# FCC TEST REPORT

| | | |
|---|---|---|
| Client Name | : | Actions Microelectronics Co., Ltd. |
| Address | : | 201, No.9 Building, Software Park, KeJiZhong Er Road, GaoXinQu, NanShan, Shenzhen, China |
| Product Name | : | MiniBox |
| Date | : | Apr. 22, 2020 |

## Shenzhen Anbotek Compliance Laboratory Limited

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# TEST REPORT

| | | |
|---|---|---|
| Applicant | : | Actions Microelectronics Co., Ltd. |
| Manufacturer | : | Actions Microelectronics Co., Ltd. |
| Product Name | : | MiniBox |
| Model No. | : | MiniBox |
| Trade Mark | : | EZCast |
| Rating(s) | : | Input: DC 5V, 2A(via adapter Input: AC 100-240V, 50/60Hz, 0.3A; Output: DC 5V, 2A) |
| **Test Standard(s)** | **:** | **FCC Part15 Subpart C, Section 15.247** |
| **Test Method(s)** | **:** | **ANSI C63.10: 2013, KDB558074 D01 DTS Meas Guidance v05r02 KDB662911 D01 Multiple Transmitter Output v02r01** |

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

| | |
|---|---|
| Date of Receipt | Feb. 29, 2020 |
| Date of Test | Feb. 29~Apr. 09, 2020 |
| Prepared by | (Engineer / Dolly Mo) |
| Reviewer | (Supervisor / Bibo Zhang) |
| Approved & Authorized Signer | (Manager / Tom Chen) |


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# 1. General Information

## 1.1. Client Information

| | | |
|---|---|---|
| Applicant | : | Actions Microelectronics Co., Ltd. |
| Address | : | 201, No.9 Building, Software Park, KeJiZhong Er Road, GaoXinQu, NanShan, Shenzhen, China |
| Manufacturer | : | Actions Microelectronics Co., Ltd. |
| Address | : | 201, No.9 Building, Software Park, KeJiZhong Er Road, GaoXinQu, NanShan, Shenzhen, China |
| Factory | : | Actions Microelectronics Co., Ltd. |
| Address | : | 201, No.9 Building, Software Park, KeJiZhong Er Road, GaoXinQu, NanShan, Shenzhen, China |

## 1.2. Description of Device (EUT)

| | | | |
|---|---|---|---|
| Product Name | : | MiniBox | |
| Model No. | : | MiniBox | |
| Trade Mark | : | EZCast | |
| Test Power Supply | : | AC 120V, 60Hz for adapter | |
| Test Sample No. | : | 1-2-1(Normal Sample), 1-2-2(Engineering Sample) | |
| Product Description | : | Operation Frequency: | 802.11b/ g/ n(HT20) 2412-2462MHz<br>802.11n(HT40) 2422-2452MHz |
| | | Number of Channel: | 802.11b/ g/ n(HT20): 11 Channels<br>802.11n(HT40)：7 Channels |
| | | Transfer Rate: | 802.11b: 11/5.5/2/1Mbps<br>802.11g: 54/48/36/24/18/12/9/6 Mbps<br>802.11n: up to 150Mbps |
| | | Modulation Type: | 802.11b: CCK; 802.11g/n: OFDM |
| | | Antenna Type: | Columnar Antenna |
| | | Antenna Gain(Peak): | 2 dBi |
| | | The directional gain: | 5.01 dBi |

**Remark:** 1)For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2) This report is for Wifi 2.4G module.

## 1.3. Auxiliary Equipment Used During Test

| | | |
|---|---|---|
| Adapter | : | Manufacturer: Shenzhen Shi Ying Yuan Electronics Co.，Ltd. |
| | | M/N: ICP12-050-20000B<br>Input: 100-240V~ 50/60Hz, 0.3A<br>Output: DC 5V, 2000mA |

## 1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

**RADIATED EMISSION TEST (BELOW 1GHz):**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

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

| Mode | Available Channel | Test Channel | Modulation Tech. | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|---|---|
| 802.11b | 1 to 11 | 1 | CCK | DBPSK | 1.0 |

For the test results, only the worst case was shown in test report.

**RADIATED EMISSION TEST (ABOVE 1GHz):**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports (if EUT with antenna diversity architecture).

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

| Mode | Available Channel | Test Channel | Modulation Tech. | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|---|---|
| 802.11b | 1 to 11 | 1, 6, 11 | CCK | DBPSK | 1.0 |
| 802.11g | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6.0 |
| 802.11n HT20 | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6.5 |
| 802.11n HT40 | 3 to 9 | 3, 6, 9 | OFDM | BPSK | 13.5 |

**POWER LINE CONDUCTED EMISSION TEST:**

The EUT was tested with the following mode

| Mode | Available Channel | Test Channel | Modulation Tech. | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|---|---|
| 802.11b | 1 to 11 | 1, 6, 11 | CCK | DBPSK | 1.0 |
| 802.11g | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6.0 |

| | | | | | |
|---|---|---|---|---|---|
| 802.11n HT20 | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6.5 |
| 802.11n HT40 | 3 to 9 | 3, 6, 9 | OFDM | BPSK | 13.5 |

**BANDEDGE MEASUREMENT:**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between 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.

| Mode | Available Channel | Test Channel | Modulation Tech. | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|---|---|
| 802.11b | 1 to 11 | 1, 11 | CCK | DBPSK | 1.0 |
| 802.11g | 1 to 11 | 1, 11 | OFDM | BPSK | 6.0 |
| 802.11n HT20 | 1 to 11 | 1, 11 | OFDM | BPSK | 6.5 |
| 802.11n HT40 | 3 to 9 | 3, 9 | OFDM | BPSK | 13.5 |

**ANTENNA PORT CONDUCTED MEASUREMENT:**

This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between 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.

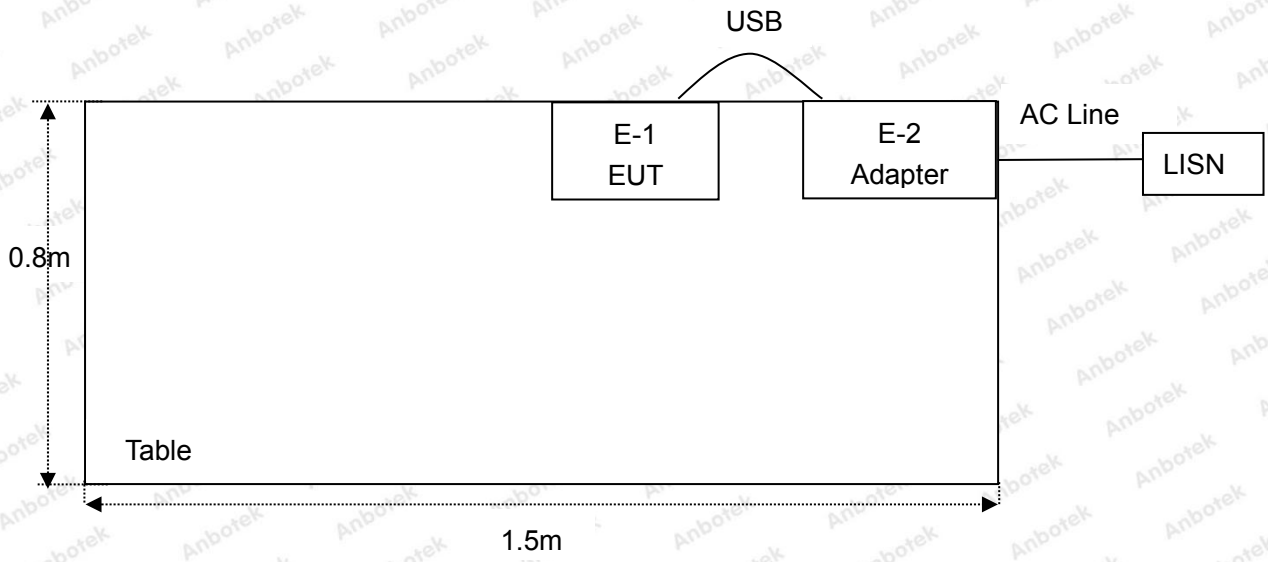
| Mode | Available Channel | Test Channel | Modulation Tech. | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|---|---|
| 802.11b | 1 to 11 | 1, 6, 11 | CCK | DBPSK | 1.0 |
| 802.11g | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6.0 |
| 802.11n HT20 | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6.5 |
| 802.11n HT40 | 3 to 9 | 3,6, 9 | OFDM | BPSK | 13.5 |

## 1.5. List of channels

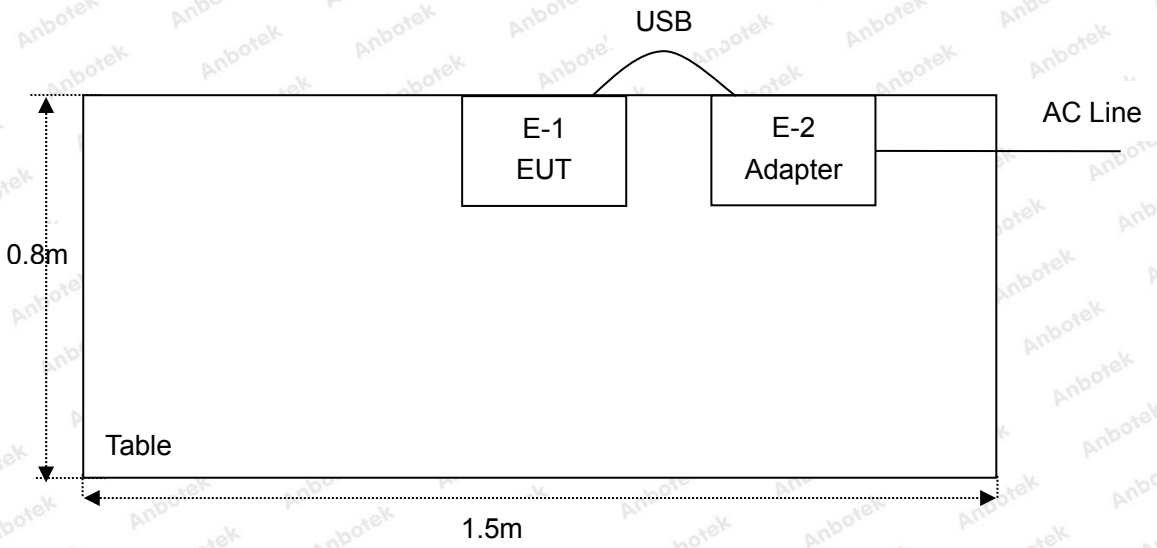
| Channel | Freq. (MHz) | Channel | Freq. (MHz) | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|---|---|---|
| 01 | 2412 | 04 | 2427 | 07 | 2442 | 10 | 2457 |
| 02 | 2417 | 05 | 2432 | 08 | 2447 | 11 | 2462 |
| 03 | 2422 | 06 | 2437 | 09 | 2452 | | |

## 1.6. Description Of Test Setup

CE




RE



## 1.7. Test Equipment List

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | L.I.S.N. Artificial Mains Network | Rohde & Schwarz | ENV216 | 100055 | Nov. 04, 2019 | 1 Year |
| 2. | EMI Test Receiver | Rohde & Schwarz | ESPI3 | 101604 | Nov. 04, 2019 | 1 Year |
| 3. | RF Switching Unit | Compliance Direction | RSU-M2 | 38303 | Nov. 04, 2019 | 1 Year |
| 4. | MAX Spectrum Analysis | Agilent | N9020A | MY51170037 | Nov. 04, 2019 | 1 Year |
| 5. | Preamplifier | SKET Electronic | BK1G18G30D | KD17503 | Nov. 04, 2019 | 1 Year |
| 6. | Double Ridged Horn Antenna | Instruments corporation | GTH-0118 | 351600 | Nov. 01, 2019 | 1 Year |
| 7. | Bilog Broadband Antenna | Schwarzbeck | VULB9163 | VULB 9163-289 | Nov. 01, 2019 | 1 Year |
| 8. | Loop Antenna | Schwarzbeck | FMZB1519B | 00053 | Nov. 01, 2019 | 1 Year |
| 9. | Horn Antenna | A-INFO | LB-180400-KF | J211060628 | Nov. 01, 2019 | 1 Year |
| 10. | Pre-amplifier | SONOMA | 310N | 186860 | Nov. 04, 2019 | 1 Year |
| 11. | EMI Test Software EZ-EMC | SHURPLE | N/A | N/A | N/A | N/A |
| 12. | RF Test Control System | YIHENG | YH3000 | 2017430 | Nov. 04, 2019 | 1 Year |
| 13. | Power Sensor | DAER | RPR3006W | 15I00041SN045 | Nov. 04, 2019 | 1 Year |
| 14. | Power Sensor | DAER | RPR3006W | 15I00041SN046 | Nov. 04, 2019 | 1 Year |
| 15. | MXA Spectrum Analysis | Agilent | N9020A | MY51170037 | Nov. 04, 2019 | 1 Year |
| 16. | MXG RF Vector Signal Generator | Agilent | N5182A | MY48180656 | Nov. 04, 2019 | 1 Year |
| 17. | Signal Generator | Agilent | E4421B | MY41000743 | Nov. 04, 2019 | 1 Year |
| 18. | DC Power Supply | LW | TPR-6420D | 374470 | Nov. 04, 2019 | 1 Year |
| 19. | Constant Temperature Humidity Chamber | ZHONGJIAN | ZJ-KHWS80B | N/A | Nov. 04, 2019 | 1 Year |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## 1.8. Measurement Uncertainty

| | | |
|---|---|---|
| Radiation Uncertainty | : | Ur = 3.9 dB (Horizontal) |
| | | Ur = 3.8 dB (Vertical) |
| | | |
| Conduction Uncertainty | : | Uc = 3.4 dB |

## 1.9. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

**FCC-Registration No.: 184111**

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registed and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111, September 27, 2019.

**ISED-Registration No.: 8058A-1**

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A, March 07, 2019.

**Test Location**

Shenzhen Anbotek Compliance Laboratory Limited.
1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102

# 2. Summary of Test Results

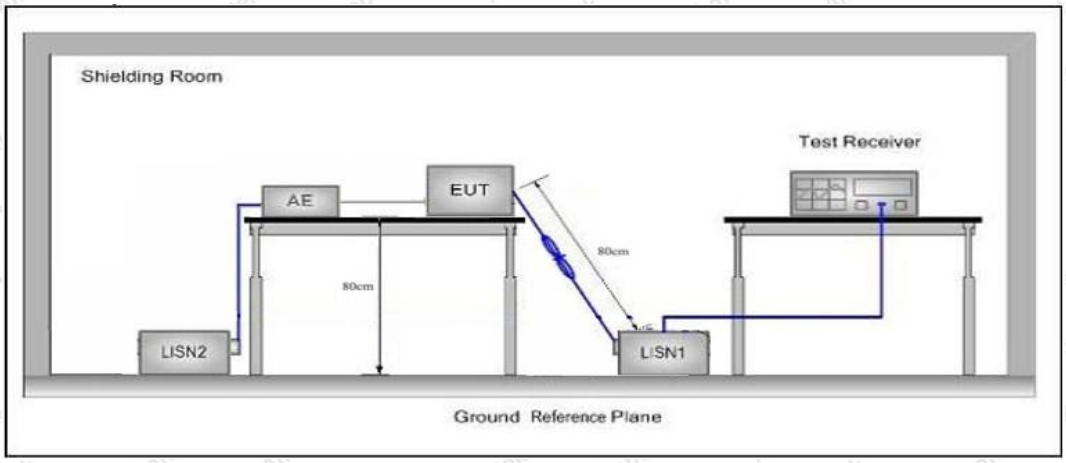
| Standard Section | Test Item | Result |
|---|---|---|
| 15.203/15.247(c) | Antenna Requirement | PASS |
| 15.207 | Conducted Emission | PASS |
| 15.205/15.209 | Spurious Emission | PASS |
| 15.247(b)(3) | Conducted Peak Output Power | PASS |
| 15.247(a)(2) | 6dB Occupied Bandwidth | PASS |
| 15.247(e) | Power Spectral Density | PASS |
| 15.247(d) | Band Edge | PASS |
| **Remark:** “N/A” is an abbreviation for Not Applicable. | | |

# 3. Conducted Emission Test

## 3.1. Test Standard and Limit

| Test Standard | FCC Part15 Section 15.207 | | |
|---|---|---|---|
| Test Limit | Frequency | Maximum RF Line Voltage (dBuV) | |
| | | Quasi-peak Level | Average Level |
| | 150kHz~500kHz | 66 ~ 56 * | 56 ~ 46 * |
| | 500kHz~5MHz | 56 | 46 |
| | 5MHz~30MHz | 60 | 50 |
| **Remark:** (1) *Decreasing linearly with logarithm of the frequency.<br>(2) The lower limit shall apply at the transition frequency. | | | |

## 3.2. Test Setup




## 3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10-2013 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

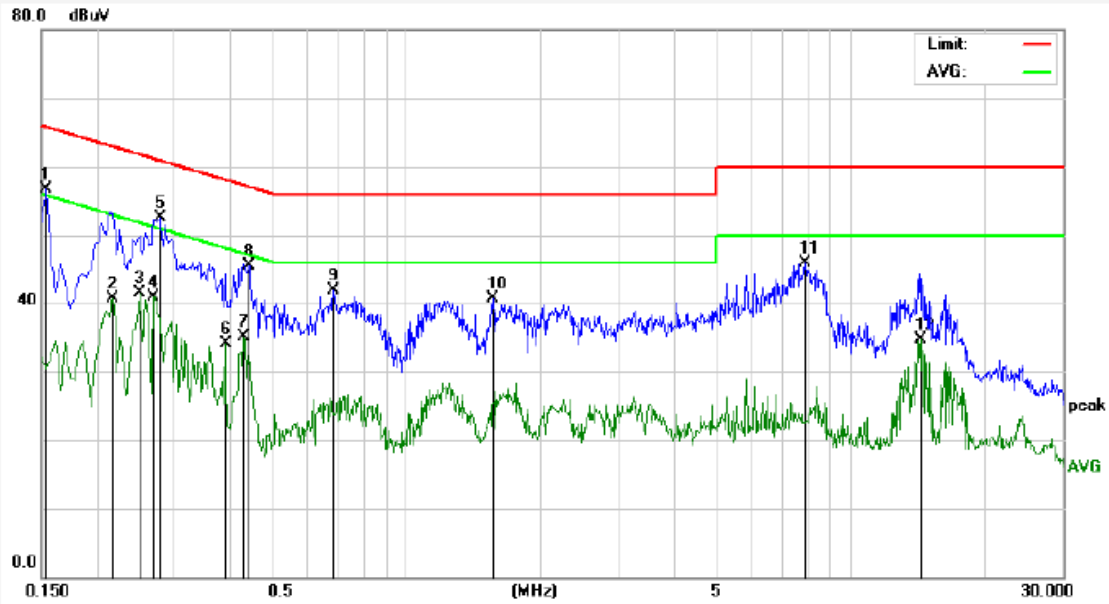
The frequency range from 150kHz to 30MHz is checked.

## 3.4. Test Data

During the test, pre-scan all modes, and found the 802.11b CH01 of ANT A which is the worst case, only the worst case is recorded in the report.

**Conducted Emission Test Data**

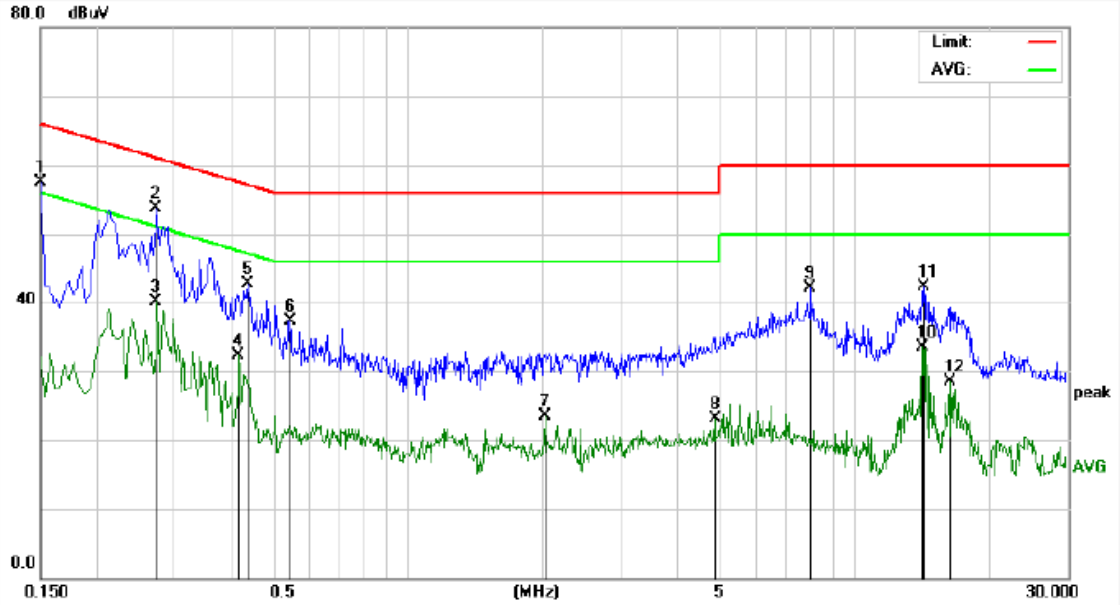
Test Site: 1# Shielded Room
Operating Condition: 802.11b CH01
Test Specification: AC 120V for adapter
Comment: Live Line
Tem.: 26℃ Hum.: 53%




| No. | Freq. (MHz) | Reading (dBuV) | Factor (dB) | Result (dBuV) | Limit (dBuV) | Over Limit (dB) | Detector | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.1539 | 36.82 | 19.90 | 56.72 | 65.78 | -9.06 | QP | |
| 2 | 0.2179 | 20.86 | 19.90 | 40.76 | 52.89 | -12.13 | AVG | |
| 3 | 0.2500 | 21.58 | 19.89 | 41.47 | 51.75 | -10.28 | AVG | |
| 4 | 0.2700 | 21.00 | 19.89 | 40.89 | 51.12 | -10.23 | AVG | |
| 5 | 0.2779 | 32.64 | 19.89 | 52.53 | 60.88 | -8.35 | QP | |
| 6 | 0.3899 | 14.16 | 19.93 | 34.09 | 48.06 | -13.97 | AVG | |
| 7 | 0.4299 | 15.13 | 19.95 | 35.08 | 47.25 | -12.17 | AVG | |
| 8 | 0.4420 | 25.61 | 19.95 | 45.56 | 57.02 | -11.46 | QP | |
| 9 | 0.6860 | 21.81 | 20.04 | 41.85 | 56.00 | -14.15 | QP | |
| 10 | 1.5660 | 20.50 | 20.13 | 40.63 | 56.00 | -15.37 | QP | |
| 11 | 7.8539 | 25.66 | 20.28 | 45.94 | 60.00 | -14.06 | QP | |
| 12 | 14.4059 | 14.52 | 20.27 | 34.79 | 50.00 | -15.21 | AVG | |

**Conducted Emission Test Data**

Test Site: 1# Shielded Room
Operating Condition: 802.11b CH01
Test Specification: AC 120V for adapter
Comment: Neutral Line
Tem.: 26℃ Hum.: 53%




| No. | Freq. (MHz) | Reading (dBuV) | Factor (dB) | Result (dBuV) | Limit (dBuV) | Over Limit (dB) | Detector | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.1499 | 37.63 | 19.90 | 57.53 | 66.00 | -8.47 | QP | |
| 2 | 0.2740 | 33.81 | 19.89 | 53.70 | 60.99 | -7.29 | QP | |
| 3 | 0.2740 | 20.31 | 19.89 | 40.20 | 50.99 | -10.79 | AVG | |
| 4 | 0.4178 | 12.43 | 19.94 | 32.37 | 47.49 | -15.12 | AVG | |
| 5 | 0.4380 | 22.83 | 19.95 | 42.78 | 57.10 | -14.32 | QP | |
| 6 | 0.5460 | 17.39 | 19.99 | 37.38 | 56.00 | -18.62 | QP | |
| 7 | 2.0259 | 3.40 | 20.14 | 23.54 | 46.00 | -22.46 | AVG | |
| 8 | 4.8619 | 2.94 | 20.20 | 23.14 | 46.00 | -22.86 | AVG | |
| 9 | 7.9659 | 21.74 | 20.29 | 42.03 | 60.00 | -17.97 | QP | |
| 10 | 14.1379 | 13.23 | 20.27 | 33.50 | 50.00 | -16.50 | AVG | |
| 11 | 14.2139 | 22.04 | 20.27 | 42.31 | 60.00 | -17.69 | QP | |
| 12 | 16.2377 | 8.17 | 20.28 | 28.45 | 50.00 | -21.55 | AVG | |

# 4. Radiation Spurious Emission and Band Edge

## 4.1. Test Standard and Limit

| Test Standard | FCC Part15 C Section 15.209 and 15.205 | | | | |
|---|---|---|---|---|---|
| Test Limit | Frequency (MHz) | Field strength (microvolt/meter) | Limit (dBuV/m) | Remark | Measurement distance (m) |
| | 0.009MHz~0.490MHz | 2400/F(kHz) | - | - | 300 |
| | 0.490MHz-1.705MHz | 24000/F(kHz) | - | - | 30 |
| | 1.705MHz-30MHz | 30 | - | - | 30 |
| | 30MHz~88MHz | 100 | 40.0 | Quasi-peak | 3 |
| | 88MHz~216MHz | 150 | 43.5 | Quasi-peak | 3 |
| | 216MHz~960MHz | 200 | 46.0 | Quasi-peak | 3 |
| | 960MHz~1000MHz | 500 | 54.0 | Quasi-peak | 3 |
| | Above 1000MHz | 500 | 54.0 | Average | 3 |
| | | - | 74.0 | Peak | 3 |

**Remark:**
(1)The lower limit shall apply at the transition frequency.
(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

## 4.2. Test Setup

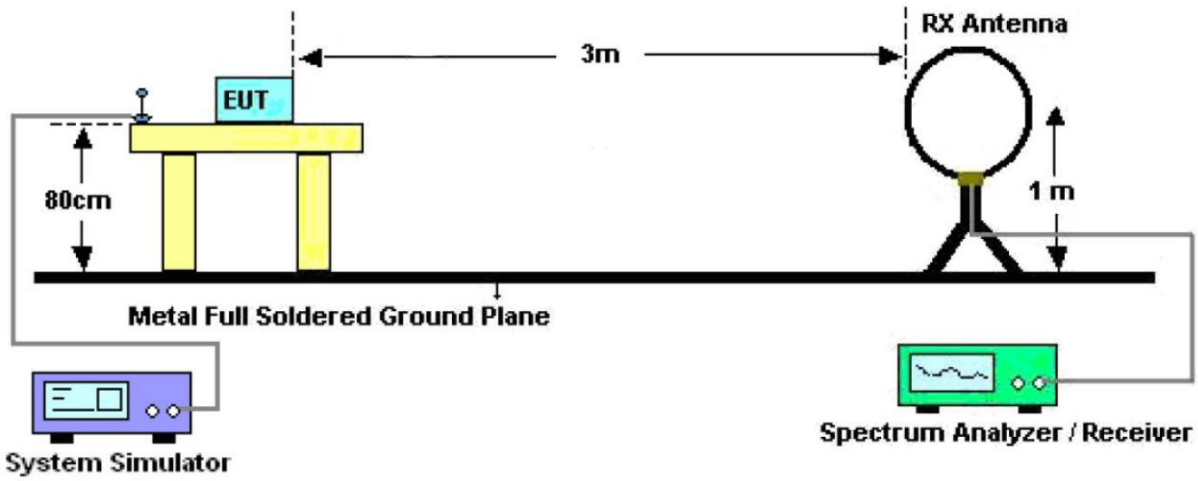



Figure 1. Below 30MHz

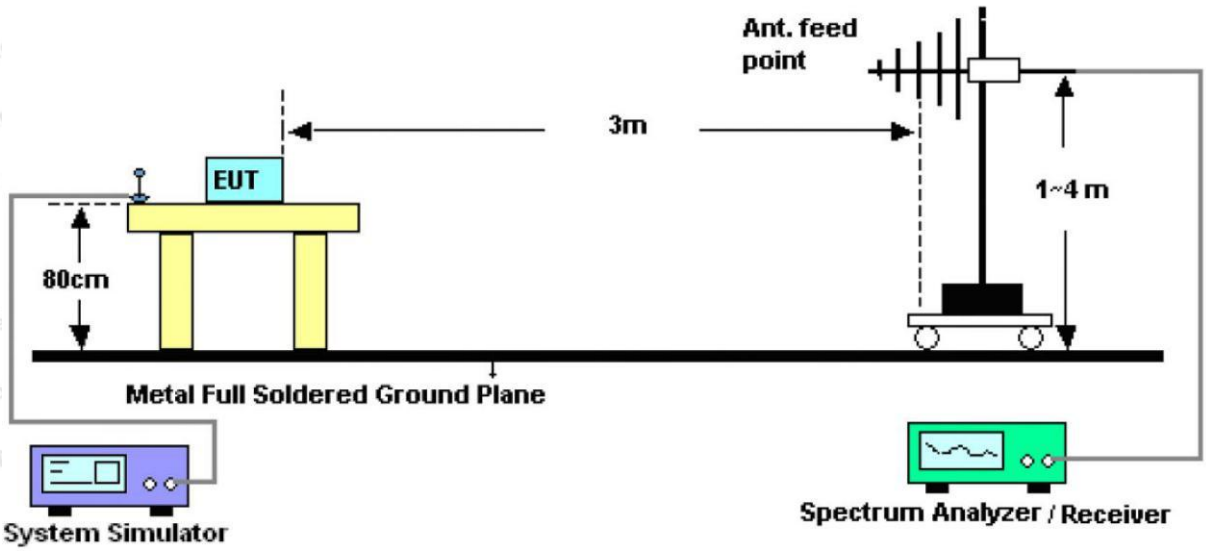



Figure 2. 30MHz to 1GHz

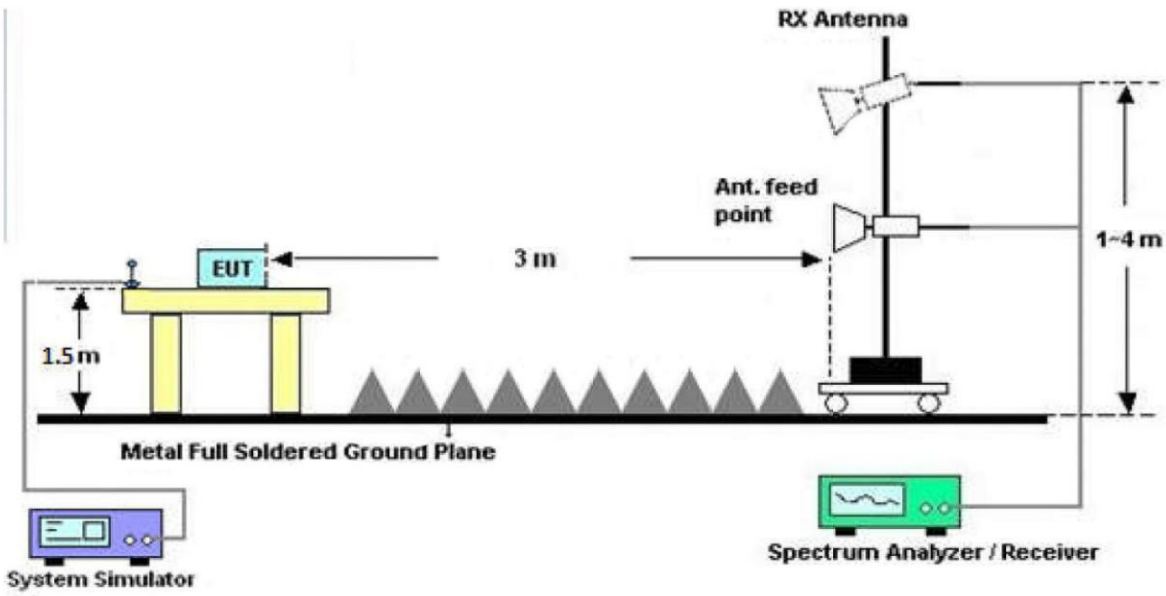



Figure 3. Above 1 GHz

## 4.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.
For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.
The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.

For the radiated emission test above 1GHz:
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.

For 9kHz to 150kHz, Set the spectrum analyzer as:
RBW = 200Hz, VBW =1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:
RBW = 9KHz, VBW =30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:
RBW = 100kHz, VBW =300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.
.
For above 1GHz,Set the spectrum analyzer as:
RBW =1MHz, VBW =1MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.
RBW =1MHz, VBW =10Hz, Detector= Average, Trace mode= Max hold, Sweep- auto couple.

### 4.4. Test Data

**PASS**

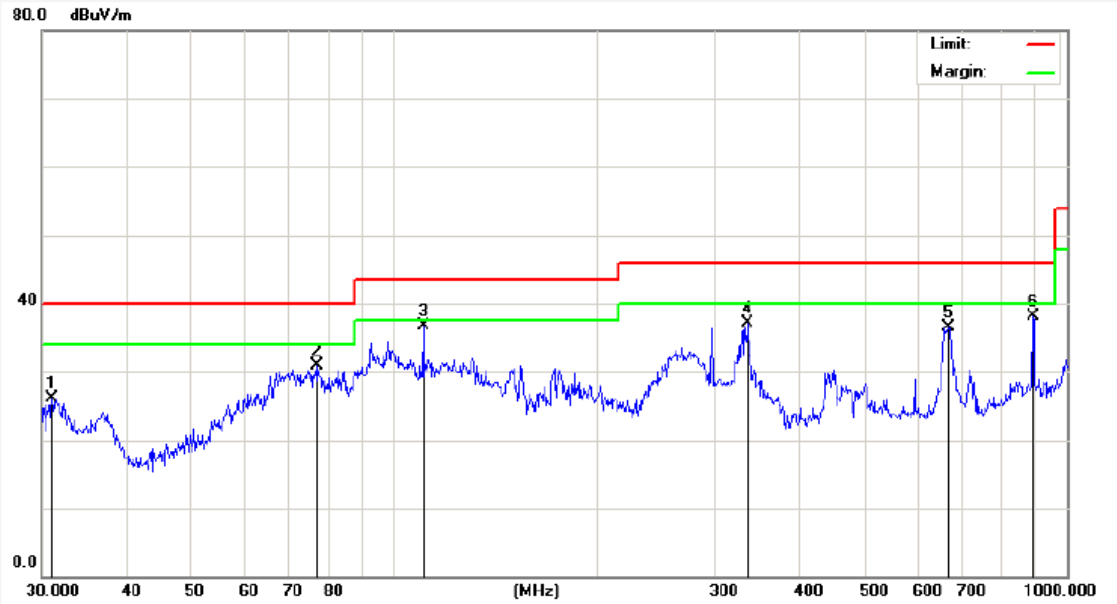
During the test, Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis is the worst case.

The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.

During the test, pre-scan all modes, and found the 802.11b CH01 of ANT A which is the worst case, only the worst case is recorded in the report.

