

Project No: TM-2309000207P
Report No.: TMWK2309003309KR

FCC ID: KA2MS30A1

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Rev.: 00

RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART E

Test Standard	FCC Part 15.407
Product name	AX3000 Wi-Fi 6 Smart Home Gateway Wi-Fi 6 AX3000 IoT Gateway
Brand Name	D-Link
Model No.	MS30
Test Result	Pass
Statements of Conformity	Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.

The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc.(Wugu Laboratory)

Approved by:



Sehni Hu
Supervisor

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.
除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	July 30, 2024	Initial Issue	ALL	Peggy Tsai

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	D-Link Corporation 14420 Myford Road Suite 100 Irvine California United States 92606
Manufacturer	D-Link Corporation 14420 Myford Road Suite 100 Irvine California United States 92606
Equipment	AX3000 Wi-Fi 6 Smart Home Gateway Wi-Fi 6 AX3000 IoT Gateway
Model No.	MS30
Model Discrepancy	N/A
Brand Name	D-Link
Received Date	January 31, 2024
Date of Test	April 16 ~ July 10, 2024
EUT Power Rating	EUT Power from Adapter. (1) AMIGO / AMS200-1201500FU I/P: 100-240Vac, 50/60Hz, 0.8A Max/50VA O/P: 12.0Vdc, 1.5A (2) AMIGO / AMS200-1201500F I/P: 100-240Vac, 50/60Hz, 0.8A Max/50VA O/P: 12.0Vdc, 1.5A, 18.0W
S.W Version	1.00
H.W: Version	A1

Remark:

1. For more details, please refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

1.2 EUT CHANNEL INFORMATION

Frequency Range	UNII-1	
	IEEE 802.11a	5180 ~ 5240 MHz
	IEEE 802.11n HT20	5180 ~ 5240 MHz
	IEEE 802.11ac VHT20	5180 ~ 5240 MHz
	IEEE 802.11n HT40	5190 ~ 5230 MHz
	IEEE 802.11ac VHT40	5190 ~ 5230 MHz
	IEEE 802.11ac VHT80	5210 MHz
	IEEE 802.11ax HE20	5180 ~ 5240 MHz
	IEEE 802.11ax HE40	5190 ~ 5230 MHz
	IEEE 802.11ax HE80	5210 MHz
	UNII-2a	
	IEEE 802.11a	5260 ~ 5320 MHz
	IEEE 802.11n HT20	5260 ~ 5320 MHz
	IEEE 802.11ac VHT20	5260 ~ 5320 MHz
	IEEE 802.11n HT40	5270 ~ 5310 MHz
	IEEE 802.11ac VHT40	5270 ~ 5310 MHz
	IEEE 802.11ac VHT80	5290 MHz
	IEEE 802.11ac VHT160	5250 MHz
	IEEE 802.11ax HE20	5260 ~ 5320 MHz
	IEEE 802.11ax HE40	5270 ~ 5310 MHz
	IEEE 802.11ax HE80	5290 MHz
	IEEE 802.11ax HE160	5250 MHz
	UNII-2c	
	IEEE 802.11a	5500 ~ 5700 MHz
	IEEE 802.11n HT20	5500 ~ 5700 MHz
	IEEE 802.11ac VHT20	5500 ~ 5700 MHz
	IEEE 802.11n HT40	5510 ~ 5670 MHz
	IEEE 802.11ac VHT40	5510 ~ 5670 MHz
	IEEE 802.11ac VHT80	5530 ~ 5610 MHz
	IEEE 802.11ac VHT160	5570 MHz
	IEEE 802.11ax HE20	5500 ~ 5700 MHz
	IEEE 802.11ax HE40	5510 ~ 5670 MHz
	IEEE 802.11ax HE80	5530 ~ 5610 MHz
	IEEE 802.11ax HE160	5570 MHz
	UNII-3	
	IEEE 802.11a	5745 ~ 5825 MHz
	IEEE 802.11n HT20	5745 ~ 5825 MHz
	IEEE 802.11ac VHT20	5745 ~ 5825 MHz
	IEEE 802.11n HT40	5755 ~ 5795 MHz
	IEEE 802.11ac VHT40	5755 ~ 5795 MHz
	IEEE 802.11ac VHT80	5775 MHz
	IEEE 802.11ax HE20	5745 ~ 5825 MHz
	IEEE 802.11ax HE40	5755 ~ 5795 MHz
	IEEE 802.11ax HE80	5775 MHz

Modulation Type	<ol style="list-style-type: none"> 1. IEEE 802.11a mode: OFDM 2. IEEE 802.11n HT20 mode: OFDM 3. IEEE 802.11n HT40 mode: OFDM 4. IEEE 802.11ac VHT20 mode: OFDM 5. IEEE 802.11ac VHT40 mode: OFDM 6. IEEE 802.11ac VHT80 mode: OFDM 7. IEEE 802.11ac VHT160 mode: OFDM 8. IEEE 802.11ax HE20 mode: OFDMA 9. IEEE 802.11ax HE40 mode: OFDMA 10. IEEE 802.11ax HE80 mode: OFDMA 11. IEEE 802.11ax HE160 mode: OFDMA
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Remark:

Refer as ANSI C63.10: 2013 clause 5.6.1 Table 4 for test channels

Number of frequencies to be tested		
Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
<input type="checkbox"/> 1 MHz or less	1	Middle
<input type="checkbox"/> 1 MHz to 10 MHz	2	1 near top and 1 near bottom
<input checked="" type="checkbox"/> More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.3 ANTENNA INFORMATION

Antenna Type	<input type="checkbox"/> PIFA <input type="checkbox"/> PCB <input checked="" type="checkbox"/> Dipole <input type="checkbox"/> Coils																																			
Antenna Gain	<table border="1"> <thead> <tr> <th>Band</th> <th>5G-0 (Chain 0) Gain (dBi)</th> <th>5G-1 (Chain 1) Gain (dBi)</th> <th>5G-2 Gain (dBi)</th> <th>MIMO Gain (dBi)</th> <th>Total Gain (dBi)</th> </tr> </thead> <tbody> <tr> <td>Band I (U-NII 1) 5150-5250M Hz</td> <td>1.79</td> <td>1.64</td> <td>1.48</td> <td>1.72</td> <td>4.73</td> </tr> <tr> <td>Band II (U-NII 2a) 5250-5350 MHz</td> <td>1.88</td> <td>1.73</td> <td>2.11</td> <td>1.81</td> <td>4.82</td> </tr> <tr> <td>Band III (U-NII 2c) 5470-5725 MHz</td> <td>1.98</td> <td>2.1</td> <td>2.11</td> <td>2.04</td> <td>5.05</td> </tr> <tr> <td>Band IV (U-NII 3) 5725-5850M Hz</td> <td>1.88</td> <td>2.15</td> <td>2.17</td> <td>2.02</td> <td>5.03</td> </tr> </tbody> </table>	Band	5G-0 (Chain 0) Gain (dBi)	5G-1 (Chain 1) Gain (dBi)	5G-2 Gain (dBi)	MIMO Gain (dBi)	Total Gain (dBi)	Band I (U-NII 1) 5150-5250M Hz	1.79	1.64	1.48	1.72	4.73	Band II (U-NII 2a) 5250-5350 MHz	1.88	1.73	2.11	1.81	4.82	Band III (U-NII 2c) 5470-5725 MHz	1.98	2.1	2.11	2.04	5.05	Band IV (U-NII 3) 5725-5850M Hz	1.88	2.15	2.17	2.02	5.03					
	Band	5G-0 (Chain 0) Gain (dBi)	5G-1 (Chain 1) Gain (dBi)	5G-2 Gain (dBi)	MIMO Gain (dBi)	Total Gain (dBi)																														
	Band I (U-NII 1) 5150-5250M Hz	1.79	1.64	1.48	1.72	4.73																														
	Band II (U-NII 2a) 5250-5350 MHz	1.88	1.73	2.11	1.81	4.82																														
	Band III (U-NII 2c) 5470-5725 MHz	1.98	2.1	2.11	2.04	5.05																														
Band IV (U-NII 3) 5725-5850M Hz	1.88	2.15	2.17	2.02	5.03																															
Note: Since port 2(5G-2) is RX don't count DG.																																				
Antenna Trade / Model	5G-0: JAE / AP02DL2527487C0 (TX/RX) 5G-1: JAE / AP02DL2527488C0 (TX/RX) 5G-2: JAE / AP02DL2527488C0 (RX)																																			
Antenna Connector	MHF compatible																																			

Notes:

- Power Directional Gain = $10 \log[(10G1/20 + 10G2/20 + \dots + 10GN/20)^2 / NANT]$ dBi for BF Mode.
 Power Directional gain = $10 \log[(10G1/10 + 10G2/10 + \dots + 10GN/10)/NANT]$ dBi for MIMO(CDD) mode.
- The antenna(s) of the EUT are permanently attached and there are no provisions for connection to an external antenna. So the EUT complies with the requirements of §15.203.

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	± 2.213 dB
Channel Bandwidth	± 2.7 %
RF output power (Spectrum)	± 2.440 dB
Power Spectral density	± 2.739 dB
Radiated Emission_9kHz-30MHz	± 3.761 dB
Radiated Emission_30MHz-200MHz	± 3.473 dB
Radiated Emission_200MHz-1GHz	± 3.946 dB
Radiated Emission_1GHz-6GHz	± 4.797 dB
Radiated Emission_6GHz-18GHz	± 4.803 dB
Radiated Emission_18GHz-26GHz	± 3.459 dB
Radiated Emission_26GHz-40GHz	± 3.297 dB

Remark:

- 1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.

CAB identifier: TW1309

Test site	Test Engineer	Remark
AC Conduction Room	Ben Yang	-
Radiation	Tony Chao · Ray Li	-
RF Conducted	Marco Chan	-
DFS Test	KW Huang	-

Remark: The lab has been recognized as the FCC accredited lab. under the KDB 974614 D01 and is listed in the FCC pubic Access Link (PAL) database, FCC Registration No. :444940, the FCC Designation No.:TW1309

1.6 INSTRUMENT CALIBRATION

Conducted_FCC/IC/NCC (All)					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Power Sensor	Anritsu	MA2411B	1911387	2023-07-25	2024-07-24
Power Meter	Anritsu	ML2496A	2136002	2023-11-16	2024-11-15
Signal Analyzer	KEYSIGHT	N9030B	MY62291089	2023-10-13	2024-10-12
Attenuator	Marvelous Microwave Inc	MVE2213-10	08	2023-11-07	2024-11-06
Software	Radio Test Software Ver. 21				

966A_Radiated Wi-Fi 5GHz					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Analyzer	KEYSIGHT	N9010A	MY52220817	2024-03-15	2025-03-14
Thermo-Hygro Meter	WISEWIND	1206	D07	2023-12-08	2024-12-07
Active Loop Antenna	SCHWARZBECK	FMZB 1513-60	1513-60-028	2023-12-13	2024-12-12
Bi-Log Antenna	Sunol Sciences	JB3	A030105	2023-08-08	2024-08-07
Preamplifier	EMEC	EM330	060609	2024-02-21	2025-02-20
Cable	Huber+Suhner	104PEA	20995+21000+182330	2024-02-21	2025-02-20
Horn Antenna	ETC	MCTD 1209	DRH13M02003	2023-12-28	2024-12-27
Preamplifier	HP	8449B	3008A00965	2023-12-22	2024-12-21
Cable	EMCI	EMC101G	221213+221011+221012	2023-10-17	2024-10-16
Attenuator	Mini-Circuits	BW-S9W5	BWS9W5-09-966A-01	2024-02-07	2025-02-06
High Pass Filters	MICRO TRONICS	HPM13195	3	2024-01-23	2025-01-22
Horn Antenna	SCHWARZBECK	BBHA9170	1047	2023-12-13	2024-12-12
Pre-Amplifier	EMCI	EMC184045SE	980860	2023-12-12	2024-12-11
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Site Validation	CCS	966A	N/A	2023-07-10	2024-07-09
Software	e3 V9-210616c				

Remark:

1. Each piece of equipment is scheduled for calibration once a year.
2. N.C.R. = No Calibration Required.

AC Mains Conduction					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI	100064	2024-06-14	2025-06-13
LISN	TESEQ	LN2-16N	22012	2024-02-29	2025-02-27
Cable	EMCI	CFD300-NL	CERF	2023-06-27	2024-06-26
				2024-06-26	2025-06-25
Software	e3 V6-110812				

DFS Test_Slave					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Signal Analyzer	Keysight	N9010A	MY54200716	2023-10-13	2024-10-12
Attenuator	E-INSTRUMENT	EPA-600H	EC1400050	2023-06-13	2024-06-12
Vector Signal Generator	KEYSIGHT	N5182B/N5182 BX07	MY61252828/ MY59362552	2024-01-19	2025-01-18
Power Divider	Marvelous Microwave	MVE8586	16011202	2023-06-16	2024-06-15
Power Divider	Solvang Technology	STI08-0015	008	2023-07-11	2024-07-10
Power Divider	Solvang Technology	STI08-0015	009	2023-07-11	2024-07-10
Cable	Woken	SUMITOMO	1	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	2	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	3	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	4	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	5	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	6	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	13	2024-03-02	2025-03-01
Software	Dynamic Frequency Selection Test version 23.12.07				

Remark:

1. Each piece of equipment is scheduled for calibration once a year.
2. N.C.R. = No Calibration Required.

DFS Test_Master					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Signal Analyzer	Keysight	N9010A	MY54200716	2023-10-13	2024-10-12
Attenuator	E-INSTRUMENT	EPA-600H	EC1400050	2023-06-13	2024-06-12
Vector Signal Generator	KEYSIGHT	N5182B/N5182B X07	MY61252828/ MY59362552	2024-01-19	2025-01-18
Power Divider	Marvelous Microwave	MVE8586	16011202	2023-06-16	2024-06-15
Power Divider	Marvelous Microwave	MVE8586	16011206	2023-07-04	2024-07-03
Power Divider	Solvang Technology	STI08-0015	009	2023-07-11	2024-07-10
Cable	Woken	SUMITOMO	1	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	2	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	3	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	4	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	5	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	6	2024-03-02	2025-03-01
Cable	Woken	SUMITOMO	13	2024-03-02	2025-03-01
Software	Dynamic Frequency Selection Test version 23.12.07				

