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# FCC Test Report

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Report No.: AGC02762230802FR03

**FCC ID** : 2AL26-KS4-US

**APPLICATION PURPOSE** : Original Equipment

**PRODUCT DESIGNATION** : Body Worn Camera

**BRAND NAME** : Reveal Media

**MODEL NAME** : KS4

**APPLICANT** : Reveal Media Limited

**DATE OF ISSUE** : Dec. 20, 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. 20, 2023	Valid	Initial Release

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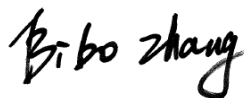
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## 1. General Information

Applicant	Reveal Media Limited
Address	Riverview House, 20 Old Bridge Street, Hampton Wick, KT1 4BU, United Kingdom
Manufacturer	Reveal Media Hong Kong Ltd.
Address	6/F., Luk Kwok Centre, 72 Gloucester Road, Wan Chai, HongKong
Factory	Reveal Media Hong Kong Ltd.
Address	6/F., Luk Kwok Centre, 72 Gloucester Road, Wan Chai, HongKong
Product Designation	Body Worn Camera
Brand Name	Reveal Media
Test Model	KS4
Series Model(s)	N/A
Difference Description	N/A
Date of receipt of test item	Aug. 03, 2023
Date of Test	Aug. 03, 2023~ Dec. 20, 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



Bibo Zhang  
(Project Engineer)

Dec. 20, 2023

Reviewed By



Calvin Liu  
(Reviewer)

Dec. 20, 2023

Approved By



Max Zhang  
Authorized Officer

Dec. 20, 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 checked="" type="checkbox"/> U-NII 2C:5470MHz~5725MHz	<input checked="" 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	EP-VRM05RFB-02	
Software Version	V1.0	
Test Frequency Range	For 802.11a/n-HT20/ac-VHT20: 5180~5240MHz, 5260~5320MHz, 5500~5720MHz, 5745~5825MHz For 802.11n-HT40/ac-VHT40: 5190~5230MHz, 5270~5310MHz, 5510~5710MHz, 5755~5795MHz For 802.11ac-VHT80: 5210MHz, 5290MHz, 5530~5690MHz, 5775MHz	
RF Output Power	IEEE 802.11a(HT20):13.28dBm; IEEE 802.11n(HT20):11.78dBm; IEEE802.11n(HT40):11.48dBm; IEEE 802.11ac(VHT20):11.86dBm; IEEE802.11ac(VHT40):12.84dBm; IEEE802.11ac(VHT80):13.28dBm;	
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 7 channels of U- NII-2A Band 12 channels of U-NII-2C Band 8 channels of U- NII 3 Band	
Antenna Designation	Iron Antenna	
Antenna Gain	1.83dBi	
Power Supply	DC 3.8V 1000mAh by battery	

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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 5260~5320MHz:

5 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), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
58	5290 MHz	--	--

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**For 5500~5720MHz:**

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz		

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz		

**2 channel is provided for 802.11ac (VHT80):**

Channel	Frequency	Channel	Frequency
106	5530 MHz	122	5610 MHz

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**For 5745~5825MHz:**

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

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

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

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

**1 channel is provided for 802.11ac (VHT80):**

Channel	Frequency	Channel	Frequency
155	5775 MHz	--	--

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### 2.3 IEEE 802.11n Modulation Scheme

MCS Index	N <sub>ss</sub>	Modulation	R	N <sub>BPSC</sub>	N <sub>CBPS</sub>		N <sub>DBPS</sub>		Data rate (Mbps)	
					20MHz	40MHz	20MHz	40MHz	800nsGI	
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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## 2.5 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for **FCC ID: 2AL26-KS4-US** filing to comply with the FCC Part 15 requirements.

## 2.6 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

## 2.7 Special Accessories

Refer to section 4.4.

## 2.8 Equipment Modifications

Not available for this EUT intended for grant.

## 2.9 Antenna Requirement

Standard Requirement
<b>15.203 requirement:</b> 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.
<b>EUT Antenna:</b> The non-detachable antenna inside the device cannot be replaced by the user at will. The gain is 1.83 dBi

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## 2.10 Description of Test Software

### **For IEEE 802.11 mode:**

The test software is the WL Command which can set the EUT into the individual test modes.

Test Mode	Channel	Power Index
802.11a	L/M/H	15
802.11n(HT20)	L/M/H	13
802.11n(HT40)	L/M/H	13
802.11ac(VHT20)	L/M/H	14
802.11ac(VHT40)	L/M/H	13
802.11ac(VHT80)	L/M/H	12

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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 3.8V

### 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 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 type="checkbox"/>	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2021-10-31	2023-10-30
<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-A119	2.4G Filter	SongYi	N/A	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-E023	AMN	R&S	100086	ESH2-Z5	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

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

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## 4. System Test Configuration

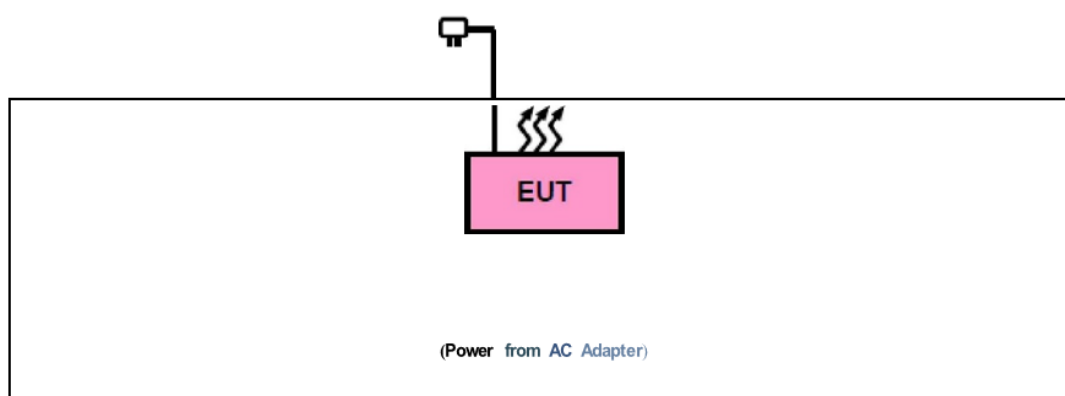
### 4.1 EUT Configuration

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	Huawei adapter	HW-200325CP0	huawei	Input: AC 100-240V 50/60Hz, 1.8A Output: DC 5V 2A	1.0m unshielded

☒ Test Accessories Come From The Manufacturer

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Battery	ICR011GB	ICON ENERGY SYSTEM (SHENZHEN) CO.,LTD	DC 3.8V 1000mAh	--

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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	RF Output Power	Pass
3	§15.407	6 dB Bandwidth	Pass
4	§2.1049	99% Occupied Bandwidth	Pass
5	§15.407	Power Spectral Density	Pass
6	§15.407	Conducted Band Edge and Out-of-Band Emissions	Pass
7	§15.209	Radiated Spurious Emission	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"/>	--	Powered by Adapter with WIFI(5G) Link
B	--	--	--	<input checked="" type="checkbox"/>	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	802.11n	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
A	802.11n	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
A	802.11n	5500-5700	100 to 140	100, 116, 140	OFDM	6.0
A	802.11n	5745-5825	149 to 165	149, 157, 165	OFDM	6.0

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● **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(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 device under test has multiple antennas. The mode that supports MIMO technology records the worst data, and the mode that does not support MIMO technology records antenna 1 as the worst data.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

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

● **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	802.11n (20MHz)	5180-5240	36	36	OFDM	6.5
A	802.11n (40MHz)		38	38	OFDM	13.5
A	802.11ac (80MHz)		42	42	OFDM	29.3
A	802.11n (20MHz)	5260-5320	52,	52,	OFDM	6.5
A	802.11n (40MHz)		54	54	OFDM	13.5
A	802.11ac (80MHz)		58	58	OFDM	29.3
A	802.11n (20MHz)	5500-5700	100	100	OFDM	6.5
A	802.11n (40MHz)		102	102	OFDM	13.5
A	802.11ac (80MHz)		106	106	OFDM	29.3
A	802.11n (20MHz)	5745-5825	149	149	OFDM	6.5
A	802.11n (40MHz)		151	151	OFDM	13.5
A	802.11ac (80MHz)		155	155	OFDM	29.3

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● **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)
B	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
B	802.11n (20MHz)		36 to 48	36, 40, 48	OFDM	6.5
B	802.11n (40MHz)		38 to 46	38, 46	OFDM	13.5
B	802.11ac (20MHz)		36 to 48	36, 40, 48	OFDM	6.5
B	802.11ac (40MHz)		38 to 46	38, 46	OFDM	13.5
B	802.11ac (80MHz)		42	42	OFDM	29.3
B	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
B	802.11n (20MHz)		52 to 64	52, 60, 64	OFDM	6.5
B	802.11n (40MHz)		54 to 62	54, 62	OFDM	13.5
B	802.11ac (20MHz)		52 to 64	52, 60, 64	OFDM	6.5
B	802.11ac (40MHz)		54 to 62	54, 62	OFDM	13.5
B	802.11ac (80MHz)		58	58	OFDM	29.3
B	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	6.0
B	802.11n (20MHz)		100 to 140	100, 116, 140	OFDM	6.5
B	802.11n (40MHz)		102 to 134	102, 110, 134	OFDM	13.5
B	802.11ac (20MHz)		100 to 140	100, 116, 140	OFDM	6.5
B	802.11ac (40MHz)		102 to 134	102, 110, 134	OFDM	13.5
B	802.11ac (80MHz)		106	106, 122	OFDM	29.3
B	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
B	802.11n (20MHz)		149 to 165	149, 157, 165	OFDM	6.5
B	802.11n (40MHz)		151 to 159	151, 159	OFDM	13.5
B	802.11ac (20MHz)		149 to 165	149, 157, 165	OFDM	6.5
B	802.11ac (40MHz)		151 to 159	151, 159	OFDM	13.5
B	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	93	0.32	0.70	-0.63
802.11n_HT20	MCS0	95	0.22	0.52	-0.45
802.11n_HT40	MCS0	90	0.46	1.06	-0.92
802.11ac_VHT20	MCS0	93	0.32	0.74	-0.63
802.11ac_VHT40	MCS0	87	0.60	1.50	-1.21
802.11ac_VHT80	MCS0	77	1.14	3.00	-2.27
Band U-NII 2A:5250MHz-5350MHz					
802.11a	6	93	0.32	0.70	-0.63
802.11n_HT20	MCS0	95	0.22	0.52	-0.45
802.11n_HT40	MCS0	90	0.45	1.06	-0.92
802.11ac_VHT20	MCS0	93	0.32	0.74	-0.63
802.11ac_VHT40	MCS0	87	0.60	1.49	-1.21
802.11ac_VHT80	MCS0	77	1.14	2.99	-2.27

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Operating mode	Data rates (Mbps)	Duty Cycle (%)	Duty Cycle Factor (dB)	1/ T Minimum VBW (kHz)	Average Factor (dB)
Band U-NII 2C:5470MHz-5725MHz					
802.11a	6	93	0.32	0.70	-0.63
802.11n_HT20	MCS0	95	0.22	0.52	-0.45
802.11n_HT40	MCS0	90	0.46	1.06	-0.92
802.11ac_VHT20	MCS0	93	0.32	0.75	-0.63
802.11ac_VHT40	MCS0	87	0.60	1.50	-1.21
802.11ac_VHT80	MCS0	76	1.19	3.00	-2.38
Band U-NII 3:5725MHz-5850MHz					
802.11a	6	93	0.32	0.70	-0.63
802.11n_HT20	MCS0	95	0.22	0.52	-0.45
802.11n_HT40	MCS0	90	0.46	1.06	-0.92
802.11ac_VHT20	MCS0	93	0.32	0.74	-0.63
802.11ac_VHT40	MCS0	87	0.60	1.49	-1.21
802.11ac_VHT80	MCS0	77	1.14	3.00	-2.27

Remark:

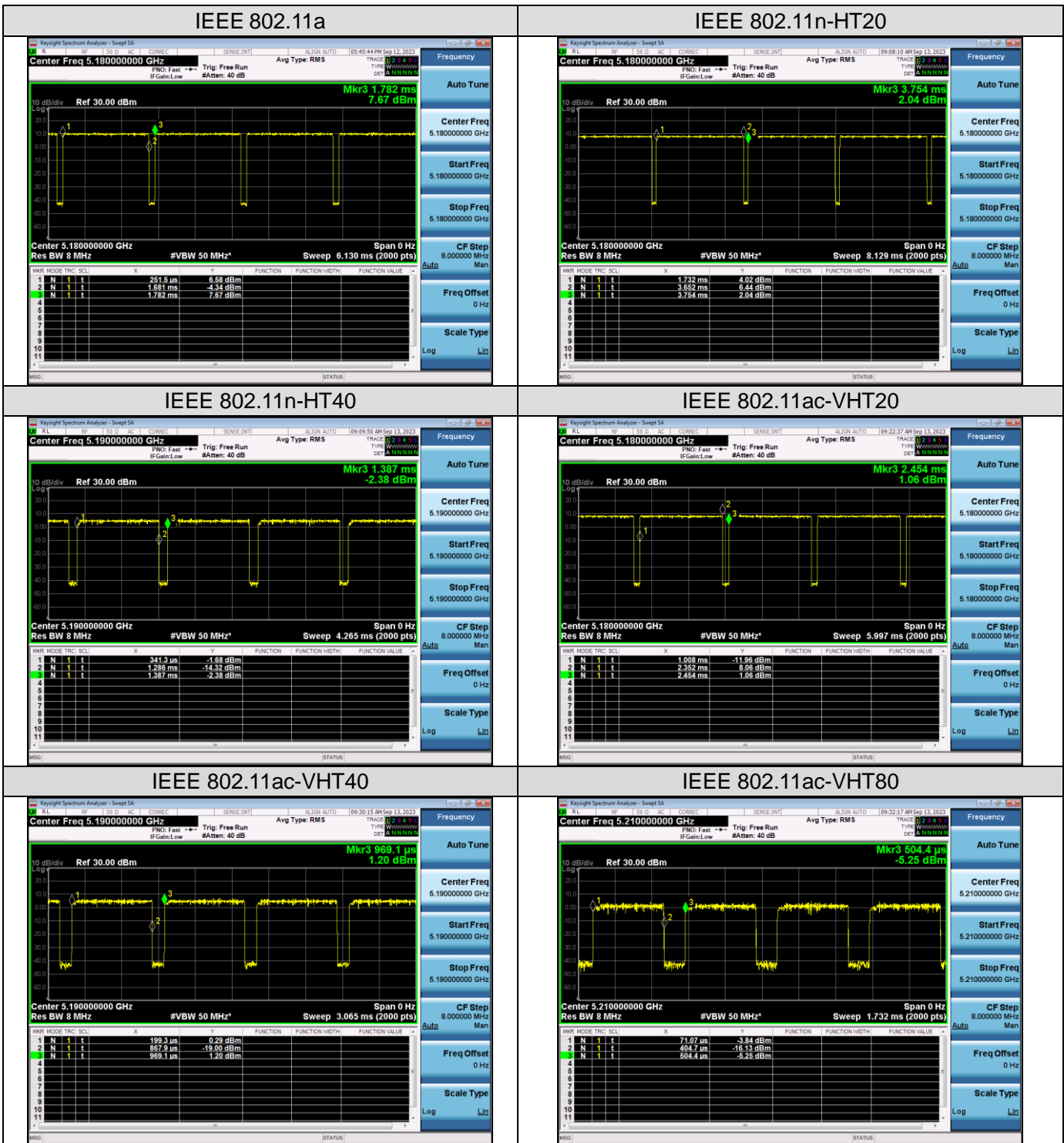
1. Duty Cycle factor =  $10 * \log (1/ \text{Duty cycle})$  , Average factor =  $20 \log_{10} \text{Duty Cycle}$
2. The duty cycle of each frequency band mode reflects the determination requirements of the low channel measurement value.
3. Involving the test items of duty cycle compensation coefficient,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

