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# FCC Test Report

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Report No.: AGC11034230801FR01

**FCC ID** : 2AYHE-2307A  
**APPLICATION PURPOSE** : Original Equipment  
**PRODUCT DESIGNATION** : Network Video Recorder  
**BRAND NAME** : Reolink  
**MODEL NAME** : RLN12W  
**APPLICANT** : Reolink Innovation Limited  
**DATE OF ISSUE** : Aug. 29, 2023  
**STANDARD(S)** : FCC Part 15 Subpart C §15.247  
**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           | /           | Aug. 29, 2023 | Valid         | Initial Release |

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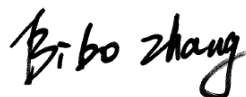
## 1. VERIFICATION OF CONFORMITY

|                                     |                                                                                                              |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Applicant</b>                    | Reolink Innovation Limited                                                                                   |
| <b>Address</b>                      | FLAT/RM 705 7/F FA YUEN COMMERCIAL BUILDING 75-77 FA YUEN STREET MONG KOK KL HONG KONG                       |
| <b>manufacturer</b>                 | Reolink Innovation Limited                                                                                   |
| <b>Address</b>                      | FLAT/RM 705 7/F FA YUEN COMMERCIAL BUILDING 75-77 FA YUEN STREET MONG KOK KL HONG KONG                       |
| <b>Factory</b>                      | Shenzhen Reolink Technology Co., Ltd                                                                         |
| <b>Address</b>                      | 2-4th Floor, Building 2, Yuanling Industrial Park, ShangWu, Shiyen Street, Bao' an District, Shenzhen, China |
| <b>Product Designation</b>          | Network Video Recorder                                                                                       |
| <b>Brand Name</b>                   | Reolink                                                                                                      |
| <b>Test Model</b>                   | RLN12W                                                                                                       |
| <b>Date of receipt of test item</b> | Aug. 08, 2023                                                                                                |
| <b>Date of Test</b>                 | Aug. 10, 2023~ Aug. 28, 2023                                                                                 |
| <b>Deviation</b>                    | No any deviation from the test method                                                                        |
| <b>Condition of Test Sample</b>     | Normal                                                                                                       |
| <b>Test Result</b>                  | Pass                                                                                                         |
| <b>Report Template</b>              | AGCRT-US-BGN/RF                                                                                              |

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.247.

Prepared By



Bibo Zhang  
(Project Engineer)

Aug. 29, 2023

Reviewed By



Calvin Liu  
(Reviewer)

Aug. 29, 2023

Approved By



Max Zhang  
Authorized Officer

Aug. 29, 2023

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## 2. GENERAL INFORMATION

### 2.1. PRODUCT DESCRIPTION

The EUT is designed as “Network Video Recorder”. It is designed by way of utilizing the DSSS and OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

|                                    |                                                                                                              |
|------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Equipment Type</b>              | WLAN 2.4G                                                                                                    |
| <b>Frequency Band</b>              | 2400MHz ~ 2483.5MHz                                                                                          |
| <b>Operation Frequency</b>         | 2412MHz ~ 2462MHz                                                                                            |
| <b>Output Power (Average)</b>      | IEEE 802.11b:14.12dBm; IEEE 802.11g:13.13dBm;<br>IEEE 802.11n(HT20):12.13dBm; IEEE 802.11n(HT40):12.01dBm    |
| <b>Output Power (Peak)</b>         | IEEE 802.11b:18.39dBm; IEEE 802.11g: 21.28dBm;<br>IEEE 802.11n(HT20): 21.66dBm; IEEE 802.11n(HT40): 20.97dBm |
| <b>Output Power (MIMO-Average)</b> | IEEE 802.11n(HT20): 14.84dBm; IEEE 802.11n(HT40): 14.87dBm                                                   |
| <b>Output Power (MIMO-Peak)</b>    | IEEE 802.11n(HT20): 24.44dBm; IEEE 802.11n(HT40): 23.85dBm                                                   |
| <b>Modulation</b>                  | 802.11b:DSSS(DQPSK, DBPSK, CCK)<br>802.11g/n: OFDM(64-QAM, 16-QAM, QPSK, BPSK)                               |
| <b>Data Rate</b>                   | 802.11b: 1/2/5.5/11Mbps<br>802.11g: 6/9/12/18/24/36/48/54Mbps<br>802.11n: up to 300Mbps                      |
| <b>Number of channels</b>          | 11                                                                                                           |
| <b>Hardware Version</b>            | V110                                                                                                         |
| <b>Software Version</b>            | v3.3.0.256_23082520                                                                                          |
| <b>Antenna Designation</b>         | SMA Antenna (Comply with requirements of the FCC part 15.203)                                                |
| <b>Antenna Gain</b>                | Refer to Chapter 2.9 of the report.                                                                          |
| <b>Number of transmit chain</b>    | 2(802.11b/g/n all used two antennas, 802.11b/g support SISO, and 802.11n support MIMO)                       |
| <b>Power Supply</b>                | DC 12V                                                                                                       |

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## 2.2. TABLE OF CARRIER FREQUENCIES

| Frequency Band | Channel Number | Frequency |
|----------------|----------------|-----------|
| 2400~2483.5MHz | 1              | 2412 MHz  |
|                | 2              | 2417 MHz  |
|                | 3              | 2422 MHz  |
|                | 4              | 2427 MHz  |
|                | 5              | 2432 MHz  |
|                | 6              | 2437 MHz  |
|                | 7              | 2442 MHz  |
|                | 8              | 2447 MHz  |
|                | 9              | 2452 MHz  |
|                | 10             | 2457 MHz  |
|                | 11             | 2462 MHz  |

Note: For 20MHz bandwidth system use Channel 1 to Channel 11. For 40MHz bandwidth system use Channel 3 to Channel 9

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### 2.3. IEEE 802.11N MODULATION SCHEME

| MCS Index | Nss | Modulation | R   | NBPSC | NCBPS |       | NDBPS |       | 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: 2AYHE-2307A** filing to comply with the FCC Part 15 requirements.

#### **2.5. TEST METHODOLOGY**

KDB 558074 D01 15.247 Meas Guidance v05: Guidance for compliance measurements on Digital transmission system, frequency hopping spread spectrum system, and hybrid system devices operating under section 15.247 of the FCC rules

ANSI C63.10:2013: American National Standard for Testing Unlicensed Wireless Devices

#### **2.6. SPECIAL ACCESSORIES**

Refer to section 5.2.

#### **2.7. EQUIPMENT MODIFICATIONS**

Not available for this EUT intended for grant.

#### **2.8. ANTENNA REQUIREMENT**

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

For more information of the antenna, please refer to the APPENDIX B: PHOTOGRAPHS OF EUT.

## 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 |                            |
| 2.4GWIFI SMA Antenna List (2.4GHz 2*2 MIMO) |                      |          |                 |                     |       |                            |
| SMA Antenna                                 | 2400~2483.5          | 2        | 20, 40          | 3.95                | 3.95  | 6.96                       |

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

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

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

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

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

- For power measurements on IEEE 802.11 devices:

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

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

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

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. DUTY CYCLE

2.4GHz WLAN (DTS) operation is possible in 20MHz 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:

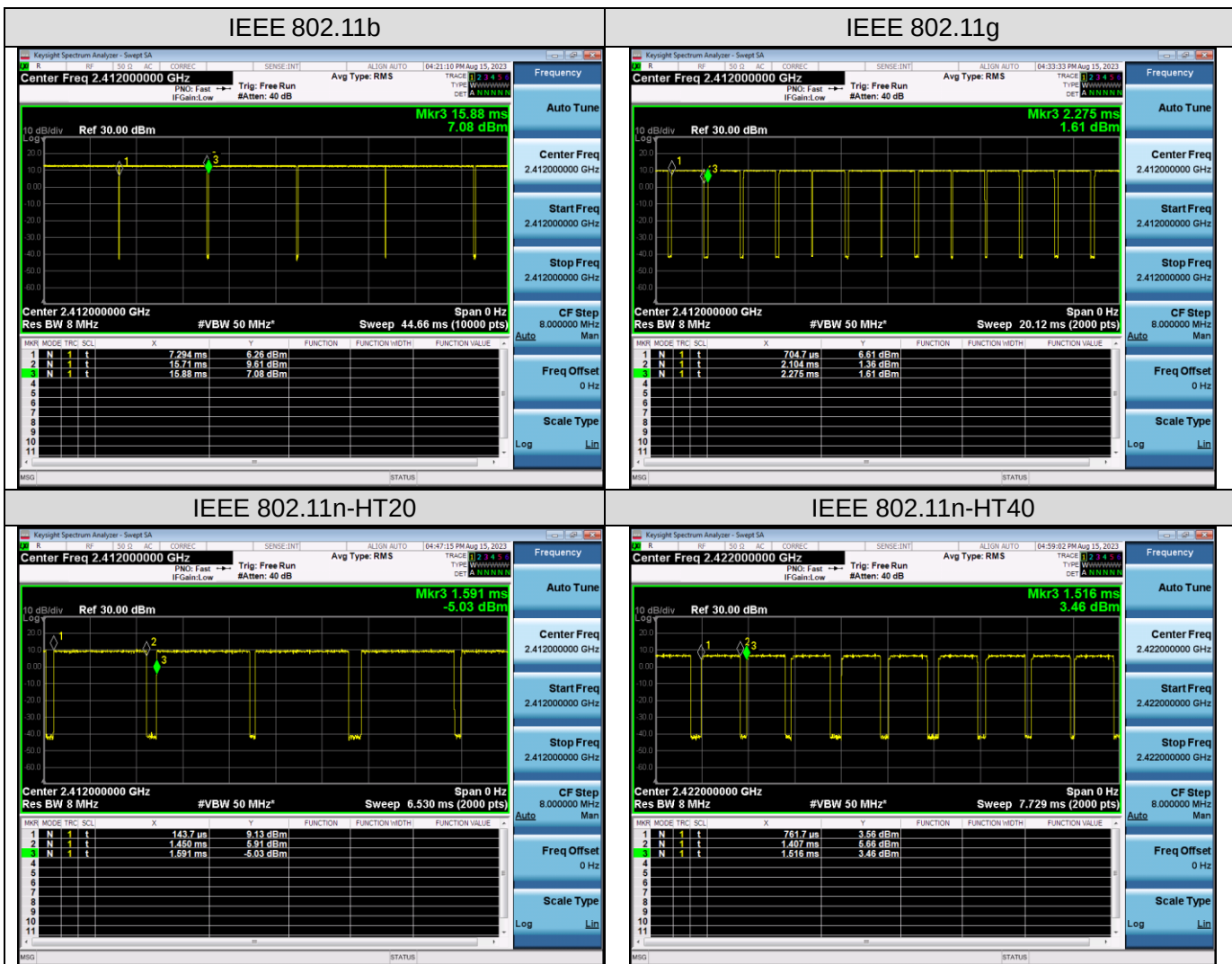
| Operating mode    | Data rates (Mbps) | Duty Cycle (%) | Duty Cycle Factor (dB) | 1/ T Minimum VBW (kHz) | Average Factor (dB) |
|-------------------|-------------------|----------------|------------------------|------------------------|---------------------|
| IEEE 802.11b      | 1                 | 98             | 0.09                   | 0.12                   | -0.17               |
| IEEE 802.11g      | 6                 | 89             | 0.50                   | 0.71                   | -1.00               |
| IEEE 802.11n-HT20 | MCS0              | 90             | 0.44                   | 0.76                   | -0.89               |
| IEEE 802.11n-HT40 | MCS0              | 85             | 0.67                   | 1.55                   | -1.34               |

Remark:

1. Duty Cycle factor =  $10 * \log (1/ \text{Duty cycle})$  2. Average factor =  $20 \log_{10} \text{Duty Cycle}$

The duty cycle of each frequency band mode reflects the determination requirements of the low channel measurement value

The test plots as follows:



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### 3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , 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 | $U_c = \pm 2.9 \text{ dB}$ |
| Uncertainty of Radiated Emission below 1GHz   | $U_c = \pm 4.0 \text{ dB}$ |
| Uncertainty of Radiated Emission above 1GHz   | $U_c = \pm 4.8 \text{ dB}$ |
| 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     | $U_c = \pm 2 \%$           |

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#### 4. DESCRIPTION OF TEST MODES

| NO. | TEST MODE DESCRIPTION            |
|-----|----------------------------------|
| 1   | Low channel transmitting (TX)    |
| 2   | Middle channel transmitting (TX) |
| 3   | High channel transmitting (TX)   |

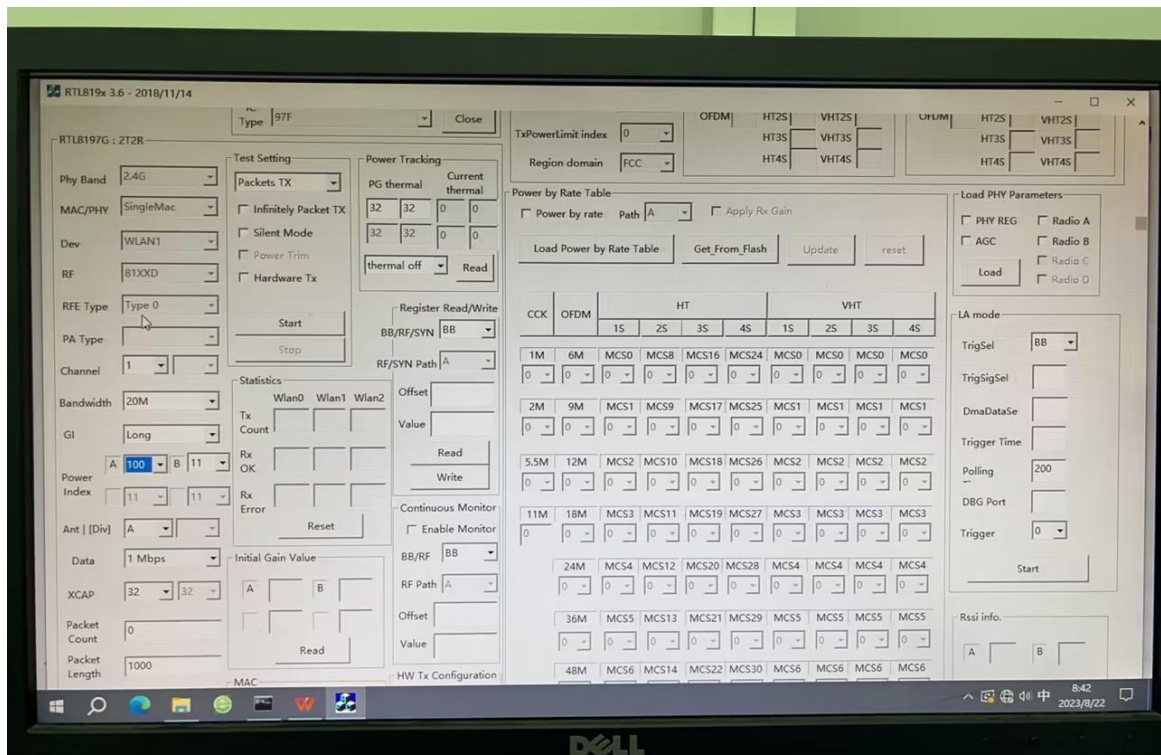
Note:

Transmit by 802.11b with Data rate (1/2/5.5/11)  
Transmit by 802.11g with Data rate (6/9/12/18/24/36/48/54)  
Transmit by 802.11n (20MHz) with Data rate (6.5/13/19.5/26/39/52/58.5/65)  
Transmit by 802.11n (40MHz) with Data rate (13.5/27/40.5/54/81/108/121.5/135)  
The test channel for 20MHz bandwidth system is channel 1, 6 and 11.  
The test channel for 40MHz bandwidth system is channel 3, 6 and 9.

#### Note:

- The EUT has been set to operate continuously on the lowest, middle and highest operation frequency Individually, and the EUT is operating at its maximum duty cycle.  
All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.
- All radiated spurious emission and conducted interference modes have been pre scanned, and the report only records that antenna 1+antenna 2 work in the worst mode.

#### Software Setting

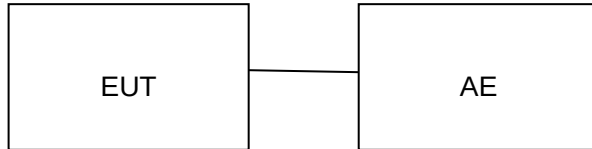


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## 5. SYSTEM TEST CONFIGURATION

### 5.1. CONFIGURATION OF EUT SYSTEM

Configure:



### 5.2. EQUIPMENT USED IN EUT SYSTEM

| Item | Equipment              | Model No.         | ID or Specification                                         | Remark |
|------|------------------------|-------------------|-------------------------------------------------------------|--------|
| 1    | Network Video Recorder | RLN12W            | 2AYHE-2307A                                                 | EUT    |
| 2    | Adapter                | DCT24W120200US-A0 | Input: AC 100-240V 50/60Hz, 0.7A Max<br>Output: DC 12V 2.0A | AE     |

### 5.3. SUMMARY OF TEST RESULTS

| Item | FCC Rules            | Description Of Test              | Result |
|------|----------------------|----------------------------------|--------|
| 1    | §15.203&15.247(b)(4) | Antenna Equipment                | Pass   |
| 2    | §15.247 (b)(1)       | RF Output Power                  | Pass   |
| 3    | §15.247 (a)(1)       | 6 dB Bandwidth                   | Pass   |
| 4    | §15.247 (e)          | Power Spectral Density           | Pass   |
| 4    | §15.247 (d)          | Conducted Spurious Emission      | Pass   |
| 5    | §15.209              | Radiated Emission& Band Edge     | Pass   |
| 6    | §15.207              | AC Power Line Conducted Emission | Pass   |

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## 6. TEST FACILITY

|                                          |                                                                                                                                          |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Site</b>                         | Attestation of Global Compliance (Shenzhen) Co., Ltd                                                                                     |
| <b>Location</b>                          | 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China |
| <b>Designation Number</b>                | CN1259                                                                                                                                   |
| <b>FCC Test Firm Registration Number</b> | 975832                                                                                                                                   |
| <b>A2LA Cert. No.</b>                    | 5054.02                                                                                                                                  |
| <b>Description</b>                       | Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA                                                                |

### TEST EQUIPMENT OF CONDUCTED EMISSION TEST

| Equipment     | Manufacturer  | Model      | S/N    | Cal. Date     | Cal. Due      |
|---------------|---------------|------------|--------|---------------|---------------|
| TEST RECEIVER | R&S           | ESPI       | 101206 | Jun. 03, 2023 | Jun. 02, 2024 |
| LISN          | R&S           | ESH2-Z5    | 100086 | Jun. 03, 2023 | Jun. 02, 2024 |
| Attenuator    | Dongfang Xupu | LM-XX-6-5W | N/A    | Jun. 09, 2023 | Jun. 08, 2024 |
| Test software | R&S           | Ver.V1.71  | N/A    | N/A           | N/A           |

### TEST EQUIPMENT OF RADIATED EMISSION TEST

| Equipment                      | Manufacturer   | Model     | S/N          | Cal. Date     | Cal. Due      |
|--------------------------------|----------------|-----------|--------------|---------------|---------------|
| TEST RECEIVER                  | R&S            | ESCI      | 10096        | Feb. 18, 2023 | Feb. 17, 2024 |
| EXA Signal Analyzer            | Aglient        | N9010A    | MY53470504   | Jun. 01, 2023 | May 31, 2024  |
| Power meter                    | R&S            | NRVD      | 8323781027   | Mar. 24 2023  | Mar. 23 2025  |
| 2.4GHz Filter                  | EM Electronics | N/A       | N/A          | Mar. 18, 2022 | Mar. 19, 2024 |
| Attenuator                     | ZHINAN         | E-002     | N/A          | Aug. 04, 2022 | Aug. 03, 2024 |
| Horn antenna                   | SCHWARZBECK    | BBHA 9170 | #768         | Oct. 31, 2021 | Oct. 30, 2023 |
| Active loop antenna (9K-30MHz) | ZHINAN         | ZN30900C  | 18051        | Mar. 12, 2022 | Mar. 11, 2024 |
| Double-Ridged Waveguide Horn   | ETS LINDGREN   | 3117      | 00034609     | Apr. 23, 2023 | Apr. 22, 2024 |
| Broadband Preamplifier         | ETS LINDGREN   | 3117PA    | 00225134     | Sep. 01, 2022 | Sep. 02, 2024 |
| ANTENNA                        | SCHWARZBECK    | VULB9168  | VULB9168-494 | Jan. 05, 2023 | Jan. 04, 2025 |
| Test software                  | Tonscend       | Ver.2.5   | N/A          | N/A           | N/A           |

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## 7. RF OUTPUT POWER MEASUREMENT

### 7.1 Provisions Applicable

For DTSSs employing digital modulation techniques operating in the bands 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W.