**Test Results (30~1000MHz)**

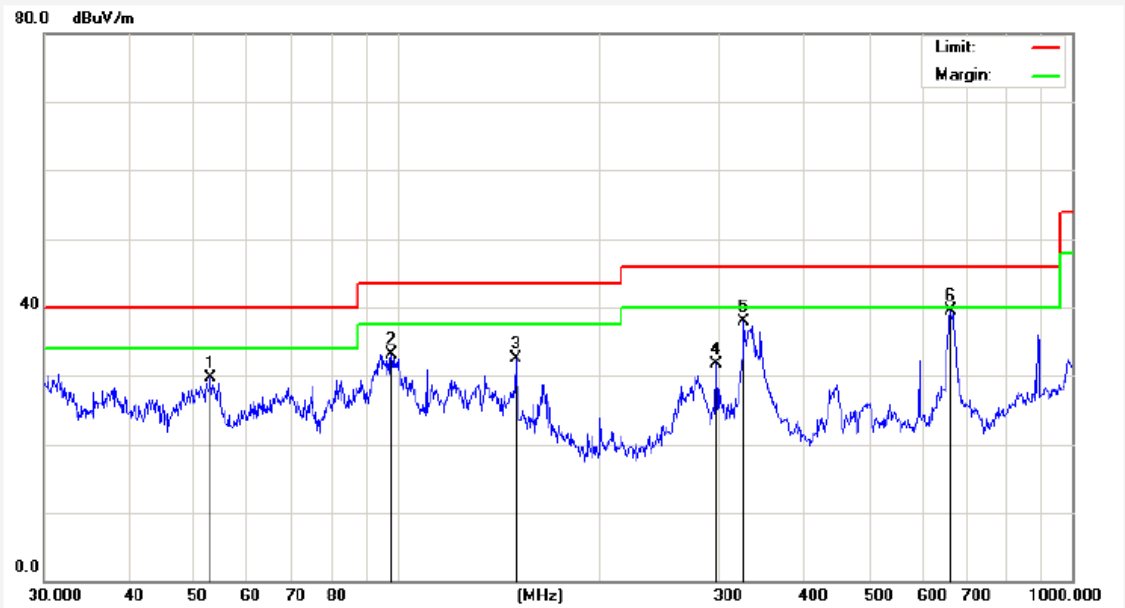
| | | | |
|---|---|---|---|
| Job No.: | 18220WC00011101 | Temp.(℃)/Hum.(%RH): | 22.3℃/50%RH |
| Standard: | FCC PART 15C | Power Source: | AC 120V, 60Hz for adapter |
| Test Mode: | 802.11b CH01 | Polarization: | Horizontal |




| No. | Freq. (MHz) | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 31.0704 | 45.26 | -19.25 | 26.01 | 40.00 | -13.99 | QP | 100 | 0 | |
| 2 | 77.0503 | 54.61 | -23.70 | 30.91 | 40.00 | -9.09 | QP | 100 | 360 | |
| 3 | 110.5687 | 60.19 | -23.42 | 36.77 | 43.50 | -6.73 | QP | 100 | 0 | |
| 4 | 336.0350 | 53.73 | -16.65 | 37.08 | 46.00 | -8.92 | QP | 100 | 360 | |
| 5 | 668.1422 | 47.52 | -11.04 | 36.48 | 46.00 | -9.52 | QP | 100 | 0 | |
| 6 | 890.7278 | 44.63 | -6.59 | 38.04 | 46.00 | -7.96 | QP | 100 | 360 | |

**Test Results (30~1000MHz)**

| | | | |
|---|---|---|---|
| Job No.: | 18220WC00011101 | Temp.(℃)/Hum.(%RH): | 22.3℃/50%RH |
| Standard: | FCC PART 15C | Power Source: | AC 120V, 60Hz for adapter |
| Test Mode: | 802.11b CH01 | Polarization: | Vertical |




| No. | Freq. (MHz) | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 52.9453 | 46.81 | -17.17 | 29.64 | 40.00 | -10.36 | QP | 100 | 360 | |
| 2 | 98.1419 | 49.81 | -16.66 | 33.15 | 43.50 | -10.35 | QP | 100 | 0 | |
| 3 | 150.0107 | 53.50 | -20.90 | 32.60 | 43.50 | -10.90 | QP | 100 | 0 | |
| 4 | 297.2241 | 48.39 | -16.77 | 31.62 | 46.00 | -14.38 | QP | 100 | 360 | |
| 5 | 326.7395 | 53.99 | -16.05 | 37.94 | 46.00 | -8.06 | QP | 100 | 0 | |
| 6 | 661.1503 | 50.04 | -10.46 | 39.58 | 46.00 | -6.42 | QP | 100 | 360 | |

**Test Results (Above 1000MHz)**

| Test Mode: 802.11b Mode | | | | | Test channel: Lowest | | | |
|---|---|---|---|---|---|---|---|---|
| Peak Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 4824.00 | 40.27 | 34.13 | 6.61 | 34.09 | 46.92 | 74.00 | -27.08 | V |
| 7236.00 | 34.20 | 37.14 | 7.74 | 34.51 | 44.57 | 74.00 | -29.43 | V |
| 9648.00 | 32.70 | 39.35 | 9.26 | 34.80 | 46.51 | 74.00 | -27.49 | V |
| 12060.00 | * | | | | | 74.00 | | V |
| 14472.00 | * | | | | | 74.00 | | V |
| 16884.00 | * | | | | | 74.00 | | V |
| 4824.00 | 38.94 | 34.13 | 6.61 | 34.09 | 45.59 | 74.00 | -28.41 | H |
| 7236.00 | 33.96 | 37.14 | 7.74 | 34.51 | 44.33 | 74.00 | -29.67 | H |
| 9648.00 | 32.28 | 39.35 | 9.26 | 34.80 | 46.09 | 74.00 | -27.91 | H |
| 12060.00 | * | | | | | 74.00 | | H |
| 14472.00 | * | | | | | 74.00 | | H |
| 16884.00 | * | | | | | 74.00 | | H |
| Average Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 4824.00 | 29.36 | 34.13 | 6.61 | 34.09 | 36.01 | 54.00 | -17.99 | V |
| 7236.00 | 23.07 | 37.14 | 7.74 | 34.51 | 33.44 | 54.00 | -20.56 | V |
| 9648.00 | 23.05 | 39.35 | 9.26 | 34.80 | 36.86 | 54.00 | -17.14 | V |
| 12060.00 | * | | | | | 54.00 | | V |
| 14472.00 | * | | | | | 54.00 | | V |
| 16884.00 | * | | | | | 54.00 | | V |
| 4824.00 | 28.48 | 34.13 | 6.61 | 34.09 | 35.13 | 54.00 | -18.87 | H |
| 7236.00 | 22.54 | 37.14 | 7.74 | 34.51 | 32.91 | 54.00 | -21.09 | H |
| 9648.00 | 22.03 | 39.35 | 9.26 | 34.80 | 35.84 | 54.00 | -18.16 | H |
| 12060.00 | * | | | | | 54.00 | | H |
| 14472.00 | * | | | | | 54.00 | | H |
| 16884.00 | * | | | | | 54.00 | | H |

**Test Results (Above 1000MHz)**

| Test Mode: 802.11b Mode | | | | | Test channel: Middle | | | |
|---|---|---|---|---|---|---|---|---|
| Peak Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 4874.00 | 39.33 | 34.35 | 6.67 | 34.09 | 46.26 | 74.00 | -27.74 | V |
| 7311.00 | 34.28 | 37.21 | 7.77 | 34.53 | 44.73 | 74.00 | -29.27 | V |
| 9748.00 | 33.72 | 39.45 | 9.33 | 34.80 | 47.70 | 74.00 | -26.30 | V |
| 12185.00 | * | | | | | 74.00 | | V |
| 14622.00 | * | | | | | 74.00 | | V |
| 17059.00 | * | | | | | 74.00 | | V |
| 4874.00 | 39.81 | 34.35 | 6.67 | 34.09 | 46.74 | 74.00 | -27.26 | H |
| 7311.00 | 32.92 | 37.21 | 7.77 | 34.53 | 43.37 | 74.00 | -30.63 | H |
| 9748.00 | 33.61 | 39.45 | 9.33 | 34.80 | 47.59 | 74.00 | -26.41 | H |
| 12185.00 | * | | | | | 74.00 | | H |
| 14622.00 | * | | | | | 74.00 | | H |
| 17059.00 | * | | | | | 74.00 | | H |
| Average Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 4874.00 | 30.19 | 34.35 | 6.67 | 34.09 | 37.12 | 54.00 | -16.88 | V |
| 7311.00 | 22.59 | 37.21 | 7.77 | 34.53 | 33.04 | 54.00 | -20.96 | V |
| 9748.00 | 22.98 | 39.45 | 9.33 | 34.80 | 36.96 | 54.00 | -17.04 | V |
| 12185.00 | * | | | | | 54.00 | | V |
| 14622.00 | * | | | | | 54.00 | | V |
| 17059.00 | * | | | | | 54.00 | | V |
| 4874.00 | 29.93 | 34.35 | 6.67 | 34.09 | 36.86 | 54.00 | -17.14 | H |
| 7311.00 | 22.01 | 37.21 | 7.77 | 34.53 | 32.46 | 54.00 | -21.54 | H |
| 9748.00 | 23.33 | 39.45 | 9.33 | 34.80 | 37.31 | 54.00 | -16.69 | H |
| 12185.00 | * | | | | | 54.00 | | H |
| 14622.00 | * | | | | | 54.00 | | H |
| 17059.00 | * | | | | | 54.00 | | H |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**Test Results (Above 1000MHz)**

| Test Mode: 802.11b Mode | | | | | Test channel: Highest | | | |
|---|---|---|---|---|---|---|---|---|
| Peak Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 4924.00 | 44.85 | 34.57 | 6.74 | 34.09 | 52.07 | 74.00 | -21.93 | V |
| 7386.00 | 34.94 | 37.29 | 7.80 | 34.55 | 45.48 | 74.00 | -28.52 | V |
| 9848.00 | 37.01 | 39.55 | 9.41 | 34.81 | 51.16 | 74.00 | -22.84 | V |
| 12310.00 | * | | | | | 74.00 | | V |
| 14772.00 | * | | | | | 74.00 | | V |
| 17234.00 | * | | | | | 74.00 | | V |
| 4924.00 | 44.16 | 34.57 | 6.74 | 34.09 | 51.38 | 74.00 | -22.62 | H |
| 7386.00 | 33.85 | 37.29 | 7.80 | 34.55 | 44.39 | 74.00 | -29.61 | H |
| 9848.00 | 33.19 | 39.55 | 9.41 | 34.81 | 47.34 | 74.00 | -26.66 | H |
| 12310.00 | * | | | | | 74.00 | | H |
| 14772.00 | * | | | | | 74.00 | | H |
| 17234.00 | * | | | | | 74.00 | | H |
| Average Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 4924.00 | 35.77 | 34.57 | 6.74 | 34.09 | 42.99 | 54.00 | -11.01 | V |
| 7386.00 | 24.86 | 37.29 | 7.80 | 34.55 | 35.40 | 54.00 | -18.60 | V |
| 9848.00 | 25.52 | 39.55 | 9.41 | 34.81 | 39.67 | 54.00 | -14.33 | V |
| 12310.00 | * | | | | | 54.00 | | V |
| 14772.00 | * | | | | | 54.00 | | V |
| 17234.00 | * | | | | | 54.00 | | V |
| 4924.00 | 34.52 | 34.57 | 6.74 | 34.09 | 41.74 | 54.00 | -12.26 | H |
| 7386.00 | 23.24 | 37.29 | 7.80 | 34.55 | 33.78 | 54.00 | -20.22 | H |
| 9848.00 | 22.45 | 39.55 | 9.41 | 34.81 | 36.60 | 54.00 | -17.40 | H |
| 12310.00 | * | | | | | 54.00 | | H |
| 14772.00 | * | | | | | 54.00 | | H |
| 17234.00 | * | | | | | 54.00 | | H |

Remark:

1. During the test, pre-scan the 802.11b,g,n(HT20),n(HT40) mode,only n（HT20）&N（HT40） support MIMO, and found the 802.11b mode of ANT A is worse case , the report only record this mode.
2. Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
3. “*”, means this data is the too weak instrument of signal is unable to test.

**Radiated Band Edge:**

| Test Mode: 802.11b Mode | | | | | Test channel: Lowest | | | |
|---|---|---|---|---|---|---|---|---|
| Peak Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2390.00 | 52.06 | 29.15 | 3.41 | 34.01 | 50.61 | 74.00 | -23.39 | H |
| 2400.00 | 61.21 | 29.16 | 3.43 | 34.01 | 59.79 | 74.00 | -14.21 | H |
| 2390.00 | 53.77 | 29.15 | 3.41 | 34.01 | 52.32 | 74.00 | -21.68 | V |
| 2400.00 | 63.12 | 29.16 | 3.43 | 34.01 | 61.70 | 74.00 | -12.30 | V |
| Average Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2390.00 | 38.70 | 29.15 | 3.41 | 34.01 | 37.25 | 54.00 | -16.75 | H |
| 2400.00 | 47.04 | 29.16 | 3.43 | 34.01 | 45.62 | 54.00 | -8.38 | H |
| 2390.00 | 40.56 | 29.15 | 3.41 | 34.01 | 39.11 | 54.00 | -14.89 | V |
| 2400.00 | 48.20 | 29.16 | 3.43 | 34.01 | 46.78 | 54.00 | -7.22 | V |

| Test Mode: 802.11b Mode | | | | | Test channel: Highest | | | |
|---|---|---|---|---|---|---|---|---|
| Peak Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2483.50 | 52.89 | 29.28 | 3.53 | 34.03 | 51.67 | 74.00 | -22.33 | H |
| 2500.00 | 48.59 | 29.30 | 3.56 | 34.03 | 47.42 | 74.00 | -26.58 | H |
| 2483.50 | 55.24 | 29.28 | 3.53 | 34.03 | 54.02 | 74.00 | -19.98 | V |
| 2500.00 | 51.18 | 29.30 | 3.56 | 34.03 | 50.01 | 74.00 | -23.99 | V |
| Average Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2483.50 | 39.13 | 29.28 | 3.53 | 34.03 | 37.91 | 54.00 | -16.09 | H |
| 2500.00 | 35.15 | 29.30 | 3.56 | 34.03 | 33.98 | 54.00 | -20.02 | H |
| 2483.50 | 41.11 | 29.28 | 3.53 | 34.03 | 39.89 | 54.00 | -14.11 | V |
| 2500.00 | 37.05 | 29.30 | 3.56 | 34.03 | 35.88 | 54.00 | -18.12 | V |

Remark: 1.Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2.the data provided now is the worst data



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**Radiated Band Edge:**

| Test Mode: 802.11g Mode | | | | | Test channel: Lowest | | | |
|---|---|---|---|---|---|---|---|---|
| Peak Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2390.00 | 51.25 | 27.53 | 5.47 | 33.92 | 50.33 | 74.00 | -23.67 | H |
| 2400.00 | 60.12 | 27.55 | 5.49 | 29.93 | 63.23 | 74.00 | -10.77 | H |
| 2390.00 | 52.90 | 27.53 | 5.47 | 33.92 | 51.98 | 74.00 | -22.02 | V |
| 2400.00 | 61.81 | 27.55 | 5.49 | 29.93 | 64.92 | 74.00 | -9.08 | V |
| Average Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2390.00 | 38.12 | 27.53 | 5.47 | 33.92 | 37.20 | 54.00 | -16.80 | H |
| 2400.00 | 46.37 | 27.55 | 5.49 | 29.93 | 49.48 | 54.00 | -4.52 | H |
| 2390.00 | 39.91 | 27.53 | 5.47 | 33.92 | 38.99 | 54.00 | -15.01 | V |
| 2400.00 | 47.47 | 27.55 | 5.49 | 29.93 | 50.58 | 54.00 | -3.42 | V |

| Test Mode: 802.11g Mode | | | | | Test channel: Highest | | | |
|---|---|---|---|---|---|---|---|---|
| Peak Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2483.50 | 51.73 | 29.28 | 3.53 | 34.03 | 50.51 | 74.00 | -23.49 | H |
| 2500.00 | 47.69 | 29.30 | 3.56 | 34.03 | 46.52 | 74.00 | -27.48 | H |
| 2483.50 | 53.91 | 29.28 | 3.53 | 34.03 | 52.69 | 74.00 | -21.31 | V |
| 2500.00 | 50.12 | 29.30 | 3.56 | 34.03 | 48.95 | 74.00 | -25.05 | V |
| Average Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2483.50 | 38.43 | 29.28 | 3.53 | 34.03 | 37.21 | 54.00 | -16.79 | H |
| 2500.00 | 34.61 | 29.30 | 3.56 | 34.03 | 33.44 | 54.00 | -20.56 | H |
| 2483.50 | 40.34 | 29.28 | 3.53 | 34.03 | 39.12 | 54.00 | -14.88 | V |
| 2500.00 | 36.47 | 29.30 | 3.56 | 34.03 | 35.30 | 54.00 | -18.70 | V |

Remark: 1.Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2.the data provided now is the worst data


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**Radiated Band Edge:**

| Test Mode: 802.11n20 Mode | | | | | Test channel: Lowest | | | |
|---|---|---|---|---|---|---|---|---|
| Peak Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2390.00 | 51.12 | 27.53 | 5.47 | 33.92 | 50.20 | 74.00 | -23.80 | H |
| 2400.00 | 59.95 | 27.55 | 5.49 | 29.93 | 63.06 | 74.00 | -10.94 | H |
| 2390.00 | 52.76 | 27.53 | 5.47 | 33.92 | 51.84 | 74.00 | -22.16 | V |
| 2400.00 | 61.60 | 27.55 | 5.49 | 29.93 | 64.71 | 74.00 | -9.29 | V |
| Average Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2390.00 | 38.03 | 27.53 | 5.47 | 33.92 | 37.11 | 54.00 | -16.89 | H |
| 2400.00 | 46.27 | 27.55 | 5.49 | 29.93 | 49.38 | 54.00 | -4.62 | H |
| 2390.00 | 39.81 | 27.53 | 5.47 | 33.92 | 38.89 | 54.00 | -15.11 | V |
| 2400.00 | 47.35 | 27.55 | 5.49 | 29.93 | 50.46 | 54.00 | -3.54 | V |

| Test Mode: 802.11n20 Mode | | | | | Test channel: Highest | | | |
|---|---|---|---|---|---|---|---|---|
| Peak Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2483.50 | 51.55 | 29.28 | 3.53 | 34.03 | 50.33 | 74.00 | -23.67 | H |
| 2500.00 | 47.54 | 29.30 | 3.56 | 34.03 | 46.37 | 74.00 | -27.63 | H |
| 2483.50 | 53.70 | 29.28 | 3.53 | 34.03 | 52.48 | 74.00 | -21.52 | V |
| 2500.00 | 49.95 | 29.30 | 3.56 | 34.03 | 48.78 | 74.00 | -25.22 | V |
| Average Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2483.50 | 38.32 | 29.28 | 3.53 | 34.03 | 37.10 | 54.00 | -16.90 | H |
| 2500.00 | 34.52 | 29.30 | 3.56 | 34.03 | 33.35 | 54.00 | -20.65 | H |
| 2483.50 | 40.22 | 29.28 | 3.53 | 34.03 | 39.00 | 54.00 | -15.00 | V |
| 2500.00 | 36.38 | 29.30 | 3.56 | 34.03 | 35.21 | 54.00 | -18.79 | V |

Remark: 1.Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2.the data provided now is the worst data



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**Radiated Band Edge:**

| Test Mode: 802.11n40 Mode | | | | | Test channel: Lowest | | | |
|---|---|---|---|---|---|---|---|---|
| Peak Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2390.00 | 50.22 | 27.53 | 5.47 | 33.92 | 49.30 | 74.00 | -24.70 | H |
| 2400.00 | 58.76 | 27.55 | 5.49 | 29.93 | 61.87 | 74.00 | -12.13 | H |
| 2390.00 | 51.81 | 27.53 | 5.47 | 33.92 | 50.89 | 74.00 | -23.11 | V |
| 2400.00 | 60.17 | 27.55 | 5.49 | 29.93 | 63.28 | 74.00 | -10.72 | V |
| Average Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2390.00 | 37.40 | 27.53 | 5.47 | 33.92 | 36.48 | 54.00 | -17.52 | H |
| 2400.00 | 45.54 | 27.55 | 5.49 | 29.93 | 48.65 | 54.00 | -5.35 | H |
| 2390.00 | 39.10 | 27.53 | 5.47 | 33.92 | 38.18 | 54.00 | -15.82 | V |
| 2400.00 | 46.55 | 27.55 | 5.49 | 29.93 | 49.66 | 54.00 | -4.34 | V |

| Test Mode: 802.11n40 Mode | | | | | Test channel: Highest | | | |
|---|---|---|---|---|---|---|---|---|
| Peak Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2483.50 | 50.27 | 29.28 | 3.53 | 34.03 | 49.05 | 74.00 | -24.95 | H |
| 2500.00 | 46.55 | 29.30 | 3.56 | 34.03 | 45.38 | 74.00 | -28.62 | H |
| 2483.50 | 52.24 | 29.28 | 3.53 | 34.03 | 51.02 | 74.00 | -22.98 | V |
| 2500.00 | 48.79 | 29.30 | 3.56 | 34.03 | 47.62 | 74.00 | -26.38 | V |
| Average Value | | | | | | | | |
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Pol. |
| 2483.50 | 37.55 | 29.28 | 3.53 | 34.03 | 36.33 | 54.00 | -17.67 | H |
| 2500.00 | 33.92 | 29.30 | 3.56 | 34.03 | 32.75 | 54.00 | -21.25 | H |
| 2483.50 | 39.36 | 29.28 | 3.53 | 34.03 | 38.14 | 54.00 | -15.86 | V |
| 2500.00 | 35.74 | 29.30 | 3.56 | 34.03 | 34.57 | 54.00 | -19.43 | V |

Remark: 1.Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2.the data provided now is the worst data



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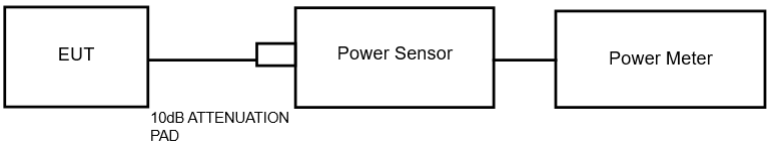
# 5. Maximum Peak Output Power Test

## 5.1. Test Standard and Limit

| | |
|---|---|
| Test Standard | FCC Part15 C Section 15.247 (b)(3) |
| Test Limit | 30dBm |

## 5.2. Test Setup




## 5.3. Test Procedure

1. The Transmitter output (antenna port) was connected to the power meter.

2. Turn on the EUT and power meter and then record the power value.

3. Repeat above procedures on all channels needed to be tested.

Note: The cable loss and attenuator loss were offset into measure device as amplitude offset.

## 5.4. Test Data

| | | | | | |
|---|---|---|---|---|---|
| Test Item | : | Max. peak output power | Test Mode | : | CH Low ~ CH High |
| Test Voltage | : | AC 120V, 60Hz for adapter | Temperature | : | 24℃ |
| Test Result | : | PASS | Humidity | : | 55%RH |

**ANT A:**

| Test Channel | Frequency (MHz) | Maximum Peak Conducted Output Power（PK）(dBm) | Limit dBm | Results |
|---|---|---|---|---|
| **TX 802.11b Mode** | | | | |
| CH01 | 2412 | 14.19 | 30 | PASS |
| CH06 | 2437 | 14.06 | 30 | PASS |
| CH11 | 2462 | 13.87 | 30 | PASS |
| **TX 802.11g Mode** | | | | |
| CH01 | 2412 | 13.80 | 30 | PASS |
| CH06 | 2437 | 13.66 | 30 | PASS |
| CH11 | 2462 | 13.39 | 30 | PASS |
| **TX 802.11n(20) Mode** | | | | |
| CH01 | 2412 | 14.30 | 30 | PASS |
| CH06 | 2437 | 14.30 | 30 | PASS |
| CH11 | 2462 | 13.32 | 30 | PASS |
| **TX 802.11n(40) Mode** | | | | |
| CH03 | 2422 | 15.08 | 30 | PASS |
| CH06 | 2437 | 14.51 | 30 | PASS |
| CH09 | 2452 | 13.77 | 30 | PASS |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**ANT B:**

| Test Channel | Frequency (MHz) | Maximum Peak Conducted Output Power（PK）(dBm) | Limit dBm | Results |
|---|---|---|---|---|
| **TX 802.11b Mode** | | | | |
| CH01 | 2412 | 14.18 | 30 | PASS |
| CH06 | 2437 | 14.13 | 30 | PASS |
| CH11 | 2462 | 13.87 | 30 | PASS |
| **TX 802.11g Mode** | | | | |
| CH01 | 2412 | 13.81 | 30 | PASS |
| CH06 | 2437 | 13.68 | 30 | PASS |
| CH11 | 2462 | 13.37 | 30 | PASS |
| **TX 802.11n(20) Mode** | | | | |
| CH01 | 2412 | 13.63 | 30 | PASS |
| CH06 | 2437 | 13.56 | 30 | PASS |
| CH11 | 2462 | 13.18 | 30 | PASS |
| **TX 802.11n(40) Mode** | | | | |
| CH03 | 2422 | 14.10 | 30 | PASS |
| CH06 | 2437 | 13.99 | 30 | PASS |
| CH09 | 2452 | 14.62 | 30 | PASS |


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**ANT A+ANT B:**

| Test Channel | Frequency (MHz) | Maximum Peak Conducted Output Power（PK）(dBm) | Limit dBm | Results |
|---|---|---|---|---|
| **TX 802.11n(20) Mode** | | | | |
| CH01 | 2412 | 16.99 | 30 | PASS |
| CH06 | 2437 | 16.96 | 30 | PASS |
| CH11 | 2462 | 16.26 | 30 | PASS |
| **TX 802.11n(40) Mode** | | | | |
| CH03 | 2422 | 17.63 | 30 | PASS |
| CH06 | 2437 | 17.27 | 30 | PASS |
| CH09 | 2452 | 17.23 | 30 | PASS |

**Note: For power test the duty cycle is 100% in continuous transmitting mode.**

**Please see the plot of next page**


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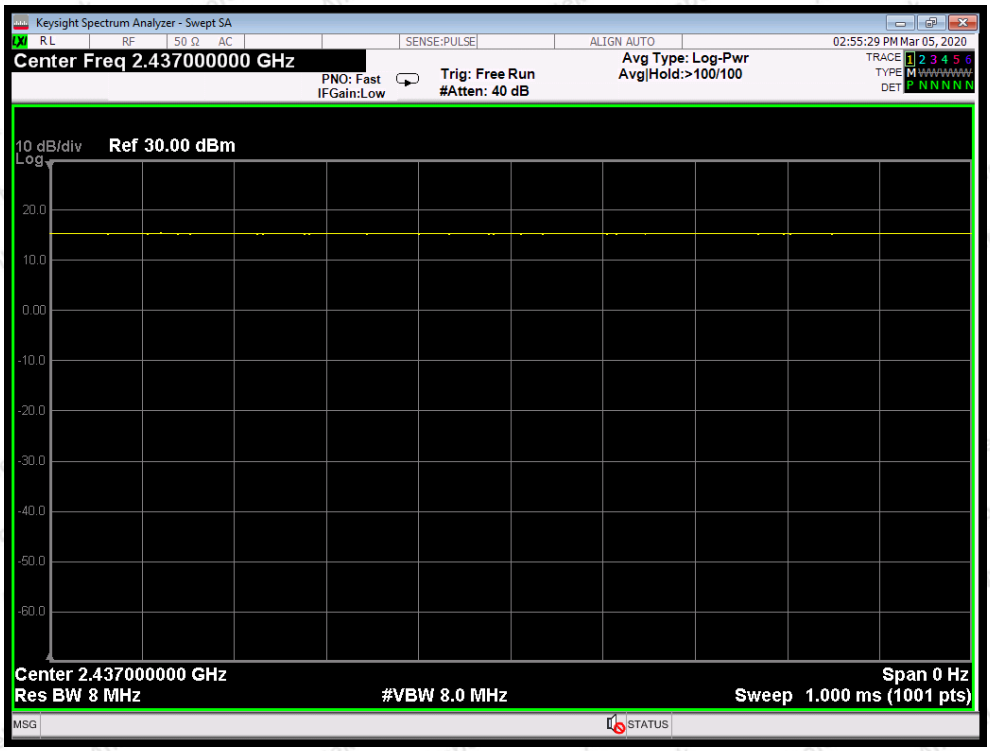
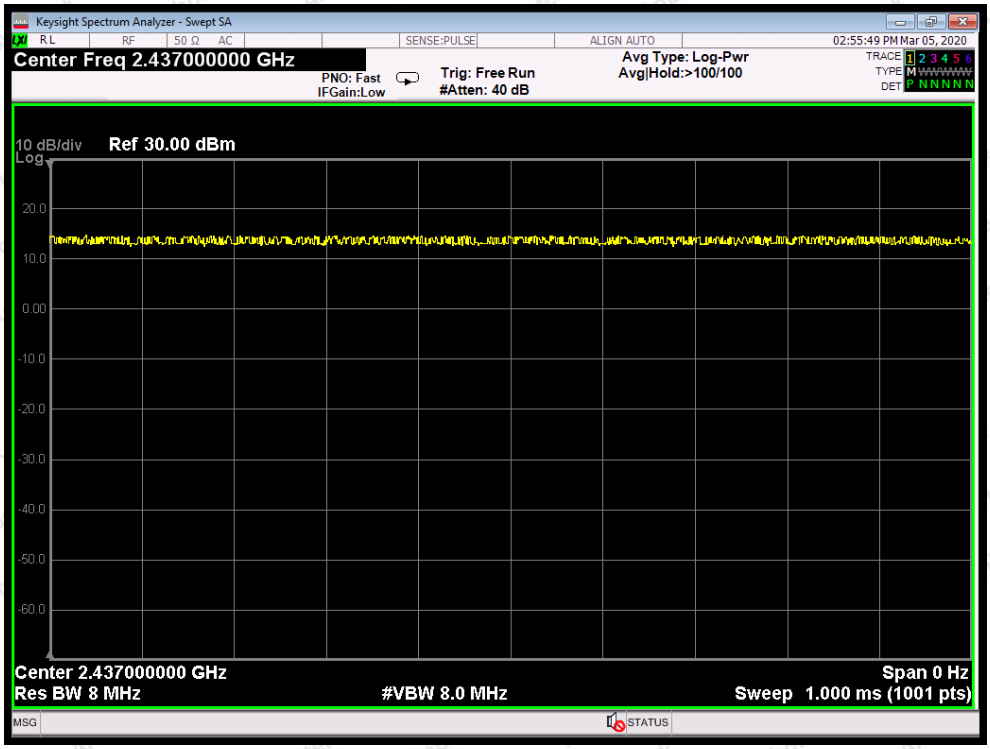
ANT A:

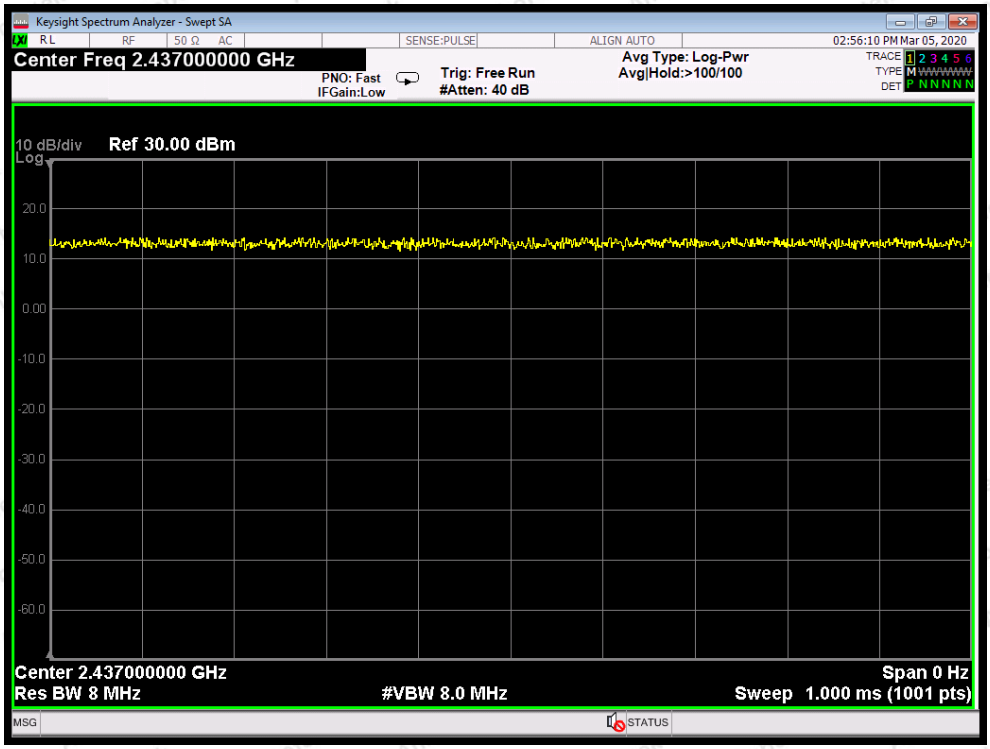
**Duty Cycle**



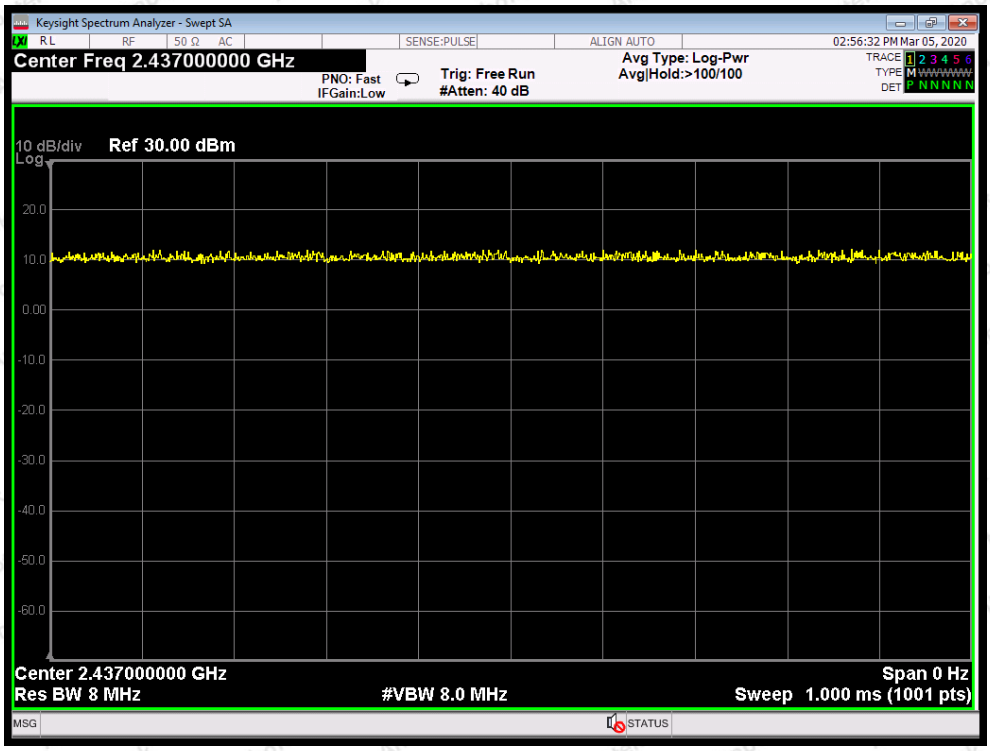

802.11b mode




802.11g mode



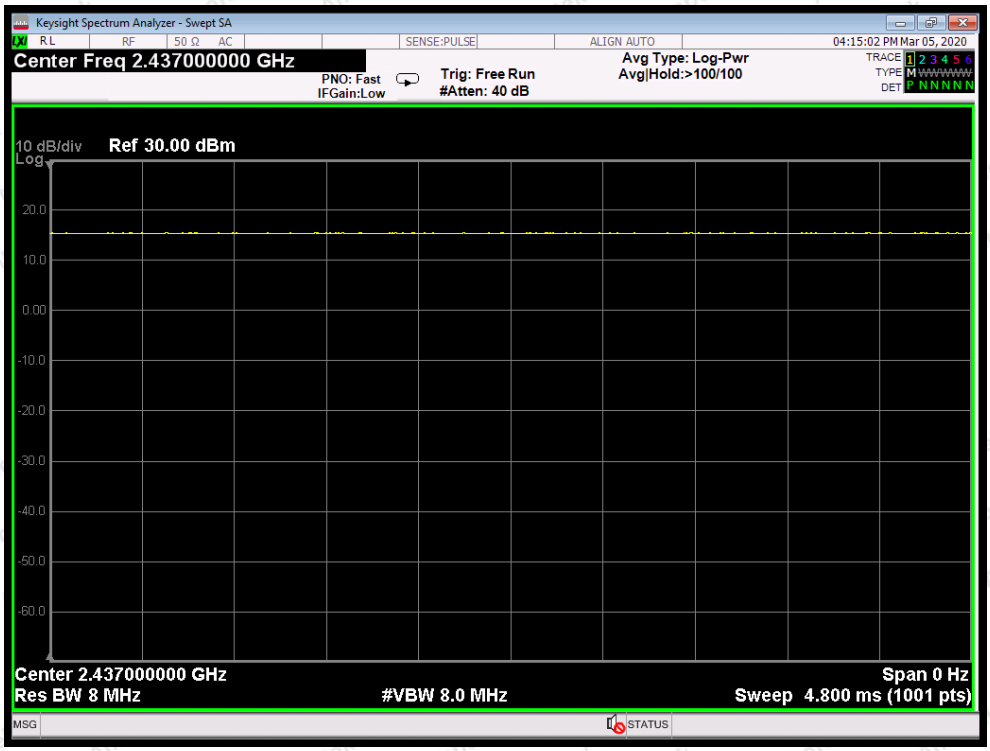

802.11n(HT20) mode



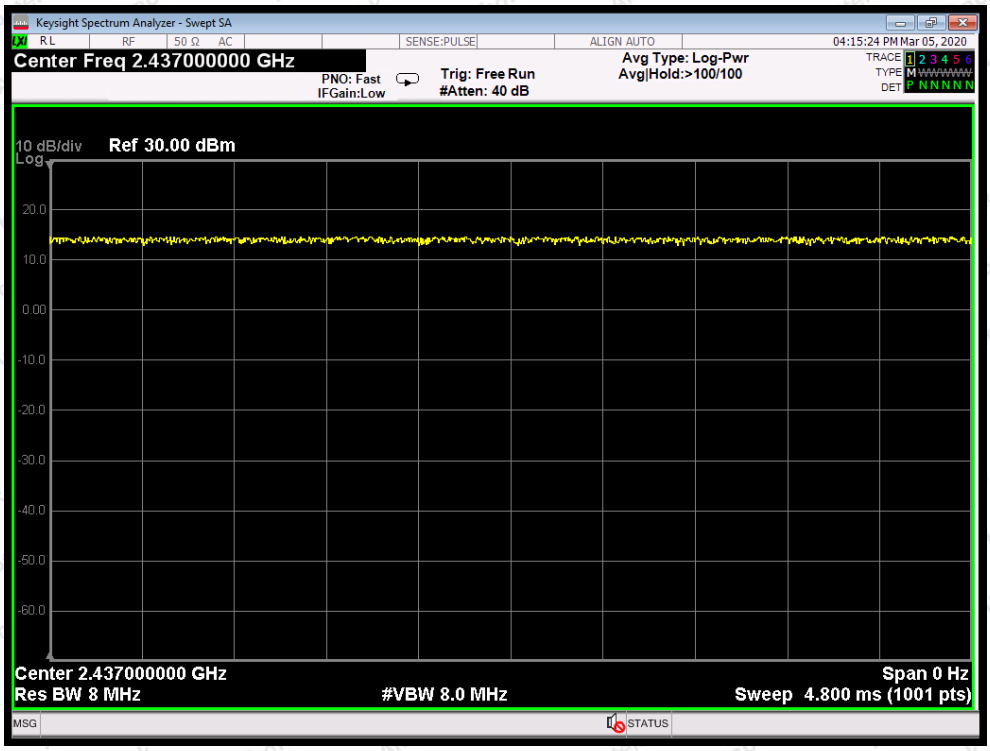

802.11n(HT40) mode

ANT B:

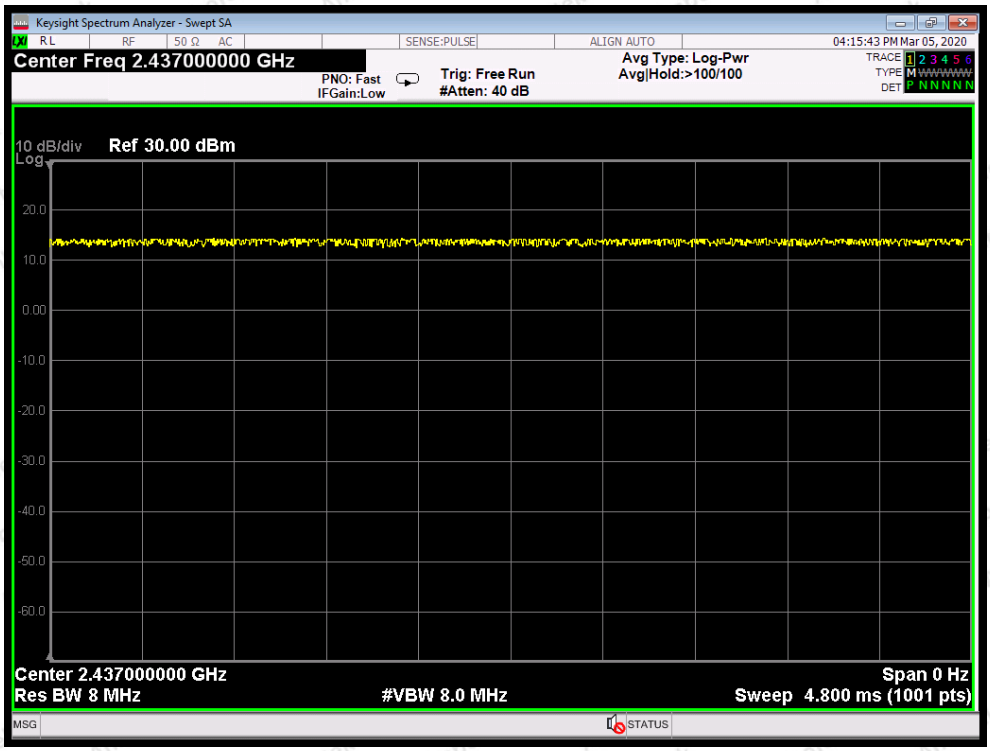
**Duty Cycle**



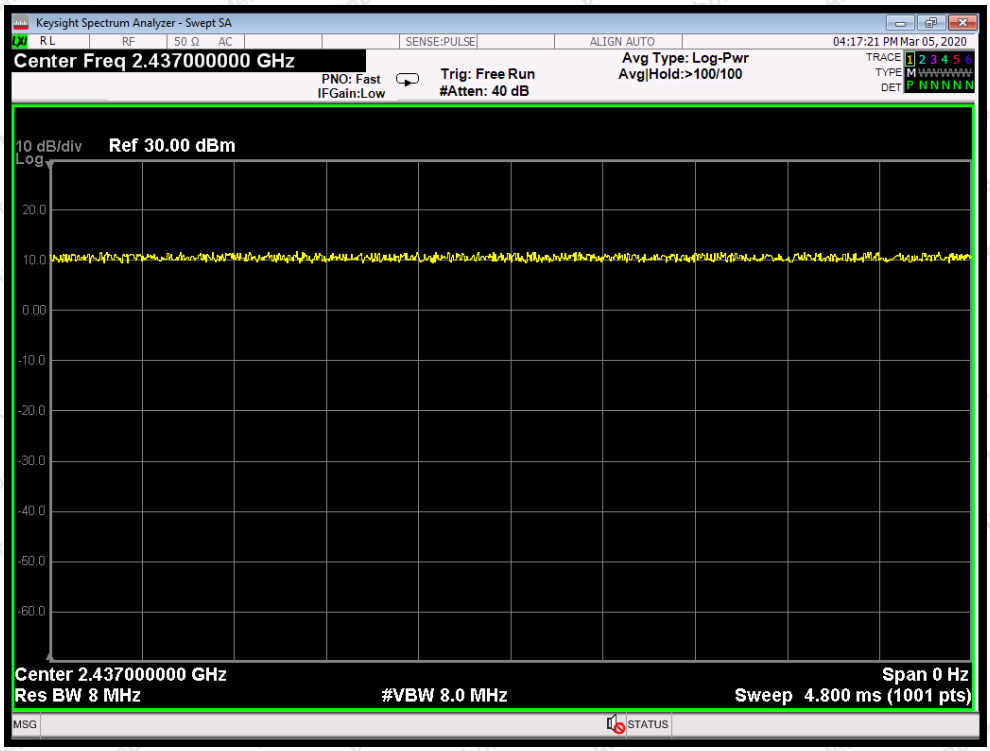

802.11b mode




802.11g mode




802.11n(HT20) mode



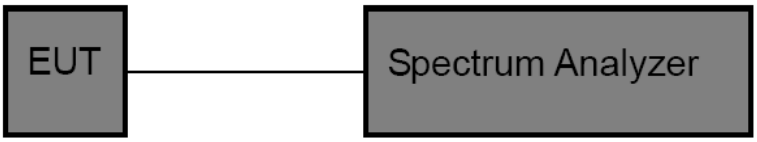

802.11n(HT40) mode

# 6. 6DB Occupy Bandwidth Test

## 6.1. Test Standard and Limit

| | |
|---|---|
| Test Standard | FCC Part15 C Section 15.247 (a)(2) |
| Test Limit | >500kHz |

## 6.2. Test Setup




## 6.3. Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:

   RBW= 100kHz, VBW≥3*RBW =300kHz

   Detector= Peak

   Trace mode= Max hold.