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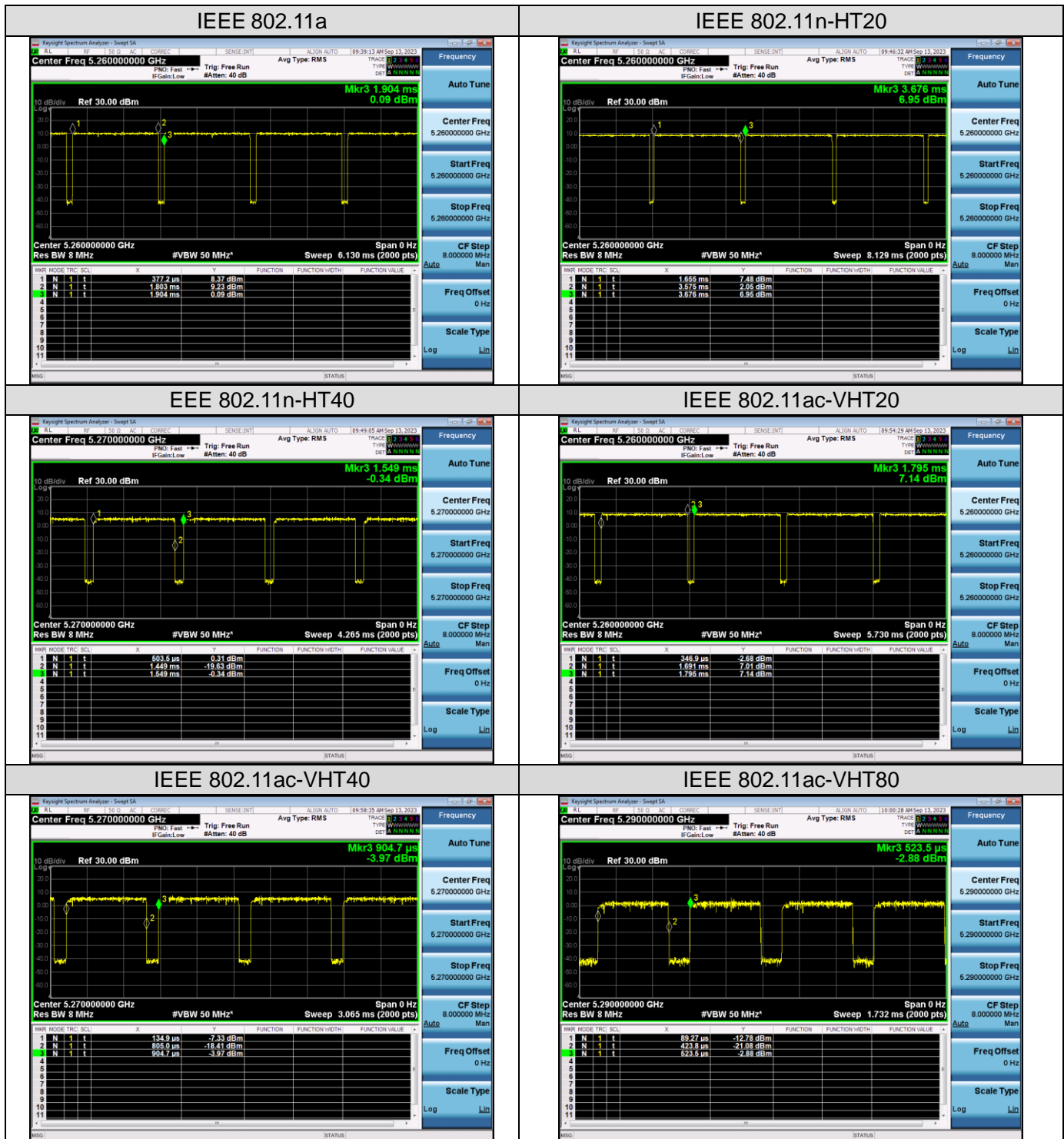


The test plots as follows:

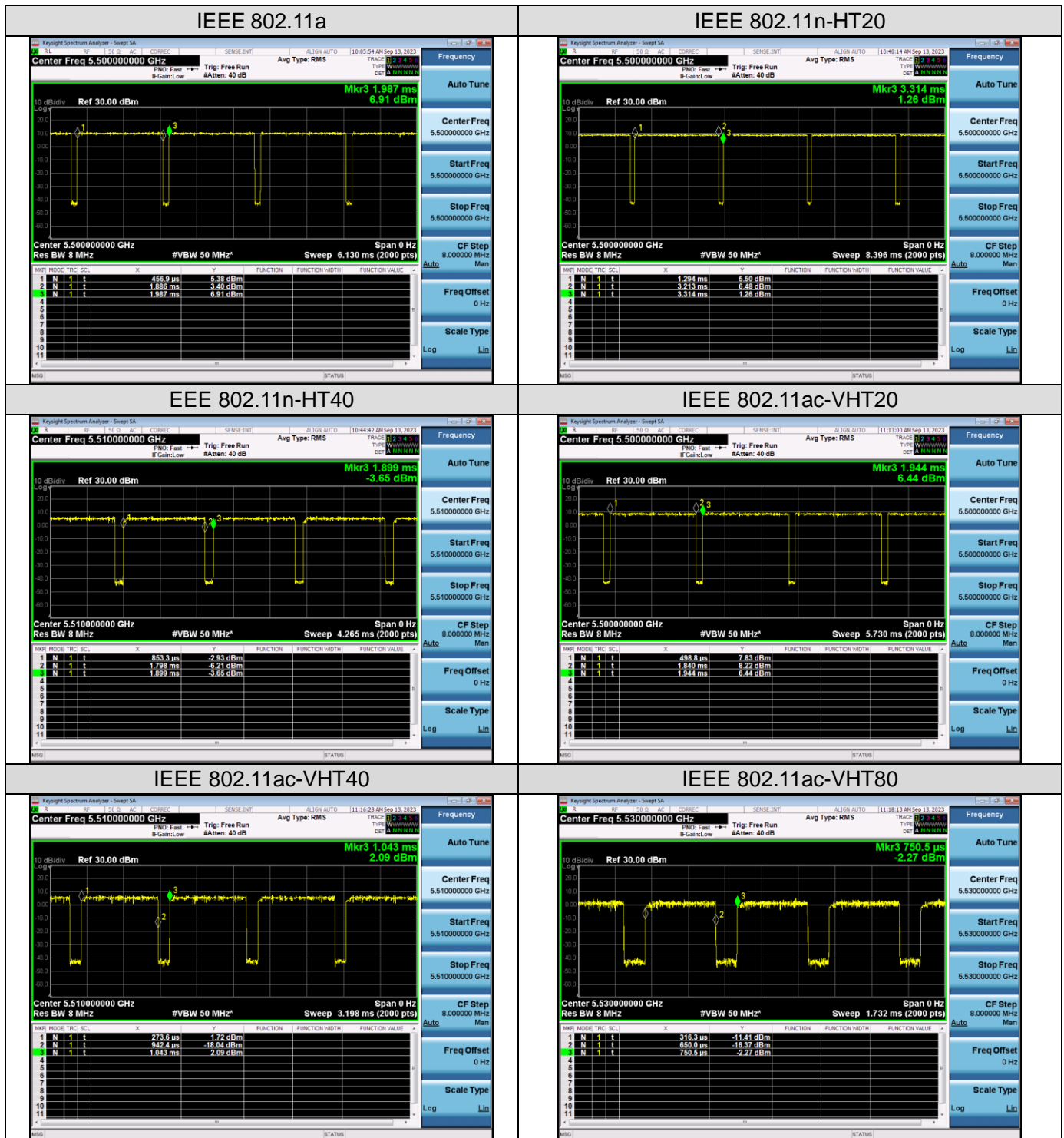


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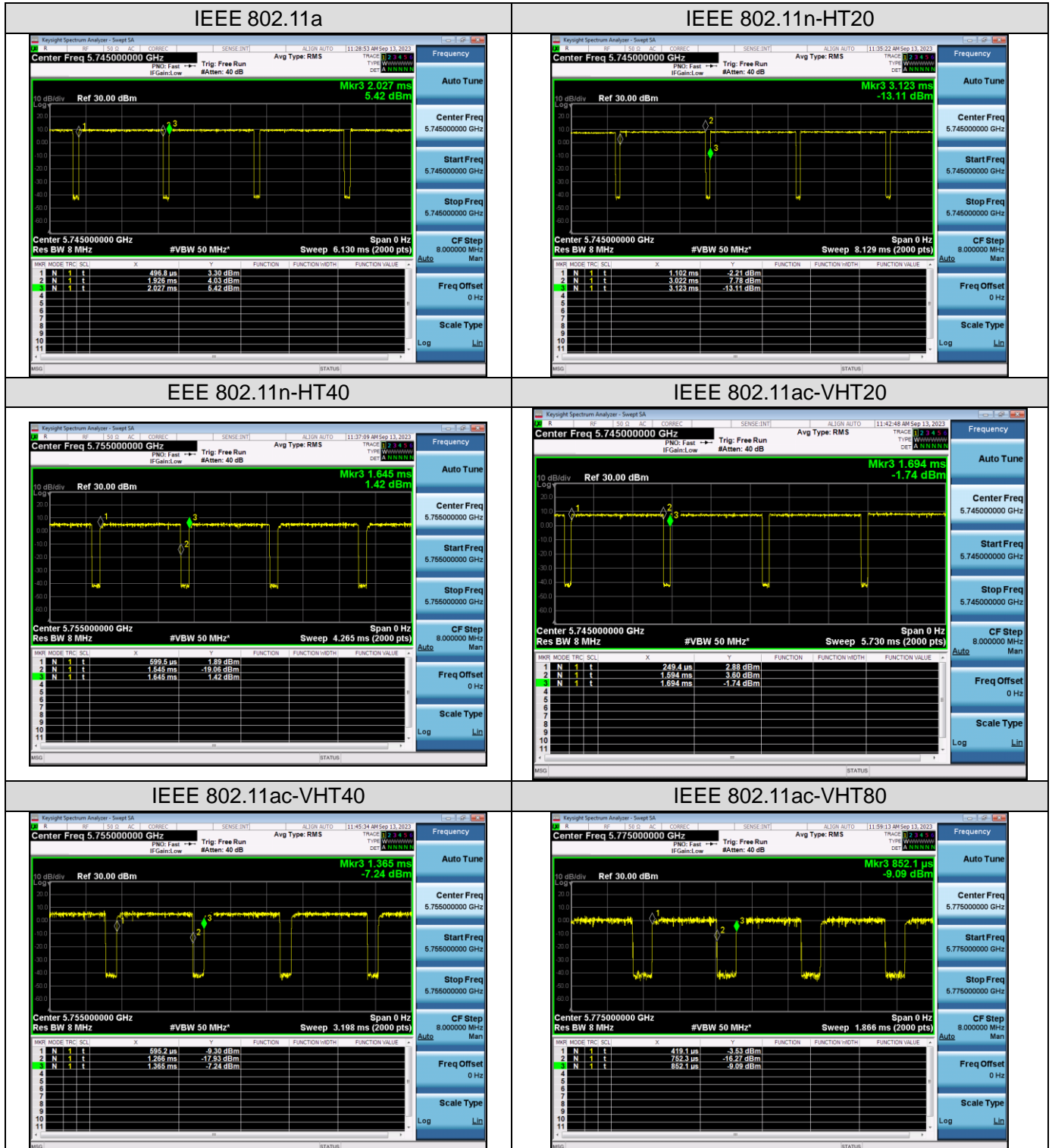


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## 7. RF Output Power Measurement

### 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.

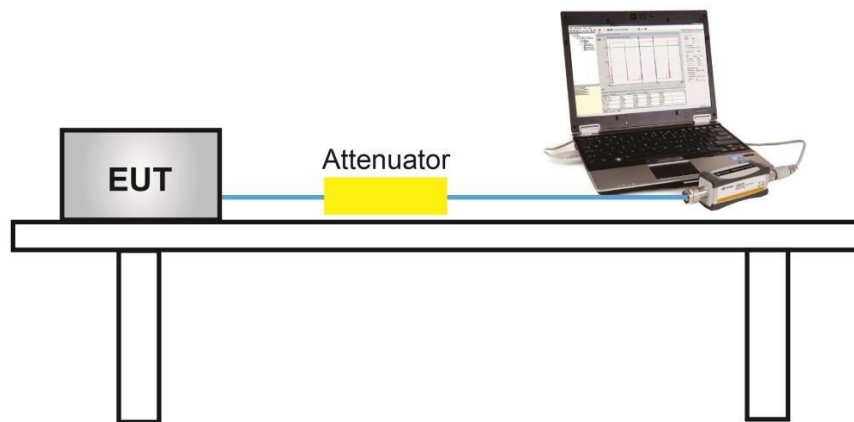
### 7.2 Measurement Procedure

☒ 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	12.48	23.98	Pass
	5200	12.67	23.98	Pass
	5240	12.92	23.98	Pass
802.11n20	5180	10.71	23.98	Pass
	5200	11.06	23.98	Pass
	5240	11.16	23.98	Pass
802.11n40	5190	10.58	23.98	Pass
	5230	10.90	23.98	Pass
802.11ac20	5180	10.93	23.98	Pass
	5200	11.19	23.98	Pass
	5240	11.38	23.98	Pass
802.11ac40	5190	11.10	23.98	Pass
	5230	11.24	23.98	Pass
802.11ac80	5210	10.64	23.98	Pass