Remark:

1. Each piece of equipment is scheduled for calibration once a year.
2. N.C.R. = No Calibration Required.

1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

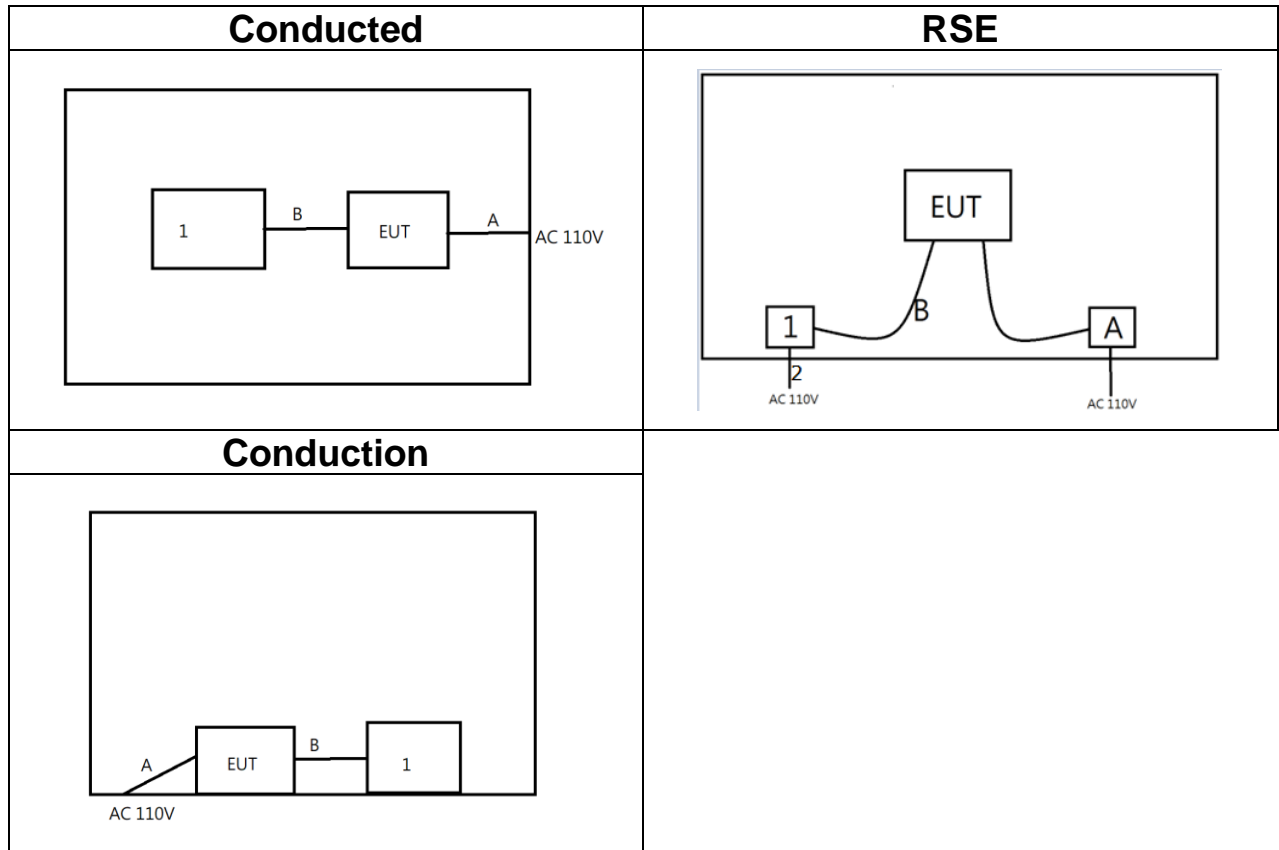
EUT Accessories Equipment						
No.	Equipment	Brand	Model	Series No.	FCC ID	IC
	N/A					

Support Equipment (Conducted)					
No.	Equipment	Brand	Model	Series No.	FCC ID
1	NB(L)	Lenovo	X260	N/A	N/A
A	Adapter	AMIGO	AMS200-1201500FU	N/A	N/A
B	RJ45	Nienyi Group	NYS4710	N/A	N/A

Support Equipment (RSE)					
No.	Equipment	Brand	Model	Series No.	FCC ID
1	NB(D)	Lenovo	ThinkPad X260	N/A	N/A
2	Adapter	Lenovo	ADLX45DLC3A	N/A	N/A
A	Adapter	AMIGO	AMS200-1201500FU	N/A	N/A
B	RJ45	Nienyi Group	NYS4710	N/A	N/A

Support Equipment (Conduction)					
No.	Equipment	Brand	Model	Series No.	FCC ID
1	NB(D)	Lenovo	ThinkPad X260	N/A	N/A
A	Adapter	AMIGO	AMS200-1201500FU	N/A	N/A
B	RJ45	Nienyi Group	NYS4710	N/A	N/A

1.8 TEST SET UP DIAGRAM



1.9 TEST PROGRAM

The EUT connection corresponds to the surrounding fixture control board.

This EUT uses " Tera Term v4.73 " and " QA Tool v0.0.2.17 " software to set the frequency, modulation, and power to allow the sample to continuously transmit (including frequency hopping mode and Co-Location).

1.10 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.407, KDB 662911 D01 v02r01, KDB 789033 D02 v02r01, KDB 905462 D02 v02.

2. TEST SUMMERY

FCC Standard Sec.	Chapter	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207	4.1	AC Conducted Emission	Pass
15.407(a)	4.2	26dB Bandwidth	Pass
15.407(e)	4.2	6dB Bandwidth	Pass
2.1049	4.2	Occupied Bandwidth (99%)	Pass
15.407(a)	4.3	Output Power Measurement	Pass
15.407(a)	4.4	Power Spectral Density	Pass
15.407(b)	4.5	Radiation Band Edge	Pass
15.407(b)	4.5	Radiation Spurious Emission	Pass
15.407(h)	5	Dynamic Frequency Selection	Pass

Summary of Dynamic Frequency of Selection Test For Master

UNII	Description	Limit	Result
U-NII Band 2-A 5250-5350MHz	Channel Availability Check Time	> 60sec	Pass
	U-NII Detection Bandwidth	> 100% of the U-NII 99% transmission power bandwidth	Pass
	Statistical Performance Check	Type 1,2,3,4 >= 60% Type 1~4 and 5 >= 80% Type 6 >= 70%	Pass
	Channel Move Time	< 10 sec	Pass
	Channel Closing Transmission Time	< 200 ms + aggregate of 60 ms over remaining 10 s period	Pass
	Non-Occupancy Period Test	> 30 minutes	Pass
U-NII Band 2-C 5470-5725MHz	Channel Availability Check Time	> 60sec	Pass
	U-NII Detection Bandwidth	> 100% of the U-NII 99% transmission power bandwidth	Pass
	Statistical Performance Check	Type 1,2,3,4 >= 60% Type 1~4 and 5 >= 80% Type 6 >= 70%	Pass
	Channel Move Time	< 10 sec	Pass
	Channel Closing Transmission Time	< 200 ms + aggregate of 60 ms over remaining 10 s period	Pass
	Non-Occupancy Period Test	> 30 minutes	Pass

Summary of Dynamic Frequency of Selection Test For Slave

UNII	Description	Limit	Result
U-NII Band 2-A 5250-5350MHz	Channel Availability Check Time	> 60sec	N/A
	U-NII Detection Bandwidth	> 100% of the U-NII 99% transmission power bandwidth	N/A
	Statistical Performance Check	Type 1,2,3,4 >= 60% Type 1~4 and 5 >= 80% Type 6 >= 70%	N/A
	Channel Move Time	< 10 sec	Pass
	Channel Closing Transmission Time	< 200 ms + aggregate of 60 ms over remaining 10 s period	Pass
	Non-Occupancy Period Test	> 30 minutes	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

<p>Operation mode</p>	<ol style="list-style-type: none"> 1. IEEE 802.11a mode: 6Mbps 2. IEEE 802.11n HT20 mode: MCS0 3. IEEE 802.11n HT40 mode: MCS0 4. IEEE 802.11ac VHT20 mode: MCS0 5. IEEE 802.11ac VHT40 mode: MCS0 6. IEEE 802.11ac VHT80 mode: MCS0 7. IEEE 802.11ac VHT160 mode: MCS0 8. IEEE 802.11ax HE20 mode: MCS0 9. IEEE 802.11ax HE40 mode: MCS0 10. IEEE 802.11ax HE80 mode: MCS0 11. IEEE 802.11ax HE160 mode: MCS0 																																											
<p>Operating Frequency</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 45%;">Mode</th> <th style="width: 40%;">Frequency Range (MHz)</th> </tr> </thead> <tbody> <tr> <td rowspan="8" style="text-align: center; vertical-align: middle;">U-NII-1</td> <td>IEEE 802.11a</td> <td>5180, 5220, 5240</td> </tr> <tr> <td>IEEE 802.11n HT20</td> <td>5180, 5220, 5240</td> </tr> <tr> <td>IEEE 802.11n HT40</td> <td>5190, 5230</td> </tr> <tr> <td>IEEE 802.11ac VHT20</td> <td>5180, 5220, 5240</td> </tr> <tr> <td>IEEE 802.11ac VHT40</td> <td>5190, 5230</td> </tr> <tr> <td>IEEE 802.11ac VHT80</td> <td>5210</td> </tr> <tr> <td>IEEE 802.11ax HE20</td> <td>5180, 5220, 5240</td> </tr> <tr> <td>IEEE 802.11ax HE40</td> <td>5190, 5230</td> </tr> <tr> <td rowspan="10" style="text-align: center; vertical-align: middle;">U-NII-2a</td> <td>IEEE 802.11a</td> <td>5260, 5300, 5320</td> </tr> <tr> <td>IEEE 802.11n HT20</td> <td>5260, 5300, 5320</td> </tr> <tr> <td>IEEE 802.11n HT40</td> <td>5270, 5310</td> </tr> <tr> <td>IEEE 802.11ac VHT20</td> <td>5260, 5300, 5320</td> </tr> <tr> <td>IEEE 802.11ac VHT40</td> <td>5270, 5310</td> </tr> <tr> <td>IEEE 802.11ac VHT80</td> <td>5290</td> </tr> <tr> <td>IEEE 802.11ac VHT160</td> <td>5250</td> </tr> <tr> <td>IEEE 802.11ax HE20</td> <td>5260, 5300, 5320</td> </tr> <tr> <td>IEEE 802.11ax HE40</td> <td>5270, 5310</td> </tr> <tr> <td>IEEE 802.11ax HE80</td> <td>5290</td> </tr> <tr> <td>IEEE 802.11ax HE160</td> <td>5250</td> </tr> </tbody> </table>		Mode	Frequency Range (MHz)	U-NII-1	IEEE 802.11a	5180, 5220, 5240	IEEE 802.11n HT20	5180, 5220, 5240	IEEE 802.11n HT40	5190, 5230	IEEE 802.11ac VHT20	5180, 5220, 5240	IEEE 802.11ac VHT40	5190, 5230	IEEE 802.11ac VHT80	5210	IEEE 802.11ax HE20	5180, 5220, 5240	IEEE 802.11ax HE40	5190, 5230	U-NII-2a	IEEE 802.11a	5260, 5300, 5320	IEEE 802.11n HT20	5260, 5300, 5320	IEEE 802.11n HT40	5270, 5310	IEEE 802.11ac VHT20	5260, 5300, 5320	IEEE 802.11ac VHT40	5270, 5310	IEEE 802.11ac VHT80	5290	IEEE 802.11ac VHT160	5250	IEEE 802.11ax HE20	5260, 5300, 5320	IEEE 802.11ax HE40	5270, 5310	IEEE 802.11ax HE80	5290	IEEE 802.11ax HE160	5250
	Mode	Frequency Range (MHz)																																										
U-NII-1	IEEE 802.11a	5180, 5220, 5240																																										
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	IEEE 802.11n HT40	5190, 5230																																										
	IEEE 802.11ac VHT20	5180, 5220, 5240																																										
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	IEEE 802.11ax HE80	5290																																										
IEEE 802.11ax HE160	5250																																											

Operating Frequency	U-NII-2c	IEEE 802.11a	5500, 5580, 5700
		IEEE 802.11n HT20	5500, 5580, 5700
		IEEE 802.11n HT40	5510, 5550, 5670
		IEEE 802.11ac VHT20	5500, 5580, 5700
		IEEE 802.11ac VHT40	5510, 5550, 5670
		IEEE 802.11ac VHT80	5530, 5610
		IEEE 802.11ac VHT160	5570
		IEEE 802.11ax HE20	5500, 5580, 5700
		IEEE 802.11ax HE40	5510, 5550, 5670
		IEEE 802.11ax HE80	5530, 5610
		IEEE 802.11ax HE160	5570
	U-NII-3	IEEE 802.11a	5745, 5785, 5825
		IEEE 802.11n HT20	5745, 5785, 5825
		IEEE 802.11n HT40	5755, 5795
		IEEE 802.11ac VHT20	5745, 5785, 5825
		IEEE 802.11ac VHT40	5755, 5795
		IEEE 802.11ac VHT80	5775
		IEEE 802.11ax HE20	5745, 5785, 5825
		IEEE 802.11ax HE40	5755, 5795
		IEEE 802.11ax HE80	5775
Operation Transmitter	<ol style="list-style-type: none"> 1. IEEE 802.11a mode: 2T3R(SISO) 2. IEEE 802.11n HT20 mode: 2T3R(MIMO) 3. IEEE 802.11n HT40 mode: 2T3R(MIMO) 4. IEEE 802.11ac VHT20 mode: 2T3R(MIMO) 5. IEEE 802.11ac VHT40 mode: 2T3R(MIMO) 6. IEEE 802.11ac VHT80 mode: 2T3R(MIMO) 7. IEEE 802.11ac VHT160 mode: 2T3R(MIMO) 8. IEEE 802.11ax HE20 mode: 2T3R(MIMO) 9. IEEE 802.11ax HE40 mode: 2T3R(MIMO) 10. IEEE 802.11ax HE80 mode: 2T3R(MIMO) 11. IEEE 802.11ax HE160 mode: 2T3R(MIMO) 		

Remark:

1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.