   Sweep- auto couple.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

## 6.4. Test Data

| | | | | | |
|---|---|---|---|---|---|
| Test Item | : | 6dB Bandwidth | Test Mode | : | CH Low ~ CH High |
| Test Voltage | : | AC 120V, 60Hz for adapter | Temperature | : | 24℃ |
| Test Result | : | PASS | Humidity | : | 55%RH |

ANT A:

| Mode | Channel | Frequency (MHz) | Bandwidth (MHz) | Limit (kHz) | Results |
|---|---|---|---|---|---|
| 802.11b | Low | 2412 | 9.134 | >500 | PASS |
| | Middle | 2437 | 9.134 | | PASS |
| | High | 2462 | 9.136 | | PASS |
| 802.11g | Low | 2412 | 16.54 | >500 | PASS |
| | Middle | 2437 | 16.51 | | PASS |
| | High | 2462 | 16.56 | | PASS |
| 802.11n20 | Low | 2412 | 17.67 | >500 | PASS |
| | Middle | 2437 | 17.65 | | PASS |
| | High | 2462 | 17.66 | | PASS |
| 802.11n40 | Low | 2422 | 36.50 | >500 | PASS |
| | Middle | 2437 | 36.49 | | PASS |
| | High | 2452 | 36.47 | | PASS |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ANT B:

| Mode | Channel | Frequency (MHz) | Bandwidth (MHz) | Limit (kHz) | Results |
|---|---|---|---|---|---|
| 802.11b | Low | 2412 | 9.134 | >500 | PASS |
| | Middle | 2437 | 9.135 | | PASS |
| | High | 2462 | 9.133 | | PASS |
| 802.11g | Low | 2412 | 16.56 | >500 | PASS |
| | Middle | 2437 | 16.56 | | PASS |
| | High | 2462 | 16.54 | | PASS |
| 802.11n20 | Low | 2412 | 17.65 | >500 | PASS |
| | Middle | 2437 | 17.67 | | PASS |
| | High | 2462 | 17.66 | | PASS |
| 802.11n40 | Low | 2422 | 36.49 | >500 | PASS |
| | Middle | 2437 | 36.48 | | PASS |
| | High | 2452 | 36.50 | | PASS |


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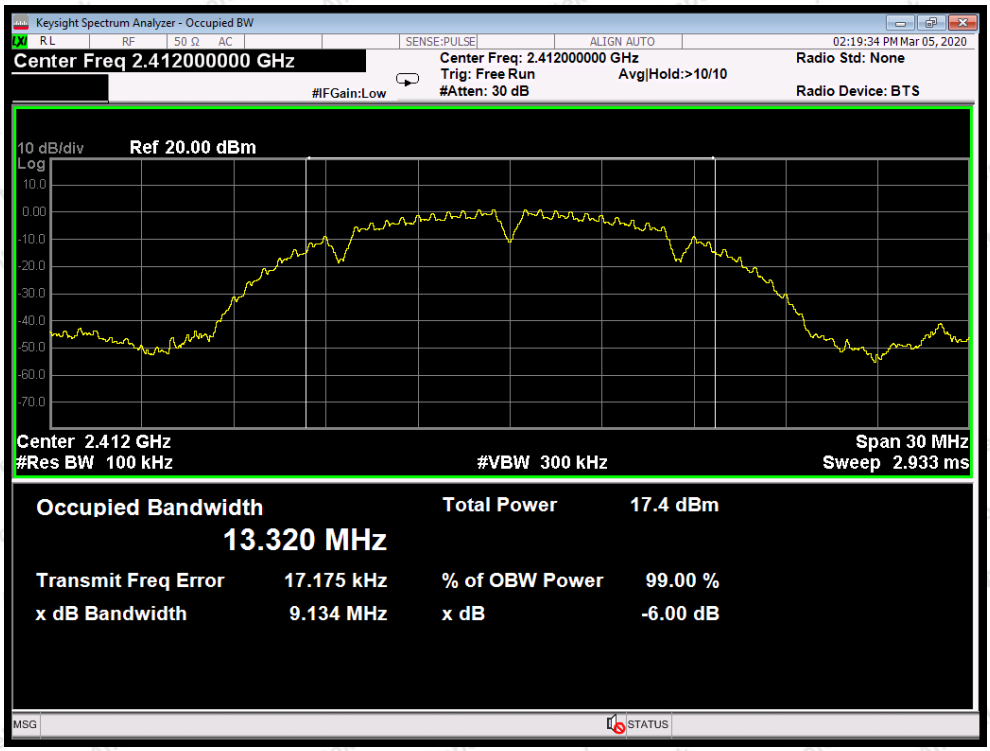
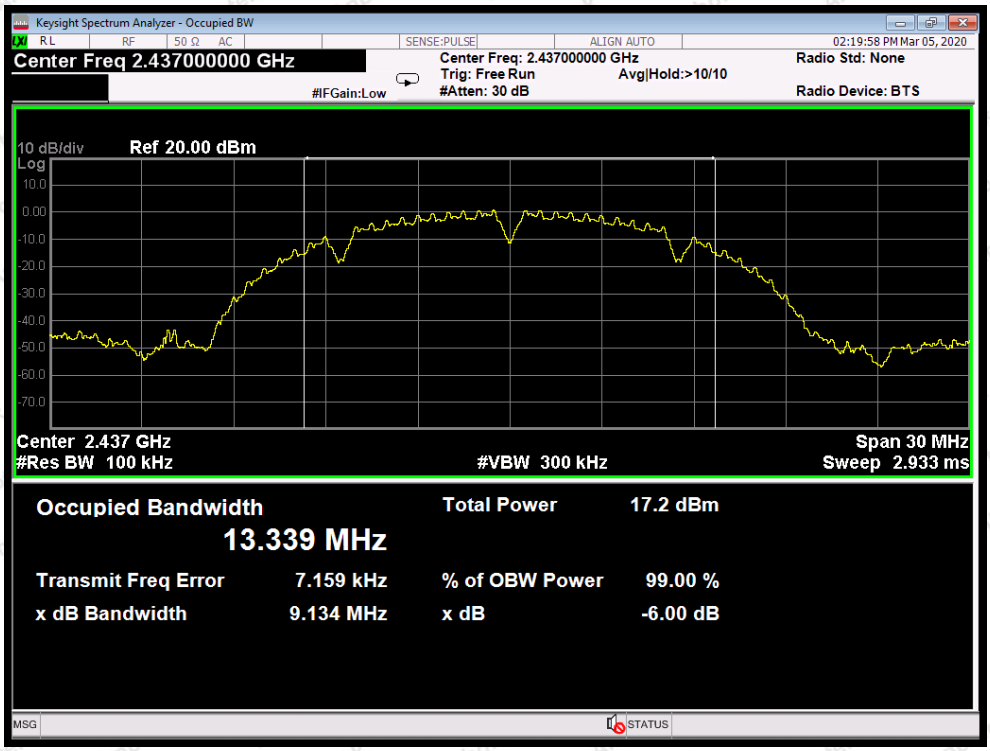
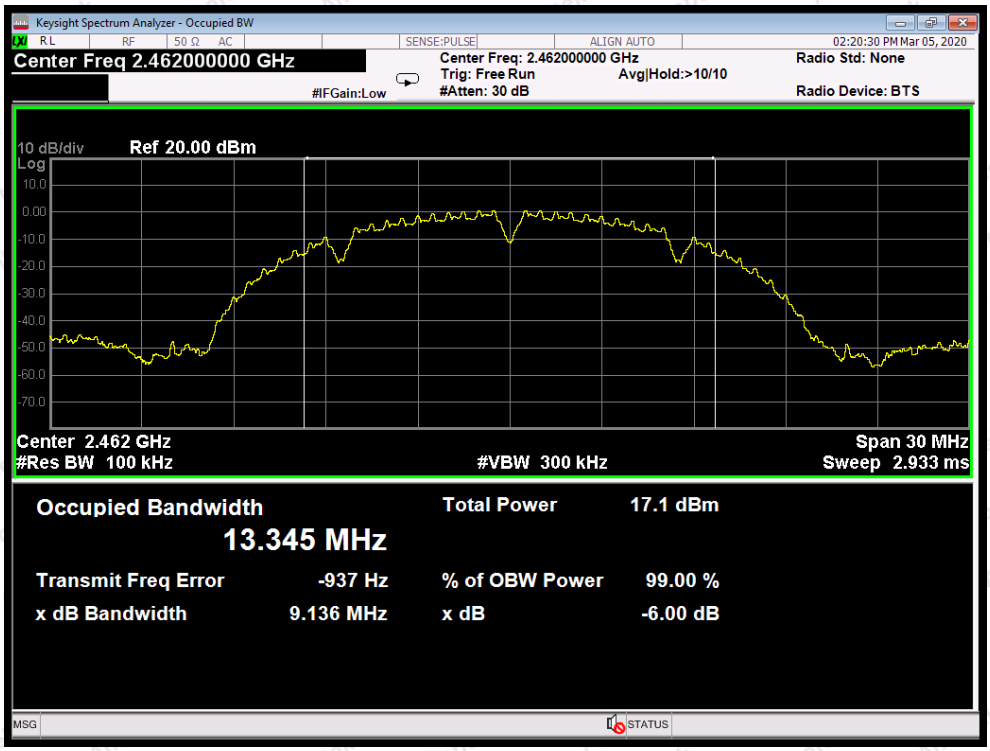
ANT A:



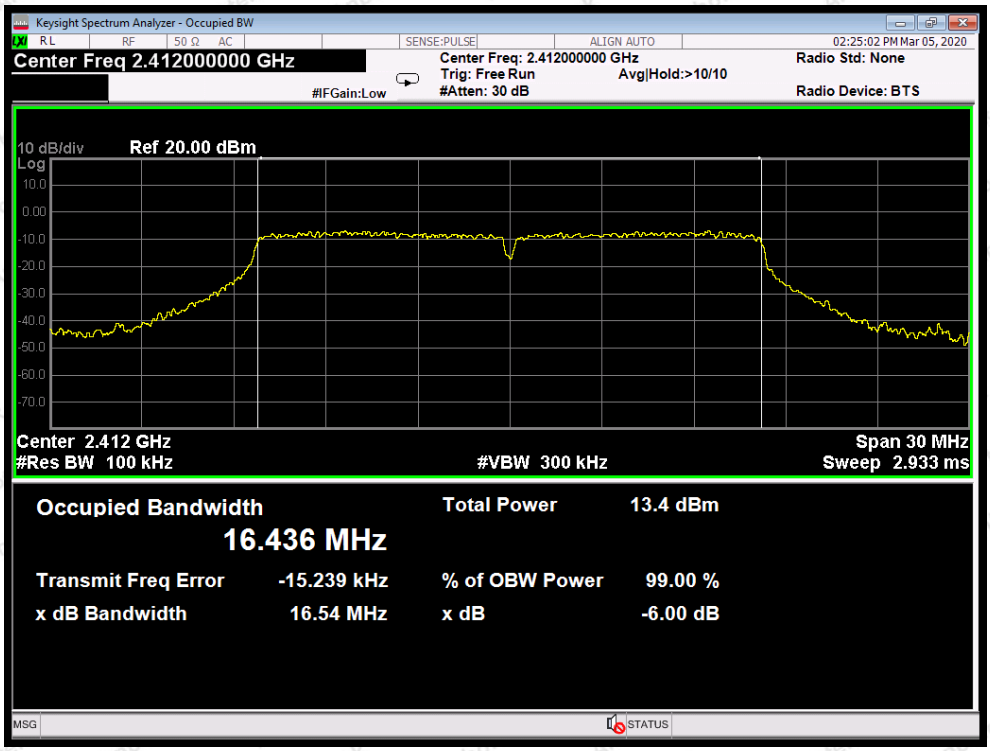

802.11b mode : Lowest



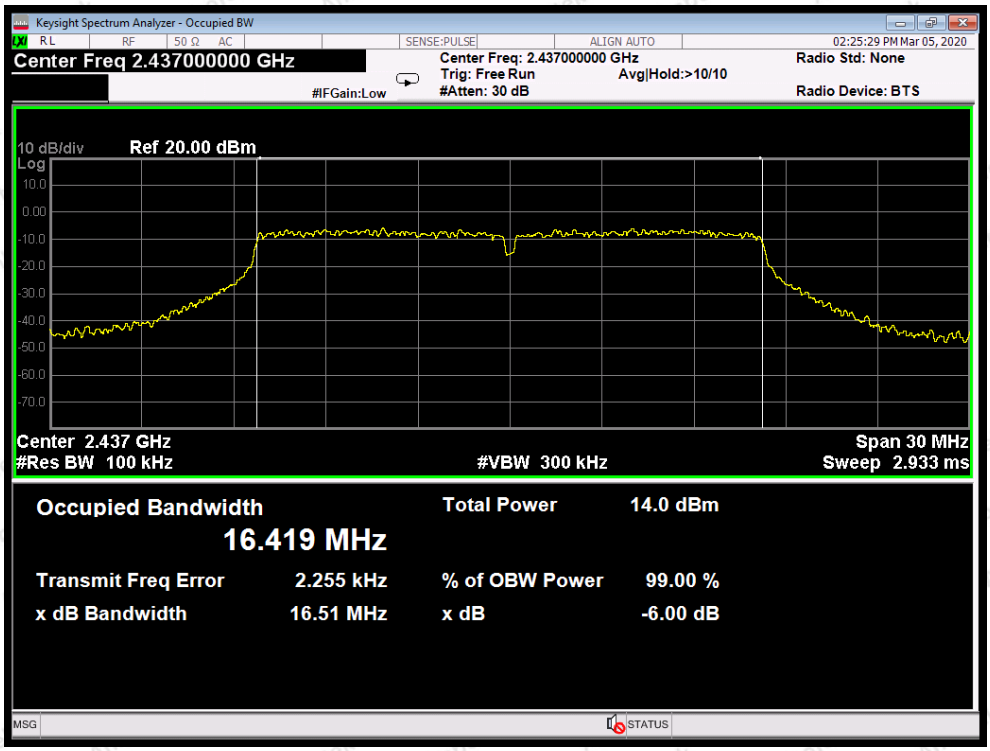

802.11b mode : Middle



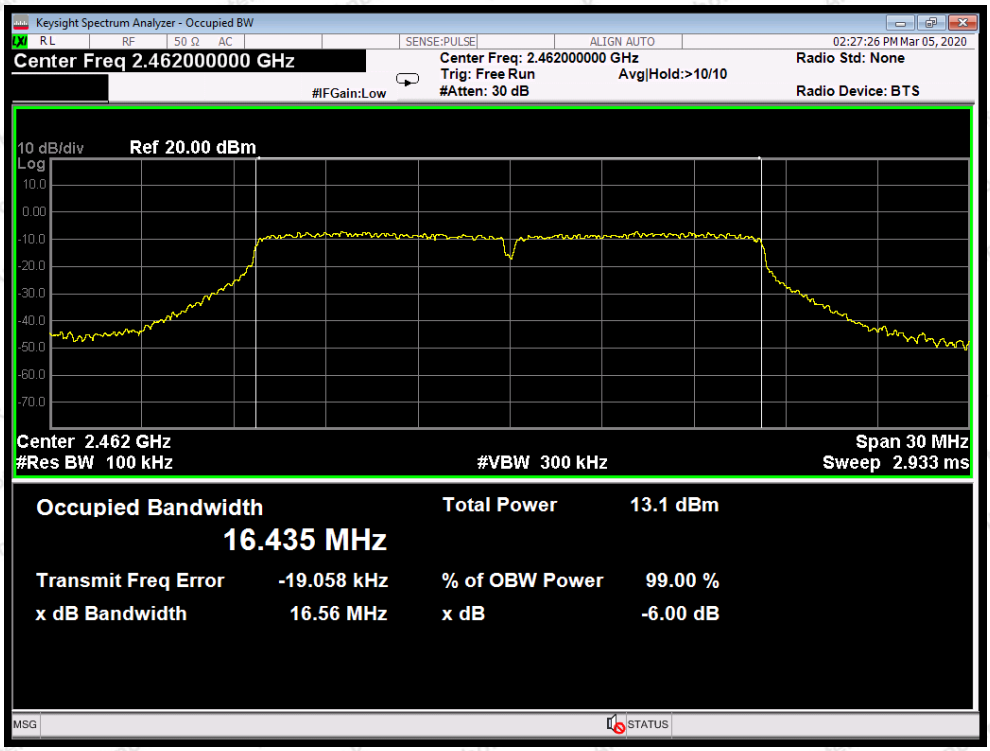

802.11b mode : Highest



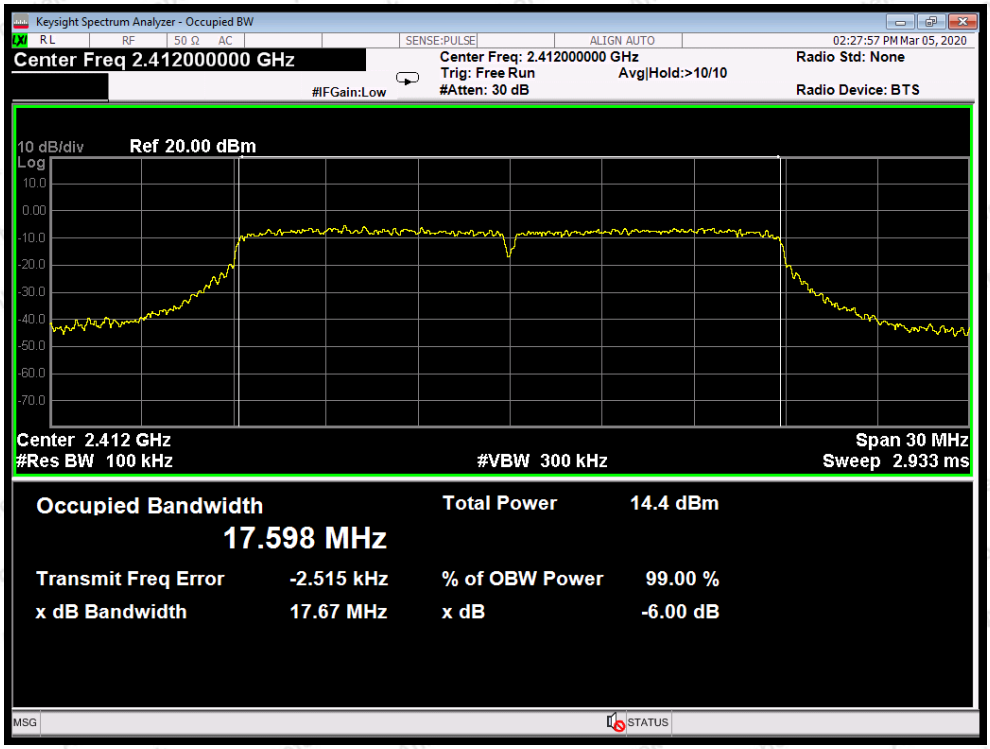

802.11g mode : Lowest



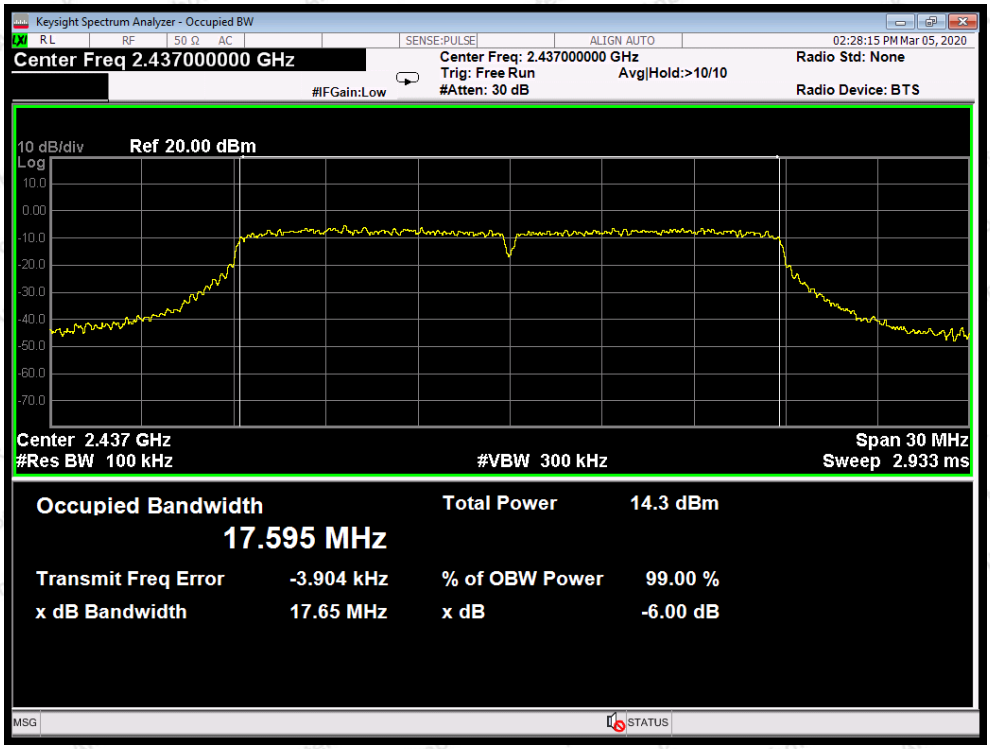

802.11g mode : Middle



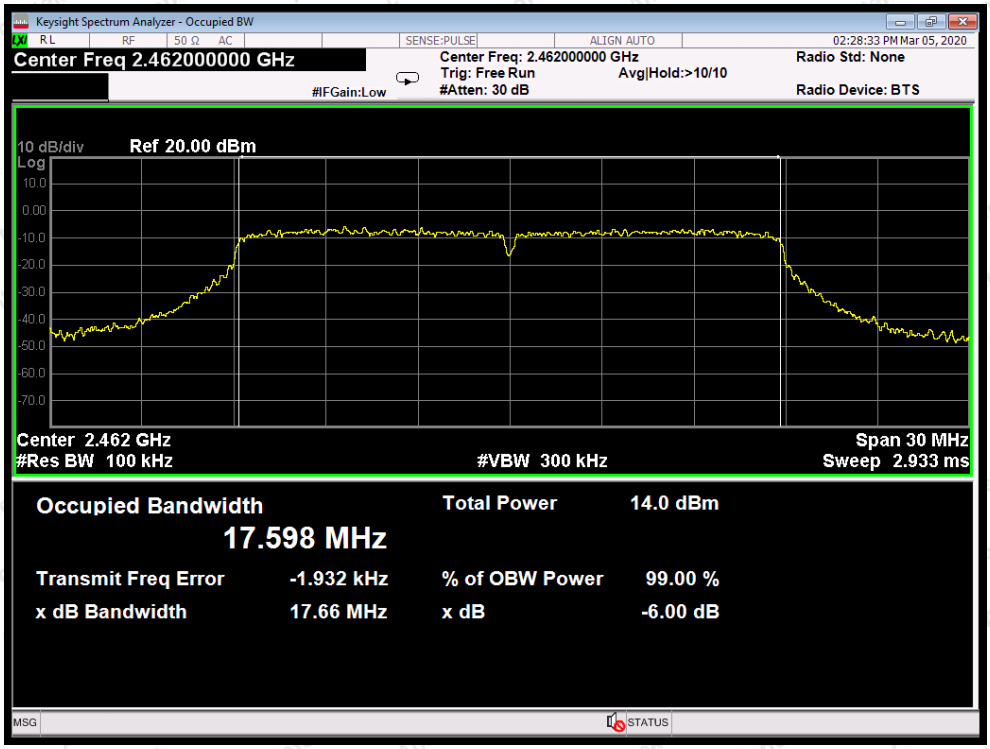

802.11g mode : Highest



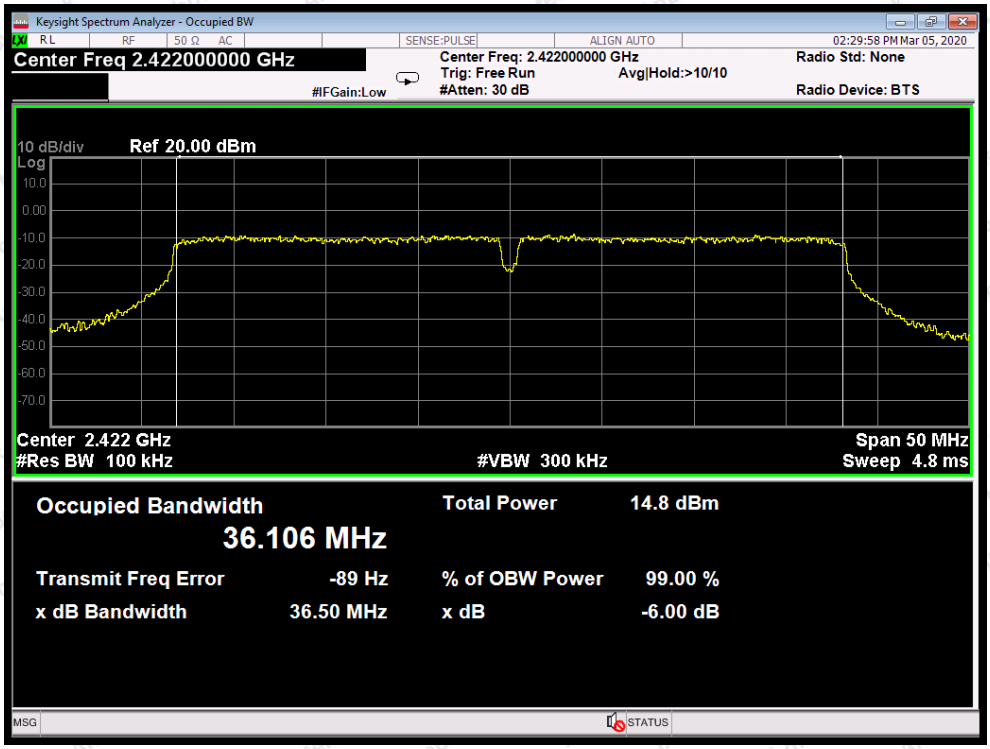

802.11n20 mode : Lowest



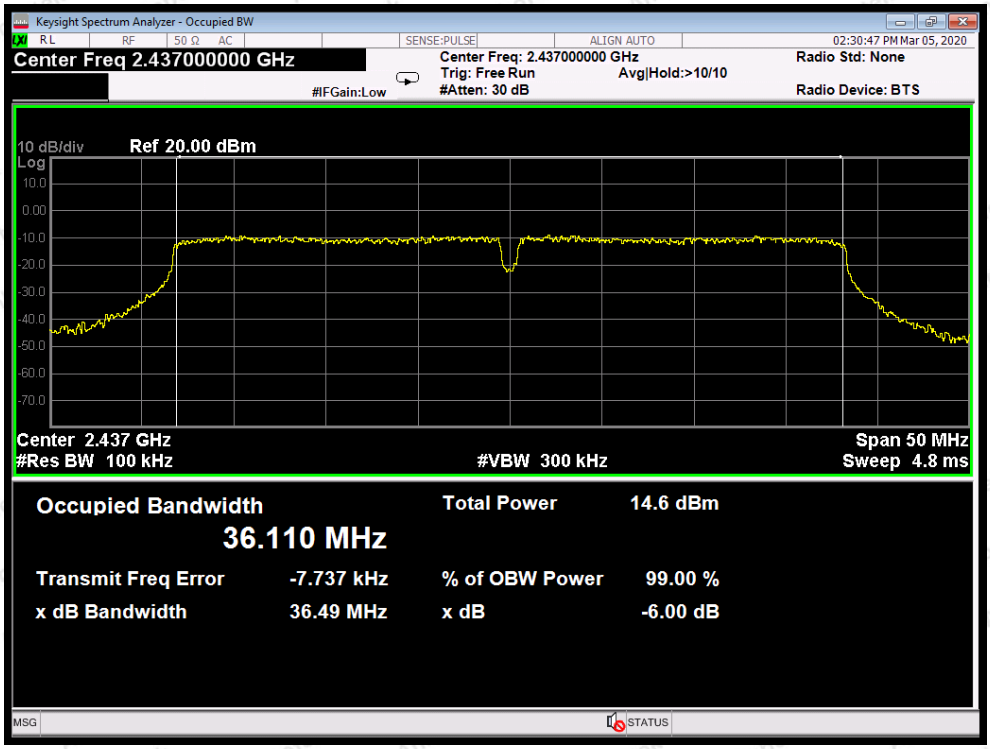

802.11n20 mode : Middle



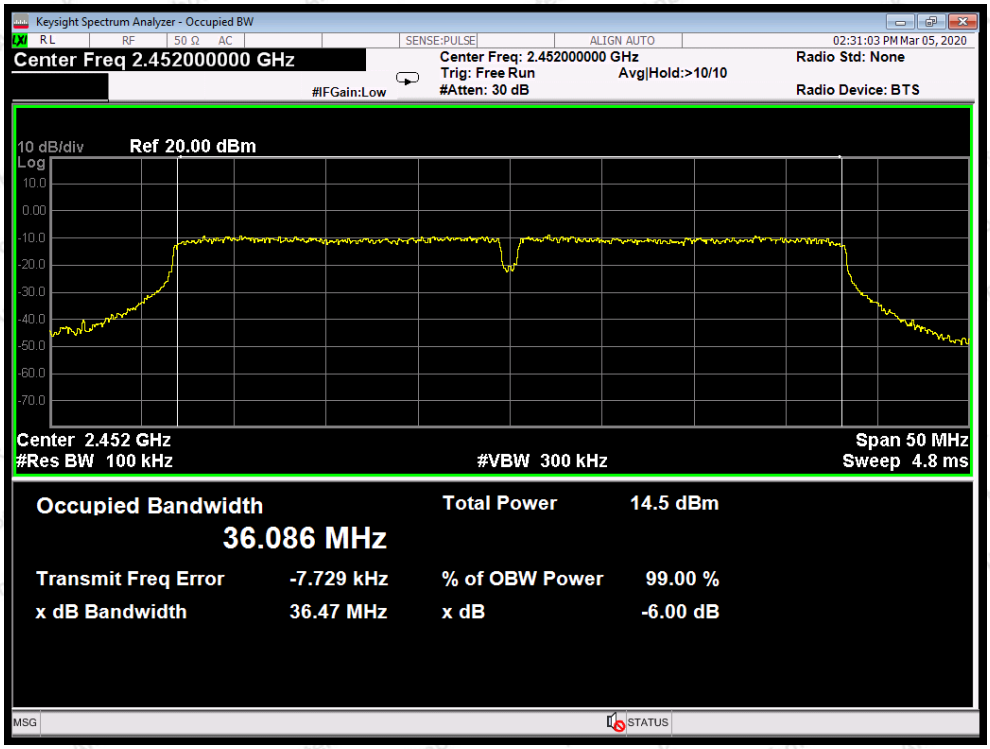

802.11n20 mode : Highest




802.11n40 mode : Lowest

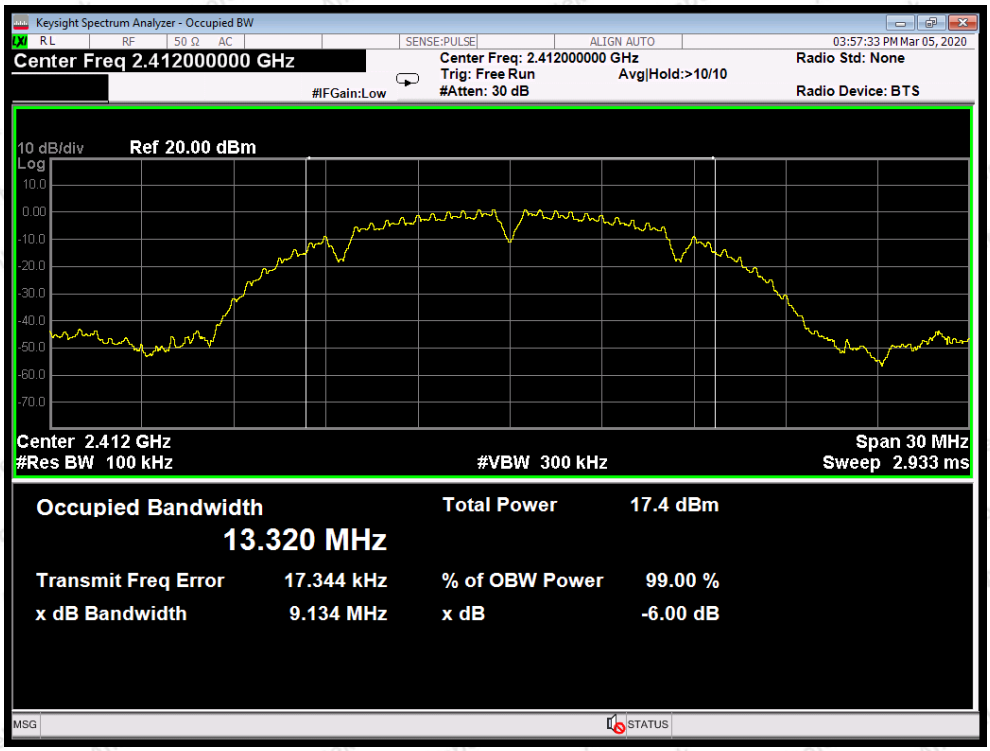



802.11n40 mode : Middle

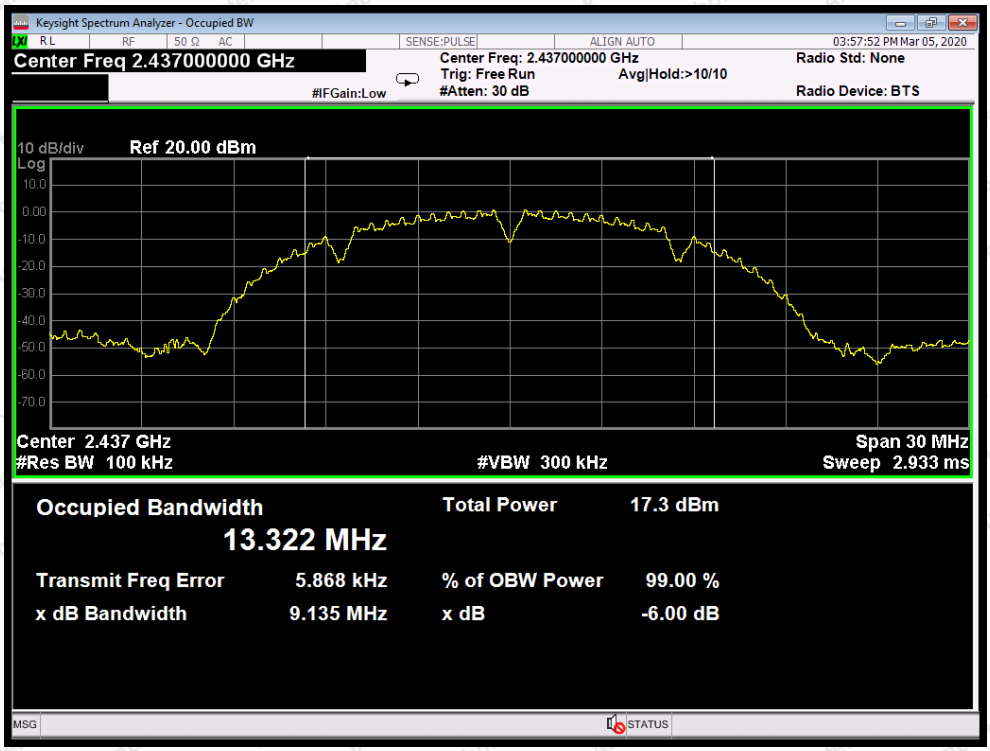



802.11n40 mode : Highest

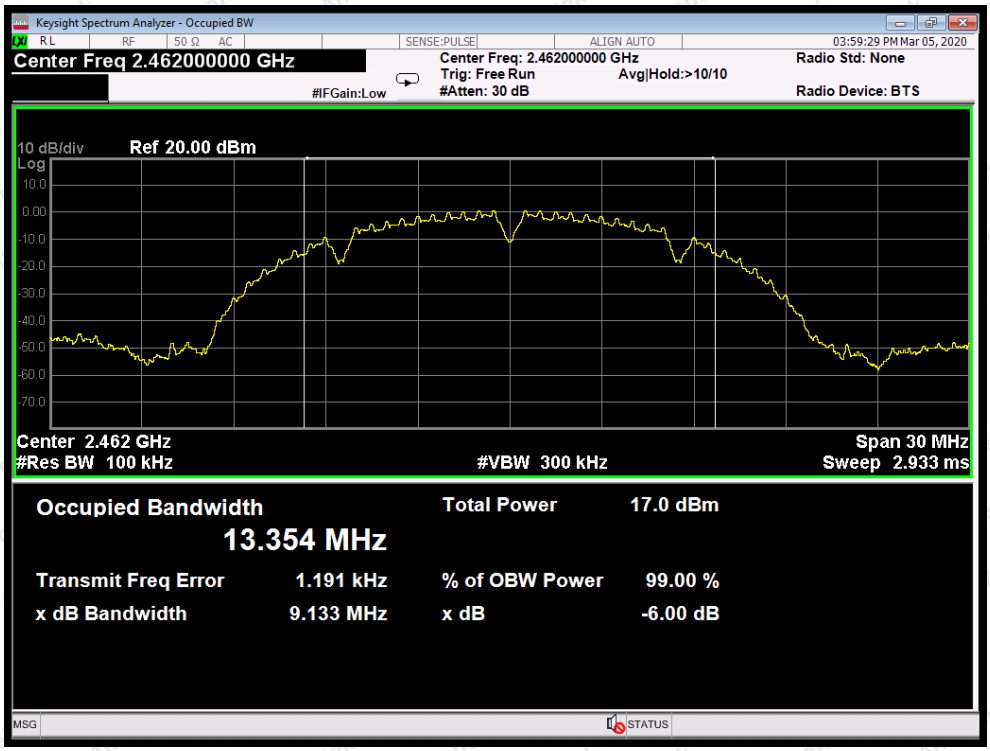
ANT B:



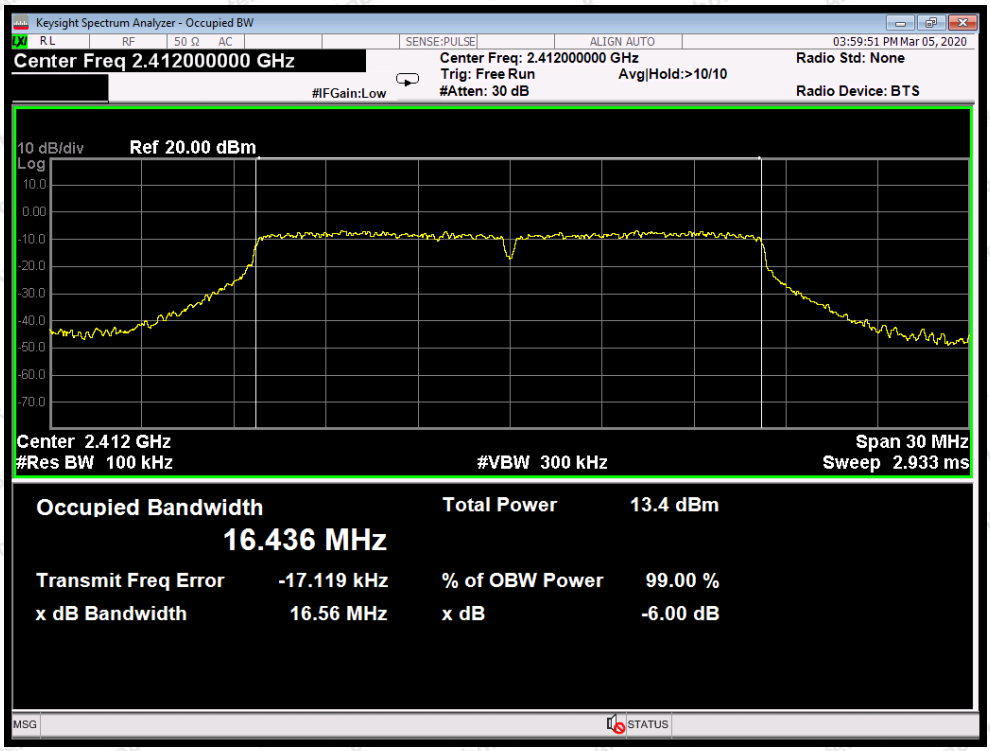

802.11b mode : Lowest



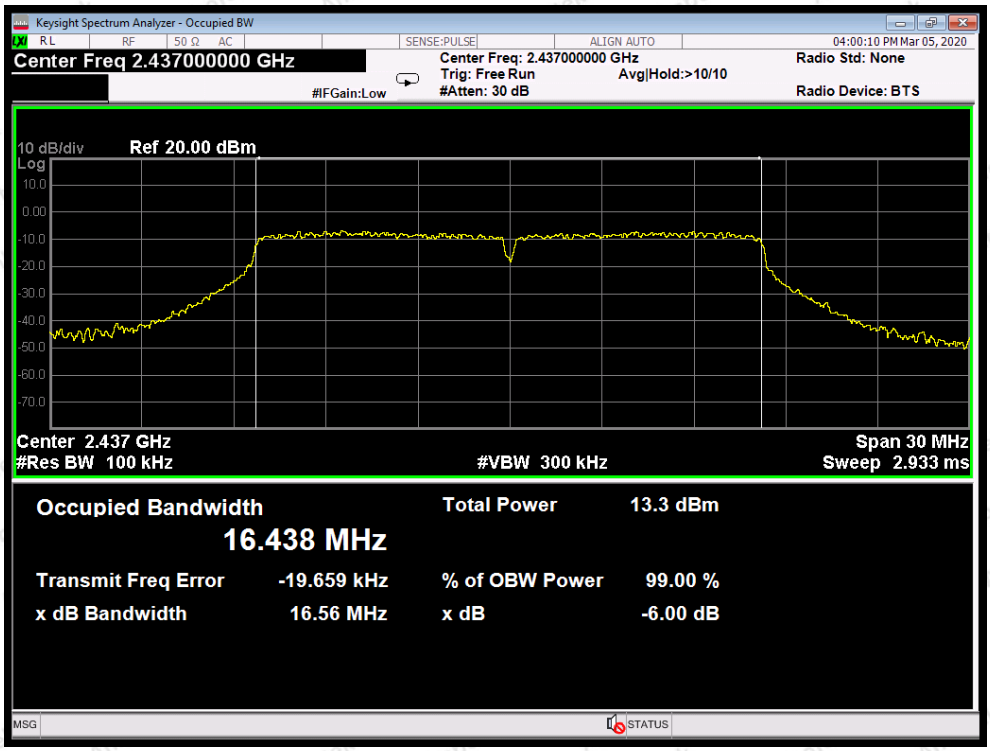

802.11b mode : Middle



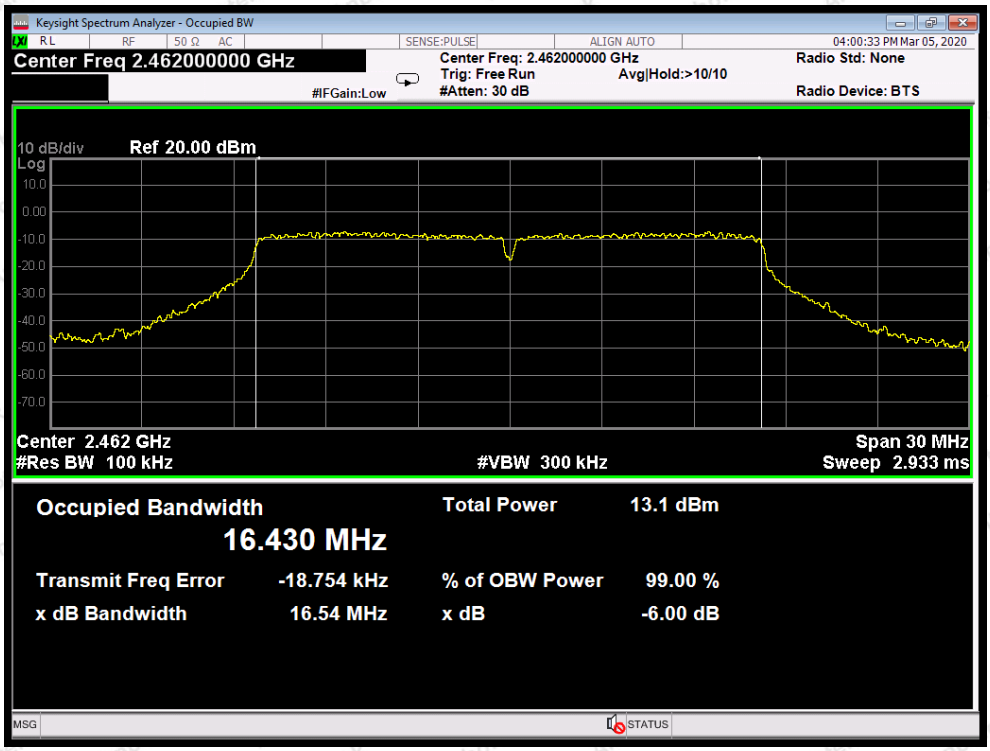

802.11b mode : Highest



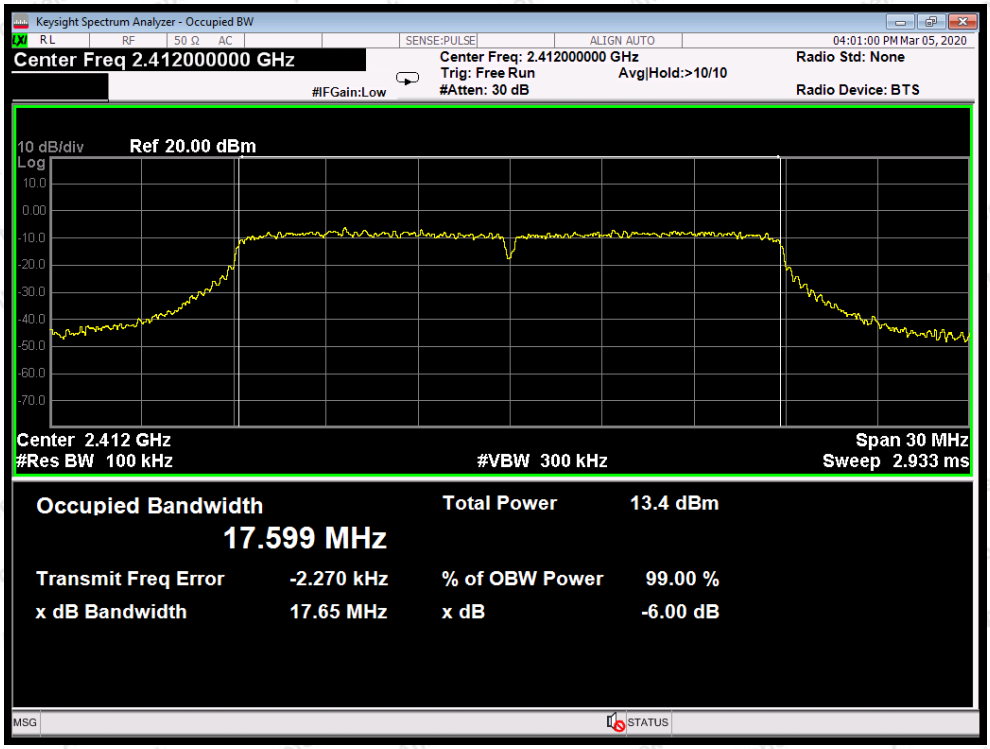

802.11g mode : Lowest



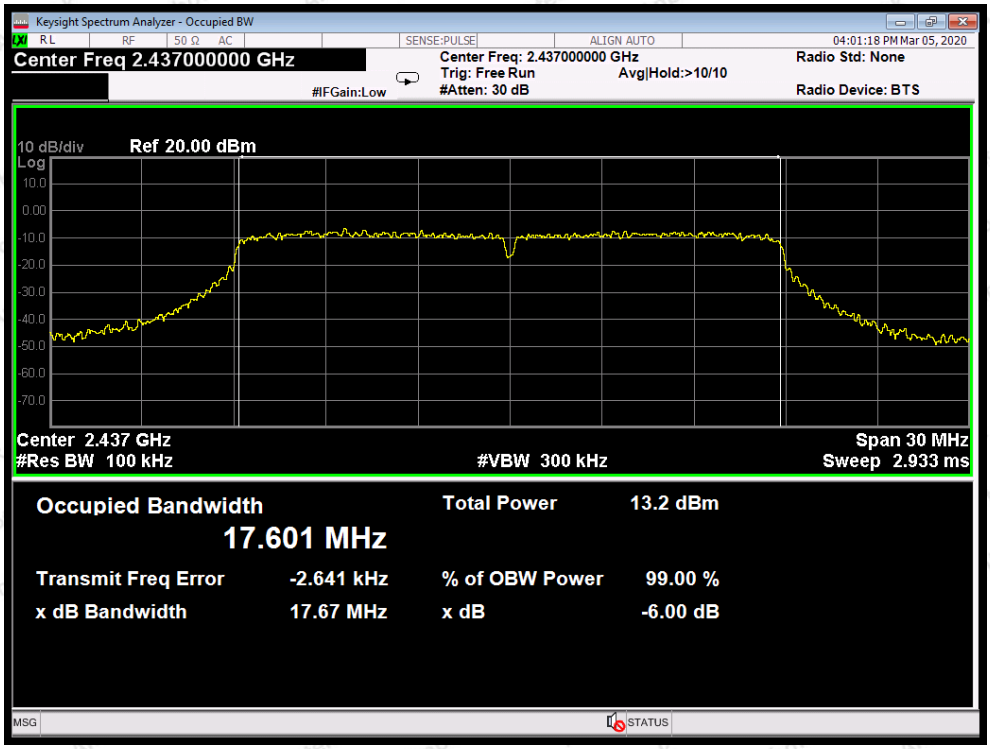

802.11g mode : Middle



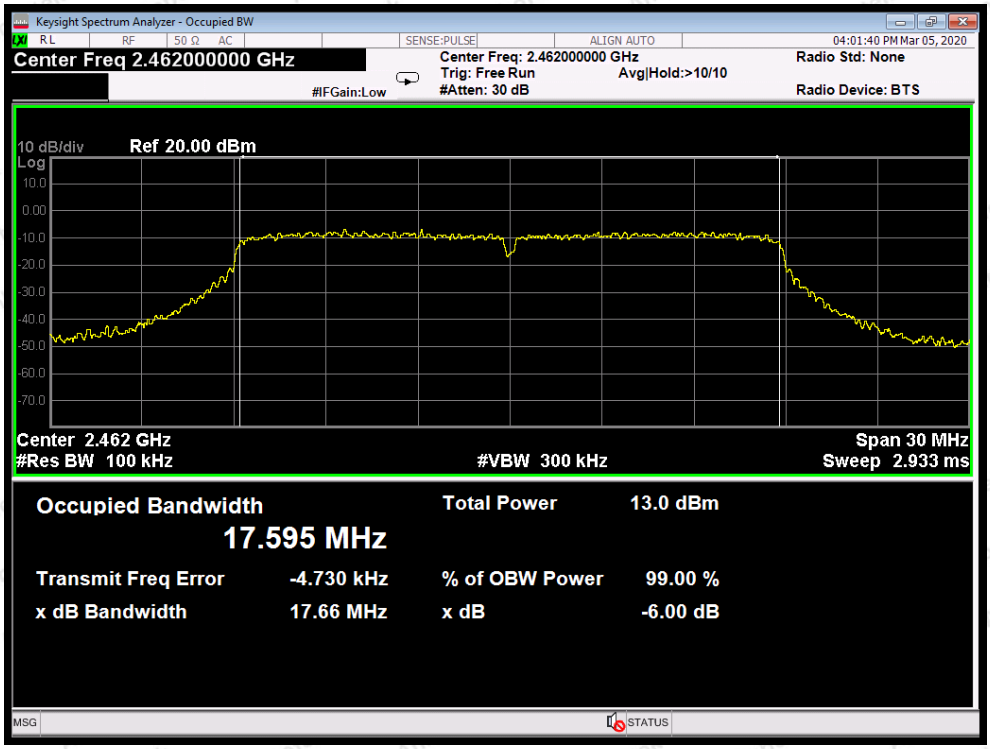

802.11g mode : Highest



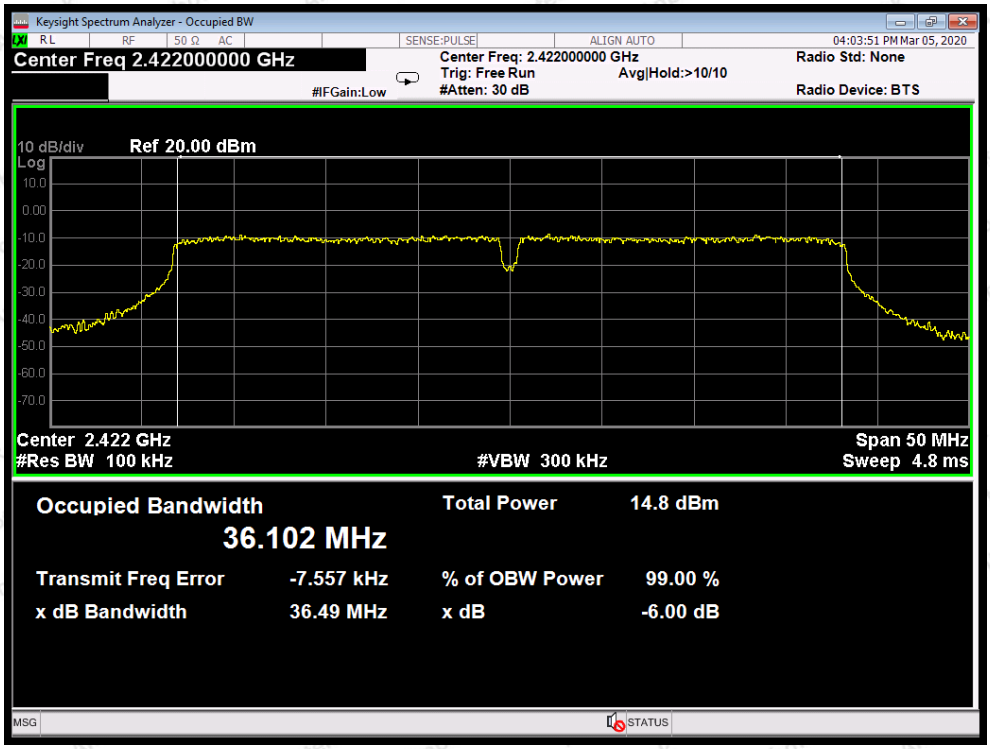

802.11n20 mode : Lowest



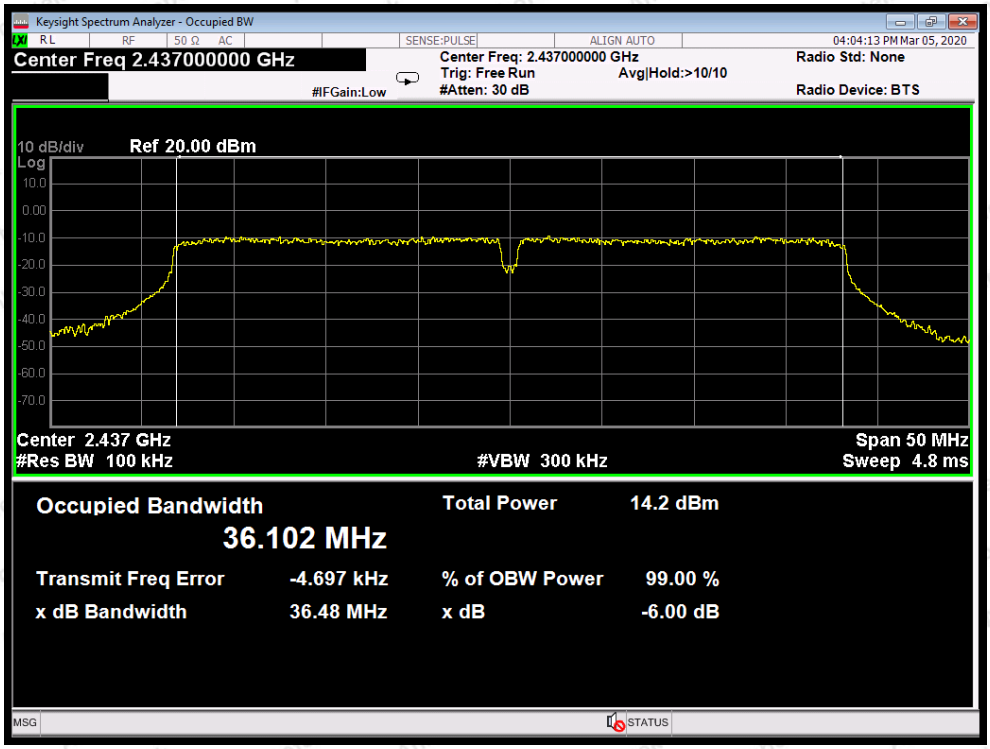

802.11n20 mode : Middle



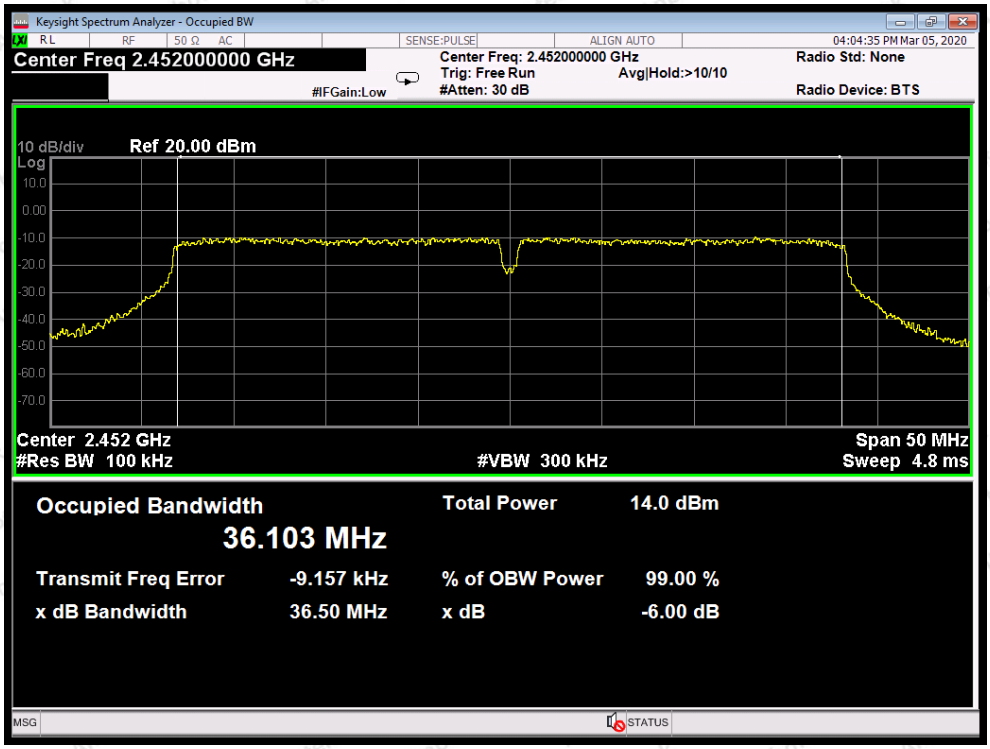

802.11n20 mode : Highest




802.11n40 mode : Lowest




802.11n40 mode : Middle



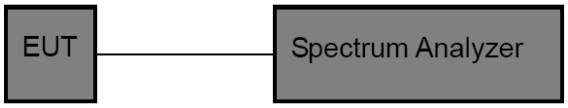

802.11n40 mode : Highest

# 7. Power Spectral Density Test

## 7.1. Test Standard and Limit

| | |
|---|---|
| Test Standard | FCC Part15 C Section |
| Test Limit | 8dBm/3KHz |

## 7.2. Test Setup




## 7.3. Test Procedure

1. Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 1.5xDTS BW
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

## 7.4. Test Data

| | | | | | |
|---|---|---|---|---|---|
| Test Item | : | Power Spectral Density | Test Mode | : | CH Low ~ CH High |
| Test Voltage | : | AC 120V, 60Hz for adapter | Temperature | : | 24℃ |
| Test Result | : | PASS | Humidity | : | 55%RH |

ANT A:

| Mode | Channel | Frequency (MHz) | PSD (dBm/3KHz) | Limit (dBm/3KHz) | Results |
|---|---|---|---|---|---|
| 802.11b | Low | 2412 | -19.203 | 8.00 | PASS |
| | Middle | 2437 | -19.336 | 8.00 | PASS |
| | High | 2462 | -19.592 | 8.00 | PASS |
| 802.11g | Low | 2412 | -21.549 | 8.00 | PASS |
| | Middle | 2437 | -21.735 | 8.00 | PASS |
| | High | 2462 | -21.492 | 8.00 | PASS |
| 802.11n20 | Low | 2412 | -20.144 | 8.00 | PASS |
| | Middle | 2437 | -20.950 | 8.00 | PASS |
| | High | 2462 | -20.625 | 8.00 | PASS |
| 802.11n40 | Low | 2422 | -20.436 | 8.00 | PASS |
| | Middle | 2437 | -23.094 | 8.00 | PASS |
| | High | 2452 | -22.441 | 8.00 | PASS |

ANT B:

| Mode | Channel | Frequency (MHz) | PSD (dBm/3KHz) | Limit (dBm/3KHz) | Results |
|---|---|---|---|---|---|
| 802.11b | Low | 2412 | -19.210 | 8.00 | PASS |
| | Middle | 2437 | -19.397 | 8.00 | PASS |
| | High | 2462 | -19.624 | 8.00 | PASS |
| 802.11g | Low | 2412 | -21.440 | 8.00 | PASS |
| | Middle | 2437 | -21.870 | 8.00 | PASS |
| | High | 2462 | -21.868 | 8.00 | PASS |
| 802.11n20 | Low | 2412 | -20.026 | 8.00 | PASS |
| | Middle | 2437 | -20.217 | 8.00 | PASS |
| | High | 2462 | -21.830 | 8.00 | PASS |
| 802.11n40 | Low | 2422 | -23.289 | 8.00 | PASS |
| | Middle | 2437 | -23.132 | 8.00 | PASS |
| | High | 2452 | -23.567 | 8.00 | PASS |

ANT A+ANT B:

| Mode | Channel | Frequency (MHz) | PSD (dBm/3KHz) | Limit (dBm/3KHz) | Results |
|---|---|---|---|---|---|
| 802.11n20 | Low | 2412 | -17.074 | 8.00 | PASS |
| | Middle | 2437 | -17.558 | 8.00 | PASS |
| | High | 2462 | -18.176 | 8.00 | PASS |
| 802.11n40 | Low | 2422 | -18.622 | 8.00 | PASS |
| | Middle | 2437 | -20.103 | 8.00 | PASS |
| | High | 2452 | -19.957 | 8.00 | PASS |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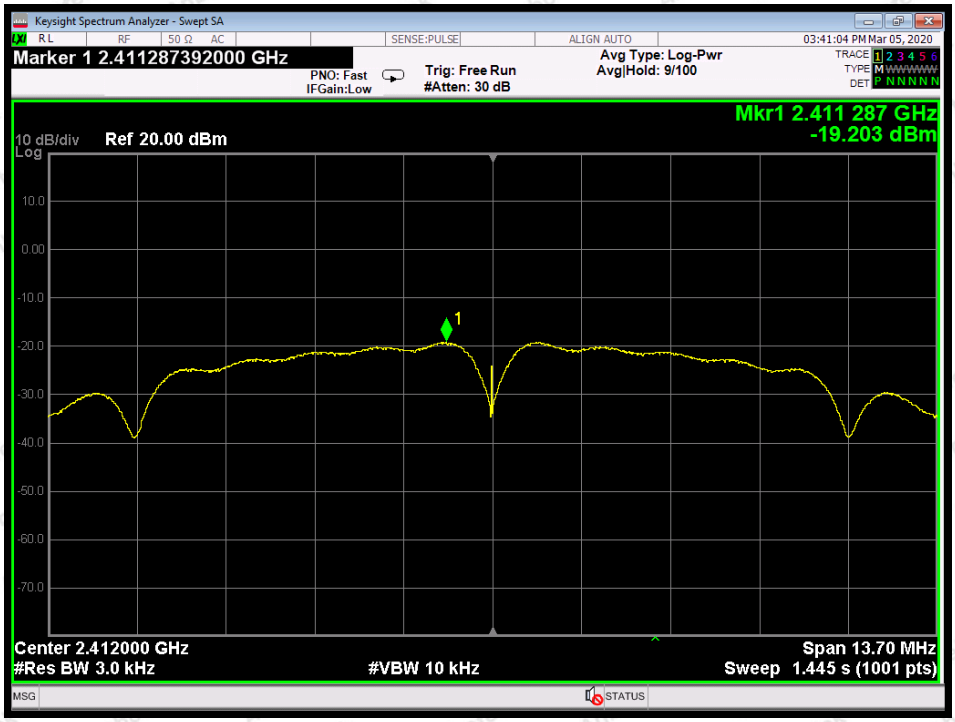
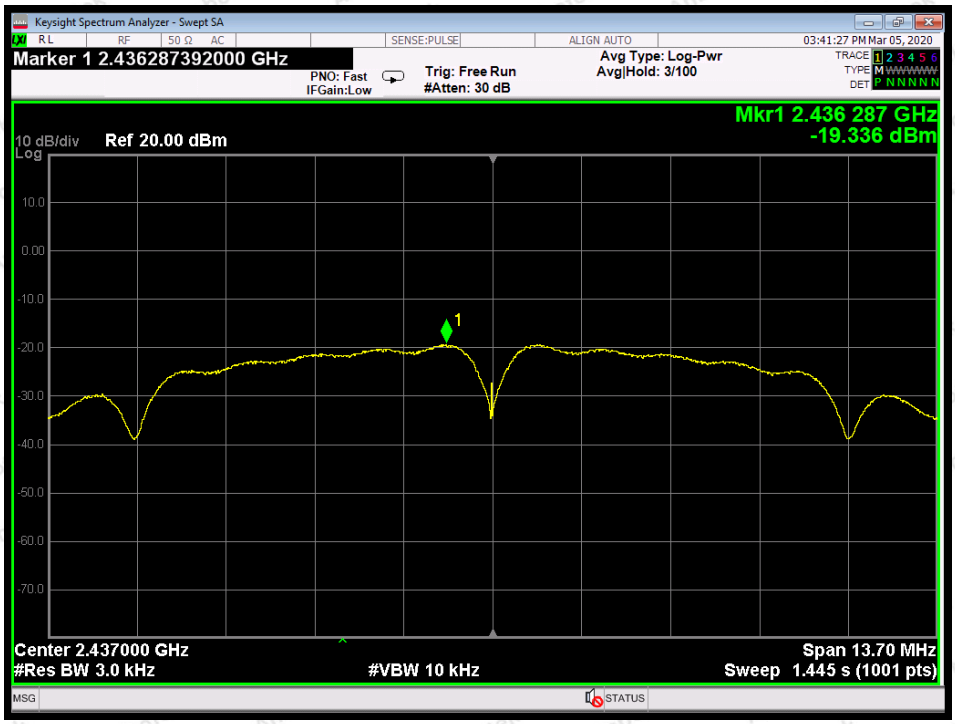
Tel:(86) 755-26066440 Fax: (86) 755-26014772 Email: service@anbotek.com
Hotline 400-003-0500
www.anbotek.com

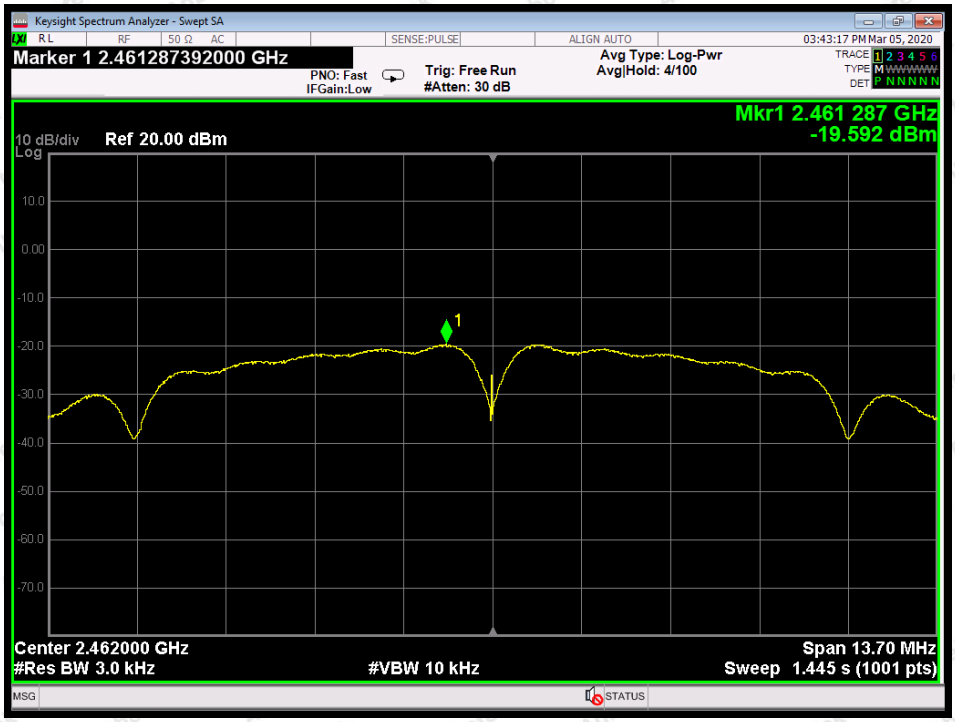
ANT A:



