FCC Test Report

Report No.: AGC16740250401FR06

FCC ID	:	WQ8-DV2379
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	NEXT LEVEL DIAGNOSTICS & ANALYSIS SYSTEM
BRAND NAME	:	AUTEL
MODEL NAME	:	MaxiSys MS909S2, MaxiSys MS919S2
APPLICANT	:	Autel Intelligent Technology Corp., Ltd.
DATE OF ISSUE	:	Jul. 03, 2025
STANDARD(S)	:	FCC Part 15 Subpart E §15.407
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jul. 03, 2025	Valid	Initial Release

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1. General Information

Applicant	Autel Intelligent Technology Corp., Ltd.
Address	Floor 2, Caihong Keji Building, 36 Hi-tech North Six Road, Songpingshan Community, Xili, Nanshan, Shenzhen 518055, China
Manufacturer	Autel Intelligent Technology Corp., Ltd
Address	Floor 2, Caihong Keji Building, 36 Hi-tech North Six Road, Songpingshan Community, Xili, Nanshan, Shenzhen 518055, China
Factory	Autel Intelligent Technology Corp., Ltd. Guangming Branch
Address	7F&6F, East Wing, Building 2, and 6F of Electronical Building, Yanxiang Industrial Zone, Gaoxin Rd, Dongzhou Community of Guangming New District, Shenzhen
Product Designation	NEXT LEVEL DIAGNOSTICS & ANALYSIS SYSTEM
Brand Name	AUTEL
Test Model	MaxiSys MS909S2
Series Model(s)	MaxiSys MS919S2
Difference Description	The model name and software function configuration are different
Date of receipt of test item	Apr. 18, 2025
Date of Test	Apr. 18, 2025 –Jul. 03, 2025
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-FCC-5G WLAN-V1

Note: The test results of this report relate only to the tested sample identified in this report.

Prepared By	Jack Gui (Project Engineer)	Jul. 03, 2025
Reviewed By	Bibo Zhang (Reviewer)	Jul. 03, 2025
Approved By	Angela Li (Authorized Officer)	Jul. 03, 2025

2. Product Information

2.1 Product Technical Description

Equipment Type	☐ Outdoor access points ☐ Indoor access points ☐ Fixed P2P access points ☒ Client devices
Operation Frequency	☒ U-NII 1:5150MHz~5250MHz ☐ U-NII 2A: 5250MHz~5350MHz ☐ U-NII 2C:5470MHz~5725MHz ☒ U-NII 3: 5725MHz~5850MHz
DFS Design Type	☐ Master ☐ Slave with radar detection ☒ Slave without radar detection
TPC Function	☐ Yes ☒ No
Hardware Version	DV2379_MAIN_V2
Software Version	V01.01.00
Test Frequency Range	For 802.11a/n-HT20/ac-VHT20: 5180~5240MHz/5745~5825MHz; For 802.11n-HT40/ac-VHT40: 5190~5230MHz/5755~5795MHz; For 802.11ac-VHT80: 5210MHz/5775MHz
RF Output Power	802.11a:12.44dBm,802.11n(HT20):11.12dBm; 802.11n(HT40):11.40dBm; 802.11ac (VHT20):11.13dBm;802.11ac (VHT40):11.48dBm; 802.11ac (VHT80):9.58dBm
RF Output Power(MIMO)	802.11n(HT20):13.64dBm; 802.11n(HT40):13.79dBm; 802.11ac (VHT20):13.71dBm;802.11ac (VHT40):13.80dBm; 802.11ac (VHT80):12.01dBm
Modulation	802.11a/n:(64-QAM, 16-QAM, QPSK, BPSK) OFDM 802.11ac :(256-QAM, 64-QAM, 16-QAM, QPSK, BPSK) OFDM
Data Rate	802.11a:6/9/12/18/24/36/48/54Mbps; 802.11n: up to 300Mbps; 802.11ac: up to 866.6Mbps;
Number of channels	7 channels of U-NII-1 Band; 8 channels of U- NII 3 Band
Antenna Designation	PIFA Antenna
Antenna Gain	Refer to Chapter 2.9 of the report.
Power Supply	DC 3.85V by battery or DC 12V by adapter

2.2 Table of Carrier Frequency

For 5180~5240MHz:

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
42	5210 MHz	--	--

For 5745~5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz	--	--

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
155	5775 MHz	--	--

2.3 IEEE 802.11n Modulation Scheme

MCS Index	Nss	Modulation	R	N_{BPSC}	N_{CBPS}		N_{DBPS}		Data rate (Mbps) 800nsGI	
					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0
6	1	64-QAM	3/4	6	312	648	234	489	58.5	121.5
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPSC	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	Guard interval

2.4 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for FCC ID: WQ8-DV2379 filing to comply with the FCC Part 15 requirements.

2.5 Test Methodology

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 15	Radio Frequency Devices
3	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
4	KDB 662911	662911 D01 Multiple Transmitter Output v02r01
5	KDB 789033	789033 D02 General U-NII Test Procedures New Rules v02r01

2.6 Special Accessories

Refer to section 4.4.

2.7 Equipment Modifications

Not available for this EUT intended for grant.

2.8 Antenna Requirement

Standard Requirement
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antennathat uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a brokenantenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
EUT Antenna:
The non-detachable antenna inside the device cannot be replaced by the user at will. The gain of the antenna refer to Section 2.9 of the report

2.9 Description of Available Antennas

Antenna Type	Frequency Band (MHz)	TX Paths	Bandwidth (MHz)	Max Peak Gain (dBi)		Max Directional Gain (dBi)
				Chain A	Chain B	
5G WIFI FPC Antenna List (5GHz 2*2 MIMO)						
FPC Antenna	5150 ~ 5250	2	20,40,80	2.0	2.6	5.61
	5725 ~ 5850	2	20,40,80	1.6	2.3	5.31

Note 1: The EUT supports Cyclic Delay Diversity (CDD) technology for 802.11n/ac/ax mode.

Note 2: The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on devices:

  Array Gain = 10 log (N_{ANT}/ N_{SS}) dB = 3.01;

- For power measurements on IEEE 802.1devices:

  Array Gain = 0 dB for $N_{ANT} \leq 4$;

  Array Gain = 0 dB (i.e., no array gain) for channel widths ≥40 MHz for any N_{ANT};

  Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20 MHz channel widths with $N_{ANT} \geq 5$.

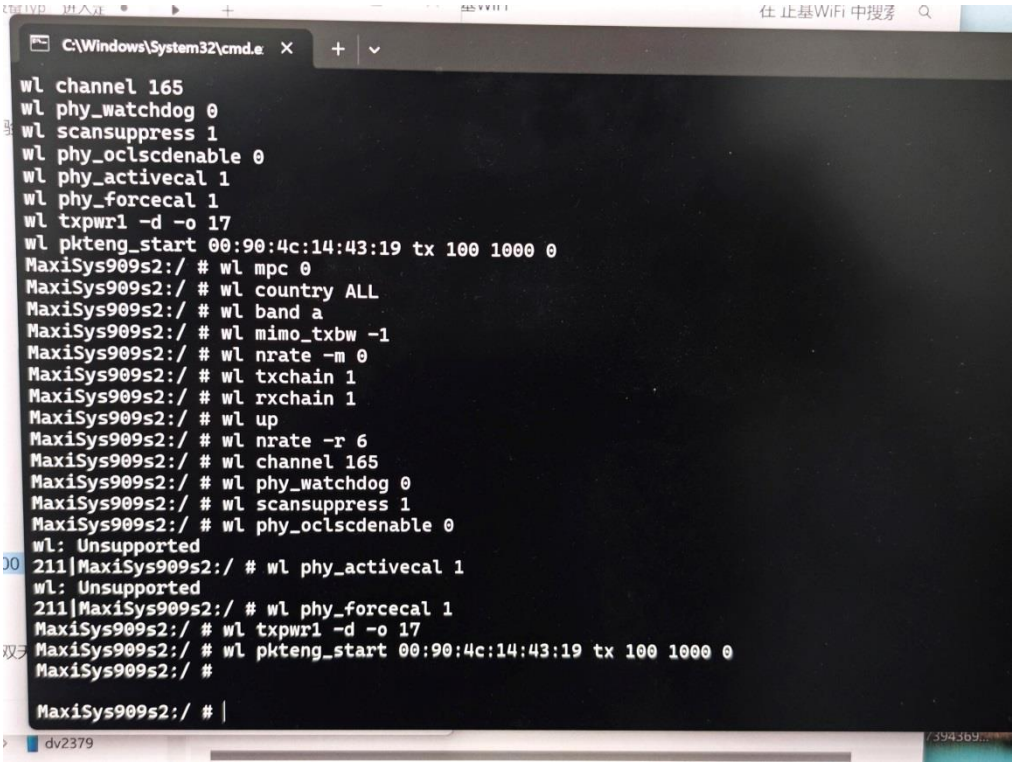
If antenna gains are not equal, Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

2.10 Description of Test Software

For IEEE 802.11 mode:

The test utility software used during testing was “CMD” and the version was “10.0.22631.5189”.

Software Setting Diagram



Test Mode- U-NII 1	Channel	Power Index	
		Chain A	Chain B
802.11a	L/M/H	13	13
802.11n(HT20)	L/M/H	12	13
802.11n(HT40)	L/M/H	12	13
802.11ac(VHT20)	L/M/H	12	13
802.11ac(VHT40)	L/M/H	12	13
802.11ac(VHT80)	L/M/H	11	12
Test Mode- U-NII 3	Channel	Power Index	
		Chain A	Chain B
802.11a	L/M/H	17	11
802.11n(HT20)	L/M/H	15	15
802.11n(HT40)	L/M/H	15	15
802.11ac(VHT20)	L/M/H	15	15
802.11ac(VHT40)	L/M/H	15	15
802.11ac(VHT80)	L/M/H	15	11

3. Test Environment

3.1 Address of The Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to follow CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories.)

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

3.3 Environmental Conditions

	Normal Conditions
Temperature range (℃)	15 - 35
Relative humidity range	20% - 75%
Pressure range (kPa)	86 - 106
Power supply	DC 3.85V by battery or DC 12V by adapter

3.4 Measurement Uncertainty

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	U_c = ±2.9 dB
Uncertainty of Radiated Emission below 1GHz	U_c = ±3.9 dB
Uncertainty of Radiated Emission above 1GHz	U_c = ±4.9 dB
Uncertainty of total RF power, conducted	U_c = ±0.8 dB
Uncertainty of RF power density, conducted	U_c = ±2.6 dB
Uncertainty of spurious emissions, conducted	U_c = ±2 %
Uncertainty of Occupied Channel Bandwidth	U_c = ±2.7 %

3.5 List of Equipment Used

● RF Conducted Test System							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-ER-E036	Spectrum Analyzer	Agilent	N9020A	MY49100060	2024-05-24	2025-05-23
☒	AGC-ER-E036	Spectrum Analyzer	Agilent	N9020A	MY49100060	2025-05-08	2026-05-07
☒	AGC-ER-E062	Power Sensor	Agilent	U2021XA	MY54110007	2025-01-14	2026-01-13
☒	AGC-ER-E063	Power Sensor	Agilent	U2021XA	MY54110009	2025-01-14	2026-01-13
☒	AGC-ER-A007	6dBFixed Attenuator	Mini circuits	Bw-S6-2W263A+	N/A	2025-01-30	2026-01-29
☒	AGC-ER-A008	6dBFixed Attenuator	Mini circuits	BW-K6-2W44+	N/A	2025-01-30	2026-01-29
☐	AGC-ER-E083	Signal Generator	Agilent	E4421B	US39340815	2024-05-23	2025-05-22
☐	AGC-ER-E083	Signal Generator	Agilent	E4421B	US39340815	2025-05-21	2026-05-20
☒	N/A	RF Connection Cable	N/A	1#	N/A	Each time	N/A
☒	N/A	RF Connection Cable	N/A	2#	N/A	Each time	N/A

● Radiated Spurious Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2025-01-14	2026-01-13
☒	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2024-03-05	2026-03-04
☒	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2024-03-05	2026-03-04
☒	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2025-03-27	2026-03-26
☒	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2023-09-24	2025-09-23
☒	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2023-09-24	2025-09-23
☒	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2024-07-24	2026-07-23
☒	AGC-EM-A118	5G Filter	SongYi	N/A	N/A	2024-05-23	2025-05-22
☒	AGC-EM-A118	5G Filter	SongYi	N/A	N/A	2025-05-16	2026-05-15
☒	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2025-06-08
☒	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2025-05-16	2027-05-15
☐	AGC-EM-A139	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2025-06-08
☐	AGC-EM-A139	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2025-05-16	2027-05-15

● AC Power Line Conducted Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2024-05-24	2025-05-23
☒	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2025-05-08	2026-05-07
☒	AGC-EM-A171	Attenuator	Mini-Circuits	UNAT-10A+	N/A	2024-02-01	2026-01-31
☒	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2024-05-28	2025-05-27
☒	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2025-05-08	2026-05-07

● Test Software					
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information
☒	AGC-EM-S001	CE Test System	R&S	ES-K1	V1.71
☒	AGC-EM-S003	RE Test System	FARA	EZ-EMC	VRA-03A
☐	AGC-EM-S004	RE Test System	Tonscend	TS+Ver2.1(JS32-RE)	4.0.0.0
☒	AGC-ER-S012	BT/WIFI Test System	Tonscend	JS1120-2	2.6
☒	AGC-EM-S011	RSE Test System	Tonscend	TS+-Ver2.1(JS36-RSE)	4.0.0.0

4.System Test Configuration

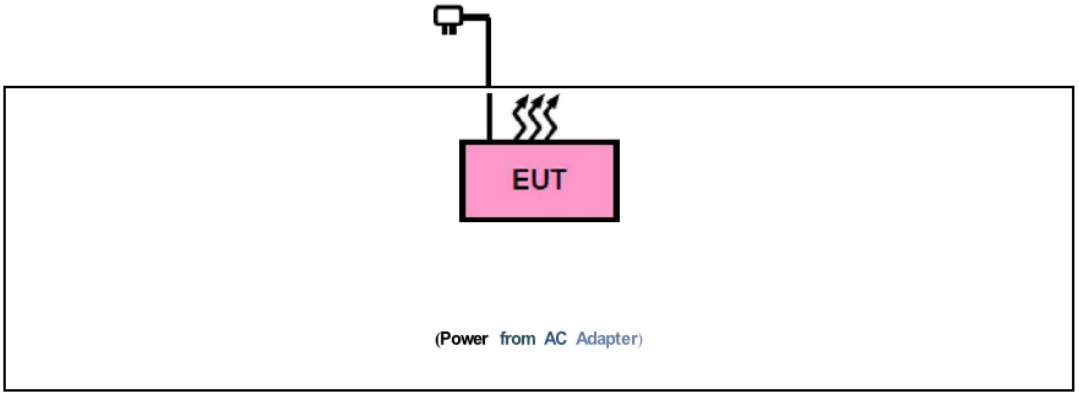
4.1 EUT Configuration

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

4.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

4.3 Configuration of Tested System



4.4 Equipment Used in Tested System

The following peripheral devices and interface cables were connected during the measurement:

☒ Test Accessories Come From The Laboratory

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Control Box	RISYM	USB-TTL	--	--
2	Redmi Notebook PC	Redmi	XMA2002-AB	--	--

☒ Test Accessories Come From The Manufacturer

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Adapter	Dong Guan City GangOi Electronic Co..Ltd	GQ80-120600-E1	AC:100-240V 50/60Hz 1.8A DC:12V 6A	--

4.5 Summary of Test Results

Item	FCC Rules	Description of Test	Result
1	§15.203	Antenna Equipment	Pass
2	§15.407(a/1/3)	RF Output Power	Pass
3	§15.407(e)	6 dB Bandwidth	Pass
4	§15.403(i)	99% Occupied Bandwidth	Pass
5	§15.407(a/1/3)	Power Spectral Density	Pass
6	§15.407(g)	Frequency Stability	Pass (See Note 1)
7	§15.407(c)	Transmission Discontinuation Requirement	Pass (See Note 2)
8	§15.407(b)(1/4)	Conducted Band Edge and Out-of-Band Emissions	Pass
9	§15.209,§15.407(b)(1/4)	Radiated Spurious Emission	Pass
10	§15.207	AC Power Line Conducted Emission	Pass

Note:

1. Refer to the manufacturer's declaration in the user manual.
2. The device operates without the transmission of information.

5. Description of Test Modes

EUT Configure Mode	Applicable To				Description
	RE > 1G	RE < 1G	PLC	APCM	
A	☒	☒	☒	☒	Powered by Adapter with WIFI(5G) Link
B	--	--	--	--	Powered by Battery with WIFI(5G) Link
C	--	--	--	--	Powered by USB with WIFI(5G) Link

Where, **RE＞1G: Radiated Emission above 1GHz** **PLC: Power Line Conducted Emission**

RE＜1G: Radiated Emission below 1GHz **APCM: Antenna Port Conducted Measurement**

NOTE 1: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on X-plane.

NOTE 2: "--"means no effect.

NOTE 3: The radiation part tests the dual-antenna MIMO as the worst combination.

- **Radiated Emission Test (Above 1GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (IF EUT with antenna diversity architecture).

☒ Support 802.11ax, device debugging is tested in Full RU state

☒ The device under test has multiple antennas. The mode that supports MIMO technology records the worst data, and the mode that does not support MIMO technology records antenna 1 as the worst data.

