FCC Test Report

Test report
On Behalf of
Shenzhen Yunlink Technology Co., Ltd
For
Access Point
Model No.: FAP655P, FAP655, FAP650, FAP650P, FAP850, FAP855, FAP855P, FAP860

FCC ID: 2ADUG-FAP655P

Prepared For : Shenzhen Yunlink Technology Co., Ltd
B3 Building, An'le Industrial Zone, Hangcheng Road, gushu, xixiang town, Baoan, Shenzhen Guangdong Province, China

Prepared By : Shenzhen HUAK Testing Technology Co., Ltd.
1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Date of Test: Nov. 14, 2024 ~ Feb. 12, 2025
Date of Report: Feb. 12, 2025
Report Number: HK2411148226-2E

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TEST RESULTCERTIFICATION

Applicant's name.....: Shenzhen Yunlink Technology Co., Ltd

Address .....: B3 Building, An'le Industrial Zone, Hangcheng Road, gushu, xixiang town, Baoan, Shenzhen Guangdong Province, China

Manufacturer's Name.....: Shenzhen Yunlink Technology Co., Ltd

Address .....: B3 Building, An'le Industrial Zone, Hangcheng Road, gushu, xixiang town, Baoan, Shenzhen Guangdong Province, China

Product description

Trade Mark: N/A

Product name .....: Access Point

Model and/or type reference .: FAP655P, FAP655, FAP650, FAP650P, FAP850, FAP855, FAP855P, FAP860

Standards.....: FCC 47 CFR Part 15 Subpart E

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Date of Test .....:

Date (s) of performance of tests .....: **Nov. 14, 2024 ~ Feb. 12, 2025**

Date of Issue .....: **Feb. 12, 2025**

Test Result .....: **Pass**

Testing Engineer : Len Liao

(Len Liao)

Technical Manager : Sliver Wan

(Sliver Wan)

Authorized Signatory : Jason Zhou

(Jason Zhou)

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** Modified History **

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Feb. 12, 2025	Jason Zhou

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TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

1. EUT Description

Product Name:	Access Point		
Model Name:	FAP655P		
Series Models:	FAP655, FAP650, FAP650P, FAP850, FAP855, FAP855P, FAP860		
Model Difference:	All model's the function, software and electric circuit are the same, only with product model named different. Test sample model: FAP655P.		
Trade Mark:	N/A		
Power Rating	DC 48V From POE Adapter		
Frequency Range :	Band I+ II : IEEE 802.11a/n/ac(HT20)/ax(HE20) 5.180GHz-5.240GHz IEEE 802.11n/ac(HT40)/ax(HE40) 5.190GHz-5.230GHz IEEE 802.11ac(HT80)/ax(HE80) 5.210GHz IEEE 802.11a/n/ac(HT20)/ax(HE20) 5.260GHz-5.320GHz IEEE 802.11n/ac(HT40)/ax(HE40) 5.270GHz-5.310GHz IEEE 802.11ac(HT80)/ax(HE80) 5.290GHz IEEE 802.11ac(HT160)/ax(HE160) 5.250GHz Band III: IEEE 802.11a/n/ac(HT20)/ax(HE20) 5.500GHz-5.700GHz IEEE 802.11n/ac(HT40)/ax(HE40) 5.510GHz-5.670GHz IEEE 802.11ac(HT80)/ax(HE80) 5.530GHz-5.610GHz IEEE 802.11ac(HT160)/ax(HE160) 5.570GHz		
Modulation Technique:	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only 1024QAM for OFDMA in 11ax mode only		
Antenna Specification:	**5.2G:** **Iron sheet antenna** Antenna 1: 4.6dBi Antenna 2: 4.4dBi MIMO: 7.51dBi	**5.3G:** **Iron sheet antenna** Antenna 1:4.6dBi Antenna 2:3.7dBi MIMO: 7.18dBi	**5.6G:** **Iron sheet antenna** Antenna 1:4.4dBi Antenna 2:4.1dBi MIMO: 7.26dBi
Operating Mode:	Master		

Note:
1.The EUT incorporates a MIMO function. Physically, it provides two completed transmitters and receivers(2T2R), two transmit signals are completely correlated, then, Direction gain=GANT + Array Gain(Array Gain=10 log(2) dB for power spectral density; Array Gain=0 for power measurement)
2. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
3. Antenna gain Refer to the antenna specifications.
4. The cable loss data is obtained from the supplier.
5. The test results in the report only apply to the tested sample.

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for ***FCCID: 2ADUG-FAP655P*** filing to comply with FCC Part 15, Subpart E Rules.

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2. Test Methodology

The tests documented in this report were performed in accordance with ANSI C63.10:2013 and FCC CFR 47 15.207, 15.209 and 15.407.

2.1 EUT Configuration

The EUT configuration for testing is installed for RF field strength measurement to meet the Commissions requirement, and is operated in a manner intended to generate the maximum emission in a continuous normal application.

2.2 EUT Exercise

The EUT is operated in the engineering mode to fix the Tx frequency for the purposes of measurement.

According to its specifications, the EUT must comply with the requirements of Section 15.407 under the FCC Rules Part 15 Subpart E.

2.3 General Test Procedures

Conducted Emissions

The EUT is placed on the turn table, which is positioned at 0.8 m above the ground plane. According to the requirements in Section 13.3 of ANSI C63.10:2013, the conducted emission from the EUT is measured in the frequency range between 0.15MHz and 30MHz, using the CISPR Quasi-Peak detector mode.

Radiated Emissions

Under 1GHz

The EUT is placed on a turn table, which is 0.8m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.10:2013.

Above 1GHz

The EUT is placed on a turn table, which is 1.5m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.10:2013.

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2.4 FCC Part 15.205 Restricted Bands of Operations

Except as shown in paragraph (d)of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110 0.495 - 0.505 [1] 2.1735 - 2.1905 4.125 - 4.128 4.17725 - 4.17775 4.20725 - 4.20775 6.215 - 6.218 6.26775 - 6.26825 6.31175 - 6.31225 8.291 - 8.294 8.362 - 8.366 8.37625 - 8.38675 8.41425 - 8.41475 12.29 - 12.293 12.51975 - 12.52025 12.57675 - 12.57725 13.36 - 13.41	16.42 - 16.423 16.69475 - 16.69525 16.80425 - 16.80475 25.50 - 25.67 37.50 - 38.25 73.00 - 74.60 74.80 - 75.20 108.00 - 121.94 123 - 138 149.90 - 150.05 156.52475 -156.52525 156.70 - 156.90 162.0125 - 167.1700 167.72 - 173.20 240 - 285 322.0- 335.4	399.9 - 410 608 - 614 960.0 - 1240 1300 - 1427 1435.0 - 1626.5 1645.5 - 1646.5 1660 - 1710 1718.8 - 1722.2 2200 - 2300 2310 - 2390 2483.5 – 2500.0 2655 - 2900 3260 - 3267 3332 - 3339 3345.8 - 3358.0 3600 - 4400	4.50 - 5.15 5.35 - 5.46 7.25 - 7.75 8.025 - 8.500 9.0 - 9.2 9.3 - 9.5 10.6 - 12.7 13.25 - 13.4 14.47 - 14.5 15.35 - 16.2 17.7 - 21.4 22.01 - 23.12 23.6 - 24.0 31.2 - 31.8 36.43 - 36.5([2])

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510MHz.
[2] Above 38.6

Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section15.209.Atfrequenciesequaltoor less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

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2.5 Description of Test Modes

Description	Modulation Technology	Modulation Type
26dB Bandwidth and 99% bandwidth	OFDM/ OFDMA	BPSK
Maximum conducted output power	OFDM/ OFDMA	BPSK
Band edges measurement	OFDM/ OFDMA	BPSK
Peak Power Spectral Density	OFDM/ OFDMA	BPSK
Radiated undesirable emission	OFDM/ OFDMA	BPSK
Power line conducted emission	OFDM/ OFDMA	BPSK

IEEE802.11amode:

Channel (5180MHz), Channel (5200MHz), Channel (5240MHz), Channel (5260MHz), Channel (5280MHz), Channel (5320MHz), Channel (5500MHz), Channel (5580MHz)and Channel (5700MHz) with 6Mbps data rate were chosen for full testing.

IEEE802.11n/ac(HT20)/ax(HE20)mode:

Channel (5180MHz), Channel (5200MHz), Channel (5240MHz), Channel (5260MHz), Channel (5280MHz), Channel (5320MHz), Channel (5500MHz), Channel (5580MHz)and Channel (5700MHz) with 6Mbps data rate were chosen for full testing.

IEEE802.11n/ac(HT40)/ax(HE40)mode:

Channel (5190MHz), Channel (5230MHz), Channel (5270MHz), Channel (5310MHz), Channel (5510MHz), Channel (5550MHz)and Channel (5670MHz) with 6Mbps data rate were chosen for full testing.

IEEE802.11ac(HT80)/ax(HE80)mode:

Channel (5210MHz), Channel (5290MHz), Channel (5530MHz), Channel (5610MHz)with MCS0 data rate were chosen for full testing.

IEEE802.11ac(HT160)/ax(HE160)mode:

Channel (5250MHz), Channel (5570MHz) with MCS0 data rate were chosen for full testing.

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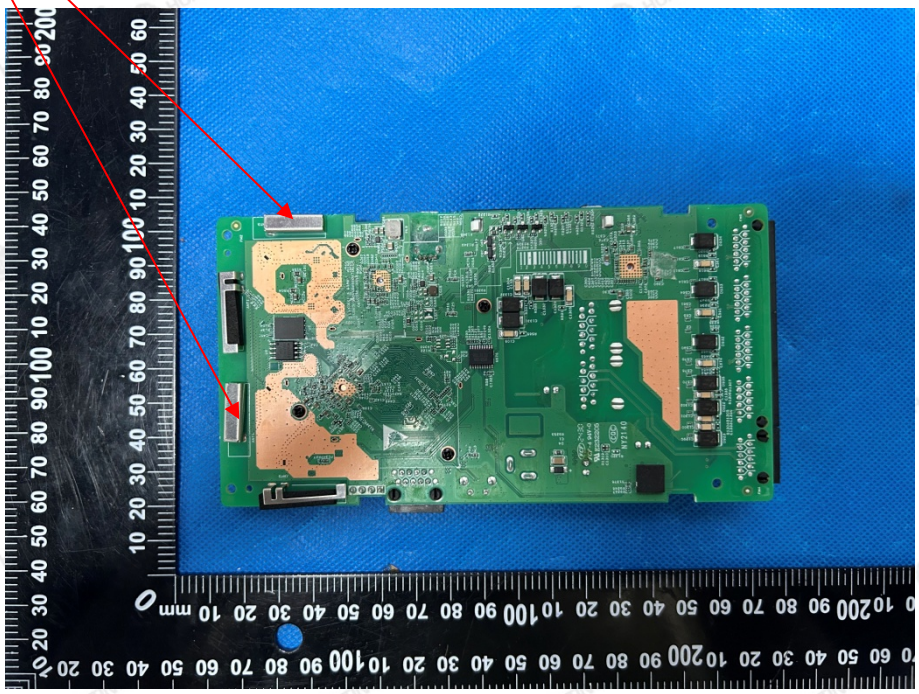
2.6 Antenna Description

an intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached oran antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section”

* the antenna of this EUT is a unique(**Iron sheet antenna** for WiFi).
* the EUT complies with the requirement of 15.203.

WIFI ANTENNA



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3. Instrument Calibration

The measuring equipment, which was utilized in performing the tests documented here in, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

3.1 Measurement Equipment Used

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	L.I.S.N.	R&S	ENV216	HKE-002	2024/02/20	1 Year
2	L.I.S.N.	R&S	ENV216	HKE-059	2024/02/20	1 Year
3	EMI Test Receiver	R&S	ESR	HKE-005	2024/02/20	1 Year
4	Spectrum analyzer	Agilent	N9020A	HKE-025	2024/02/20	1 Year
5	Spectrum analyzer	R&S	FSV3044	HKE-126	2024/02/20	1 Year
6	Preamplifier	EMCI	EMC051845S	HKE-006	2024/02/20	1 Year
7	Preamplifier	Schwarzbeck	BBV 9743	HKE-016	2024/02/20	1 Year
8	Preamplifier	A.H. Systems	SAS-574	HKE-182	2024/02/20	1 Year
9	6d Attenuator	Pasternack	6db	HKE-184	2024/02/20	1 Year
10	EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	2024/02/20	1 Year
11	Broadband Antenna	Schwarzbeck	VULB9168	HKE-167	2024/02/21	2 Year
12	Loop Antenna	COM-POWER	AL-130R	HKE-014	2024/02/21	2 Year
13	Horn Antenna	Schwarzbeck	9120D	HKE-013	2024/02/21	2 Year
14	EMI Test Software	Tonscend	JS32-CE 2.5.0.6	HKE-081	/	/
15	EMI Test Software	Tonscend	JS32-RE 5.0.0	HKE-082	/	/
16	RF Automatic control unit	Tonscend	JS0806-2	HKE-060	2024/02/20	1 Year
17	High pass filter unit	Tonscend	JS0806-F	HKE-055	2024/02/20	1 Year
18	Wireless Communication Test Set	R&S	CMU200	HKE-026	2024/02/20	1 Year
19	Wireless Communication Test Set	R&S	CMW500	HKE-027	2024/02/20	1 Year
20	High-low temperature chamber	Guangke	HT-80L	HKE-118	2024/06/10	1 Year
21	Temperature and humidity meter	Boyang	HTC-1	HKE-075	2024/06/10	1 Year
22	RF Test Software	Tonscend	JS1120-3 Version 3.3.23	HKE-083	/	/
23	10dB Attenuator	Schwarzbeck	VTSD9561F	HKE-153	2024/02/20	1 Year
24	RSE Test Software	Tonscend	JS36-RSE 5.0.0	HKE-184	/	/

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3.2 Measurement Uncertainty

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR 100 028-1 [2] and shall correspond to an expansion factor(coverage factor) k = 1,96 or k = 2 (which provide confidence levels of respectively 95% and 95,45% in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Table 6 is based on such expansion factors.

Table6: Maximum measurement uncertainty

Parameter	UNCERTAINTY
Radio frequency	±0.8 × 10-7
RF power, conducted	±3.35dB
Maximum frequency deviation: -within 300Hz and 6 kHz of audio frequency	1.3%
-within 6 kHz and 25 kHz of audio frequency	0.65 dB
Adjacent channel power	0.2054
Conducted spurious emission of transmitter, valid up to 6 GHz	±2.20dB
Conducted emission of receivers	±0.37dB
Radiated emission of transmitter, valid up to 6 GHz	±3.94 dB
Radiated emission of receiver, valid up to 6 GHz	±3.94 dB
RF level uncertainty for a given BER	±0.3 dB
Temperature	±0.1°C
Humidity	±1.0%

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4. Facilities and Accreditations

4.1 Facilities

All measurement facilities used to collect the measurement data are located at
☒ 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
The sites are constructed in conformance with the requirements of ANSI C63.10:2013 and CISPR Publication 22.All receiving equipment conforms to CISPR Publication16 1, "RadioInterference Measuring Apparatus and Measurement Methods."

Testing Laboratory Authorization：

A2LA Accreditation Code is 4781.01.
FCC Designation Number is CN1229.
Canada IC CAB identifier is CN0045.
CNAS Registration Number is L9589.

4.2 Equipment

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, bucolical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

4.3 Table of Accreditations and Listings

The test facilities used toper form radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 200581-0 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with USA, Certification and Engineering Bureau, 424105 for 10m chamber, 238958 for 3m chamber.

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5. Setup of Equipment Under Test

5.1 Setup Configuration of EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

5.2 Support Equipment

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Trade Mark	Model/Type No.	Specification	Remark
1	Access Point	N/A	FAP655P	N/A	EUT
2	POE Adapter	N/A	STD-POE4805-A	Input: 100-240V, 50/60Hz, 0.8A Output: DC48V, 500mA	Peripheral
3	U Disk	N/A	N/A	N/A	Peripheral
4	Network cable*4	N/A	N/A	N/A	Peripheral
5	Laptop 1/2	N/A	TP00096A	Input: DC 20V, 2.25~3.25A	Peripheral
6	Laptop 3	N/A	TP00018A	Input: DC 20V, 3.25A/4.5A	Peripheral
7	Laptop 4	N/A	TP00067A	Input: DC 20V, 2.25A/3.25A	Peripheral

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3. For conducted measurements (Output Power, 26db Bandwidth and 99% Occupied Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

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6. FCC Part 15 Requirements

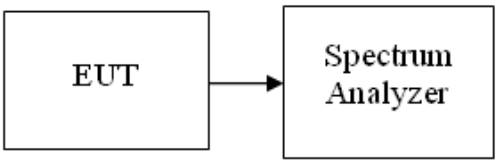
6.1 26dB Bandwidth and 99% Occupied Bandwidth

LIMIT

According to§15.403(i),for purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Compliance with the emissions limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

Test Configuration

TESTPROCEDURE



1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low-loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzers RBW = approximately 1% of the emission bandwidth, VBW >RBW, Detector = Peak, Span>26dB bandwidth, and Sweep = auto, Trace mode = max hold.
4. Measure the maximum width of the emission that is 26dB 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%.
5. Repeat until all the rest channels were investigated.
6. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
7. Use the 99 % power bandwidth function of the instrument (if available).

TESTRESULTS

No non-compliance noted

Test Data

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Antenna 1

Testmode:IEEE802.11a mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	18.42	16.228
Mid	5200	18.36	16.229
High	5240	18.57	16.248

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	19.55	16.356
Mid	5280	19.79	16.366
High	5320	19.53	16.350

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	19.12	16.360
Mid	5580	19.47	16.348
High	5700	19.23	16.377

Testmode:IEEE802.11n HT20 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	19.55	17.416
Mid	5200	19.78	17.439
High	5240	19.67	17.454

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	20.43	17.522
Mid	5280	20.48	17.548
High	5320	20.24	17.510

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	20.58	17.546
Mid	5580	20.32	17.540
High	5700	20.35	17.541

Testmode:IEEE802.11n HT40 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	39.27	35.812
High	5230	39.13	35.825

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5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	39.63	35.838
High	5310	39.81	35.794

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	39.69	35.844
Mid	5550	40.03	35.877
High	5670	39.66	35.767

Testmode:IEEE802.11ac HT20 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	19.92	17.444
Mid	5200	19.88	17.421
High	5240	19.80	17.431

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	20.57	17.531
Mid	5280	20.50	17.537
High	5320	20.35	17.510

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	20.14	17.527
Mid	5580	20.32	17.539
High	5700	20.09	17.536

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Testmode:IEEE802.11ac HT40 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	38.91	35.851
High	5230	39.04	35.817

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	39.68	35.815
High	5310	39.83	35.777

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	39.91	35.840
Mid	5550	40.25	35.889
High	5670	39.70	35.730

Testmode:IEEE802.11ac HT80 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5210	80.64	74.810

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5290	81.28	74.822

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5530	82.05	74.900
High	5610	81.53	74.884

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Testmode:IEEE802.11ac HT160 mode

5150~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5250	165.90	154.17

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5570	166.20	153.20

Testmode:IEEE802.11ax HE20 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	20.64	18.794
Mid	5200	20.67	18.770
High	5240	20.62	18.826

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	20.80	18.828
Mid	5280	20.92	18.824
High	5320	20.87	18.802

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	20.73	18.768
Mid	5580	20.92	18.825
High	5700	20.72	18.833

Testmode:IEEE802.11ax HE40 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	40.00	37.473
High	5230	39.97	37.413

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	40.58	37.506
High	5310	40.46	37.446

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	40.57	37.407
Mid	5550	40.56	37.520
High	5670	40.63	37.361

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Testmode:IEEE802.11ax HE80 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5210	80.90	76.563

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5290	116.20	76.414

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5530	82.48	76.711
High	5610	82.30	76.601

Testmode:IEEE802.11ax HE160 mode

5150~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5250	167.80	155.29

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5570	167.10	154.43

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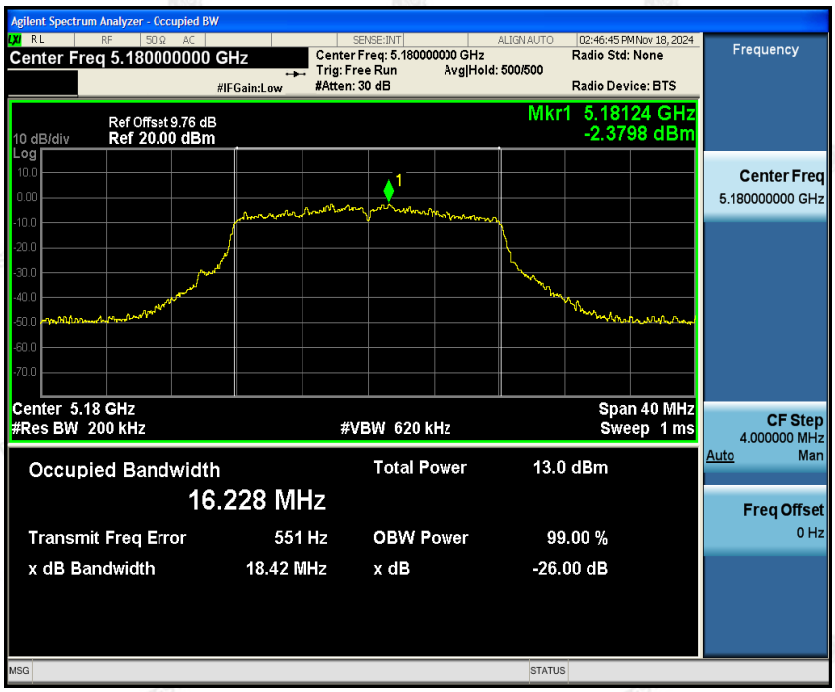
Test Plot

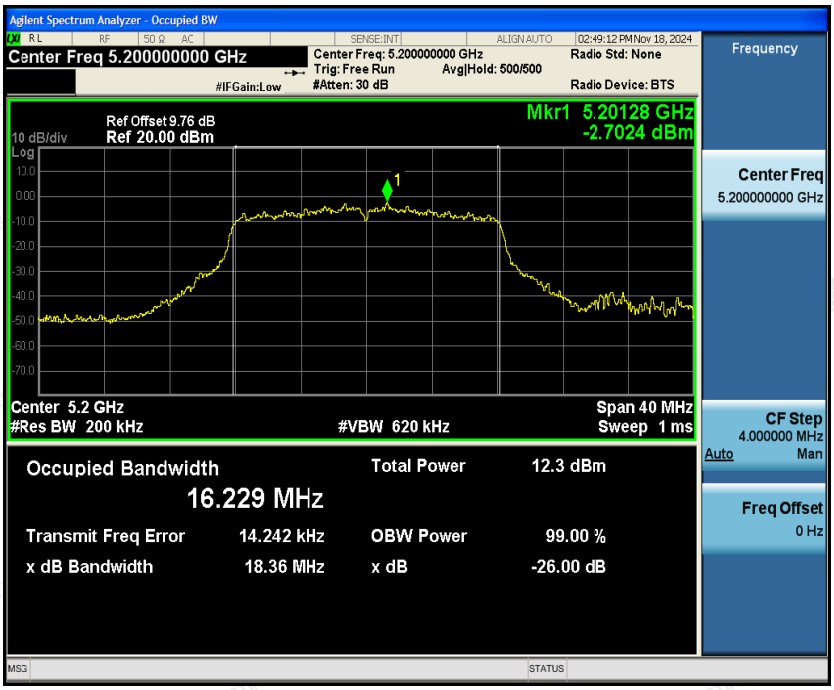
IEEE802.11a mode:

5150~5250MHz

Low Channel



Mid Channel



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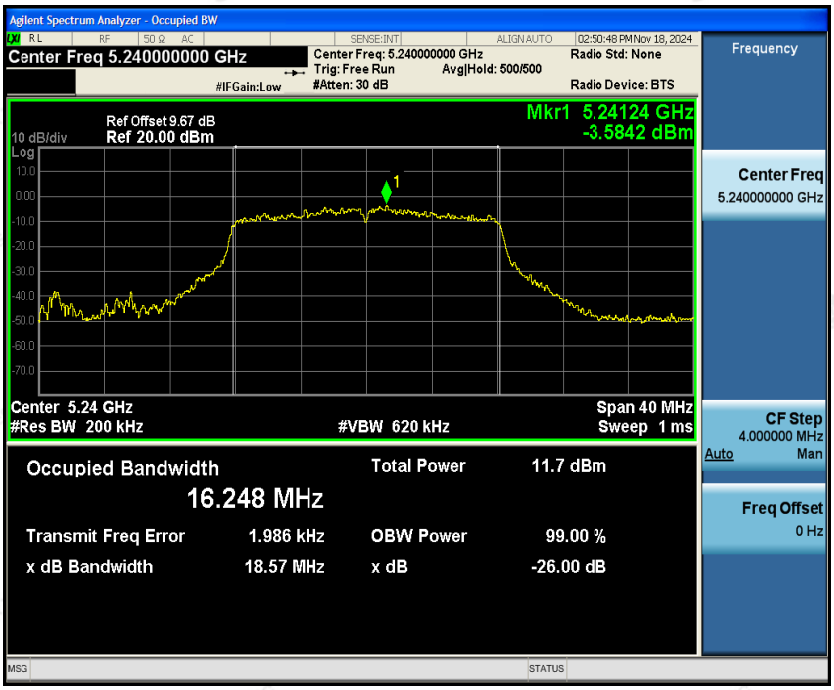
High Channel



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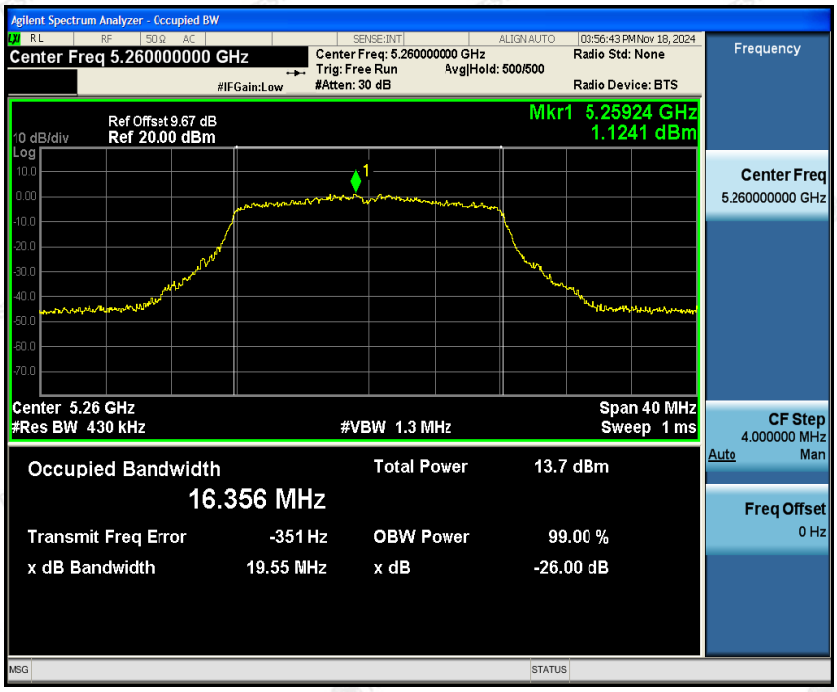
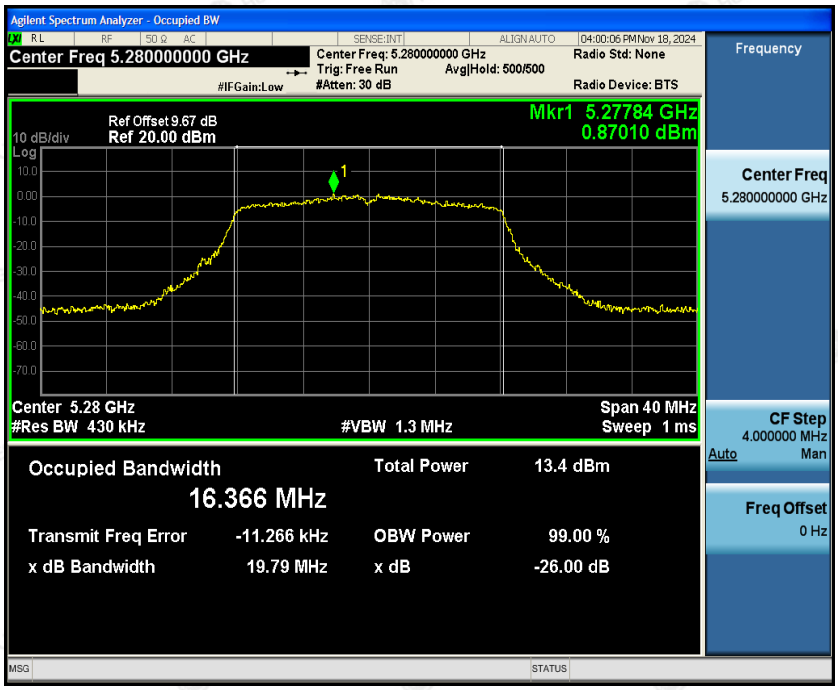
5250~5350MHz

Low Channel



Mid Channel



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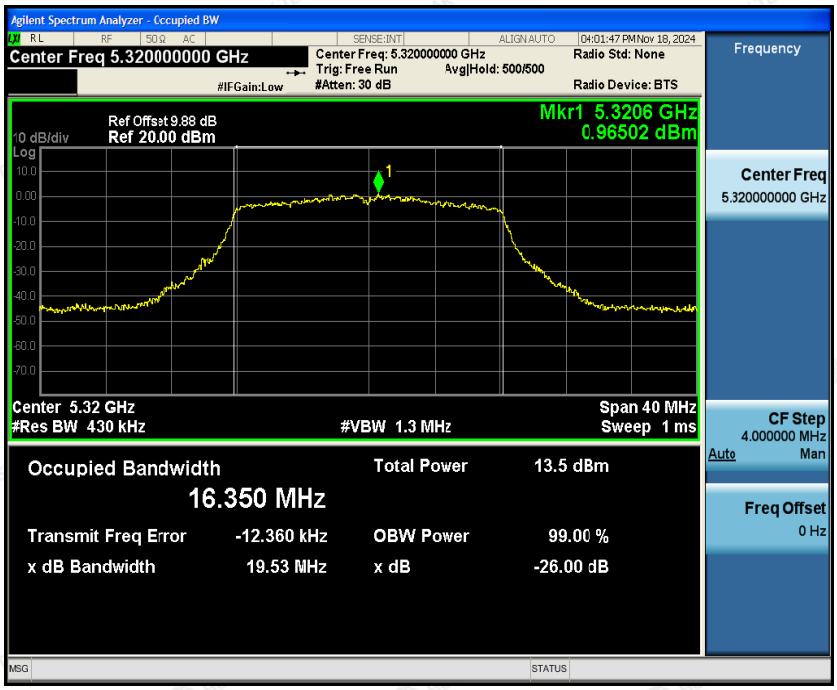
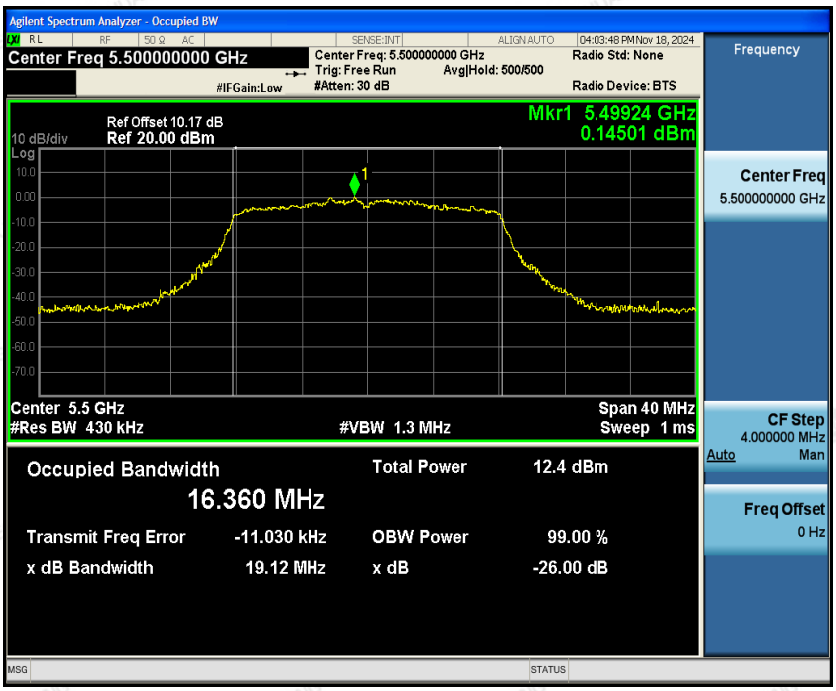
High Channel



5470~5725MHz

Low Channel



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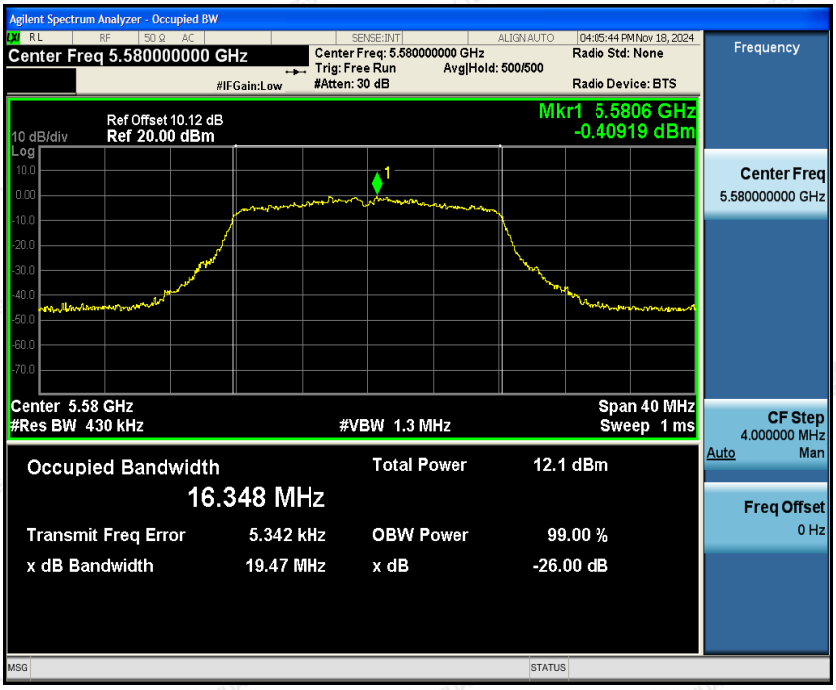
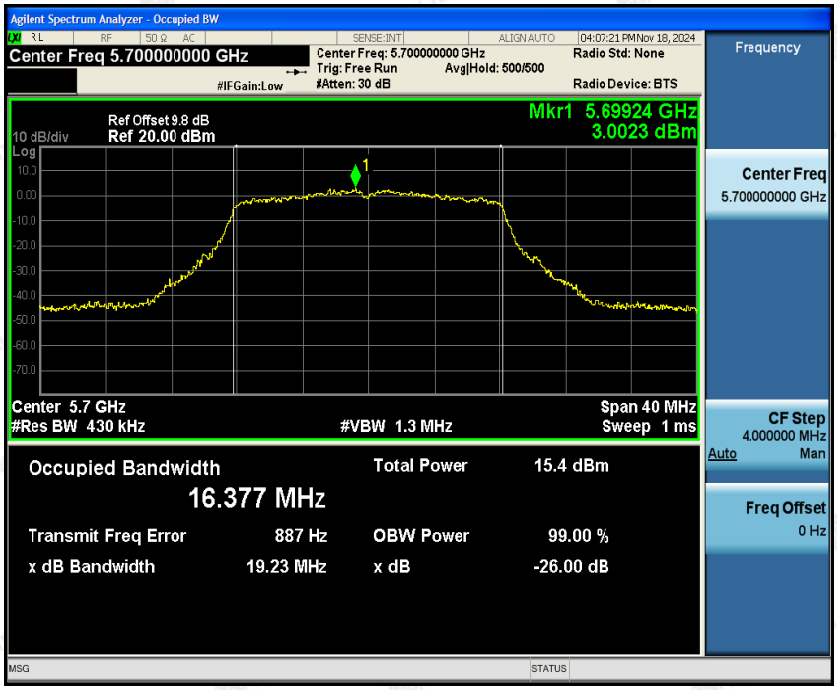
Mid Channel