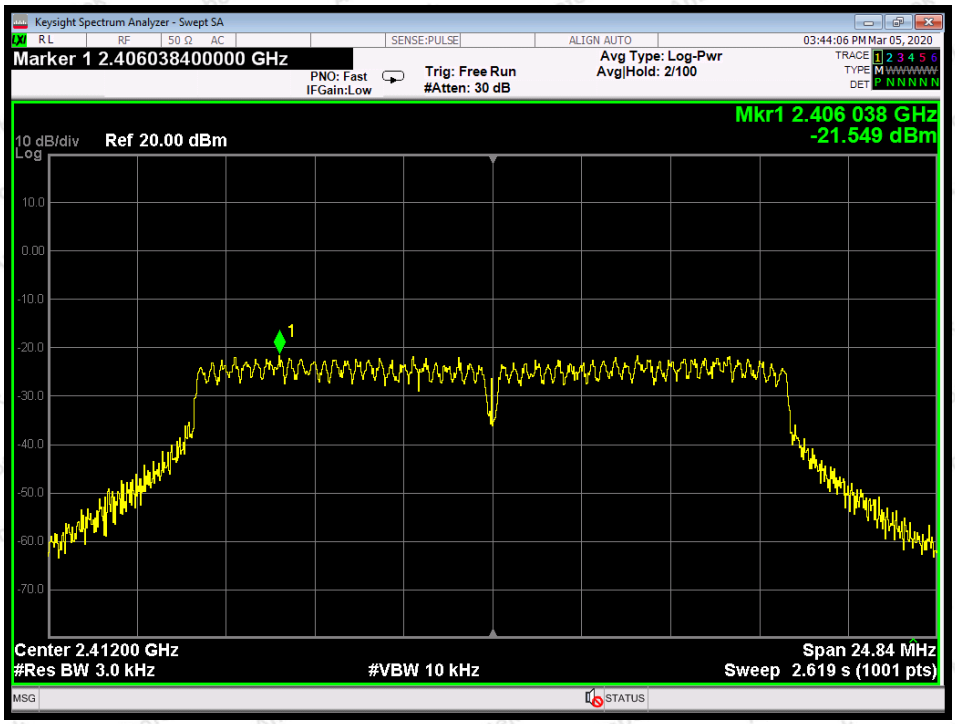

802.11b mode : Lowest



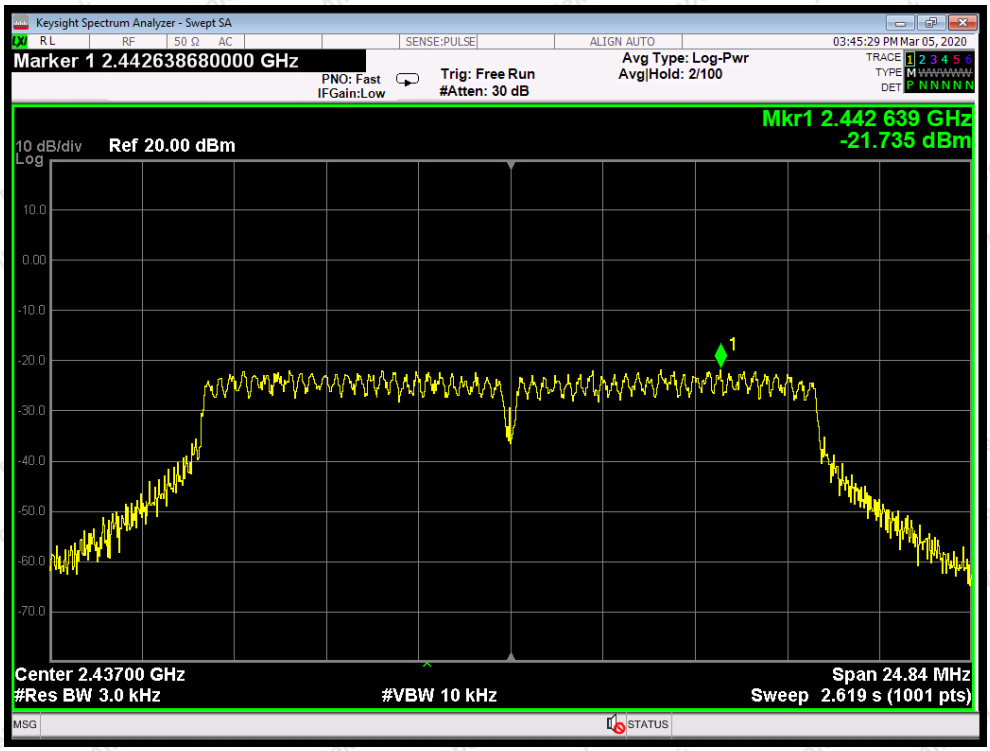

802.11b mode : Middle



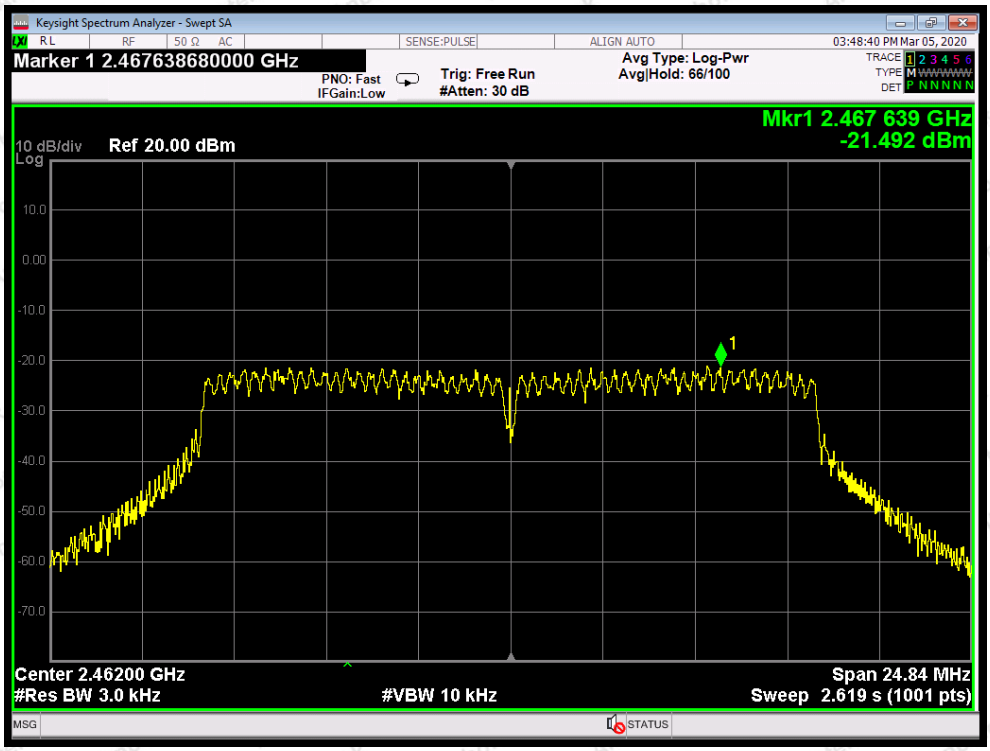

802.11b mode : Highest



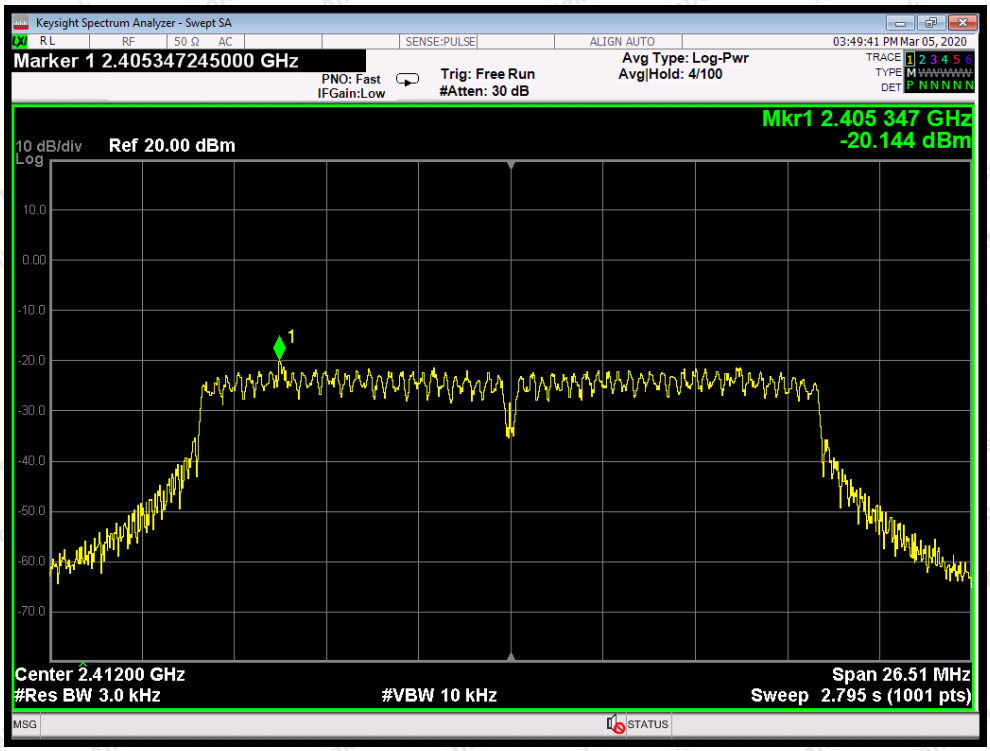

802.11g mode : Lowest



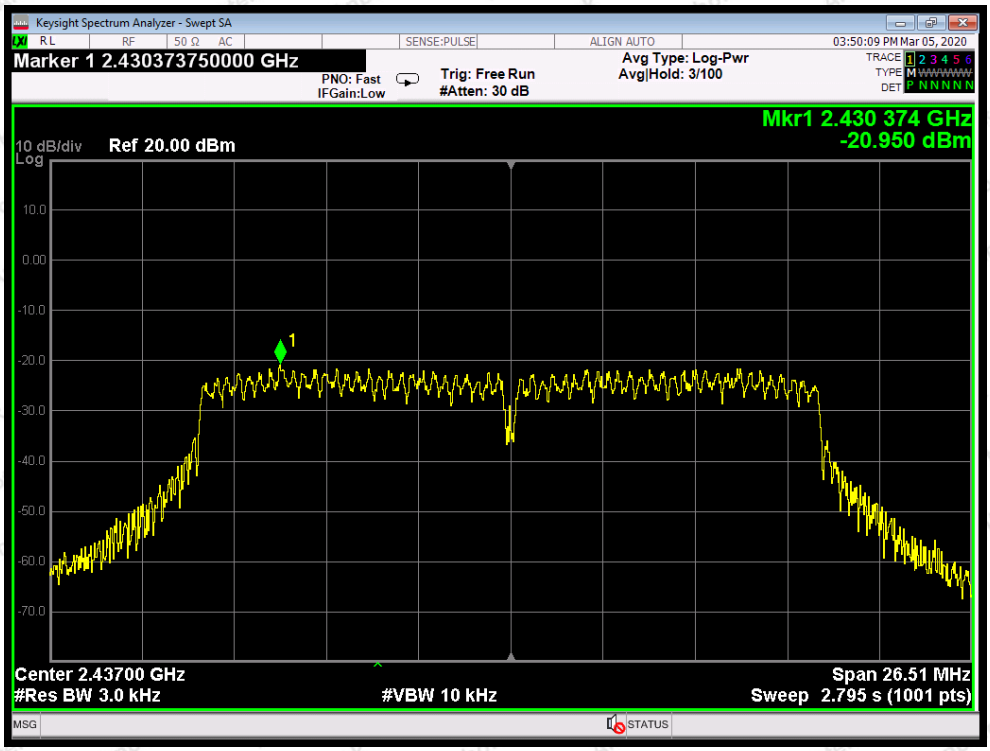

802.11g mode : Middle



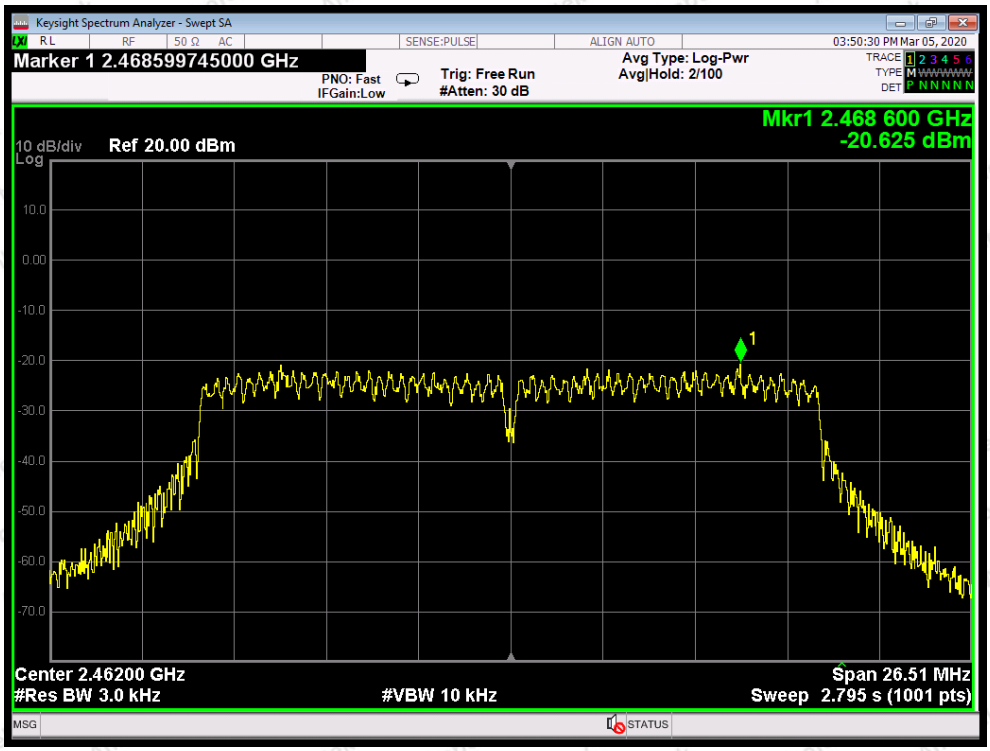

802.11g mode : Highest



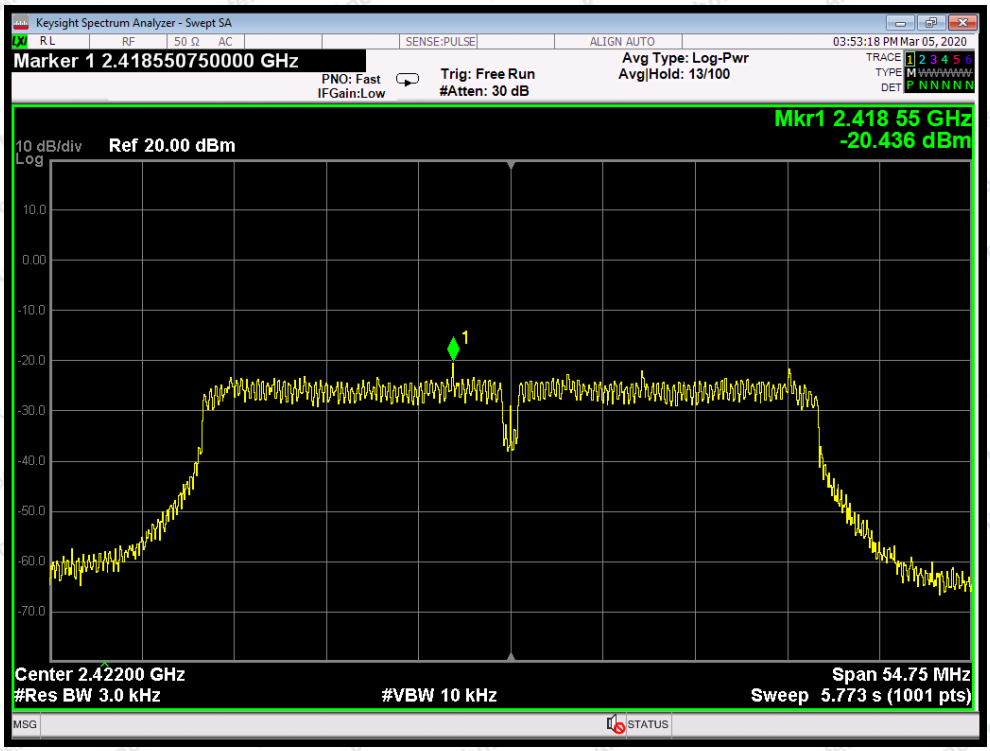

802.11n20 mode : Lowest



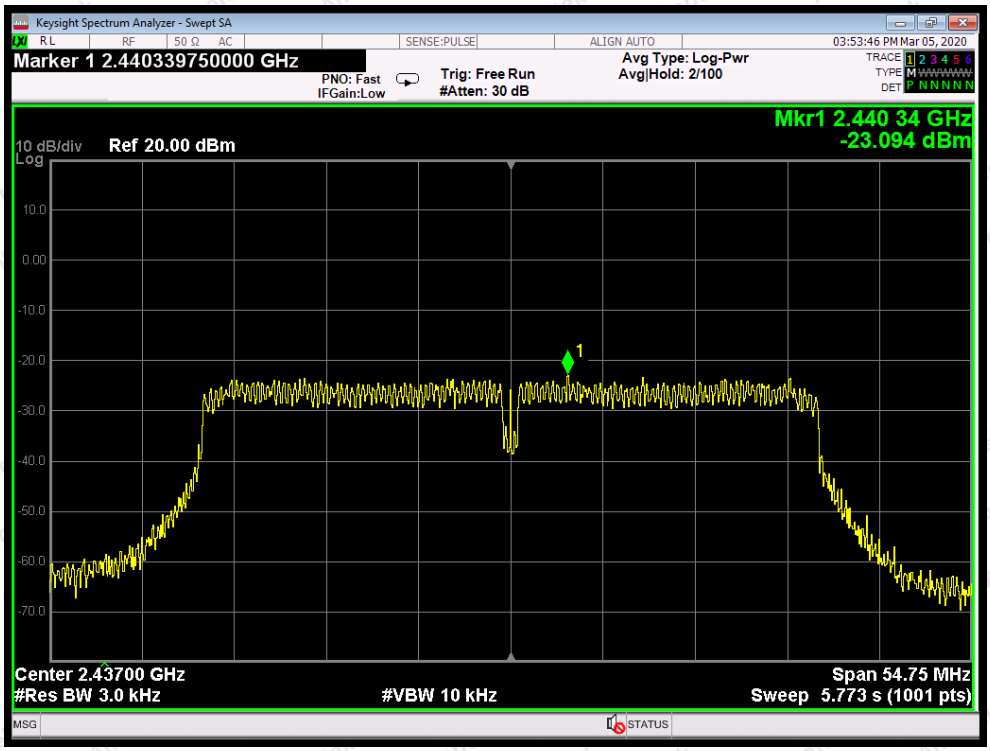

802.11n20 mode : Middle



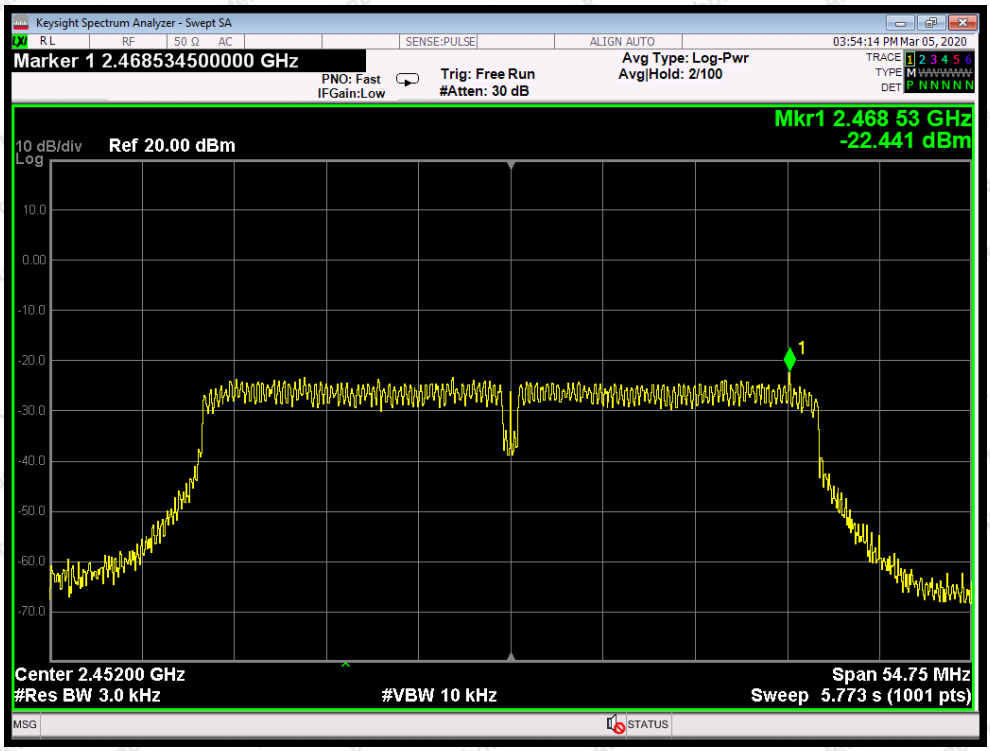

802.11n20 mode : Highest




802.11n40 mode : Lowest

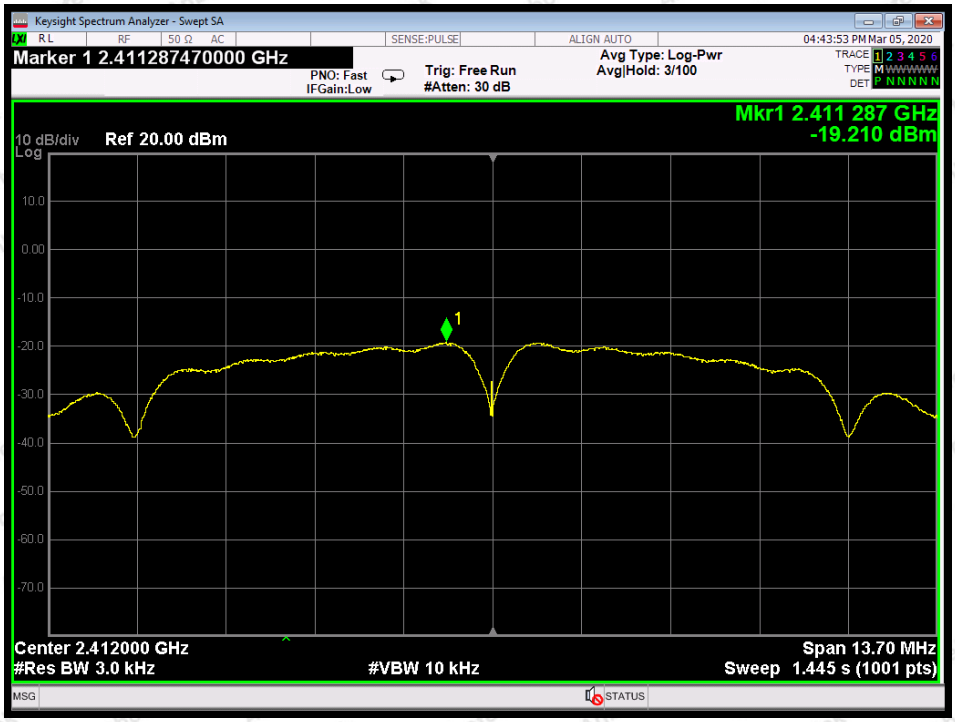



802.11n40 mode : Middle

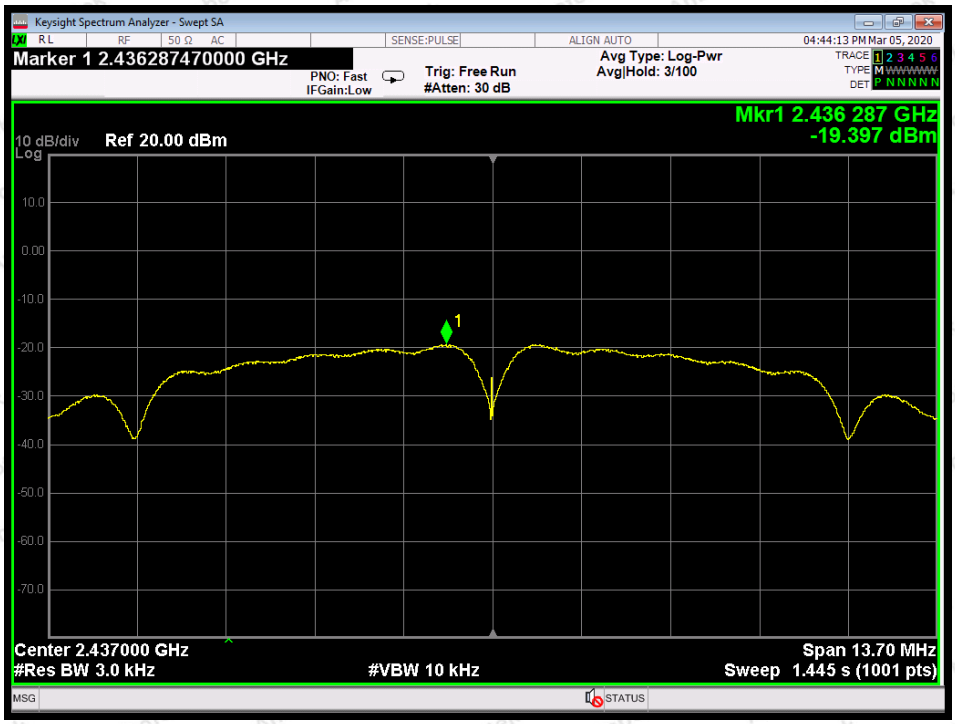



802.11n40 mode : Highest

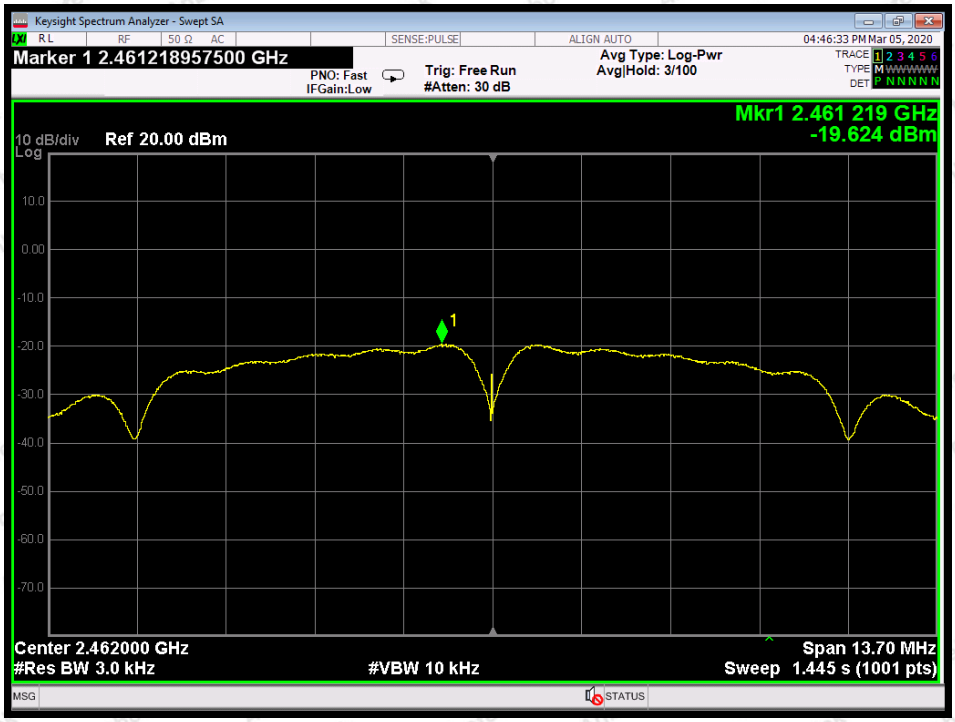
ANT B:



