
FCC Test Report

Report No.: AGC13454220318FE05

FCC ID : 2A2R7PE-LT002
APPLICATION PURPOSE : Original Equipment
PRODUCT DESIGNATION : 4K UST Laser Projector
BRAND NAME : Paris Rhône
MODEL NAME : PE-LT002
APPLICANT : Shenzhen Danya Technology Co., Ltd.
DATE OF ISSUE : Apr. 24, 2022
STANDARD(S) : FCC Part 15.247
TEST PROCEDURE(S) :
REPORT VERSION : V1.0

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REPORT REVISE RECORD

| Report Version | Revise Time | Issued Date | Valid Version | Notes |
|----------------|-------------|---------------|---------------|-----------------|
| V1.0 | / | Apr. 24, 2022 | Valid | Initial Release |

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1. VERIFICATION OF CONFORMITY

| | |
|---------------------------------|---|
| Applicant | Shenzhen Danya Technology Co., Ltd. |
| Address | Room 3323, Building C, Galaxy World Phase II, Minle Community, Minzhi Street, Longhua District, Shenzhen, Guangdong, China |
| manufacturer | Shenzhen Danya Technology Co., Ltd. |
| Address | Room 3323, Building C, Galaxy World Phase II, Minle Community, Minzhi Street, Longhua District, Shenzhen, Guangdong, China |
| Factory | APPOTRONICS CO., LTD BAO'AN BRANCH |
| Address | 301, 1 Block & 101 and 301, 3 Block, Yaochuan Industrial Park, Tangwei Community, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, P.R. China |
| Product Designation | 4K UST Laser Projector |
| Brand Name | Paris Rhône |
| Test Model | PE-LT002 |
| Date of test | Apr. 01, 2022 to Apr. 21, 2022 |
| Deviation | No any deviation from the test method |
| Condition of Test Sample | Normal |
| Test Result | Pass |
| Report Template | 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



Cool Cheng
(Project Engineer)

Apr. 22, 2022

Reviewed By



Calvin Liu
(Reviewer)

Apr. 22, 2022

Approved By



Max Zhang
(Authorized Officer)

Apr. 22, 2022

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as “4K UST Laser Projector”. 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

| | |
|-------------------------------|---|
| Equipment Type | WLAN 2.4G |
| Frequency Band | 2400MHz ~ 2483.5MHz |
| Operation Frequency | 2412MHz ~ 2462MHz |
| Output Power (Average) | IEEE 802.11b:16.57dBm; IEEE 802.11g:14.48dBm; IEEE 802.11n(HT20):9.98dBm; IEEE 802.11n(HT40):8.20dBm |
| Output Power (Peak) | IEEE 802.11b:19.46dBm; IEEE 802.11g:21.82dBm; IEEE 802.11n(HT20):17.83dBm; IEEE 802.11n(HT40):15.09dBm |
| Modulation | 802.11b:DQPSK, DBPSK, CCK 802.11g/n: 64-QAM, 16-QAM, QPSK, BPSK |
| Data Rate | 802.11b: 1/2/5.5/11Mbps 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps |
| Number of channels | 11 |
| Hardware Version | REV:1.0 |
| Software Version | V1.0 |
| Antenna Designation | FPC antenna (Comply with requirements of the FCC part 15.203) |
| Antenna Gain | 2.86dBi |
| Power Supply | AC 100-240V, 50/60Hz, 4A |
| Test Power | AC 120V/60Hz |

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2.2. TABLE OF CARRIER FREQUENCYS

| 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) | |
|-----------|-----|------------|-----|-------|-------|-------|-------|-------|-----------------|-------|
| | | | | | 20MHz | 40MHz | 20MHz | 40MHz | 20MHz | 40MHz |
| 0 | 1 | BPSK | 1/2 | 1 | 52 | 108 | 26 | 54 | 6.5 | 13.5 |
| 1 | 1 | QPSK | 1/2 | 2 | 104 | 216 | 52 | 108 | 13.0 | 27.0 |
| 2 | 1 | QPSK | 3/4 | 2 | 104 | 216 | 78 | 162 | 19.5 | 40.5 |
| 3 | 1 | 16-QAM | 1/2 | 4 | 208 | 432 | 104 | 216 | 26.0 | 54.0 |
| 4 | 1 | 16-QAM | 3/4 | 4 | 208 | 432 | 156 | 324 | 39.0 | 81.0 |
| 5 | 1 | 64-QAM | 2/3 | 6 | 312 | 648 | 208 | 432 | 52.0 | 108.0 |
| 6 | 1 | 64-QAM | 3/4 | 6 | 312 | 648 | 234 | 489 | 58.5 | 121.5 |
| 7 | 1 | 64-QAM | 5/6 | 6 | 312 | 648 | 260 | 540 | 65.0 | 135.0 |

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

2.4. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2A2R7PE-LT002** 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.

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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.

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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 | $U_c = \pm 3.1 \text{ dB}$ |
| 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 | $U_c = \pm 2 \text{ %}$ |
| Uncertainty of Occupied Channel Bandwidth | $U_c = \pm 2 \text{ %}$ |

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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:

1. 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 or equal 98%
2. All modes under which configuration applicable have been tested and the worst mode test data recording in the test report, if no other mode data.

Software Setting

Serial COM6 - SecureCRT

File Edit View Options Transfer Script Tools Window Help

Enter host <Alt+R>

Serial-COM6 x

```
./rtwpriv wlan0 mp_pwrctl dm start
console:/data # ./rtwpriv wlan0 mp_bandwidth 40M=0,shortGI=0
wlan0    mp_bandwidth:change BW 0 to BW 0

console:/data # ./rtwpriv wlan0 mp_ant_tx a
wlan0    mp_ant_tx:switch Tx antenna to a
console:/data # ./rtwpriv wlan0 mp_rate 2
wlan0    mp_rate:Set data rate to 2 index 0
console:/data # ./rtwpriv wlan0 mp_get_txpower
wlan0    mp_get_txpower:patha=42
console:/data # ./rtwpriv wlan0 mp_ctxt background,pkt
wlan0    mp_ctxt:
Start continuous DA=ffffffffffff len=1500 count=0

console:/data # ./rtwpriv wlan0 mp_pwrctl dm start
wlan0    mp_pwrctl:dm:PwrCtlDM start Thermal tracking on

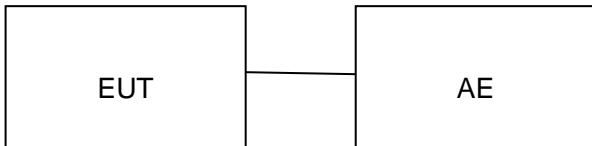
console:/data # [ACFG_NFX_AR] timeout
[ACFG_NFX_AR] timeout
[ACFG_NFX_AR] timeout
[ACFG_NFX_AR] timeout
[ACFG_NFX_AR] timeout
[ACFG_NFX_AR] timeout
```

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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 | 4K UST Laser Projector | PE-LT002 | 2A2R7PE-LT002 | EUT |

5.3. SUMMARY OF TEST RESULTS

| FCC RULES | DESCRIPTION OF TEST | RESULT |
|---------------|---|-----------|
| §15.247(b)(3) | Output Power | Compliant |
| §15.247(a)(2) | 6 dB Bandwidth | Compliant |
| §15.247 | Conducted Spurious Emission | Compliant |
| §15.247(e) | Maximum Conducted Output Power Spectral Density | Compliant |
| §15.209 | Radiated Emission | Compliant |
| §15.247(d) | Band Edges | Compliant |
| §15.207 | Line Conduction Emission | Compliant |

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6. TEST FACILITY

| | |
|-----------------------------------|--|
| Test Site | Attestation of Global Compliance (Shenzhen) Co., Ltd |
| Location | 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China |
| Designation Number | CN1259 |
| FCC Test Firm Registration Number | 975832 |
| A2LA Cert. No. | 5054.02 |
| Description | 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 | May 15, 2021 | May 14, 2022 |
| LISN | R&S | ESH2-Z5 | 100086 | Jun. 09, 2021 | Jun. 08, 2022 |
| Test software | R&S | ES-K1(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 | May 15, 2021 | May 14, 2022 |
| EXA Signal Analyzer | Aglient | N9010A | MY53470504 | Nov. 17, 2021 | Nov. 16, 2022 |
| Power sensor | Aglient | U2021XA | MY54110007 | Jun. 08, 2021 | Jun. 07, 2022 |
| 2.4GHz Fliter | Micro-tronics | 087 | N/A | Mar. 22, 2022 | Mar. 21, 2024 |
| Attenuator | Weinachel Corp | 58-30-33 | N/A | Sep. 03, 2020 | Sep. 02, 2022 |
| Horn antenna | SCHWARZBECK | BBHA 9170 | #768 | Oct. 31, 2021 | Oct. 30, 2023 |
| Active loop antenna (9K-30MHz) | ZHINAN | ZN30900C | 00034609 | May 22, 2020 | May 21, 2022 |
| Double-Ridged Waveguide Horn | ETS LINDGREN | 3117 | 00034609 | Apr. 23, 2021 | Apr. 22, 2023 |
| Broadband Preamplifier | ETS LINDGREN | 3117PA | 00225134 | Sep. 03, 2020 | Sep. 02, 2022 |
| ANTENNA | SCHWARZBECK | VULB9168 | D69250 | Jan. 08, 2020 | Jan. 07, 2023 |
| Test software | Tonscend | JS32-RE (Ver.2.5) | N/A | N/A | N/A |

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7. OUTPUT POWER

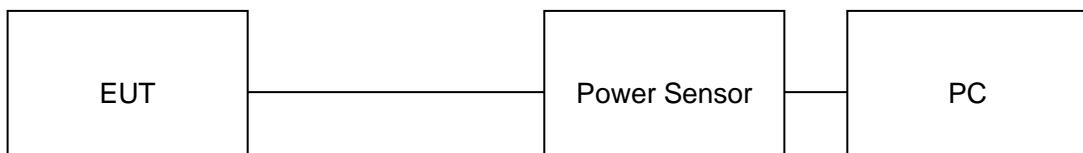
7.1. MEASUREMENT PROCEDURE

For average power test:

1. Connect EUT RF output port to power sensor through an RF attenuator.
2. Connect the power sensor to the PC.
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Record the maximum power from the software.

Note : The EUT was tested according to ANSI C63.10 (2013) for compliance to FCC 47CFR 15.247 requirements.

7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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7.3. LIMITS AND MEASUREMENT RESULT

| Test Data of Conducted Output Power | | | | | |
|-------------------------------------|--------------------|---------------------|------------------|--------------|--------------|
| Test Mode | Test Channel (MHz) | Average Power (dBm) | Peak Power (dBm) | Limits (dBm) | Pass or Fail |
| 802.11b | 2412 | 16.13 | 19.06 | ≤30 | Pass |
| | 2437 | 16.57 | 19.46 | ≤30 | Pass |
| | 2462 | 16.41 | 19.31 | ≤30 | Pass |
| 802.11g | 2412 | 12.96 | 20.77 | ≤30 | Pass |
| | 2437 | 14.48 | 21.82 | ≤30 | Pass |
| | 2462 | 13.21 | 20.69 | ≤30 | Pass |
| 802.11n20 | 2412 | 9.69 | 17.36 | ≤30 | Pass |
| | 2437 | 9.85 | 17.83 | ≤30 | Pass |
| | 2462 | 9.98 | 17.66 | ≤30 | Pass |
| 802.11n40 | 2422 | 6.70 | 14.61 | ≤30 | Pass |
| | 2437 | 8.20 | 15.09 | ≤30 | Pass |
| | 2452 | 7.81 | 14.99 | ≤30 | Pass |

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8. BANDWIDTH

8.1. MEASUREMENT PROCEDURE

6dB bandwidth:

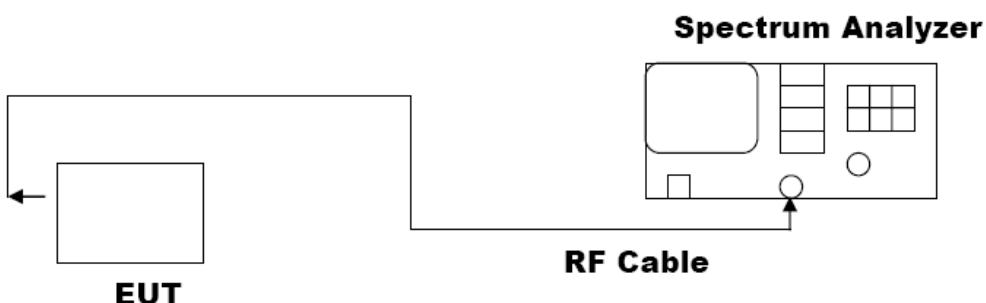
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 kHz, VBW \geq 3 \times RBW.
4. Set SPA Trace 1 Max hold, then View.

Occupied bandwidth:

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 2 to 5 times the 20 dB bandwidth, centered on a hopping 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.

Note: The EUT was tested according to ANSI C63.10 for compliance to FCC PART 15.247 requirements.

8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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8.3. LIMITS AND MEASUREMENT RESULTS

| Test Data of Occupied Bandwidth and DTS Bandwidth | | | | | |
|---|--------------------|------------------------------|----------------------|--------------|--------------|
| Test Mode | Test Channel (MHz) | 99% Occupied Bandwidth (MHz) | -6dB Bandwidth (MHz) | Limits (MHz) | Pass or Fail |
| 802.11b | 2412 | 15.082 | 10.09 | ≥0.5 | Pass |
| | 2437 | 15.110 | 10.09 | ≥0.5 | Pass |
| | 2462 | 15.104 | 10.08 | ≥0.5 | Pass |
| 802.11g | 2412 | 16.814 | 16.35 | ≥0.5 | Pass |
| | 2437 | 16.849 | 16.34 | ≥0.5 | Pass |
| | 2462 | 16.834 | 16.35 | ≥0.5 | Pass |
| 802.11n20 | 2412 | 17.733 | 17.54 | ≥0.5 | Pass |
| | 2437 | 17.772 | 17.54 | ≥0.5 | Pass |
| | 2462 | 17.743 | 17.53 | ≥0.5 | Pass |
| 802.11n40 | 2422 | 36.374 | 36.09 | ≥0.5 | Pass |
| | 2437 | 36.415 | 36.31 | ≥0.5 | Pass |
| | 2452 | 36.397 | 36.28 | ≥0.5 | Pass |

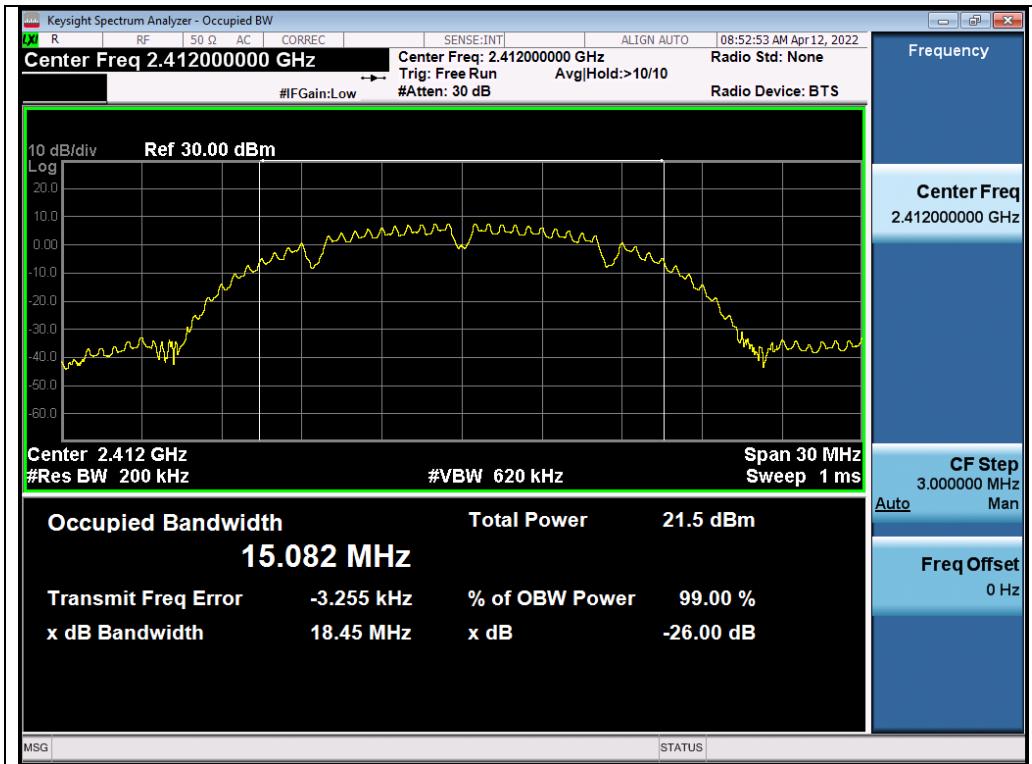
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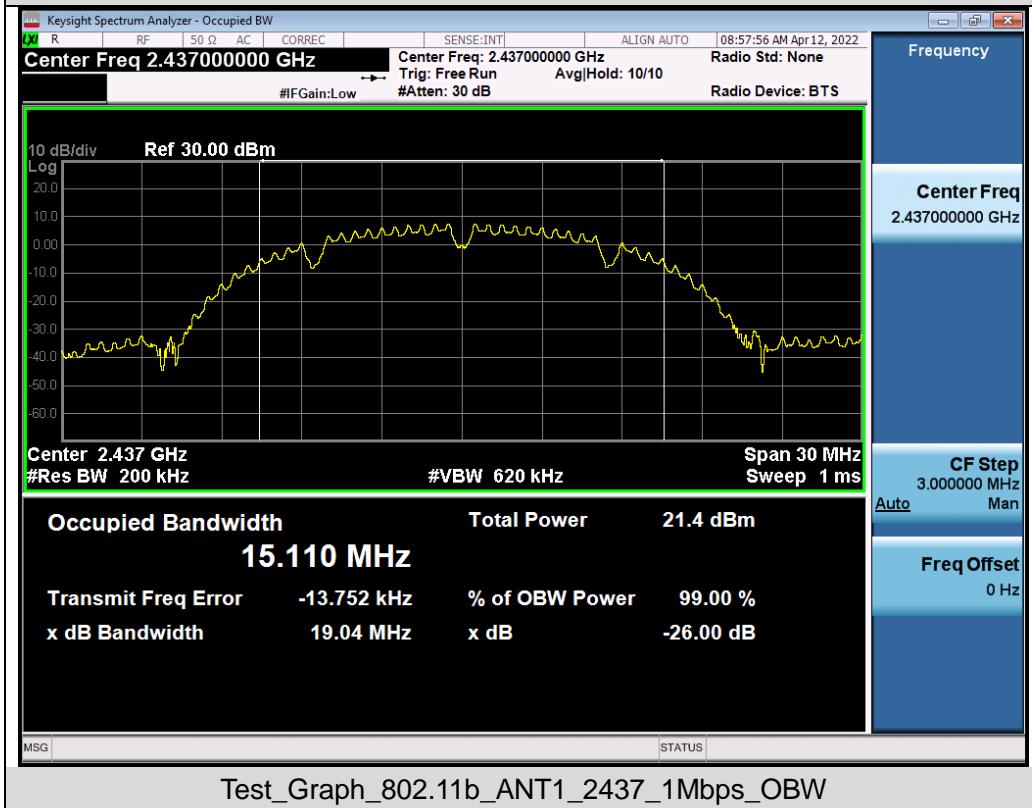
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Test Graphs of Occupied Bandwidth



