
FCC Test Report

Report No.: AGC00688231203FR03

FCC ID : 2AKC6-WB603

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION : USB ADAPTER

BRAND NAME : N/A

MODEL NAME : WB603, 5B21D, XHT3510, RTL809

APPLICANT : SHEN ZHEN XIN HUA TIAN TECHNOLOGY CO., LTD

DATE OF ISSUE : Dec. 29, 2023

STANDARD(S) : FCC Part 15 Subpart E §15.407

REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Dec. 29, 2023	Valid	Initial Release

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1. General Information

Applicant	SHEN ZHEN XIN HUA TIAN TECHNOLOGY CO., LTD
Address	3Floor, B Buliding, DaHong Industrial Park, GuangMin District, Shenzhen City, China
Manufacturer	SHEN ZHEN XIN HUA TIAN TECHNOLOGY CO., LTD
Address	3Floor, B Buliding, DaHong Industrial Park, GuangMin District, Shenzhen City, China
Factory	SHEN ZHEN XIN HUA TIAN TECHNOLOGY CO., LTD
Address	3Floor, B Buliding, DaHong Industrial Park, GuangMin District, Shenzhen City, China
Product Designation	USB ADAPTER
Brand Name	N/A
Test Model	WB603
Series Model(s)	5B21D, XHT3510, RTL809
Difference Description	All the same except of the appearance shape and model name are different.
Date of receipt of test item	Dec. 15, 2023
Date of Test	Dec. 15, 2023 to Dec. 28, 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



Jack Gui
(Project Engineer)

Dec. 29, 2023

Reviewed By



Calvin Liu
(Reviewer)

Dec. 29, 2023

Approved By



Max Zhang
Authorized Officer

Dec. 29, 2023

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2. Product Information

2.1 Product Technical Description

Equipment Type	<input type="checkbox"/> Outdoor access points <input type="checkbox"/> Fixed P2P access points	<input type="checkbox"/> Indoor access points <input checked="" type="checkbox"/> Client devices
Operation Frequency	<input checked="" type="checkbox"/> U-NII 1:5150MHz~5250MHz <input type="checkbox"/> U-NII 2C:5470MHz~5725MHz	<input type="checkbox"/> U-NII 2A: 5250MHz~5350MHz <input checked="" type="checkbox"/> U-NII 3: 5725MHz~5850MHz
DFS Design Type	<input type="checkbox"/> Master <input type="checkbox"/> Slave with radar detection <input checked="" type="checkbox"/> Slave without radar detection	
TPC Function	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Hardware Version	V2.0	
Software Version	V1.2	
Test Frequency Range	For 802.11a/n-HT20/ac-VHT20: 5180~5240MHz, 5745~5825MHz For 802.11n-HT40/ac-VHT40: 5190~5230MHz, 5755~5795MHz For 802.11ac-VHT80: 5210MHz, 5775MHz	
RF Output Power	IEEE 802.11a(HT20):7.77dBm; IEEE 802.11n(HT20):7.57dBm; IEEE802.11n(HT40):7.85dBm; IEEE 802.11ac(VHT20):7.39dBm; IEEE802.11ac(VHT40):7.78dBm; IEEE802.11ac(VHT80):7.37dBm	
Modulation	802.11a/n:(64-QAM, 16-QAM, QPSK, BPSK) OFDM 802.11ac :(256-QAM, 64-QAM, 16-QAM, QPSK, BPSK) OFDM	
Data Rate	802.11a:6/9/12/18/24/36/48/54Mbps; 802.11n:up to 300Mbps; 802.11ac:up to 866.6Mbps;	
Number of channels	7 channels of U-NII-1 Band 8 channels of U- NII 3 Band	
Antenna Designation	External Antenna	
Antenna Gain	4.44dBi	
Power Supply	DC 5V	

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2.2 Table of Carrier Frequency

For 5180~5240MHz:

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
42	5210 MHz	--	--

For 5745~5825MHz:

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

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

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

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

Channel	Frequency	Channel	Frequency
155	5775 MHz	--	--

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2.3 IEEE 802.11n Modulation Scheme

MCS Index	N _{ss}	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

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2.4 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for FCC ID: 2AKC6-WB603 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
<p>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 antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</p>
<p>EUT Antenna: The non-detachable antenna inside the device cannot be replaced by the user at will. The gain of the antenna is 4.44dBi.</p>

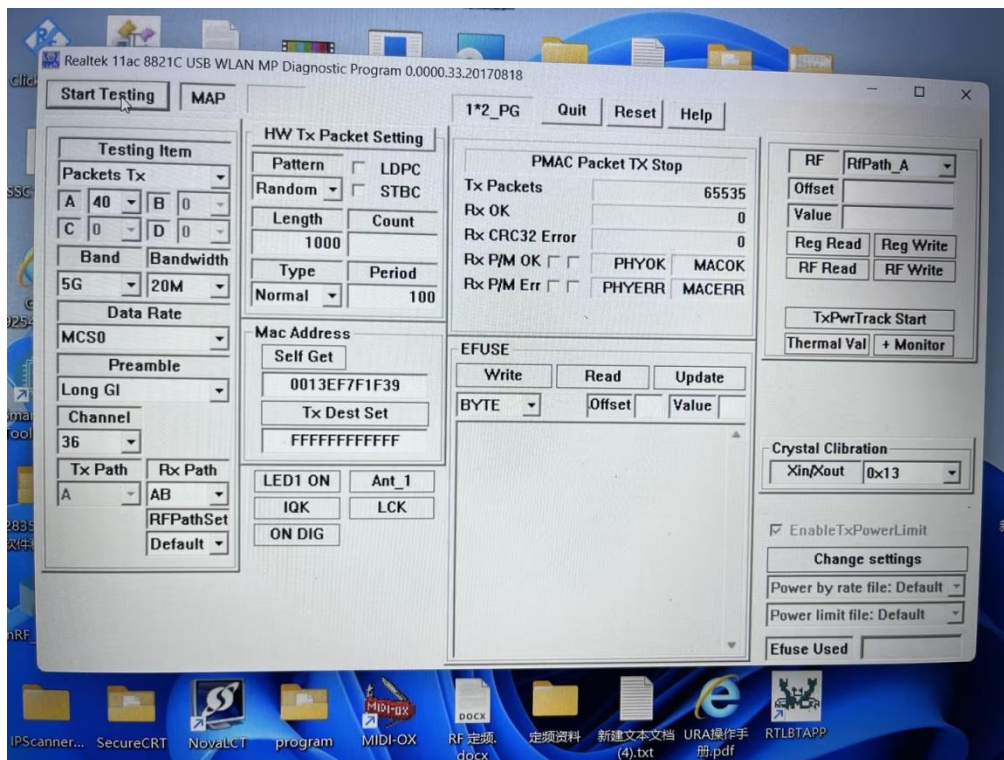
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2.9 Description of Test Software

For IEEE 802.11 mode:

The test utility software used during testing was “Realtek 11ac 8821C USB WLAN MP Diagnostic Program”, and the version was “0.0000.33.20170818”.

Software Setting Diagram



Test Mode(U-NII-1 Band)	Channel	Power Index
802.11a	L/M/H	42
802.11n(HT20)	L/M/H	40
802.11n(HT40)	L/M/H	40
802.11ac(VHT20)	L/M/H	40
802.11ac(VHT40)	L/M/H	40
802.11ac(VHT80)	L/M/H	40
Test Mode(U-NII-1 Band)	Channel	Power Index
802.11a	L/M/H	35
802.11n(HT20)	L/M/H	35
802.11n(HT40)	L/M/H	35
802.11ac(VHT20)	L/M/H	35
802.11ac(VHT40)	L/M/H	35
802.11ac(VHT80)	L/M/H	35

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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.

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3.3 Environmental Conditions

	Normal Conditions
Temperature range (°C)	15 - 35
Relative humidity range	20% - 75%
Pressure range (kPa)	86 - 106
Power supply	DC 5V

3.4 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded 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	$U_c = \pm 2.9 \text{ dB}$
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 3.9 \text{ dB}$
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.9 \text{ dB}$
Uncertainty of total RF power, conducted	$U_c = \pm 0.8 \text{ dB}$
Uncertainty of RF power density, conducted	$U_c = \pm 2.6 \text{ dB}$
Uncertainty of spurious emissions, conducted	$U_c = \pm 2 \%$
Uncertainty of Occupied Channel Bandwidth	$U_c = \pm 2.7 \%$

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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)
<input checked="" type="checkbox"/>	AGC-ER-E036	Spectrum Analyzer	Agilent	N9020A	MY49100060	2023-06-01	2024-05-31
<input checked="" type="checkbox"/>	AGC-ER-E062	Power Sensor	Agilent	U2021XA	MY54110007	2023-03-03	2024-03-02
<input checked="" type="checkbox"/>	AGC-ER-E063	Power Sensor	Agilent	U2021XA	MY54110009	2023-03-03	2024-03-02
<input checked="" type="checkbox"/>	AGC-EM-A152	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08
<input checked="" type="checkbox"/>	AGC-ER-E083	Signal Generator	Agilent	E4421B	US39340815	2023-06-01	2024-05-31
<input checked="" type="checkbox"/>	N/A	RF Connection Cable	N/A	1#	N/A	Each time	N/A
<input checked="" type="checkbox"/>	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)
<input type="checkbox"/>	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2023-02-18	2024-02-17
<input checked="" type="checkbox"/>	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2023-06-03	2024-06-02
<input checked="" type="checkbox"/>	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2023-06-01	2024-05-31
<input checked="" type="checkbox"/>	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2022-03-12	2024-03-11
<input checked="" type="checkbox"/>	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2023-05-11	2025-05-10
<input checked="" type="checkbox"/>	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2023-03-23	2024-03-22
<input checked="" type="checkbox"/>	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2023-09-24	2025-09-23
<input checked="" type="checkbox"/>	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2022-08-04	2024-08-03
<input checked="" type="checkbox"/>	AGC-EM-A118	5G Filter	SongYi	BRM50716	N/A	2023-06-01	2024-05-31
<input checked="" type="checkbox"/>	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08
<input type="checkbox"/>	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)
<input checked="" type="checkbox"/>	AGC-EM-E045	EMI Test Receiver	R&S	ESPI	101206	2023-06-03	2024-06-02
<input checked="" type="checkbox"/>	AGC-EM-A130	6dB Attenuator	Eeatsheep	LM-XX-6-5W	DC-6GZ	2023-06-09	2024-06-08
<input checked="" type="checkbox"/>	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2023-06-03	2024/06/02

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● Test Software					
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information
<input checked="" type="checkbox"/>	AGC-EM-S003	RE Test System	FARA	EZ-EMC	V.RA-03A
<input checked="" type="checkbox"/>	AGC-EM-S011	RSE Test System	Tonscend	TS ⁺ Ver2.1(JS36-RSE)	4.0.0.0
<input checked="" type="checkbox"/>	AGC-EM-S001	CE Test System	R&S	ES-K1	V1.71
<input checked="" type="checkbox"/>	AGC-ER-S009	BT/WIFI Test System	Tonscend	JS1120-3	2.6.77.0518

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4. System Test Configuration

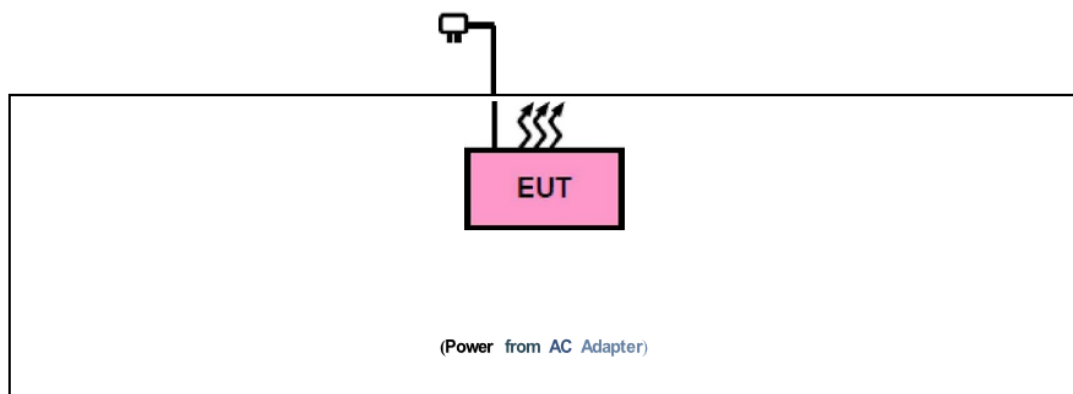
4.1 EUT Configuration

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	Redmi Notebook Adapter	AD100G	Redmi	--	--
2	Redmi Notebook PC	XMA2002-AB	Redmi	--	--

☒ Test Accessories Come From The Manufacturer

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	--	--	--	--	--

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4.5 Summary of Test Results

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

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5. Description of Test Modes

EUT Configure Mode	Applicable To				Description
	RE > 1G	RE < 1G	PLC	APCM	
A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	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.

● Radiated Emission Test (Above 1GHz):

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

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0

● Radiated Emission Test (Below 1GHz):

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

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11n (40MHz)	5745-5825	151 to 159	159	OFDM	13.5

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● **Power Line Conducted Emission Test:**

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

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11n (40MHz)	5745-5825	151 to 159	159	OFDM	13.5

● **Band edge Measurement:**

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

EUT Configure Mode	Mode	Freq. Band (MHz)	Available Channel	Tested Channel	Modulation	Data Rate (Mbps)
A	802.11a	5180-5240	36 to 48	36	OFDM	6.0
A	802.11n (40MHz)		38 to 46	38	OFDM	13.5
A	802.11ac (80MHz)		42	42	OFDM	29.3

● **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)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
A	802.11n (20MHz)		36 to 48	36, 40, 48	OFDM	6.5
A	802.11n (40MHz)		38 to 46	38, 46	OFDM	13.5
A	802.11ac (20MHz)		36 to 48	36, 40, 48	OFDM	6.5
A	802.11ac (40MHz)		38 to 46	38, 46	OFDM	13.5
A	802.11ac (80MHz)		42	42	OFDM	29.3
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
A	802.11n (20MHz)		149 to 165	149, 157, 165	OFDM	6.5
A	802.11n (40MHz)		151 to 159	151, 159	OFDM	13.5
A	802.11ac (20MHz)		149 to 165	149, 157, 165	OFDM	6.5
A	802.11ac (40MHz)		151 to 159	151, 159	OFDM	13.5
A	802.11ac (80MHz)		155	155	OFDM	29.3

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6. Duty Cycle Measurement

5GHz WLAN (NII) operation is possible in 20MHz, 40MHz and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = 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)
Band U-NII1:5150MHz-5250MHz					
802.11a	6	96.12	0.17	0.73	-0.34
802.11n_HT20	MCS0	92.45	0.34	1.58	-0.68
802.11n_HT40	MCS0	96.01	0.18	0.78	-0.35
802.11ac_VHT20	MCS0	85.92	0.66	3.15	-1.32
802.11ac_VHT40	MCS0	92.30	0.35	1.57	-0.70
802.11ac_VHT80	MCS0	85.92	0.66	3.15	-1.32

Operating mode	Data rates (Mbps)	Duty Cycle (%)	Duty Cycle Factor (dB)	1/ T Minimum VBW (kHz)	Average Factor (dB)
Band U-NII 3:5725MHz-5850MHz					
802.11a	6	96.39	0.16	0.73	-0.32
802.11n_HT20	MCS0	95.77	0.19	0.79	-0.38
802.11n_HT40	MCS0	92.02	0.36	1.58	-0.72
802.11ac_VHT20	MCS0	96.01	0.18	0.78	-0.35
802.11ac_VHT40	MCS0	92.31	0.35	1.57	-0.70
802.11ac_VHT80	MCS0	85.61	0.67	3.16	-1.35

Remark:

1. Duty Cycle factor = $10 * \log (1/ \text{Duty cycle})$, Average factor = $20 \log_{10} \text{Duty Cycle}$
2. The duty cycle of each frequency band mode reflects the determination requirements of the low channel measurement value.
3. Involving the test items of duty cycle compensation coefficient, the final results have been added and calculated by the software and presented.