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Test Data of Conducted Output Power for band 5.25-5.35 GHz				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5260	12.57	23.98	Pass
	5300	12.76	23.98	Pass
	5320	12.78	23.98	Pass
802.11n20	5260	11.35	23.98	Pass
	5300	11.64	23.98	Pass
	5320	11.78	23.98	Pass
802.11n40	5270	11.10	23.98	Pass
	5310	11.39	23.98	Pass
802.11ac20	5260	11.43	23.98	Pass
	5300	11.72	23.98	Pass
	5320	11.86	23.98	Pass
802.11ac40	5270	11.30	23.98	Pass
	5310	11.57	23.98	Pass
802.11ac80	5290	11.05	23.98	Pass

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Test Data of Conducted Output Power for band 5.470-5.725 GHz				
Test Mode	Test Channel (MHz)	Average Power (dBm)	Limits (dBm)	Pass or Fail
802.11a	5500	12.84	23.98	Pass
	5580	13.28	23.98	Pass
	5700	12.79	23.98	Pass
802.11n20	5500	11.73	23.98	Pass
	5580	11.90	23.98	Pass
	5700	11.44	23.98	Pass
802.11n40	5510	11.47	23.98	Pass
	5590	11.48	23.98	Pass
	5670	11.27	23.98	Pass
802.11ac20	5500	11.74	23.98	Pass
	5580	11.78	23.98	Pass
	5700	11.53	23.98	Pass
802.11ac40	5510	11.62	23.98	Pass
	5590	10.93	23.98	Pass
	5670	12.84	23.98	Pass
802.11ac80	5530	13.28	23.98	Pass
	5610	12.79	23.98	Pass
	5610	11.73	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	12.04	30	Pass
	5785	11.77	30	Pass
	5825	11.02	30	Pass
802.11n20	5745	10.74	30	Pass
	5785	10.22	30	Pass
	5825	9.72	30	Pass
802.11n40	5755	10.58	30	Pass
	5795	9.90	30	Pass
802.11ac20	5745	10.67	30	Pass
	5785	10.34	30	Pass
	5825	9.81	30	Pass
802.11ac40	5755	10.71	30	Pass
	5795	10.15	30	Pass
802.11ac80	5775	9.87	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:

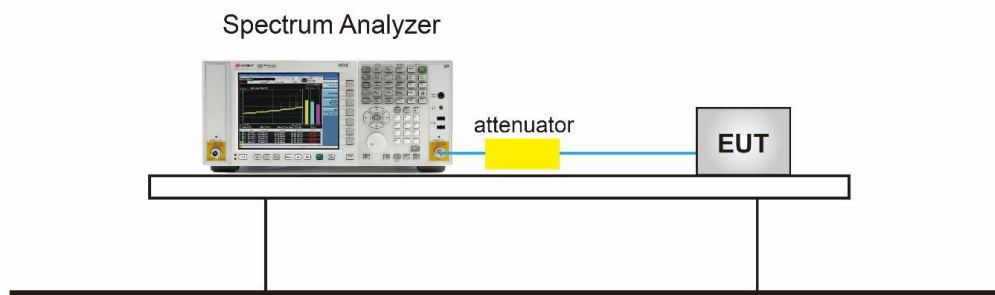
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set Span = approximately 1.5 to 5 times the OBW, centered on a nominal channel  
The nominal IF filter bandwidth (3 dB RBW) shall 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	16.616	21.170	N/A	Pass
	5200	16.645	21.025	N/A	Pass
	5240	16.597	21.341	N/A	Pass
802.11n20	5180	17.745	21.331	N/A	Pass
	5200	17.758	21.386	N/A	Pass
	5240	17.733	21.189	N/A	Pass
802.11n40	5190	36.151	39.451	N/A	Pass
	5230	36.154	39.515	N/A	Pass
802.11ac20	5180	17.749	21.322	N/A	Pass
	5200	17.720	21.515	N/A	Pass
	5240	17.756	21.349	N/A	Pass
802.11ac40	5190	36.165	39.497	N/A	Pass
	5230	36.105	39.438	N/A	Pass
802.11ac80	5210	75.542	80.213	N/A	Pass

Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.25-5.35 GHz					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5260	16.624	21.054	N/A	Pass
	5300	16.586	20.922	N/A	Pass
	5320	16.604	20.943	N/A	Pass
802.11n20	5260	17.769	21.403	N/A	Pass
	5300	17.702	21.279	N/A	Pass
	5320	17.733	21.131	N/A	Pass
802.11n40	5270	36.195	39.550	N/A	Pass
	5310	36.237	39.708	N/A	Pass
802.11ac20	5260	17.773	21.433	N/A	Pass
	5300	17.692	21.161	N/A	Pass
	5320	17.716	21.214	N/A	Pass
802.11ac40	5270	36.138	39.576	N/A	Pass
	5310	36.145	39.435	N/A	Pass
802.11ac80	5290	75.512	80.412	N/A	Pass

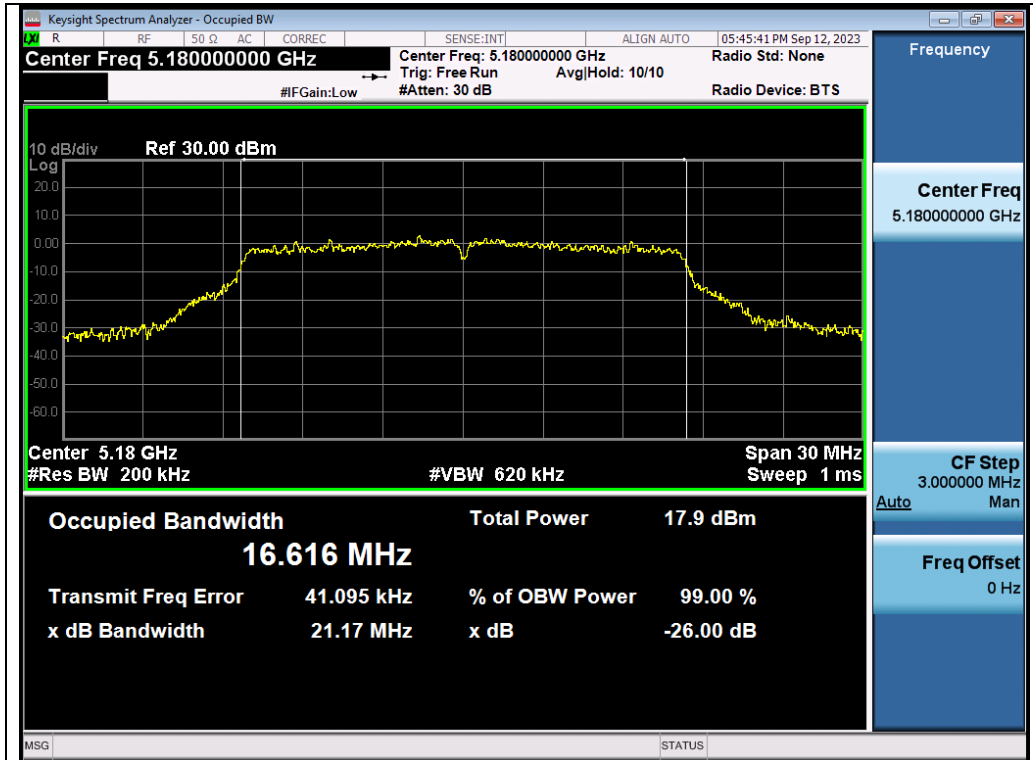
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Test Data of Occupied Bandwidth and -26dB Bandwidth for band 5.47-5.725 GHz					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5500	16.586	21.108	N/A	Pass
	5600	16.743	26.561	N/A	Pass
	5700	16.594	20.975	N/A	Pass
802.11n20	5500	17.726	21.212	N/A	Pass
	5600	17.747	21.231	N/A	Pass
	5700	17.742	21.299	N/A	Pass
802.11n40	5510	36.170	39.429	N/A	Pass
	5590	36.195	39.418	N/A	Pass
	5670	36.146	39.244	N/A	Pass
802.11ac20	5500	17.729	21.490	N/A	Pass
	5600	17.727	21.175	N/A	Pass
	5700	17.731	21.326	N/A	Pass
802.11ac40	5510	36.136	39.380	N/A	Pass
	5590	36.117	39.237	N/A	Pass
	5670	36.158	39.521	N/A	Pass
802.11ac80	5530	75.551	80.606	N/A	Pass
	5610	75.627	80.571	N/A	Pass

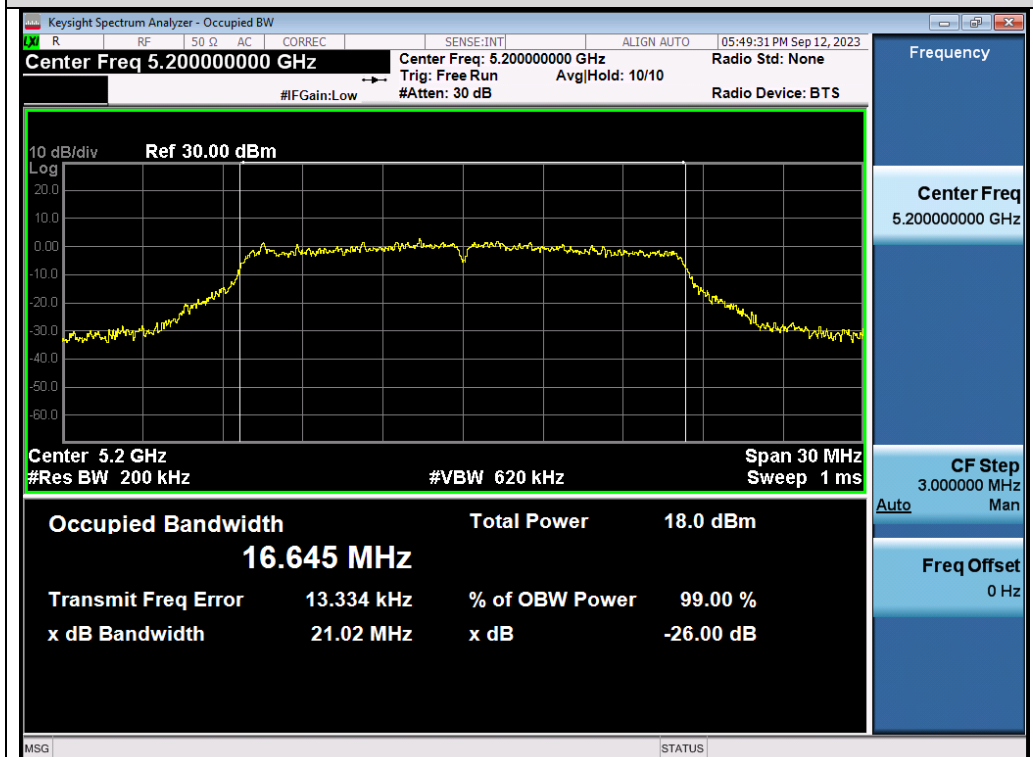
Test Data of Occupied Bandwidth and DTS Bandwidth for band 5.725-5.85 GHz					
Test Mode	Test Channel (MHz)	99% Occupied Bandwidth (MHz)	DTS Bandwidth (MHz)	Limits (MHz)	Pass or Fail
802.11a	5745	16.591	16.326	0.5	Pass
	5785	16.612	16.339	0.5	Pass
	5825	16.603	16.340	0.5	Pass
802.11n20	5745	17.742	17.601	0.5	Pass
	5785	17.731	17.533	0.5	Pass
	5825	17.758	17.576	0.5	Pass
802.11n40	5755	36.169	35.590	0.5	Pass
	5795	36.137	36.316	0.5	Pass
802.11ac20	5745	17.744	17.576	0.5	Pass
	5785	17.705	17.572	0.5	Pass
	5825	17.728	17.288	0.5	Pass
802.11ac40	5755	36.136	36.277	0.5	Pass
	5795	36.153	36.264	0.5	Pass
802.11ac80	5775	75.610	75.269	0.5	Pass