High Channel



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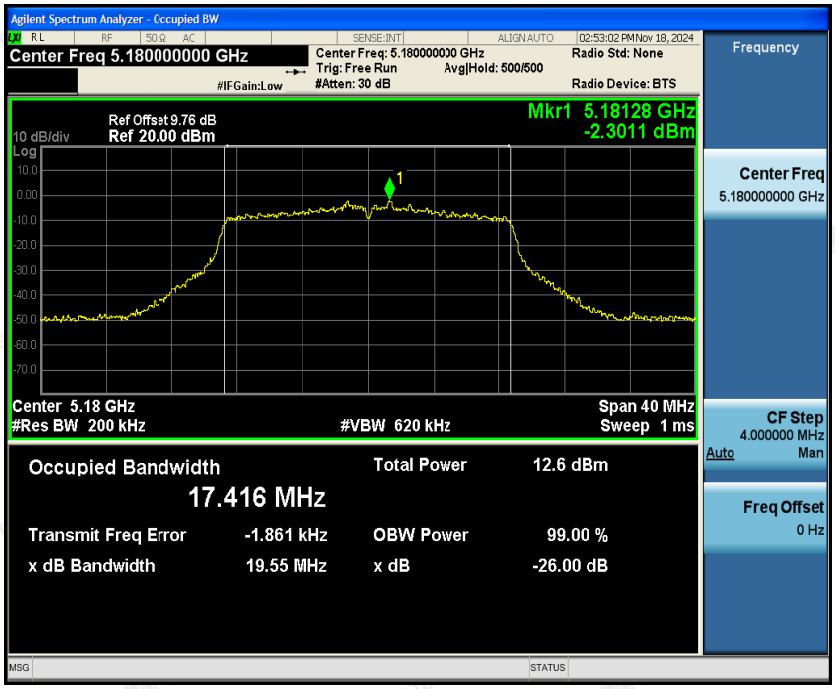
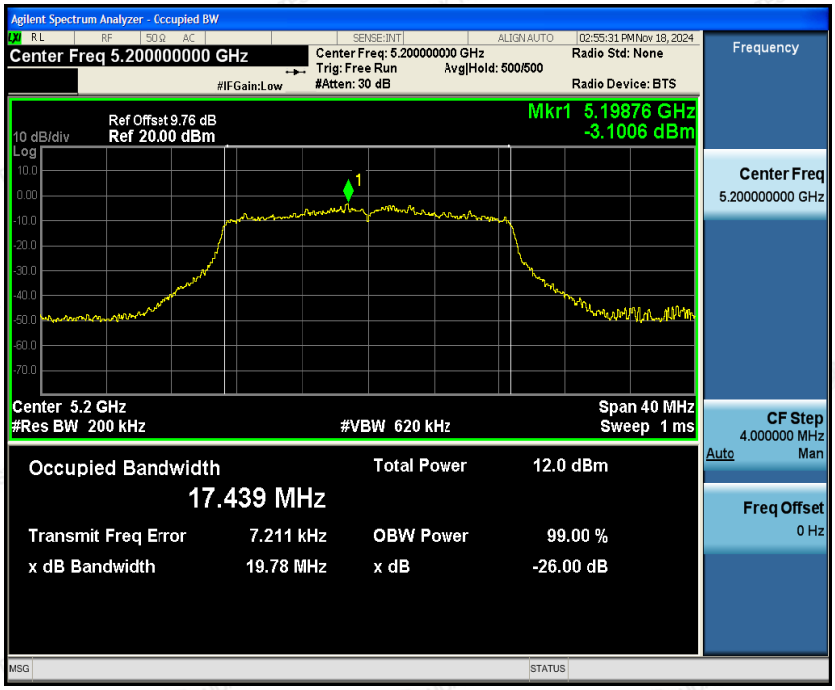
IEEE802.11n HT20 mode

5150~5250MHz

Low Channel



Mid Channel



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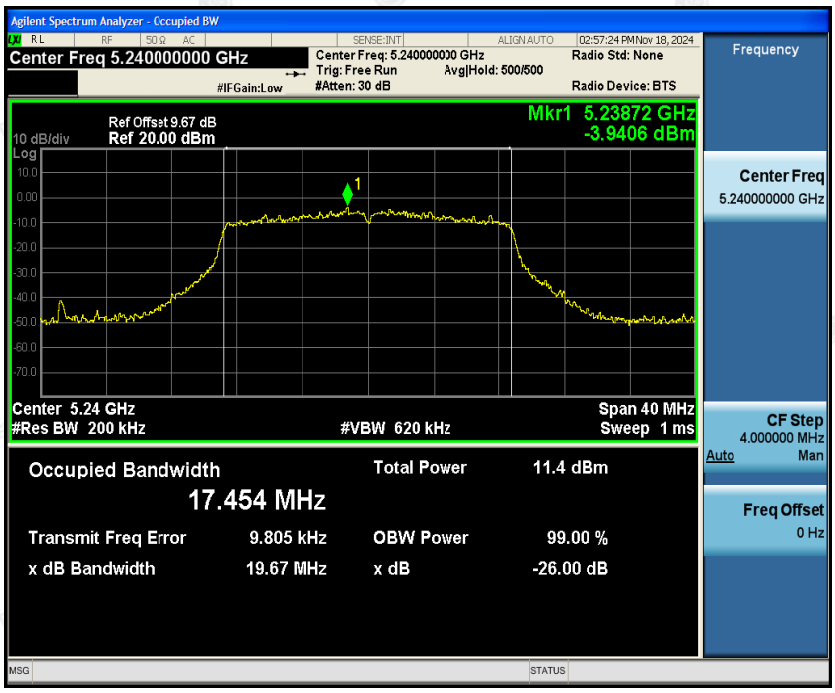
High Channel



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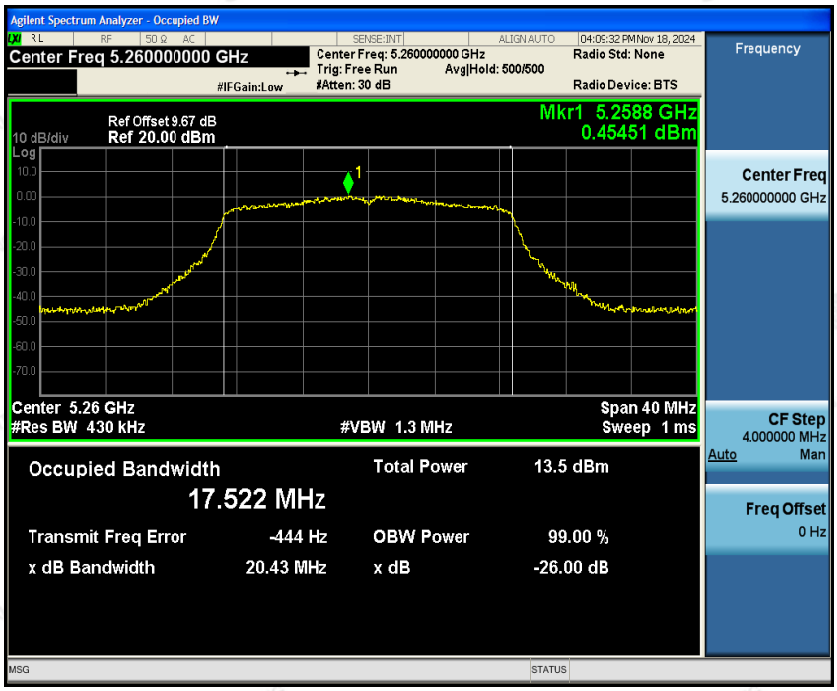
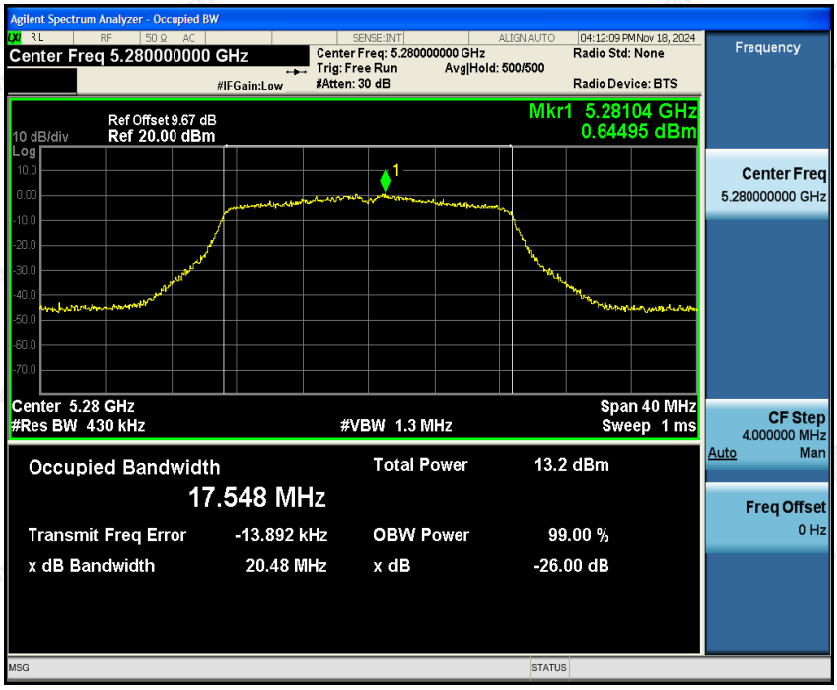
5250~5350MHz

Low Channel



Mid Channel



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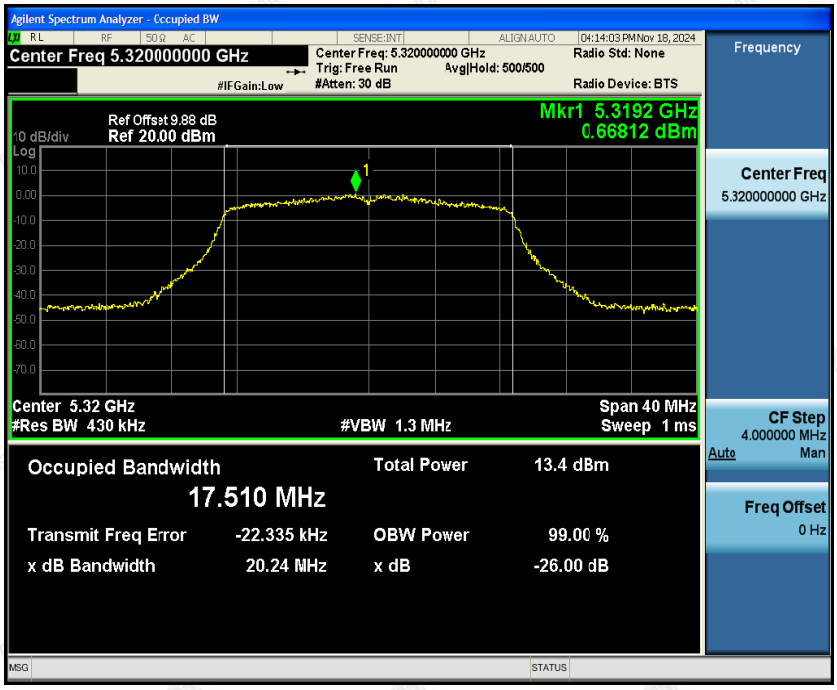
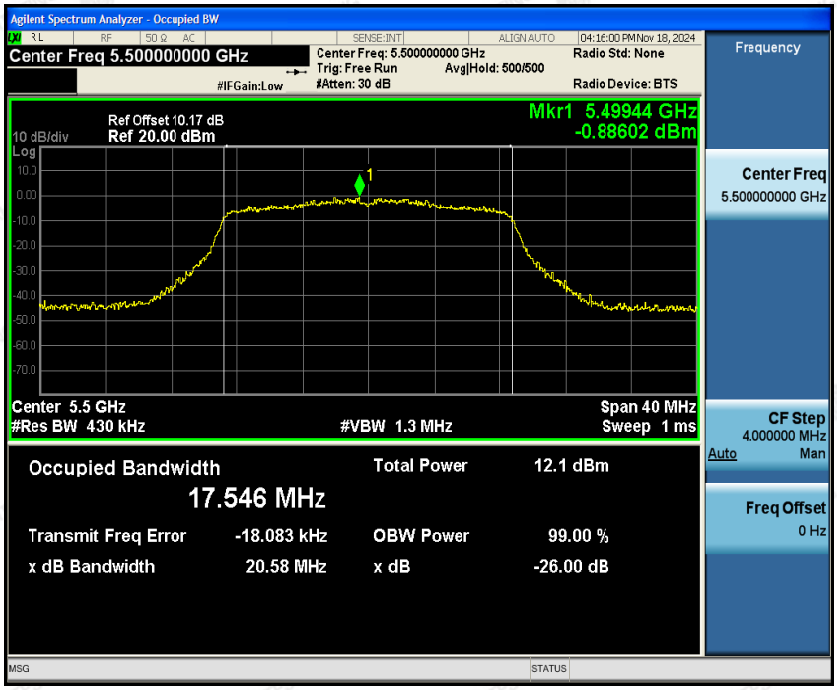
High Channel



5470~5725MHz

Low Channel



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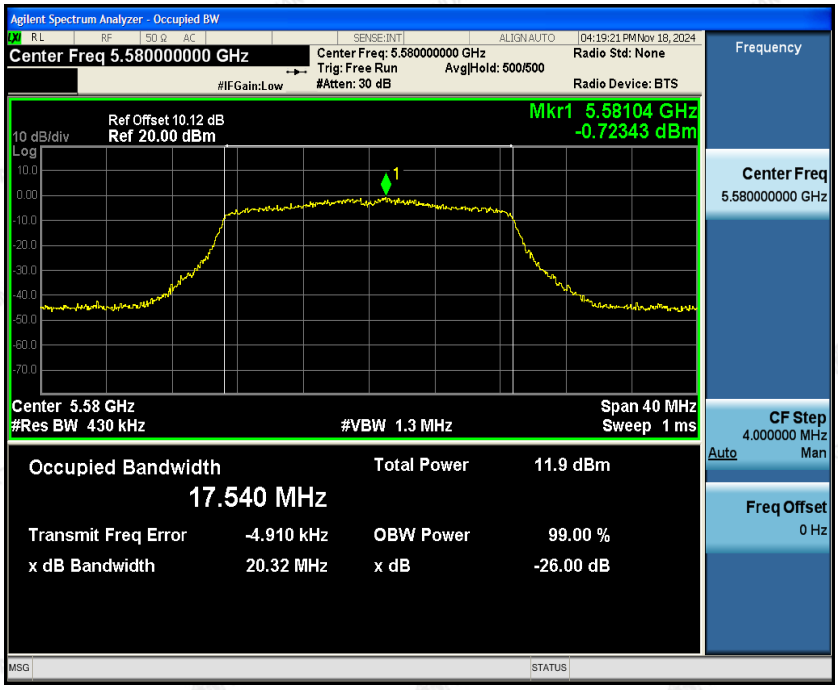
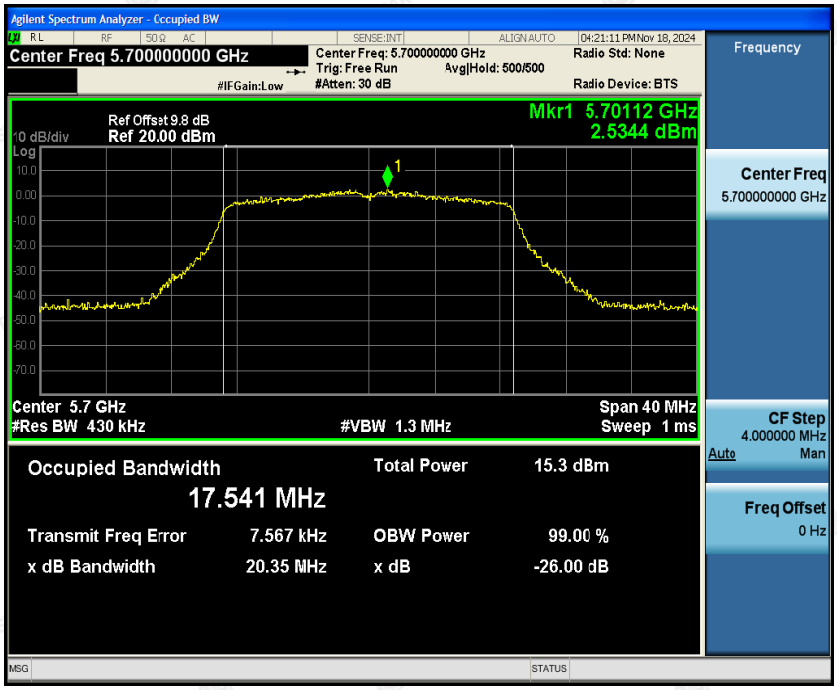
Mid Channel



High Channel



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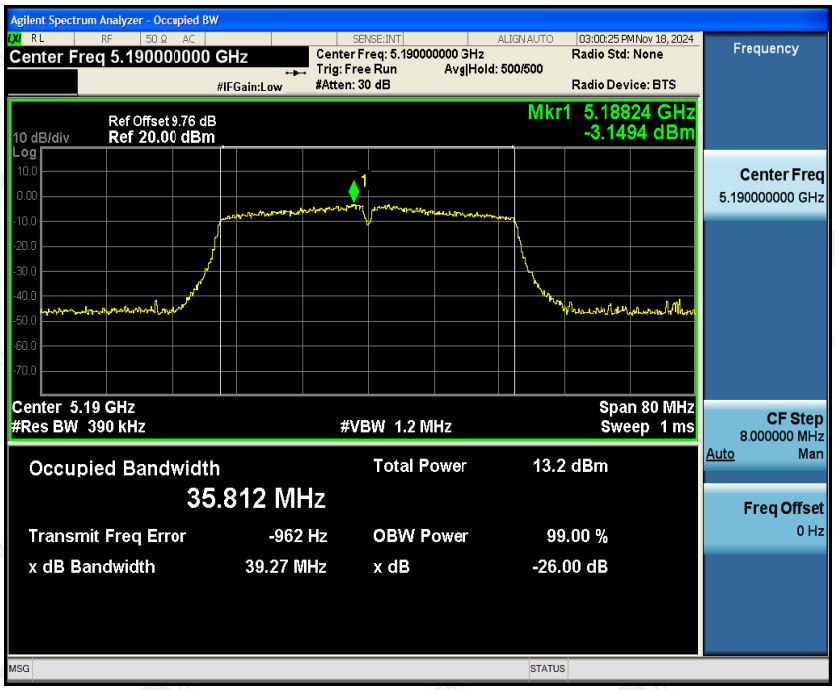
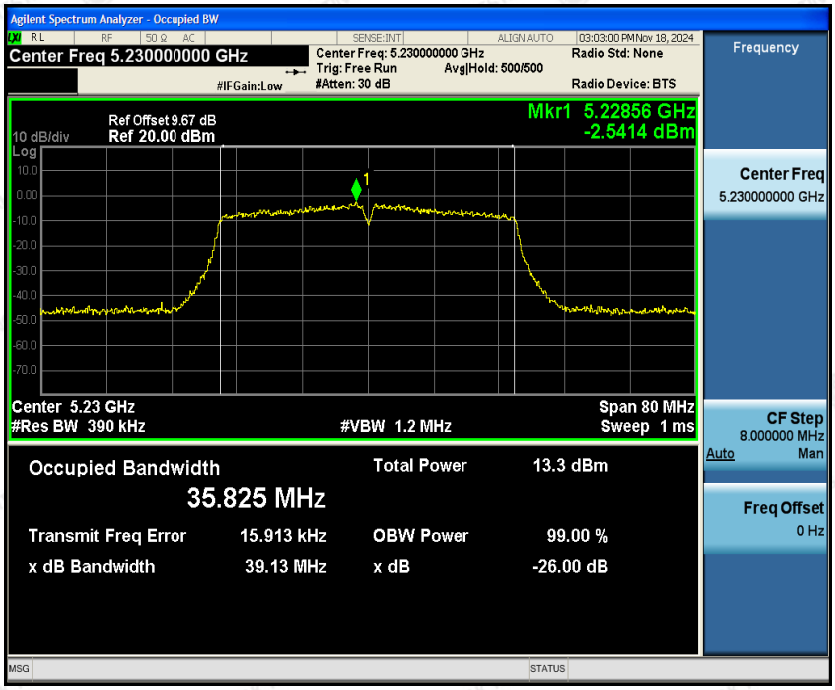
IEEE802.11n HT40 mode

5150~5250MHz

Low Channel



High Channel



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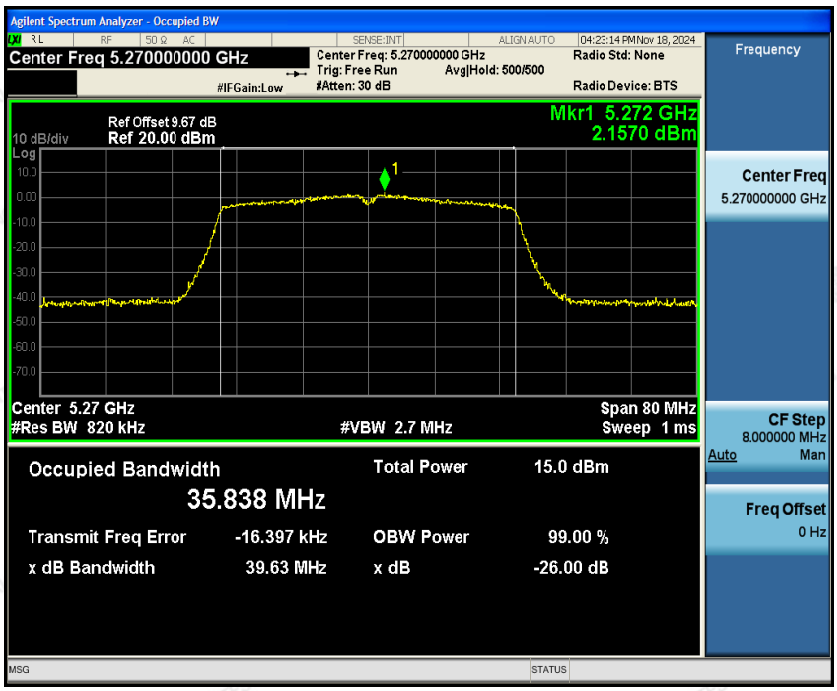
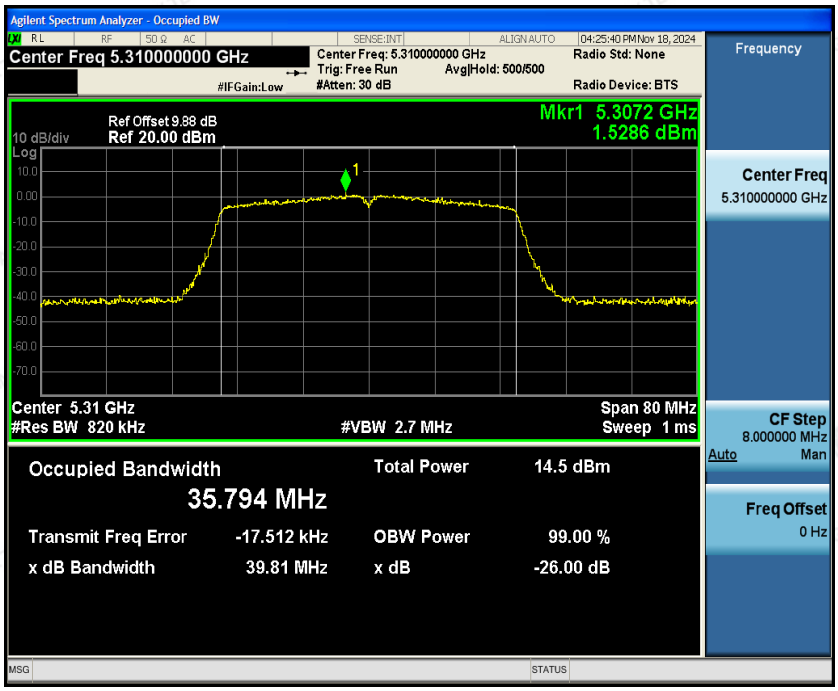
5250~5350MHz

Low Channel



High Channel



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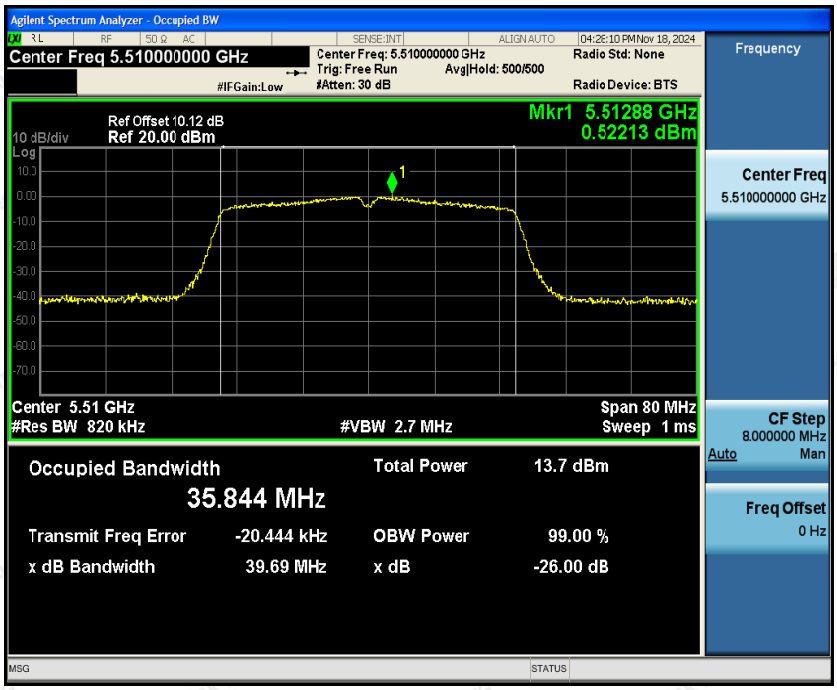
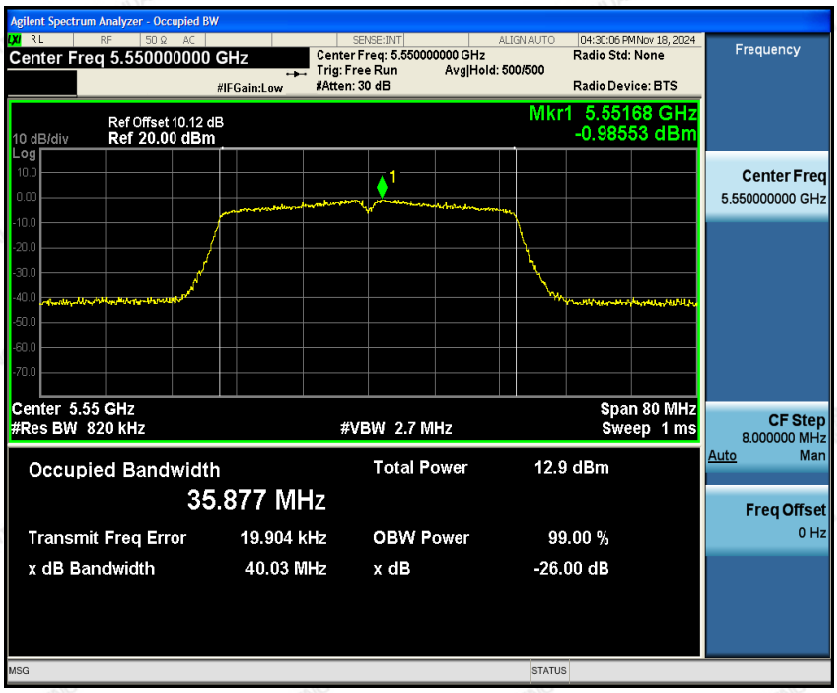
5470~5725MHz

Low Channel



Mid Channel



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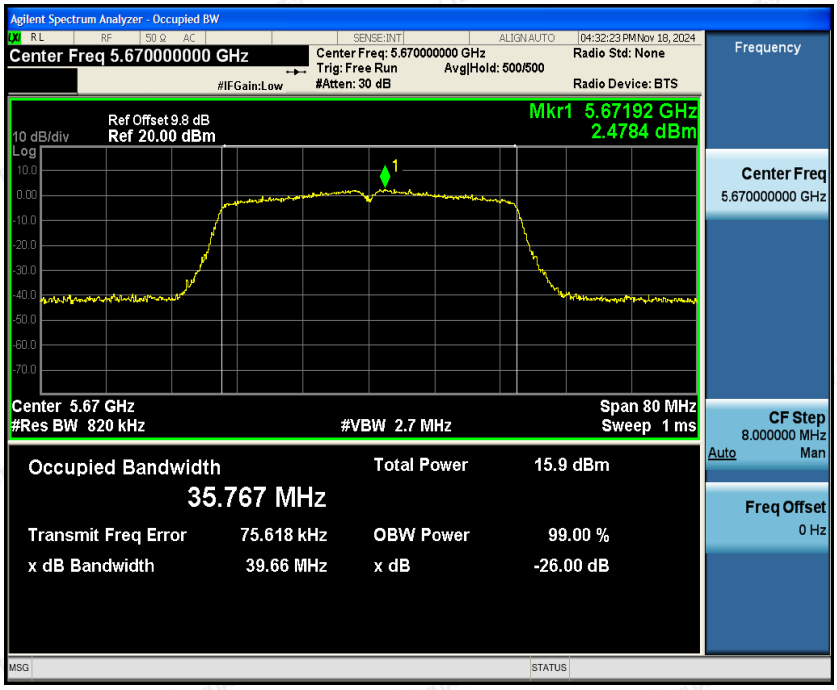
High Channel



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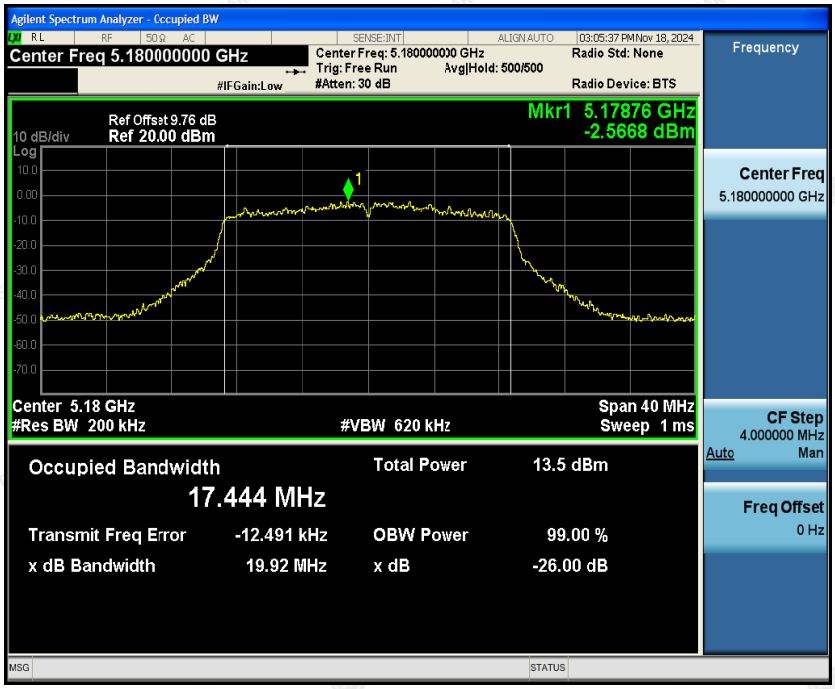
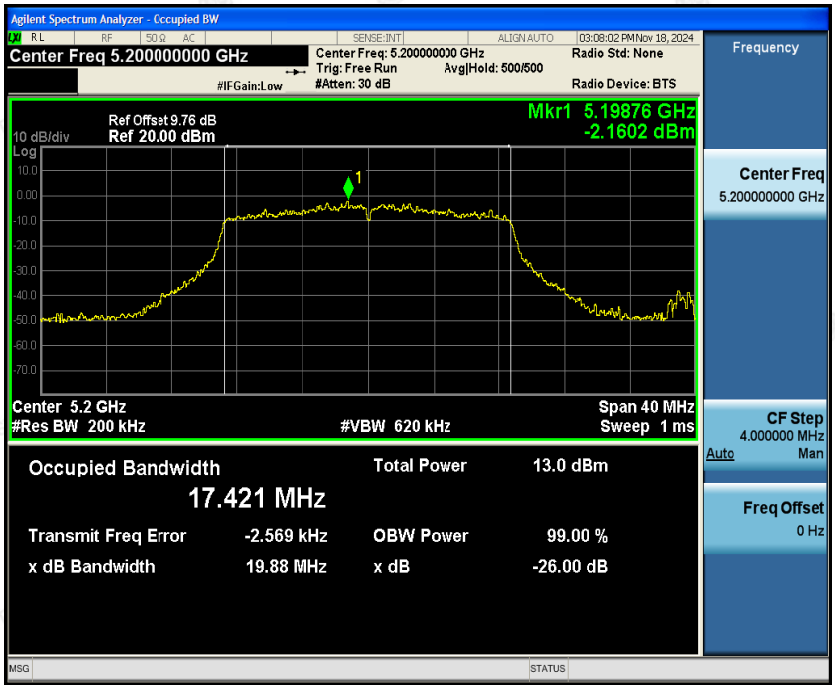
IEEE802.11ac HT20 mode

5150~5250MHz

Low Channel



Mid Channel



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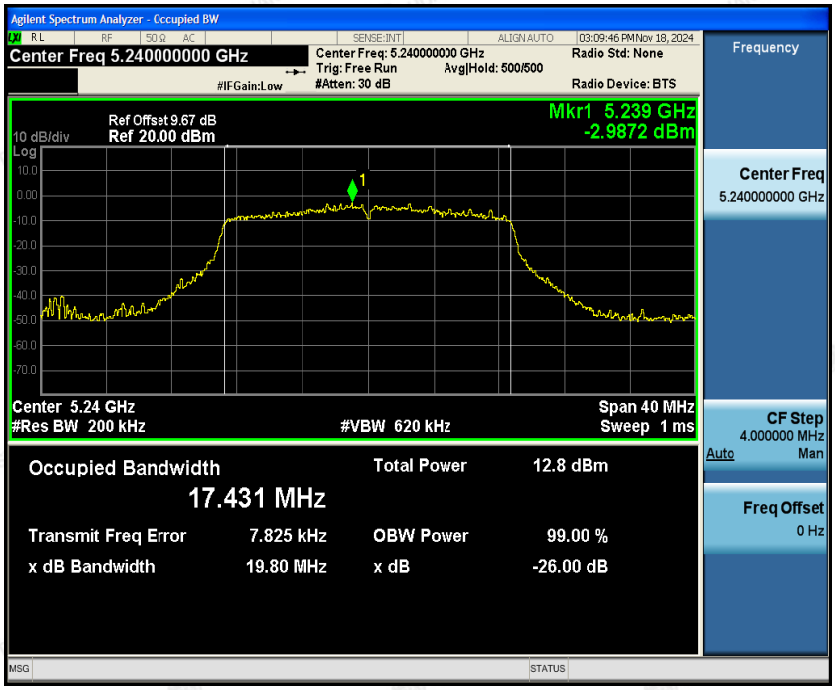
High Channel



