FCC Test Report

Report No.: AGC15863230701FR04

FCC ID	:	2BCNZ-FYX7663BU
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	WiFi module
BRAND NAME	:	FEIYUXIN
MODEL NAME	:	FYX7663BU
APPLICANT	:	Shenzhen FEIYUXIN electronics co., ltd
DATE OF ISSUE	:	Sep. 26, 2023
STANDARD(S)	:	FCC Part 15 Subpart E §15.407
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Sep. 26, 2023	Valid	Initial Release

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1. General Information

Applicant	Shenzhen FEIYUXIN electronics co., ltd
Address	Floor 1-4, Workshop No.76 Baotong South Road, Xikeng Community, Yuanshan Street, Longgang District, Shenzhen City, Guangdong Province, China
Manufacturer	Shenzhen FEIYUXIN electronics co., ltd
Address	Floor 1-4, Workshop No.76 Baotong South Road, Xikeng Community, Yuanshan Street, Longgang District, Shenzhen City, Guangdong Province, China
Factory	Shenzhen FEIYUXIN electronics co., ltd
Address	Floor 1-4, Workshop No.76 Baotong South Road, Xikeng Community, Yuanshan Street, Longgang District, Shenzhen City, Guangdong Province, China
Product Designation	WiFi module
Brand Name	FEIYUXIN
Test Model	FYX7663BU
Series Model(s)	N/A
Difference Description	N/A
Date of receipt of test item	Aug. 11, 2023
Date of Test	Aug. 25, 2023 – Sep. 26, 2023
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-FCC-5G WLAN-V1

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

Prepared By	Cici Li (Project Engineer)	Sep. 26, 2023
Reviewed By	Calvin Liu (Reviewer)	Sep. 26, 2023
Approved By	Max Zhang Authorized Officer	Sep. 26, 2023

2. Product Information

2.1 Product Technical Description

Equipment Type	☐ Outdoor access points ☐ Indoor access points ☐ Fixed P2P access points ☒ Client devices
Operation Frequency	☒ U-NII 1:5150MHz~5250MHz ☒ U-NII 2A: 5250MHz~5350MHz ☐ U-NII 2C:5470MHz~5725MHz ☒ U-NII 3: 5725MHz~5850MHz
DFS Design Type	☐ Master ☐ Slave with radar detection ☒ Slave without radar detection
TPC Function	☐ Yes ☒ No
Hardware Version	1.0
Software Version	1.0
Test Frequency Range	For 802.11a/n-HT20/ac-VHT20: 5180~5240MHz, 5260~5320MHz, 5745~5825MHz For 802.11n-HT40: 5190~5230MHz, 5270~5310MHz, 5755~5795MHz
RF Output Power	IEEE 802.11a(HT20):12.33dBm; IEEE 802.11n(HT20):11.34dBm; IEEE802.11n(HT40):11.58dBm; IEEE 802.11ac(VHT20):11.22dBm
RF Output Power_MIMO	IEEE 802.11nHT(20):13.60dBm;IEEE802.11n(HT40):14.03dBm IEEE 802.11ac(VHT20):13.68dBm
Modulation	802.11a/n:(64-QAM, 16-QAM, QPSK, BPSK) OFDM 802.11ac :(256-QAM, 64-QAM, 16-QAM, QPSK, BPSK) OFDM
Data Rate	802.11a:6/9/12/18/24/36/48/54Mbps; 802.11n:up to 300Mbps; 802.11ac:up to 866.8Mbps
Number of channels	6 channels of U-NII-1 Band 6 channels of U- NII-2A Band 7 channels of U- NII 3 Band
Antenna Designation	PCB Antenna
Antenna Gain	Refer to Chapter 2.9 of the report.
Power Supply	DC 3.3V

2.2 Table of Carrier Frequency

For 5180~5240MHz:

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

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

2 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

For 5260~5320MHz:

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

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

2 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

For 5745~5825MHz:

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

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

2 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

2.3 IEEE 802.11n Modulation Scheme

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

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

2.4 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for **FCC ID: 2BCNZ-FYX7663BU** filing to comply with the FCC Part 15 requirements.

2.5 Test Methodology

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

2.6 Special Accessories

Refer to section 4.4.

2.7 Equipment Modifications

Not available for this EUT intended for grant.

2.8 Antenna Requirement

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

2.9 Description of Available Antennas

Antenna Type	Frequency Band (MHz)	TX Paths	Bandwidth (MHz)	Max Peak Gain (dBi)		Max Directional Gain (dBi)
				Ant 1	Ant 2	
5G WIFI PIFA Antenna List (5GHz 2*2 MIMO)						
PCB Antenna	5150 ~ 5250	2	20,40,80	1.77	1.82	4.83
	5280 ~ 5350	2	20,40,80	1.91	1.73	4.92
	5725 ~ 5850	2	20,40,80	1.79	1.49	4.80

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

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

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

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

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

- For power measurements on IEEE 802.1devices:

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

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

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

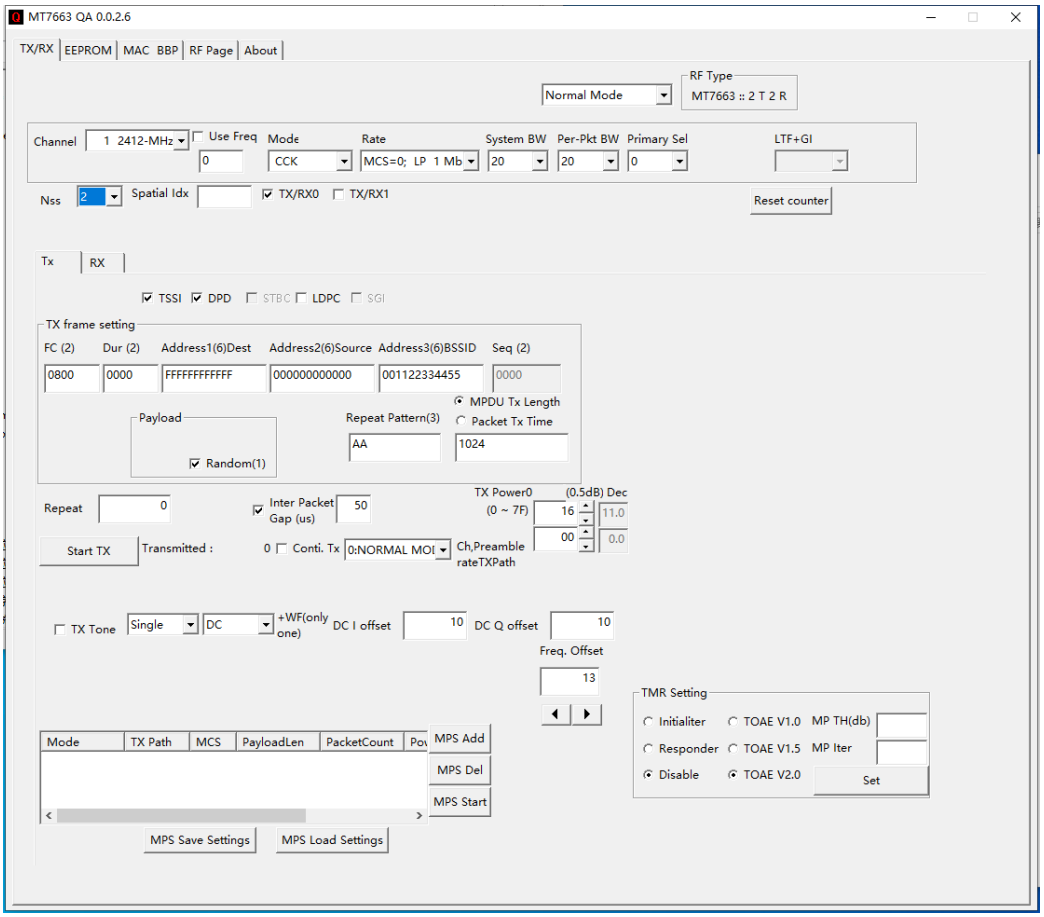
If antenna gains are not equal, Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

2.10 Description of Test Software

For IEEE 802.11 mode:

The test utility software used during testing was “MT7663 QA 0.0.2.6”.

Software Setting Diagram



Mode (5150-5250MHz)	Channel	Power Index	
		Chain 1	Chain 2
802.11a	L/M/H	16	18
802.11n(HT20)	L/M/H	16	18
802.11n(HT40)	L/M/H	16	18
802.11ac(VHT20)	L/M/H	16	18
Mode (5250-5350MHz)	**Channel**	**Power Index**	
		Chain 1	**Chain 2**
802.11a	L/M/H	16	18
802.11n(HT20)	L/M/H	16	18
802.11n(HT40)	L/M/H	16	18
802.11ac(VHT20)	L/M/H	16	18
Mode (5725-5850MHz)	**Channel**	**Power Index**	
		Chain 1	**Chain 2**
802.11a	L/M/H	16	18
802.11n(HT20)	L/M/H	16	18
802.11n(HT40)	L/M/H	16	18
802.11ac(VHT20)	L/M/H	16	18

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	5V

3.4 Measurement Uncertainty

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

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

3.5 List of Equipment Used

● RF Conducted Test System							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-ER-E036	Spectrum Analyzer	Agilent	N9020A	MY49100060	2023-06-01	2024-05-31
☒	AGC-ER-E062	Power Sensor	Agilent	U2021XA	MY54110007	2023-03-03	2024-03-02
☒	AGC-ER-E063	Power Sensor	Agilent	U2021XA	MY54110009	2023-03-03	2024-03-02
☒	AGC-EM-A152	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08
☒	AGC-ER-E083	Signal Generator	Agilent	E4421B	US39340815	2023-06-01	2024-05-31
☒	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	2023-02-18	2024-02-17
☒	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2023-06-03	2024-06-02
☒	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2023-06-01	2024-05-31
☒	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2022-03-12	2024-03-11
☒	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2023-05-11	2025-05-10
☒	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2023-03-23	2024-03-22
☒	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2021-10-31	2023-10-30
☒	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2022-08-04	2024-08-03
☒	AGC-EM-A118	5G Filter	SongYi	BRM50716	N/A	2023-06-01	2024-05-31
☒	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08
☐	AGC-EM-A139	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08

● AC Power Line Conducted Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E045	EMI Test Receiver	R&S	ESPI	101206	2023-06-03	2024-06-02
☒	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2023-06-03	2024/06/02
☒	AGC-EM-A130	6dB Attenuator	Eeatsheep	LM-XX-6-5W	DC-6GZ	2023-06-09	2024-06-08

● 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-S004	RE Test System	Tonscend	TS^{+} Ver2.1(JS32-RE)	4.0.0.0
☒	AGC-ER-S012	BT/WIFI-Test System	Tonscend	JS1120-2	2.6
☒	AGC-EM-S011	RSE Test System	Tonscend	TS+-Ver2.1(JS36-RSE)	4.0.0.0

4.System Test Configuration

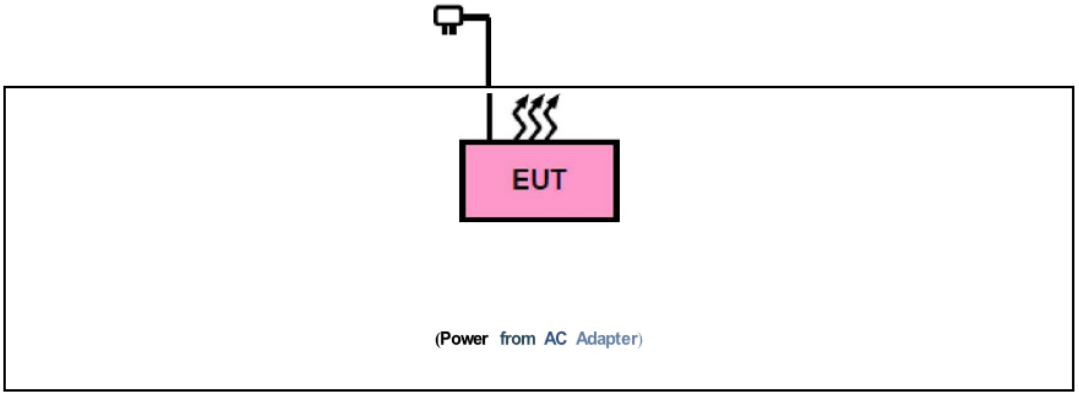
4.1 EUT Configuration

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

4.2 EUT Exercise

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

4.3 Configuration of Tested System



4.4 Equipment Used in Tested System

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

☒ Test Accessories Come From The Laboratory

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Huawei Notebook PC 2	huawei	D15	--	2.2m,unshielded
2	Adapter(PC)	MI	AD651	--	--

☒ Test Accessories Come From The Manufacturer

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Control Box	N/A	N/A	USB-TTL	--

4.5 Summary of Test Results

Item	FCC Rules	Description Of Test	Result
1	§15.203	Antenna Equipment	Pass
2	§15.407(a/1/2/3)	RF Output Power	Pass
3	§15.407(e)	6dB Bandwidth Measurement	Pass
4	§2.1049	26dB bandwidth Measurement	Pass
5	§15.407(a/1/2/3)	Power Spectral Density	Pass
6	§15.407(b)(1/2/3/4)	Conducted Spurious Emission	Pass
7	§15.209,§15.407(b)(1/2/3/4)	Radiated Emission& Band Edge	Pass
8	§15.207	AC Power Line Conducted Emission	Pass

5. Description of Test Modes

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE > 1G	RE < 1G	PLC	APCM	
A	--	--	--	--	Powered by Adapter with WIFI(5G) Link
B	--	--	--	--	Powered by Battery with WIFI(5G) Link
C	☒	☒	☒	☒	Powered by USB with WIFI(5G) Link

Where, **RE＞1G: Radiated Emission above 1GHz** **PLC: Power Line Conducted Emission**
RE＜1G: Radiated Emission below 1GHz **APCM: Antenna Port Conducted Measurement**

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

NOTE 2: "--"means no effect.

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

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations be Meen available modulations, data rates and antenna ports (IF EUT with antenna diversity architecture).
☒ The equipment under test has multiple antennas, and only the MIMO mode is recorded as the worst.
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
C	802.11n (20MHz)	5180-5240	36 to 48	36, 40, 48	OFDM	6.5
C	802.11n (20MHz)	5260-5320	52 to 64	52, 60, 64	OFDM	6.5
C	802.11n (20MHz)	5745-5825	149 to 165	149, 157, 165	OFDM	6.5

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 equipment under test has multiple antennas, and only the MIMO mode is recorded as the worst.
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
C	802.11n(20MHz)	5180-5240	36 to 48	36	OFDM	6.5

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 equipment under test has multiple antennas, and only the MIMO mode is recorded as the worst.
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
C	802.11n(20MHz)	5180-5240	36 to 48	36	OFDM	6.5

Bandedge 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 equipment under test has multiple antennas, when there is no MIMO technology mode, antenna 1 is evaluated. When there is MIMO technology mode, antenna 1 + antenna 2 are evaluated as the worst data.
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
C	802.11a	5180-5240	36 to 48	36	OFDM	6.0
C	802.11n (40MHz)		38 to 46	38	OFDM	MCS0
C	802.11a	5260-5320	52 to 64	64	OFDM	6.0
C	802.11n (40MHz)		54 to 62	62	OFDM	MCS0

Antenna Port Conducted Measurement:

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

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

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
C	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
C	802.11n (20MHz)		36 to 48	36, 40, 48	OFDM	MCS0
C	802.11n (40MHz)		38 to 46	38, 46	OFDM	MCS0
C	802.11ac (20MHz)		36 to 48	36, 40, 48	OFDM	MCS0
C	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
C	802.11n (20MHz)		52 to 64	52, 60, 64	OFDM	MCS0
C	802.11n (40MHz)		54 to 62	54, 62	OFDM	MCS0
C	802.11ac (20MHz)		52 to 64	52, 60, 64	OFDM	MCS0
C	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
C	802.11n (20MHz)		149 to 165	149, 157, 165	OFDM	MCS0
C	802.11n (40MHz)		151 to 159	151, 159	OFDM	MCS0
C	802.11ac (20MHz)		149 to 165	149, 157, 165	OFDM	MCS0

6. Duty Cycle Measurement

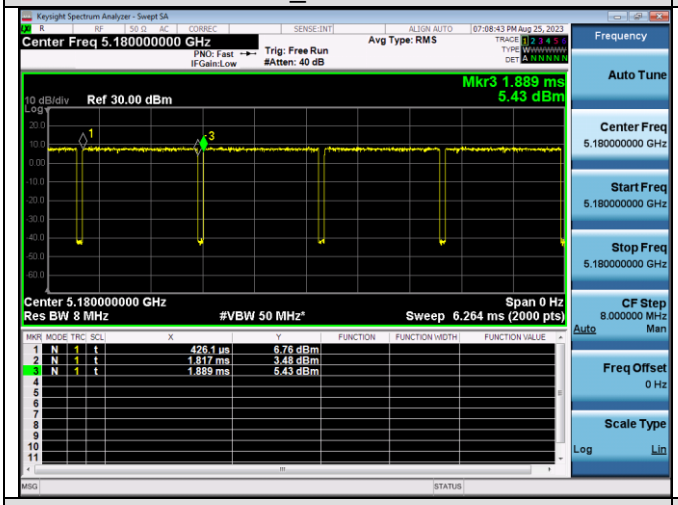
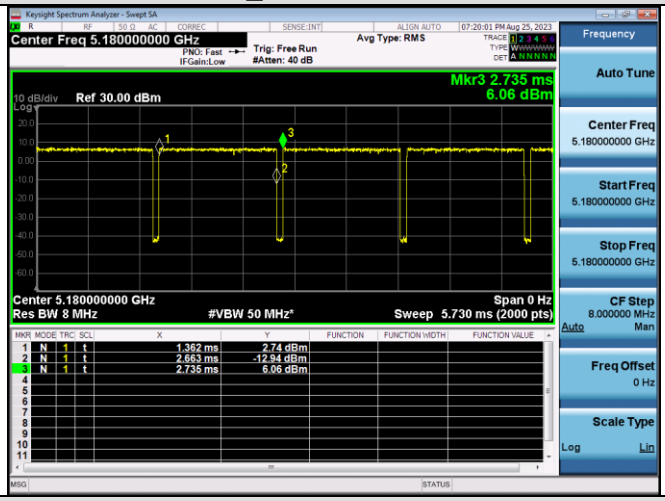
5GHz WLAN (NII) operation is possible in 20MHz and 40MHzchannel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = Peak. The RBW and VBW were both greater than 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)	1/ T Minimum VBW (kHz)	Average Factor (dB)
For band 5.150-5.250 GHz:					
IEEE 802.11a	6	95.08	0.22	0.72	-0.44
IEEE 802.11n-HT20	MCS0	94.69	0.24	0.77	-0.47
IEEE 802.11n-HT40	MCS0	90.00	0.46	1.54	-0.92
IEEE 802.11ac-VHT20	MCS0	94.94	0.23	0.76	-0.45
For band 5.25-5.35 GHz:					
IEEE 802.11a	6	95.08	0.22	0.72	-0.44
IEEE 802.11n-HT20	MCS0	94.75	0.23	0.77	-0.47
IEEE 802.11n-HT40	MCS0	90.26	0.45	1.54	-0.89
IEEE 802.11ac-VHT20	MCS0	94.79	0.23	0.76	-0.46
For band 5.725-5.850 GHz:					
IEEE 802.11a	6	94.95	0.23	0.72	-0.45
IEEE 802.11n-HT20	MCS0	94.75	0.23	0.77	-0.47
IEEE 802.11n-HT40	MCS0	90.00	0.46	1.54	-0.92
IEEE 802.11ac-VHT20	MCS0	94.80	0.23	0.76	-0.46

Remark:

1. Duty Cycle factor = 10 * log (1/ Duty cycle)
2. Average factor = 20 log10 Duty Cycle
3. The duty cycle of each frequency band mode reflects the determination requirements of the low channel measurement value.