Test_Graph_802.11b_ANT1_2412_1Mbps_OBW



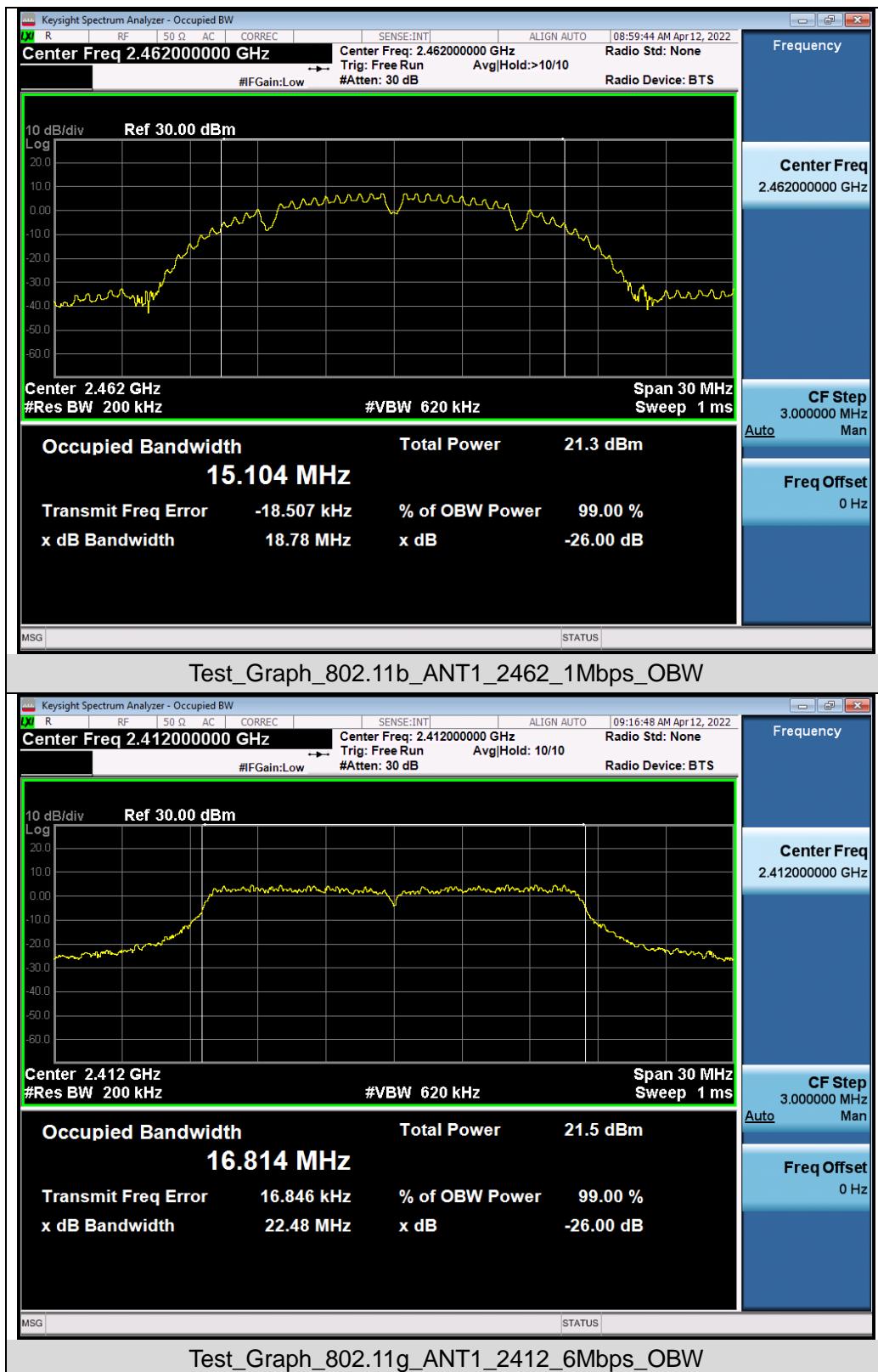
Test_Graph_802.11b_ANT1_2437_1Mbps_OBW

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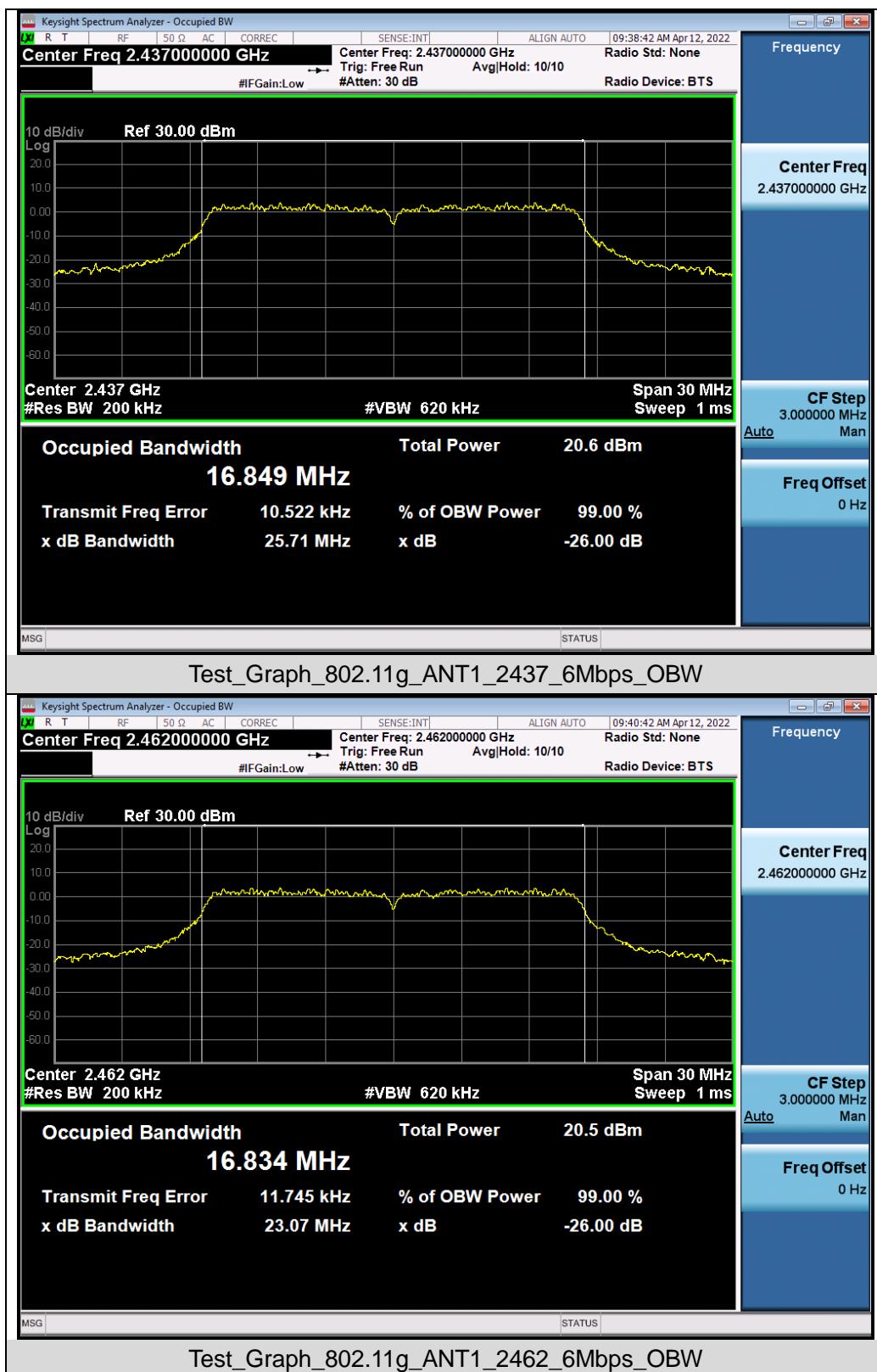


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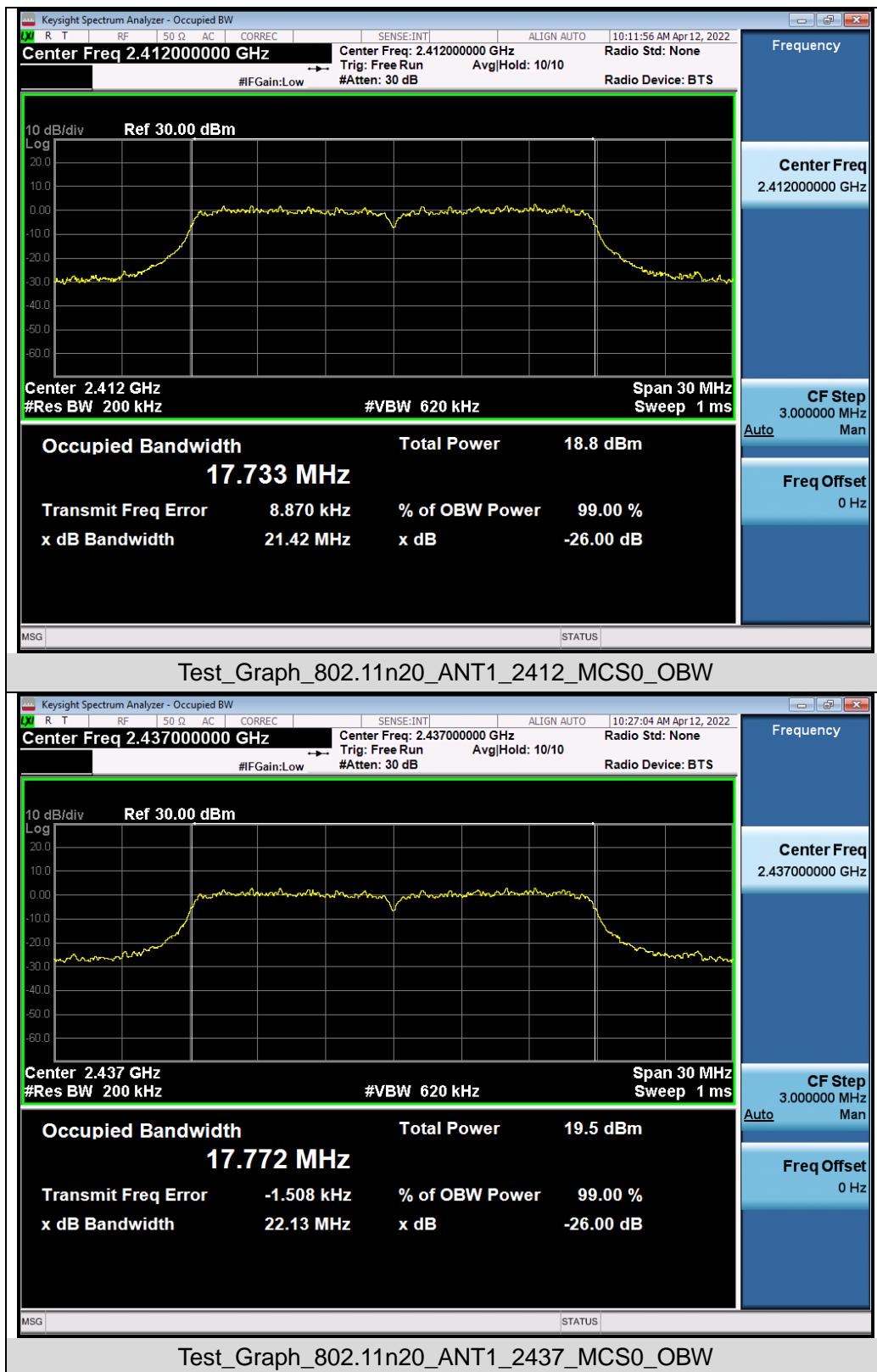


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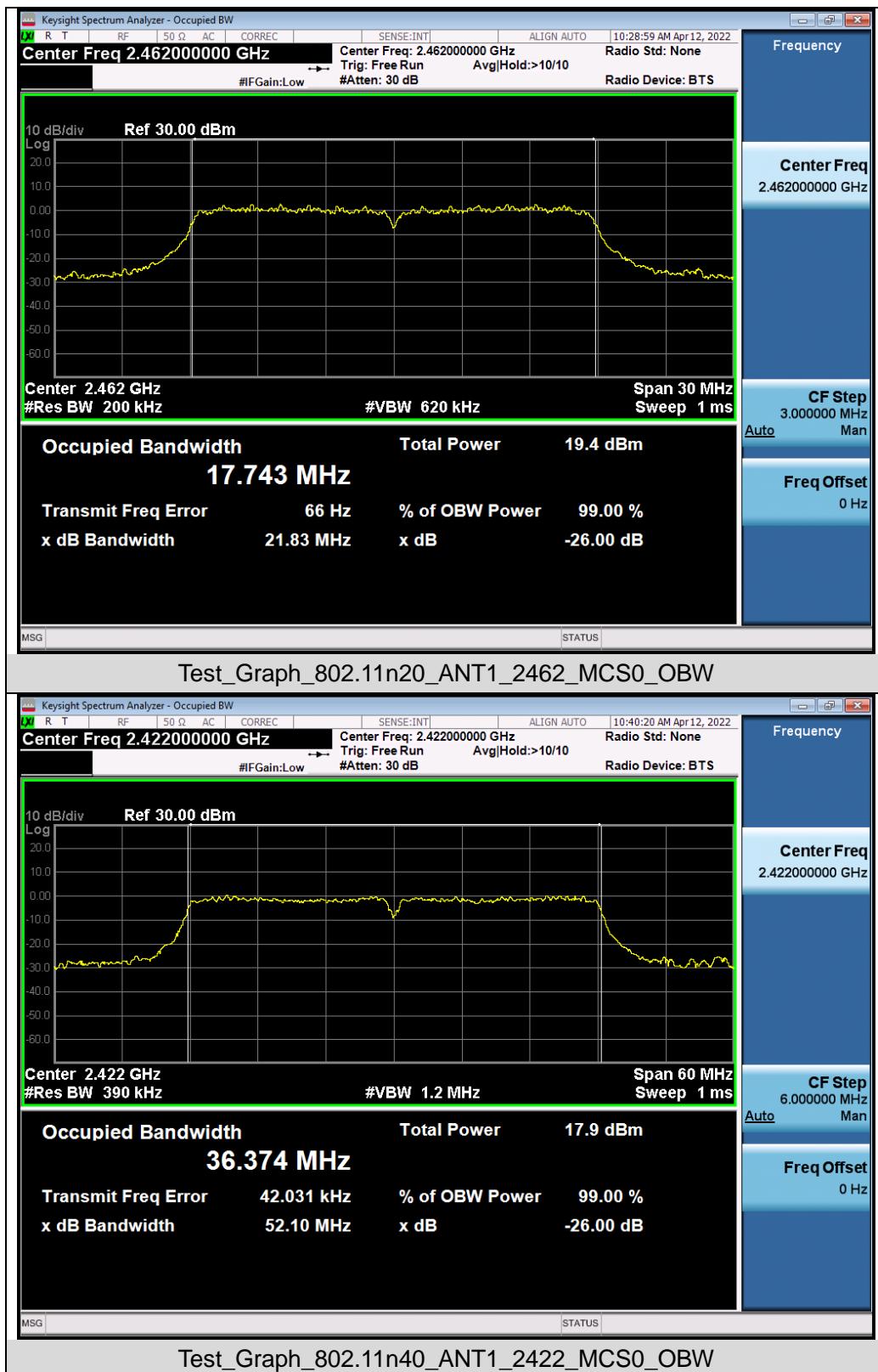