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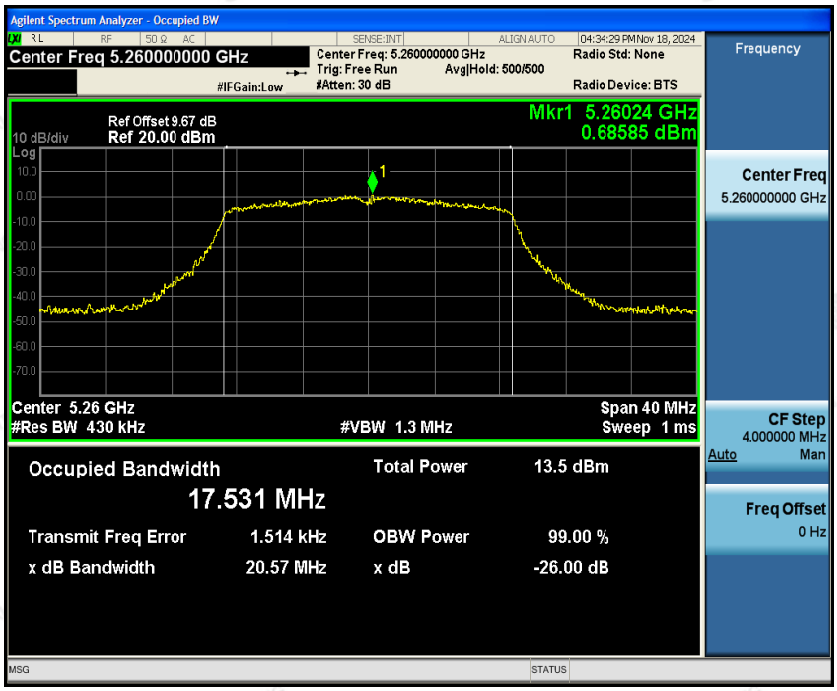
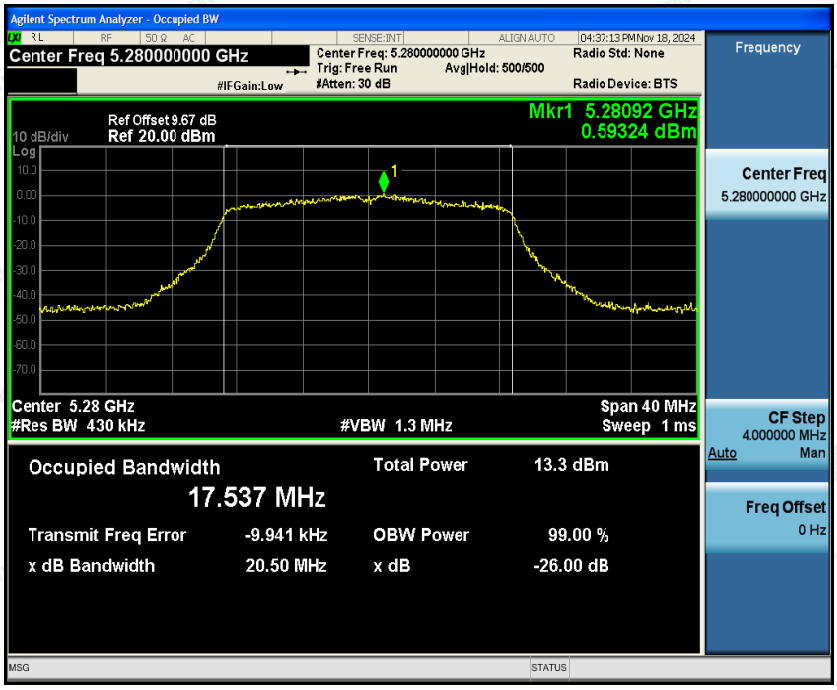
5250~5350MHz

Low Channel



Mid Channel



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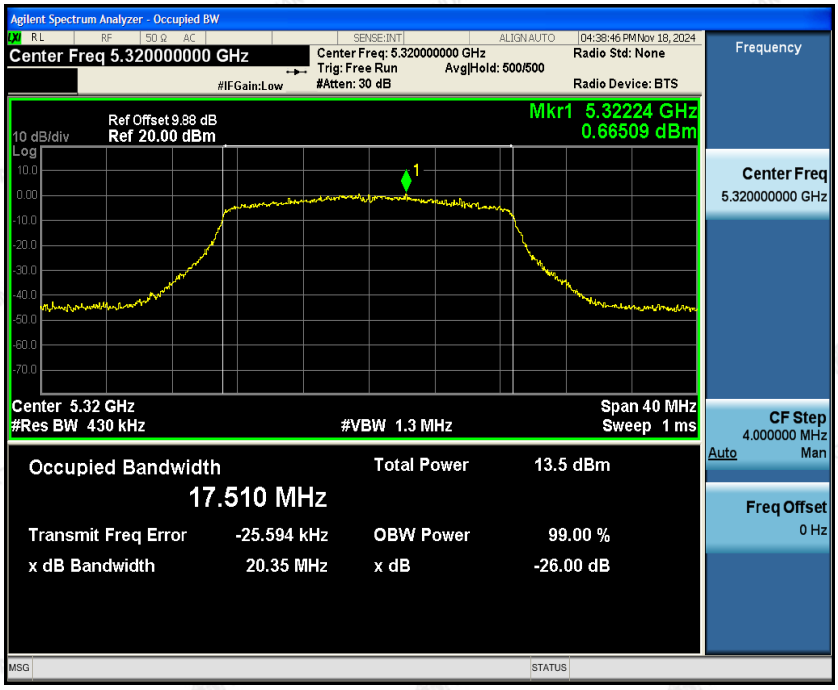
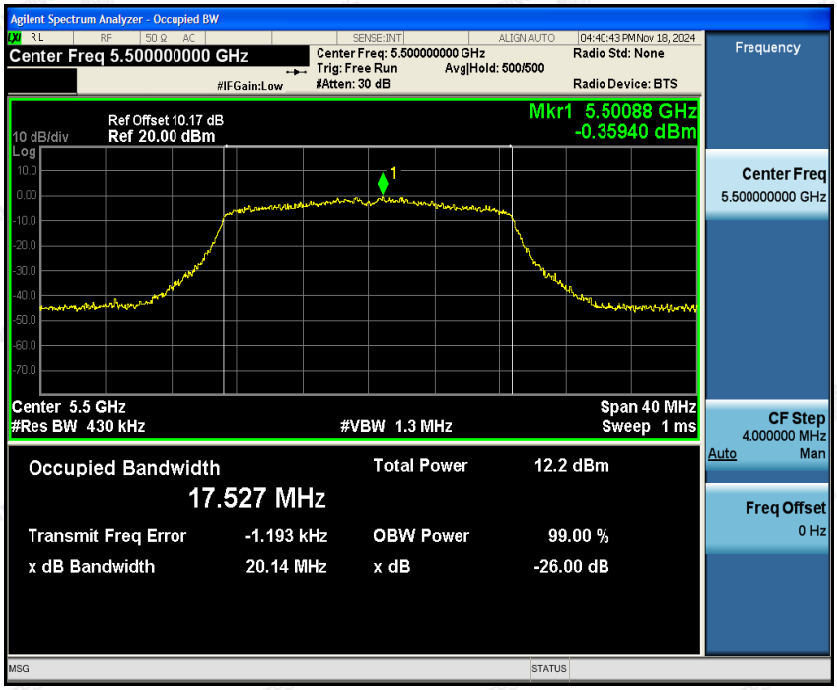
High Channel



5470~5725MHz

Low Channel



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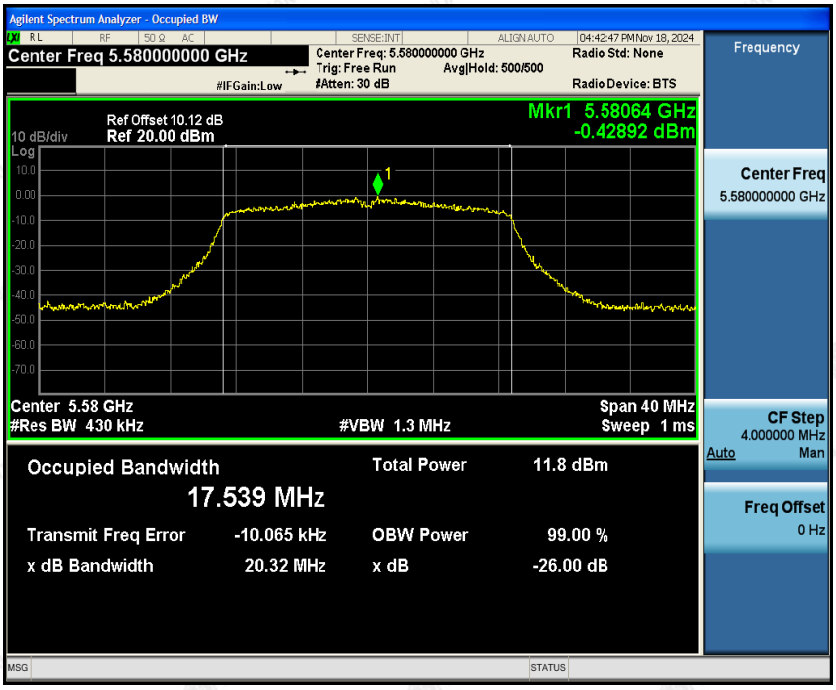
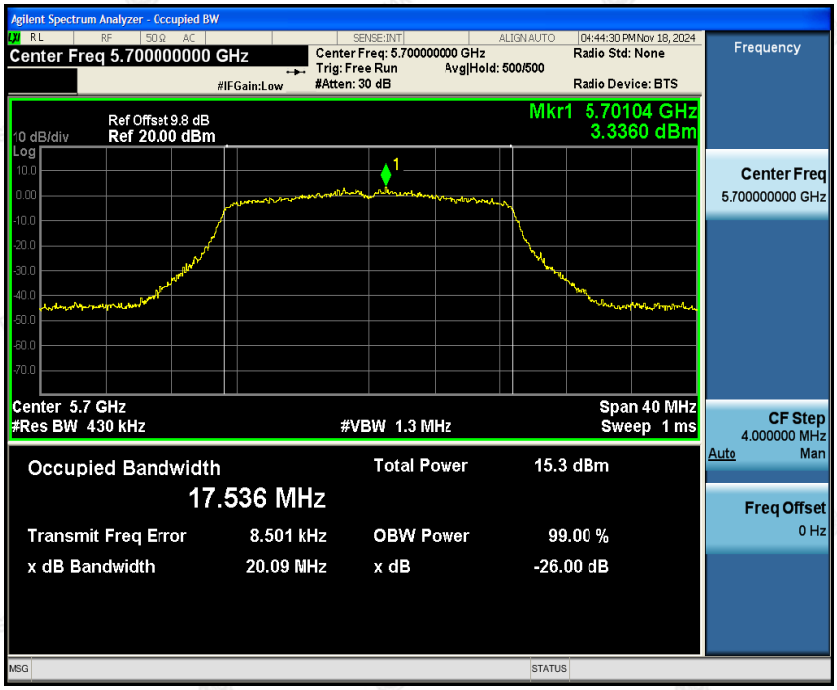
Mid Channel



High Channel



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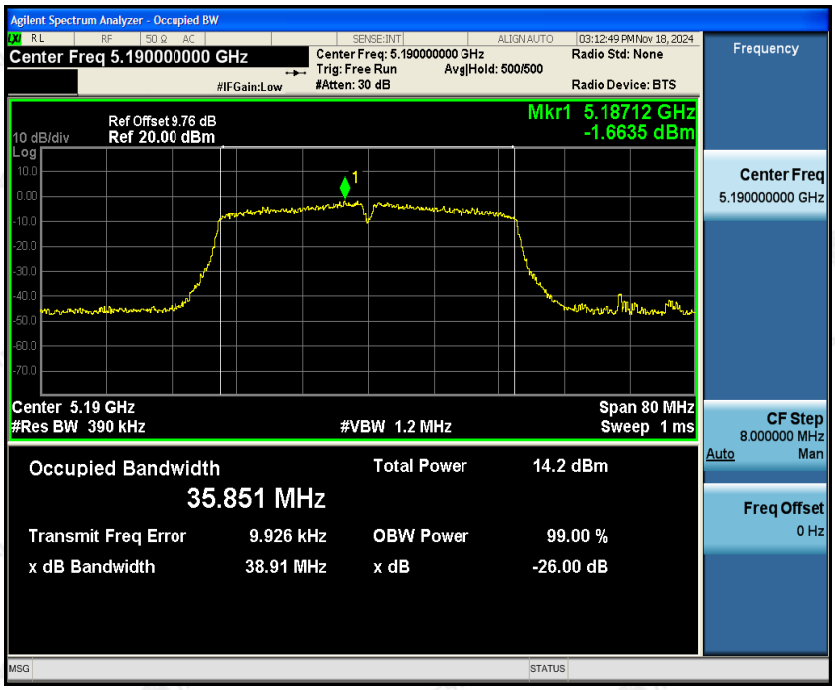
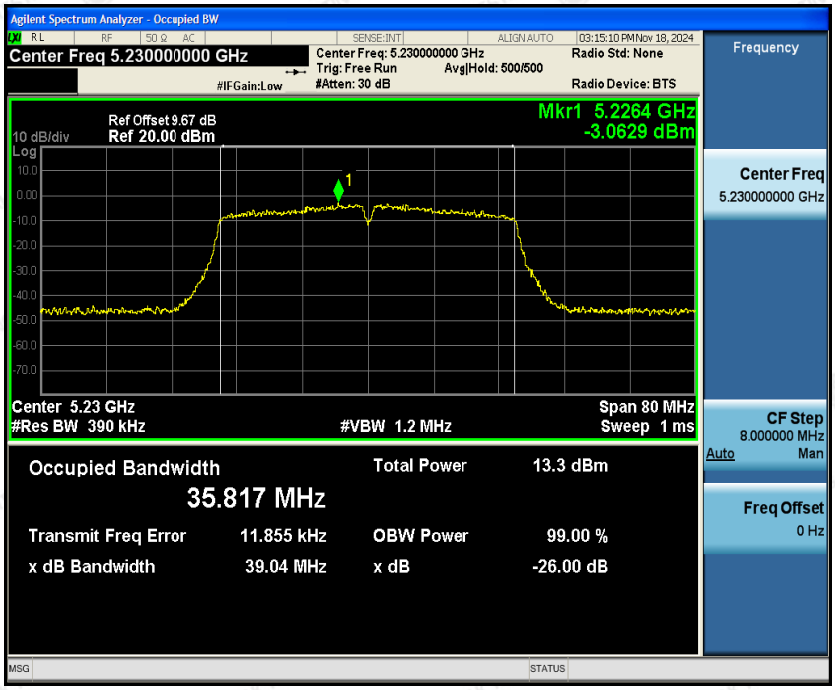
IEEE802.11ac HT40 mode

5150~5250MHz

Low Channel



High Channel



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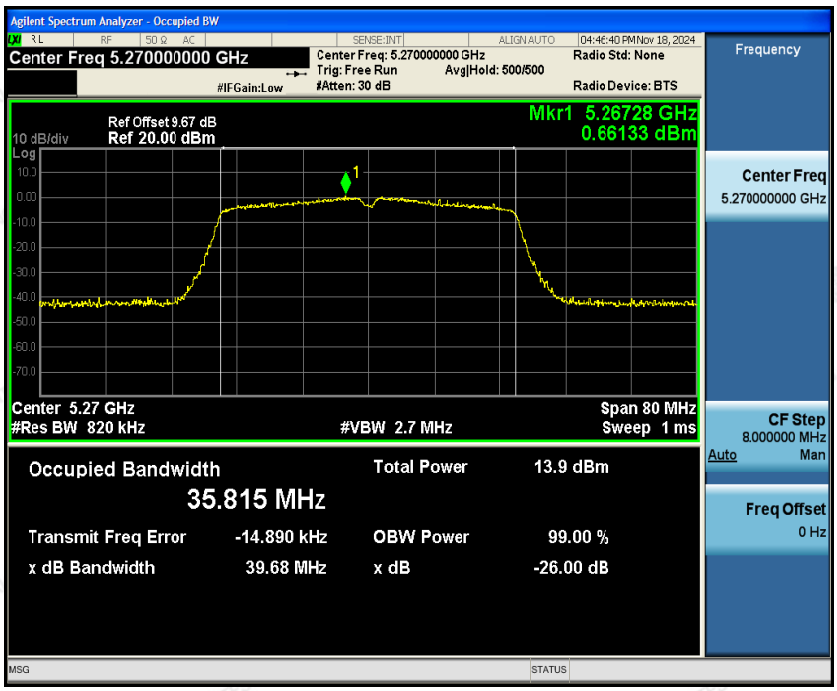
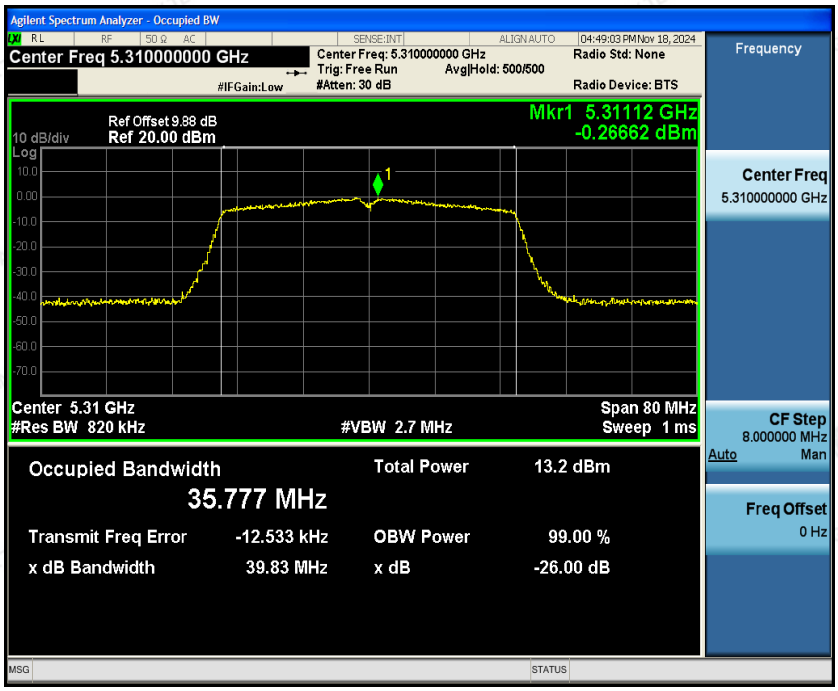
5250~5350MHz

Low Channel



High Channel



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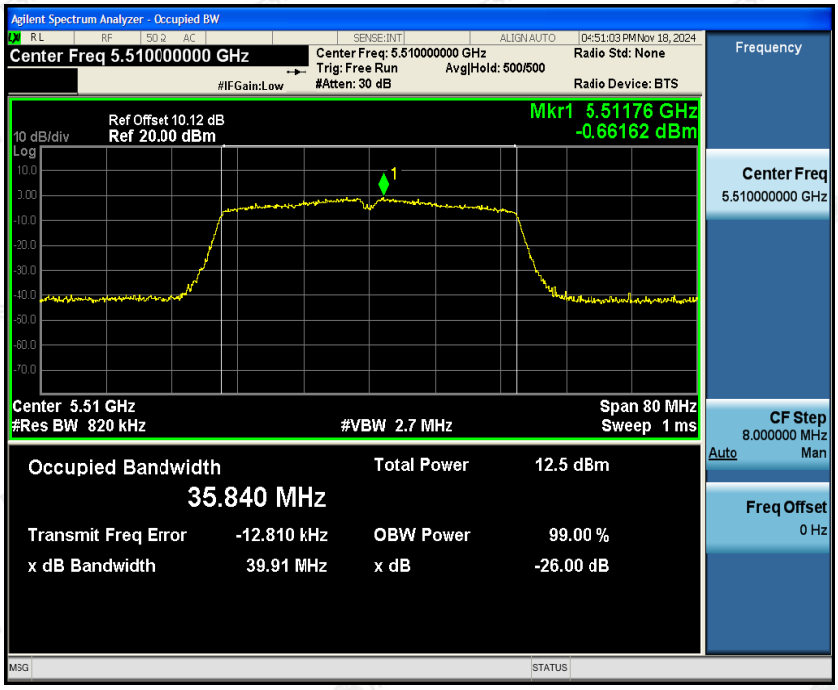
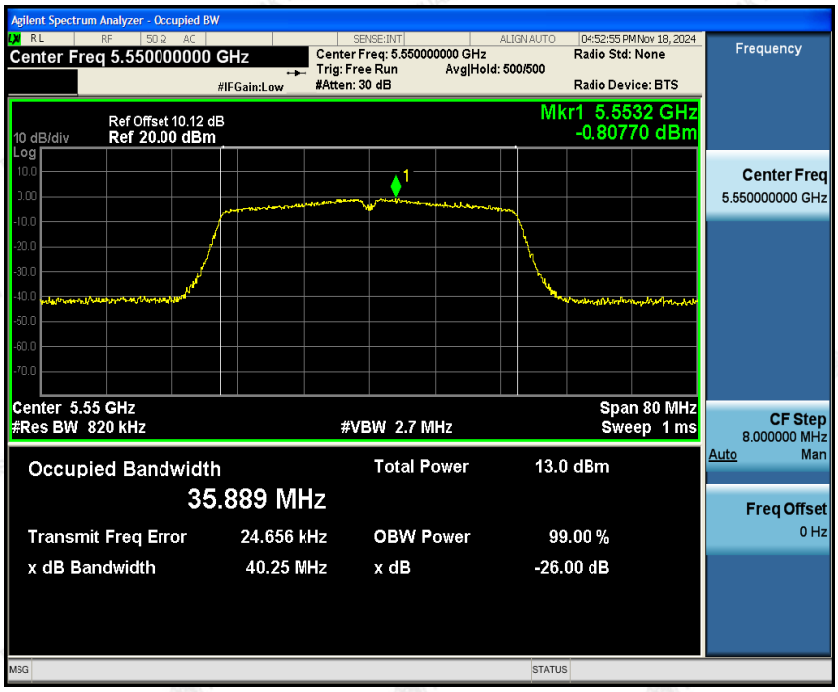
5470~5725MHz

Low Channel



Mid Channel



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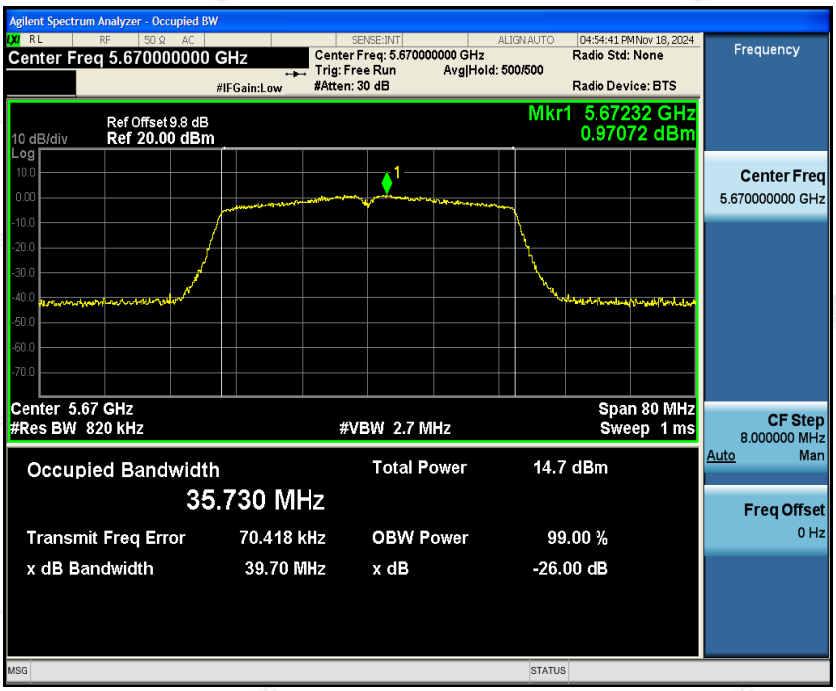
High Channel



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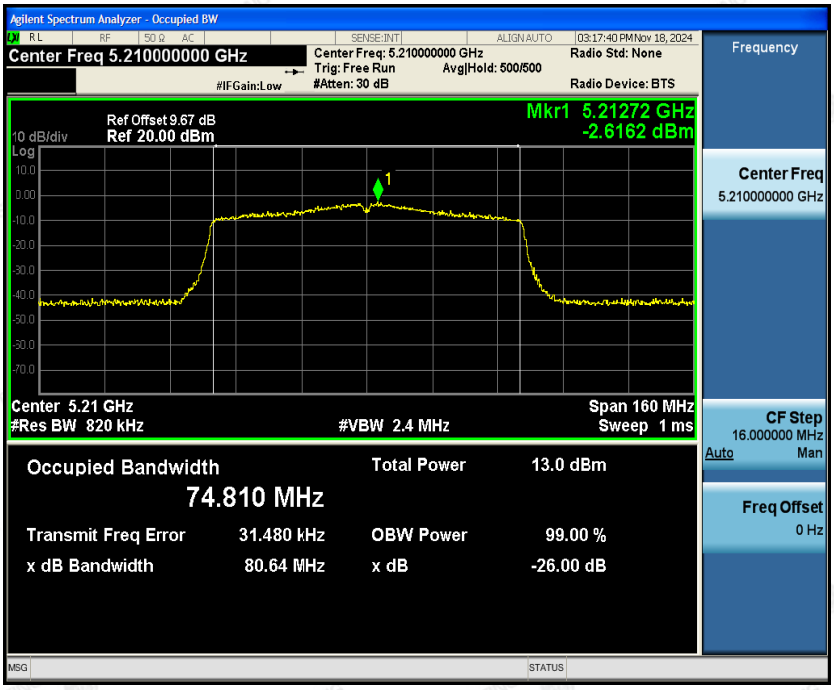
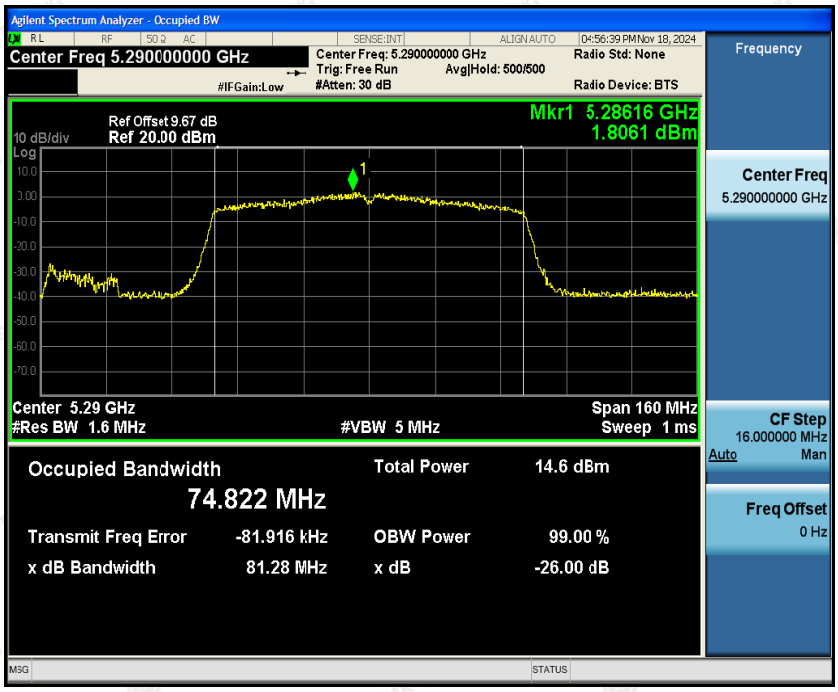
IEEE802.11ac HT80 mode

5150-5250MHz



5250-5350MHz



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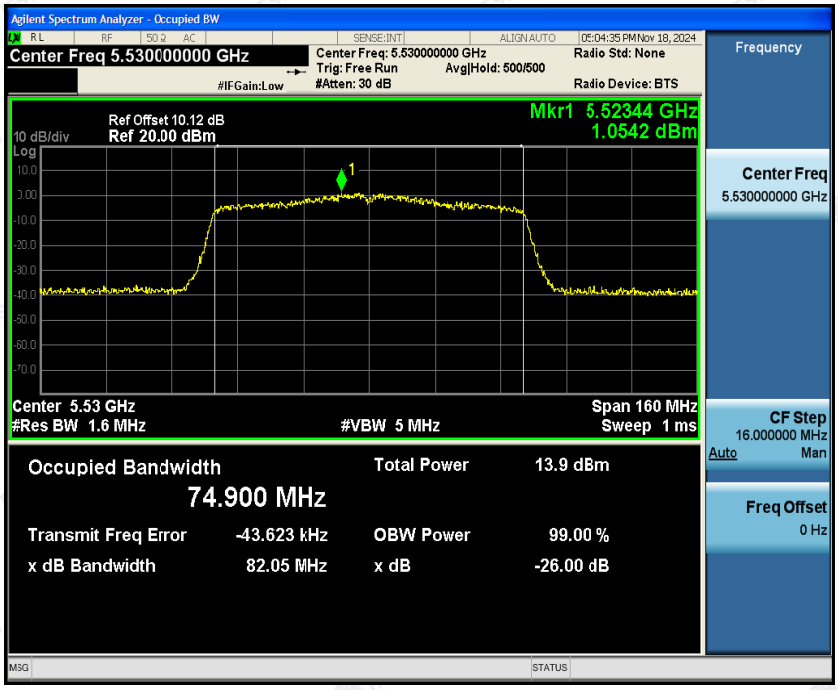
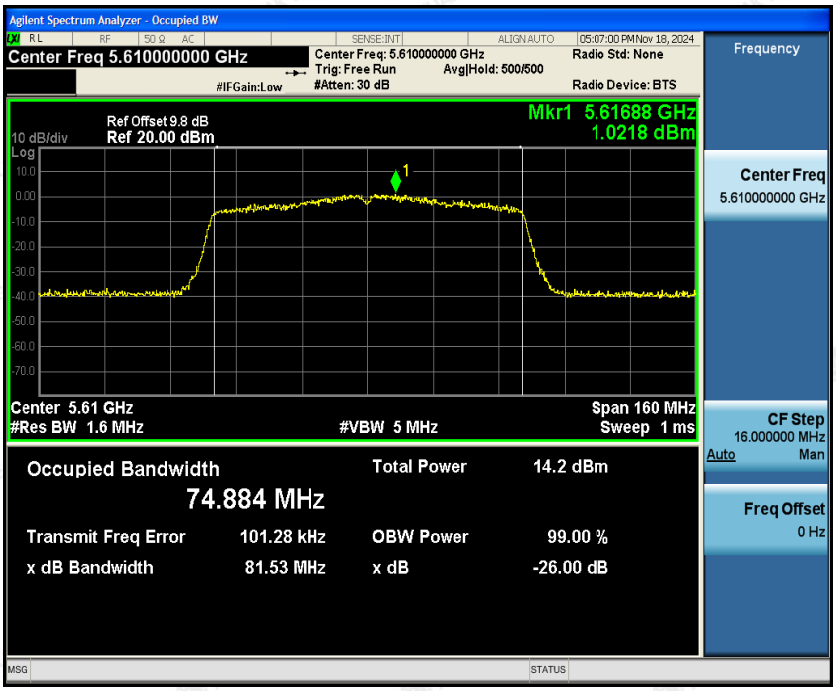
5470-5725MHz

Low Channel



High Channel



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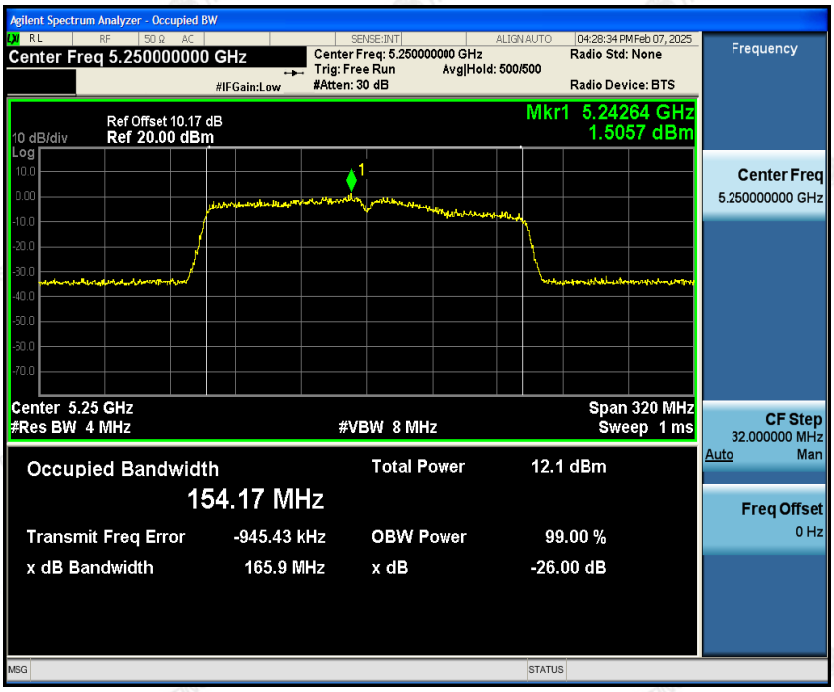
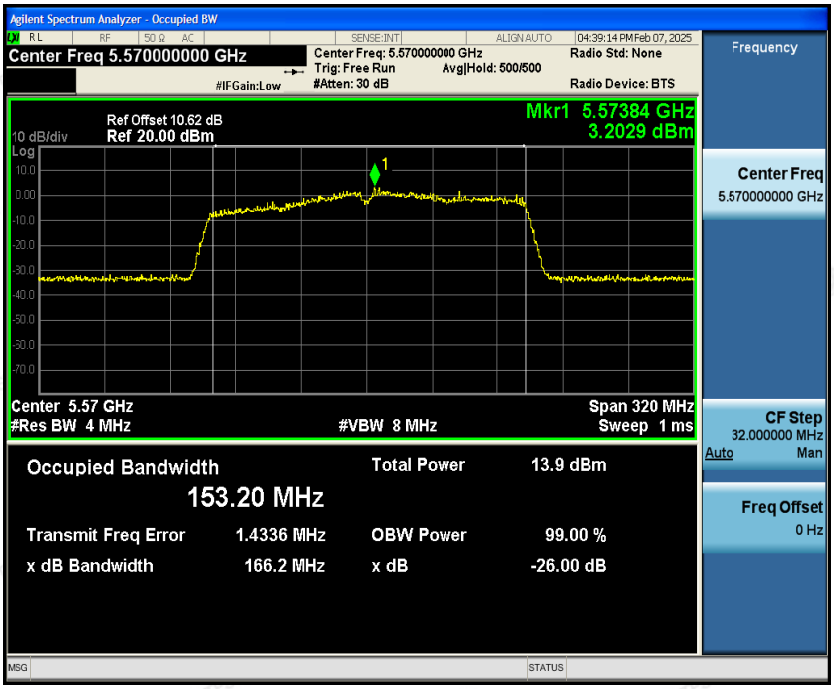
IEEE802.11ac HT160 mode

5150-5350MHz



5470-5725MHz



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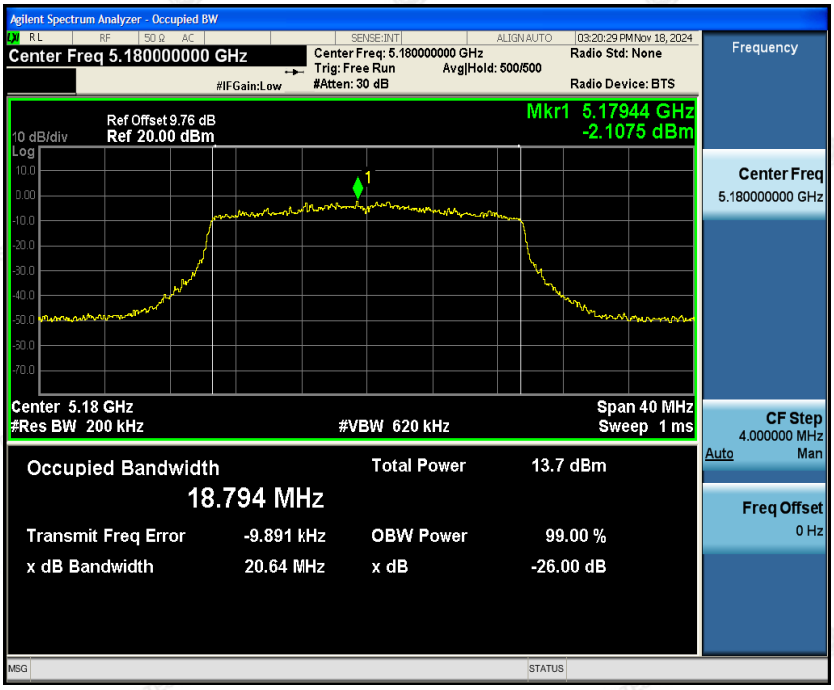
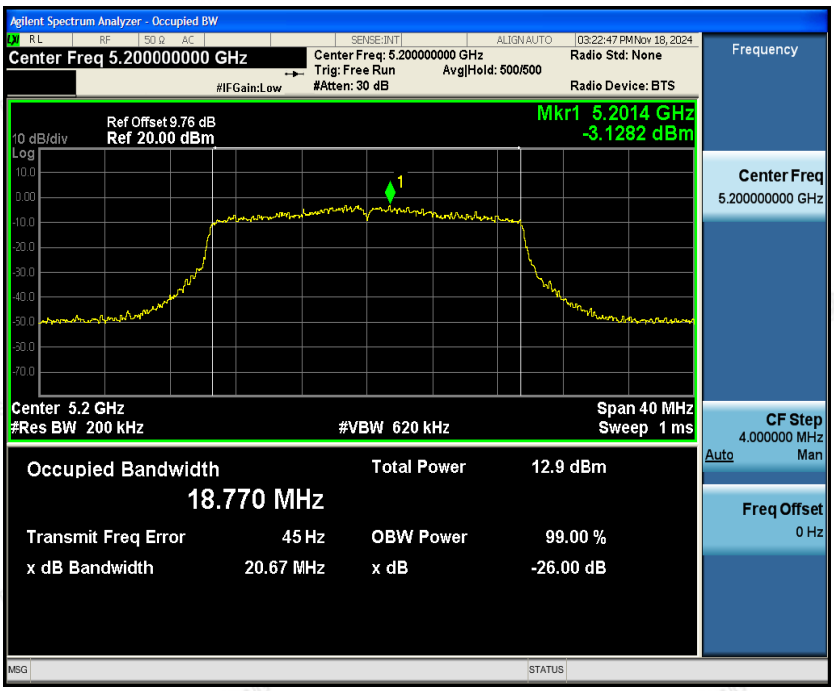
IEEE802.11ax HE20 mode