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11n (20MHz)	5180-5240	36 to 48	36, 40, 48	OFDM	MCS0
A	802.11n (20MHz)	5745-5825	149 to 165	149, 157, 165	OFDM	MCS0

- **Radiated Emission Test (Below 1GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (If EUT with antenna diversity architecture).
☒ The device under test has multiple antennas. The mode that supports MIMO technology records the worst data, and the mode that does not support MIMO technology records antenna 1 as the worst data.
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11ac(40MHz)	5745-5825	151 to 159	151	OFDM	MCS0

- **Power Line Conducted Emission Test:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (If EUT with antenna diversity architecture).
☒ The device under test has multiple antennas. The mode that supports MIMO technology records the worst data, and the mode that does not support MIMO technology records antenna 1 as the worst data.
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11ac(40MHz)	5745-5825	151 to 159	151	OFDM	MCS0

- **Band edge Measurement:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (If EUT with antenna diversity architecture).
☒ Support 802.11ax, device debugging is tested in Full RU state
☒ The device under test has multiple antennas. The mode that supports MIMO technology records the worst data, and the mode that does not support MIMO technology records antenna 1 as the worst data.
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11a	5180-5240	36 to 48	36	OFDM	6.0
A	802.11n (40MHz)		38 to 46	38	OFDM	MCS0
A	802.11ac (80MHz)		42	42	OFDM	MCS0
A	802.11a	5745-5825	149 to 165	149, 165	OFDM	6.0

- **Antenna Port Conducted Measurement:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (If EUT with antenna diversity architecture).

☒ Support 802.11ax, device debugging is tested in Full RU state

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
B	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
B	802.11n (20MHz)		36 to 48	36, 40, 48	OFDM	MCS0
B	802.11n (40MHz)		38 to 46	38, 46	OFDM	MCS0
B	802.11ac (20MHz)		36 to 48	36, 40, 48	OFDM	MCS0
B	802.11ac (40MHz)		38 to 46	38, 46	OFDM	MCS0
B	802.11ac (80MHz)		42	42	OFDM	MCS0
B	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
B	802.11n (20MHz)		149 to 165	149, 157, 165	OFDM	MCS0
B	802.11n (40MHz)		151 to 159	151, 159	OFDM	MCS0
B	802.11ac (20MHz)		149 to 165	149, 157, 165	OFDM	MCS0
B	802.11ac (40MHz)		151 to 159	151, 159	OFDM	MCS0
B	802.11ac (80MHz)		155	155	OFDM	MCS0

6. Duty Cycle Measurement

5GHz WLAN (NII) operation is possible in 20MHz, 40MHz and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = Average. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Chain A

Operating mode	Data rates (Mbps)	Duty Cycle (%)	Duty Cycle Factor (dB)
Band U-NII1:5150MHz-5250MHz			
802.11a	6	93.12	0.31
802.11n_HT20	MCS0	92.83	0.32
802.11n_HT40	MCS0	86.52	0.63
802.11ac_VHT20	MCS0	92.88	0.32
802.11ac_VHT40	MCS0	86.54	0.63
802.11ac_VHT80	MCS0	76.13	1.18
Band U-NII 3:5725MHz-5850MHz			
802.11a	6	93.32	0.3
802.11n_HT20	MCS0	92.83	0.32
802.11n_HT40	MCS0	86.52	0.63
802.11ac_VHT20	MCS0	92.87	0.32
802.11ac_VHT40	MCS0	86.61	0.62
802.11ac_VHT80	MCS0	76.22	1.18

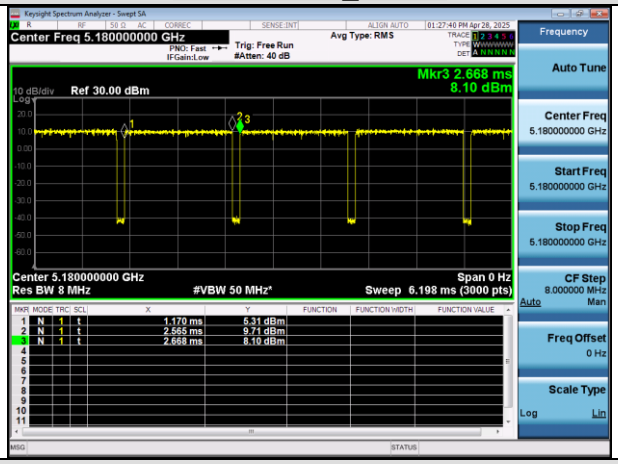
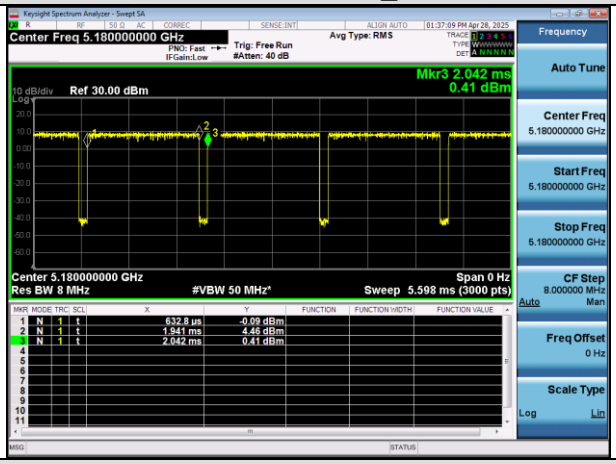
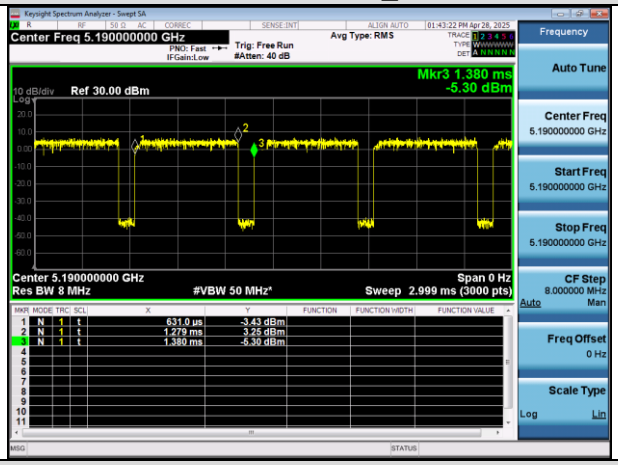
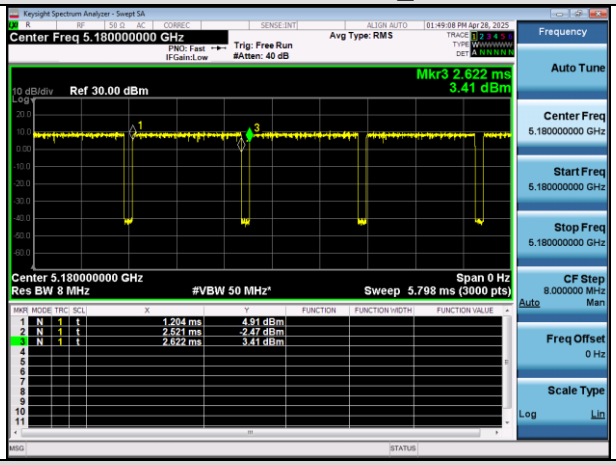
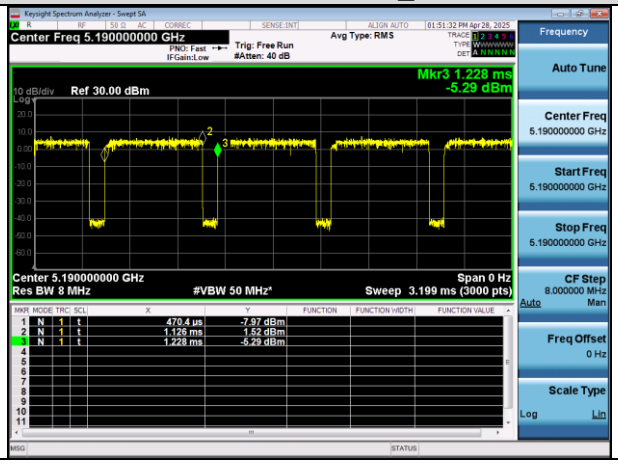
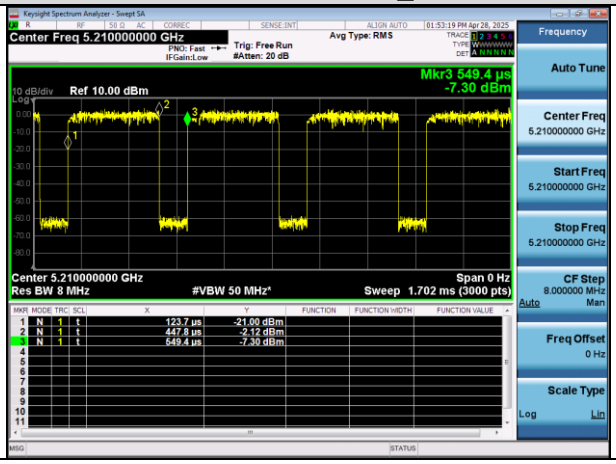
Chain B

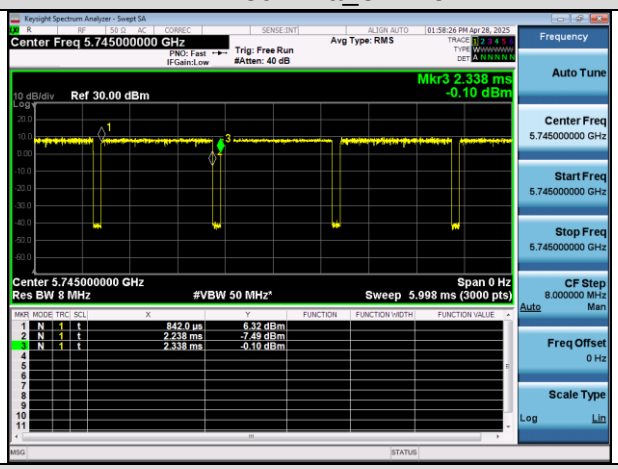
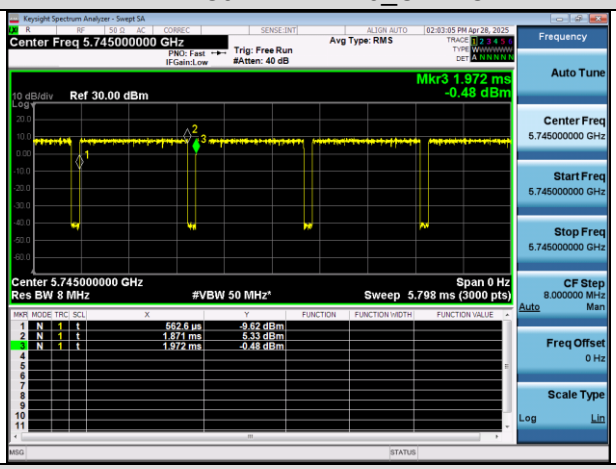
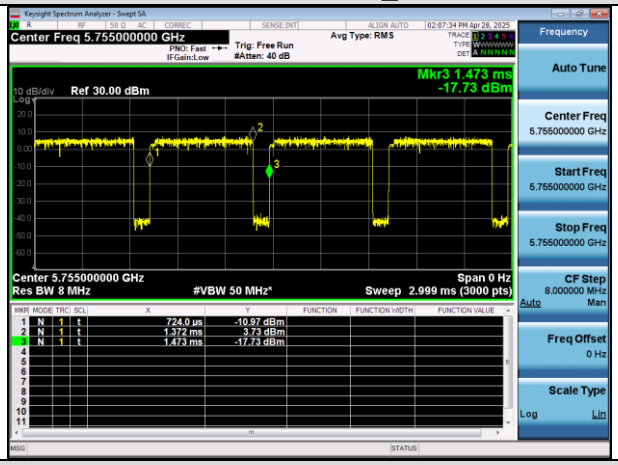
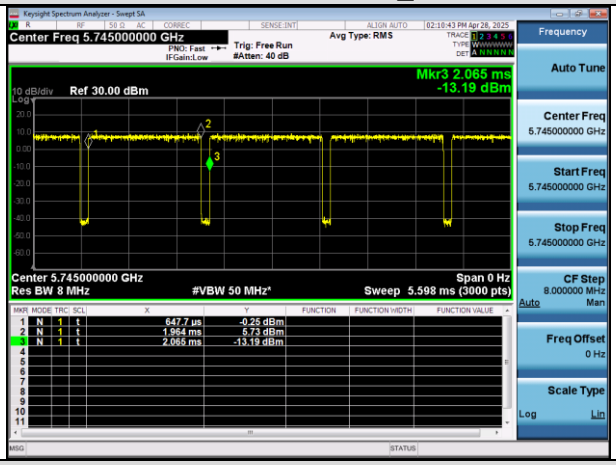
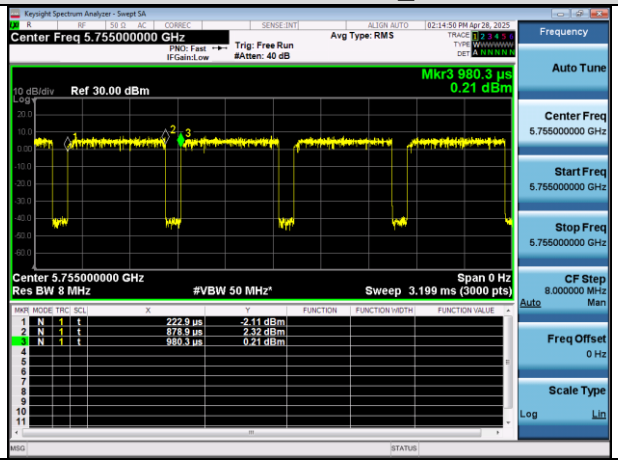
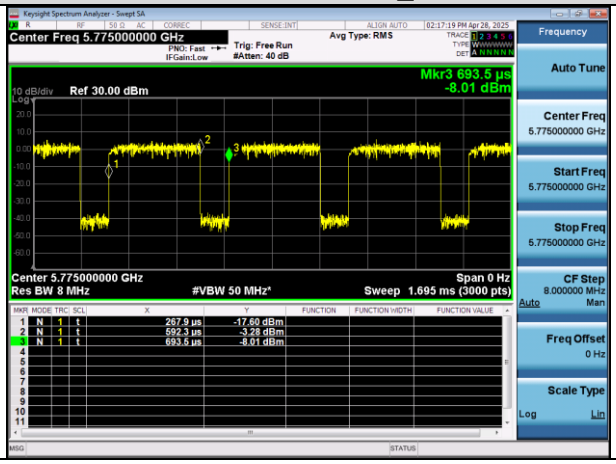
Operating mode	Data rates (Mbps)	Duty Cycle (%)	Duty Cycle Factor (dB)
Band U-NII1:5150MHz-5250MHz			
802.11a	6	93.06	0.31
802.11n_HT20	MCS0	92.83	0.32
802.11n_HT40	MCS0	86.52	0.63
802.11ac_VHT20	MCS0	92.87	0.32
802.11ac_VHT40	MCS0	86.58	0.63
802.11ac_VHT80	MCS0	76.27	1.18
Band U-NII 3:5725MHz-5850MHz			
802.11a	6	93.26	0.30
802.11n_HT20	MCS0	92.83	0.32
802.11n_HT40	MCS0	86.52	0.63
802.11ac_VHT20	MCS0	93.04	0.31
802.11ac_VHT40	MCS0	86.80	0.61
802.11ac_VHT80	MCS0	76.33	1.17

Remark:

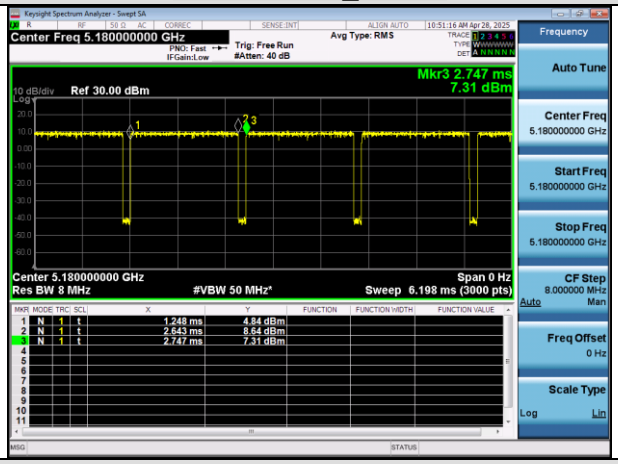
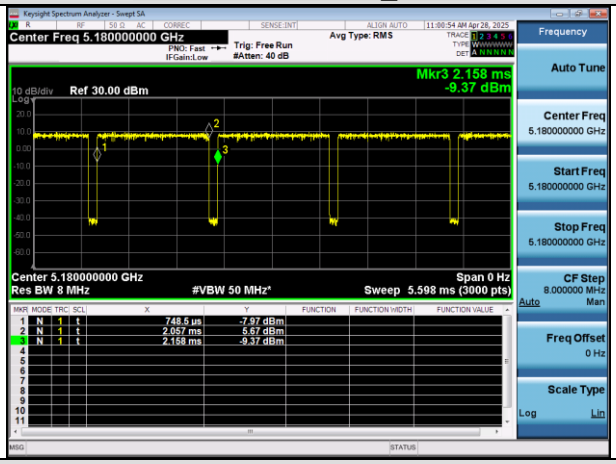
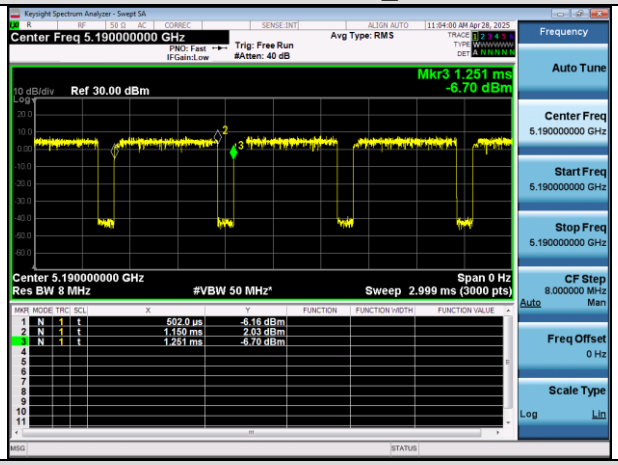
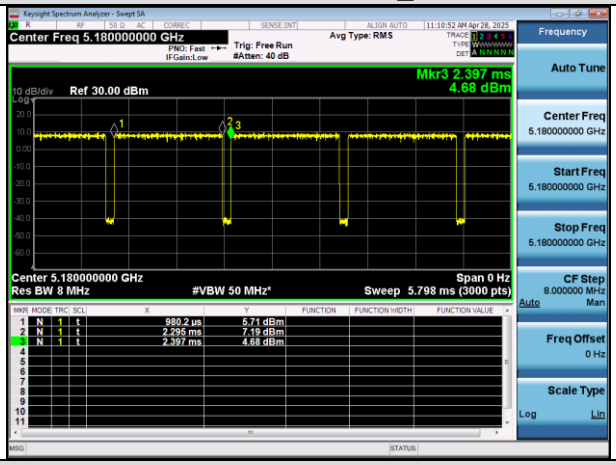
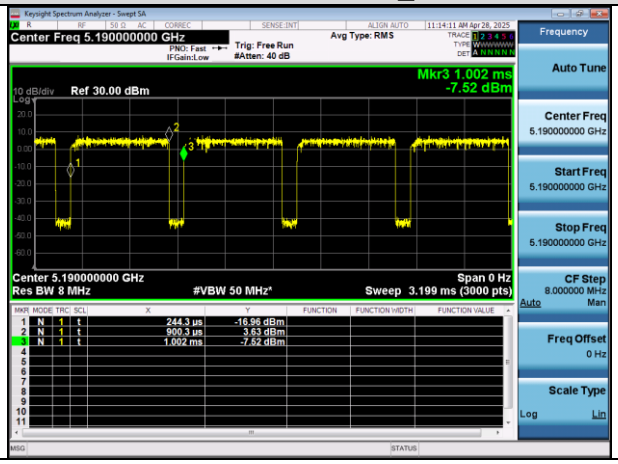
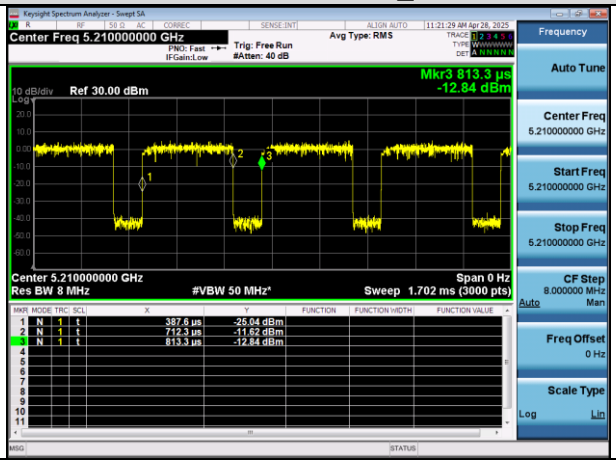
1. Duty Cycle factor = 10 * log (1/ Duty cycle)
2. The duty cycle of each frequency band mode reflects the determination requirements of the low channel measurement value.
3. Involving the test items of duty cycle compensation coefficient, the final results have been added and calculated by the software and presented.

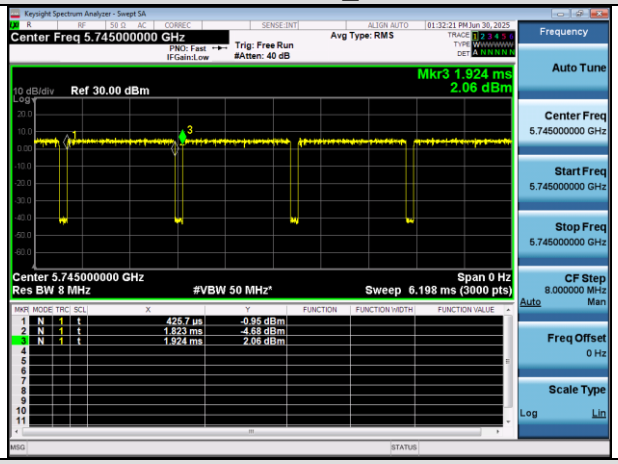
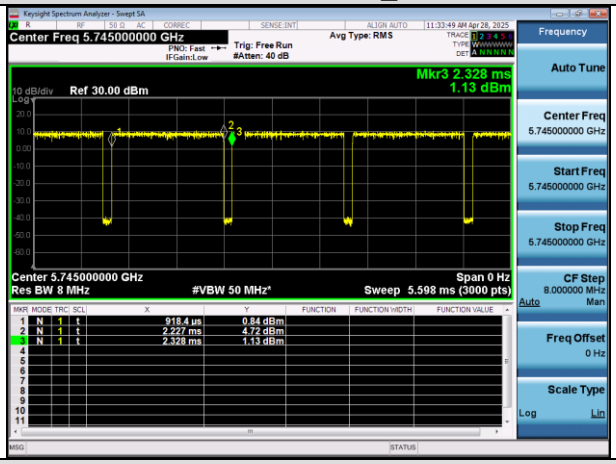
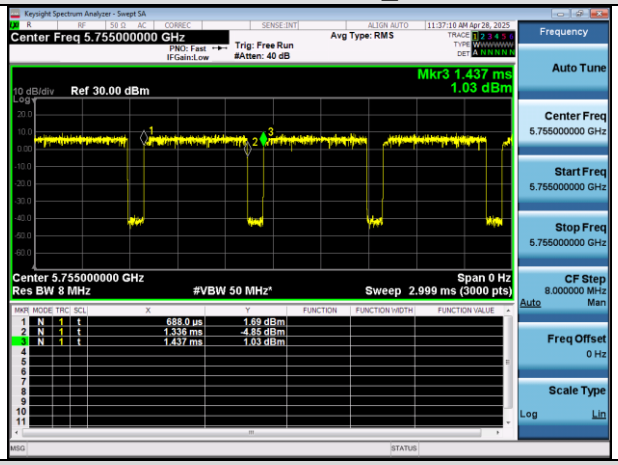
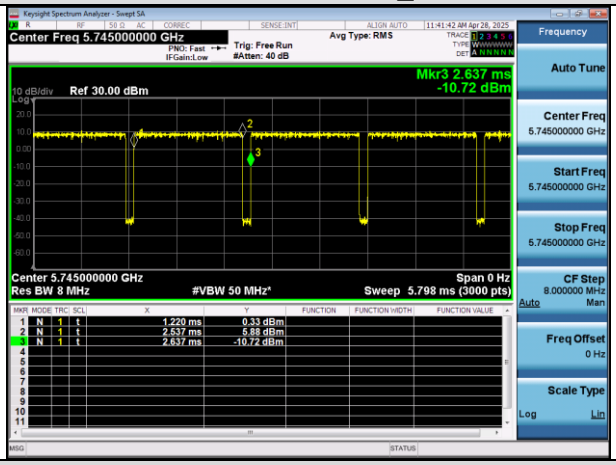
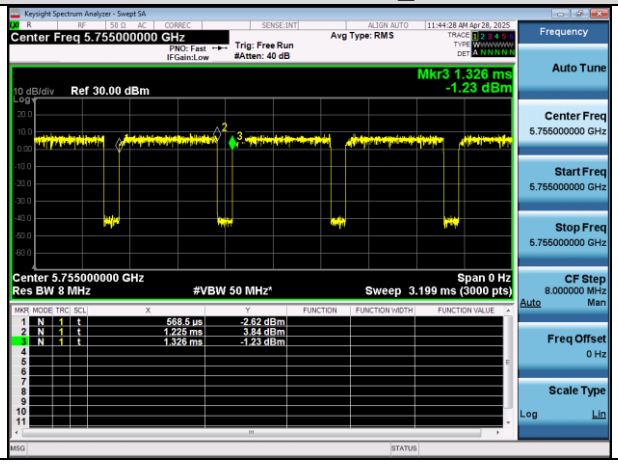
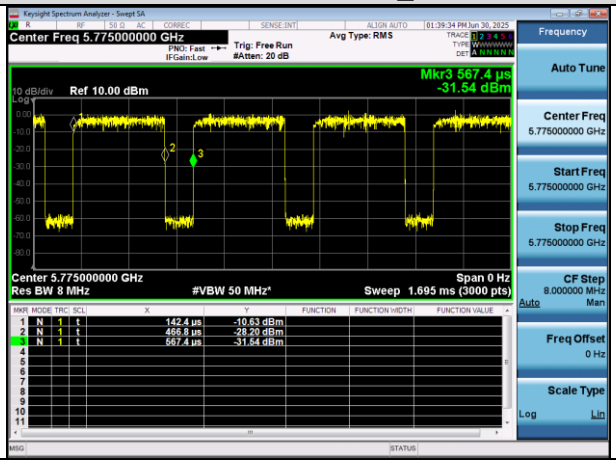
The Chain A test plots as follows:

IEEE 802.11a_U-NII 1	IEEE 802.11n-HT20_U-NII 1
	
IEEE 802.11n-HT40_U-NII 1	**IEEE 802.11ac-VHT20_U-NII 1**
	
IEEE 802.11ac-VHT40_U-NII 1	**IEEE 802.11ac-VHT80_U-NII 1**
	

IEEE 802.11a_U-NII 3	IEEE 802.11n-HT20_U-NII 3
	
IEEE 802.11n-HT40_U-NII 3	**IEEE 802.11ac-VHT20_U-NII 3**
	
IEEE 802.11ac-VHT40_U-NII 3	**IEEE 802.11ac-VHT80_U-NII 3**
	

The Chain B test plots as follows:

IEEE 802.11a_U-NII 1	IEEE 802.11n-HT20_U-NII 1
	
IEEE 802.11n-HT40_U-NII 1	**IEEE 802.11ac-VHT20_U-NII 1**
	
IEEE 802.11ac-VHT40_U-NII 1	**IEEE 802.11ac-VHT80_U-NII 1**
	

IEEE 802.11a_U-NII 3	IEEE 802.11n-HT20_U-NII 3
	
IEEE 802.11n-HT40_U-NII 3	**IEEE 802.11ac-VHT20_U-NII 3**
	
IEEE 802.11ac-VHT40_U-NII 3	**IEEE 802.11ac-VHT80_U-NII 3**
	

7. RF Output Power Measurement

7.1 Provisions Applicable

Operation Band	EUT Category		LIMIT
U-NII-1	☐	Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p < 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
	☐	Fixed point-to-point Access Point	1 Watt (30 dBm)
	☐	Indoor Access Point	1 Watt (30 dBm)
	☒	Client devices	250mW (23.98 dBm)
U-NII-2A	/		250mW (23.98 dBm) or 11 dBm+10 log B*
U-NII-2C	/		250mW (23.98 dBm) or 11 dBm+10 log B*
U-NII-3	/		1 Watt (30 dBm)

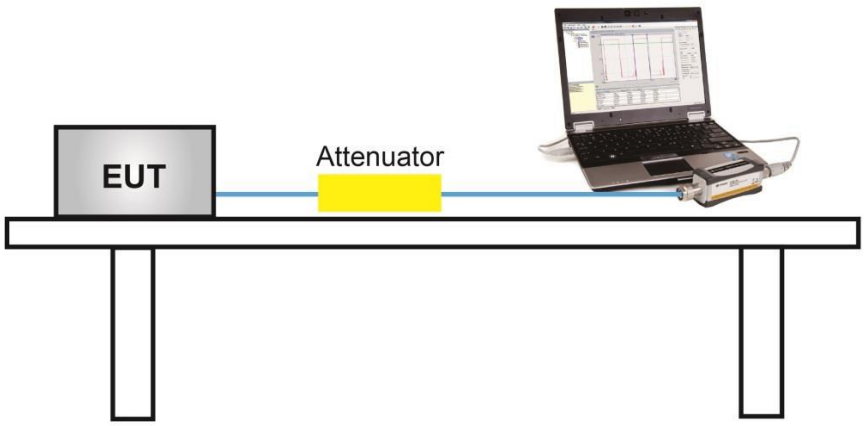
Note: Where B is the 26dB emission bandwidth in MHz.

7.2 Measurement Procedure

☒Method PM is Measurement using an RF average power meter. The procedure for this method is as follows:

1. The testing follows the ANSI C63.10 Section 12.3.3.1
2. Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the following conditions are satisfied:
3. The EUT is configured to transmit continuously, or to transmit with a constant duty cycle.
4. At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.
5. The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
6. Determine according to the duty cycle of the equipment: when it is less than 98%, follow the steps below.
7. Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.
8. Adjust the measurement in dBm by adding [10 log (1 / D)], where D is the duty cycle {e.g., [10 log (1 / 0.25)], if the duty cycle is 25%}.
9. The final test results have been increased by the duty cycle factor and recorded in the report.

7.3 Measurement Setup (Block Diagram of Configuration)



7.4 Measurement Result

Test Data of Conducted Output Power for band 5.15-5.25 GHz-Chain A				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5180	12.44	23.98	Pass
	5200	10.42	23.98	Pass
	5240	9.67	23.98	Pass
802.11n20	5180	10.81	23.98	Pass
	5200	10.47	23.98	Pass
	5240	9.71	23.98	Pass
802.11n40	5190	9.50	23.98	Pass
	5230	8.69	23.98	Pass
802.11ac20	5180	10.95	23.98	Pass
	5200	10.66	23.98	Pass
	5240	9.86	23.98	Pass
802.11ac40	5190	9.73	23.98	Pass
	5230	8.71	23.98	Pass
802.11ac80	5210	8.34	23.98	Pass

Test Data of Conducted Output Power for band 5.15-5.25 GHz-Chain B				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5180	11.40	23.98	Pass
	5200	11.34	23.98	Pass
	5240	11.29	23.98	Pass
802.11n20	5180	10.44	23.98	Pass
	5200	10.39	23.98	Pass
	5240	10.23	23.98	Pass
802.11n40	5190	10.22	23.98	Pass
	5230	9.93	23.98	Pass
802.11ac20	5180	10.44	23.98	Pass
	5200	10.50	23.98	Pass
	5240	10.26	23.98	Pass
802.11ac40	5190	10.21	23.98	Pass
	5230	9.98	23.98	Pass
802.11ac80	5210	9.58	23.98	Pass

Test Data of Conducted Output Power for band 5.725-5.850 GHz-Chain A				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5745	10.07	30	Pass
	5785	9.73	30	Pass
	5825	9.25	30	Pass
802.11n20	5745	10.02	30	Pass
	5785	9.54	30	Pass
	5825	9.13	30	Pass
802.11n40	5755	10.05	30	Pass
	5795	9.75	30	Pass
802.11ac20	5745	9.53	30	Pass
	5785	9.84	30	Pass
	5825	9.30	30	Pass
802.11ac40	5755	9.98	30	Pass
	5795	9.79	30	Pass
802.11ac80	5775	8.84	30	Pass

Test Data of Conducted Output Power for band 5.725-5.850 GHz-Chain B				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5745	6.85	30	Pass
	5785	8.01	30	Pass
	5825	8.49	30	Pass
802.11n20	5745	11.12	30	Pass
	5785	10.79	30	Pass
	5825	10.38	30	Pass
802.11n40	5755	11.40	30	Pass
	5795	11.10	30	Pass
802.11ac20	5745	11.13	30	Pass
	5785	10.83	30	Pass
	5825	10.38	30	Pass
802.11ac40	5755	11.48	30	Pass
	5795	11.04	30	Pass
802.11ac80	5775	5.55	30	Pass

Test Data of Conducted Output Power for band 5.15-5.25 GHz-MIMO				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11n20	5180	13.64	23.98	Pass
	5200	13.44	23.98	Pass
	5240	12.99	23.98	Pass
802.11n40	5190	12.89	23.98	Pass
	5230	12.36	23.98	Pass
802.11ac20	5180	13.71	23.98	Pass
	5200	13.59	23.98	Pass
	5240	13.07	23.98	Pass
802.11ac40	5190	12.99	23.98	Pass
	5230	12.40	23.98	Pass
802.11ac80	5210	12.01	23.98	Pass

Test Data of Conducted Output Power for band 5.725-5.85 GHz-MIMO				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11n20	5745	13.62	30	Pass
	5785	13.22	30	Pass
	5825	12.81	30	Pass
802.11n40	5755	13.79	30	Pass
	5795	13.49	30	Pass
802.11ac20	5745	13.41	30	Pass
	5785	13.37	30	Pass
	5825	12.88	30	Pass
802.11ac40	5755	**13.80**	30	Pass
	5795	13.47	30	Pass
802.11ac80	5775	10.51	30	Pass

8. 6dB&26dB Bandwidth Measurement

8.1 Provisions Applicable

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

8.2 Measurement Procedure

◆ **-6dB bandwidth (DTS bandwidth) Test setting:**

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on operation frequency individually.
3. Set RBW = 100kHz.
4. Set the VBW ≥3*RBW. Detector = Peak. Trace mode = max hold.
5. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.

◆ **99% occupied bandwidth test setting:**

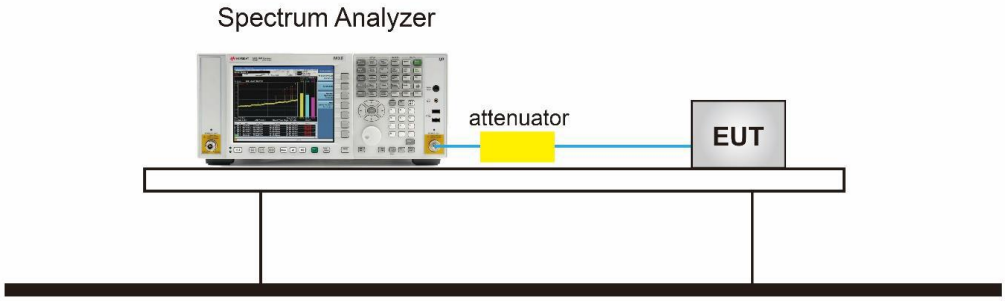
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set Span = approximately 1.5 to 5 times the OBW, centered on a nominal channel
   The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
4. Set SPA Trace 1 Max hold, then View.

