	11.25	13.99	-0.732	13.26	36	PASS
			26/8	7.48	8.51	11.03	-0.732	10.30	36	PASS
			52/40	7.55	8.48	11.05	-0.732	10.31	36	PASS
			106/54	7.73	8.62	11.20	-0.732	10.47	36	PASS

802.11ax_HE_40M WLAN1								
CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
3	2422	MCS0	full	8.83	-1.77	7.06	36	PASS
			242/61	7.57	-1.77	5.80	36	PASS
4	2427	MCS0	full	12.64	-1.77	10.87	36	PASS
5	2432	MCS0	full	12.91	-1.77	11.14	36	PASS
6	2437	MCS0	full	13.58	-1.77	11.81	36	PASS
7	2442	MCS0	full	12.95	-1.77	11.18	36	PASS
8	2447	MCS0	full	11.58	-1.77	9.81	36	PASS
9	2452	MCS0	full	10.84	-1.77	9.07	36	PASS
			242/62	8.11	-1.77	6.34	36	PASS

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802.11ax_HE_40M WLAN2								
CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
3	2422	MCS0	full	8.91	0.105	9.02	36	PASS
			242/61	8.80	0.105	8.91	36	PASS
4	2427	MCS0	full	12.66	0.105	12.77	36	PASS
5	2432	MCS0	full	12.94	0.105	13.05	36	PASS
6	2437	MCS0	full	13.61	0.105	13.72	36	PASS
7	2442	MCS0	full	12.97	0.105	13.08	36	PASS
8	2447	MCS0	full	11.60	0.105	11.71	36	PASS
9	2452	MCS0	full	10.88	0.105	10.99	36	PASS
			242/62	9.47	0.105	9.58	36	PASS

802.11ax_HE40M_2TX										
CH	Freq. (MHz)	Data Rate	RU Config	Avg. Output Power		Total Avg. Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit	RESULT
				WLAN1	WLAN2					
3	2422	MCS0	full	8.66	9.23	11.97	-0.732	11.24	36	PASS
			242/61	7.63	8.88	11.32	-0.732	10.58	36	PASS
4	2427	MCS0	full	11.15	12.67	14.99	-0.732	14.26	36	PASS
5	2432	MCS0	full	12.05	13.59	15.90	-0.732	15.17	36	PASS
6	2437	MCS0	full	12.09	13.68	15.97	-0.732	15.24	36	PASS
7	2442	MCS0	full	12.16	13.66	15.99	-0.732	15.26	36	PASS
8	2447	MCS0	full	10.18	11.61	13.97	-0.732	13.24	36	PASS
9	2452	MCS0	full	10.08	11.65	13.95	-0.732	13.22	36	PASS
			242/62	8.13	9.67	11.98	-0.732	11.25	36	PASS

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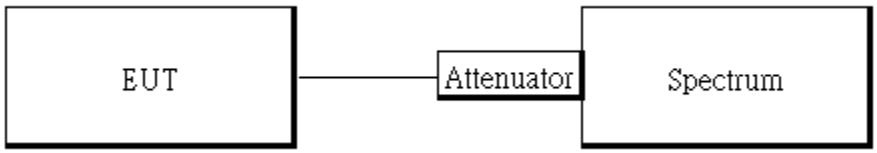
9 EMISSION BANDWIDTH MEASUREMENT

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 ≥ 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.

9.4 Measurement Result:

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9.4.1 6dB BW measurements

802.11b WLAN1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	10100	≧ 500	PASS
2437	**10110**	≧ 500	PASS
2462	**10110**	≧ 500	PASS

802.11b WLAN2

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	10110	≧ 500	PASS
2437	**10120**	≧ 500	PASS
2462	10110	≧ 500	PASS

802.11g WLAN1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	16390	≧ 500	PASS
2437	16390	≧ 500	PASS
2462	**16410**	≧ 500	PASS

802.11g WLAN2

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	**16420**	≧ 500	PASS
2437	16410	≧ 500	PASS
2462	**16420**	≧ 500	PASS

802.11n_HT_20M WLAN1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	17550	≧ 500	PASS
2437	17370	≧ 500	PASS
2462	**17570**	≧ 500	PASS

802.11n_HT_20M WLAN2

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2412	17590	≧ 500	PASS
2437	**17600**	≧ 500	PASS
2462	17590	≧ 500	PASS

802.11n_HT_40M WLAN1

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2422	35690	≧ 500	PASS
2437	**35770**	≧ 500	PASS
2452	35740	≧ 500	PASS

802.11n_HT_40M WLAN2

Freq. (MHz)	6dB BW (kHz)	Limit (kHz)	Result
2422	35710	≧ 500	PASS
2437	**35770**	≧ 500	PASS
2452	35660	≧ 500	PASS

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802.11ax_HE_20M WLAN1

Freq. (MHz)	RU Config	6dB BW (kHz)	Limit (kHz)	Result
2412	full	**18540**	≧ 500	PASS
	26/0	2050	≧ 500	PASS
	52/37	4065	≧ 500	PASS
	106/53	8233	≧ 500	PASS
2437	full	18430	≧ 500	PASS
2462	full	18450	≧ 500	PASS
	26/8	2040	≧ 500	PASS
	52/40	4037	≧ 500	PASS
	106/54	8271	≧ 500	PASS

802.11ax_HE_20M WLAN2

Freq. (MHz)	RU Config	6dB BW (kHz)	Limit (kHz)	Result
2412	full	18280	≧ 500	PASS
	26/0	2044	≧ 500	PASS
	52/37	4041	≧ 500	PASS
	106/53	8250	≧ 500	PASS
2437	full	**18550**	≧ 500	PASS
2462	full	18350	≧ 500	PASS
	26/8	2042	≧ 500	PASS
	52/40	4045	≧ 500	PASS
	106/54	8261	≧ 500	PASS

802.11ax_HE_40M WLAN1

Freq. (MHz)	RU Config	6dB BW (kHz)	Limit (kHz)	Result
2422	full	37340	≧ 500	PASS
	242/61	18860	≧ 500	PASS
2437	full	**37530**	≧ 500	PASS
2452	full	37210	≧ 500	PASS
	242/62	18870	≧ 500	PASS

802.11ax_HE_40M WLAN2

Freq. (MHz)	RU Config	6dB BW (kHz)	Limit (kHz)	Result
2422	full	37090	≧ 500	PASS
	242/61	18860	≧ 500	PASS
2437	full	**37330**	≧ 500	PASS
2452	full	36980	≧ 500	PASS
	242/62	18860	≧ 500	PASS

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802.11b_20MHz_WLAN1_2412MHz

802.11b_20MHz_WLAN2_2412MHz

802.11b_20MHz_WLAN1_2437MHz

802.11b_20MHz_WLAN2_2437MHz

802.11b_20MHz_WLAN1_2462MHz

802.11b_20MHz_WLAN2_2462MHz

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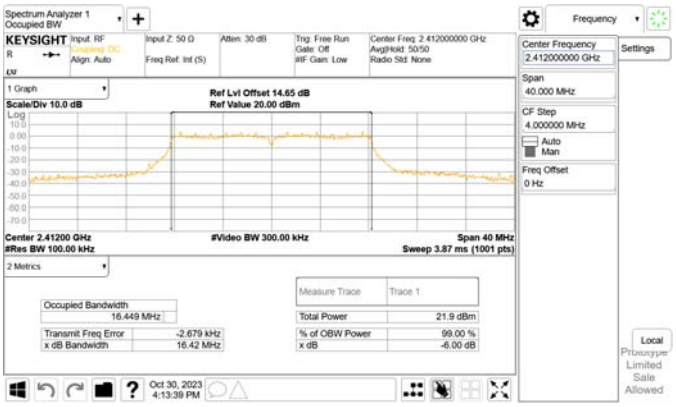
802.11g_20MHz_WLAN1_2412MHz

802.11g_20MHz_WLAN2_2412MHz



802.11g_20MHz_WLAN1_2437MHz

802.11g_20MHz_WLAN2_2437MHz

802.11g_20MHz_WLAN1_2462MHz

802.11g_20MHz_WLAN2_2462MHz

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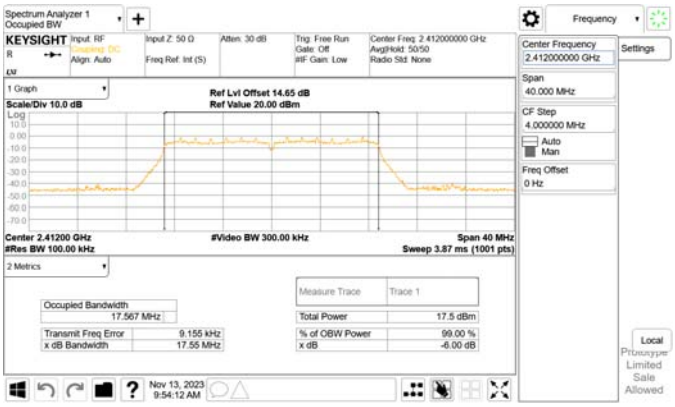
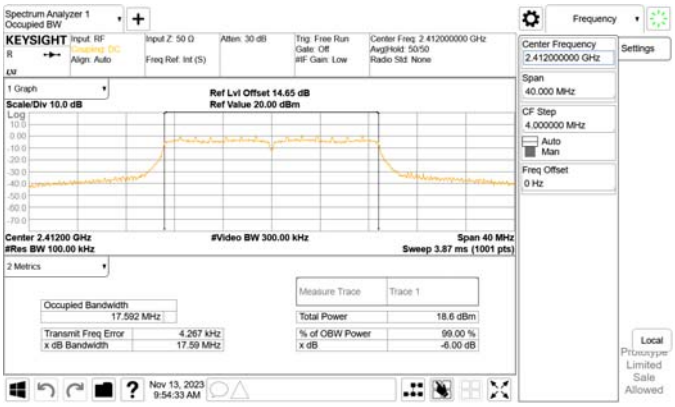
802.11n_20MHz_WLAN1_2412MHz

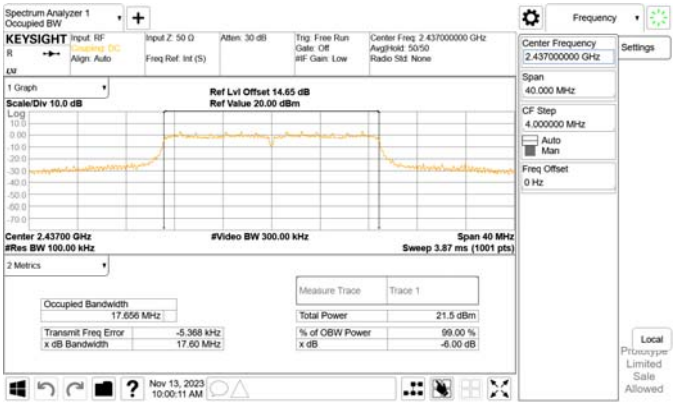


802.11n_20MHz_WLAN2_2412MHz



802.11n_20MHz_WLAN1_2437MHz

802.11n_20MHz_WLAN2_2437MHz



802.11n_20MHz_WLAN1_2462MHz

802.11n_20MHz_WLAN2_2462MHz

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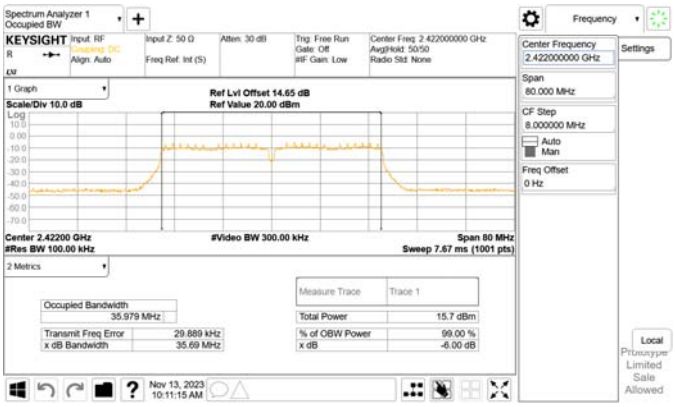
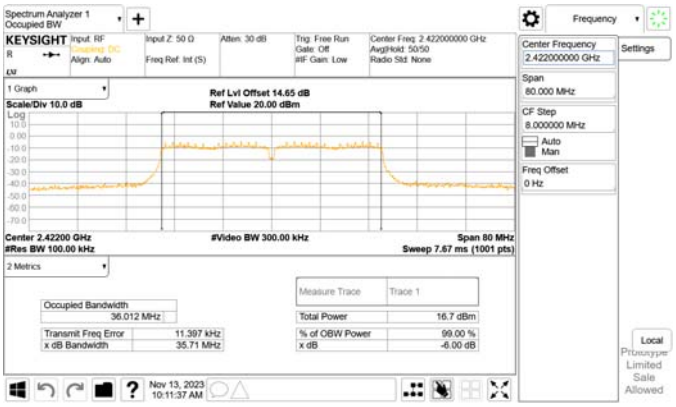
802.11n_40MHz_WLAN1_2422MHz