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The test plots as follows:



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7. RF Output Power Measurement

7.1 Provisions Applicable

Operation Band	EUT Category		LIMIT
U-NII-1	<input type="checkbox"/>	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)
	<input type="checkbox"/>	Fixed point-to-point Access Point	1 Watt (30 dBm)
	<input type="checkbox"/>	Indoor Access Point	1 Watt (30 dBm)
	<input checked="" type="checkbox"/>	Client devices	250mW (23.98 dBm)
U-NII-2A	/		250mW (23.98 dBm) or 11 dBm+10 log B*
U-NII-2C	/		250mW (23.98 dBm) or 11 dBm+10 log B*
U-NII-3	/		1 Watt (30 dBm)

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

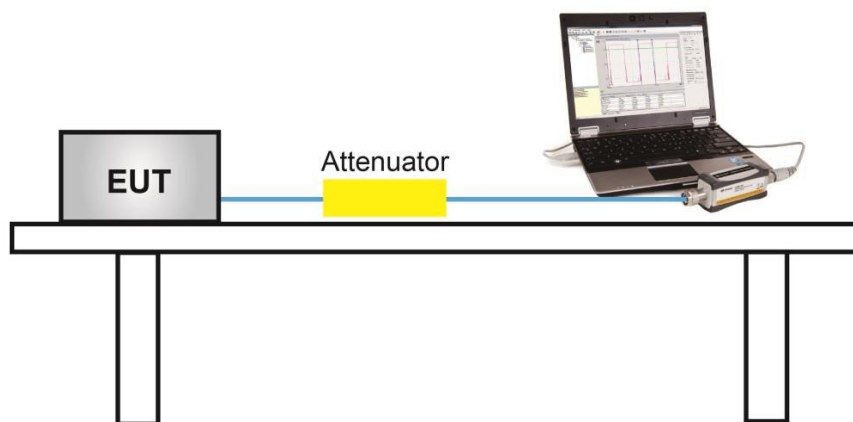
7.2 Measurement Procedure

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

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

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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				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5180	7.20	23.98	Pass
	5200	7.35	23.98	Pass
	5240	7.77	23.98	Pass
802.11n20	5180	6.17	23.98	Pass
	5200	6.33	23.98	Pass
	5240	6.60	23.98	Pass
802.11n40	5190	7.16	23.98	Pass
	5230	7.22	23.98	Pass
802.11ac20	5180	7.24	23.98	Pass
	5200	6.66	23.98	Pass
	5240	6.97	23.98	Pass
802.11ac40	5190	6.91	23.98	Pass
	5230	7.57	23.98	Pass
802.11ac80	5210	7.60	23.98	Pass

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Test Data of Conducted Output Power for band 5.725-5.850 GHz				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5745	6.98	30	Pass
	5785	7.27	30	Pass
	5825	7.13	30	Pass
802.11n20	5745	6.96	30	Pass
	5785	7.57	30	Pass
	5825	7.50	30	Pass
802.11n40	5755	7.84	30	Pass
	5795	7.85	30	Pass
802.11ac20	5745	7.19	30	Pass
	5785	7.39	30	Pass
	5825	7.35	30	Pass
802.11ac40	5755	7.77	30	Pass
	5795	7.78	30	Pass
802.11ac80	5775	7.37	30	Pass

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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 $\geq 3 \times$ 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:

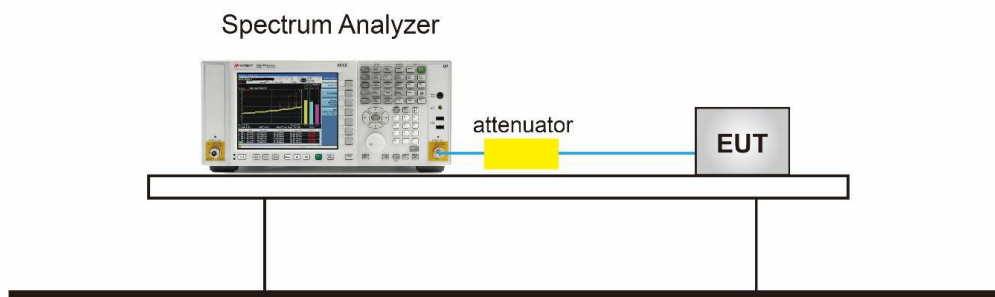
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set Span = approximately 1.5 to 5 times the OBW, centered on a nominal channel
The nominal IF filter bandwidth (3 dB RBW) shall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



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8.4 Measurement Results

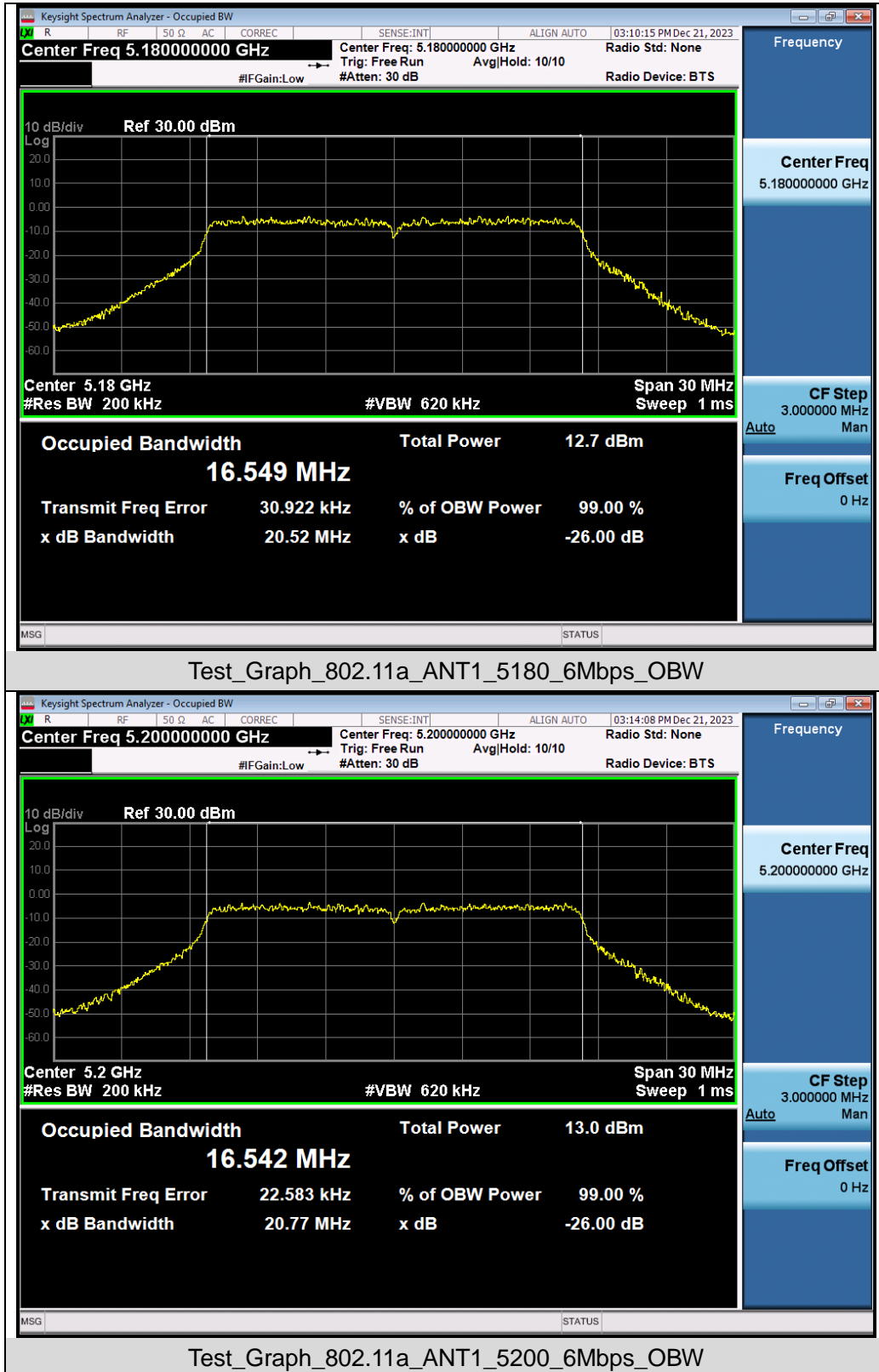
Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5180	16.549	20.521	N/A	Pass
	5200	16.542	20.767	N/A	Pass
	5240	16.544	20.273	N/A	Pass
802.11n20	5180	17.648	20.751	N/A	Pass
	5200	17.637	20.704	N/A	Pass
	5240	17.638	20.671	N/A	Pass
802.11n40	5190	36.254	42.498	N/A	Pass
	5230	36.226	42.508	N/A	Pass
802.11ac20	5180	17.618	20.783	N/A	Pass
	5200	17.645	21.057	N/A	Pass
	5240	17.645	21.039	N/A	Pass
802.11ac40	5190	36.222	41.900	N/A	Pass
	5230	36.161	41.893	N/A	Pass
802.11ac80	5210	75.570	82.105	N/A	Pass

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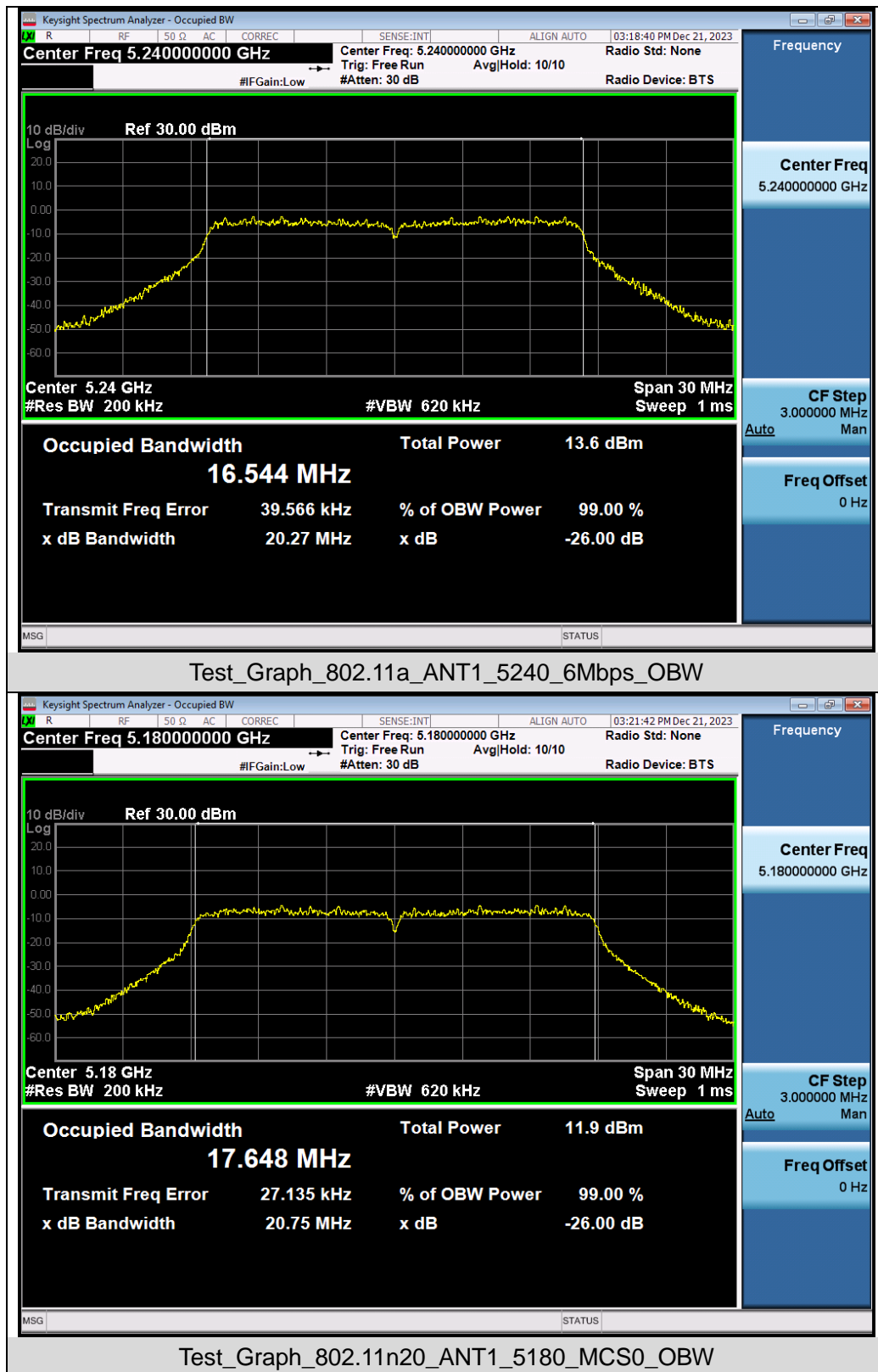
Test Data of Occupied Bandwidth and DTS Bandwidth for band 5.725-5.85 GHz					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5745	16.583	16.351	0.5	Pass
	5785	16.567	16.343	0.5	Pass
	5825	16.571	16.342	0.5	Pass
802.11n20	5745	17.666	17.540	0.5	Pass
	5785	17.645	17.268	0.5	Pass
	5825	17.659	17.521	0.5	Pass
802.11n40	5755	36.311	35.703	0.5	Pass
	5795	36.276	36.059	0.5	Pass
802.11ac20	5745	17.675	17.531	0.5	Pass
	5785	17.676	17.512	0.5	Pass
	5825	17.672	17.020	0.5	Pass
802.11ac40	5755	36.249	36.304	0.5	Pass
	5795	36.225	36.251	0.5	Pass
802.11ac80	5775	75.750	75.196	0.5	Pass