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Test Graphs of DTS Bandwidth



Test_Graph_802.11b_ANT1_2412_1Mbps_DTSBW



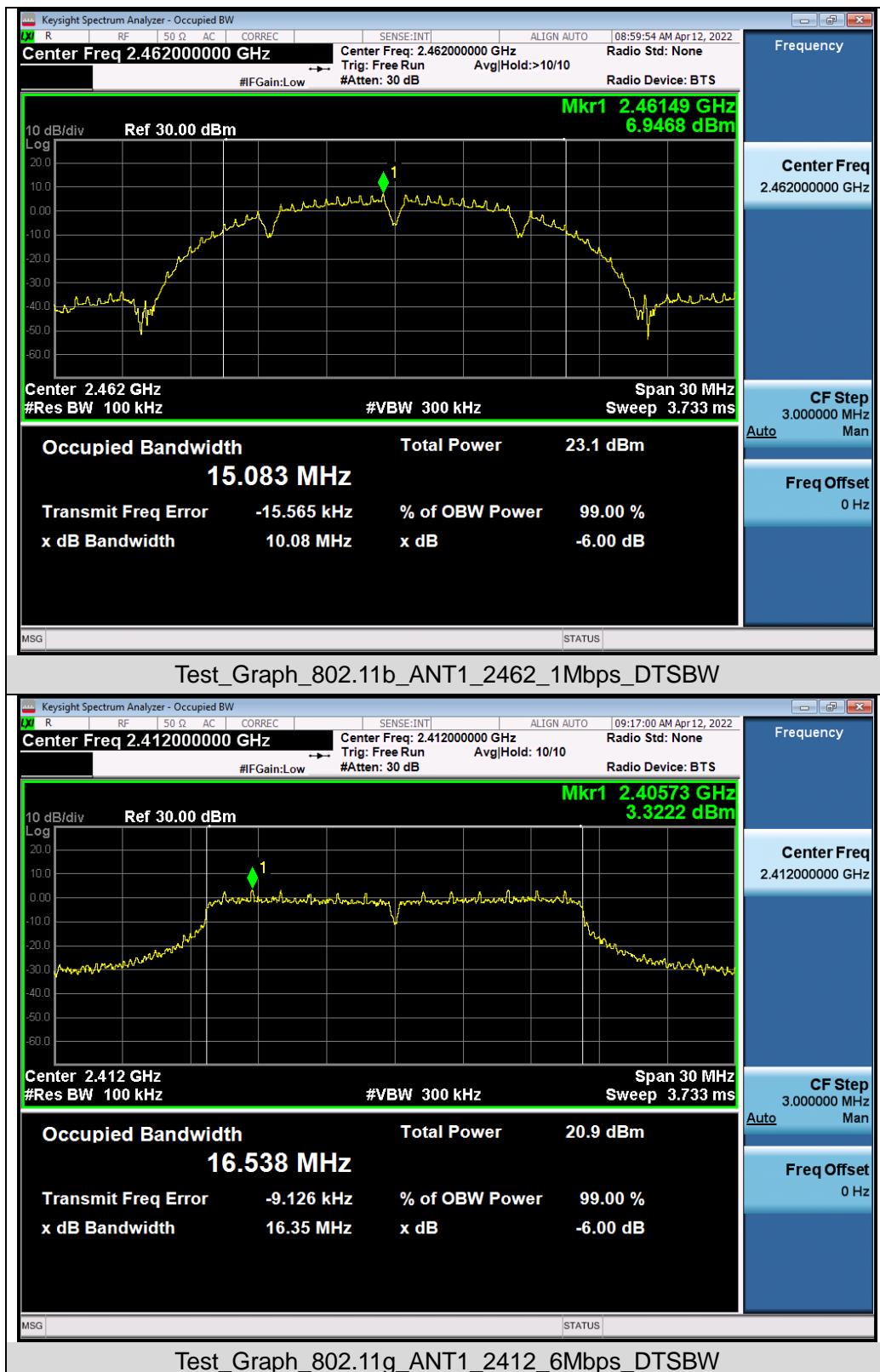
Test_Graph_802.11b_ANT1_2437_1Mbps_DTSBW

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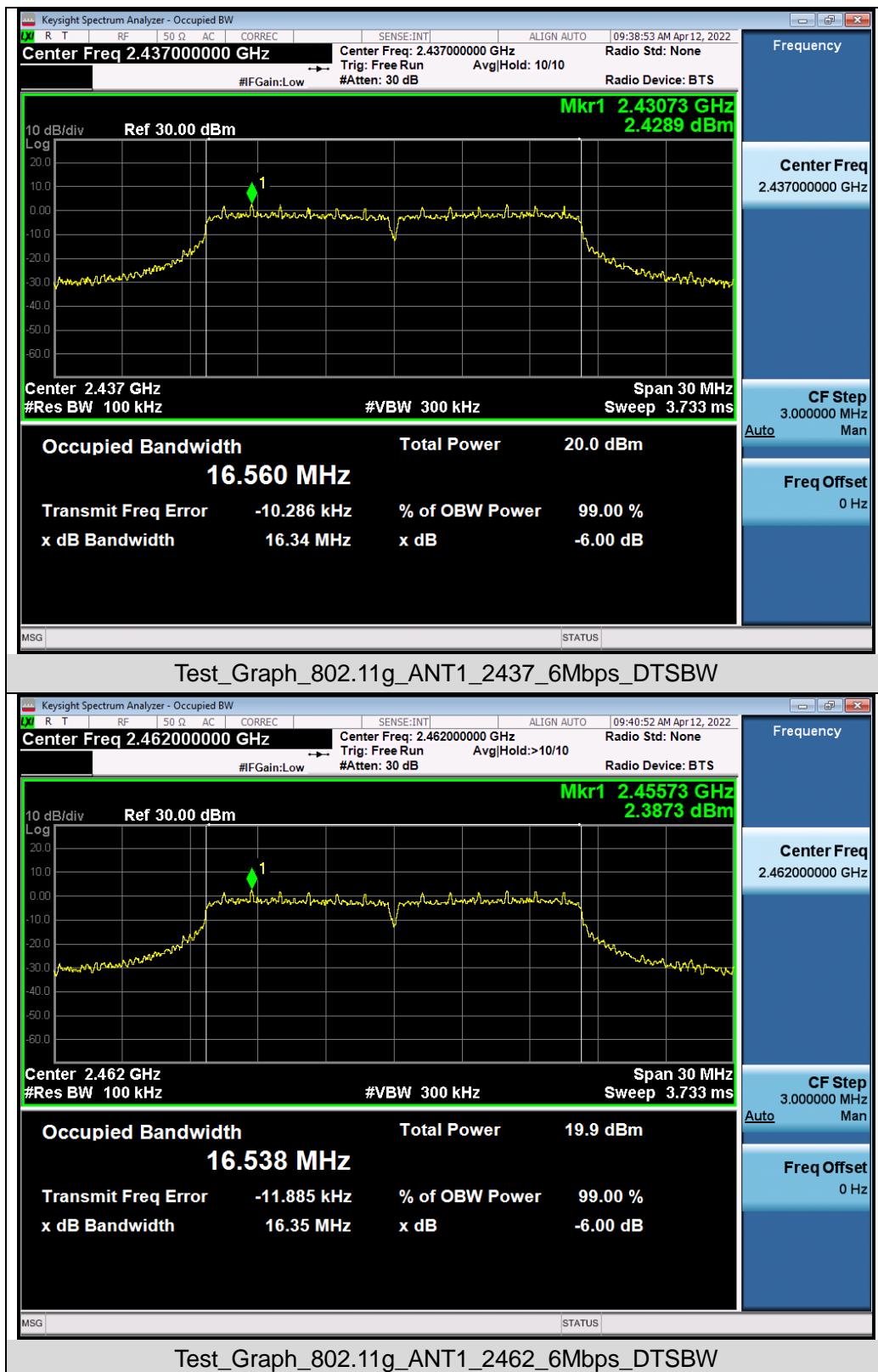


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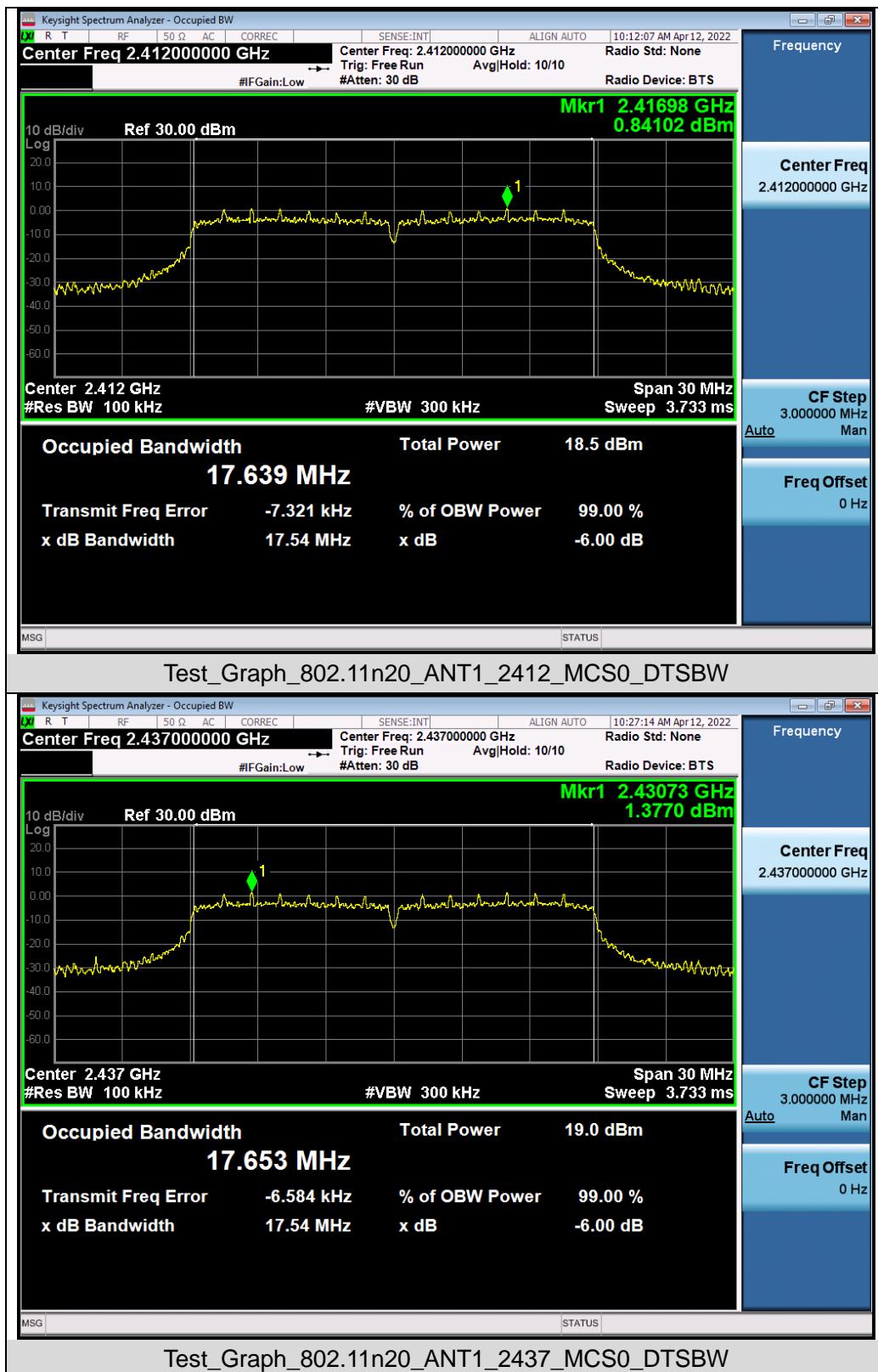


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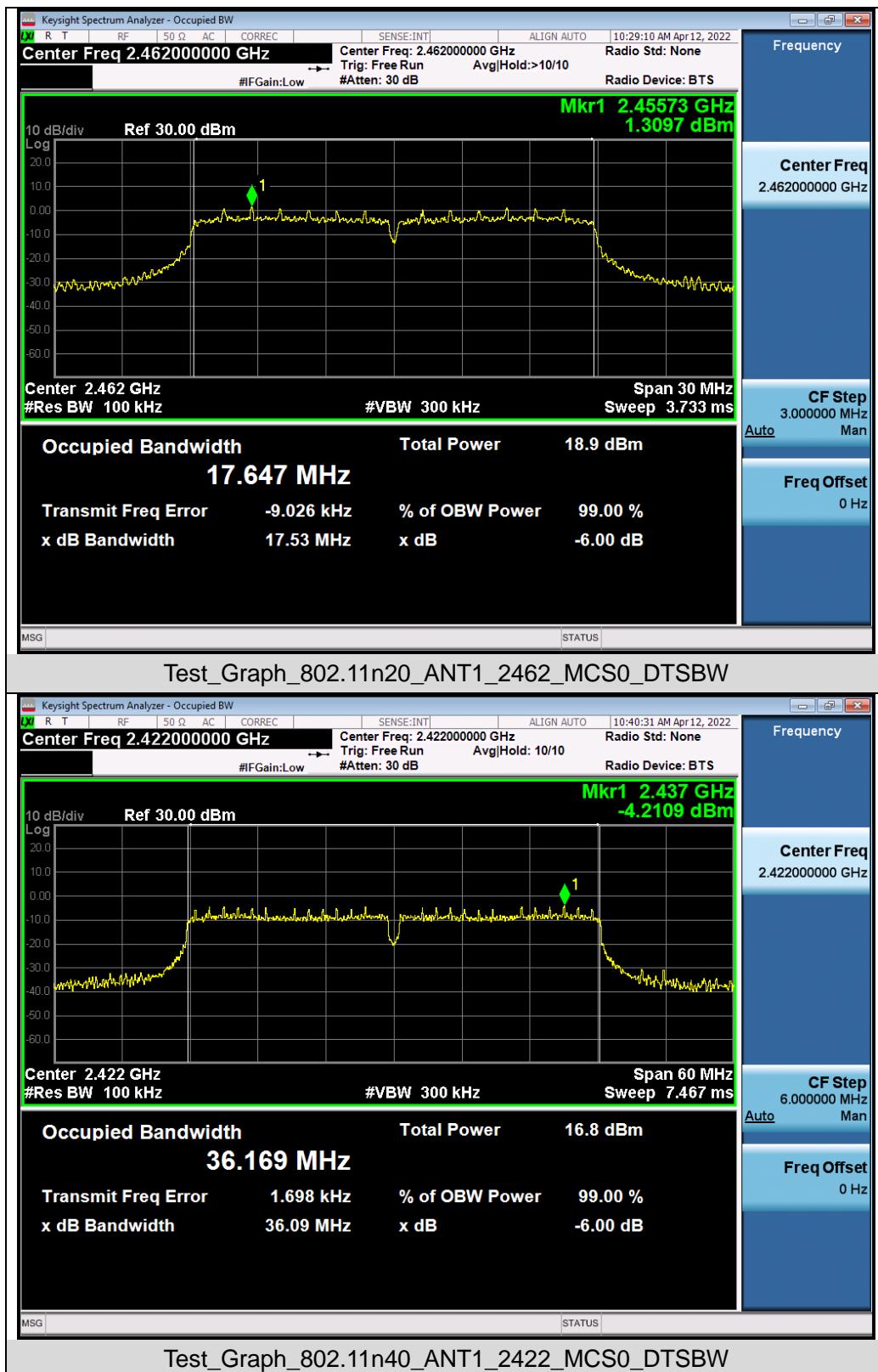