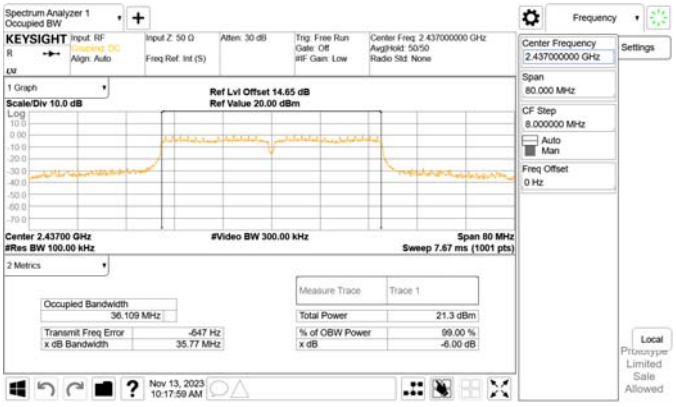


802.11n_40MHz_WLAN2_2422MHz



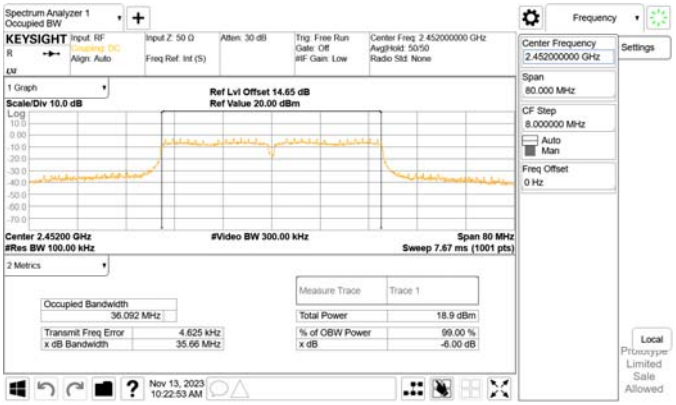
802.11n_40MHz_WLAN1_2437MHz

802.11n_40MHz_WLAN2_2437MHz



802.11n_40MHz_WLAN1_2452MHz

802.11n_40MHz_WLAN2_2452MHz



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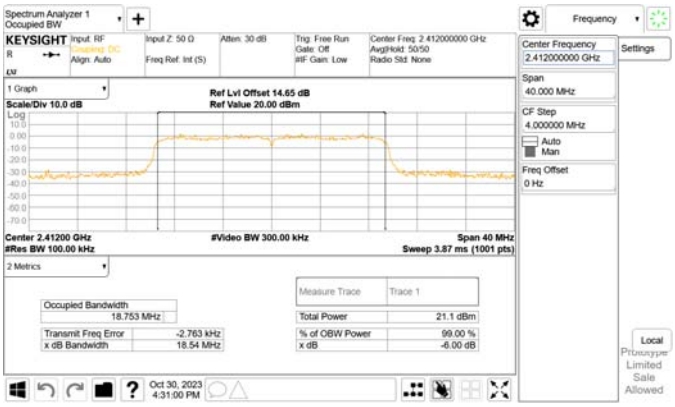
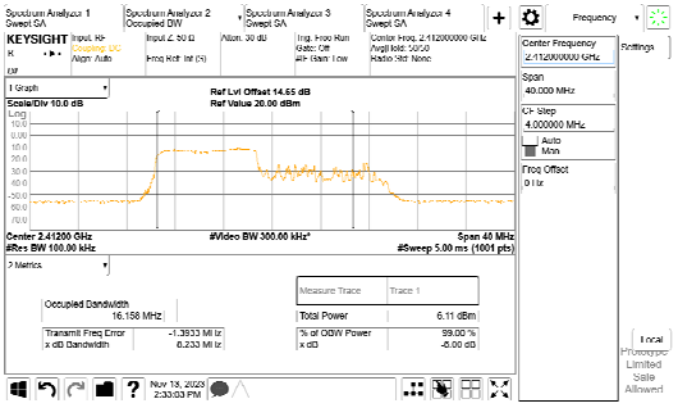
802.11ax_20MHz_WLAN1_2412MHz



802.11ax_20MHz_WLAN1_2412MHz_RU106_53



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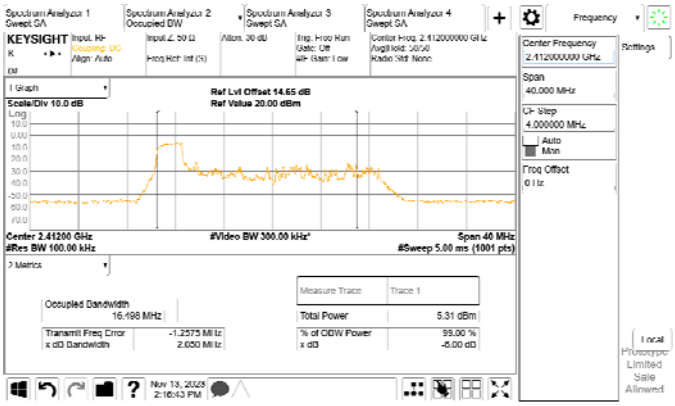
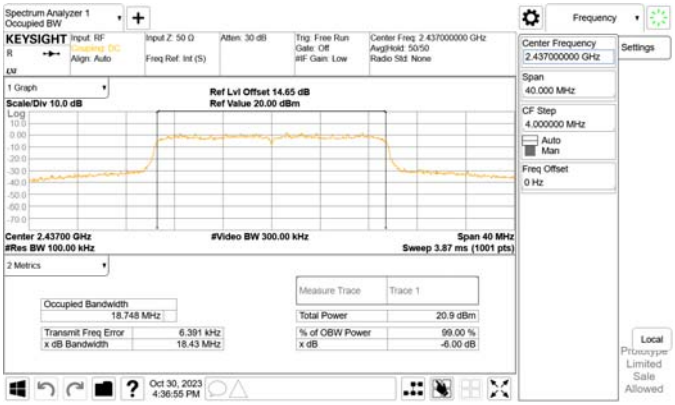
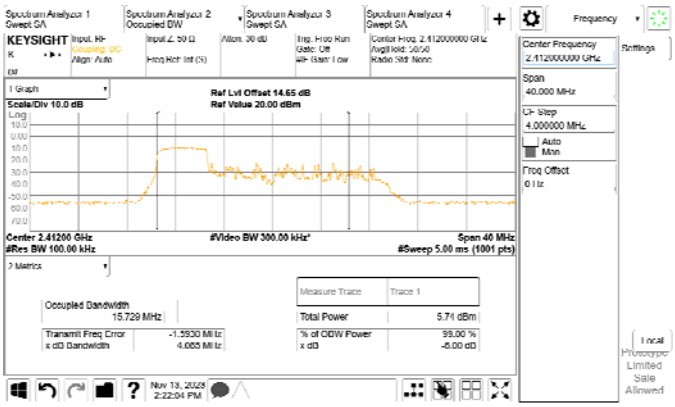


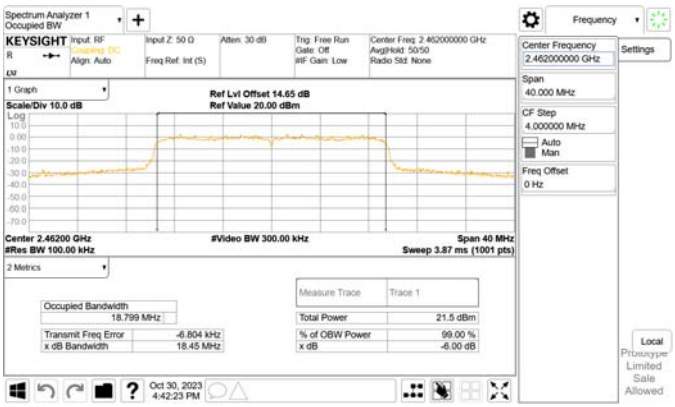
802.11ax_20MHz_WLAN1_2437MHz



802.11ax_20MHz_WLAN1_2412MHz_RU52_37



802.11ax_20MHz_WLAN1_2462MHz



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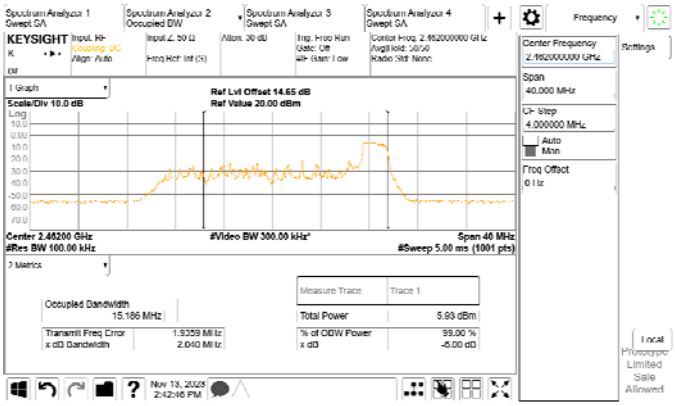
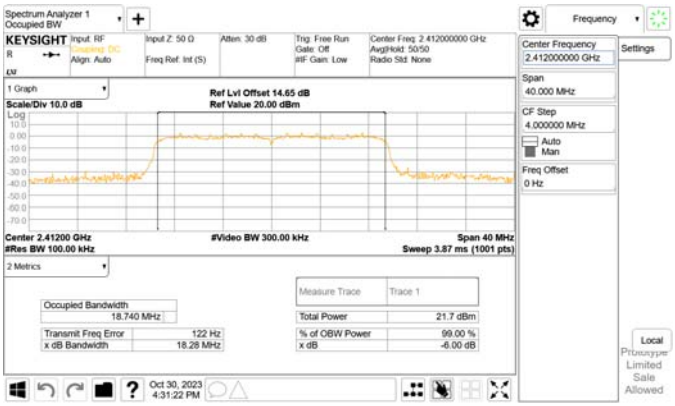
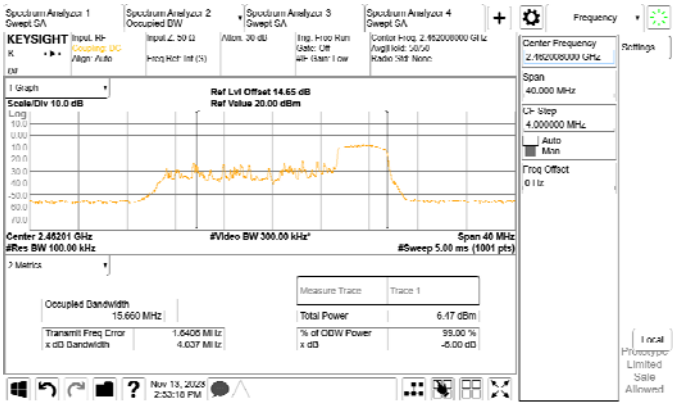
802.11ax_20MHz_WLAN1_2462MHz_RU26_8