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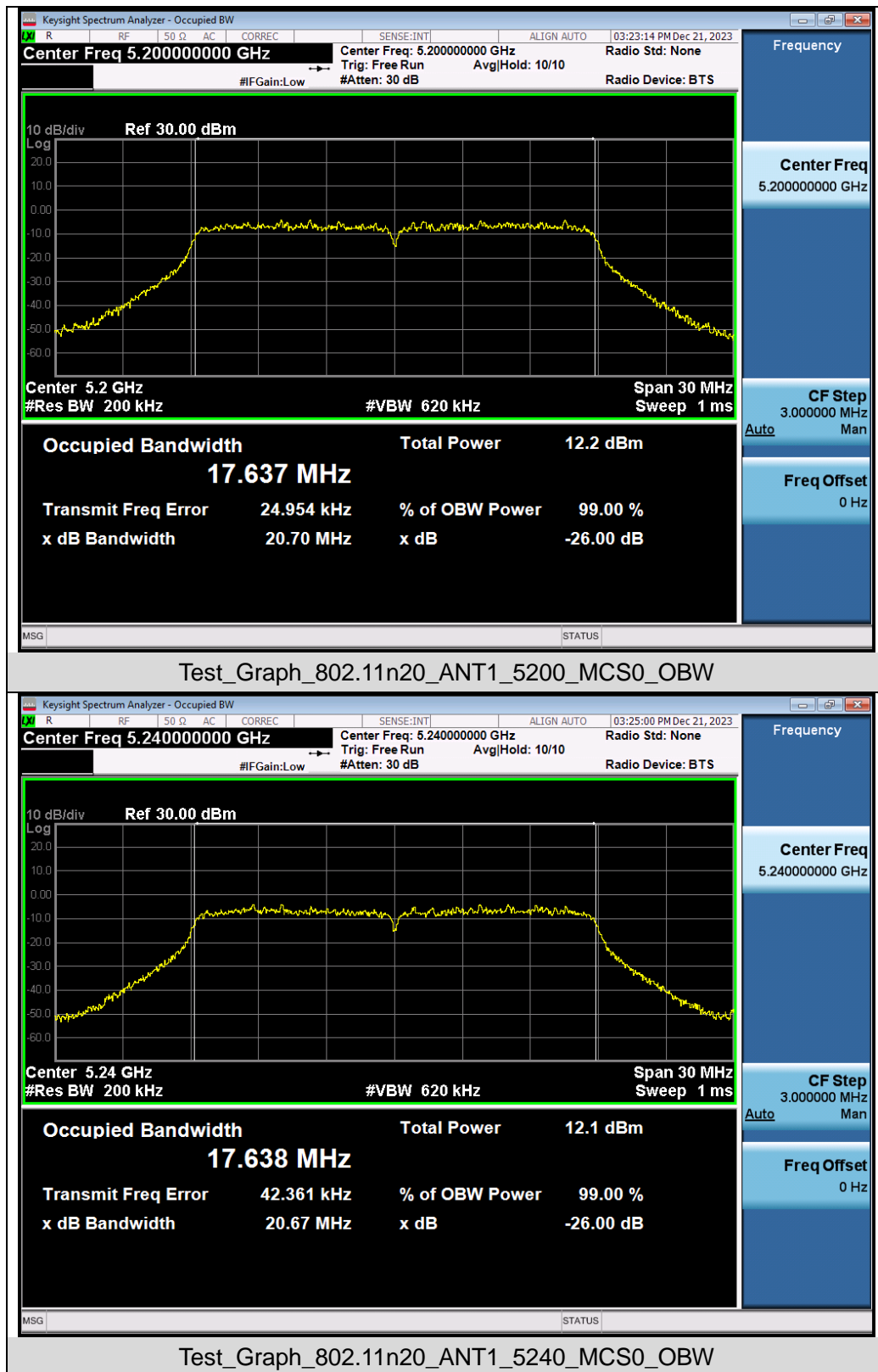
Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.15-5.25 GHz



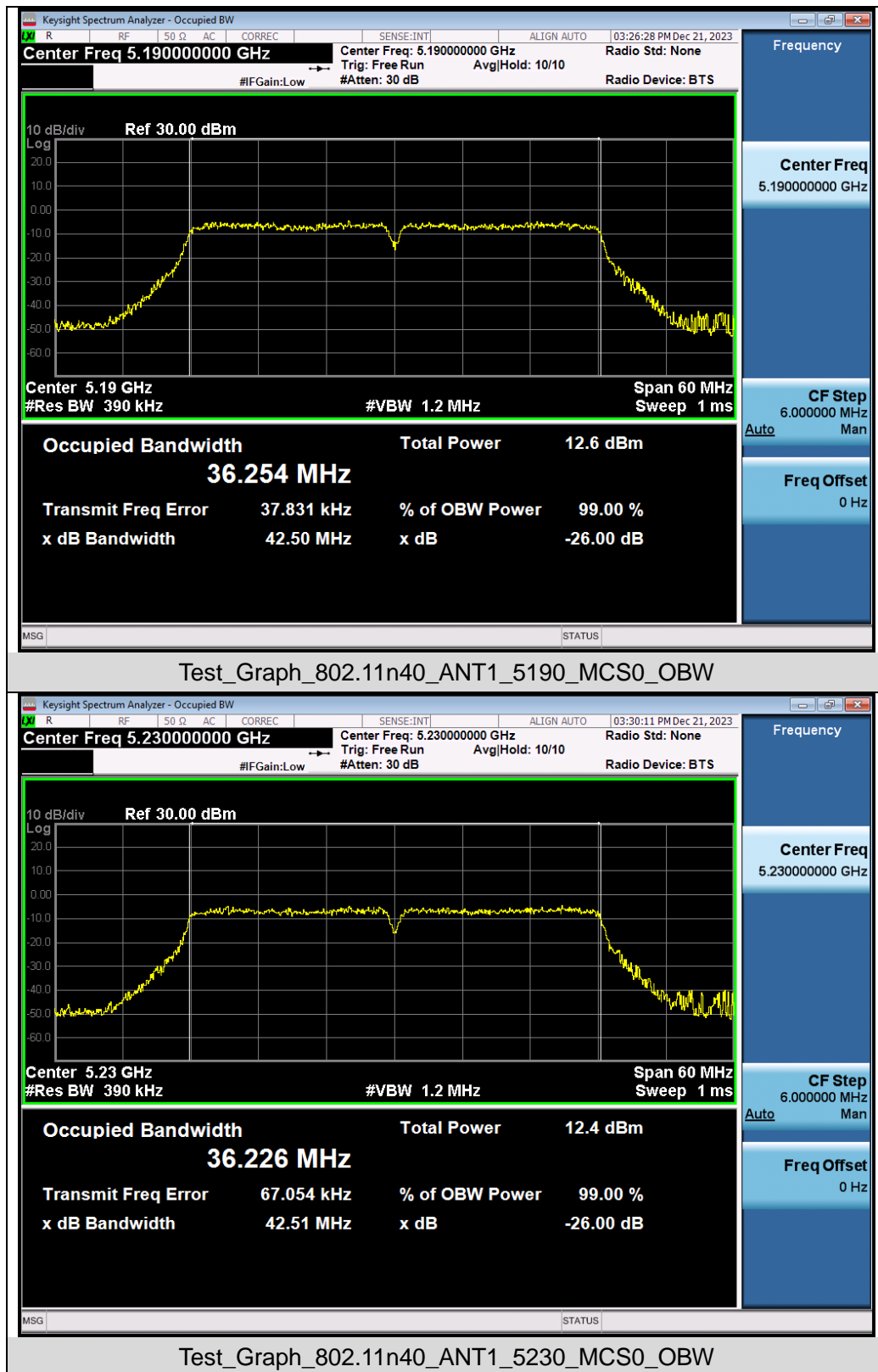
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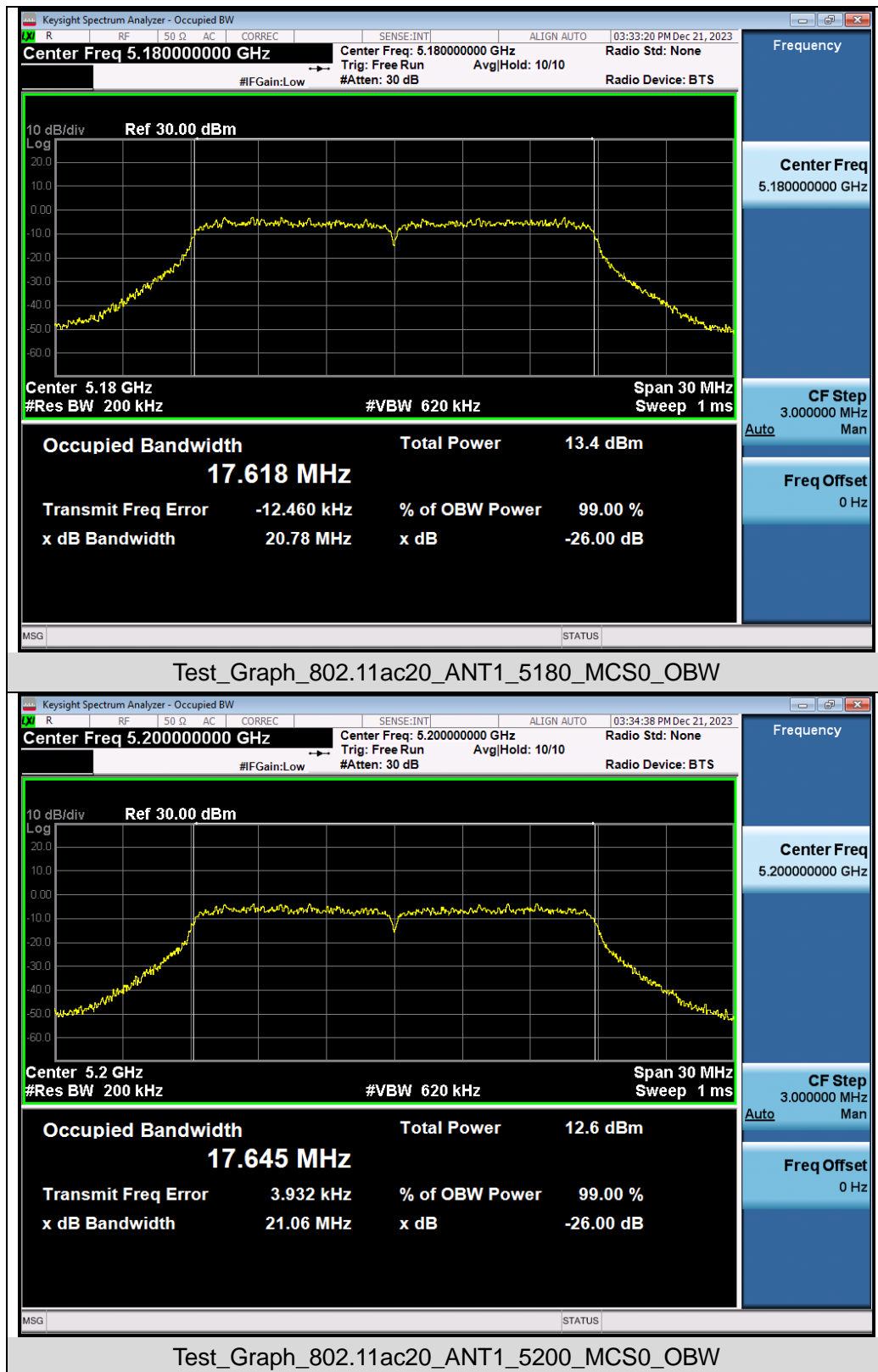
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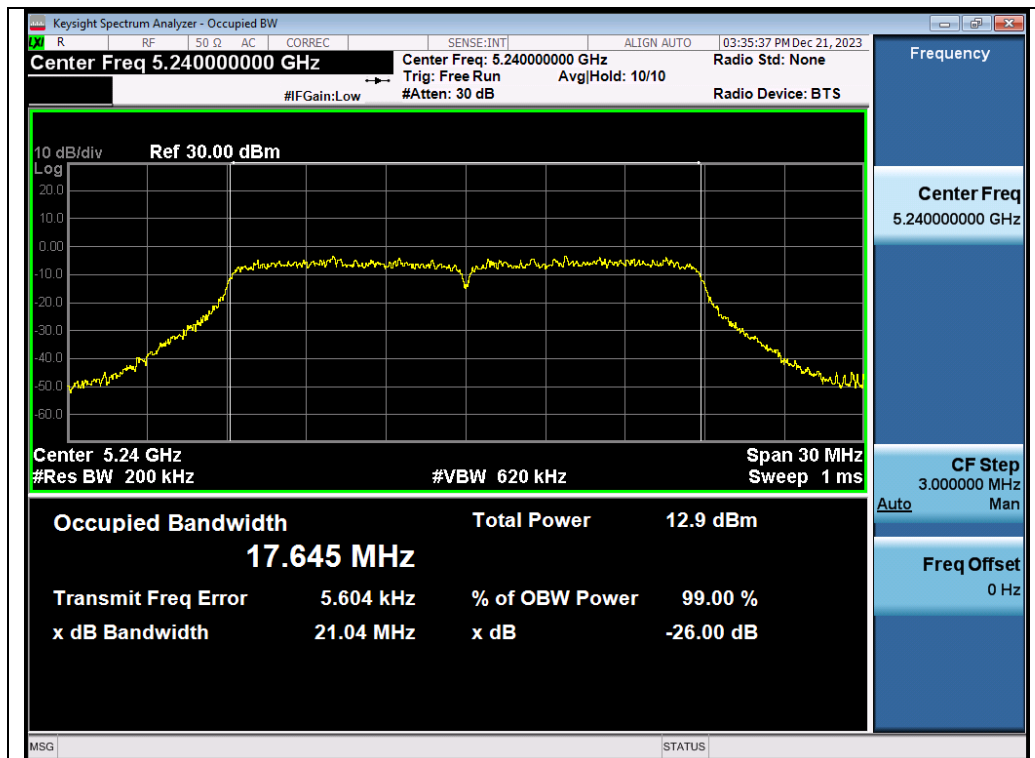
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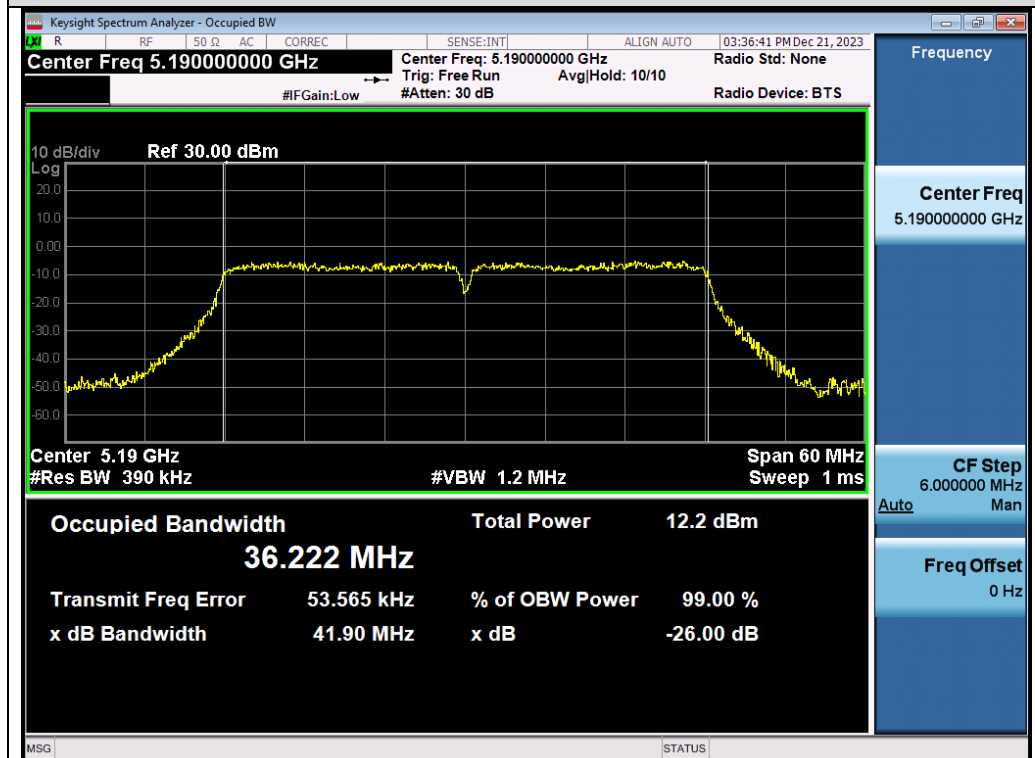
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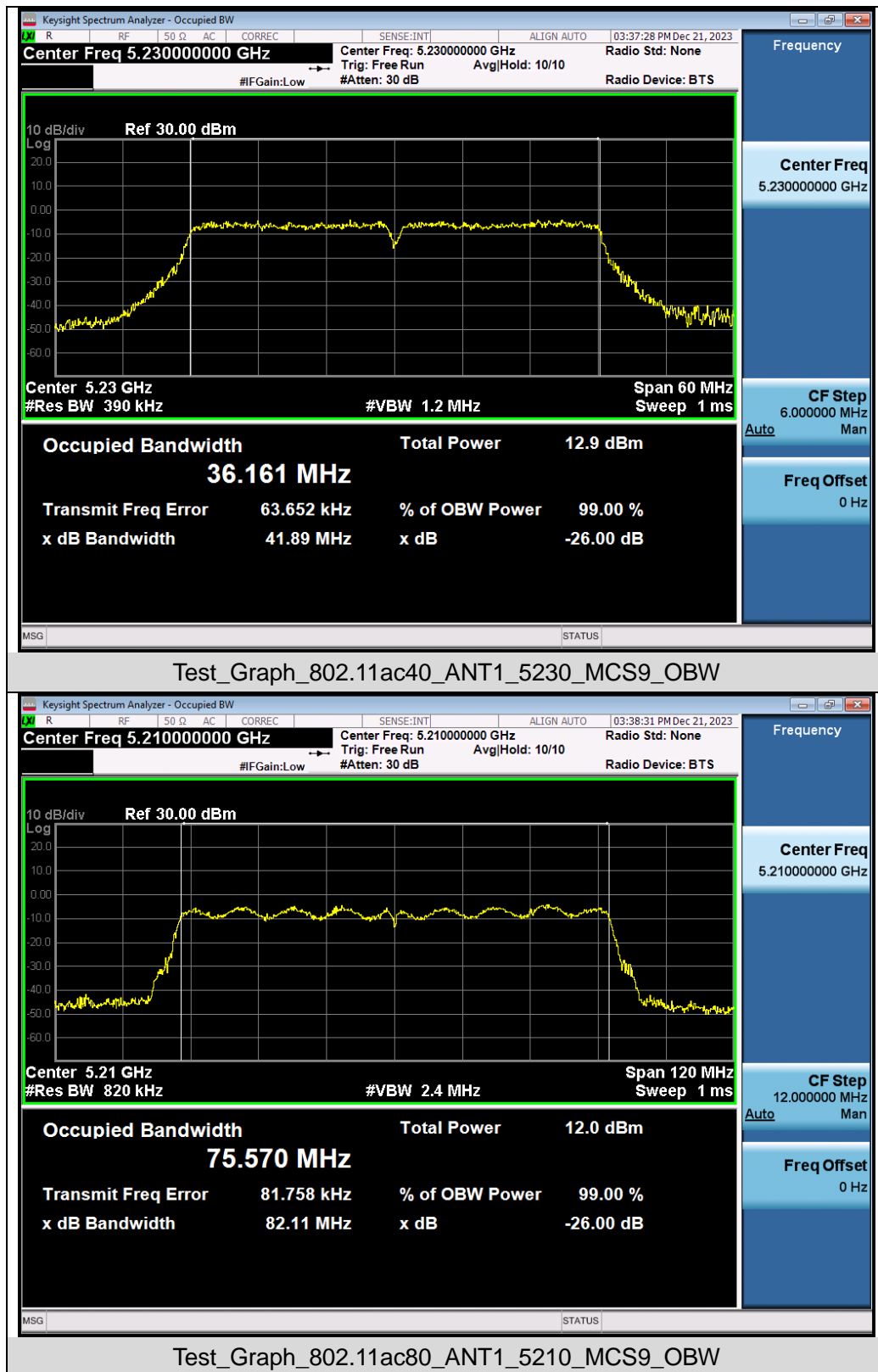