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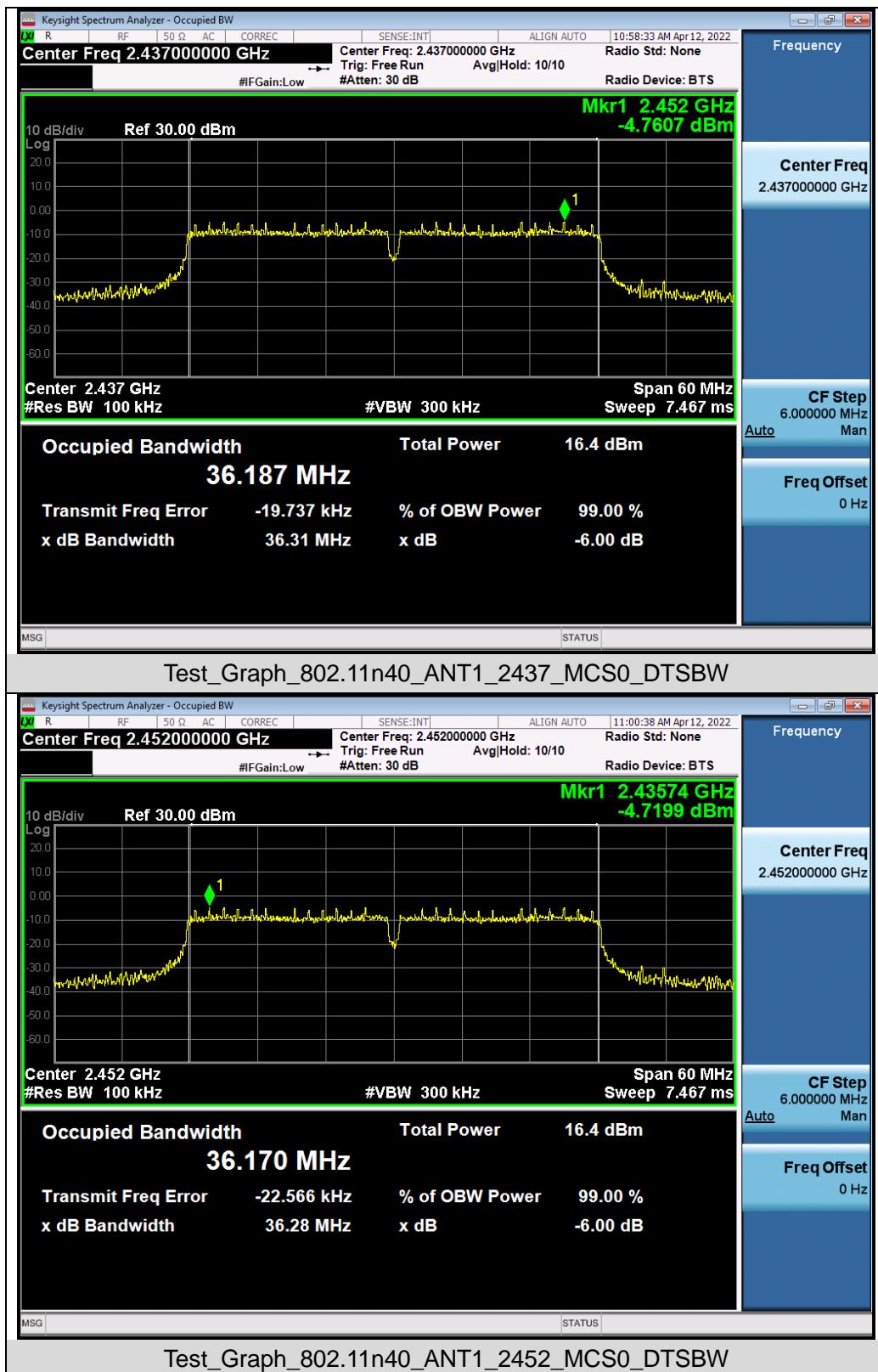


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9. CONDUCTED SPURIOUS EMISSION

9.1. MEASUREMENT PROCEDURE

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 SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to ANSI C63.10 (2013) for compliance to FCC 47CFR 15.247 requirements. Owing to satisfy the requirements of the number of measurement points, we set the RBW=1MHz, VBW>RBW, scan up through 10th harmonic, and consider the tested results as the worst case, if the tested results conform to the requirement, we can deem that the real tested results(set the RBW=100KHz, VBW>RBW) are conform to the requirement.

9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2.

9.3. MEASUREMENT EQUIPMENT USED JN

The same as described in section 6.

9.4. LIMITS AND MEASUREMENT RESULT

| LIMITS AND MEASUREMENT RESULT | | |
|---|--|----------|
| Applicable Limits | Measurement Result | |
| | Test Data | Criteria |
| 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. 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)) | At least -20dBc than the limit Specified on the BOTTOM Channel | PASS |
| | At least -20dBc than the limit Specified on the TOP Channel | PASS |

Note: The limits reference level is according to the test plot of -6dB bandwidth.

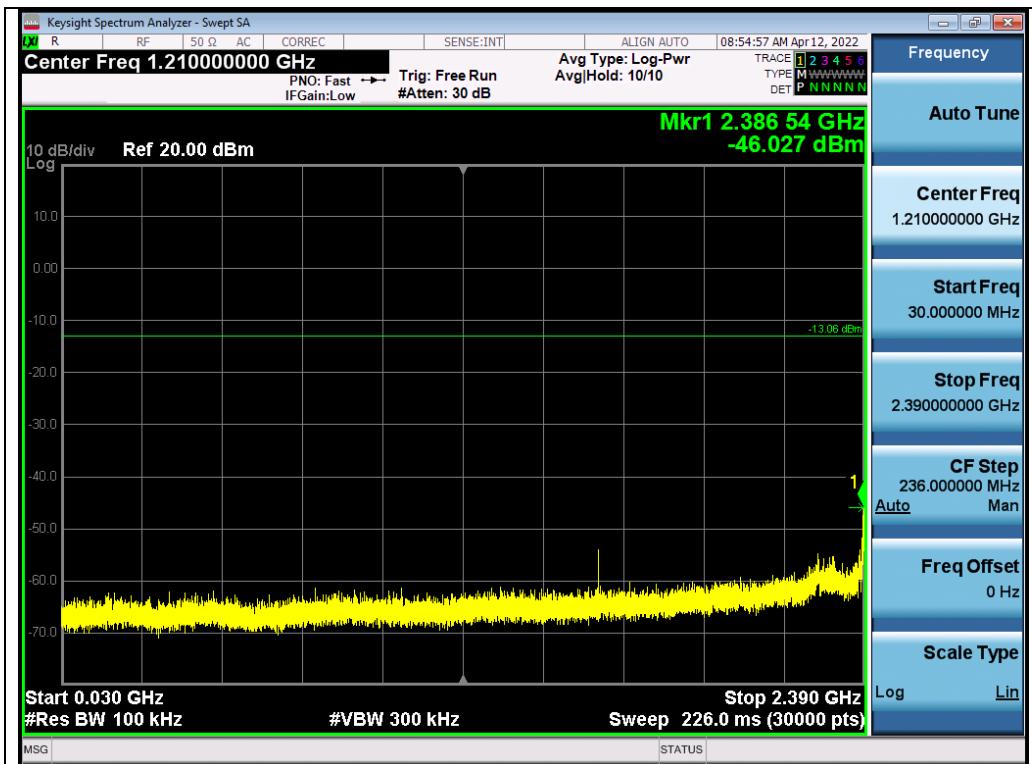
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Test Graphs of Spurious Emissions in Non-Restricted Frequency Bands



Test_Graph_802.11b_ANT1_2412_1Mbps_Lower Band Emissions



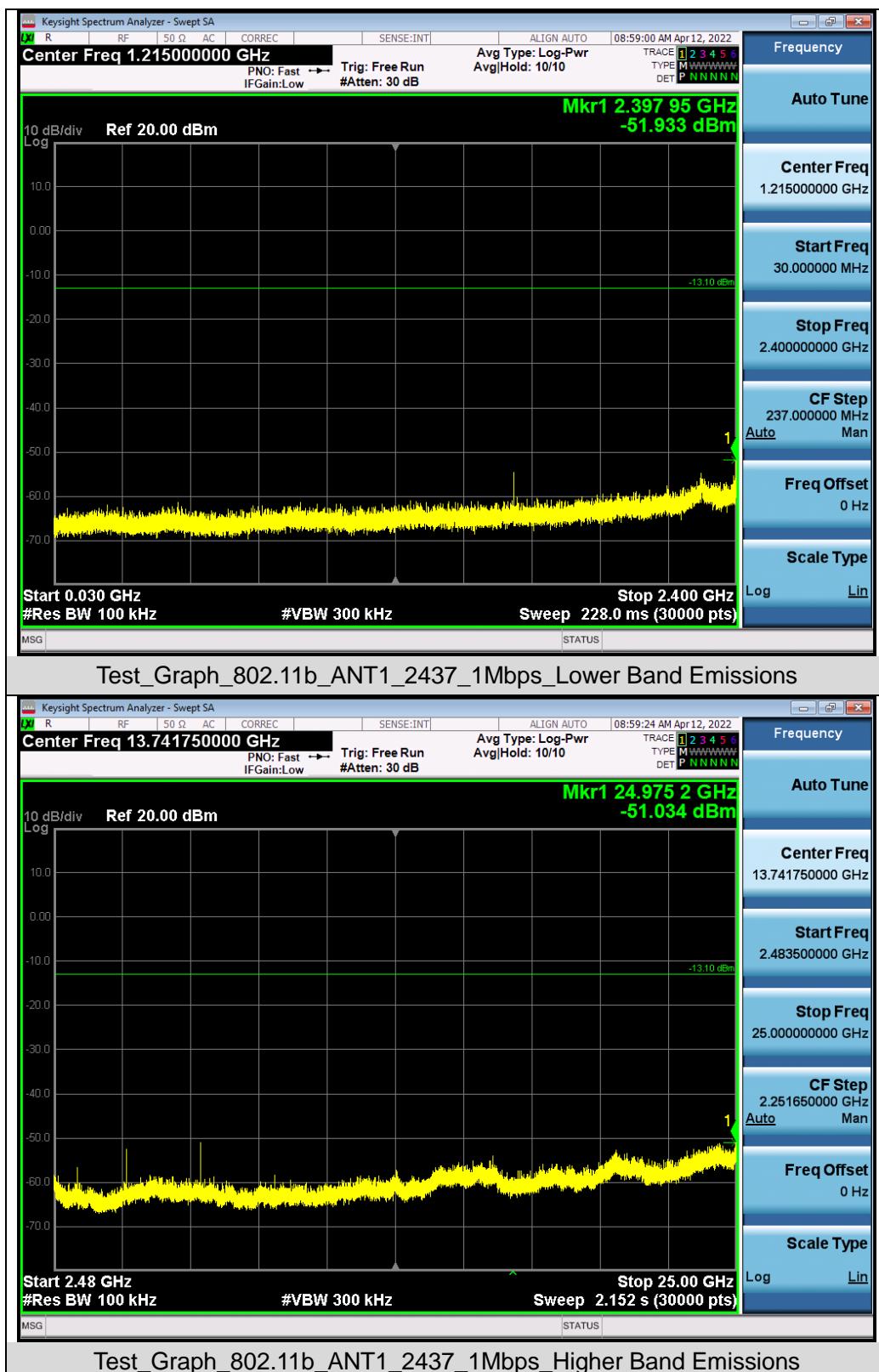
Test_Graph_802.11b_ANT1_2412_1Mbps_Higher Band Emissions

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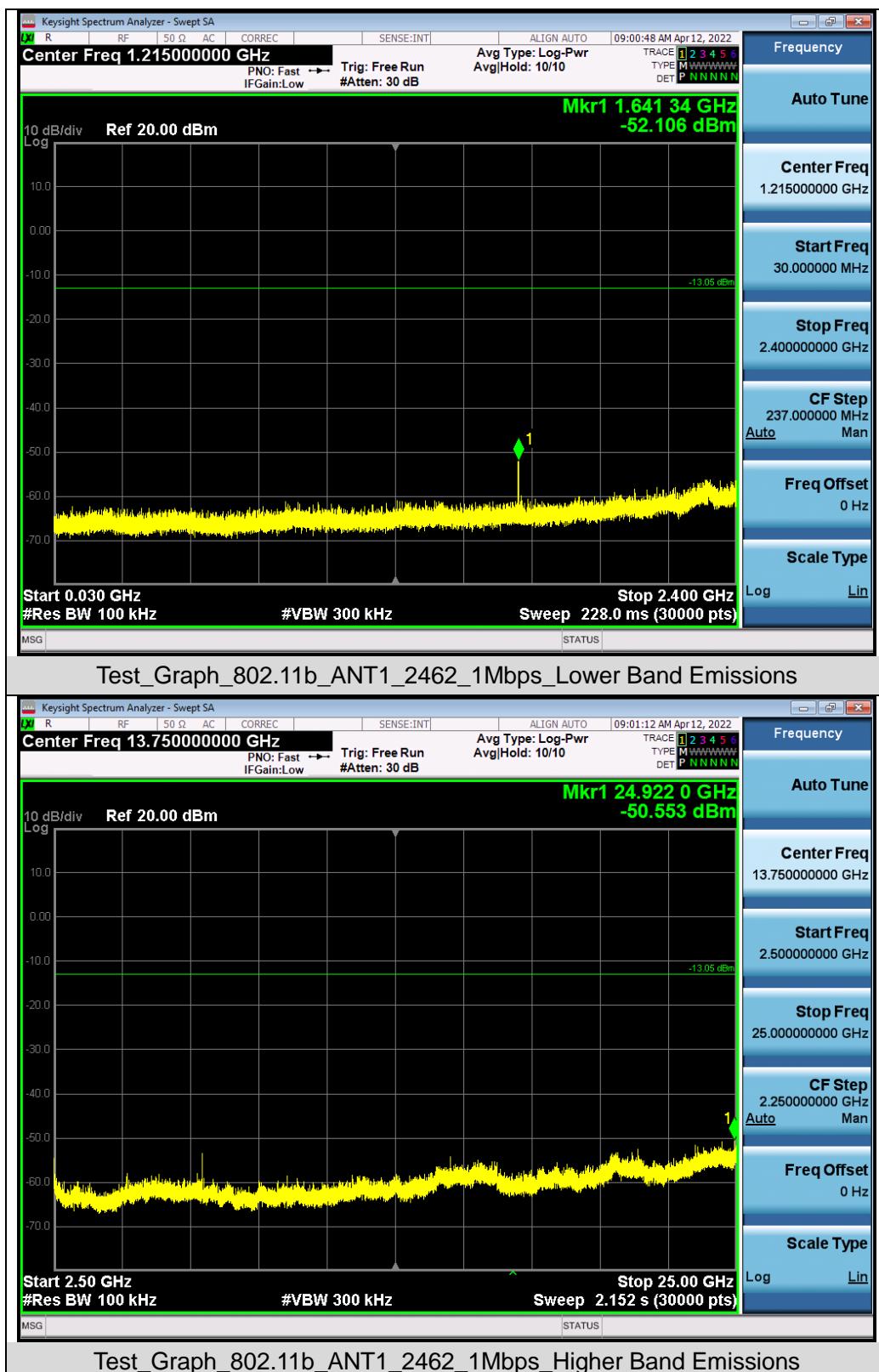


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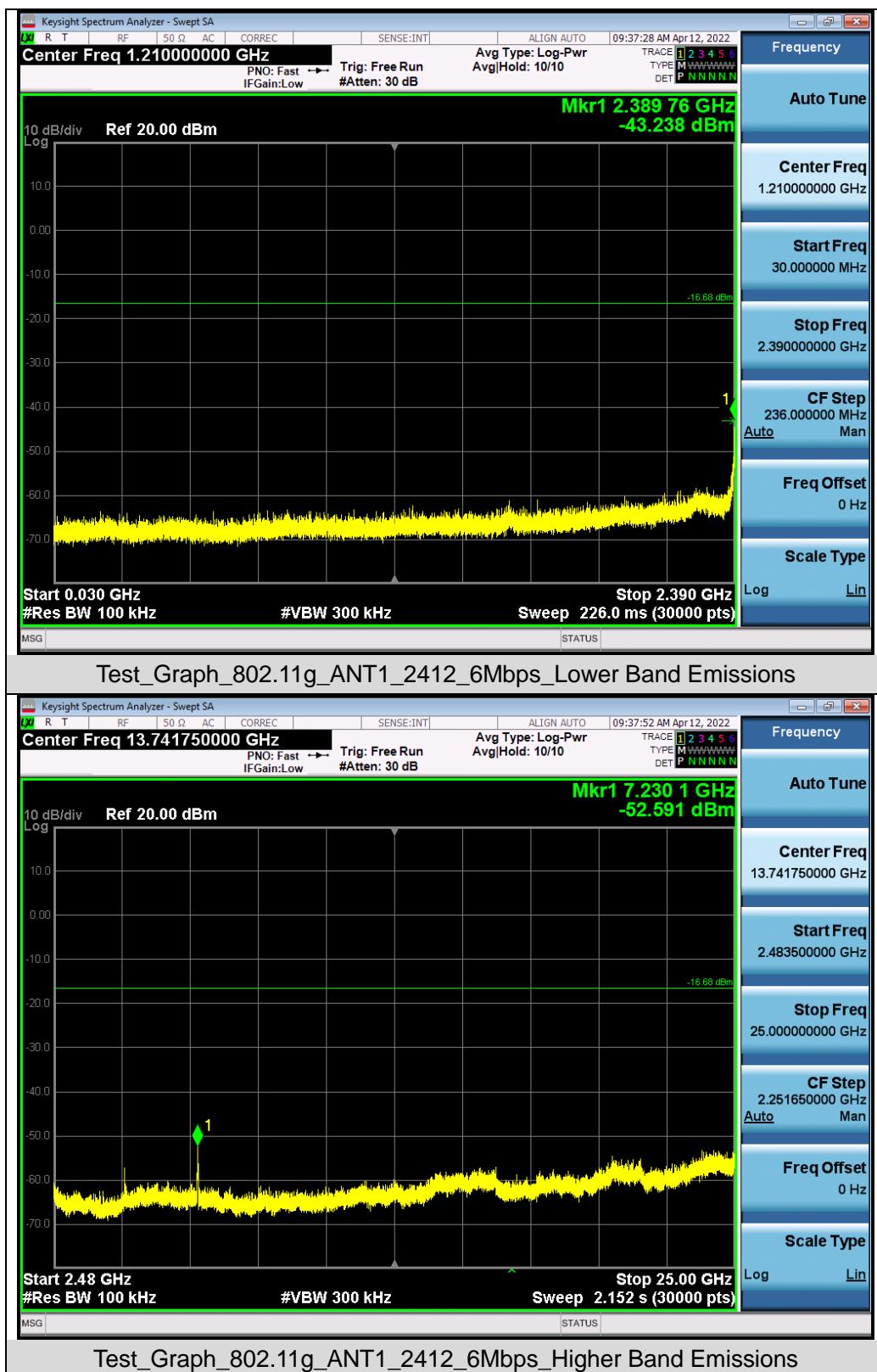