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

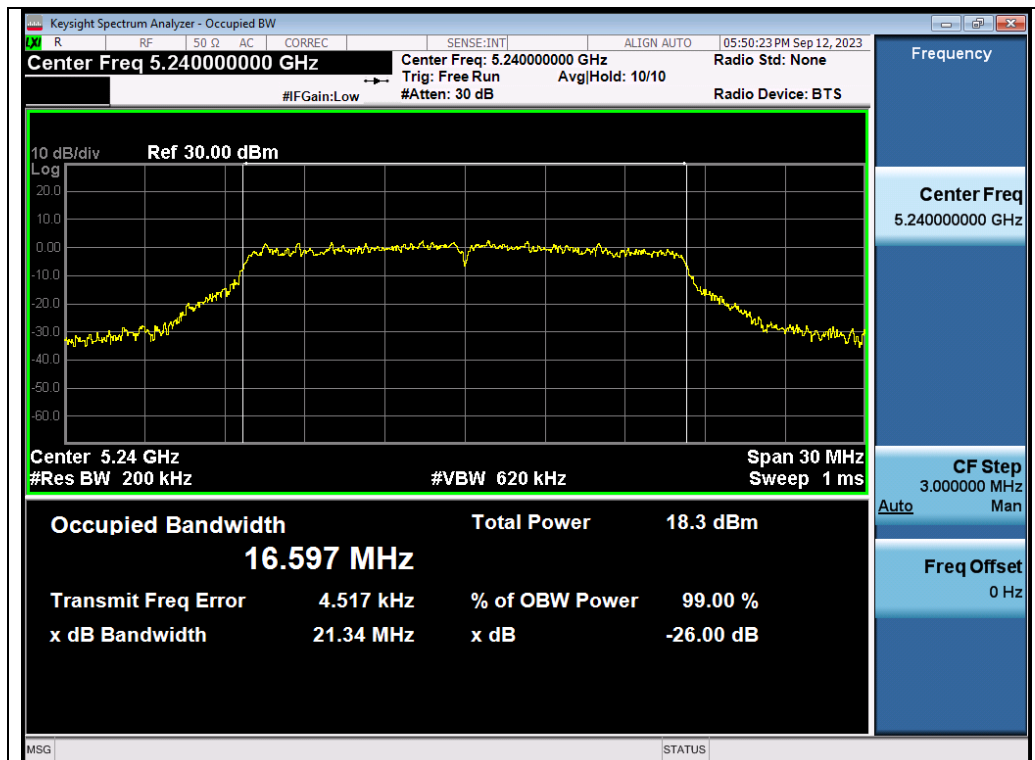


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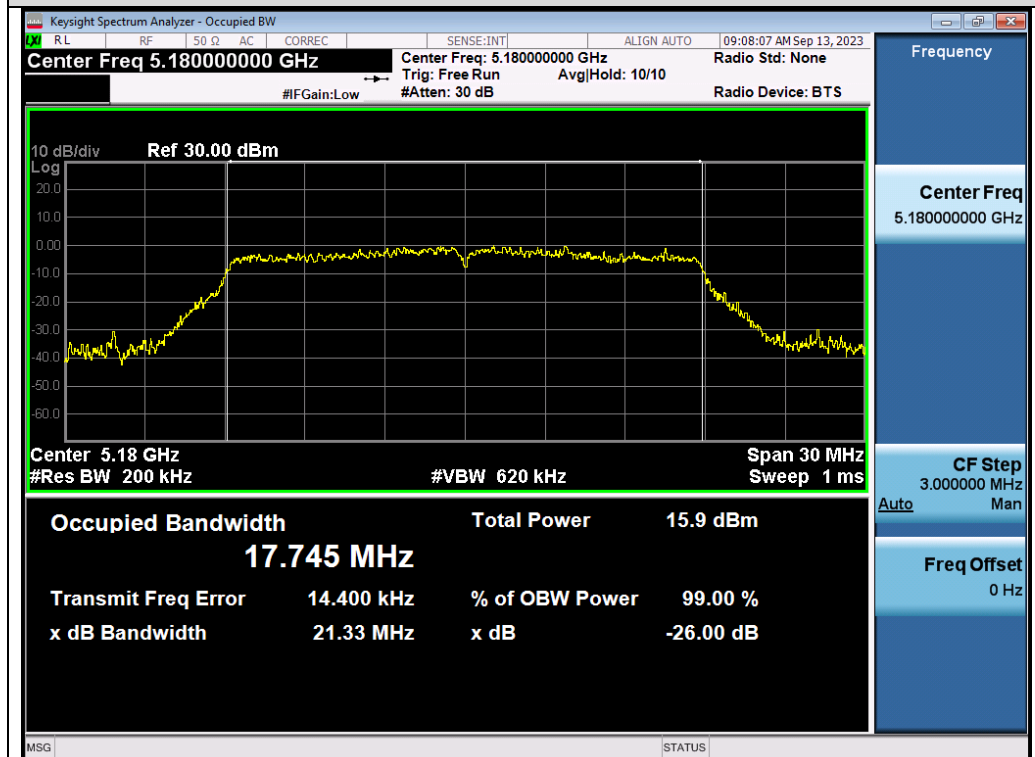


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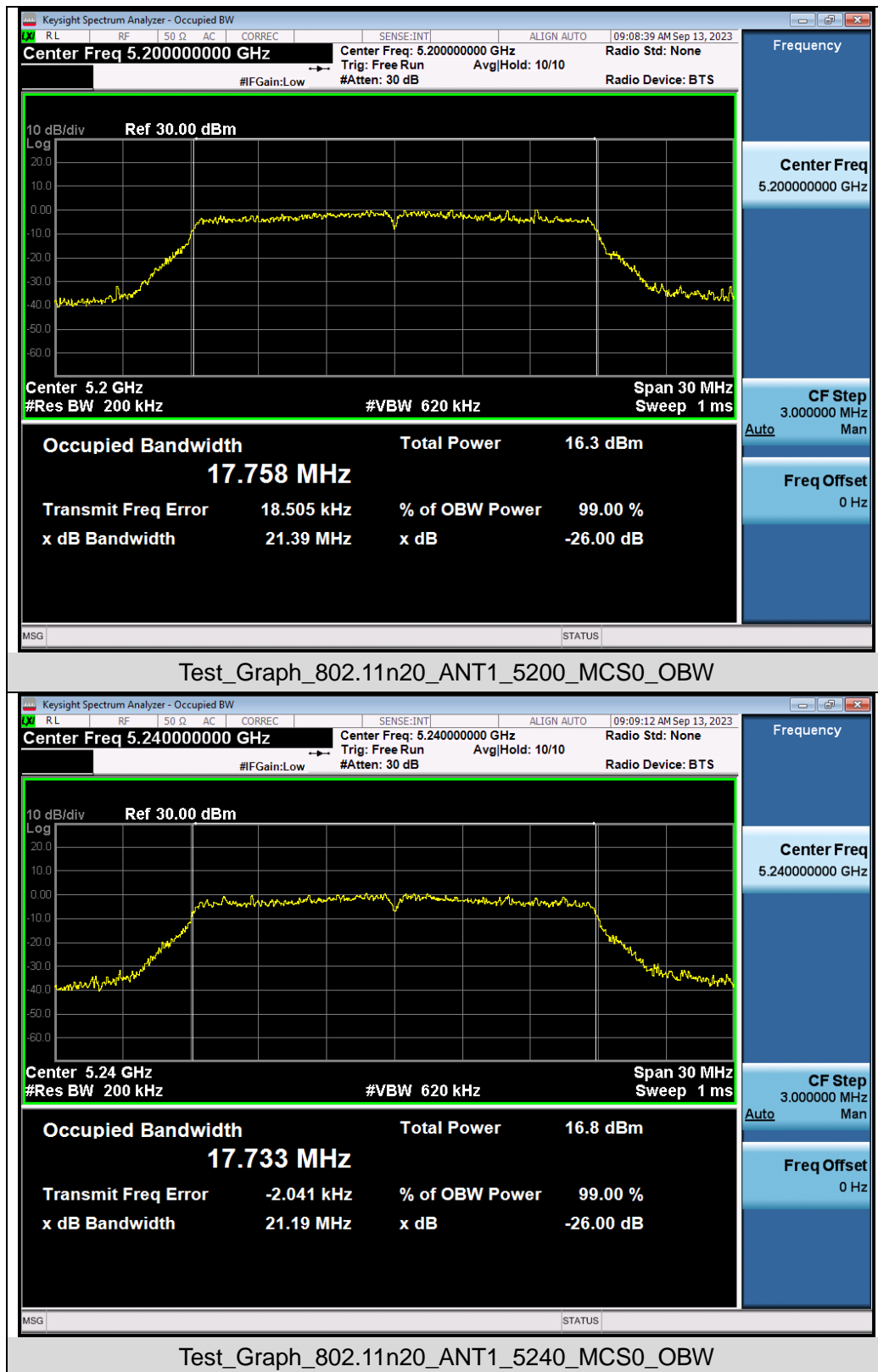
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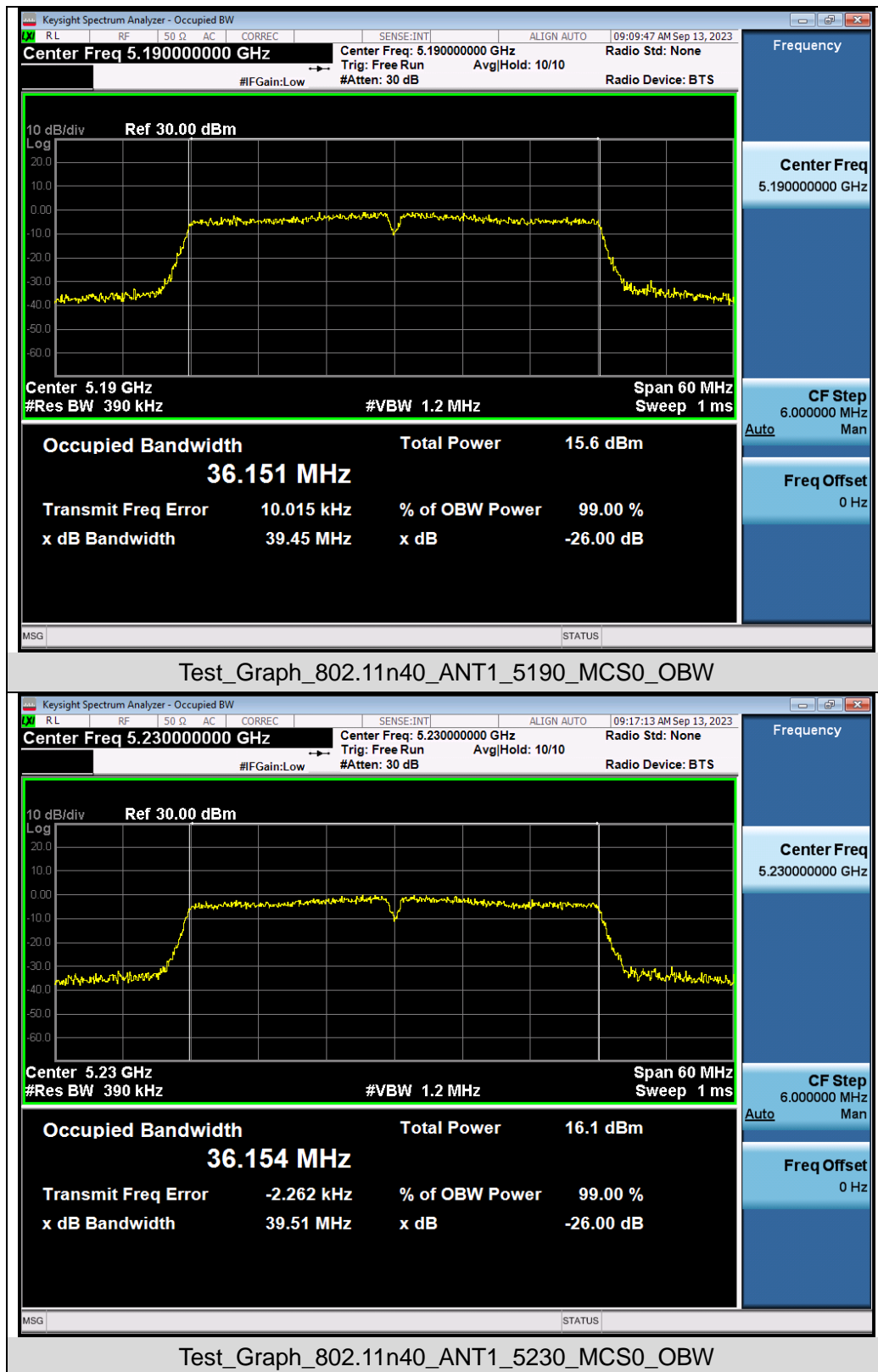
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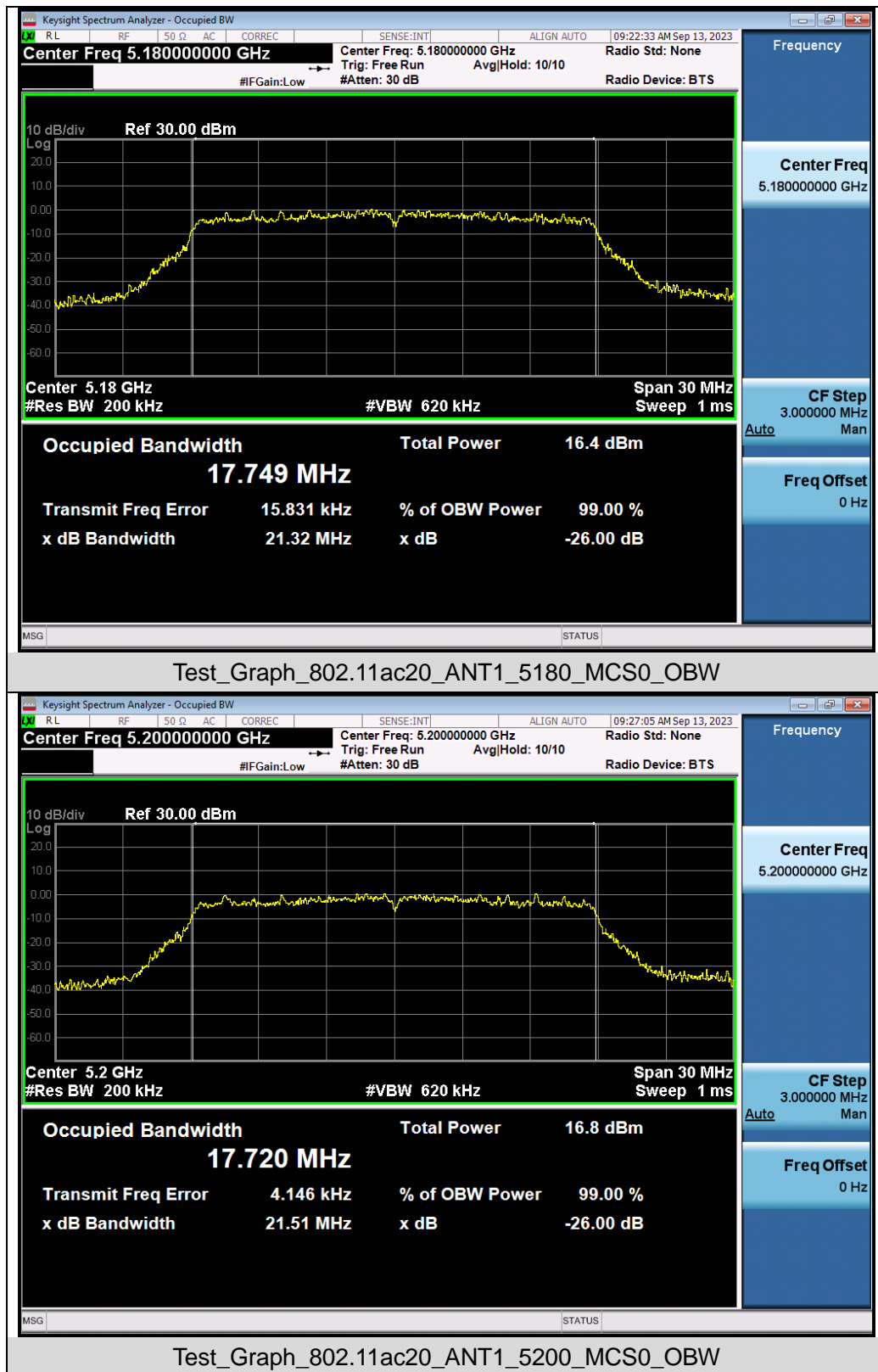