802.11ax_20MHz_WLAN2_2412MHz



802.11ax_20MHz_WLAN1_2462MHz_RU52_40



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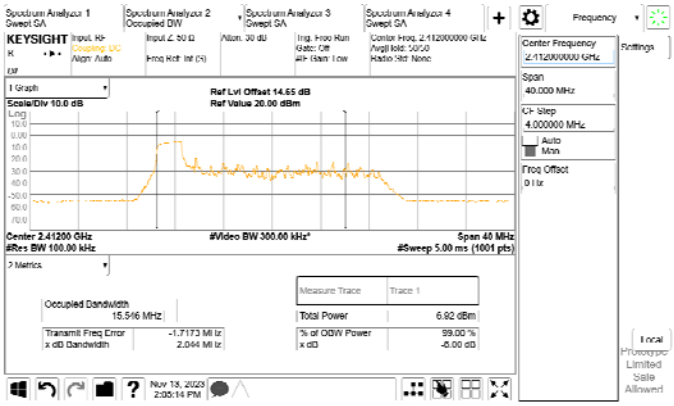

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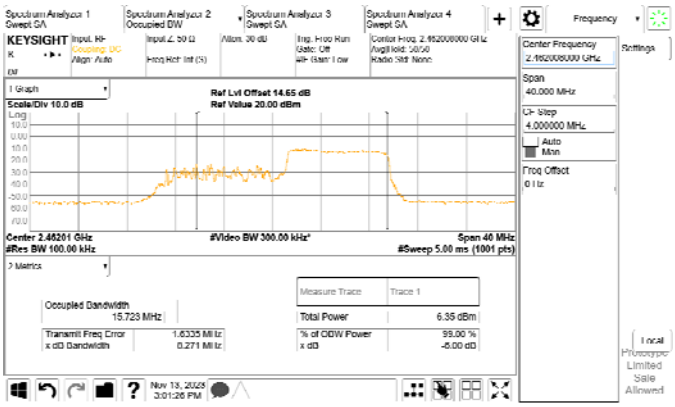
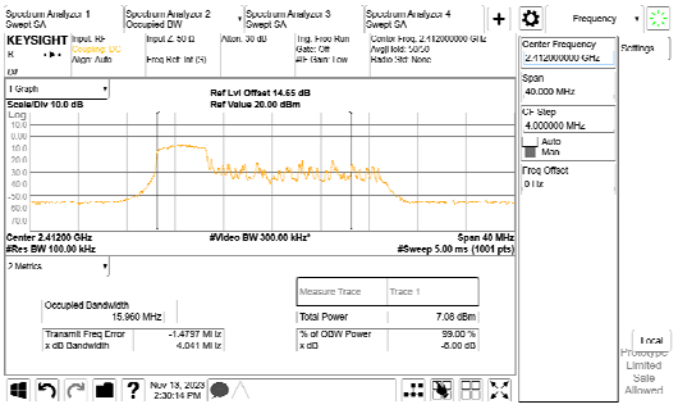


802.11ax_20MHz_WLAN2_2412MHz_RU52_37



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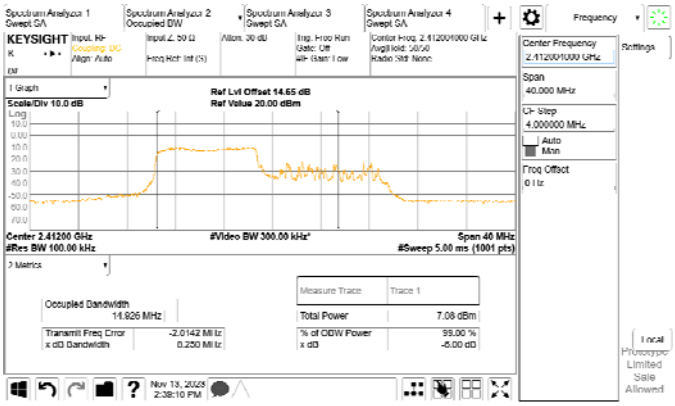
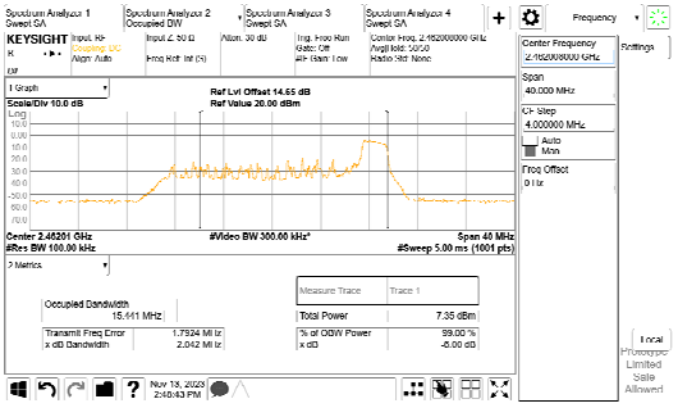
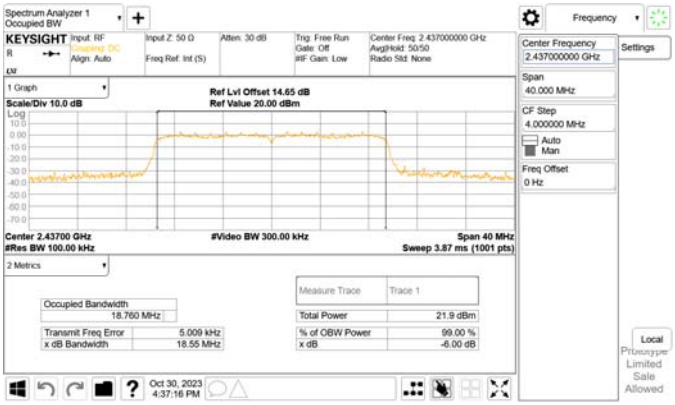
802.11ax_20MHz_WLAN2_2412MHz_RU106_53



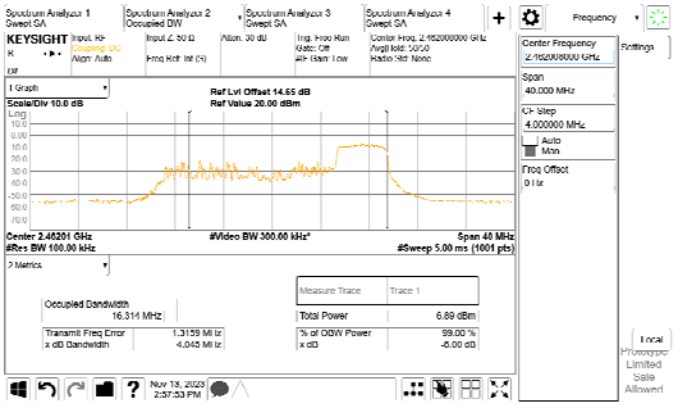
802.11ax_20MHz_WLAN2_2462MHz_RU26_8



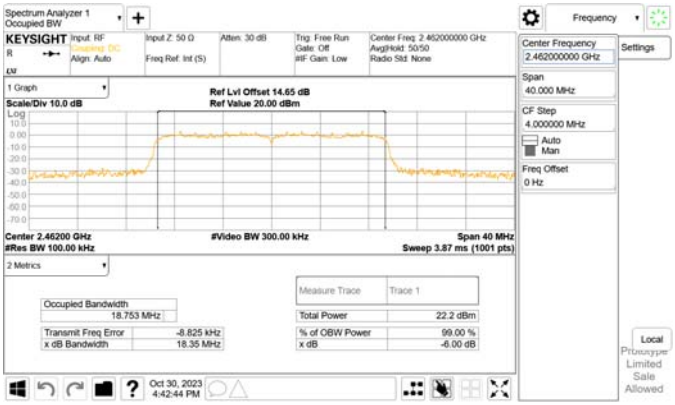
802.11ax_20MHz_WLAN2_2437MHz



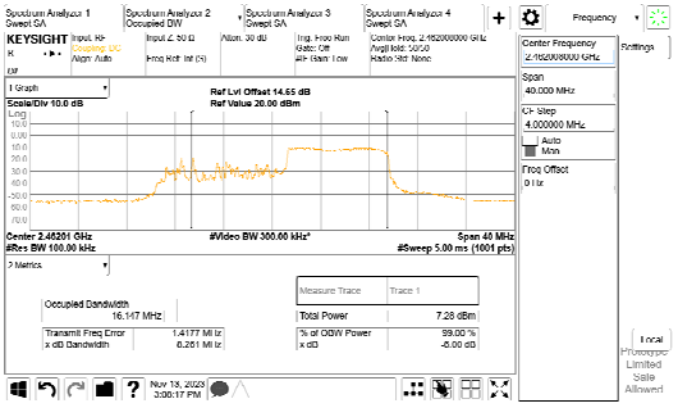
802.11ax_20MHz_WLAN2_2462MHz_RU52_40



802.11ax_20MHz_WLAN2_2462MHz



802.11ax_20MHz_WLAN2_2462MHz_RU106_54



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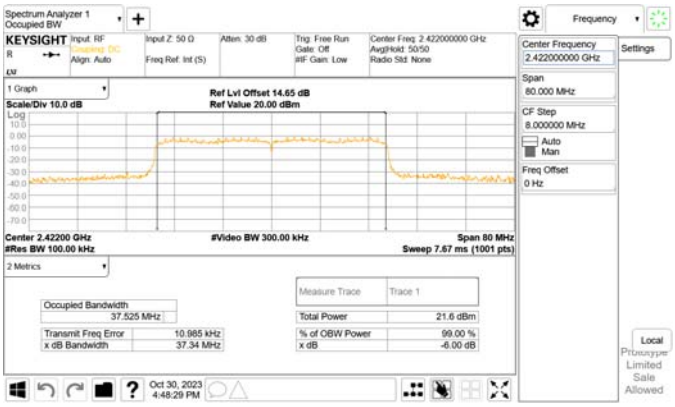
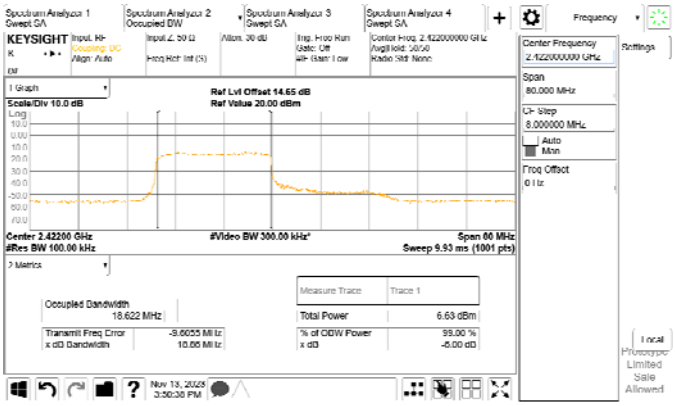
802.11ax_40MHz_WLAN1_2422MHz