◆ **-26dB Bandwidth test setting:**

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

Note: The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

8.3 Measurement Setup (Block Diagram of Configuration)



8.4 Measurement Results

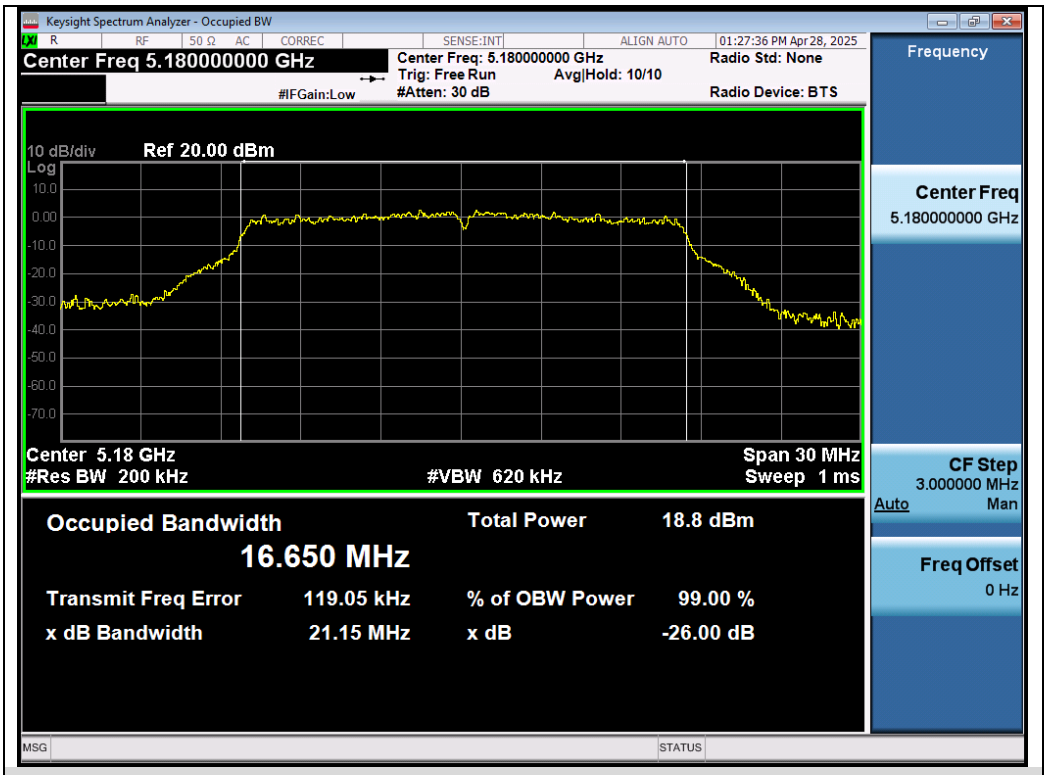
Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz-Chain A					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5180	16.650	21.155	N/A	Pass
	5200	16.632	21.027	N/A	Pass
	5240	16.617	20.973	N/A	Pass
802.11n20	5180	17.770	21.247	N/A	Pass
	5200	17.782	21.429	N/A	Pass
	5240	17.804	21.361	N/A	Pass
802.11n40	5190	36.276	43.886	N/A	Pass
	5230	36.208	39.475	N/A	Pass
802.11ac20	5180	17.791	21.588	N/A	Pass
	5200	17.814	21.614	N/A	Pass
	5240	17.789	21.332	N/A	Pass
802.11ac40	5190	36.233	40.125	N/A	Pass
	5230	36.200	39.585	N/A	Pass
802.11ac80	5210	75.649	81.429	N/A	Pass

Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz-Chain B					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5180	16.696	23.176	N/A	Pass
	5200	16.661	21.210	N/A	Pass
	5240	16.765	23.997	N/A	Pass
802.11n20	5180	17.760	21.220	N/A	Pass
	5200	17.752	21.339	N/A	Pass
	5240	17.780	21.321	N/A	Pass
802.11n40	5190	36.213	39.628	N/A	Pass
	5230	36.229	39.700	N/A	Pass
802.11ac20	5180	17.773	21.382	N/A	Pass
	5200	17.787	21.716	N/A	Pass
	5240	17.765	21.290	N/A	Pass
802.11ac40	5190	36.232	39.730	N/A	Pass
	5230	36.201	39.684	N/A	Pass
802.11ac80	5210	75.692	81.765	N/A	Pass

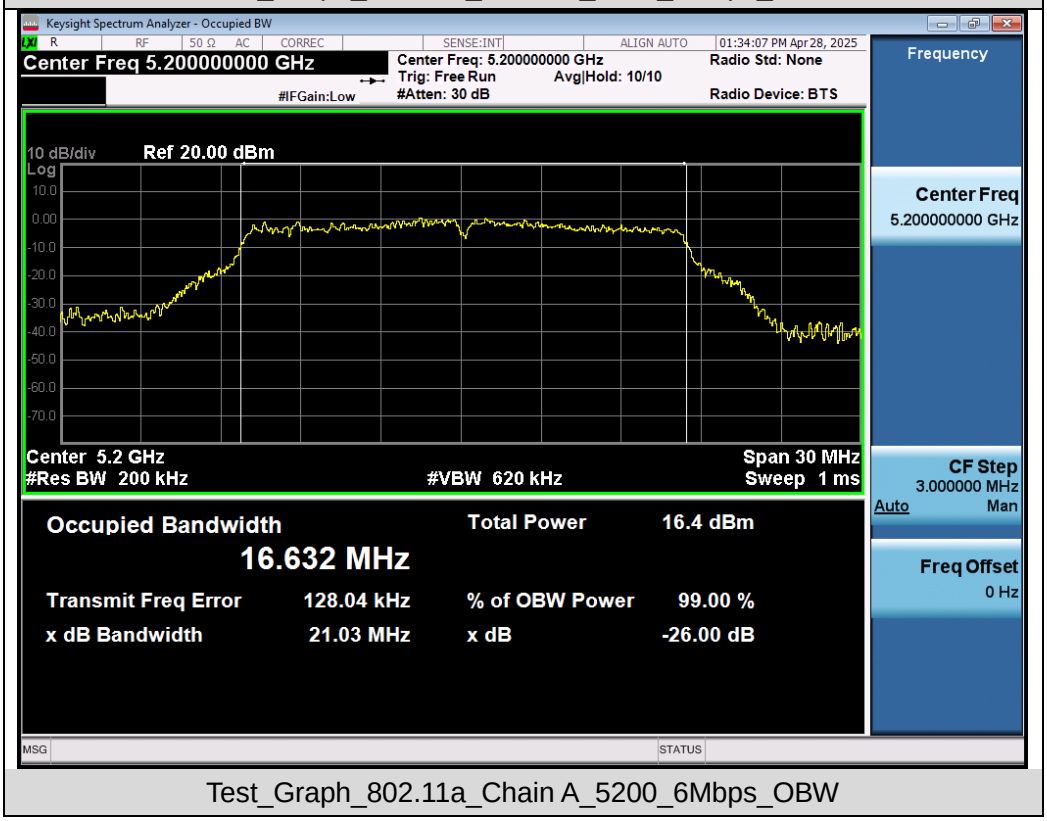
Test Data of Occupied Bandwidth and DTS Bandwidth for band 5.725-5.85 GHz-Chain A					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5745	16.852	16.314	0.5	Pass
	5785	16.837	16.327	0.5	Pass
	5825	16.812	16.356	0.5	Pass
802.11n20	5745	17.923	17.685	0.5	Pass
	5785	17.927	16.926	0.5	Pass
	5825	17.872	17.217	0.5	Pass
802.11n40	5755	36.315	35.402	0.5	Pass
	5795	36.316	35.753	0.5	Pass
802.11ac20	5745	17.924	17.339	0.5	Pass
	5785	17.901	17.618	0.5	Pass
	5825	17.902	17.617	0.5	Pass
802.11ac40	5755	36.394	35.452	0.5	Pass
	5795	36.310	35.651	0.5	Pass
802.11ac80	5775	75.517	75.233	0.5	Pass

Test Data of Occupied Bandwidth and DTS Bandwidth for band 5.725-5.85 GHz-Chain B					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5745	16.624	16.337	0.5	Pass
	5785	16.690	15.947	0.5	Pass
	5825	16.665	16.450	0.5	Pass
802.11n20	5745	17.803	17.577	0.5	Pass
	5785	17.787	17.593	0.5	Pass
	5825	17.790	17.592	0.5	Pass
802.11n40	5755	36.242	35.768	0.5	Pass
	5795	36.260	36.041	0.5	Pass
802.11ac20	5745	17.816	17.316	0.5	Pass
	5785	17.818	17.595	0.5	Pass
	5825	17.791	17.333	0.5	Pass
802.11ac40	5755	36.245	33.206	0.5	Pass
	5795	36.232	35.825	0.5	Pass
802.11ac80	5775	75.503	70.699	0.5	Pass

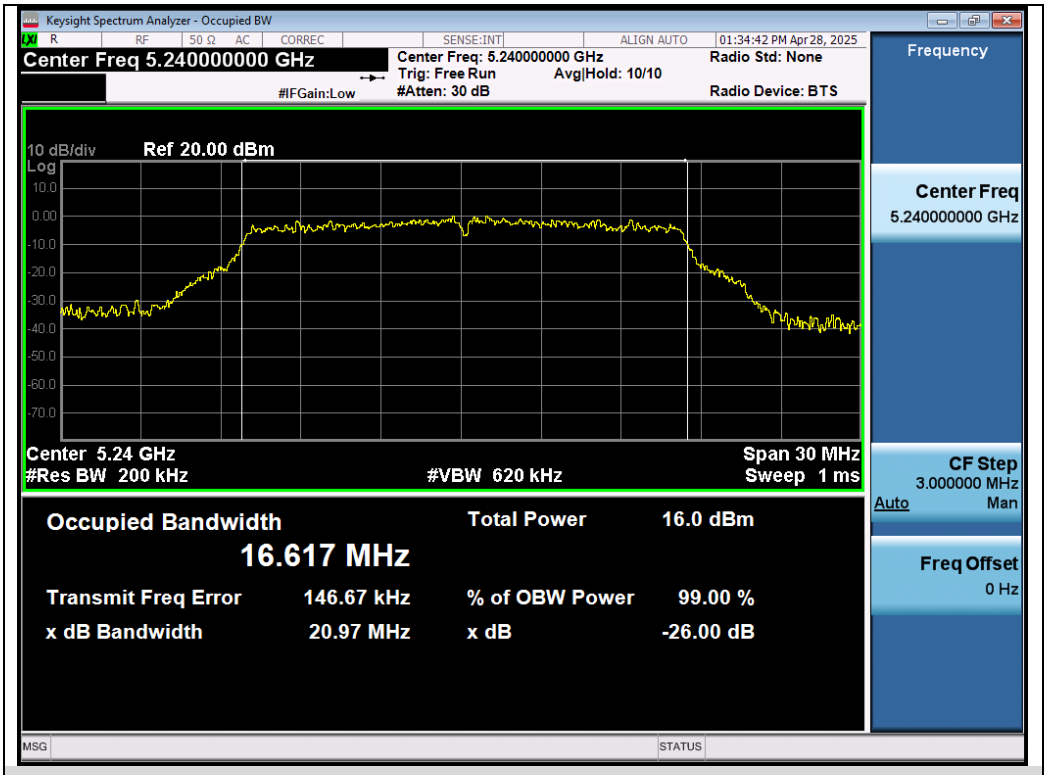
Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz



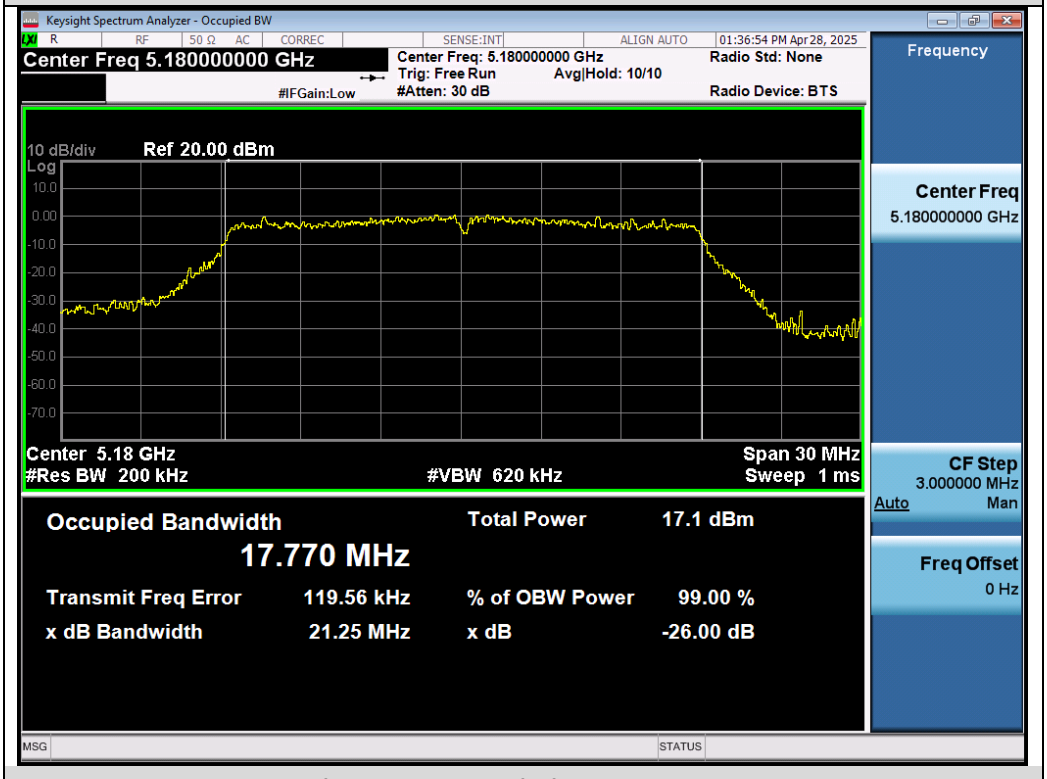
Test_Graph_802.11a_Chain A_5180_6Mbps_OBW



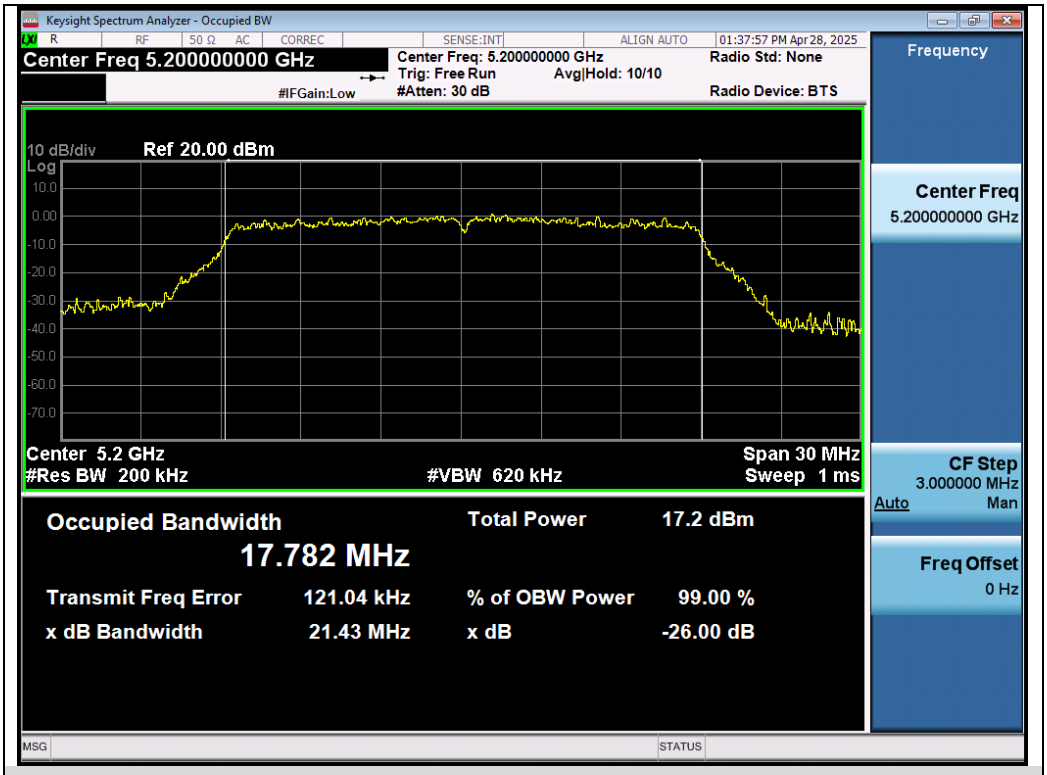
Test_Graph_802.11a_Chain A_5200_6Mbps_OBW