5150~5250MHz

Low Channel



Mid Channel



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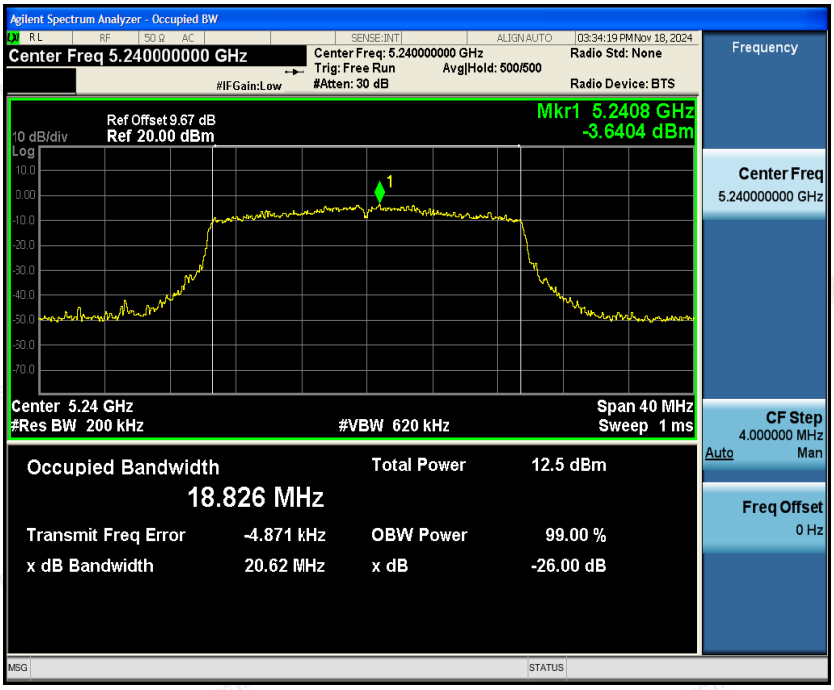
High Channel



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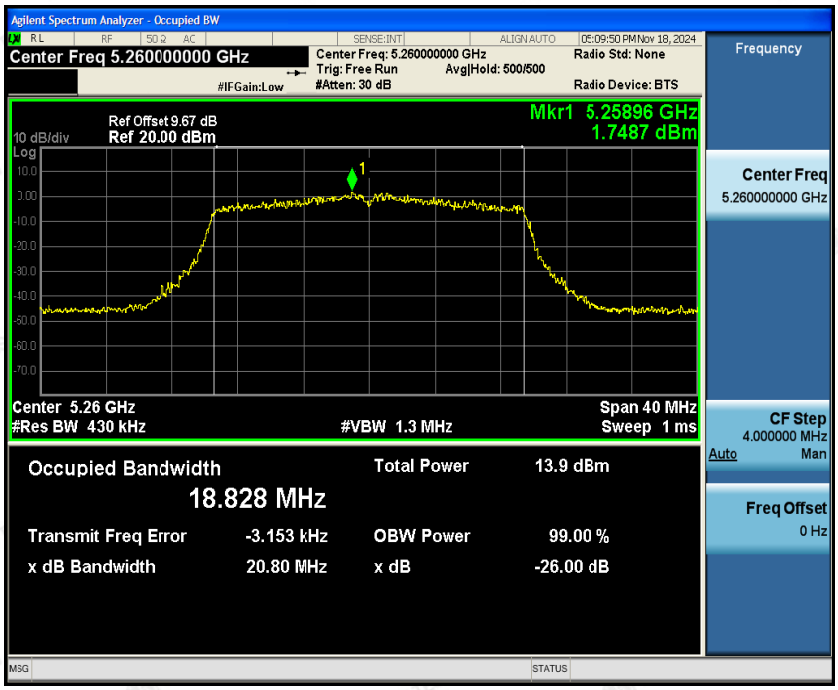
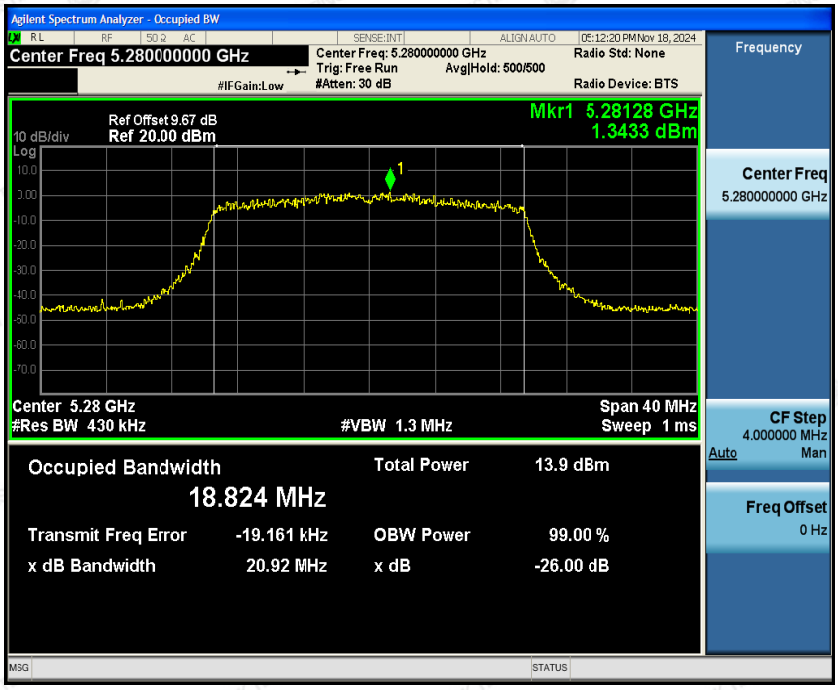
5250~5350MHz

Low Channel



Mid Channel



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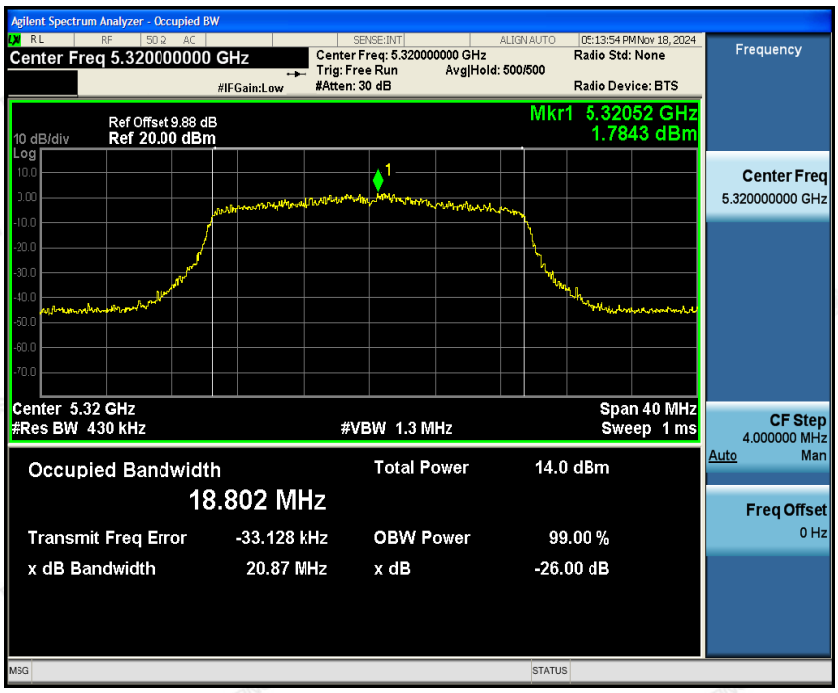
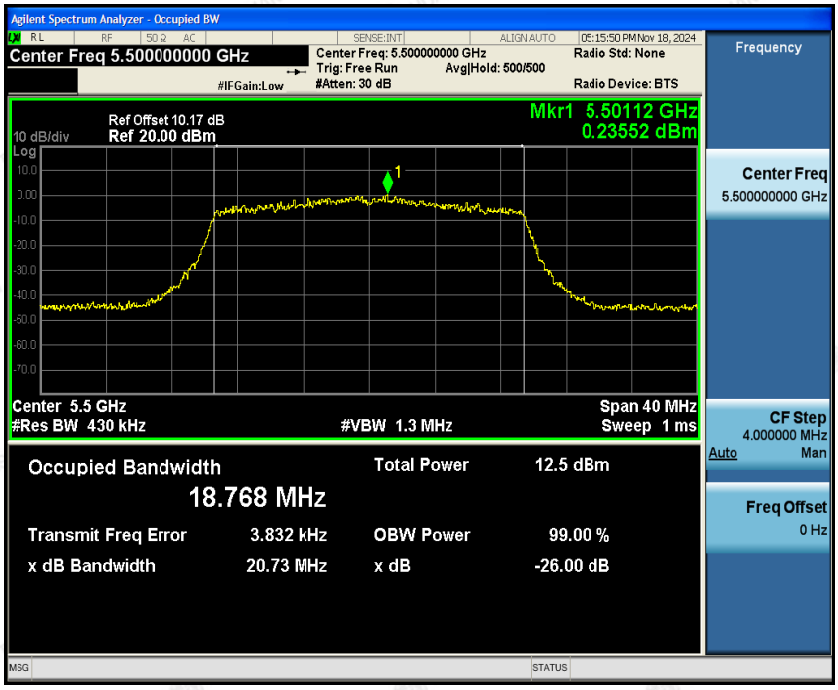
High Channel



5470~5725MHz

Low Channel



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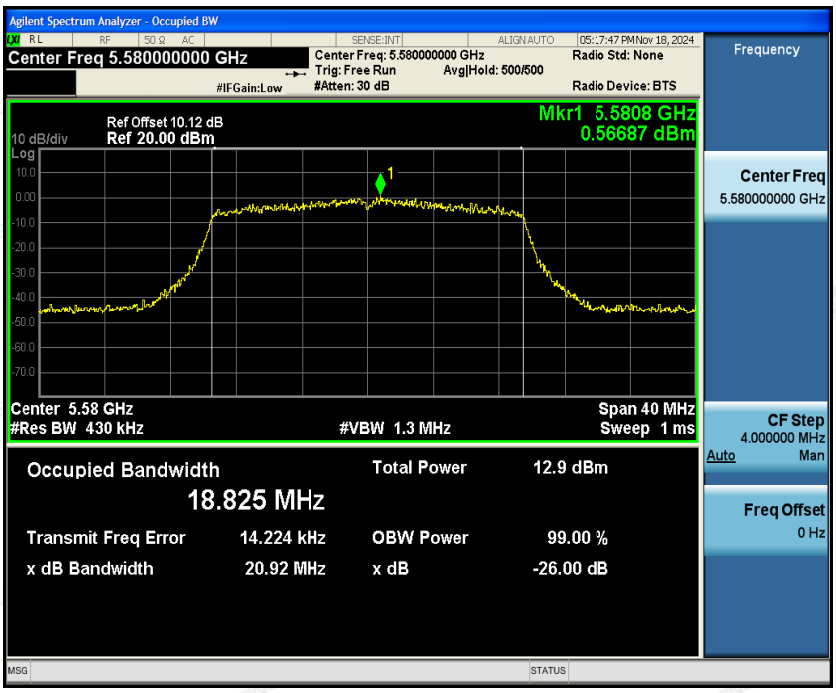
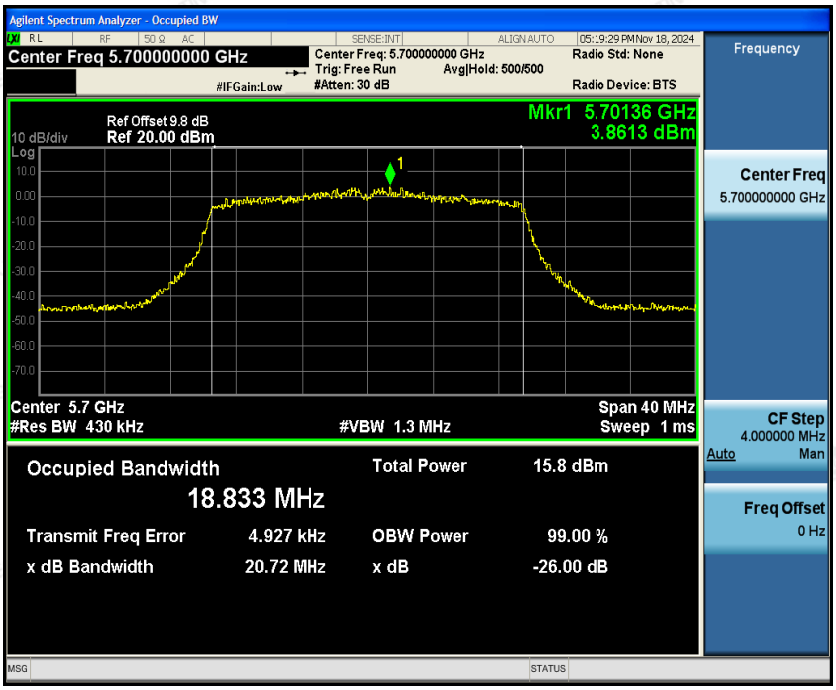
Mid Channel



High Channel



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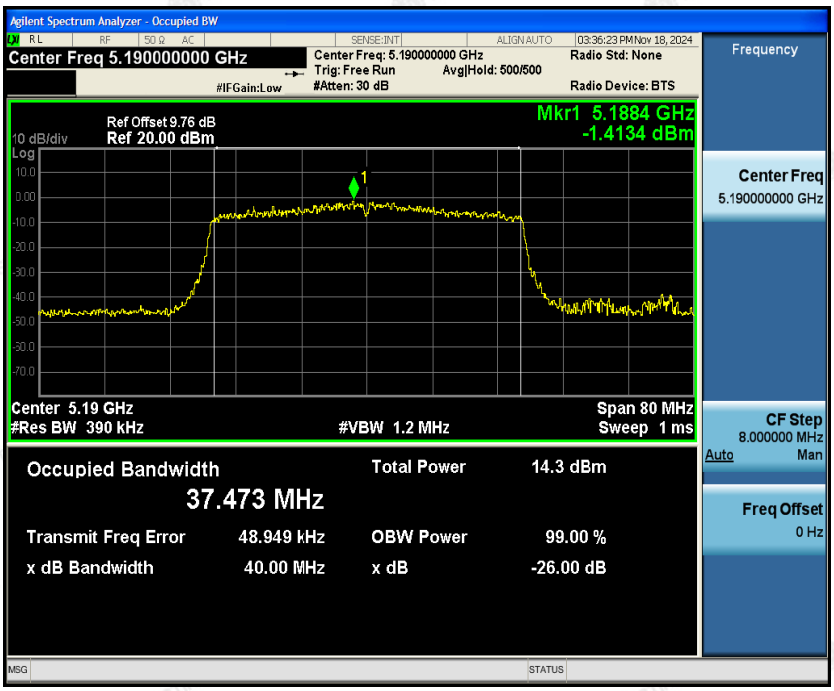
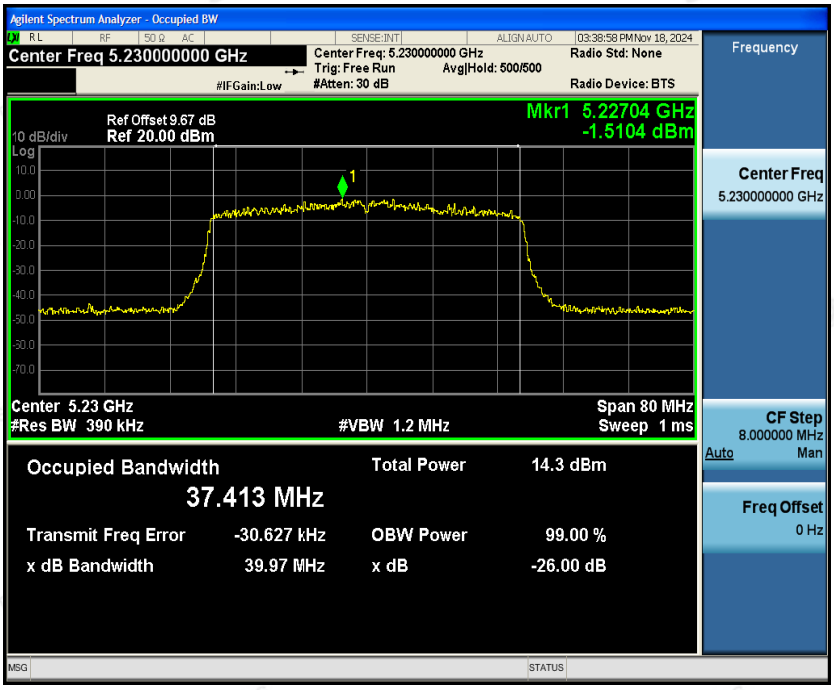
IEEE802.11ax HE40 mode

5150~5250MHz

Low Channel



High Channel



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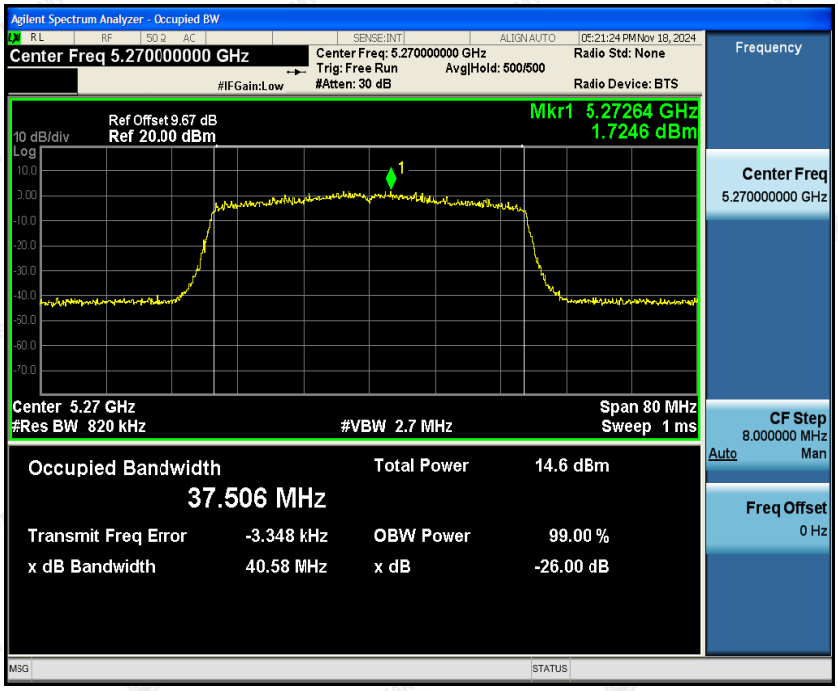
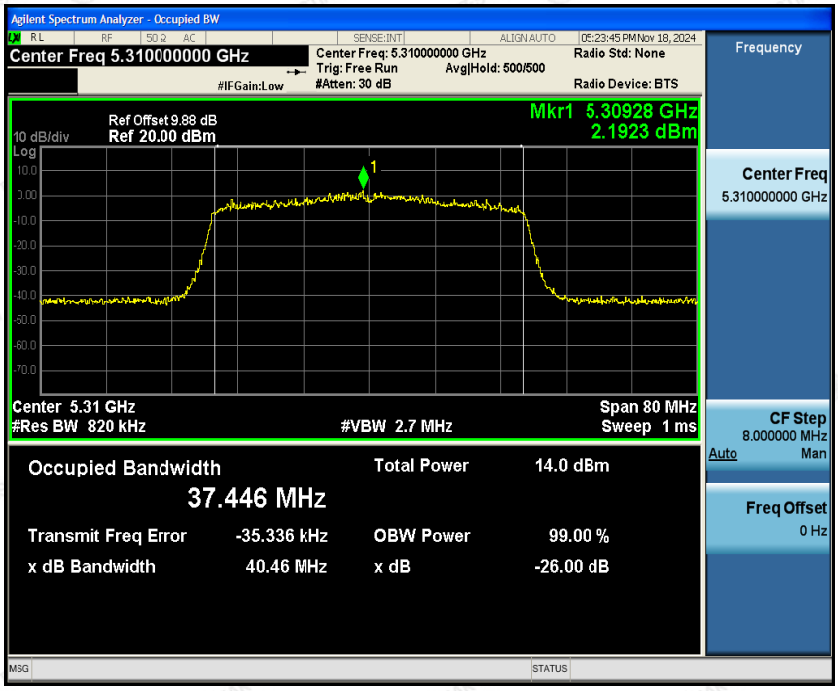
5250~5350MHz

Low Channel



High Channel



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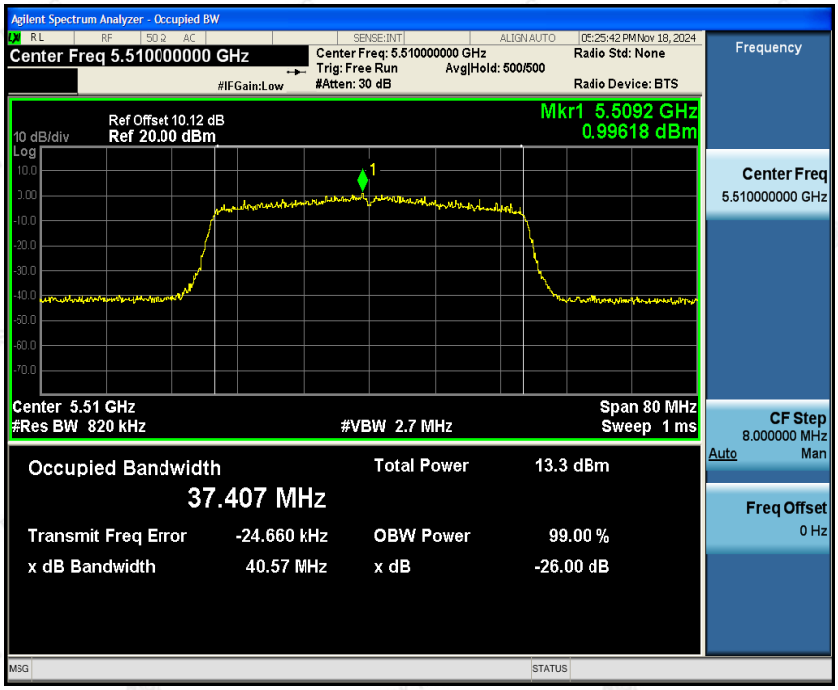
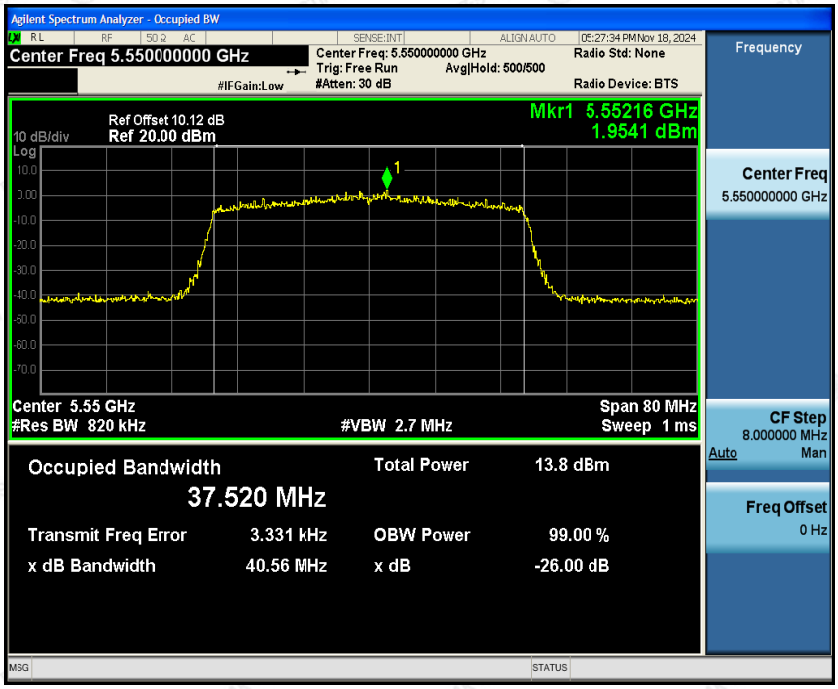
5470~5725MHz

Low Channel



Mid Channel



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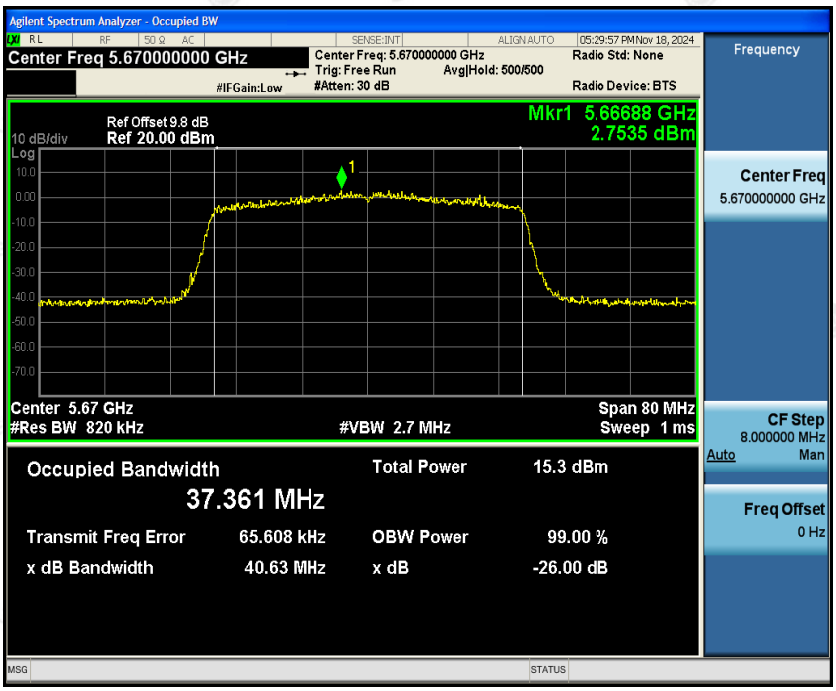
High Channel



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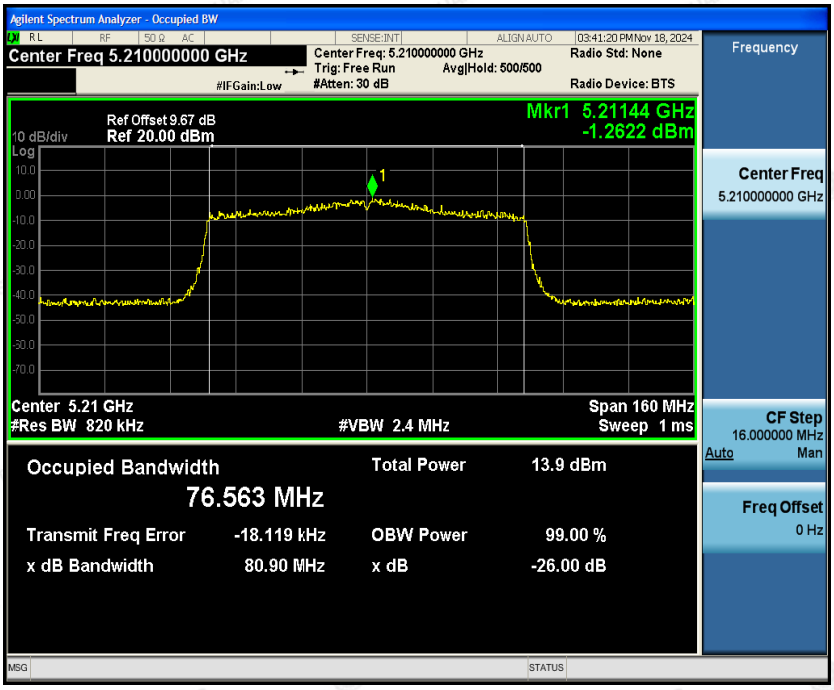
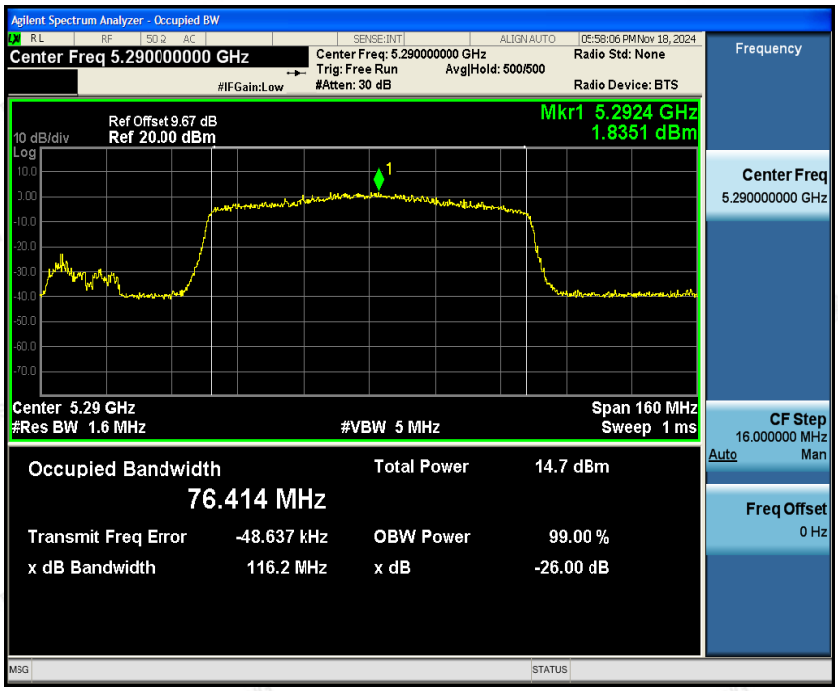
IEEE802.11ax HE80 mode

5150~5250MHz



5250~5350MHz



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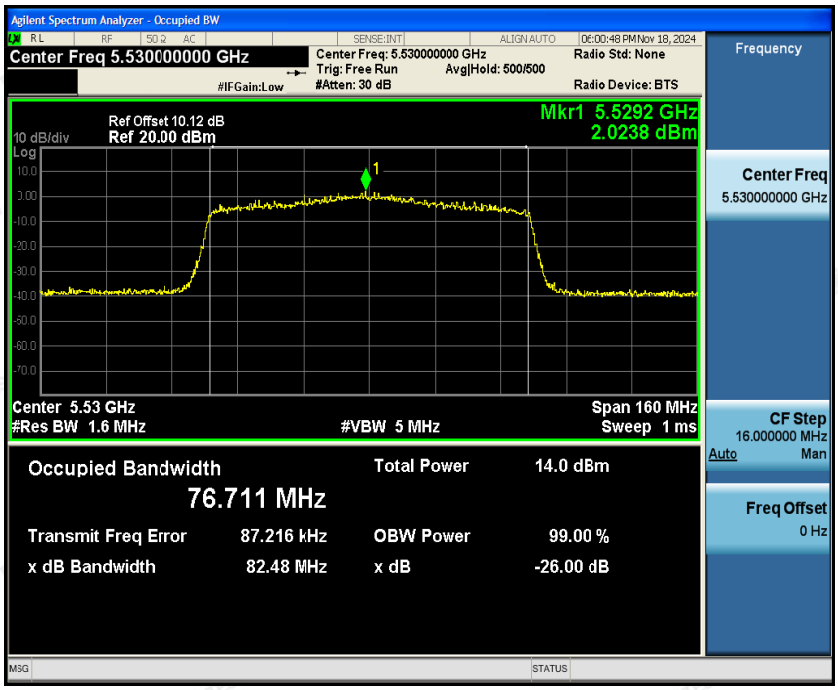
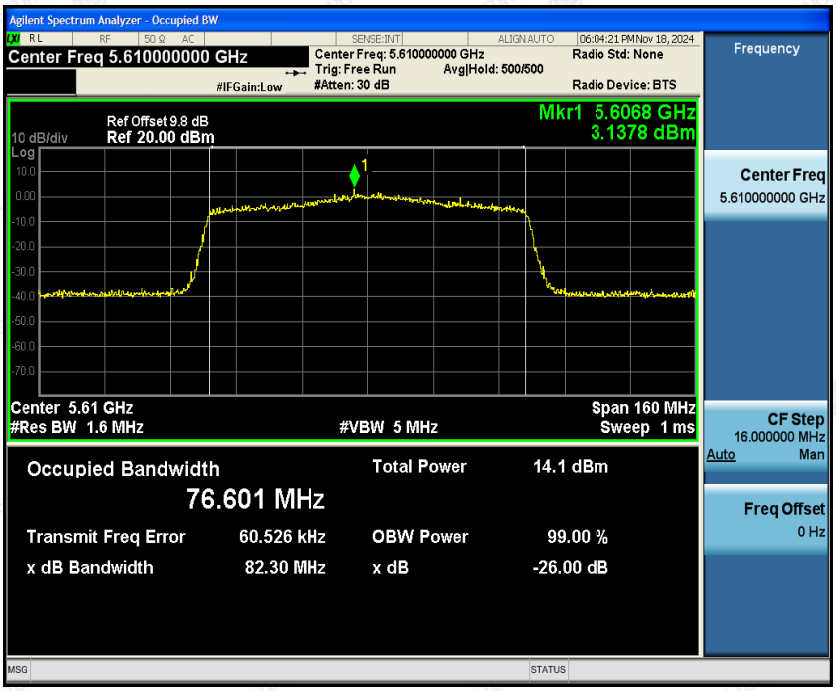
5470~5725MHz