3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conducted Emission	
Test Condition	AC Power line conducted emission for line and neutral
Power supply Mode	Mode 1: EUT Power by Adapter(AMS200-1201500FU) Mode 2: EUT Power by Adapter(AMS200-1201500F)
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4

Radiated Emission Measurement Above 1G	
Test Condition	Radiated Emission Above 1G
Power supply Mode	Mode 1: EUT Power by Adapter(AMS200-1201500FU) Mode 2: EUT Power by Adapter(AMS200-1201500F)
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4
Worst Position	<input type="checkbox"/> Placed in fixed position. <input checked="" type="checkbox"/> Placed in fixed position at X-Plane (E2-Plane) <input type="checkbox"/> Placed in fixed position at Y-Plane (E1-Plane) <input type="checkbox"/> Placed in fixed position at Z-Plane (H-Plane)

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Power supply Mode	Mode 1: EUT Power by Adapter(AMS200-1201500FU) Mode 2: EUT Power by Adapter(AMS200-1201500F)
Worst Mode	<input checked="" type="checkbox"/> Mode 1 <input type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4

Radiated Emission Measurement [Co-Location]	
Test Condition	Radiated Emission [Co-Location]
Power supply Mode	Mode 1: EUT Power by Wi-Fi 5G+Wi-Fi 2.4G+Zigbee Mode 2: EUT Power by Wi-Fi 5G+Wi-Fi 2.4G+BLE_2M
Worst Mode	<input type="checkbox"/> Mode 1 <input checked="" type="checkbox"/> Mode 2 <input type="checkbox"/> Mode 3 <input type="checkbox"/> Mode 4

Remark:

1. The worst mode was record in this test report.
2. AC power line conducted emission were performed the EUT transmit at the highest output power channel as worse case.
3. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(X-Plane) were recorded in this report
4. The modulation and bandwidth are similar for 802.11n mode for HT20 / HT40 and 802.11ac mode for VHT20 / VHT40, therefore investigated worst case to representative mode in test report
5. The device supports SISO and MIMO at 802.11n20/n40/ac20/ac40/ac80/ac160/ax20/ax40/ax80/ax160 mode, SISO and MIMO's power level is the same,per pre-test, MIMO 2TX mode was the worst and reported.
6. The device supports non_BF and BF modes. Since the non_BF mode similar to BF radio frequency characteristics, some test items of BF mode will be exempted.
7. This device only supports FULL RU for AX mode.
8. The device supports Master DFS and TPC , EUT employ a TPC mechanism and TPC have the capability to operate at least 6 dB below highest RF output power.

3.3 EUT DUTY CYCLE

Non-Beamformig

Temperature: 20.3 ~ 25.3°C

Test date: May 21 ~ July 9, 2024

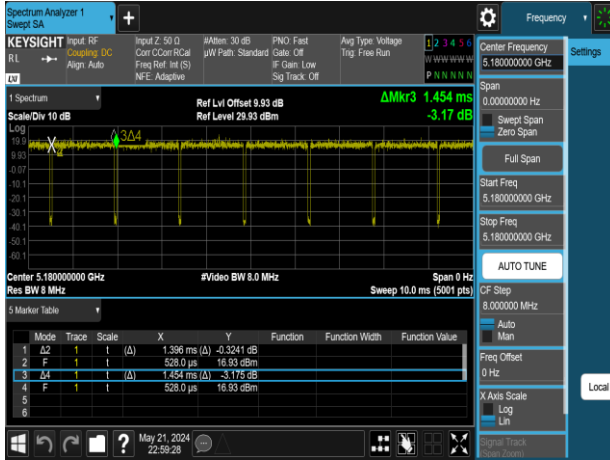
Humidity: 53 ~ 64% RH

Tested by: Marco Chan

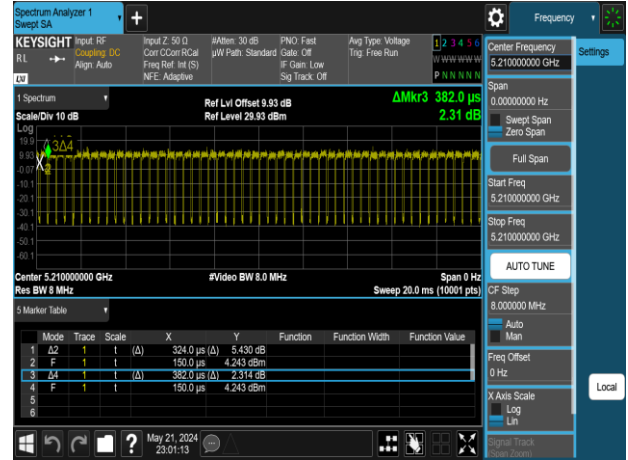
Mode	Duty Cycle (%) =Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)	
802.11a	96.01	0.18	0.72	1.00	
802.11n_20	95.89	0.18	0.76	1.00	
802.11n_40	91.78	0.37	1.54	2.00	
802.11ac_80	84.82	0.72	3.09	4.00	
802.11ac_160	76.03	1.19	5.43	6.00	
Mode	RU Config	Duty Cycle (%) =Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11ax_20	Full	94.83	0.23	0.97	1.00
802.11ax_40	Full	90.73	0.42	1.82	2.00
802.11ax_80	Full	84.18	0.75	3.36	4.00
802.11ax_160	Full	76.27	1.18	5.56	6.00

Report No.: TMWK2309003309KR

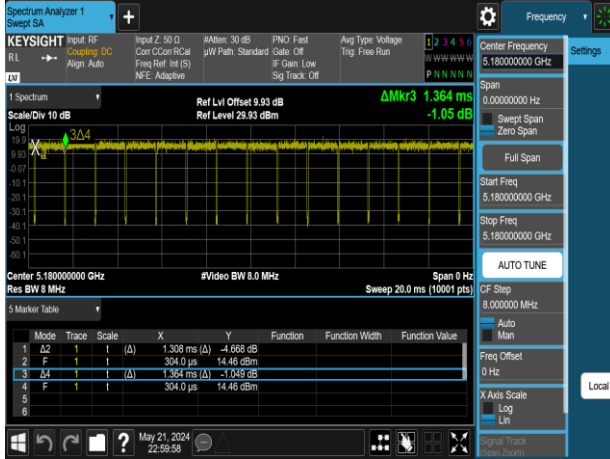
802.11a_20MHz_Chain0_5180MHz



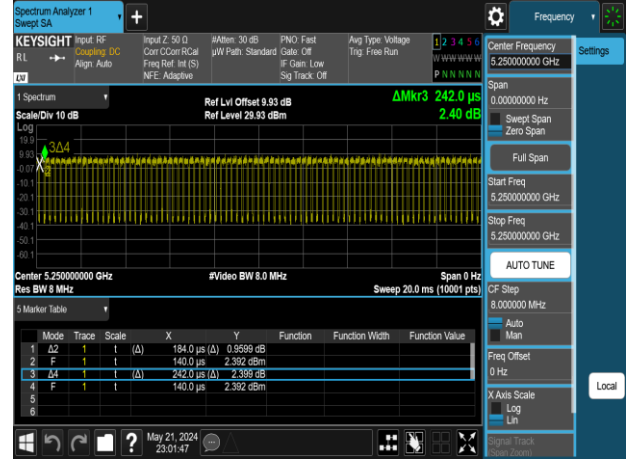
802.11ac_80MHz_Chain0_5210MHz



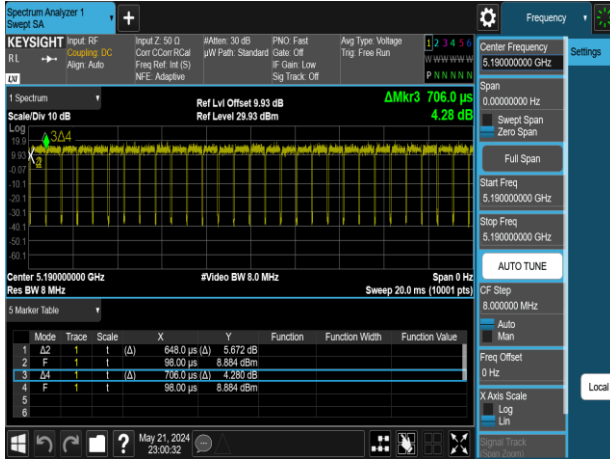
802.11n_20MHz_Chain0_5180MHz



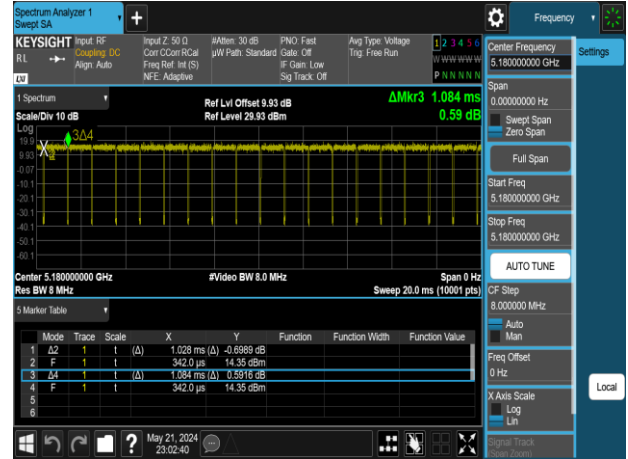
802.11ac_160MHz_Chain0_5250MHz



802.11n_40MHz_Chain0_5190MHz

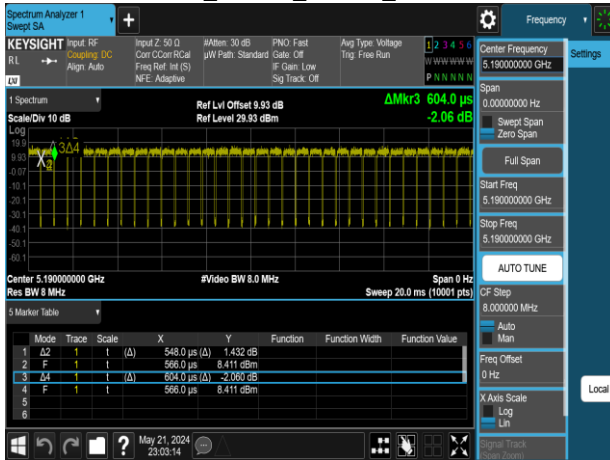


802.11ax_20MHz_Chain0_5180MHz

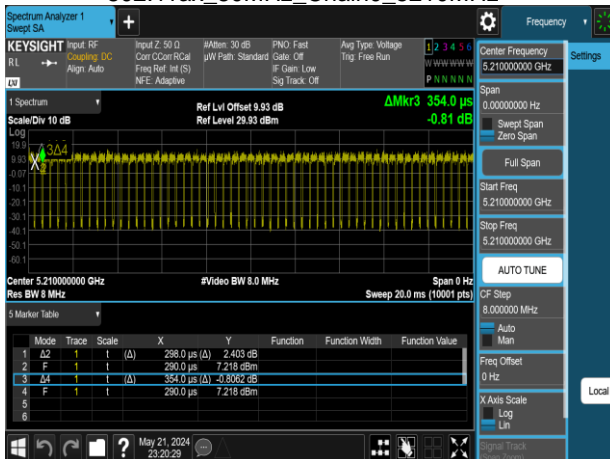


Report No.: TMWK2309003309KR

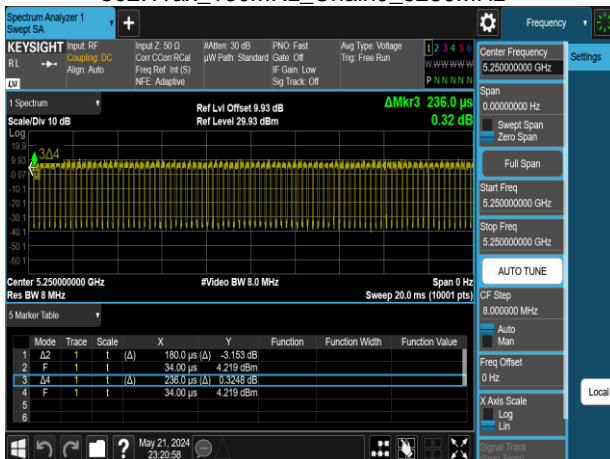
802.11ax_40MHz_Chain0_5190MHz



802.11ax_80MHz_Chain0_5210MHz



802.11ax_160MHz_Chain0_5250MHz



Beamformig

Temperature: 20.3 ~ 25.3°C

Test date: May 21 ~ July 10, 2024

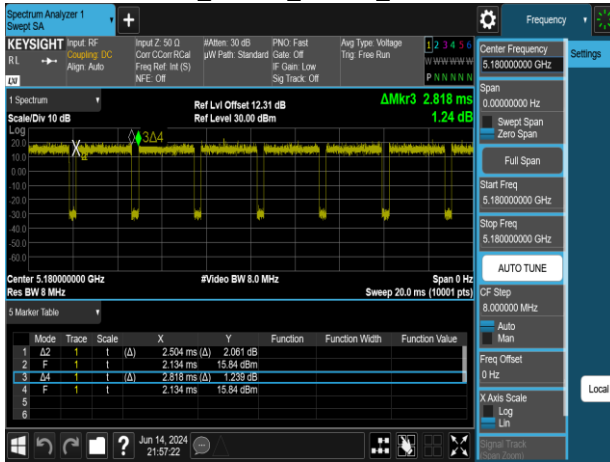
Humidity: 53 ~ 64% RH

Tested by: Marco Chan

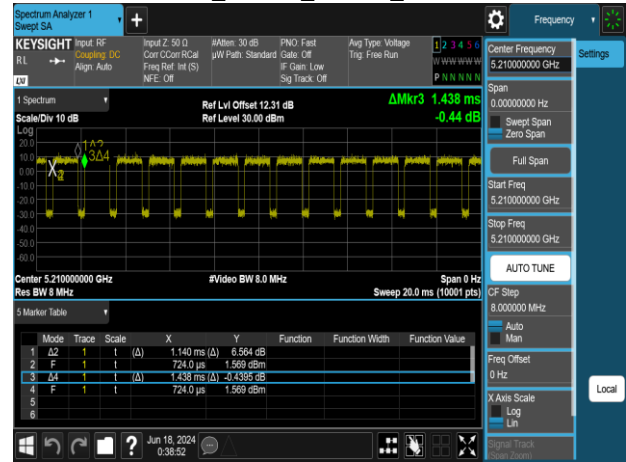
Mode		Duty Cycle (%) =Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11n_20		88.86	0.51	0.40	1.00
802.11n_40		88.74	0.52	0.41	1.00
802.11ac_80		79.28	1.01	0.88	1.00
802.11ac_160		50.16	3.00	3.13	4.00
Mode	RU Config	Duty Cycle (%) =Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11ax_20	Full	92.29	0.35	0.26	1.00
802.11ax_40	Full	85.88	0.66	0.52	1.00
802.11ax_80	Full	75.40	1.23	1.06	2.00
802.11ax_160	Full	47.18	3.26	3.52	4.00