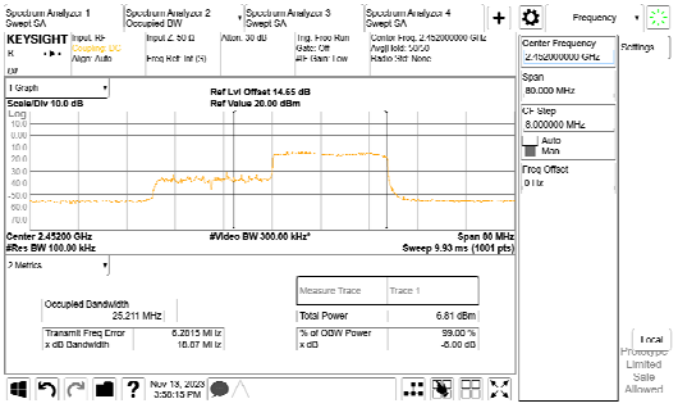


802.11ax_40MHz_WLAN1_2452MHz

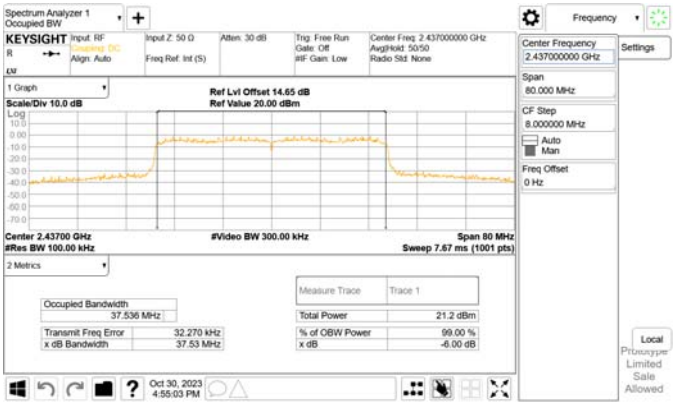
802.11ax_40MHz_WLAN1_2422MHz_RU242_61



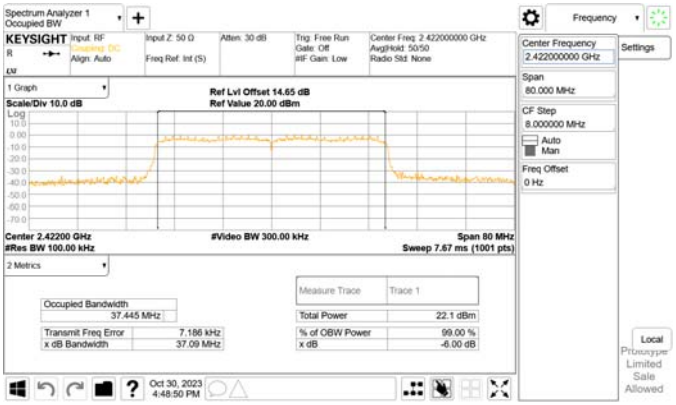
802.11ax_40MHz_WLAN1_2452MHz_RU242_62



802.11ax_40MHz_WLAN1_2437MHz



802.11ax_40MHz_WLAN2_2422MHz



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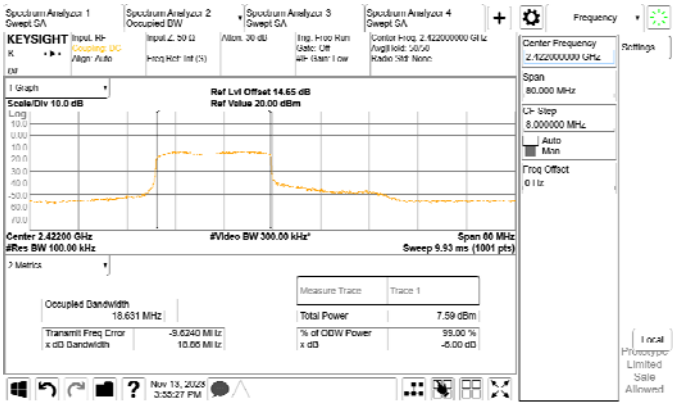
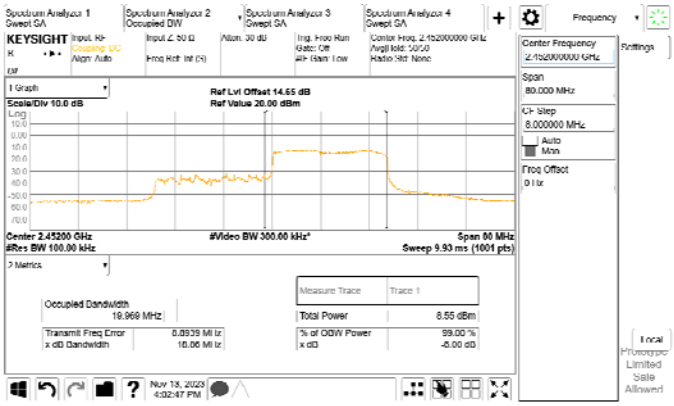
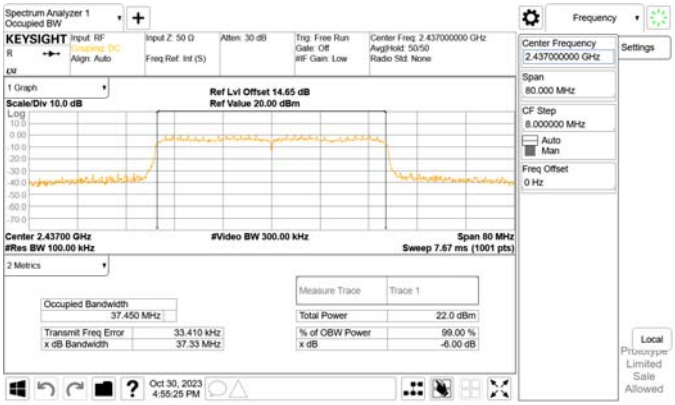
802.11ax_40MHz_WLAN2_2422MHz_RU242_61



802.11ax_40MHz_WLAN2_2452MHz_RU242_62



802.11ax_40MHz_WLAN2_2437MHz



802.11ax_40MHz_WLAN2_2452MHz

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9.4.2 99% Bandwidth

802.11b WLAN1

Freq. (MHz)	99% BW (MHz)
2412	13.232
2437	13.658
2462	13.473

802.11b WLAN2

Freq. (MHz)	99% BW (MHz)
2412	13.334
2437	13.355
2462	13.359

802.11g WLAN1

Freq. (MHz)	99% BW (MHz)
2412	16.858
2437	16.809
2462	16.902

802.11g WLAN2

Freq. (MHz)	99% BW (MHz)
2412	16.699
2437	16.700
2462	16.723

802.11n_HT20M WLAN1

Freq. (MHz)	99% BW (MHz)
2412	17.662
2437	17.697
2462	17.670

802.11n_HT20M WLAN2

Freq. (MHz)	99% BW (MHz)
2412	17.683
2437	17.782
2462	17.698

802.11n_HT40M WLAN1

Freq. (MHz)	99% BW (MHz)
2422	36.232
2437	36.222
2452	36.174

802.11n_HT40M WLAN2

Freq. (MHz)	99% BW (MHz)
2422	36.177
2437	36.298
2452	36.199

802.11ax_HE20M WLAN1

Freq. (MHz)	RU Config	99% BW (MHz)
2412	full	18.809
2437	full	18.792
2462	full	18.823

802.11ax_HE20M WLAN2

Freq. (MHz)	RU Config	99% BW (MHz)
2412	full	18.791
2437	full	18.809
2462	full	18.800

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802.11ax_HE40M WLAN1

Freq. (MHz)	RU Config	99% BW (MHz)
2422	full	37.603
2437	full	37.586
2452	full	37.582

802.11ax_HE40M WLAN2

Freq. (MHz)	RU Config	99% BW (MHz)
2422	full	37.563
2437	full	37.573
2452	full	37.549

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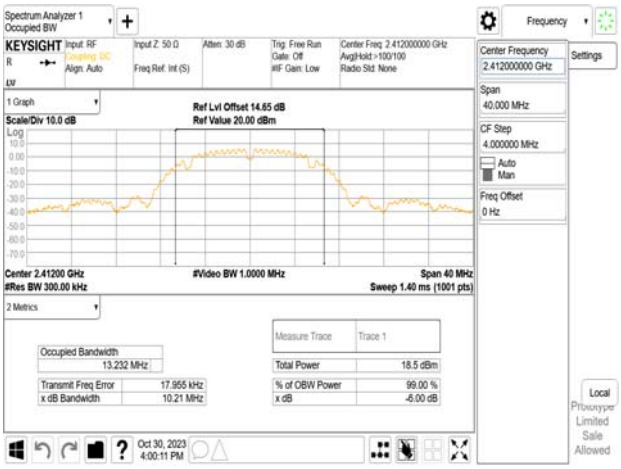
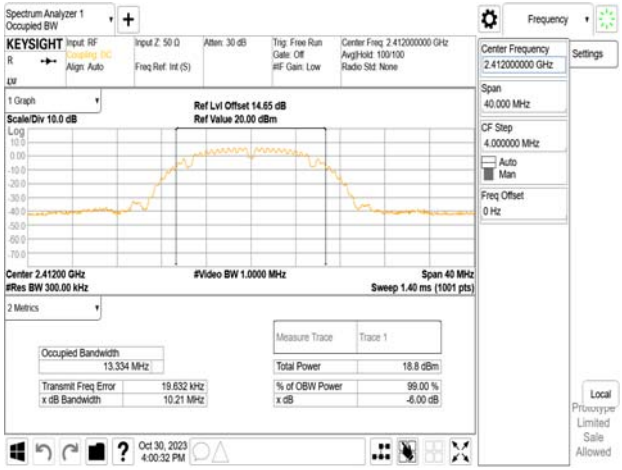
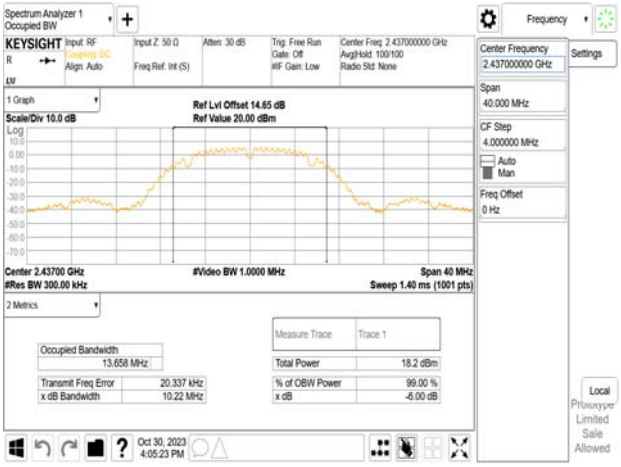
802.11b_20MHz_WLAN1_2412MHz



