FCC Test Report

Report No.: AGC16740241101FR07

FCC ID	:	WQ8-DV2377
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	NEXT LEVEL DIAGNOSTICS & MEASUREMENT SYSTEM
BRAND NAME	:	AUTEL
MODEL NAME	:	MaxiSys Ultra S2, MaxiSys Ultra EV S2, MaxiSys Ultra S2&ADAS, MaxiSys Ultra EV S2&ADAS, MaxiSys Ultra S2 ADAS
APPLICANT	:	Autel Intelligent Technology Corp., Ltd.
DATE OF ISSUE	:	Dec. 25, 2024
STANDARD(S)	:	FCC Part 15 Subpart E §15.407
REPORT VERSION	:	V1.0

*A*ttestation of *G*lobal *C*ompliance (Shenzhen) Co., Ltd

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Dec. 25, 2024	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 & MEASUREMENT SYSTEM
Brand Name	AUTEL
Test Model	MaxiSys Ultra S2
Series Model(s)	MaxiSys Ultra EV S2, MaxiSys Ultra S2&ADAS, MaxiSys Ultra EV S2&ADAS, MaxiSys Ultra S2 ADAS
Difference Description	The model name and software function configuration are different
Date of receipt of test item	Nov. 04, 2024
Date of Test	Nov. 04, 2024~Dec. 25, 2024
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-FCC-5.9G 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)	Dec. 25, 2024
Reviewed By	Calvin Liu (Reviewer)	Dec. 25, 2024
Approved By	Angela Li (Authorized Officer)	Dec. 25, 2024

2. Product Information

2.1 Product Technical Description

Equipment Type	Client devices
Operation Frequency	U-NII 4: 5850MHz~5895MHz (Cross-band U-NII 3: 5725-5850MHz)
Hardware Version	DV2377_MAIN_V2
Software Version	V01.01.00
Test Frequency Range	For 802.11a/n(HT20)/ac (VHT20)/ax(HE20): 5845-5885MHz For 802.11a/n(HT20)/ac (VHT40)/ax(HE40): 5835-5875MHz For 802.11ac (VHT80)/ax(HE80): 5835MHz For 802.11ac (VHT160)/ax(HE160): 5815MHz
Max. E.I.R.P.	802.11a:16.43dBm; 802.11n20:12.45dBm; 802.11n40:15.90dBm; 802.11ac20:12.47dBm; 802.11ac40:15.94dBm; 802.11ac80:15.89dBm; 802.11ac160:15.64dBm; 802.11ax20:11.41dBm; 802.11ax40:15.34dBm; 802.11ax80:15.60dBm; 802.11ax160:15.28dBm;
Max. E.I.R.P. (MIMO)	802.11n20:18.36dBm; 802.11n40:21.71dBm; 802.11ac20:18.37dBm; 802.11ac40:21.72dBm; 802.11ac80:21.65dBm; 802.11ac160:21.50dBm; 802.11ax20:17.38dBm; 802.11ax40:21.19dBm; 802.11ax80: 21.45dBm; 802.11ax160:20.96dBm;
Modulation	802.11a/n:(64-QAM, 16-QAM, QPSK, BPSK) OFDM 802.11ac:(256-QAM, 64-QAM, 16-QAM, QPSK, BPSK) OFDM 802.11ax:(1024-QAM,256-QAM, 64-QAM, 16-QAM, QPSK, BPSK) OFDMA
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps; 802.11n: up to 300Mbps; 802.11ac: up to 866.7Mbps; 802.11ax: up to 1201Mbps
Number of channels	9
Antenna Designation	FPC Antenna
Antenna Gain	Refer to Chapter 2.8 of the report.
Power Supply	DC 3.85V by battery or DC 12V by adapter

2.2 Table of Carrier Frequency

For UNII-3/4 Band:

3 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20),802.11ax (HE20):

Channel	Frequency	Channel	Frequency
169	5845 MHz	173	5865 MHz
177	5885 MHz	--	--

1 channel are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
167	5835 MHz	175	5875 MHz

1 channel is provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency
171	5855 MHz

1 channel is provided for 802.11ac (VHT160), 802.11ax (HE160):

Channel	Frequency
163	5815 MHz

2.3 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for FCC ID: WQ8-DV2377 filing to comply with the FCC Part 15 requirements.

2.4 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

2.5 Special Accessories

Refer to section 4.4.

2.6 Equipment Modifications

Not available for this EUT intended for grant.

2.7 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 2.8 of the report

2.8 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	5845-5885	2	20	3.1	2.9	6.01
	5835-5875	2	40	3.1	2.9	6.01
	5855	2	80	3.1	2.9	6.01
	5815	2	160	3.0	2.8	5.91

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.

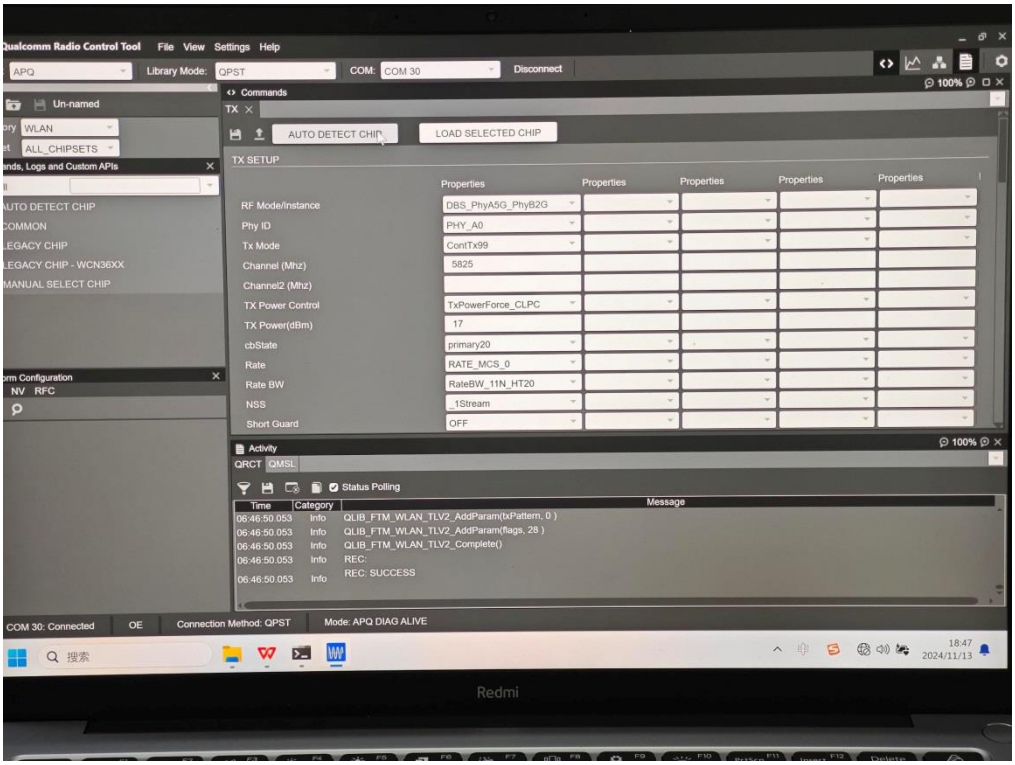
- If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.
- For power spectral density (PSD) measurements on devices:
  - Array Gain = 10 log (N_{ANT}/ N_{SS}) dB = 3.01;
- For power measurements on IEEE 802.1devices:
  - Array Gain = 0 dB 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.

2.9 Description of Test Software

For IEEE 802.11 mode:

The test utility software used during testing was “Qualcomm Radio Control Tool”, and the version was “4.0.00132.0”.

Software Setting Diagram



Test Mode	Channel	Power Index	
		Chain A	Chain B
802.11a	L/M/H	17	17
802.11n(HT20)	L/M/H	16	16
802.11n(HT40)	L/H	16	16
802.11ac(VHT20)	L/M/H	16	16
802.11ac(VHT40)	L/H	16	16
802.11ac(VHT80)	M	16	16
802.11ac(VHT160)	L	16	16
802.11ax(HE20)	L/M/H	16	16
802.11ax(HE40)	L/H	16	16
802.11ax(HE80)	M	16	16
802.11ax(HE160)	L	16	16

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 = 2.0 %

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-E062	Power Sensor	Agilent	U2021XA	MY54110007	2024-02-01	2025-01-31
☒	AGC-ER-E063	Power Sensor	Agilent	U2021XA	MY54110009	2024-02-01	2025-01-31
☒	AGC-ER-A001	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-09-21	2025-09-20
☒	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	2024-02-01	2025-01-31
☒	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2024-05-24	2025-05-23
☒	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2024-05-28	2025-05-27
☒	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2024-03-05	2026-03-04
☒	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2023-05-11	2025-05-10
☒	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2024-03-31	2025-03-30
☒	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2023-09-24	2025-09-23
☒	AGC-EM-E083	Pre-amplifier	CHENGXI	EMC184045SE	980508	2023-09-20	2025-09-19
☒	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2024-07-24	2026-07-23
☒	AGC-EM-A118	5G Filter	SongYi	BRM50716	N/A	2024-05-23	2025-05-22
☒	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2025-06-08

● 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-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

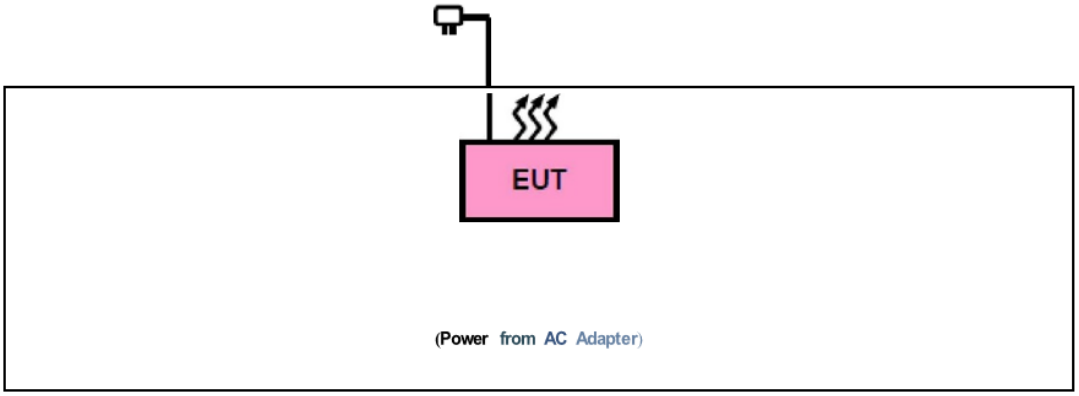
4.1 EUT Configuration

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	--	--

☒ 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)(3)(iii)	RF Output Power and E.I.R.P.	Pass
3	§15.407(e)	DTS Bandwidth	Pass
4	§2.1049	99%Occupied Bandwidth	Pass
5	§15.407(a)(3)(iii)	E.I.R.P. 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)(5)(ii)(iii)	Conducted Band Edge and Out-of-Band Emissions	Pass
9	§15.209, §15.407(b)(5)(ii)(iii)	Radiated Spurious Emission and Band Edge	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
Measurement Annotation					
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. Positioning in three axes was pre-tested, with the worst case being positioning in the X-plane.					
2. The radiation part tests the dual-antenna MIMO as the worst combination.					
3. "--"means no effect.					

● 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).
☒	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 Cjain A as the worst data.

Select Channel Parameter Configuration Test List						
EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11n (20MHz)	5845-5885	169 to 177	169,173,177	OFDM	MCS0
A	802.11n (40MHz)	5835-5875	167,175	167,175	OFDM	MCS0
A	802.11ax (80MHz)	5855	171	171	OFDM	MCS0
A	802.11ax (160MHz)	5815	163	163	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.

Select Channel Parameter Configuration Test List

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11n (20MHz)	5845-5885	169 to 177	169	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.

Select Channel Parameter Configuration Test List

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11n (20MHz)	5845-5885	169 to 177	169	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).
☒	The device supports multiple antenna transmission, allowing MIMO technology mode to be recorded as the worst.
☒	MIMO technology is not supported, and the 802.11a mode only records the worst antenna (Chain A) as the worst
☒	Support 802.11ax, device debugging is tested in Full RU state.
☒	The device antenna gain and cable loss are added to the spectrum compensation coefficient or offset through software.

Select Channel Parameter Configuration Test List

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11a	5845-5885	169 to 177	169,177	OFDM	6.0
A	802.11n (40MHz)	5835-5875	167,175	167,175	OFDM	MCS0
A	802.11ac (160MHz)	5815	163	163	OFDMA	MCS0
A	802.11ax (160MHz)	5815	163	163	OFDMA	MCS0

● Antenna 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).
☒	The device supports multiple antenna transmission, allowing MIMO technology mode to be recorded as the worst.
☒	MIMO technology is not supported, and the 802.11a mode only records the worst antenna (Chain A) as the worst
☒	Support 802.11ax, device debugging is tested in Full RU state.
☒	The device antenna gain and cable loss are added to the spectrum compensation coefficient or offset through software.

Select Channel Parameter Configuration Test List						
EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11a	5845-5885	169 to 177	169,173,177	OFDM	6.0
A	802.11n (20MHz)		169 to 177	169,173,177	OFDM	MCS0
A	802.11ac (20MHz)		169 to 177	169,173,177	OFDM	MCS0
A	802.11ax (20MHz)		169 to 177	169,173,177	OFDM	MCS0
A	802.11n (40MHz)	5835-5875	167,175	167,175	OFDM	MCS0
A	802.11ac (40MHz)		167,175	167,175	OFDM	MCS0
A	802.11ax (40MHz)		167,175	167,175	OFDM	MCS0
A	802.11ac (80MHz)	5855	171	171	OFDM	MCS0
A	802.11ax (80MHz)		171	171	OFDMA	MCS0
A	802.11ac (160MHz)	5815	163	163	OFDM	MCS0
A	802.11ax (160MHz)		163	163	OFDMA	MCS0

6. Duty Cycle Measurement

5GHz WLAN (NII) operation is possible in 20MHz, 40MHz 80MHz and 160MHz 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:

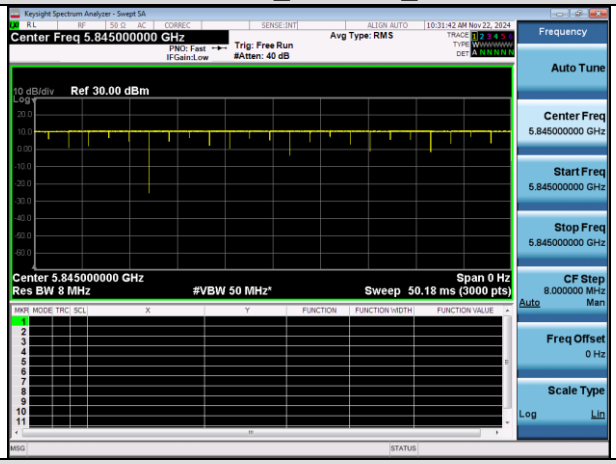
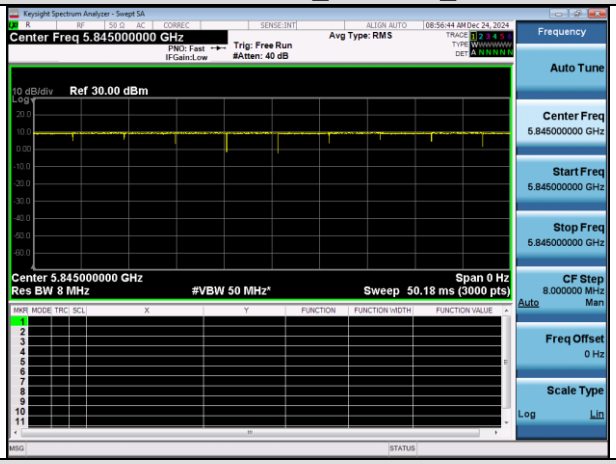
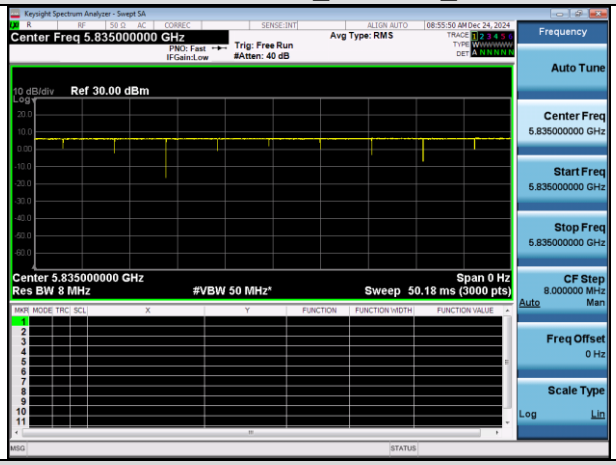
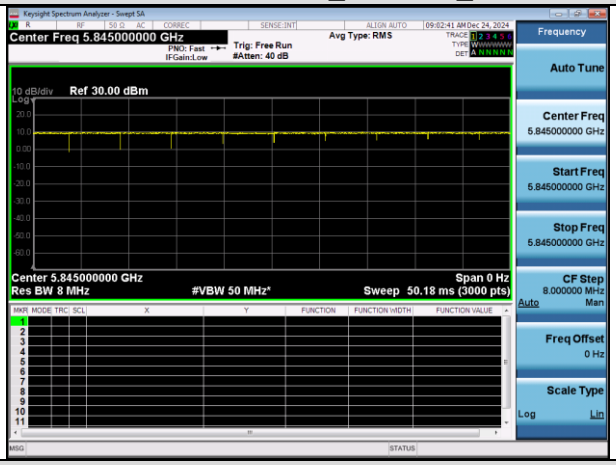
Operating mode	Data rates (Mbps)	Duty Cycle (%)	Duty Cycle Factor (dB)
Band U-NII 3/4:5725MHz-5895MHz-Chain A			
802.11a	6	100	/
802.11n_HT20	MCS0	100	/
802.11ac_VHT20	MCS0	100	/
802.11ax_HE20	MCS0	100	/
802.11n_HT40	MCS0	100	/
802.11ac_VHT40	MCS0	100	/
802.11ax_HE40	MCS0	100	/
802.11ac_VHT80	MCS0	100	/
802.11ax_HE80	MCS0	100	/
802.11ac_VHT160	MCS0	100	/
802.11ax_HE160	MCS0	100	/

Operating mode	Data rates (Mbps)	Duty Cycle (%)	Duty Cycle Factor (dB)
Band U-NII 3/4:5725MHz-5895MHz- Chain B			
802.11a	6	100	/
802.11n_HT20	MCS0	100	/
802.11ac_VHT20	MCS0	100	/
802.11ax_HE20	MCS0	100	/
802.11n_HT40	MCS0	100	/
802.11ac_VHT40	MCS0	100	/
802.11ax_HE40	MCS0	100	/
802.11ac_VHT80	MCS0	100	/
802.11ax_HE80	MCS0	100	/
802.11ac_VHT160	MCS0	100	/
802.11ax_HE160	MCS0	100	/

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 test plots as follows:

IEEE 802.11a_U-NII 3/4_Chain A	IEEE 802.11n-HT20_U-NII 3/4_Chain A
	
IEEE 802.11n-HT40_U-NII 3/4_Chain A	**IEEE 802.11ac-VHT20_U-NII 3/4_Chain A**
	
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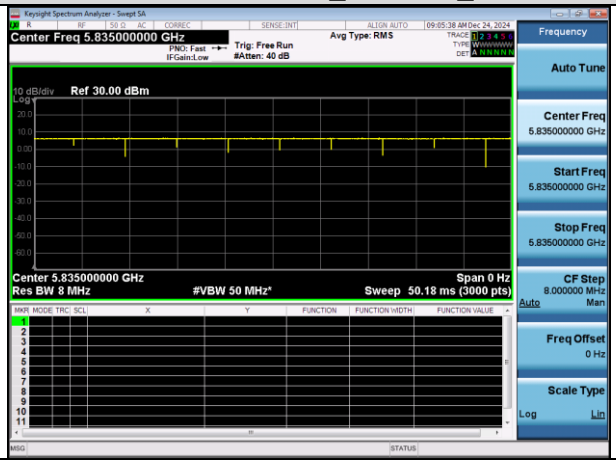	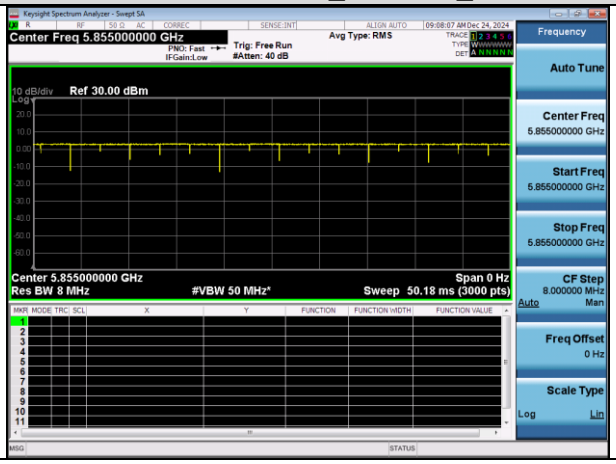

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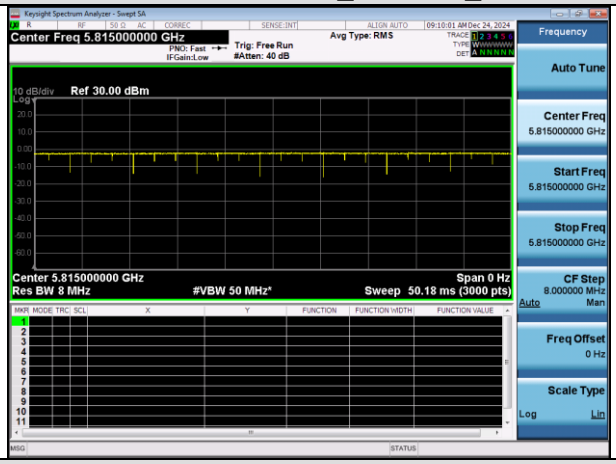	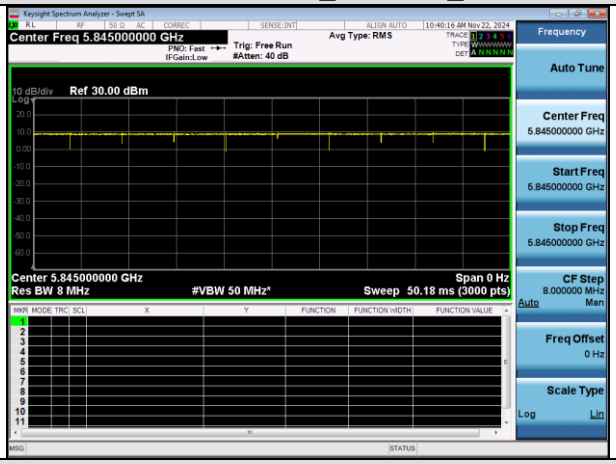
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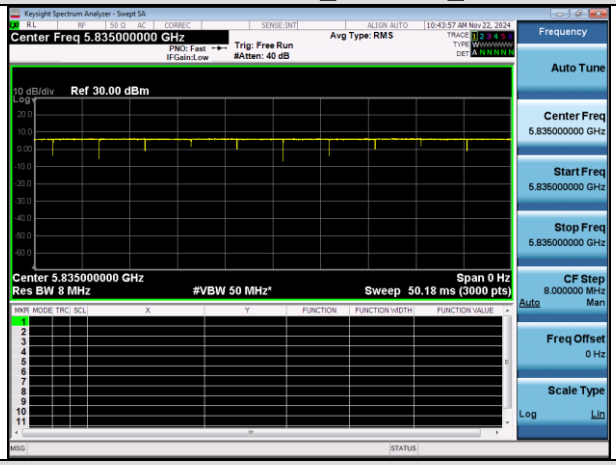	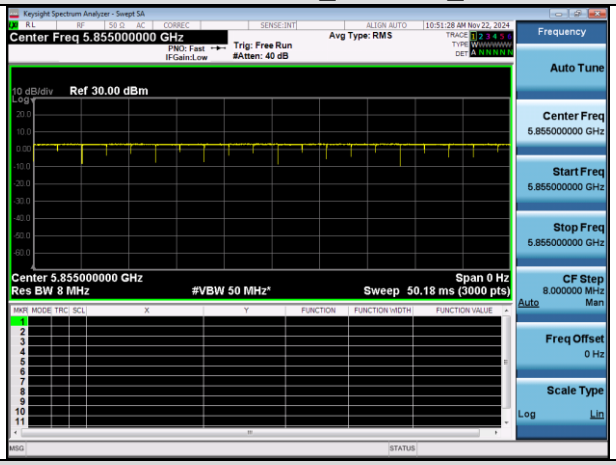
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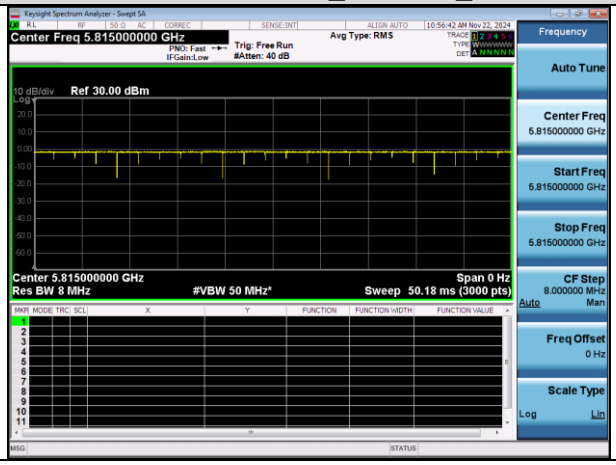
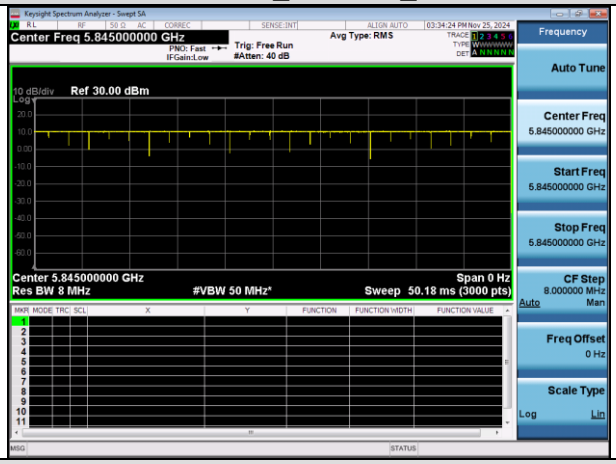
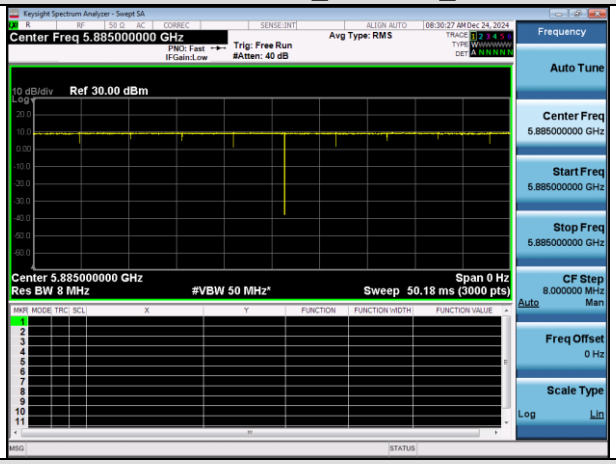
	/

IEEE 802.11a_U-NII 3/4_Chain B	IEEE 802.11n-HT20_U-NII 3/4_Chain B
	
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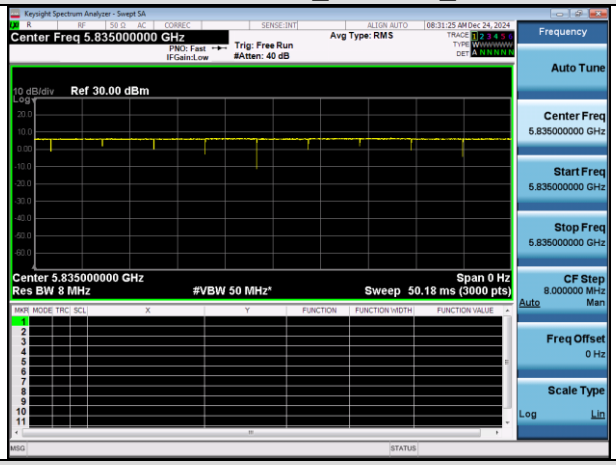	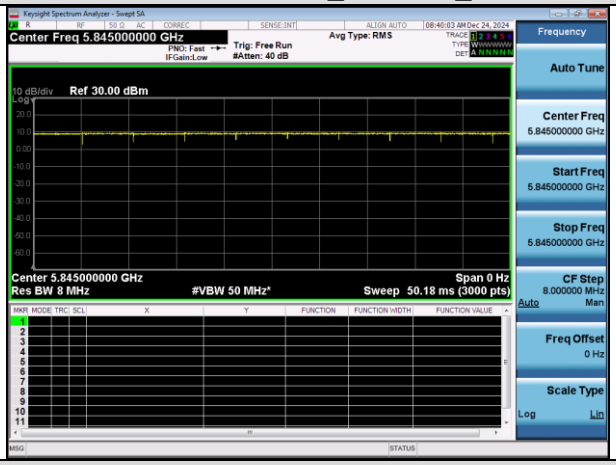
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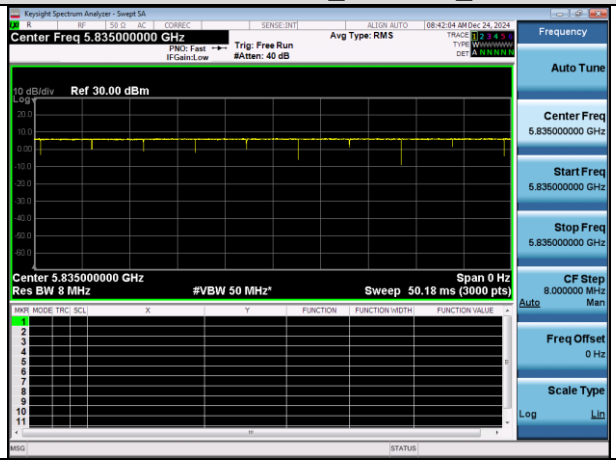
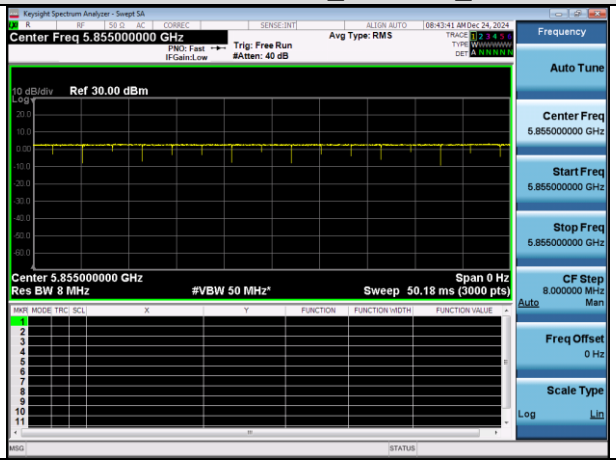
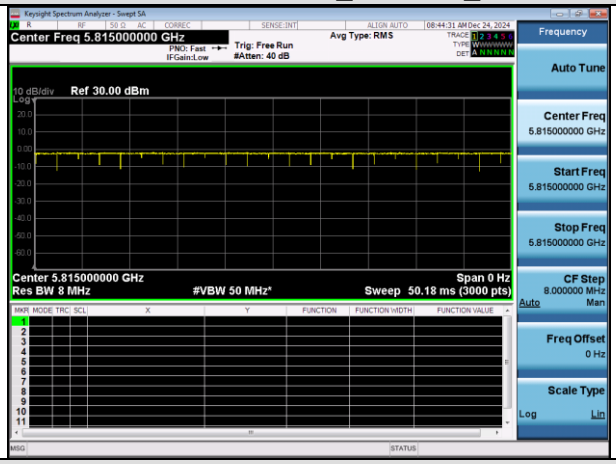
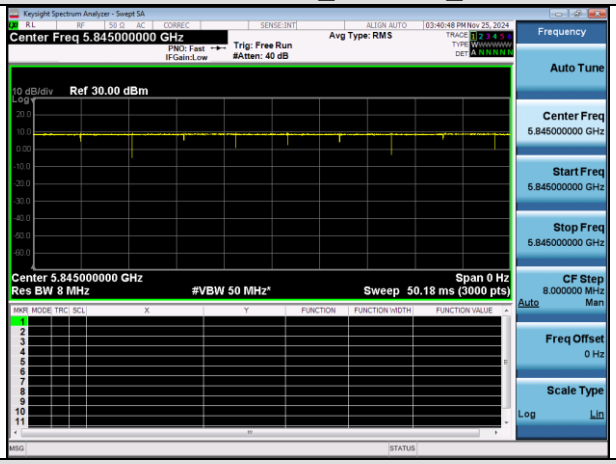
	

IEEE 802.11ac-VHT160_U-NII 3/4_Chain B	IEEE 802.11ax-HE20_U-NII 3/4_Chain B
	
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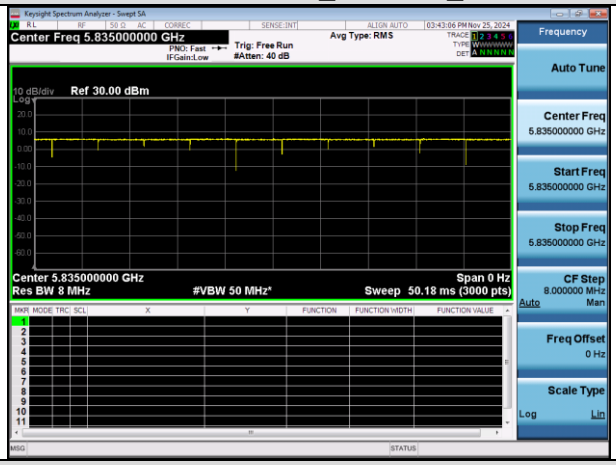
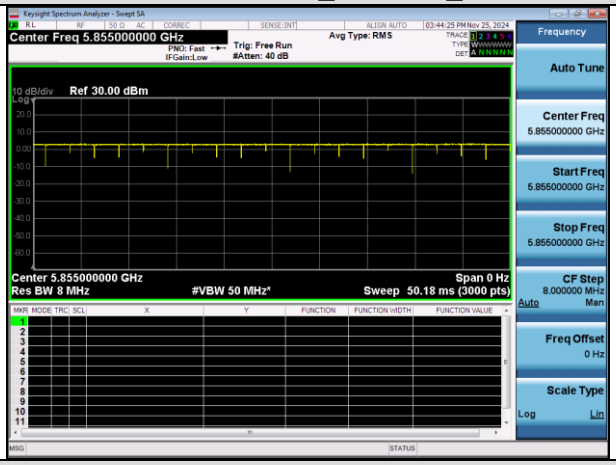
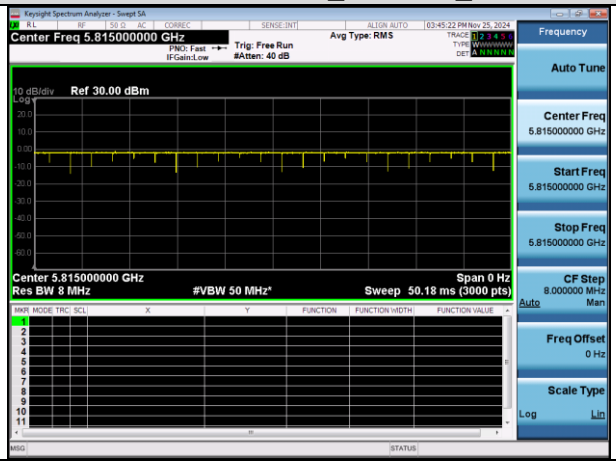
	
IEEE 802.11ax-HE160_U-NII 3/4_Chain B	**/**
	/

7. RF Output Power Measurement

7.1 Provisions Applicable

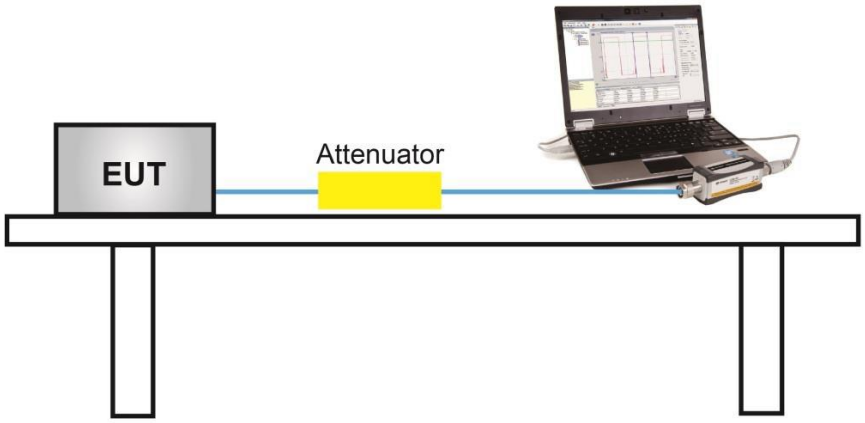
For client devices operating under the control of an indoor access point in the 5.850- 5.895 GHz band, the maximum power spectral density must not exceed 14 dBm E.I.R.P. in any 1MHz band, and the maximum E.I.R.P. over the frequency band of operation must not exceed 30 dBm. Client devices operating on a channel that spans the 5.725-5.850 GHz and 5.850-5.895 GHz bands must not exceed an E.I.R.P. of 30 dBm.