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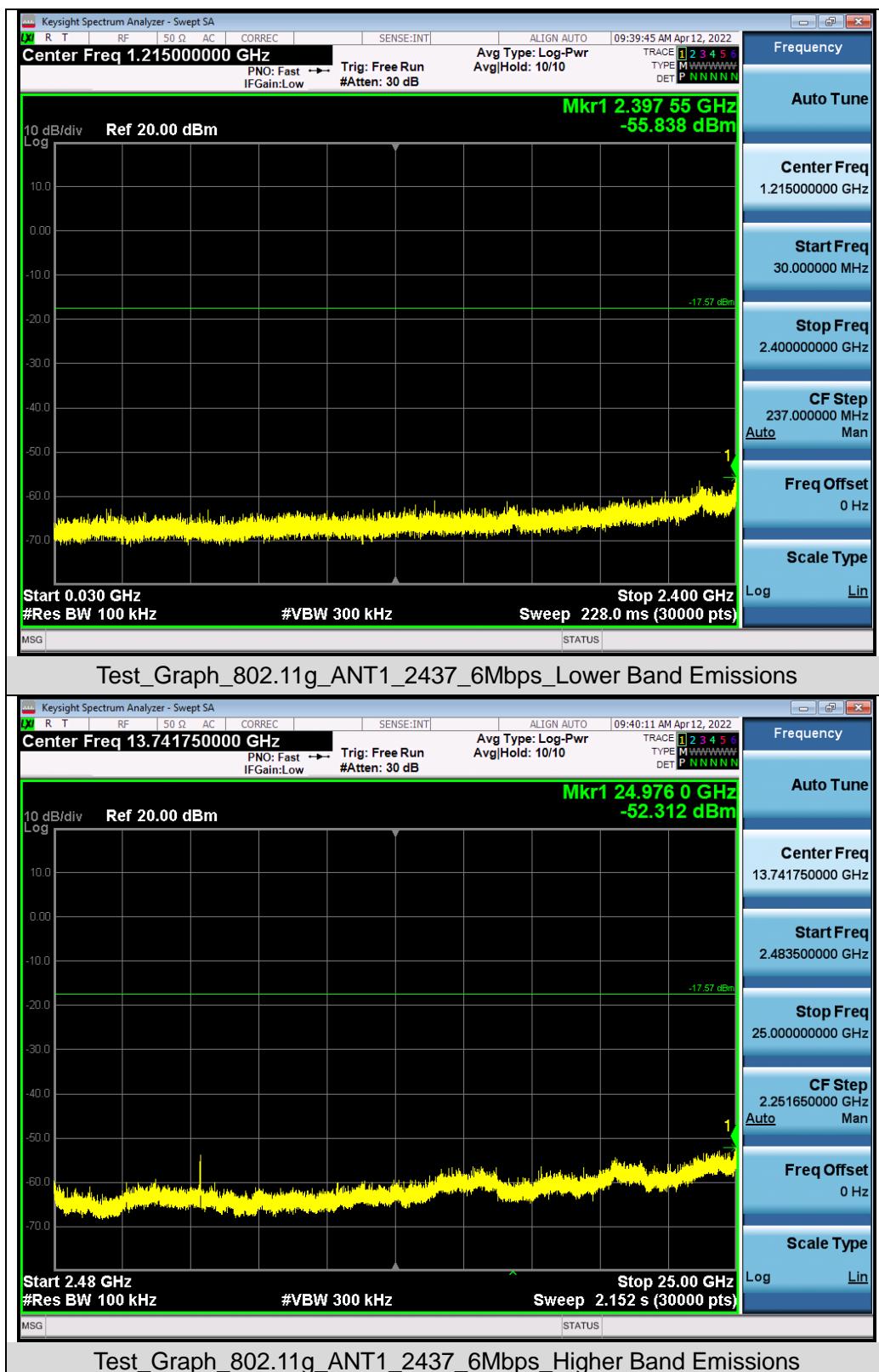


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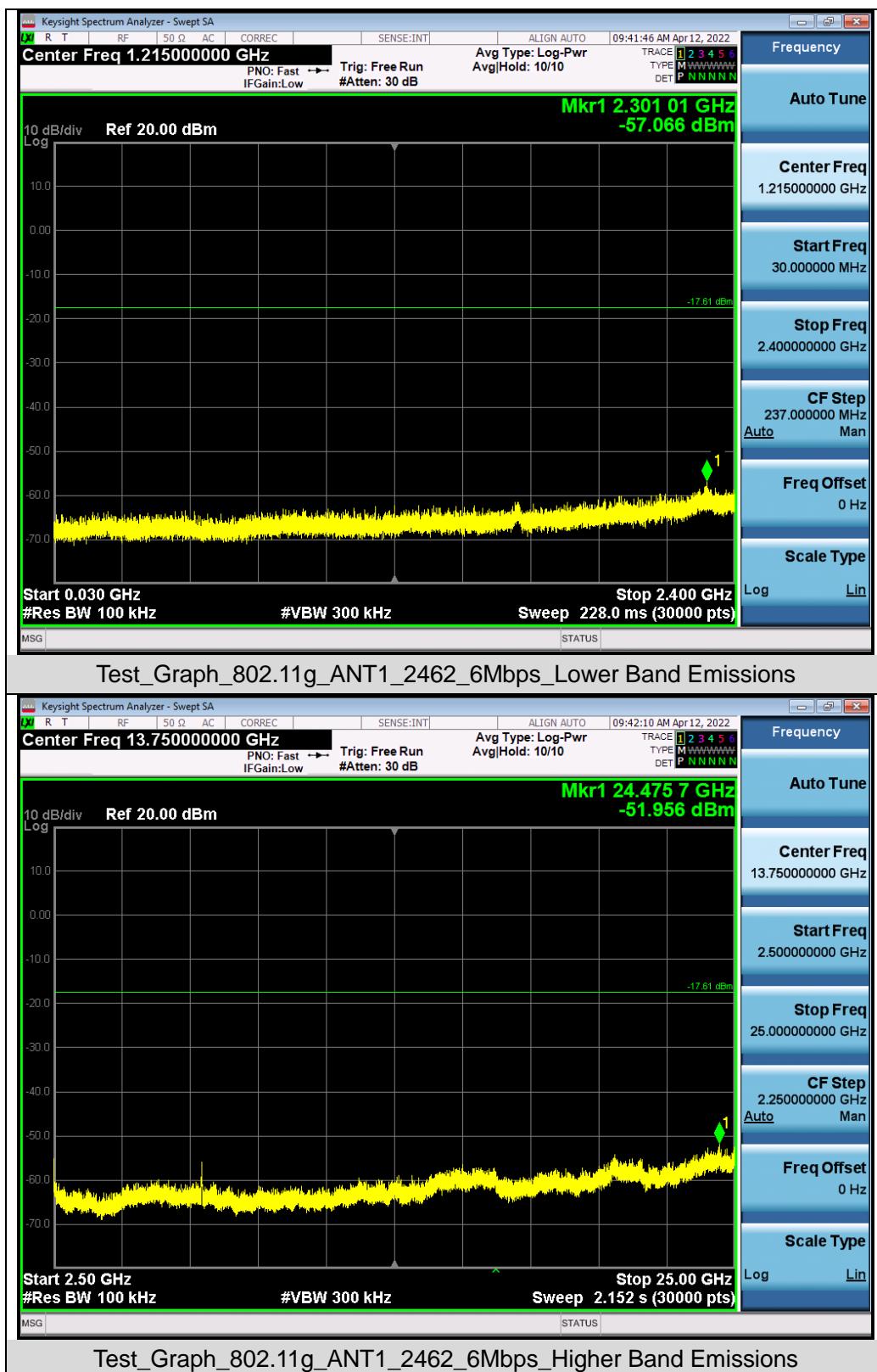


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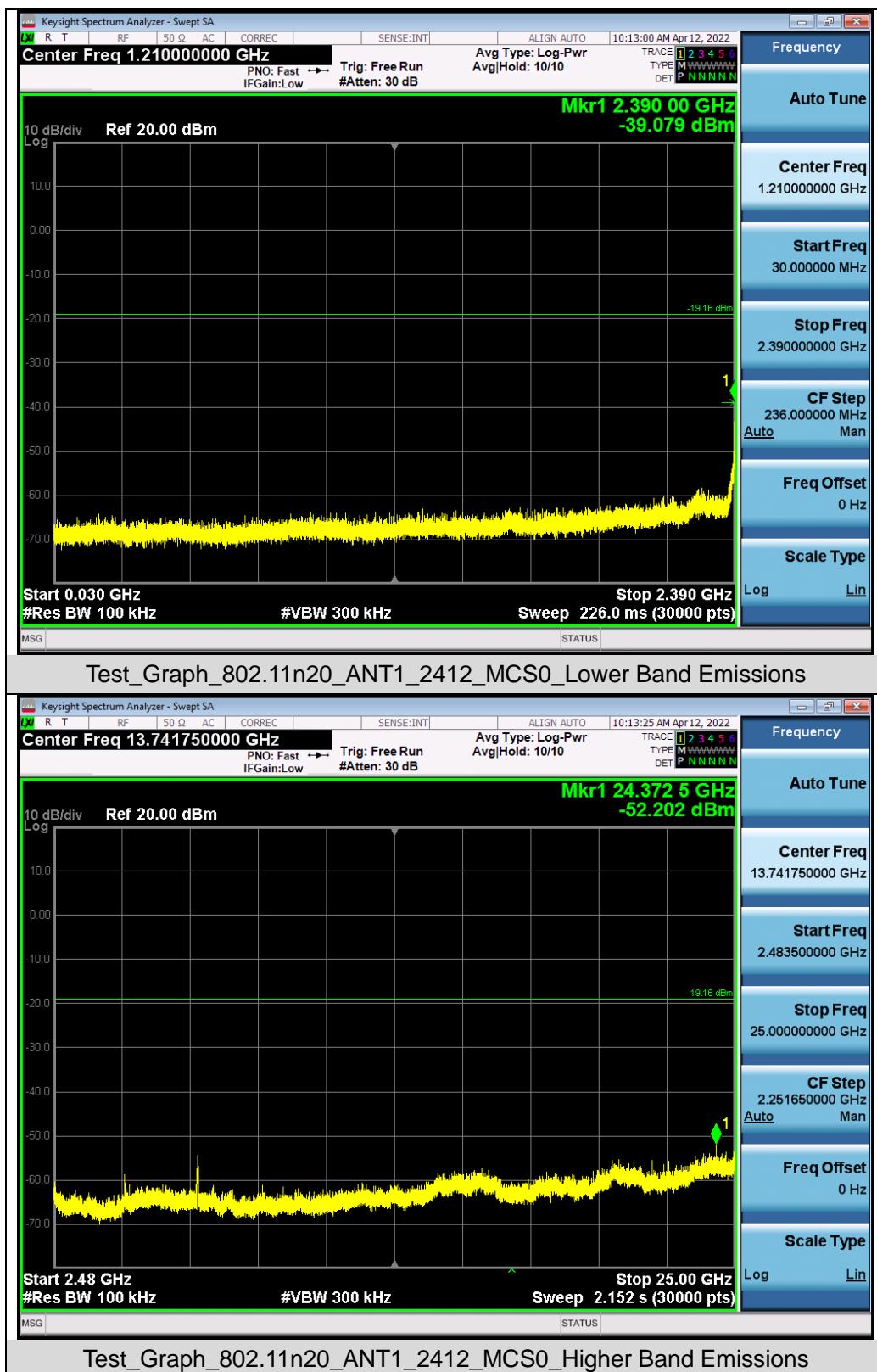


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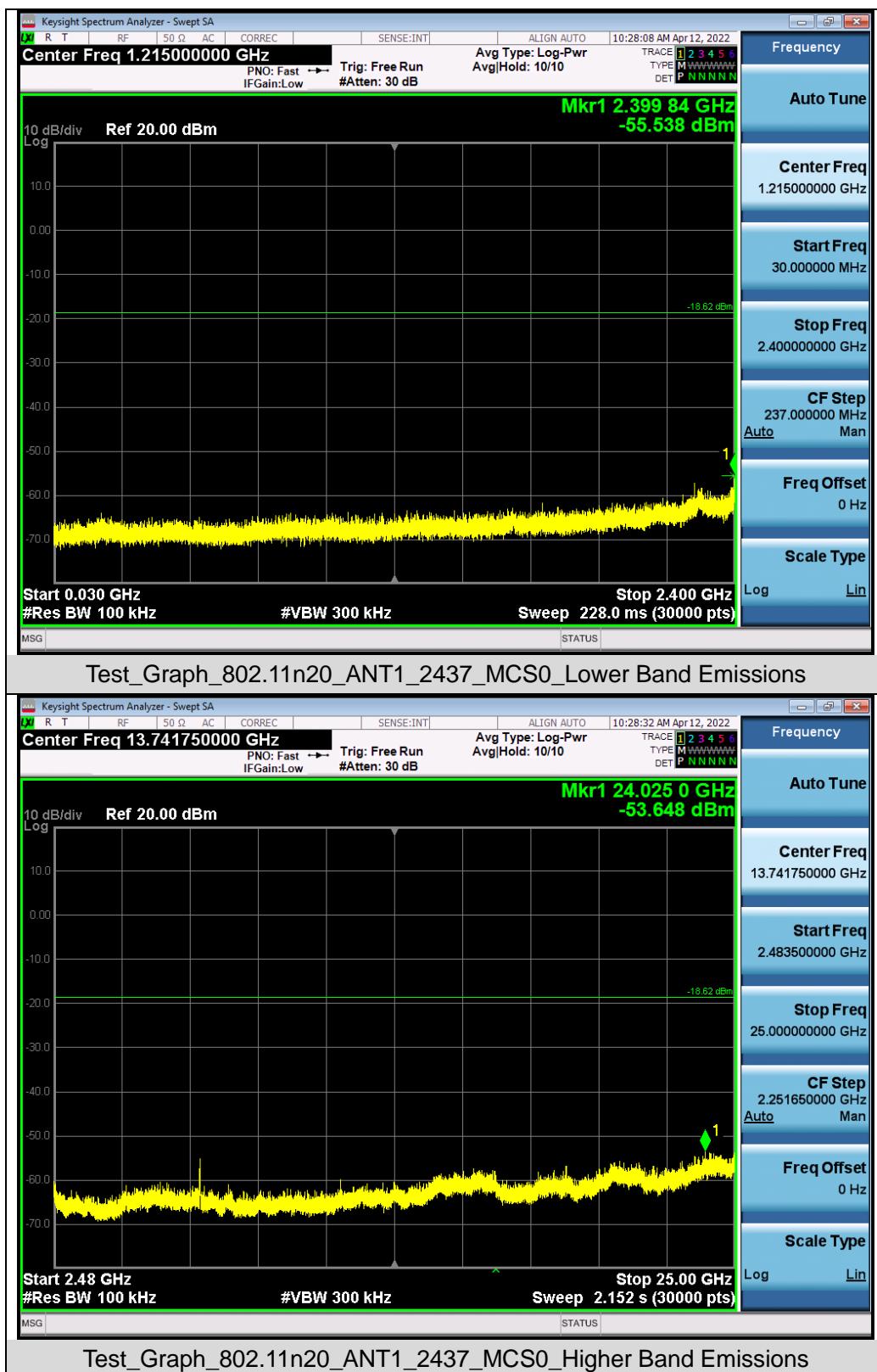