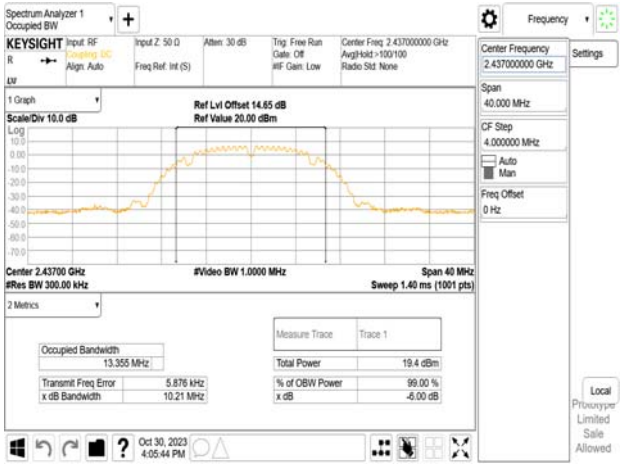
802.11b_20MHz_WLAN2_2412MHz



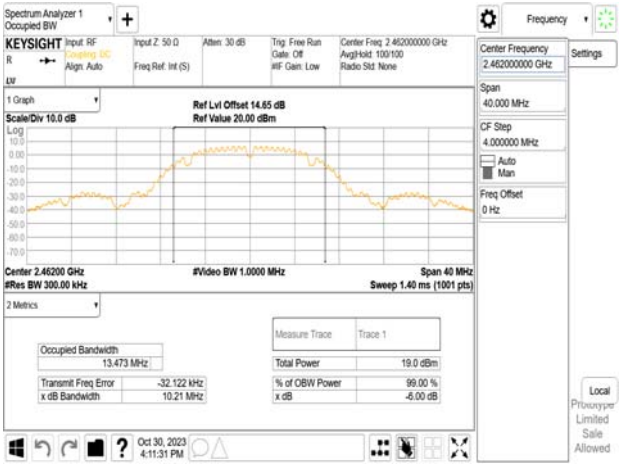
802.11b_20MHz_WLAN1_2437MHz



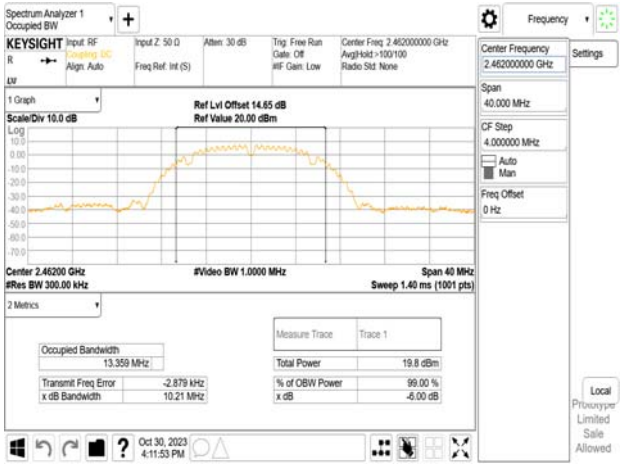
802.11b_20MHz_WLAN2_2437MHz



802.11b_20MHz_WLAN1_2462MHz



802.11b_20MHz_WLAN2_2462MHz



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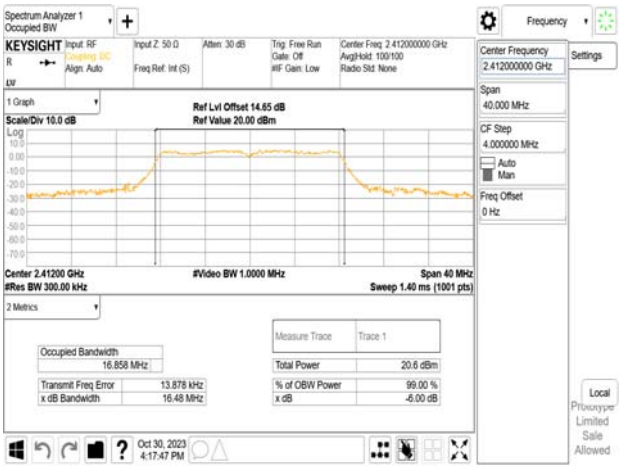
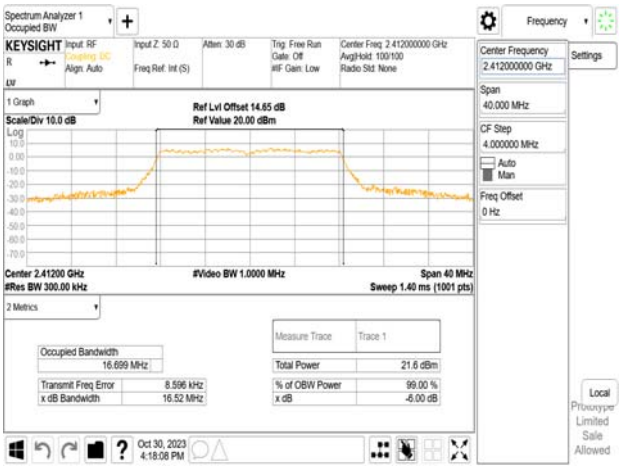
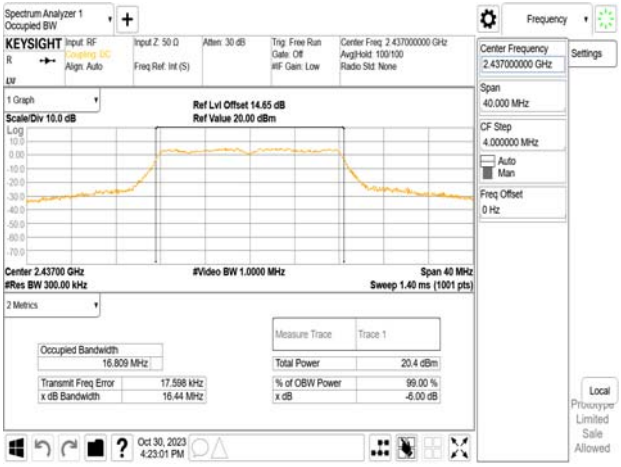
802.11g_20MHz_WLAN1_2412MHz



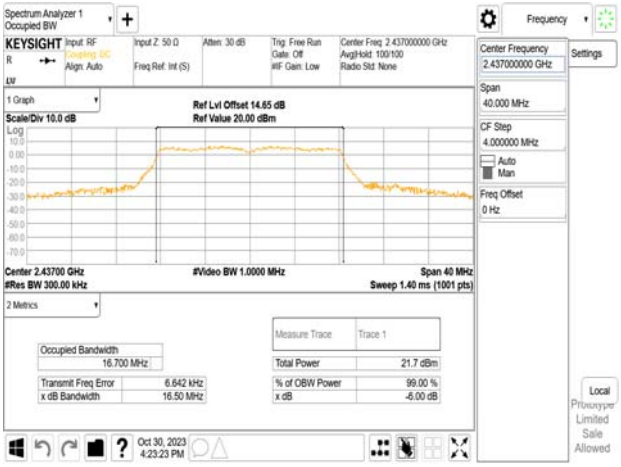
802.11g_20MHz_WLAN2_2412MHz



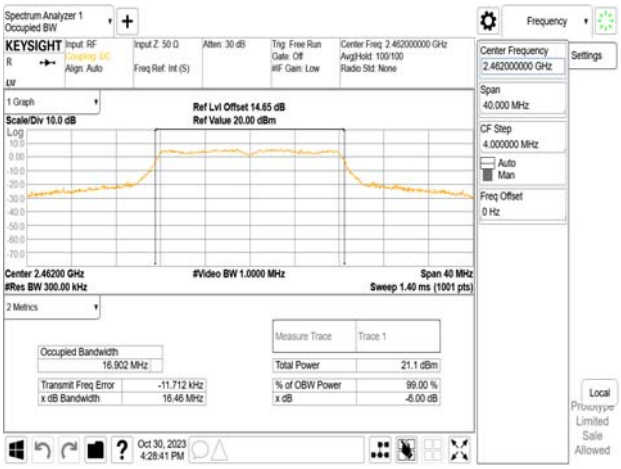
802.11g_20MHz_WLAN1_2437MHz



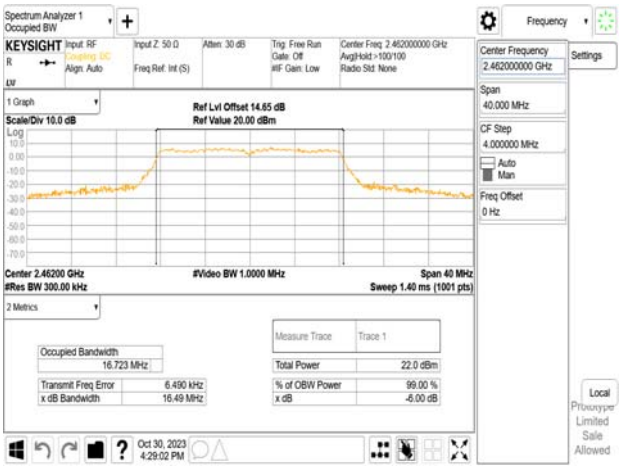
802.11g_20MHz_WLAN2_2437MHz



802.11g_20MHz_WLAN1_2462MHz



802.11g_20MHz_WLAN2_2462MHz



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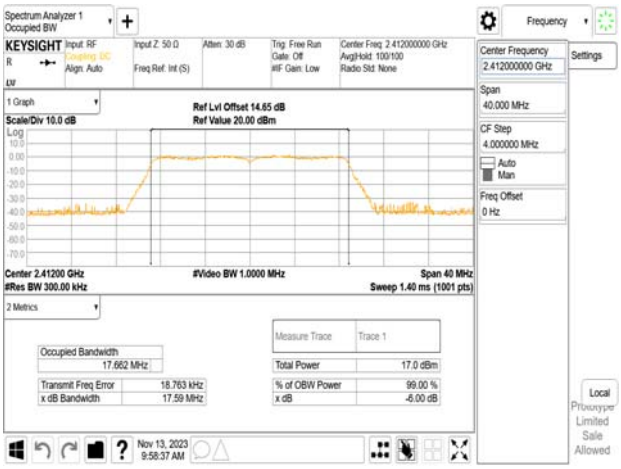
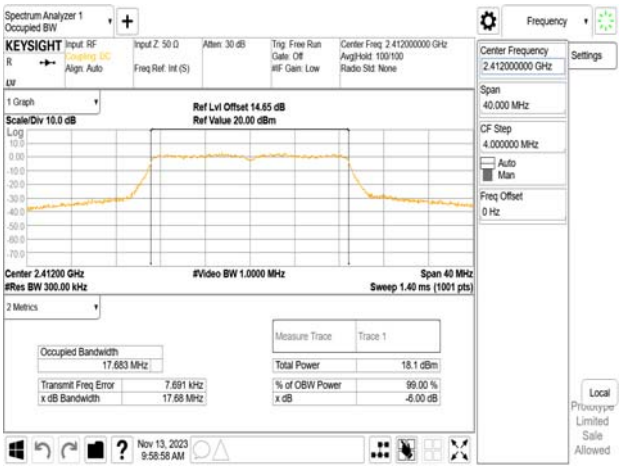
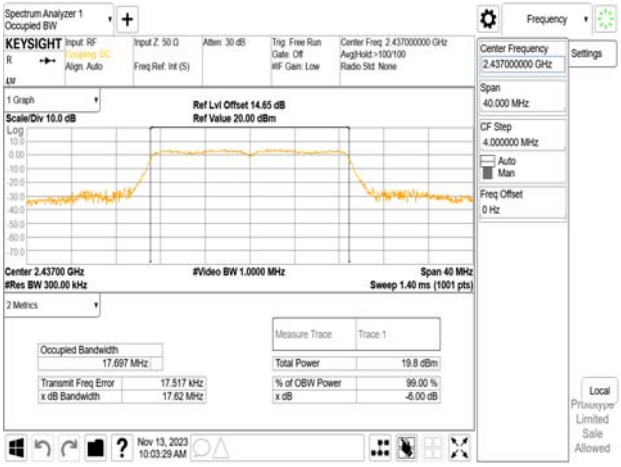
802.11n_20MHz_WLAN1_2412MHz