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 resulting measurement value in dBm by adding [10 log (1 / D)], where D is the duty cycle {for example, if the duty cycle is 25%, then [10 log (1 / 0.25)]}.
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 E.I.R.P. for UNII-3/4 Band (5.725-5.895GHz)							
Mode	Frequency (MHz)	Antenna	Average Power (dBm)	Ant Gain (dBi)	E.I.R.P. (dBm)	Limits (dBm)	Result
802.11a	5845	Chain A	13.33	3.1	16.43	≤30	PASS
	5865	Chain A	13.26	3.1	16.36	≤30	PASS
	5885	Chain A	13.32	3.1	16.42	≤30	PASS
802.11n20	5845	Chain A	9.35	3.1	12.45	≤30	PASS
	5865	Chain A	9.25	3.1	12.35	≤30	PASS
	5885	Chain A	9.31	3.1	12.41	≤30	PASS
802.11n40	5835	Chain A	12.80	3.1	15.90	≤30	PASS
	5875	Chain A	12.65	3.1	15.75	≤30	PASS
802.11ac20	5845	Chain A	9.37	3.1	12.47	≤30	PASS
	5865	Chain A	9.13	3.1	12.23	≤30	PASS
	5885	Chain A	9.20	3.1	12.30	≤30	PASS
802.11ac40	5835	Chain A	12.84	3.1	15.94	≤30	PASS
	5875	Chain A	12.64	3.1	15.74	≤30	PASS
802.11ac80	5855	Chain A	12.79	3.1	15.89	≤30	PASS
802.11ac160	5815	Chain A	12.64	3.0	15.64	≤30	PASS
802.11ax20	5845	Chain A	8.31	3.1	11.41	≤30	PASS
	5865	Chain A	8.18	3.1	11.28	≤30	PASS
	5885	Chain A	8.16	3.1	11.26	≤30	PASS
802.11ax40	5835	Chain A	12.24	3.1	15.34	≤30	PASS
	5875	Chain A	12.15	3.1	15.25	≤30	PASS
802.11ax80	5855	Chain A	12.50	3.1	15.60	≤30	PASS
802.11ax160	5815	Chain A	12.28	3.0	15.28	≤30	PASS

Test Data of E.I.R.P. for UNII-3/4 Band (5.725-5.895GHz)							
Mode	Frequency (MHz)	Antenna	Average Power (dBm)	Ant Gain (dBi)	E.I.R.P. (dBm)	Limits (dBm)	Result
802.11a	5845	Chain B	13.10	6.6	16.00	≤30	PASS
	5865	Chain B	13.08	6.6	15.98	≤30	PASS
	5885	Chain B	13.43	6.6	16.33	≤30	PASS
802.11n20	5845	Chain B	9.33	6.6	12.23	≤30	PASS
	5865	Chain B	9.14	6.6	12.04	≤30	PASS
	5885	Chain B	9.29	6.6	12.19	≤30	PASS
802.11n40	5835	Chain B	12.57	6.6	15.47	≤30	PASS
	5875	Chain B	12.23	6.6	15.13	≤30	PASS
802.11ac20	5845	Chain B	9.32	6.6	12.22	≤30	PASS
	5865	Chain B	9.10	6.6	12.00	≤30	PASS
	5885	Chain B	9.29	6.6	12.19	≤30	PASS
802.11ac40	5835	Chain B	12.55	6.6	15.35	≤30	PASS
	5875	Chain B	12.23	6.6	15.13	≤30	PASS
802.11ac80	5855	Chain B	12.46	6.6	15.36	≤30	PASS
802.11ac160	5815	Chain B	12.52	6.5	15.42	≤30	PASS
802.11ax20	5845	Chain B	8.40	6.6	11.30	≤30	PASS
	5865	Chain B	8.23	6.6	11.13	≤30	PASS
	5885	Chain B	8.37	6.6	11.27	≤30	PASS
802.11ax40	5835	Chain B	12.09	6.6	14.99	≤30	PASS
	5875	Chain B	12.11	6.6	15.01	≤30	PASS
802.11ax80	5855	Chain B	12.36	6.6	15.26	≤30	PASS
802.11ax160	5815	Chain B	11.79	6.5	14.59	≤30	PASS

Test Data of E.I.R.P. for UNII-3/4 Band (5.725-5.895GHz)							
Mode	Frequency (MHz)	Antenna	Average Power (dBm)	D.G. (dBi)	E.I.R.P. (dBm)	Limits (dBm)	Result
802.11n20	5845	MIMO	12.35	6.01	18.36	≤30	PASS
	5865	MIMO	12.21	6.01	18.22	≤30	PASS
	5885	MIMO	12.31	6.01	18.32	≤30	PASS
802.11n40	5835	MIMO	15.70	6.01	21.71	≤30	PASS
	5875	MIMO	15.46	6.01	21.47	≤30	PASS
802.11ac20	5845	MIMO	12.36	6.01	18.37	≤30	PASS
	5865	MIMO	12.13	6.01	18.14	≤30	PASS
	5885	MIMO	12.26	6.01	18.27	≤30	PASS
802.11ac40	5835	MIMO	15.71	6.01	21.72	≤30	PASS
	5875	MIMO	15.45	6.01	21.46	≤30	PASS
802.11ac80	5855	MIMO	15.64	6.01	21.65	≤30	PASS
802.11ac160	5815	MIMO	15.59	5.91	21.50	≤30	PASS
802.11ax20	5845	MIMO	11.37	6.01	17.38	≤30	PASS
	5865	MIMO	11.22	6.01	17.23	≤30	PASS
	5885	MIMO	11.28	6.01	17.29	≤30	PASS
802.11ax40	5835	MIMO	15.18	6.01	21.19	≤30	PASS
	5875	MIMO	15.14	6.01	21.15	≤30	PASS
802.11ax80	5855	MIMO	15.44	6.01	21.45	≤30	PASS
802.11ax160	5815	MIMO	15.05	5.91	20.96	≤30	PASS

Note:

1. E.I.R.P. (dBm)= Average Powe(dBm)+ANT Gain(dBi)
2. Total E.I.R.P. (dBm)= Total Average Powe(dBm)+ Directional gain (dBi)

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:

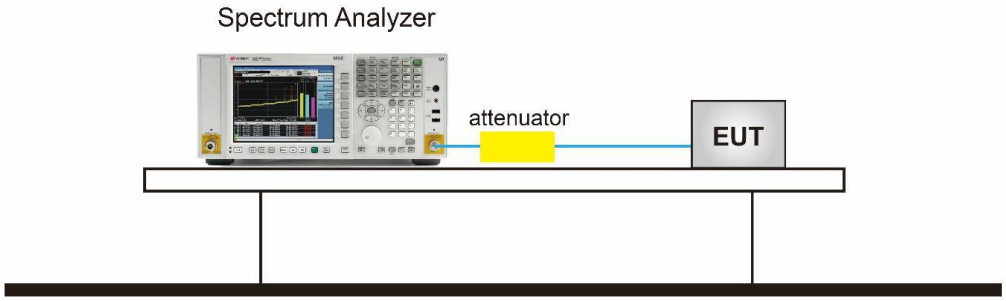
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set Span = approximately 1.5 to 5 times the OBW, centered on a nominal channel
4. The nominal IF filter bandwidth (3 dB RBW) shall 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
5. 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

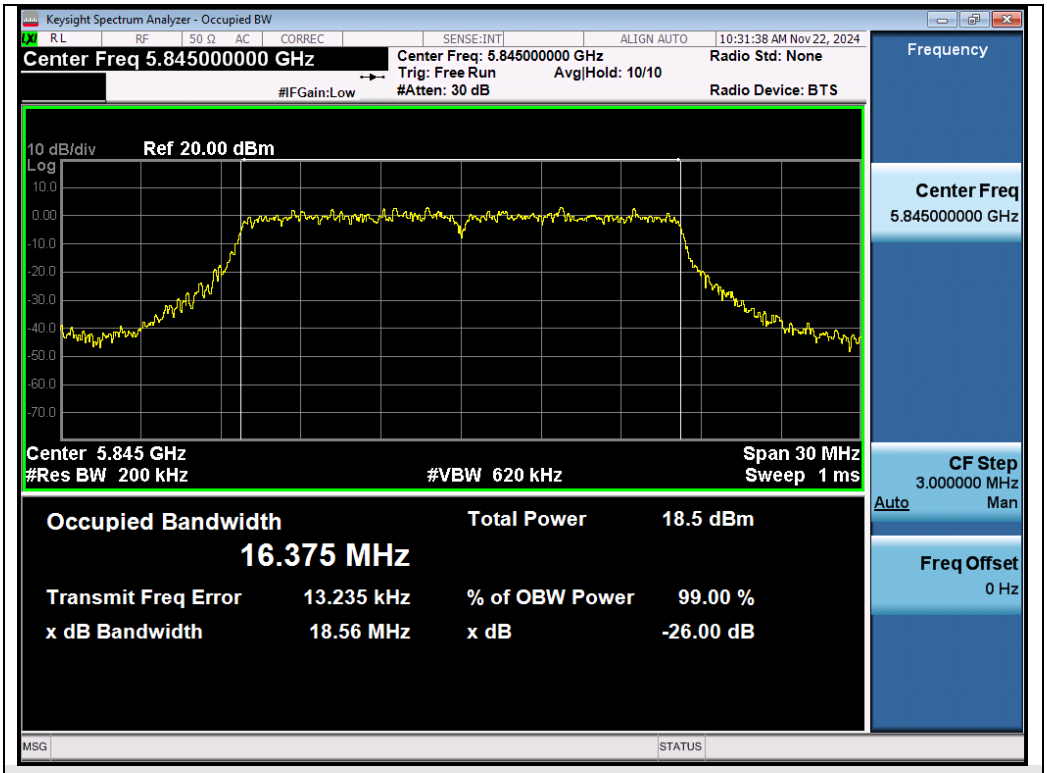
Test Data of Occupied Bandwidth and -26dB Bandwidth for UNII-3/4 Band (5.725-5.895GHz)-Chain A					
Mode	Frequency (MHz)	99% Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Result
802.11a	5845	16.375	18.56	N/A	PASS
	5865	16.392	18.91	N/A	PASS
	5885	16.366	19.10	N/A	PASS
802.11n20	5845	17.574	20.19	N/A	PASS
	5865	17.562	20.19	N/A	PASS
	5885	17.558	20.33	N/A	PASS
802.11n40	5835	36.051	39.61	N/A	PASS
	5875	36.051	39.43	N/A	PASS
802.11ac20	5845	17.588	19.98	N/A	PASS
	5865	17.588	20.22	N/A	PASS
	5885	17.600	20.12	N/A	PASS
802.11ac40	5835	36.015	39.35	N/A	PASS
	5875	36.025	39.57	N/A	PASS
802.11ac80	5855	75.412	82.08	N/A	PASS
802.11ac160	5815	154.339	165.4	N/A	PASS
802.11ax20	5845	18.902	21.14	N/A	PASS
	5865	18.943	20.72	N/A	PASS
	5885	18.928	21.09	N/A	PASS
802.11ax40	5835	37.781	39.95	N/A	PASS
	5875	37.747	40.62	N/A	PASS
802.11ax80	5855	77.087	81.61	N/A	PASS
802.11ax160	5815	156.064	164.7	N/A	PASS

Test Data of Occupied Bandwidth and -26dB Bandwidth for UNII-3/4 Band (5.725-5.895GHz)-Chain A					
Mode	Frequency (MHz)	99% Bandwidth (MHz)	DTS Bandwidth (MHz)	Limits (MHz)	Result
802.11a	5845	16.352	16.353	⩾0.5	PASS
	5865	16.334	16.352	⩾0.5	PASS
	5885	16.341	16.333	⩾0.5	PASS
802.11n20	5845	17.581	17.615	⩾0.5	PASS
	5865	17.555	17.323	⩾0.5	PASS
	5885	17.561	17.590	⩾0.5	PASS
802.11n40	5835	36.026	35.259	⩾0.5	PASS
	5875	36.099	36.425	⩾0.5	PASS
802.11ac20	5845	17.573	17.672	⩾0.5	PASS
	5865	17.583	17.716	⩾0.5	PASS
	5885	17.582	17.072	⩾0.5	PASS
802.11ac40	5835	36.003	35.699	⩾0.5	PASS
	5875	36.029	36.357	⩾0.5	PASS
802.11ac80	5855	75.331	75.530	⩾0.5	PASS
802.11ac160	5815	154.42	155.438	⩾0.5	PASS
802.11ax20	5845	18.897	18.770	⩾0.5	PASS
	5865	18.897	18.577	⩾0.5	PASS
	5885	18.892	18.936	⩾0.5	PASS
802.11ax40	5835	37.702	37.827	⩾0.5	PASS
	5875	37.702	37.524	⩾0.5	PASS
802.11ax80	5855	77.105	77.850	⩾0.5	PASS
802.11ax160	5815	155.96	157.834	⩾0.5	PASS

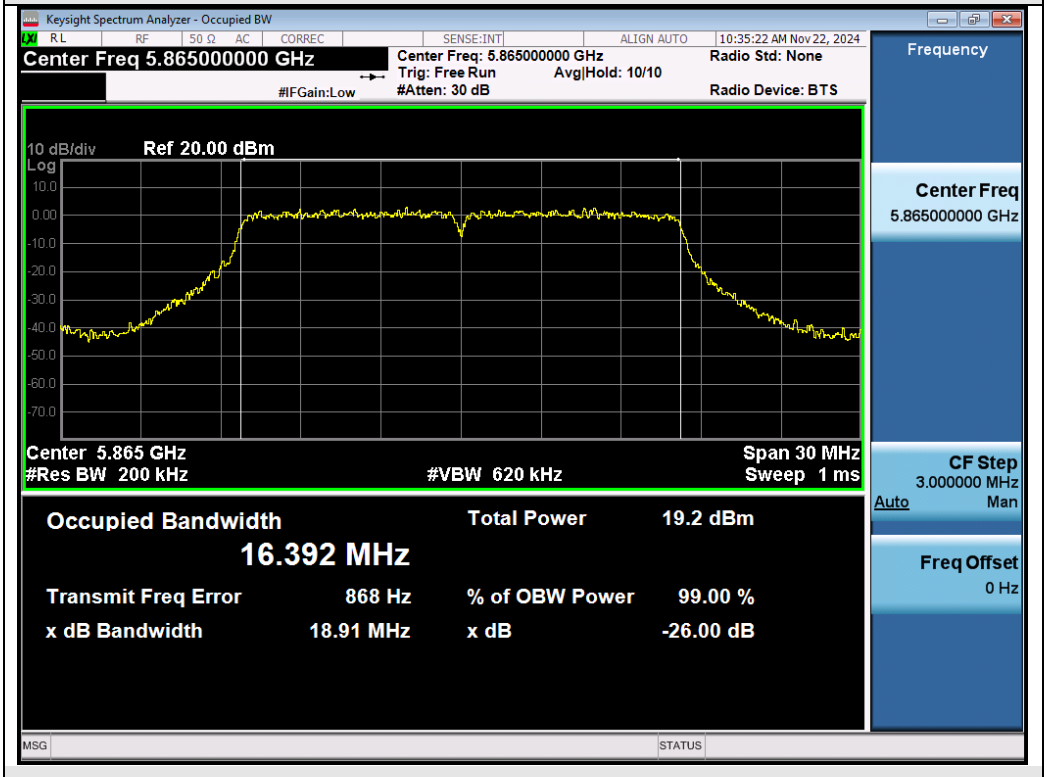
Test Data of Occupied Bandwidth and -26dB Bandwidth for UNII-3/4 Band (5.725-5.895GHz)-Chain B					
Mode	Frequency (MHz)	99% Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Result
802.11a	5845	16.387	18.65	N/A	PASS
	5865	16.374	18.73	N/A	PASS
	5885	16.376	19.04	N/A	PASS
802.11n20	5845	17.576	20.15	N/A	PASS
	5865	17.571	20.04	N/A	PASS
	5885	17.572	19.94	N/A	PASS
802.11n40	5835	36.085	39.10	N/A	PASS
	5875	36.032	39.44	N/A	PASS
802.11ac20	5845	17.582	20.03	N/A	PASS
	5865	17.594	20.21	N/A	PASS
	5885	17.593	19.89	N/A	PASS
802.11ac40	5835	36.051	39.70	N/A	PASS
	5875	36.051	39.71	N/A	PASS
802.11ac80	5855	75.431	81.51	N/A	PASS
802.11ac160	5815	154.499	163.9	N/A	PASS
802.11ax20	5845	18.928	20.70	N/A	PASS
	5865	18.916	20.92	N/A	PASS
	5885	18.934	20.89	N/A	PASS
802.11ax40	5835	37.780	40.12	N/A	PASS
	5875	37.669	40.37	N/A	PASS
802.11ax80	5855	77.116	81.02	N/A	PASS
802.11ax160	5815	156.066	165.1	N/A	PASS

Test Data of Occupied Bandwidth and -26dB Bandwidth for UNII-3/4 Band (5.725-5.895GHz)-Chain B					
Mode	Frequency (MHz)	99% Bandwidth (MHz)	DTS Bandwidth (MHz)	Limits (MHz)	Result
802.11a	5845	16.363	16.378	⩾0.5	PASS
	5865	16.359	16.333	⩾0.5	PASS
	5885	16.350	16.370	⩾0.5	PASS
802.11n20	5845	17.577	17.666	⩾0.5	PASS
	5865	17.572	17.577	⩾0.5	PASS
	5885	17.563	17.567	⩾0.5	PASS
802.11n40	5835	36.047	36.348	⩾0.5	PASS
	5875	36.029	36.019	⩾0.5	PASS
802.11ac20	5845	17.570	17.613	⩾0.5	PASS
	5865	17.584	17.615	⩾0.5	PASS
	5885	17.585	17.626	⩾0.5	PASS
802.11ac40	5835	36.096	36.446	⩾0.5	PASS
	5875	36.080	34.289	⩾0.5	PASS
802.11ac80	5855	75.480	72.769	⩾0.5	PASS
802.11ac160	5815	154.37	151.973	⩾0.5	PASS
802.11ax20	5845	18.890	18.885	⩾0.5	PASS
	5865	18.915	18.491	⩾0.5	PASS
	5885	18.919	18.531	⩾0.5	PASS
802.11ax40	5835	37.695	37.599	⩾0.5	PASS
	5875	37.680	37.698	⩾0.5	PASS
802.11ax80	5855	77.155	77.885	⩾0.5	PASS
802.11ax160	5815	155.93	156.713	⩾0.5	PASS

Test Graphs of Occupied Bandwidth and -26dB Bandwidth for UNII-3/4 Band (5.725-5.895GHz)