Low Channel



High Channel



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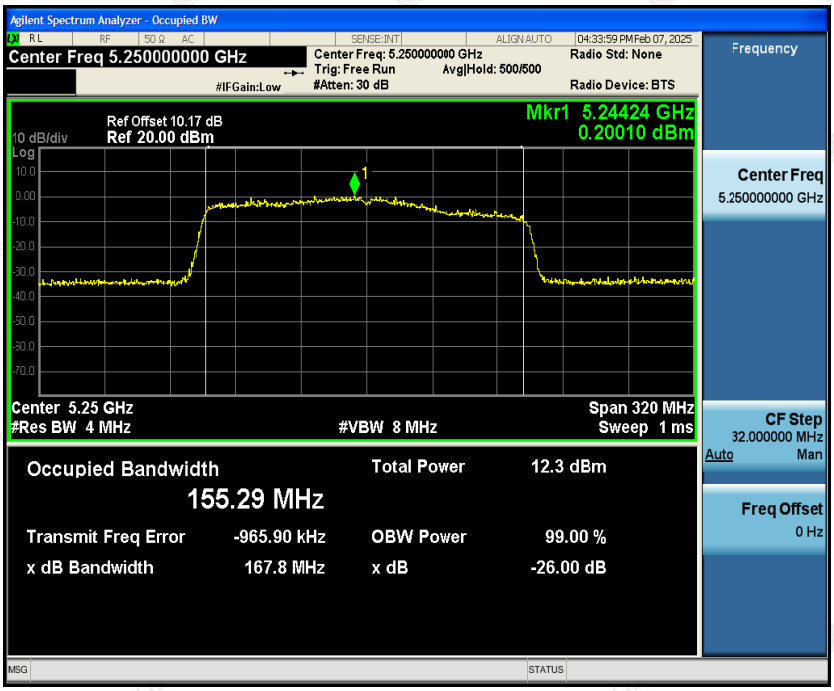
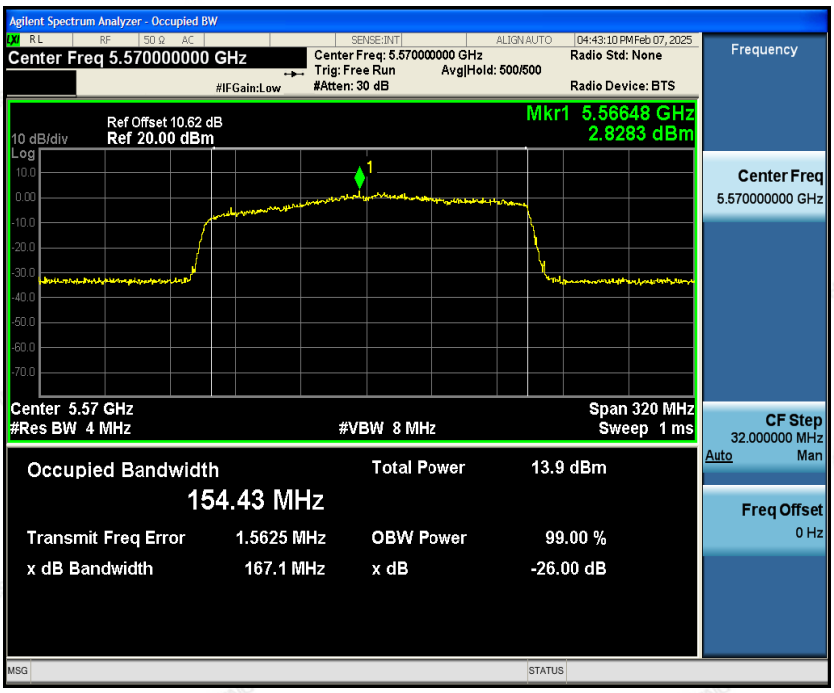
IEEE802.11ax HE160 mode

5150~5350MHz



5470~5725MHz



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Antenna 2

Testmode:IEEE802.11a mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	18.41	16.224
Mid	5200	18.49	16.217
High	5240	18.58	16.237

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	20.48	16.799
Mid	5280	21.01	16.764
High	5320	20.53	16.744

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	20.99	16.751
Mid	5580	20.62	16.765
High	5700	20.70	16.763

Testmode:IEEE802.11n HT20 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	19.81	17.444
Mid	5200	19.54	17.454
High	5240	19.94	17.471

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	20.48	17.550
Mid	5280	20.35	17.542
High	5320	20.06	17.528

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	20.18	17.544
Mid	5580	20.51	17.544
High	5700	20.45	17.544

Testmode:IEEE802.11n HT40 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	39.21	35.784
High	5230	38.94	35.784

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5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	39.77	35.856
High	5310	39.74	35.793

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	39.89	35.847
Mid	5550	39.77	35.897
High	5670	39.84	35.782

Testmode:IEEE802.11ac HT20 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	19.84	17.455
Mid	5200	20.08	17.436
High	5240	19.61	17.466

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	20.18	17.537
Mid	5280	20.35	17.538
High	5320	20.12	17.504

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	20.30	17.542
Mid	5580	20.30	17.537
High	5700	20.44	17.536

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Testmode:IEEE802.11ac HT40 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	39.03	35.827
High	5230	39.44	35.823

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	39.99	35.844
High	5310	39.77	35.785

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	39.63	35.849
Mid	5550	40.00	35.906
High	5670	39.80	35.764

Testmode:IEEE802.11ac HT80 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5210	80.39	74.847

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5290	80.92	74.652

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5530	81.61	74.869
High	5610	81.35	74.795

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Testmode:IEEE802.11ac HT160 mode

5150~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5250	165.00	152.79

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5570	167.90	155.29

Testmode:IEEE802.11ax HE20 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5180	20.62	18.787
Mid	5200	20.70	18.834
High	5240	20.27	18.798

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5260	20.86	18.801
Mid	5280	20.88	18.858
High	5320	20.75	18.819

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5500	20.74	18.830
Mid	5580	20.66	18.811
High	5700	20.81	18.801

Testmode:IEEE802.11ax HE40 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5190	39.90	37.509
High	5230	39.60	37.503

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5270	40.65	37.505
High	5310	40.17	37.413

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5510	40.86	37.446
Mid	5550	40.53	37.522
High	5670	40.70	37.471

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Testmode:IEEE802.11ax HE80 mode

5150~5250MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5210	81.43	76.672

5250~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5290	82.42	76.474

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low	5530	82.15	76.487
High	5610	81.74	76.675

Testmode:IEEE802.11ax HE160 mode

5150~5350MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5250	168.00	154.17

5470~5725MHz

Channel	Frequency(MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
--	5570	169.30	156.60

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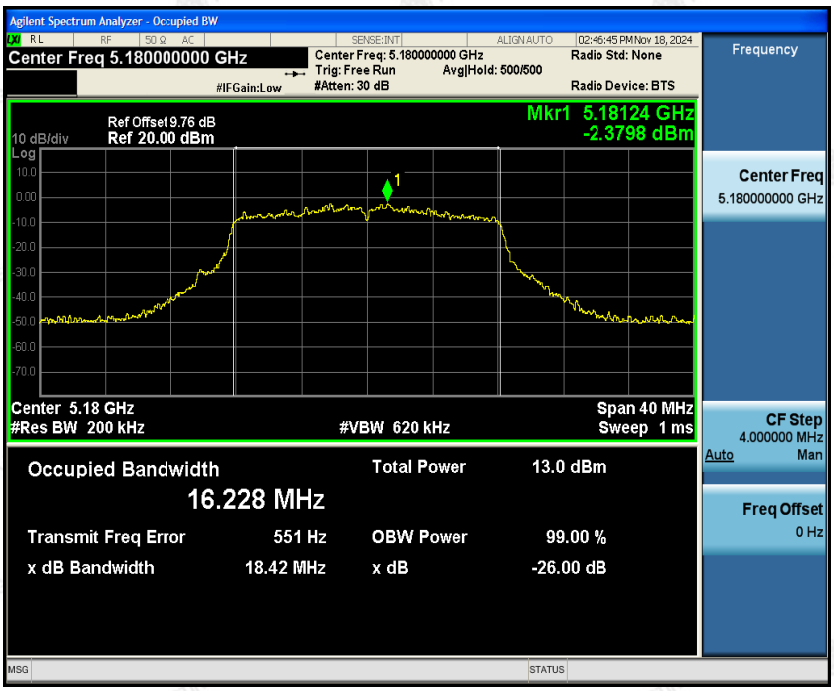
Test Plot

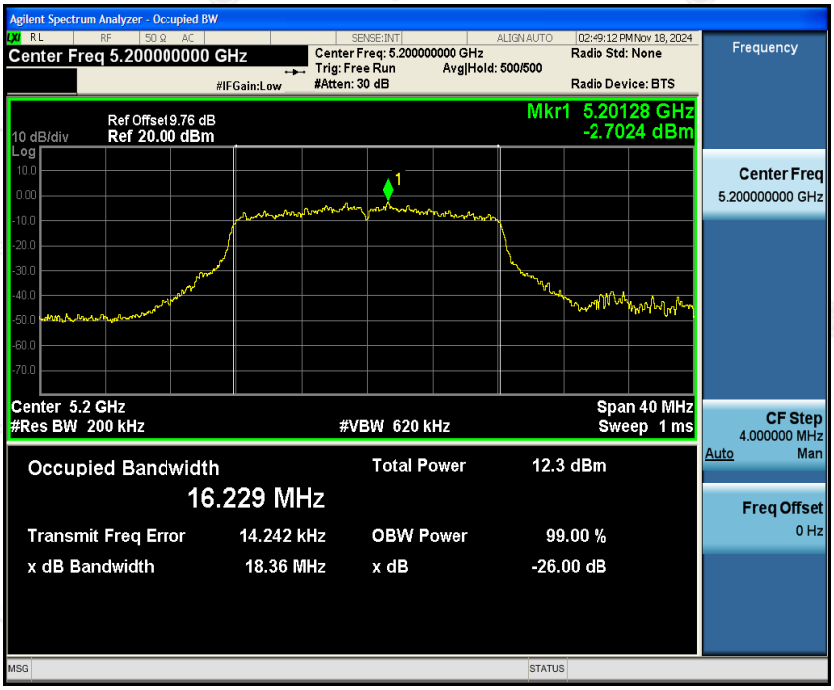
IEEE802.11a mode:

5150~5250MHz

Low Channel



Mid Channel



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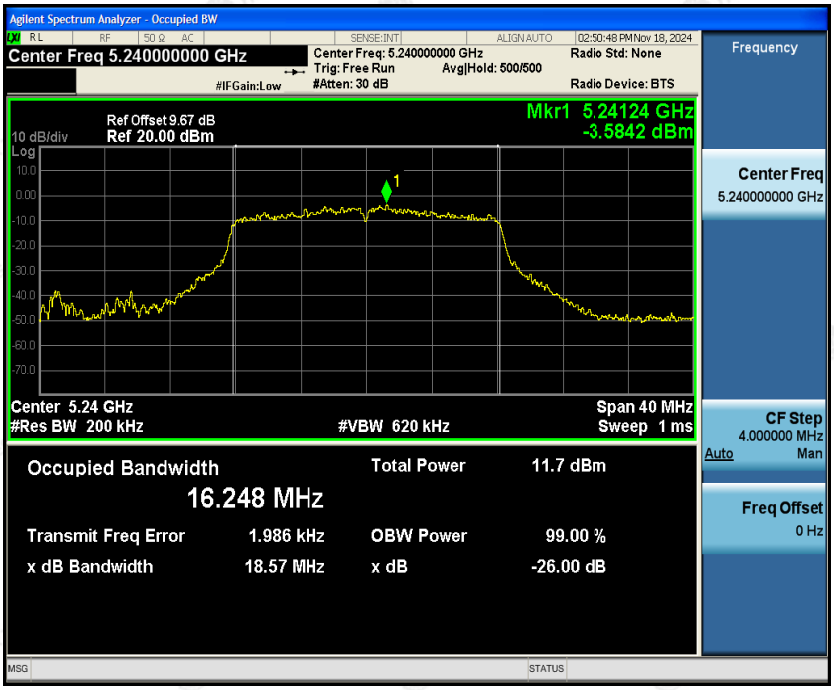
High Channel



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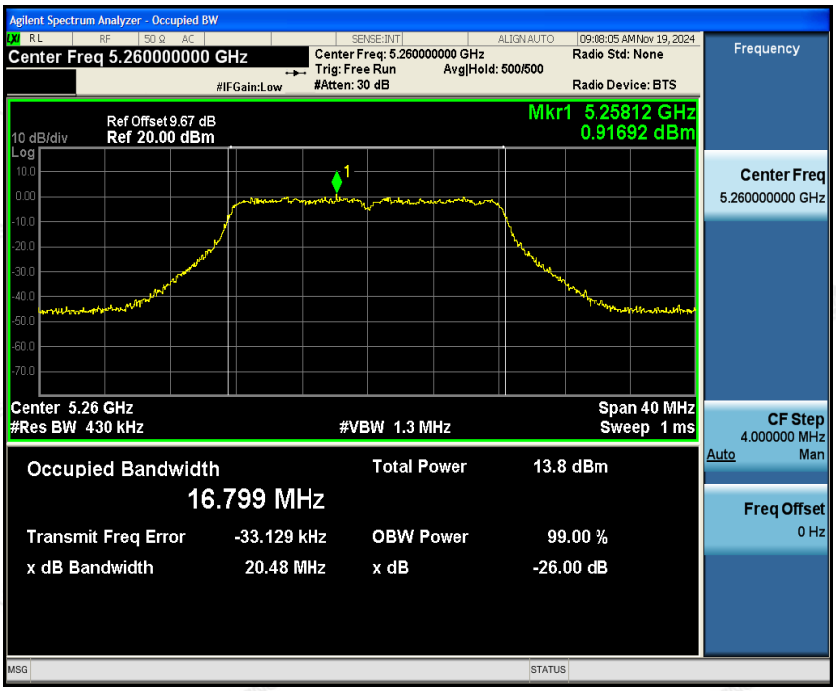
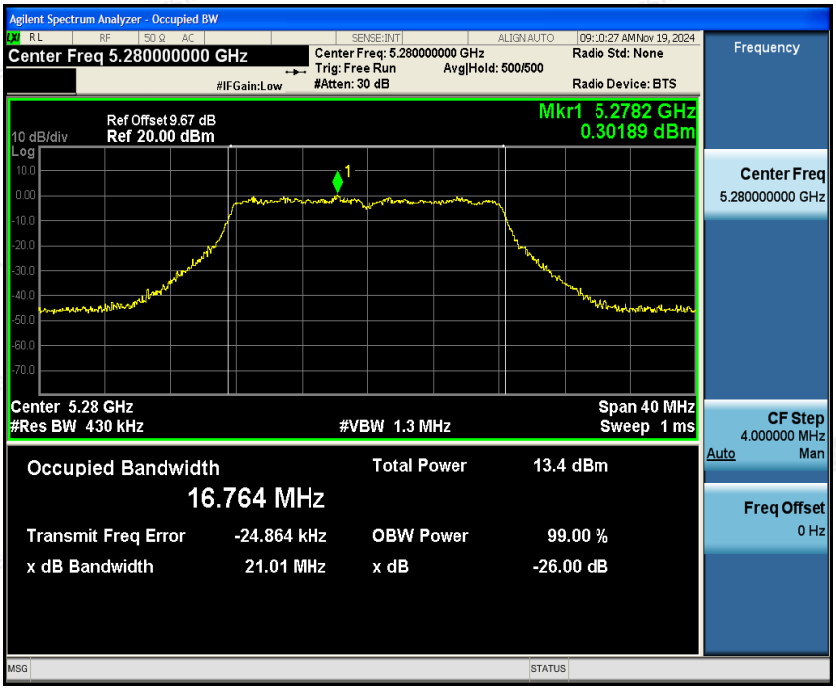
5250~5350MHz

Low Channel



Mid Channel



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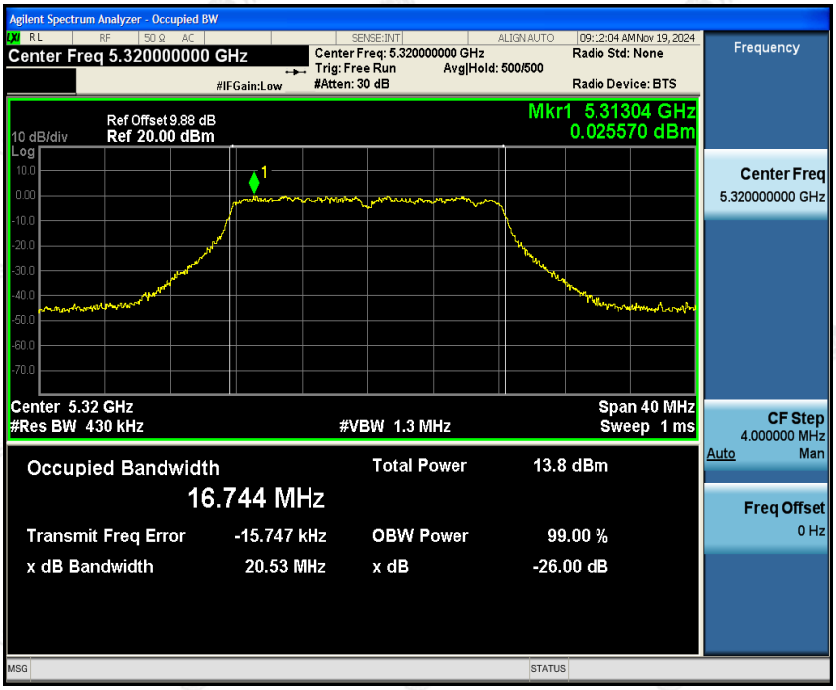
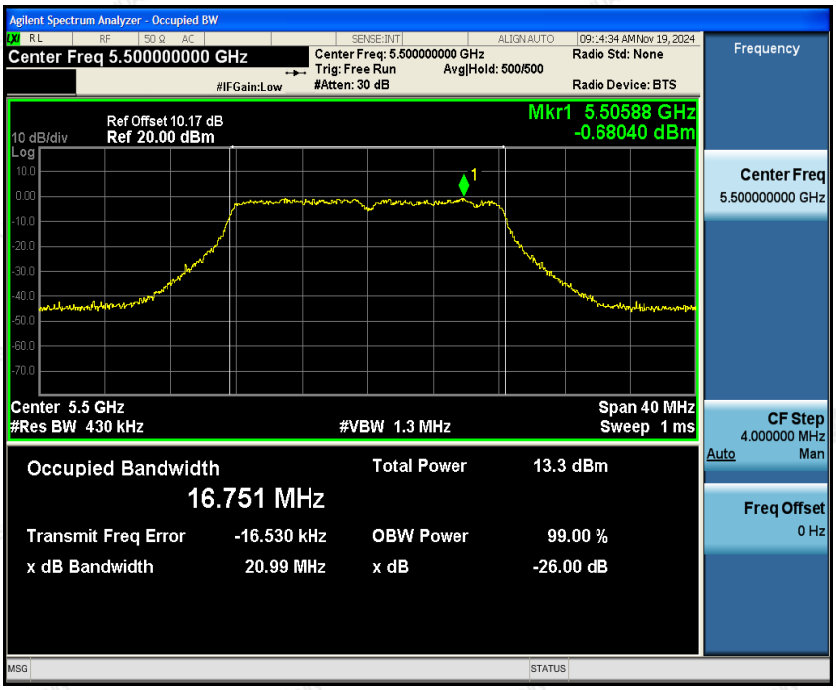
High Channel



5470~5725MHz

Low Channel



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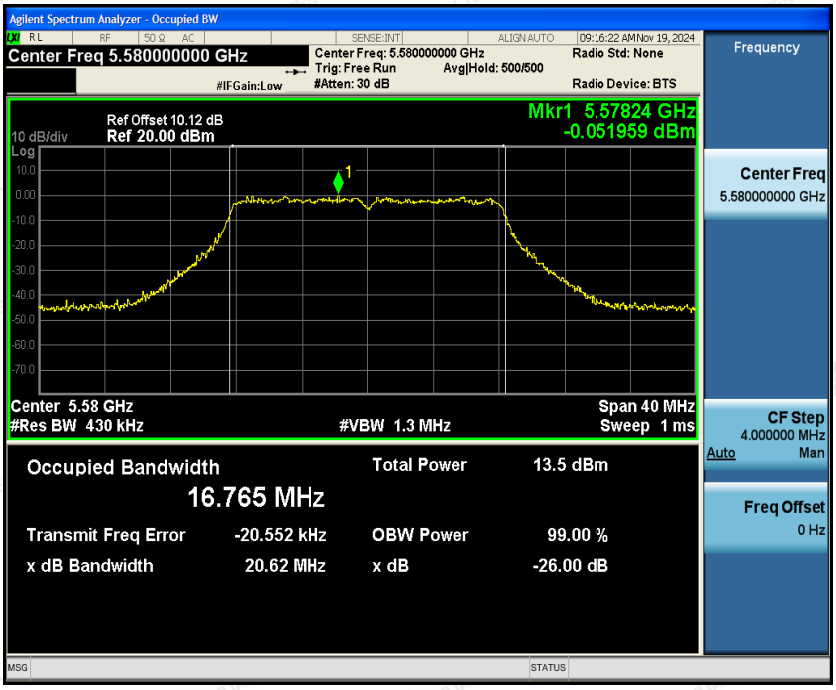
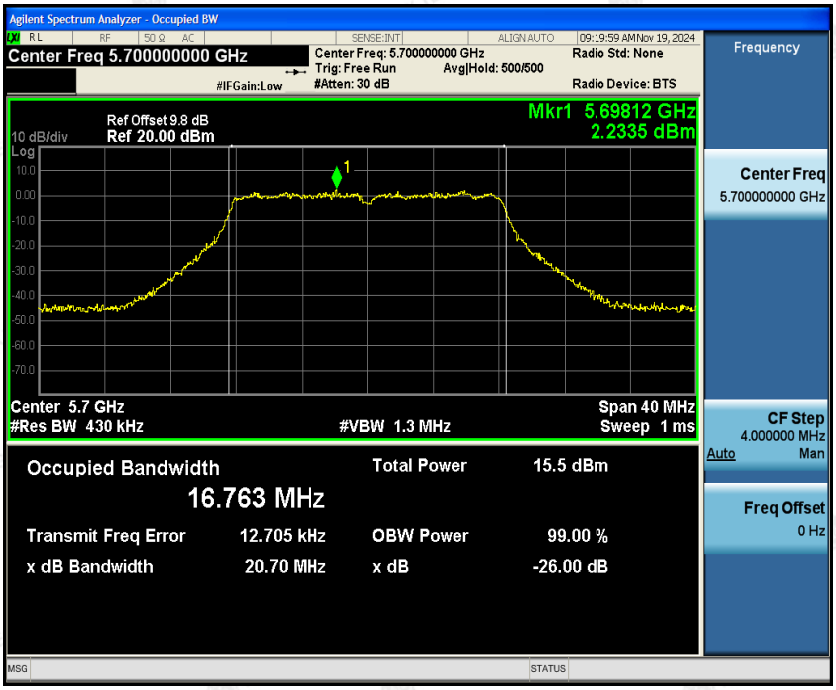
Mid Channel



High Channel



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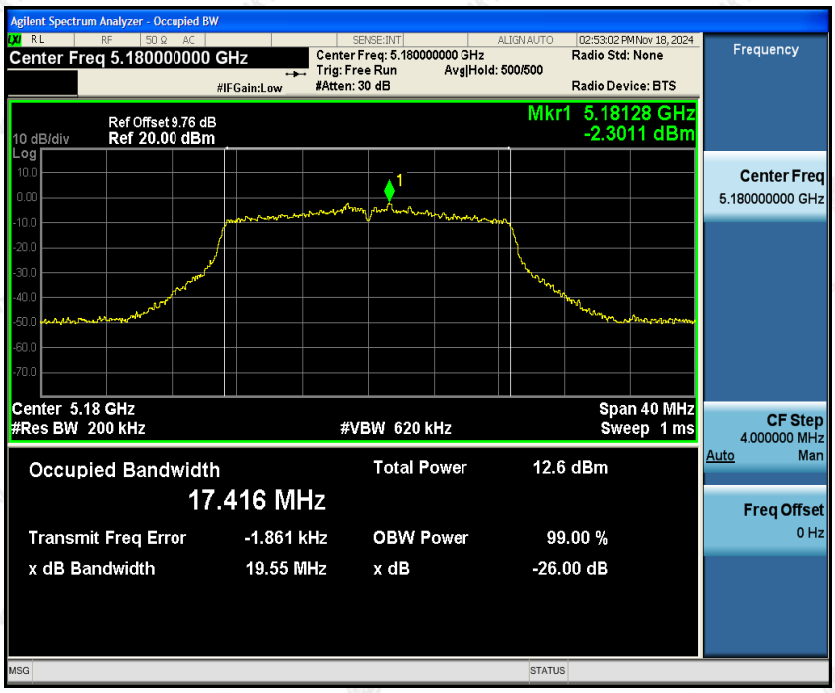
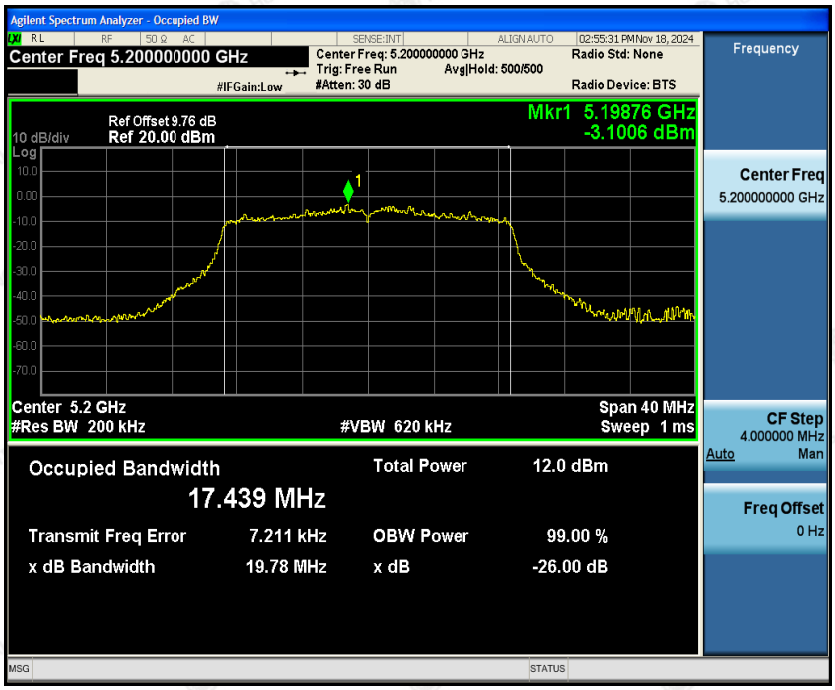
IEEE802.11n HT20 mode

5150~5250MHz

Low Channel



Mid Channel



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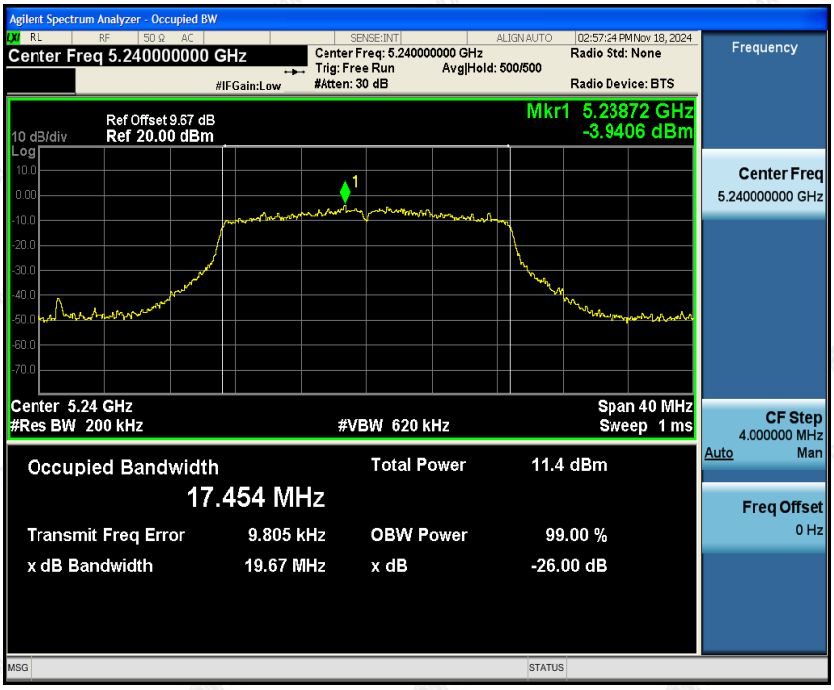
High Channel



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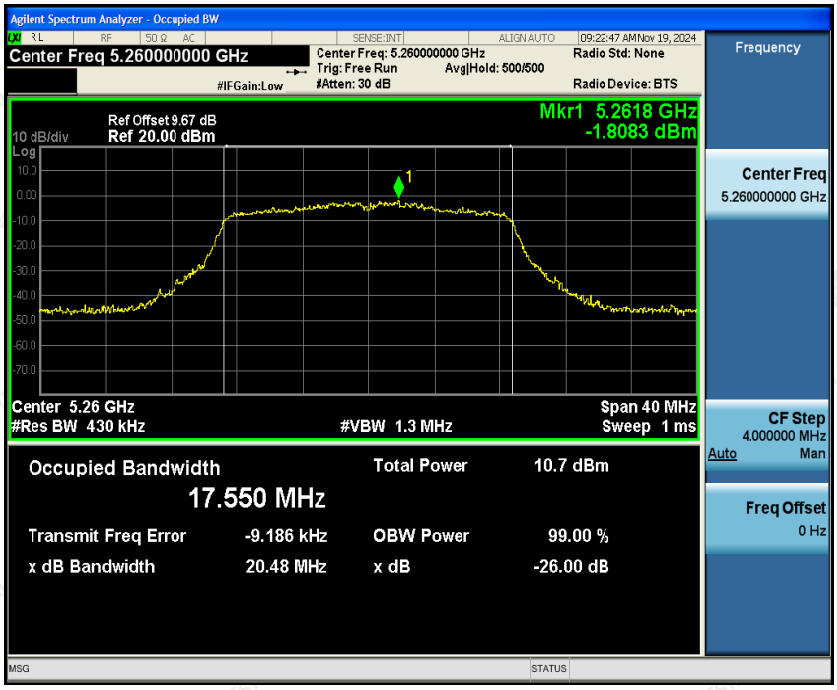
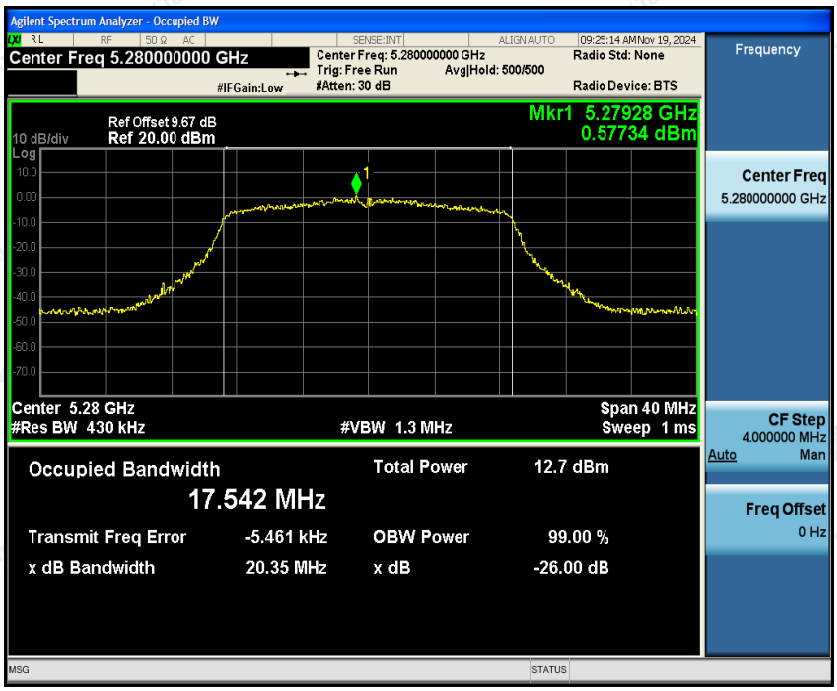
5250~5350MHz

Low Channel



Mid Channel



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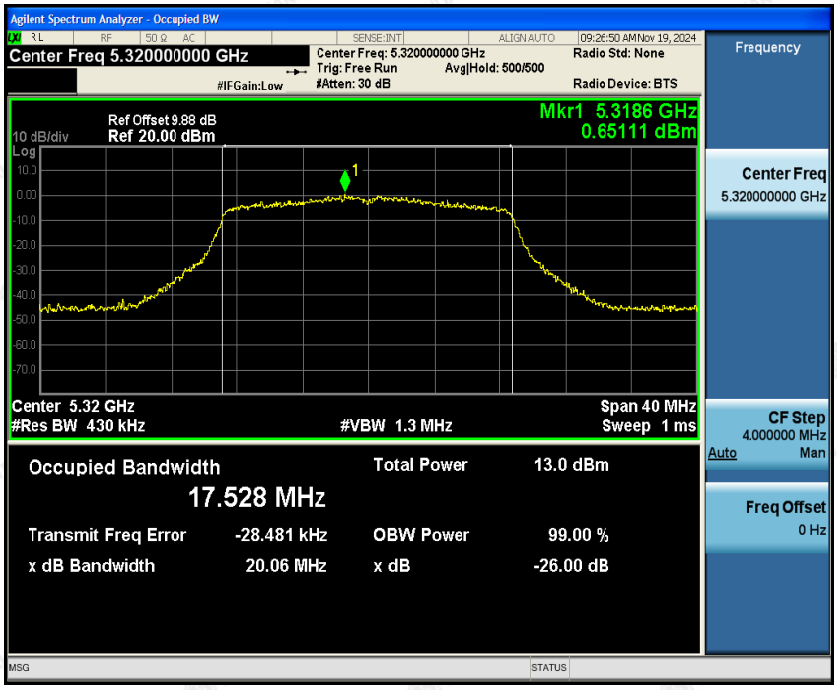
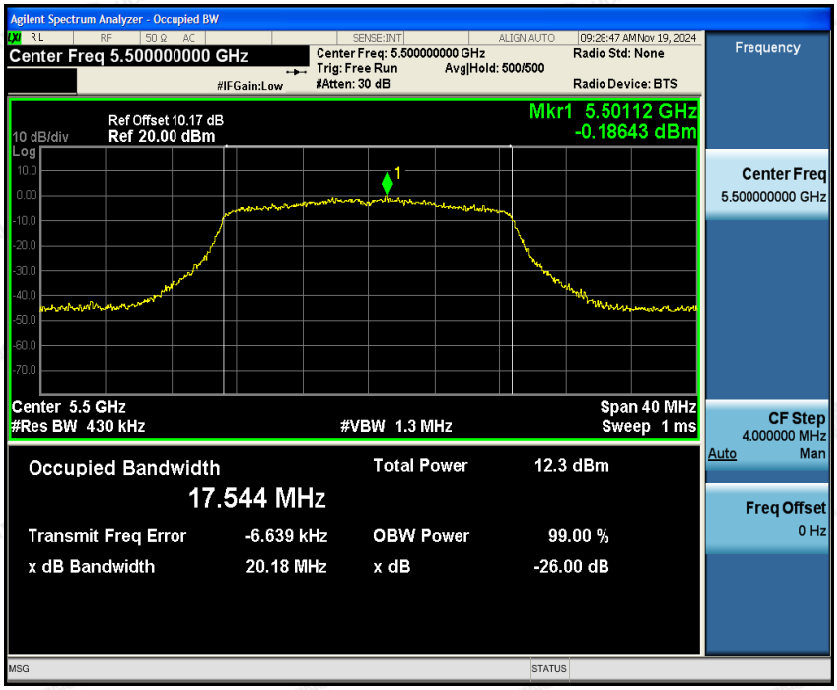
High Channel