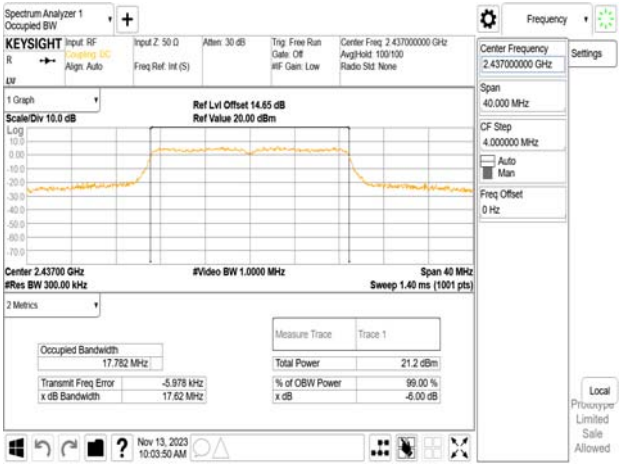
802.11n_20MHz_WLAN2_2412MHz



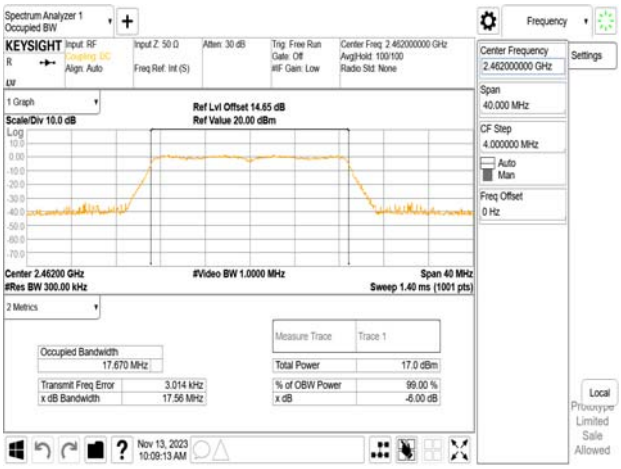
802.11n_20MHz_WLAN1_2437MHz



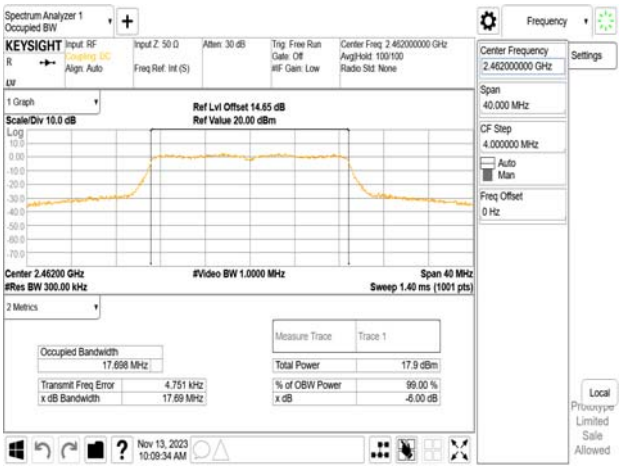
802.11n_20MHz_WLAN2_2437MHz



802.11n_20MHz_WLAN1_2462MHz



802.11n_20MHz_WLAN2_2462MHz



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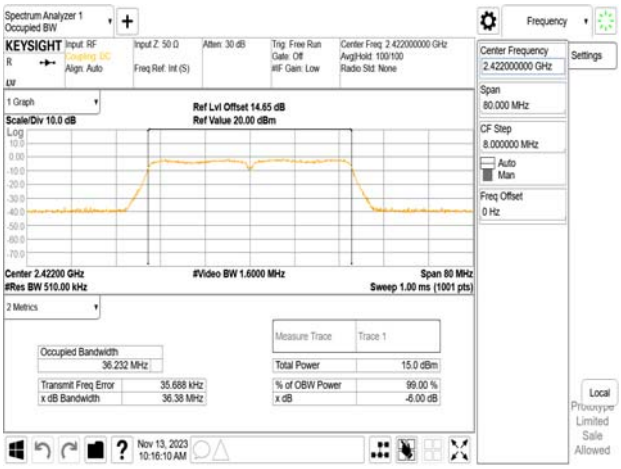
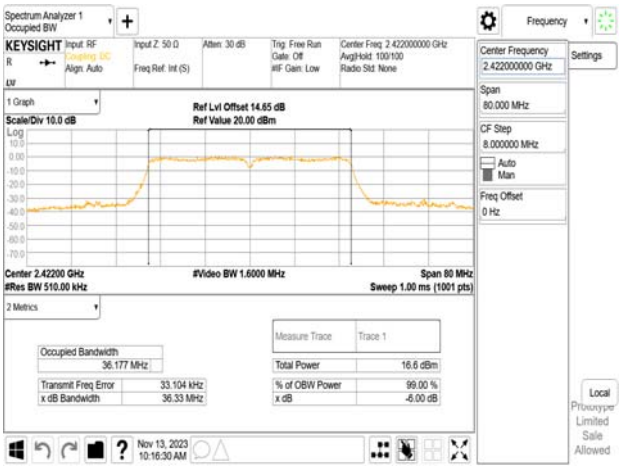
802.11n_40MHz_WLAN1_2422MHz



802.11n_40MHz_WLAN2_2422MHz



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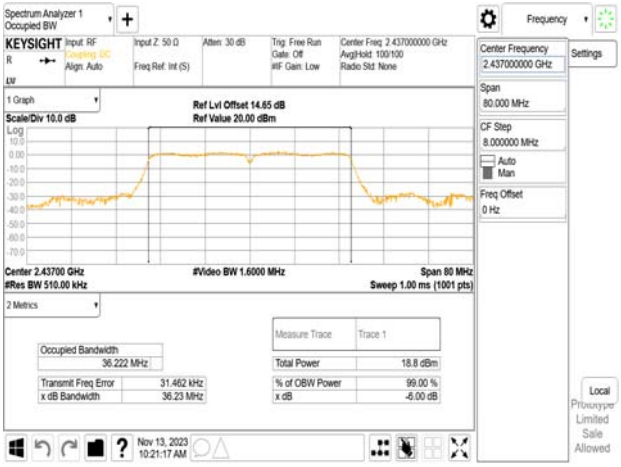

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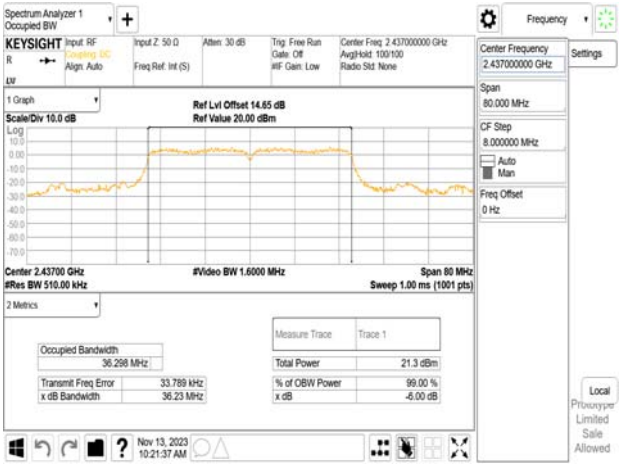
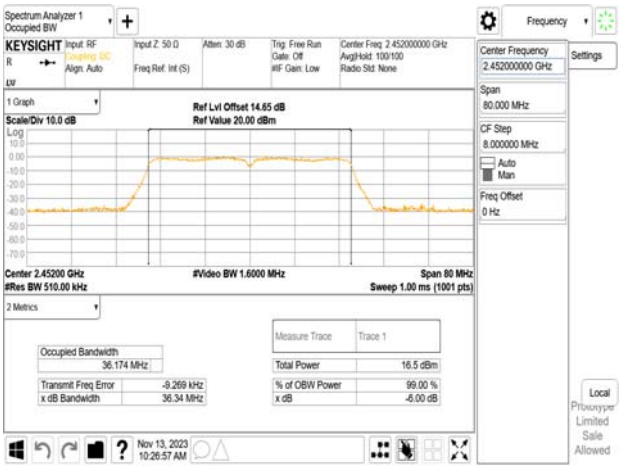
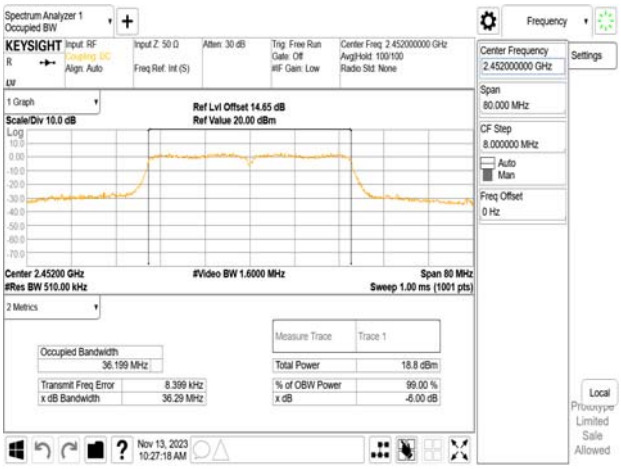


802.11n_40MHz_WLAN1_2452MHz



802.11n_40MHz_WLAN2_2452MHz



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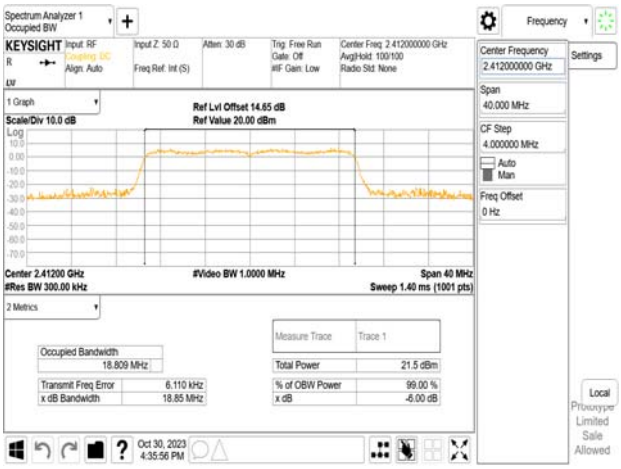
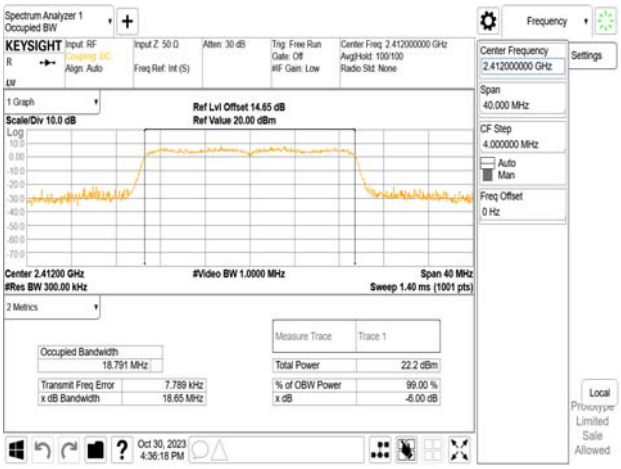
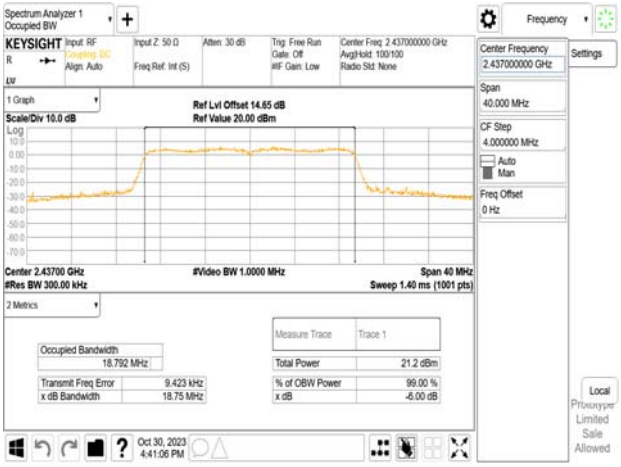
802.11ax_20MHz_WLAN1_2412MHz