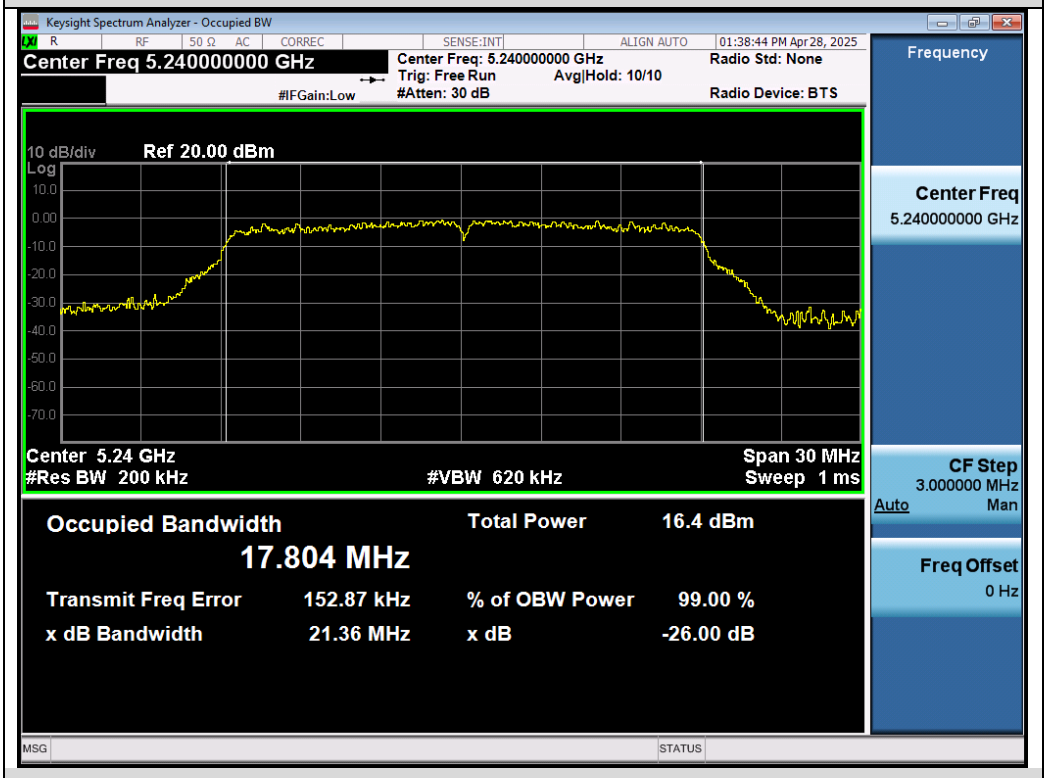
Test_Graph_802.11a_Chain A_5240_6Mbps_OBW



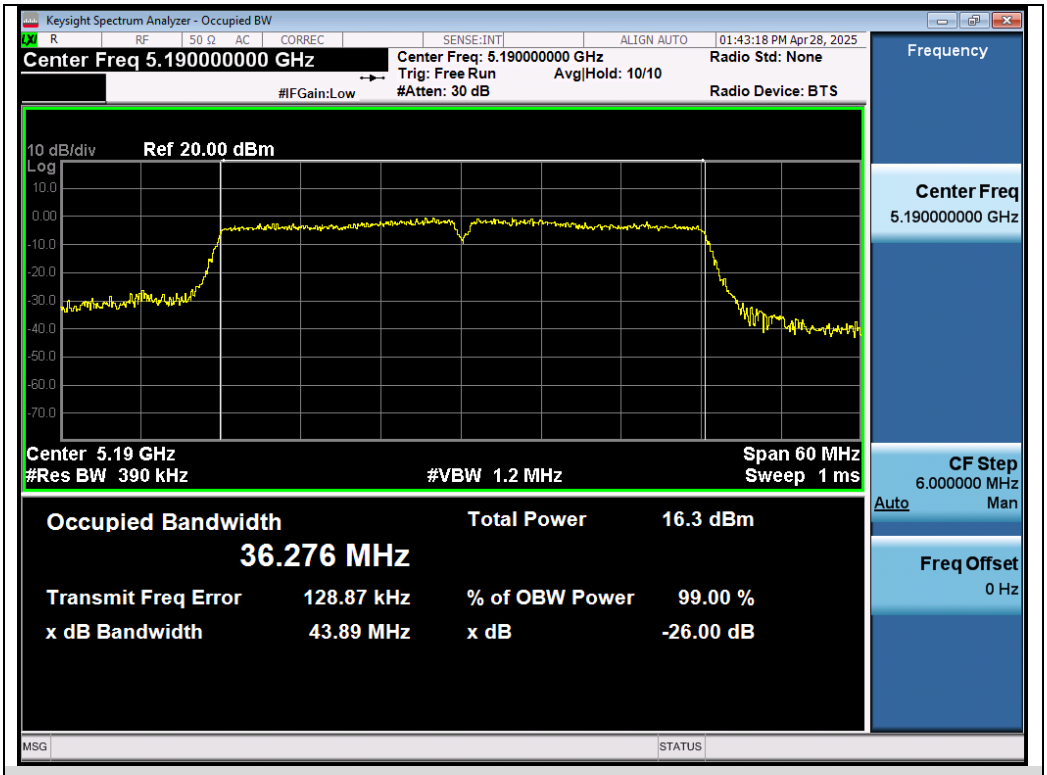
Test_Graph_802.11n20_Chain A_5180_MCS0_OBW



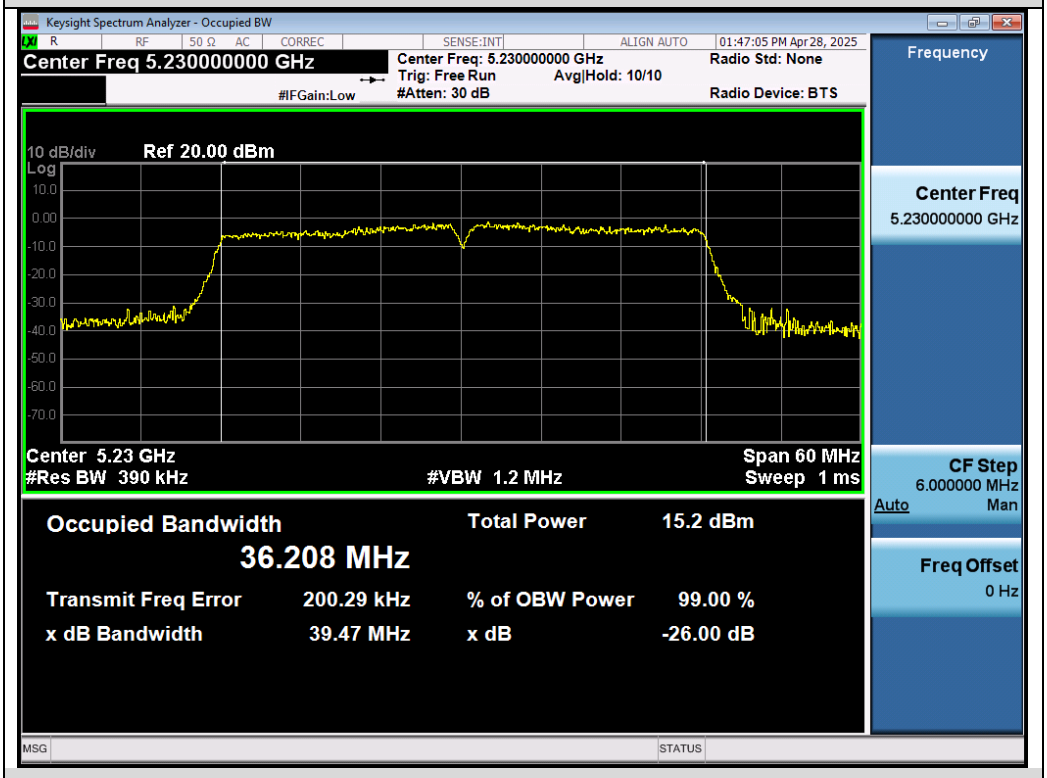
Test_Graph_802.11n20_Chain A_5200_MCS0_OBW



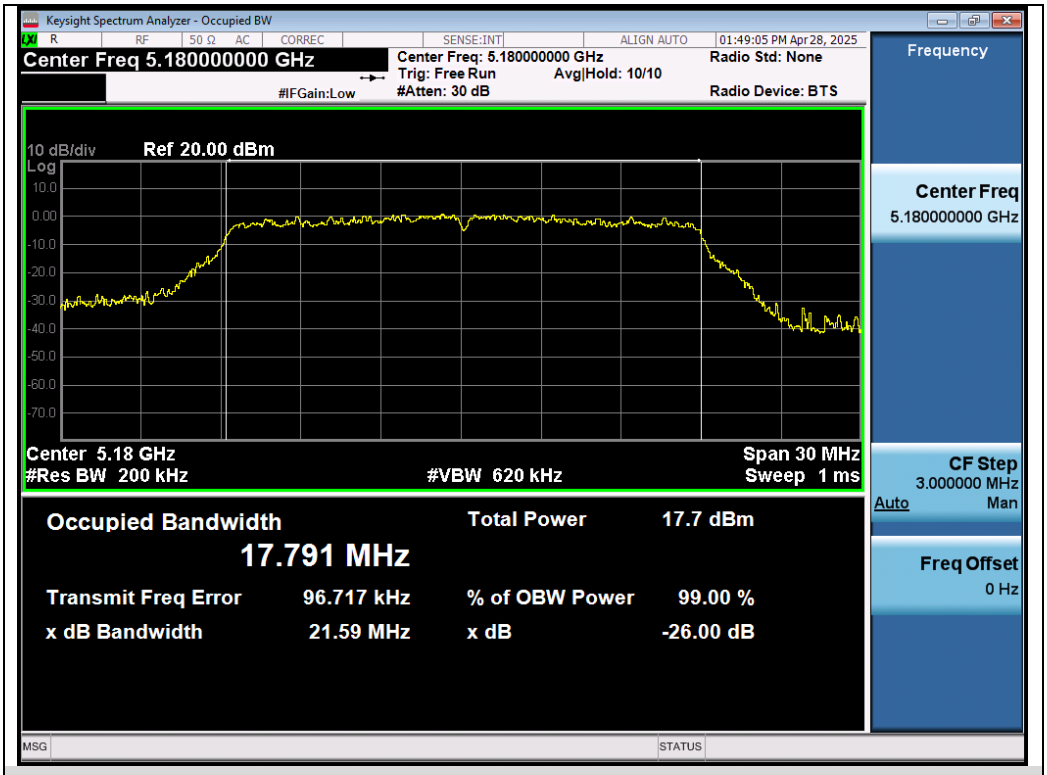
Test_Graph_802.11n20_Chain A_5240_MCS0_OBW



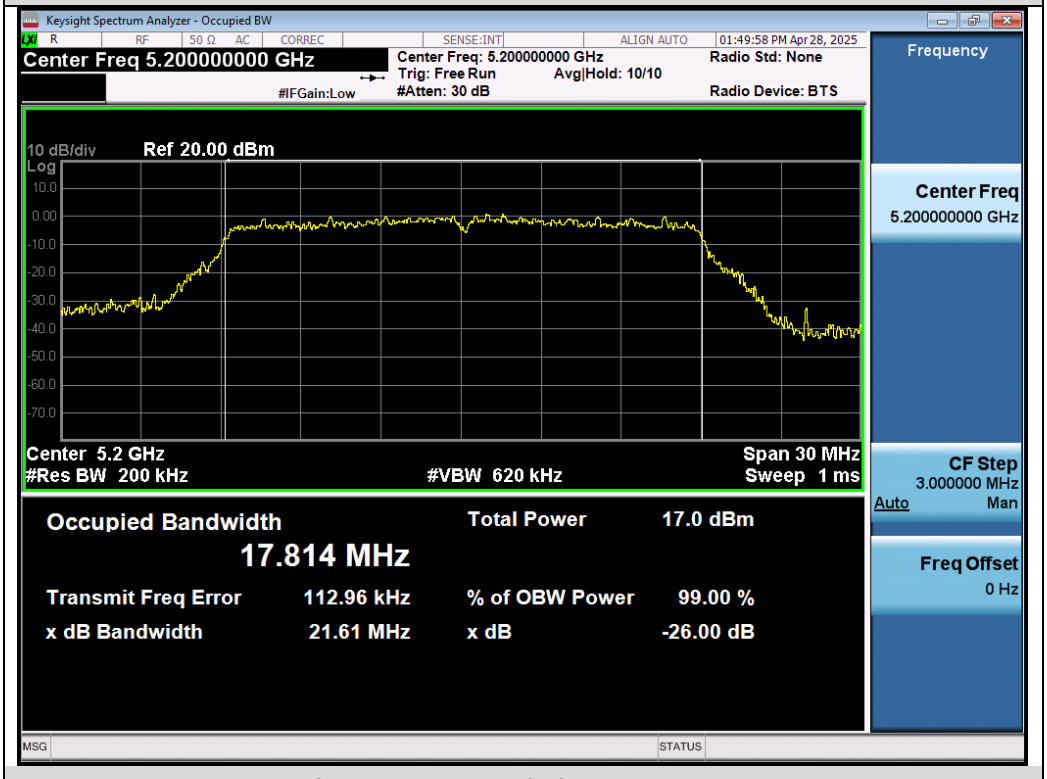
Test_Graph_802.11n40_Chain A_5190_MCS0_OBW



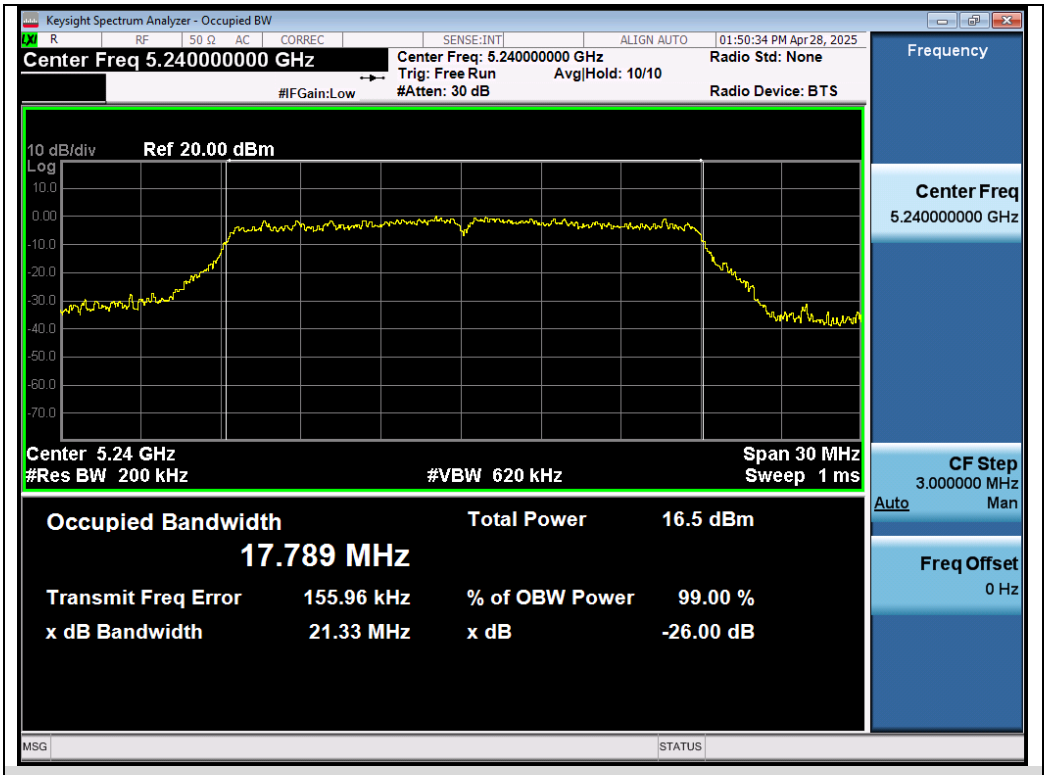
Test_Graph_802.11n40_Chain A_5230_MCS0_OBW



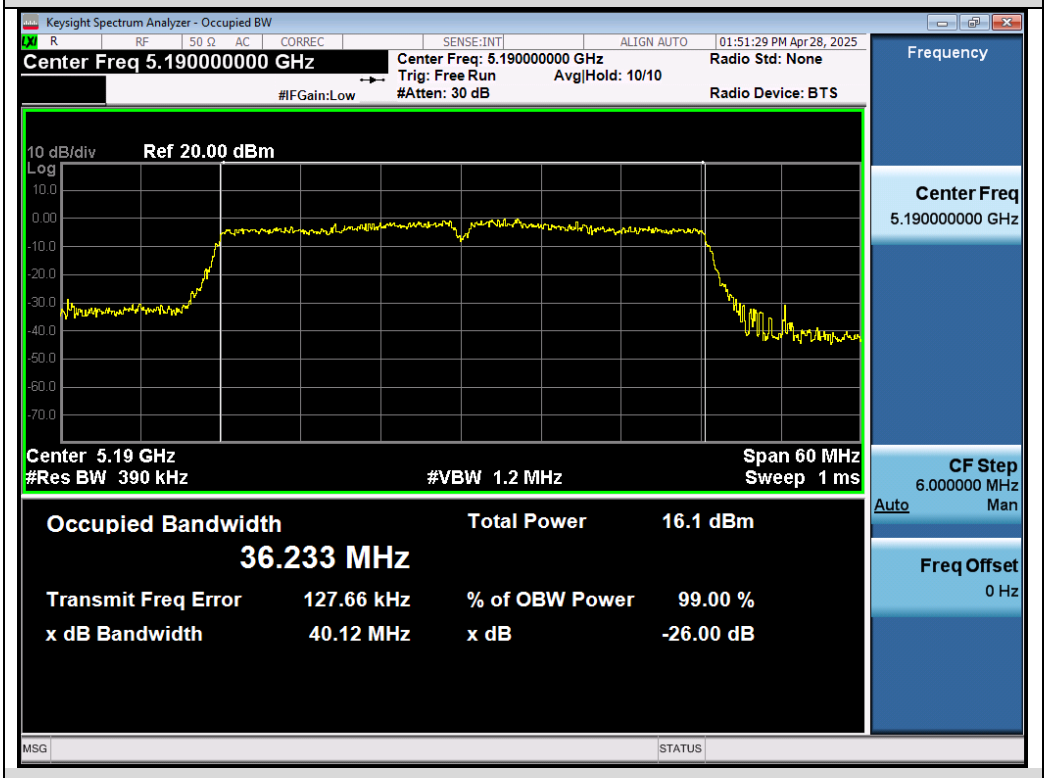
Test_Graph_802.11ac20_Chain A_5180_MCS0_OBW