Test_Graph_802.11ac20_ANT1_5240_MCS9_OBW



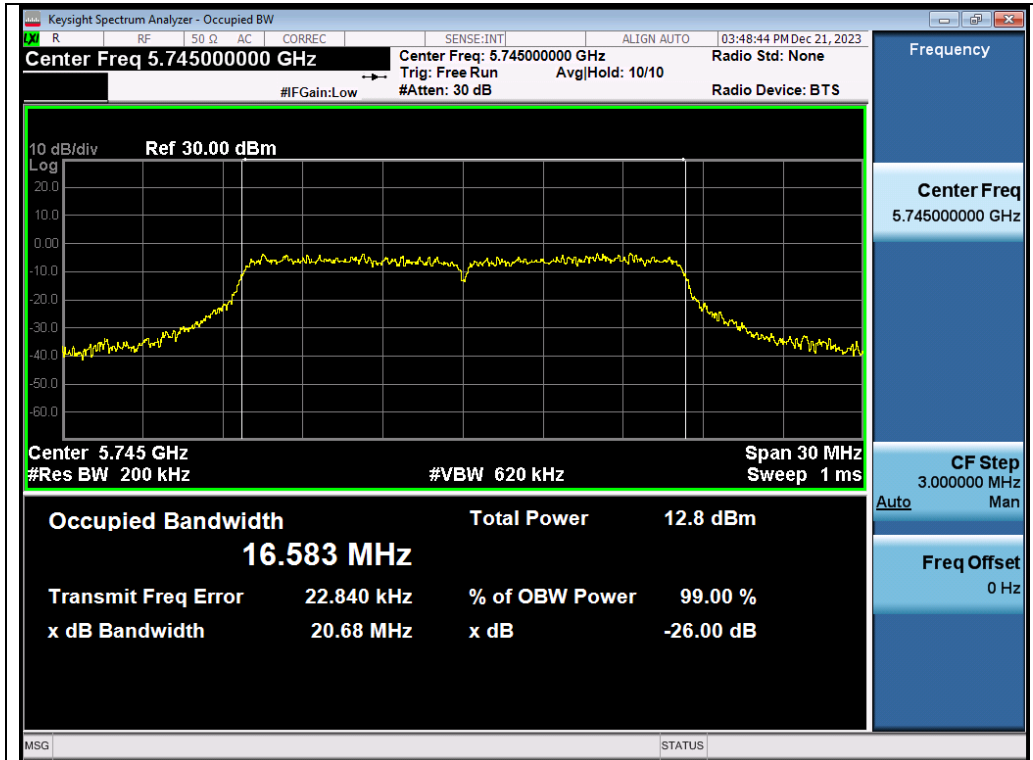
Test_Graph_802.11ac40_ANT1_5190_MCS9_OBW

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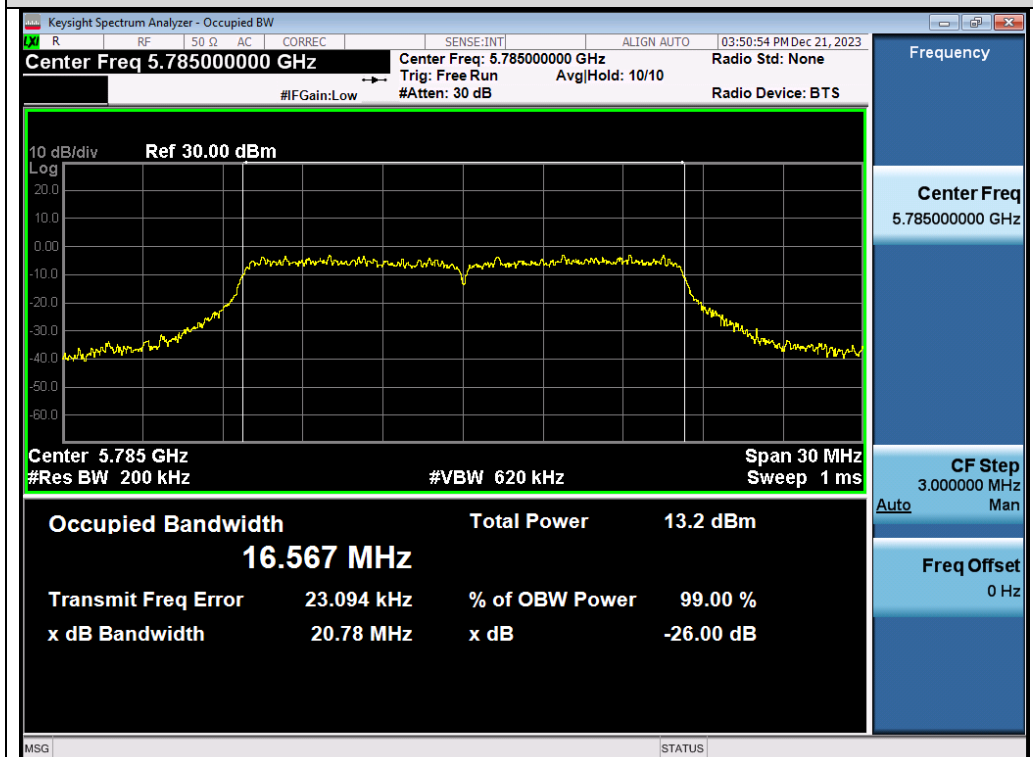


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Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.745-5.825 GHz