The test plots as follows:

U-NII 1_IEEE 802.11a	U-NII 1_IEEE 802.11n-HT20
	
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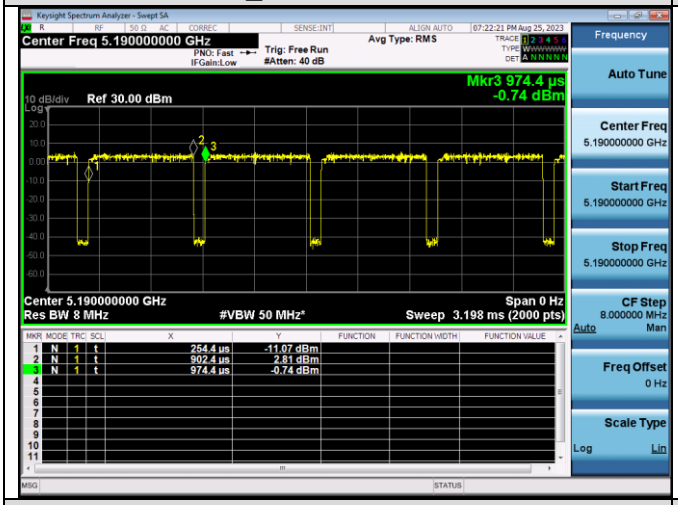
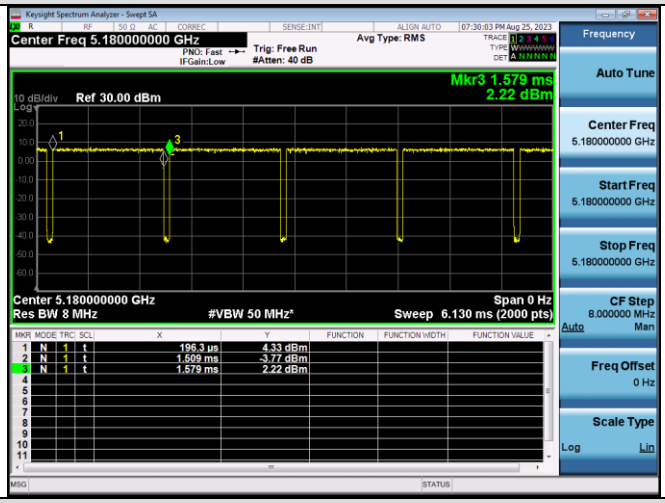
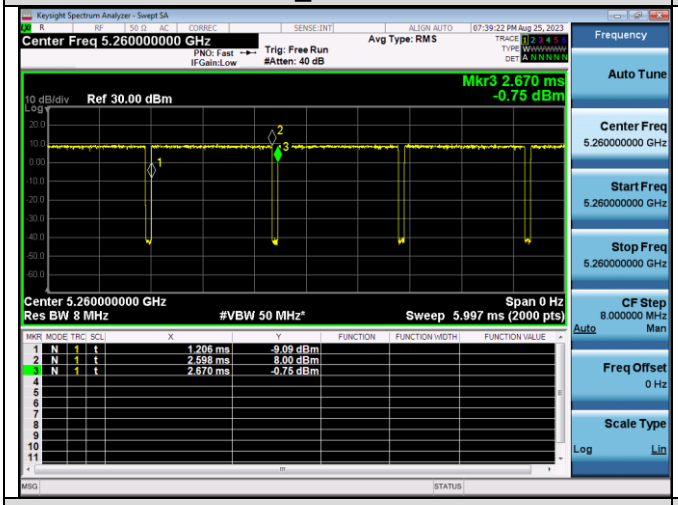
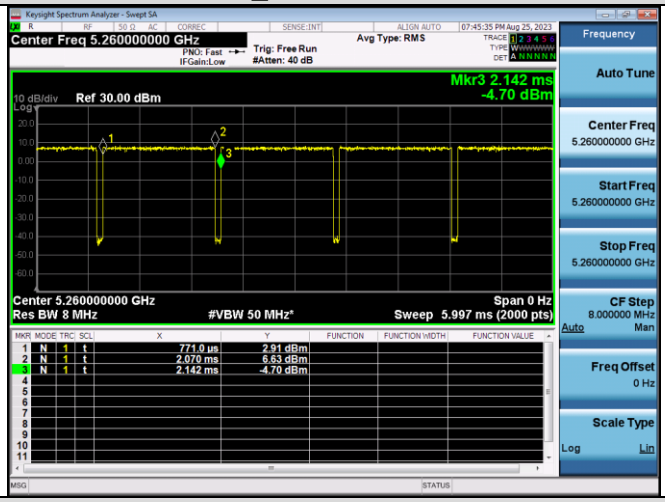
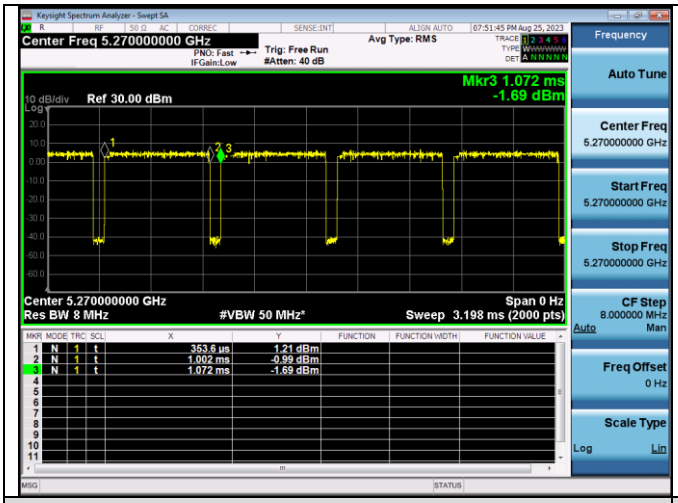
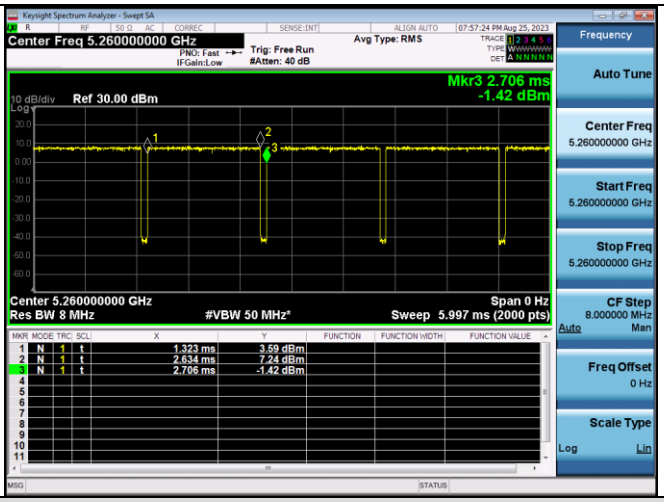
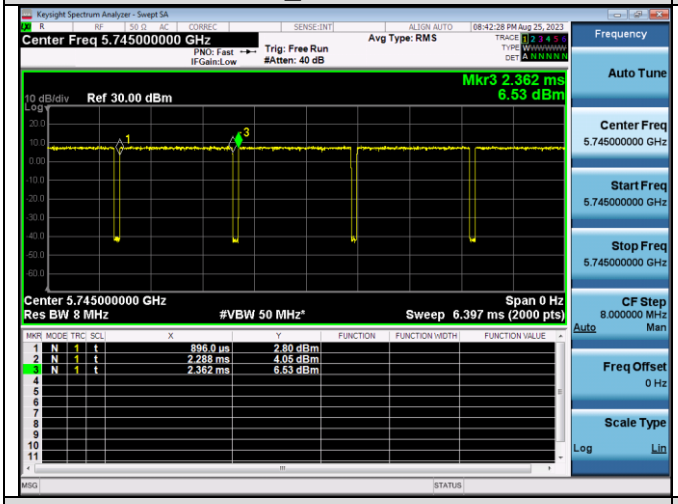
	
U-NII 2A_ IEEE 802.11a	U-NII 2A_ IEEE 802.11n-HT20
	
U-NII 2A_ IEEE 802.11n-HT40	U-NII 2A_ IEEE 802.11ac-VHT20



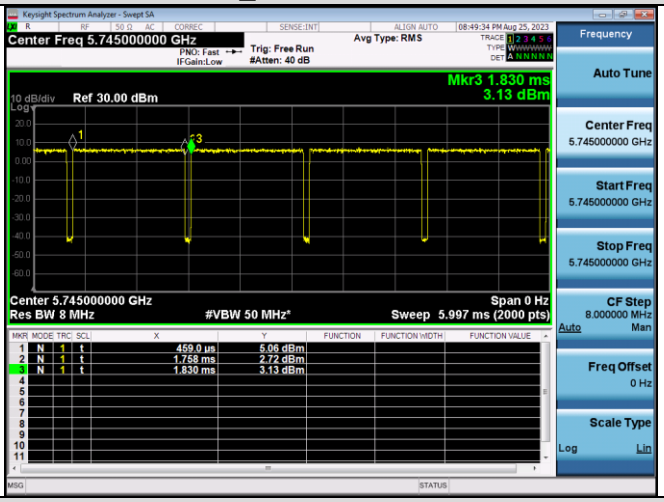
U-NII 3_ IEEE 802.11a



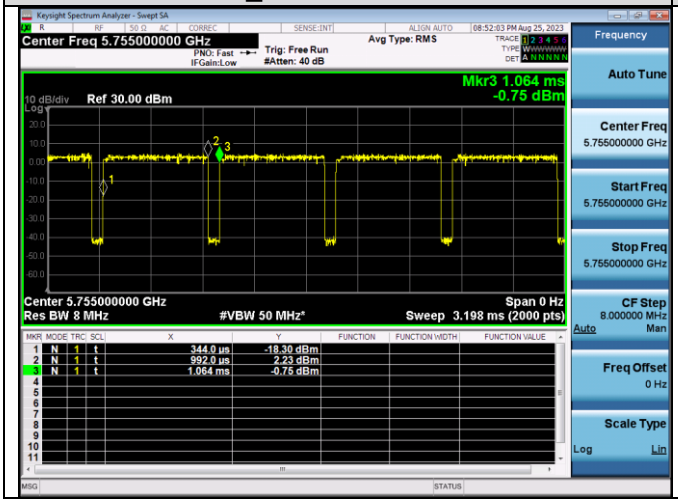
U-NII 3_ IEEE 802.11n-HT20

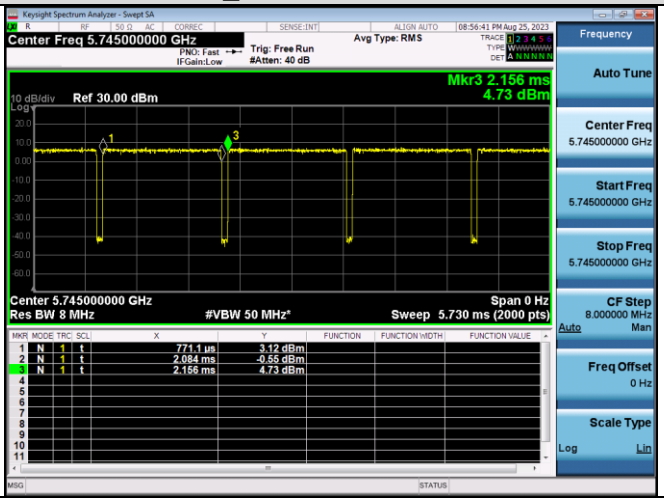


U-NII 3_ IEEE 802.11n-HT40



U-NII 3_ IEEE 802.11ac-VHT20





7. RF Output Power Measurement

7.1 Provisions Applicable

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

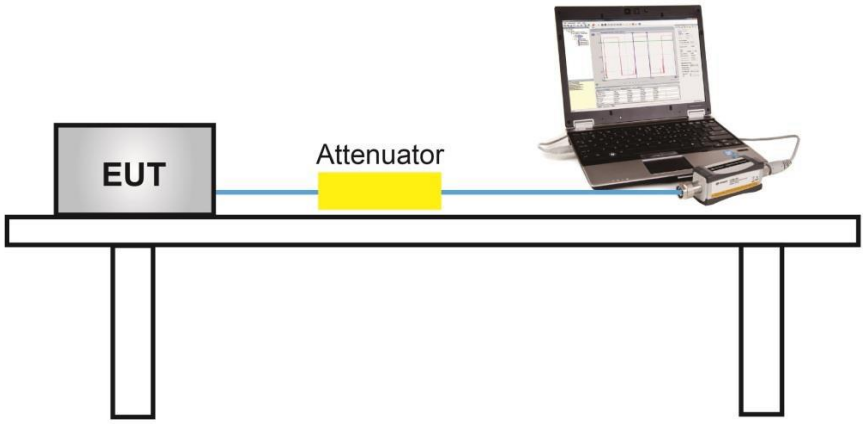
Note: Where B is the 26dB emission bandwidth in MHz.

7.2 Measurement Procedure

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

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

7.3 Measurement Setup (Block Diagram of Configuration)



7.4 Measurement Result

Test Data of Conducted Output Power for band 5.15-5.25 GHz-ANT 1				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5180	9.95	23.98	Pass
	5200	9.46	23.98	Pass
	5240	8.81	23.98	Pass
802.11n20	5180	8.90	23.98	Pass
	5200	8.30	23.98	Pass
	5240	7.62	23.98	Pass
802.11n40	5190	8.86	23.98	Pass
	5230	8.23	23.98	Pass
802.11ac20	5180	8.73	23.98	Pass
	5200	8.07	23.98	Pass
	5240	7.50	23.98	Pass

Test Data of Conducted Output Power for band 5.15-5.25 GHz-ANT 2				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5180	9.77	23.98	Pass
	5200	9.46	23.98	Pass
	5240	9.50	23.98	Pass
802.11n20	5180	8.56	23.98	Pass
	5200	8.43	23.98	Pass
	5240	8.42	23.98	Pass
802.11n40	5190	8.82	23.98	Pass
	5230	8.91	23.98	Pass
802.11ac20	5180	8.46	23.98	Pass
	5200	8.33	23.98	Pass
	5240	8.33	23.98	Pass

Test Data of Conducted Output Power for band 5.15-5.25 GHz-MIMO				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11n20	5180	11.74	23.98	Pass
	5200	11.38	23.98	Pass
	5240	11.05	23.98	Pass
802.11n40	5190	11.85	23.98	Pass
	5230	11.59	23.98	Pass
802.11ac20	5180	11.61	23.98	Pass
	5200	11.21	23.98	Pass
	5240	10.95	23.98	Pass

Test Data of Conducted Output Power for band 5.25-5.35 GHz-ANT 1				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5260	10.91	23.98	Pass
	5300	8.30	23.98	Pass
	5320	8.15	23.98	Pass
802.11n20	5260	9.69	23.98	Pass
	5300	7.32	23.98	Pass
	5320	7.18	23.98	Pass
802.11n40	5270	10.38	23.98	Pass
	5310	7.93	23.98	Pass
802.11ac20	5260	10.05	23.98	Pass
	5300	7.62	23.98	Pass
	5320	7.31	23.98	Pass

Test Data of Conducted Output Power for band 5.25-5.35 GHz-ANT 2				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5260	12.33	23.98	Pass
	5300	9.82	23.98	Pass
	5320	9.53	23.98	Pass
802.11n20	5260	11.34	23.98	Pass
	5300	8.71	23.98	Pass
	5320	8.36	23.98	Pass
802.11n40	5270	11.58	23.98	Pass
	5310	8.97	23.98	Pass
802.11ac20	5260	11.22	23.98	Pass
	5300	8.76	23.98	Pass
	5320	8.41	23.98	Pass

Test Data of Conducted Output Power for band 5.25-5.35 GHz-MIMO				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11n20	5260	13.60	23.98	Pass
	5300	11.08	23.98	Pass
	5320	10.82	23.98	Pass
802.11n40	5270	14.03	23.98	Pass
	5310	11.49	23.98	Pass
802.11ac20	5260	13.68	23.98	Pass
	5300	11.24	23.98	Pass
	5320	10.91	23.98	Pass

Test Data of Conducted Output Power for band 5.725-5.850 GHz-ANT 1				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5745	9.74	30	Pass
	5785	9.08	30	Pass
	5825	6.34	30	Pass
802.11n20	5745	8.65	30	Pass
	5785	7.97	30	Pass
	5825	5.21	30	Pass
802.11n40	5755	8.88	30	Pass
	5795	8.10	30	Pass
802.11ac20	5745	8.67	30	Pass
	5785	8.04	30	Pass
	5825	5.22	30	Pass

Test Data of Conducted Output Power for band 5.725-5.850 GHz-ANT 2				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5745	9.97	30	Pass
	5785	9.24	30	Pass
	5825	6.79	30	Pass
802.11n20	5745	8.85	30	Pass
	5785	8.18	30	Pass
	5825	5.77	30	Pass
802.11n40	5755	9.07	30	Pass
	5795	8.31	30	Pass
802.11ac20	5745	8.85	30	Pass
	5785	8.17	30	Pass
	5825	5.73	30	Pass

Test Data of Conducted Output Power for band 5.725-5.85 GHz-MIMO				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11n20	5745	11.76	30	Pass
	5785	11.09	30	Pass
	5825	8.51	30	Pass
802.11n40	5755	11.99	30	Pass
	5795	11.22	30	Pass
802.11ac20	5745	11.77	30	Pass
	5785	11.12	30	Pass
	5825	8.49	30	Pass