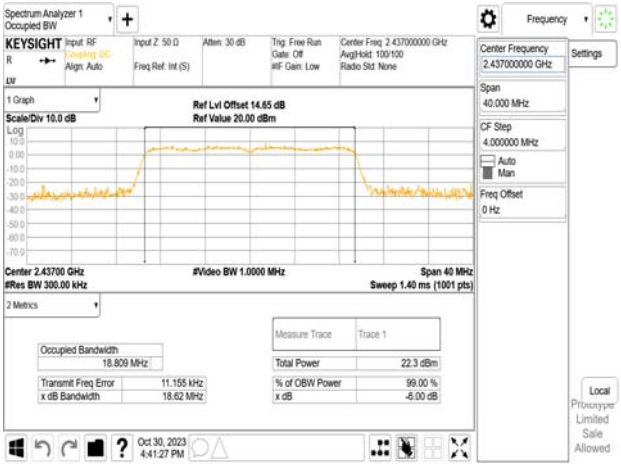
802.11ax_20MHz_WLAN2_2412MHz



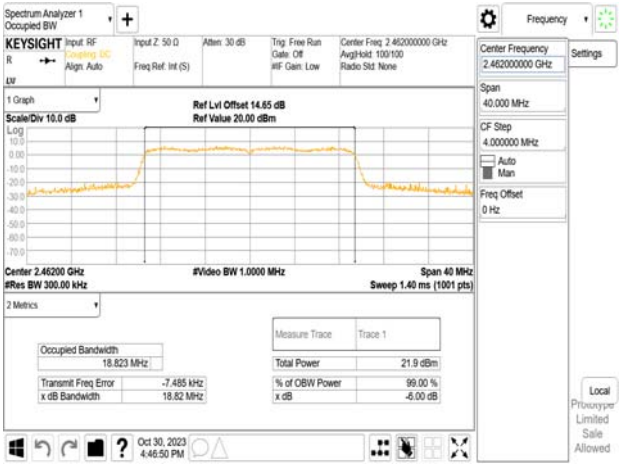
802.11ax_20MHz_WLAN1_2437MHz



802.11ax_20MHz_WLAN2_2437MHz



802.11ax_20MHz_WLAN1_2462MHz



802.11ax_20MHz_WLAN2_2462MHz

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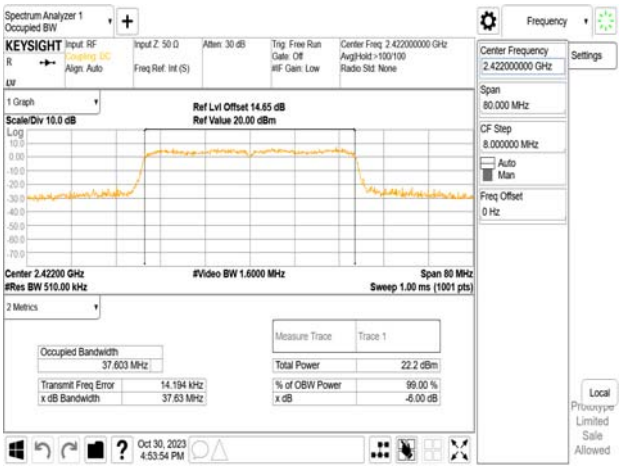
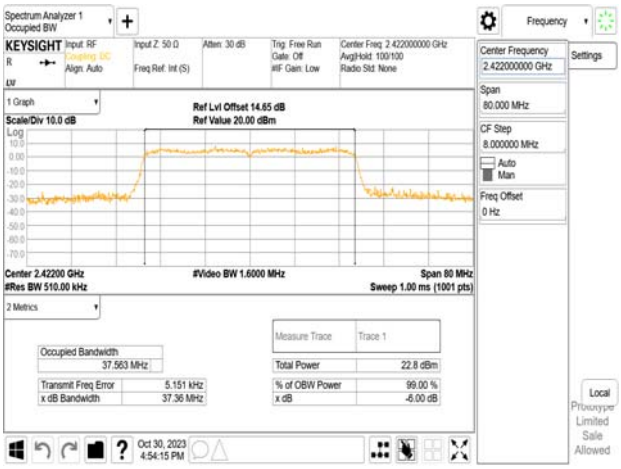
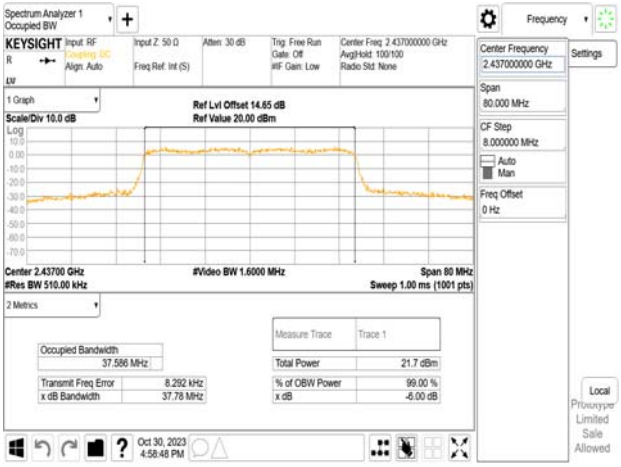
802.11ax_40MHz_WLAN1_2422MHz



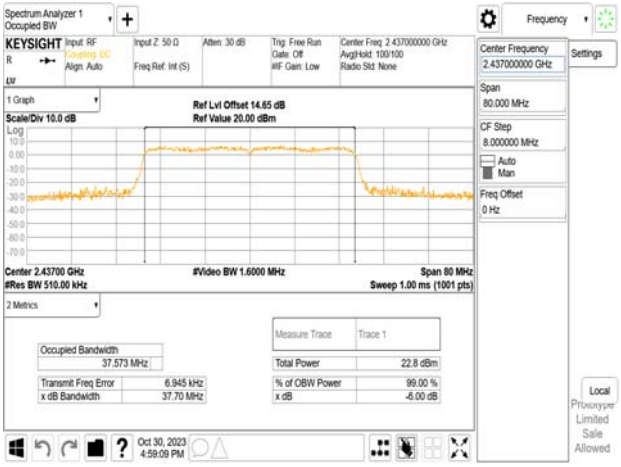
802.11ax_40MHz_WLAN2_2422MHz



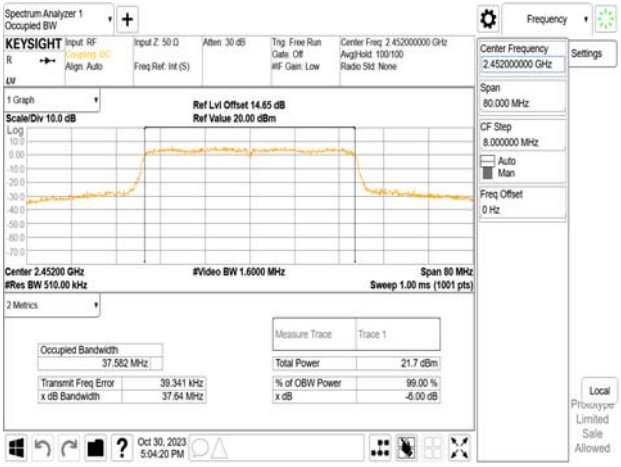
802.11ax_40MHz_WLAN1_2437MHz



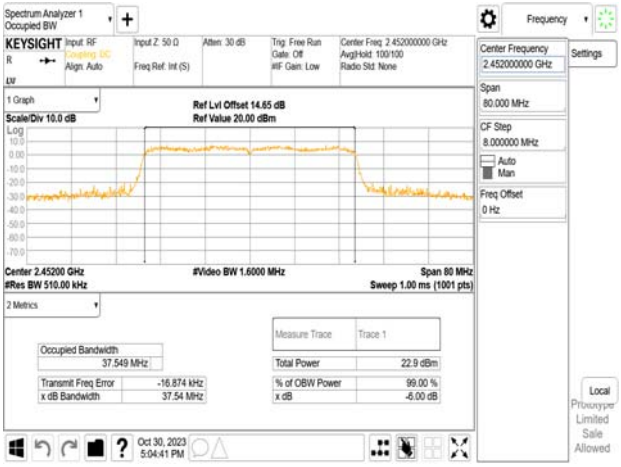
802.11ax_40MHz_WLAN2_2437MHz



802.11ax_40MHz_WLAN1_2452MHz



802.11ax_40MHz_WLAN2_2452MHz



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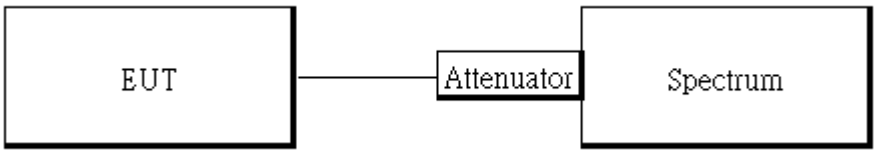
10 CONDUCTED BAND EDGES AND SPURIOUS EMISSION MEASUREMENT

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 -20dBm.
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.