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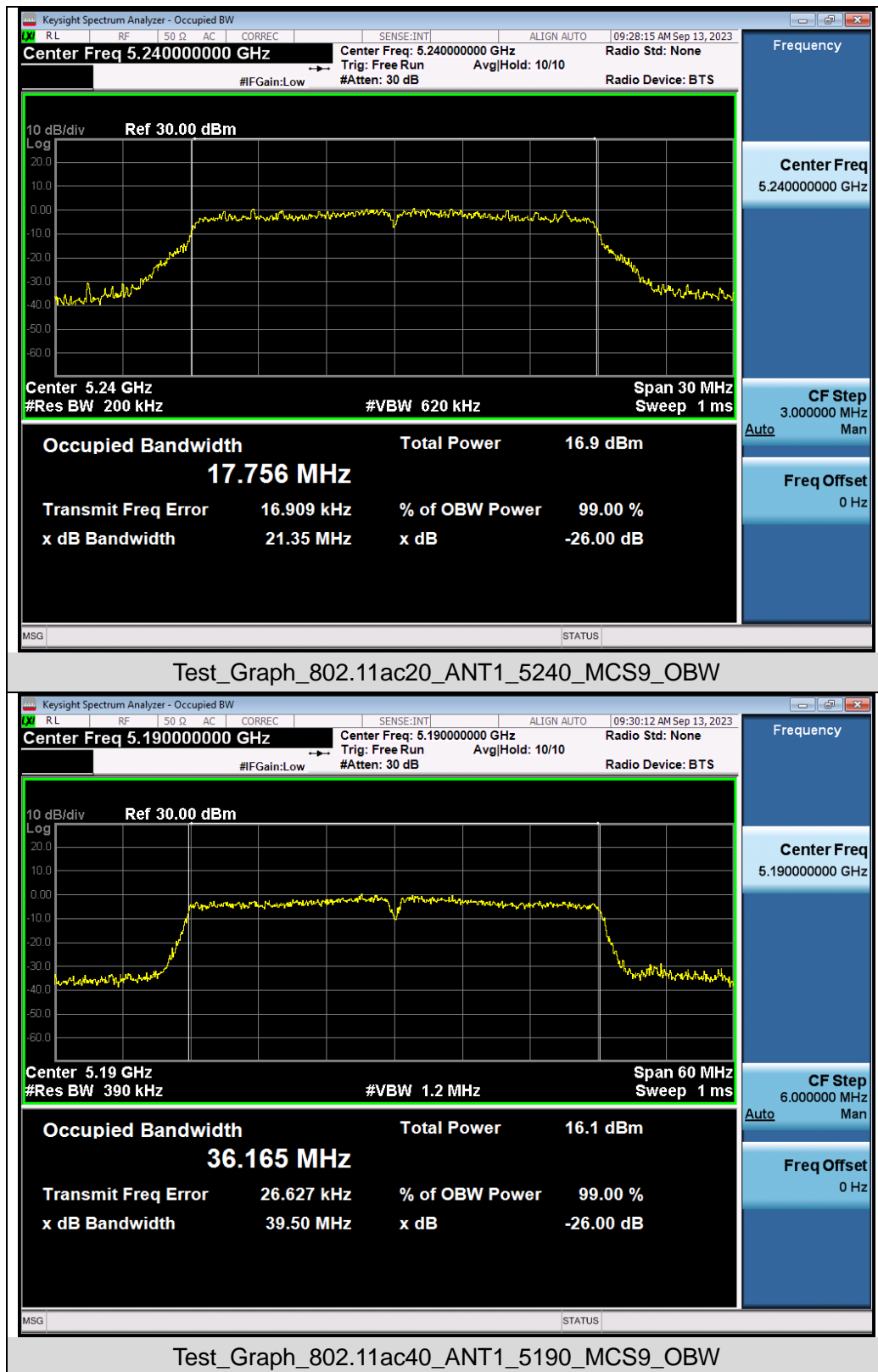
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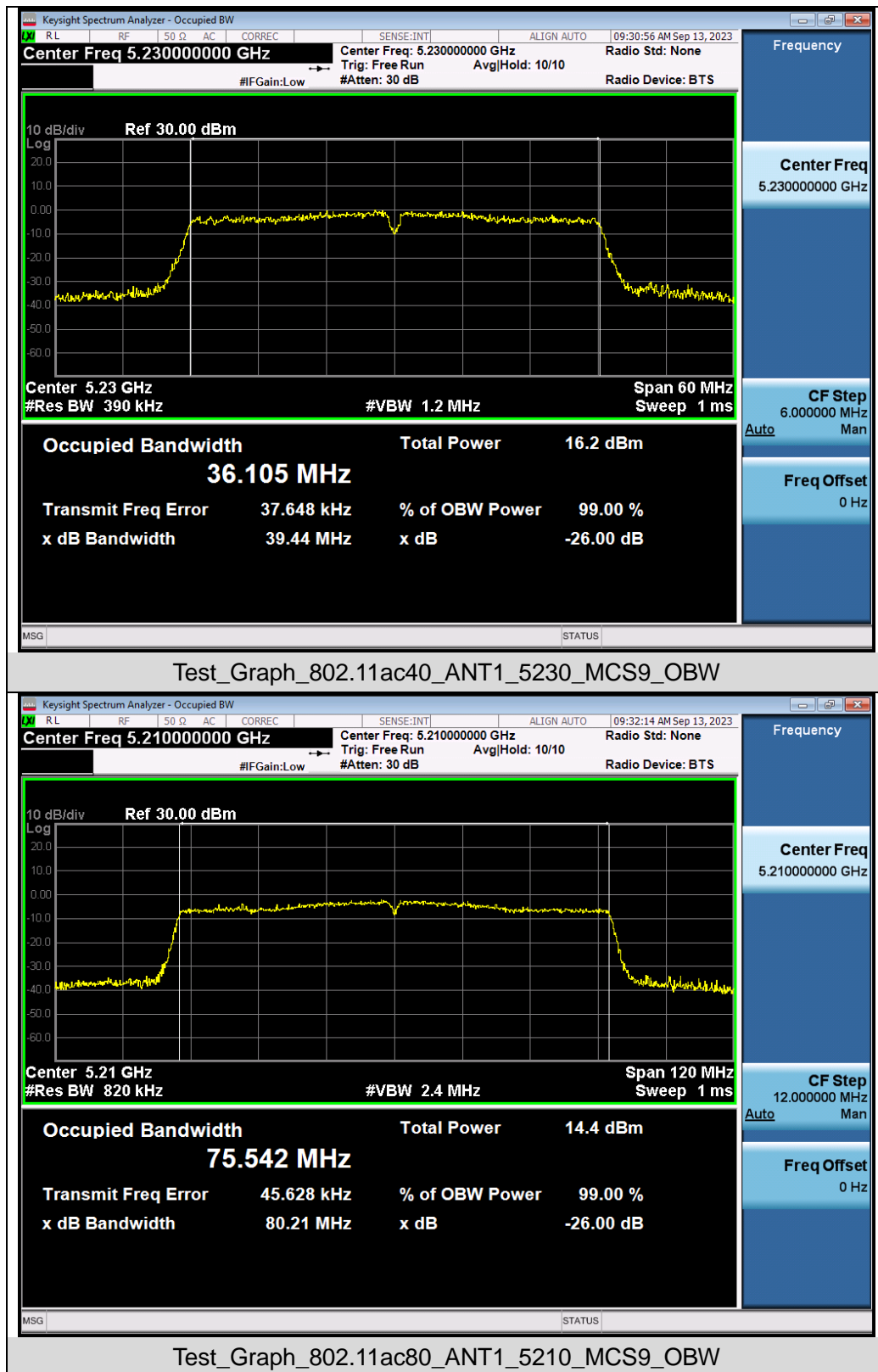
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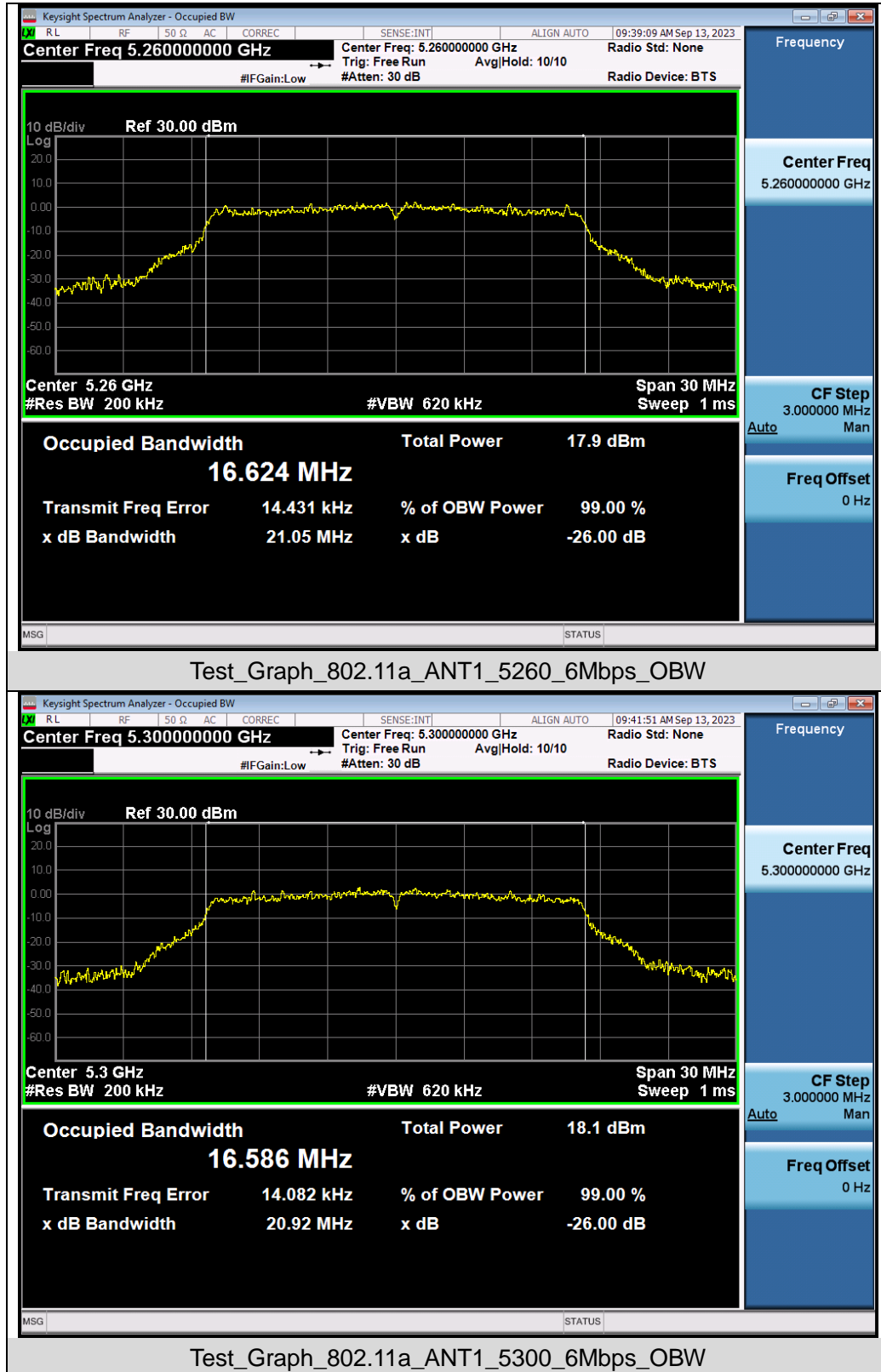


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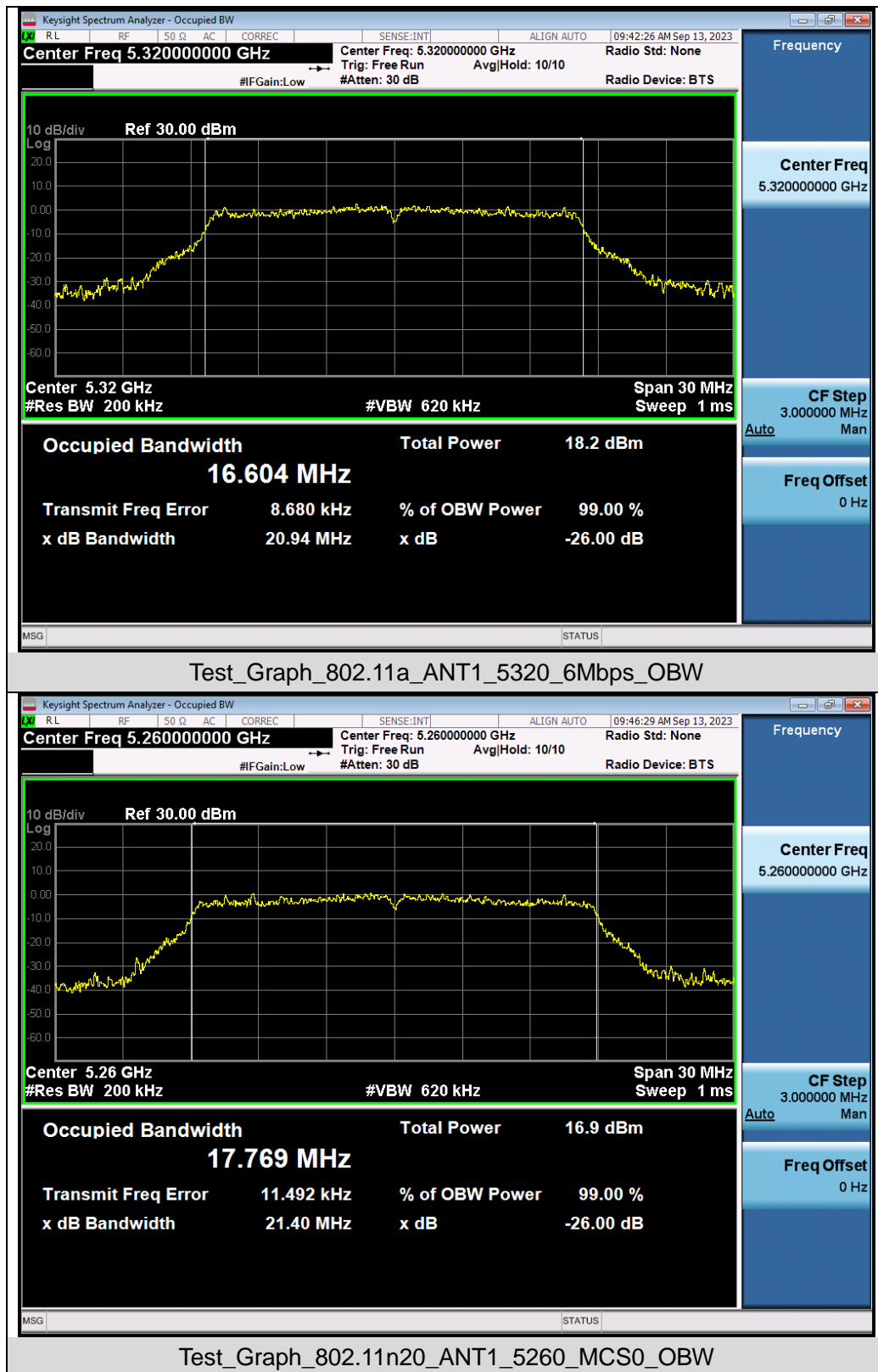