Report No.: TMWK2309003309KR

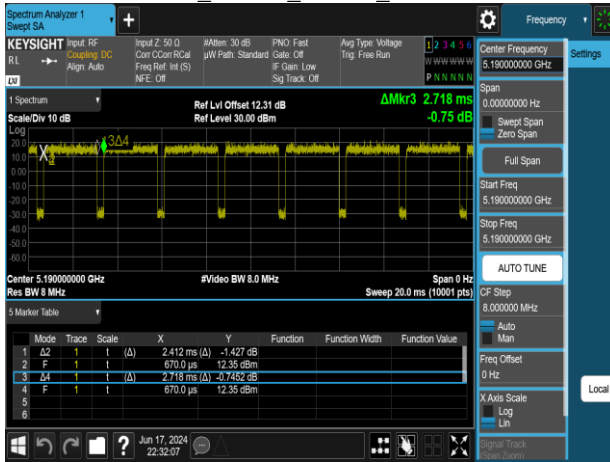
802.11n_20MHz_Chain0_5180MHz



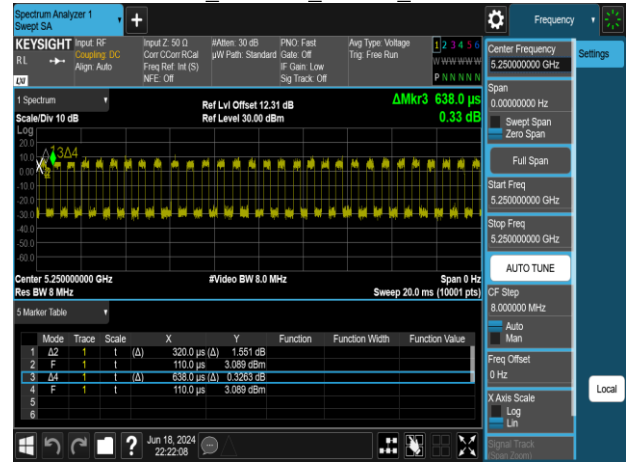
802.11ac_80MHz_Chain0_5210MHz



802.11n_40MHz_Chain0_5190MHz

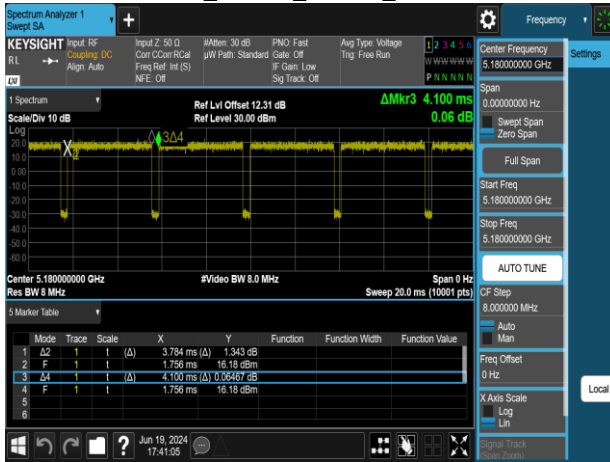


802.11ac_160MHz_Chain0_5250MHz

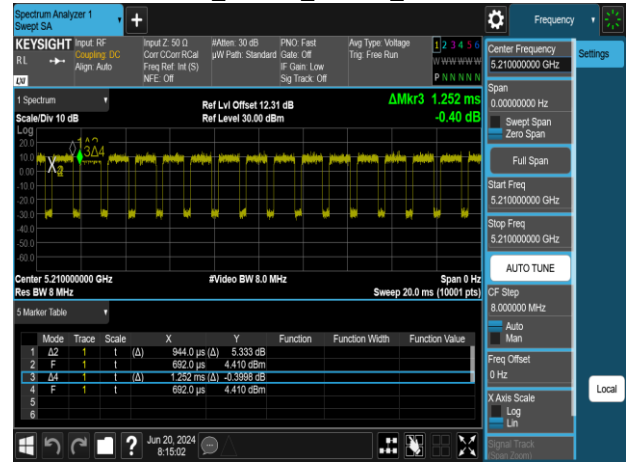


Report No.: TMWK2309003309KR

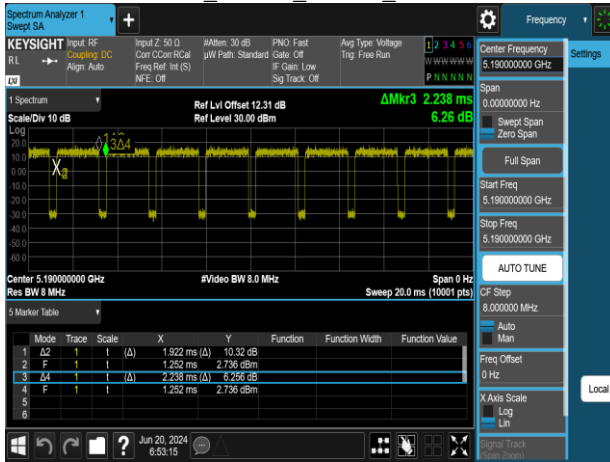
802.11ax_20MHz_Chain0_5180MHz



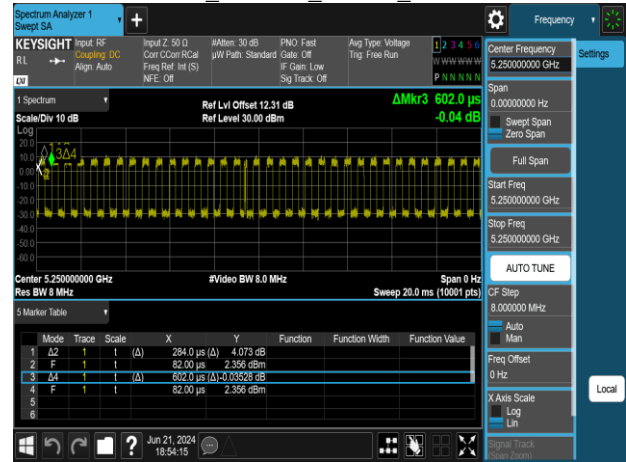
802.11ax_80MHz_Chain0_5210MHz



802.11ax_40MHz_Chain0_5190MHz



802.11ax_160MHz_Chain0_5250MHz



4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a),

Frequency Range (MHz)	Limits(dB μ V)	
	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

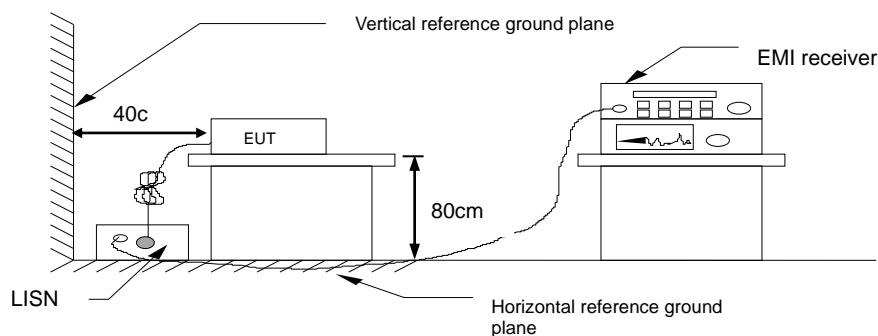
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 6.2,

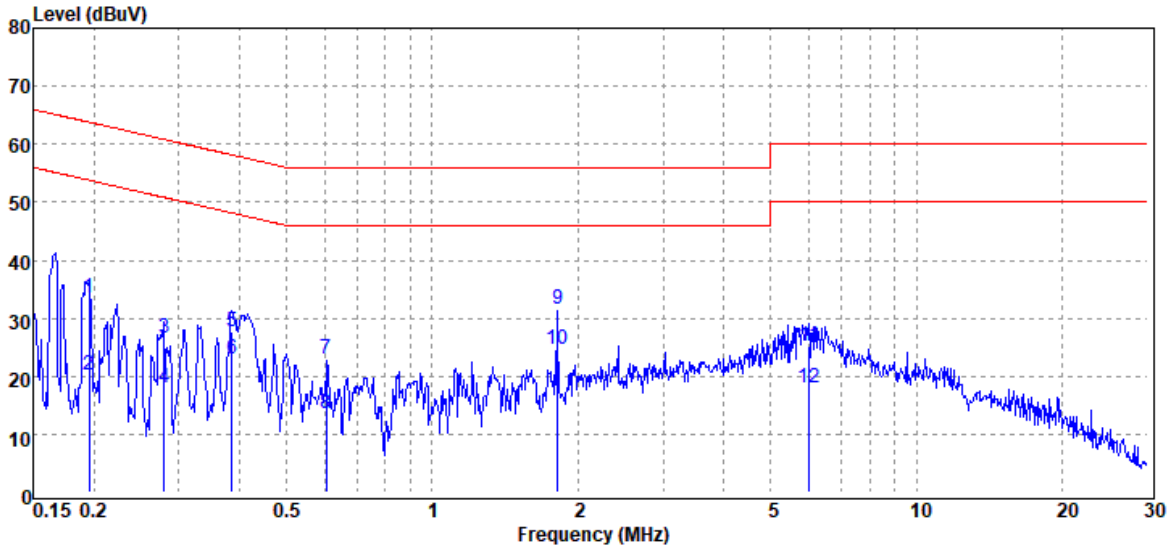
1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup



4.1.4 Test Result

Project No	: TM-2309000207P	Test Date	: 2024-06-24
Operation Mode	: 5G	Temp./Humi.	: 23.4°C / 54%
Test Chamber	: Conduction	Engineer	: Ben Yang
Probe	: LINE	Test Voltage	: AC 120V/60Hz
Note	:		



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dB μ V	Factor dB	Actual FS dB μ V	Limit dB μ V	Margin dB
0.196	QP	33.39	0.14	33.53	63.78	-30.25
0.196	Average	20.03	0.14	20.17	53.78	-33.61
0.280	QP	26.41	0.14	26.55	60.82	-34.27
0.280	Average	17.84	0.14	17.98	50.82	-32.84
0.386	QP	27.57	0.14	27.71	58.15	-30.44
0.386	Average	22.88	0.14	23.02	48.15	-25.13
0.605	QP	22.70	0.14	22.84	56.00	-33.16
0.605	Average	13.42	0.14	13.56	46.00	-32.44
1.814	QP	31.29	0.20	31.49	56.00	-24.51
1.814	Average	24.46	0.20	24.66	46.00	-21.34
6.003	QP	24.85	0.29	25.14	60.00	-34.86
6.003	Average	17.72	0.29	18.01	50.00	-31.99

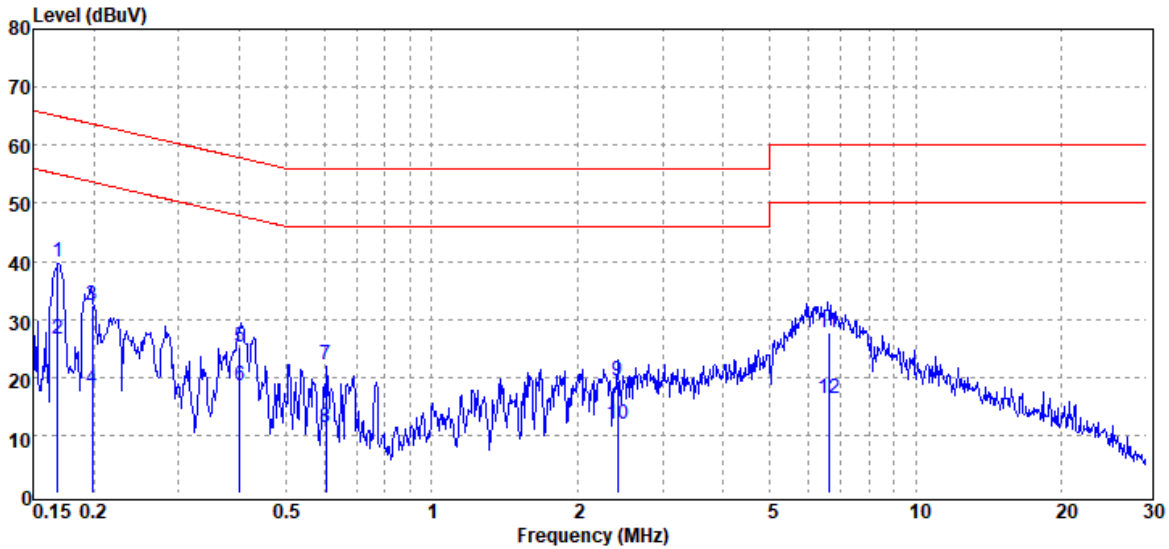
Note: 1. Actual FS= Spectrum Read Level + Factor