### 7.2 Measurement Procedure

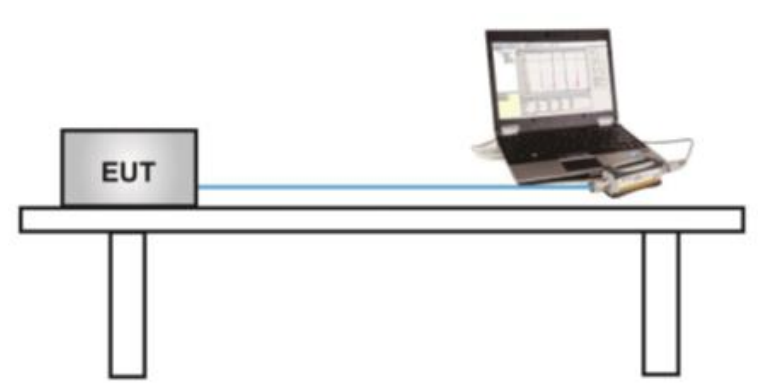
☒ Method PM is Measurement using an RF Peak power meter. The procedure for this method is as follows:

1. The testing follows the ANSI C63.10 Section 11.9.1.3
2. The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

☒ 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 11.9.2.3
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)



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#### 7.4. LIMITS AND MEASUREMENT RESULT

| Test Data of Conducted Output Power-ANT 1 |                    |                     |                  |              |              |
|-------------------------------------------|--------------------|---------------------|------------------|--------------|--------------|
| Test Mode                                 | Test Channel (MHz) | Average Power (dBm) | Peak Power (dBm) | Limits (dBm) | Pass or Fail |
| 802.11b                                   | 2412               | 12.42               | 17.73            | ≤30          | Pass         |
|                                           | 2437               | 12.81               | 18.03            | ≤30          | Pass         |
|                                           | 2462               | <b>14.12</b>        | 18.39            | ≤30          | Pass         |
| 802.11g                                   | 2412               | 11.80               | 20.73            | ≤30          | Pass         |
|                                           | 2437               | 11.31               | 21.02            | ≤30          | Pass         |
|                                           | 2462               | 12.03               | 21.70            | ≤30          | Pass         |
| 802.11n20                                 | 2412               | 11.55               | 20.65            | ≤30          | Pass         |
|                                           | 2437               | 11.40               | 20.94            | ≤30          | Pass         |
|                                           | 2462               | 11.94               | 21.66            | ≤30          | Pass         |
| 802.11n40                                 | 2422               | 11.21               | 20.44            | ≤30          | Pass         |
|                                           | 2437               | 11.90               | 20.65            | ≤30          | Pass         |
|                                           | 2452               | 12.00               | 20.97            | ≤30          | Pass         |

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| Test Data of Conducted Output Power-ANT 2 |                    |                     |                  |              |              |
|-------------------------------------------|--------------------|---------------------|------------------|--------------|--------------|
| Test Mode                                 | Test Channel (MHz) | Average Power (dBm) | Peak Power (dBm) | Limits (dBm) | Pass or Fail |
| 802.11b                                   | 2412               | 12.99               | 17.96            | ≤30          | Pass         |
|                                           | 2437               | 12.71               | 17.83            | ≤30          | Pass         |
|                                           | 2462               | <b>13.95</b>        | 17.76            | ≤30          | Pass         |
| 802.11g                                   | 2412               | 12.26               | 21.28            | ≤30          | Pass         |
|                                           | 2437               | 12.25               | 21.19            | ≤30          | Pass         |
|                                           | 2462               | 13.13               | 21.06            | ≤30          | Pass         |
| 802.11n20                                 | 2412               | 12.10               | 21.21            | ≤30          | Pass         |
|                                           | 2437               | 12.13               | 21.14            | ≤30          | Pass         |
|                                           | 2462               | 11.62               | 21.18            | ≤30          | Pass         |
| 802.11n40                                 | 2422               | 12.01               | 20.90            | ≤30          | Pass         |
|                                           | 2437               | 11.33               | 20.85            | ≤30          | Pass         |
|                                           | 2452               | 11.71               | 20.71            | ≤30          | Pass         |

| Test Data of Conducted Output Power-MIMO |                    |                     |                  |              |              |
|------------------------------------------|--------------------|---------------------|------------------|--------------|--------------|
| Test Mode                                | Test Channel (MHz) | Average Power (dBm) | Peak Power (dBm) | Limits (dBm) | Pass or Fail |
| 802.11n20                                | 2412               | 14.84               | 23.95            | ≤30          | Pass         |
|                                          | 2437               | 14.79               | 24.05            | ≤30          | Pass         |
|                                          | 2462               | 14.79               | 24.44            | ≤30          | Pass         |
| 802.11n40                                | 2422               | 14.64               | 23.69            | ≤30          | Pass         |
|                                          | 2437               | 14.63               | 23.76            | ≤30          | Pass         |
|                                          | 2452               | <b>14.87</b>        | 23.85            | ≤30          | Pass         |

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## 8. 6DB BANDWIDTH MEASUREMENT

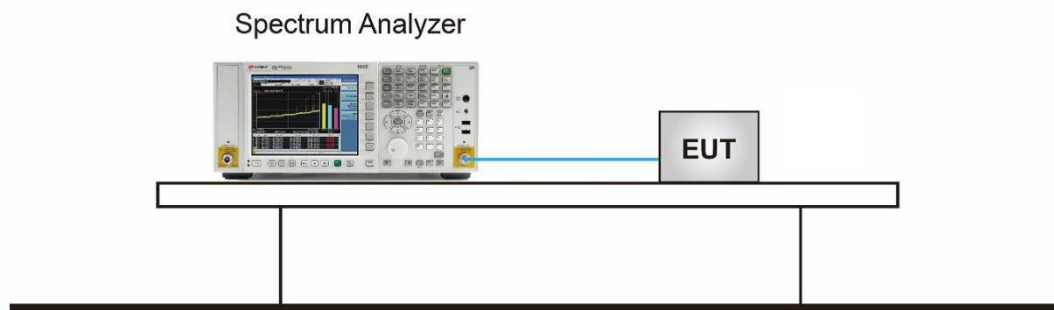
### 8.1 MEASUREMENT LIMITS

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

### 8.2 MEASUREMENT PROCEDURE

1. The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
2. The RF output of EUT was connected to the spectrum analyzer by RF cable. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. For 6dB Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW)  $\geq 3 * \text{RBW}$ .
6. Detector = peak
7. Trace mode = max hold.
8. Sweep = auto couple.
9. Allow the trace to stabilize.
10. Measure and record the results in the test report.

### 8.3 MEASUREMENT SETUP (BLOCK DIAGRAM OF CONFIGURATION)



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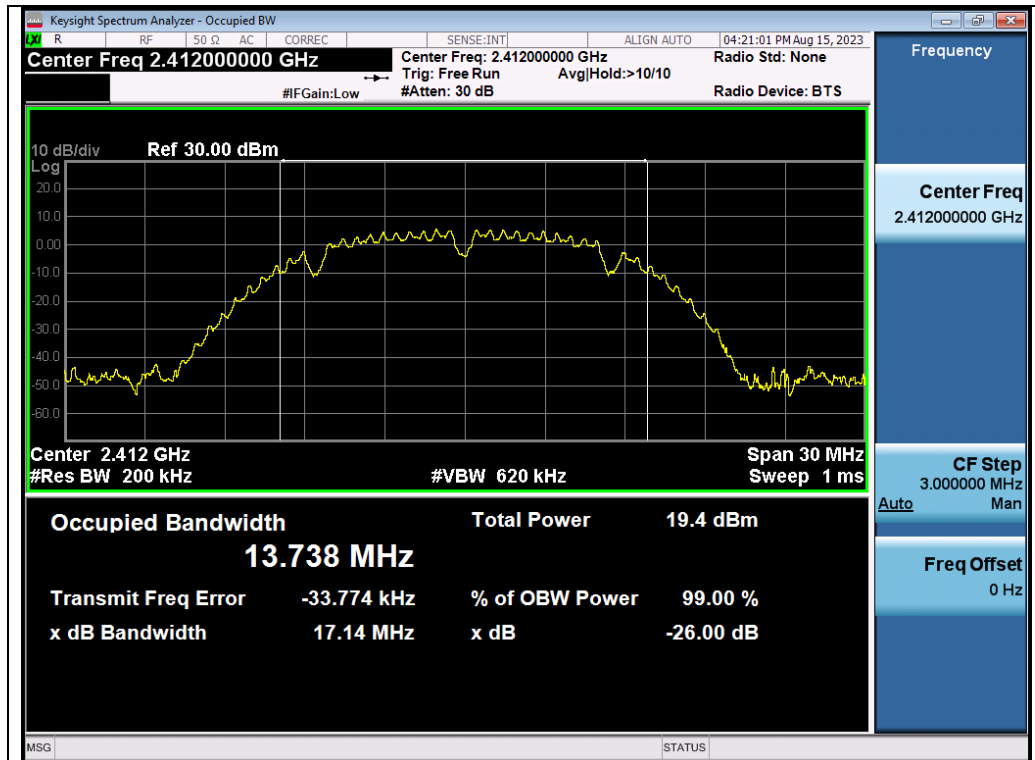
#### 8.4. MEASUREMENT RESULTS

| Test Data of Occupied Bandwidth and DTS Bandwidth-ANT 1 |                    |                              |                     |                  |              |
|---------------------------------------------------------|--------------------|------------------------------|---------------------|------------------|--------------|
| Test Mode                                               | Test Channel (MHz) | 99% Occupied Bandwidth (MHz) | DTS Bandwidth (MHz) | DTS Limits (MHz) | Pass or Fail |
| 802.11b                                                 | 2412               | 13.738                       | 10.076              | ≥0.5             | Pass         |
|                                                         | 2437               | 13.732                       | 10.066              | ≥0.5             | Pass         |
|                                                         | 2462               | 13.732                       | 10.085              | ≥0.5             | Pass         |
| 802.11g                                                 | 2412               | 16.538                       | 16.032              | ≥0.5             | Pass         |
|                                                         | 2437               | 16.525                       | 16.044              | ≥0.5             | Pass         |
|                                                         | 2462               | 16.509                       | 16.343              | ≥0.5             | Pass         |
| 802.11n20                                               | 2412               | 17.662                       | 17.271              | ≥0.5             | Pass         |
|                                                         | 2437               | 17.686                       | 17.557              | ≥0.5             | Pass         |
|                                                         | 2462               | 17.669                       | 17.294              | ≥0.5             | Pass         |
| 802.11n40                                               | 2422               | 35.671                       | 35.112              | ≥0.5             | Pass         |
|                                                         | 2437               | 35.685                       | 35.098              | ≥0.5             | Pass         |
|                                                         | 2452               | 35.662                       | 35.098              | ≥0.5             | Pass         |

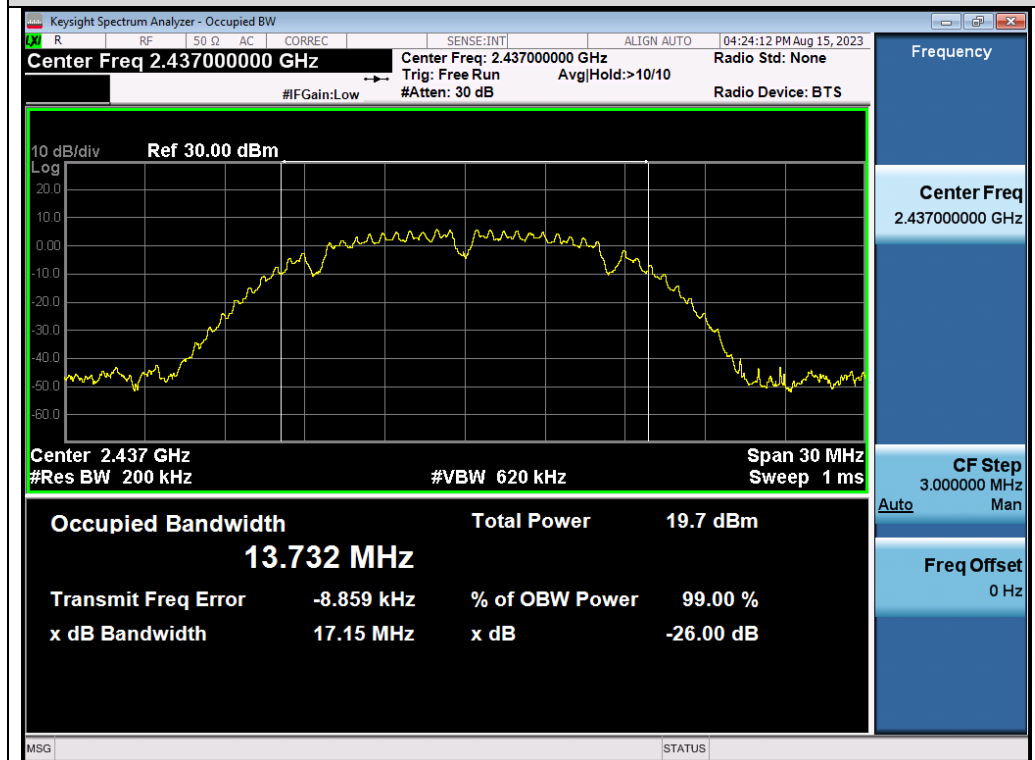
| Test Data of Occupied Bandwidth and DTS Bandwidth-ANT 2 |                    |                              |                     |                  |              |
|---------------------------------------------------------|--------------------|------------------------------|---------------------|------------------|--------------|
| Test Mode                                               | Test Channel (MHz) | 99% Occupied Bandwidth (MHz) | DTS Bandwidth (MHz) | DTS Limits (MHz) | Pass or Fail |
| 802.11b                                                 | 2412               | 13.714                       | 10.045              | ≥0.5             | Pass         |
|                                                         | 2437               | 13.716                       | 10.068              | ≥0.5             | Pass         |
|                                                         | 2462               | 13.691                       | 10.015              | ≥0.5             | Pass         |
| 802.11g                                                 | 2412               | 16.547                       | 16.294              | ≥0.5             | Pass         |
|                                                         | 2437               | 16.561                       | 16.343              | ≥0.5             | Pass         |
|                                                         | 2462               | 16.554                       | 16.176              | ≥0.5             | Pass         |
| 802.11n20                                               | 2412               | 17.653                       | 17.267              | ≥0.5             | Pass         |
|                                                         | 2437               | 17.656                       | 17.547              | ≥0.5             | Pass         |
|                                                         | 2462               | 17.658                       | 17.300              | ≥0.5             | Pass         |
| 802.11n40                                               | 2422               | 35.662                       | 35.086              | ≥0.5             | Pass         |
|                                                         | 2437               | 35.683                       | 35.095              | ≥0.5             | Pass         |
|                                                         | 2452               | 35.716                       | 35.099              | ≥0.5             | Pass         |

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### Test Graphs of Occupied Bandwidth