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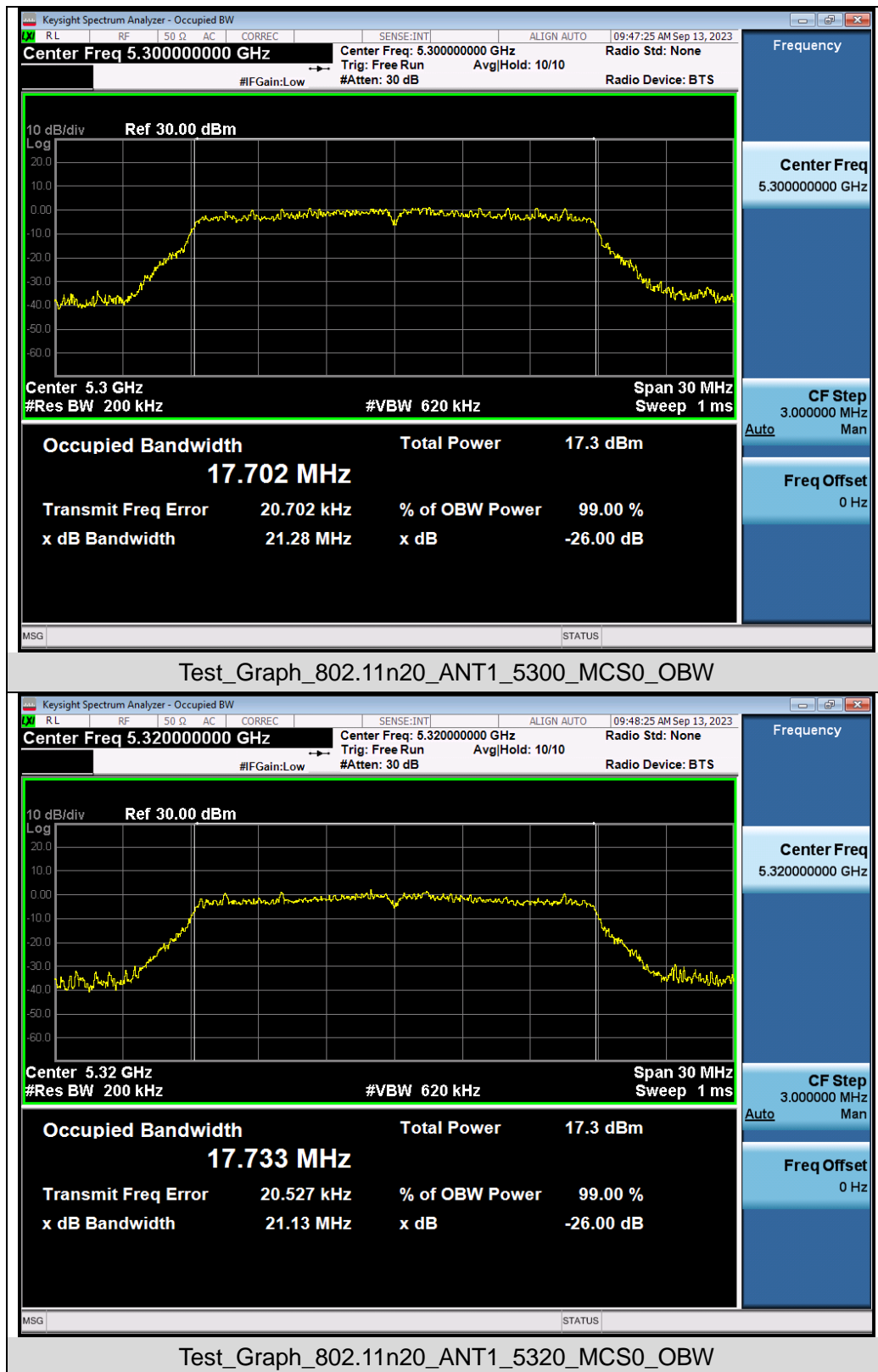
### Test Graphs of Occupied Bandwidth for band 5.25-5.35 GHz



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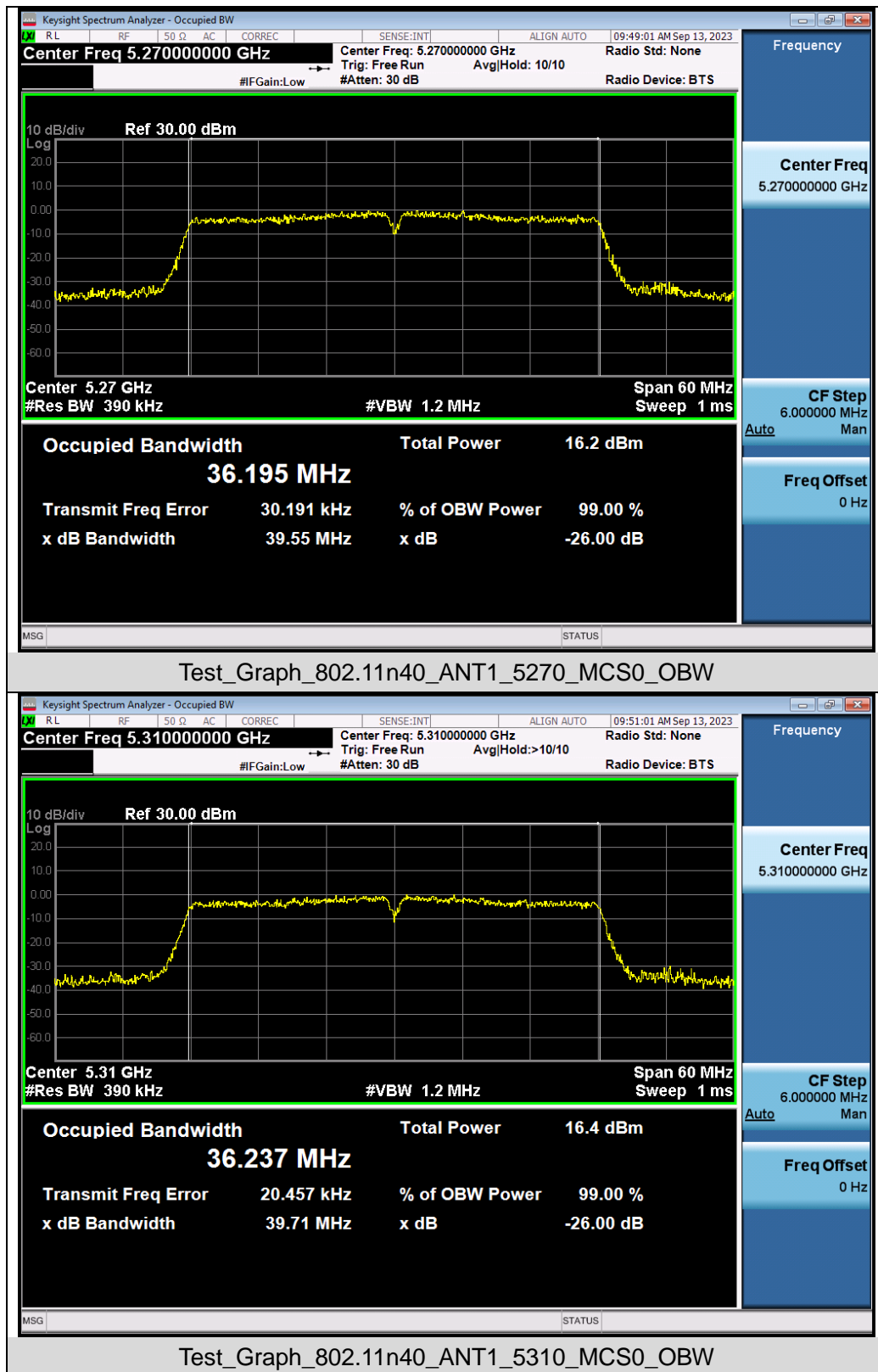


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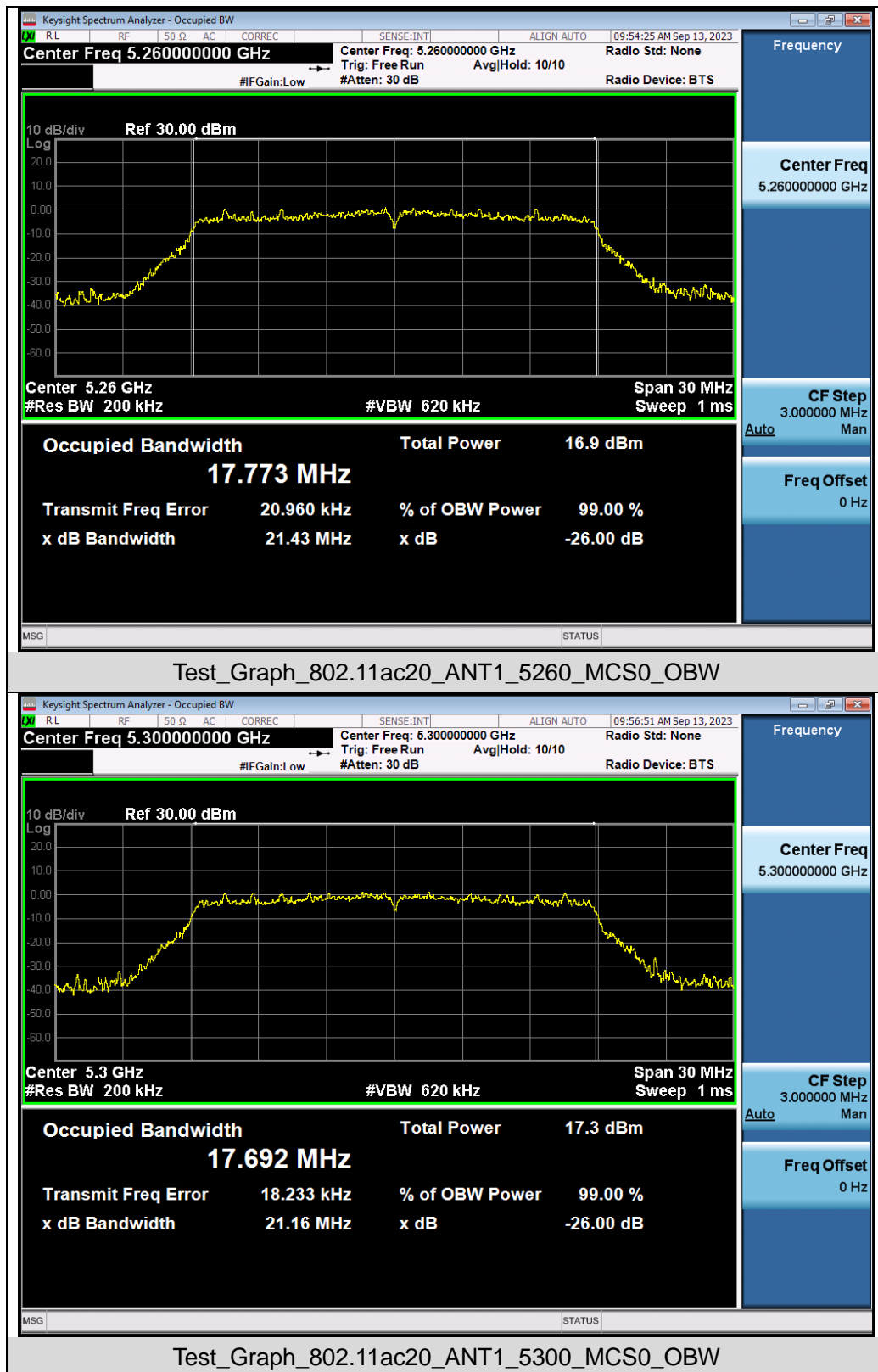


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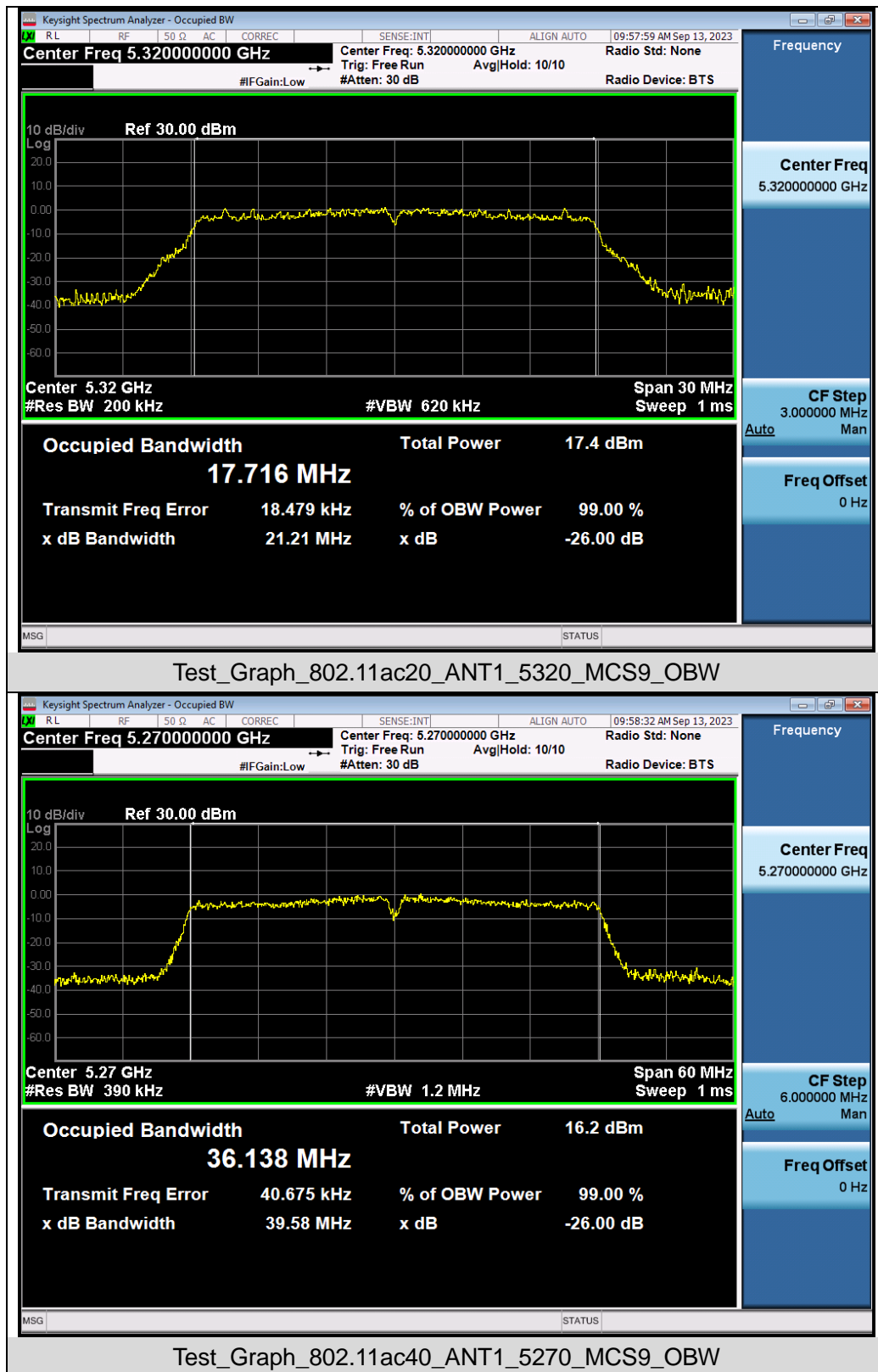