Note: 2. Margin= Actual FS - Limit

Report No.: TMWK2309003309KR

Project No : TM-2309000207P
 Operation Mode : 5G
 Test Chamber : Conduction
 Probe : NEUTRAL
 Note :

Test Date : 2024-06-24
 Temp./Humi. : 23.4°C / 54%
 Engineer : Ben Yang
 Test Voltage : AC 120V/60Hz



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dB μ V	Factor dB	Actual FS dB μ V	Limit dB μ V	Margin dB
0.169	QP	39.62	0.11	39.73	65.03	-25.30
0.169	Average	26.50	0.11	26.61	55.03	-28.42
0.199	QP	32.36	0.11	32.47	63.67	-31.20
0.199	Average	17.93	0.11	18.04	53.67	-35.63
0.402	QP	25.10	0.11	25.21	57.82	-32.61
0.402	Average	18.35	0.11	18.46	47.82	-29.36
0.605	QP	21.91	0.11	22.02	56.00	-33.98
0.605	Average	11.37	0.11	11.48	46.00	-34.52
2.422	QP	19.11	0.21	19.32	56.00	-36.68
2.422	Average	11.73	0.21	11.94	46.00	-34.06
6.602	QP	27.45	0.28	27.73	60.00	-32.27
6.602	Average	16.08	0.28	16.36	50.00	-33.64

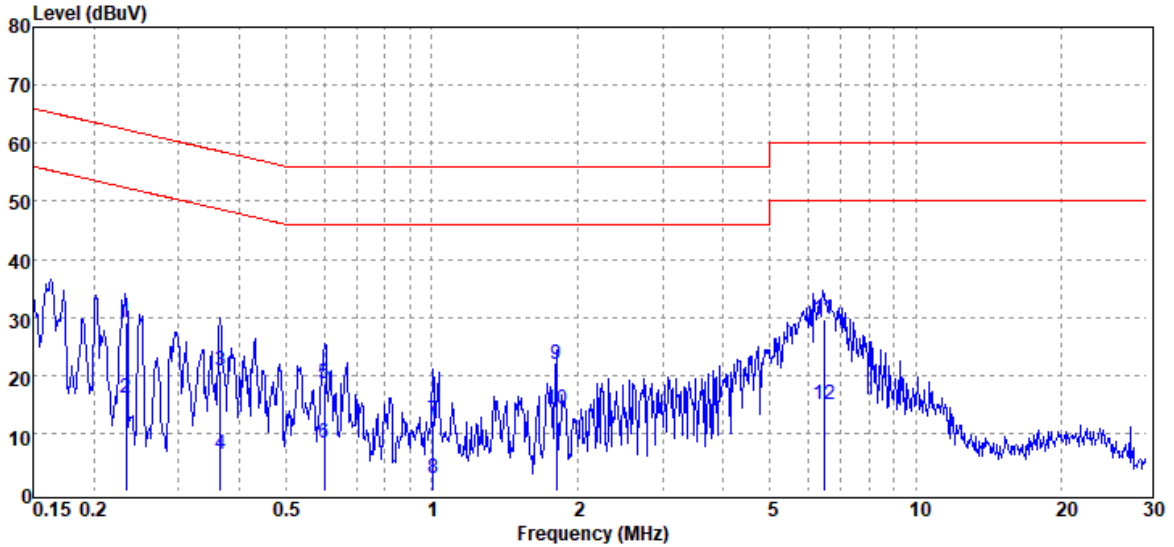
Note: 1. Actual FS= Spectrum Read Level + Factor

Note: 2. Margin= Actual FS - Limit

Report No.: TMWK2309003309KR

Project No : TM-2309000207P
 Operation Mode : 5G
 Test Chamber : Conduction
 Probe : LINE
 Note :

Test Date : 2024-07-03
 Temp./Humi. : 23.4°C / 54%
 Engineer : Ben Yang
 Test Voltage : AC 230V/50Hz



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dB μ V	Factor dB	Actual FS dB μ V	Limit dB μ V	Margin dB
0.233	QP	28.91	0.12	29.03	62.33	-33.30
0.233	Average	15.80	0.12	15.92	52.33	-36.41
0.366	QP	20.54	0.11	20.65	58.60	-37.95
0.366	Average	6.38	0.11	6.49	48.60	-42.11
0.599	QP	18.57	0.11	18.68	56.00	-37.32
0.599	Average	8.16	0.11	8.27	46.00	-37.73
1.005	QP	12.18	0.12	12.30	56.00	-43.70
1.005	Average	2.09	0.12	2.21	46.00	-43.79
1.811	QP	21.82	0.15	21.97	56.00	-34.03
1.811	Average	13.91	0.15	14.06	46.00	-31.94
6.451	QP	29.23	0.27	29.50	60.00	-30.50
6.451	Average	14.75	0.27	15.02	50.00	-34.98

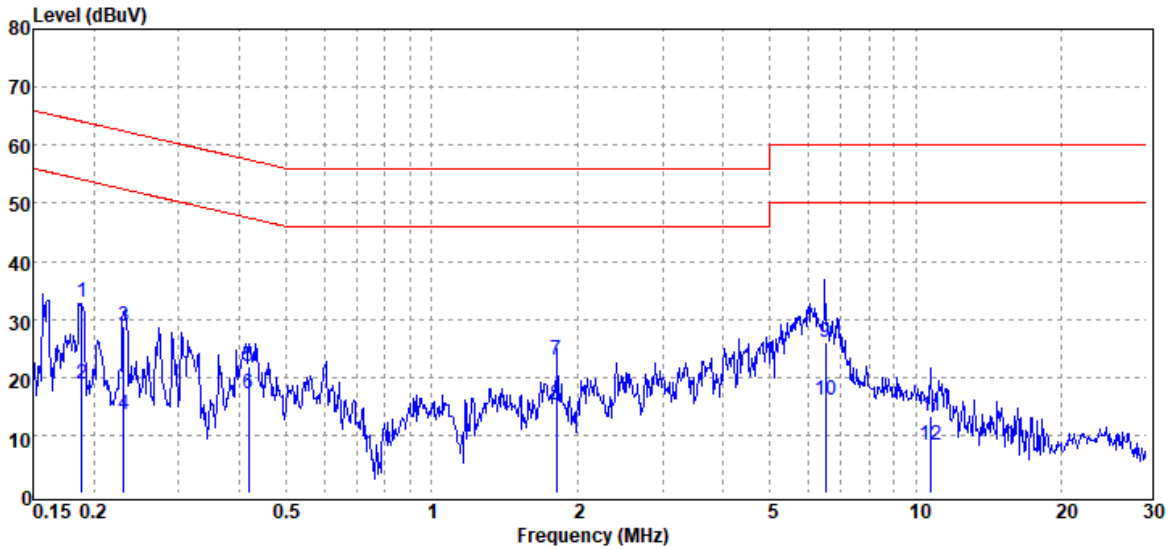
Note: 1. Actual FS= Spectrum Read Level + Factor

Note: 2. Margin= Actual FS - Limit

Report No.: TMWK2309003309KR

Project No : TM-2309000207P
 Operation Mode : 5G
 Test Chamber : Conduction
 Probe : NEUTRAL
 Note :

Test Date : 2024-07-03
 Temp./Humi. : 23.4°C / 54%
 Engineer : Ben Yang
 Test Voltage : AC 230V/50Hz



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Read Level dBuV	Factor dB	Actual FS dBuV	Limit dBuV	Margin dB
0.189	QP	32.88	0.09	32.97	64.09	-31.12
0.189	Average	18.76	0.09	18.85	54.09	-35.24
0.231	QP	28.76	0.09	28.85	62.42	-33.57
0.231	Average	13.52	0.09	13.61	52.42	-38.81
0.418	QP	21.80	0.08	21.88	57.48	-35.60
0.418	Average	17.07	0.08	17.15	47.48	-30.33
1.812	QP	22.83	0.13	22.96	56.00	-33.04
1.812	Average	15.08	0.13	15.21	46.00	-30.79
6.518	QP	25.69	0.24	25.93	60.00	-34.07
6.518	Average	15.85	0.24	16.09	50.00	-33.91
10.760	QP	12.89	0.30	13.19	60.00	-46.81
10.760	Average	8.01	0.30	8.31	50.00	-41.69

Note: 1. Actual FS= Spectrum Read Level + Factor

Note: 2. Margin= Actual FS - Limit

4.2 26dB BANDWIDTH, 6dB BANDWIDTH AND OCCUPIED BANDWIDTH(99%)

4.2.1 Test Limit

26 dB Bandwidth : For reporting purposes only.

6 dB Bandwidth : Least 500kHz.

Occupied Bandwidth(99%) : For reporting purposes only.

4.2.2 Test Procedure

26dB

1. This measurement setting are specified in section D of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set RBW: approximately 1% of the emission bandwidth.
3. Set the VBW>RBW.
4. Detoctor = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26dB down from the peak of the emission. Compare this with the RBW setting of the analyser. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

6dB

1. This measurement setting are specified in section D of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set RBW = 100 kHz.
3. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
4. Detoctor = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

99%

1. This measurement setting are specified in section D of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set center frequency to the nominal EUT channel center frequency.
3. Set span = 1.5 times to 5.0 times the OBW.
4. Set RBW = 1 % to 5% of the OBW.
5. Set VBW \geq 3 xRBW

4.2.3 Test Setup

Refer to section 1.8.



4.2.4 Test Result

Non-Beamformig

Temperature: 20.3 ~ 25.3°C

Test date: May 21 ~ July 9, 2024

Humidity: 53 ~ 64% RH

Tested by: Marco Chan

Occupied Bandwidth(99%)

1. Chain 0

802.11a_Ch0

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5180	16.908	12.280
5220	17.902	12.530
5240	17.709	12.480
5260	16.506	12.180
5300	16.633	12.210
5320	16.655	12.220
5500	16.640	12.210
5580	16.547	12.190
5700	16.592	12.200

802.11a_Ch0

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5745	25.121	16.43
5785	25.175	16.40
5825	22.298	16.38

2. Chain 1

802.11a_Ch1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5180	16.690	12.220
5220	17.151	12.340
5240	17.216	12.360
5260	16.511	12.180
5300	16.667	12.220
5320	16.626	12.210
5500	16.630	12.210
5580	16.522	12.180
5700	16.628	12.210

802.11a_Ch1

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5745	20.961	16.33
5785	21.439	16.27
5825	18.113	16.31

3. MIMO

802.11n_HT20_Ch0

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5180	17.826	12.510
5220	17.919	12.530
5240	18.150	12.590
5260	17.722	12.490
5300	17.798	12.500
5320	17.798	12.500
5500	17.773	12.500
5580	17.758	12.490
5700	17.792	12.500

802.11n_HT20_Ch0

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5745	18.679	17.51
5785	18.778	17.54
5825	18.682	17.62

802.11n_HT20_Ch1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5180	17.965	12.540
5220	17.891	12.530
5240	18.061	12.570
5260	17.673	12.470
5300	17.784	12.500
5320	17.781	12.500
5500	17.750	12.490
5580	17.673	12.470
5700	17.754	12.490

802.11n_HT20_Ch1

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5745	19.348	17.55
5785	19.858	17.52
5825	19.233	17.60

802.11n_HT40_Ch0

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5190	36.231	15.590
5230	36.480	15.620
5270	35.977	15.560
5310	36.171	15.580
5510	36.121	15.580
5550	36.064	15.570
5670	36.306	15.600

802.11n_HT40_Ch0

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5755	36.935	36.05
5795	36.781	35.75

802.11n_HT40_Ch1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5190	36.087	15.570
5230	36.342	15.600
5270	36.108	15.580
5310	36.230	15.590
5510	36.170	15.580
5550	36.082	15.570
5670	36.243	15.590

802.11n_HT40_Ch1

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5755	36.854	35.24
5795	36.997	35.19

802.11ac_VHT80_Ch0

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5210	75.691	18.790
5290	75.244	18.760
5530	75.259	18.770
5610	75.306	18.770

802.11ac_VHT80_Ch0

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5775	75.315	71.38

802.11ac_VHT80_Ch1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5210	75.377	18.770
5290	75.440	18.780
5530	75.423	18.780
5610	75.315	18.770

802.11ac_VHT80_Ch1

Frequency (MHz)	99% BW (MHz)	6dB BW (MHz)
5775	75.351	72.82

802.11ac_VHT160_Ch0

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5250	153.60	21.860
5570	154.70	21.890

802.11ac_VHT160_Ch1

Frequency (MHz)	99% BW (MHz)	10 Log (B) (dB)
5250	153.43	21.860
5570	153.60	21.860

802.11ax_HE20_Ch0

Frequency (MHz)	RU config	99% BW (MHz)	10 Log (B) (dB)
5180	full	19.026	12.790
5220	full	19.085	12.810
5240	full	18.968	12.780
5260	full	18.926	12.770
5300	full	18.988	12.780
5320	full	19.022	12.790
5500	full	18.975	12.780
5580	full	18.952	12.780
5700	full	19.024	12.790