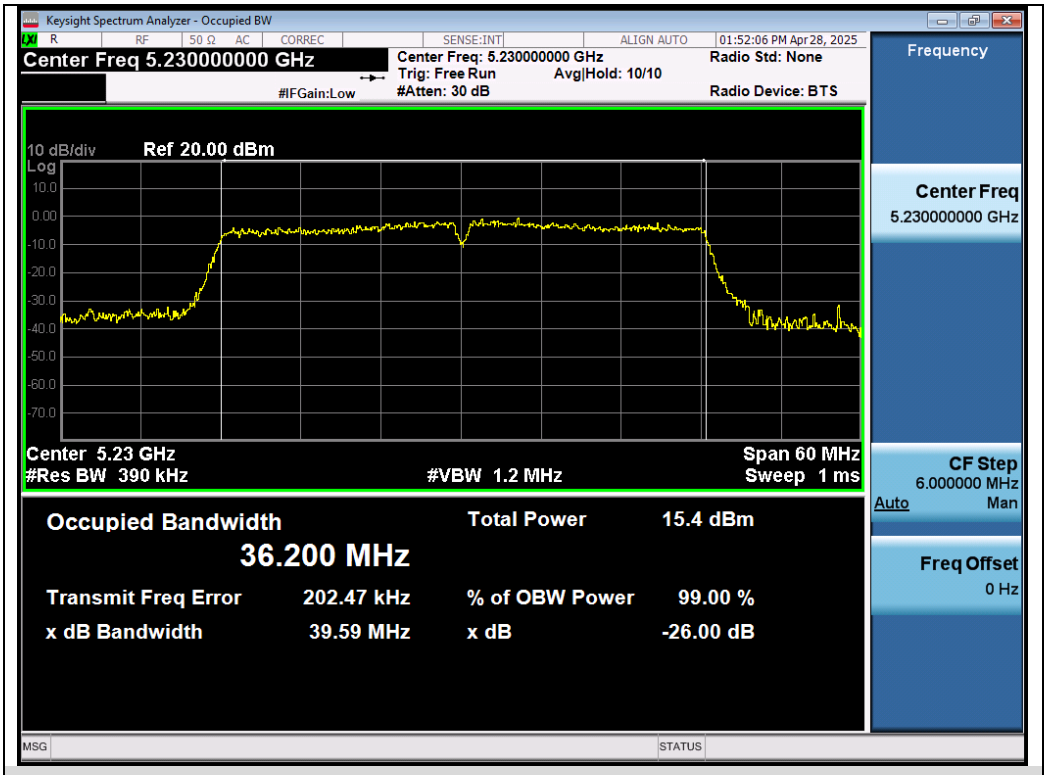
Test_Graph_802.11ac20_Chain A_5200_MCS0_OBW



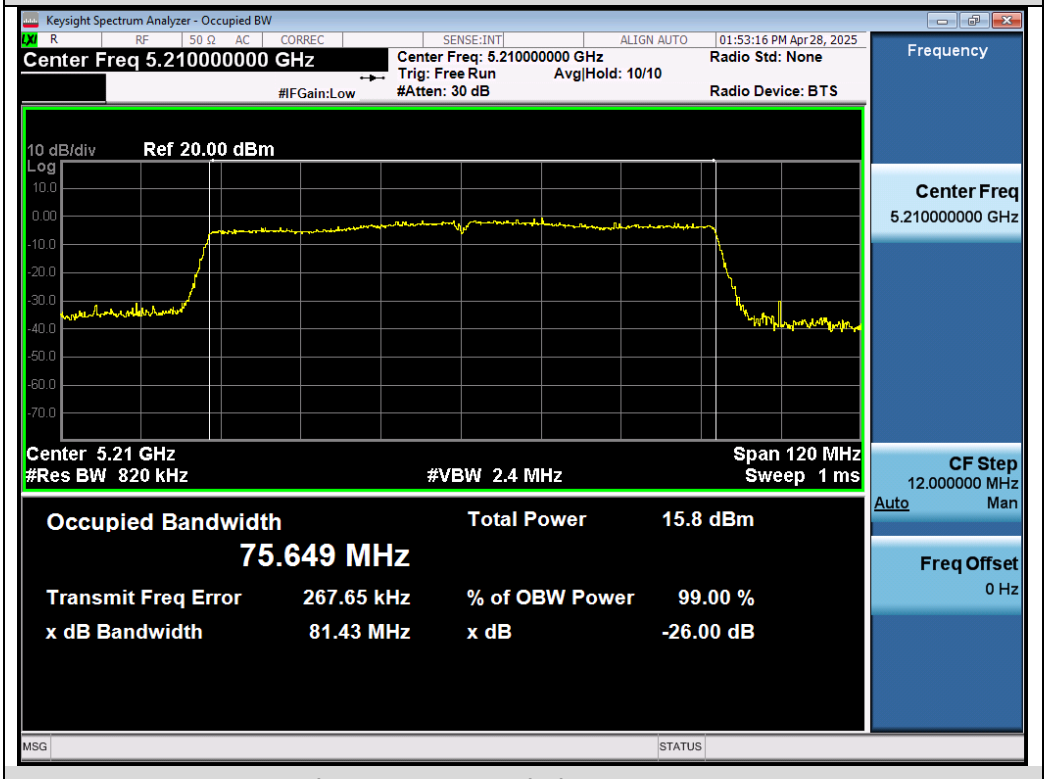
Test_Graph_802.11ac20_Chain A_5240_MCS0_OBW



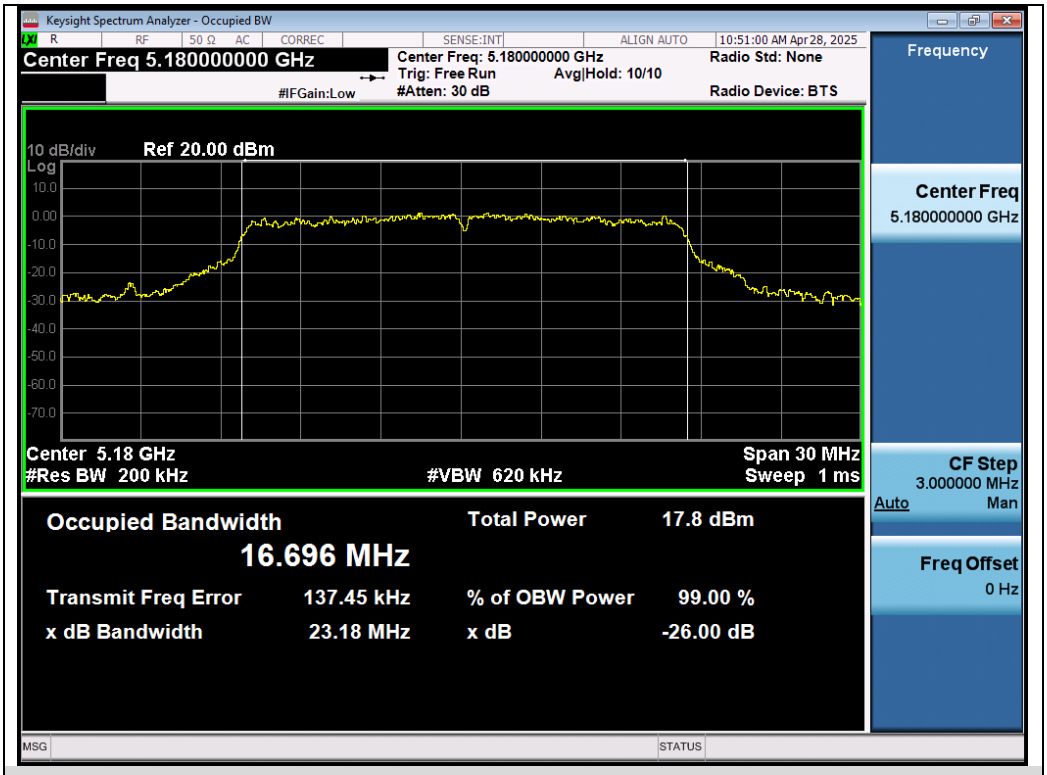
Test_Graph_802.11ac40_Chain A_5190_MCS0_OBW



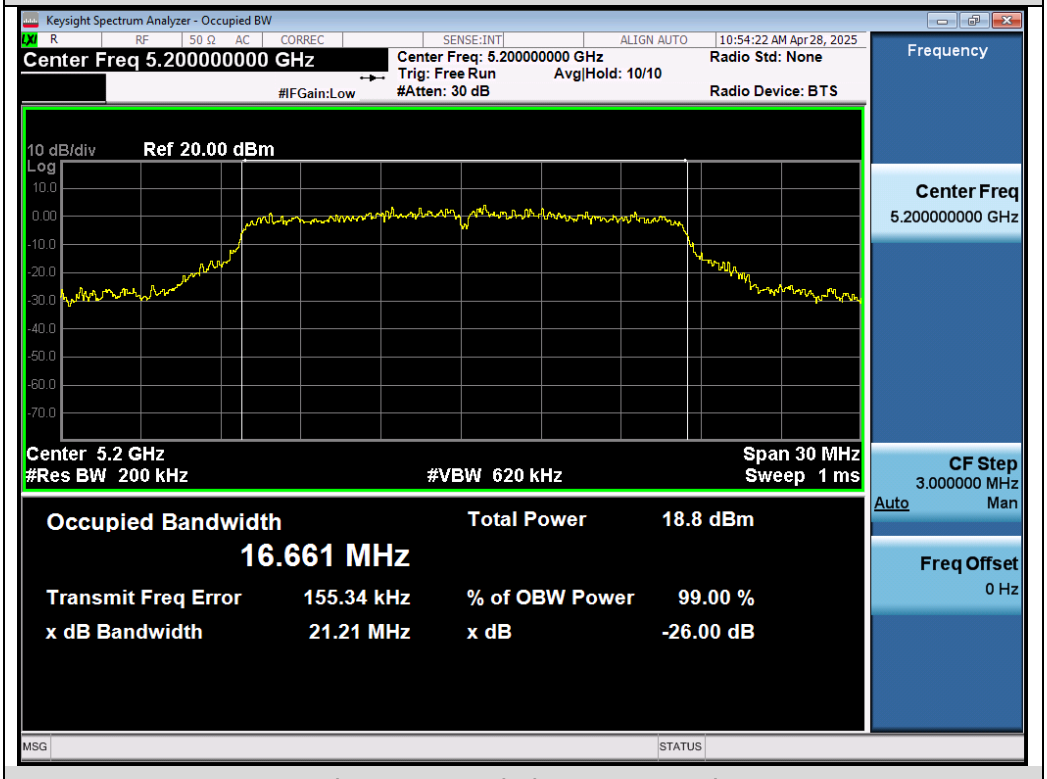
Test_Graph_802.11ac40_Chain A_5230_MCS0_OBW



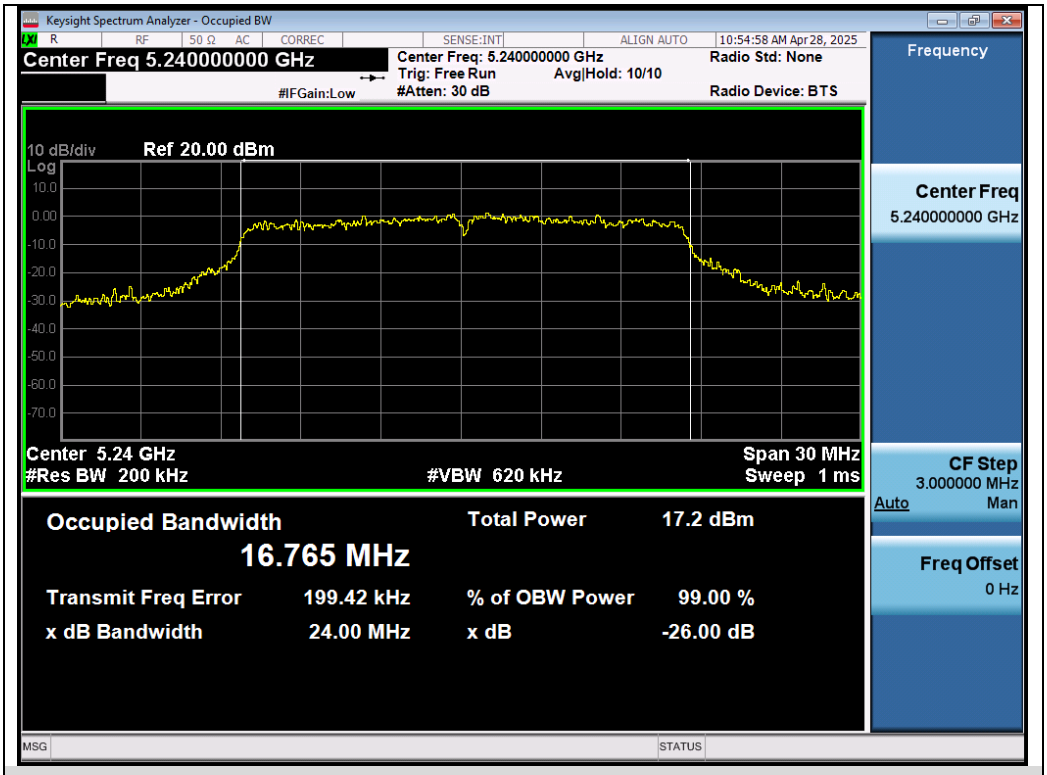
Test_Graph_802.11ac80_Chain A_5210_MCS0_OBW



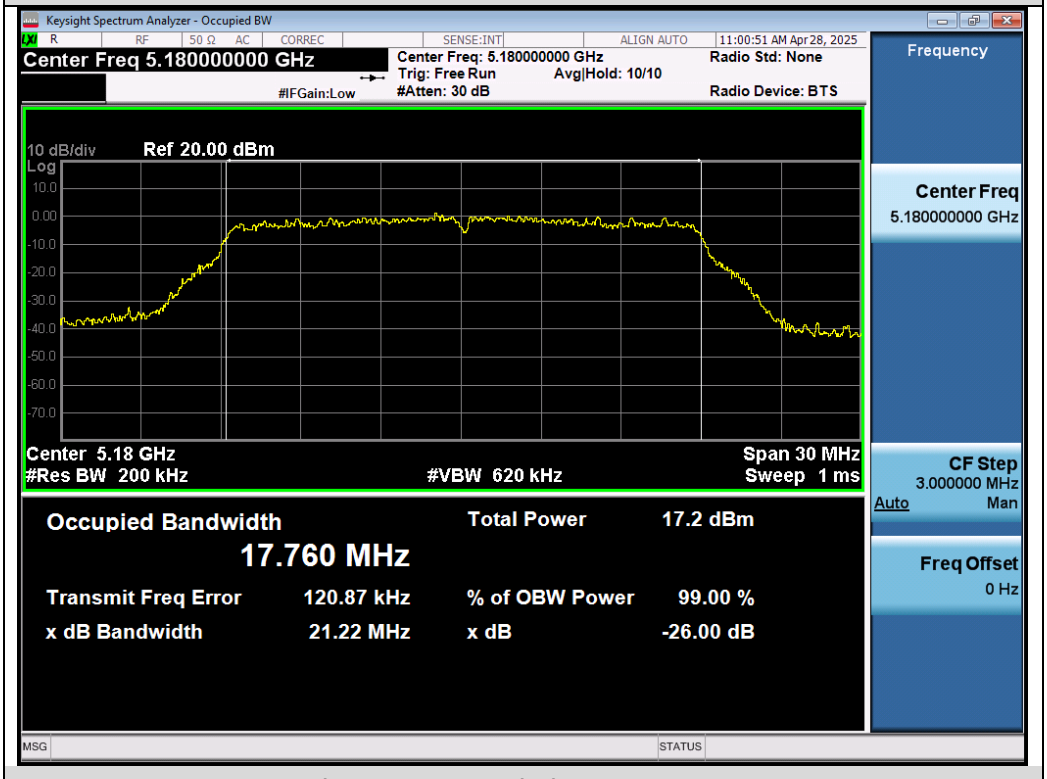
Test_Graph_802.11a_Chain B_5180_6Mbps_OBW



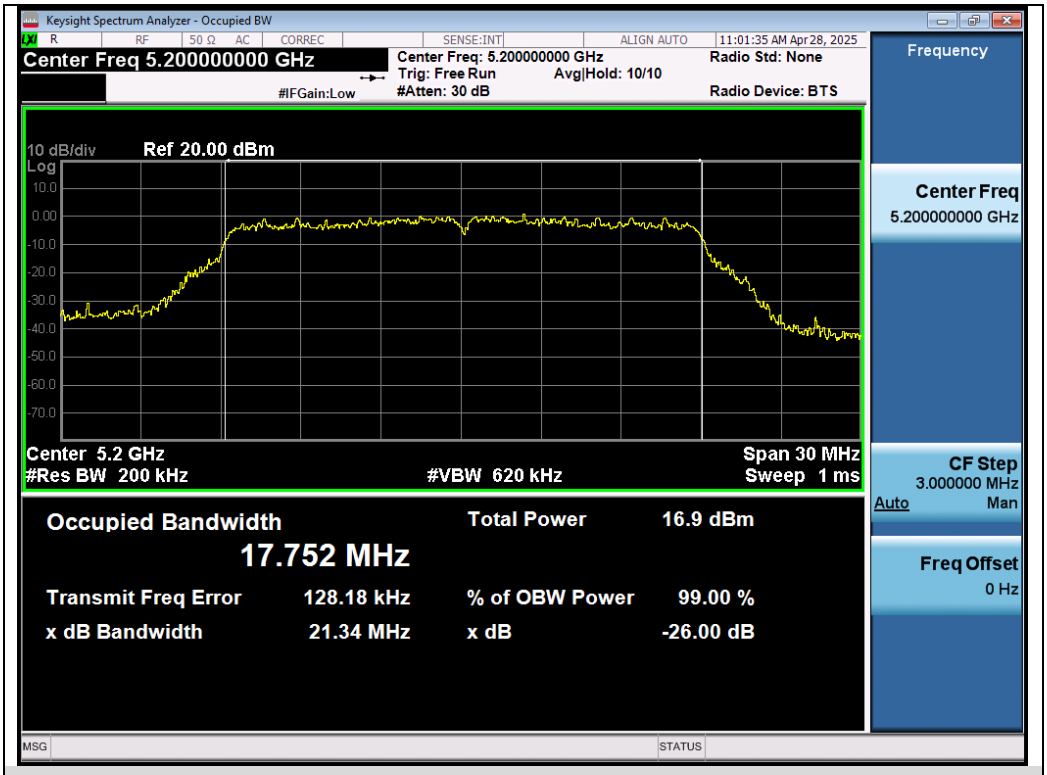
Test_Graph_802.11a_Chain B_5200_6Mbps_OBW