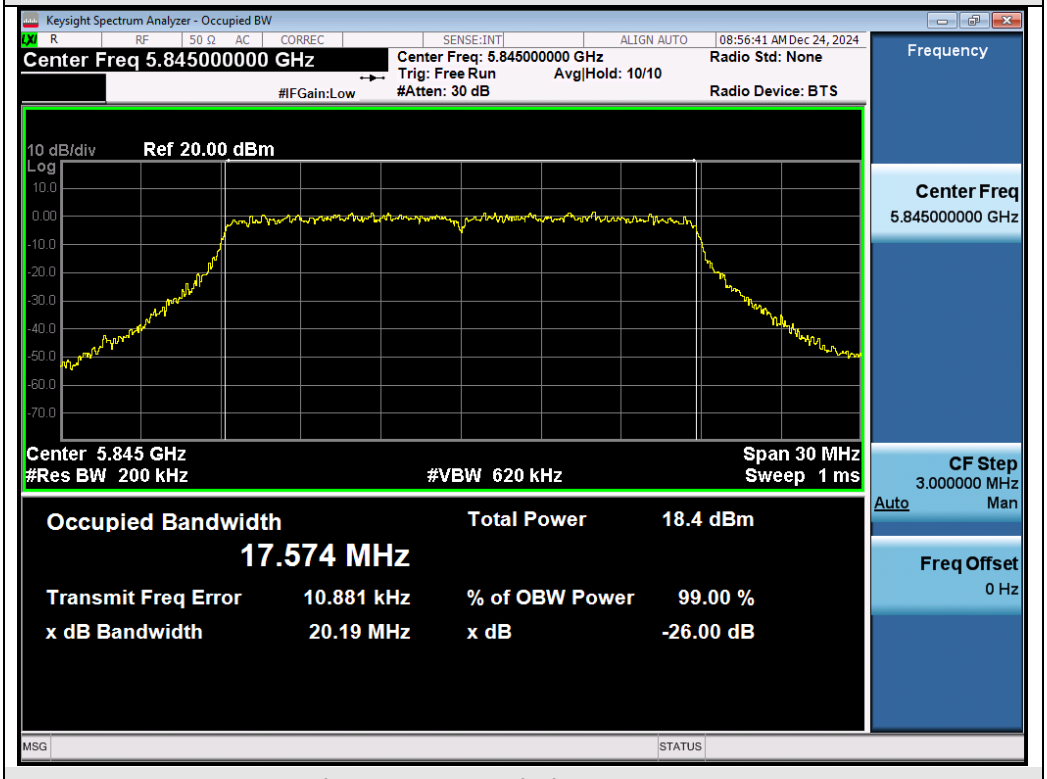


Test_Graph_802.11a_Chain A_5845_6Mbps_OBW

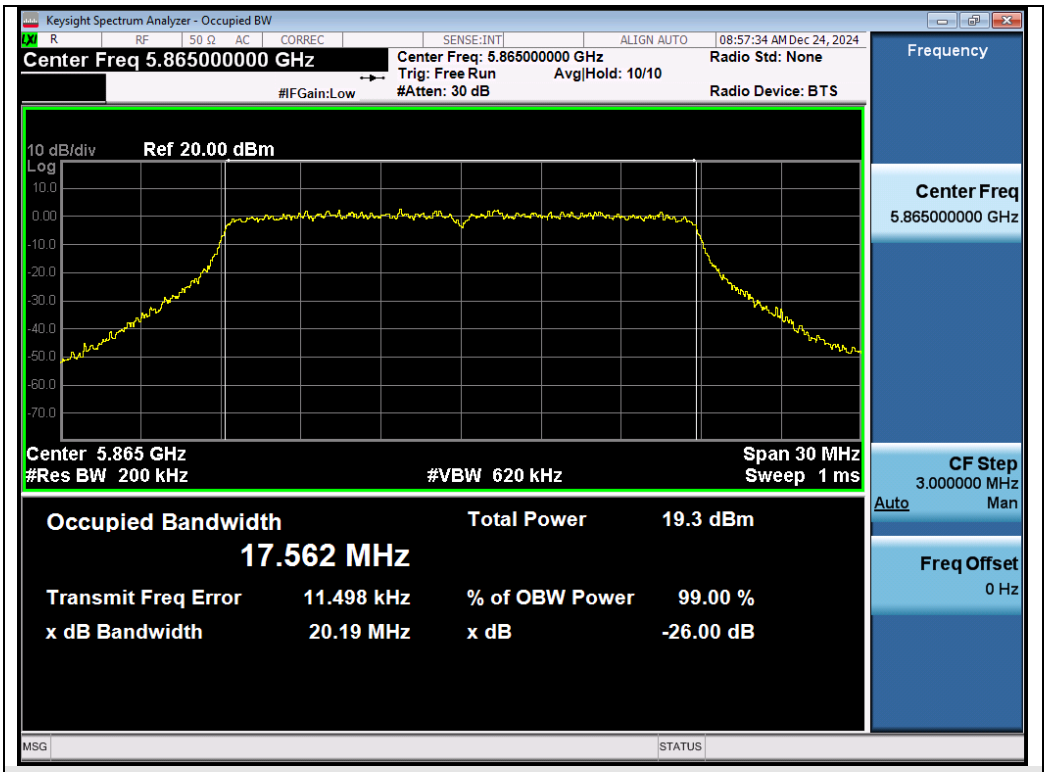


Test_Graph_802.11a_Chain A_5865_6Mbps_OBW

Test_Graph_802.11a_Chain A_5885_6Mbps_OBW

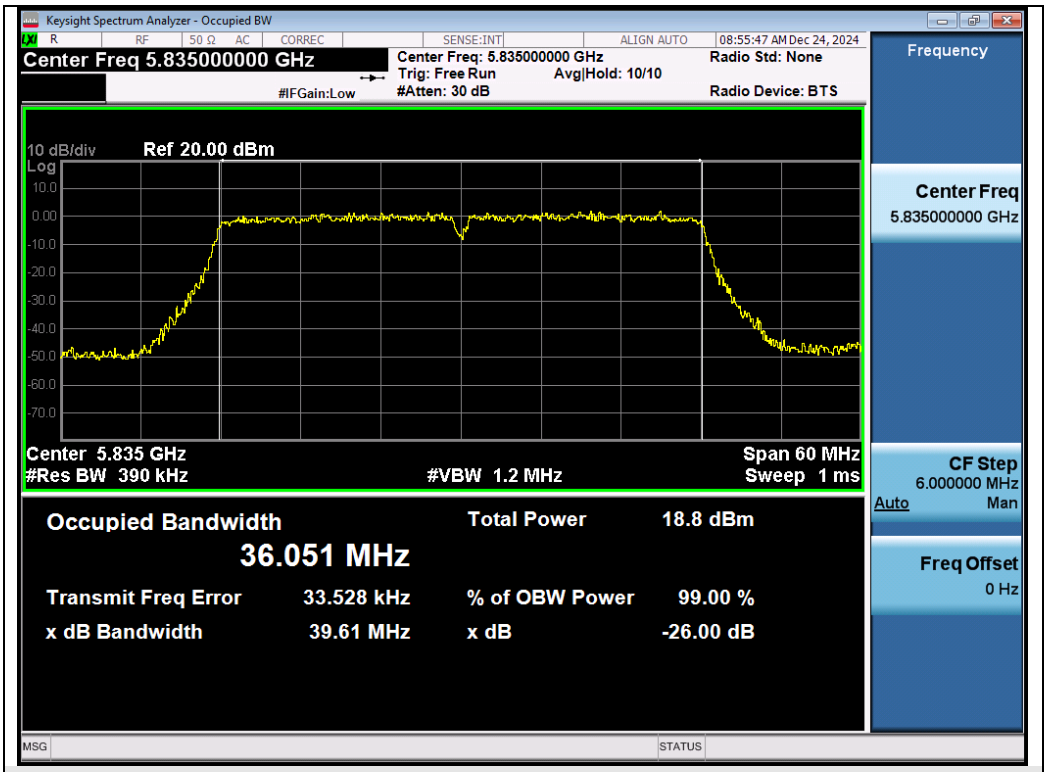


Test_Graph_802.11n20_Chain A_5845_MCS0_OBW

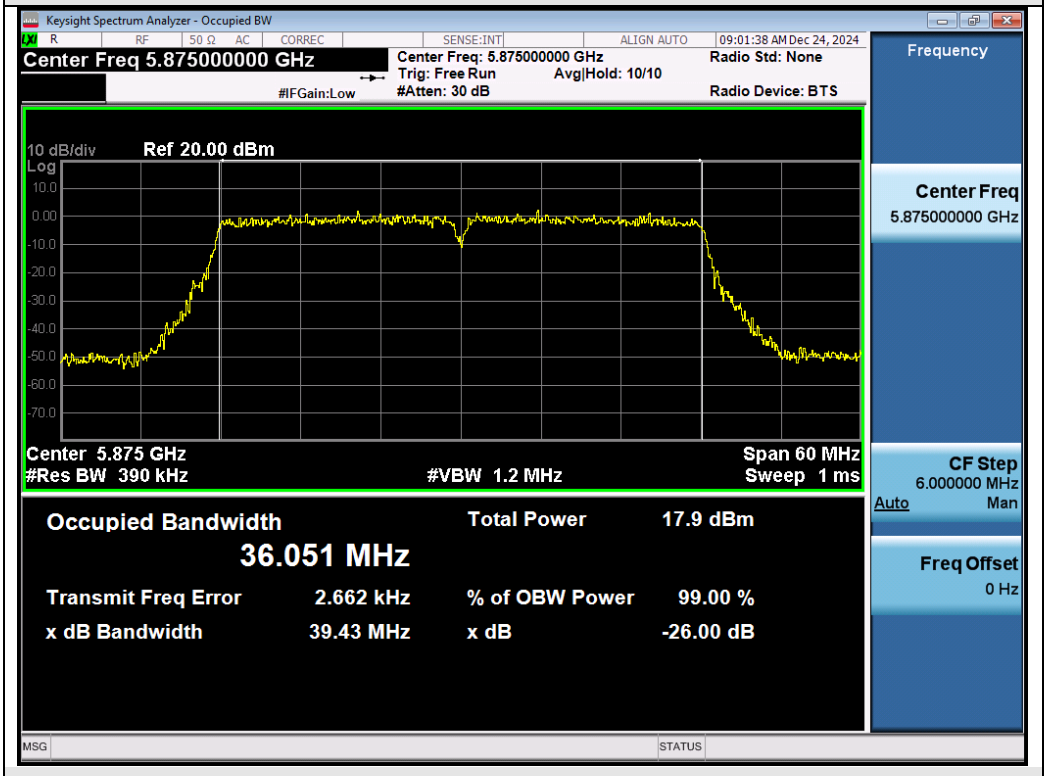


Test_Graph_802.11n20_Chain A_5865_MCS0_OBW

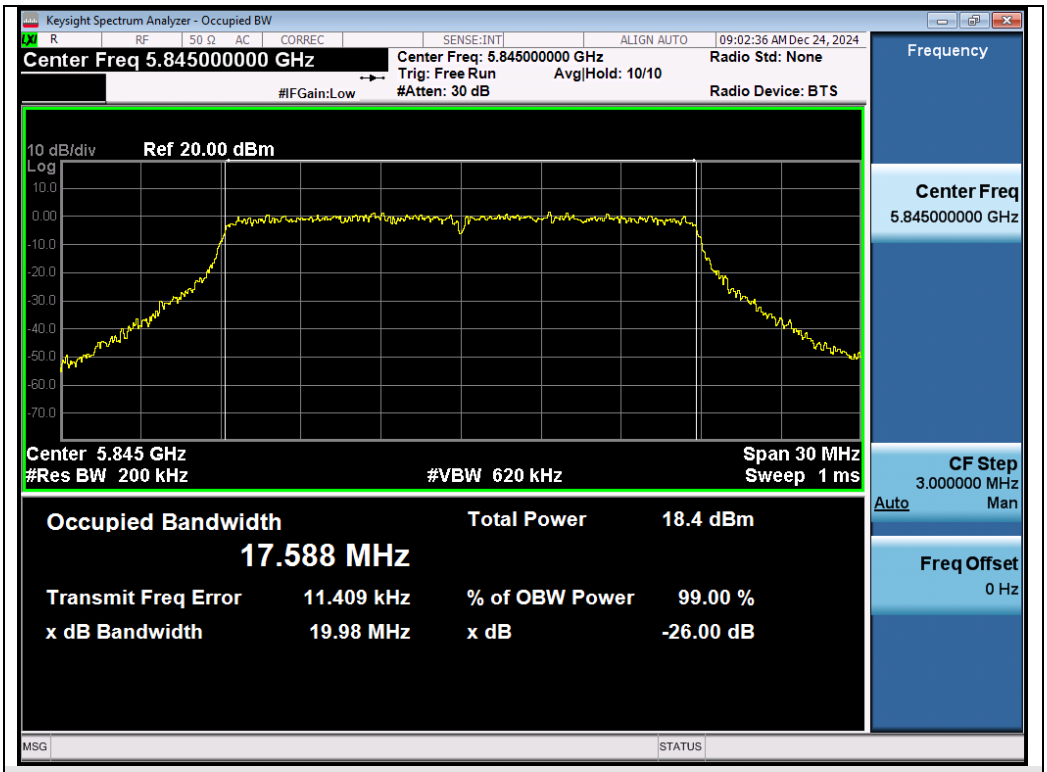
Test_Graph_802.11n20_Chain A_5885_MCS0_OBW



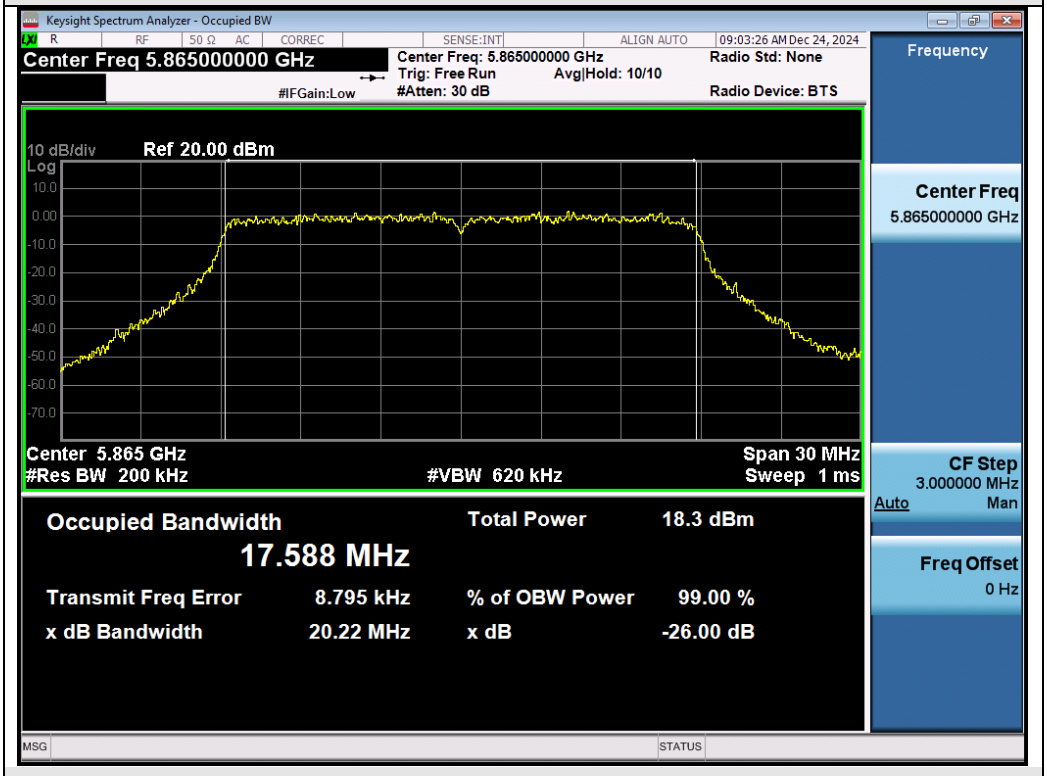
Test_Graph_802.11n40_Chain A_5835_MCS0_OBW



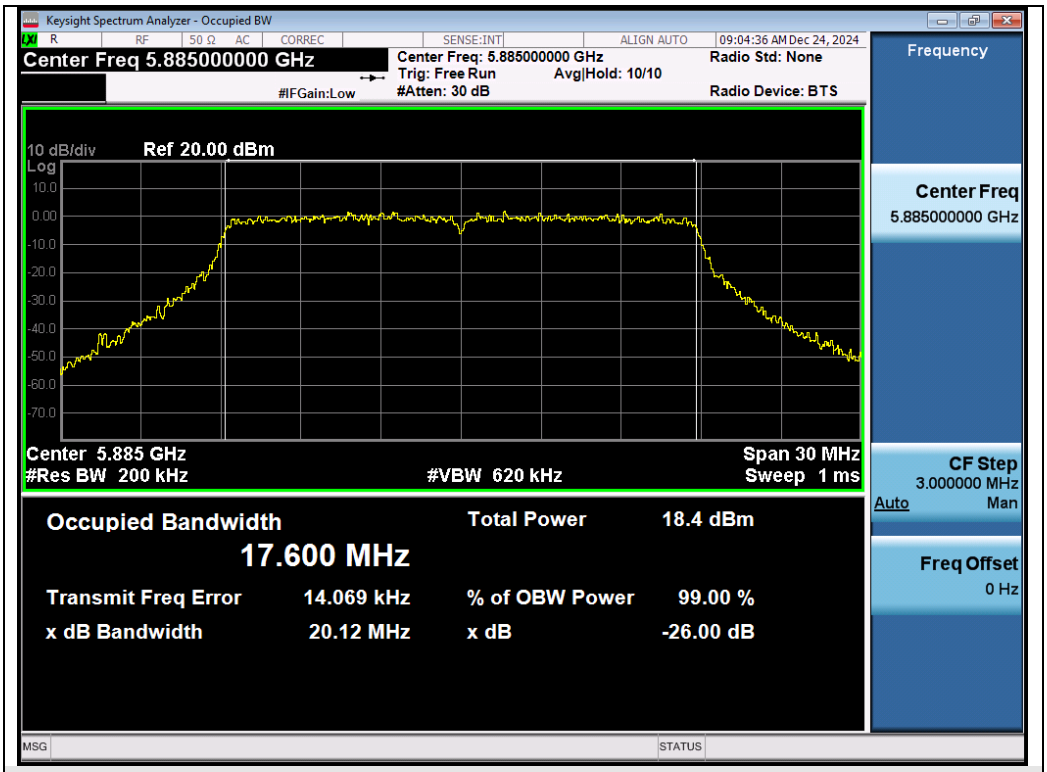
Test_Graph_802.11n40_Chain A_5875_MCS0_OBW