5470~5725MHz

Low Channel



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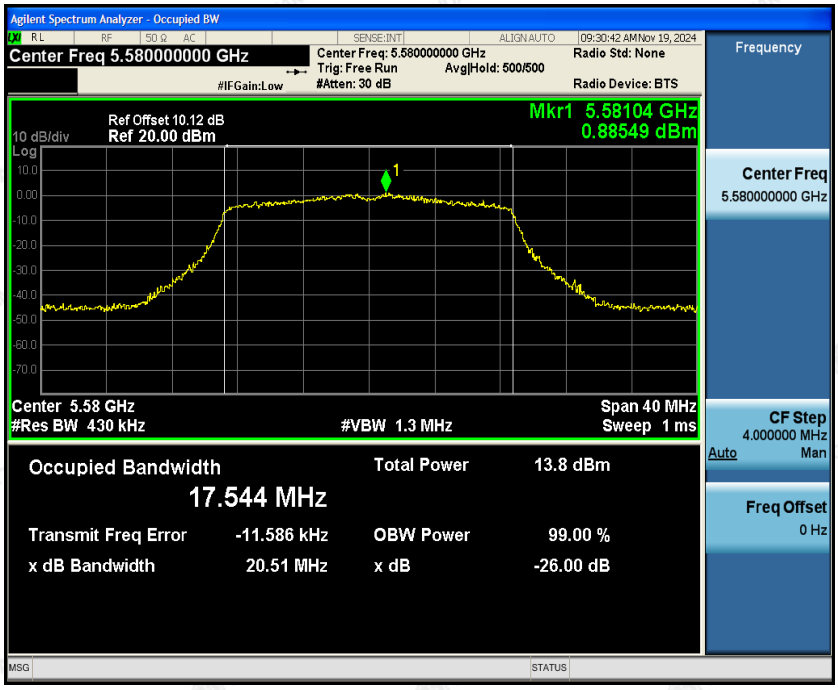
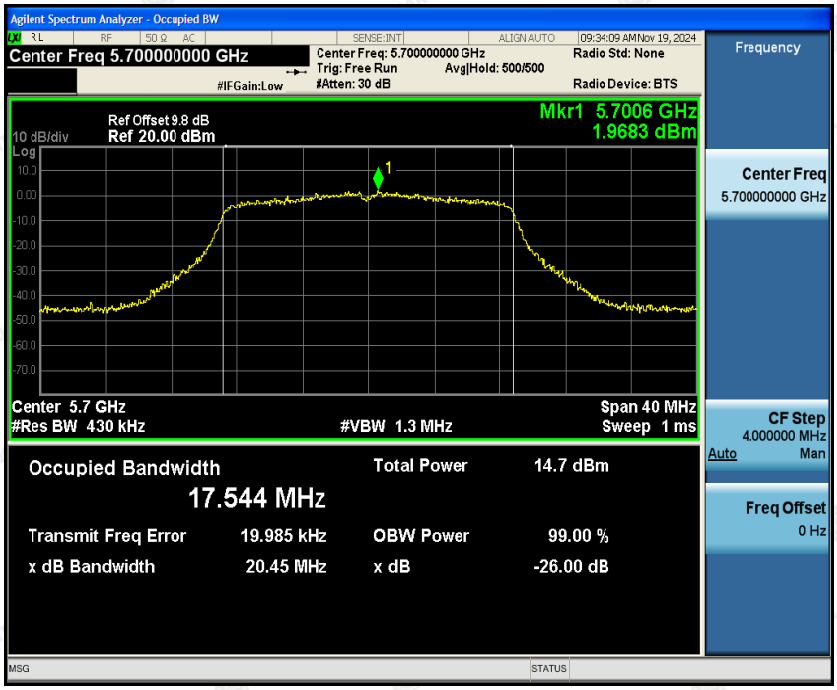
Mid Channel



High Channel



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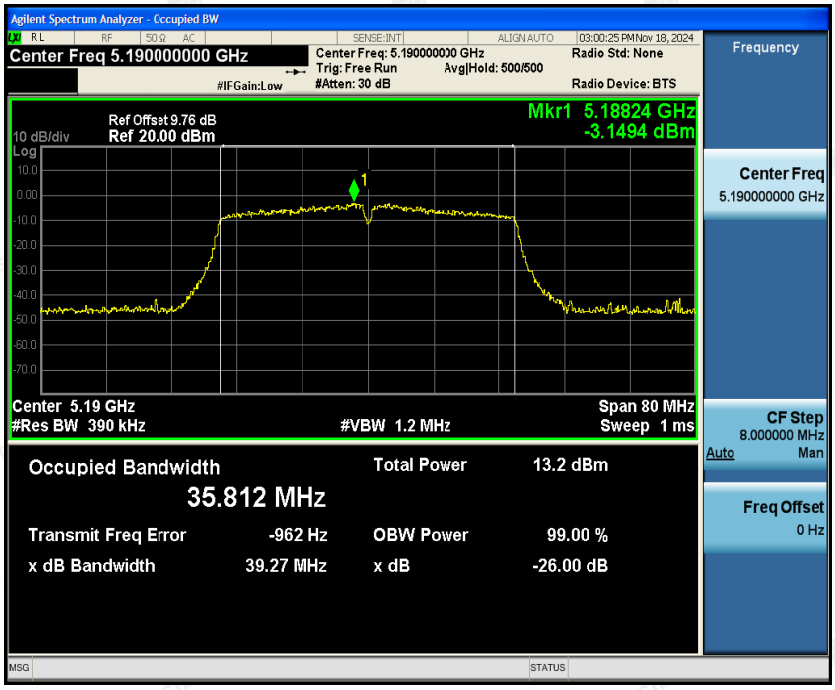
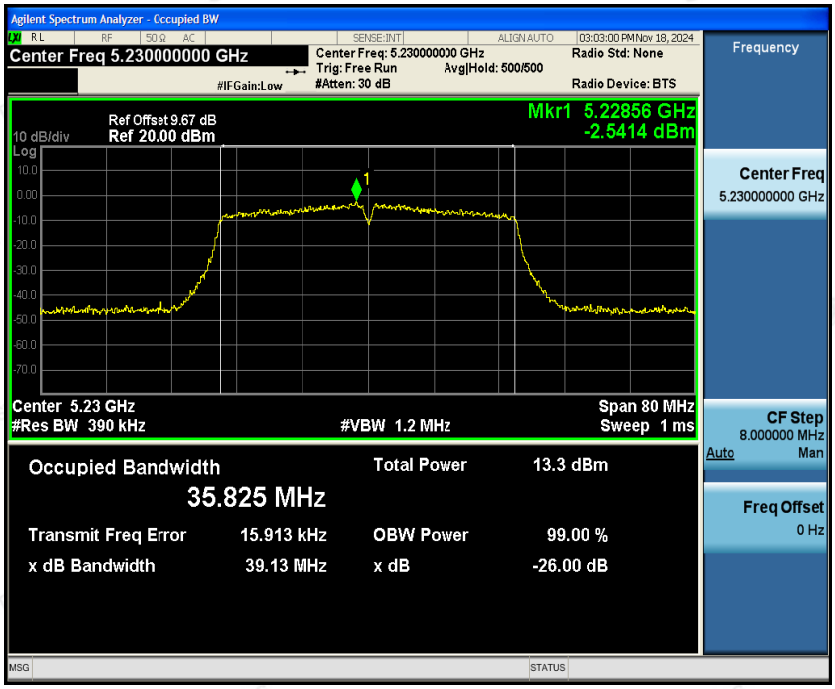
IEEE802.11n HT40 mode

5150~5250MHz

Low Channel



High Channel



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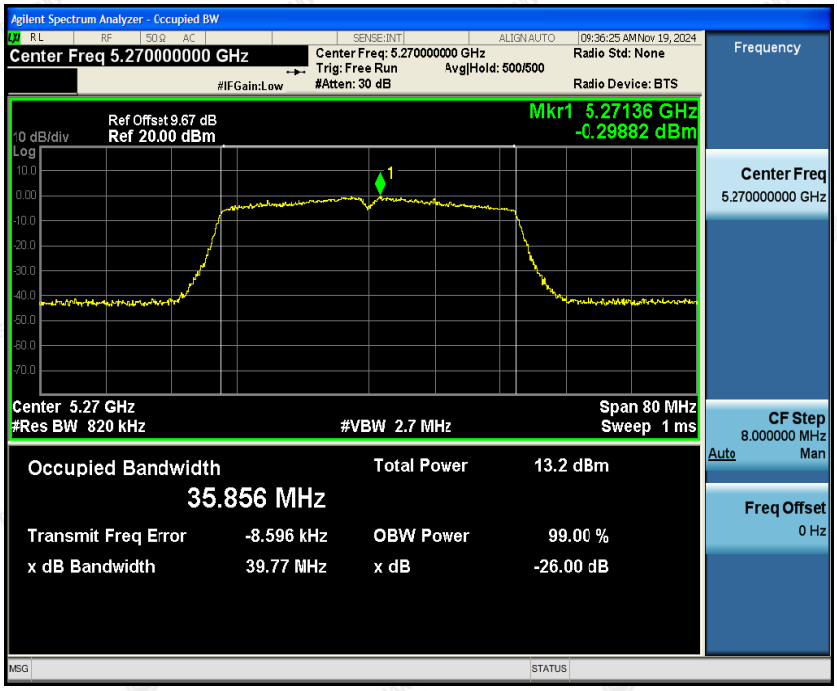
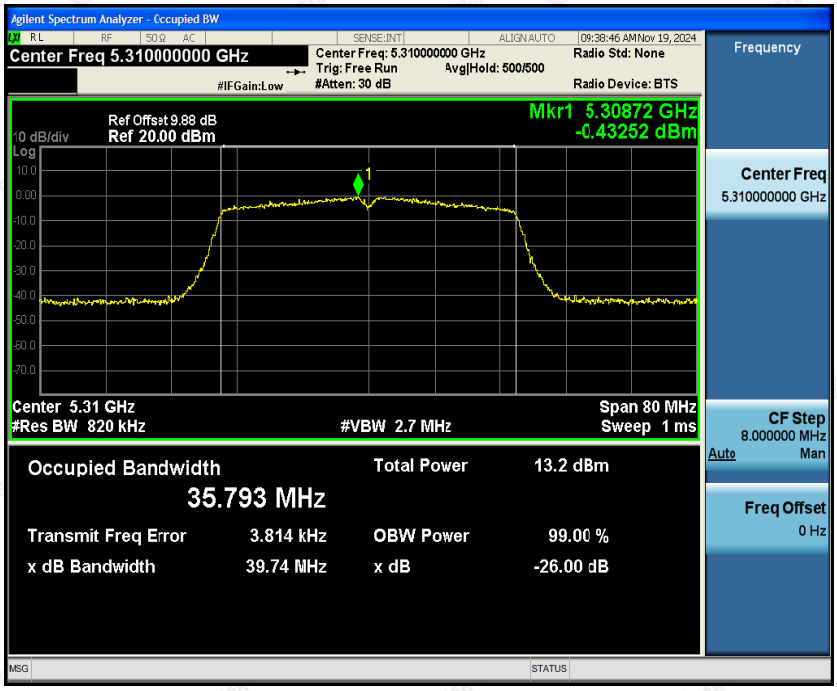
5250~5350MHz

Low Channel



High Channel



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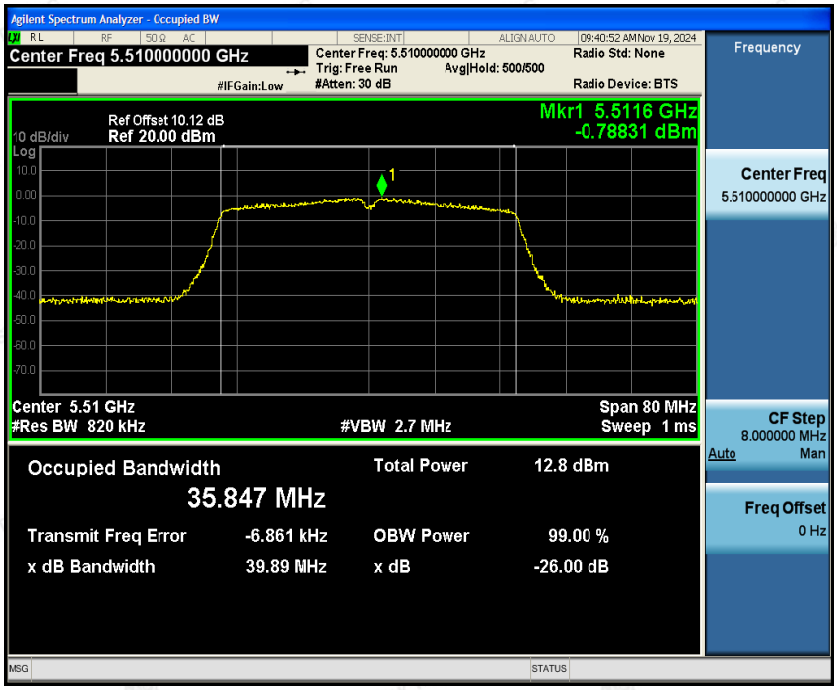
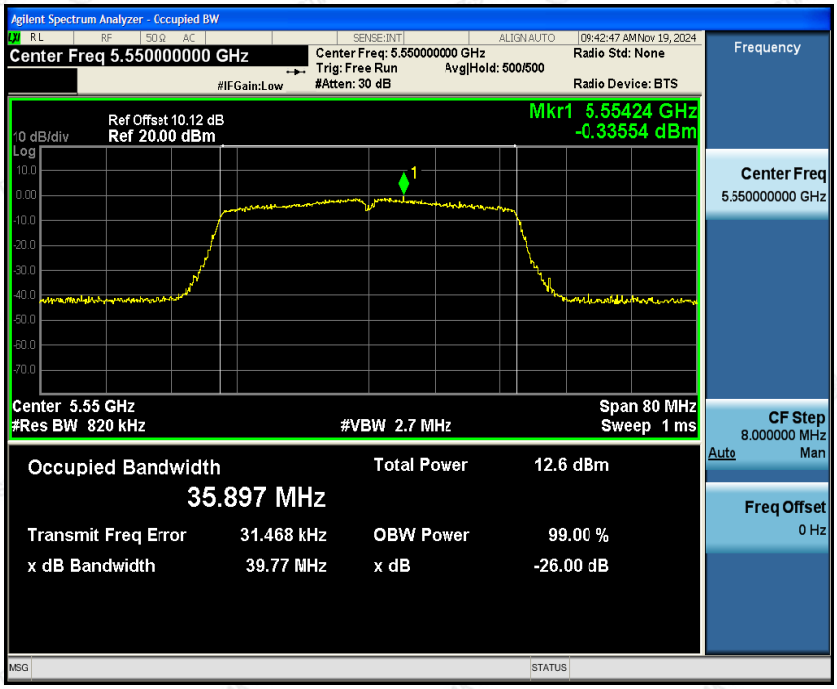
5470~5725MHz

Low Channel



Mid Channel



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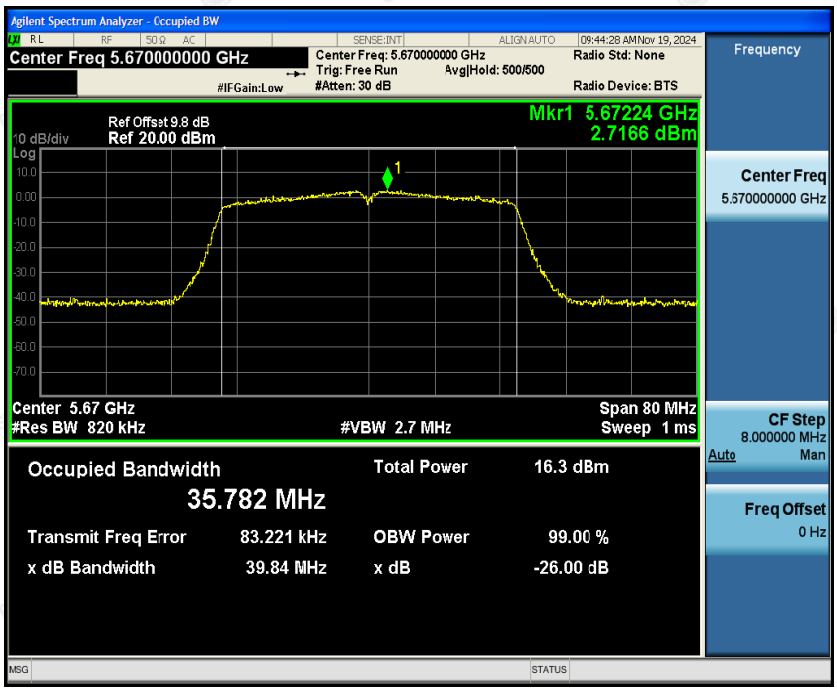
High Channel



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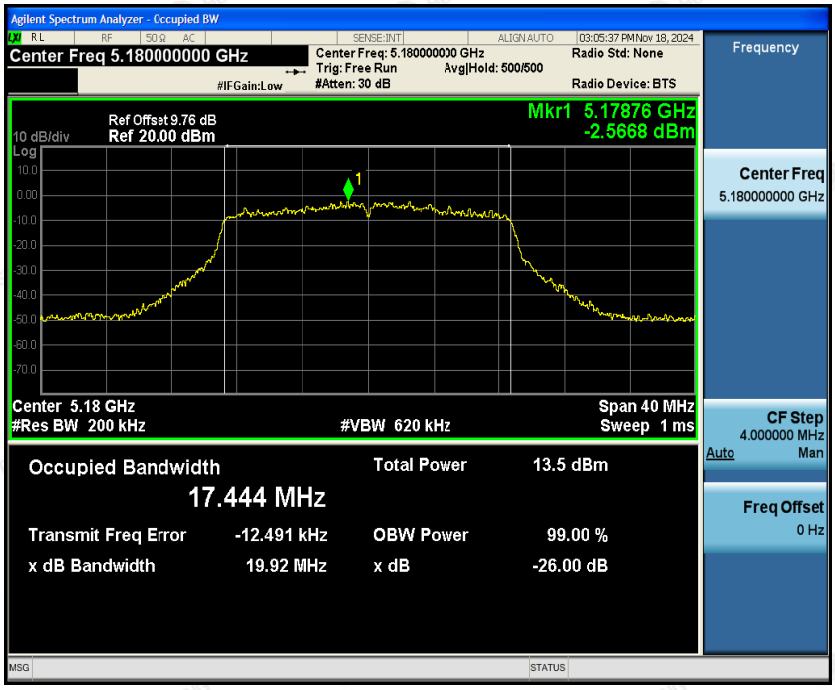
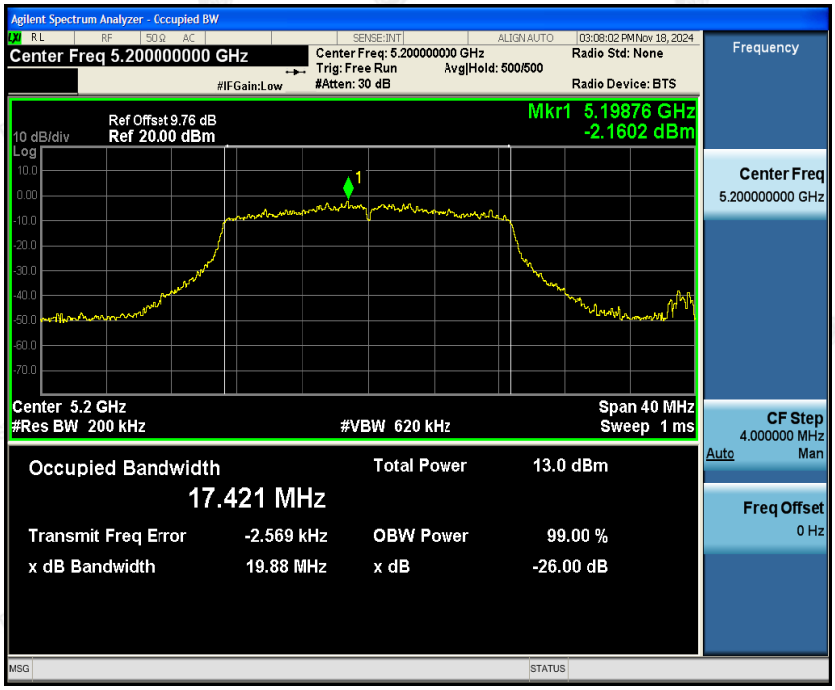
IEEE802.11ac HT20 mode

5150~5250MHz

Low Channel



Mid Channel



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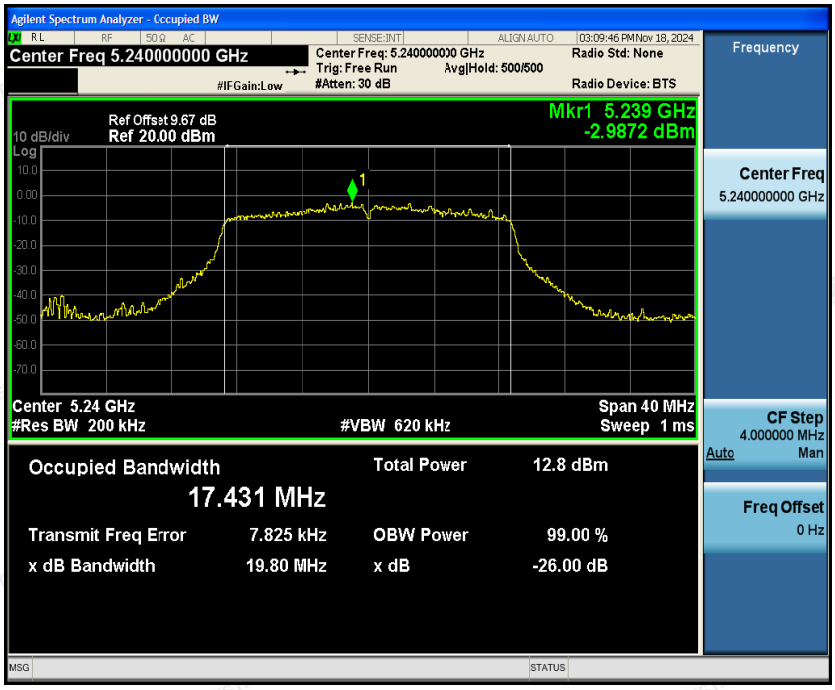
High Channel



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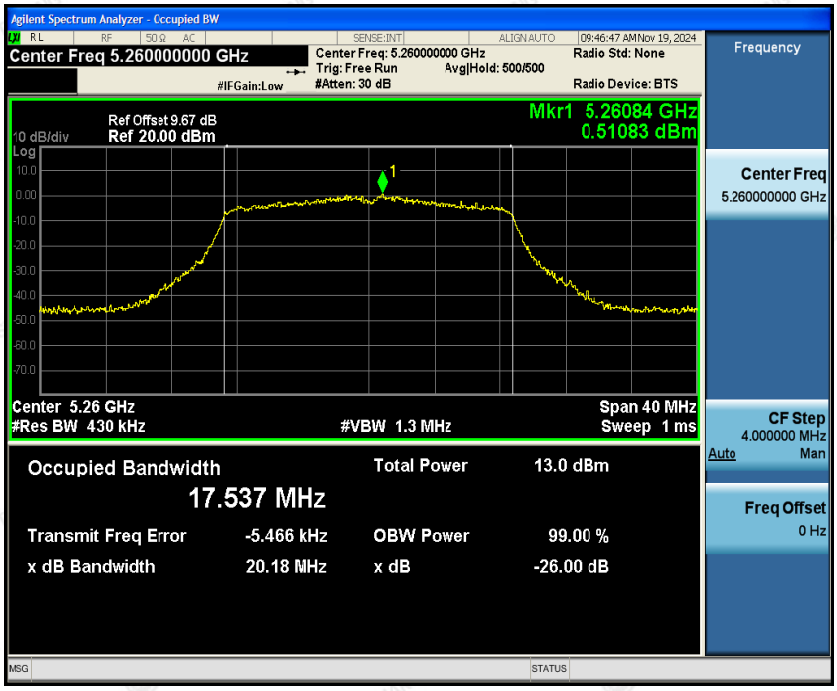
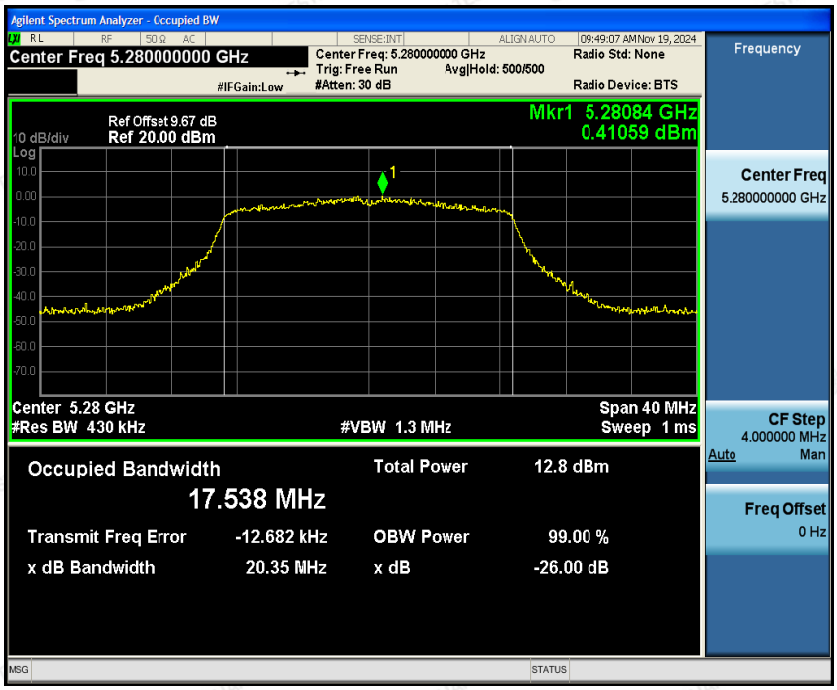
5250~5350MHz

Low Channel



Mid Channel



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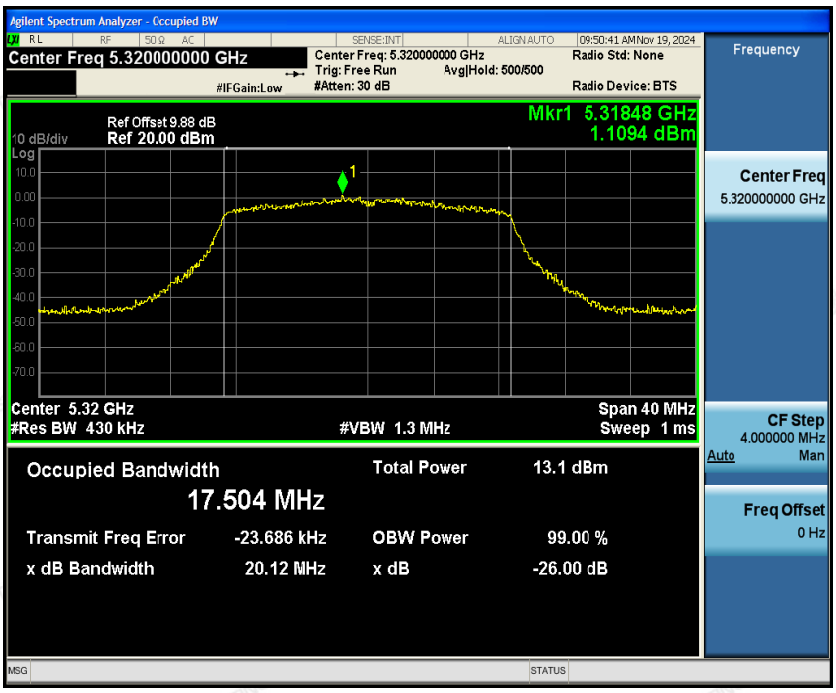
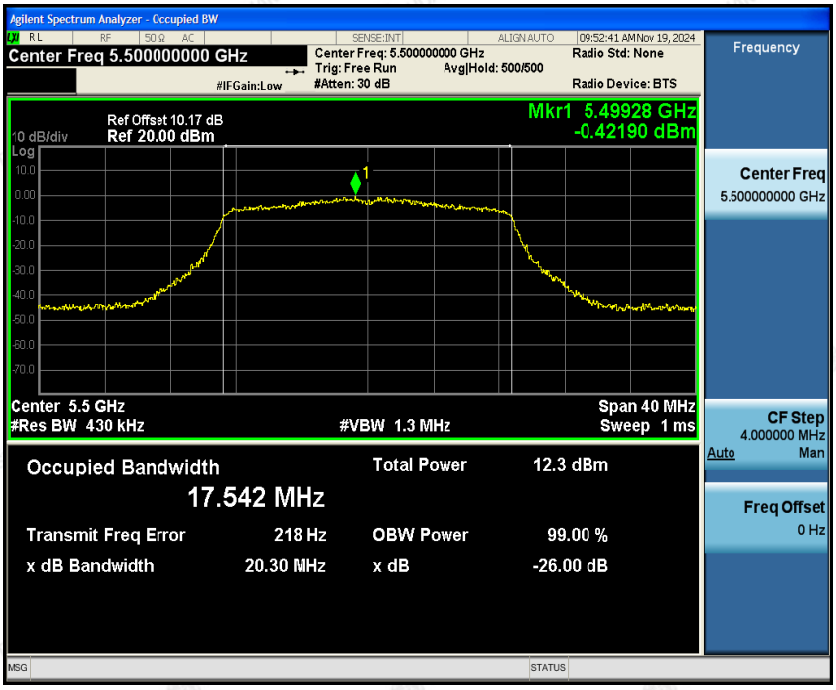
High Channel



5470~5725MHz

Low Channel



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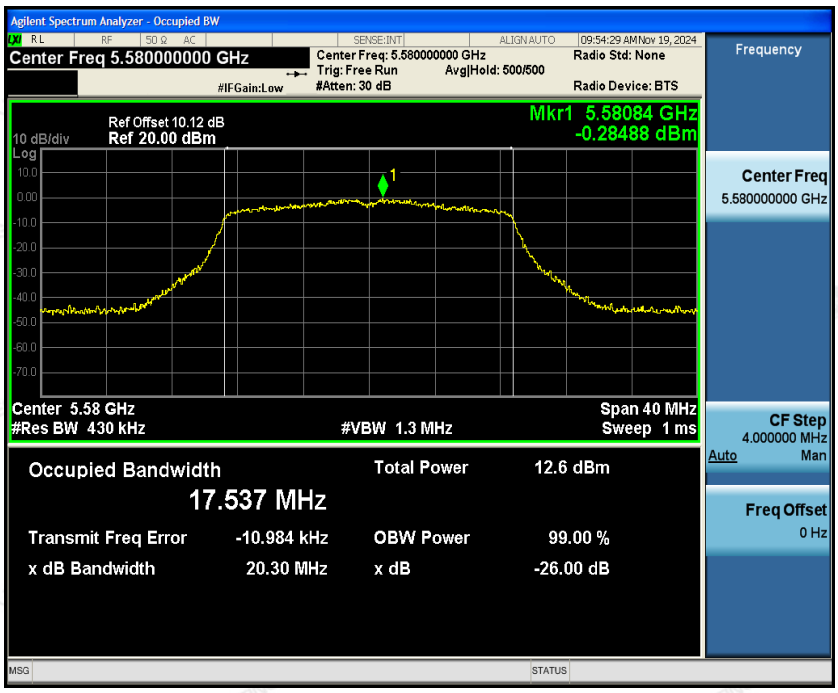
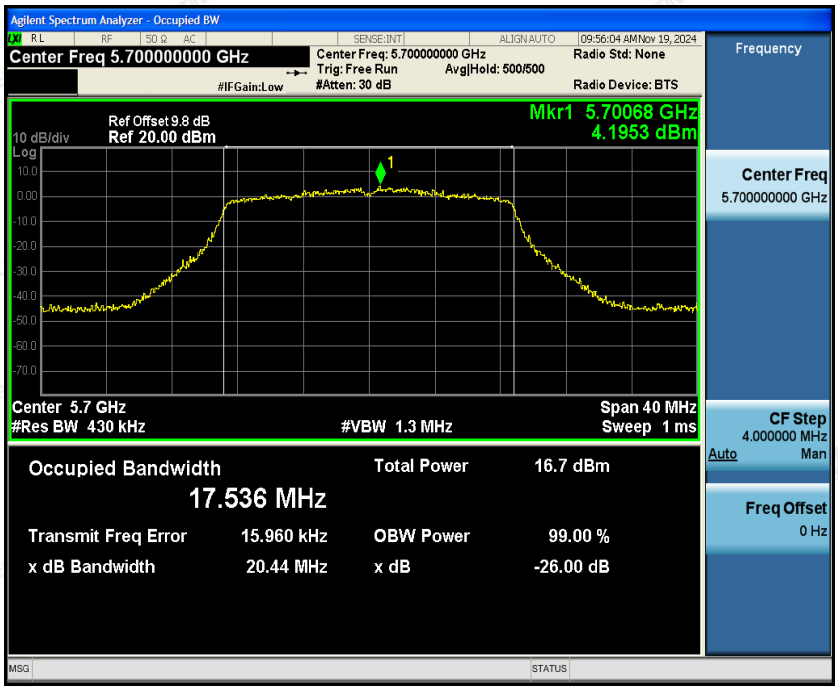
Mid Channel



High Channel



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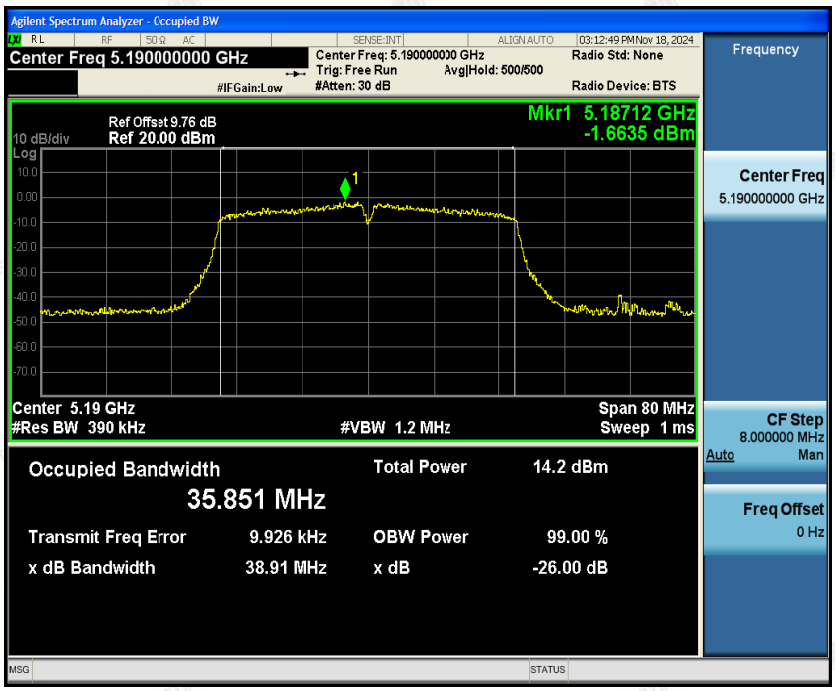
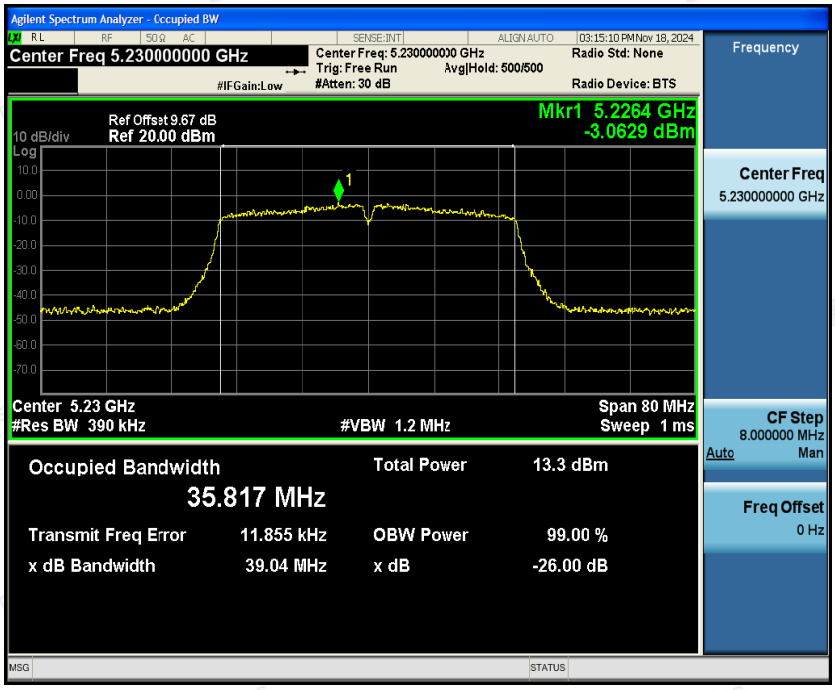
IEEE802.11ac HT40 mode