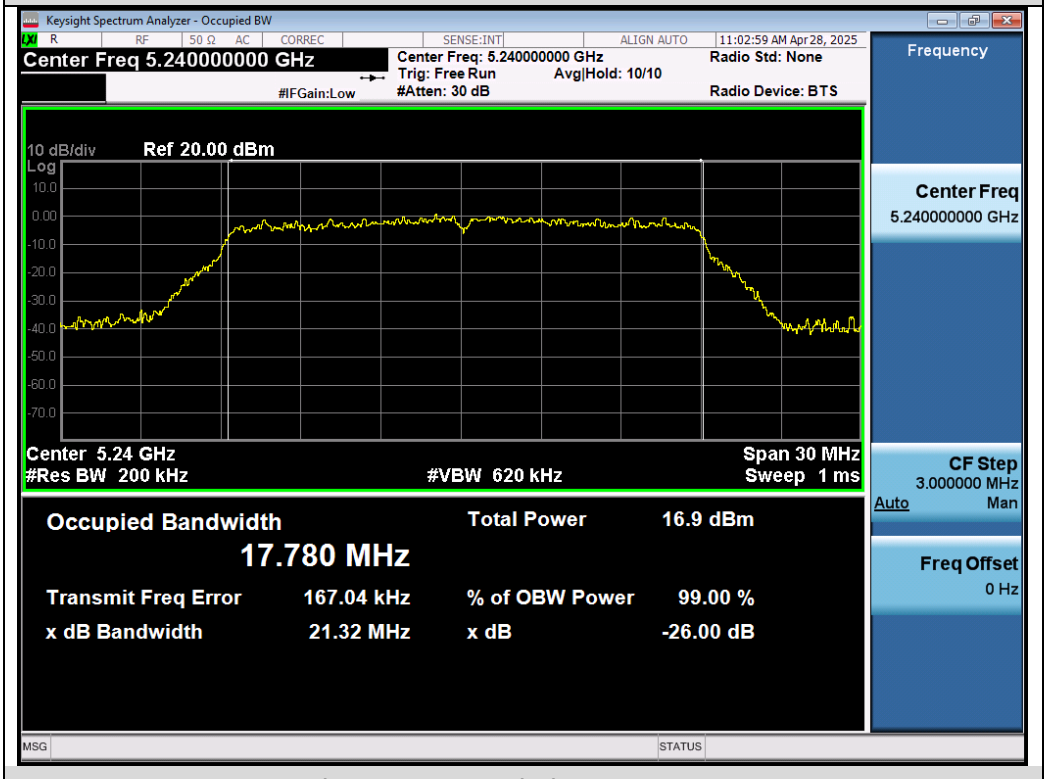
Test_Graph_802.11a_Chain B_5240_6Mbps_OBW



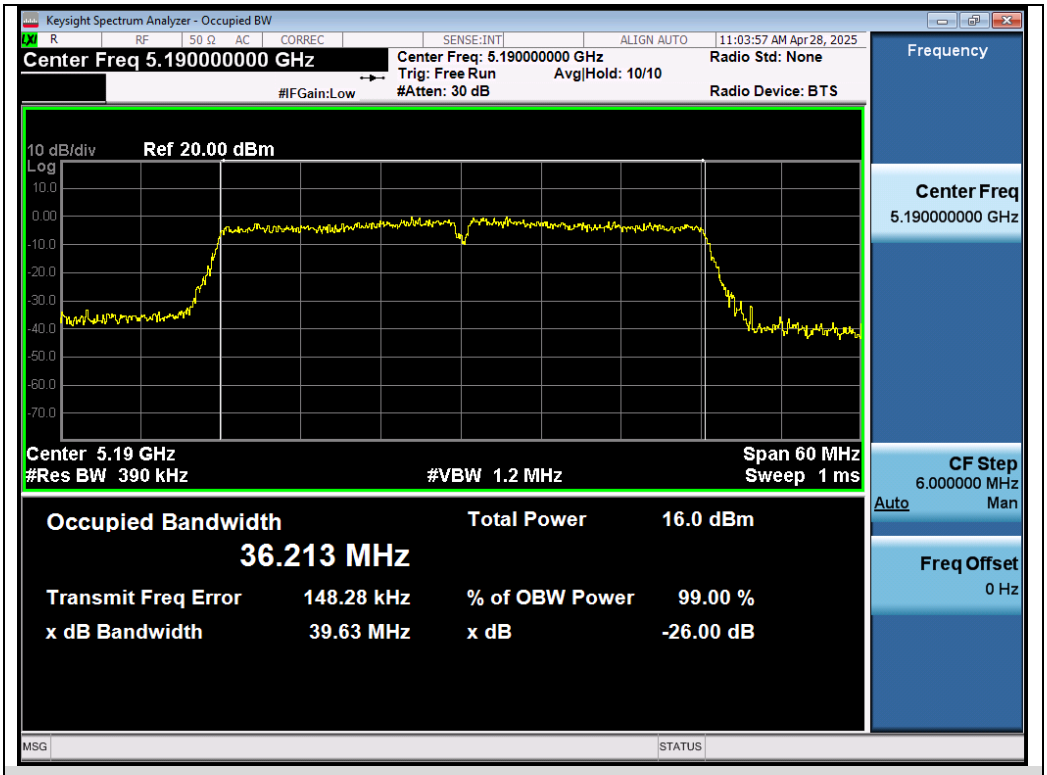
Test_Graph_802.11n20_Chain B_5180_MCS0_OBW



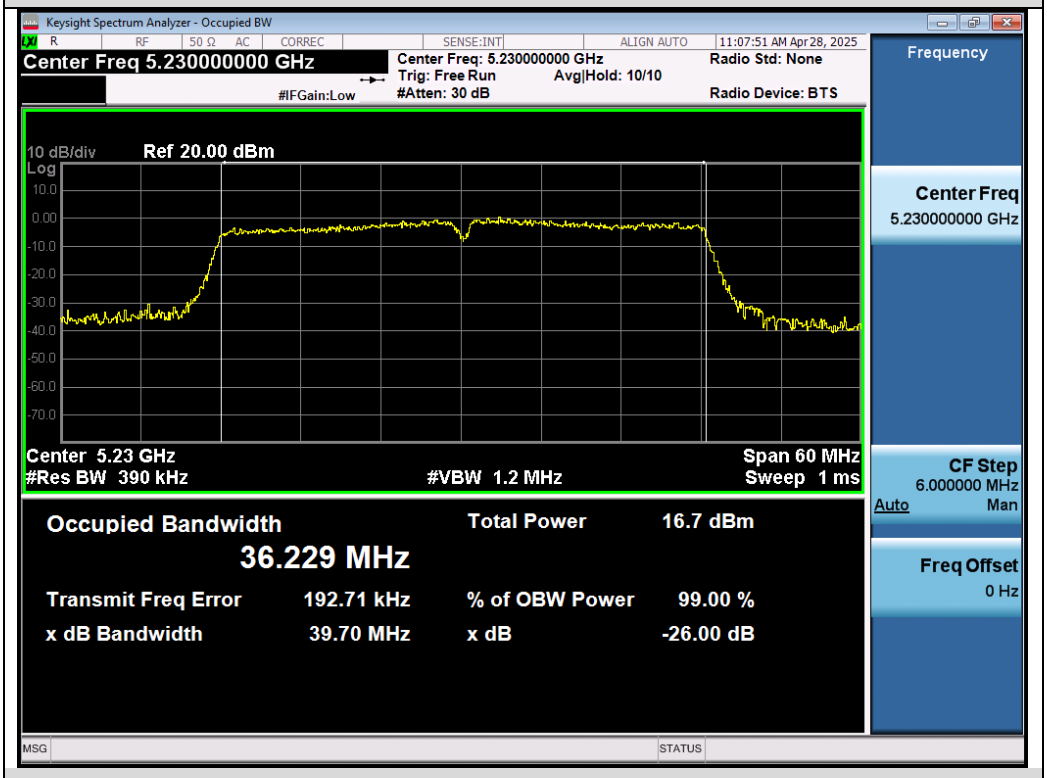
Test_Graph_802.11n20_Chain B_5200_MCS0_OBW



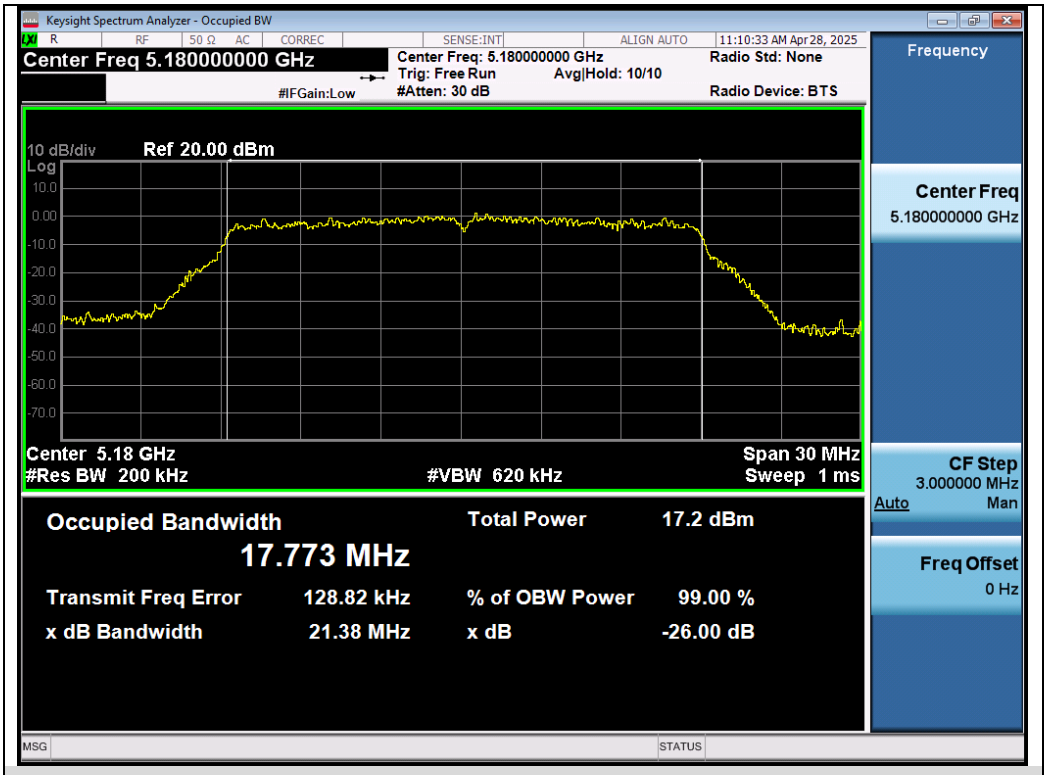
Test_Graph_802.11n20_Chain B_5240_MCS0_OBW



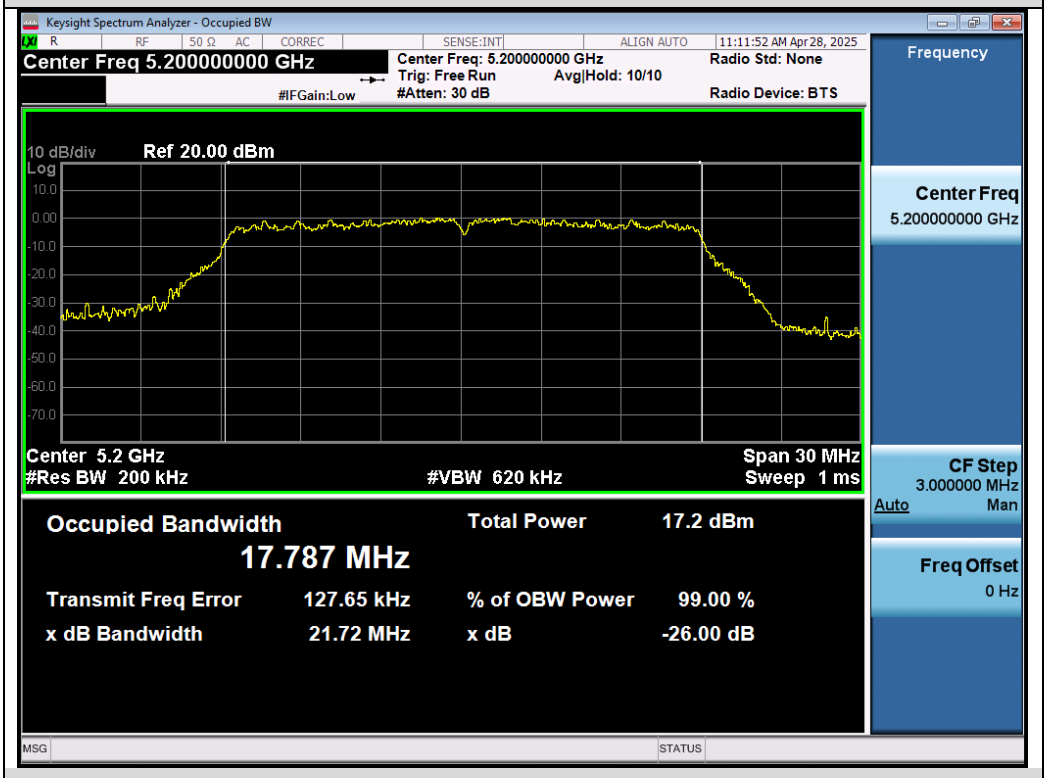
Test_Graph_802.11n40_Chain B_5190_MCS0_OBW



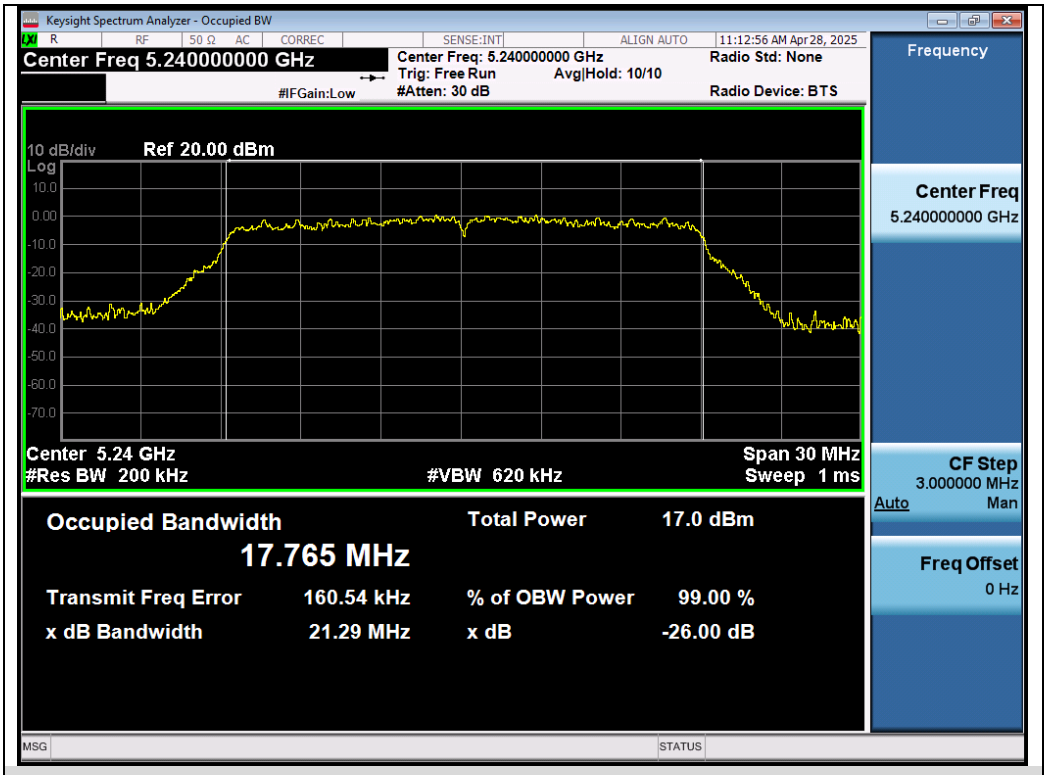
Test_Graph_802.11n40_Chain B_5230_MCS0_OBW