802.11ax_HE20_Ch0

Frequency (MHz)	RU config	99% BW (MHz)	6dB BW (MHz)
5745	full	19.400	18.94
5785	full	19.363	19.02
5825	full	19.285	18.09

802.11ax_HE20_Ch1

Frequency (MHz)	RU config	99% BW (MHz)	10 Log (B) (dB)
5180	full	19.016	12.790
5220	full	19.085	12.810
5240	full	18.995	12.790
5260	full	18.979	12.780
5300	full	19.034	12.800
5320	full	19.000	12.790
5500	full	19.020	12.790
5580	full	18.952	12.780
5700	full	18.968	12.780

802.11ax_HE20_Ch1

Frequency (MHz)	RU config	99% BW (MHz)	6dB BW (MHz)
5745	full	19.953	18.94
5785	full	19.962	18.80
5825	full	19.320	18.90

802.11ax_HE40_Ch0

Frequency (MHz)	RU config	99% BW (MHz)	10 Log (B) (dB)
5190	full	37.744	15.770
5230	full	37.936	15.790
5270	full	37.529	15.740
5310	full	37.673	15.760
5510	full	37.640	15.760
5550	full	37.606	15.750
5670	full	37.705	15.760

802.11ax_HE40_Ch0

Frequency (MHz)	RU config	99% BW (MHz)	6dB BW (MHz)
5755	full	37.981	34.43
5795	full	38.327	37.40

802.11ax_HE40_Ch1

Frequency (MHz)	RU config	99% BW (MHz)	10 Log (B) (dB)
5190	full	37.705	15.760
5230	full	37.870	15.780
5270	full	37.583	15.750
5310	full	37.622	15.750
5510	full	37.705	15.760
5550	full	37.648	15.760
5670	full	37.724	15.770

802.11ax_HE40_Ch1

Frequency (MHz)	RU config	99% BW (MHz)	6dB BW (MHz)
5755	full	38.135	37.53
5795	full	40.697	36.75

802.11ax_HE80_Ch0

Frequency (MHz)	RU config	99% BW (MHz)	10 Log (B) (dB)
5210	full	77.290	18.880
5290	full	76.700	18.850
5530	full	76.698	18.850
5610	full	76.878	18.860

802.11ax_HE80_Ch0

Frequency (MHz)	RU config	99% BW (MHz)	6dB BW (MHz)
5775	full	76.759	76.54

802.11ax_HE80_Ch1

Frequency (MHz)	RU config	99% BW (MHz)	10 Log (B) (dB)
5210	full	76.929	18.860
5290	full	76.912	18.860
5530	full	76.948	18.860
5610	full	76.842	18.860

802.11ax_HE80_Ch1

Frequency (MHz)	RU config	99% BW (MHz)	6dB BW (MHz)
5775	full	76.865	74.74

802.11ax_HE160_Ch0

Frequency (MHz)	RU config	99% BW (MHz)	10 Log (B) (dB)
5250	full	155.57	21.920
5570	full	155.88	21.930

802.11ax_HE160_Ch1

Frequency (MHz)	RU config	99% BW (MHz)	10 Log (B) (dB)
5250	full	156.03	21.930
5570	full	155.45	21.920

6 dB Bandwidth & 26 dB Bandwidth

1. Chain 0

802.11a_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	29.38	14.680
5220	34.33	15.360
5240	29.96	14.770
5260	20.38	13.090
5300	27.69	14.420
5320	23.26	13.670
5500	24.32	13.860
5580	22.85	13.590
5700	24.74	13.930

802.11a_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	16.28	12.120
5785	16.32	12.130
5825	16.32	12.130

802.11a_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.739206	< 5250
5745	5733.232789	> 5725

Note: The measurement results of all 6dBc test channels are greater than 500kHz.

2. Chain 1

802.11a_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	25.03	13.980
5220	29.75	14.730
5240	29.78	14.740
5260	20.98	13.220
5300	27.44	14.380
5320	24.98	13.980
5500	23.46	13.700
5580	20.91	13.200
5700	21.20	13.260

802.11a_Ch1

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	16.33	12.130
5785	15.79	11.980
5825	16.34	12.130

802.11a_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.473561	< 5250
5745	5734.963188	> 5725

Note: The measurement results of all 6dBc test channels are greater than 500kHz.

3. MIMO

802.11n_HT20_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	26.96	14.310
5220	28.99	14.620
5240	29.65	14.720
5260	21.36	13.300
5300	26.24	14.190
5320	26.13	14.170
5500	23.75	13.760
5580	22.83	13.590
5700	25.41	14.050

802.11n_HT20_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	28.65	14.570
5220	28.64	14.570
5240	29.62	14.720
5260	20.88	13.200
5300	24.28	13.850
5320	22.78	13.580
5500	22.49	13.520
5580	21.07	13.240
5700	25.38	14.040

802.11n_HT20_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	17.30	12.380
5785	17.29	12.380
5825	17.57	12.450

802.11n_HT20_Ch1

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	17.62	12.460
5785	16.93	12.290
5825	17.29	12.380

802.11n_HT20_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5249.017512	< 5250
5745	5736.052599	> 5725

802.11n_HT20_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.971079	< 5250
5745	5735.942161	> 5725

Note: The measurement results of all 6dBc test channels are greater than 500kHz.

802.11n_HT40_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	48.00	16.810
5230	59.83	17.770
5270	40.77	16.100
5310	47.16	16.740
5510	48.50	16.860
5550	41.07	16.140
5670	59.21	17.720

802.11n_HT40_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	44.71	16.500
5230	59.24	17.730
5270	44.89	16.520
5310	42.67	16.300
5510	43.10	16.340
5550	39.46	15.960
5670	43.49	16.380

802.11n_HT40_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	35.15	15.460
5795	35.13	15.460

802.11n_HT40_Ch1

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5755	33.88	15.300
5795	31.39	14.970

802.11n_HT40_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5230	5248.398811	< 5250
5755	5736.894937	> 5725

802.11n_HT40_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5230	5248.227799	< 5250
5755	5736.809126	> 5725

Note: The measurement results of all 6dBc test channels are greater than 500kHz.

802.11ac_VHT80_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5210	107.4	20.310
5290	90.29	19.560
5530	94.00	19.730
5610	79.73	19.020

802.11ac_VHT80_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5210	95.14	19.780
5290	96.01	19.820
5530	91.58	19.620
5610	79.24	18.990

802.11ac_VHT80_Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5775	73.95	18.690

802.11ac_VHT80_Ch1

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5775	73.96	18.690

802.11ac_VHT80_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5210	5247.834914	< 5250
5775	5737.545912	> 5725

802.11ac_VHT80_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5210	5247.705854	< 5250
5775	5737.365396	> 5725

802.11ac_VHT160_Ch0

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5250	167.8	22.250
5570	171.0	22.330

802.11ac_VHT160_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5250	162.0	22.100
5570	165.7	22.190

Note: The measurement results of all 6dBc test channels are greater than 500kHz.

802.11ax_HE20_Ch0

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5180	full	22.39	13.500
5220	full	29.77	14.740
5240	full	29.85	14.750
5260	full	21.85	13.390
5300	full	24.86	13.960
5320	full	24.37	13.870
5500	full	24.90	13.960
5580	full	22.58	13.540
5700	full	23.47	13.710

802.11ax_HE20_Ch1

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5180	full	23.89	13.780
5220	full	28.61	14.570
5240	full	29.84	14.750
5260	full	21.67	13.360
5300	full	24.74	13.930
5320	full	27.58	14.410
5500	full	26.42	14.220
5580	full	21.50	13.320
5700	full	21.85	13.390

802.11ax_HE20_Ch0

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5745	full	16.81	12.260
5785	full	18.18	12.600
5825	full	16.66	12.220

802.11ax_HE20_Ch1

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5745	full	18.42	12.650
5785	full	16.90	12.280
5825	full	16.70	12.230

802.11ax_HE20_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5249.452936	< 5250
5745	5735.377901	> 5725

802.11ax_HE20_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5249.482439	< 5250
5745	5735.333209	> 5725

Note: The measurement results of all 6dBc test channels are greater than 500kHz.

802.11ax_HE40_Ch0

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5190	full	41.24	16.150
5230	full	59.42	17.740
5270	full	39.69	15.990
5310	full	48.85	16.890
5510	full	43.72	16.410
5550	full	39.52	15.970
5670	full	50.40	17.020

802.11ax_HE40_Ch1

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5190	full	52.47	17.200
5230	full	54.73	17.380
5270	full	43.59	16.390
5310	full	46.46	16.670
5510	full	42.37	16.270
5550	full	39.03	15.910
5670	full	50.77	17.060

802.11ax_HE40_Ch0

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5755	full	35.60	15.510
5795	full	35.03	15.440

802.11ax_HE40_Ch1

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5755	full	35.13	15.460
5795	full	35.05	15.450

802.11ax_HE40_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5230	5248.945359	< 5250
5755	5736.121860	> 5725

802.11ax_HE40_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5230	5248.901493	< 5250
5755	5736.023378	> 5725

Note: The measurement results of all 6dBc test channels are greater than 500kHz.

802.11ax_HE80_Ch0

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5210	full	93.46	19.710
5290	full	80.69	19.070
5530	full	80.89	19.080
5610	full	80.00	19.030

802.11ax_HE80_Ch1

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5210	full	90.90	19.590
5290	full	80.52	19.060
5530	full	80.68	19.070
5610	full	79.92	19.030

802.11ax_HE80_Ch0

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5775	full	73.98	18.690

802.11ax_HE80_Ch1

Freq. (MHz)	RU config	6dB BW (MHz)	10 Log (B) (dB)
5775	full	75.18	18.760

802.11ax_HE80_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5210	5248.632722	< 5250
5775	5736.946429	> 5725

802.11ax_HE80_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5210	5248.567017	< 5250
5775	5736.645337	> 5725

802.11ax_HE160_Ch0

Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5250	full	163.7	22.140
5570	full	169.4	22.290

802.11ax_HE160_Ch1

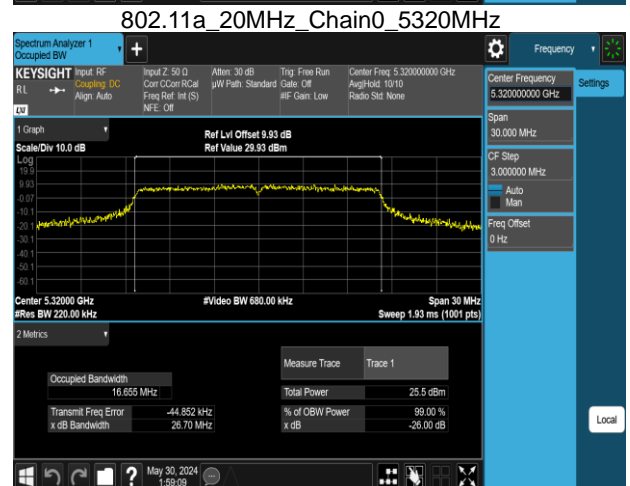
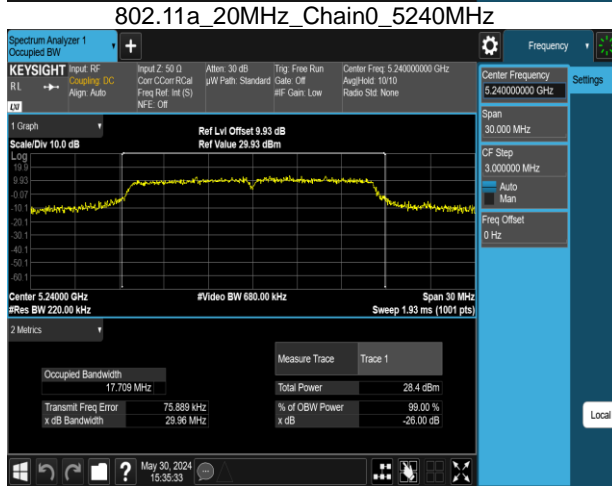
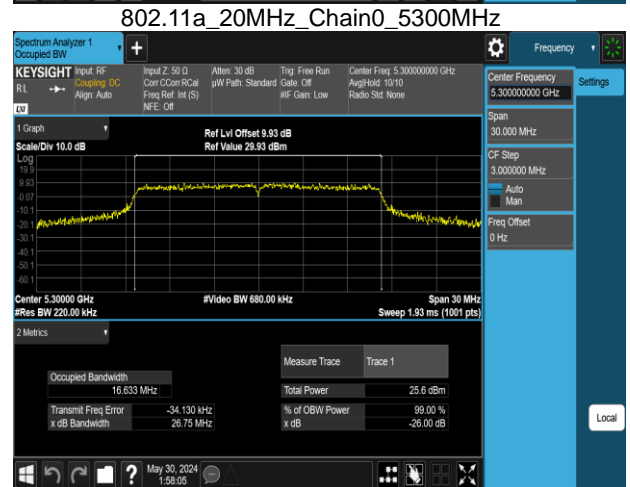
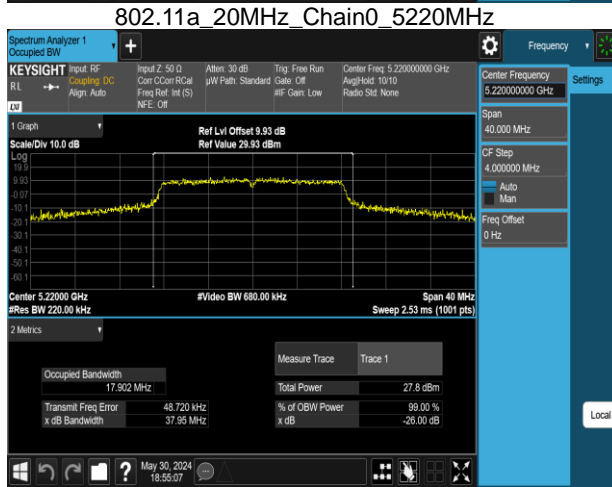
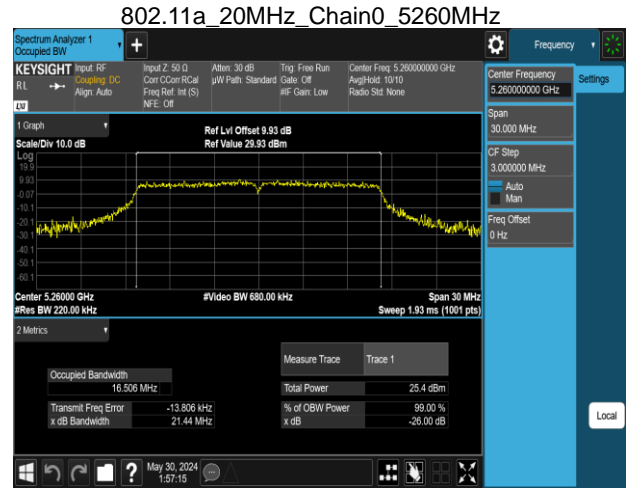
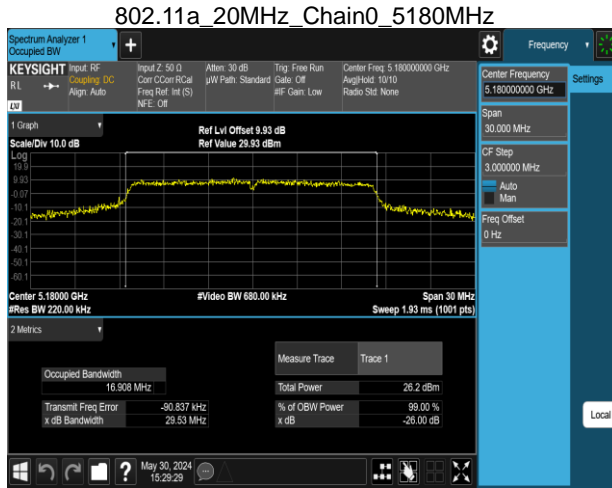
Freq. (MHz)	RU config	26dB BW (MHz)	10 Log (B) (dB)
5250	full	162.4	22.110
5570	full	163.9	22.150