5150~5250MHz

Low Channel



High Channel



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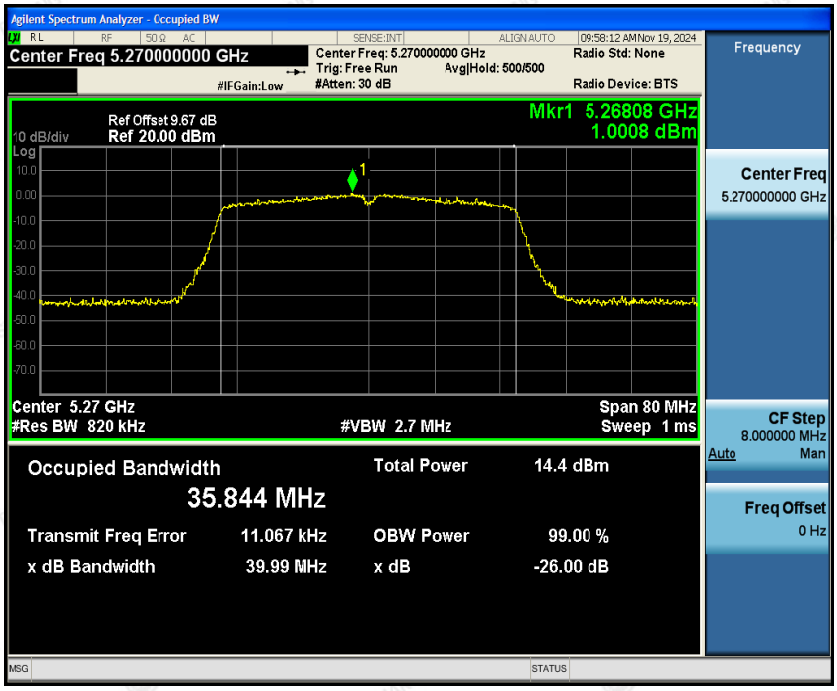
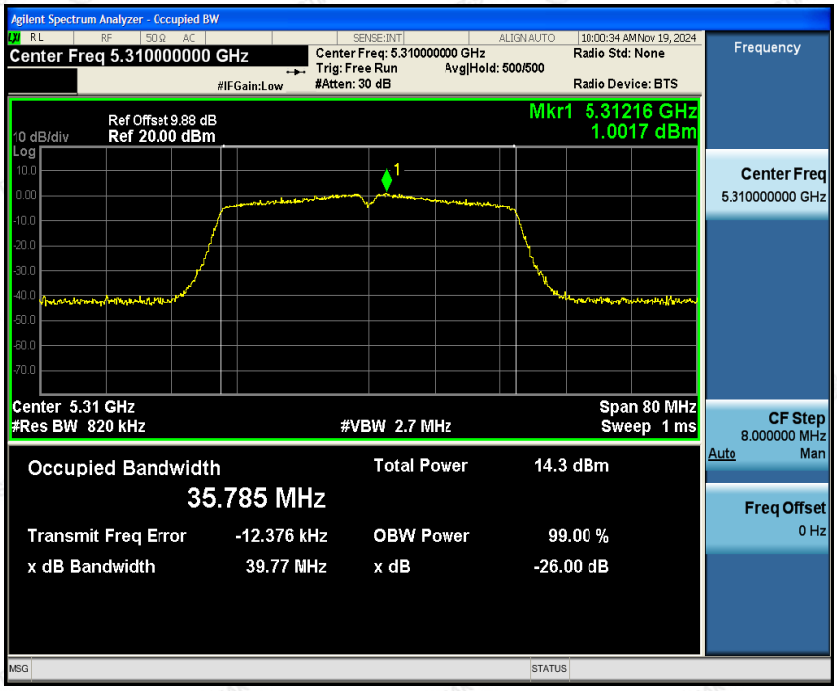
5250~5350MHz

Low Channel



High Channel



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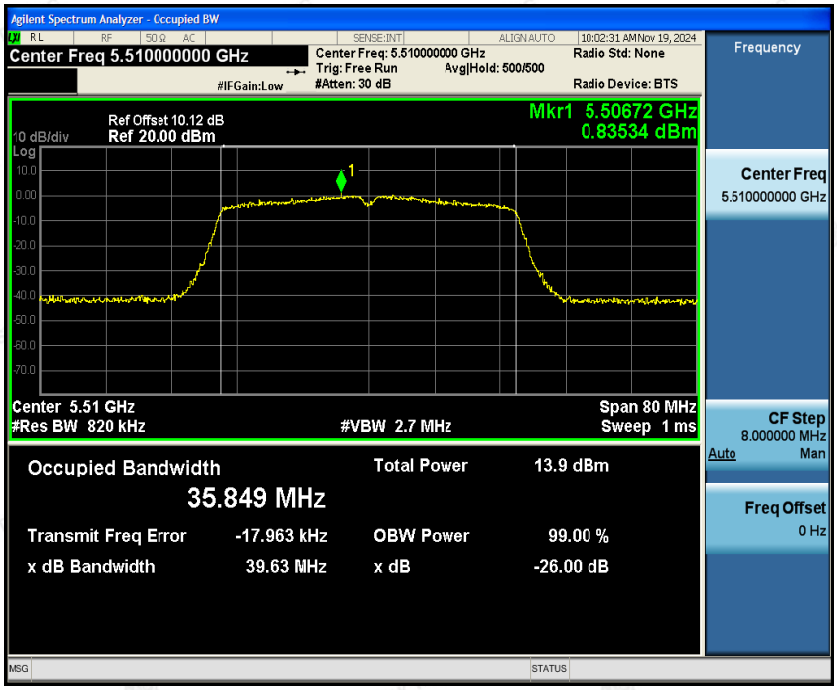
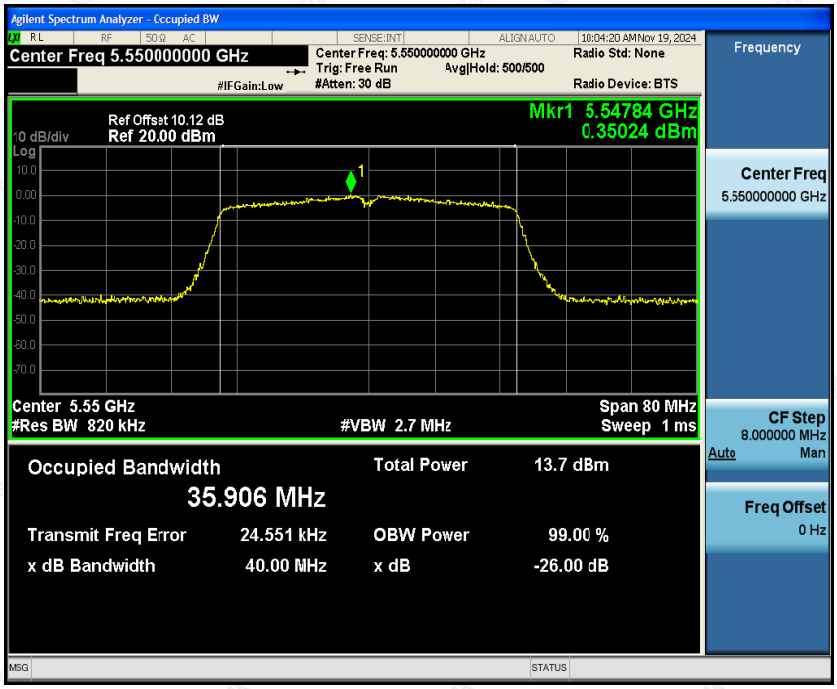
5470~5725MHz

Low Channel



Mid Channel



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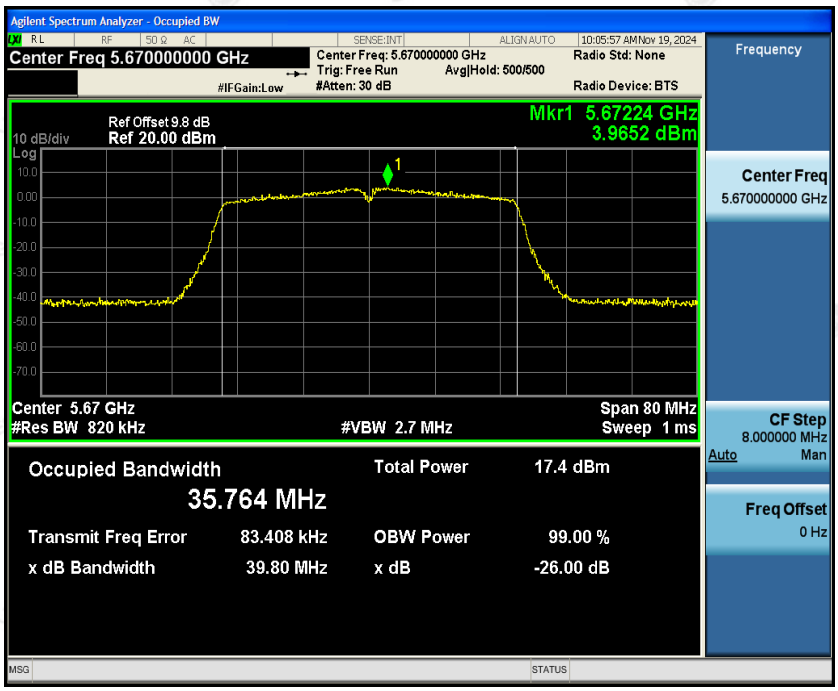
High Channel



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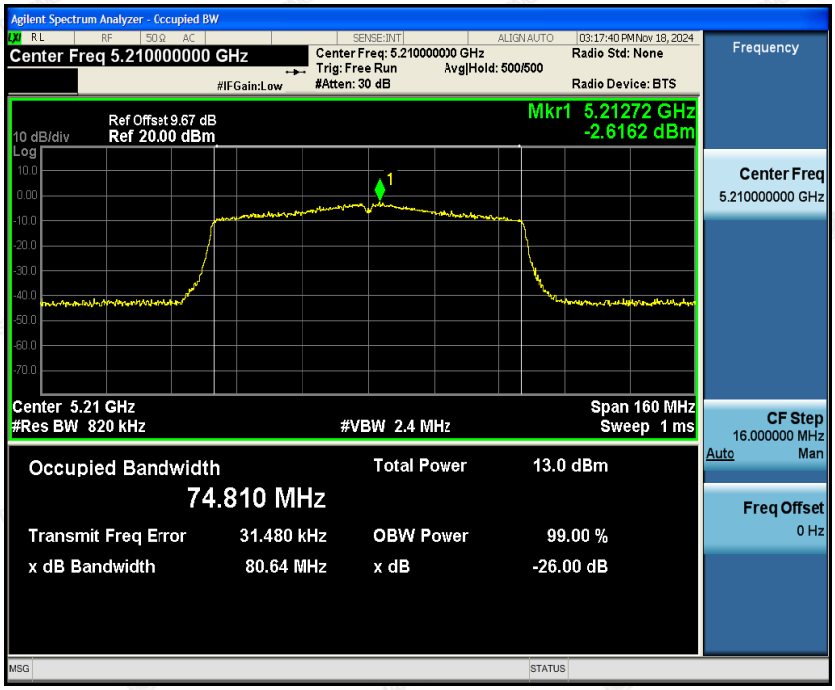
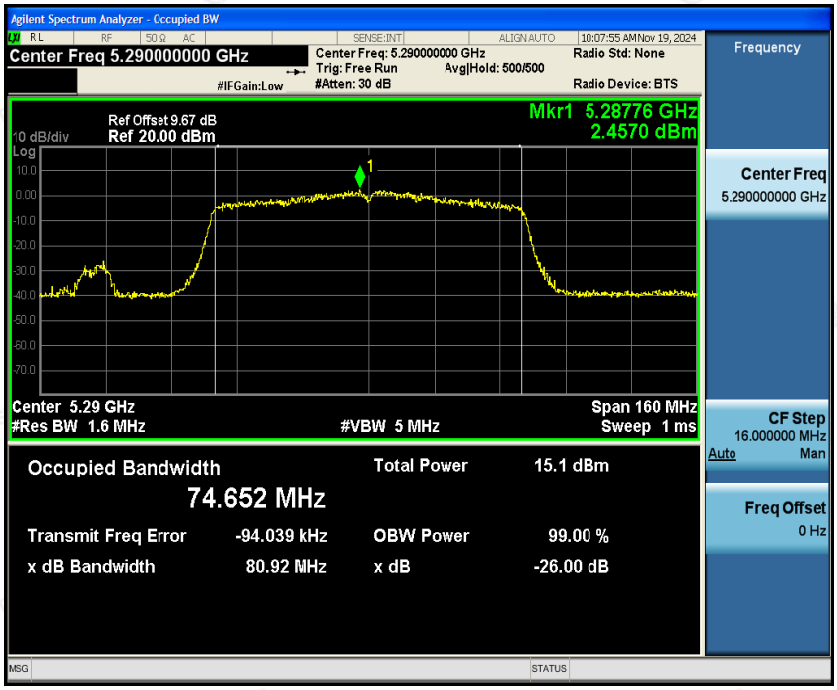
IEEE802.11ac HT80 mode

5150~5250MHz



5250~5350MHz



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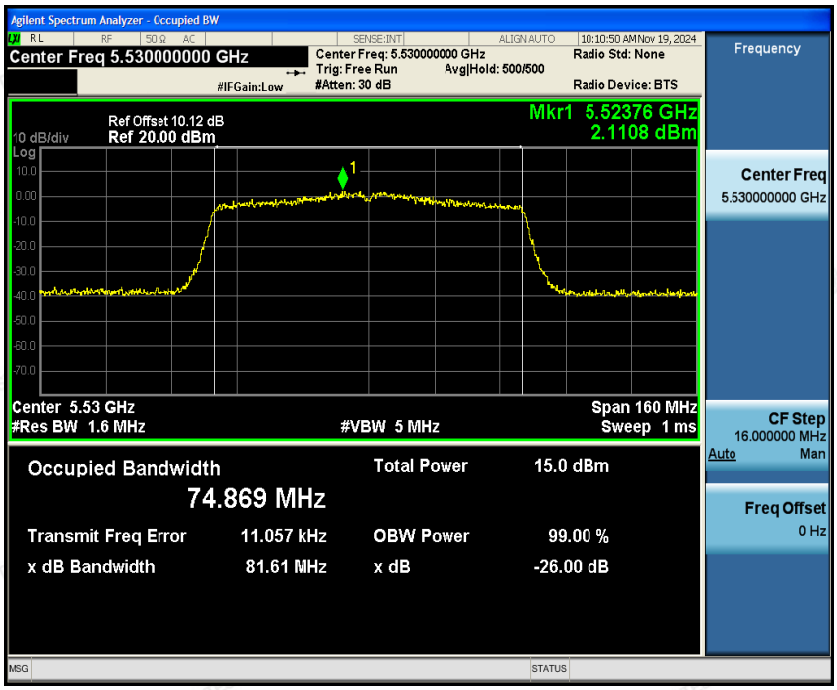
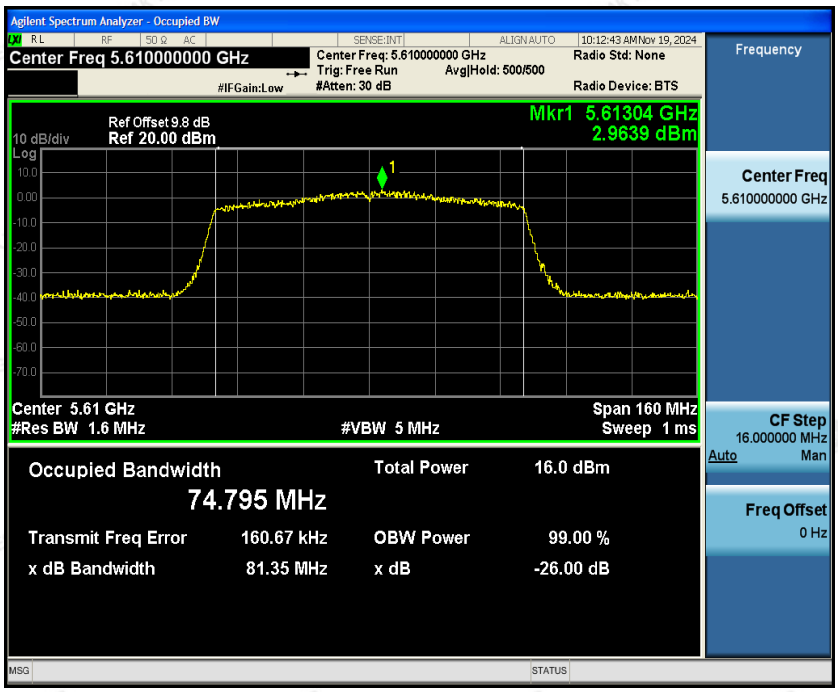
5470~5725MHz

Low Channel



High Channel



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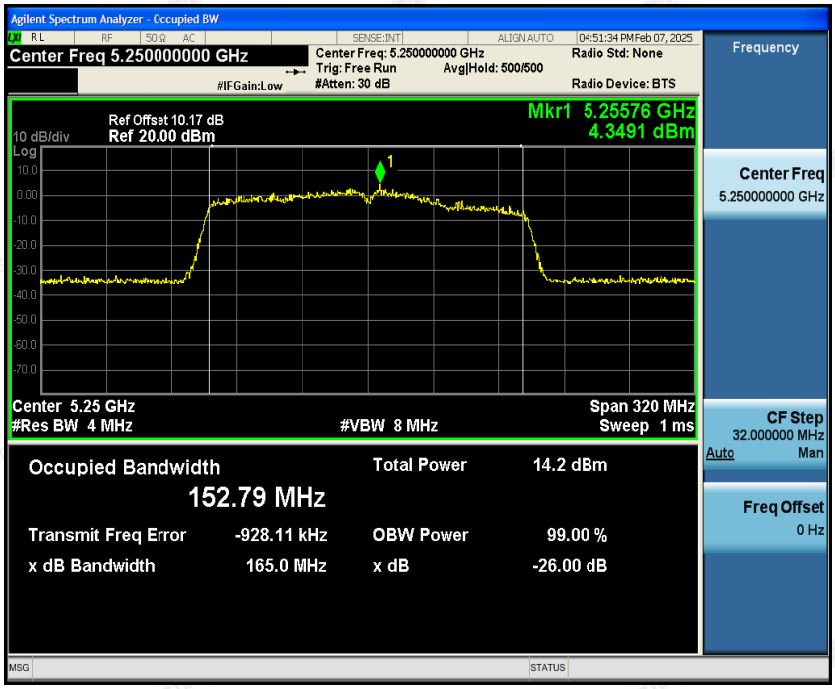
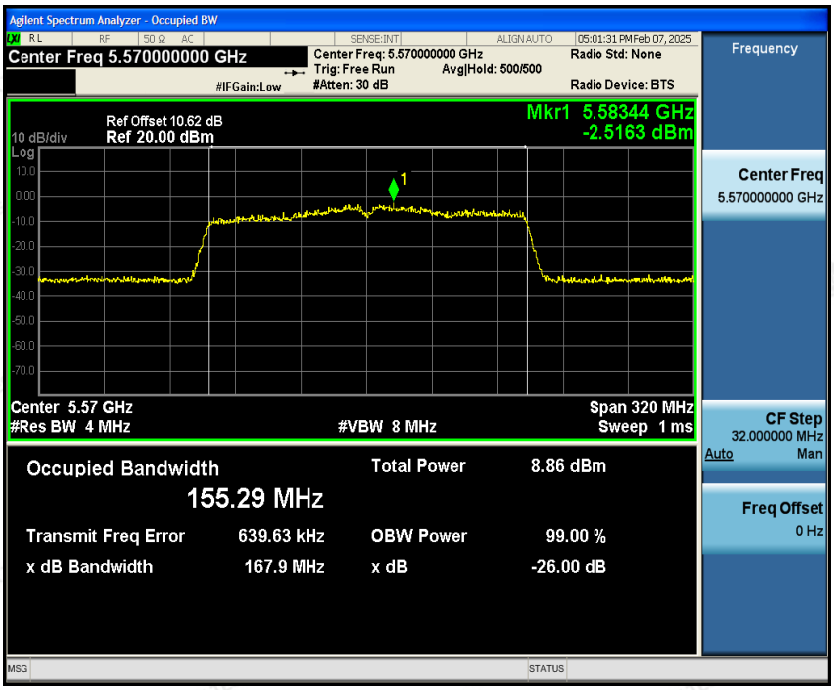
IEEE802.11ac HT160 mode

5150~5350MHz



5470~5725MHz



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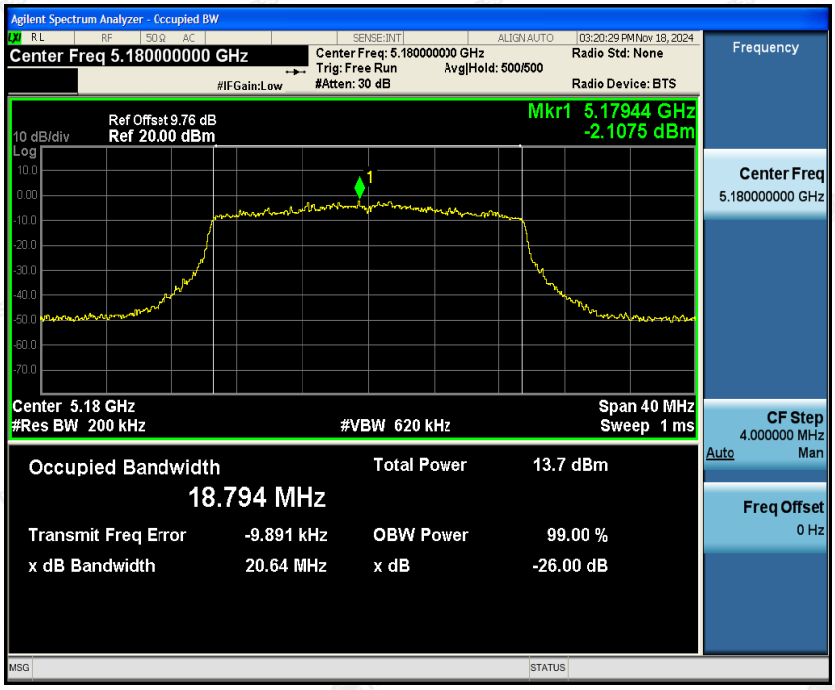
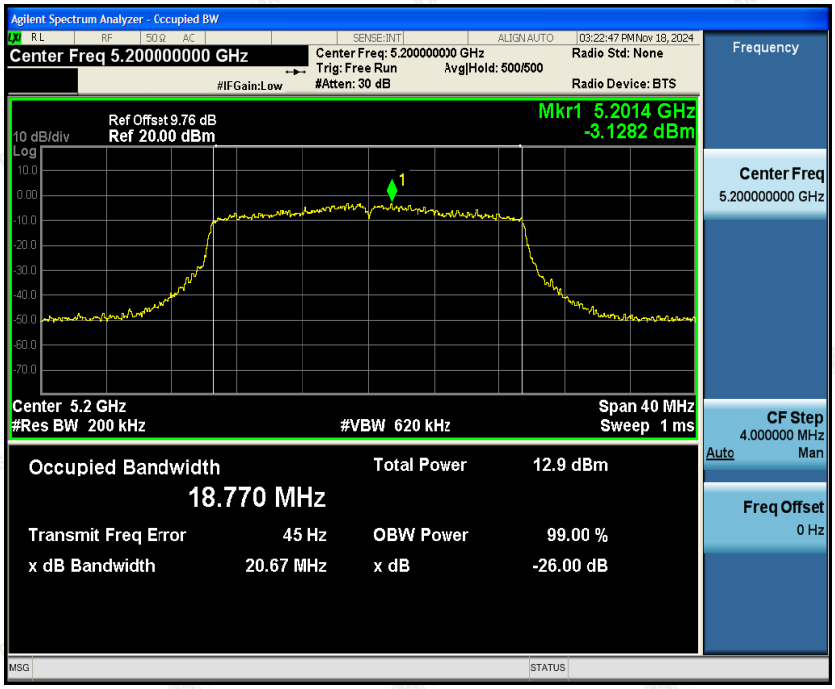
IEEE802.11ax HE20 mode

5150~5250MHz

Low Channel



Mid Channel



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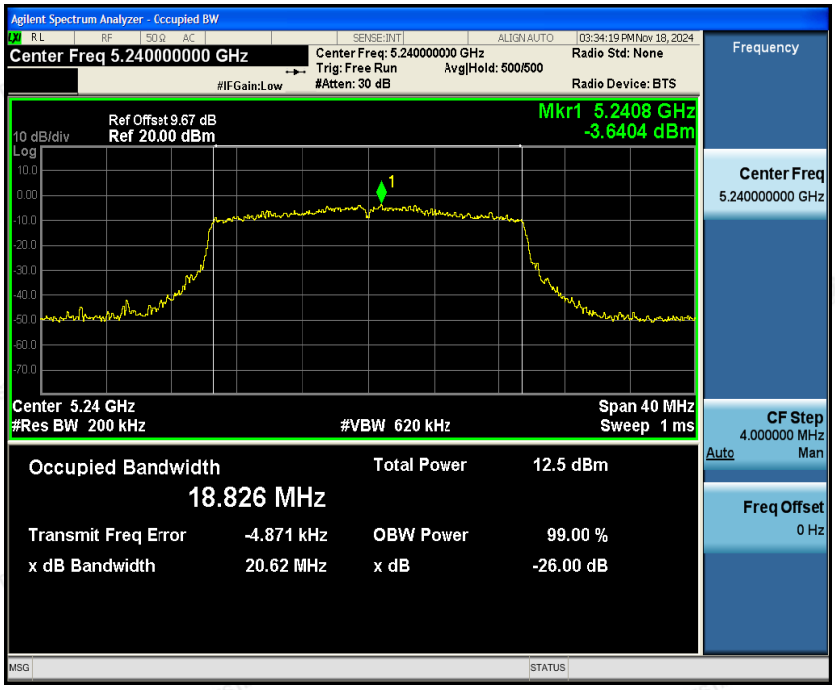
High Channel



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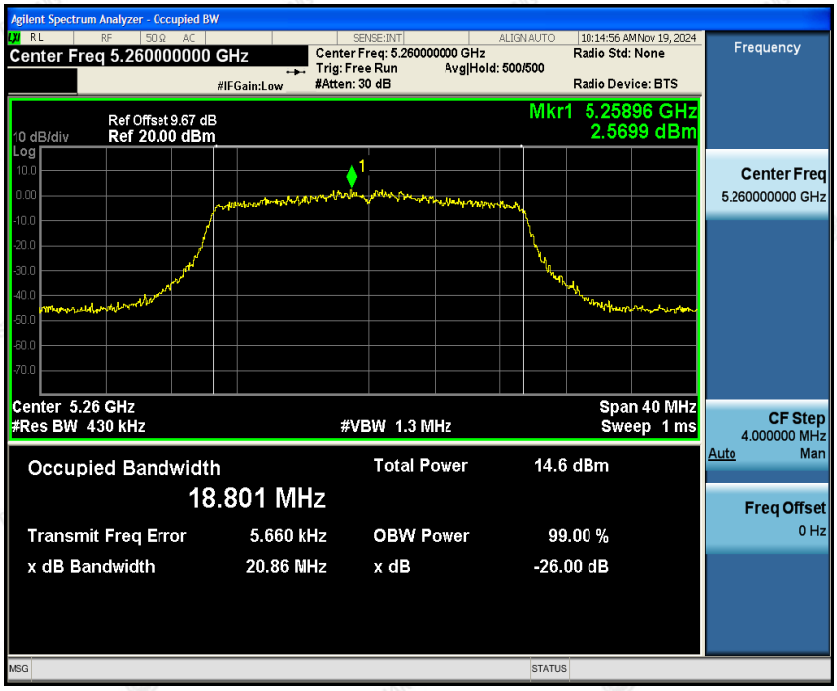
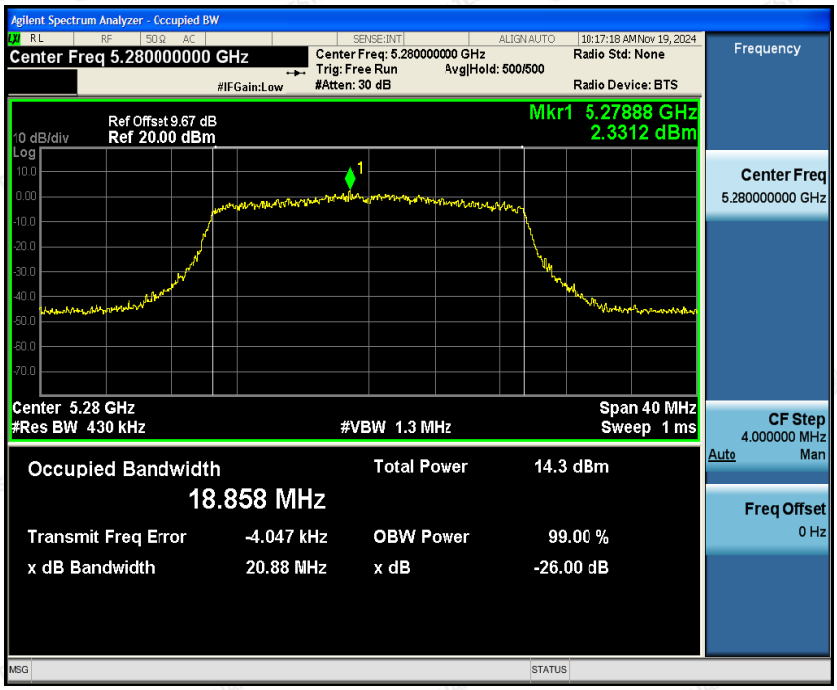
5250~5350MHz

Low Channel



Mid Channel



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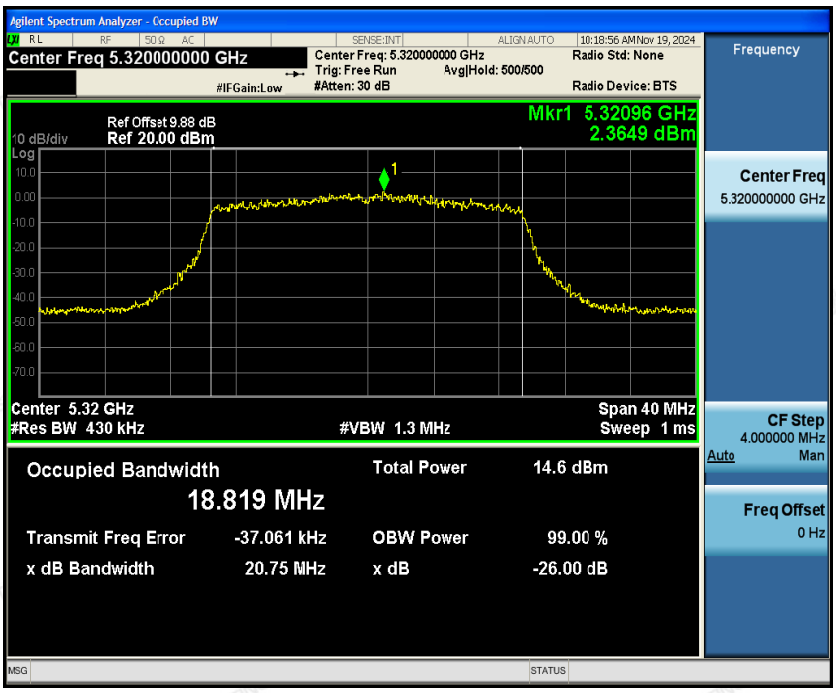
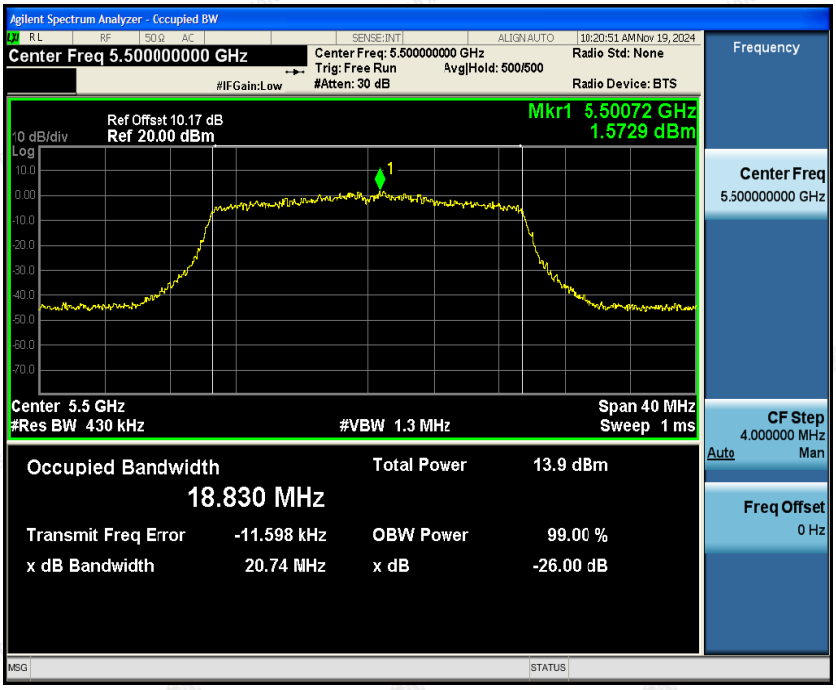
High Channel



5470~5725MHz

Low Channel



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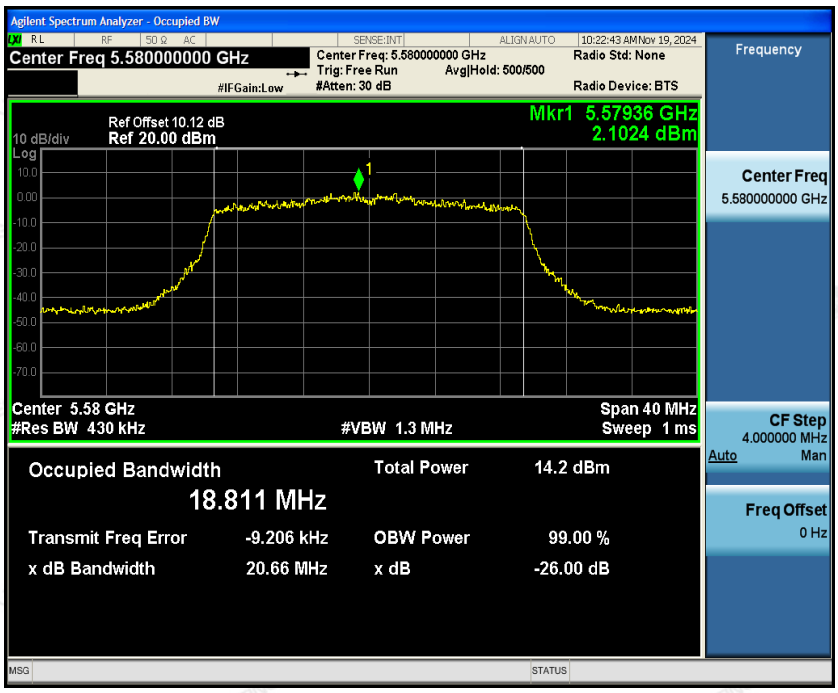
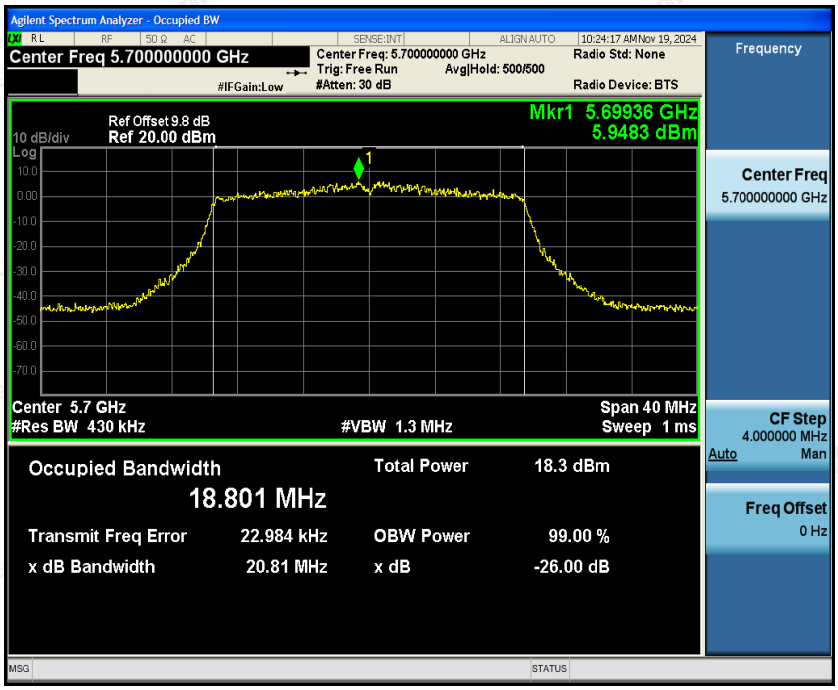
Mid Channel