10.4 Measurement Result

802.11b WLAN1

Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	5.63	-14.37
2437	5.28	-14.72
2462	6.17	-13.83

802.11b WLAN2

Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	6.02	-13.98
2437	6.48	-13.52
2462	6.97	-13.03

802.11g WLAN1

Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	2.79	-17.21
2437	2.64	-17.36
2462	3.34	-16.66

802.11g WLAN2

Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	3.67	-16.33
2437	3.85	-16.15
2462	4.24	-15.76

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802.11n_HT_20M WLAN1

Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	-0.43	-20.43
2437	2.24	-17.76
2462	-0.57	-20.57

802.11n_HT_20M WLAN2

Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2412	0.44	-19.56
2437	3.42	-16.58
2462	0.25	-19.75

802.11n_HT_40M WLAN1

Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2422	-5.53	-25.53
2437	-1.87	-21.87
2452	-4.06	-24.06

802.11n_HT_40M WLAN2

Reference Level of Limit		
Freq. (MHz)	PSD (dBm)	Reference Level of Limit (dBm)
2422	-4.36	-24.36
2437	-0.11	-20.11
2452	-2.43	-22.43

802.11ax_HE_20M WLAN1

Reference Level of Limit			
Freq. (MHz)	RU Config	PSD (dBm)	Reference Level of Limit (dBm)
2412	full	2.01	-17.99
	26/0	3.88	-16.12
	52/37	1.44	-18.56
	106/53	-1.41	-21.41
2437	full	2.00	-18.00
2462	full	2.45	-17.55
	26/8	3.93	-16.07
	52/40	0.83	-19.17
	106/54	-1.71	-21.71

802.11ax_HE_20M WLAN2

Reference Level of Limit			
Freq. (MHz)	RU Config	PSD (dBm)	Reference Level of Limit (dBm)
2412	full	2.81	-17.19
	26/0	4.05	-15.95
	52/37	1.72	-18.28
	106/53	-0.70	-20.70
2437	full	3.00	-17.00
2462	full	3.26	-16.74
	26/8	4.73	-15.27
	52/40	2.14	-17.86
	106/54	-0.49	-20.49

802.11ax_HE_40M WLAN1

Reference Level of Limit			
Freq. (MHz)	RU Config	PSD (dBm)	Reference Level of Limit (dBm)
2422	full	-0.57	-20.57
	242/61	-3.29	-23.29
2437	full	-0.81	-20.81
2452	full	-0.91	-20.91
	242/62	-2.94	-22.94

802.11ax_HE_40M WLAN2

Reference Level of Limit			
Freq. (MHz)	RU Config	PSD (dBm)	Reference Level of Limit (dBm)
2422	full	0.33	-19.67
	242/61	-2.38	-22.38
2437	full	0.34	-19.66
2452	full	0.40	-19.60
	242/62	-1.72	-21.72

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802.11b_20MHz_WLAN1_2412MHz

802.11b_20MHz_WLAN2_2412MHz

802.11b_20MHz_WLAN1_2437MHz

802.11b_20MHz_WLAN2_2437MHz

802.11b_20MHz_WLAN1_2462MHz

802.11b_20MHz_WLAN2_2462MHz

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802.11g_20MHz_WLAN1_2412MHz

802.11g_20MHz_WLAN2_2412MHz

802.11g_20MHz_WLAN1_2437MHz

802.11g_20MHz_WLAN2_2437MHz

802.11g_20MHz_WLAN1_2462MHz

802.11g_20MHz_WLAN2_2462MHz

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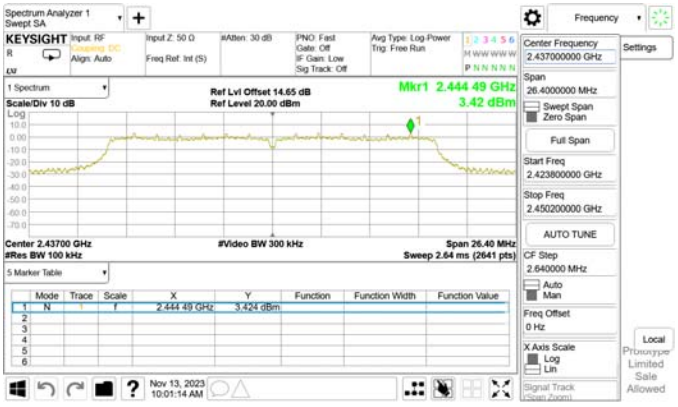
802.11n_20MHz_WLAN1_2412MHz

802.11n_20MHz_WLAN2_2412MHz

802.11n_20MHz_WLAN1_2437MHz

802.11n_20MHz_WLAN2_2437MHz



802.11n_20MHz_WLAN1_2462MHz

802.11n_20MHz_WLAN2_2462MHz

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802.11n_40MHz_WLAN1_2422MHz

802.11n_40MHz_WLAN2_2422MHz

802.11n_40MHz_WLAN1_2437MHz

802.11n_40MHz_WLAN2_2437MHz

802.11n_40MHz_WLAN1_2452MHz

802.11n_40MHz_WLAN2_2452MHz

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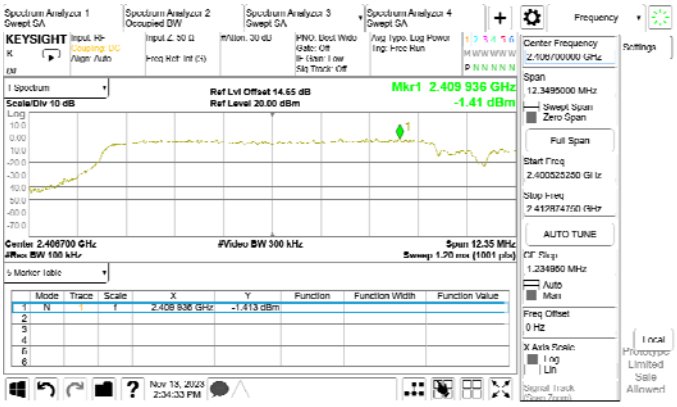
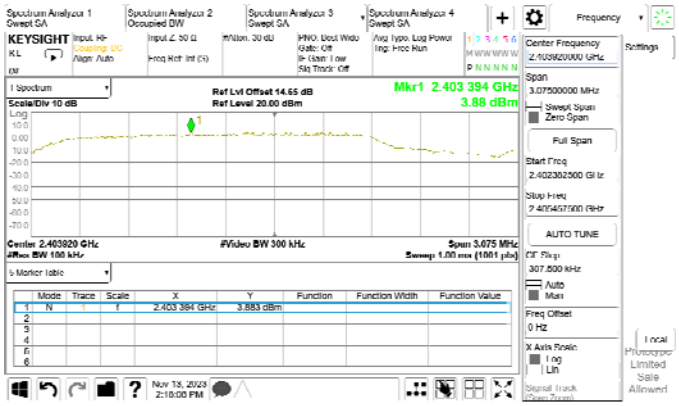
802.11ax_20MHz_WLAN1_2412MHz

802.11ax_20MHz_WLAN1_2412MHz_RU106_53

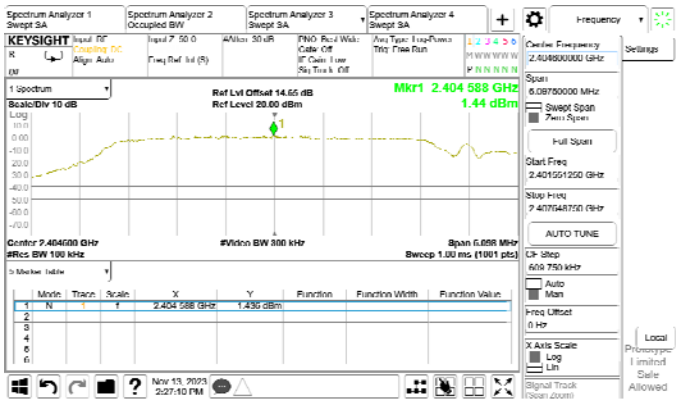


802.11ax_20MHz_WLAN1_2412MHz_RU26_0



802.11ax_20MHz_WLAN1_2437MHz

802.11ax_20MHz_WLAN1_2412MHz_RU52_37



802.11ax_20MHz_WLAN1_2462MHz

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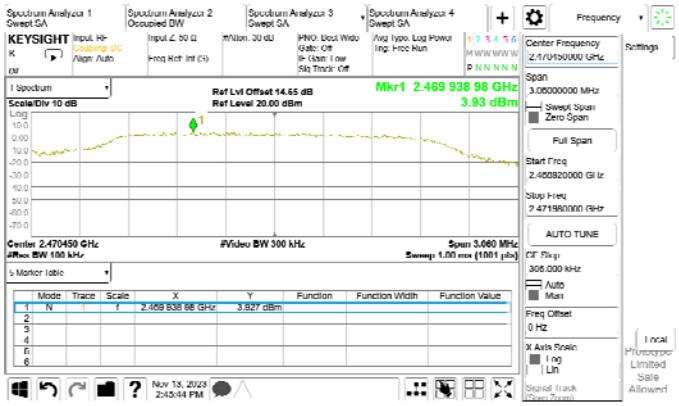
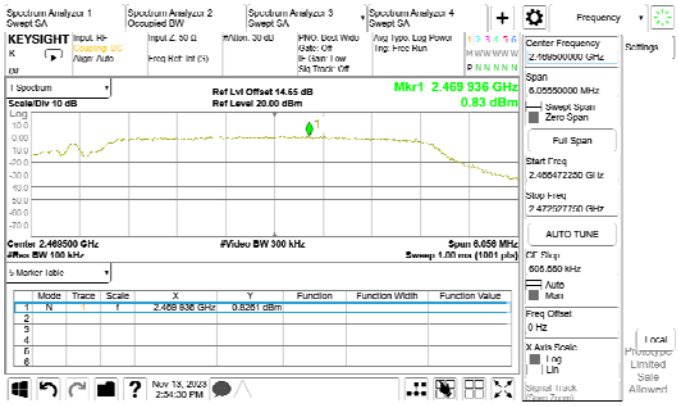
802.11ax_20MHz_WLAN1_2462MHz_RU26_8

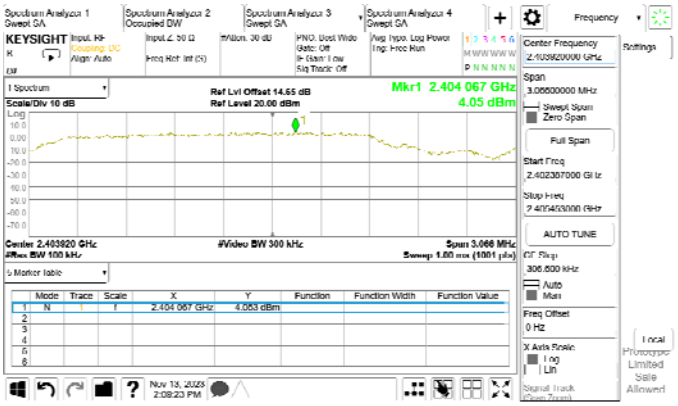


802.11ax_20MHz_WLAN2_2412MHz

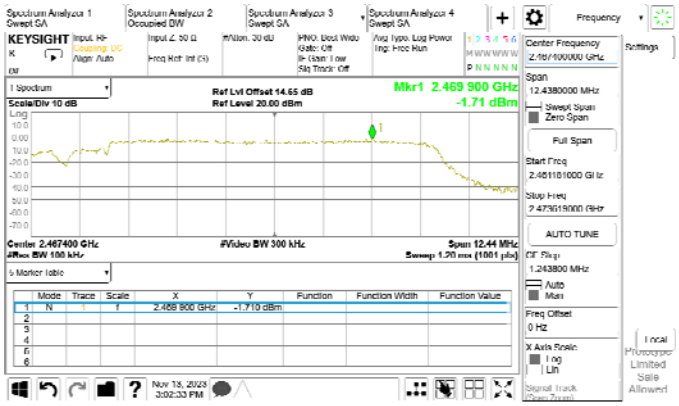
802.11ax_20MHz_WLAN1_2462MHz_RU52_40



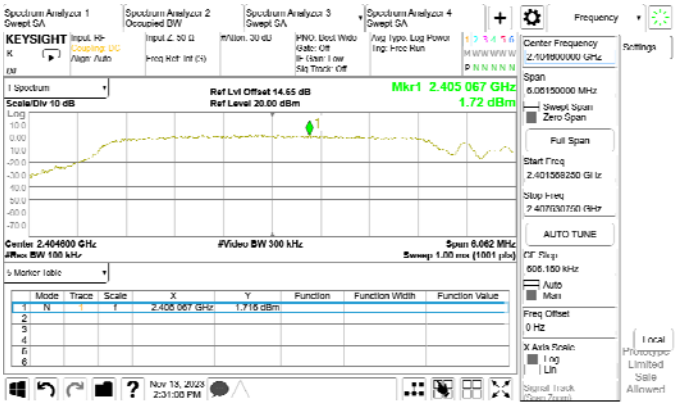
802.11ax_20MHz_WLAN2_2412MHz_RU26_0



802.11ax_20MHz_WLAN1_2462MHz_RU106_54



802.11ax_20MHz_WLAN2_2412MHz_RU52_37



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