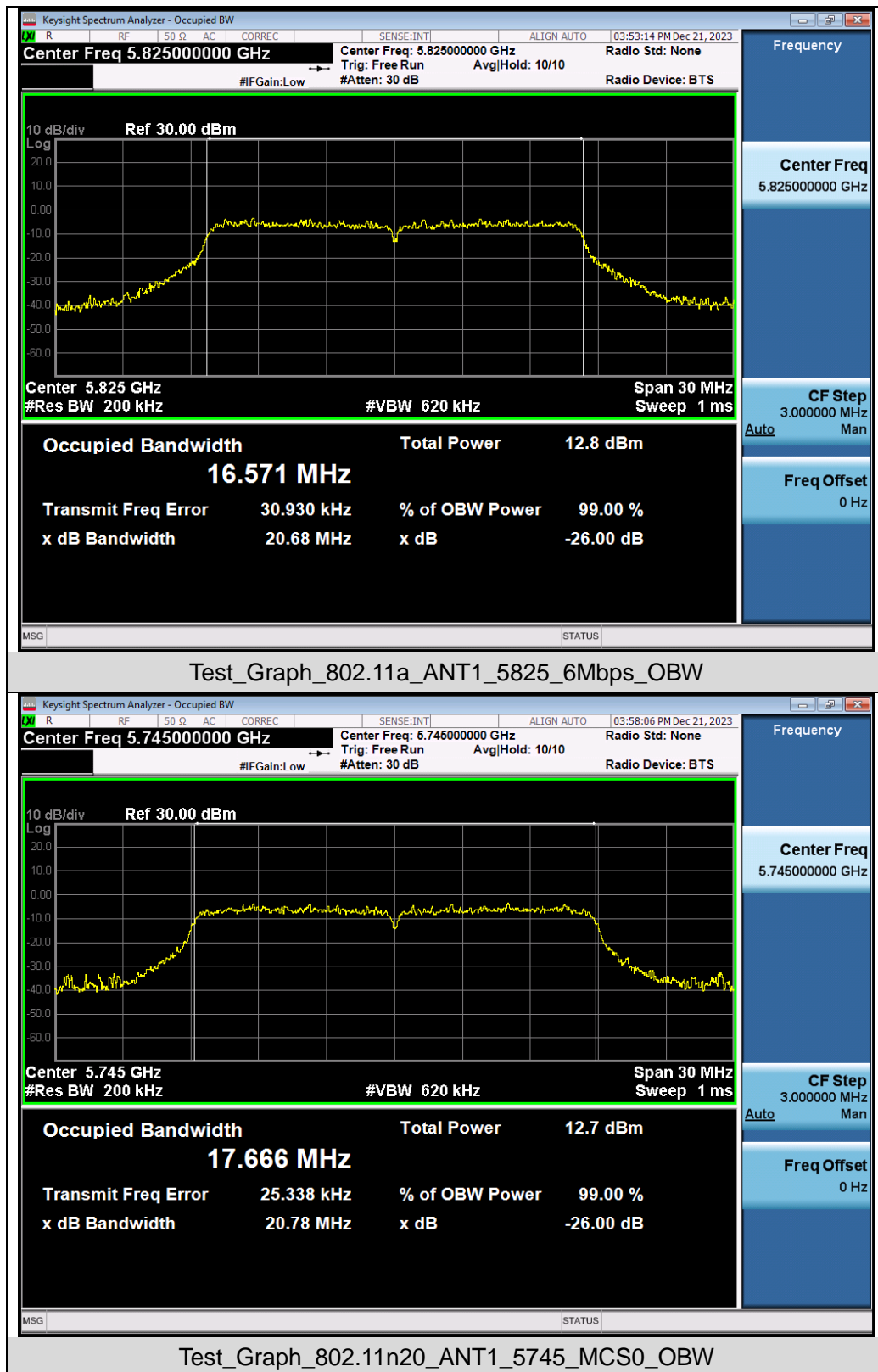


Test_Graph_802.11a_ANT1_5745_6Mbps_OBW

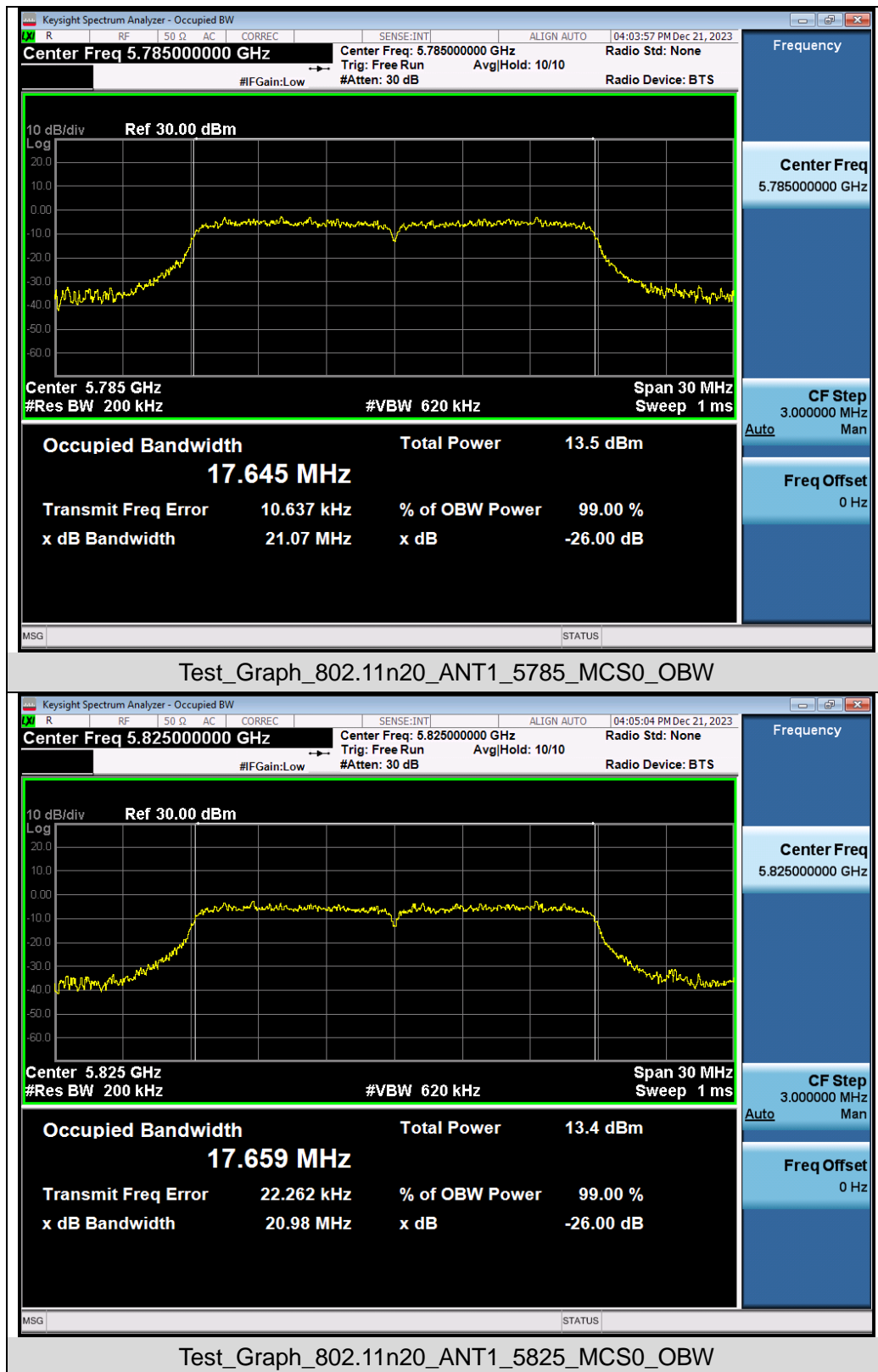


Test_Graph_802.11a_ANT1_5785_6Mbps_OBW

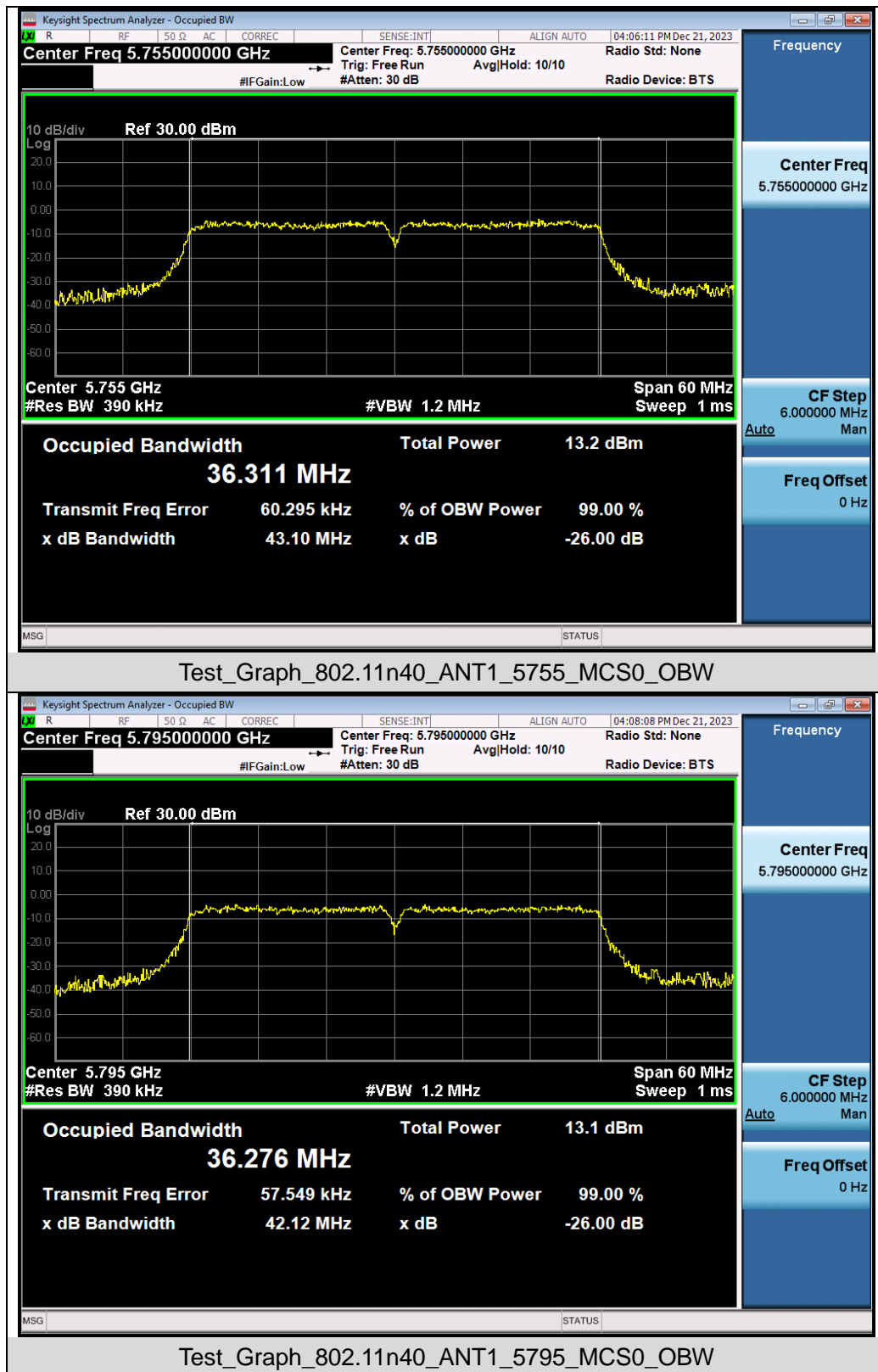
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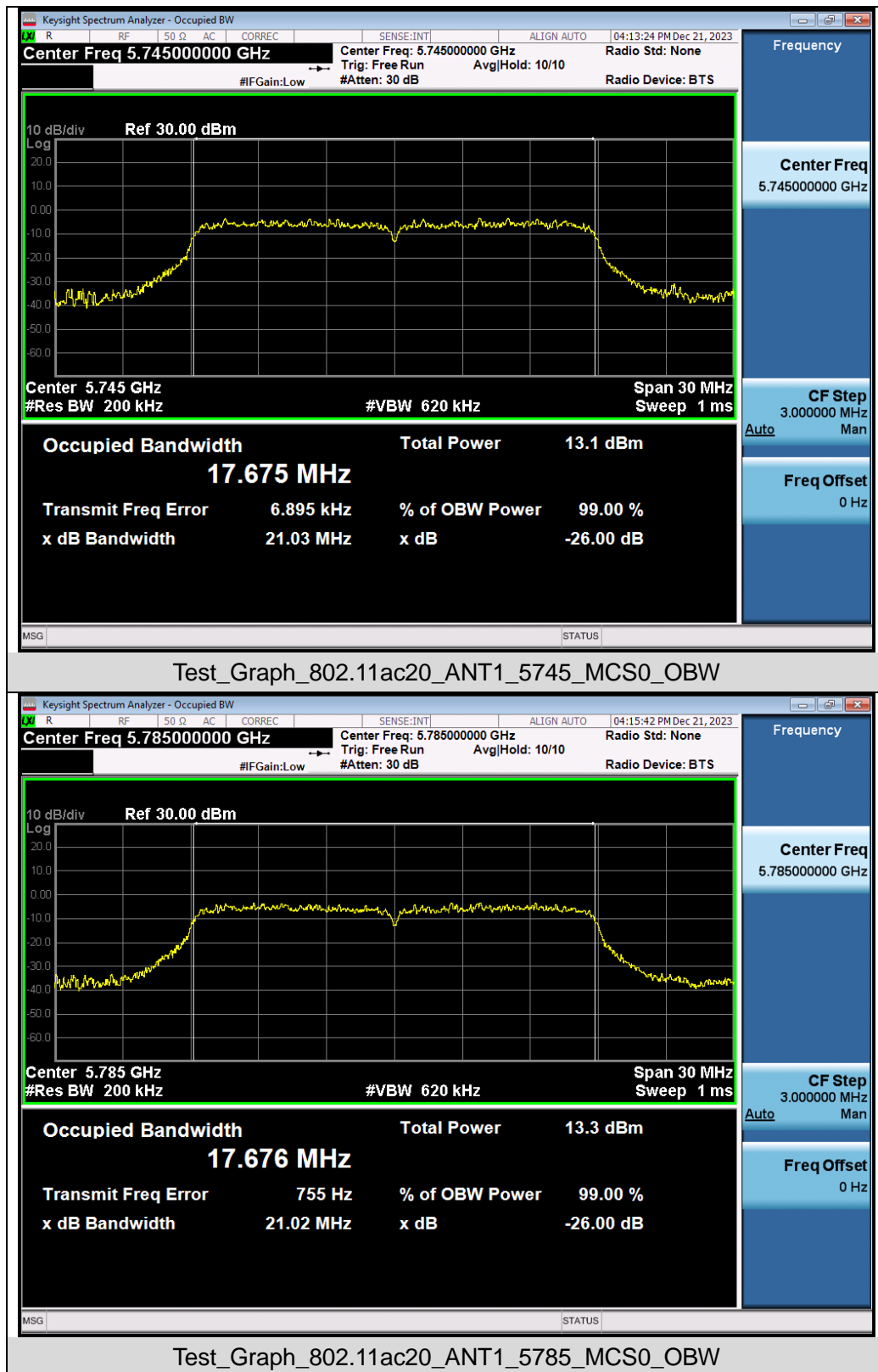
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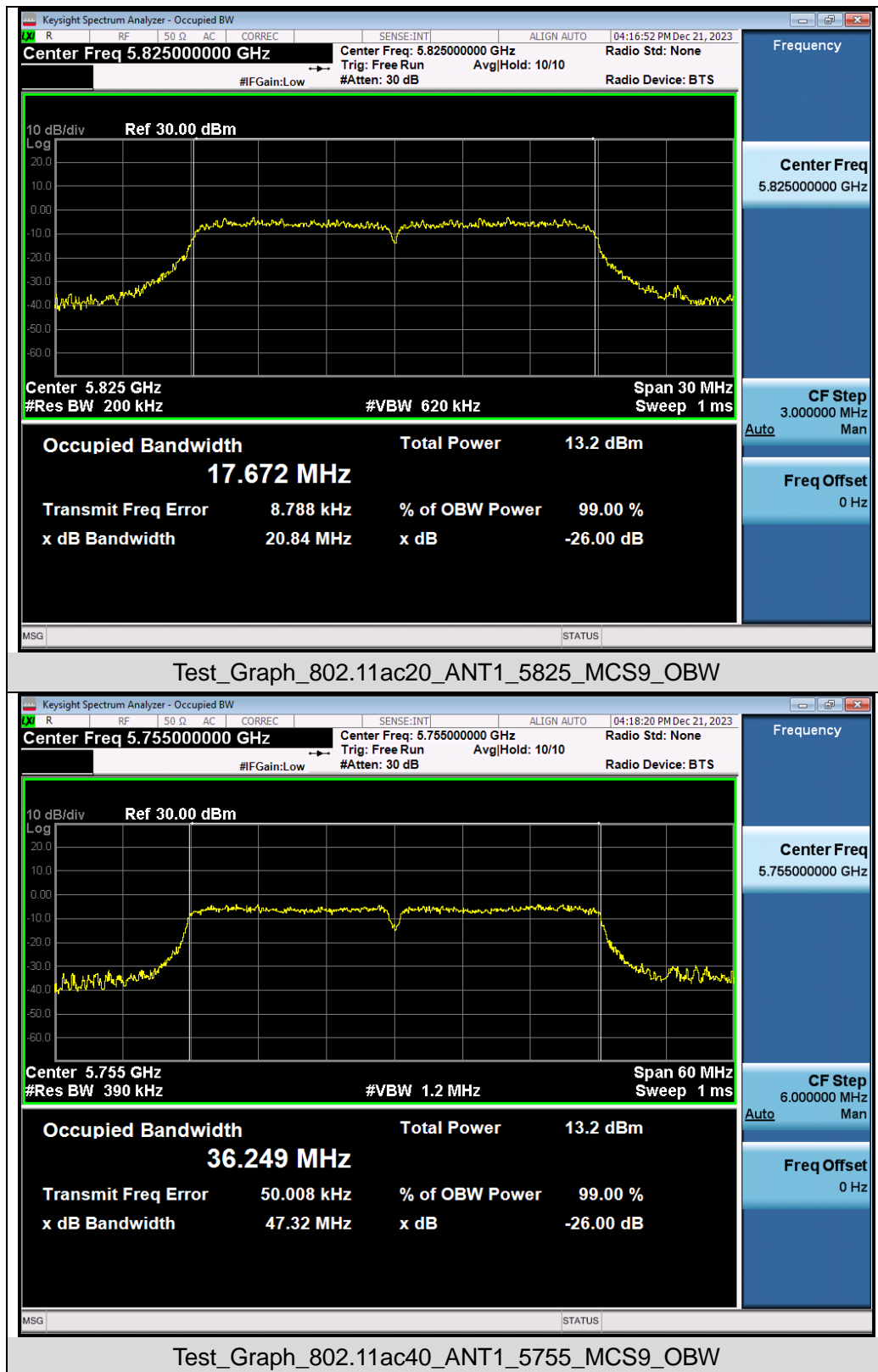
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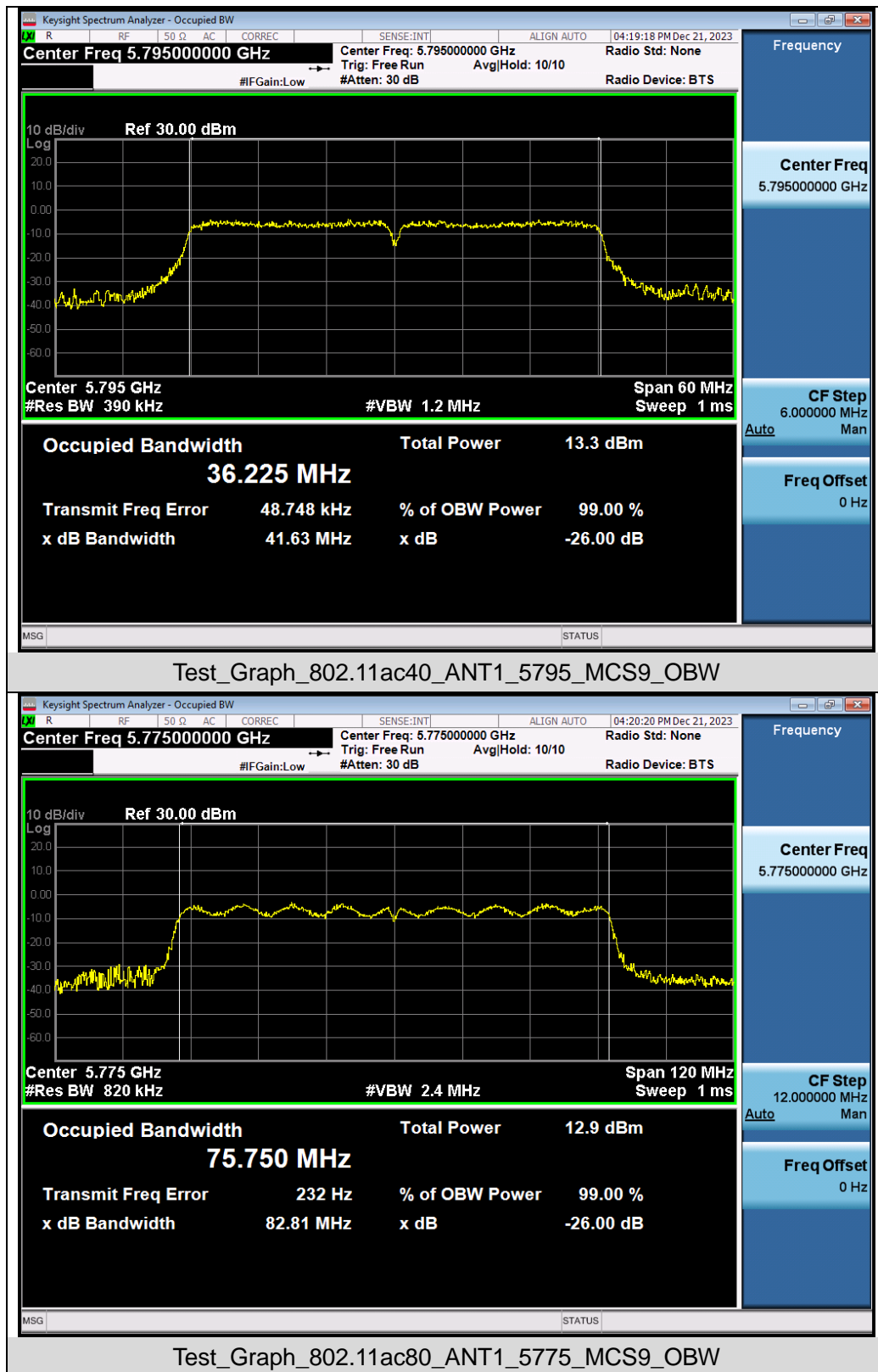
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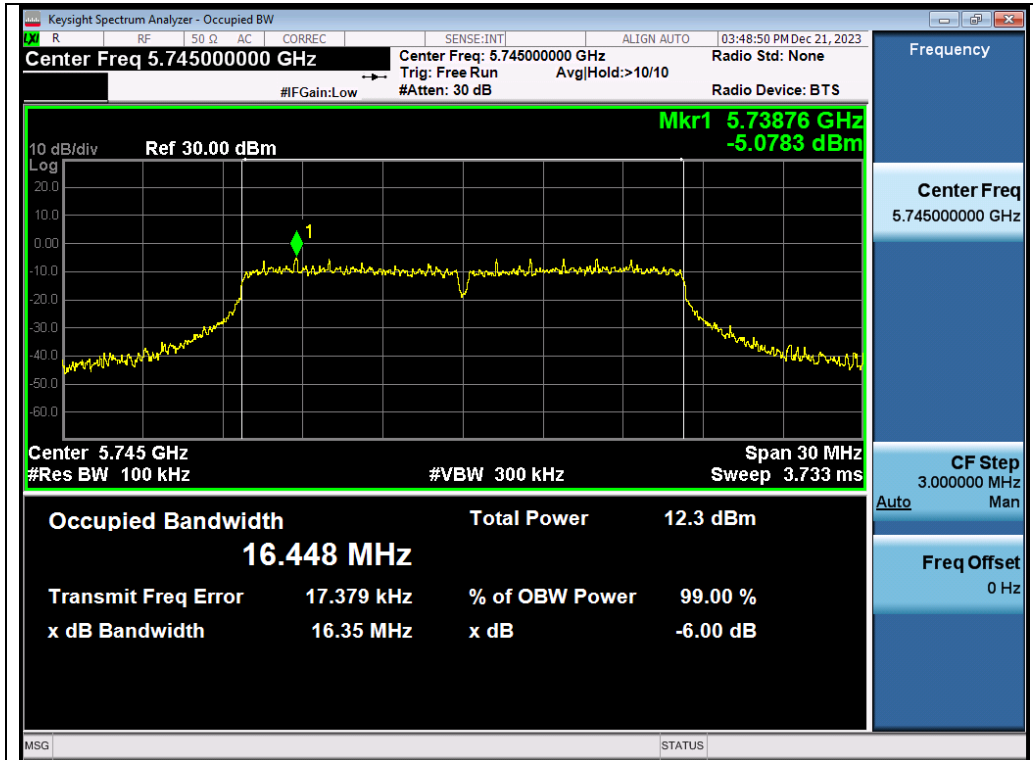