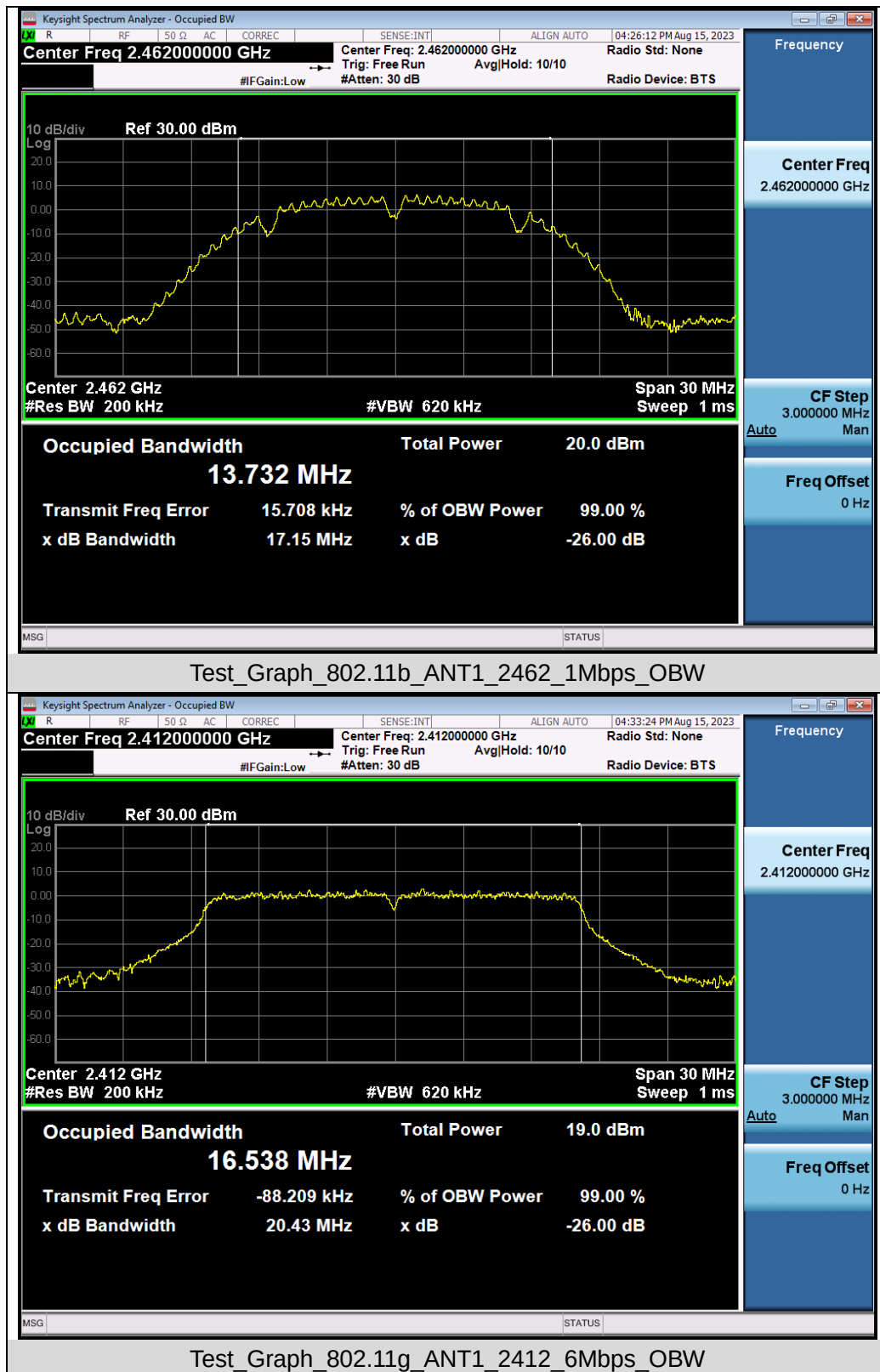


Test\_Graph\_802.11b\_ANT1\_2412\_1Mbps\_OBW

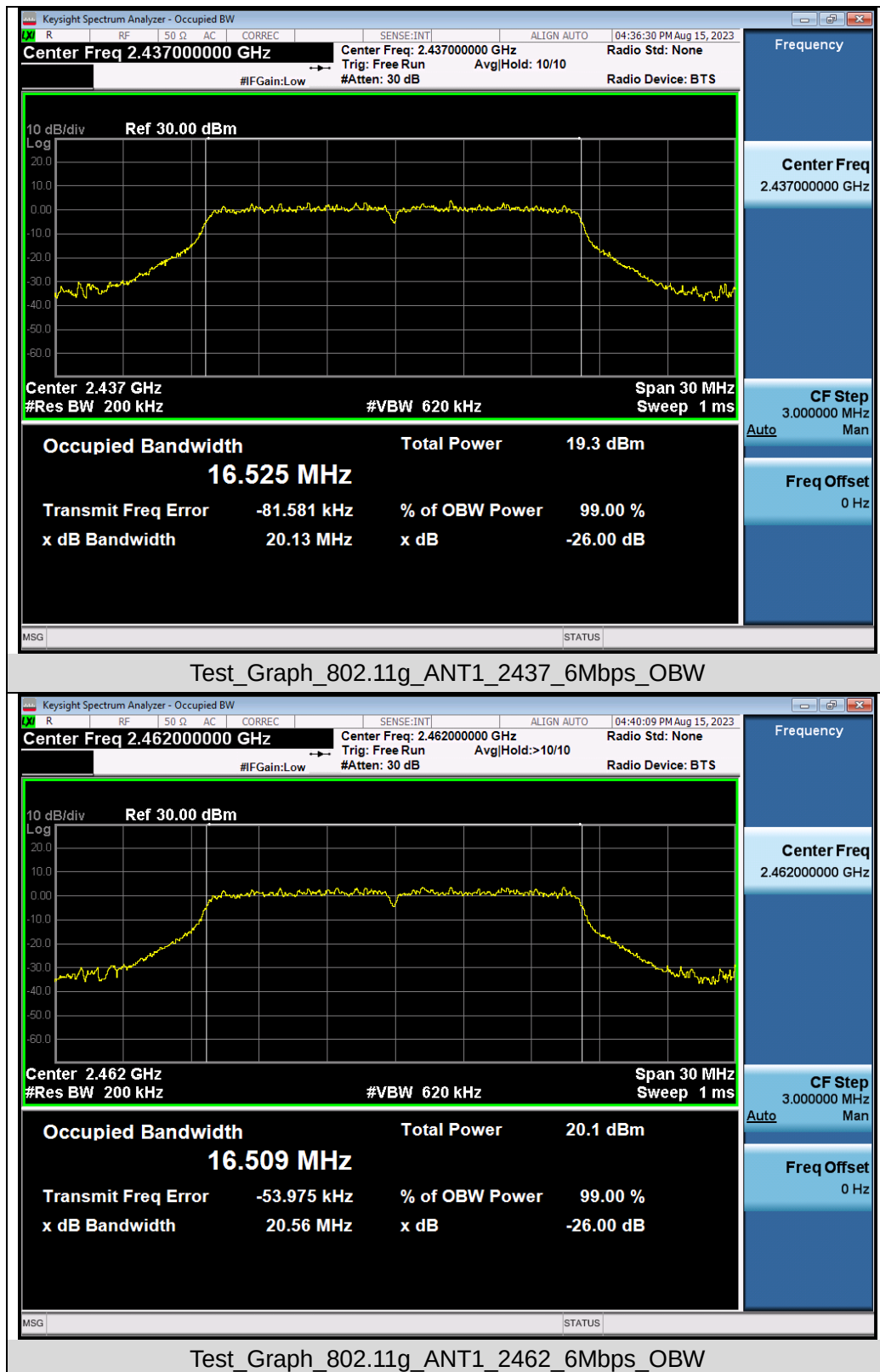


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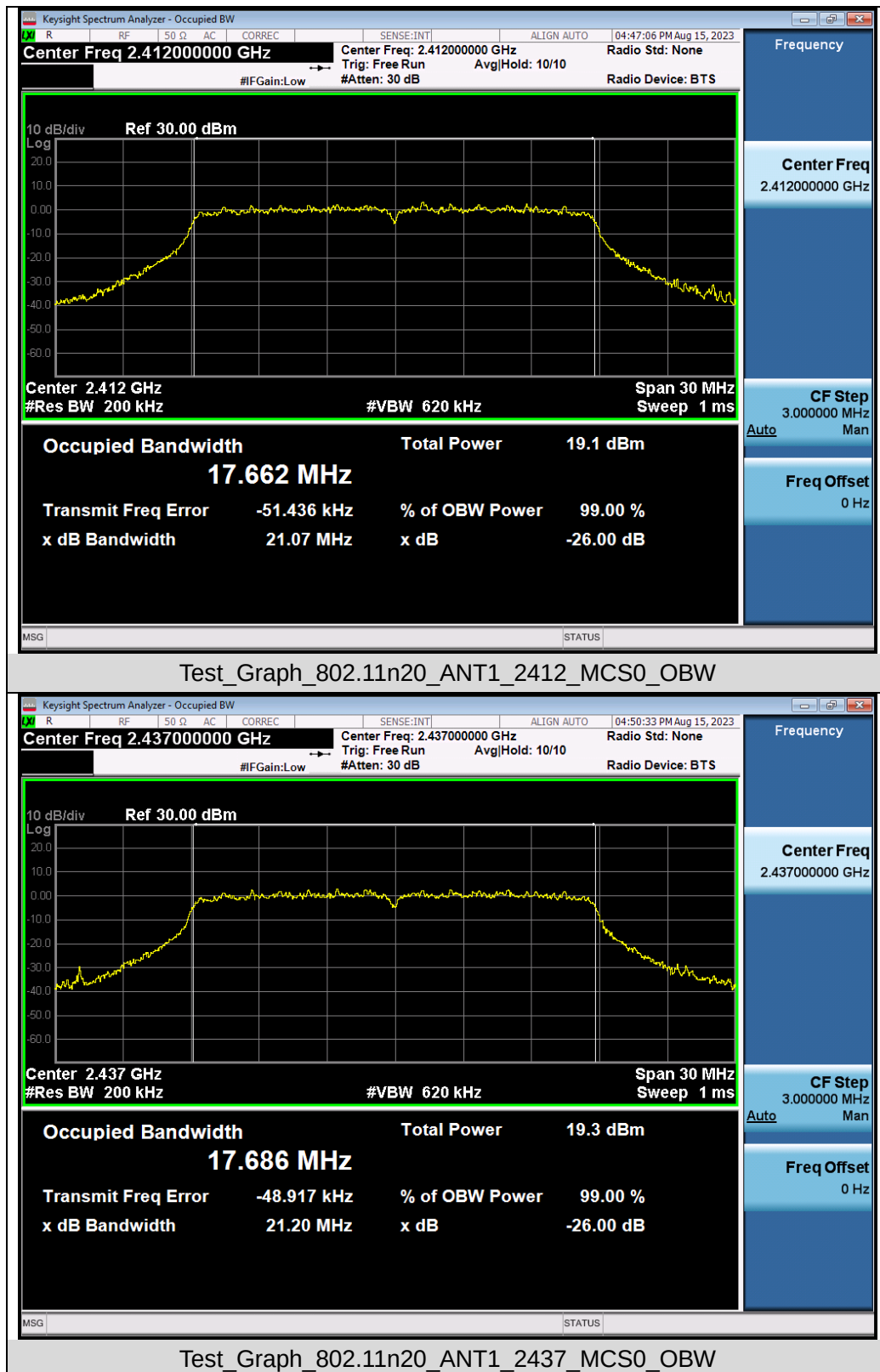
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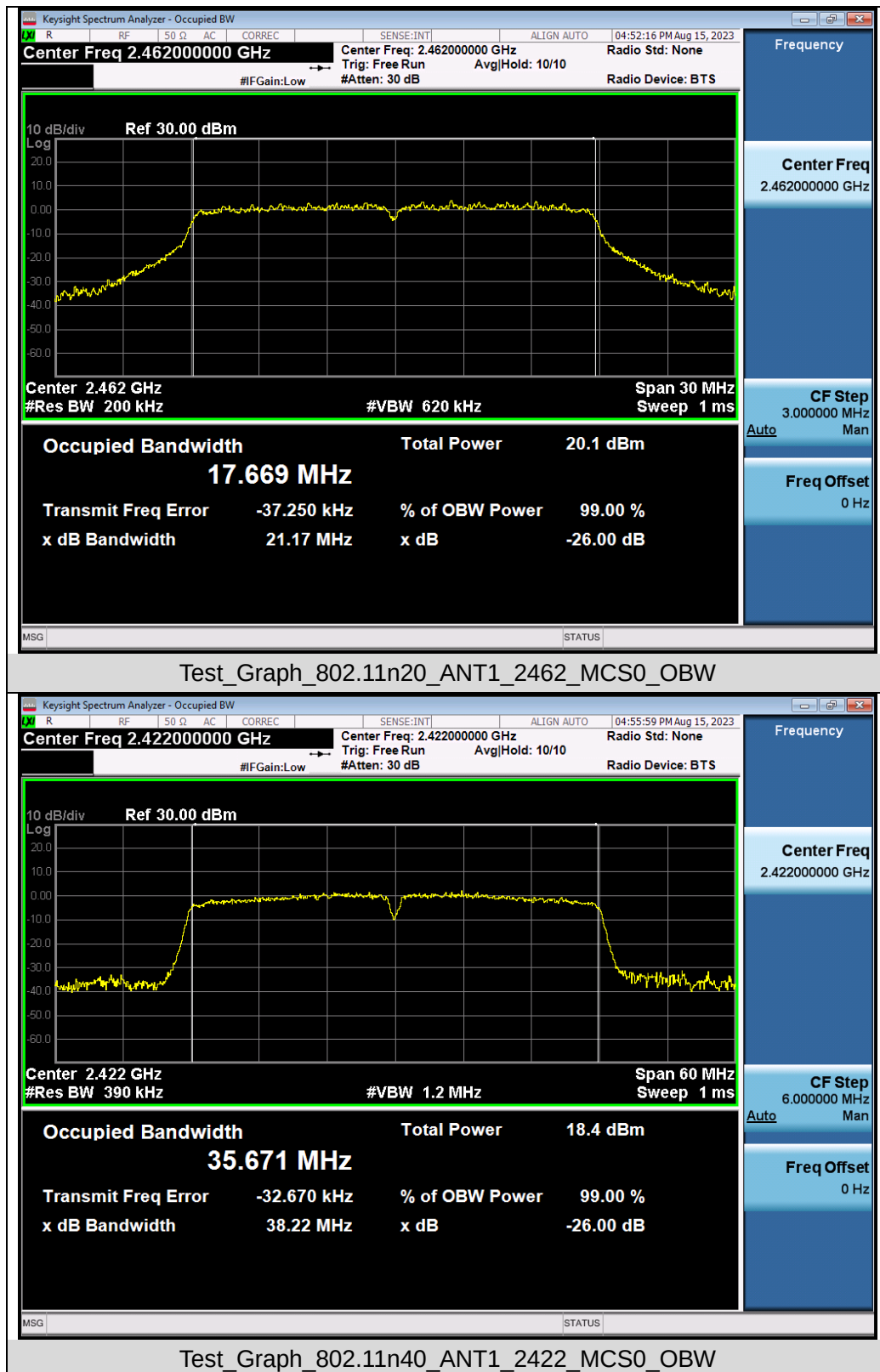
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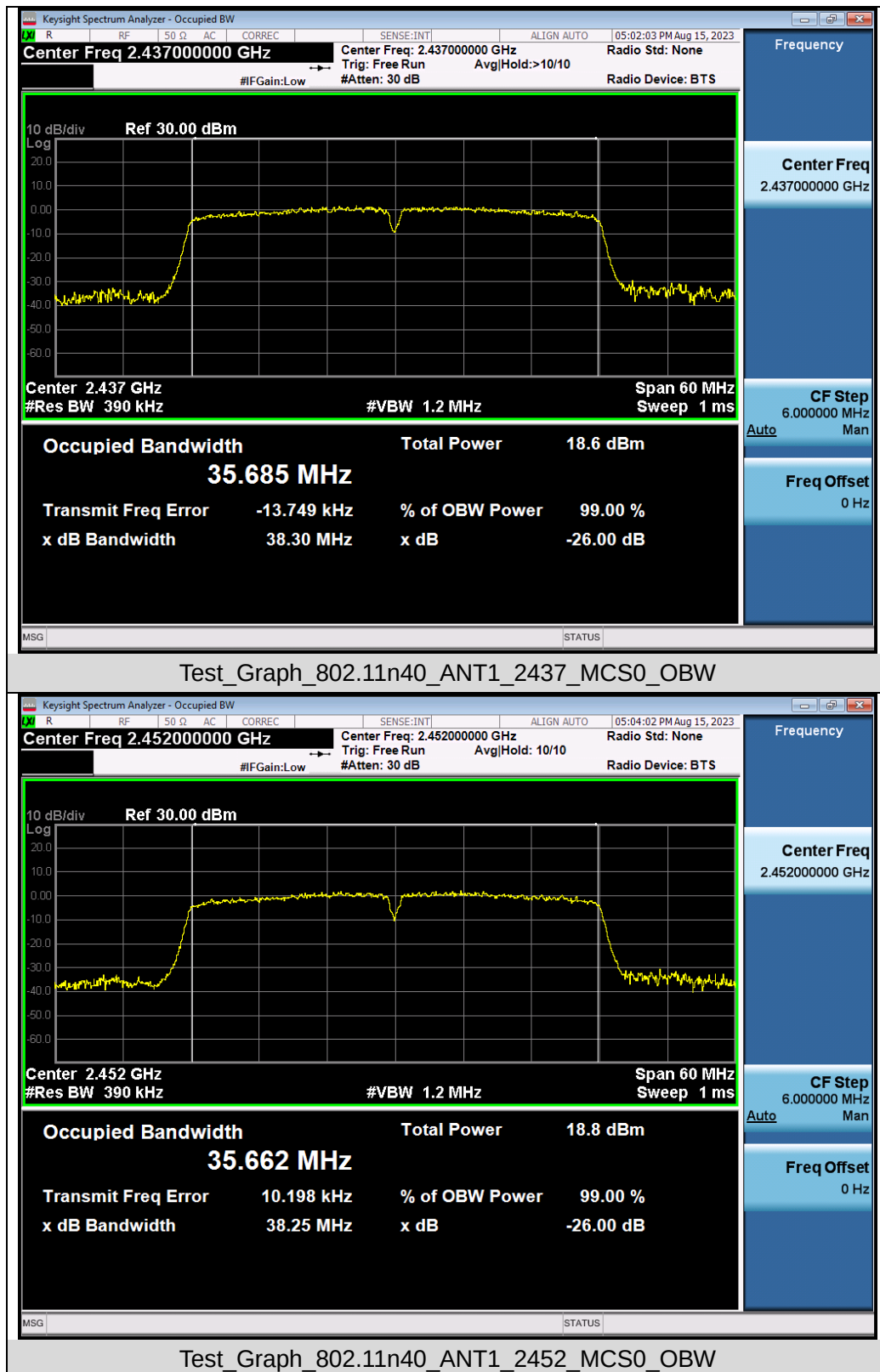
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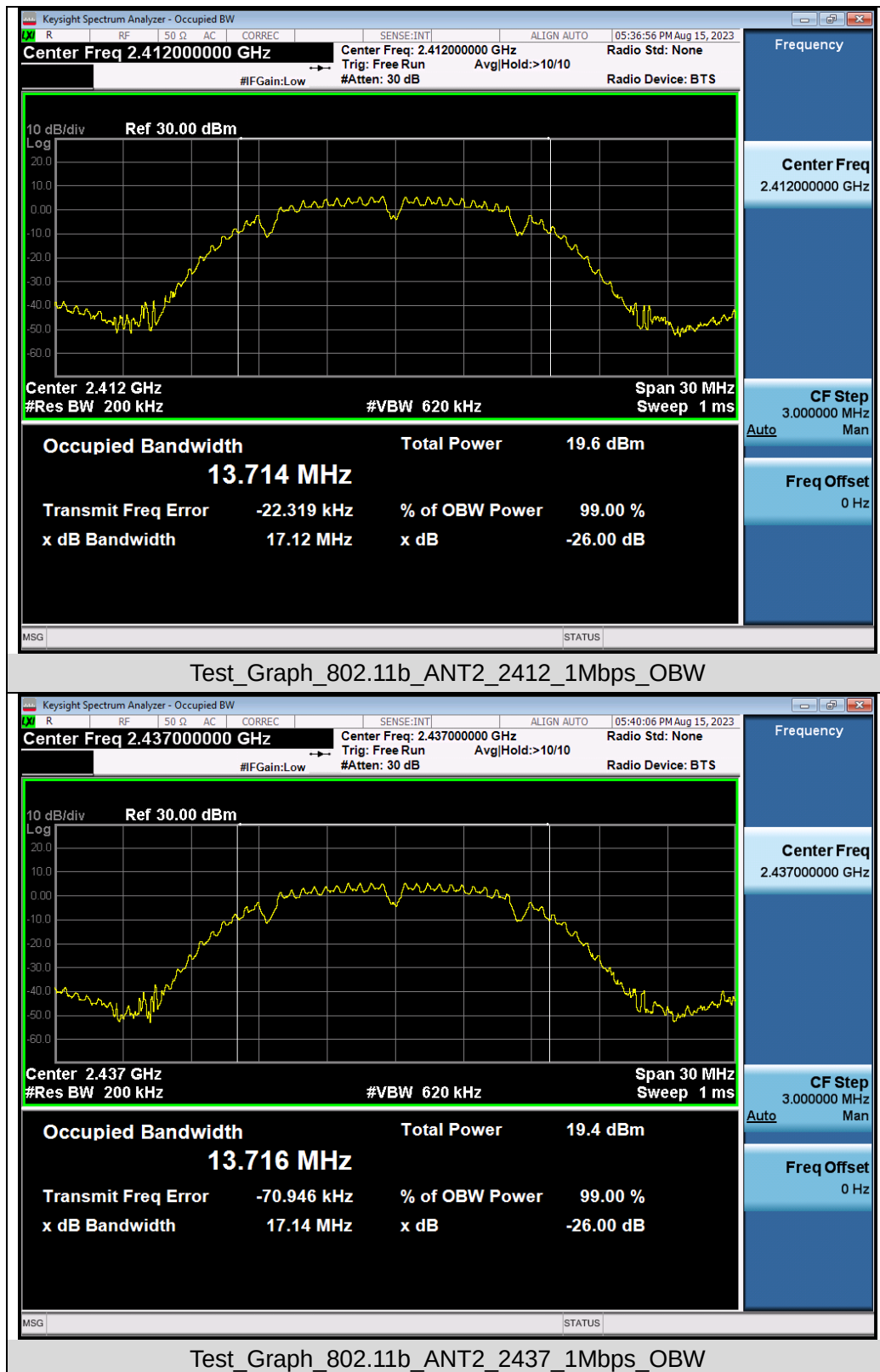