8. 6dB&26dB Bandwidth Measurement

8.1 Provisions Applicable

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

8.2 Measurement Procedure

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

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

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

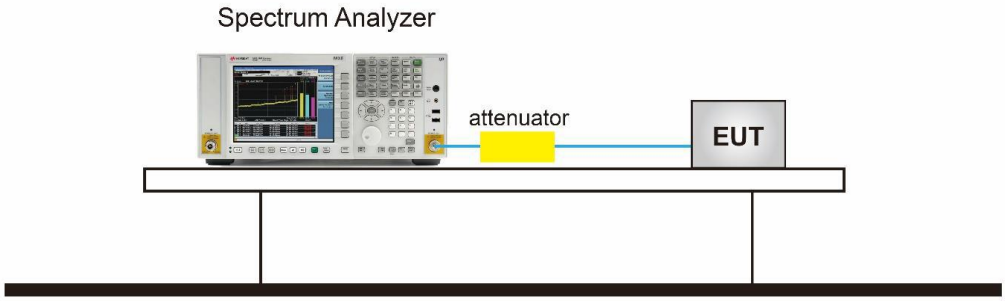
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set Span = approximately 1.5 to 5 times the OBW, centered on a nominal channel
   The nominal IF filter bandwidth (3 dB RBW) shall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

◆ **-26dB Bandwidth test setting:**

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

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

8.3 Measurement Setup (Block Diagram of Configuration)



8.4 Measurement Results

Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz-ANT 1					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5180	16.416	19.906	N/A	Pass
	5200	16.410	19.995	N/A	Pass
	5240	16.462	19.891	N/A	Pass
802.11n20	5180	17.553	19.896	N/A	Pass
	5200	17.572	20.090	N/A	Pass
	5240	17.564	20.033	N/A	Pass
802.11n40	5190	35.961	39.979	N/A	Pass
	5230	35.993	40.286	N/A	Pass
802.11ac20	5180	17.540	19.898	N/A	Pass
	5200	17.566	20.076	N/A	Pass
	5240	17.535	20.028	N/A	Pass

Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz-ANT 2					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5180	16.417	19.824	N/A	Pass
	5200	16.445	19.759	N/A	Pass
	5240	16.417	20.084	N/A	Pass
802.11n20	5180	17.550	20.252	N/A	Pass
	5200	17.563	19.925	N/A	Pass
	5240	17.565	19.916	N/A	Pass
802.11n40	5190	35.989	39.950	N/A	Pass
	5230	35.967	40.134	N/A	Pass
802.11ac20	5180	17.521	19.900	N/A	Pass
	5200	17.556	19.992	N/A	Pass
	5240	17.546	19.902	N/A	Pass

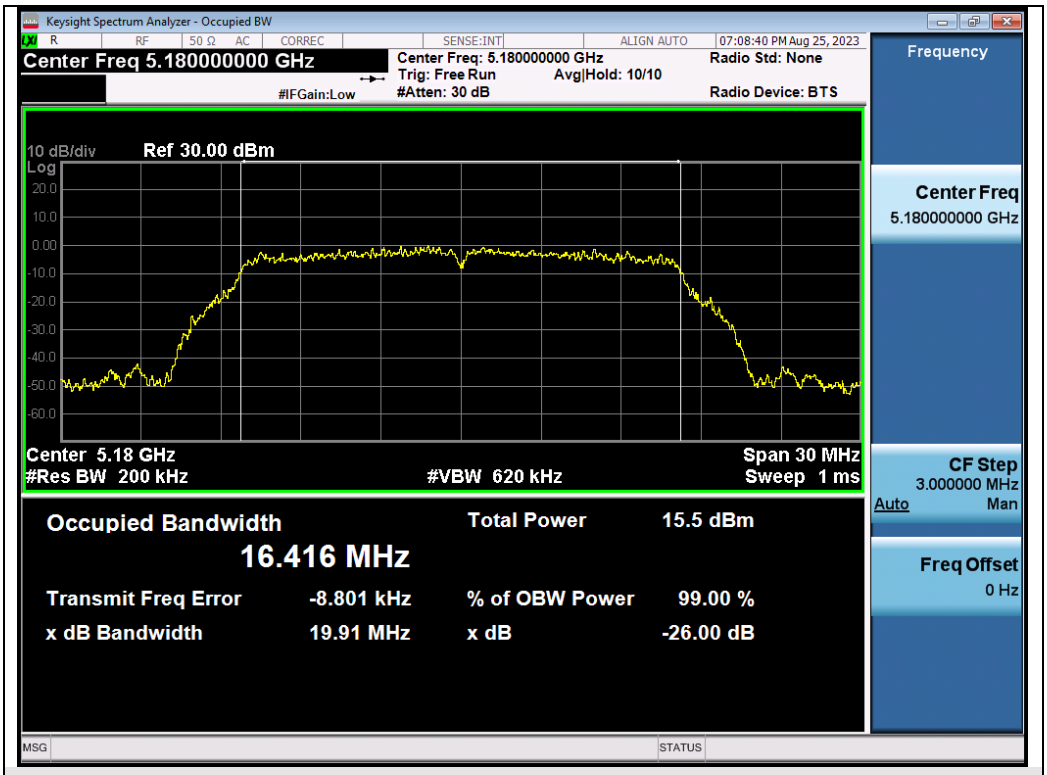
Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.25-5.35 GHz-ANT 1					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5260	16.456	19.883	N/A	Pass
	5300	16.446	19.712	N/A	Pass
	5320	16.452	20.079	N/A	Pass
802.11n20	5260	17.573	20.081	N/A	Pass
	5300	17.568	19.896	N/A	Pass
	5320	17.555	20.092	N/A	Pass
802.11n40	5270	36.035	40.592	N/A	Pass
	5310	35.995	40.514	N/A	Pass
802.11ac20	5260	17.575	20.428	N/A	Pass
	5300	17.547	20.124	N/A	Pass
	5320	17.546	20.090	N/A	Pass

Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.25-5.35 GHz-ANT 2					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5260	16.479	19.941	N/A	Pass
	5300	16.450	19.853	N/A	Pass
	5320	16.439	19.879	N/A	Pass
802.11n20	5260	17.557	20.113	N/A	Pass
	5300	17.543	20.062	N/A	Pass
	5320	17.552	20.129	N/A	Pass
802.11n40	5270	35.968	40.353	N/A	Pass
	5310	35.947	40.058	N/A	Pass
802.11ac20	5260	17.547	20.144	N/A	Pass
	5300	17.539	20.301	N/A	Pass
	5320	17.577	20.153	N/A	Pass

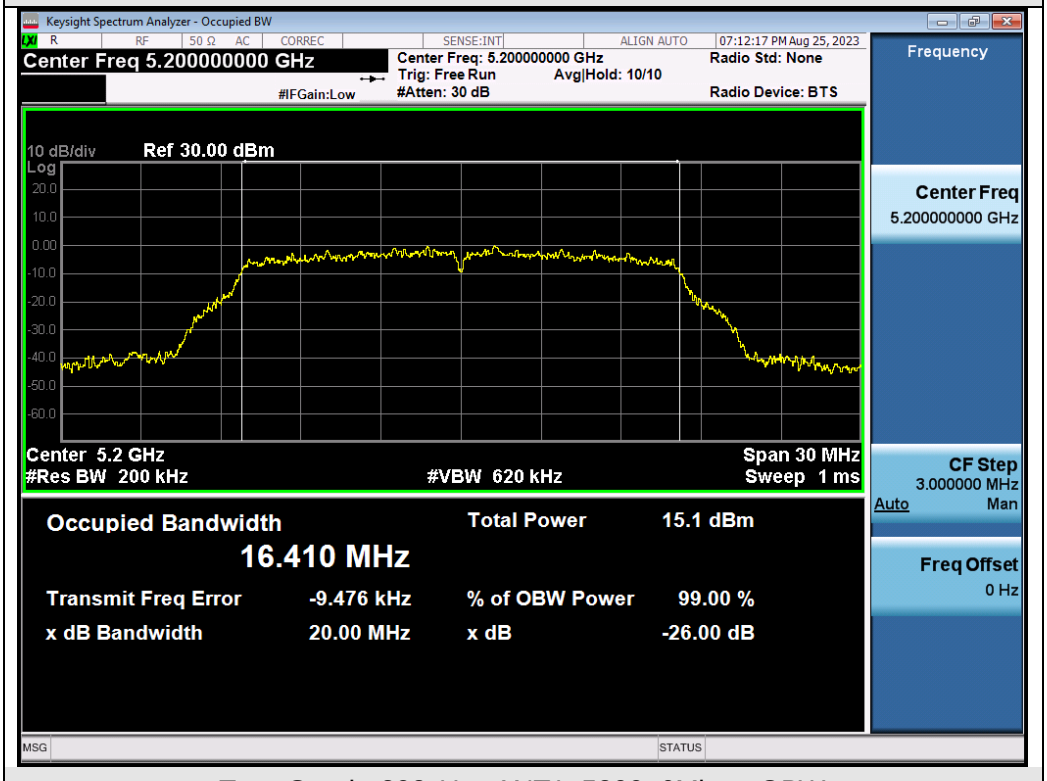
Test Data of Occupied Bandwidth and DTS Bandwidth for band 5.725-5.85 GHz-ANT 1					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	DTS Limits (MHz)	Pass or Fail
802.11a	5745	16.485	15.091	0.5	Pass
	5785	16.471	13.221	0.5	Pass
	5825	16.434	12.937	0.5	Pass
802.11n20	5745	17.578	15.113	0.5	Pass
	5785	17.560	15.312	0.5	Pass
	5825	17.557	13.883	0.5	Pass
802.11n40	5755	36.013	35.119	0.5	Pass
	5795	36.024	35.087	0.5	Pass
802.11ac20	5745	17.564	14.419	0.5	Pass
	5785	17.568	15.095	0.5	Pass
	5825	17.568	16.060	0.5	Pass

Test Data of Occupied Bandwidth and DTS Bandwidth for band 5.725-5.85 GHz-ANT 2					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	DTS Limits (MHz)	Pass or Fail
802.11a	5745	16.481	15.067	0.5	Pass
	5785	16.496	15.353	0.5	Pass
	5825	16.467	15.106	0.5	Pass
802.11n20	5745	17.565	15.126	0.5	Pass
	5785	17.586	15.044	0.5	Pass
	5825	17.576	15.099	0.5	Pass
802.11n40	5755	35.988	35.104	0.5	Pass
	5795	36.065	35.066	0.5	Pass
802.11ac20	5745	17.596	15.000	0.5	Pass
	5785	17.561	15.113	0.5	Pass
	5825	17.576	15.072	0.5	Pass

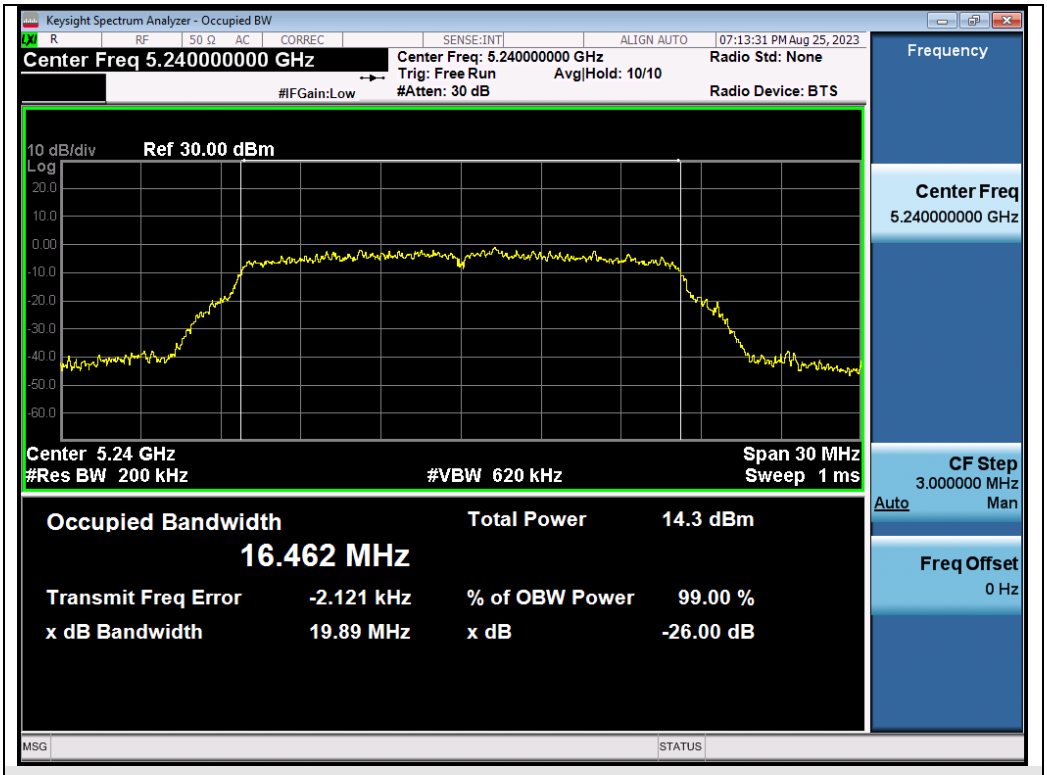
Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz



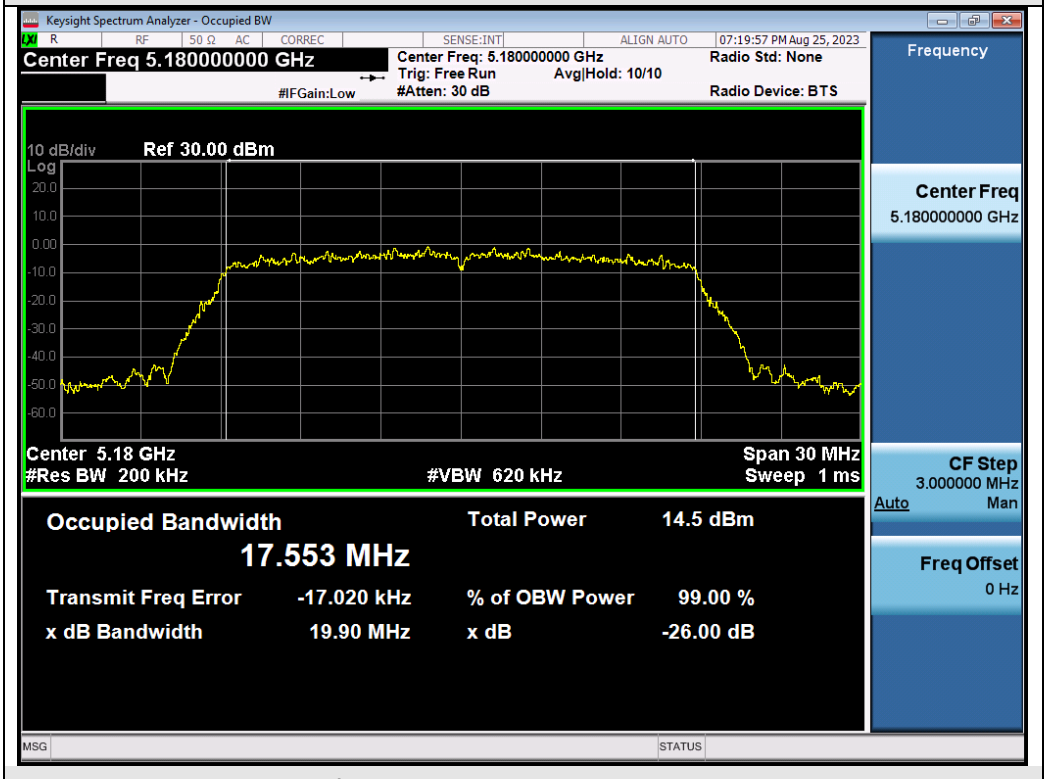
Test_Graph_802.11a_ANT1_5180_6Mbps_OBW



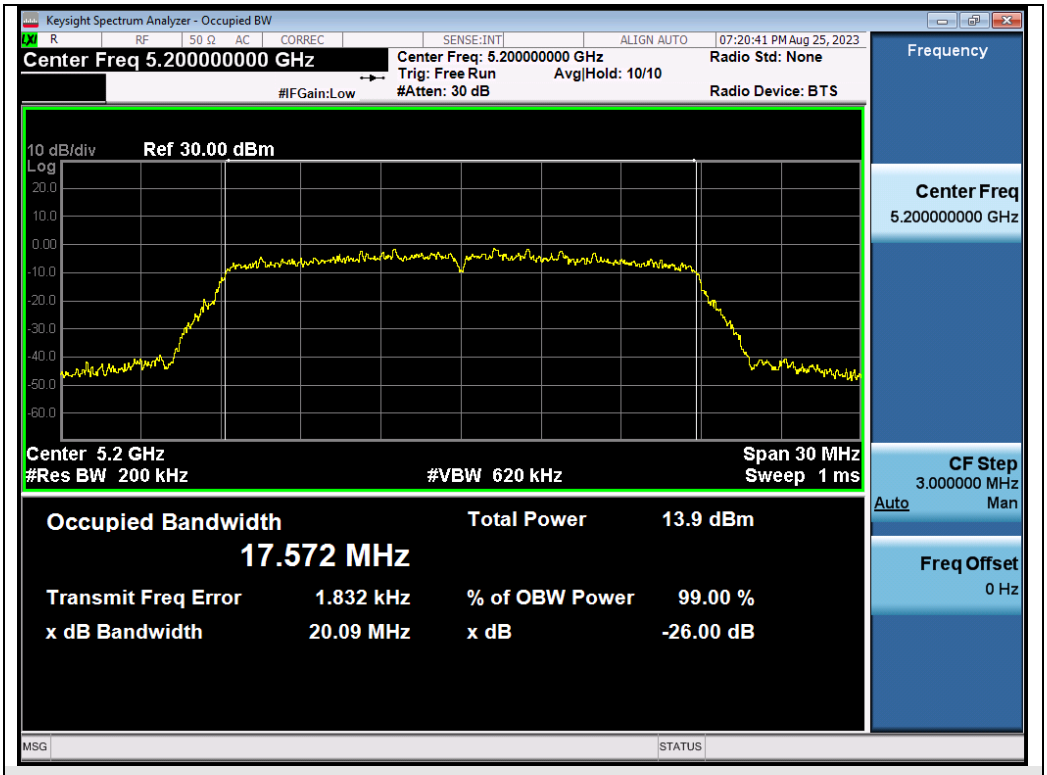
Test_Graph_802.11a_ANT1_5200_6Mbps_OBW



Test_Graph_802.11a_ANT1_5240_6Mbps_OBW

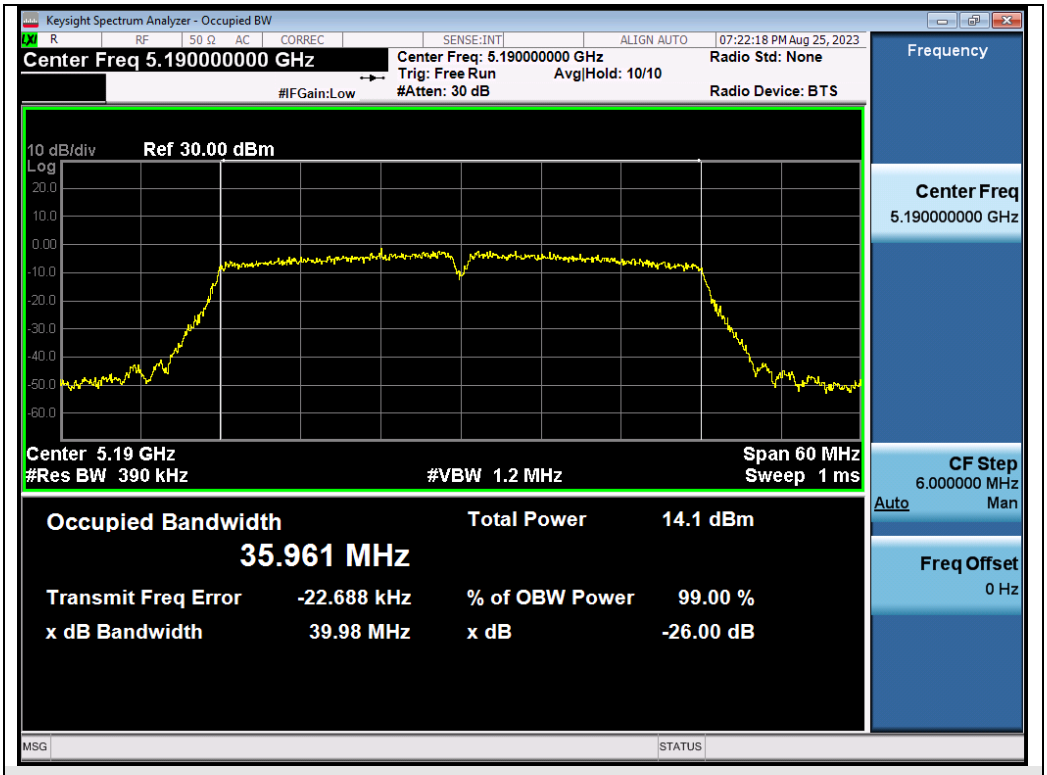


Test_Graph_802.11n20_ANT1_5180_MCS0_OBW

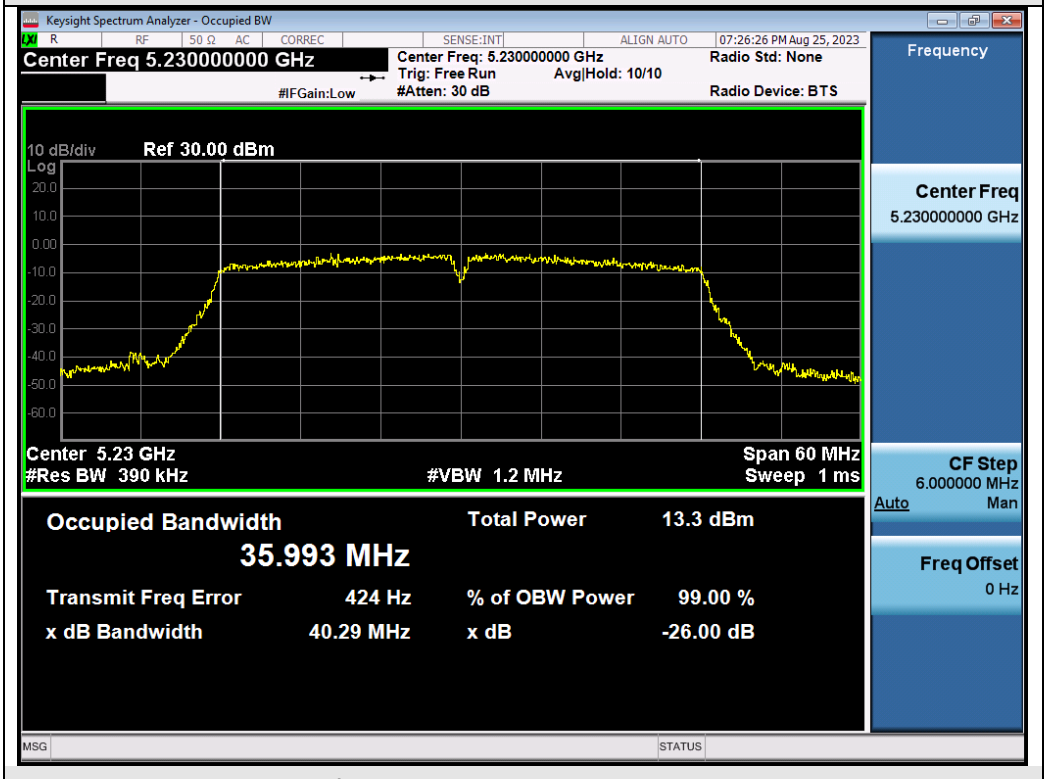


Test_Graph_802.11n20_ANT1_5200_MCS0_OBW

Test_Graph_802.11n20_ANT1_5240_MCS0_OBW

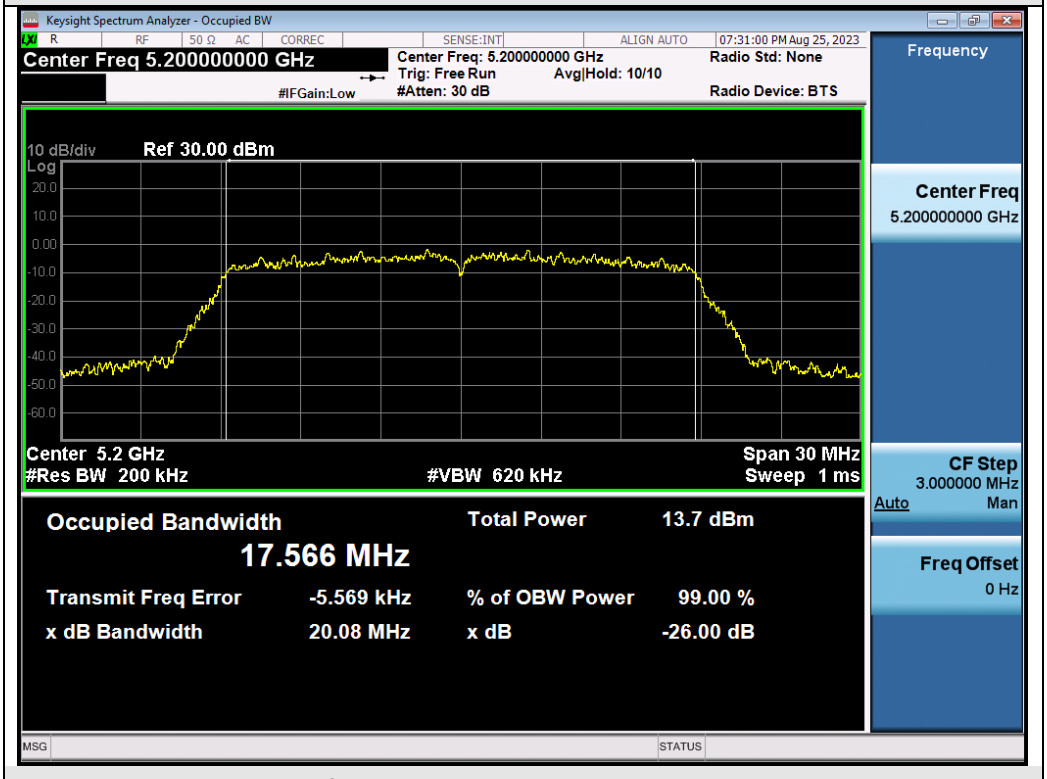


Test_Graph_802.11n40_ANT1_5190_MCS0_OBW



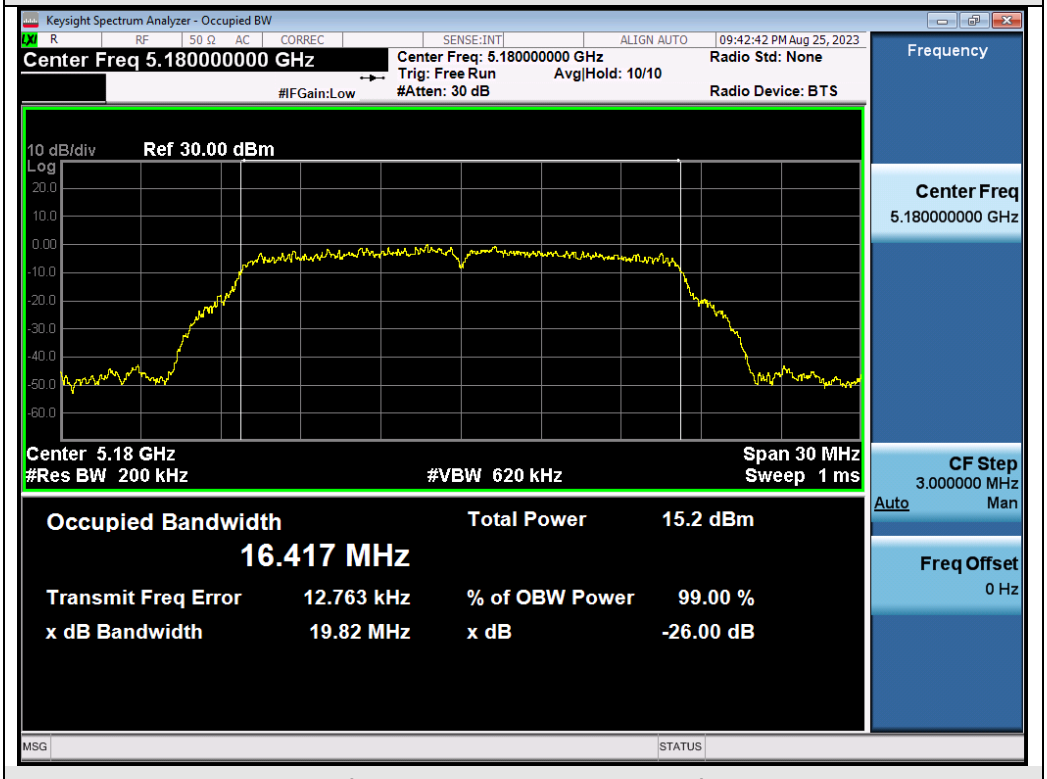
Test_Graph_802.11n40_ANT1_5230_MCS0_OBW

Test_Graph_802.11ac20_ANT1_5180_MCS0_OBW

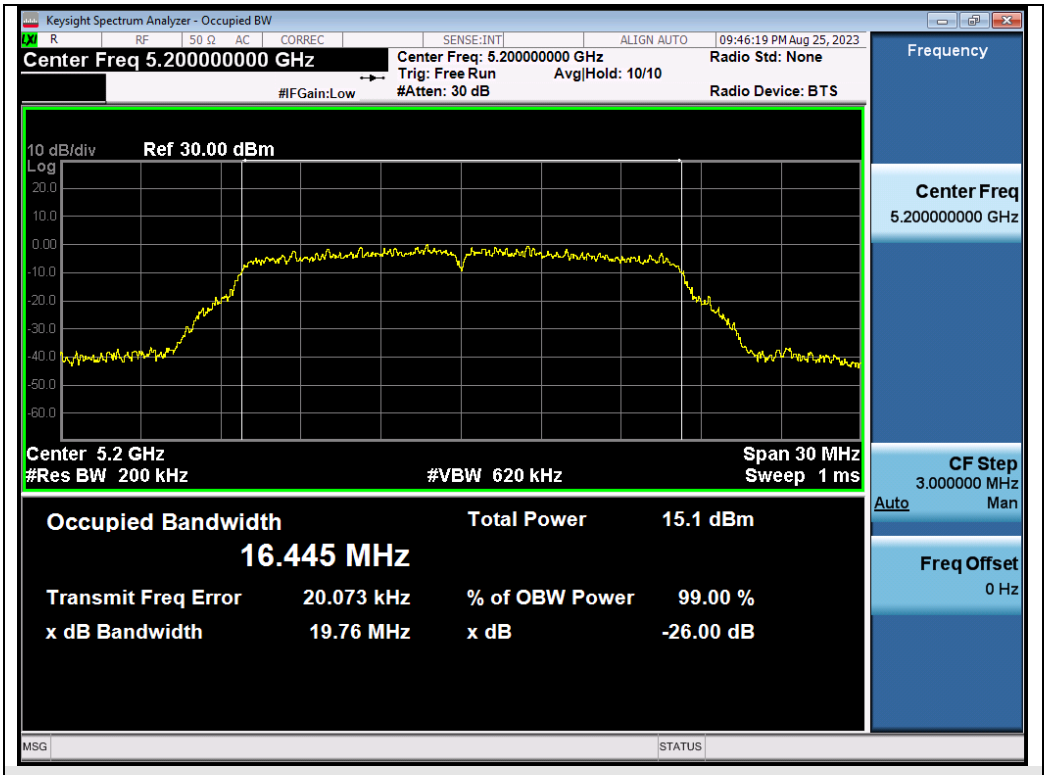


Test_Graph_802.11ac20_ANT1_5200_MCS0_OBW

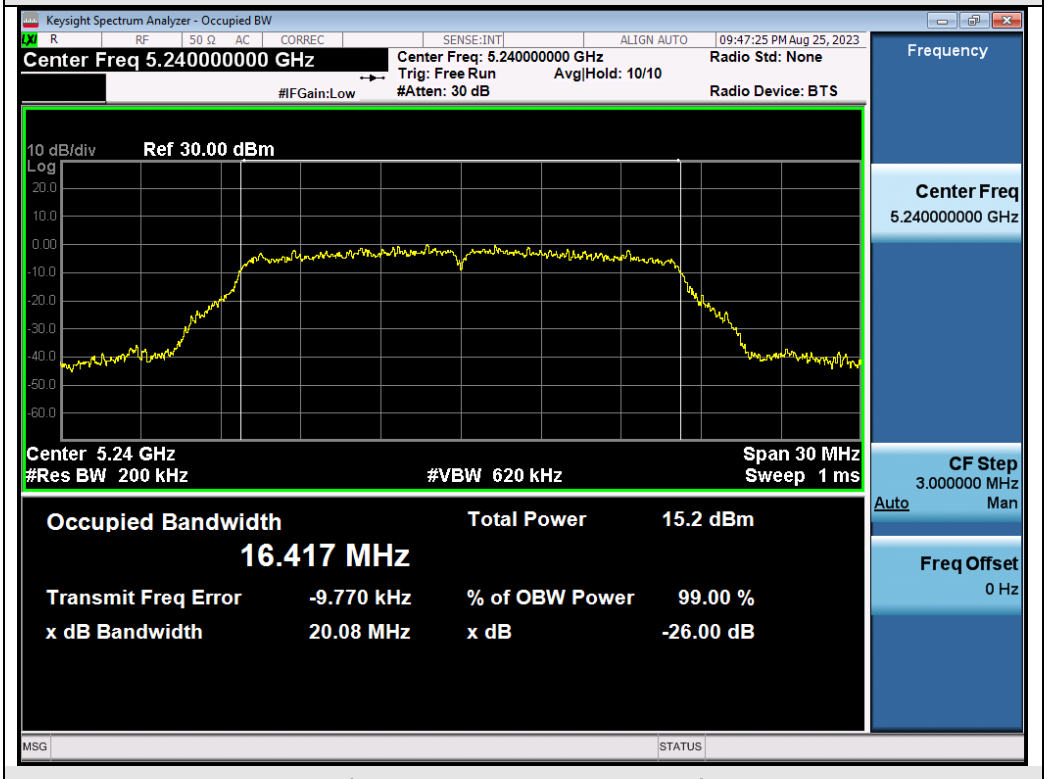
Test_Graph_802.11ac20_ANT1_5240_MCS9_OBW