High Channel



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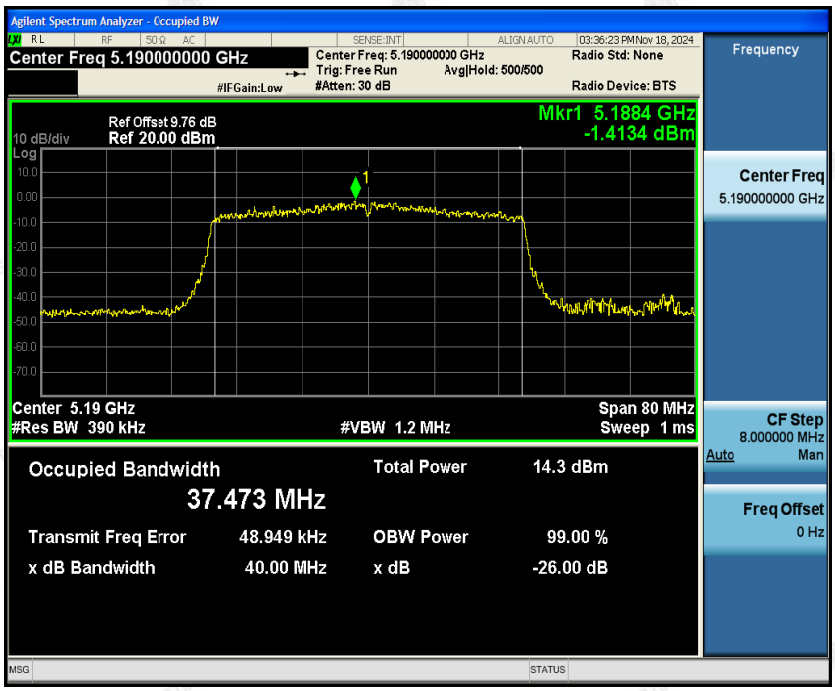
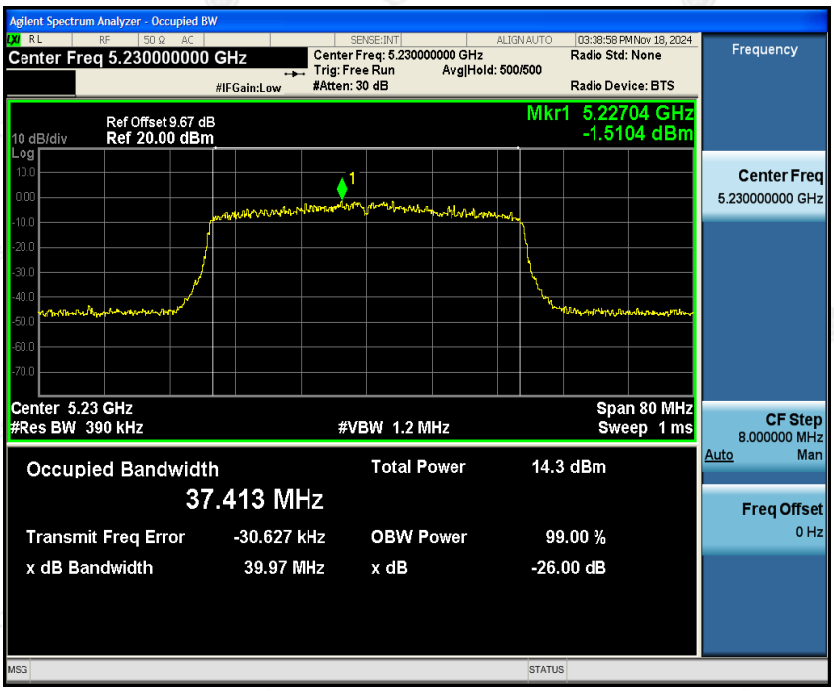
IEEE802.11ax HE40 mode

5150~5250MHz

Low Channel



High Channel



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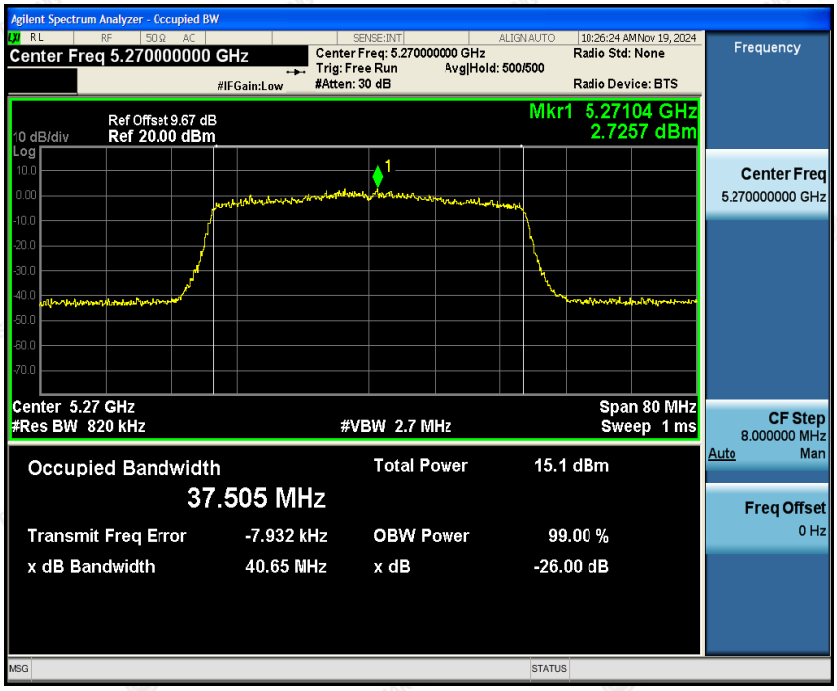
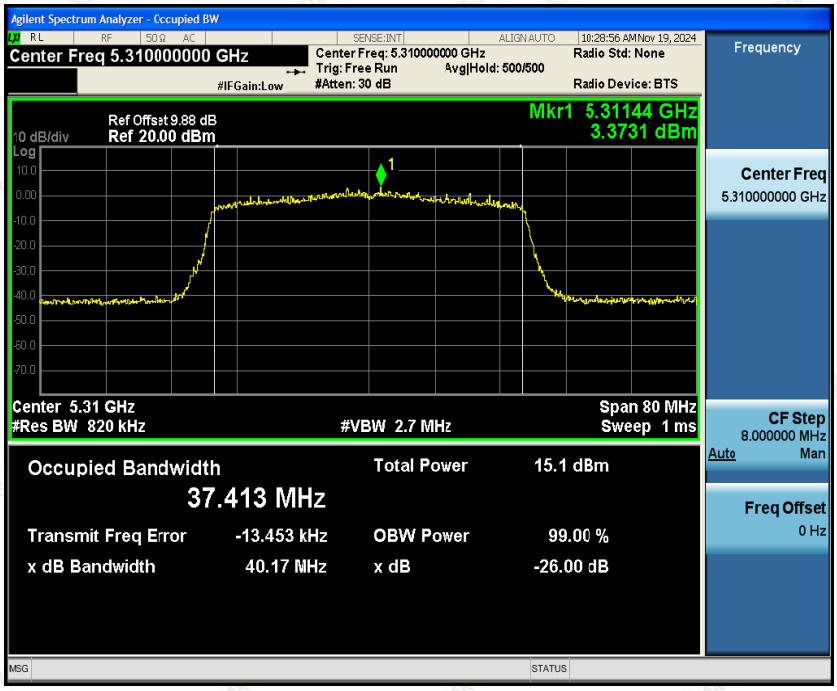
5250~5350MHz

Low Channel



High Channel



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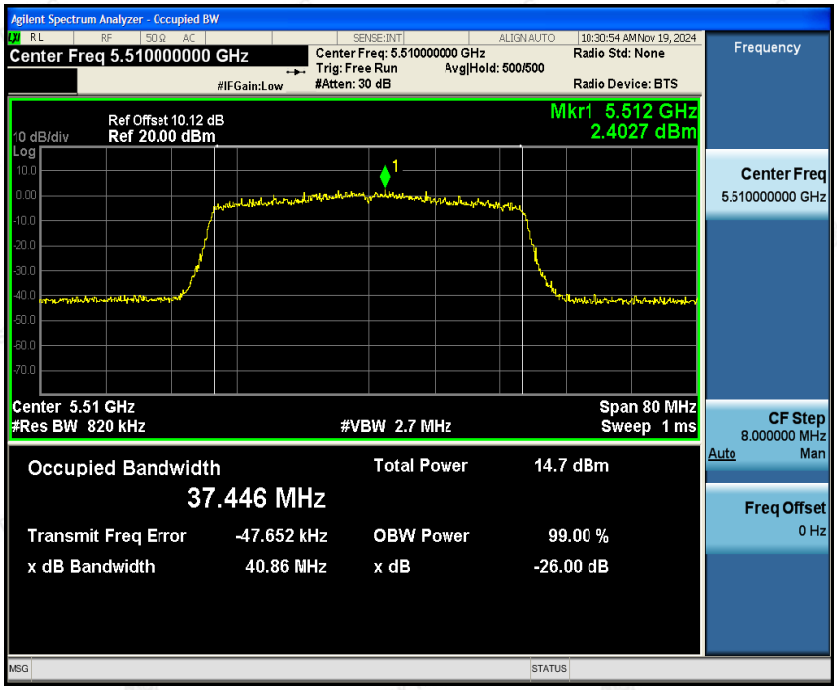
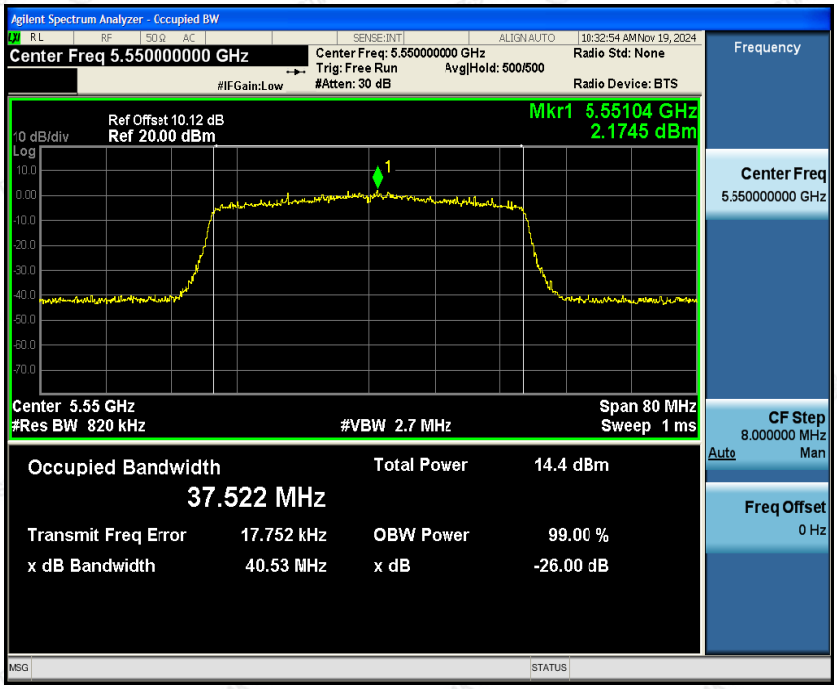
5470~5725MHz

Low Channel



Mid Channel



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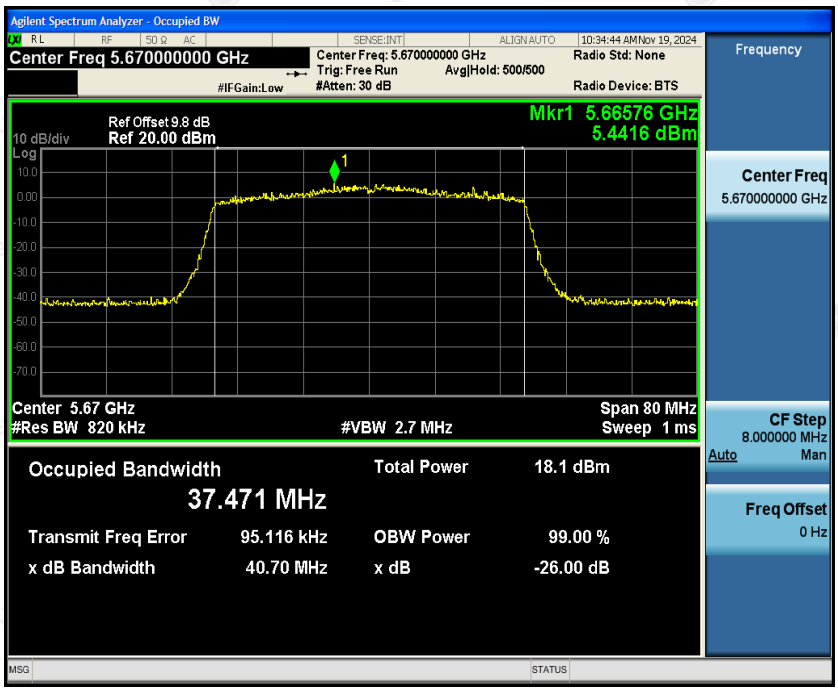
High Channel



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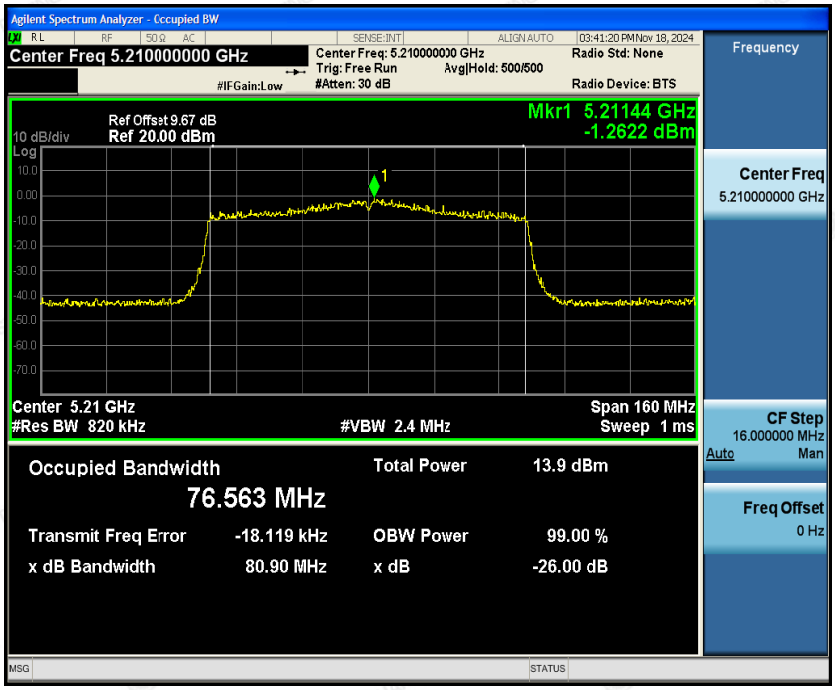
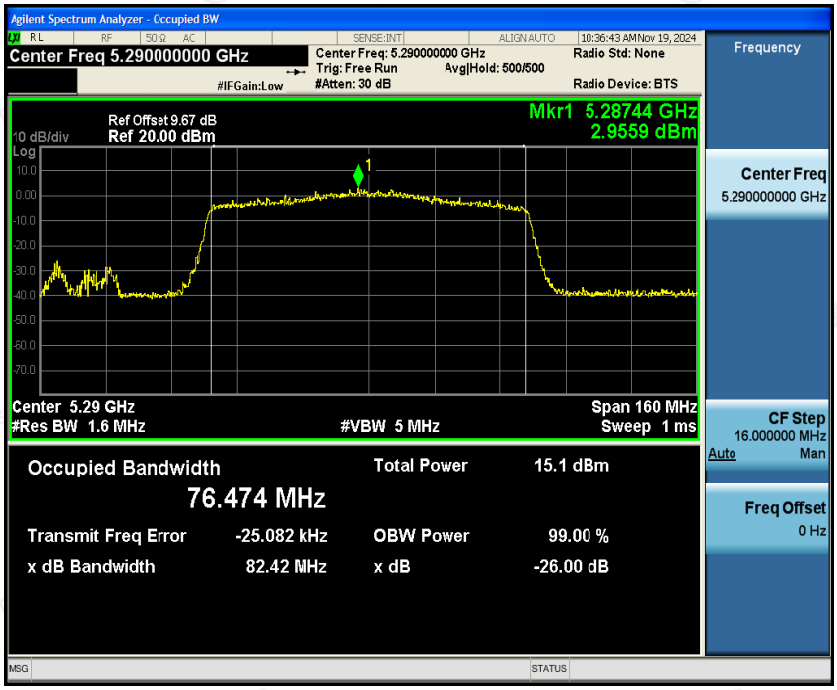
IEEE802.11ax HE80 mode

5150~5250MHz



5250~5350MHz



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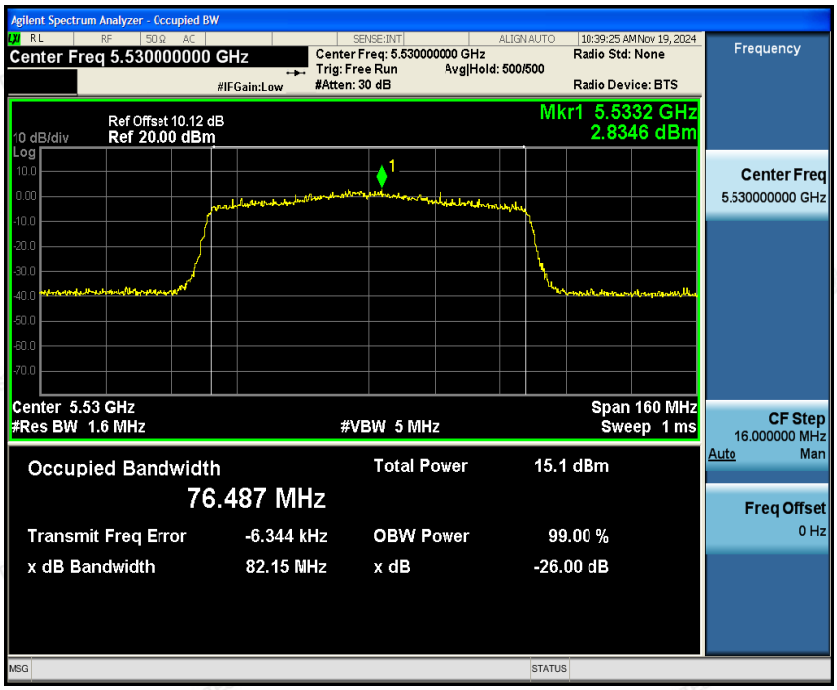
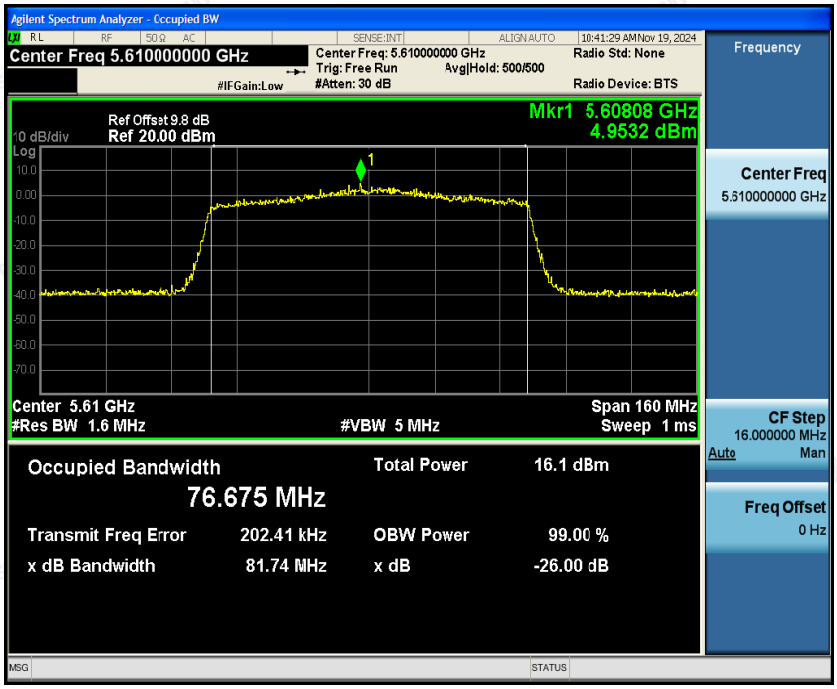
5470~5725MHz

Low Channel



High Channel



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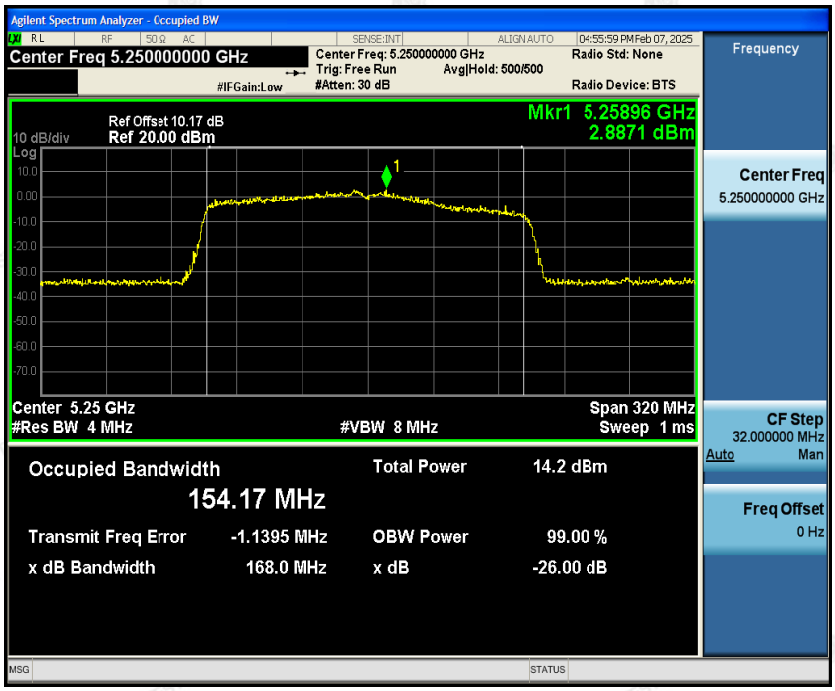
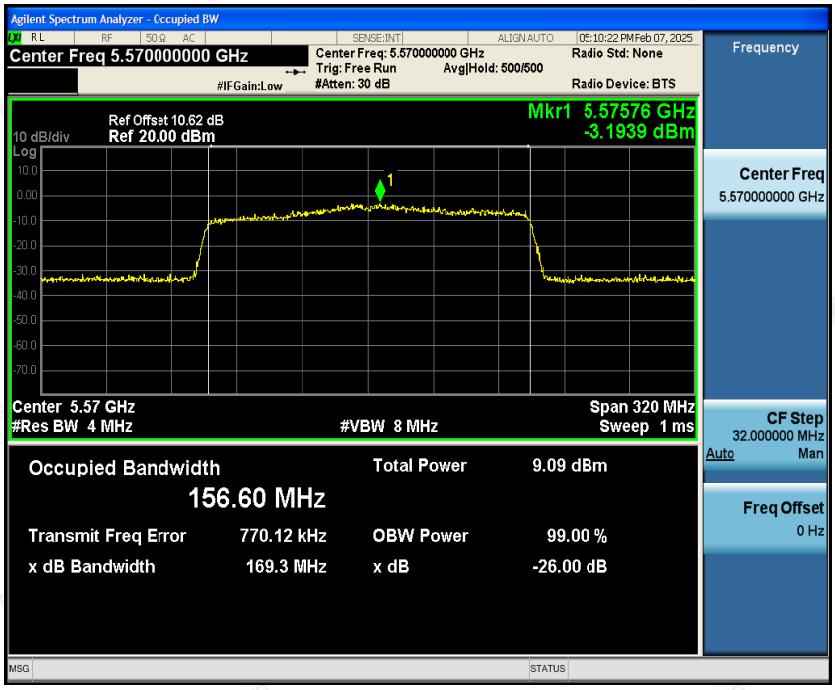
IEEE802.11ax HE160 mode

5150~5350MHz



5470~5725MHz



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6.2 Maximum Conducted Output Power

LIMIT

According to §15.407(a),

For the 5.15-5.25 GHz bands, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

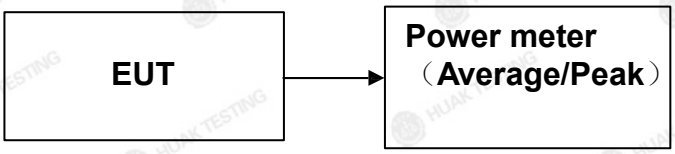
For the 5.25-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm+10 log B, where B is the 26 dB emission bandwidth in megahertz.

If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W

The peak power shall not exceed the limit as follow:

Test Configuration



The EUT was connected to a spectrum analyzer through a 50Ω RF cable.

TES TPROCEDURE

The testing follows Method PM of FCCKDB789033 D02General UNII Test Procedures New Rules v02r01.

Method PM (Measurement using an RF peak power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.

TEST RESULTS

No non-compliance noted

TEST RESULTS

No non-compliance noted

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Test Data

Testmode:IEEE802.11a mode

5150~5250MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5180	5.86	7.06	/	30.00
Mid	5200	5.23	5.37	/	30.00
High	5240	7.80	8.29	/	30.00

5250~5350MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5260	6.75	6.45	/	23.68
Mid	5280	6.49	6.13	/	23.70
High	5320	6.56	6.52	/	23.66

5470~5725MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5500	5.43	5.91	/	23.69
Mid	5580	5.05	5.92	/	23.71
High	5700	8.53	8.14	/	23.67

Testmode:IEEE802.11n HT20 mode

5150~5250MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5180	5.42	5.65	8.55	30.00
Mid	5200	6.76	6.96	9.87	30.00
High	5240	5.33	6.87	9.18	30.00

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5250~5350MHz

Channel	Frequency(MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5260	6.38	5.85	9.13	22.78
Mid	5280	6.10	5.61	8.87	22.80
High	5320	6.23	5.83	9.04	22.73

5470~5725MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5500	4.96	5.16	8.07	22.69
Mid	5580	4.65	6.56	8.72	22.72
High	5700	8.14	7.50	10.84	22.67

Testmode:IEEE802.11n HT40 mode

5150~5250MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5190	6.02	7.29	9.71	30.00
High	5230	6.10	5.63	8.88	30.00

5250~5350MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5270	7.27	5.53	9.50	22.8
Mid	5310	6.78	5.42	9.16	22.8

5470~5725MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5510	5.96	5.04	8.53	22.72
Mid	5550	5.12	4.80	7.97	22.72
High	5670	8.11	8.53	11.34	22.72

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Testmode:IEEE802.11ac HT20 mode

5150~5250MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5180	6.27	5.67	8.99	30.00
Mid	5200	5.72	6.98	9.41	30.00
High	5240	5.63	5.88	8.77	30.00

5250~5350MHz

Channel	Frequency(MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5260	6.40	5.86	9.15	22.80
Mid	5280	6.09	5.58	8.85	22.76
High	5320	6.22	5.87	9.06	22.80

5470~5725MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5500	5.07	5.17	8.13	22.70
Mid	5580	4.60	5.40	8.03	22.72
High	5700	8.14	7.47	10.83	22.72

Testmode:IEEE802.11ac HT40 mode

5150~5250MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5190	7.00	6.27	9.66	30.00
High	5230	6.08	5.66	8.89	30.00

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5250~5350MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5270	6.22	6.66	9.46	22.80
Mid	5310	5.53	6.63	9.13	22.80

5470~5725MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5510	4.86	6.16	8.57	22.72
Mid	5550	5.19	5.93	8.59	22.72
High	5670	6.93	9.60	11.48	22.72

Testmode:IEEE802.11ac HT80 mode

5150~5250MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
--	5210	5.12	5.46	8.30	30.00

5250~5350MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
--	5270	5.65	3.77	7.82	22.80

5470~5725MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5510	4.82	5.94	8.43	22.72
High	5670	5.04	6.89	9.07	22.72

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Testmode:IEEE802.11ac HT160 mode

5150~5350MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
--	5250	2.66	4.68	6.80	22.80

5470~5725MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
--	5570	4.37	1.64	6.23	22.72

Testmode:IEEE802.11ax HE20 mode

5150~5250MHz

Channel	Frequency(MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5180	5.54	5.85	8.71	30.00
Mid	5200	5.95	7.17	9.61	30.00
High	5240	6.55	5.10	8.90	30.00

5250~5350MHz

Channel	Frequency(MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5260	5.48	6.06	8.79	22.80
Mid	5280	5.26	5.78	8.54	22.80
High	5320	5.38	6.08	8.75	22.80

5470~5725MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5500	4.01	5.33	7.73	22.72
Mid	5580	4.35	5.56	8.01	22.72
High	5700	7.25	9.79	11.71	22.72

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Testmode:IEEE802.11ax HE40 mode

5150~5250MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5190	5.78	6.99	9.44	30.00
Mid	5230	5.77	6.38	9.10	30.00

5250~5350MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5270	5.87	6.32	9.11	22.80
Mid	5310	5.16	6.30	8.78	22.80

5470~5725MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5510	4.51	5.84	8.24	22.72
Mid	5550	4.94	5.56	8.27	22.72
High	5670	6.51	9.30	11.14	22.72

Testmode:IEEE802.11ax HE80 mode

5150~5250MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
--	5210	5.09	5.39	8.25	30.00

5250~5350MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
--	5270	5.50	6.00	8.77	22.80

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5470~5725MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
Low	5510	4.71	5.82	8.31	22.72
High	5670	4.93	6.74	8.94	22.72

Testmode:IEEE802.11ax HE160 mode

5150~5350MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
--	5250	2.76	4.71	6.85	22.80

5470~5725MHz

Channel	Frequency (MHz)	Peak Output Power (dBm)		Mimo	Limit(dBm)
		Ant1	Ant2		
--	5570	4.46	1.64	6.29	22.72

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6.3 Band Edges Measurement

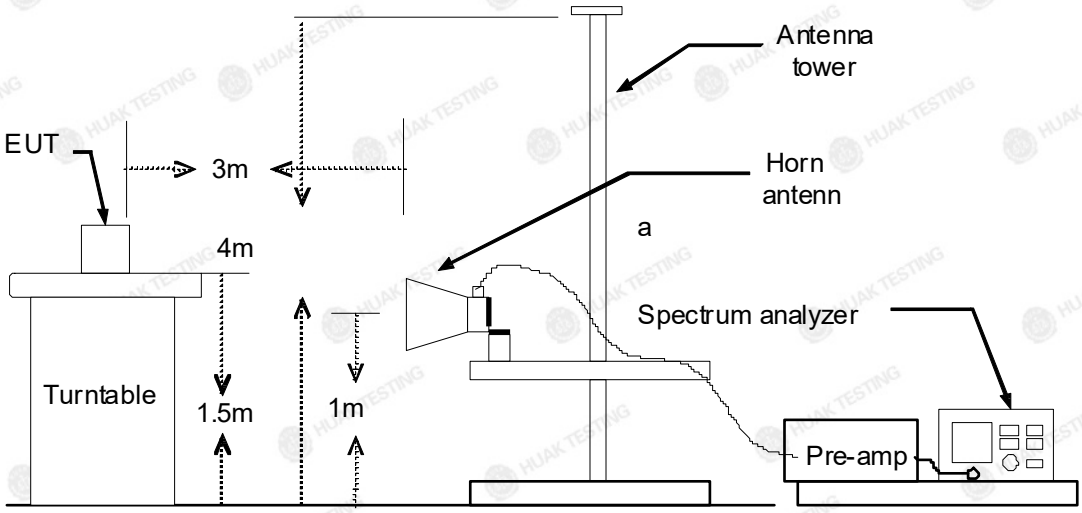
LIMIT

According to §15.407(b),

(1) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

Test Configuration



TESTPROCEDURE

1. The EUT is placed on a turntable, which is 1.5m above the ground plane.
2. The turntable shall be rotated for 360degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / Sweep=AUTO

VBW=10Hz, when duty cycle is no less than 98 percent.

VBW≧1/T, when duty cycle is less than98 percent, where is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
IEEE 802.11 a	100	-	-	10Hz
IEEE 802.11n/ac HT20/ax HE20	100	-	-	10Hz
IEEE 802.11n/ac HT40/ax HE40	100	-	-	10Hz
IEEE 802.11ac HT80/ax HE80	100	-	-	10Hz

TESTRESULTS

Refer to attach spectrum analyzer data chart.

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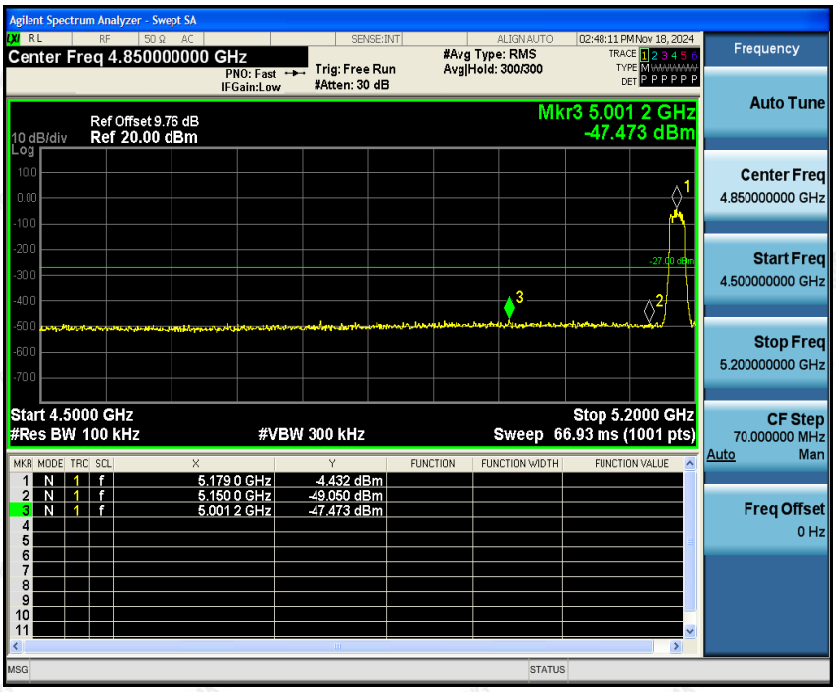
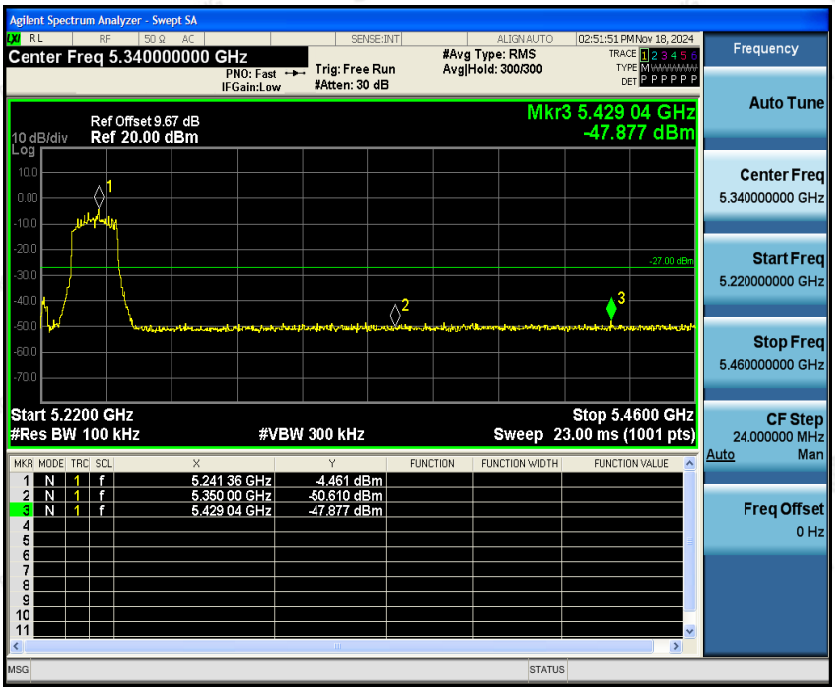
Antenna1

Band Edges(IEEE802.11a mode)

5180MHz



5240MHz



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