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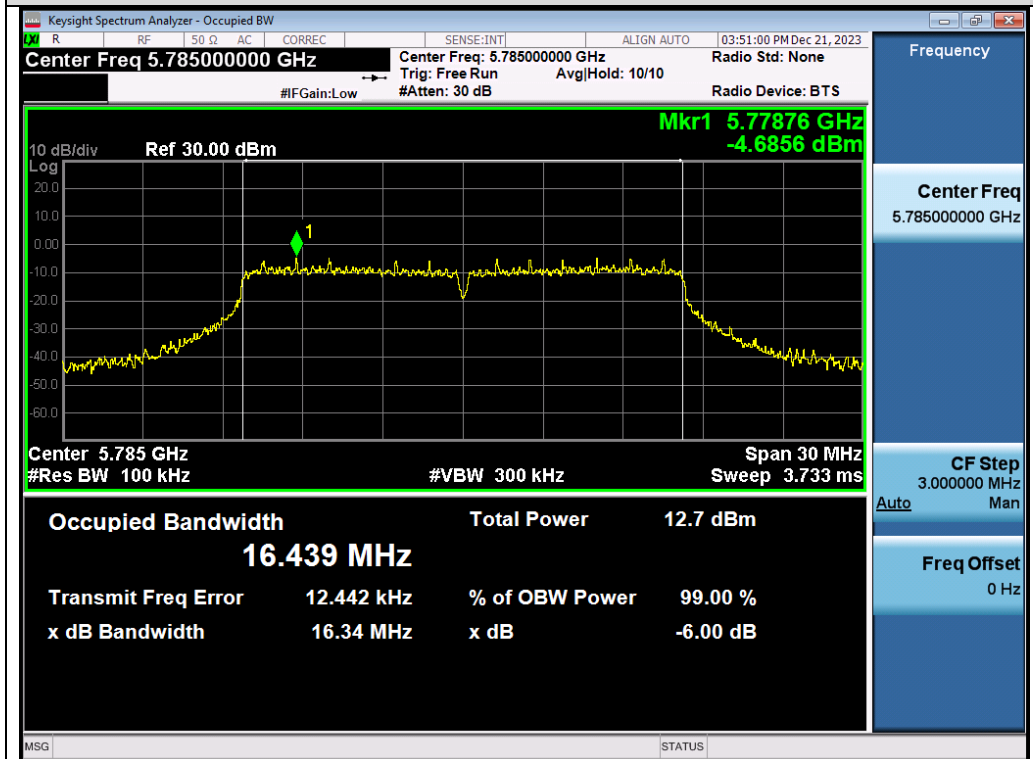


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Test Graphs of DTS Bandwidth for band 5.725-5.85 GHz