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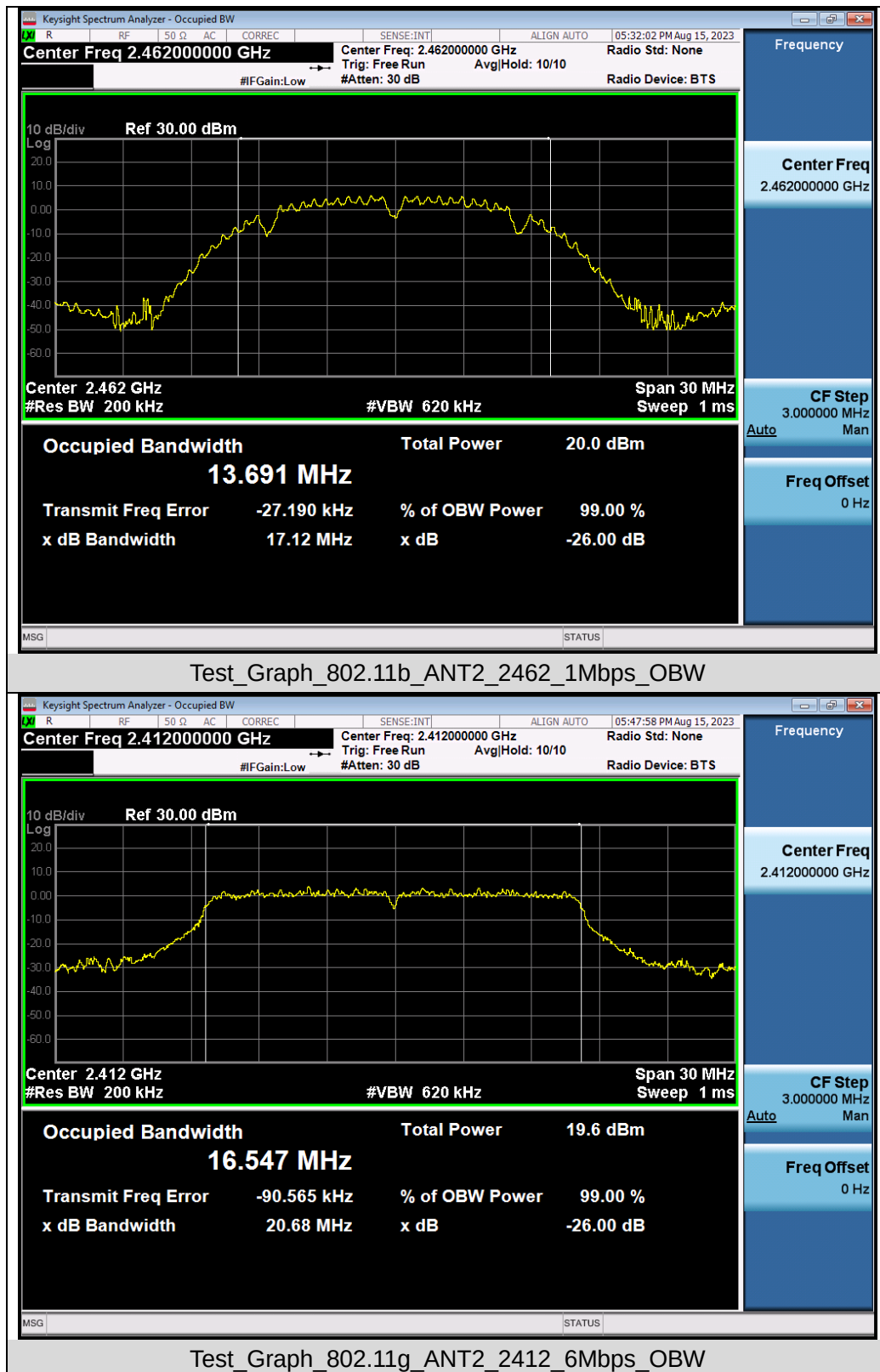
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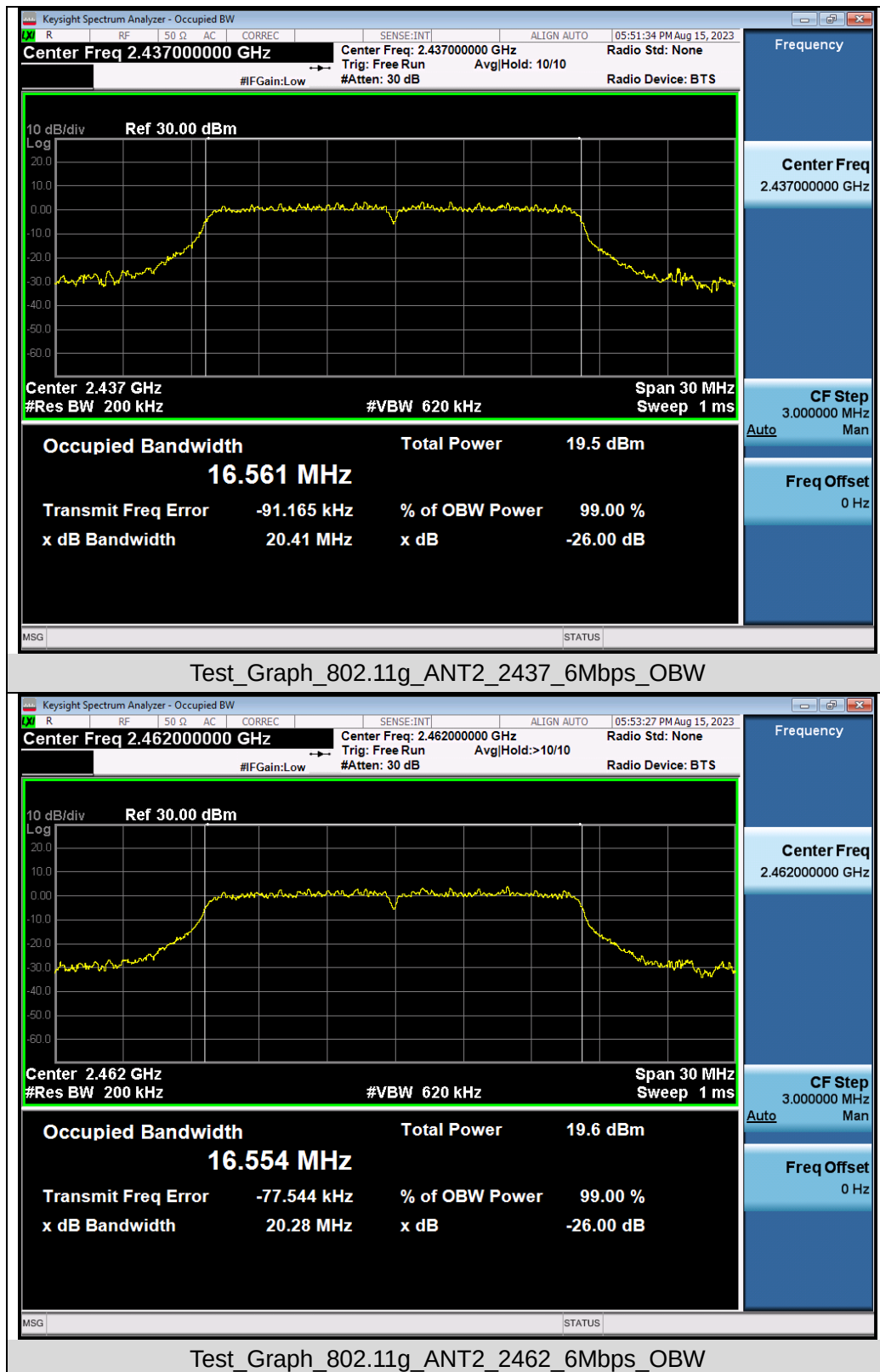
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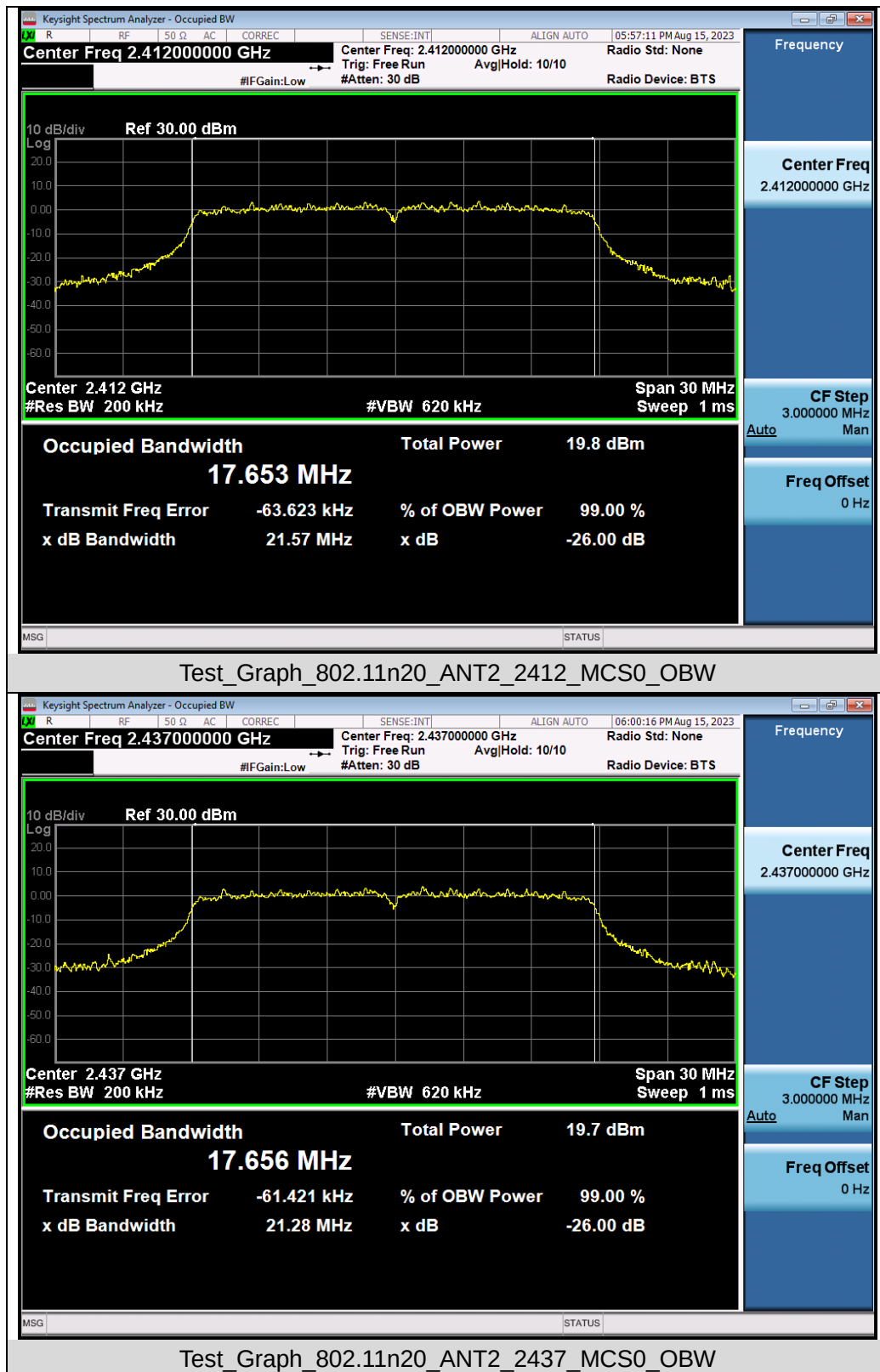
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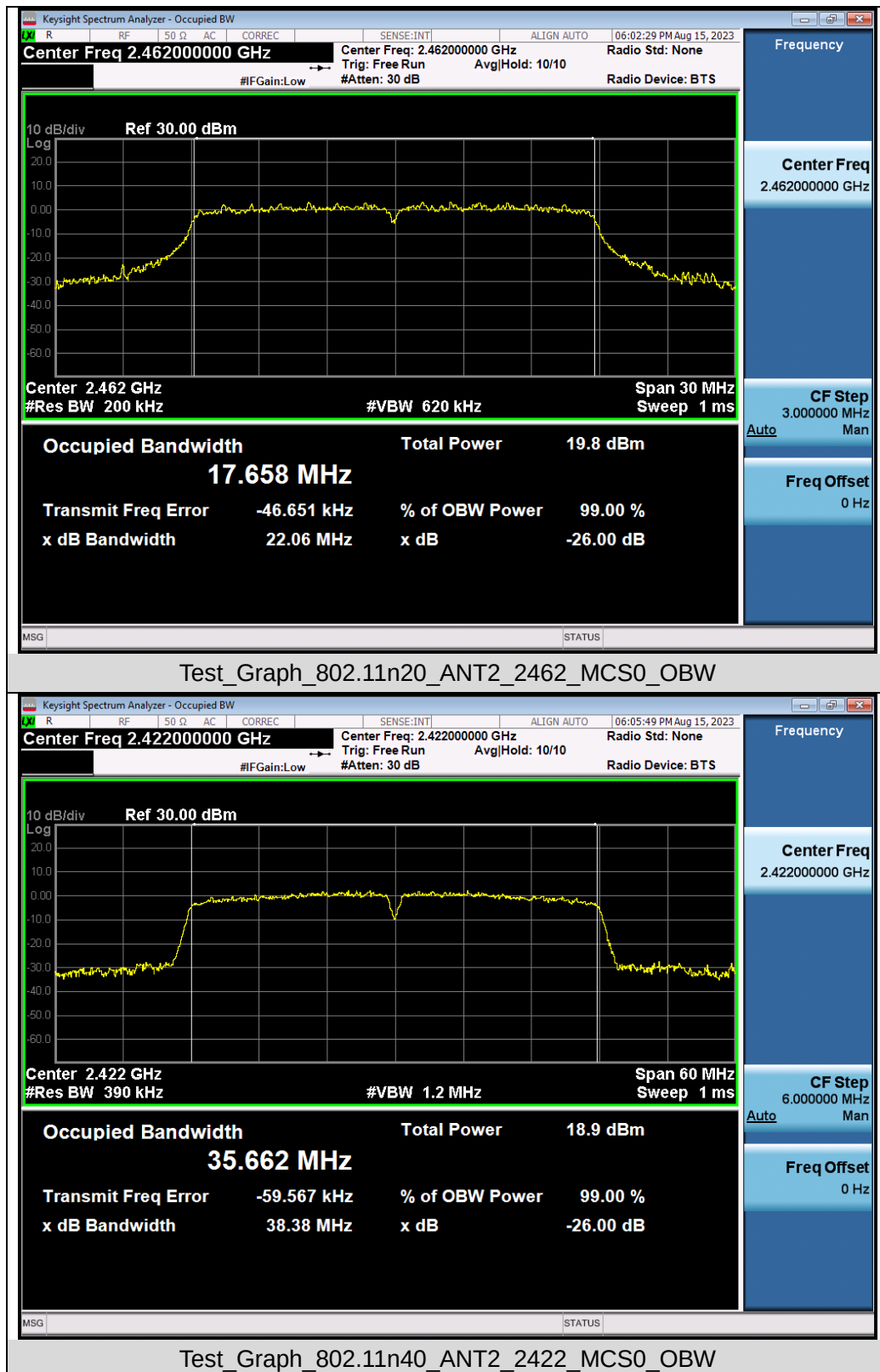
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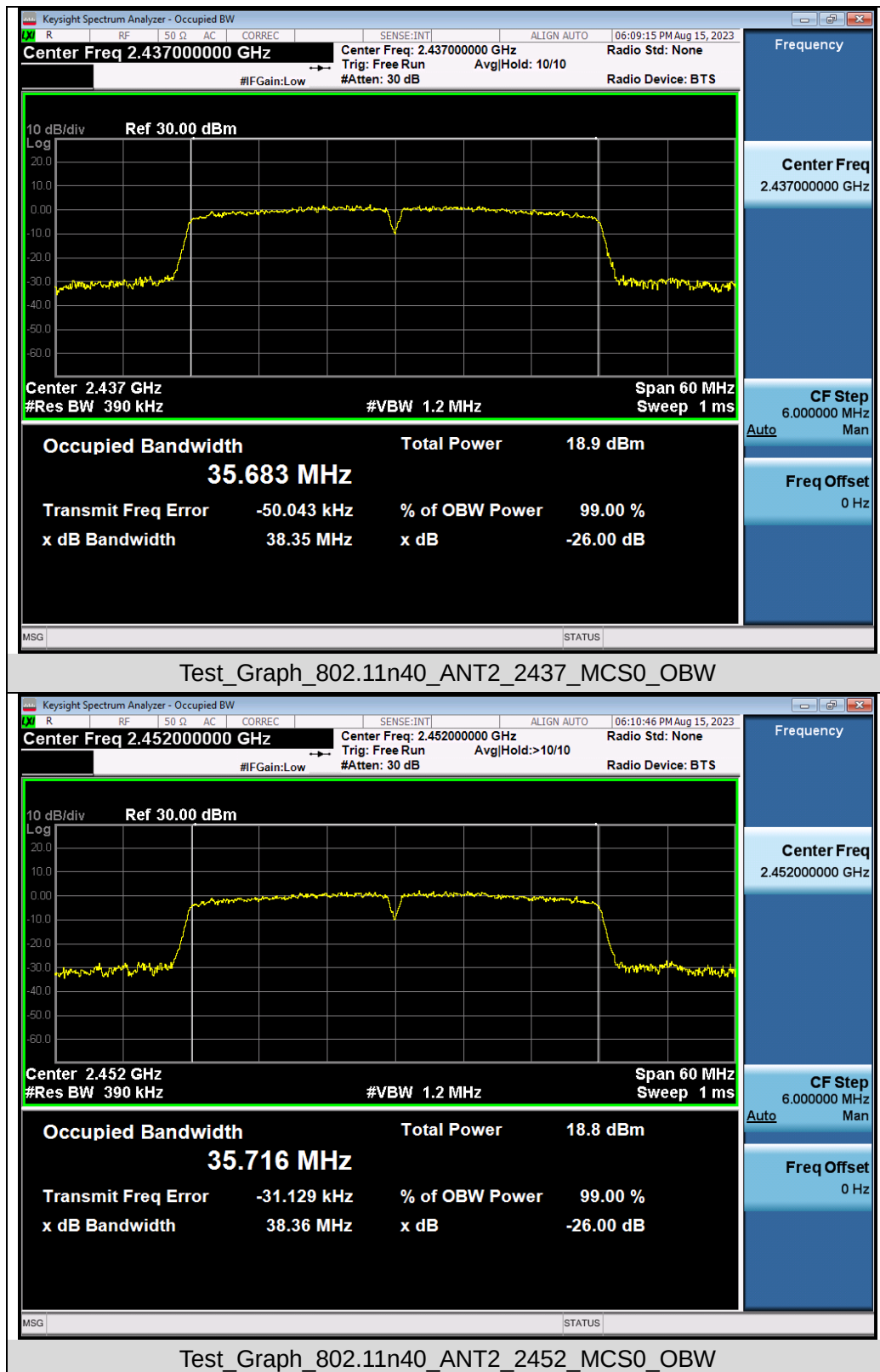
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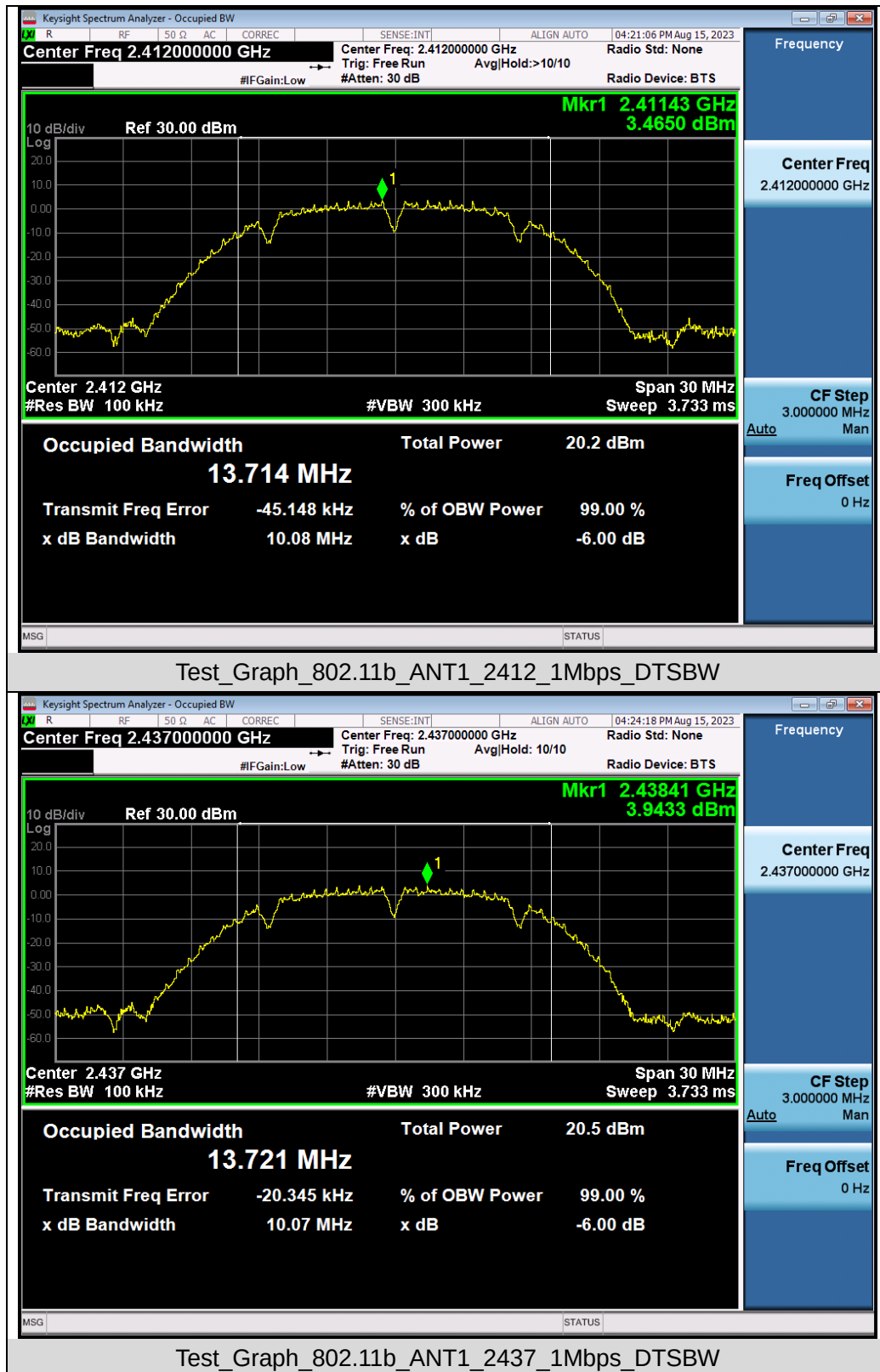