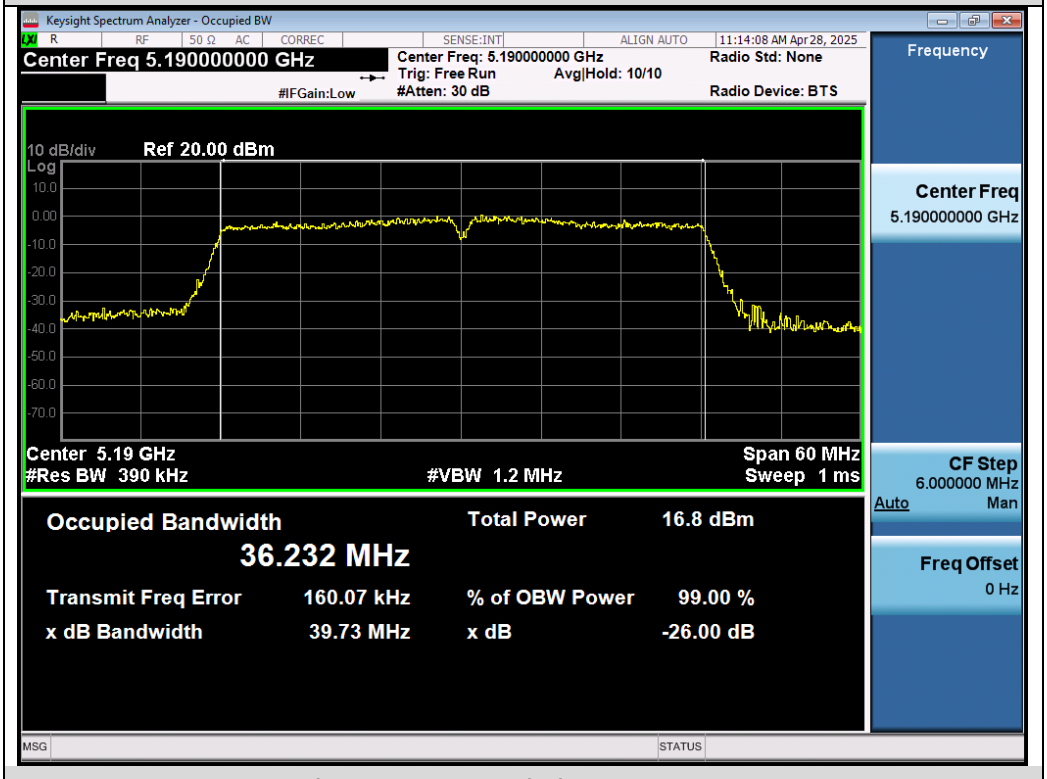
Test_Graph_802.11ac20_Chain B_5180_MCS0_OBW



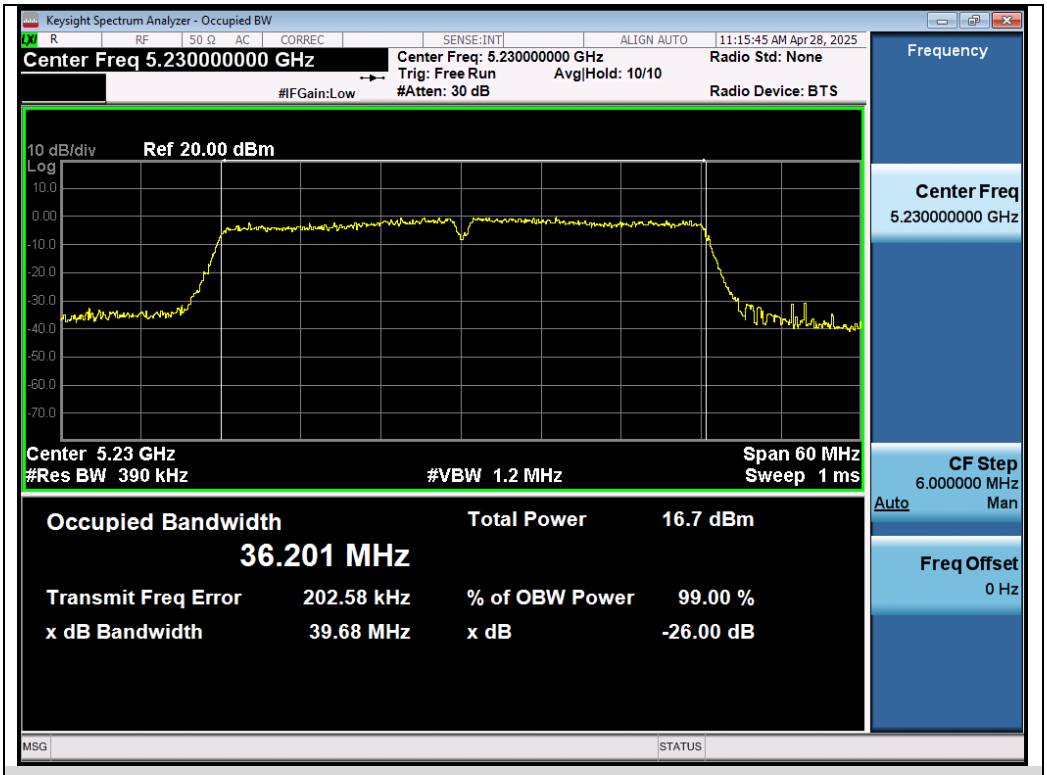
Test_Graph_802.11ac20_Chain B_5200_MCS0_OBW



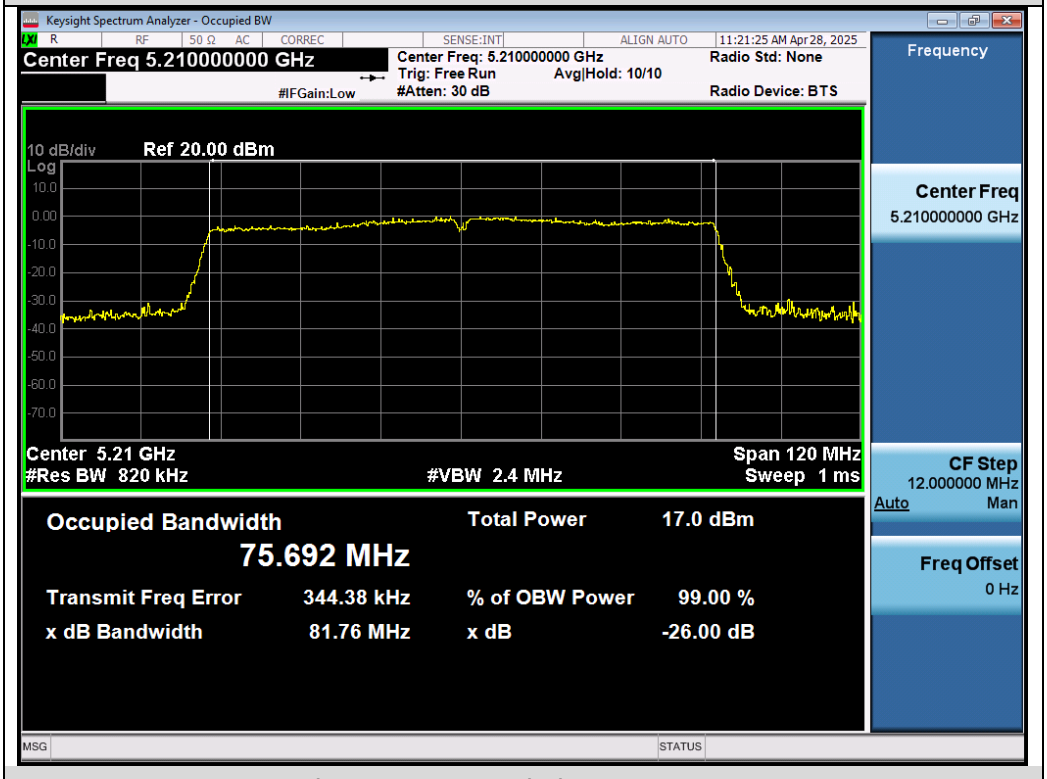
Test_Graph_802.11ac20_Chain B_5240_MCS0_OBW



Test_Graph_802.11ac40_Chain B_5190_MCS0_OBW

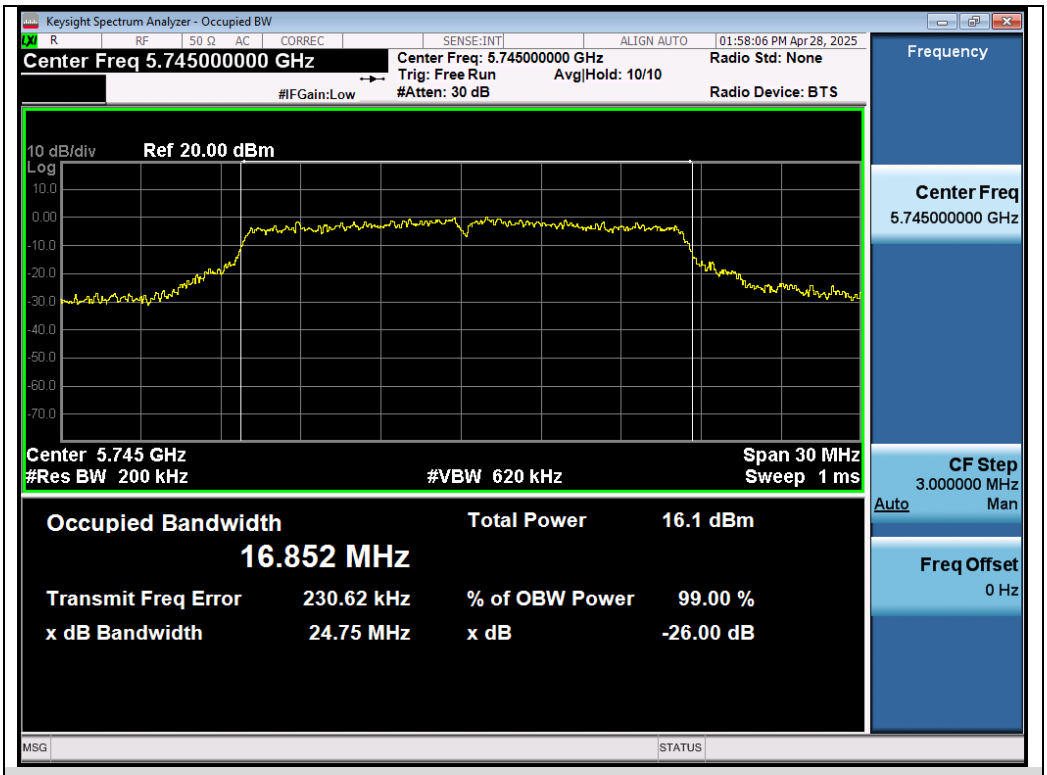


Test_Graph_802.11ac40_Chain B_5230_MCS0_OBW

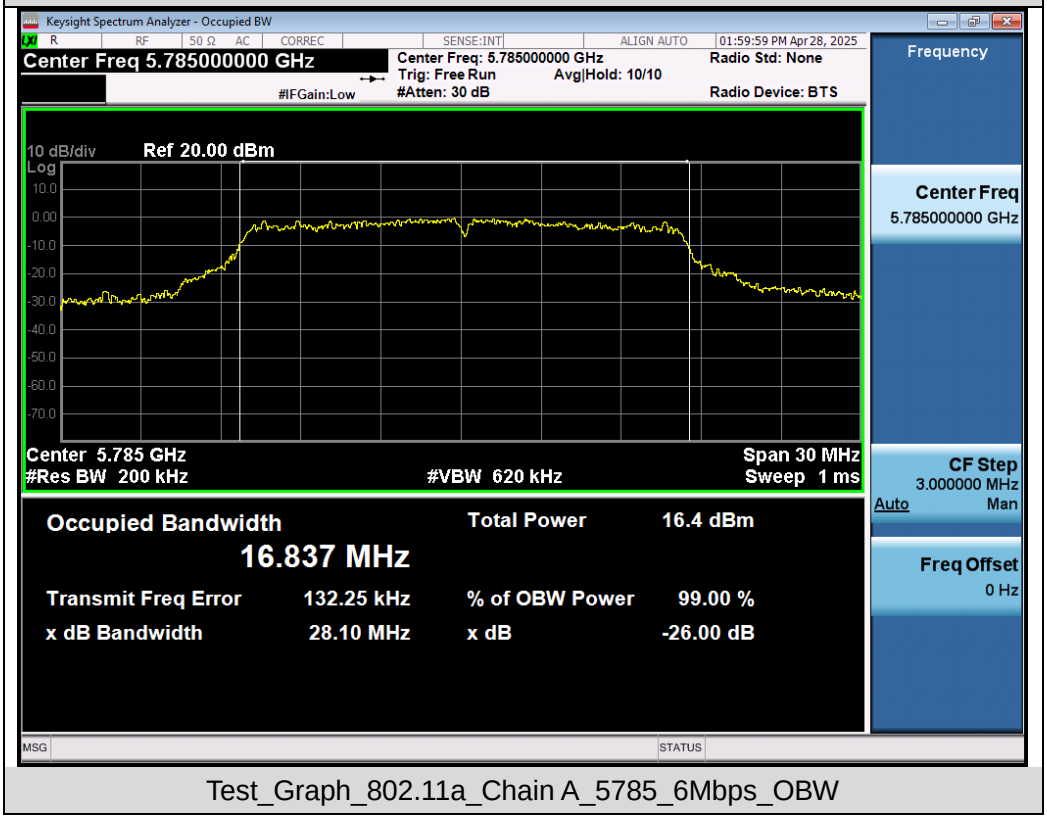


Test_Graph_802.11ac80_Chain B_5210_MCS0_OBW

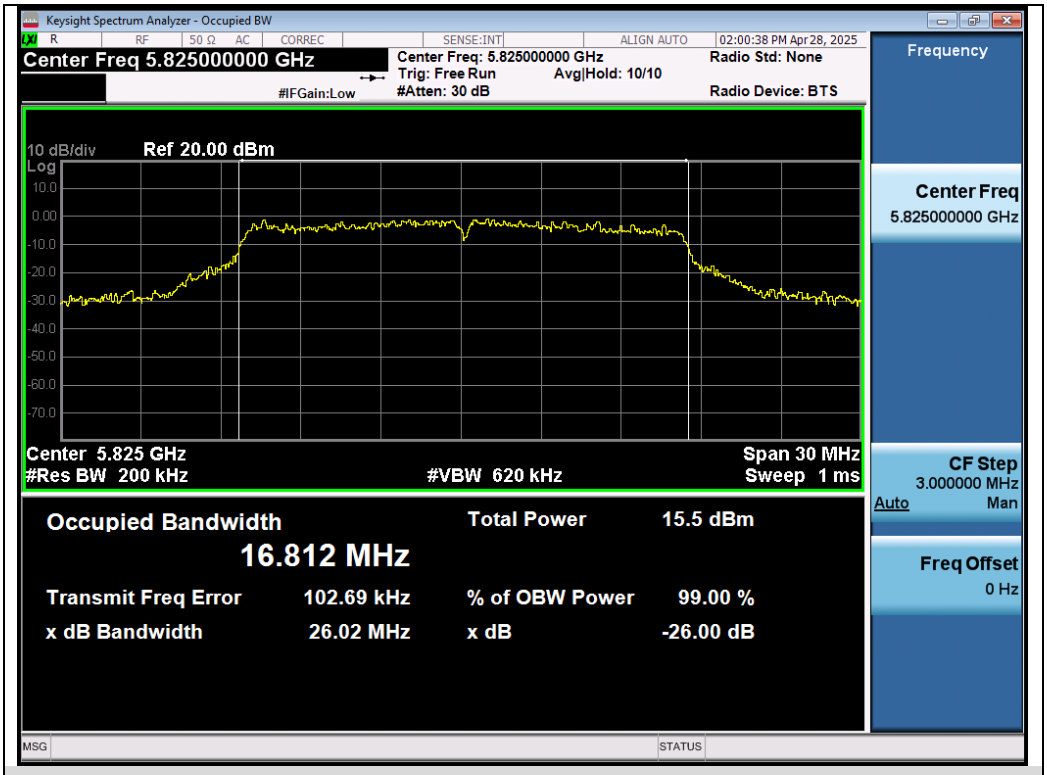
Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.745-5.825 GHz



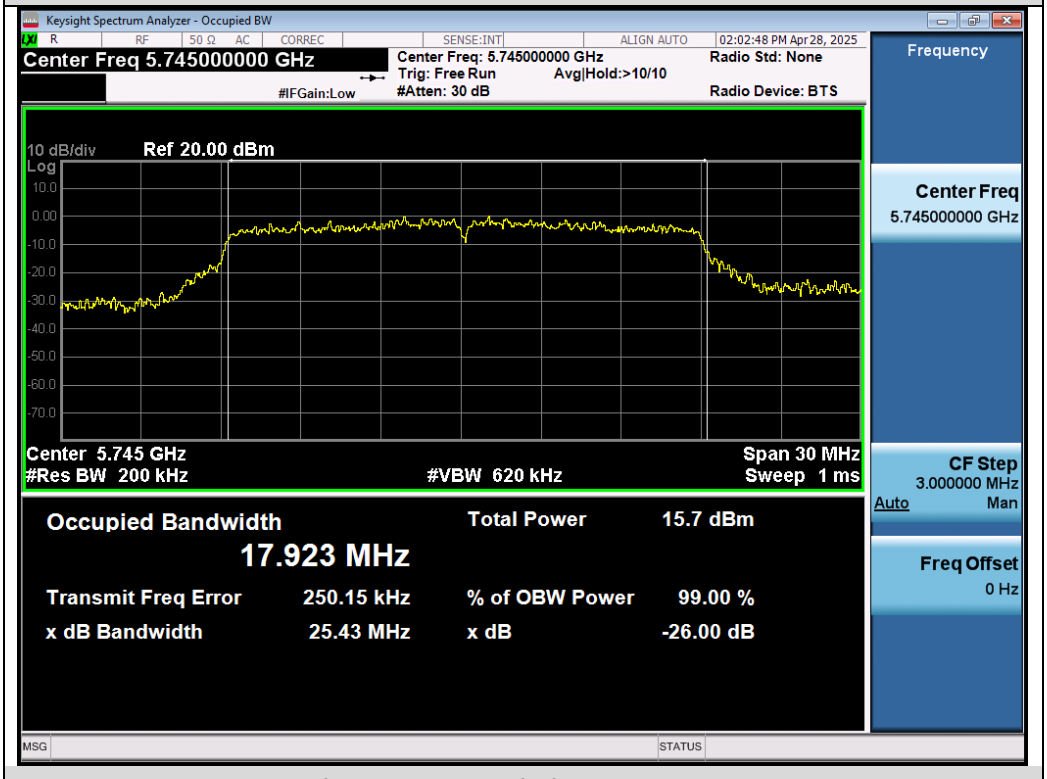
Test_Graph_802.11a_Chain A_5745_6Mbps_OBW



Test_Graph_802.11a_Chain A_5785_6Mbps_OBW



Test_Graph_802.11a_Chain A_5825_6Mbps_OBW



Test_Graph_802.11n20_Chain A_5745_MCS0_OBW