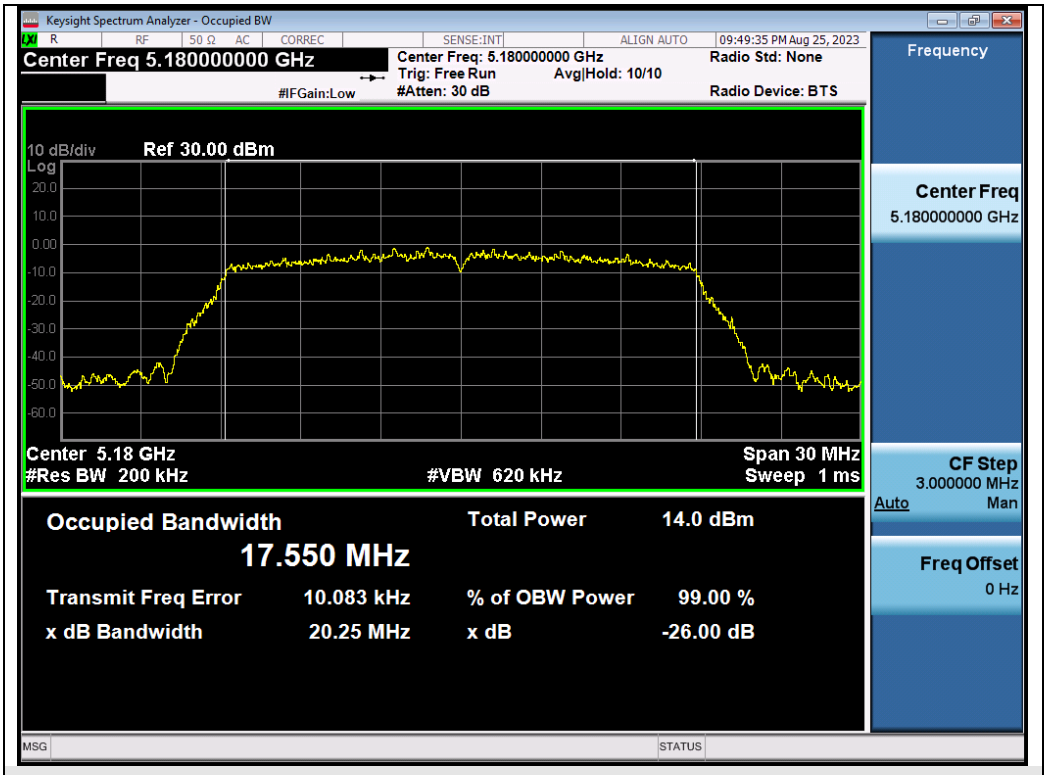
Test_Graph_802.11a_ANT2_5180_6Mbps_OBW



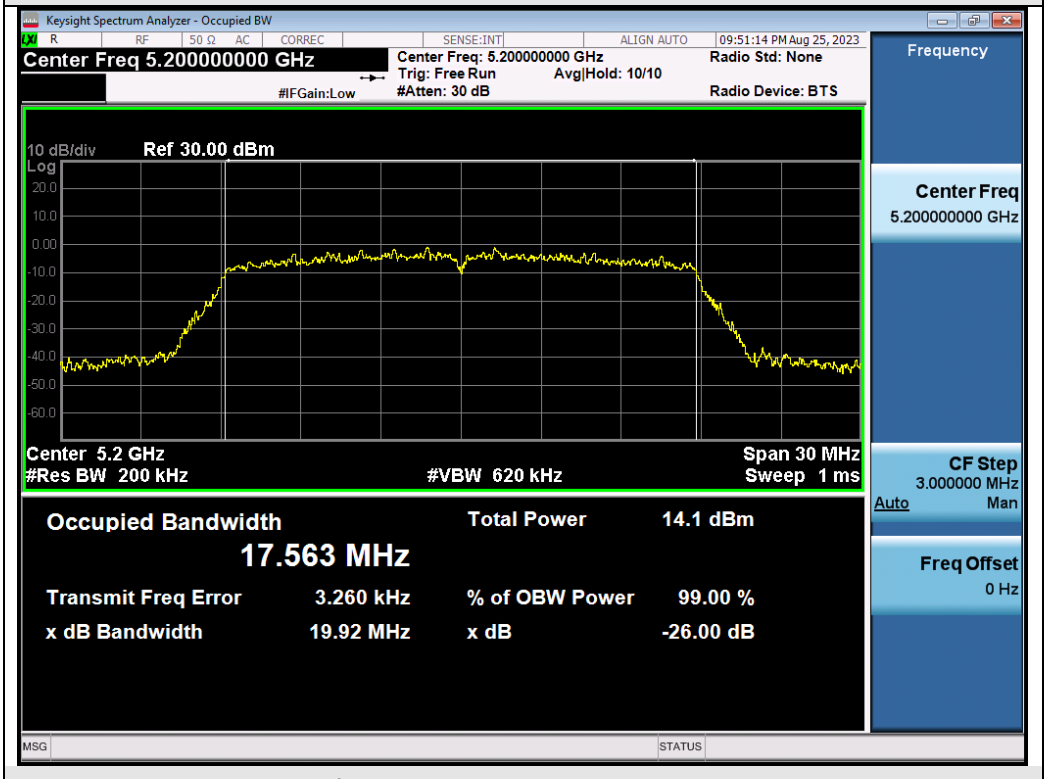
Test_Graph_802.11a_ANT2_5200_6Mbps_OBW



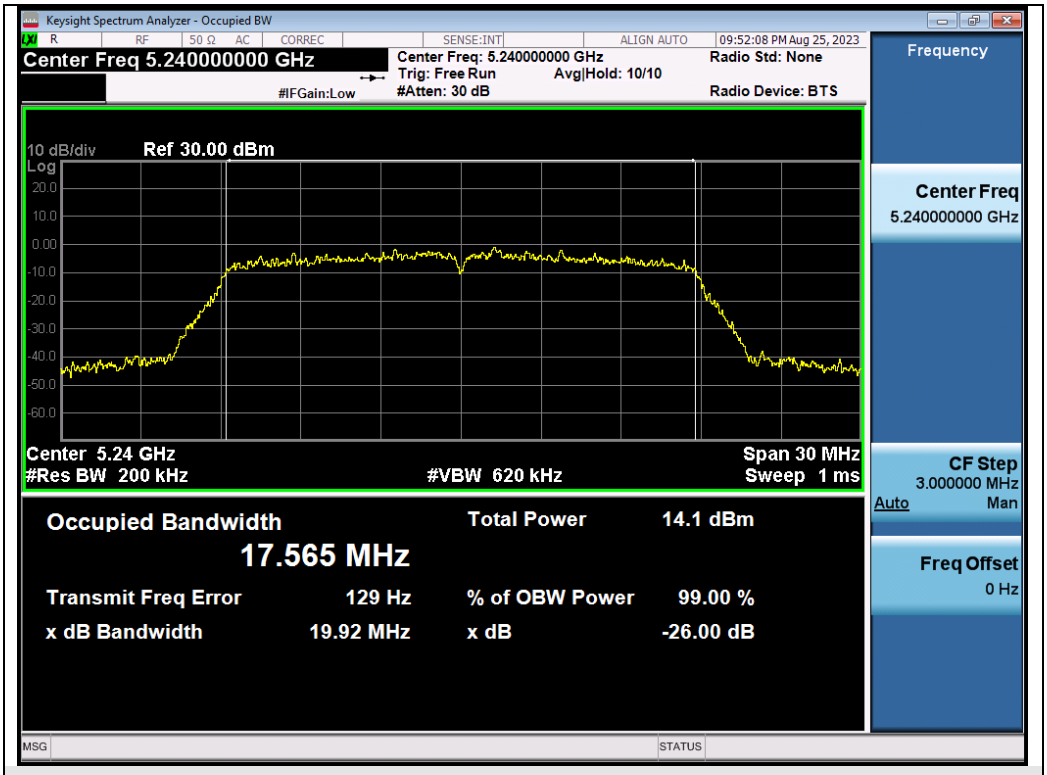
Test_Graph_802.11a_ANT2_5240_6Mbps_OBW



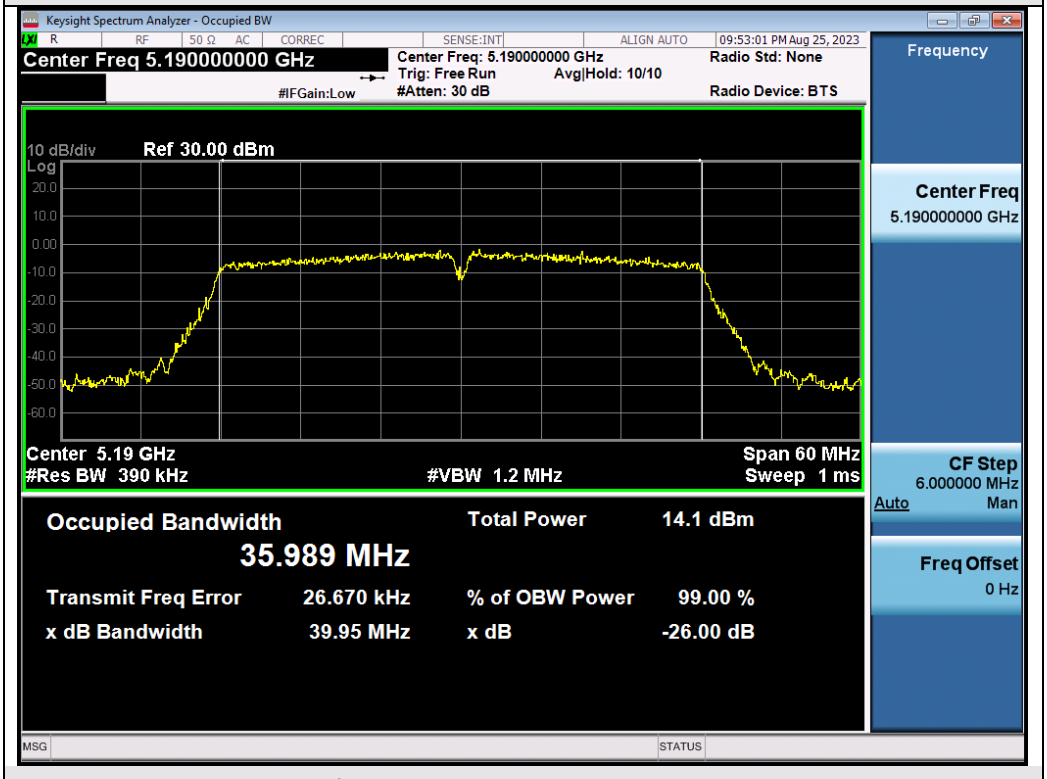
Test_Graph_802.11n20_ANT2_5180_MCS0_OBW



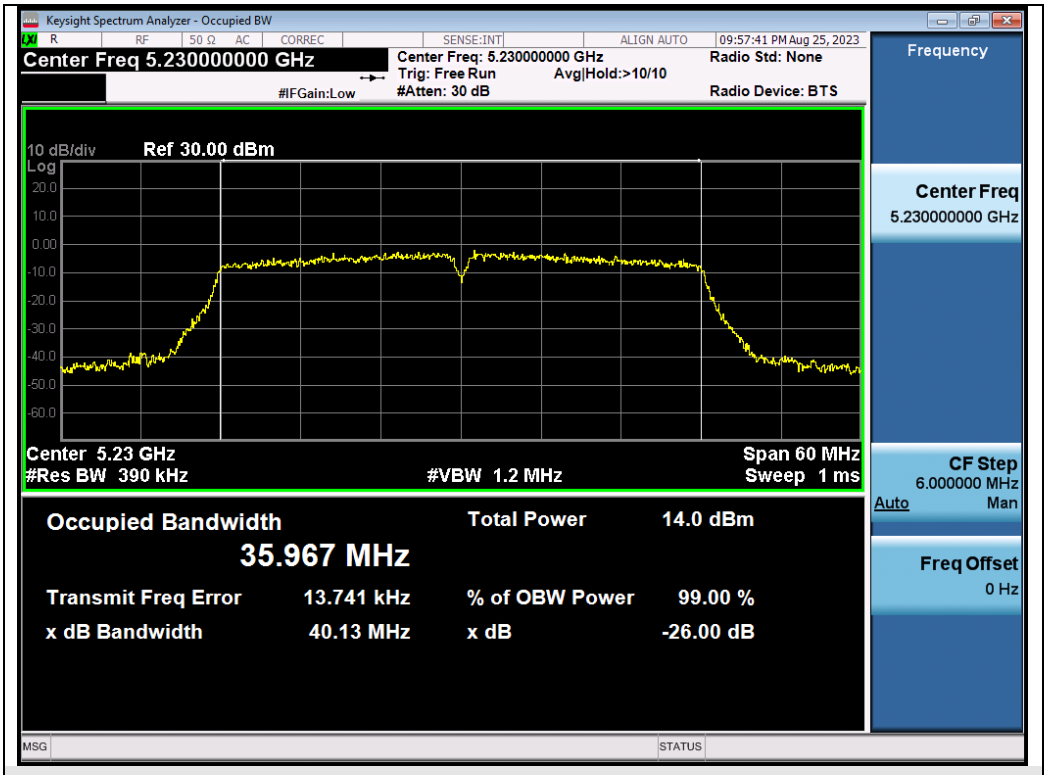
Test_Graph_802.11n20_ANT2_5200_MCS0_OBW



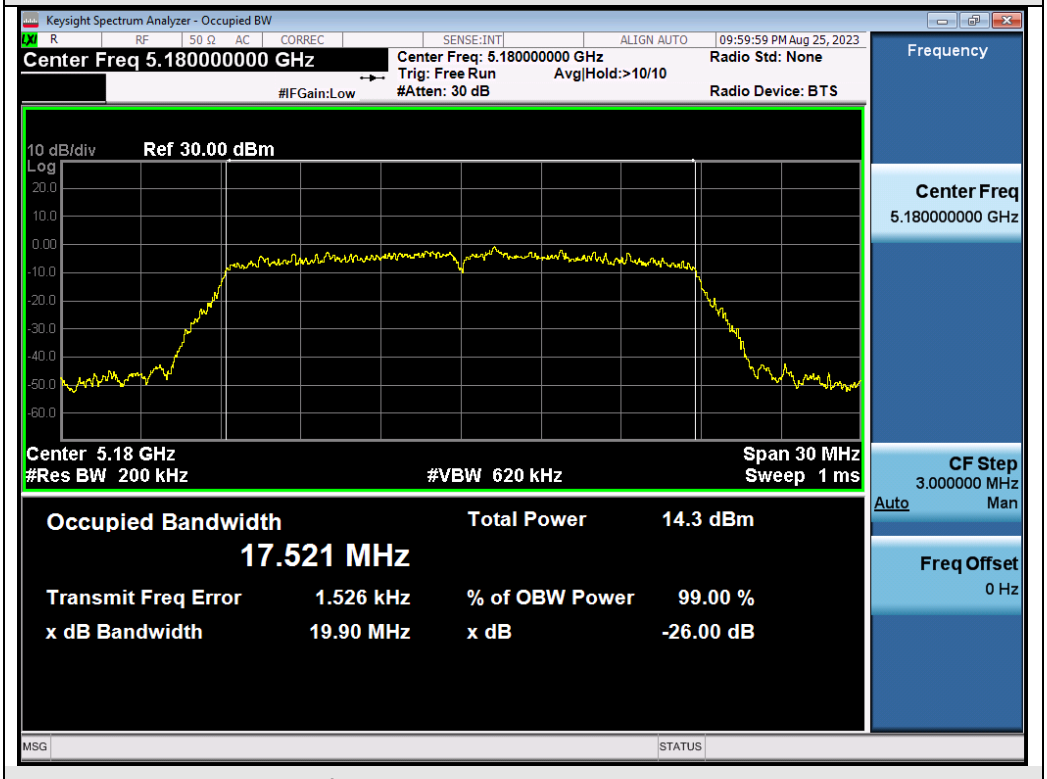
Test_Graph_802.11n20_ANT2_5240_MCS0_OBW



Test_Graph_802.11n40_ANT2_5190_MCS0_OBW



Test_Graph_802.11n40_ANT2_5230_MCS0_OBW

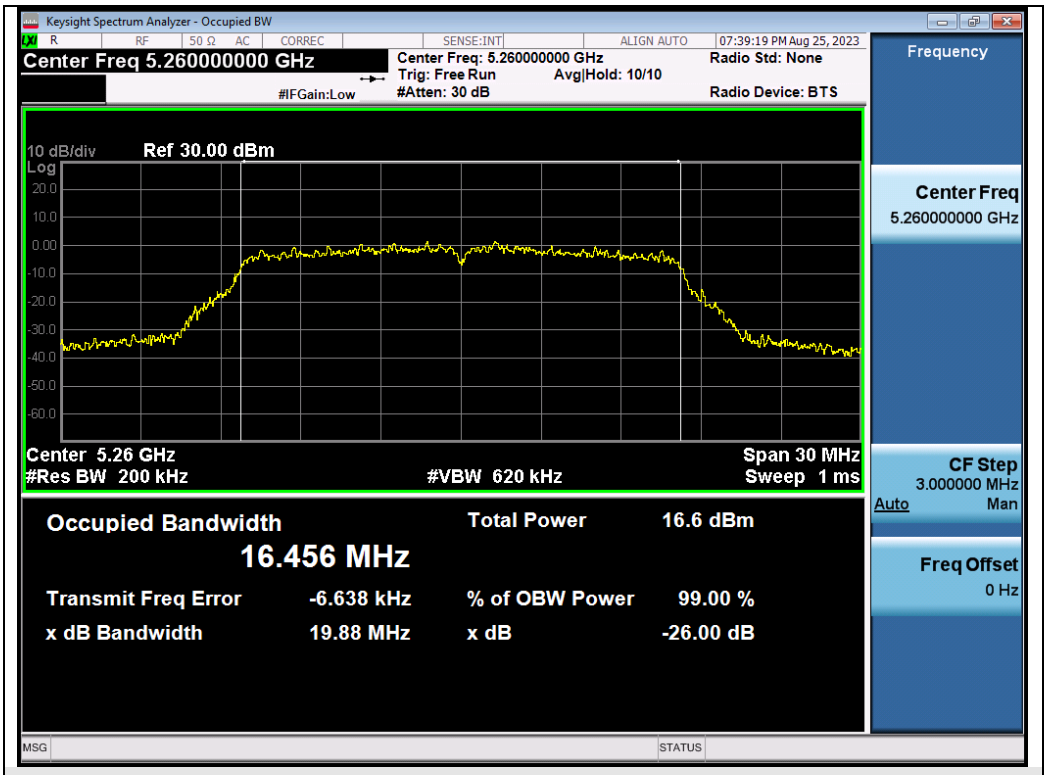


Test_Graph_802.11ac20_ANT2_5180_MCS0_OBW

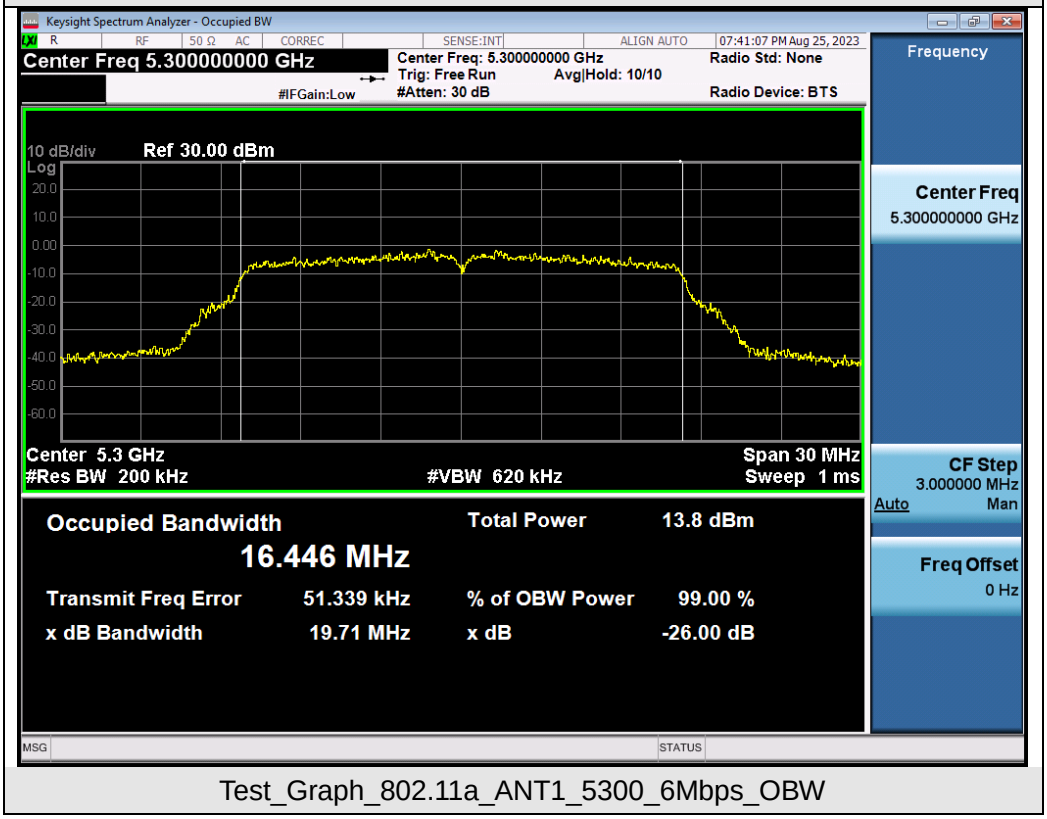
Test_Graph_802.11ac20_ANT2_5200_MCS0_OBW