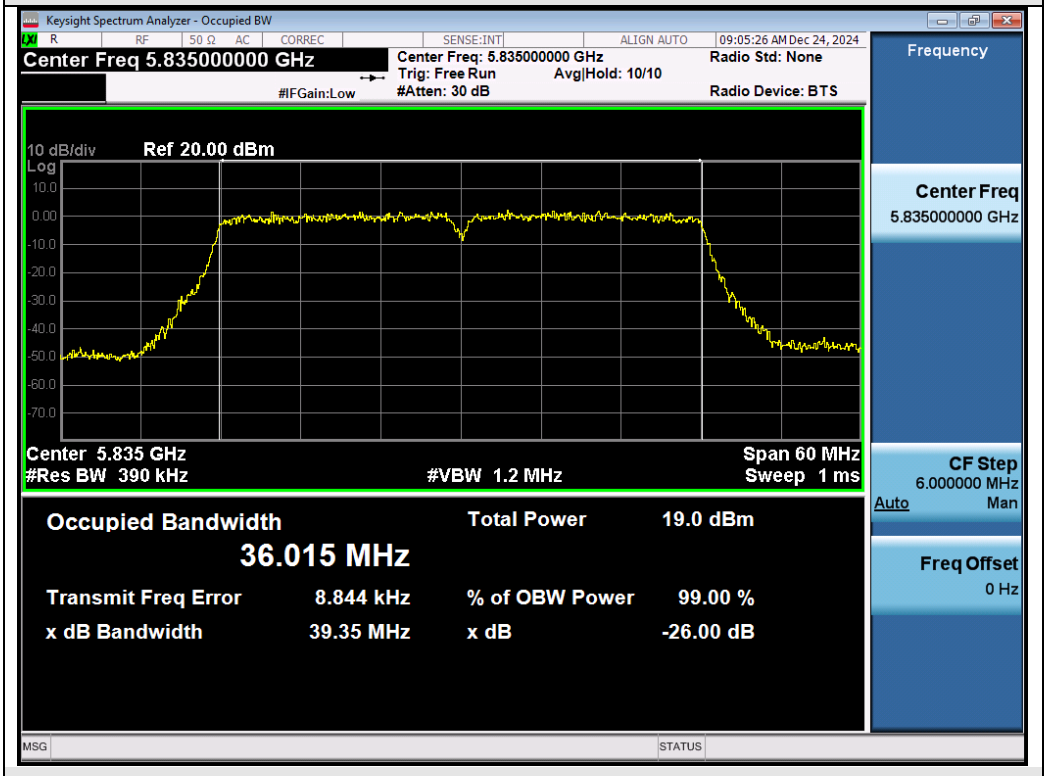
Test_Graph_802.11ac20_Chain A_5845_MCS0_OBW



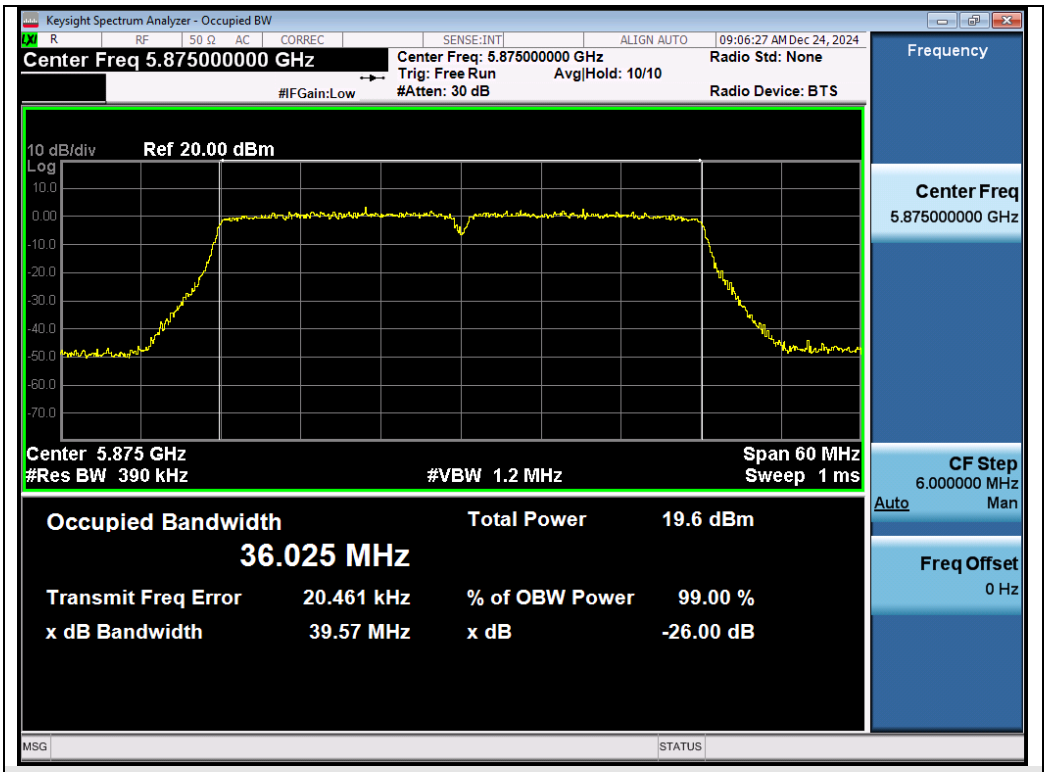
Test_Graph_802.11ac20_Chain A_5865_MCS0_OBW



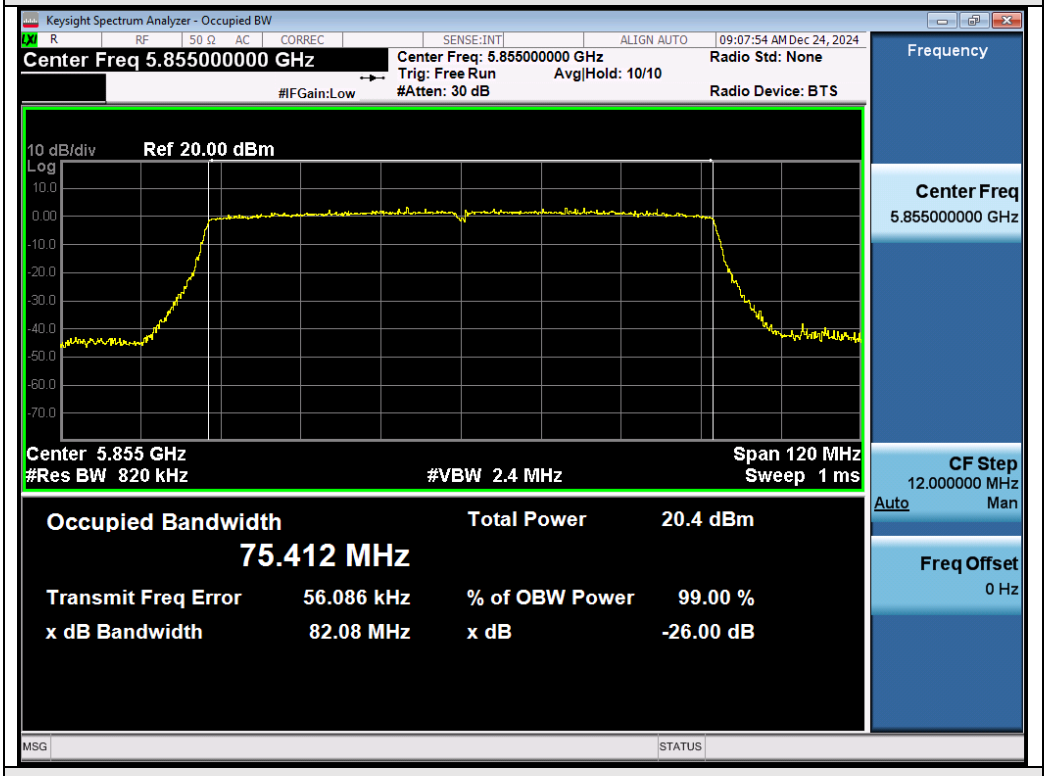
Test_Graph_802.11ac20_Chain A_5885_MCS0_OBW



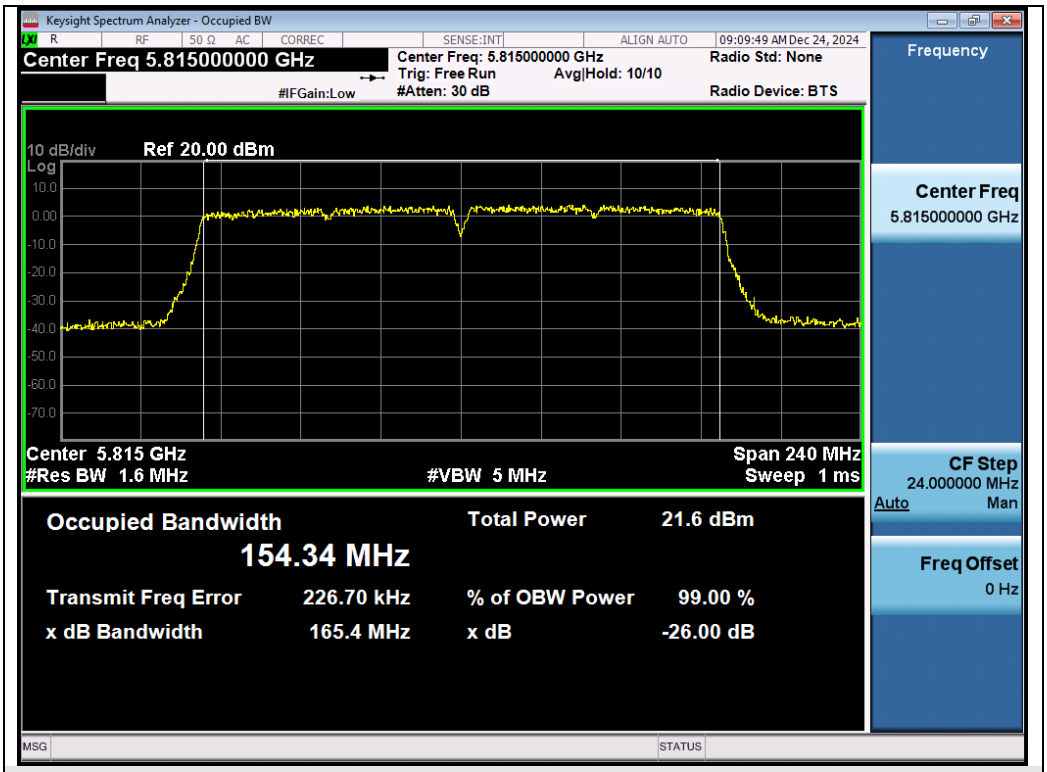
Test_Graph_802.11ac40_Chain A_5835_MCS0_OBW



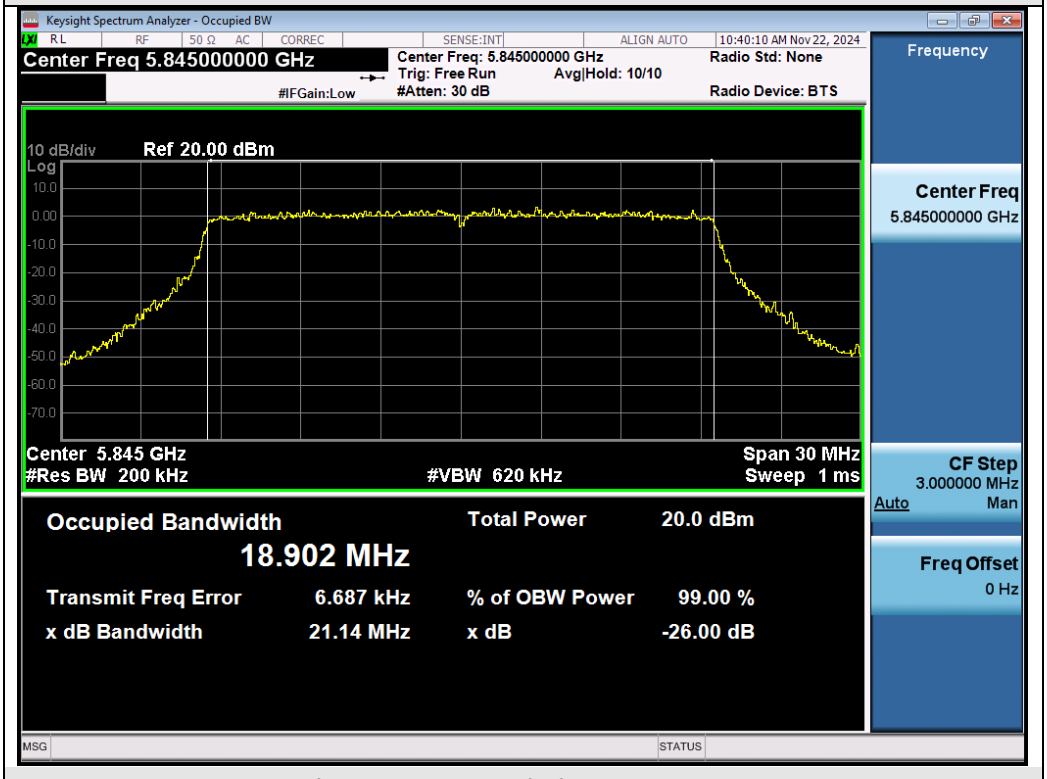
Test_Graph_802.11ac40_Chain A_5875_MCS0_OBW



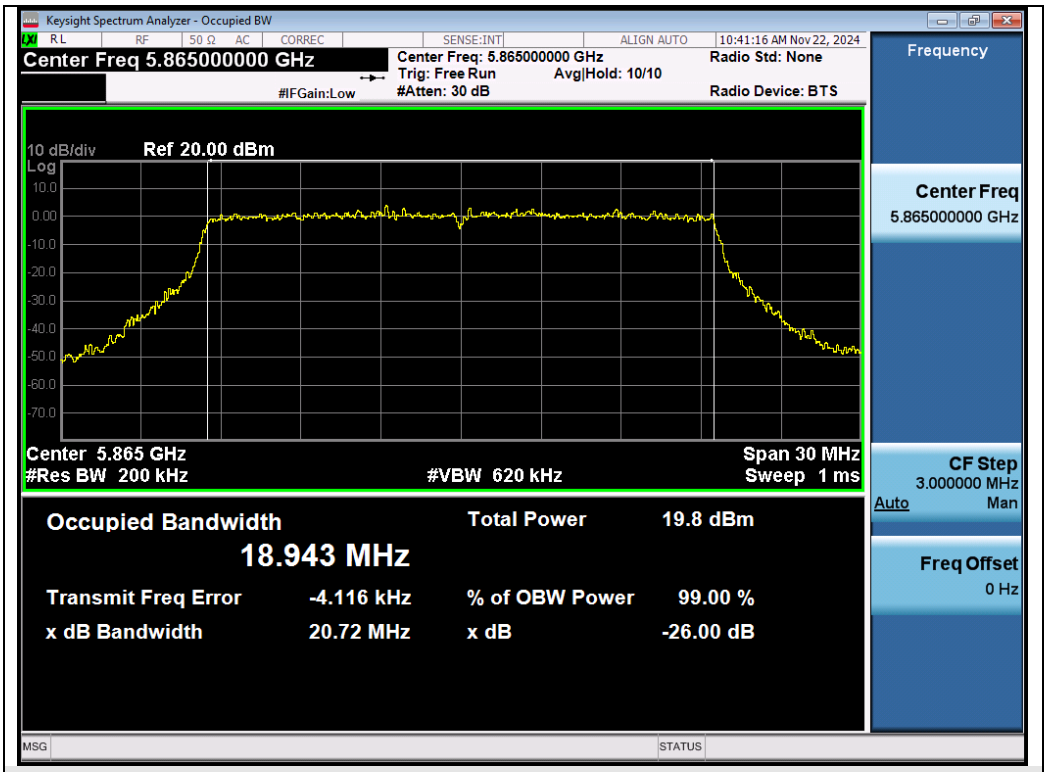
Test_Graph_802.11ac80_Chain A_5855_MCS0_OBW



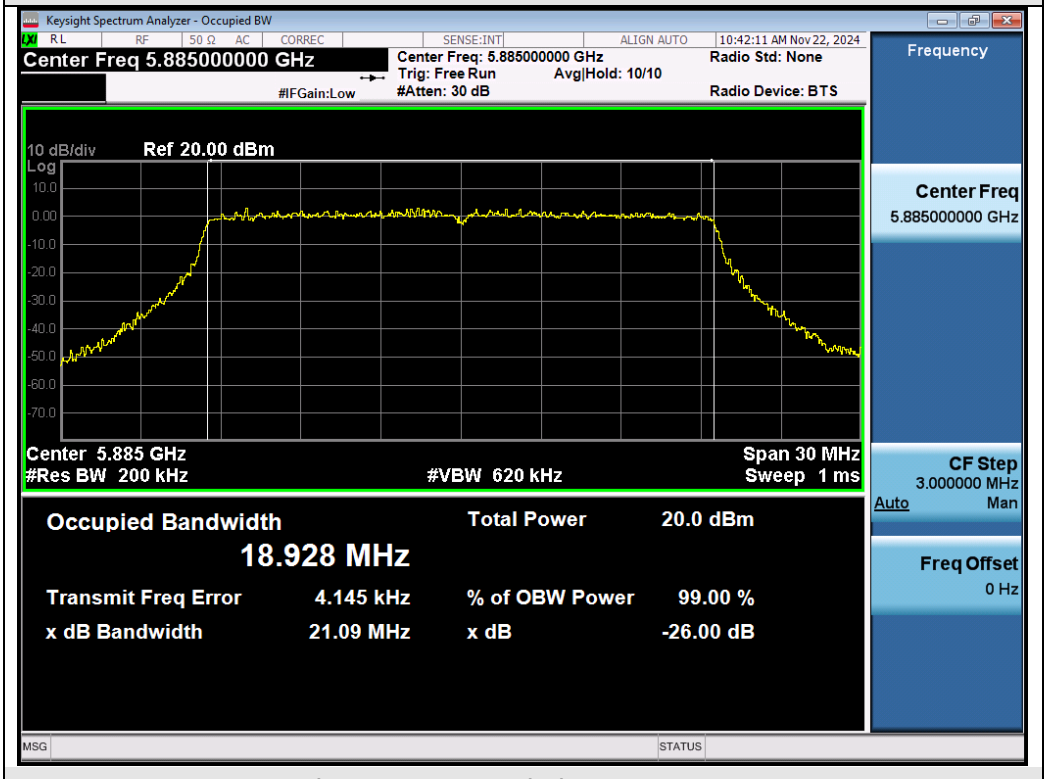
Test_Graph_802.11ac160_Chain A_5815_MCS0_OBW



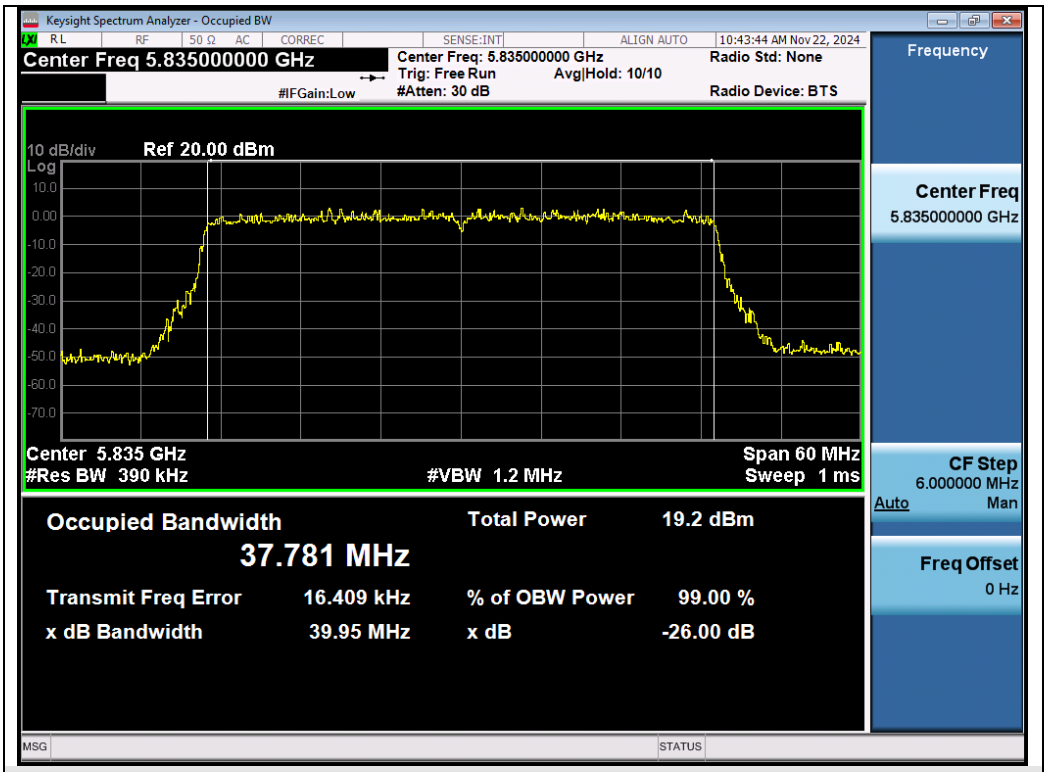
Test_Graph_802.11ax20_Chain A_5845_MCS0_OBW