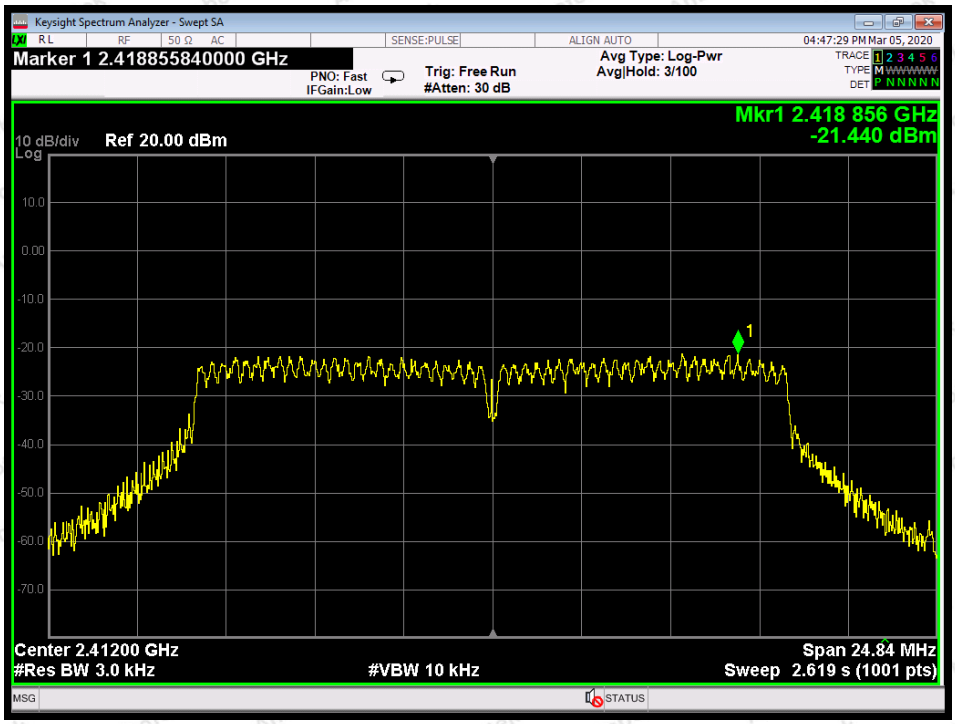

802.11b mode : Lowest



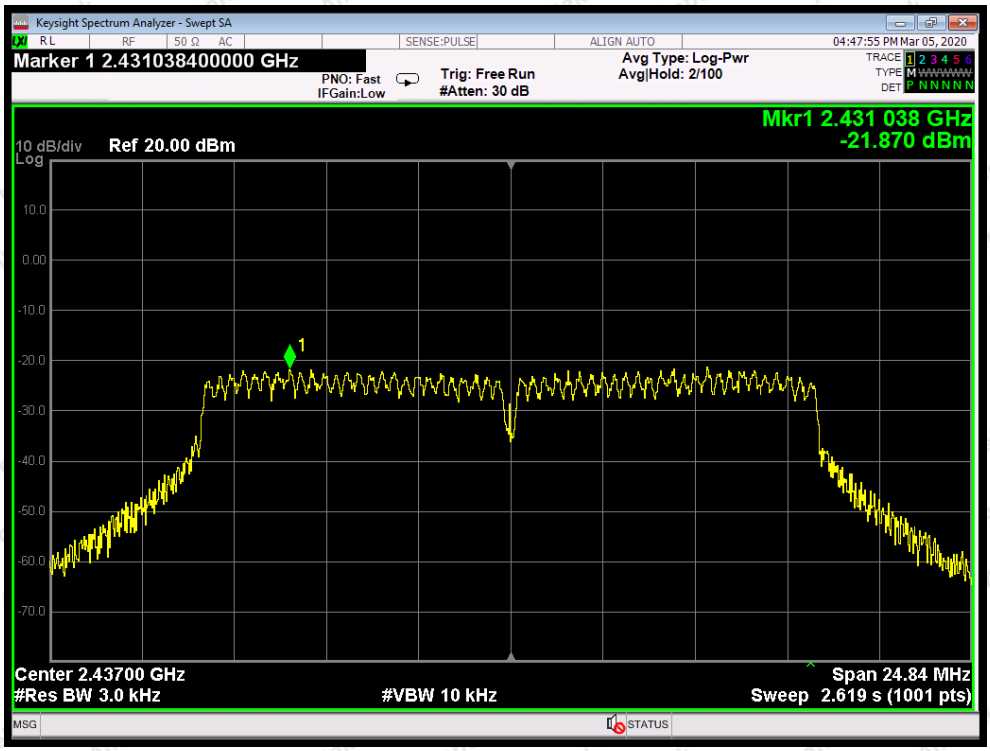

802.11b mode : Middle



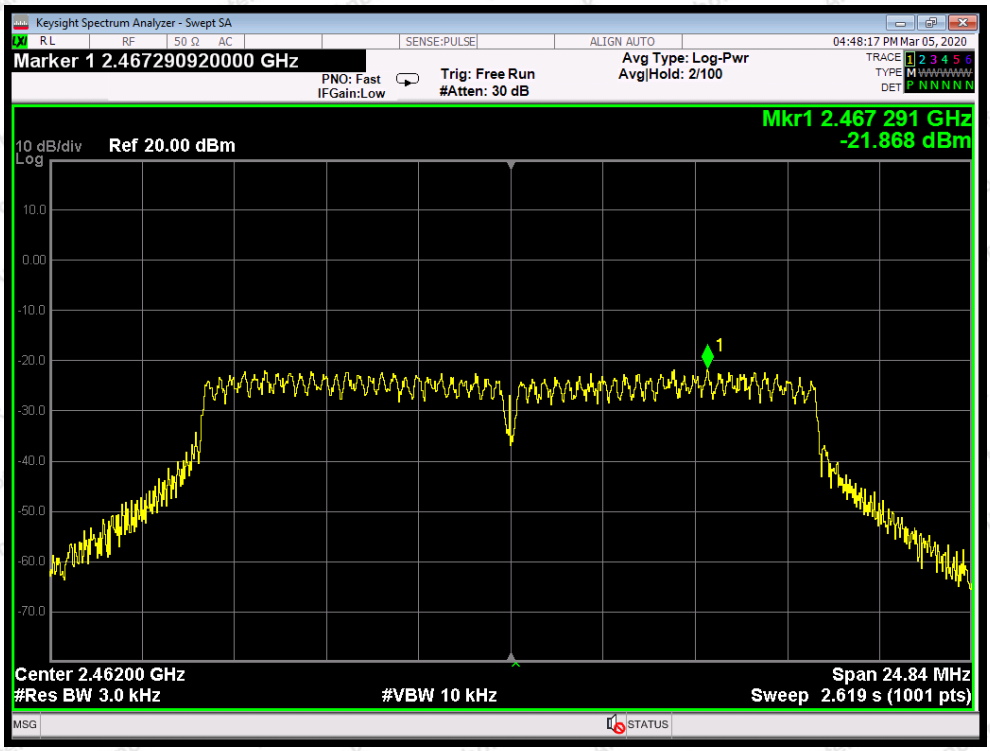

802.11b mode : Highest



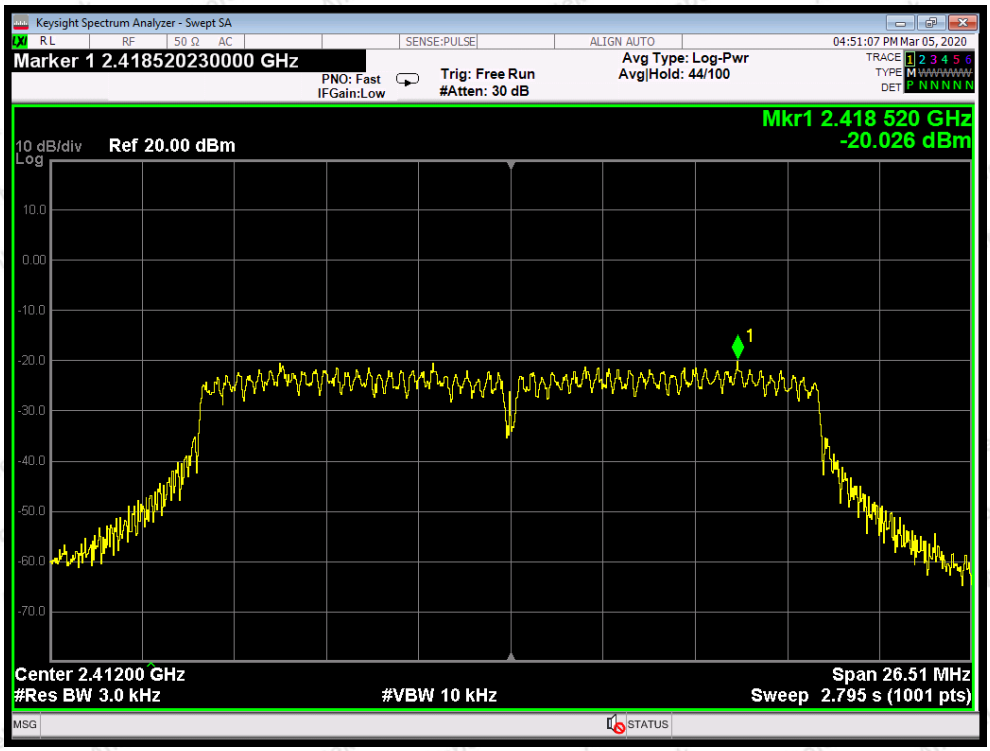

802.11g mode : Lowest



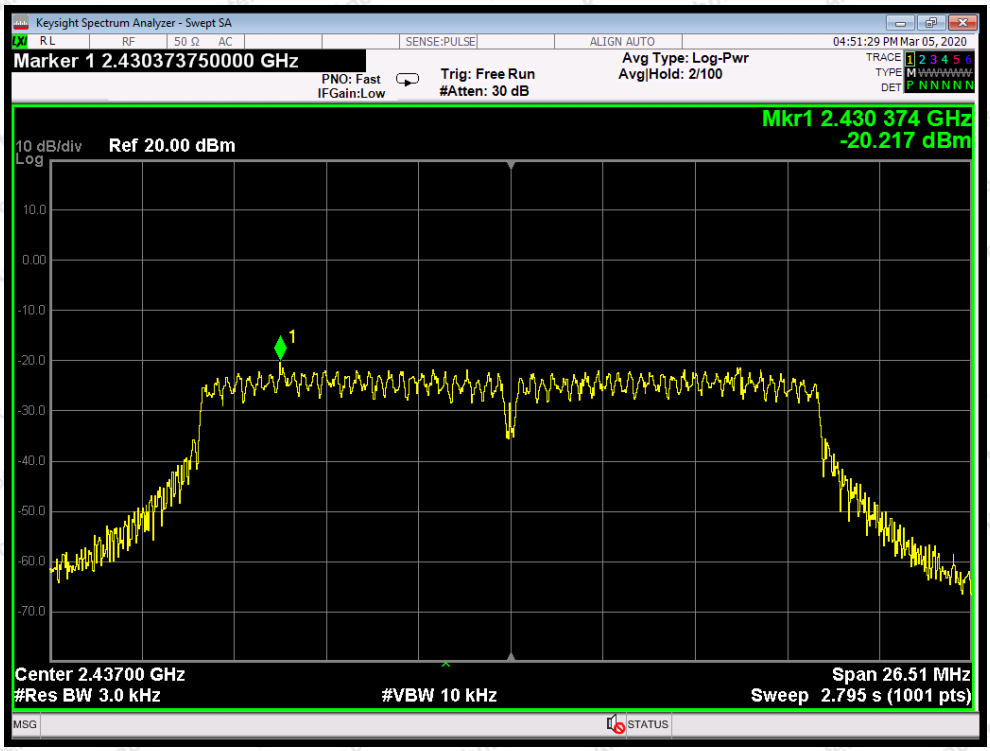

802.11g mode : Middle



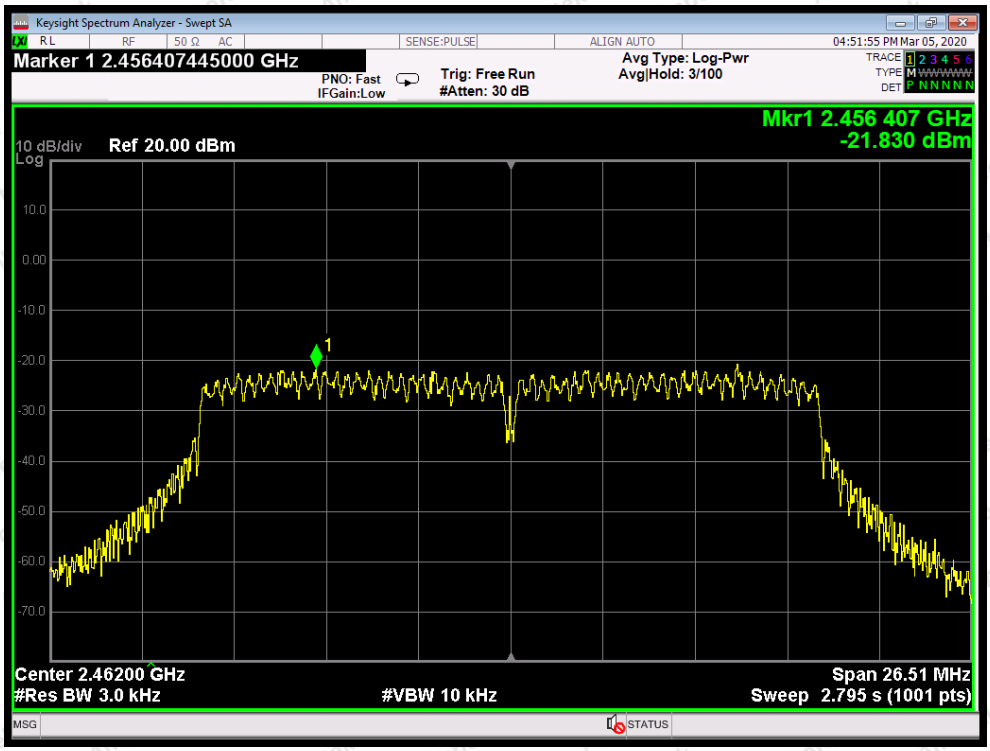

802.11g mode : Highest



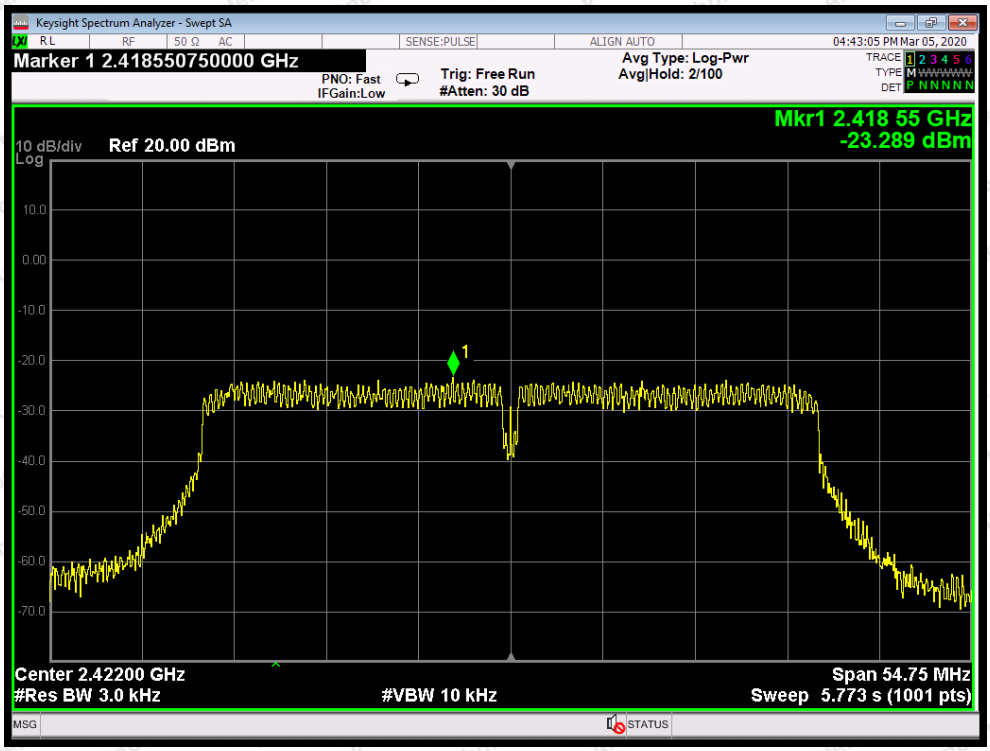

802.11n20 mode : Lowest



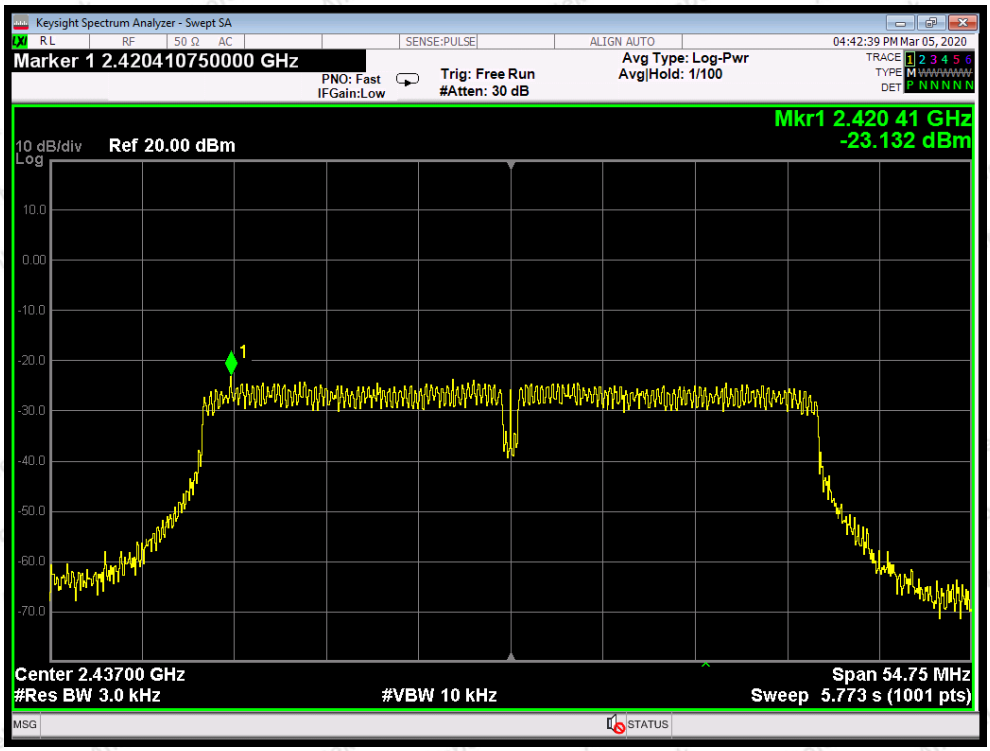

802.11n20 mode : Middle



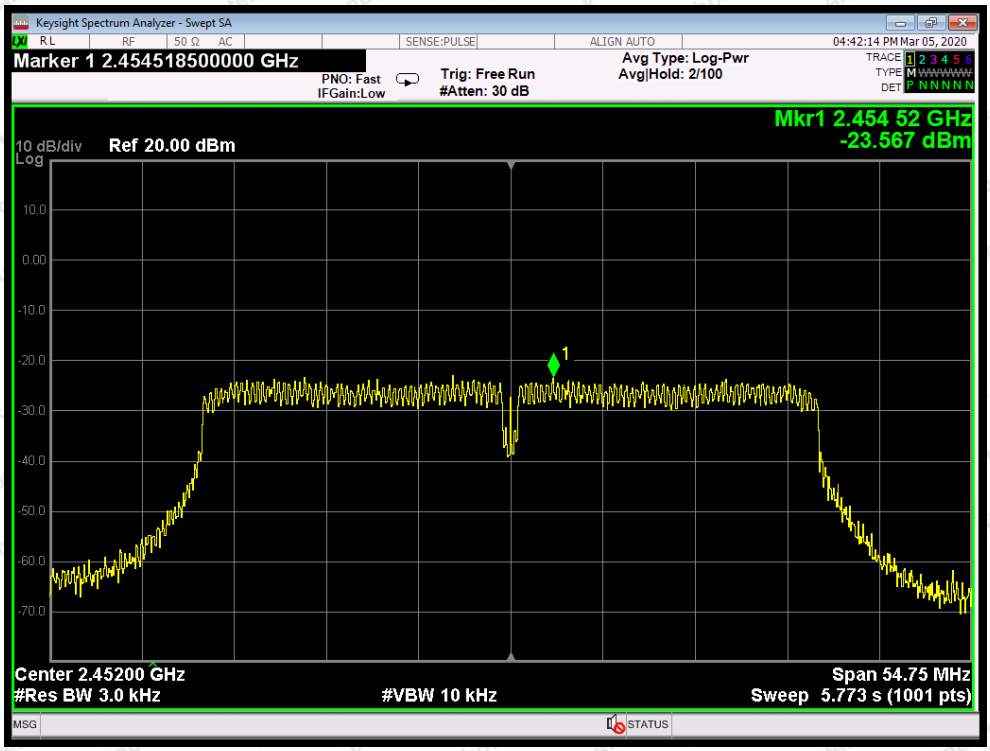

802.11n20 mode : Highest




802.11n40 mode : Lowest




802.11n40 mode : Middle



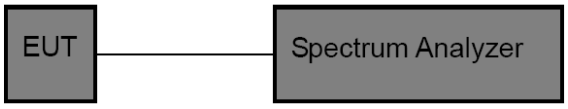

802.11n40 mode : Highest

# 8. 100kHz Bandwidth of Frequency Band Edge Requirement

## 8.1. Test Standard and Limit

| | |
|---|---|
| Test Standard | FCC Part15 C Section 15.247 (d) |
| Test Limit | in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a). |

## 8.2. Test Setup




## 8.3. Test Procedure

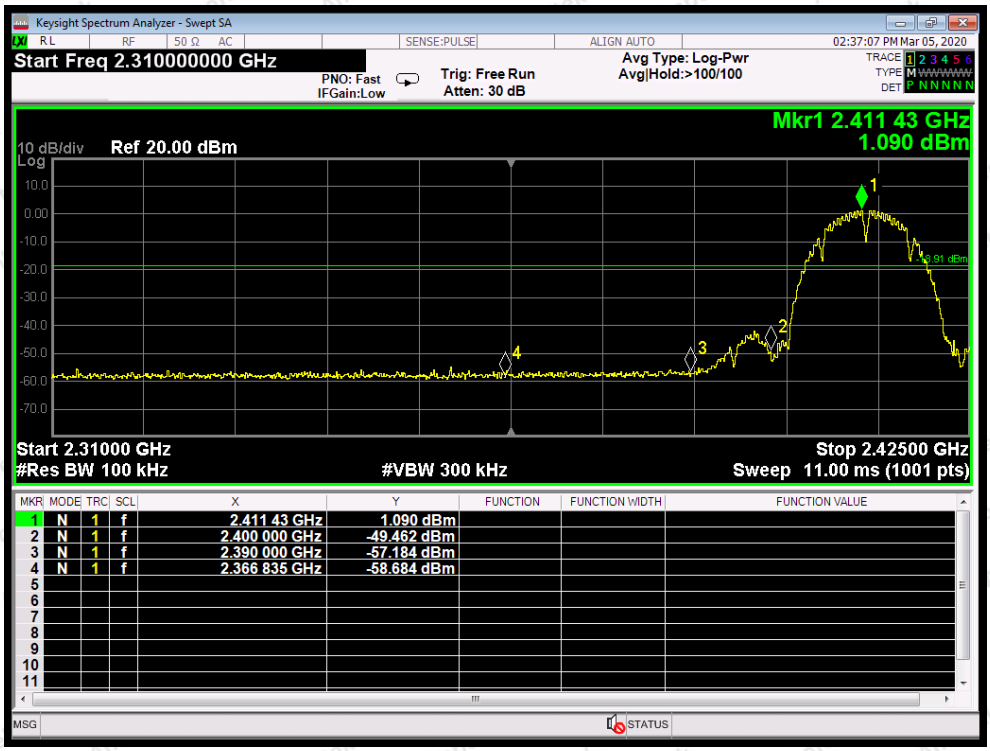
Using the following spectrum analyzer setting:

1. Set the RBW = 100KHz.
2. Set the VBW = 300KHz.
3. Sweep time = auto couple.
4. Detector function = peak.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.

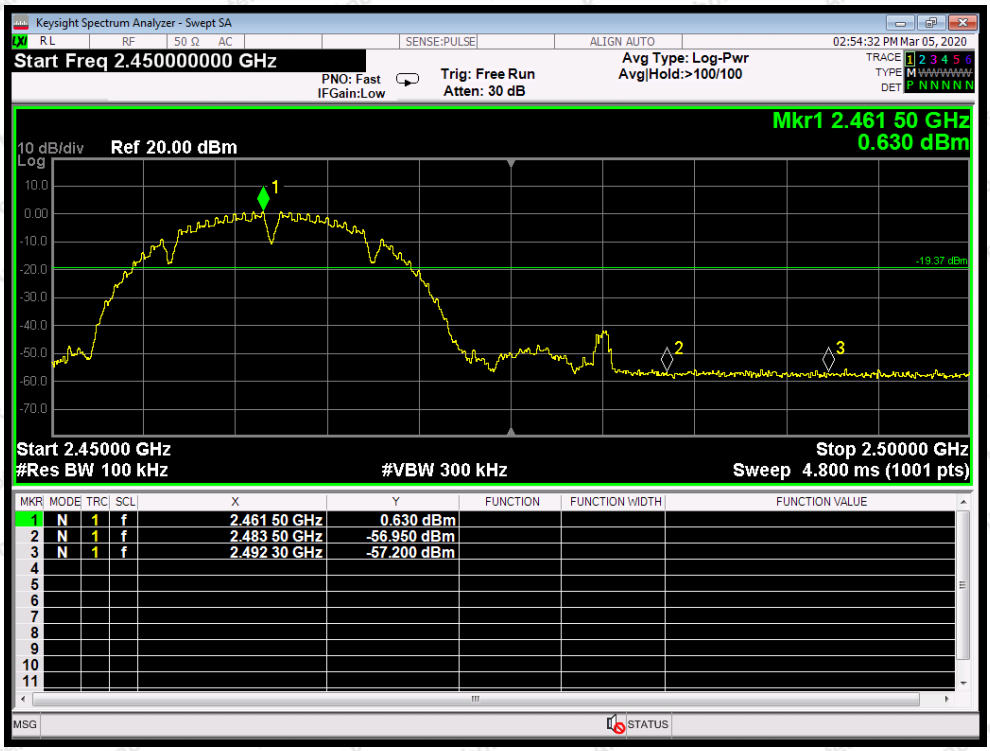
## 8.4. Test Data

| | | | | | |
|---|---|---|---|---|---|
| Test Item | : | Band edge | Test Mode | : | CH Low ~ CH High |
| Test Voltage | : | AC 120V, 60Hz for adapter | Temperature | : | 24℃ |
| Test Result | : | PASS | Humidity | : | 55%RH |

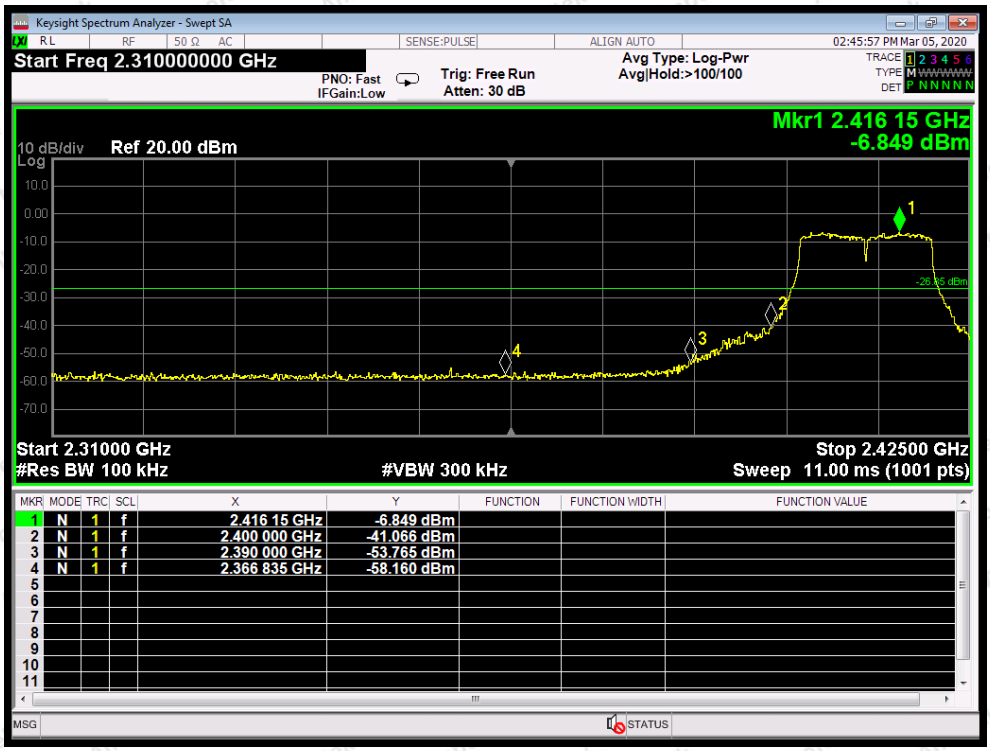
ANT A:



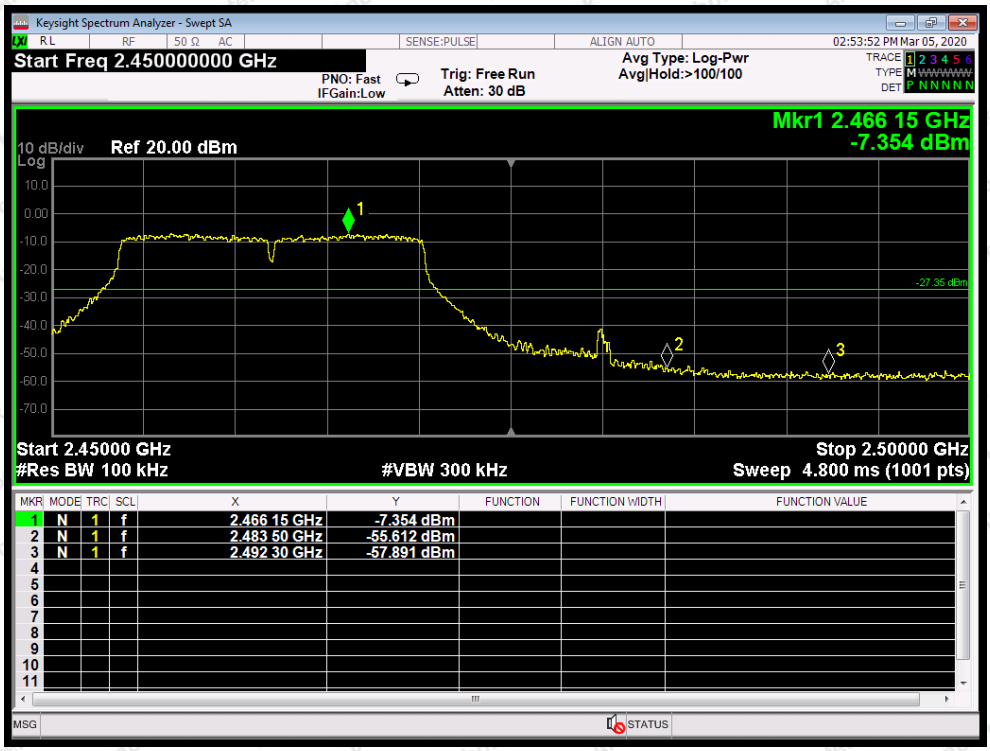

802.11b mode : Lowest



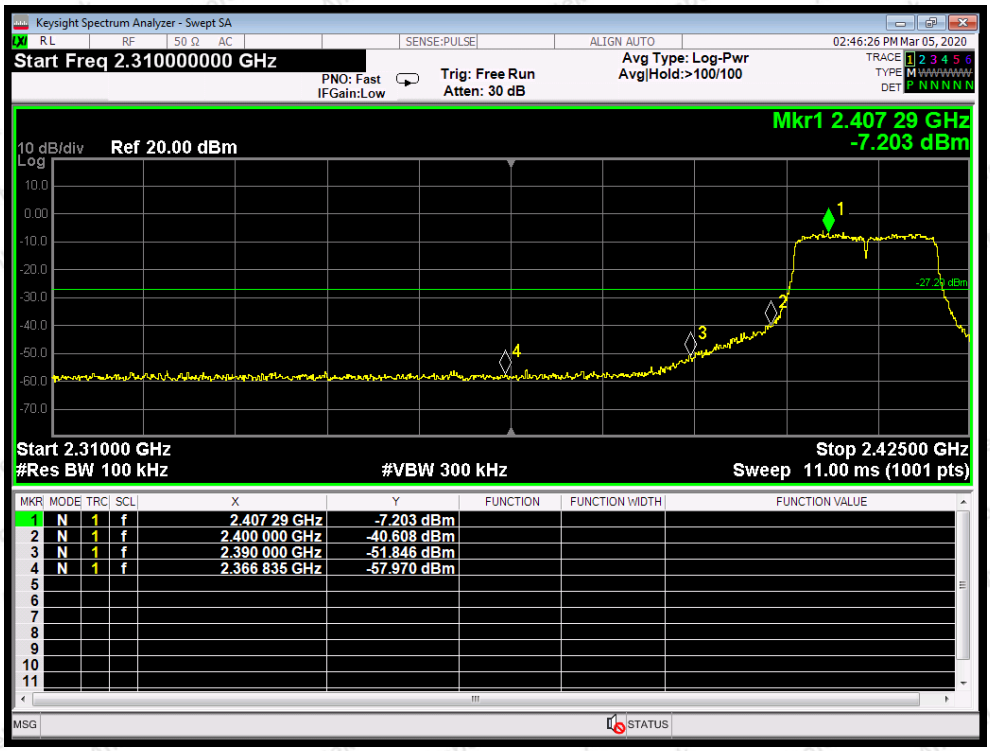

802.11b mode : Highest



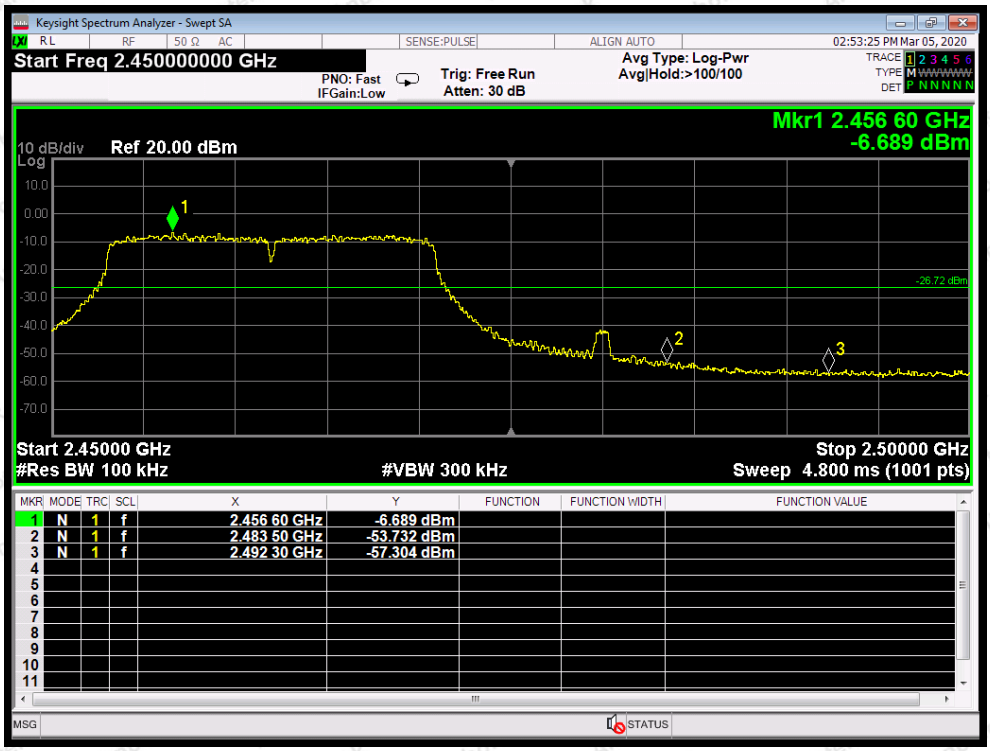

802.11g mode : Lowest



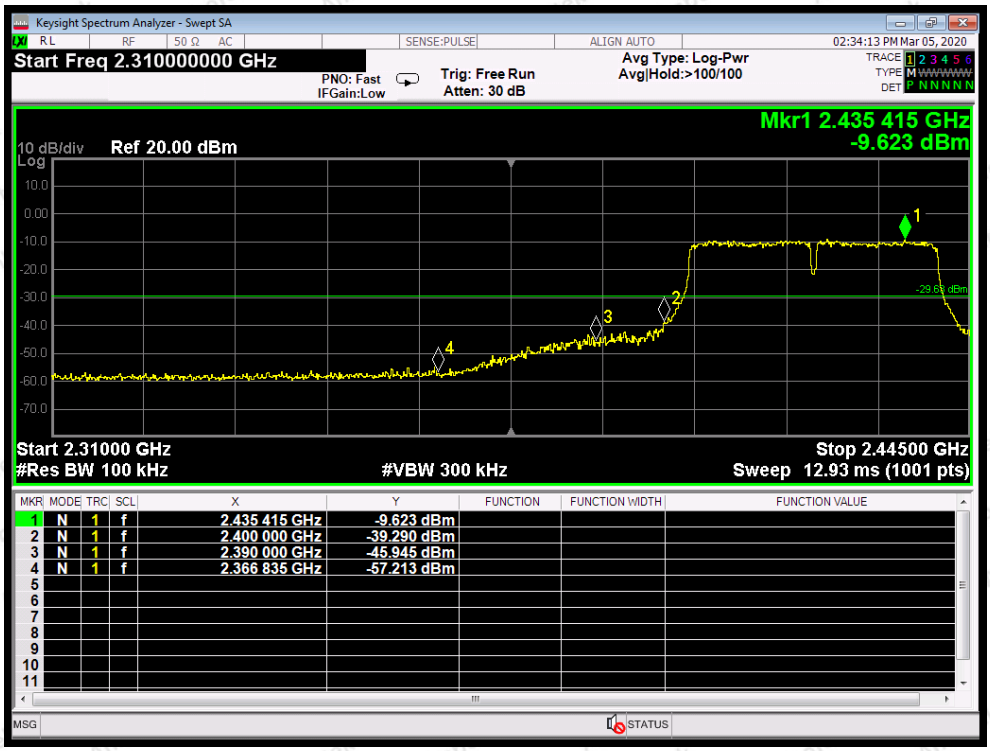

802.11g mode : Highest



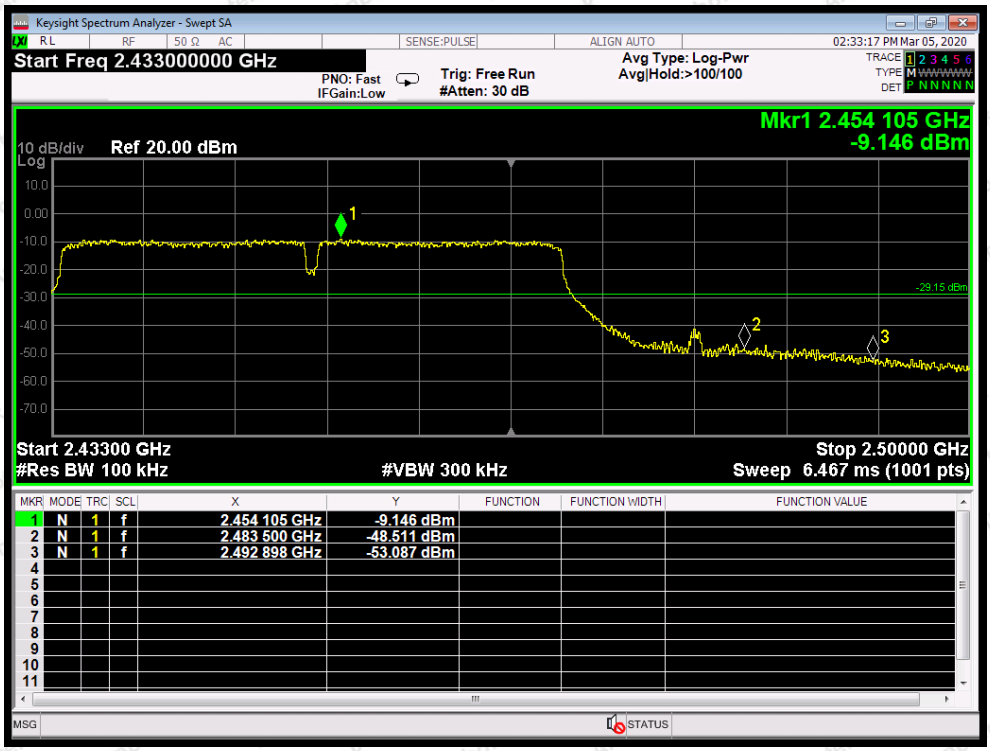

802.11n20 mode : Lowest




802.11n20 mode : Highest

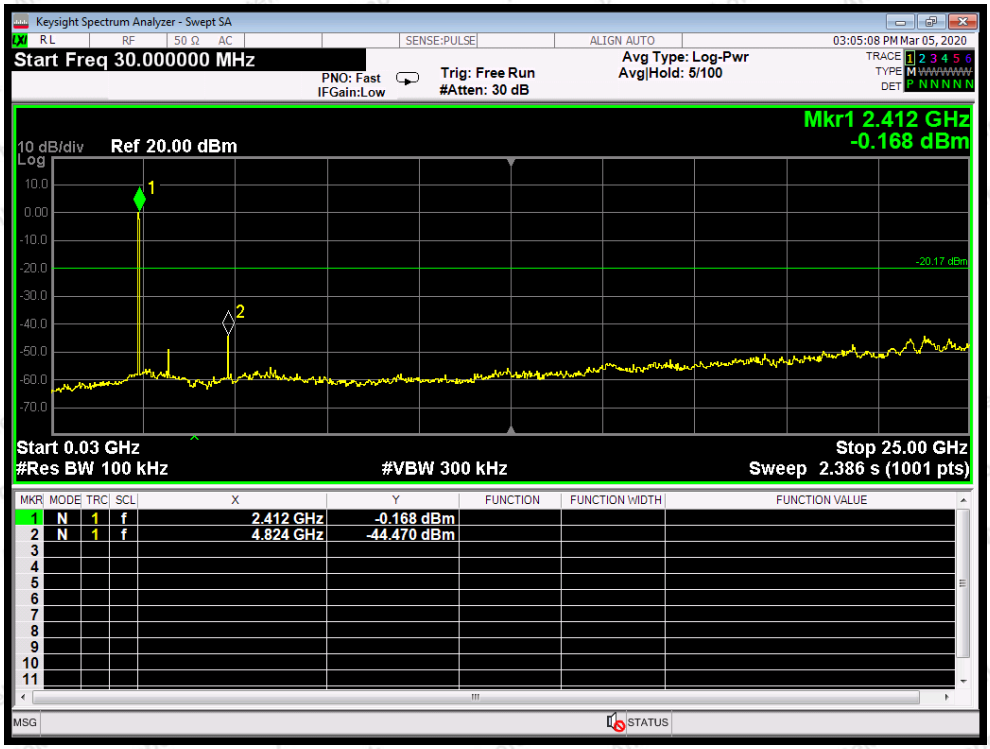



802.11n40 mode : Lowest

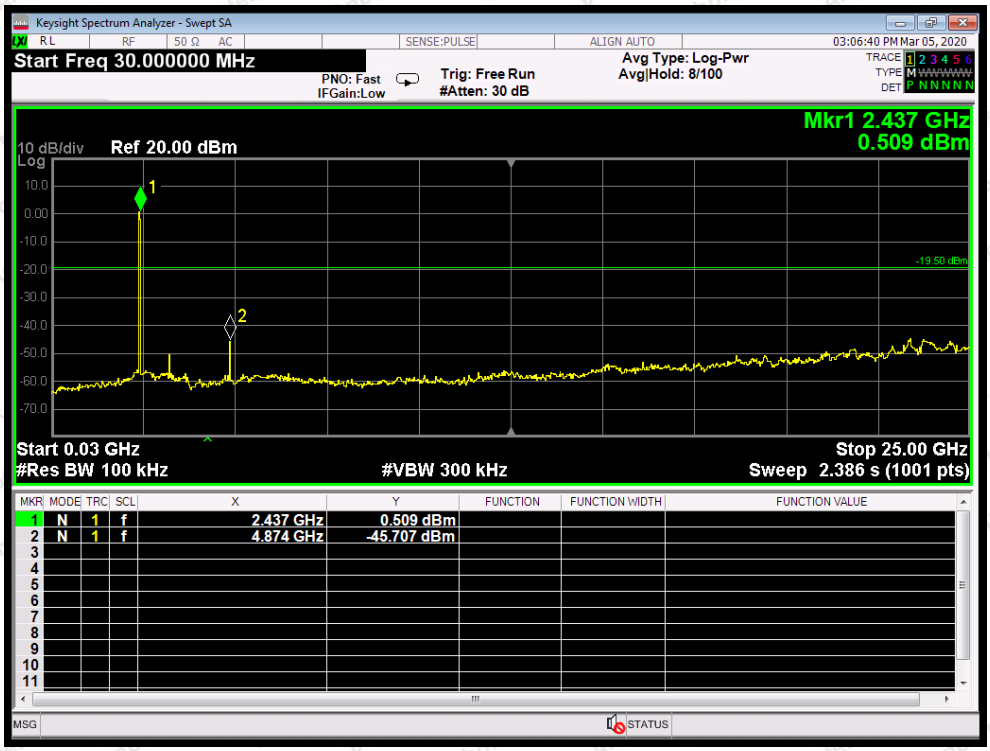



802.11n40 mode : Highest

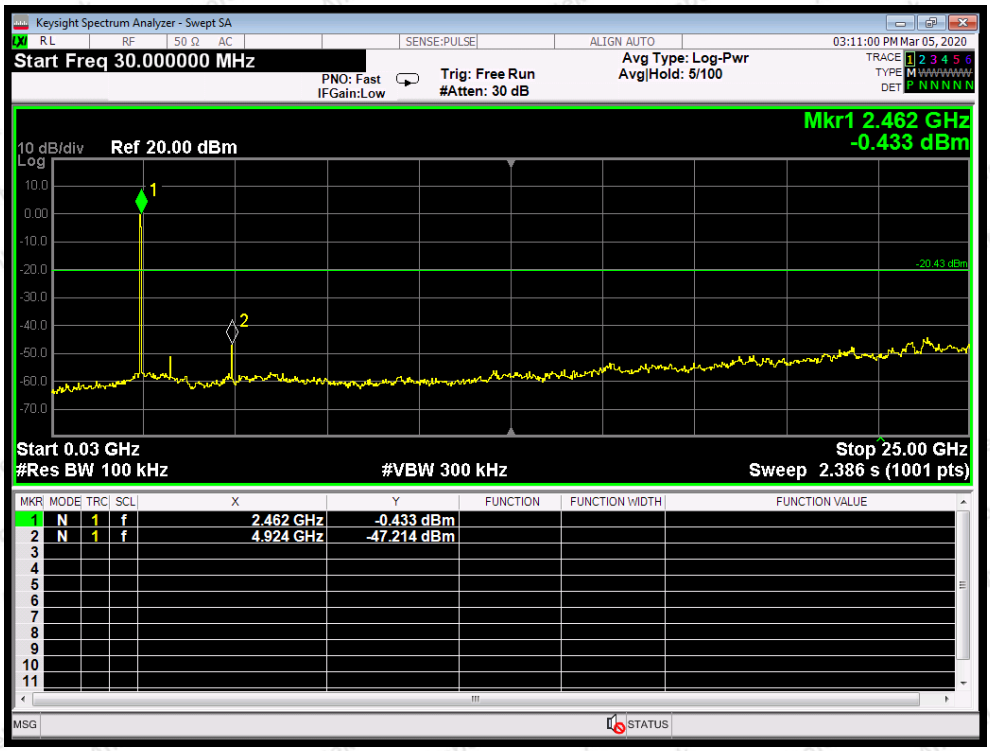
Conducted Emission Method



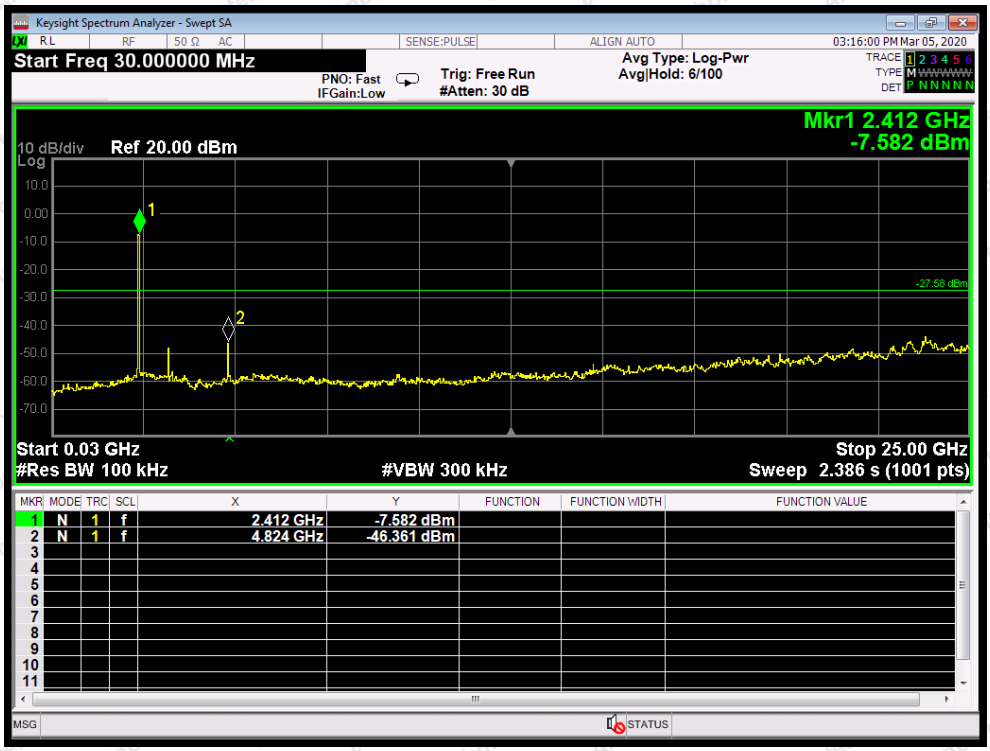

802.11b mode : Lowest



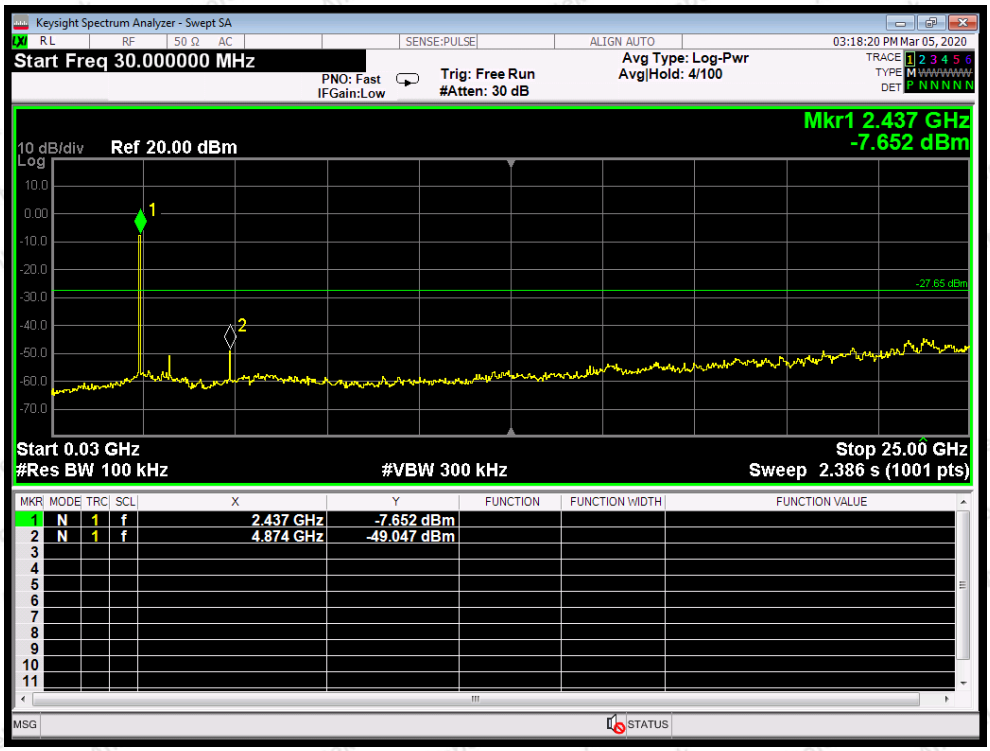

802.11b mode : Middle



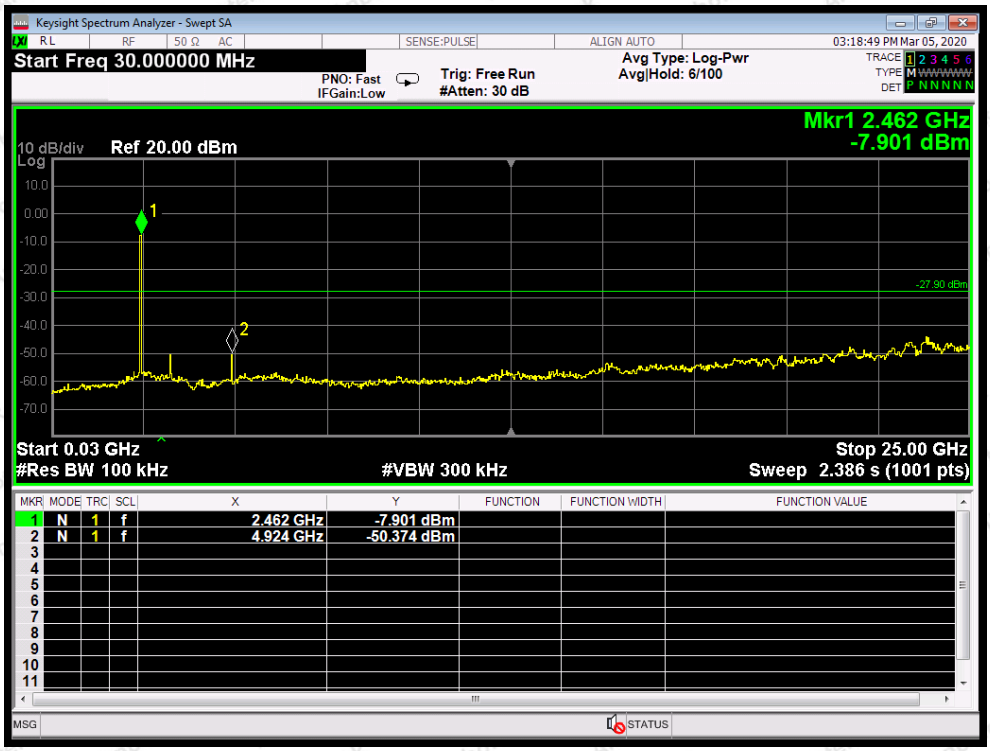

802.11b mode : Highest



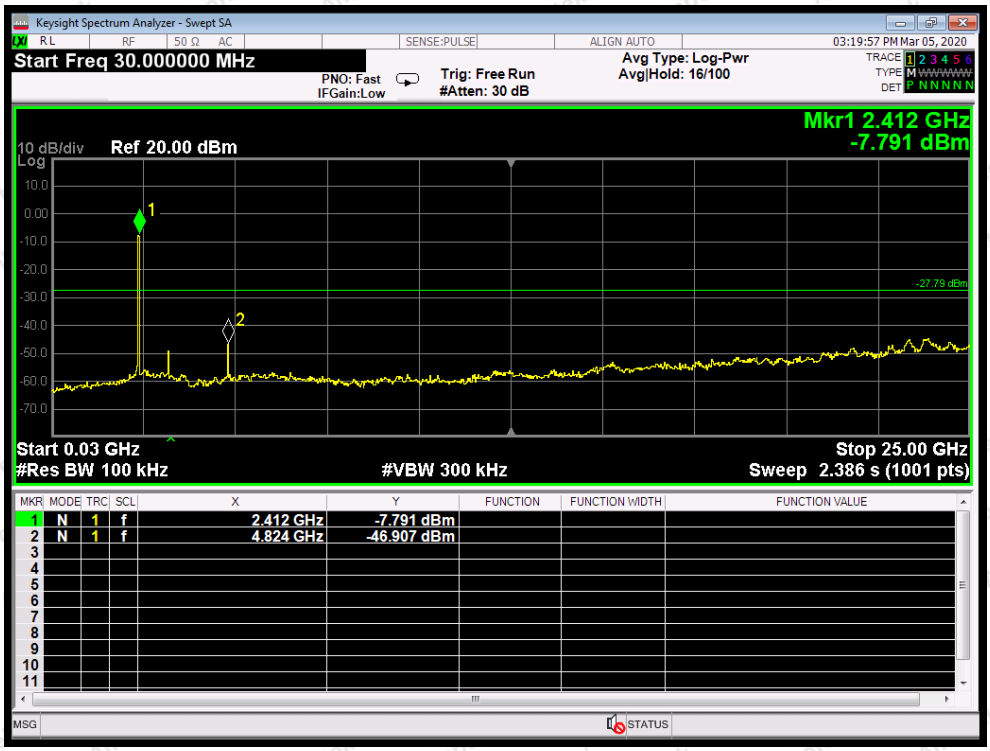

802.11g mode : Lowest



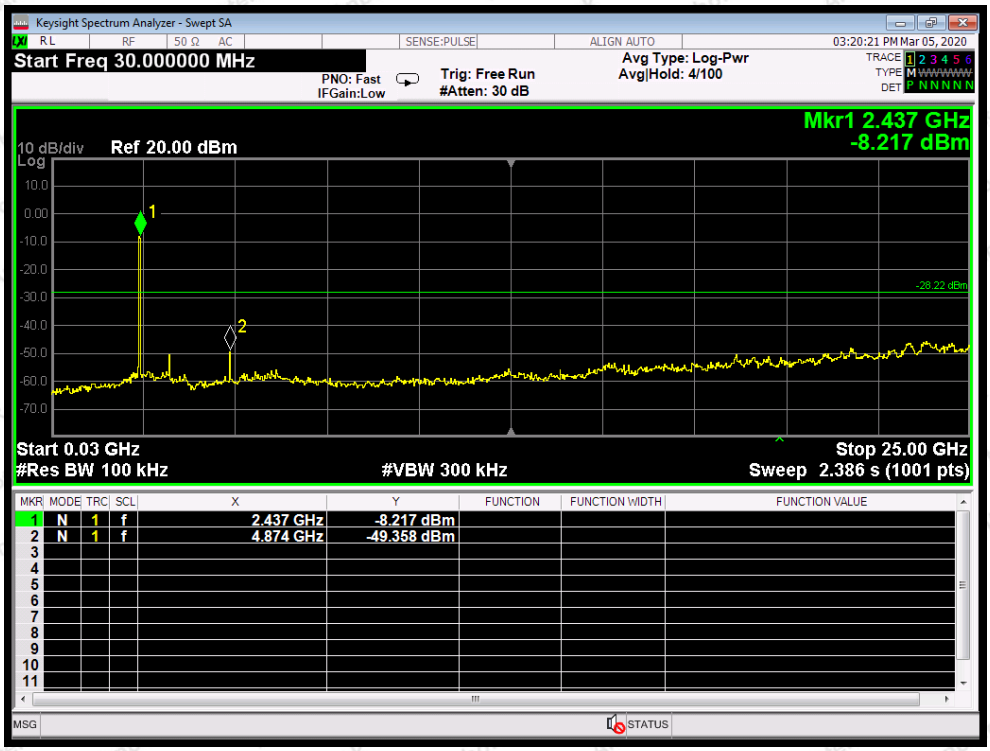

802.11g mode : Middle



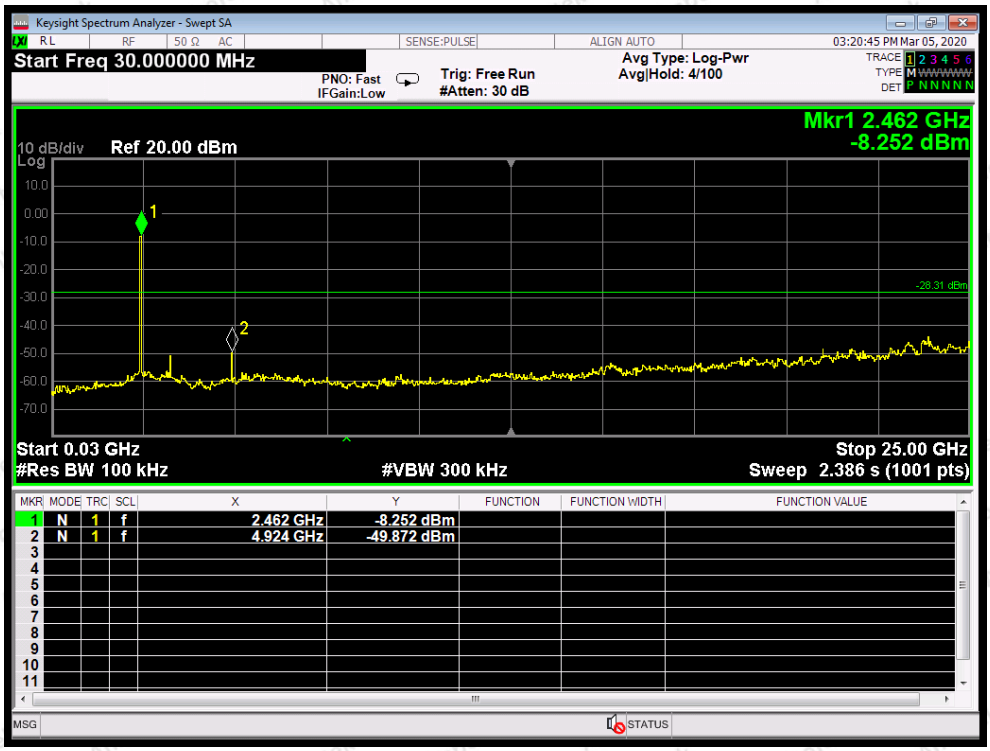

802.11g mode : Highest



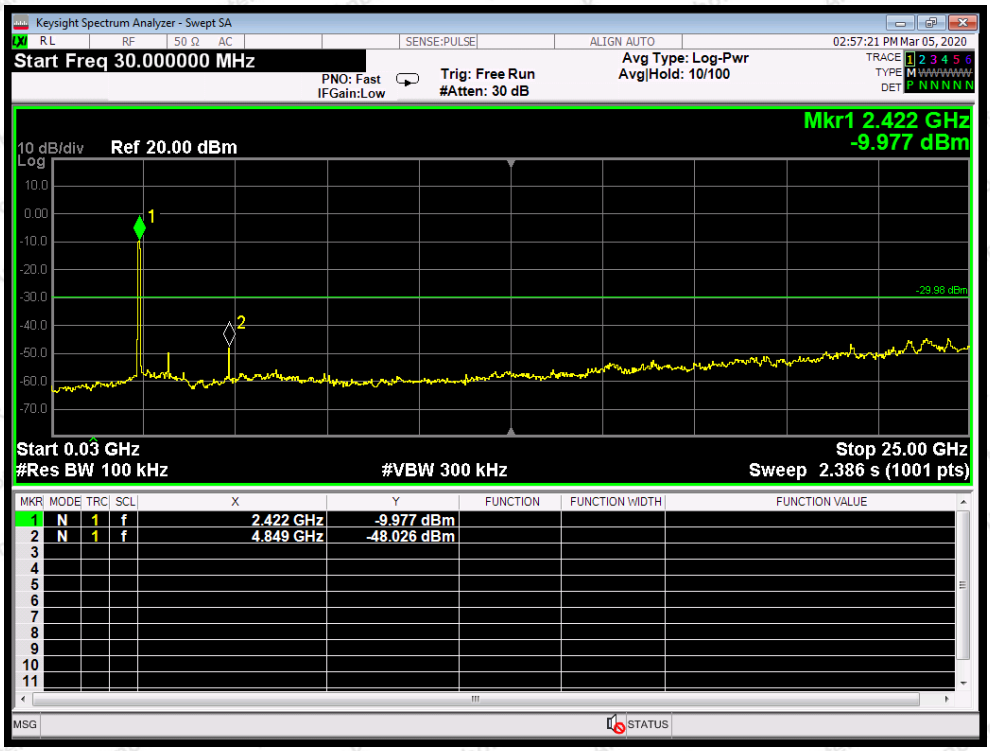

802.11n20 mode : Lowest




802.11n20 mode : Middle




802.11n20 mode : Highest

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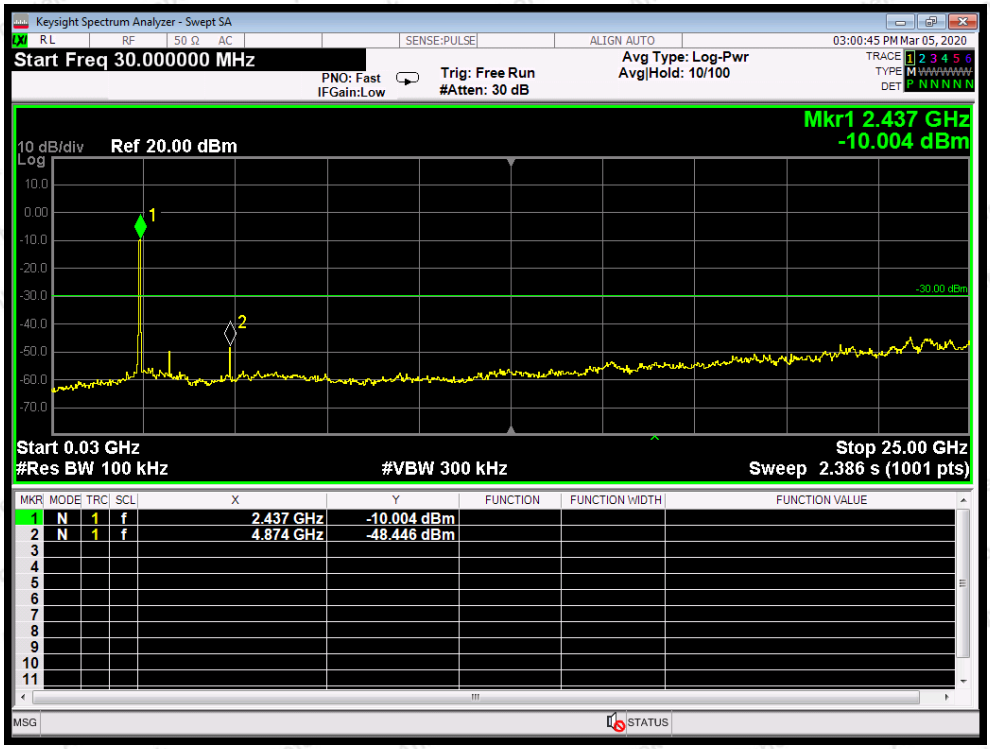


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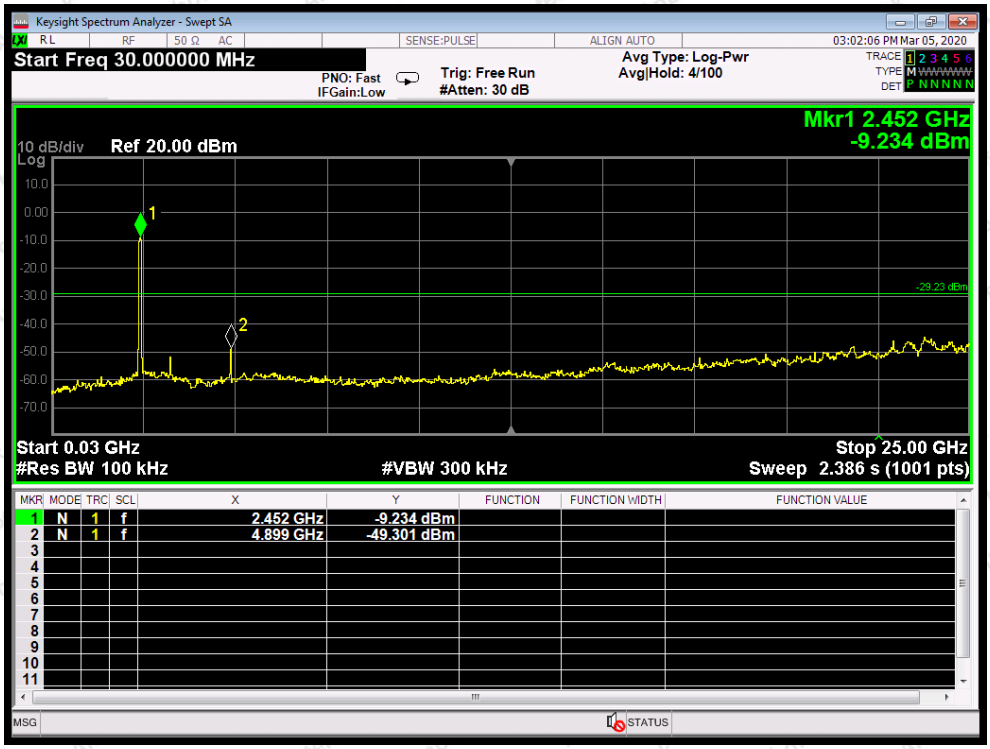
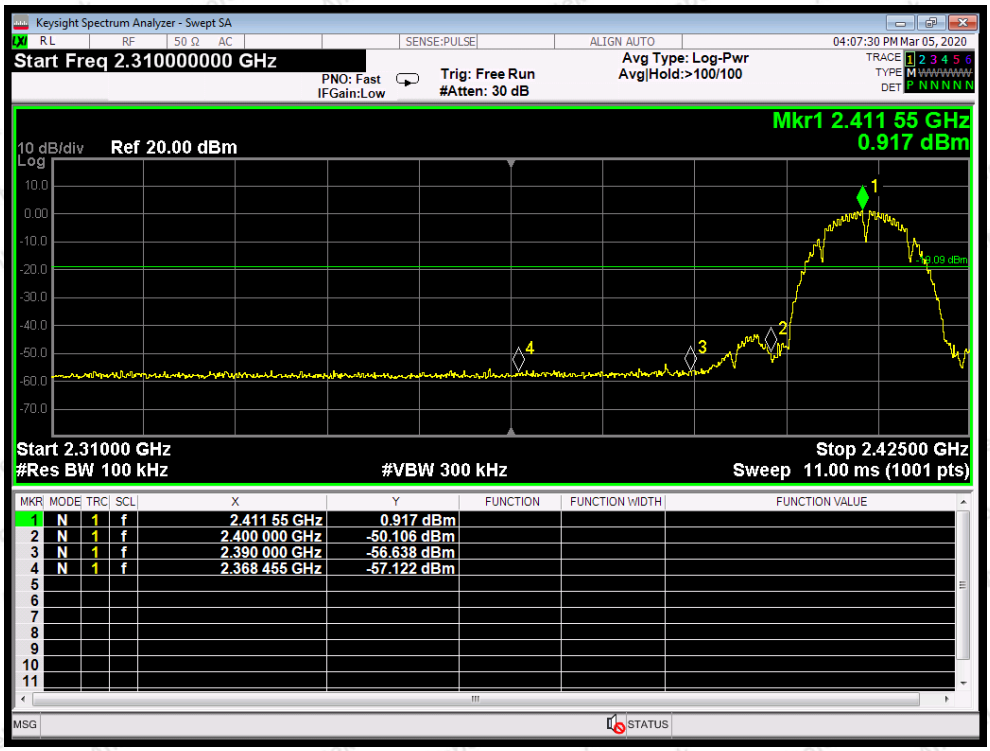
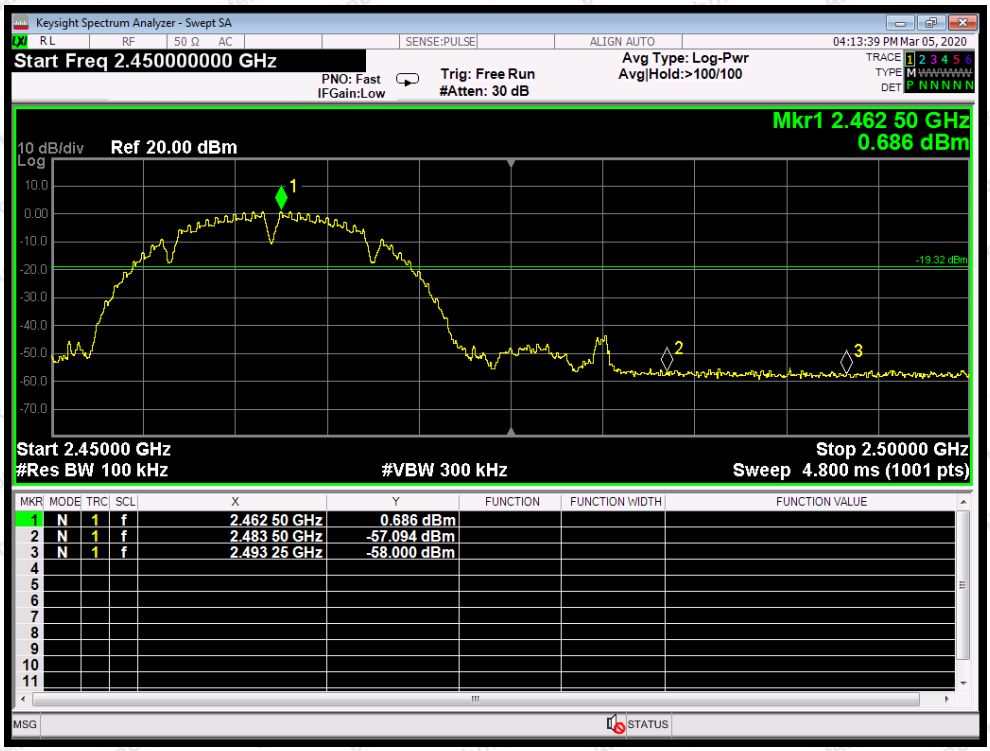



802.11n40 mode : Highest

ANT B:




802.11b mode : Lowest

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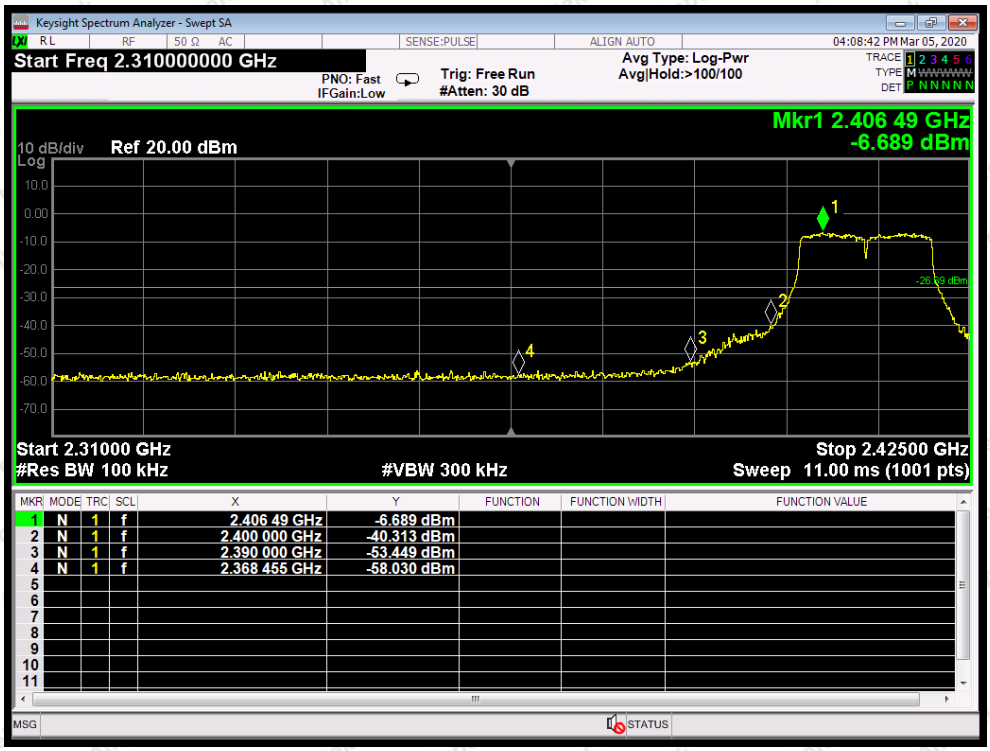


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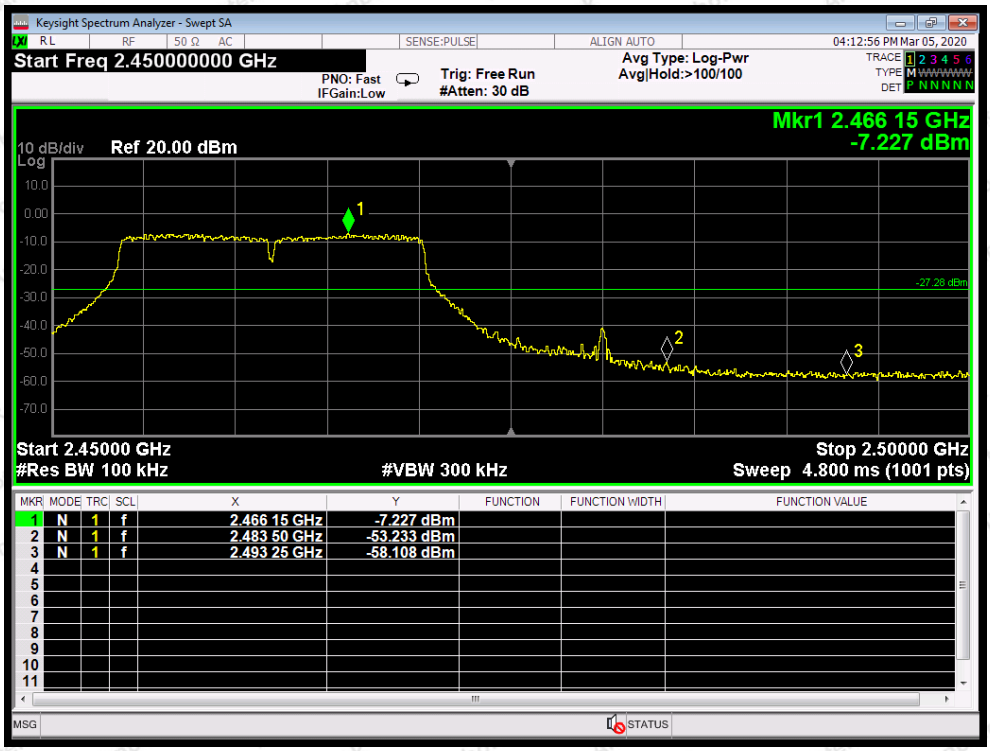


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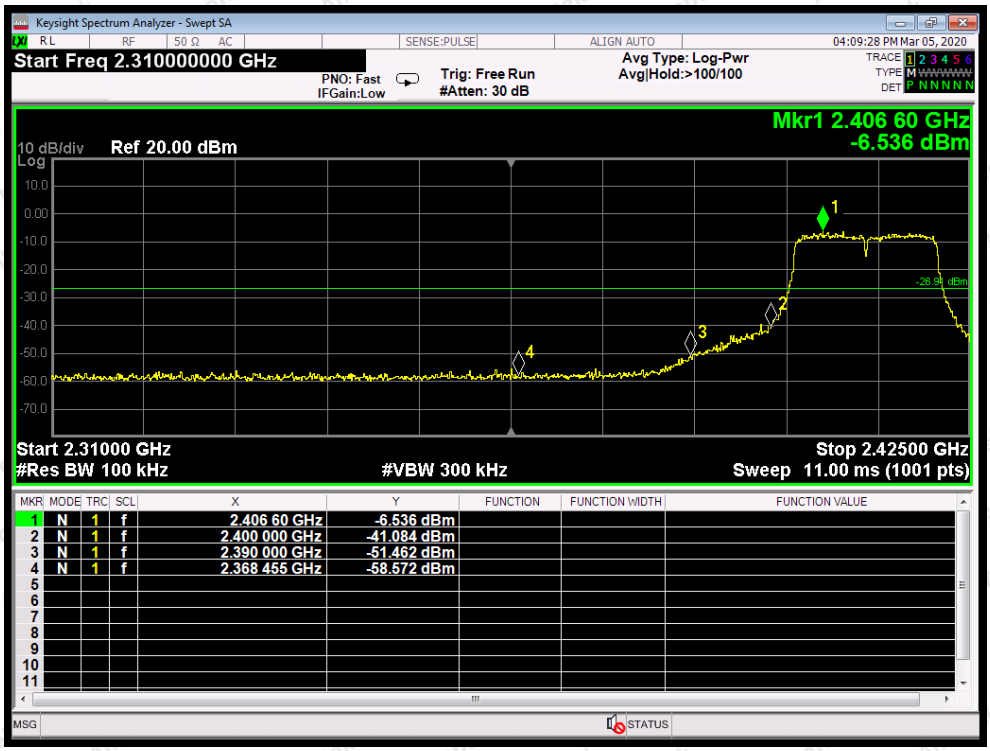
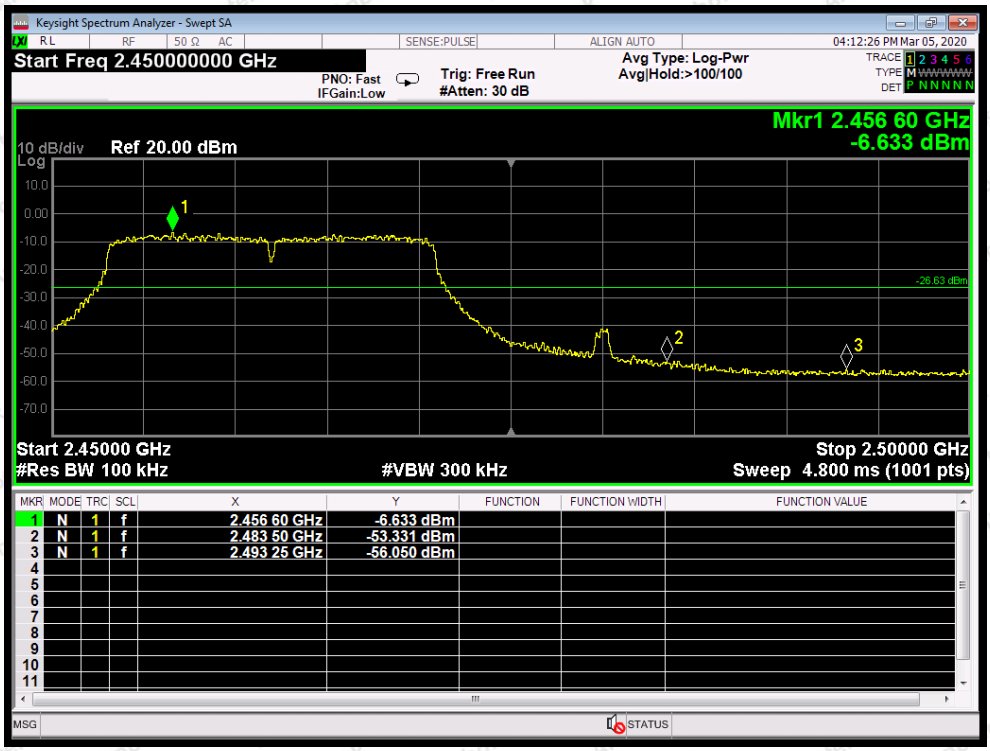
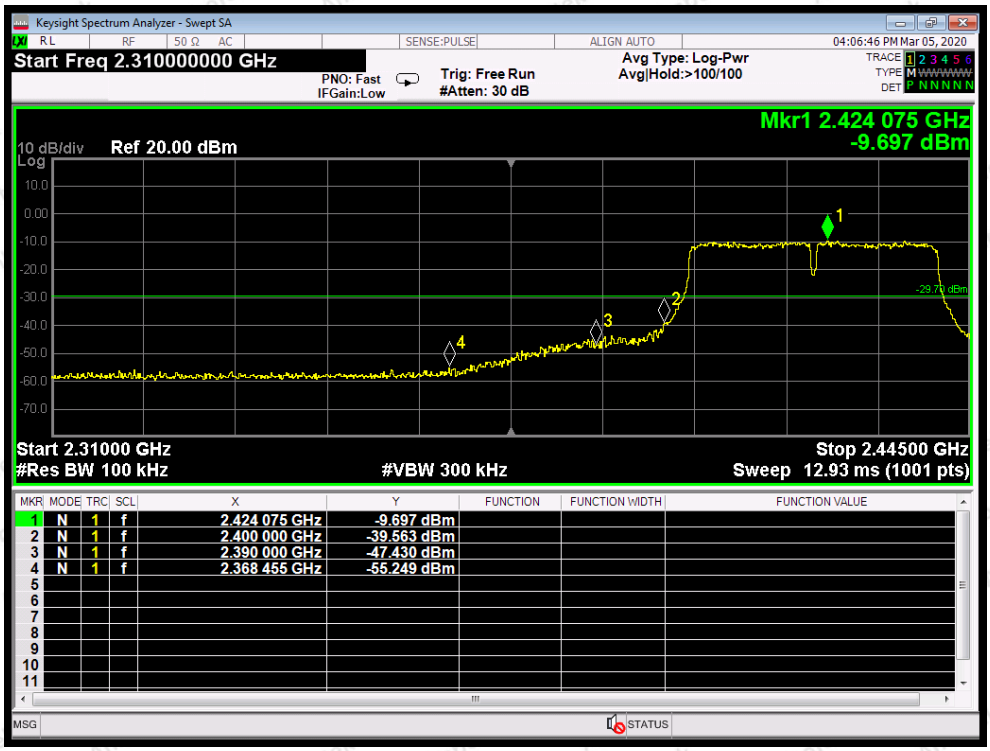