Test_Graph_802.11ac20_ANT2_5240_MCS9_OBW

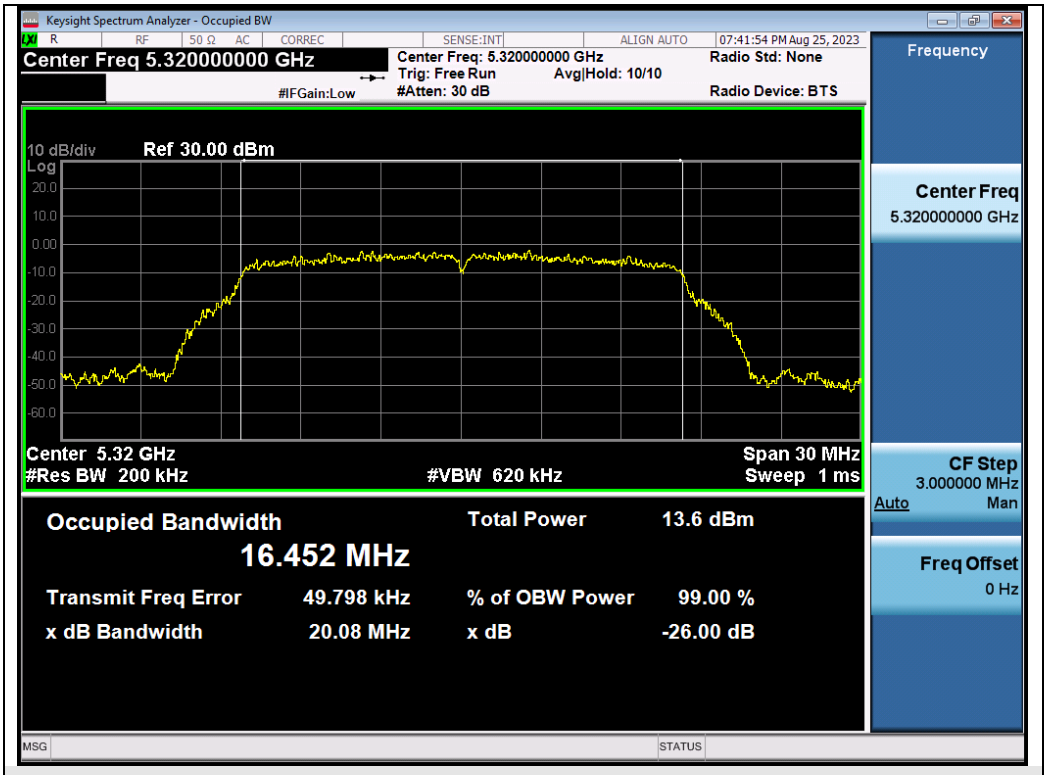
Test Graphs of Occupied Bandwidth for band 5.25-5.35 GHz



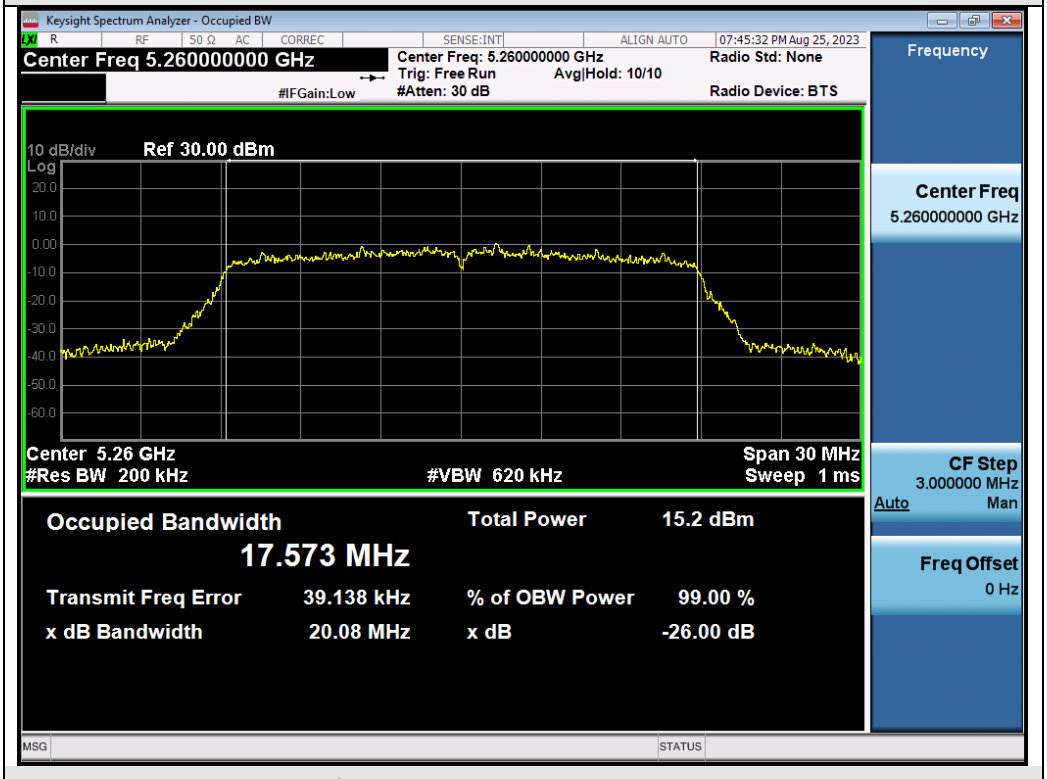
Test_Graph_802.11a_ANT1_5260_6Mbps_OBW



Test_Graph_802.11a_ANT1_5300_6Mbps_OBW

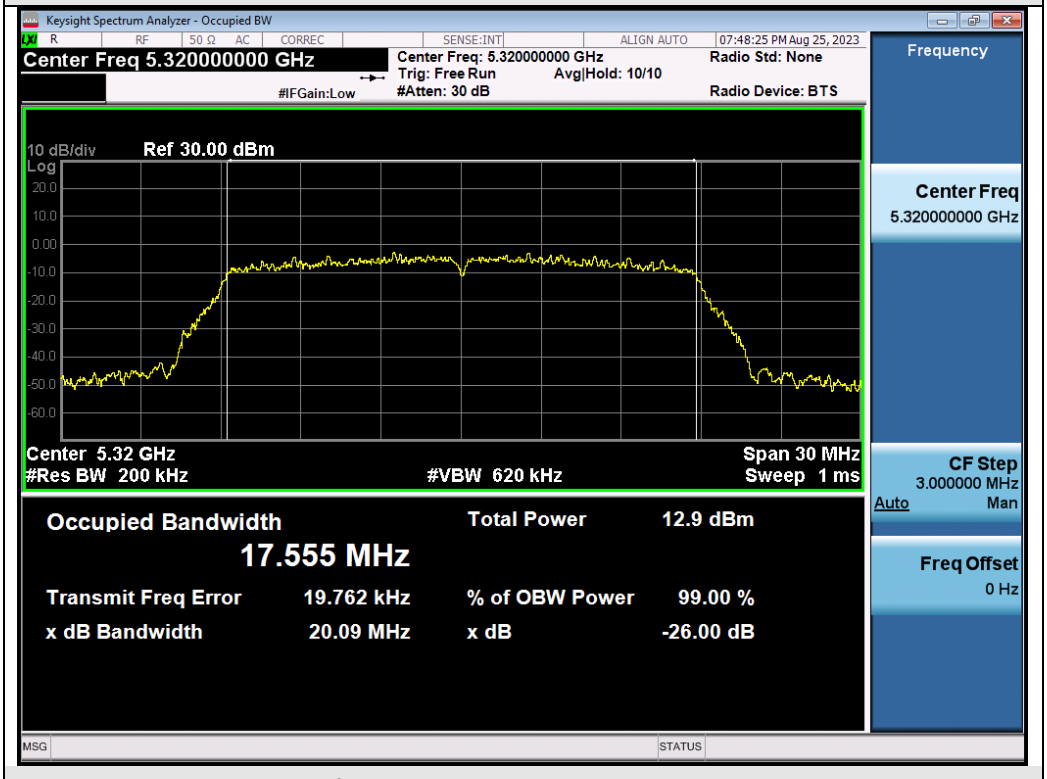


Test_Graph_802.11a_ANT1_5320_6Mbps_OBW

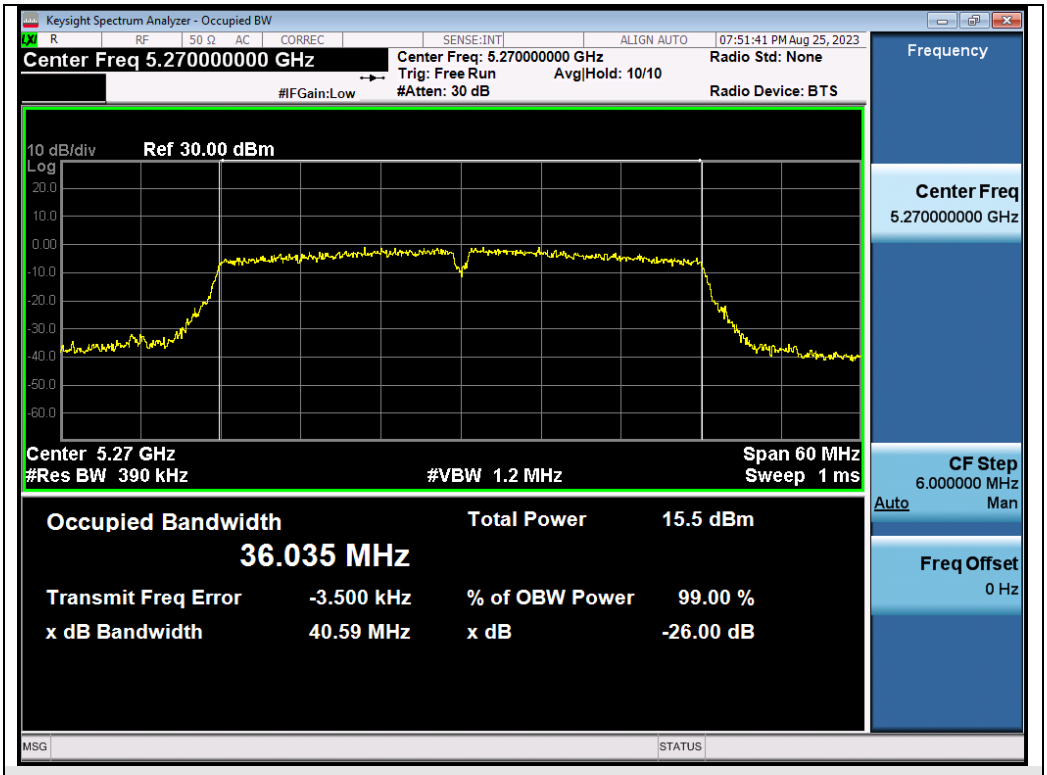


Test_Graph_802.11n20_ANT1_5260_MCS0_OBW

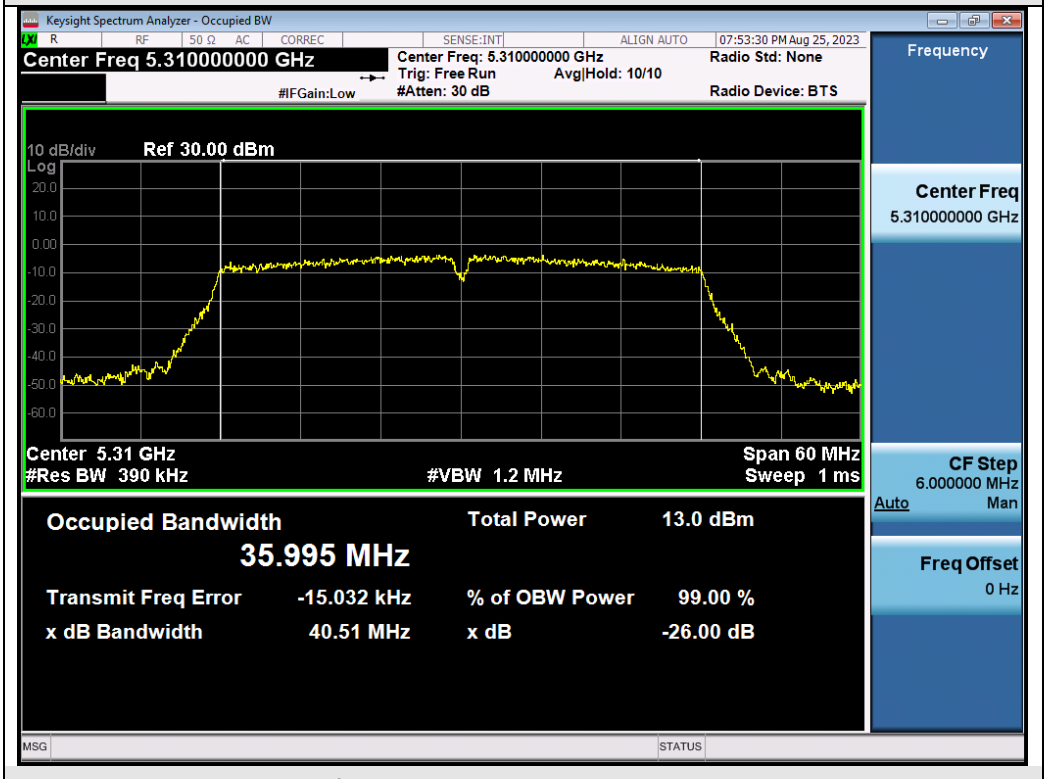
Test_Graph_802.11n20_ANT1_5300_MCS0_OBW



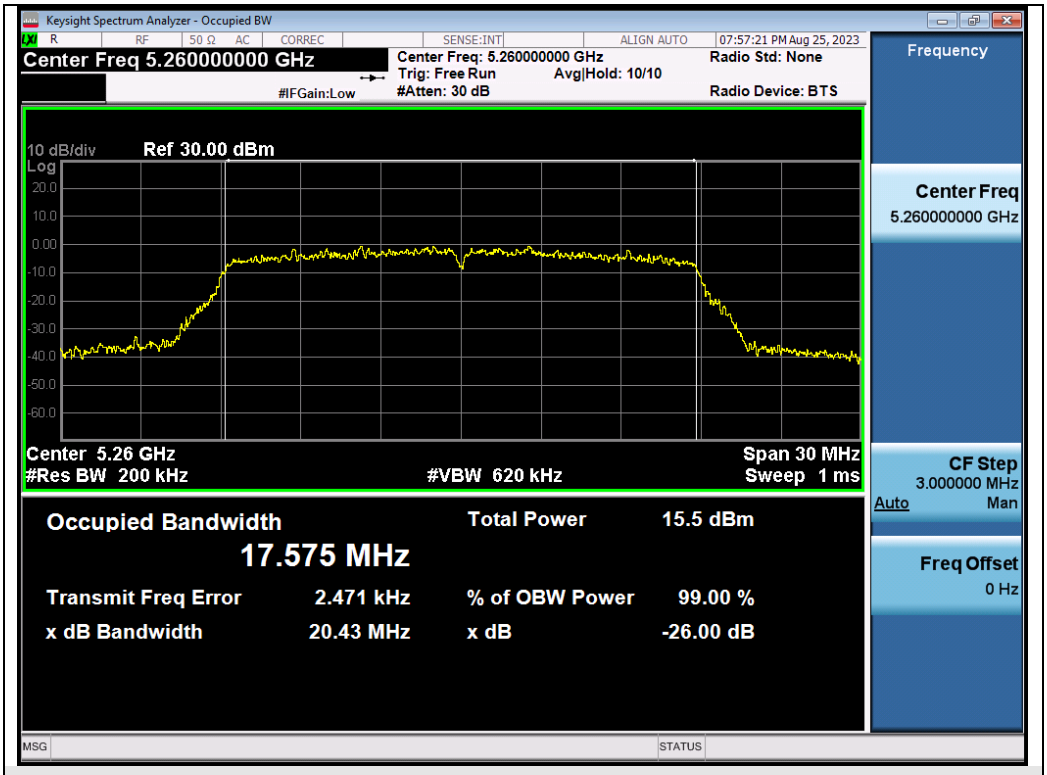
Test_Graph_802.11n20_ANT1_5320_MCS0_OBW



Test_Graph_802.11n40_ANT1_5270_MCS0_OBW



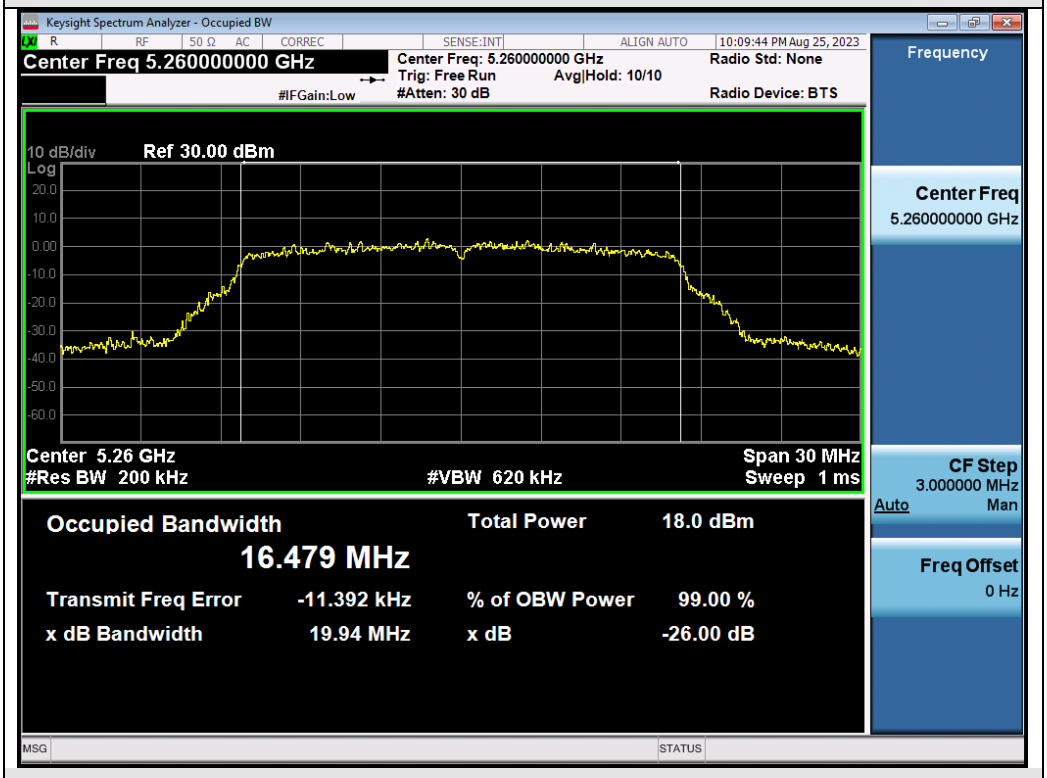
Test_Graph_802.11n40_ANT1_5310_MCS0_OBW



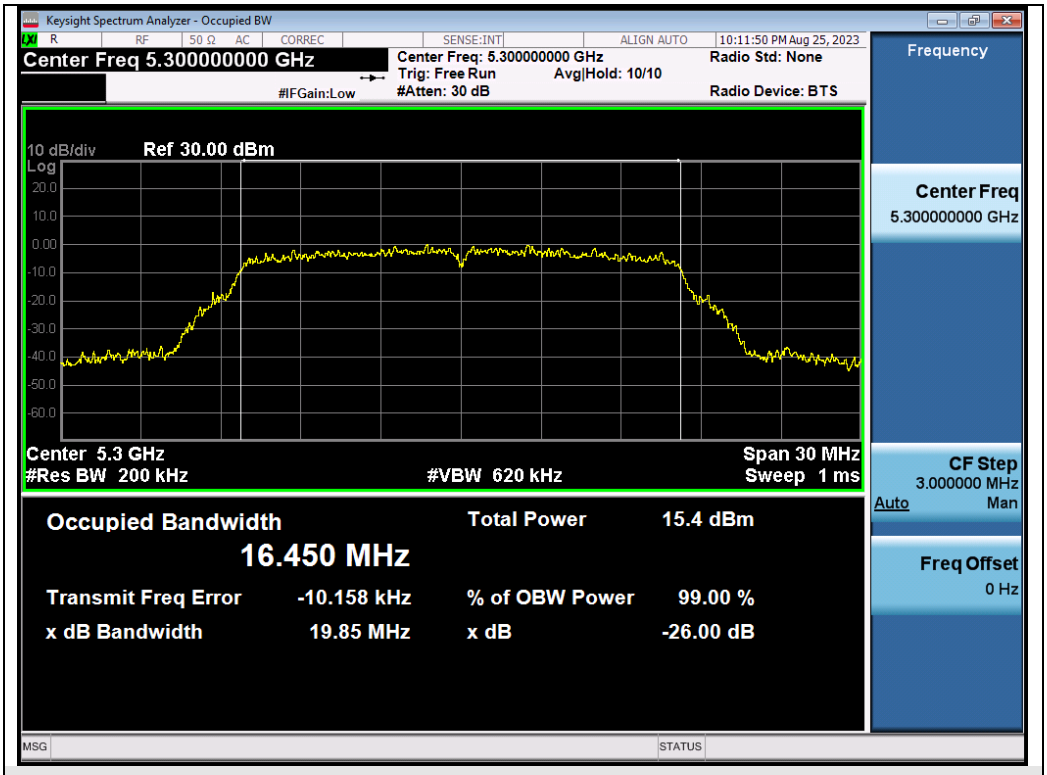
Test_Graph_802.11ac20_ANT1_5260_MCS0_OBW