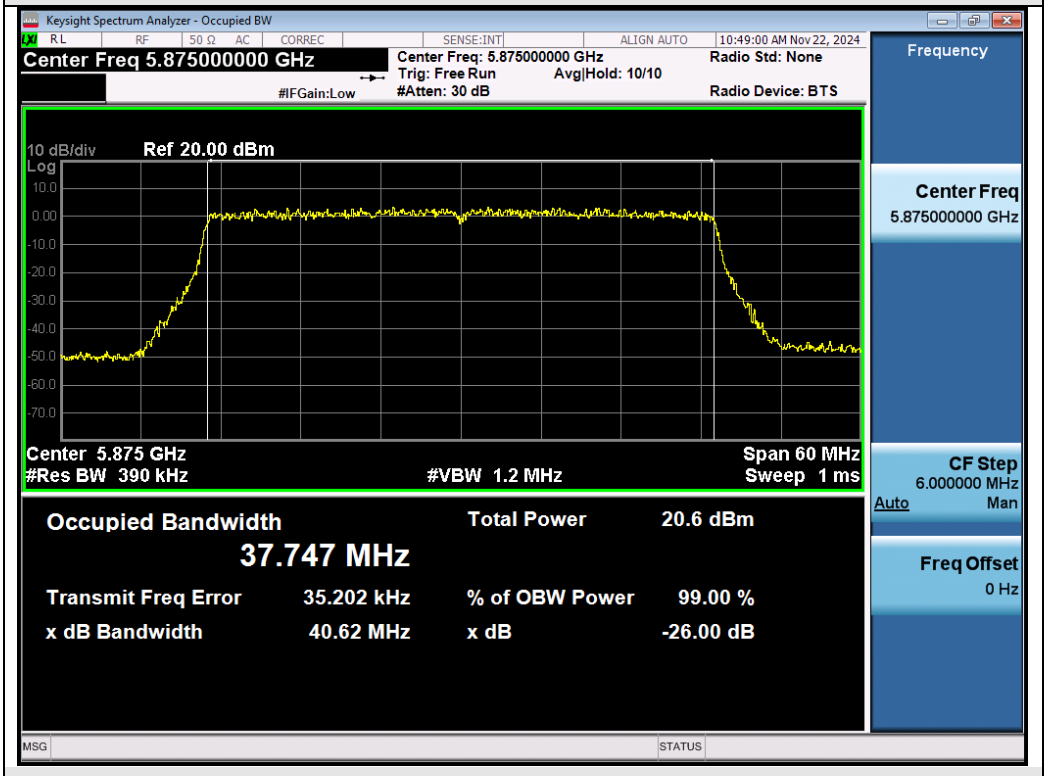
Test_Graph_802.11ax20_Chain A_5865_MCS0_OBW



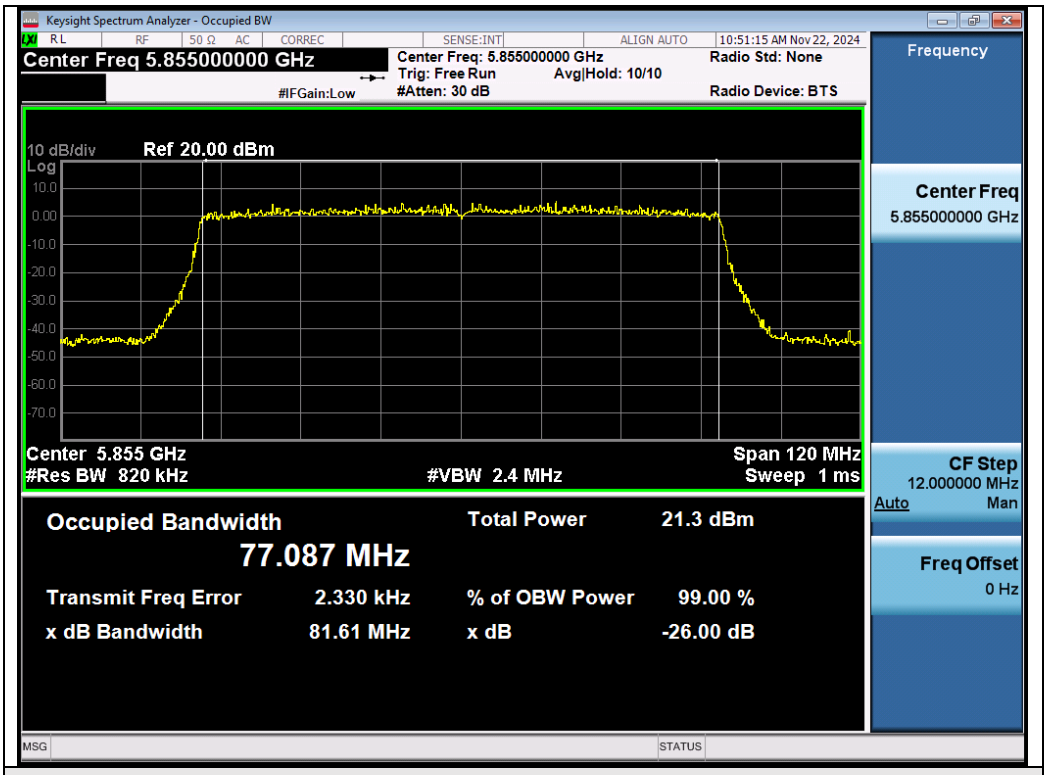
Test_Graph_802.11ax20_Chain A_5885_MCS0_OBW



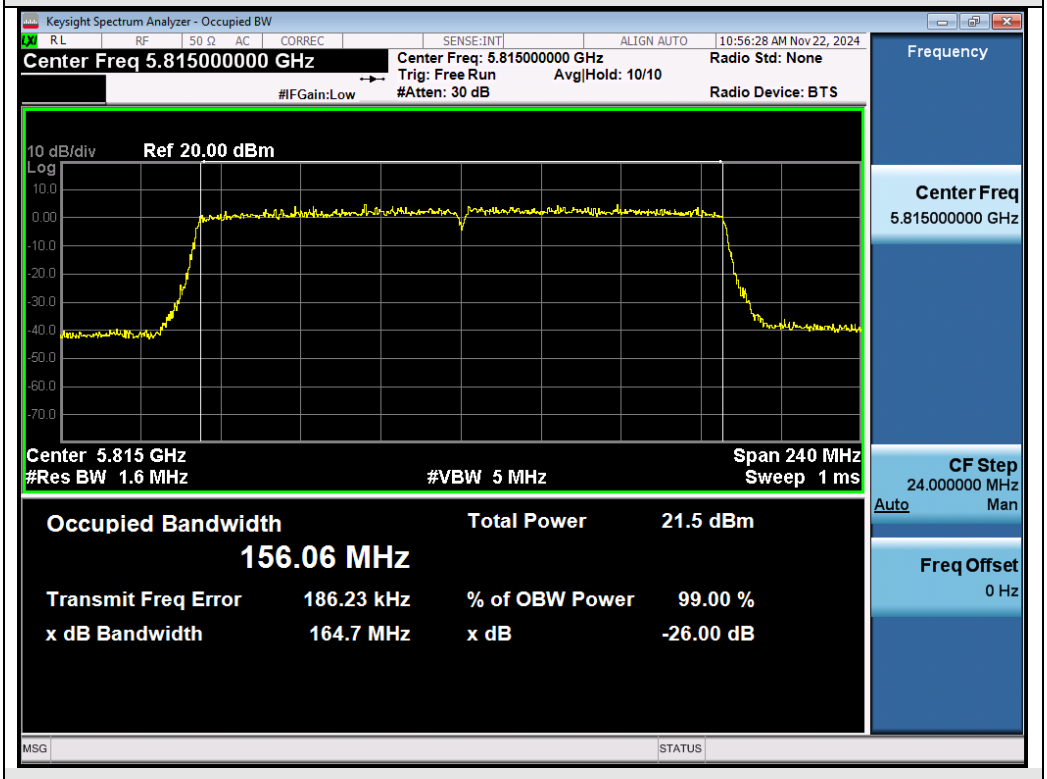
Test_Graph_802.11ax40_Chain A_5835_MCS0_OBW



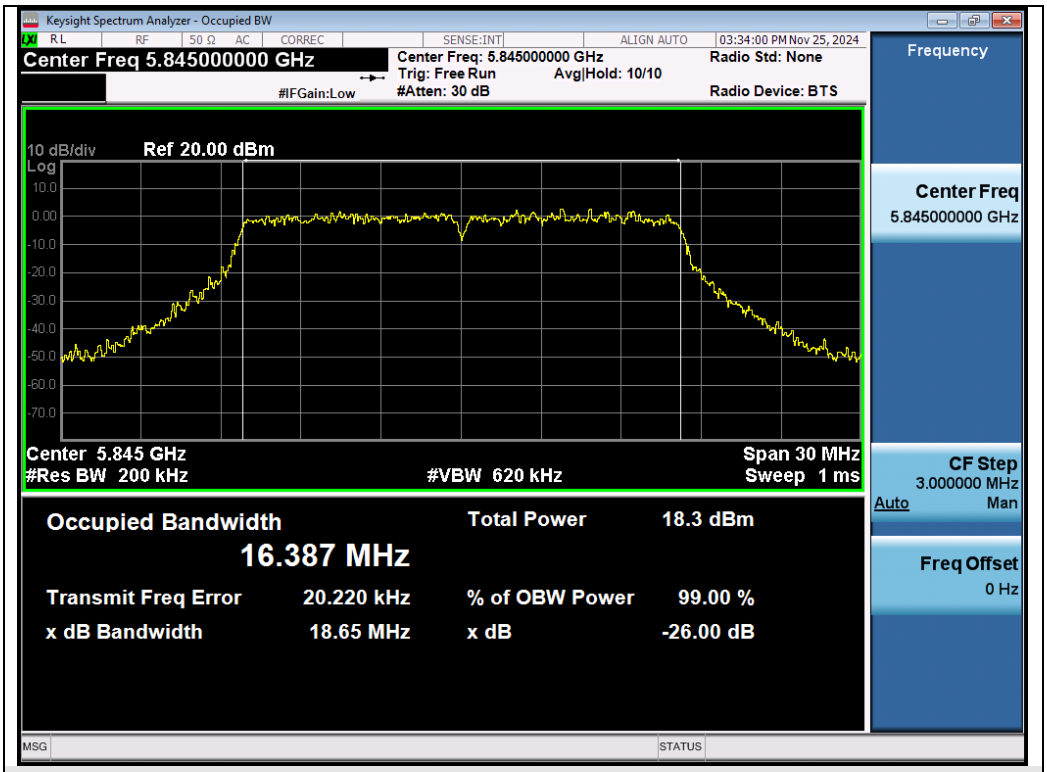
Test_Graph_802.11ax40_Chain A_5875_MCS0_OBW



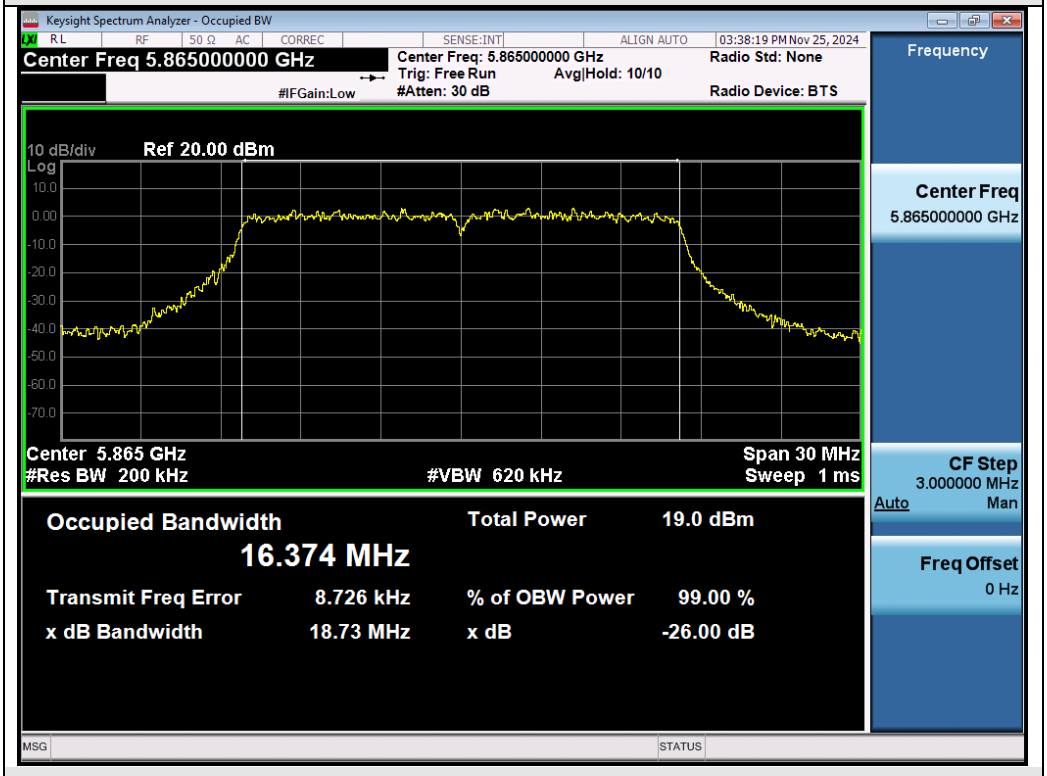
Test_Graph_802.11ax80_Chain A_5855_MCS0_OBW



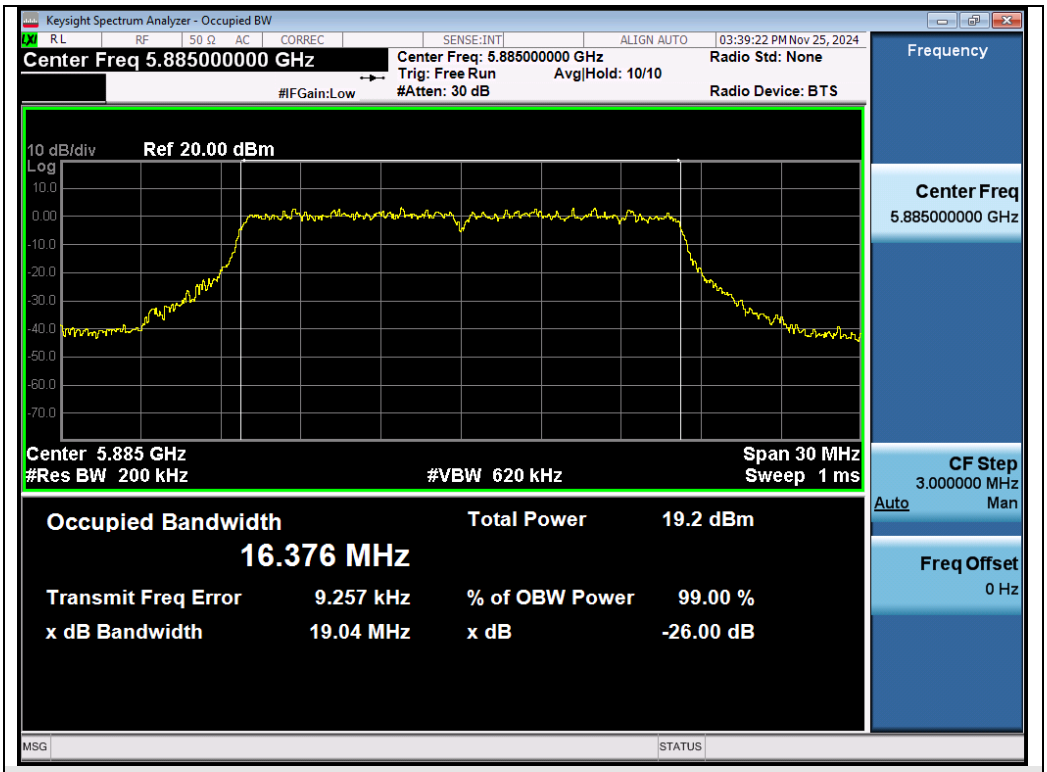
Test_Graph_802.11ax160_Chain A_5815_MCS0_OBW



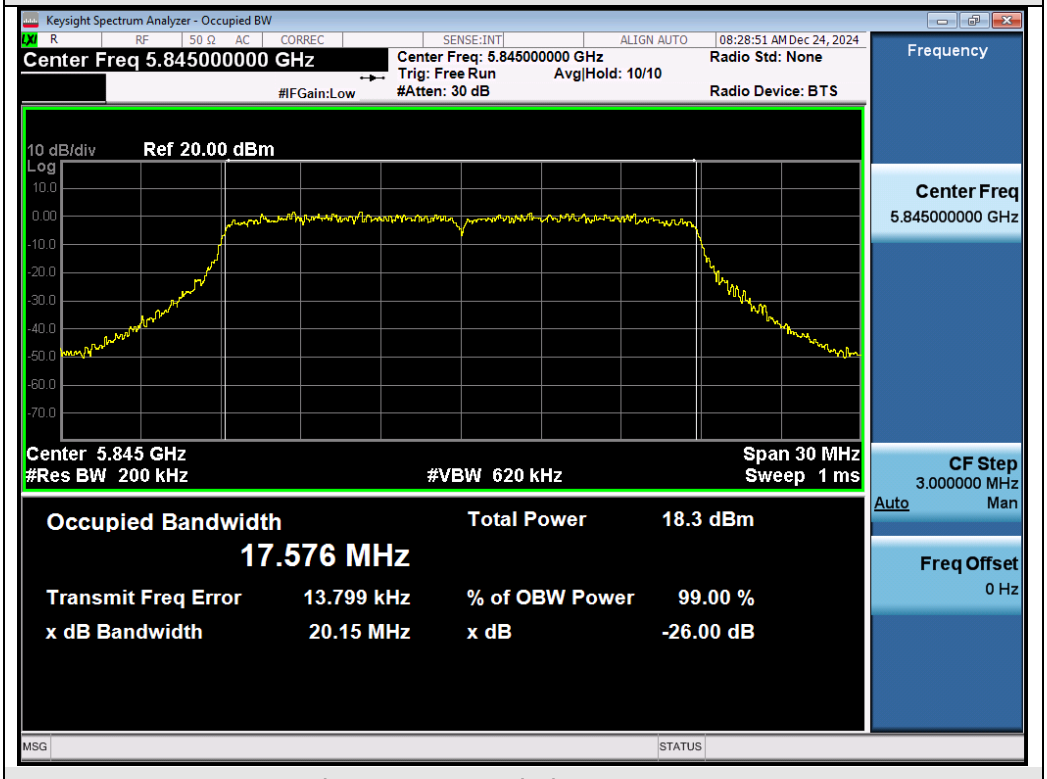
Test_Graph_802.11a_Chain B_5845_6Mbps_OBW