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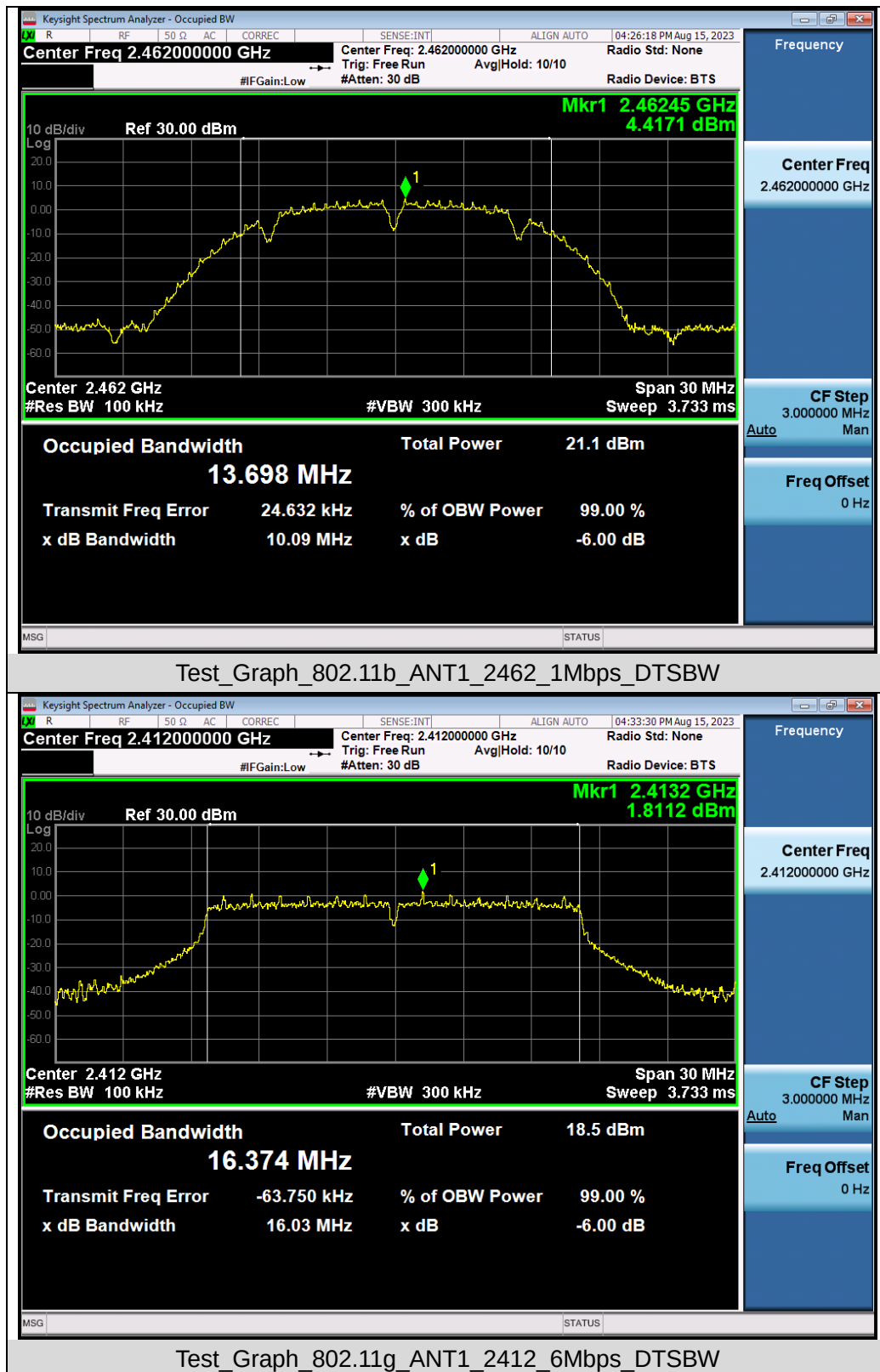


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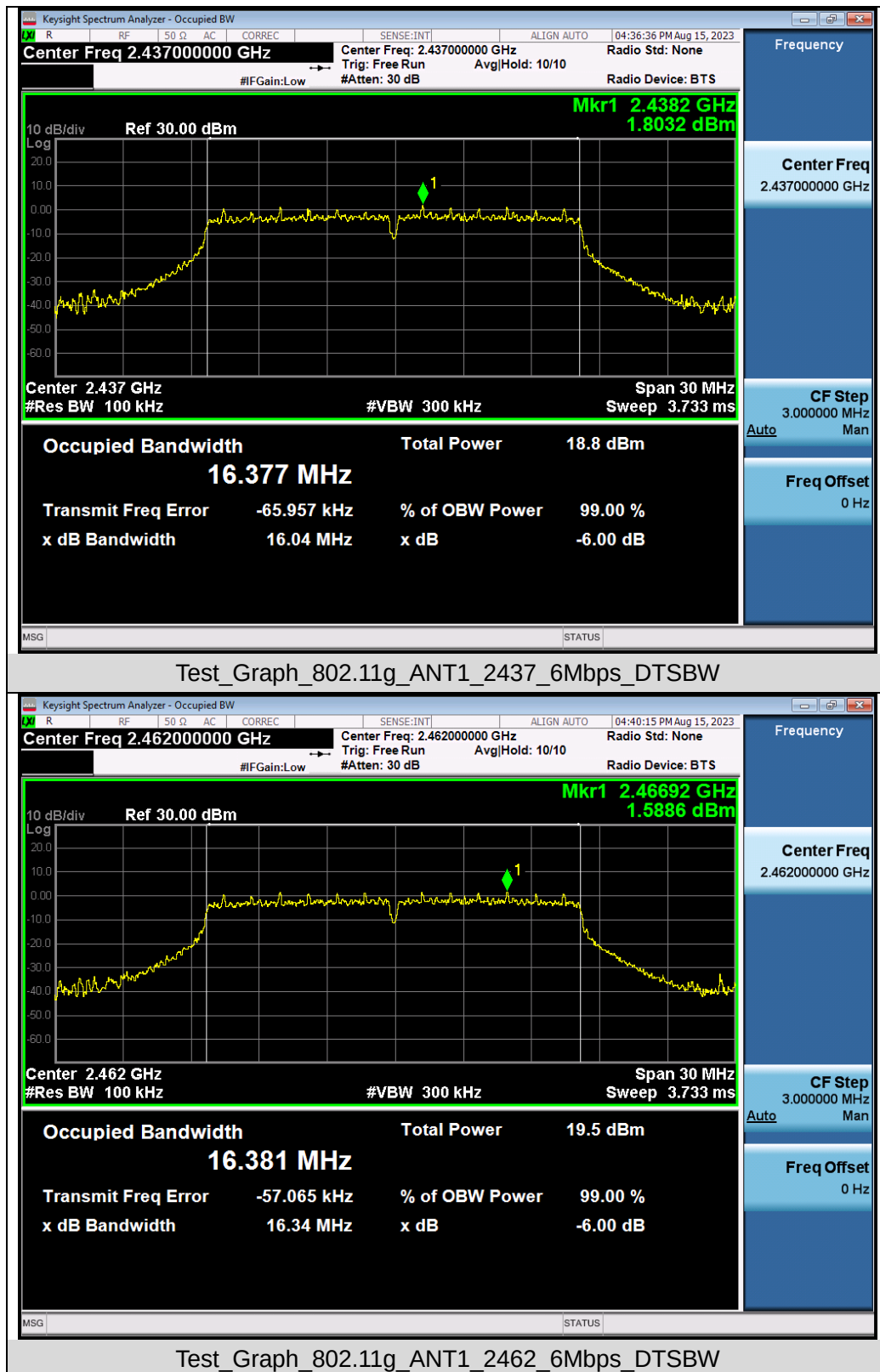
### Test Graphs of DTS Bandwidth