Test_Graph_802.11ac20_ANT1_5300_MCS0_OBW

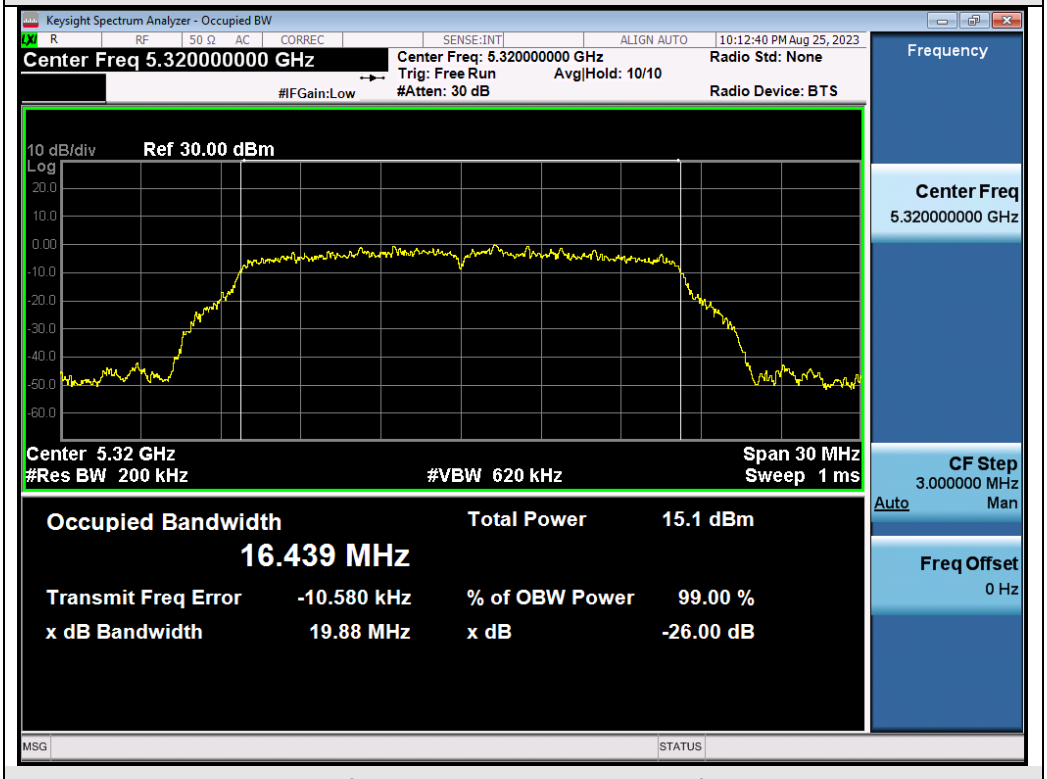
Test_Graph_802.11ac20_ANT1_5320_MCS9_OBW