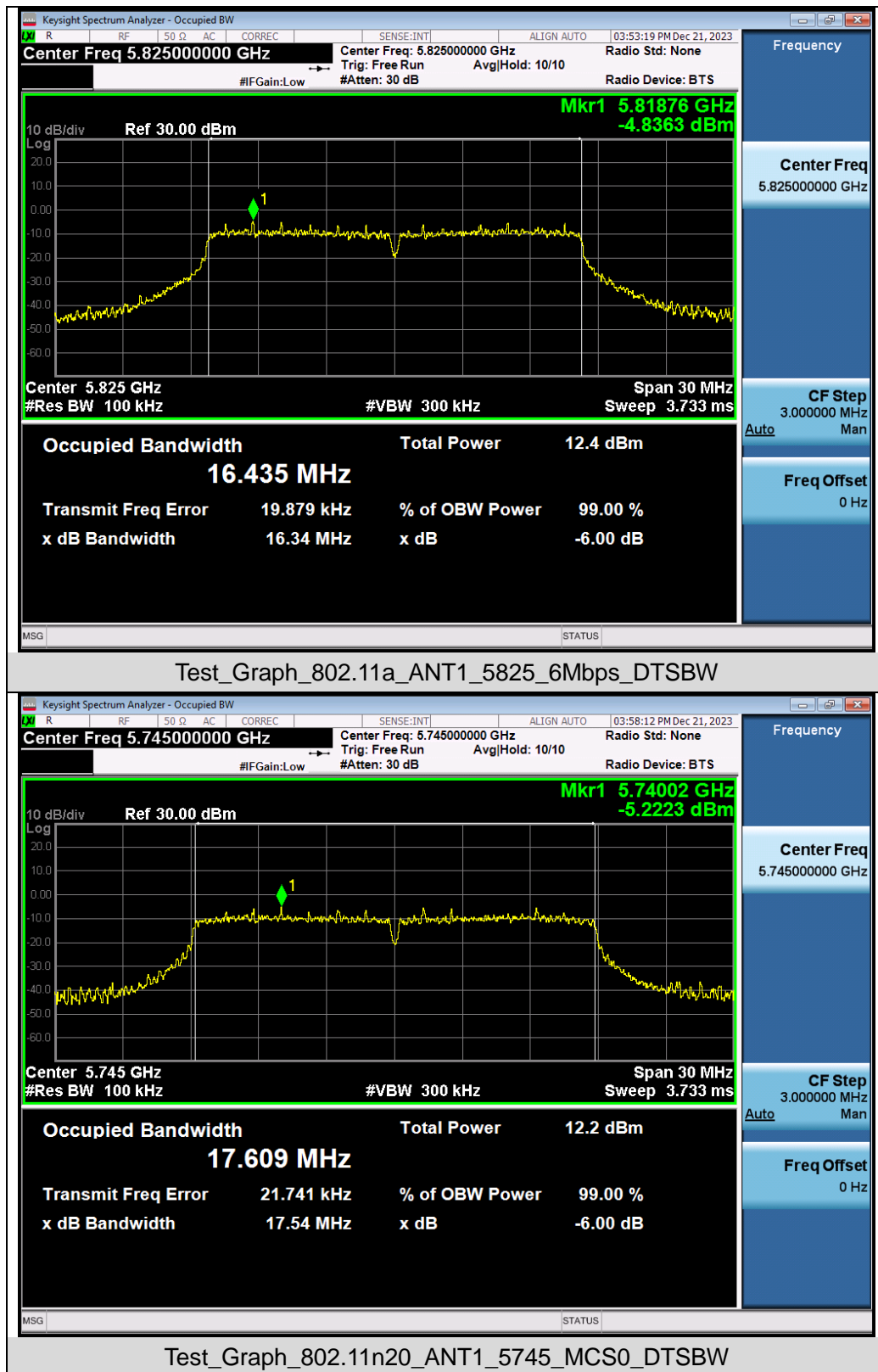


Test_Graph_802.11a_ANT1_5745_6Mbps_DTSSBW

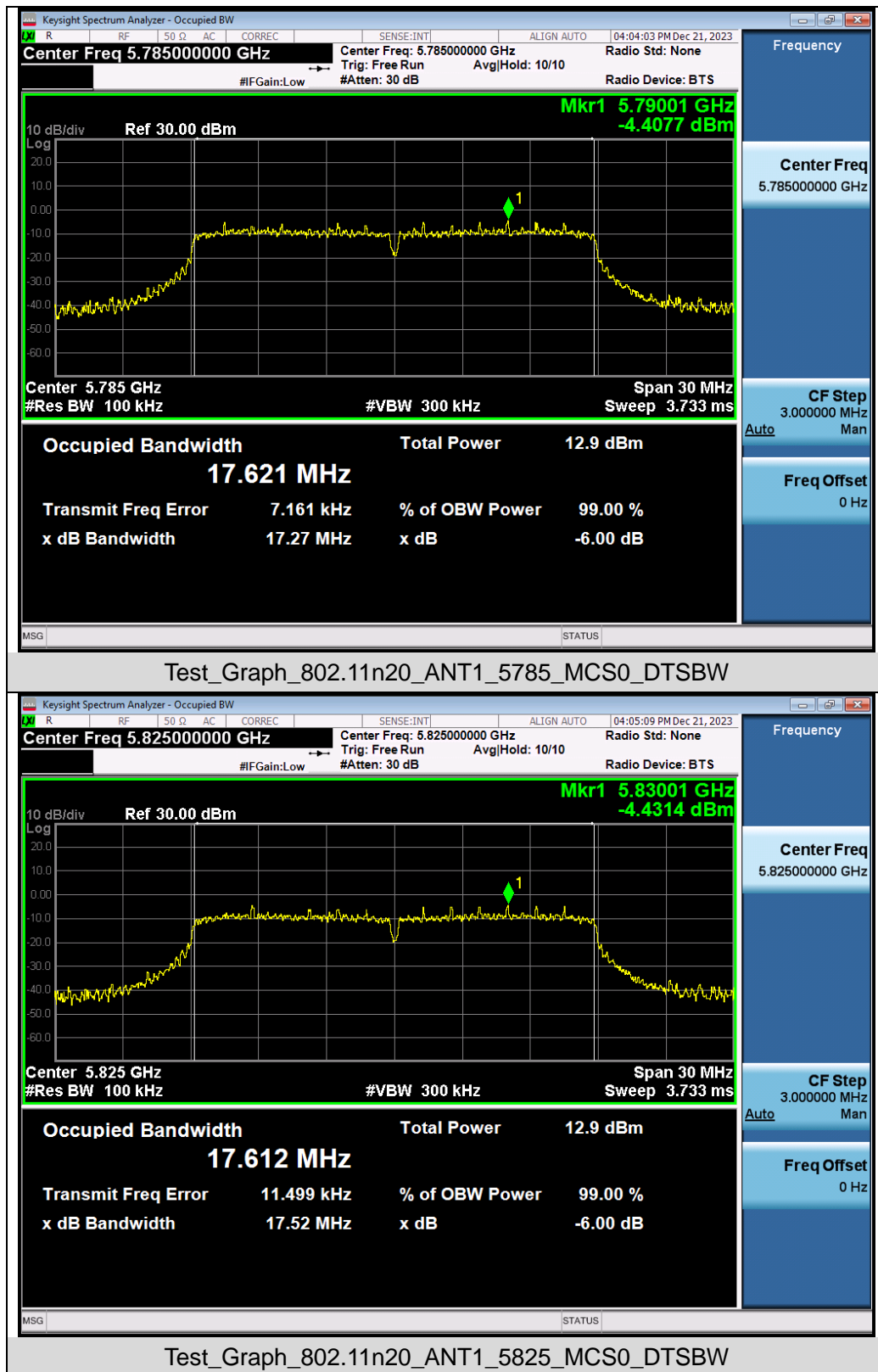


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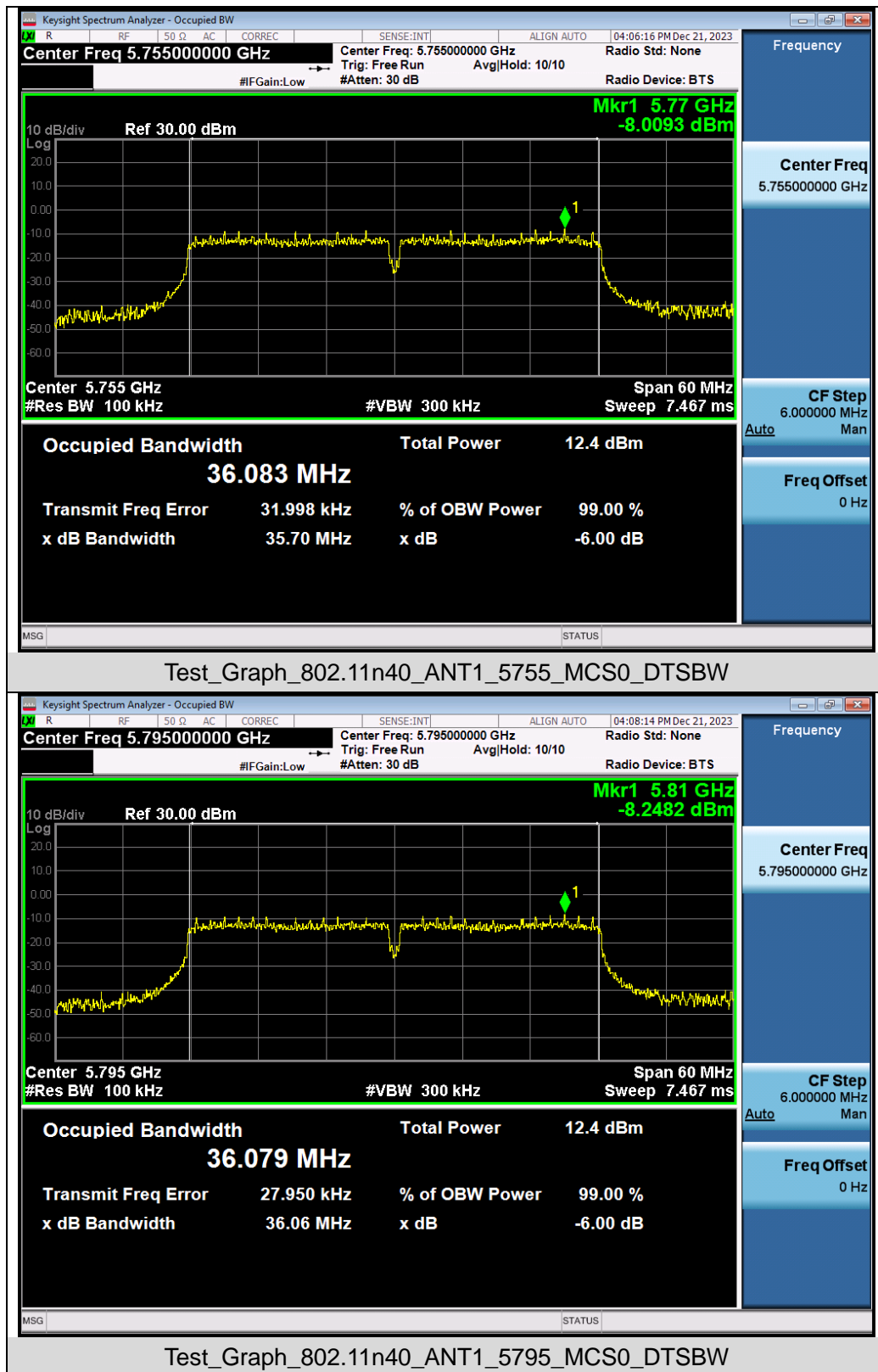
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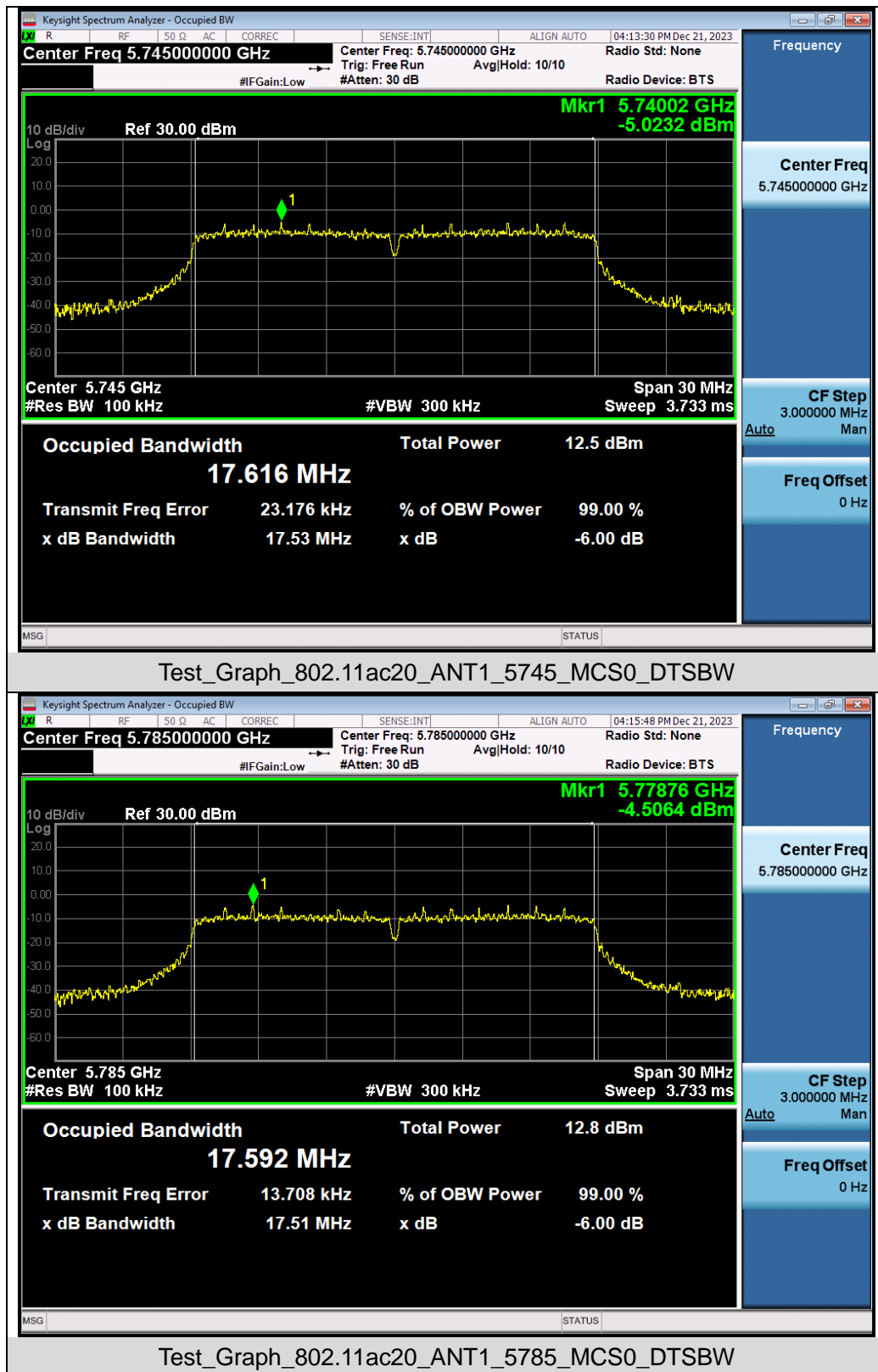
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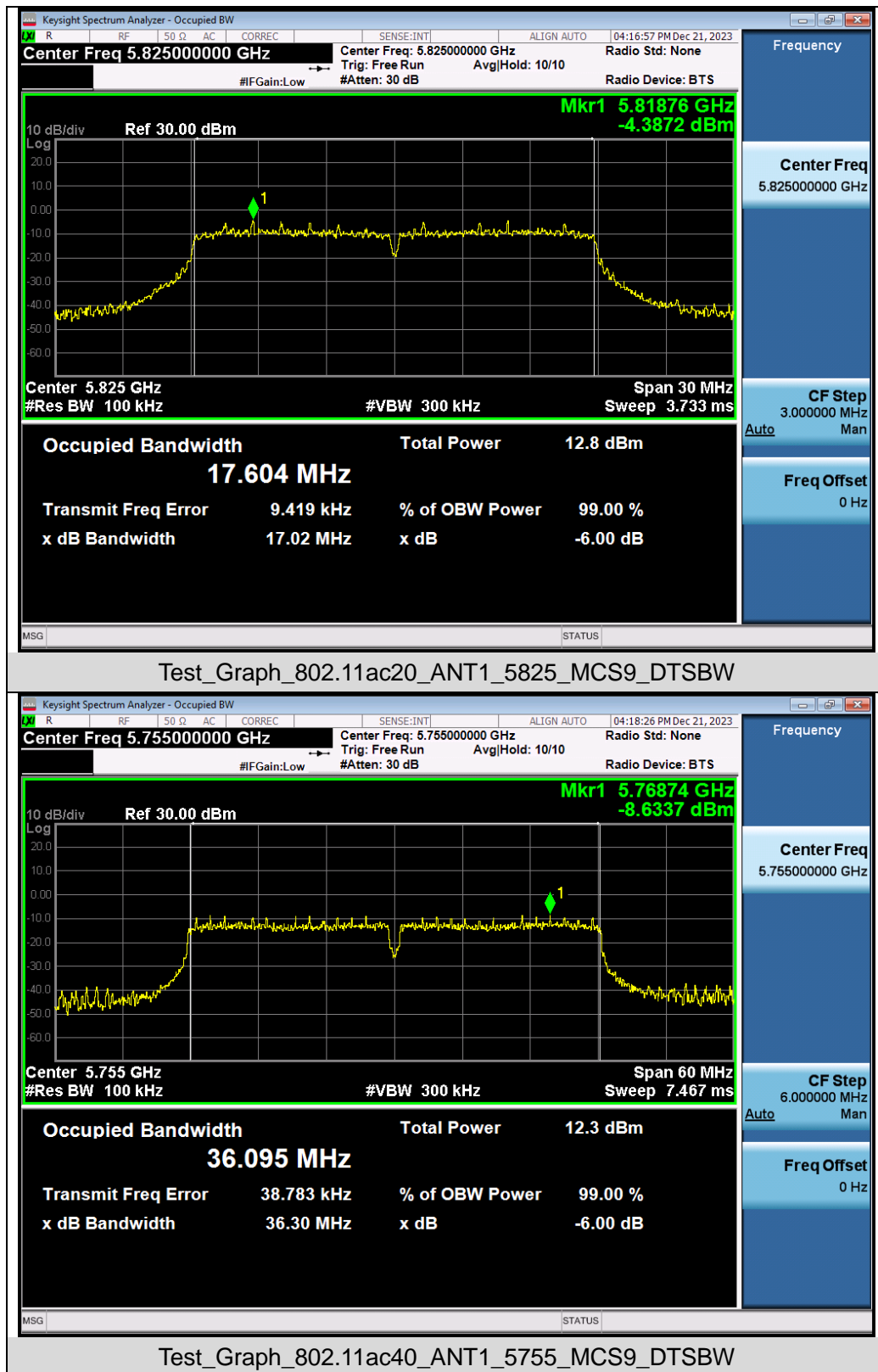
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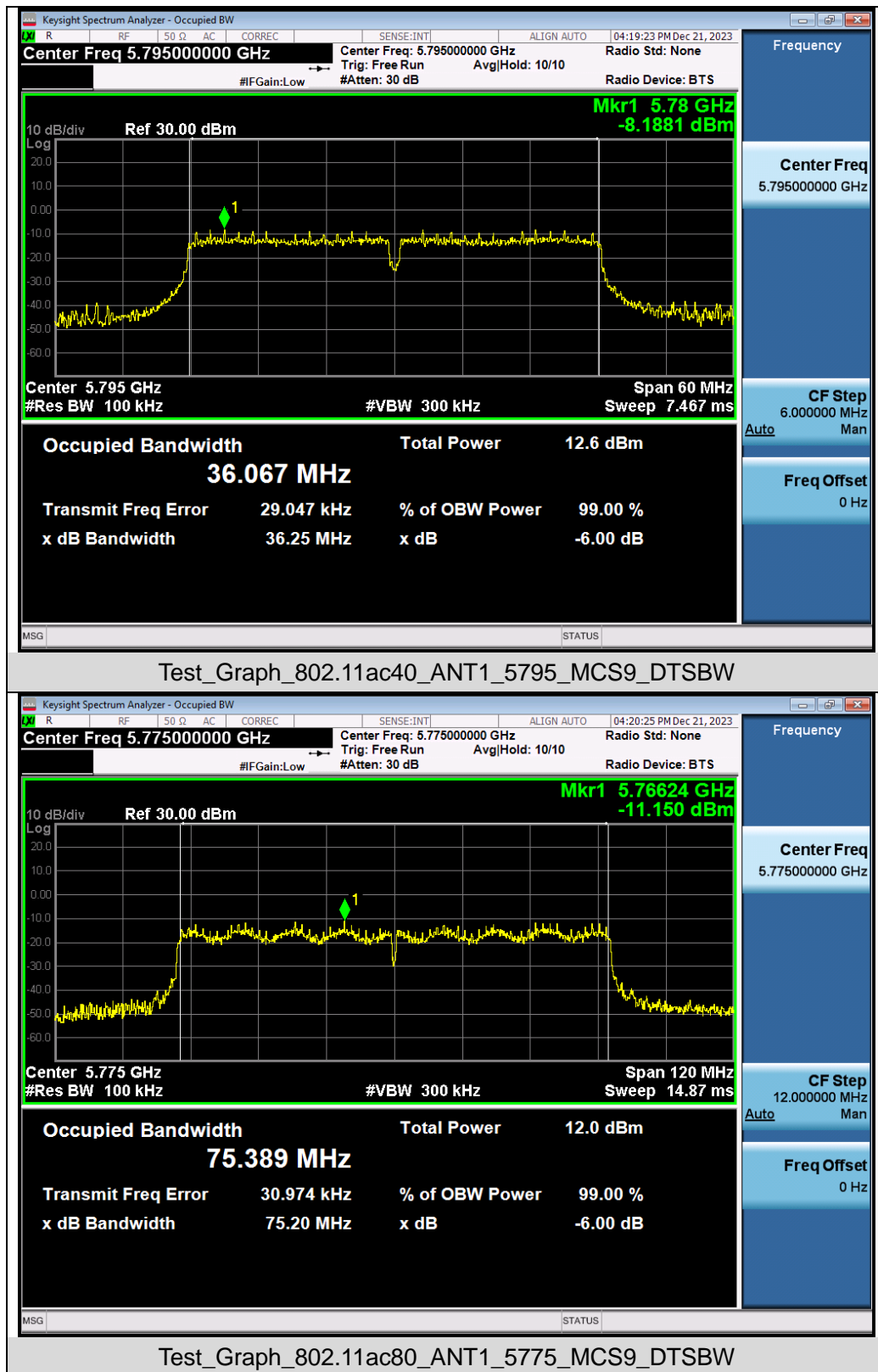
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9. Power Spectral Density Measurement

9.1 Provisions Applicable

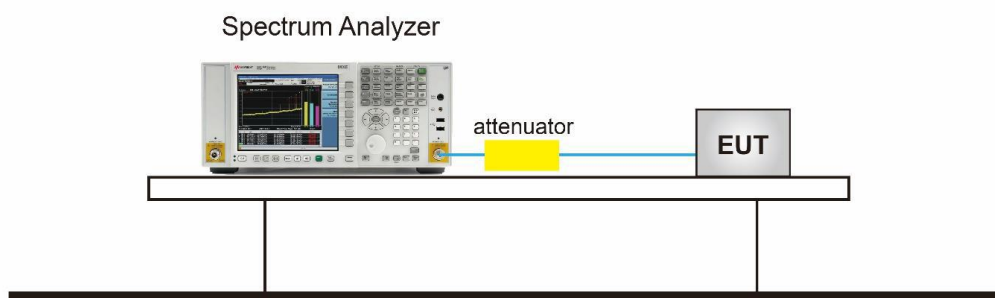
Operation Band	EUT Category		LIMIT
U-NII-1	<input type="checkbox"/>	Outdoor Access Point	17dBm/ MHz
	<input type="checkbox"/>	Fixed point-to-point Access Point	17dBm/ MHz
	<input type="checkbox"/>	Indoor Access Point	17dBm/ MHz
	<input checked="" type="checkbox"/>	Client devices	11dBm/ MHz
U-NII-2A	/		11dBm/ MHz
U-NII-2C	/		11dBm/ MHz
U-NII-3	/		30 dBm/500kHz

9.2 Measurement Procedure

☒ For Average power spectral density test:

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator.
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz.
4. If measurement bandwidth of Maximum PSD is specified in 500 kHz, RBW = 100KHz
5. Set VBW $\geq [3 \times \text{RBW}]$.
6. Sweep Time=Auto couple.
7. Detector function=RMS (i.e., power averaging).
8. Trace average at least 100 traces in power averaging (rms) mode.
9. When the measurement bandwidth of Maximum PSD is specified in 100 kHz, add a constant factor $10 \times \log(500\text{kHz}/100\text{kHz}) = 6.99 \text{ dB}$ to the measured result.
10. Determine according to the duty cycle of the equipment: when it is less than 98%, follow the steps below.
11. Add $[10 \log (1/D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add $[10 \log (1/0.25)] = 6 \text{ dB}$ if the duty cycle is 25%.
12. Record the test results in the report.