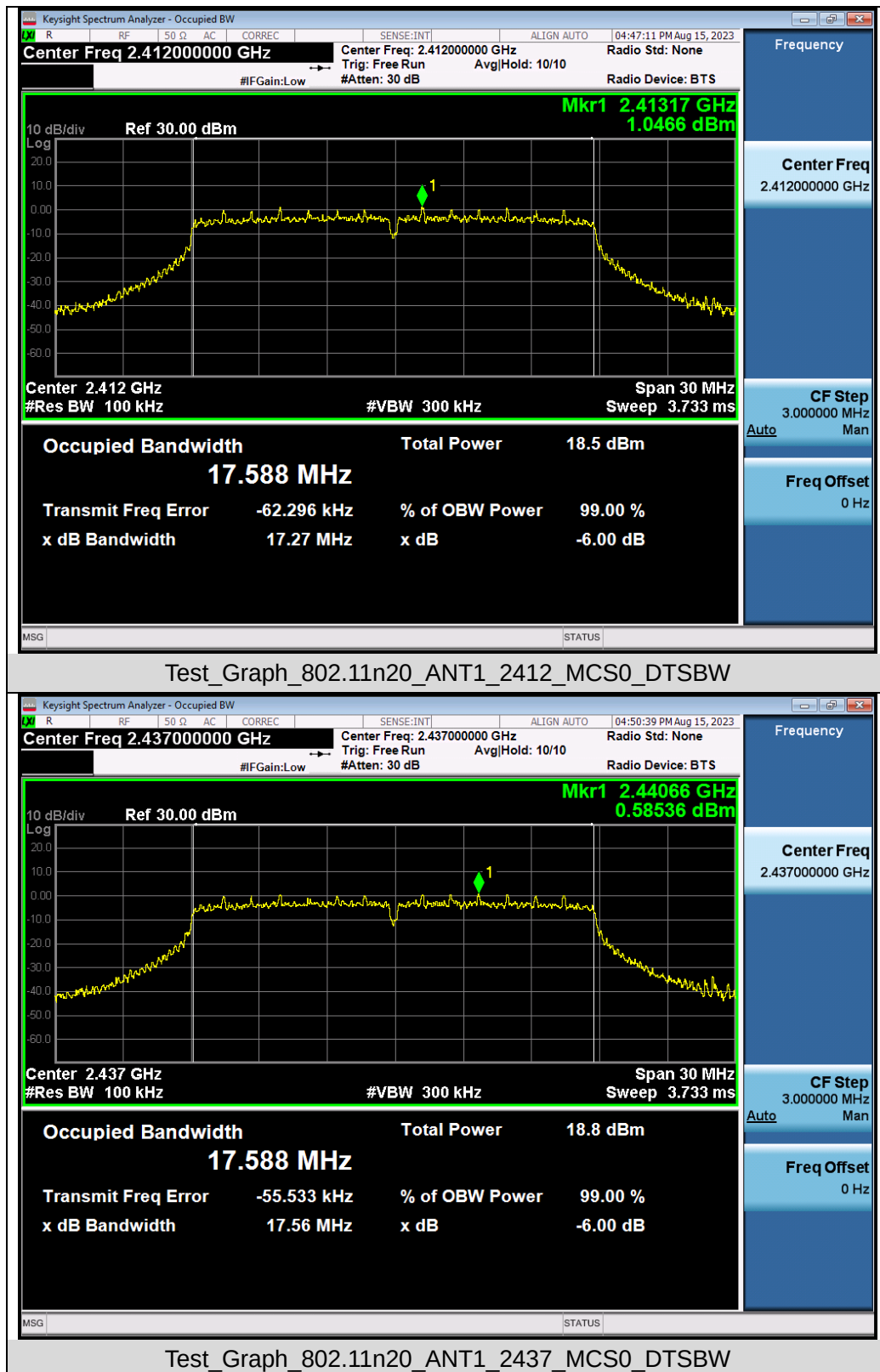
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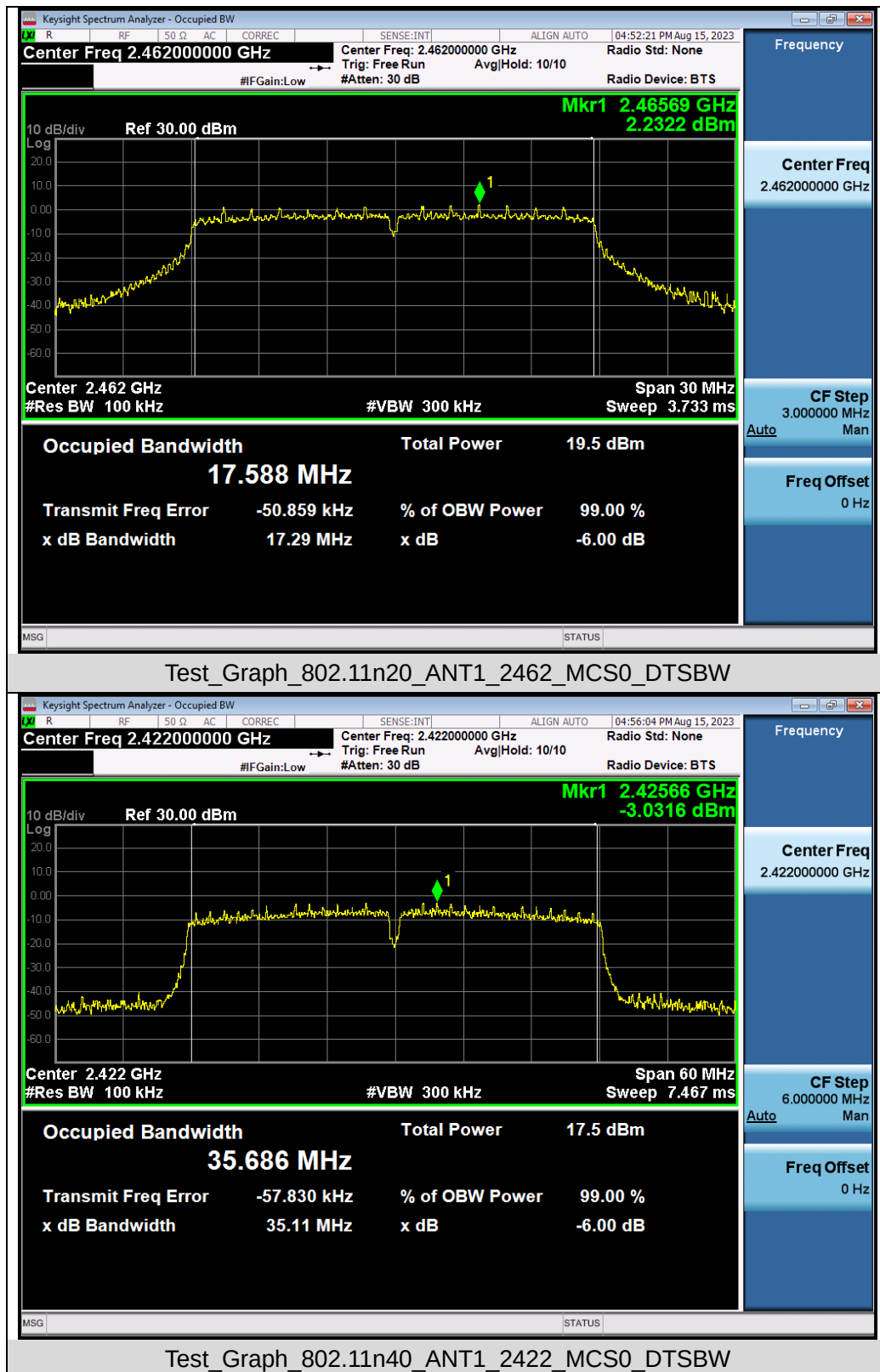
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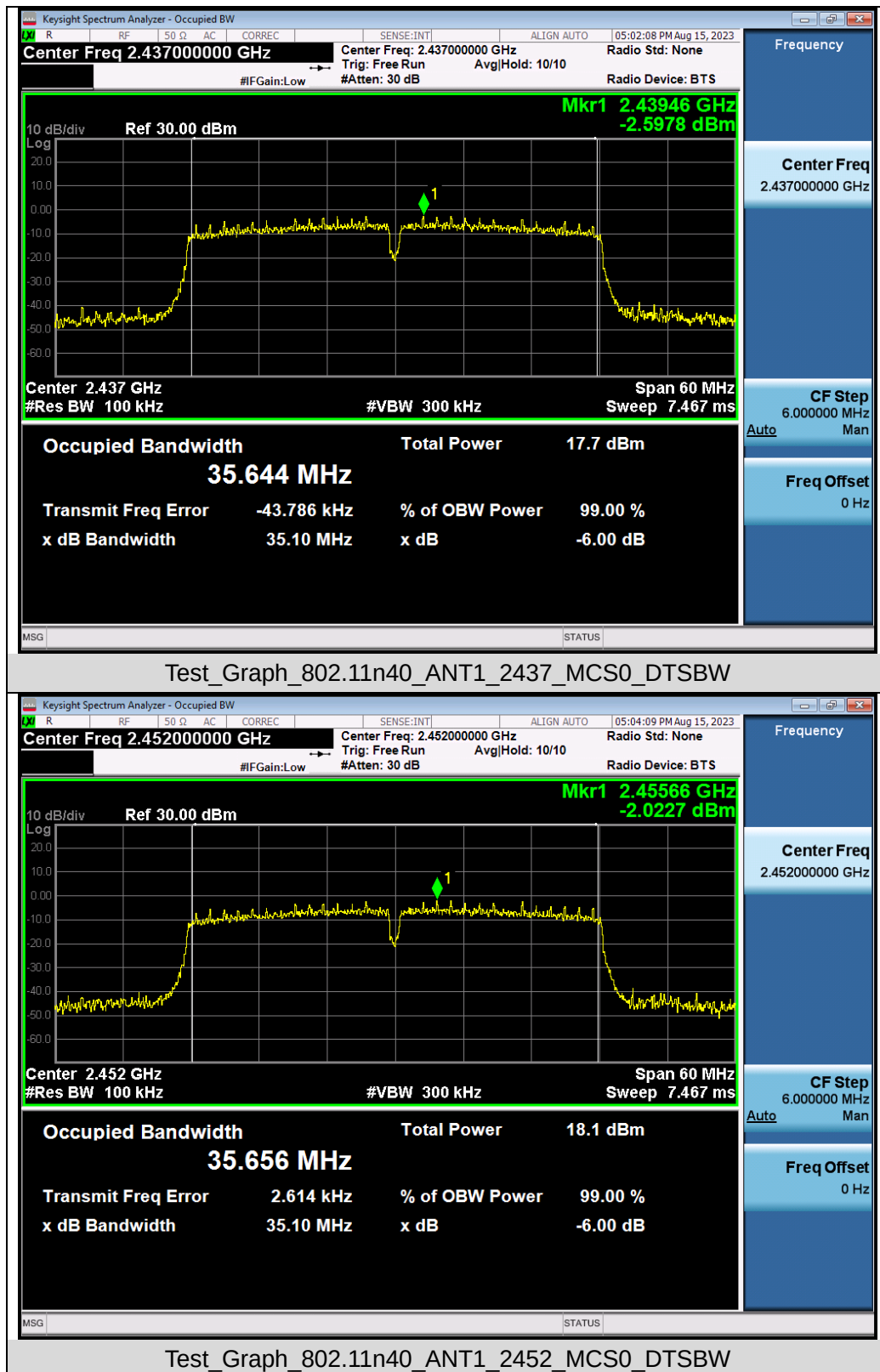
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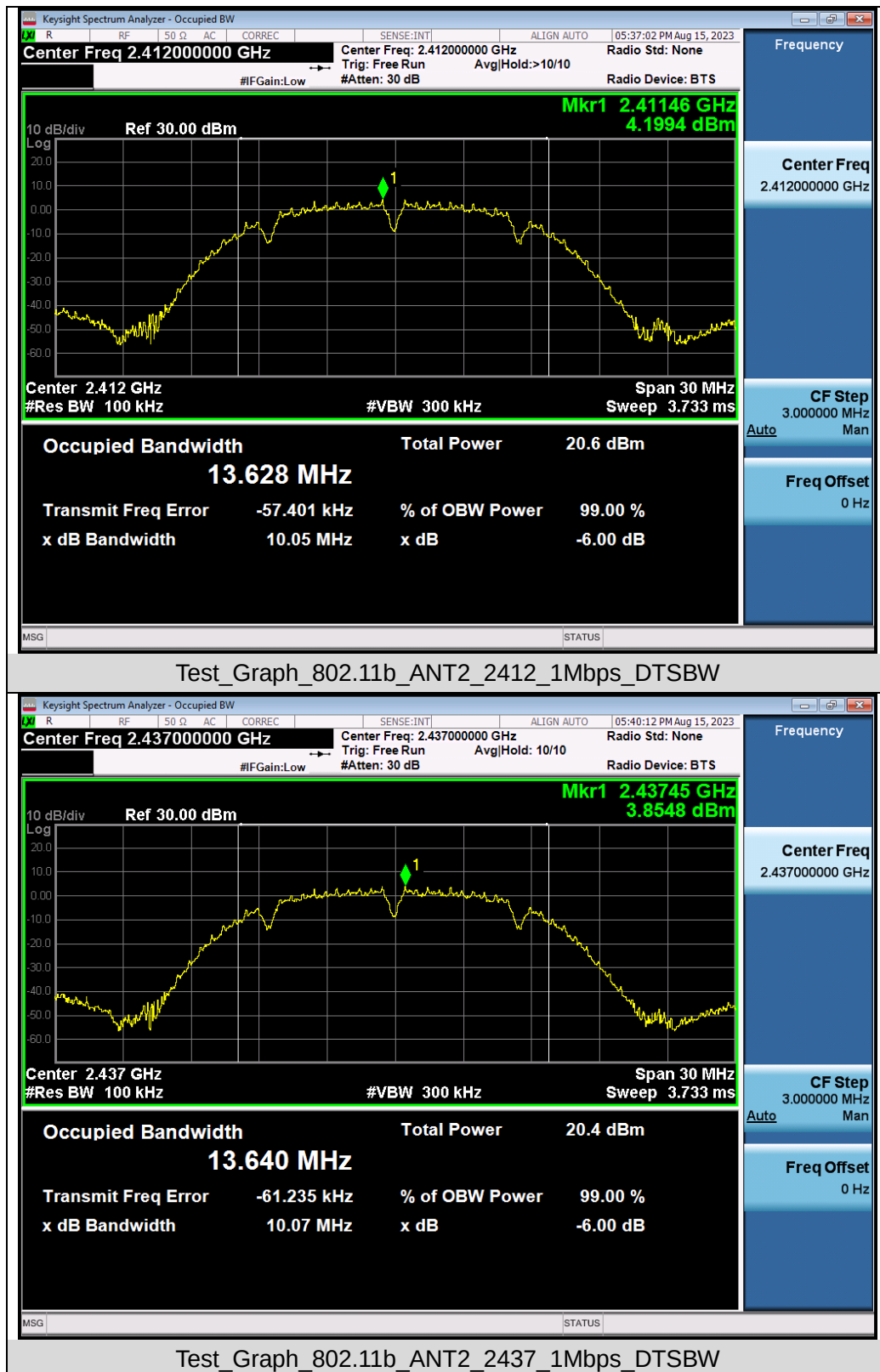
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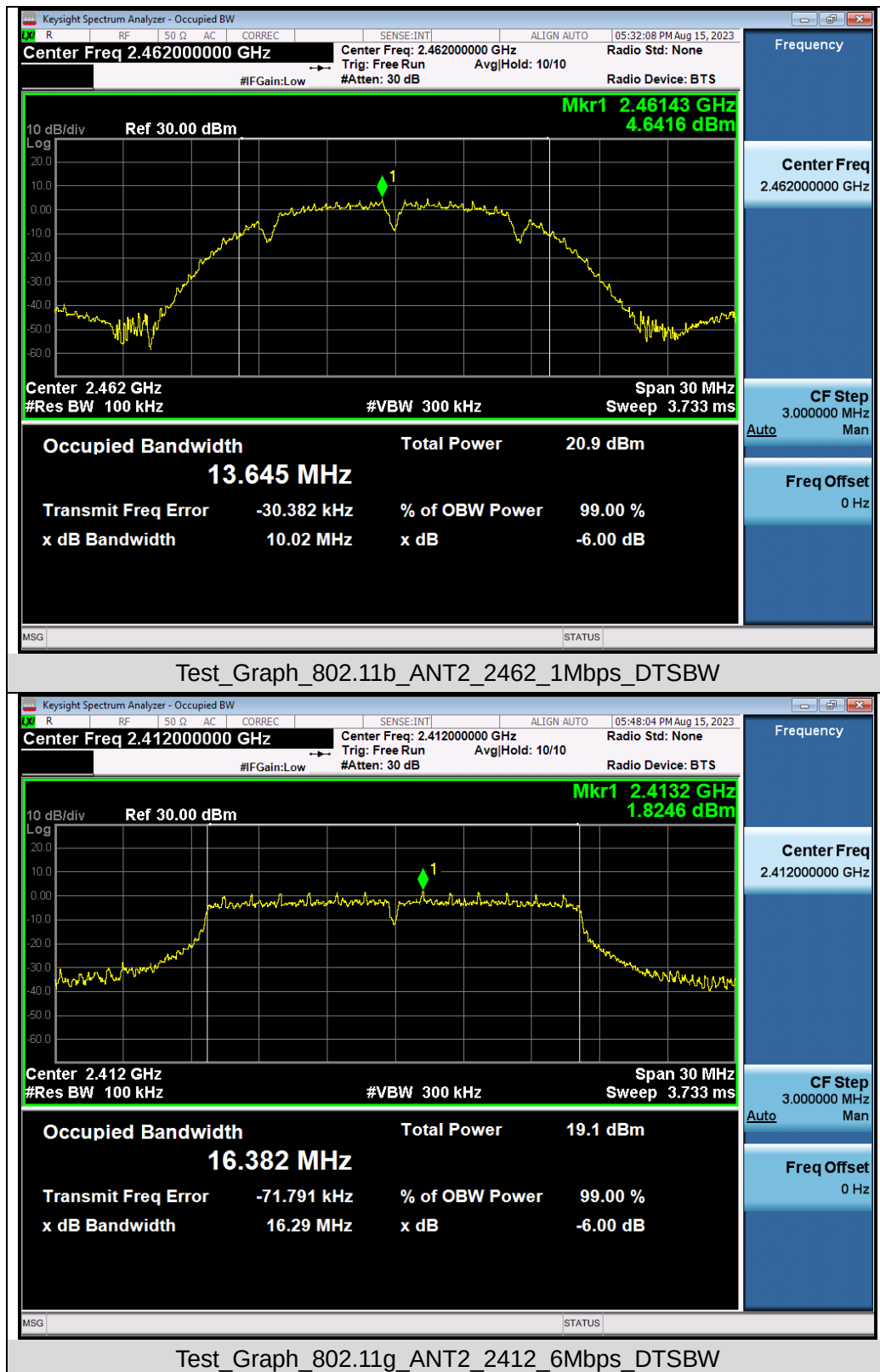
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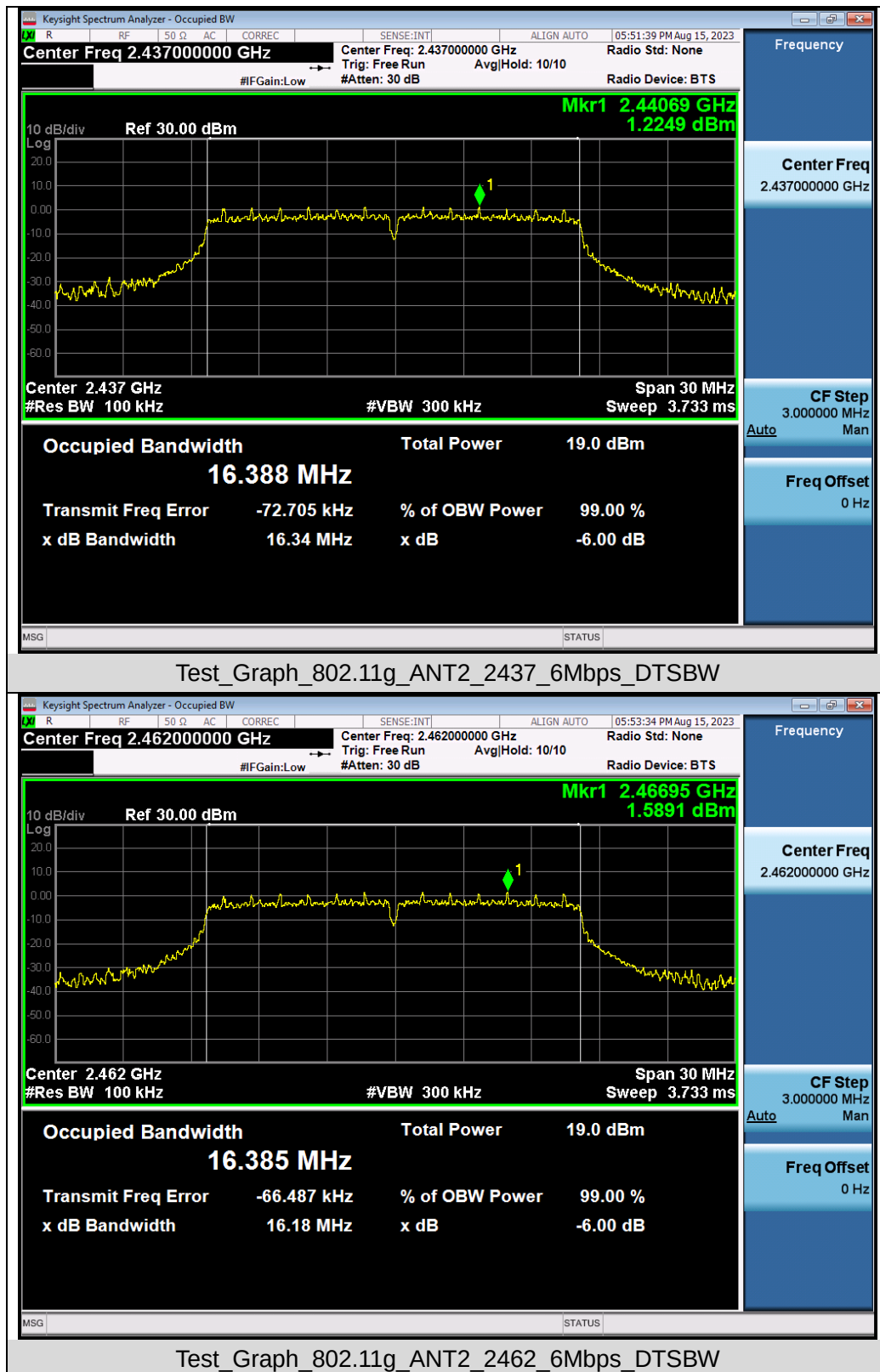
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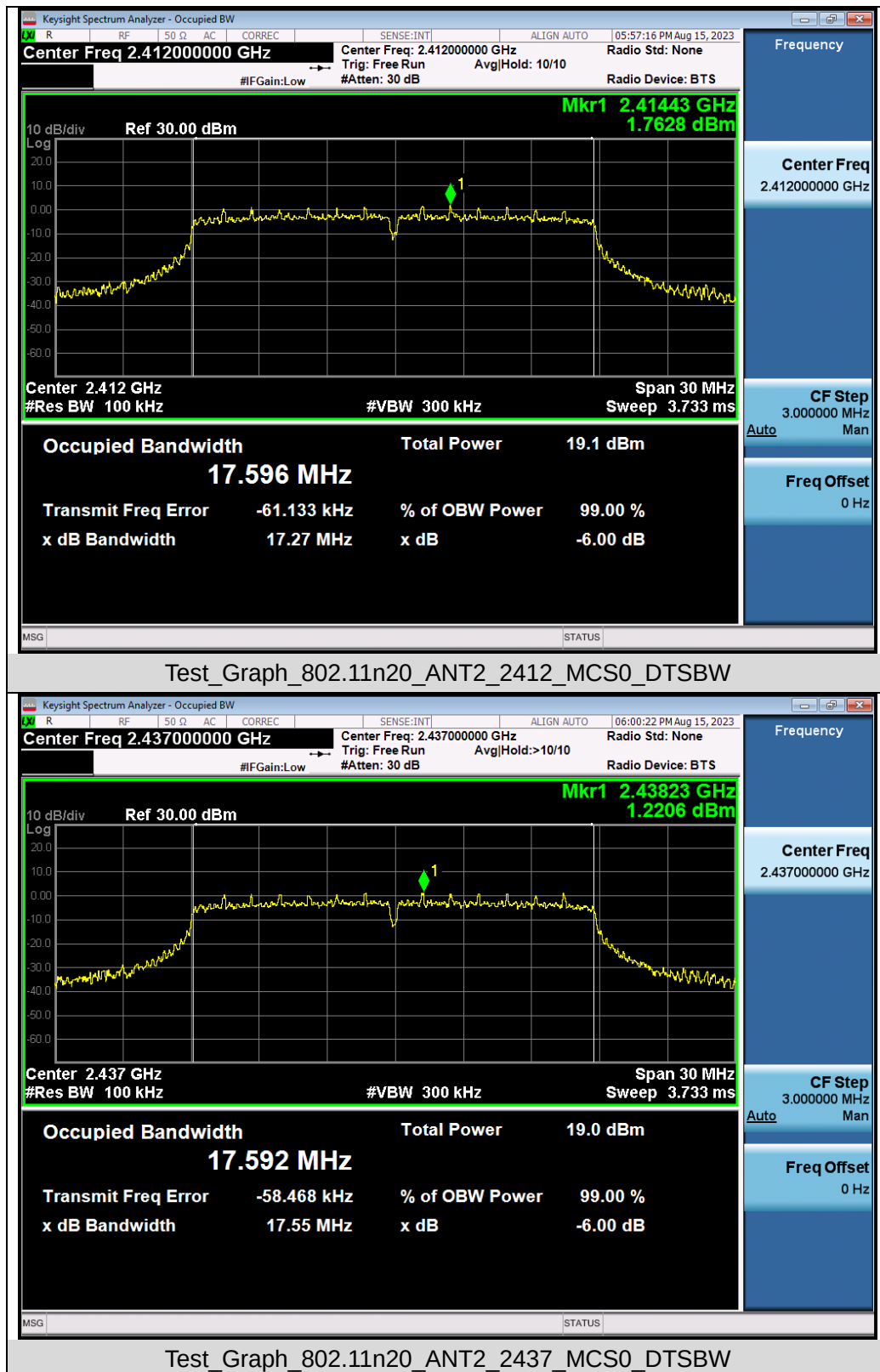
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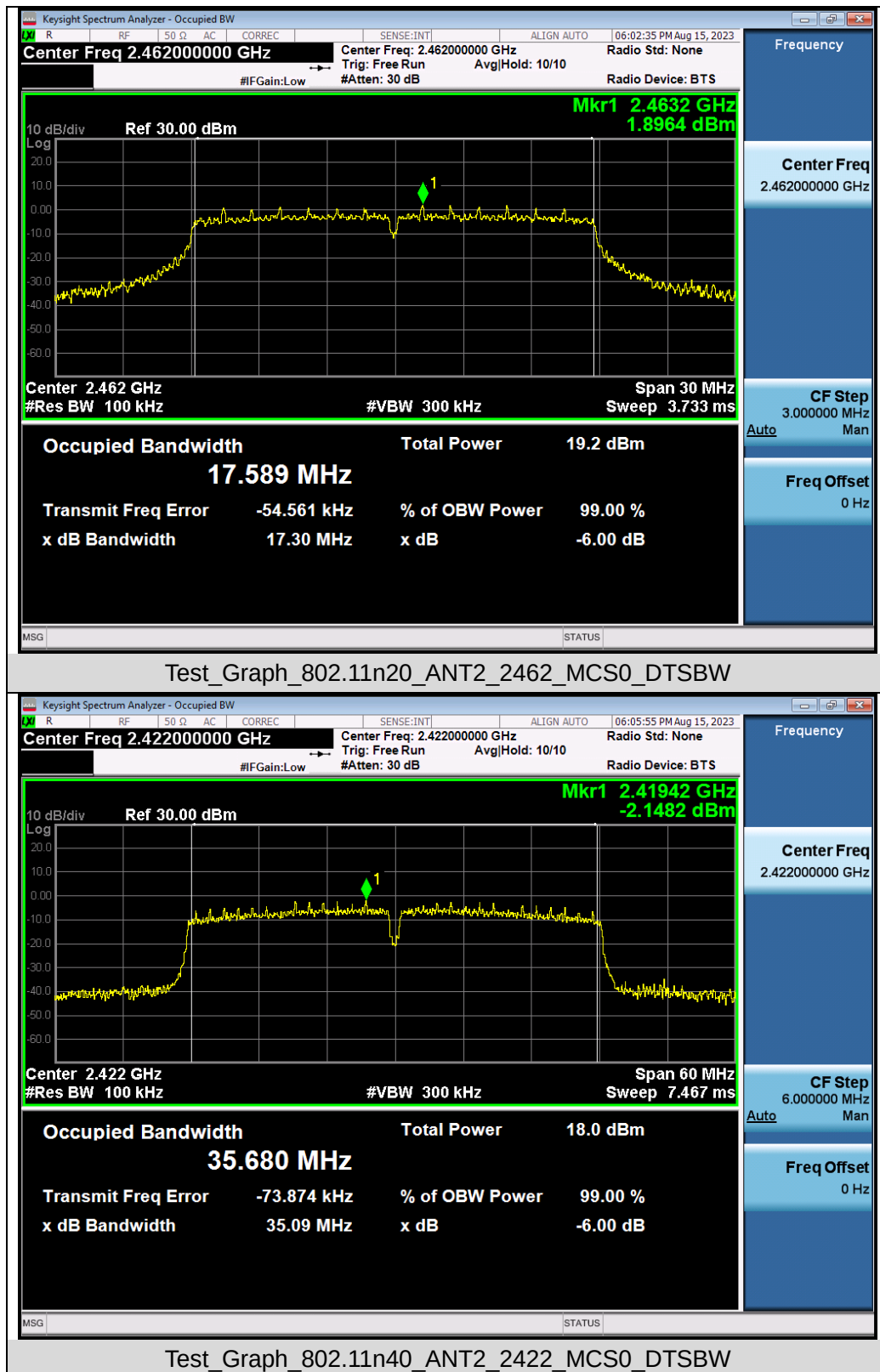
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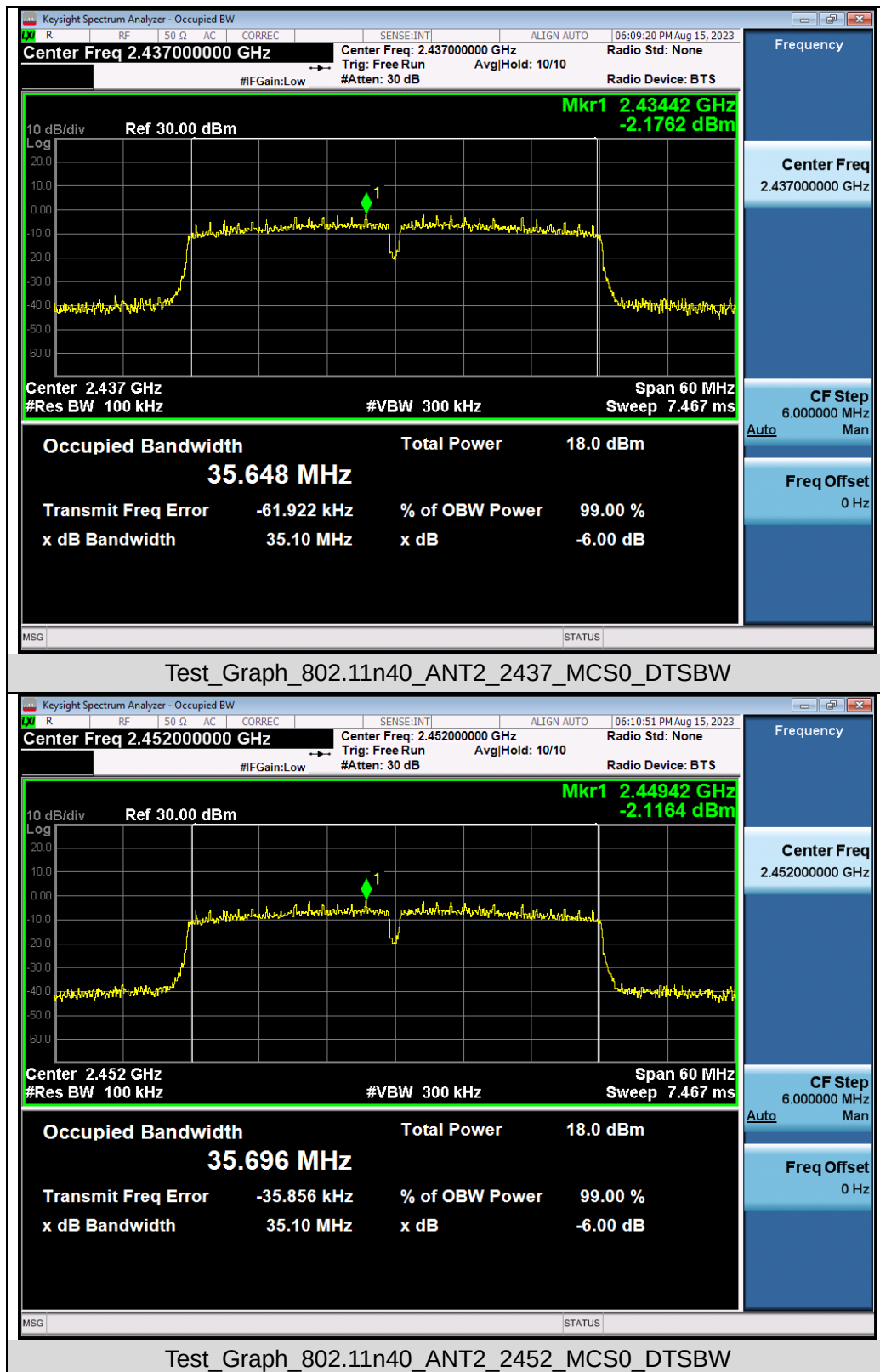
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## 9. CONDUCTED SPURIOUS EMISSION

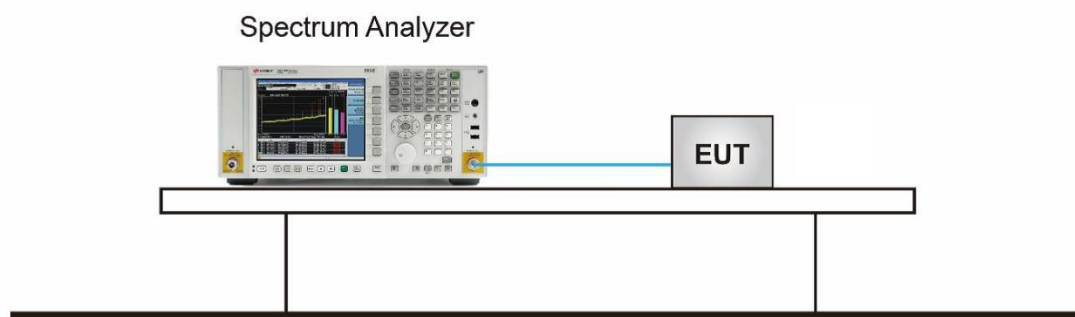
### 9.1 MEASUREMENT LIMIT

| LIMITS AND MEASUREMENT RESULT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|----------|
| Applicable Limits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Measurement Result                                             |          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Test Data                                                      | Criteria |
| <p>In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power.</p> <p>In addition, radiation emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in§15.209(a))</p> | At least -20dBc than the limit Specified on the BOTTOM Channel | PASS     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | At least -20dBc than the limit Specified on the TOP Channel    | PASS     |

### 9.2 MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer
2. Set the EUT Work on the top, the Middle and the bottom operation frequency individually.
3. Set the Span = wide enough to capture the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic.
4. RBW = 100 kHz; VBW= 300 kHz; Sweep = auto; Detector function = peak.(Test frequency below 1GHz)
5. RBW = 1 MHz; VBW= 3 MHz; Sweep = auto; Detector function = peak.(Test frequency Above 1GHz)
6. Set SPA Trace 1 Max hold, then View.
7. Mark the maximum useless stray point and compare it with the limit value to record the result.