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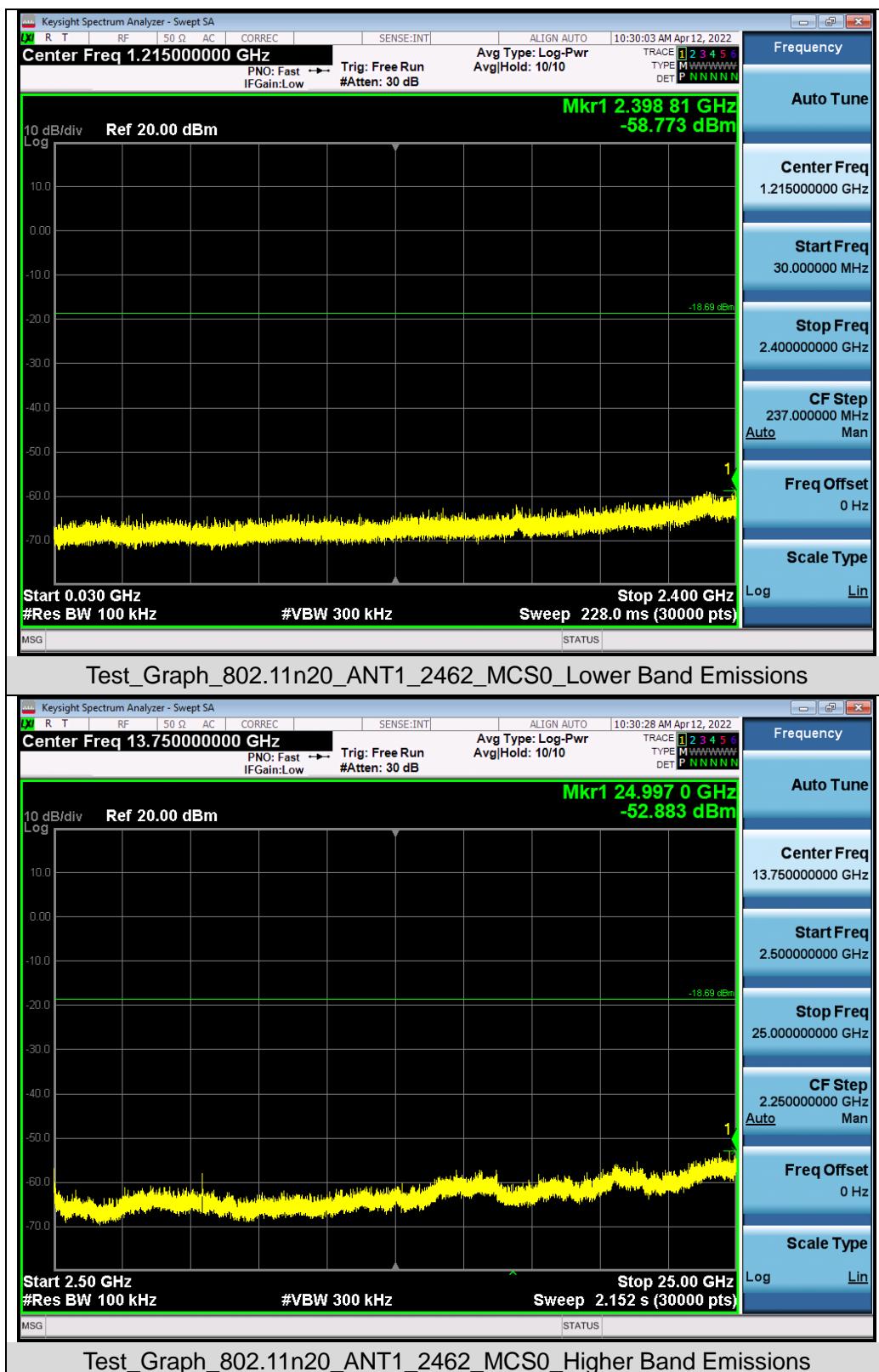


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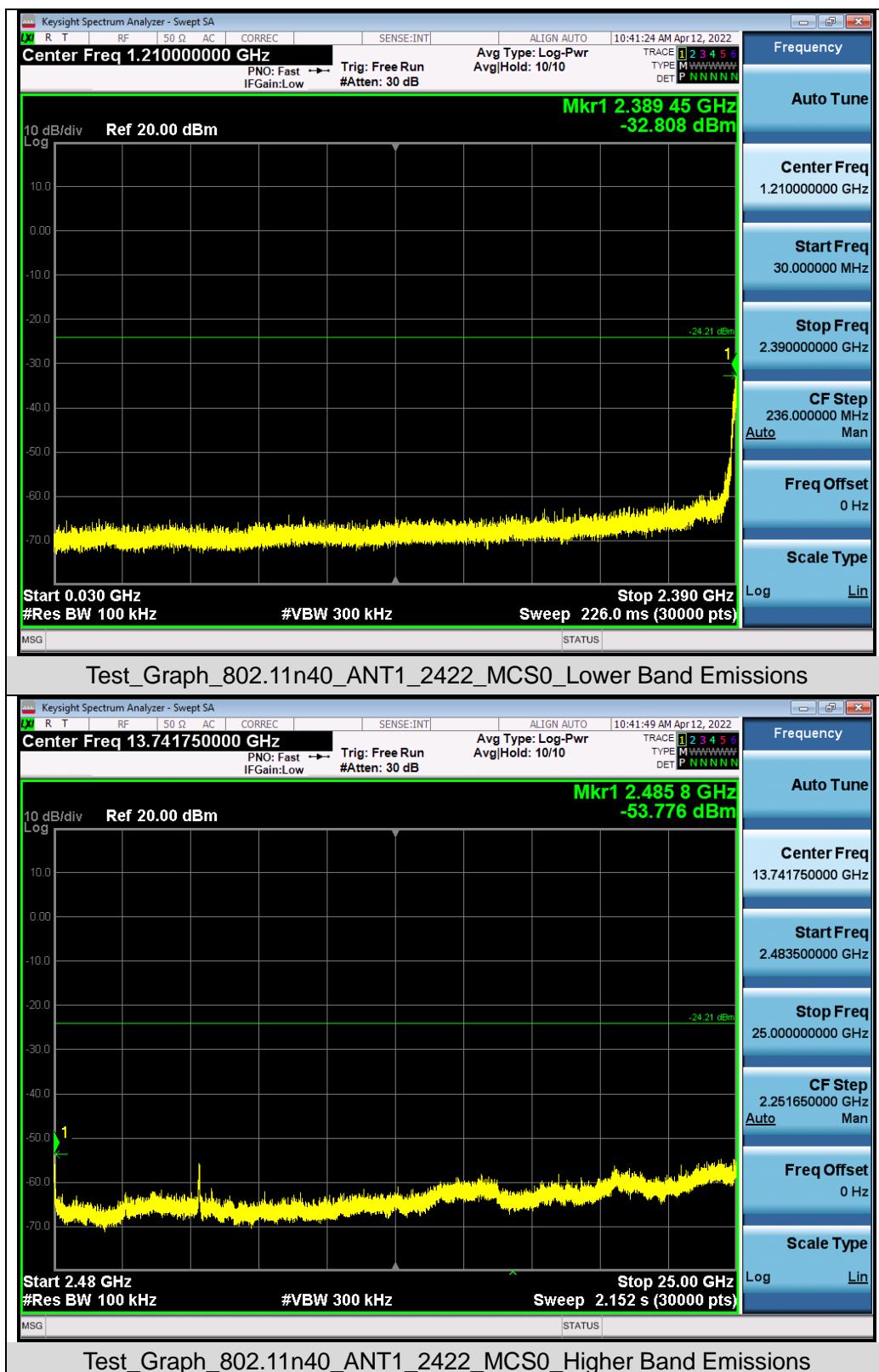


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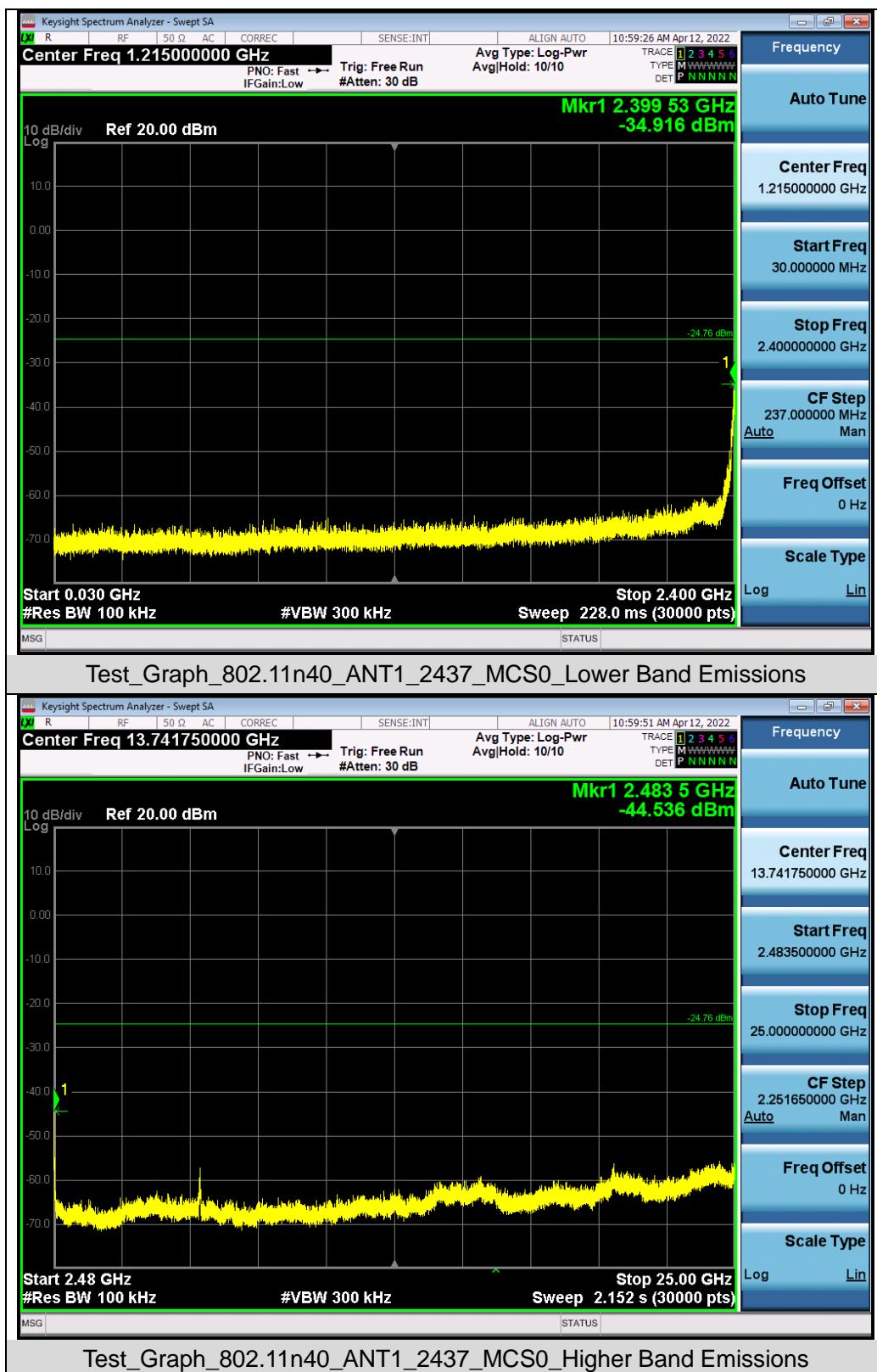


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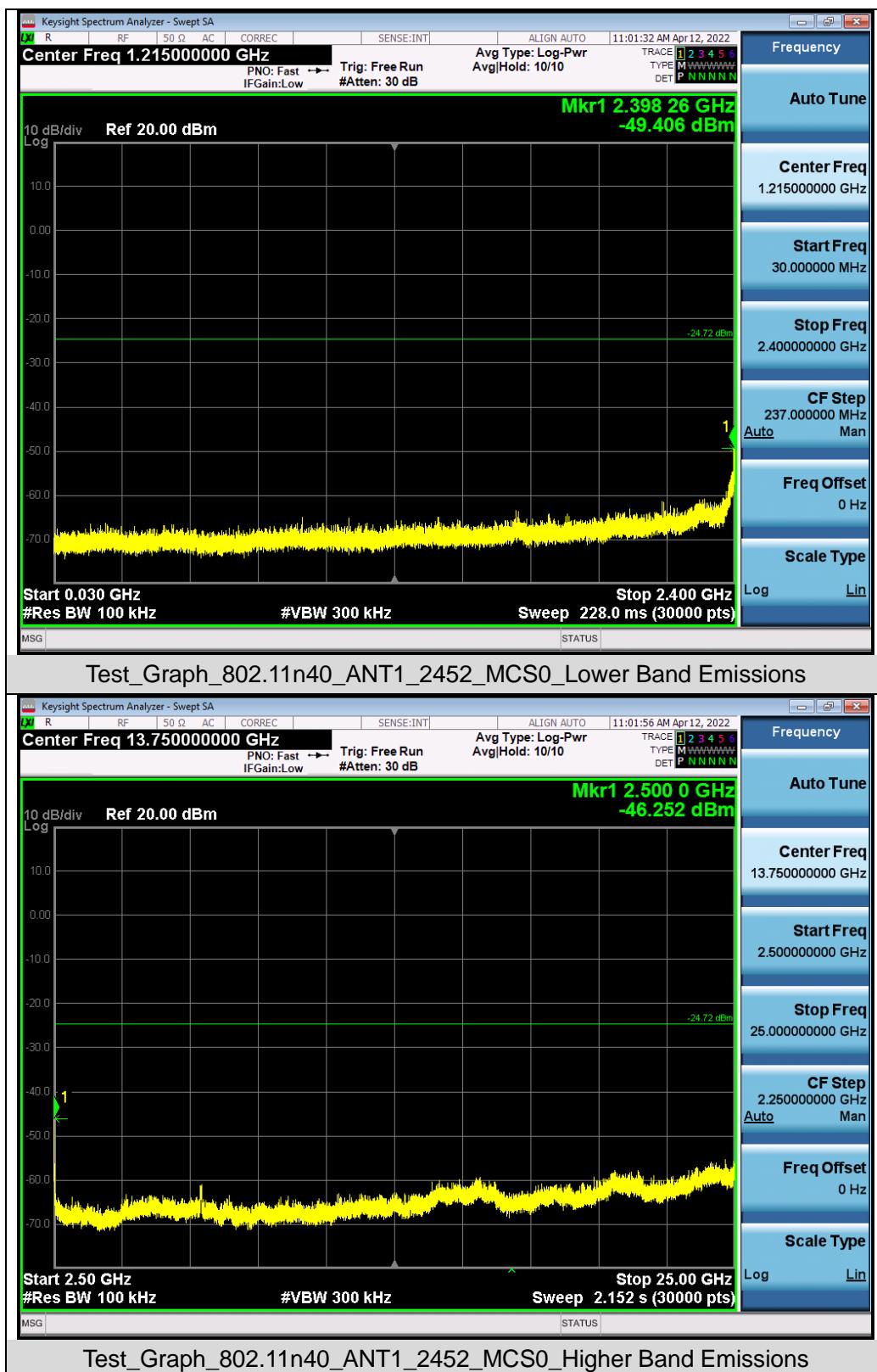


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Test Graphs of Band Edge Emissions in Non-Restricted Frequency Bands



Test_Graph_802.11b_ANT1_2412_1Mbps_Lower Band Edge Emissions



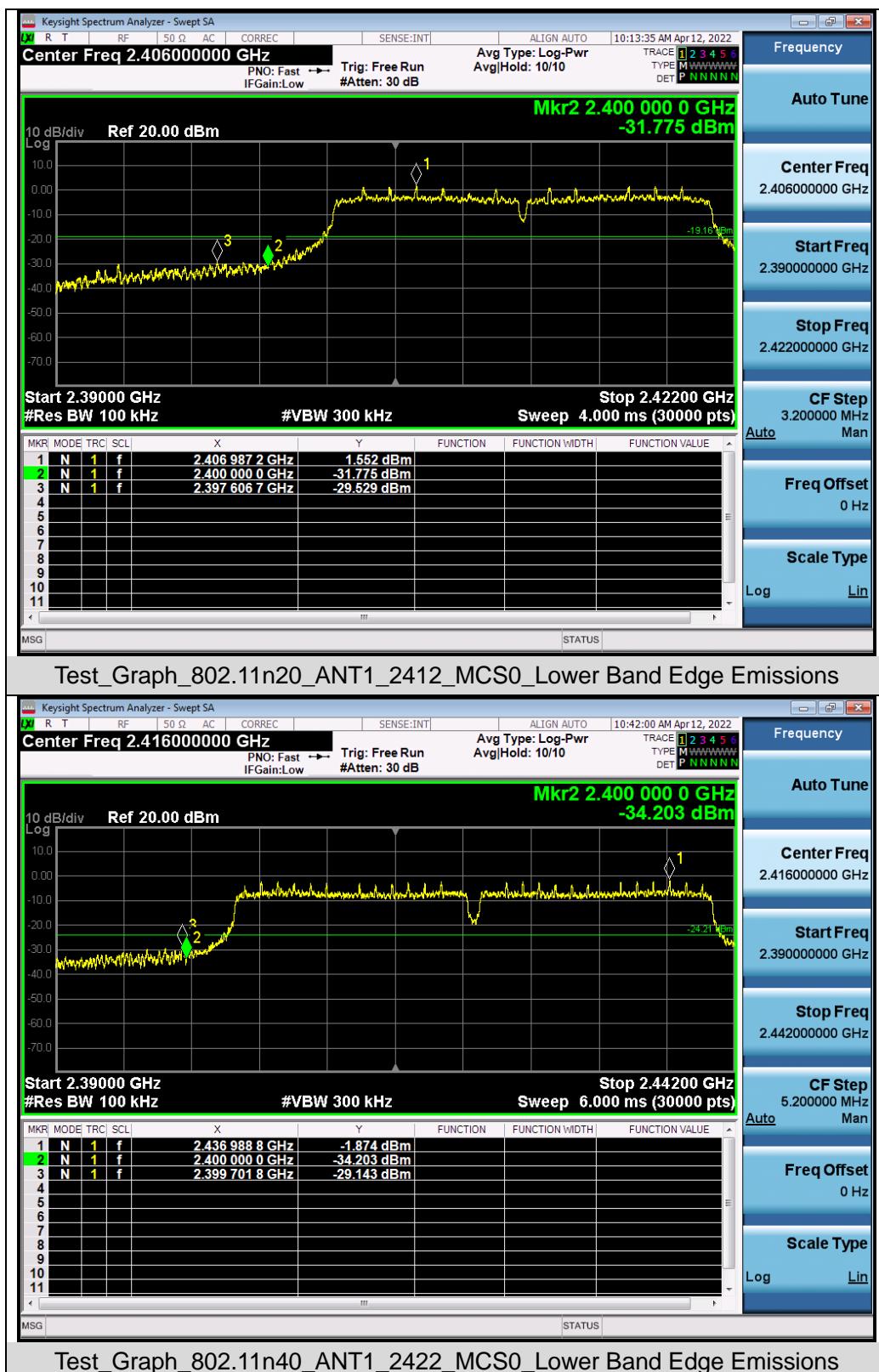
Test_Graph_802.11g_ANT1_2412_6Mbps_Lower Band Edge Emissions

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Note: Emissions from 2483.5-2500MHz which fall in the restricted bands had been considered with the radiated emission limits specified.