Note: The measurement results of all 6dBc test channels are greater than 500kHz.

Test Data

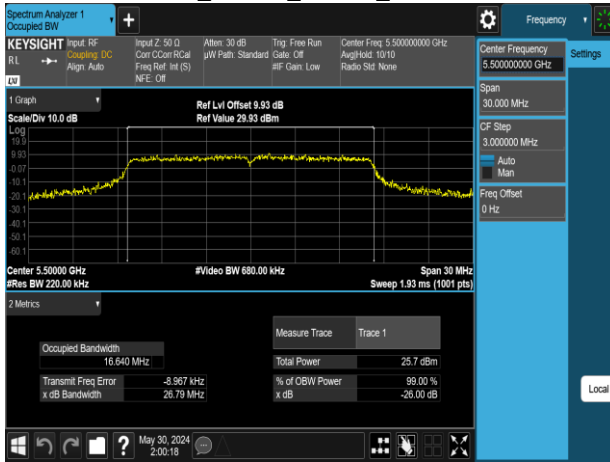
Occupied Bandwidth(99%)

1. Chain 0

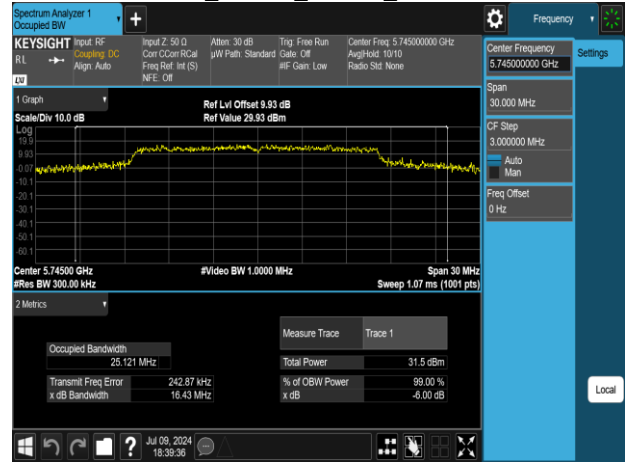


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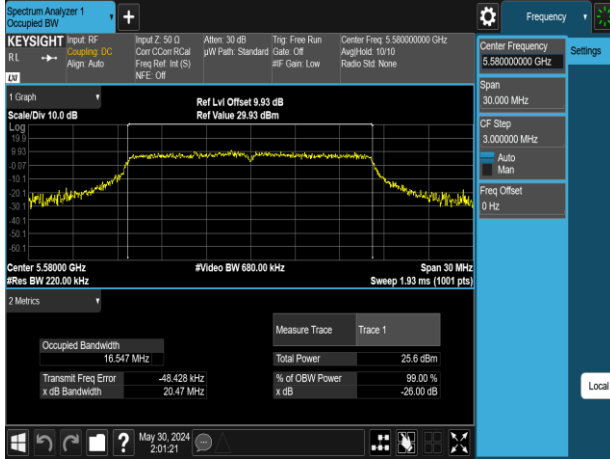
802.11a_20MHz_Chain0_5500MHz



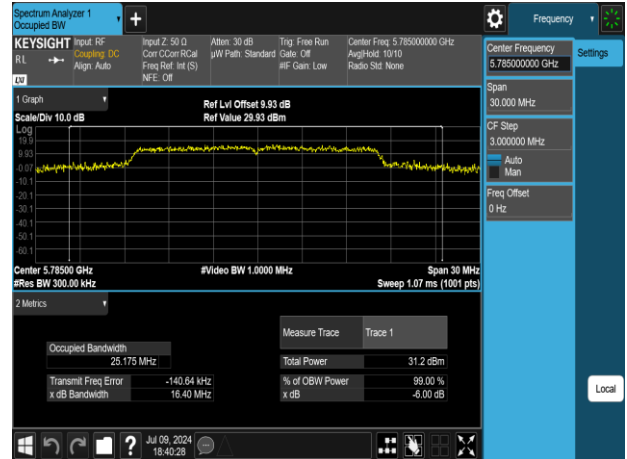
802.11a_20MHz_Chain0_5745MHz



802.11a_20MHz_Chain0_5580MHz



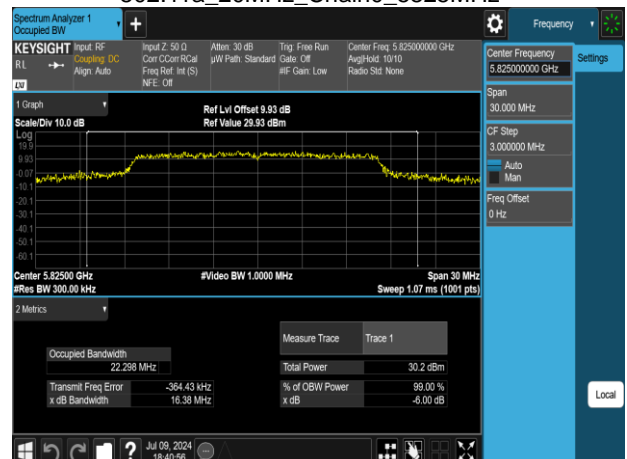
802.11a_20MHz_Chain0_5785MHz



802.11a_20MHz_Chain0_5700MHz

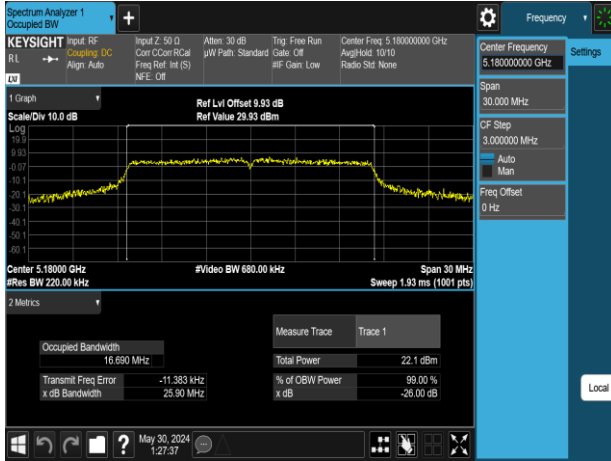


802.11a_20MHz_Chain0_5825MHz

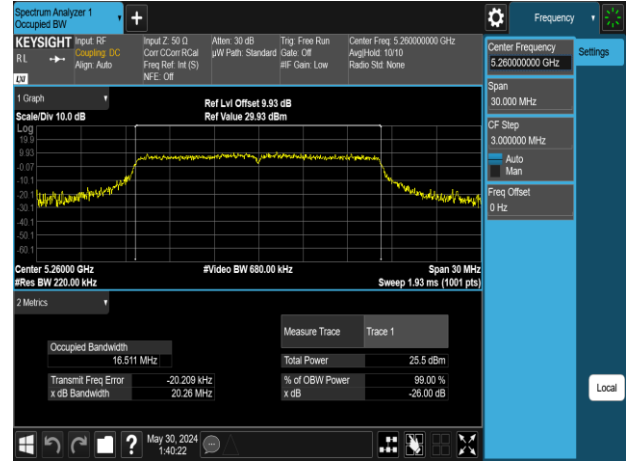


2. Chain 1

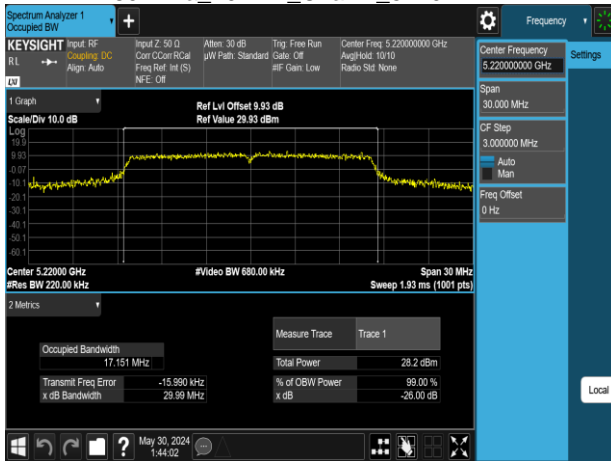
802.11a_20MHz_Chain1_5180MHz



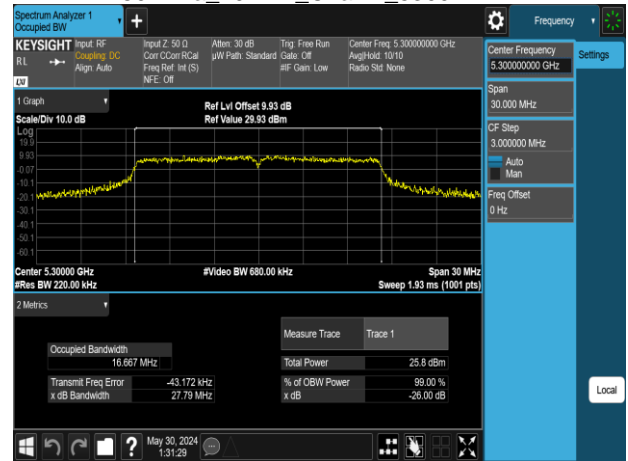
802.11a_20MHz_Chain1_5260MHz



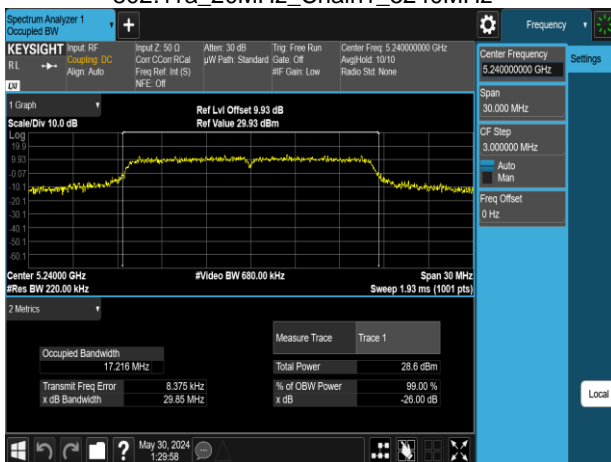
802.11a_20MHz_Chain1_5220MHz



802.11a_20MHz_Chain1_5300MHz



802.11a_20MHz_Chain1_5240MHz



802.11a_20MHz_Chain1_5320MHz

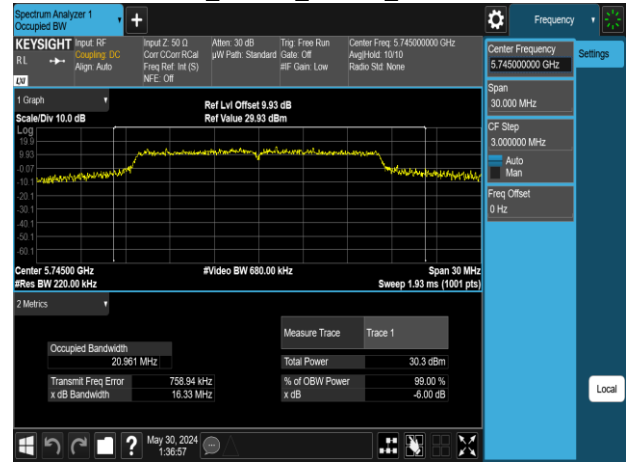


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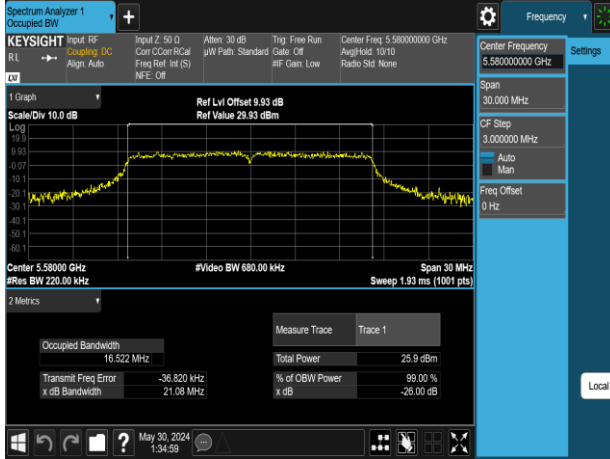
802.11a_20MHz_Chain1_5500MHz