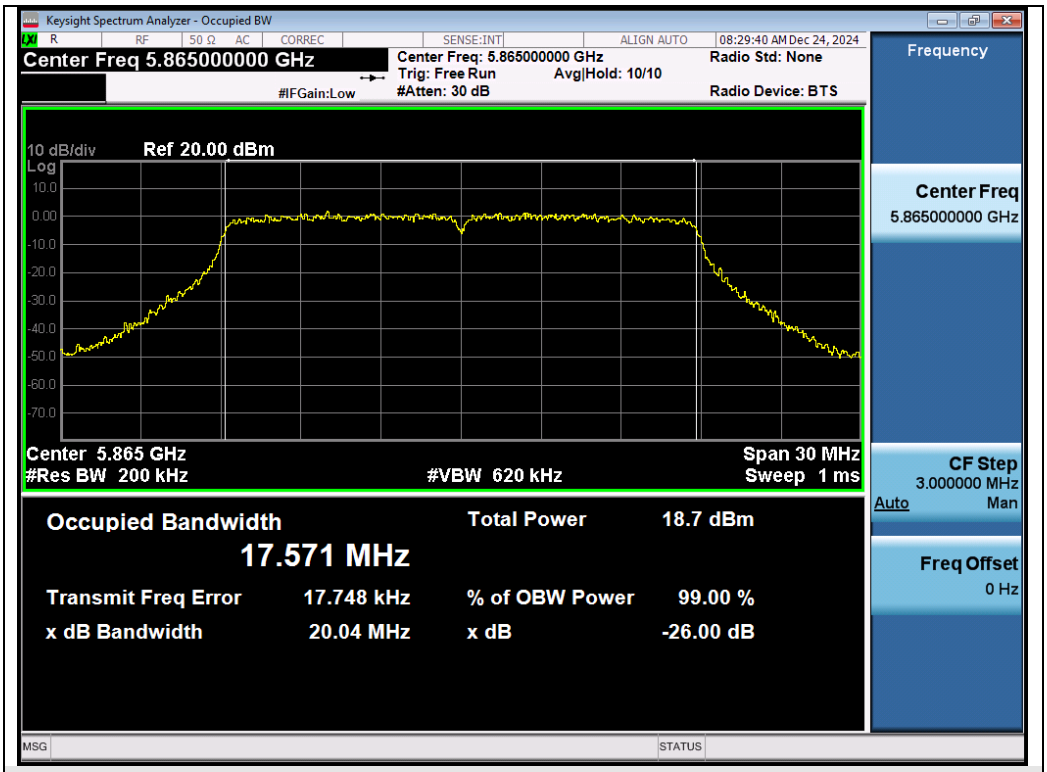
Test_Graph_802.11a_Chain B_5865_6Mbps_OBW



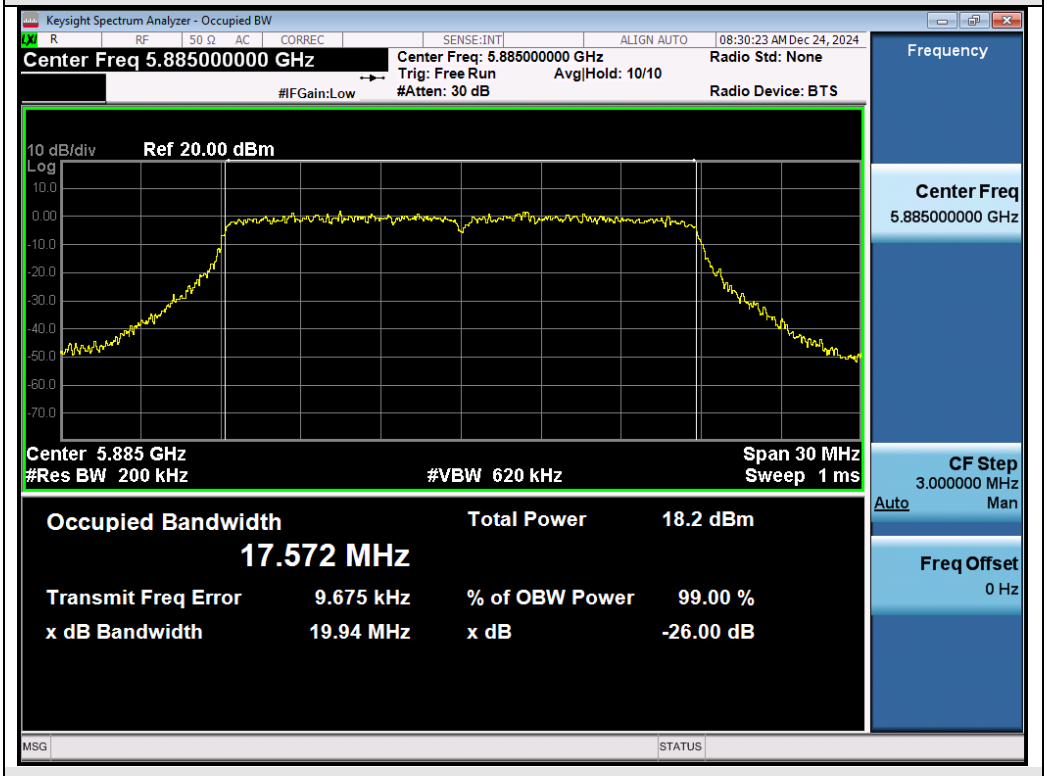
Test_Graph_802.11a_Chain B_5885_6Mbps_OBW



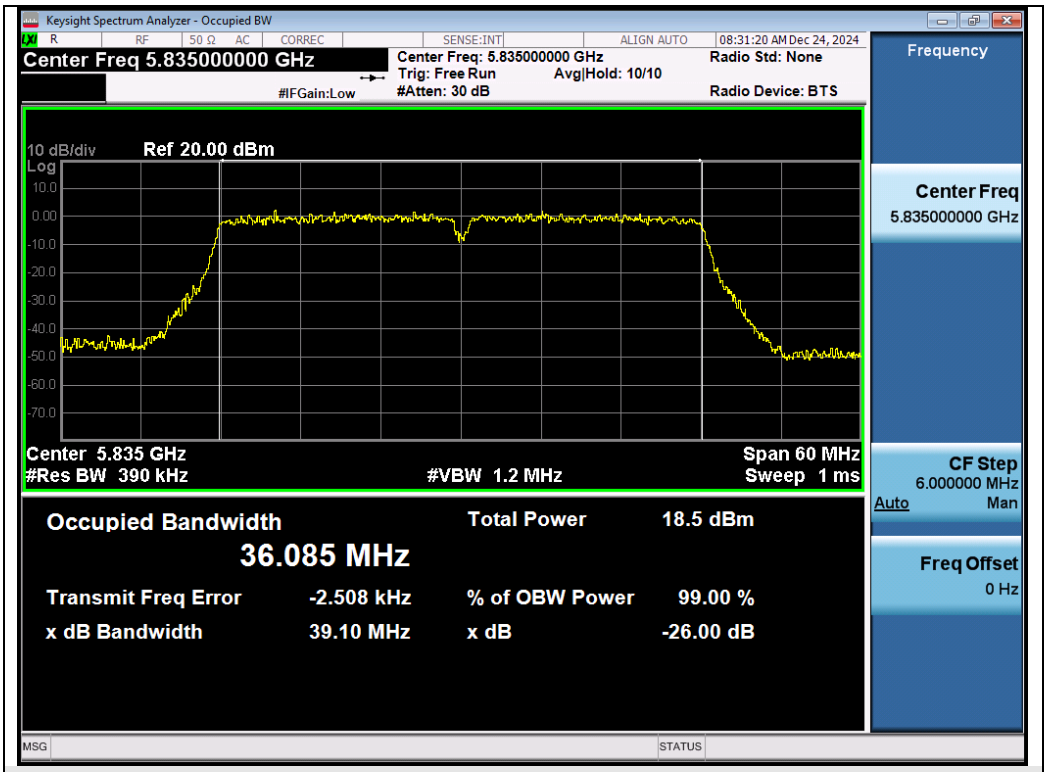
Test_Graph_802.11n20_Chain B_5845_MCS0_OBW



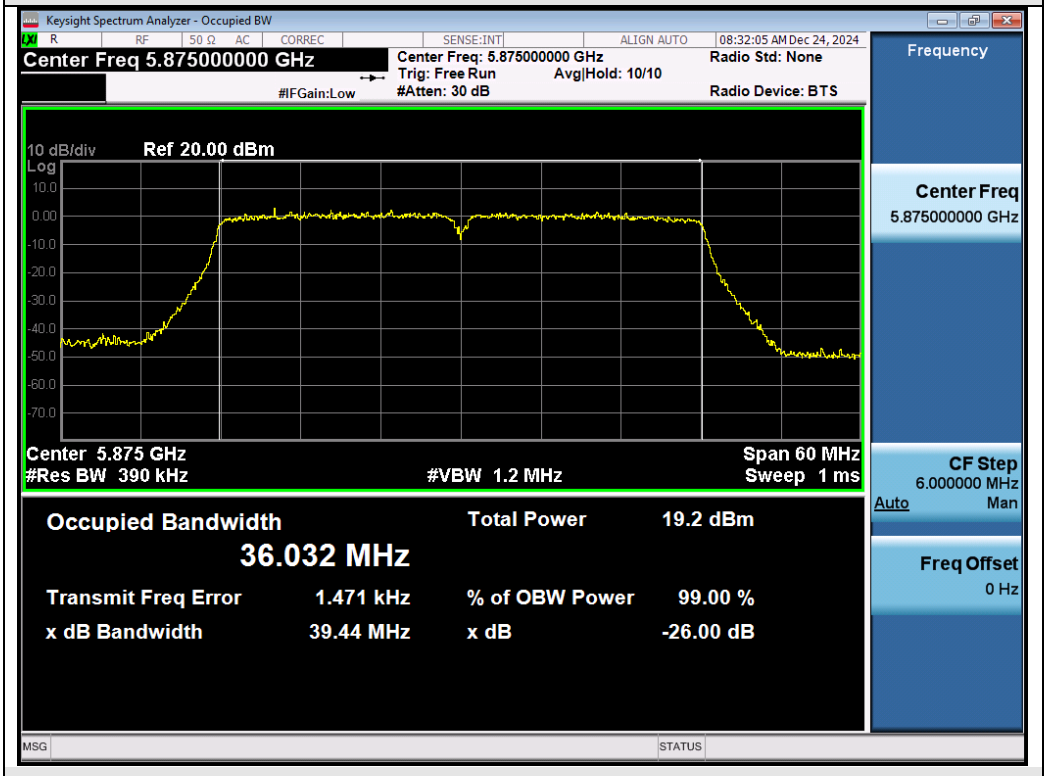
Test_Graph_802.11n20_Chain B_5865_MCS0_OBW



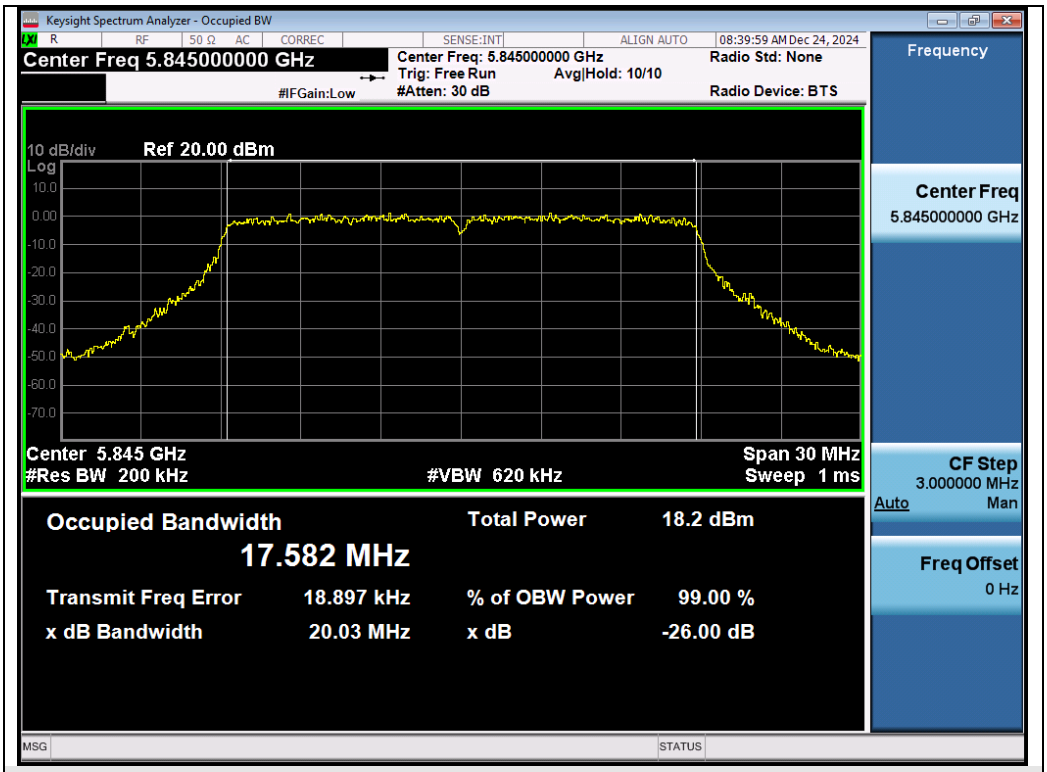
Test_Graph_802.11n20_Chain B_5885_MCS0_OBW



Test_Graph_802.11n40_Chain B_5835_MCS0_OBW

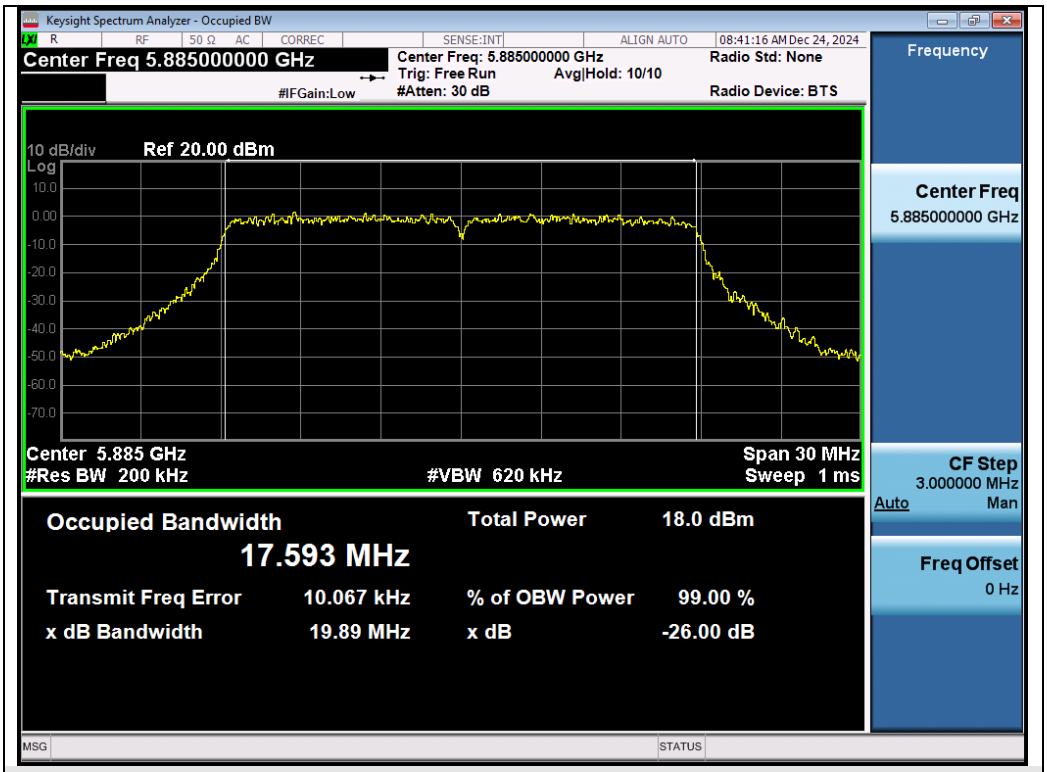


Test_Graph_802.11n40_Chain B_5875_MCS0_OBW

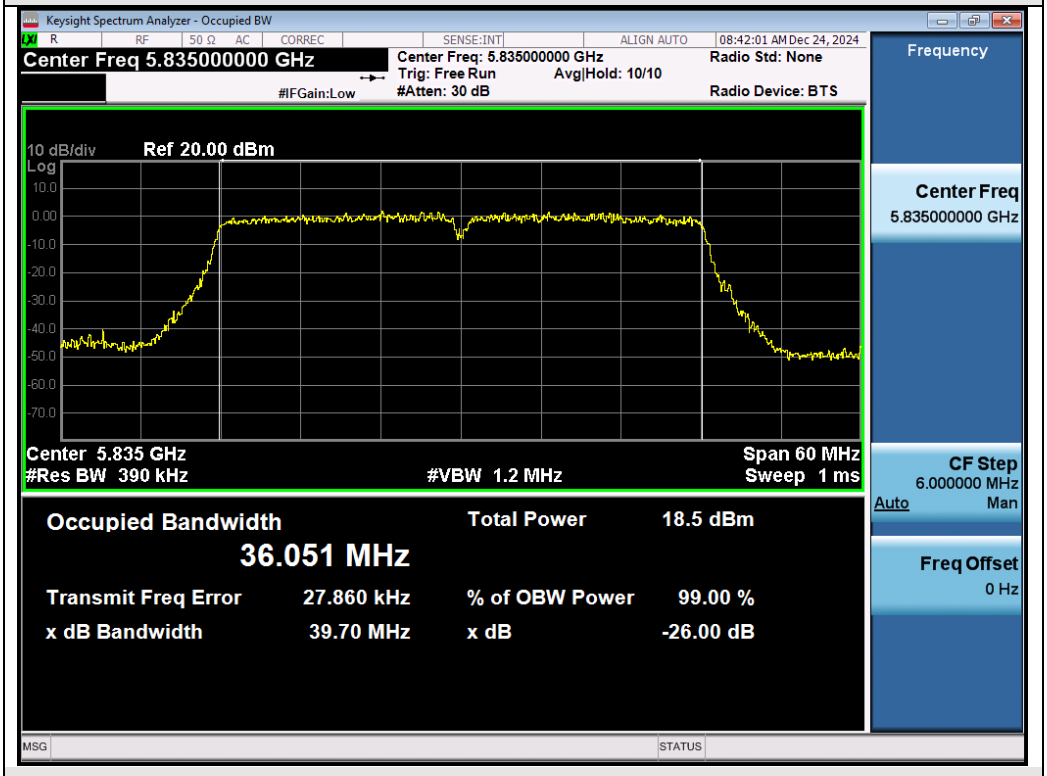


Test_Graph_802.11ac20_Chain B_5845_MCS0_OBW

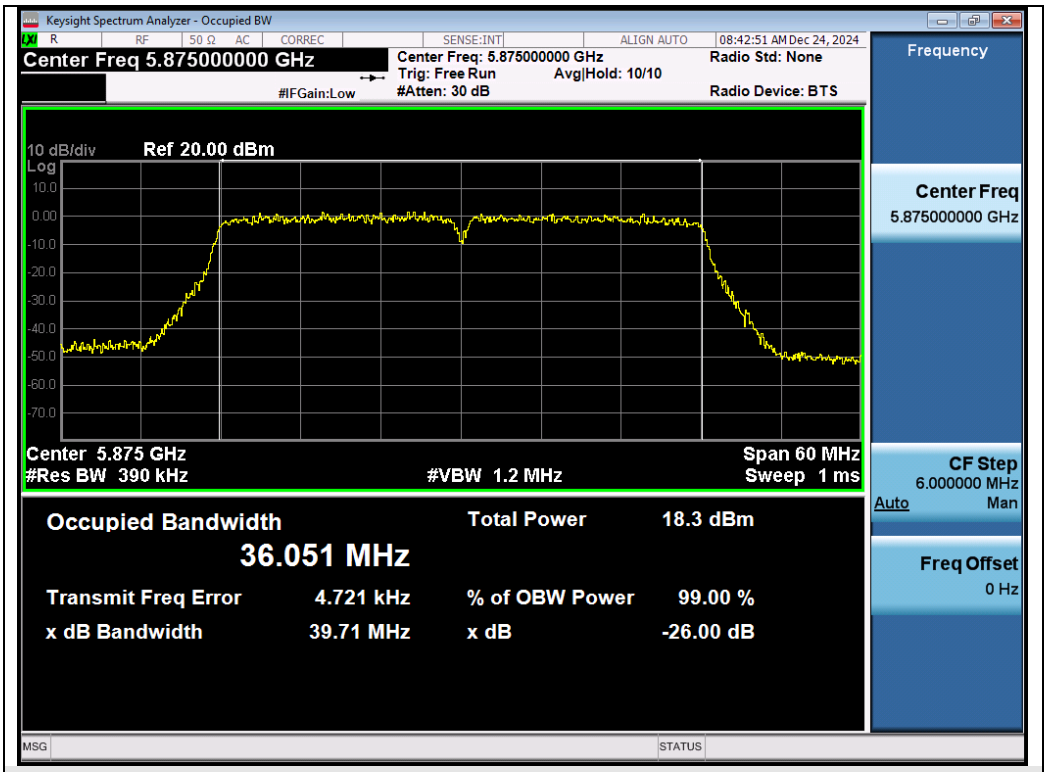
Test_Graph_802.11ac20_Chain B_5865_MCS0_OBW