9.3 Measurement Setup (Block Diagram of Configuration)



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9.4 Measurement Result

Test Data of Conducted Output Power Density for band 5.15-5.25 GHz				
Test Mode	Test Channel (MHz)	Average Power Density (dBm/MHz)	Limits (dBm/MHz)	Pass or Fail
802.11a	5180	-3.848	11	Pass
	5200	-3.657	11	Pass
	5240	-3.331	11	Pass
802.11n20	5180	-5.176	11	Pass
	5200	-4.938	11	Pass
	5240	-4.650	11	Pass
802.11n40	5190	-7.340	11	Pass
	5230	-6.948	11	Pass
802.11ac20	5180	-4.252	11	Pass
	5200	-4.733	11	Pass
	5240	-4.325	11	Pass
802.11ac40	5190	-7.479	11	Pass
	5230	-6.561	11	Pass
802.11ac80	5210	-8.747	11	Pass

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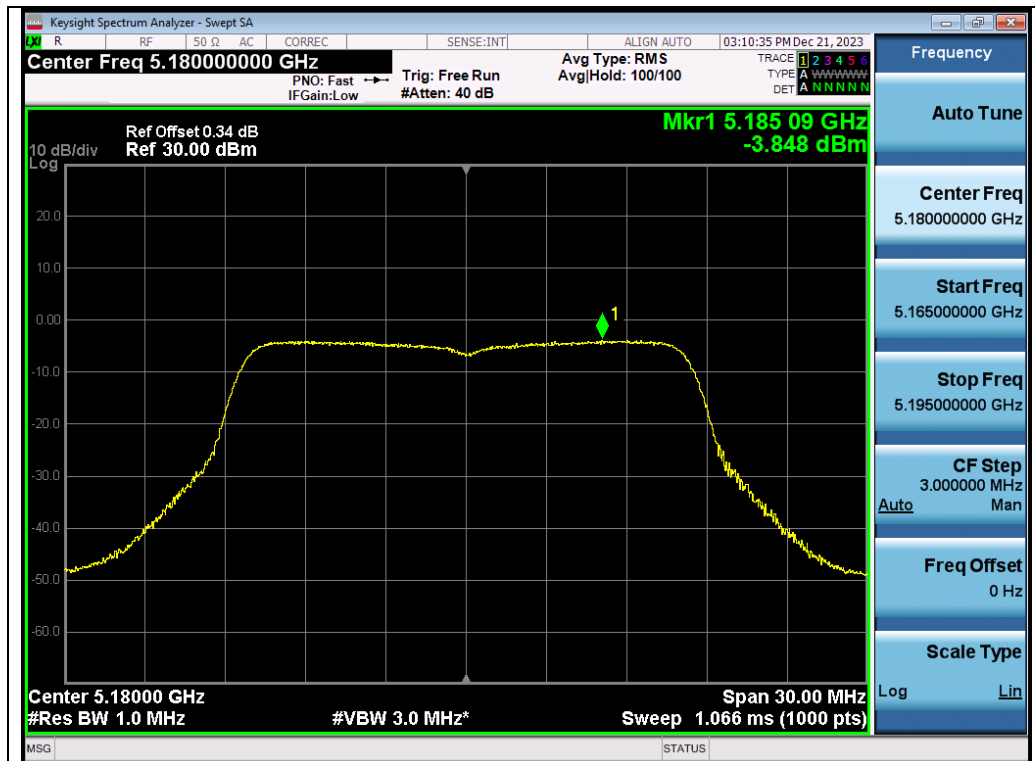
Test Data of Conducted Output Power Density for band 5.725-5.85 GHz					
Test Mode	Test Channel (MHz)	Average Power Density (dBm/100kHz)	Average Power Density (dBm/500kHz)	Limits (dBm/500kHz)	Pass or Fail
802.11a	5745	-12.983	-5.993	30	Pass
	5785	-12.865	-5.875	30	Pass
	5825	-12.528	-5.538	30	Pass
802.11n20	5745	-12.626	-5.636	30	Pass
	5785	-12.462	-5.472	30	Pass
	5825	-12.292	-5.302	30	Pass
802.11n40	5755	-15.095	-8.105	30	Pass
	5795	-15.433	-8.443	30	Pass
802.11ac20	5745	-13.125	-6.135	30	Pass
	5785	-12.471	-5.481	30	Pass
	5825	-12.727	-5.737	30	Pass
802.11ac40	5755	-15.594	-8.604	30	Pass
	5795	-15.125	-8.135	30	Pass
802.11ac80	5775	-16.566	-9.576	30	Pass

Note:1.Power density(dBm/500kHz) = Power density(dBm/100kHz)+10*log(500/100).

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Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd
Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/

Test Graphs of Conducted Output Power Spectral Density for band 5.15-5.25 GHz

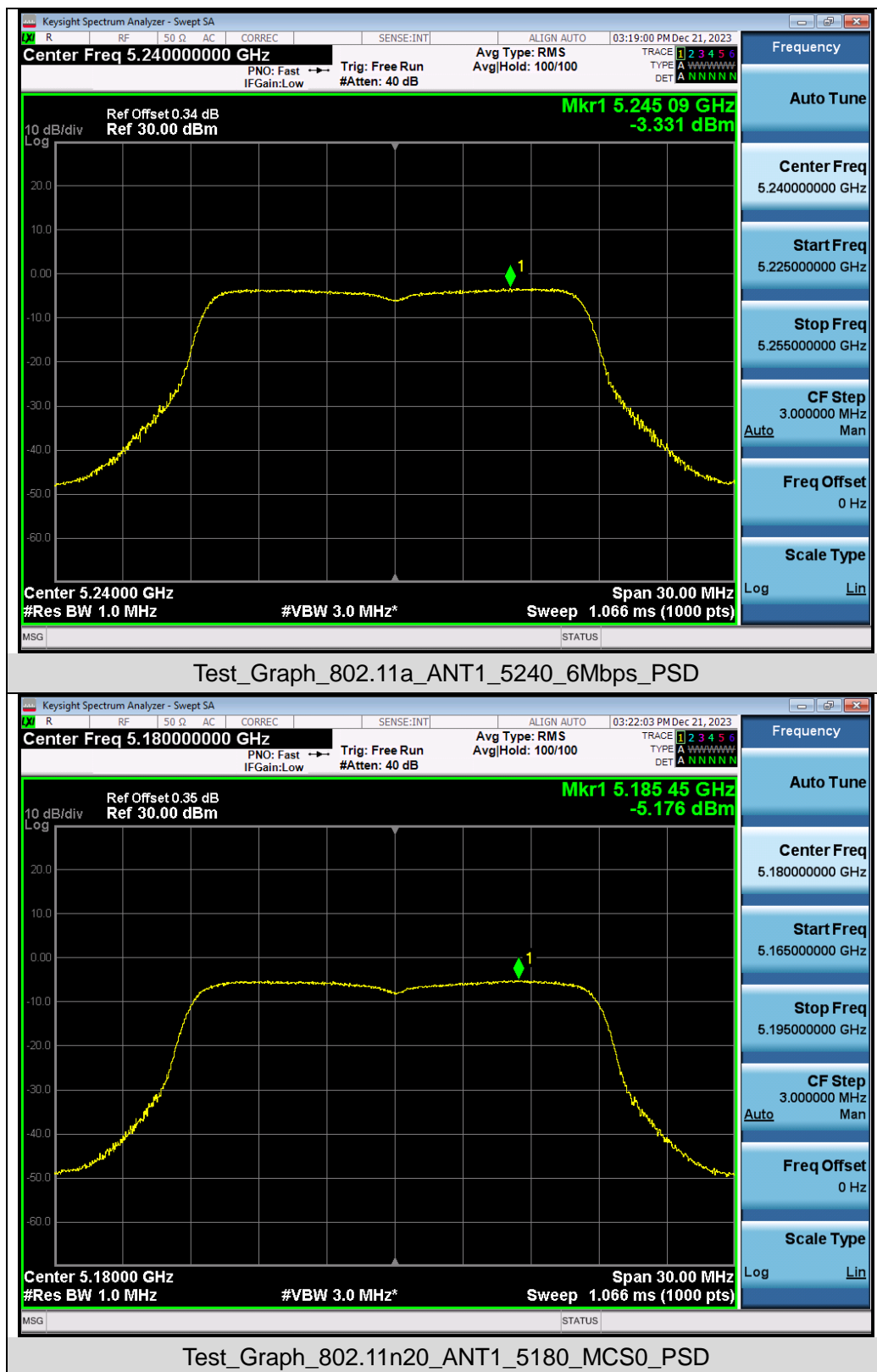


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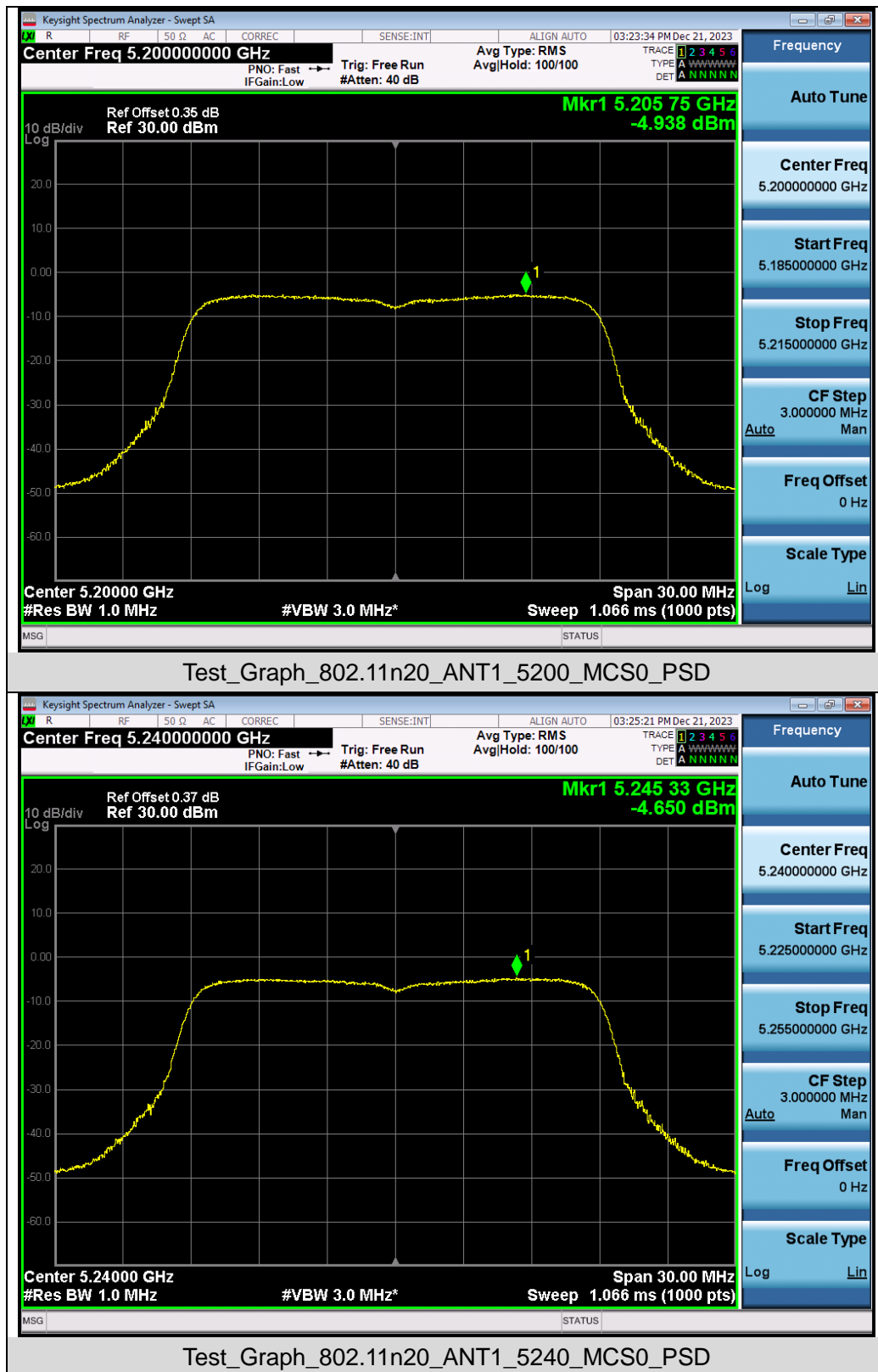


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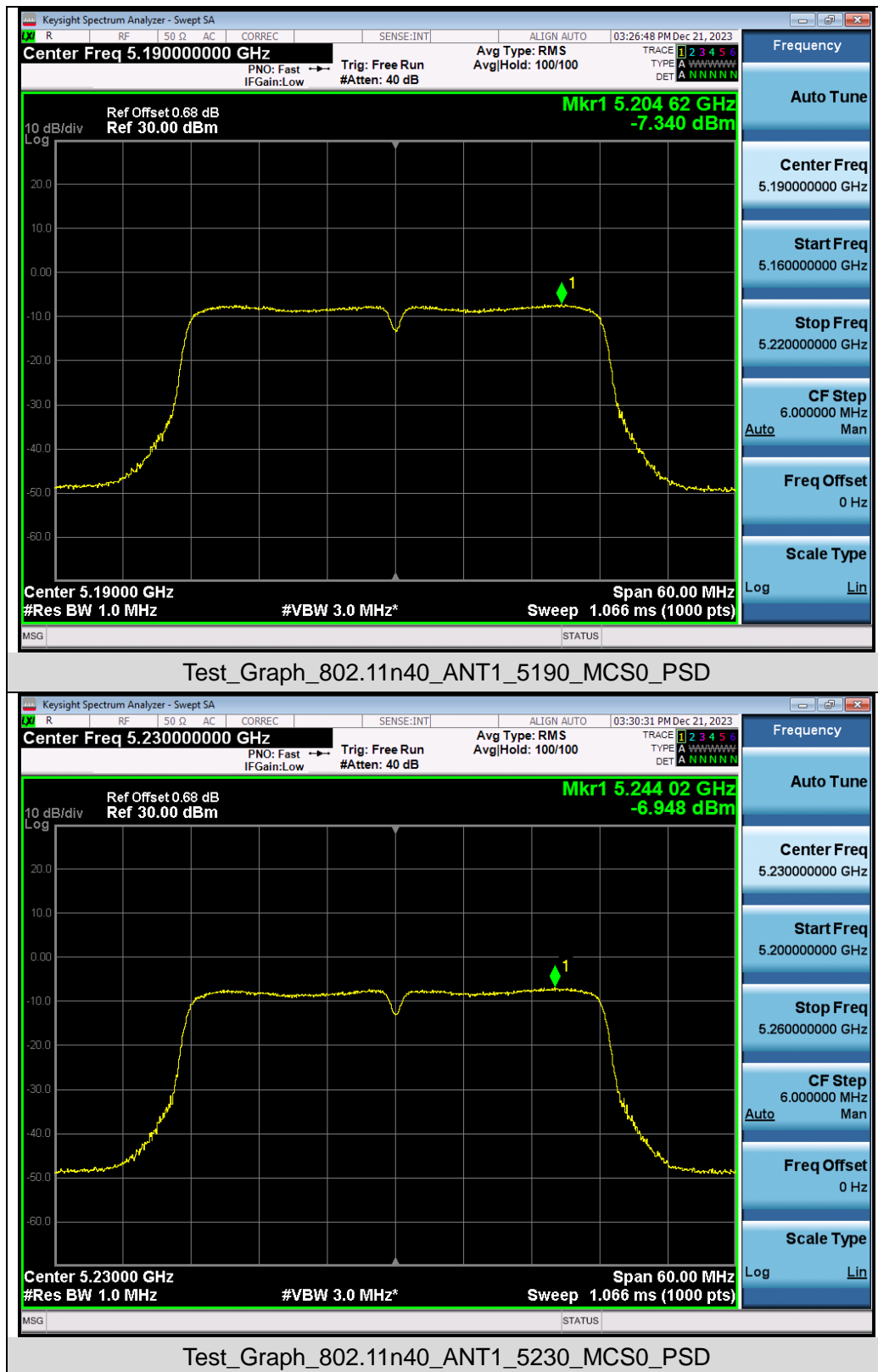
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