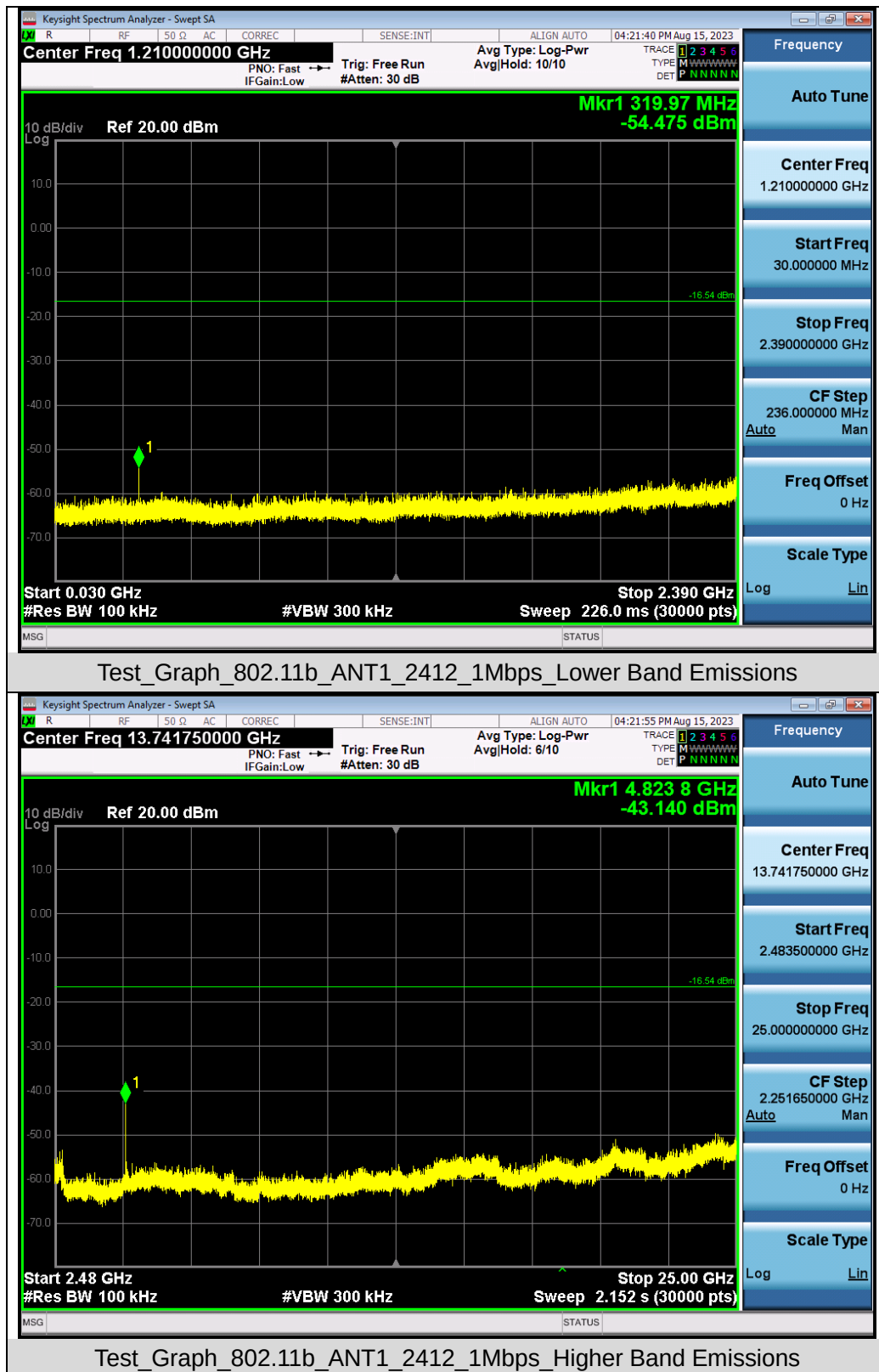
### 9.3 MEASUREMENT SETUP (BLOCK DIAGRAM OF CONFIGURATION)



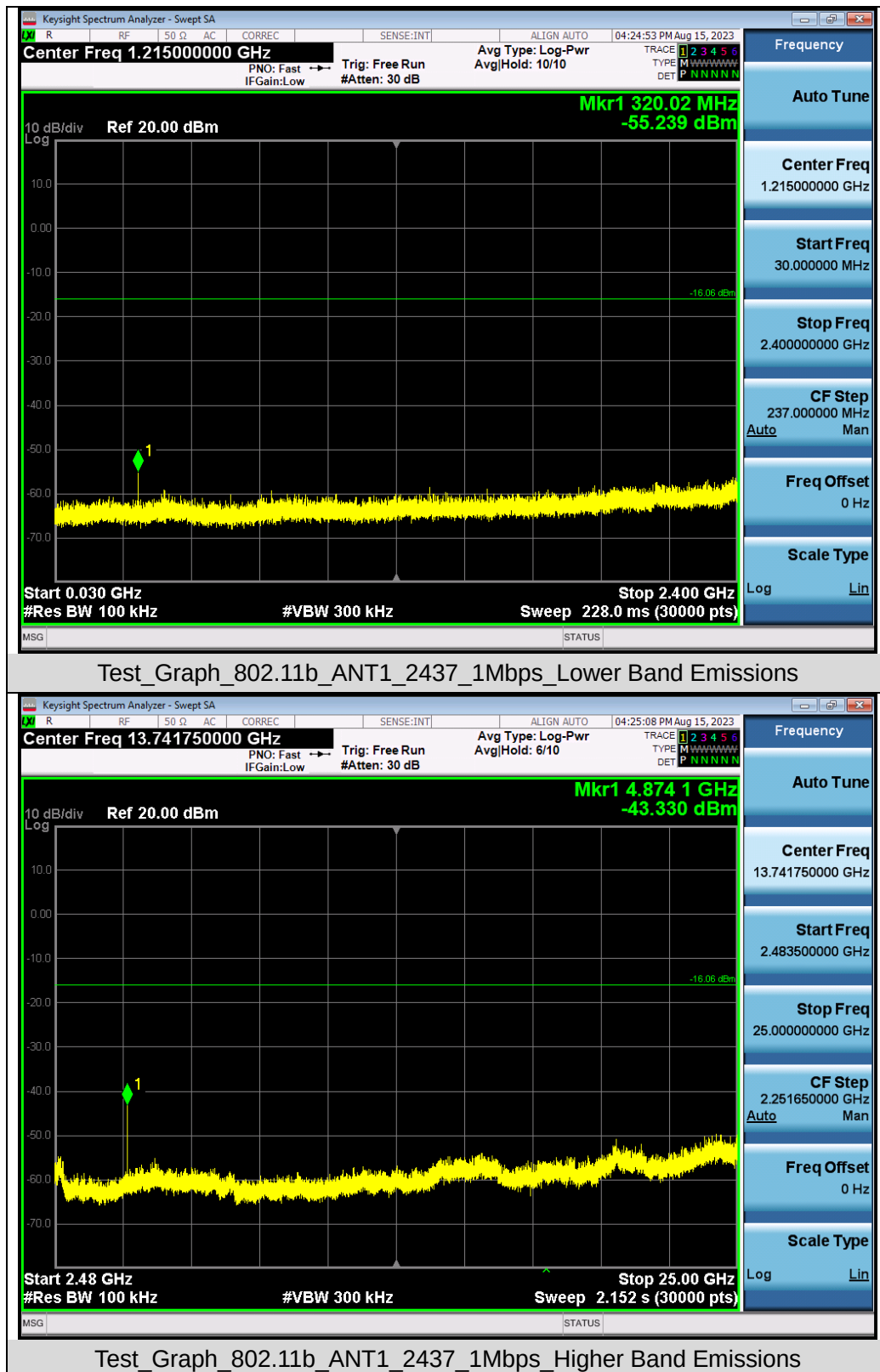
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## 9.4 MEASUREMENT RESULTS

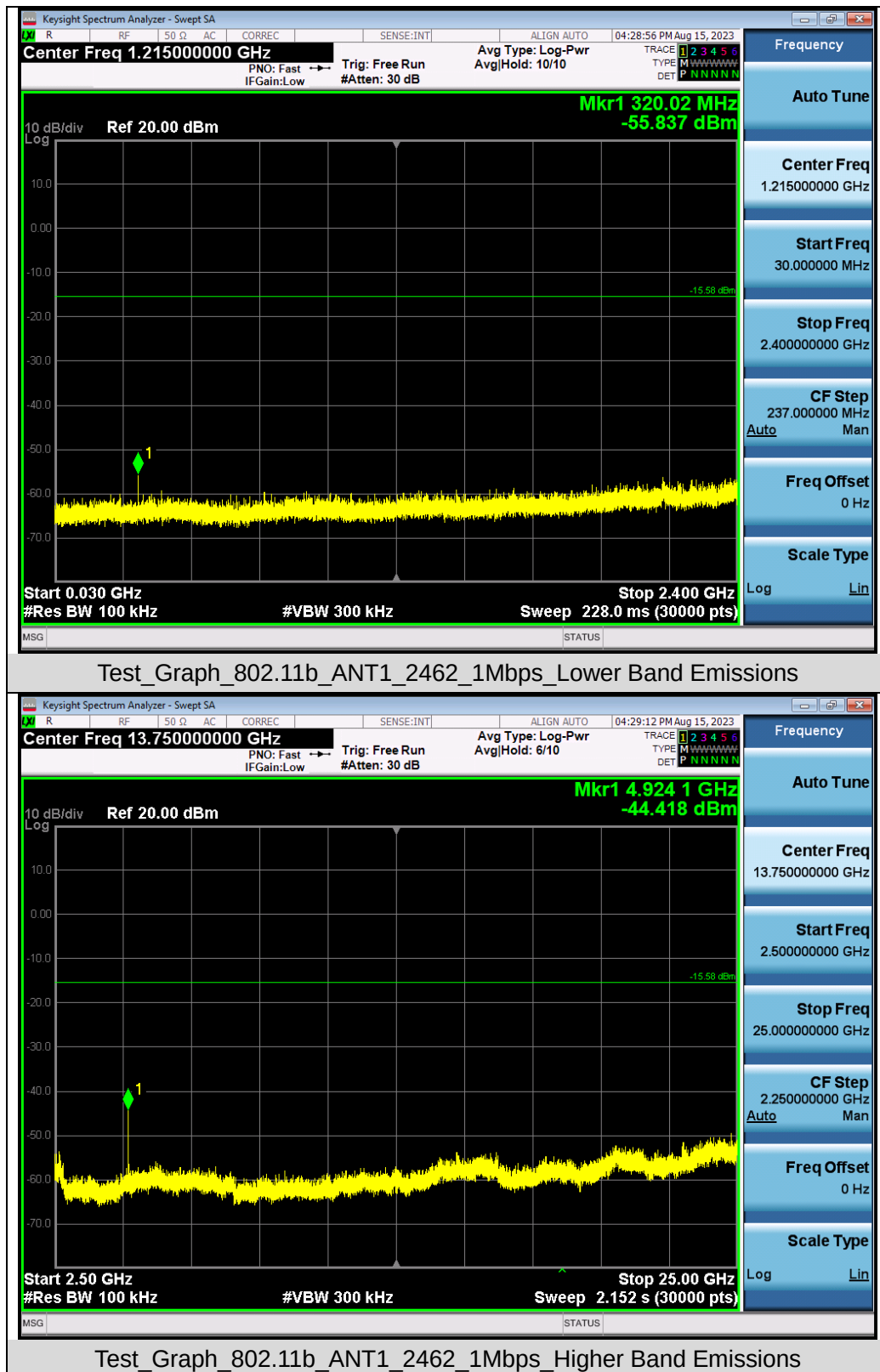
### Test Graphs of Spurious Emissions in Non-Restricted Frequency Bands