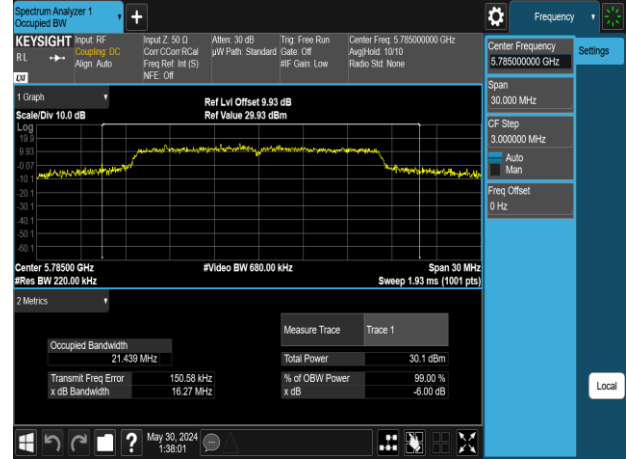
802.11a_20MHz_Chain1_5745MHz



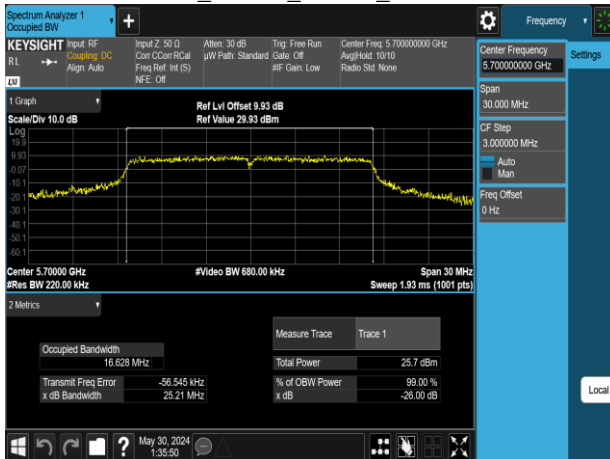
802.11a_20MHz_Chain1_5580MHz



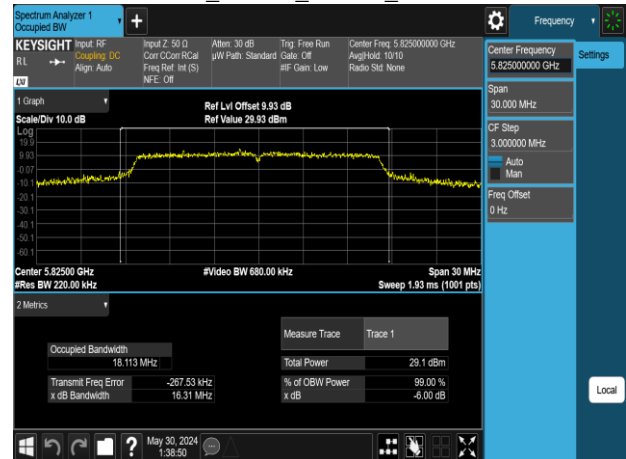
802.11a_20MHz_Chain1_5785MHz



802.11a_20MHz_Chain1_5700MHz

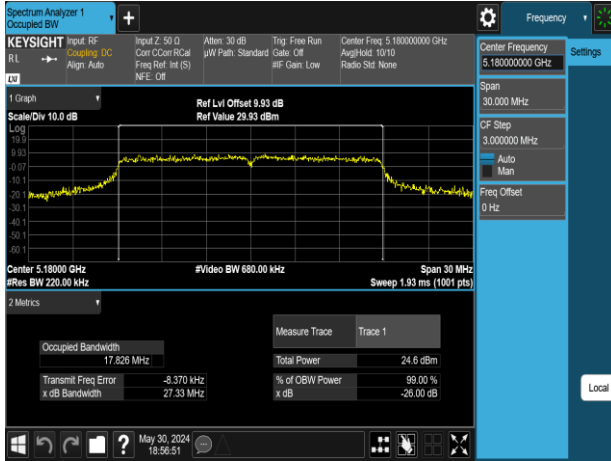


802.11a_20MHz_Chain1_5825MHz

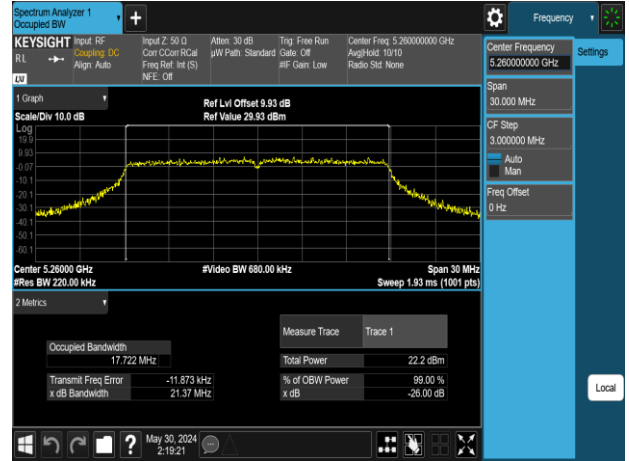


3. MIMO

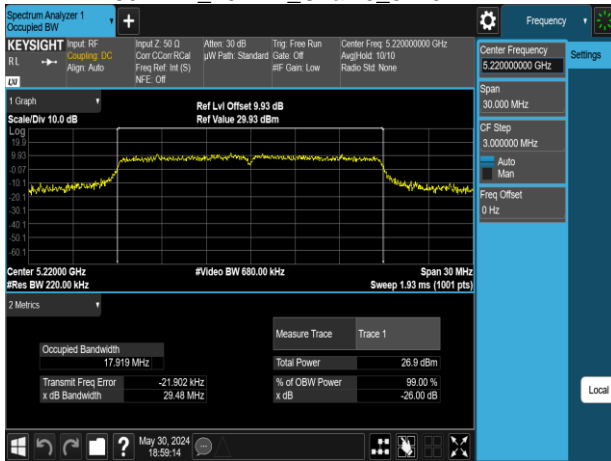
802.11n_20MHz_Chain0_5180MHz



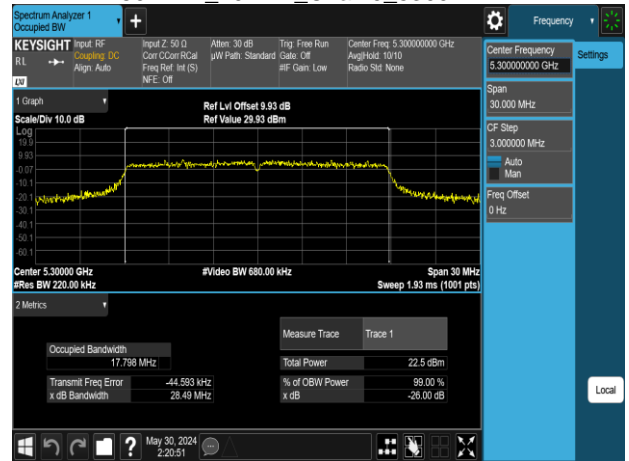
802.11n_20MHz_Chain0_5260MHz



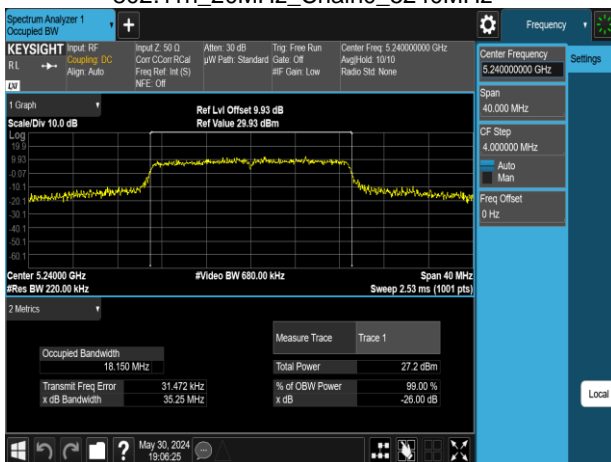
802.11n_20MHz_Chain0_5220MHz



802.11n_20MHz_Chain0_5300MHz



802.11n_20MHz_Chain0_5240MHz

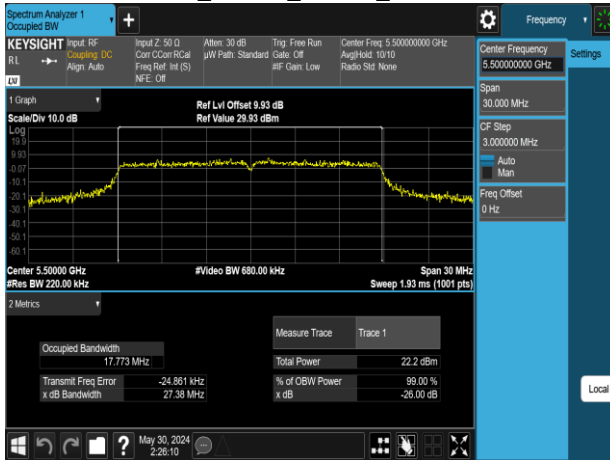


802.11n_20MHz_Chain0_5320MHz

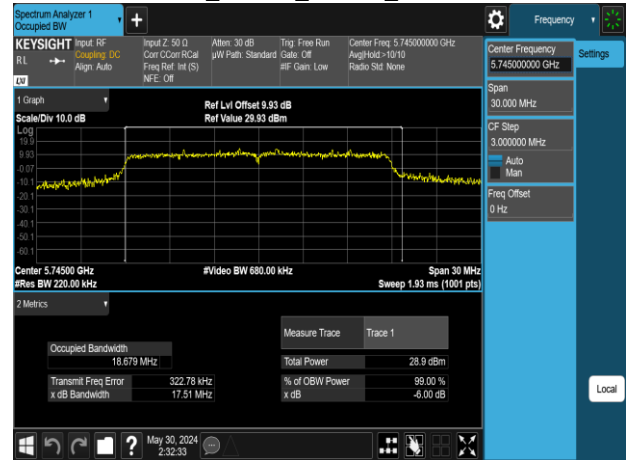


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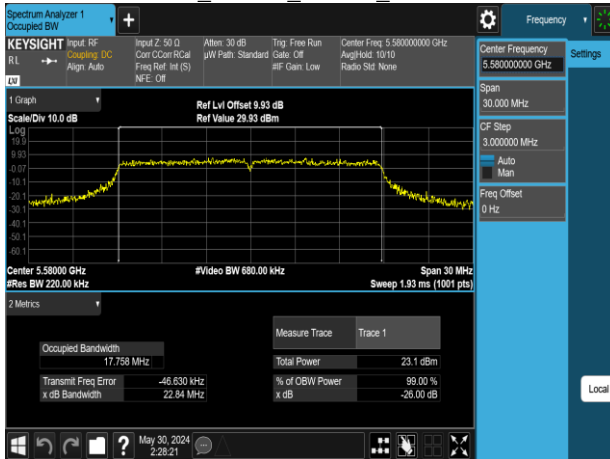
802.11n_20MHz_Chain0_5500MHz



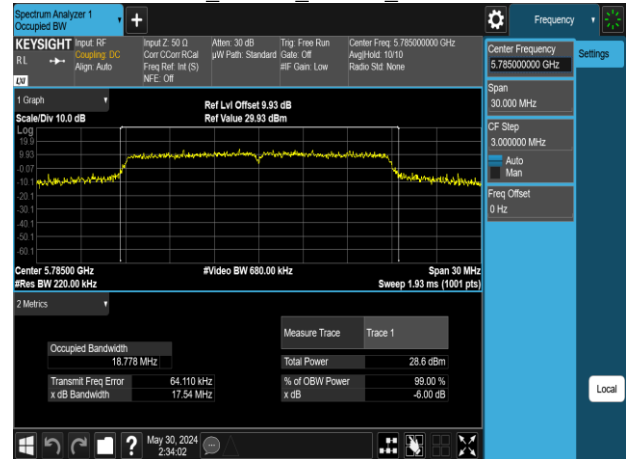
802.11n_20MHz_Chain0_5745MHz



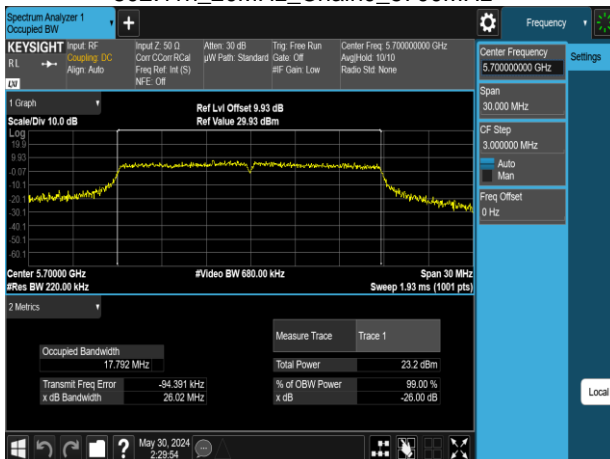
802.11n_20MHz_Chain0_5580MHz



802.11n_20MHz_Chain0_5785MHz



802.11n_20MHz_Chain0_5700MHz



802.11n_20MHz_Chain0_5825MHz