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10. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY

10.1 MEASUREMENT PROCEDURE

- (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 SPA Trace 1 Max hold, then View.

Note: The method of PKPSD in the ANSI C63.10 (2013) item 11.10 was used in this testing.

10.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

Refer to Section 8.2.

10.3 MEASUREMENT EQUIPMENT USED

Refer to Section 6.

10.4 LIMITS AND MEASUREMENT RESULT

| Test Data of Conducted Output Power Spectral Density | | | | | |
|--|--------------------|---------------------------|--------------------------|------------------|--------------|
| Test Mode | Test Channel (MHz) | Power density (dBm/20kHz) | Power density (dBm/3kHz) | Limit (dBm/3kHz) | Pass or Fail |
| 802.11b | 2412 | 2.465 | -5.774 | ≤8 | Pass |
| | 2437 | 2.185 | -6.054 | ≤8 | Pass |
| | 2462 | 2.607 | -5.632 | ≤8 | Pass |
| 802.11g | 2412 | -4.308 | -12.547 | ≤8 | Pass |
| | 2437 | -3.496 | -11.735 | ≤8 | Pass |
| | 2462 | -3.705 | -11.944 | ≤8 | Pass |
| 802.11n20 | 2412 | -7.601 | -15.84 | ≤8 | Pass |
| | 2437 | -7.090 | -15.329 | ≤8 | Pass |
| | 2462 | -7.262 | -15.501 | ≤8 | Pass |
| 802.11n40 | 2422 | -13.643 | -21.882 | ≤8 | Pass |
| | 2437 | -13.424 | -21.663 | ≤8 | Pass |
| | 2452 | -13.460 | -21.699 | ≤8 | Pass |

Note: Power density(dBm/3kHz) = Power density(dBm/20kHz) – 10*log(20/3).

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Test Graphs of Conducted Output Power Spectral Density



Test_Graph_802.11b_ANT1_2412_1Mbps_PSD



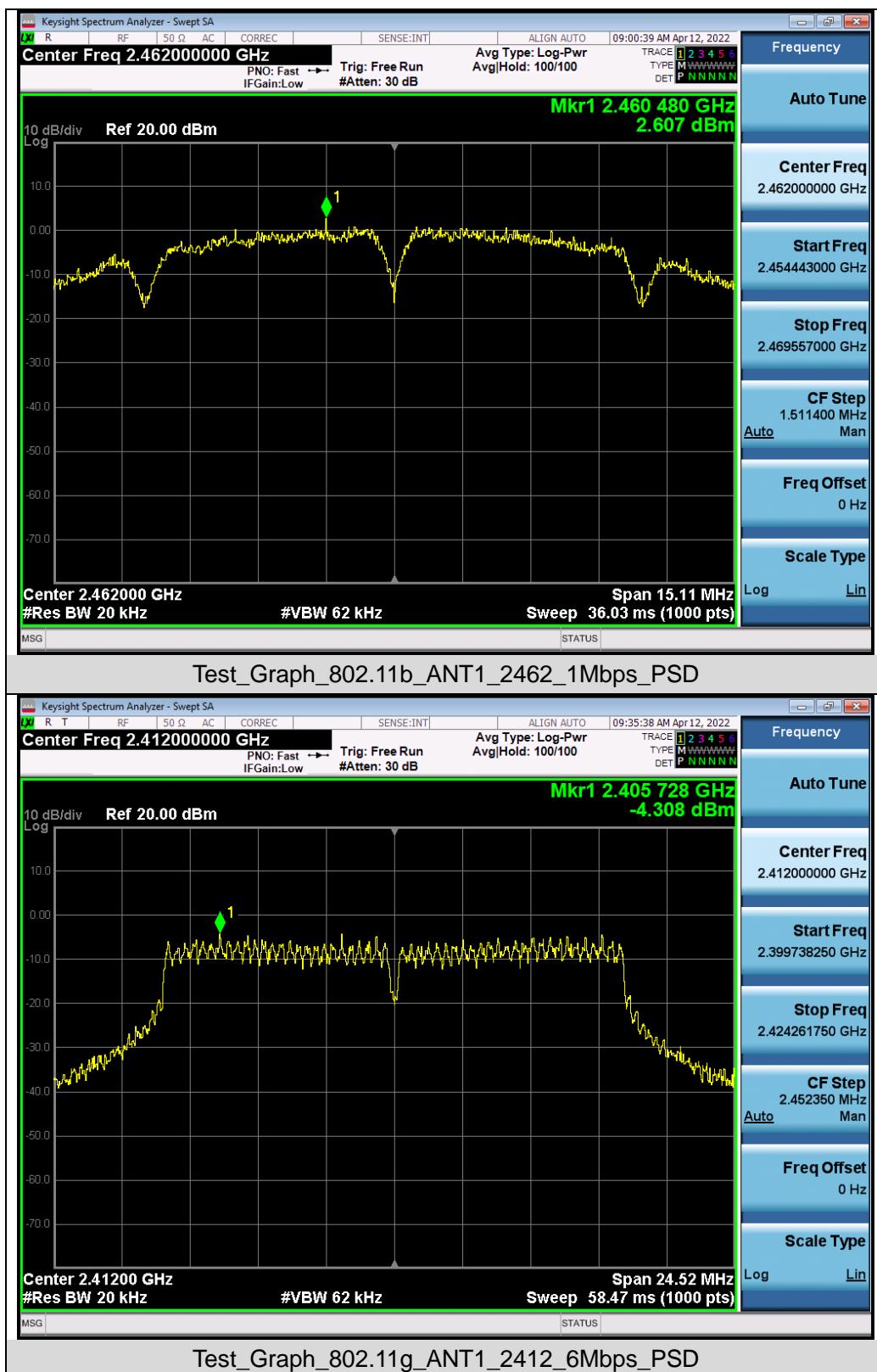
Test_Graph_802.11b_ANT1_2437_1Mbps_PSD

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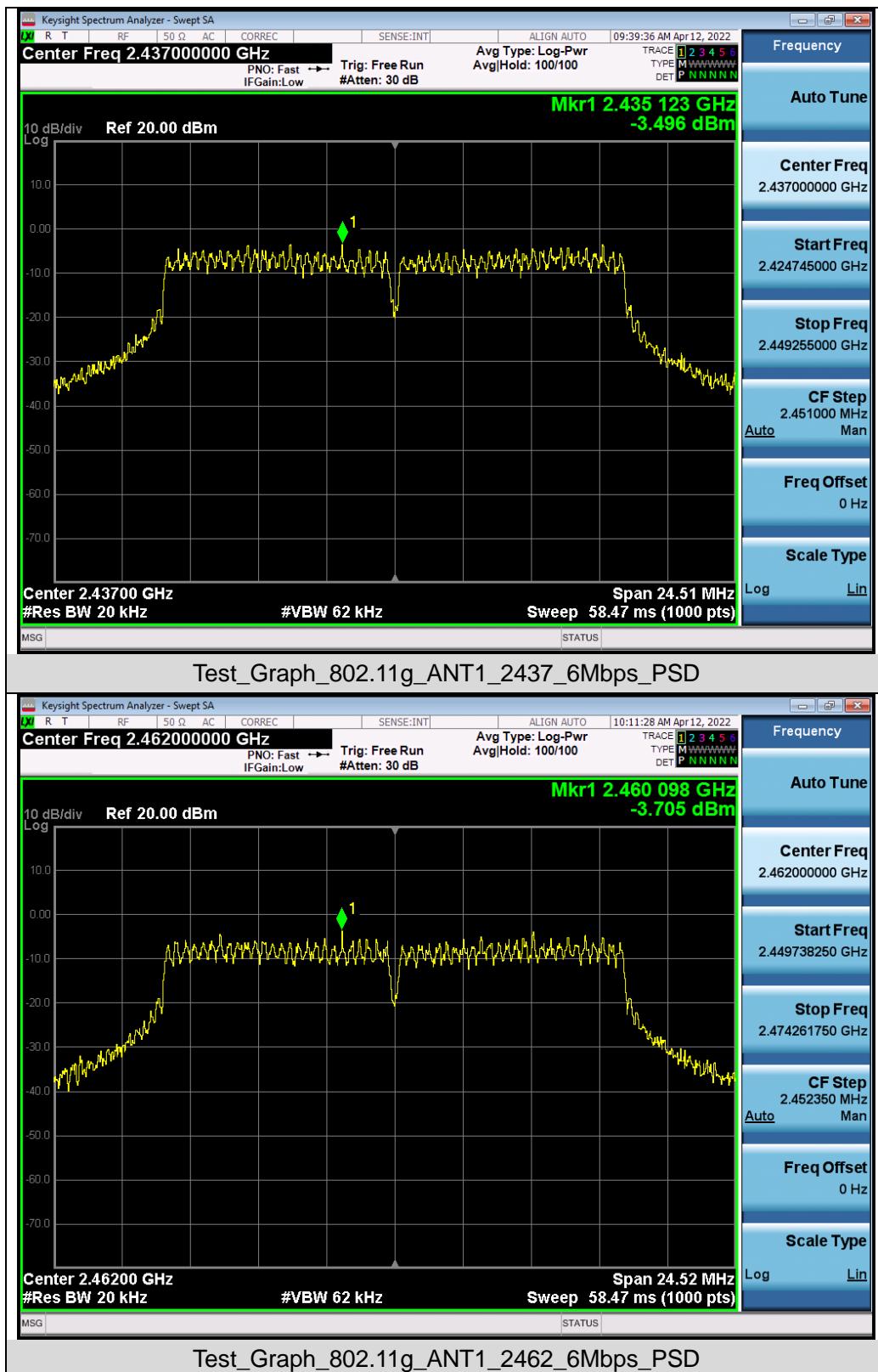


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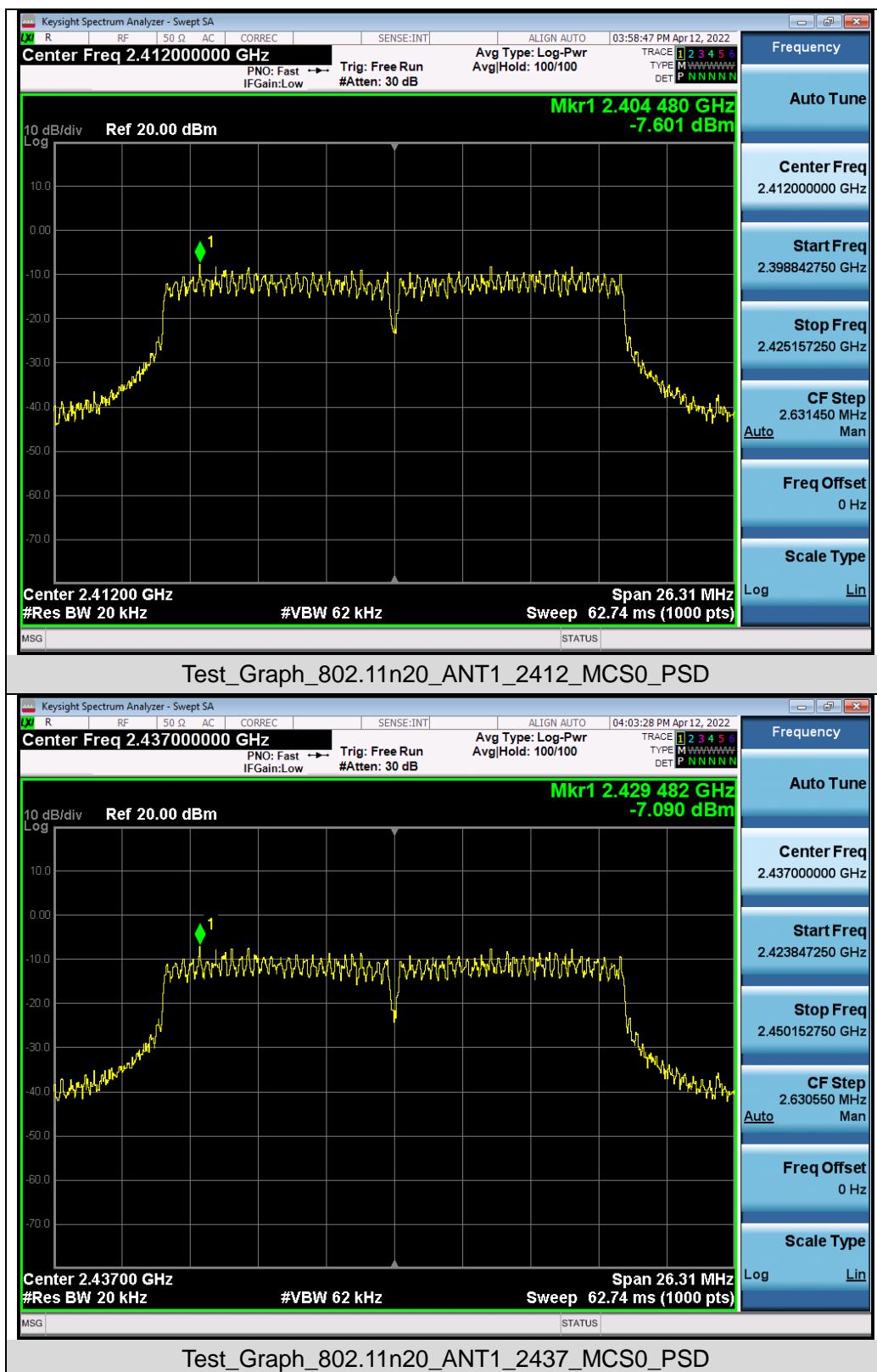


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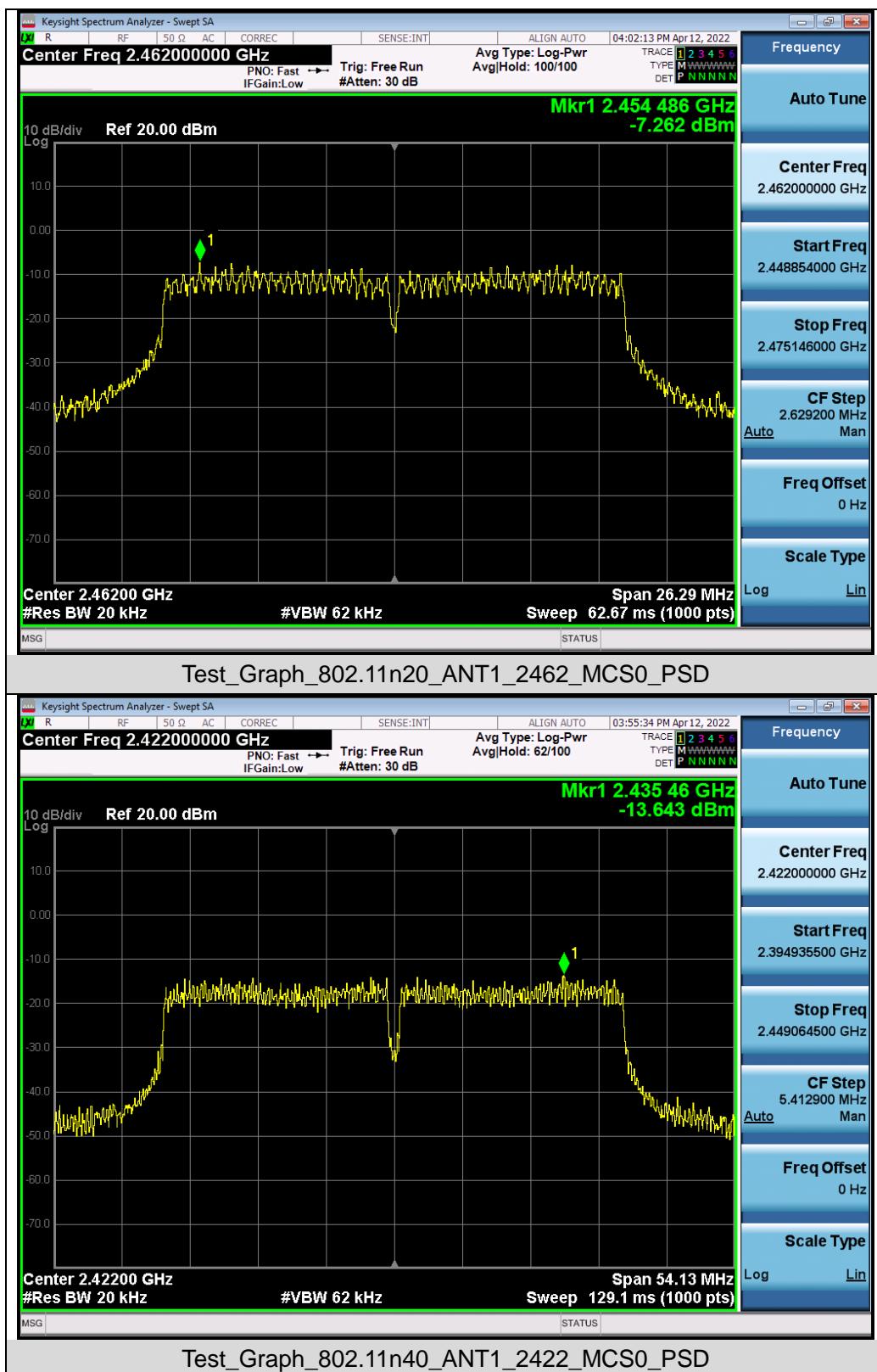