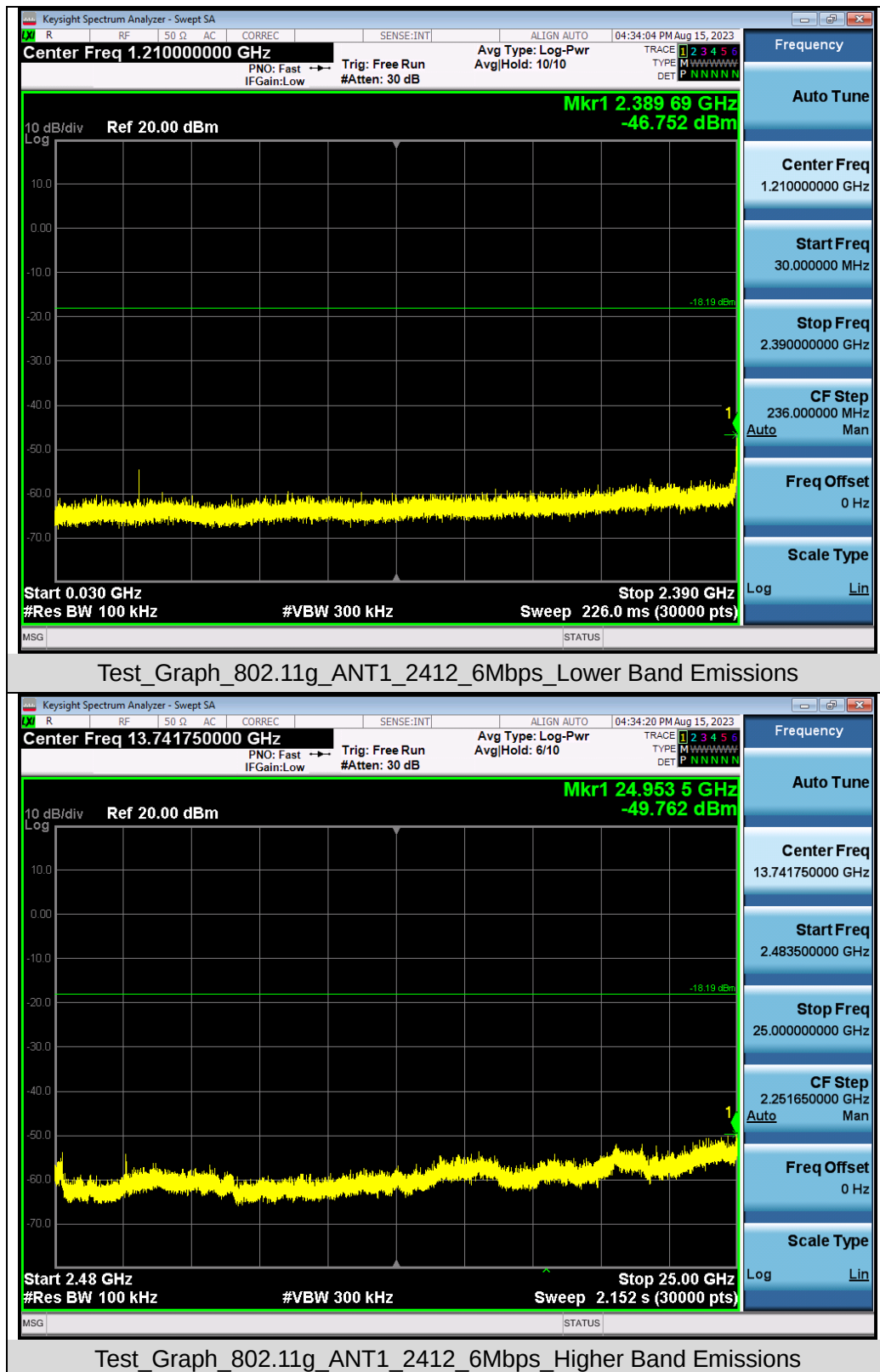
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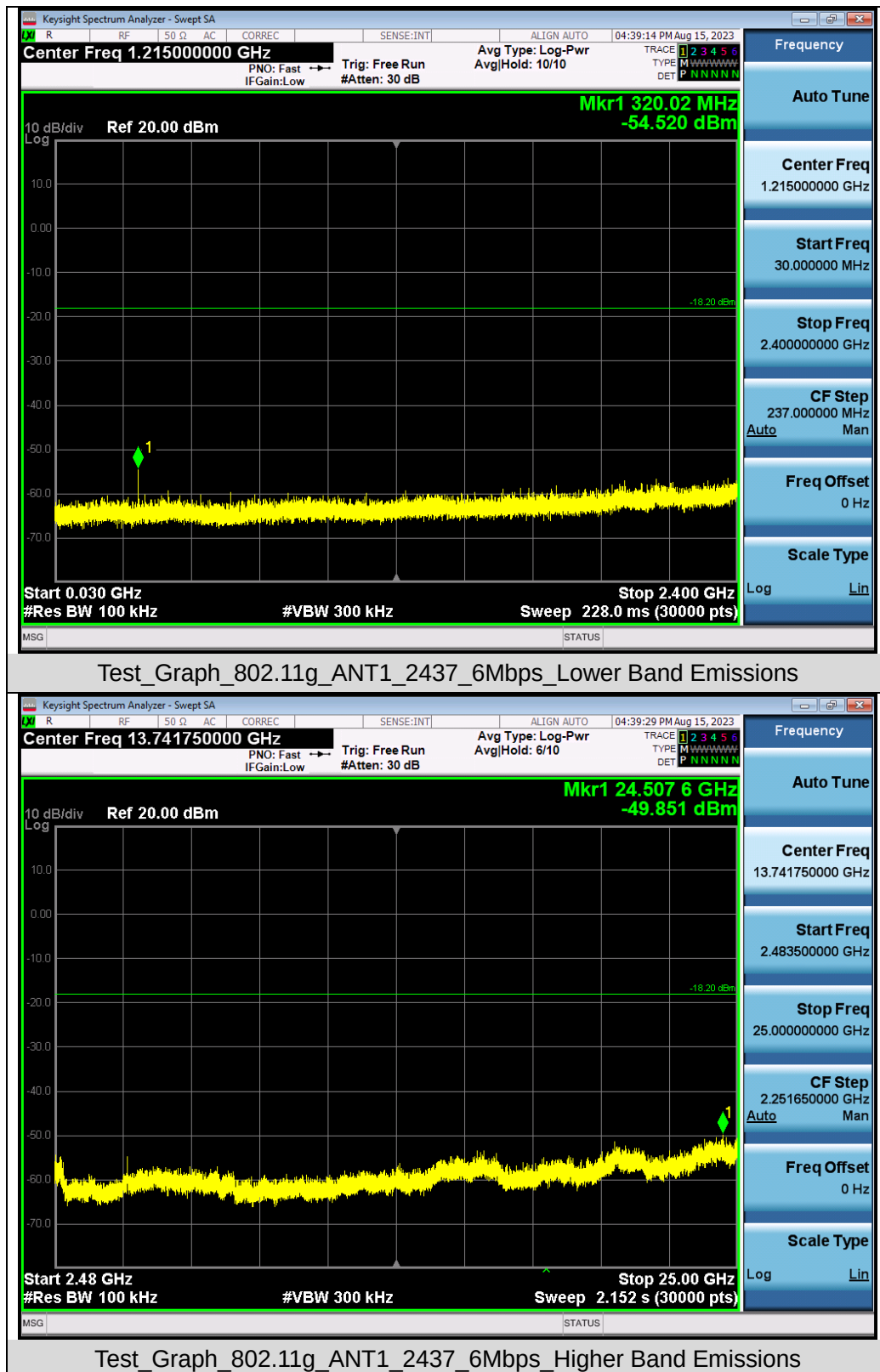
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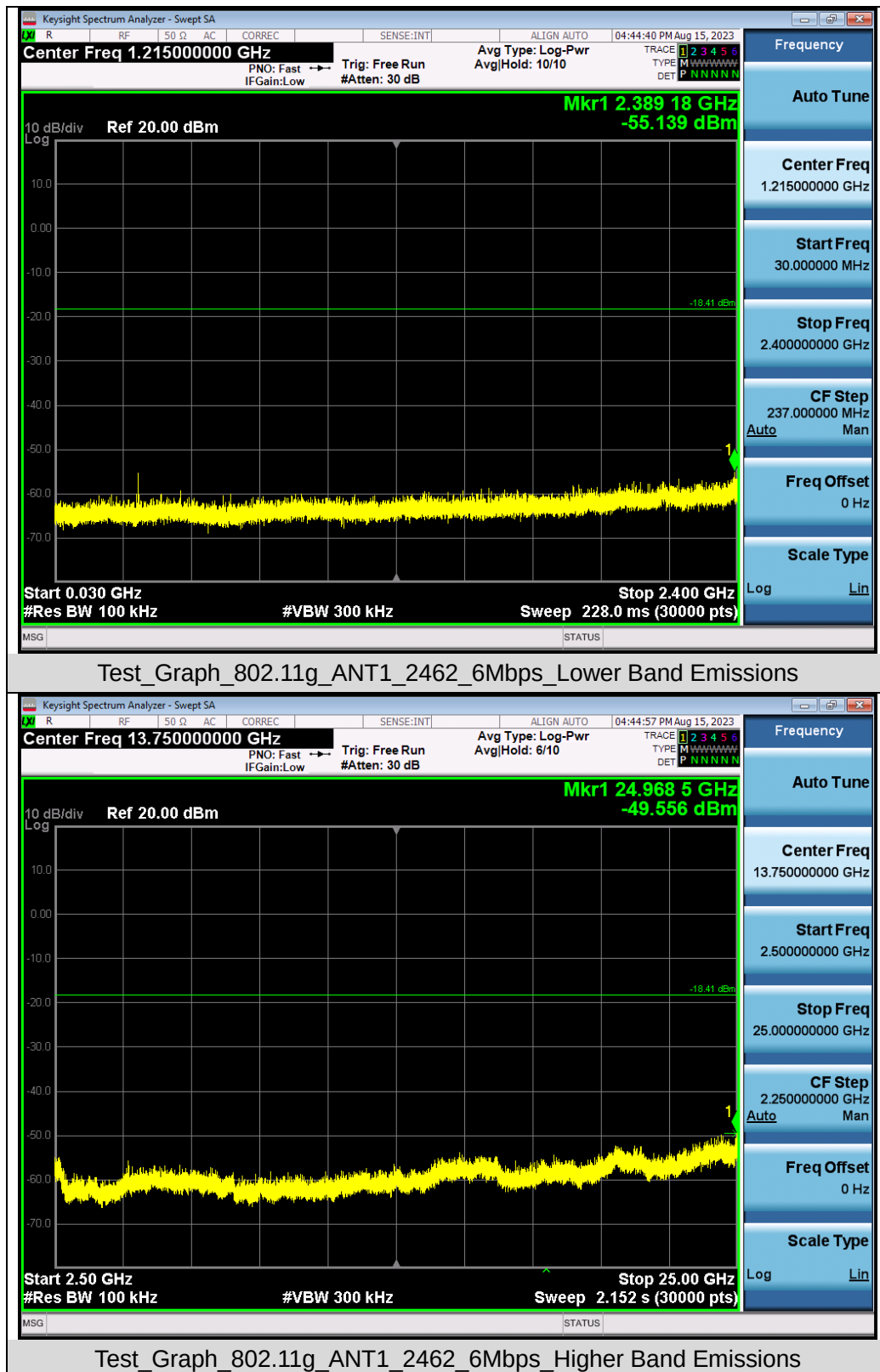
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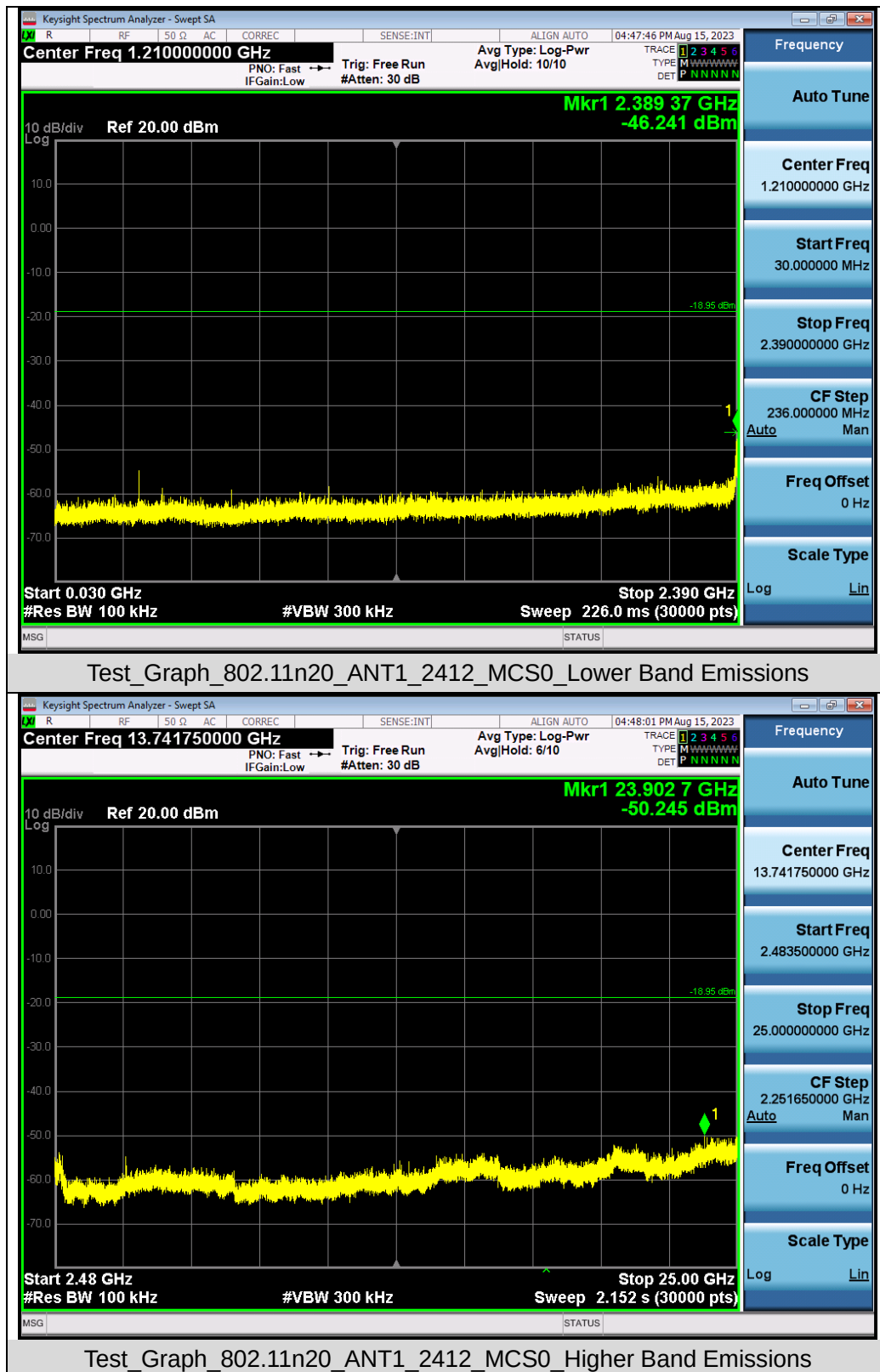
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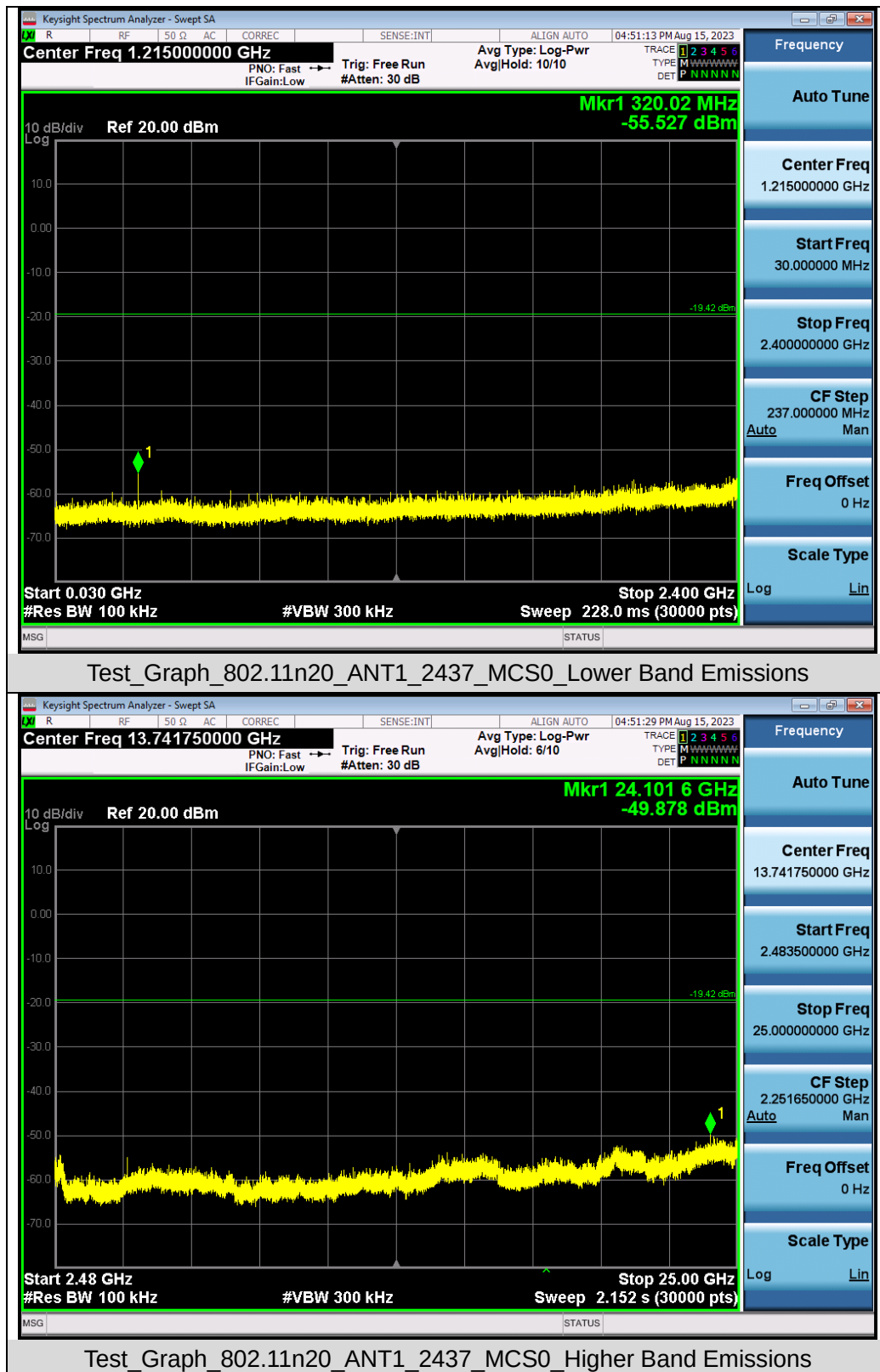
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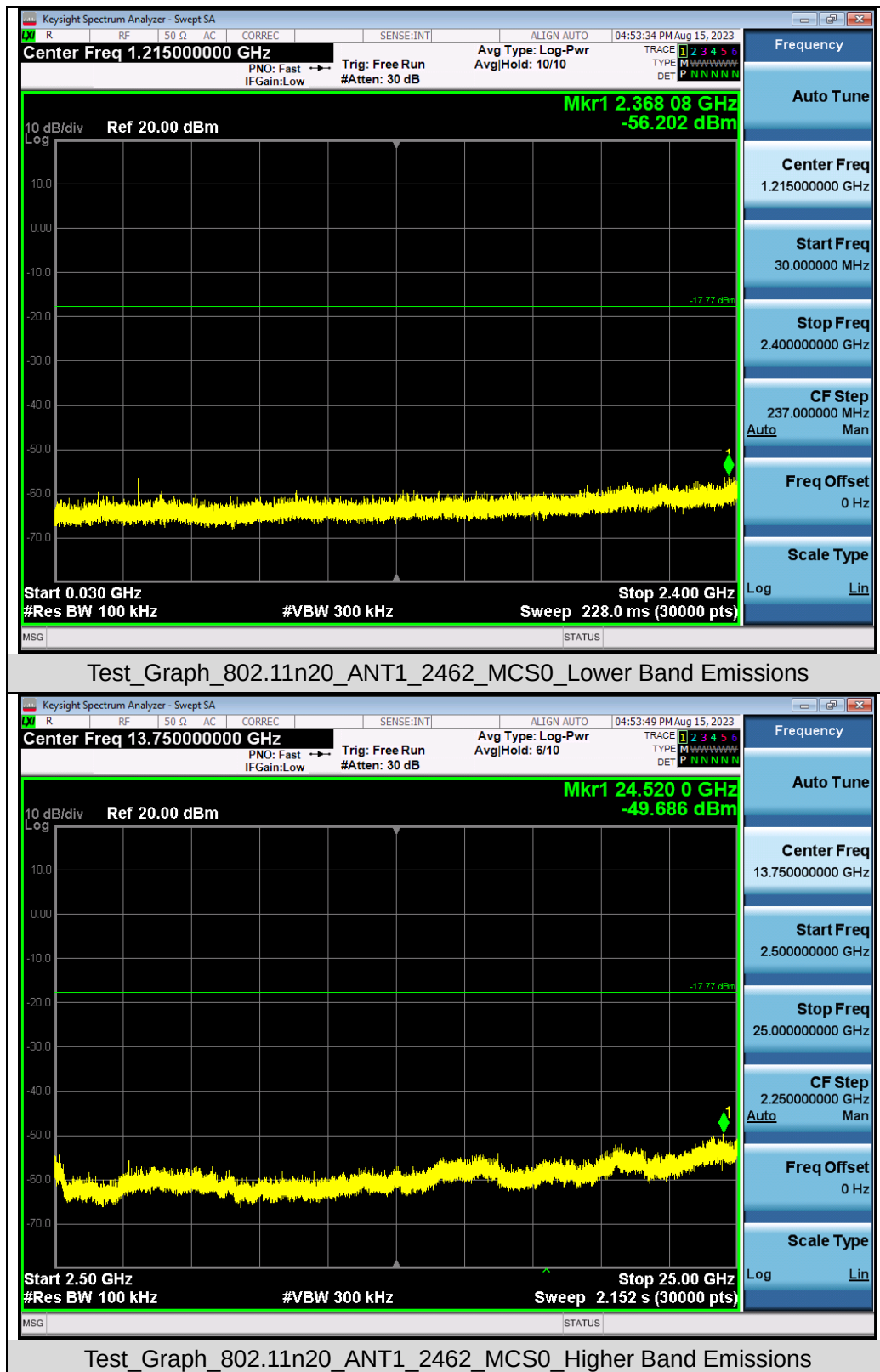
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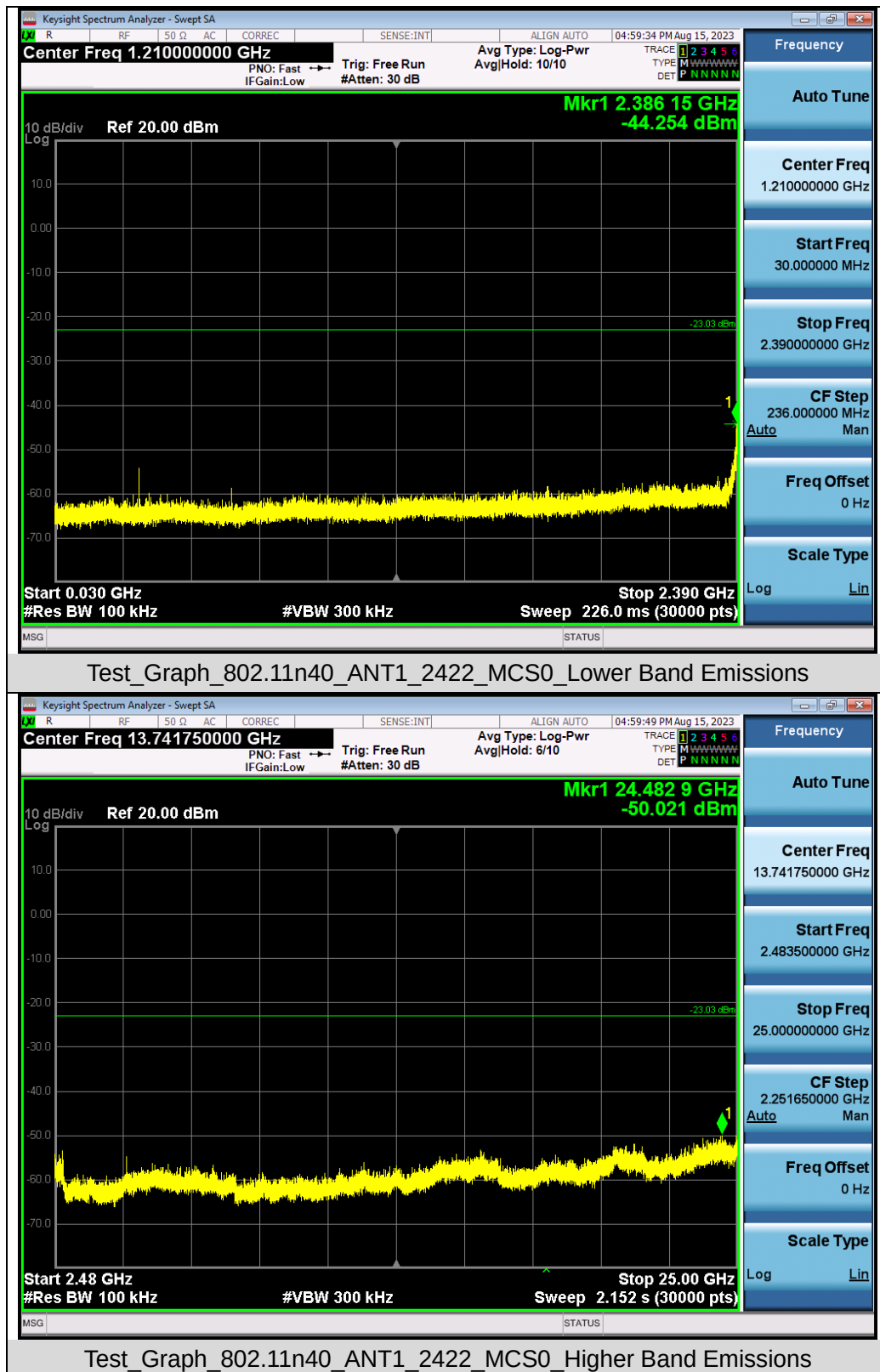
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