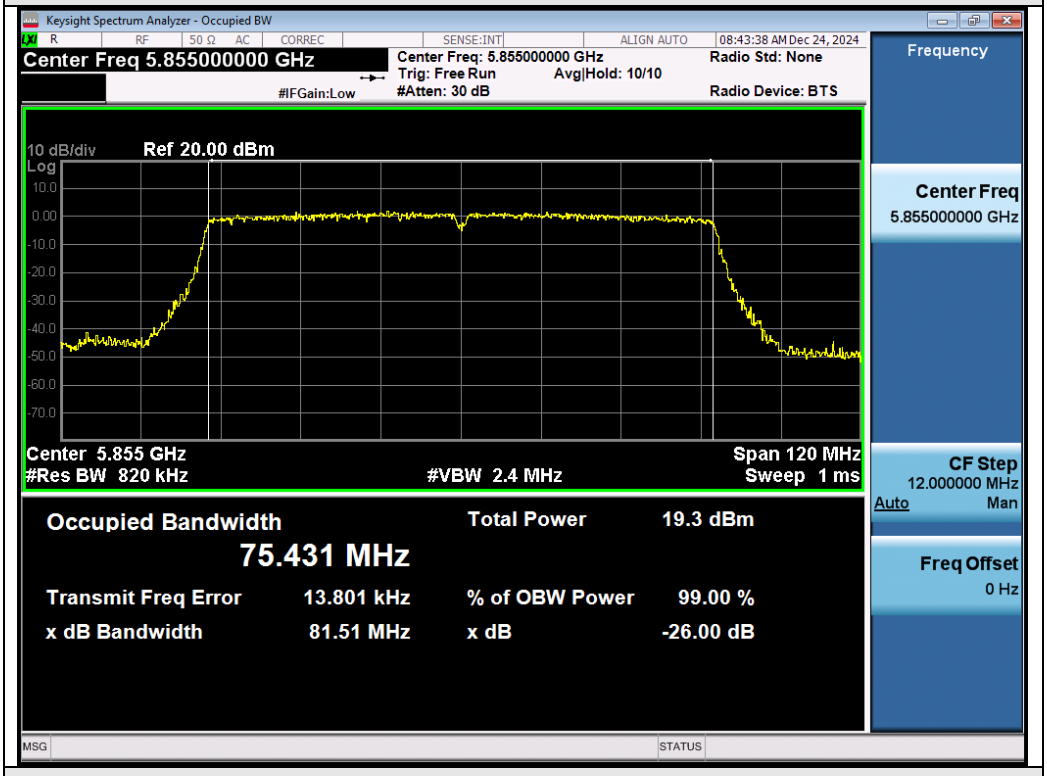
Test_Graph_802.11ac20_Chain B_5885_MCS0_OBW



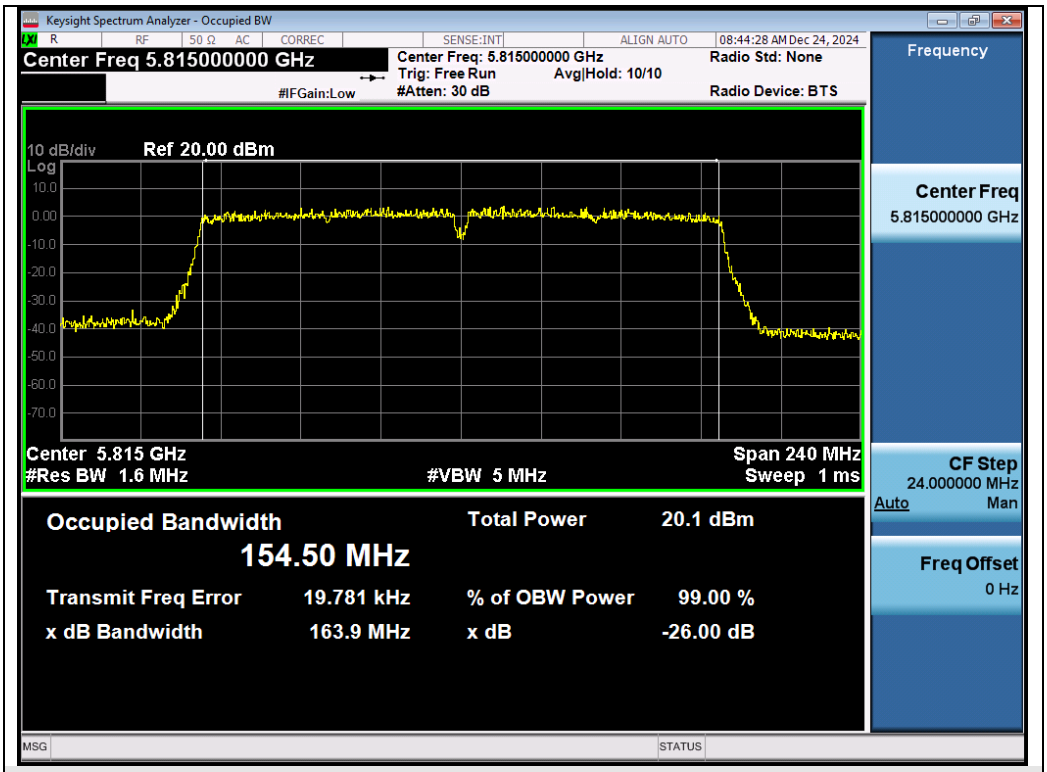
Test_Graph_802.11ac40_Chain B_5835_MCS0_OBW



Test_Graph_802.11ac40_Chain B_5875_MCS0_OBW

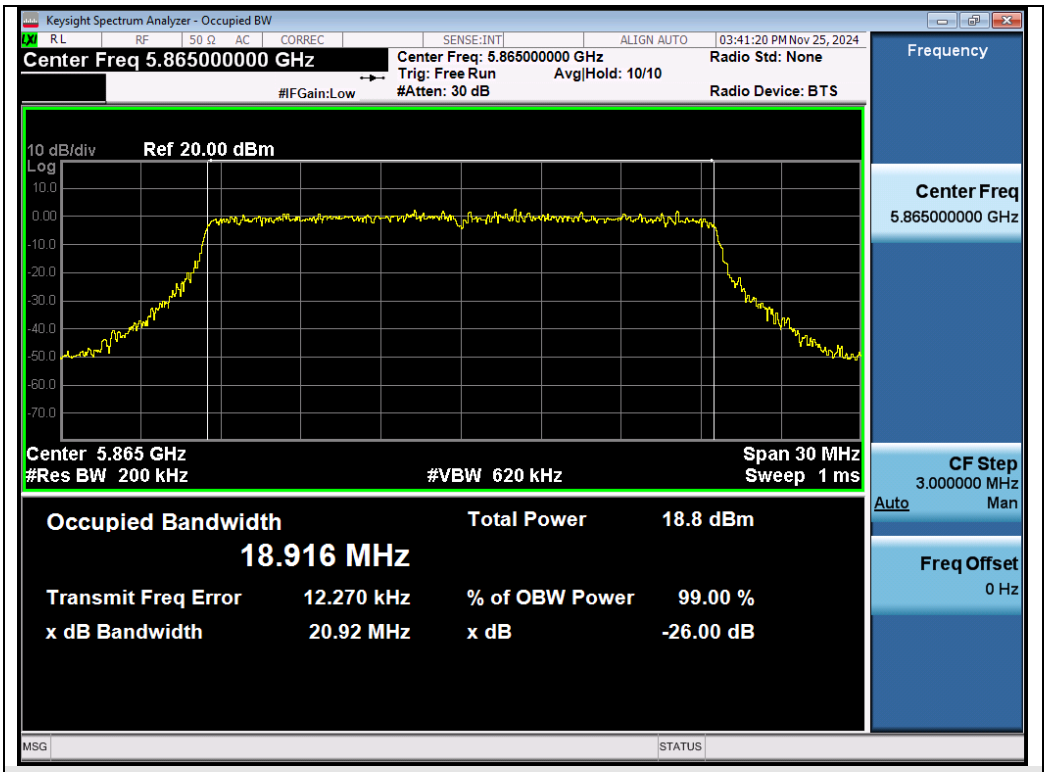


Test_Graph_802.11ac80_Chain B_5855_MCS0_OBW

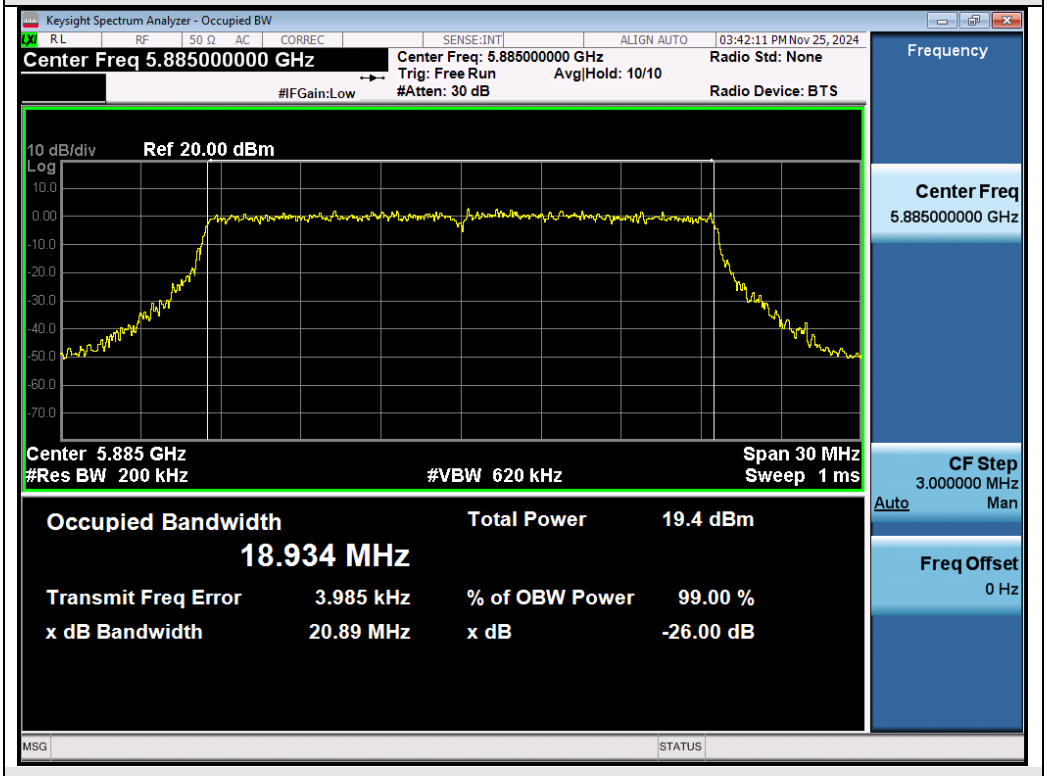


Test_Graph_802.11ac160_Chain B_5815_MCS0_OBW

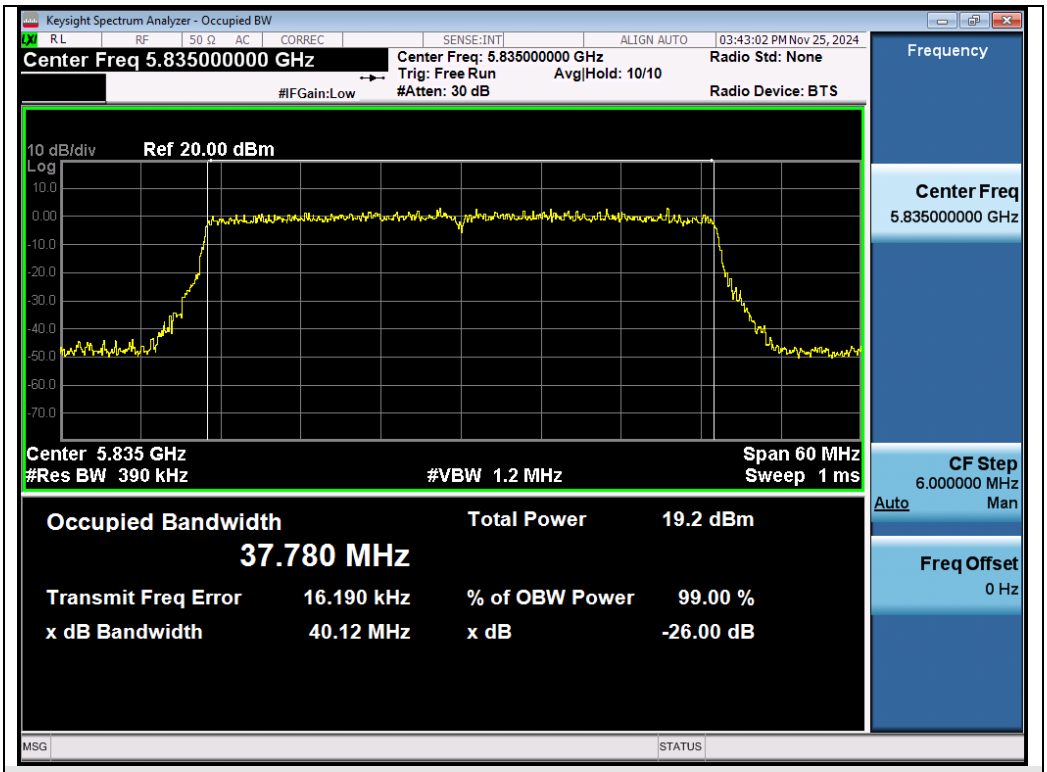
Test_Graph_802.11ax20_Chain B_5845_MCS0_OBW



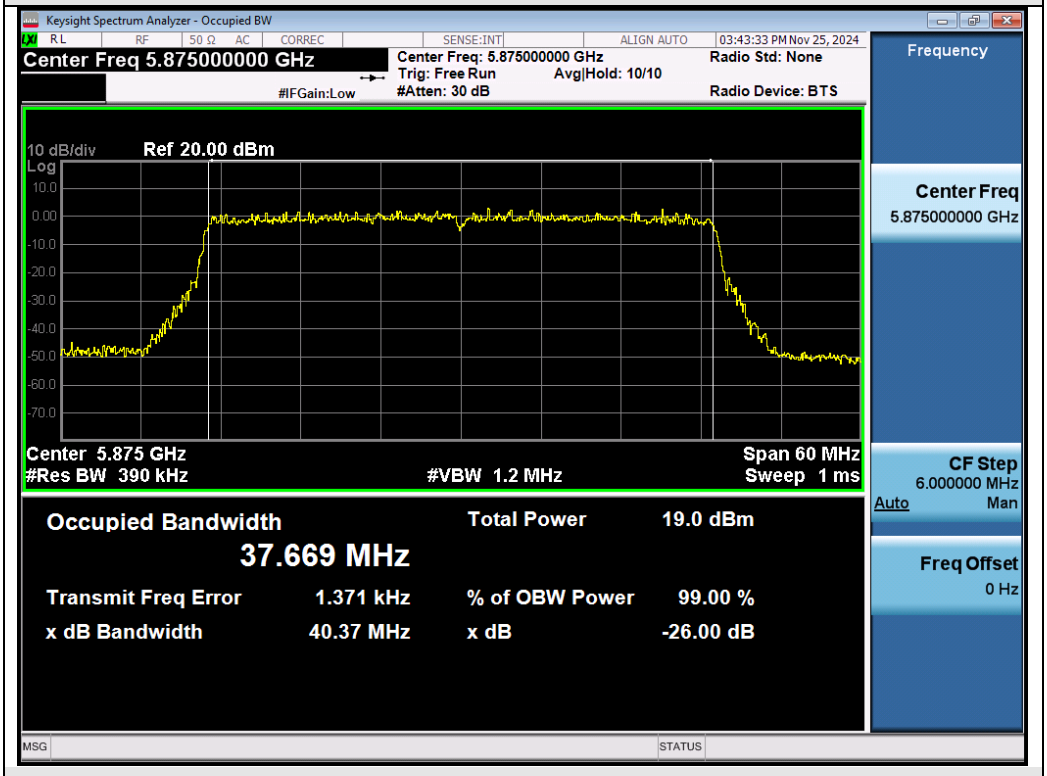
Test_Graph_802.11ax20_Chain B_5865_MCS0_OBW



Test_Graph_802.11ax20_Chain B_5885_MCS0_OBW



Test_Graph_802.11ax40_Chain B_5835_MCS0_OBW



Test_Graph_802.11ax40_Chain B_5875_MCS0_OBW