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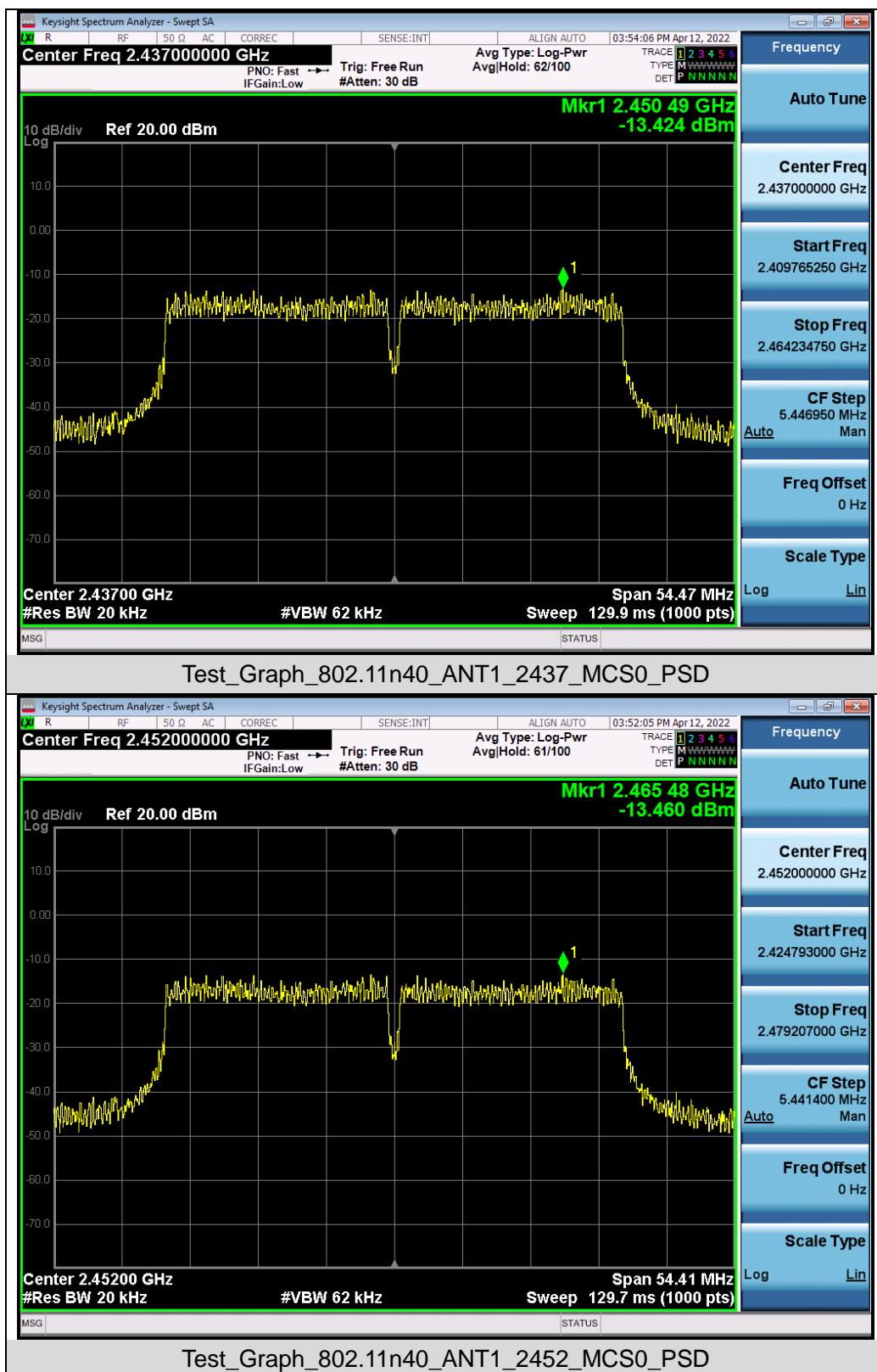


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11. RADIATED EMISSION

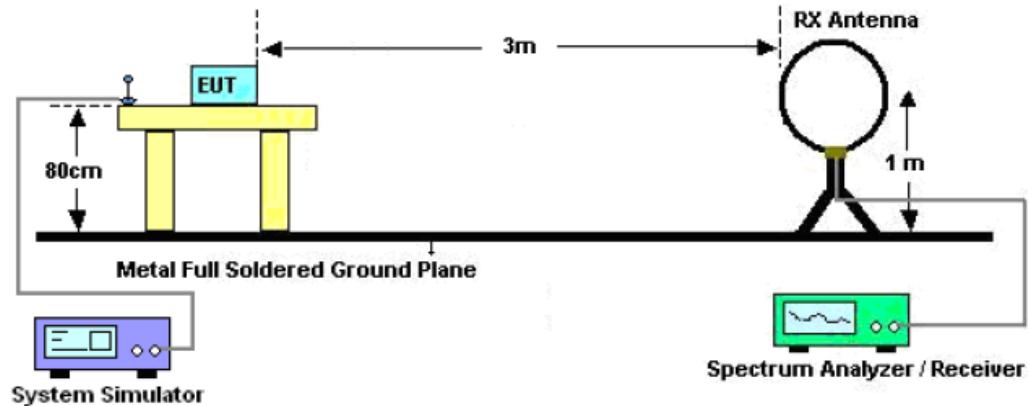
11.1. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

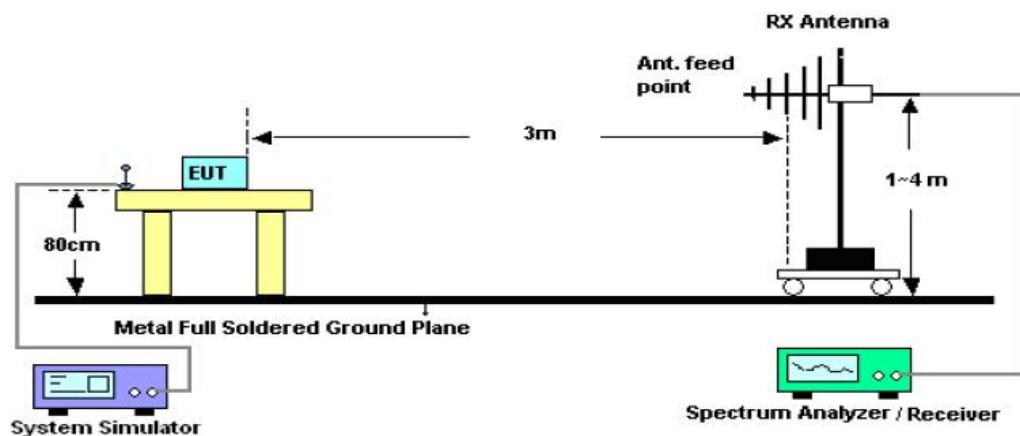
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11.2. TEST SETUP

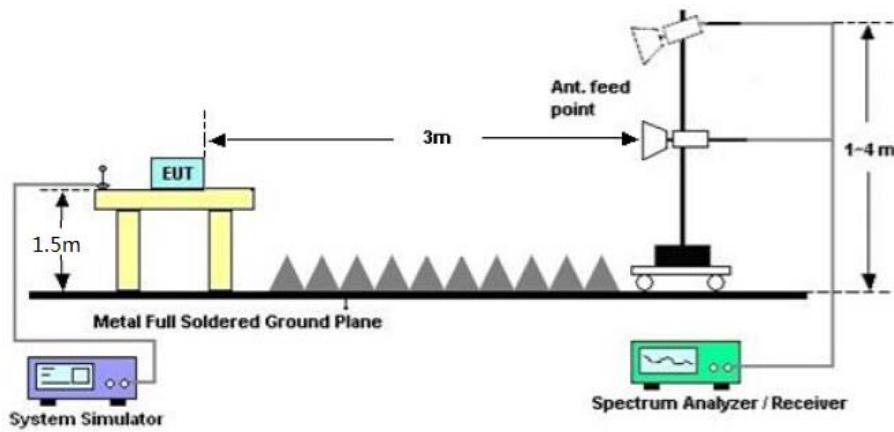
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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11.3. LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table has to be followed

| Frequencies (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|------------------------------|--|--|
| 0.009~0.490 | 2400/F(kHz) | 300 |
| 0.490~1.705 | 24000/F(kHz) | 30 |
| 1.705~30.0 | 30 | 30 |
| 30~88 | 100 | 3 |
| 88~216 | 150 | 3 |
| 216~960 | 200 | 3 |
| Above 960 | 500 | 3 |

Note: All modes were tested for restricted band radiated emission,
the test records reported below are the worst result compared to other modes.

11.4. TEST RESULT

Radiated emission below 30MHz

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

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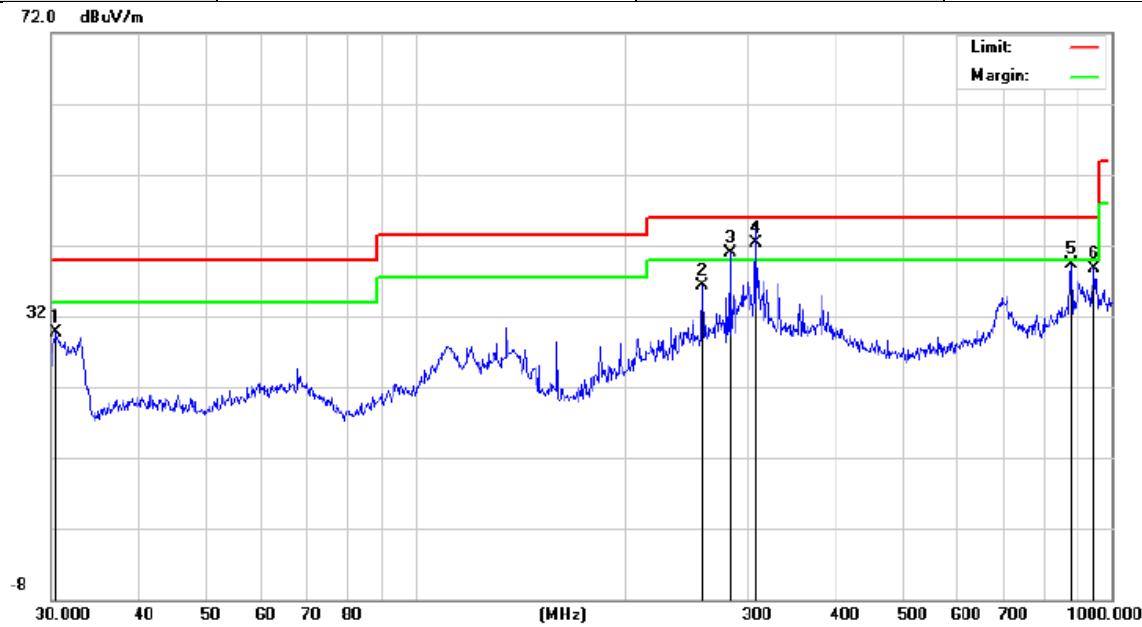
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Radiated emission from 30MHz to 1000MHz

| | | | |
|--------------------|-------------------------------------|--------------------------|----------------|
| EUT | 4K UST Laser Projector | Model Name | PE-LT002 |
| Temperature | 25°C | Relative Humidity | 58% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11g with date rate 1 2412MHz | Antenna | Horizontal |



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|-----|------------|-------|---------------|----------------|--------------|--------|------|----------|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector |
| 1 | 30.5306 | 16.59 | 13.19 | 29.78 | 40.00 | -10.22 | peak | |
| 2 | 258.3264 | 18.90 | 17.34 | 36.24 | 46.00 | -9.76 | peak | |
| 3 | ! 282.9852 | 20.34 | 20.61 | 40.95 | 46.00 | -5.05 | peak | |
| 4 | * 307.8313 | 17.95 | 24.38 | 42.33 | 46.00 | -3.67 | QP | |
| 5 | 875.2470 | 11.31 | 28.01 | 39.32 | 46.00 | -6.68 | peak | |
| 6 | 942.1305 | 9.89 | 28.91 | 38.80 | 46.00 | -7.20 | peak | |

RESULT: PASS

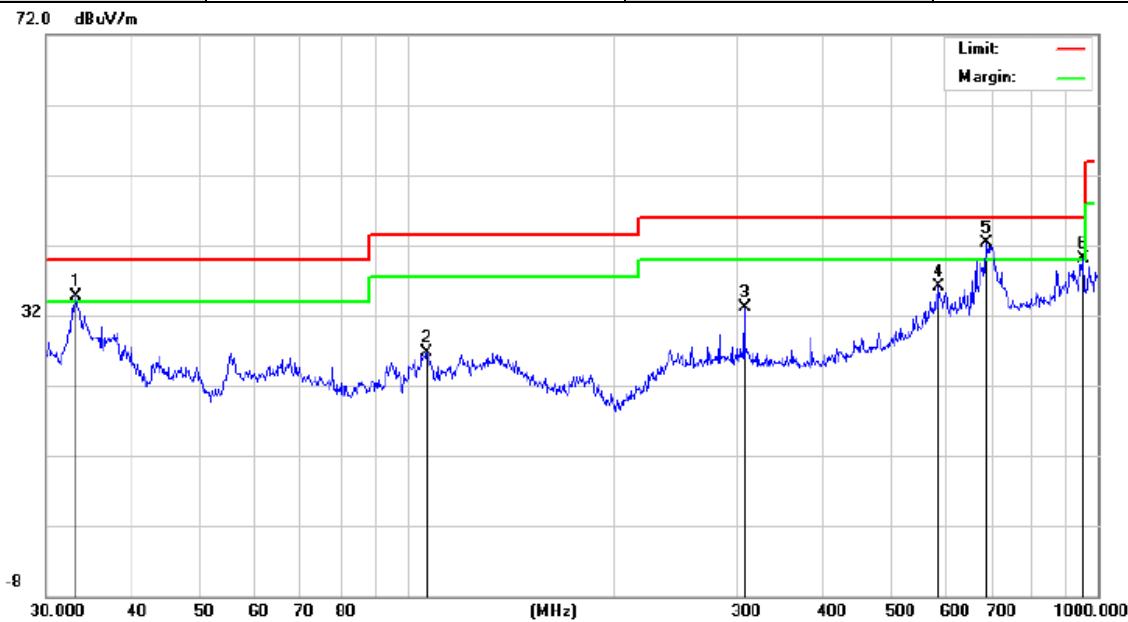
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| | | | |
|--------------------|-------------------------------------|--------------------------|----------------|
| EUT | 4K UST Laser Projector | Model Name | PE-LT002 |
| Temperature | 25°C | Relative Humidity | 58% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11g with date rate 1 2412MHz | Antenna | Vertical |



| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Over |
|-----|-----|----------|---------|---------|----------|--------|--------|
| | | | Level | Factor | ment | | |
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB |
| 1 | ! | 33.2112 | 21.43 | 13.27 | 34.70 | 40.00 | -5.30 |
| 2 | | 106.7587 | 11.10 | 15.69 | 26.79 | 43.50 | -16.71 |
| 3 | | 307.8313 | 12.63 | 20.43 | 33.06 | 46.00 | -12.94 |
| 4 | | 588.9051 | 10.44 | 25.62 | 36.06 | 46.00 | -9.94 |
| 5 | * | 689.5643 | 16.17 | 26.13 | 42.30 | 46.00 | -3.70 |
| 6 | ! | 952.0937 | 10.40 | 29.64 | 40.04 | 46.00 | -5.96 |

RESULT: PASS

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