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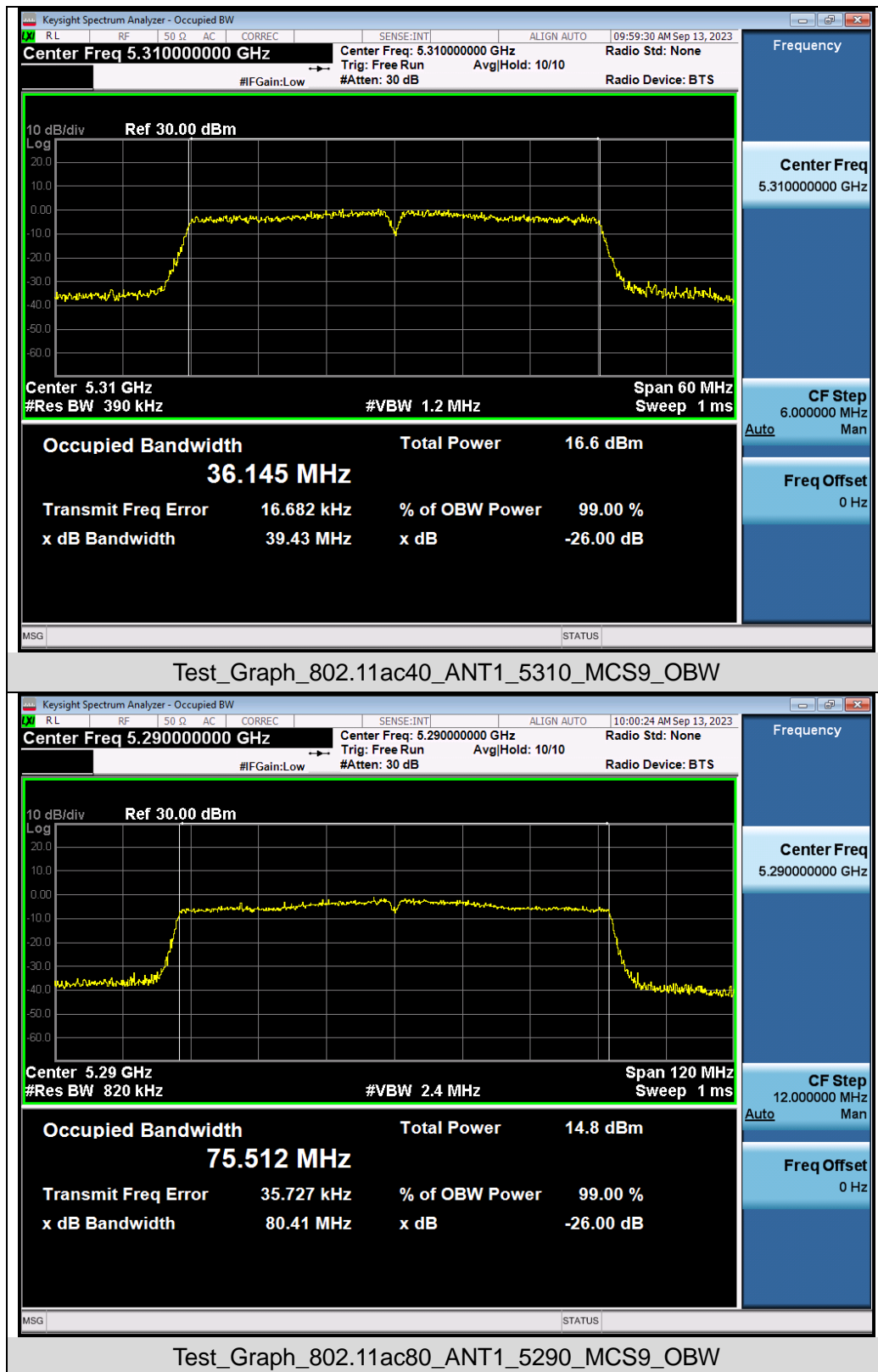


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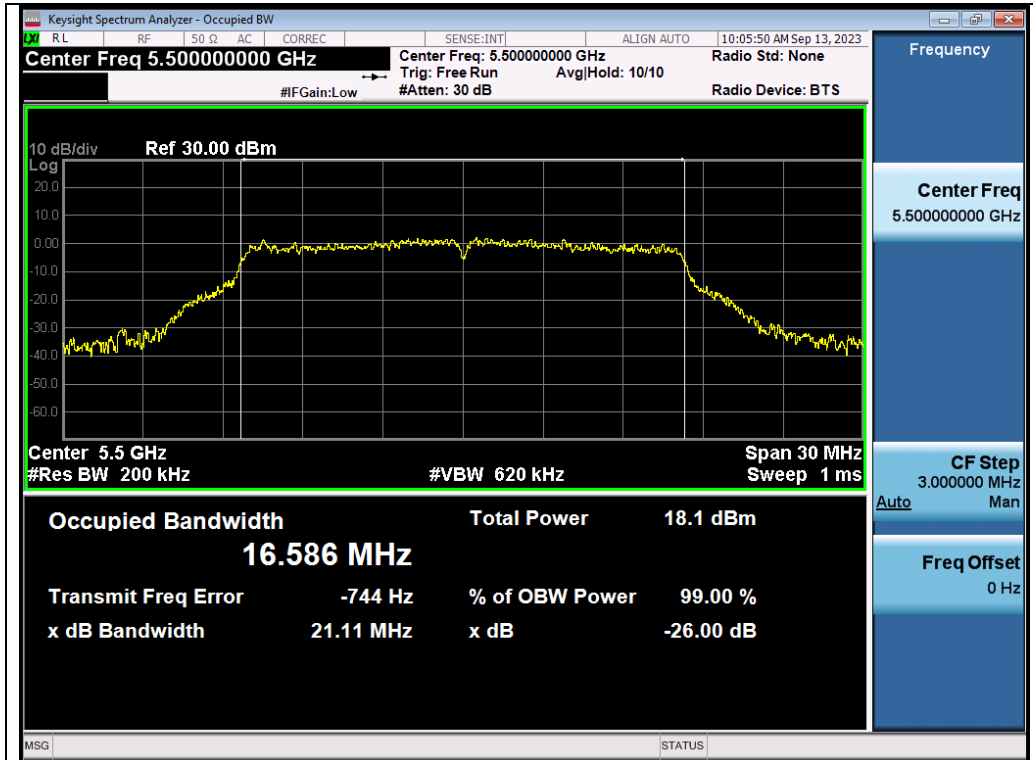
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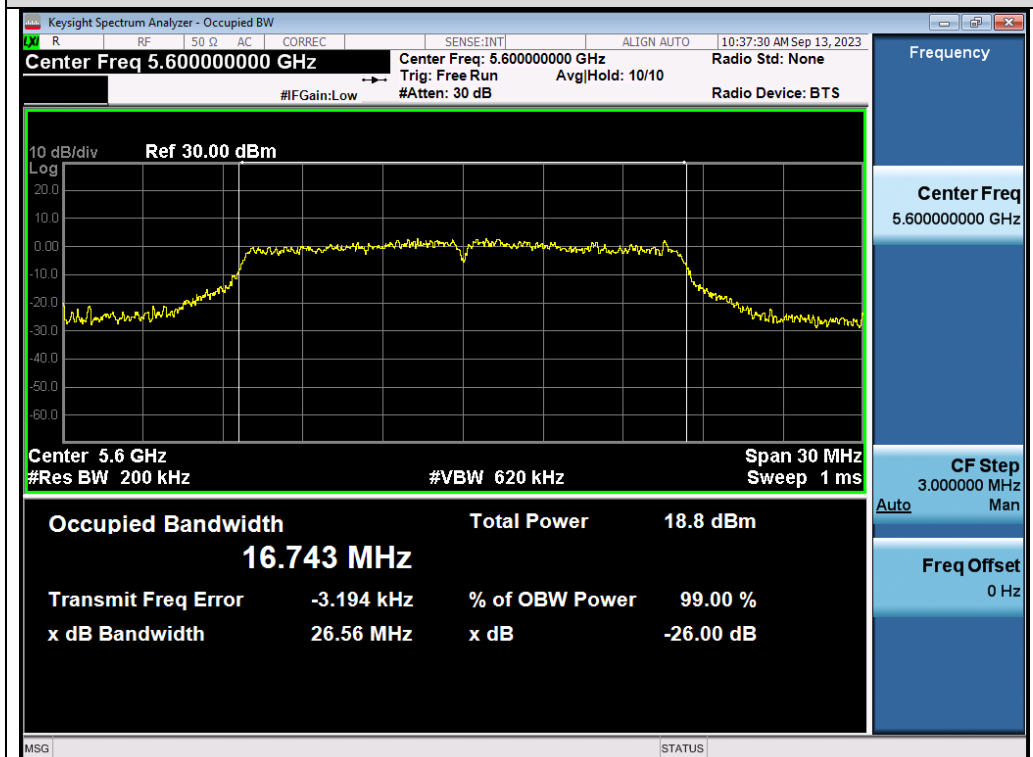
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### Test Graphs of Occupied Bandwidth and -26dB Bandwidth for band 5.470-5.725 GHz