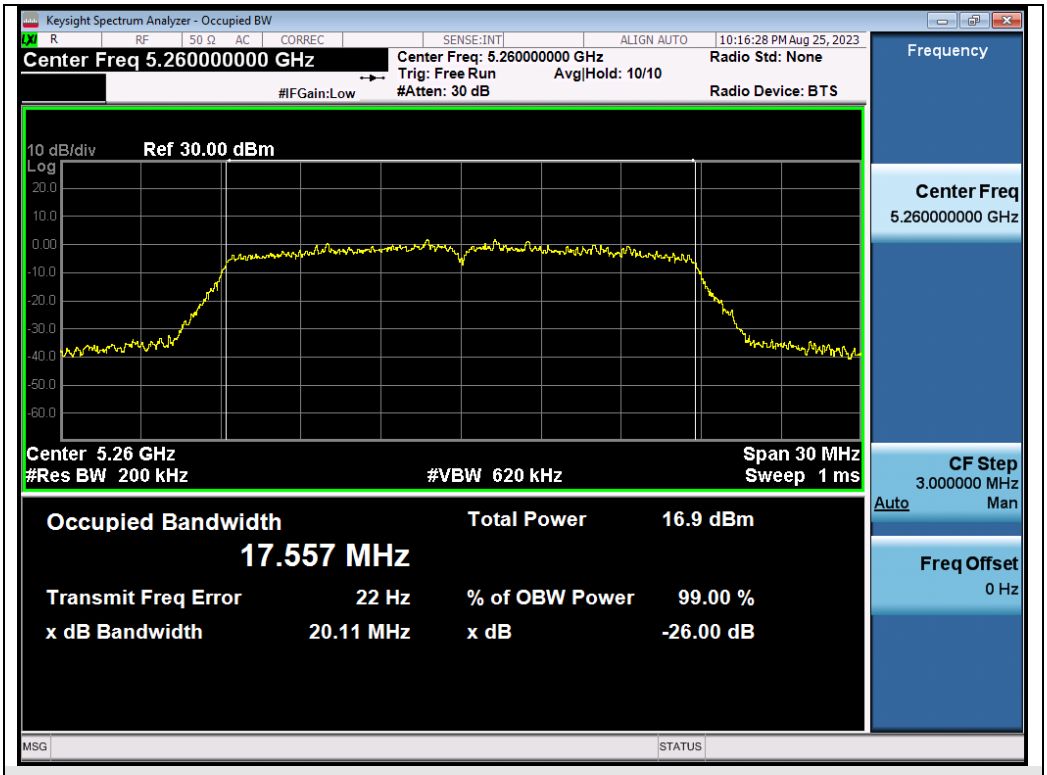
Test_Graph_802.11a_ANT2_5260_6Mbps_OBW



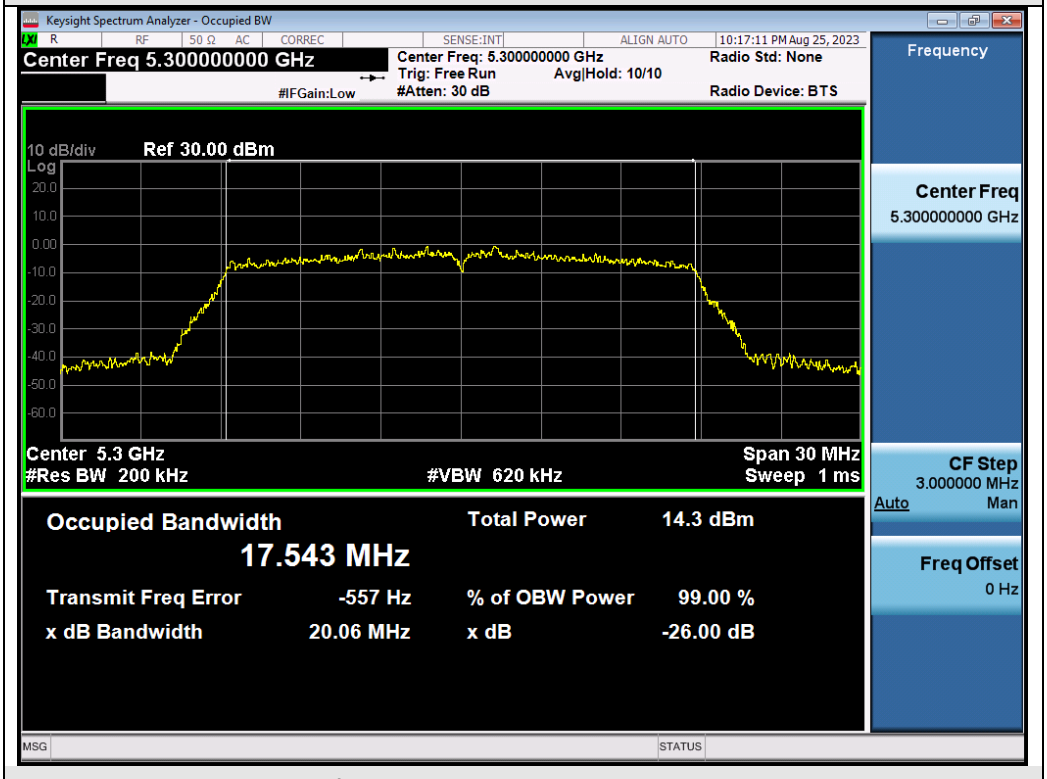
Test_Graph_802.11a_ANT2_5300_6Mbps_OBW



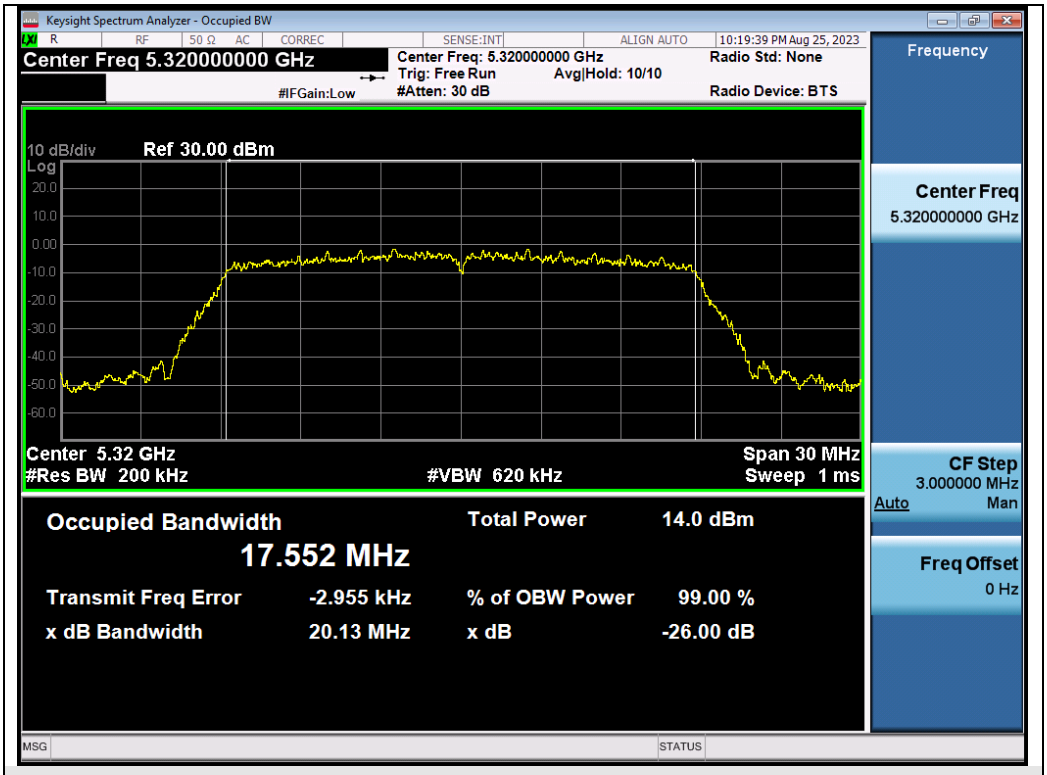
Test_Graph_802.11a_ANT2_5320_6Mbps_OBW



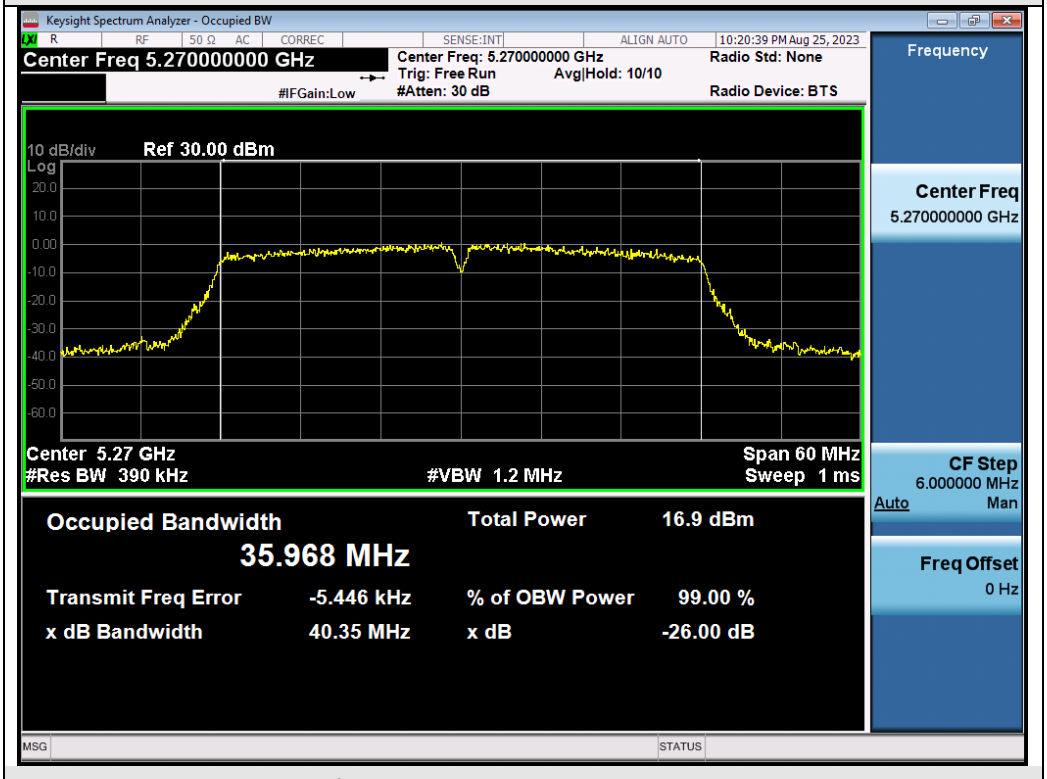
Test_Graph_802.11n20_ANT2_5260_MCS0_OBW



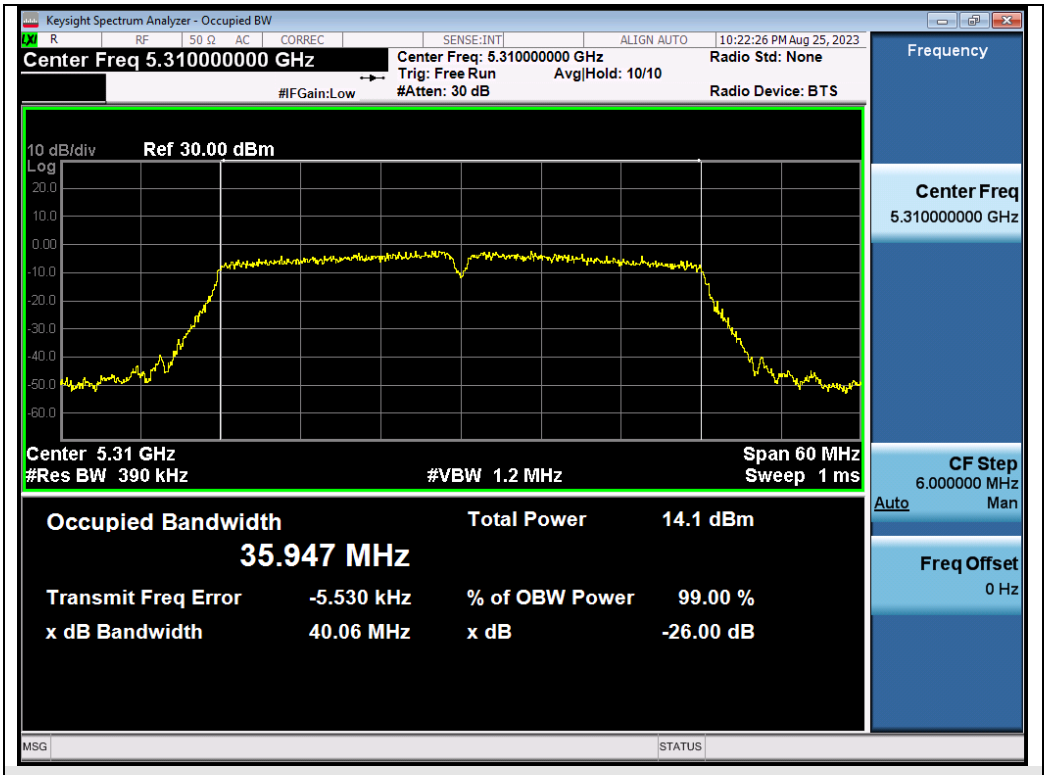
Test_Graph_802.11n20_ANT2_5300_MCS0_OBW



Test_Graph_802.11n20_ANT2_5320_MCS0_OBW



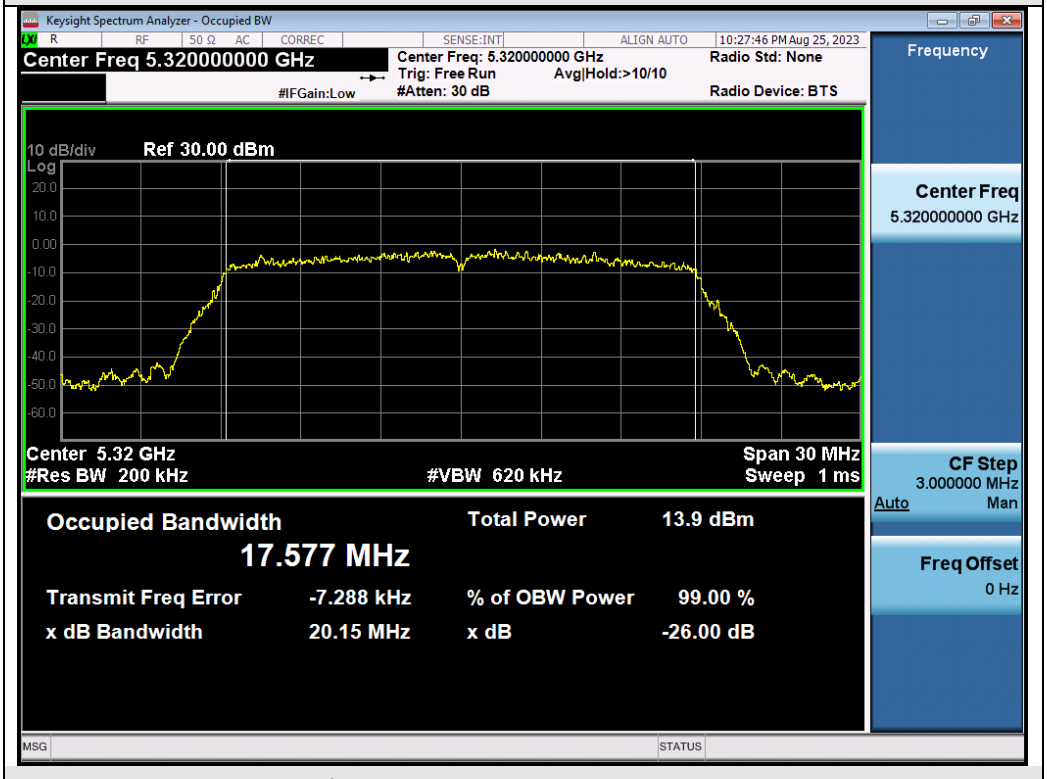
Test_Graph_802.11n40_ANT2_5270_MCS0_OBW



Test_Graph_802.11n40_ANT2_5310_MCS0_OBW

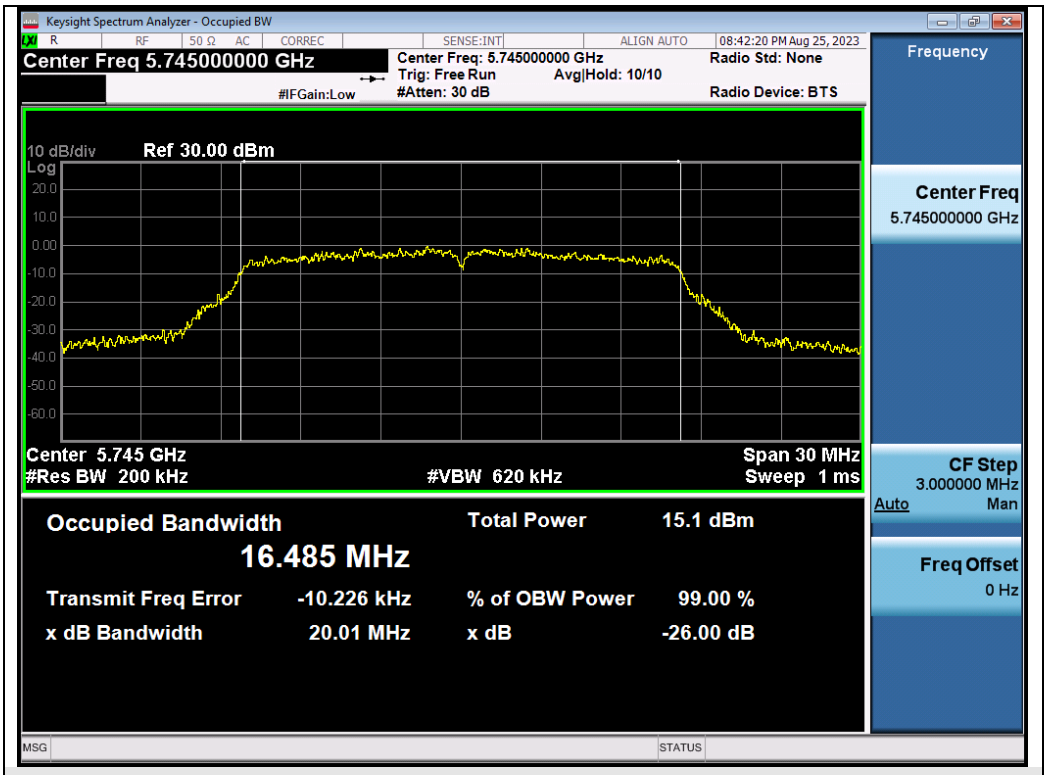
Test_Graph_802.11ac20_ANT2_5260_MCS0_OBW

Test_Graph_802.11ac20_ANT2_5300_MCS0_OBW

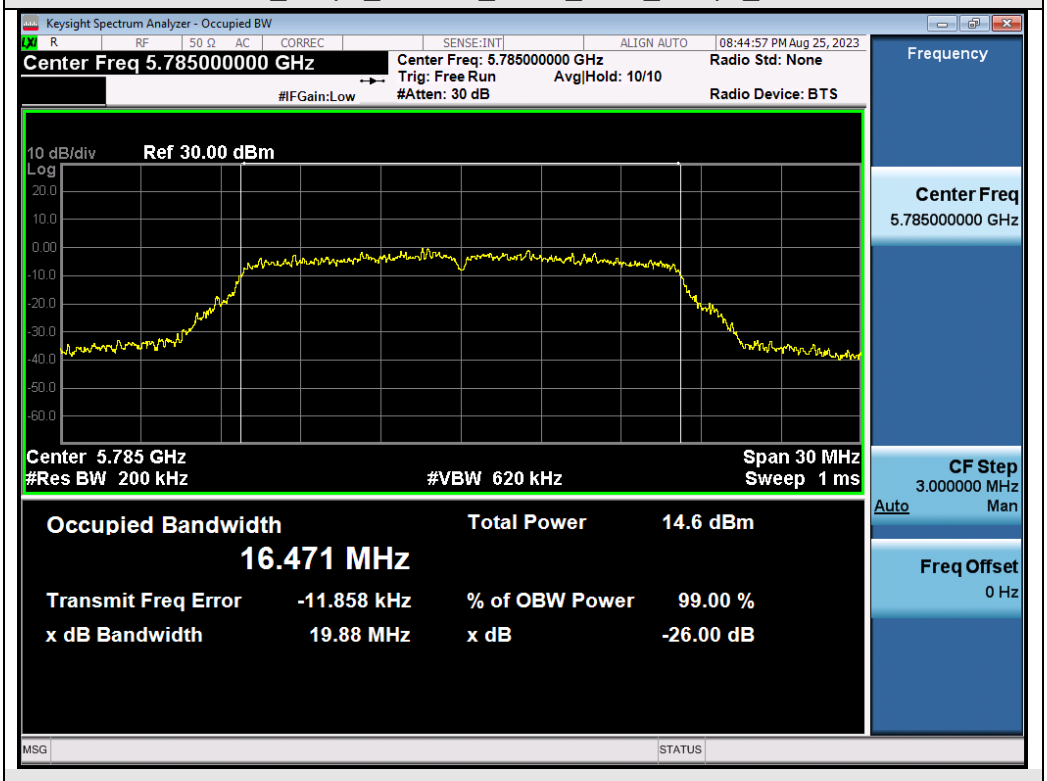


Test_Graph_802.11ac20_ANT2_5320_MCS9_OBW

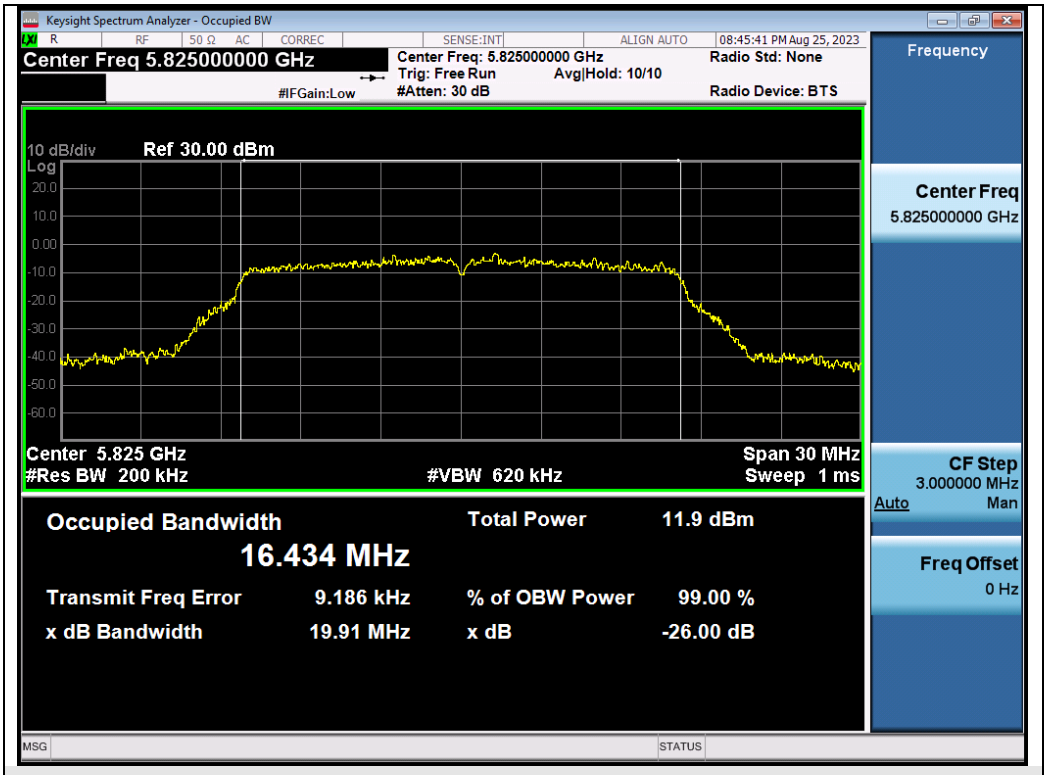
Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.745-5.825 GHz



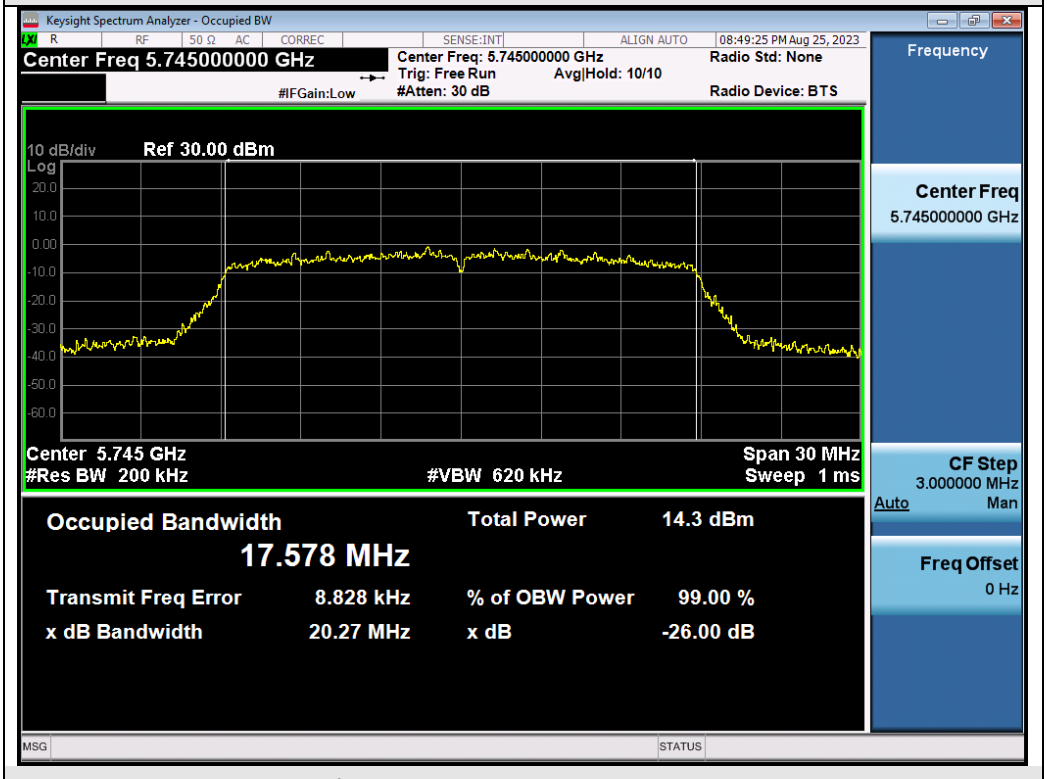
Test_Graph_802.11a_ANT1_5745_6Mbps_OBW



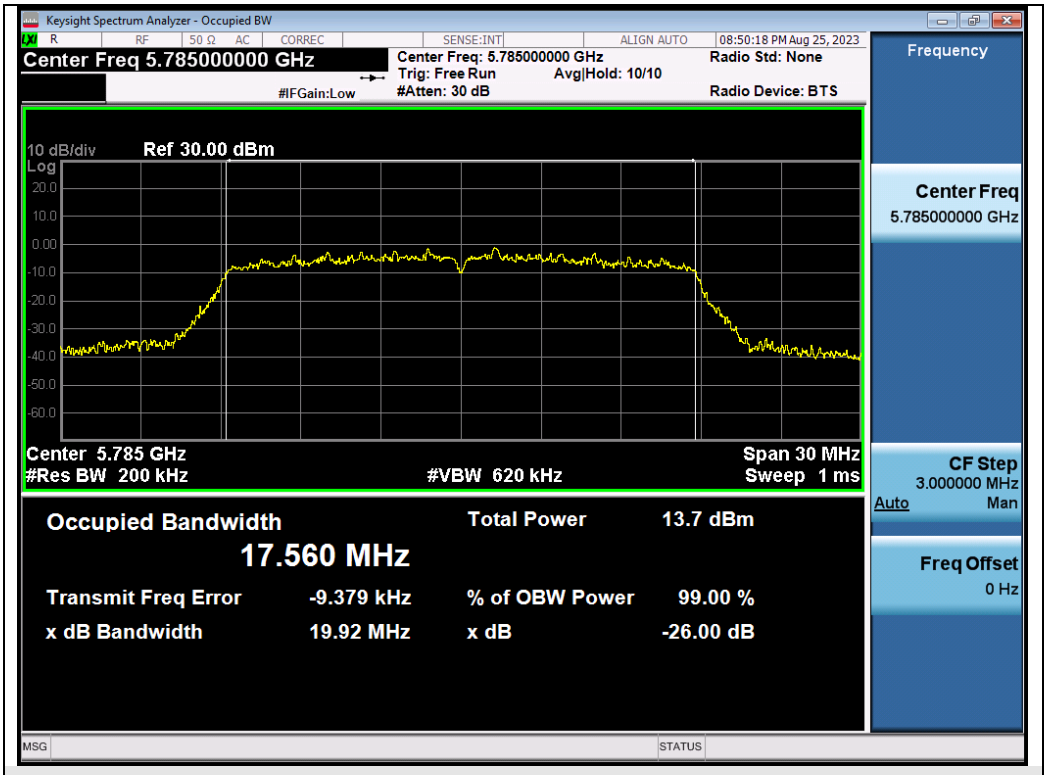
Test_Graph_802.11a_ANT1_5785_6Mbps_OBW



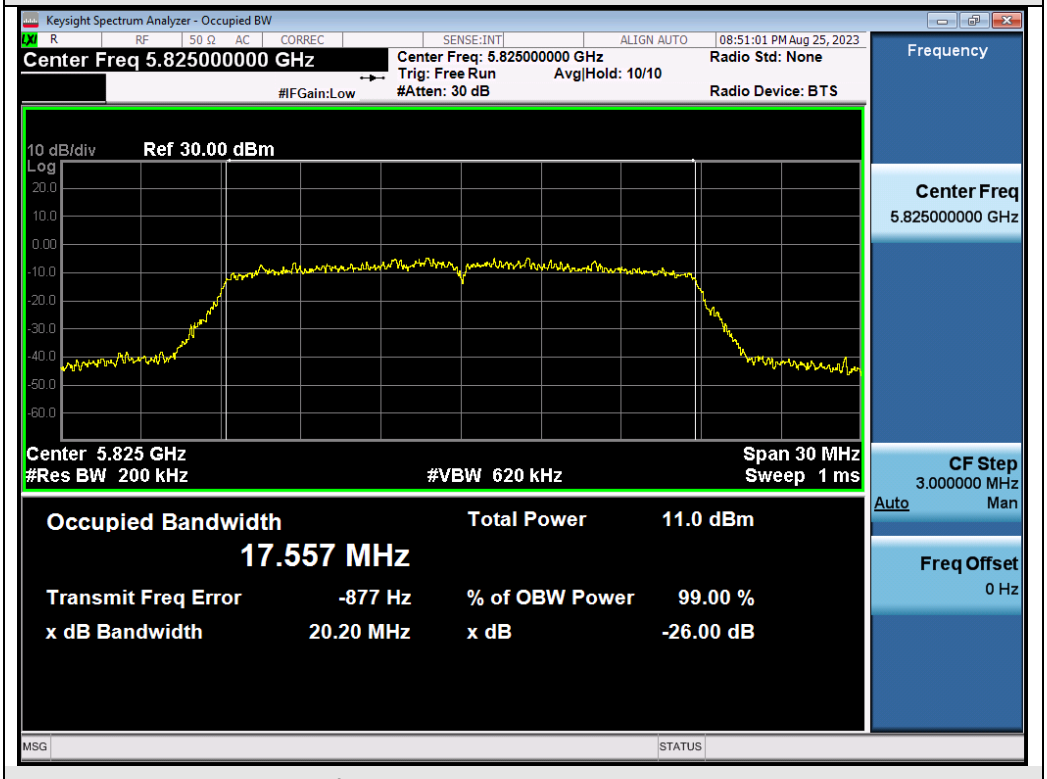
Test_Graph_802.11a_ANT1_5825_6Mbps_OBW



Test_Graph_802.11n20_ANT1_5745_MCS0_OBW



Test_Graph_802.11n20_ANT1_5785_MCS0_OBW



Test_Graph_802.11n20_ANT1_5825_MCS0_OBW