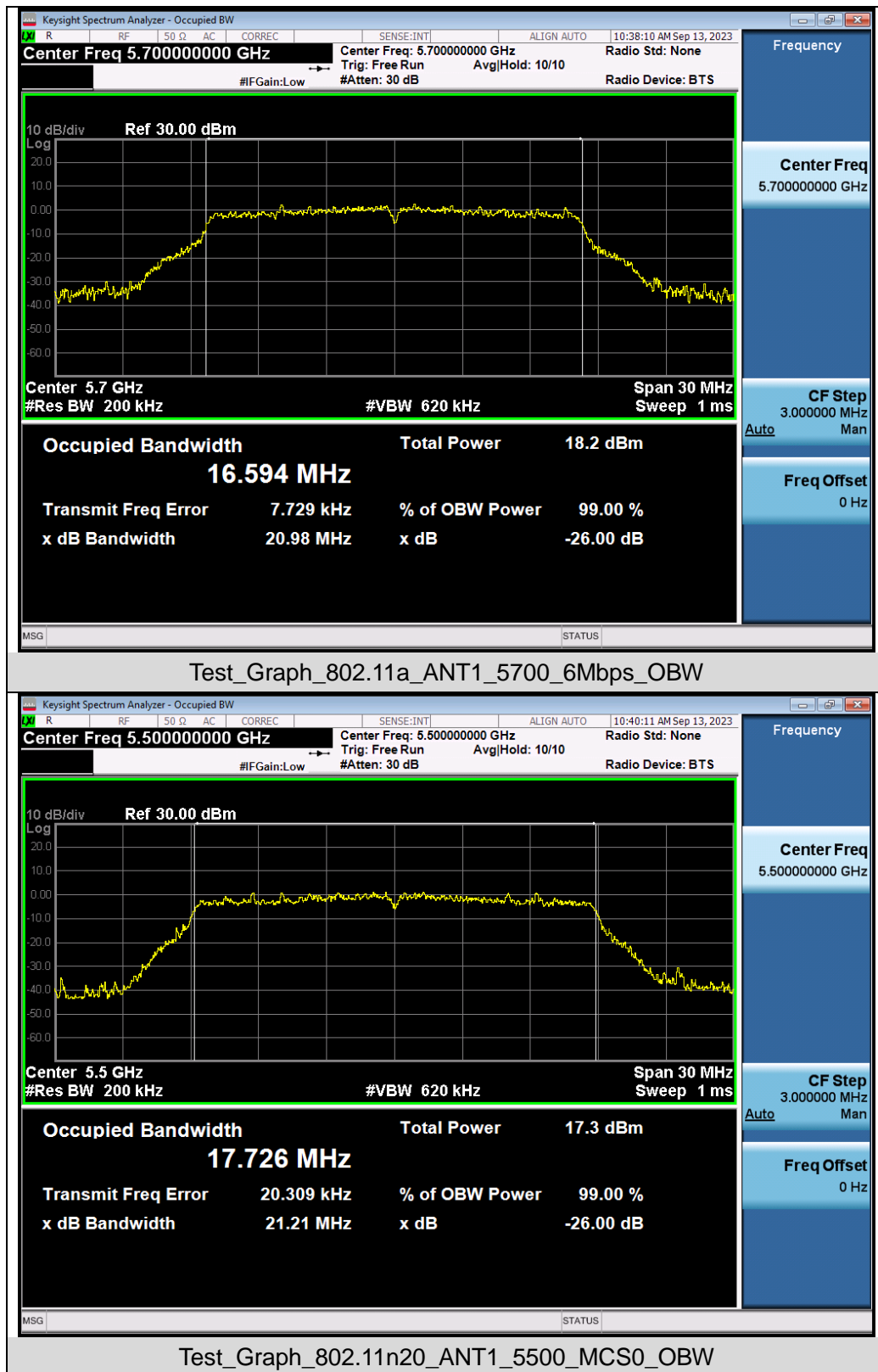


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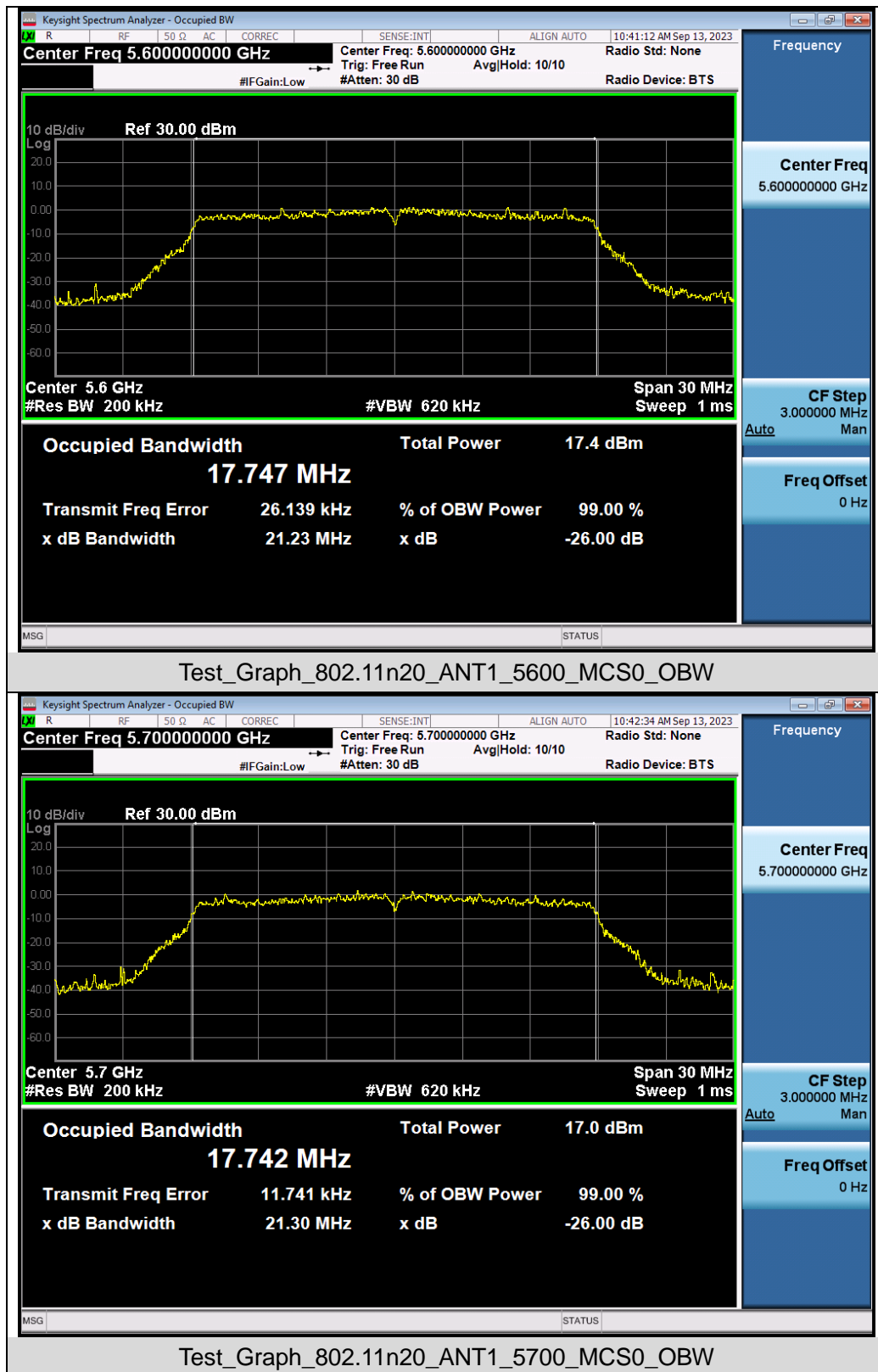


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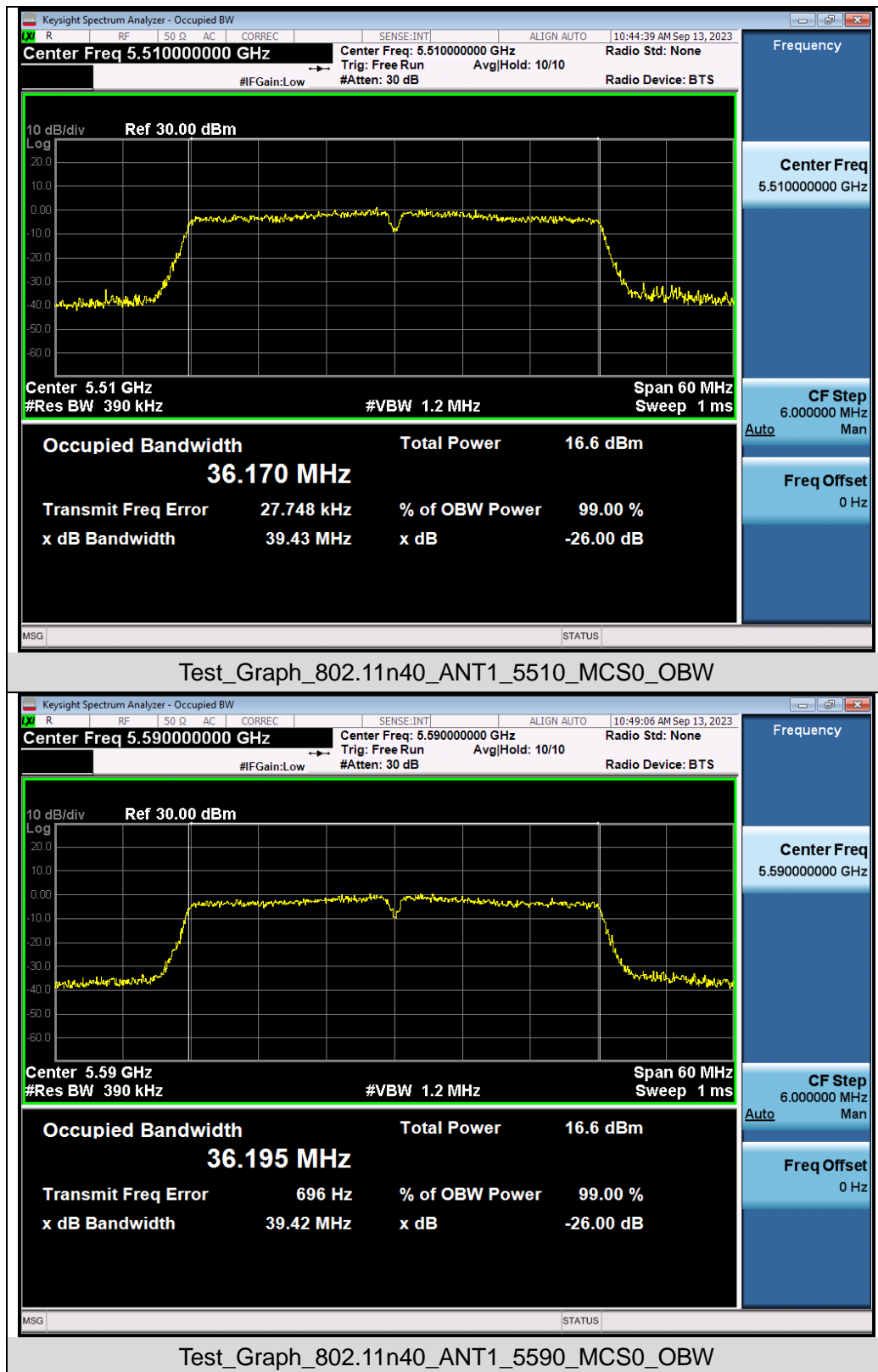


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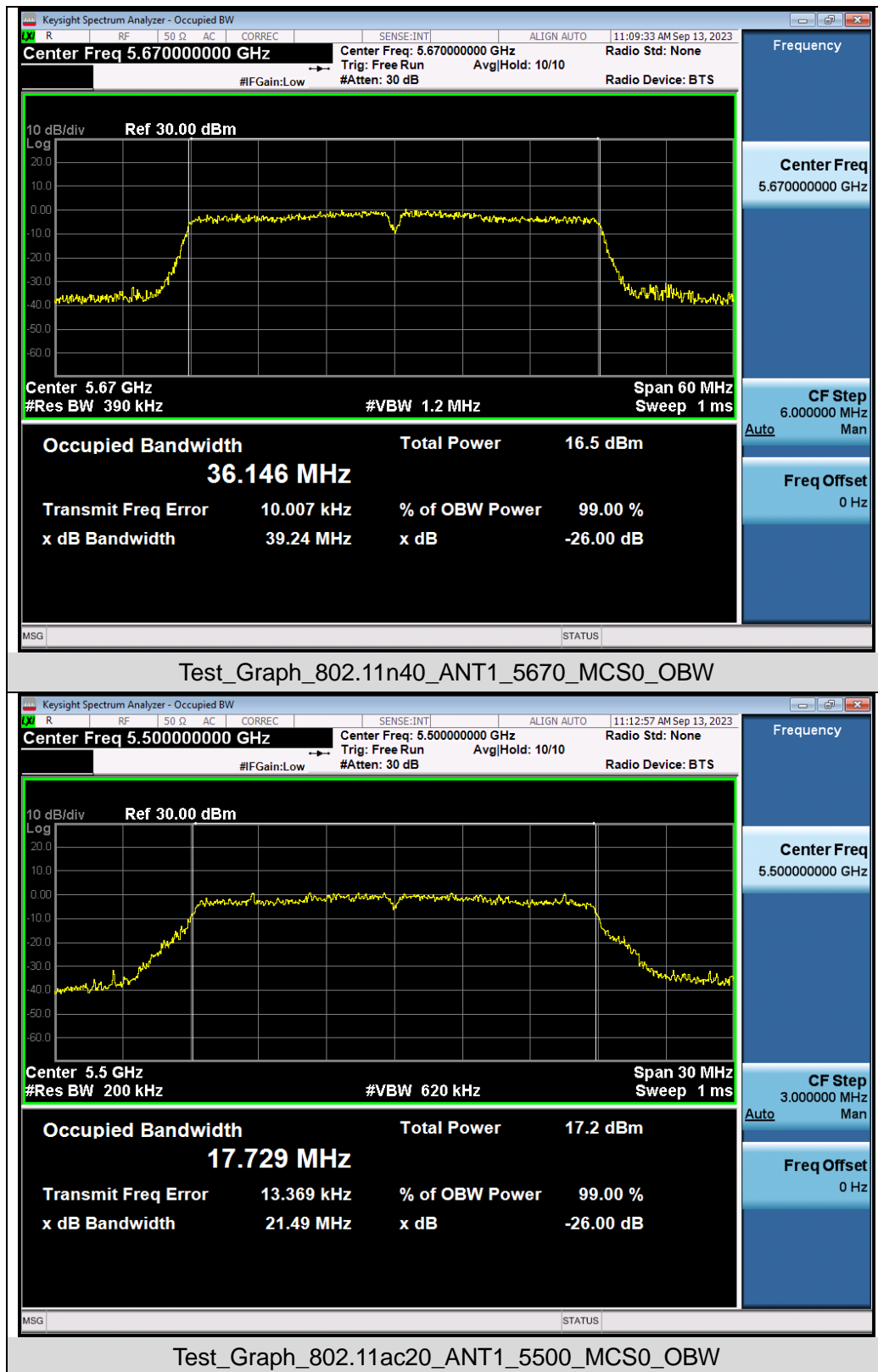


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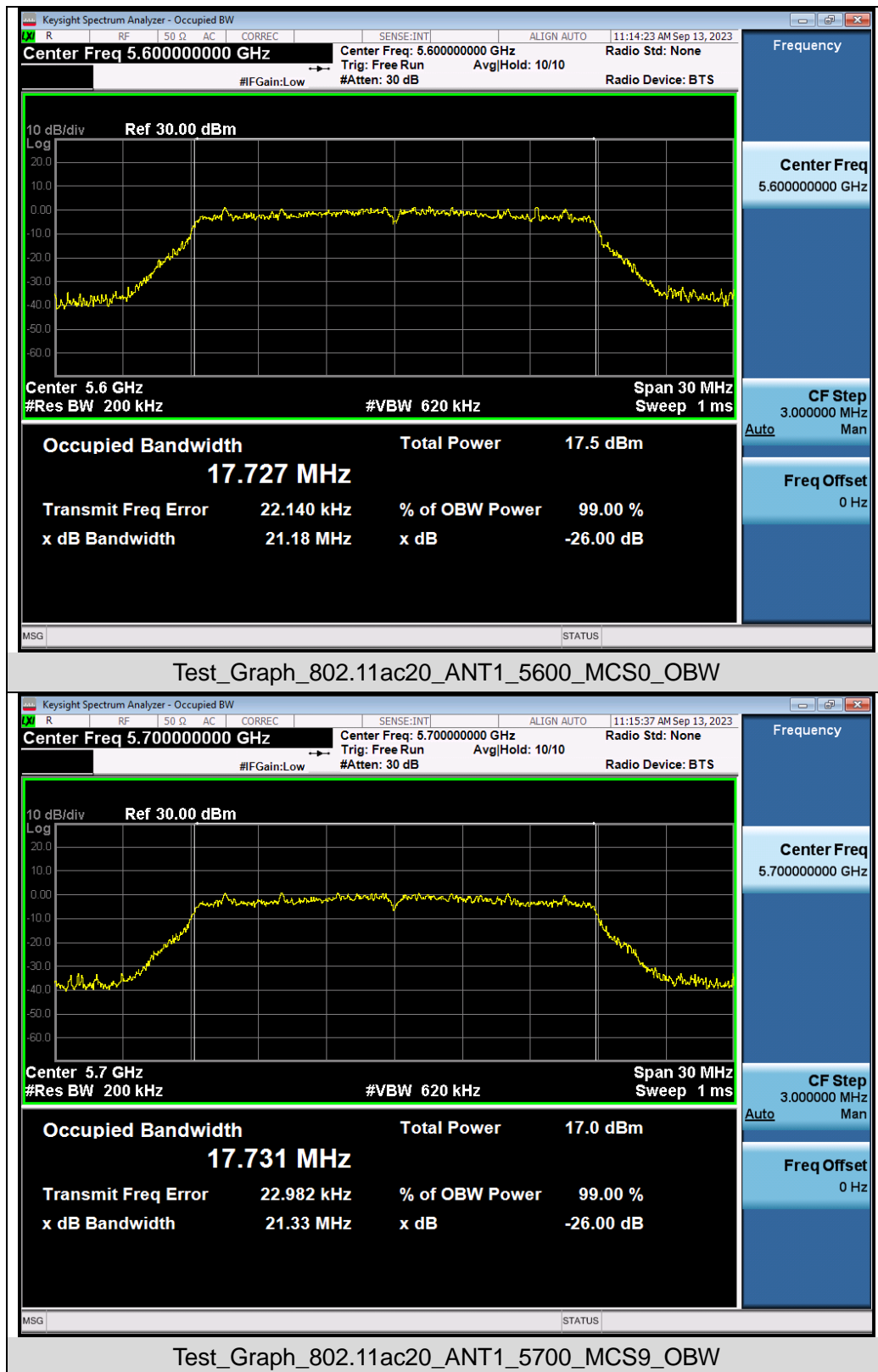


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