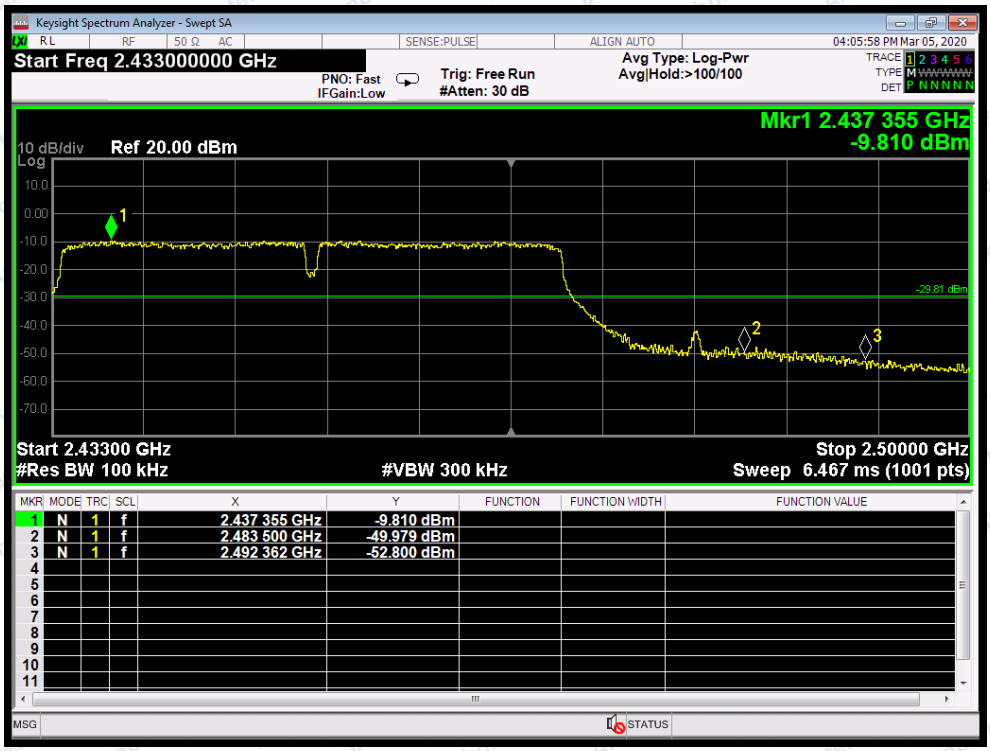

802.11n20 mode : Lowest




802.11n20 mode : Highest

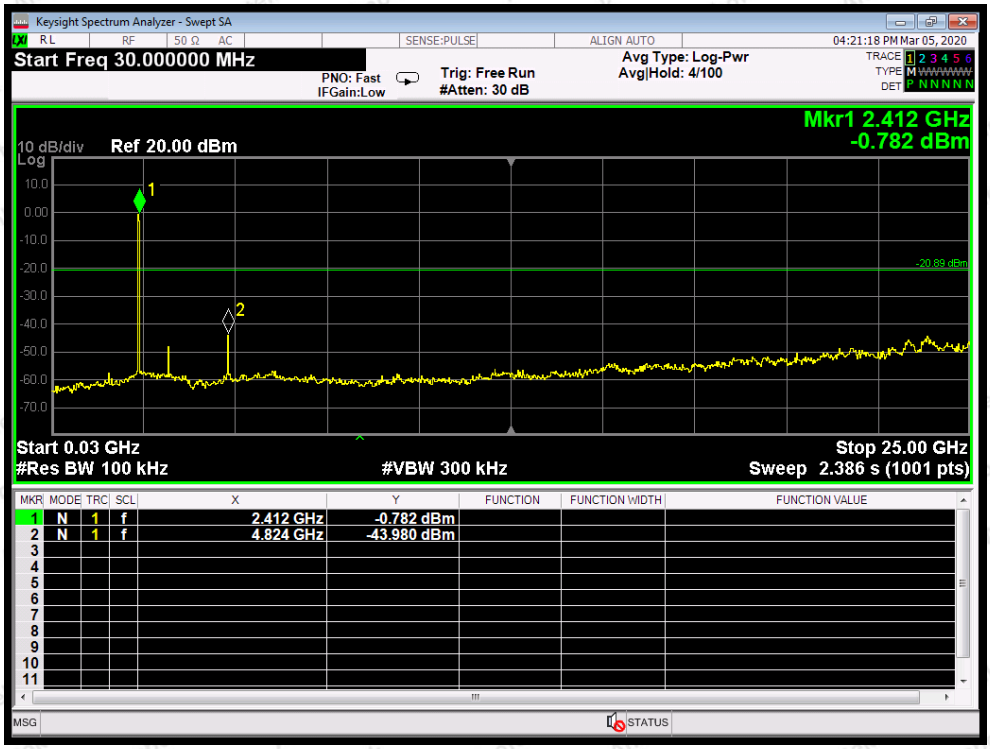



802.11n40 mode : Lowest

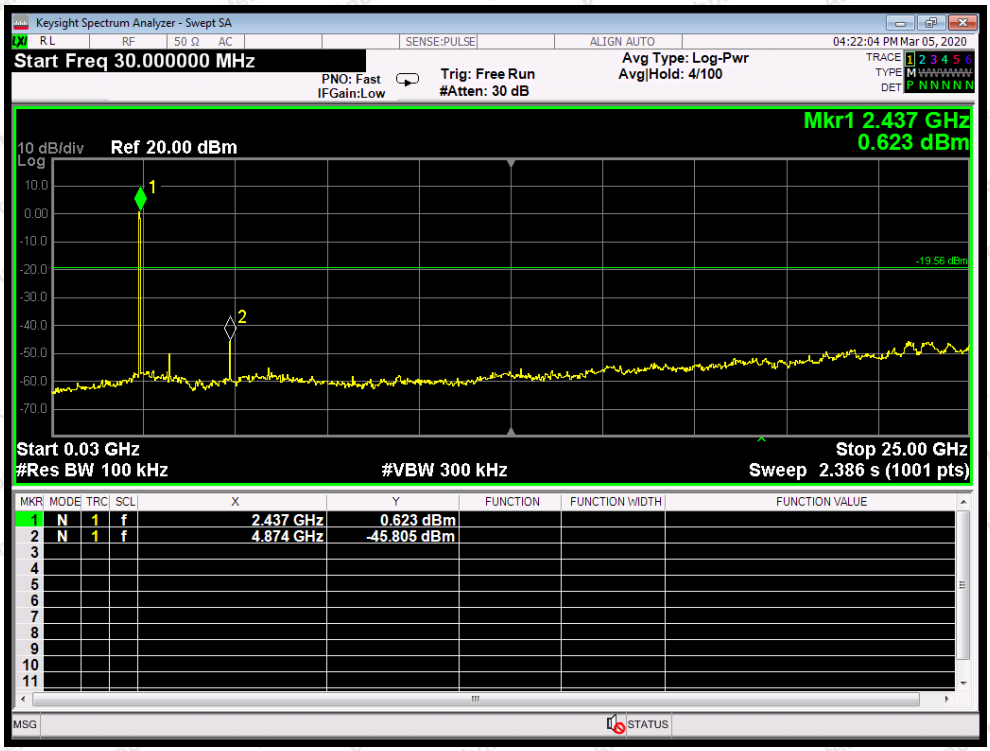



802.11n40 mode : Highest

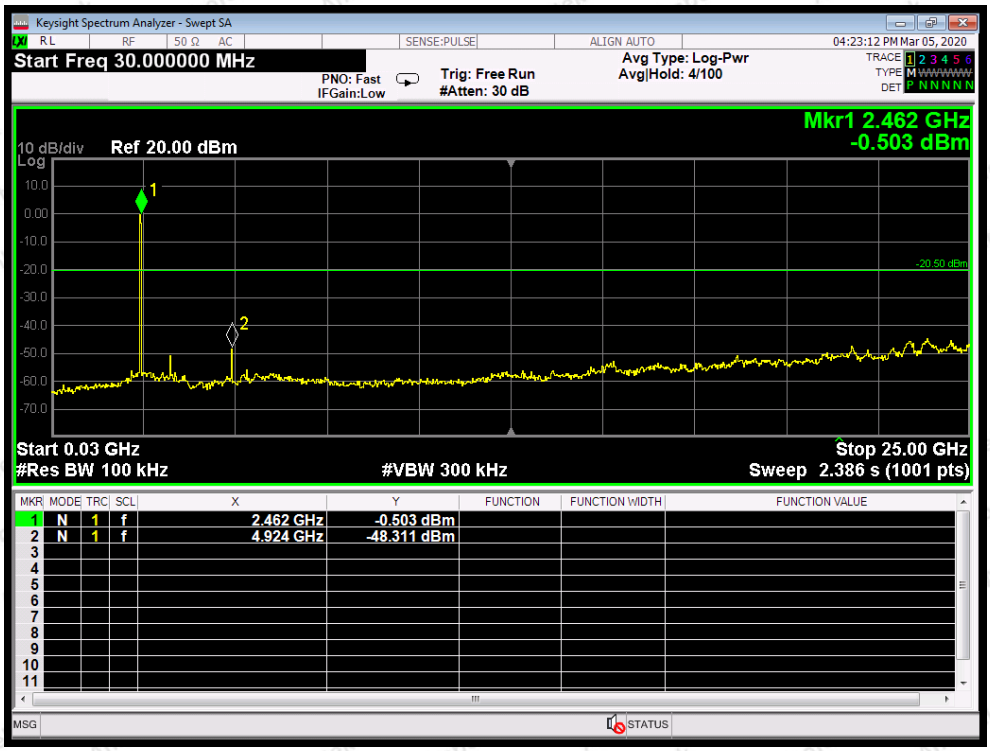
Conducted Emission Method



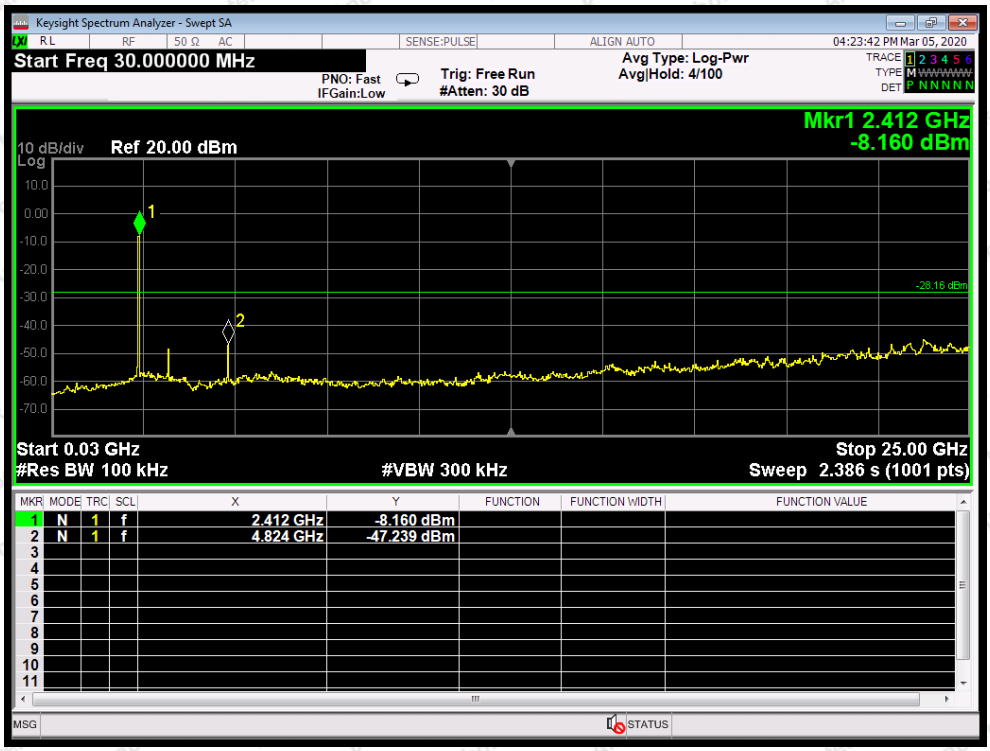

802.11b mode : Lowest



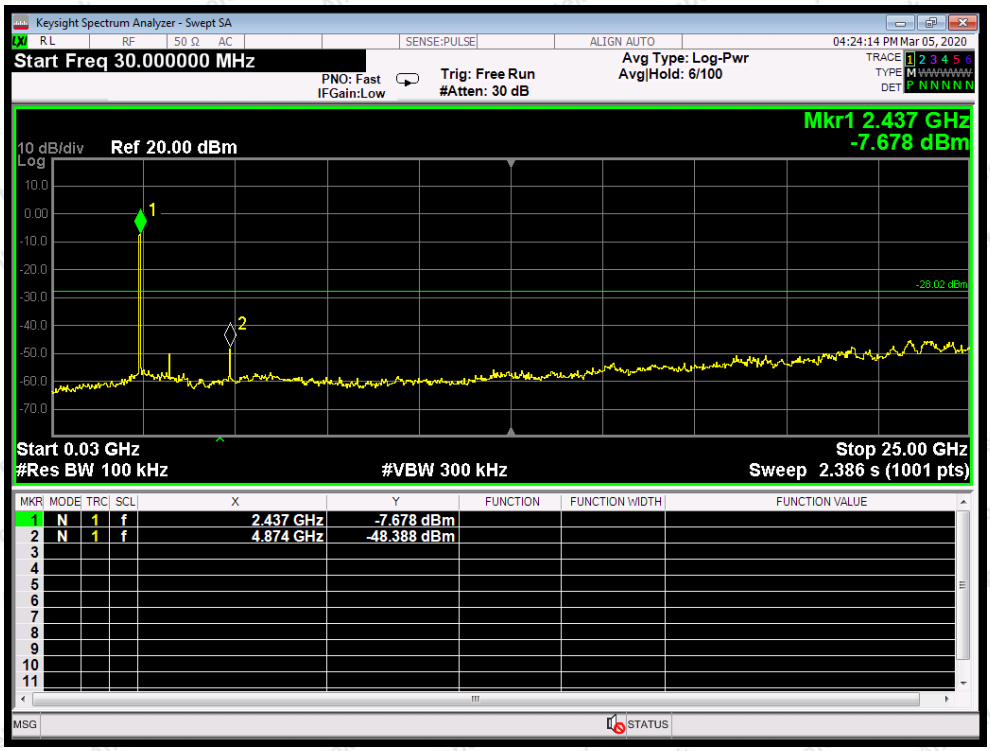

802.11b mode : Middle



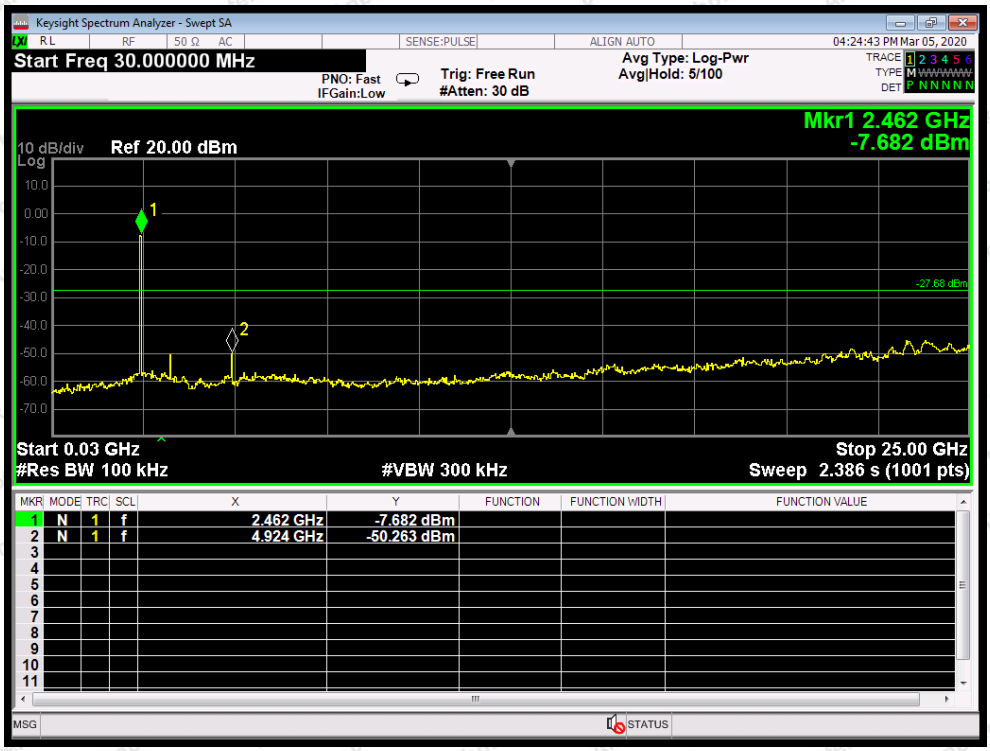

802.11b mode : Highest



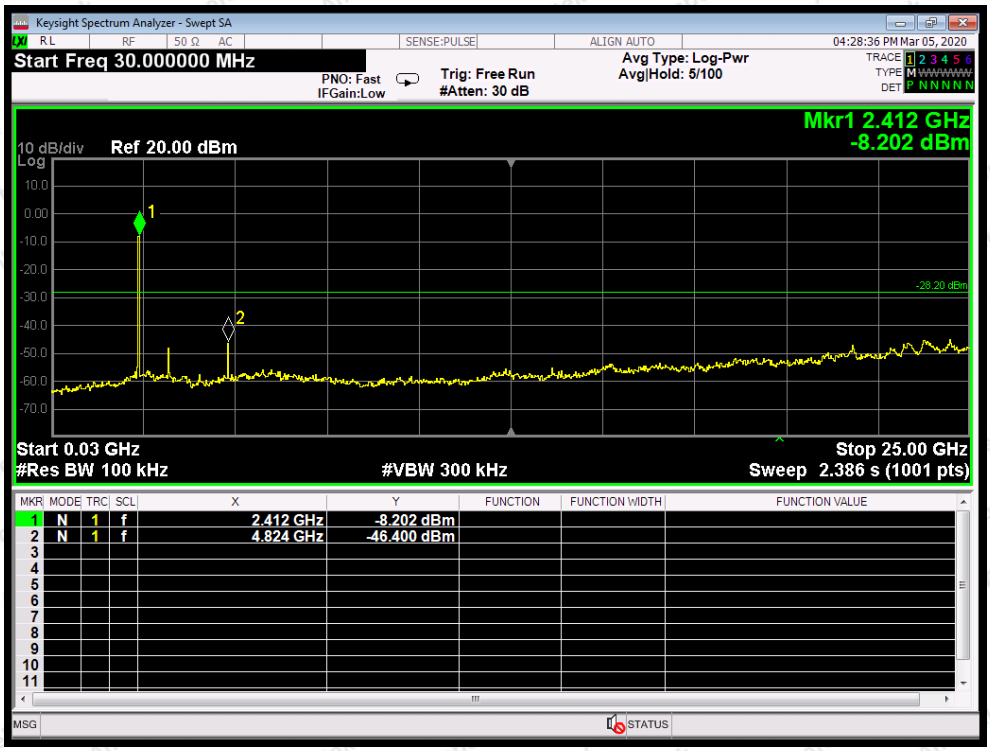

802.11g mode : Lowest



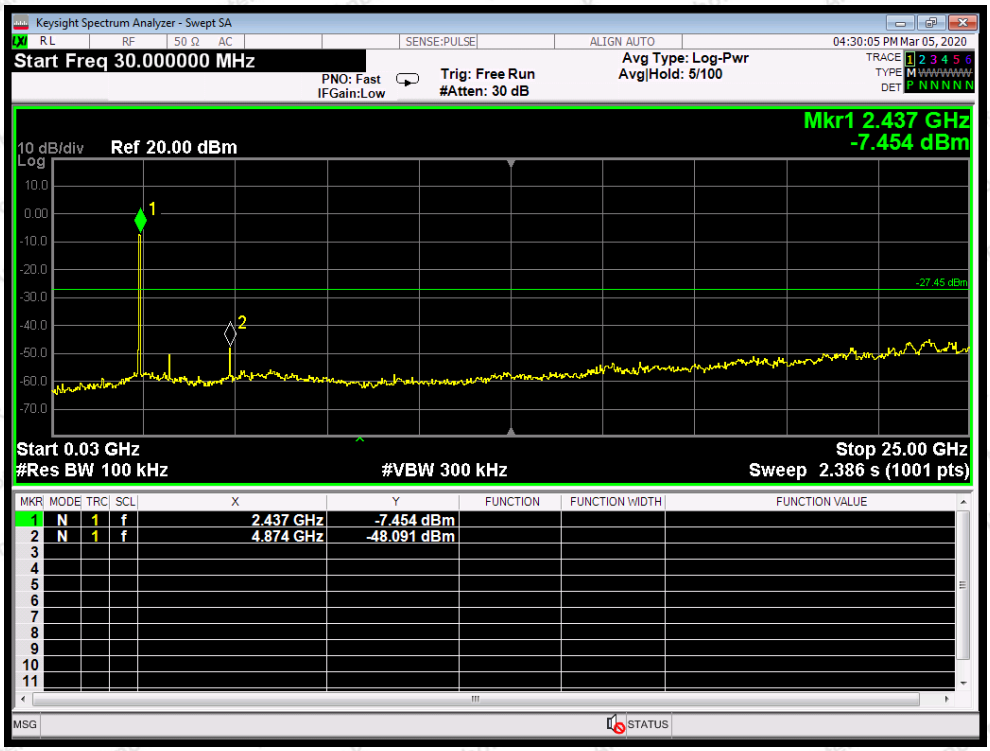

802.11g mode : Middle



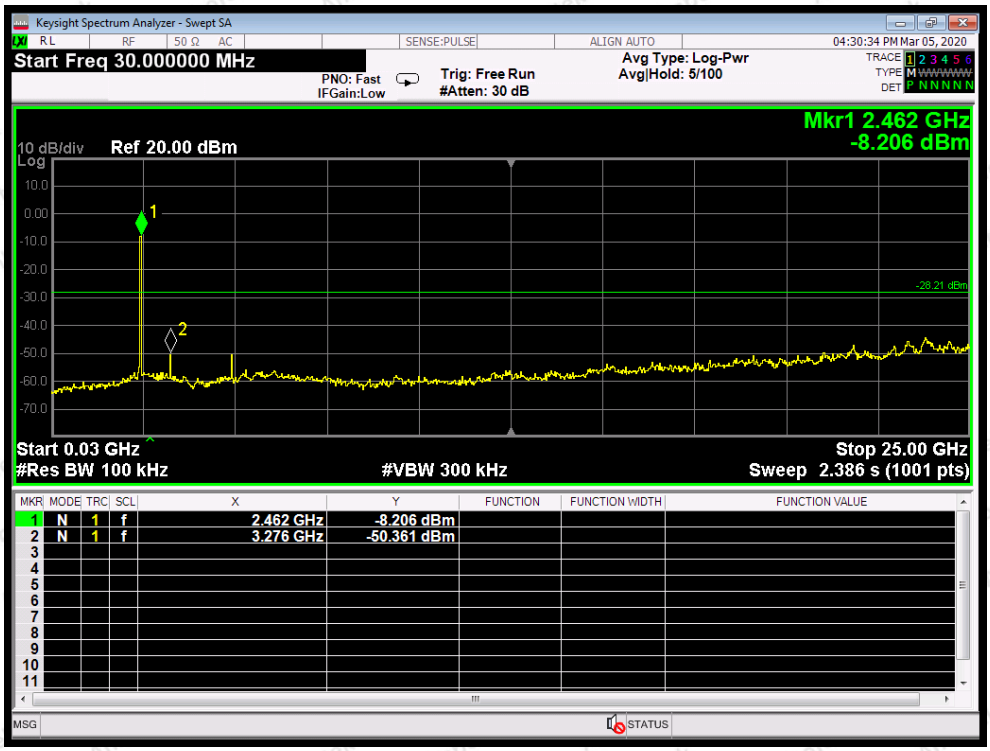

802.11g mode : Highest



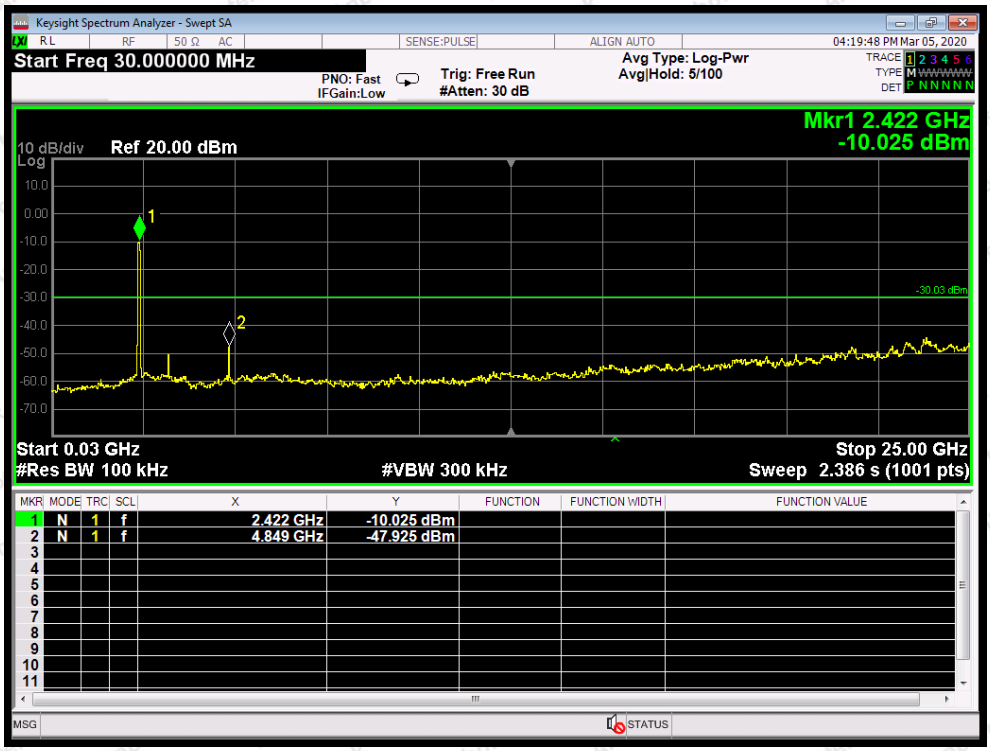

802.11n20 mode : Lowest



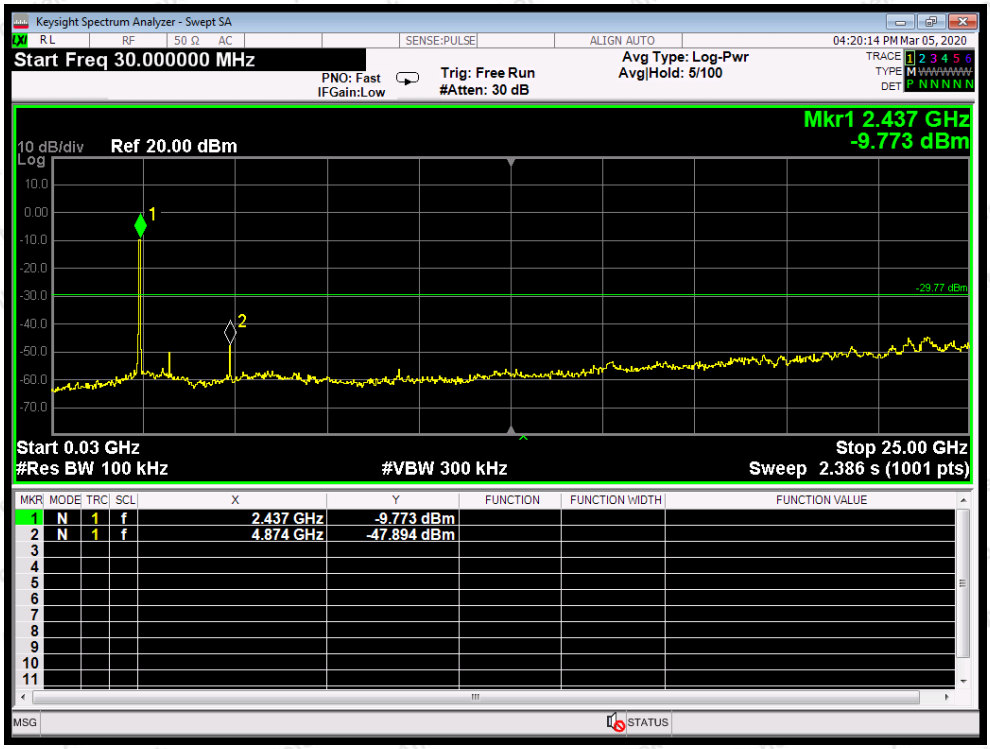

802.11n20 mode : Middle



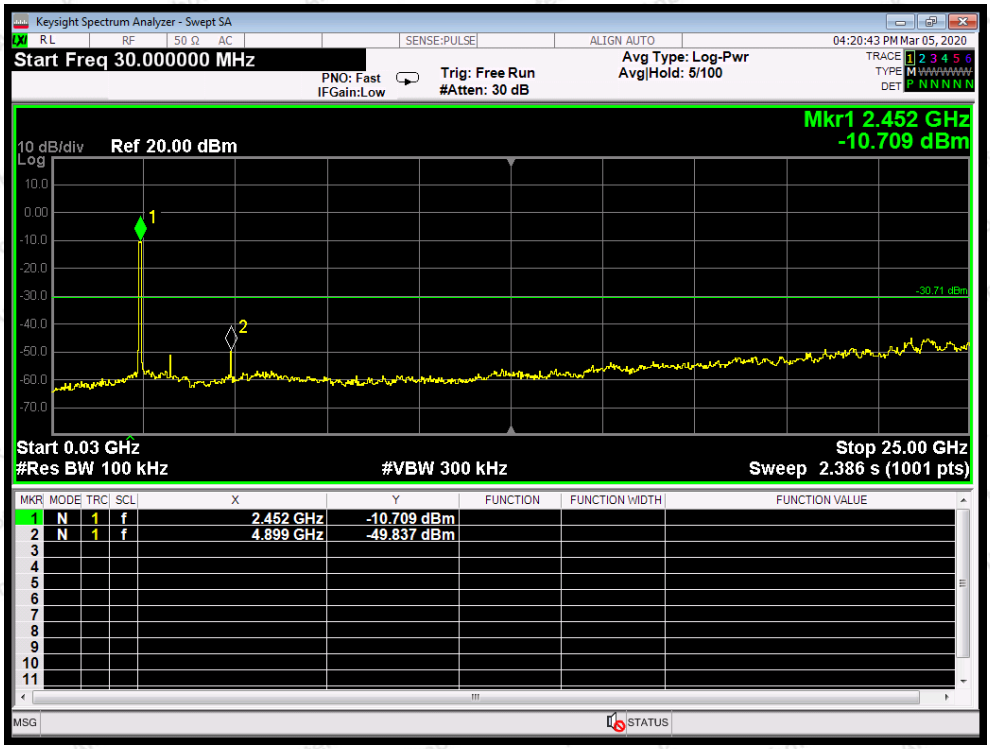

802.11n20 mode : Highest




802.11n40 mode : Lowest




802.11n40 mode : Middle




802.11n40 mode : Highest

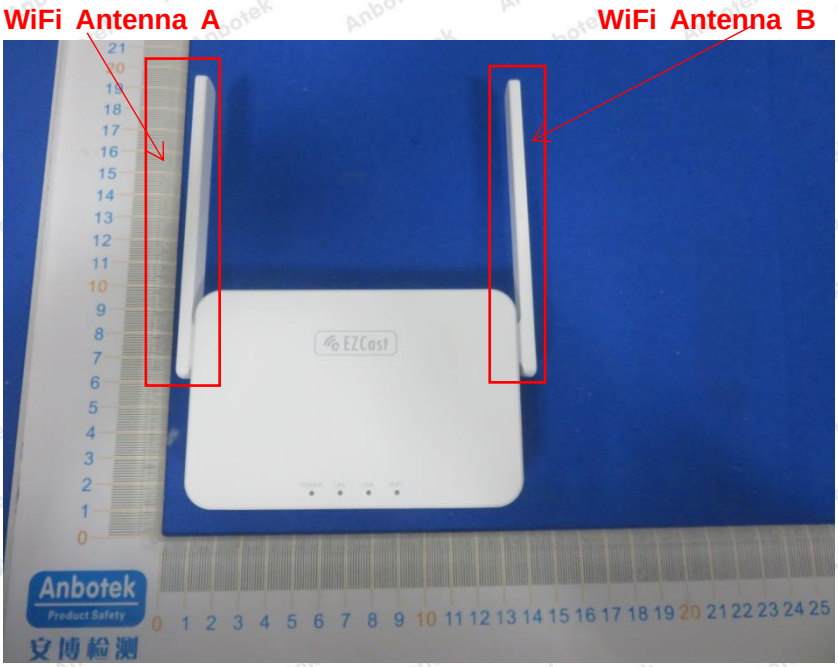
# 9. Antenna Requirement

## 9.1. Test Standard and Requirement

| | |
|---|---|
| Test Standard | FCC Part15 Section 15.203 /247(c) |
| Requirement | 1) 15.203 requirement:<br>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.<br>2) 15.247(c) (1)(i) requirement:<br>Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. |

## 9.2. Antenna Connected Construction

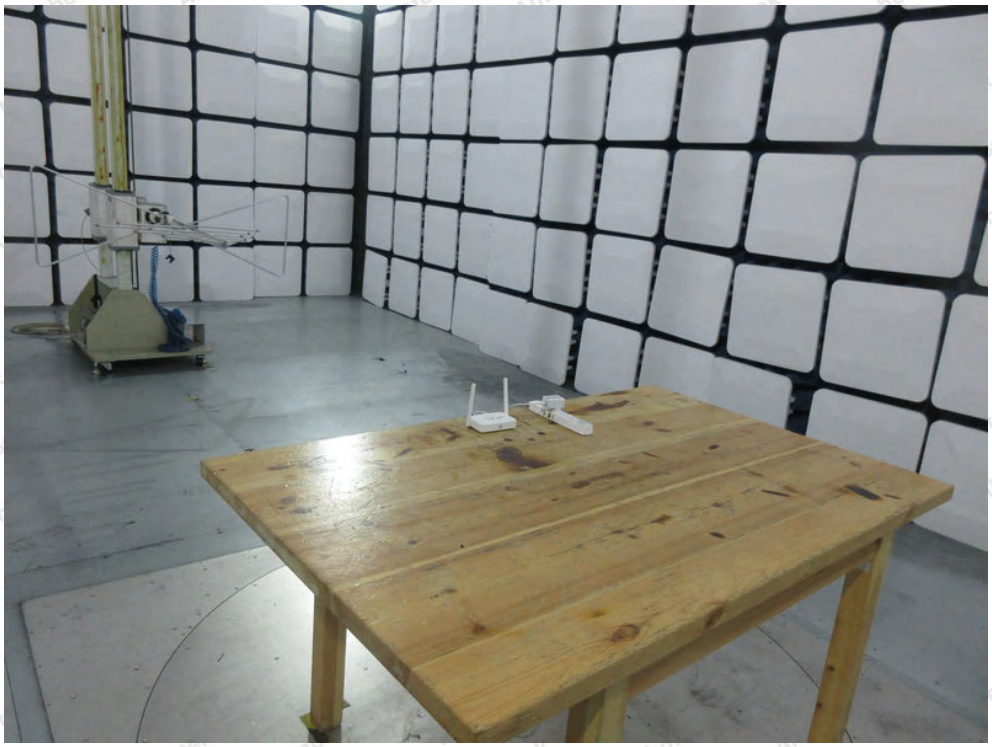
The antenna is a Columnar Antenna which permanently attached, and the best case gain of the antenna is 2 dBi. It complies with the standard requirement.

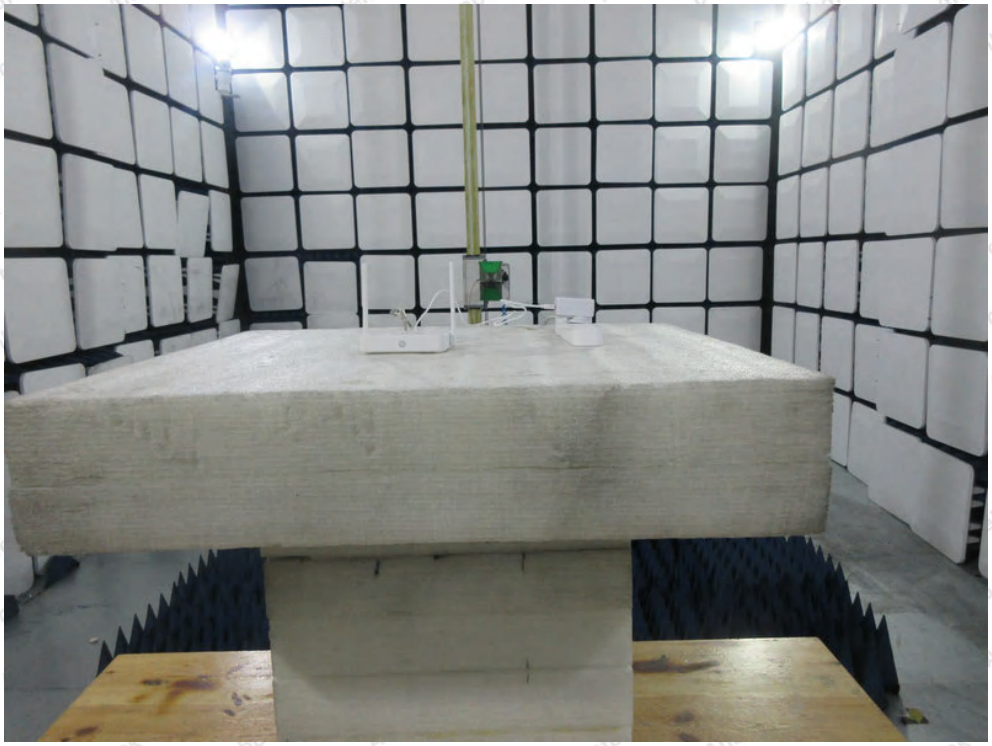


# APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Conducted Emission Measurement

Photo of Radiation Emission Test



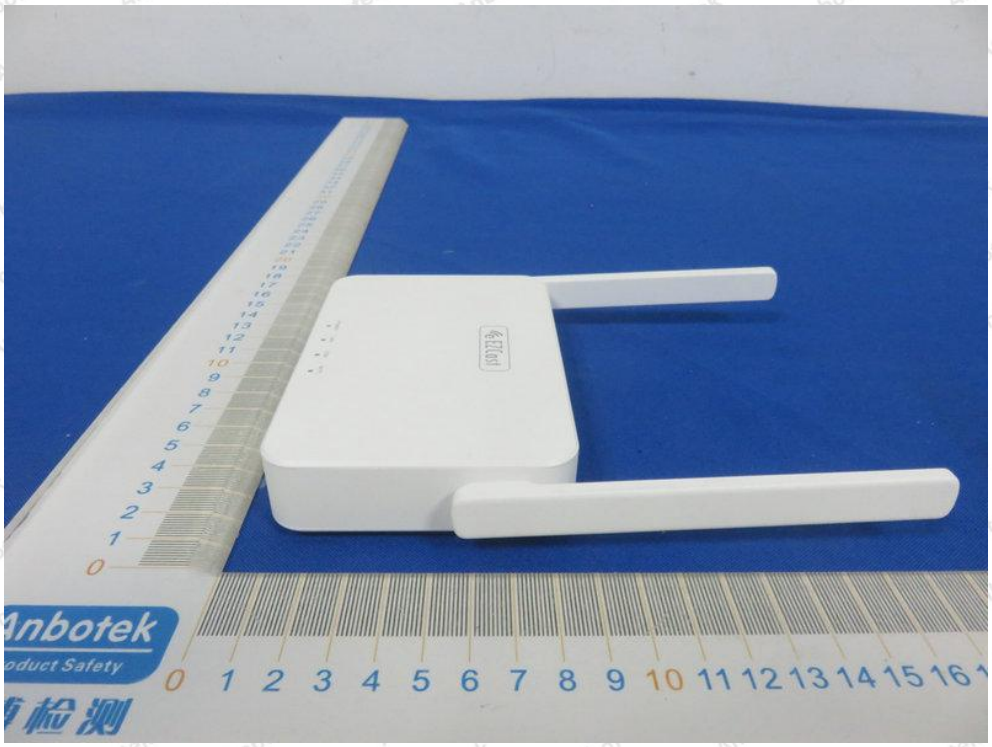


# APPENDIX II -- EXTERNAL PHOTOGRAPH

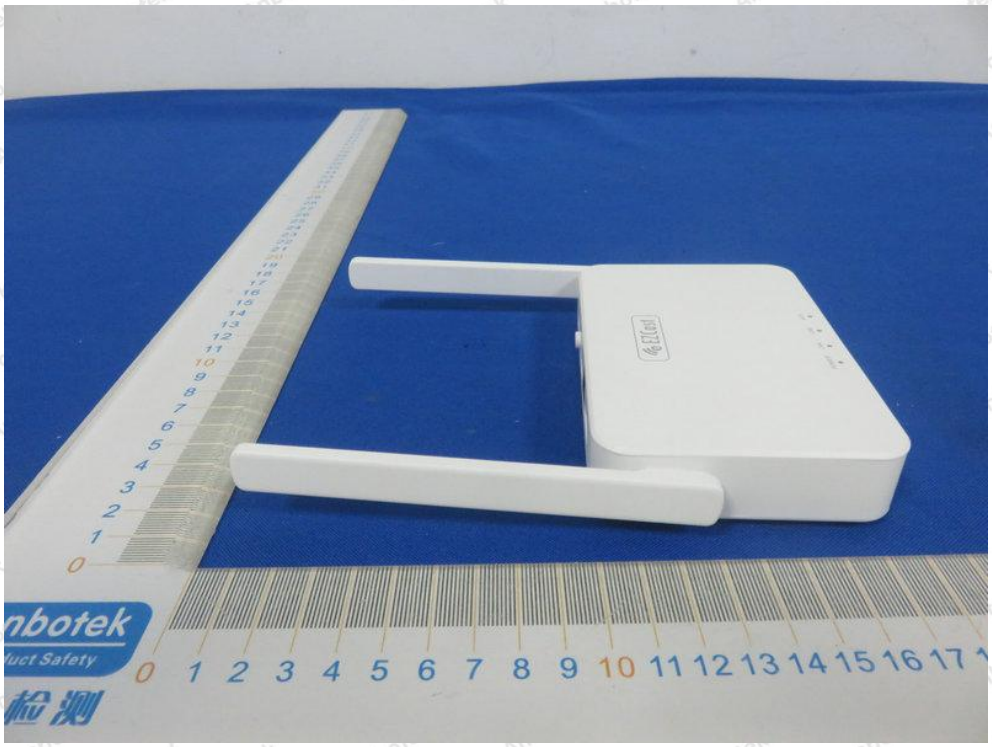
EZCast
Anbotek
Product Safety
安博检测

Anbotek
Product Safety
安博检测

EZCast


EZCast

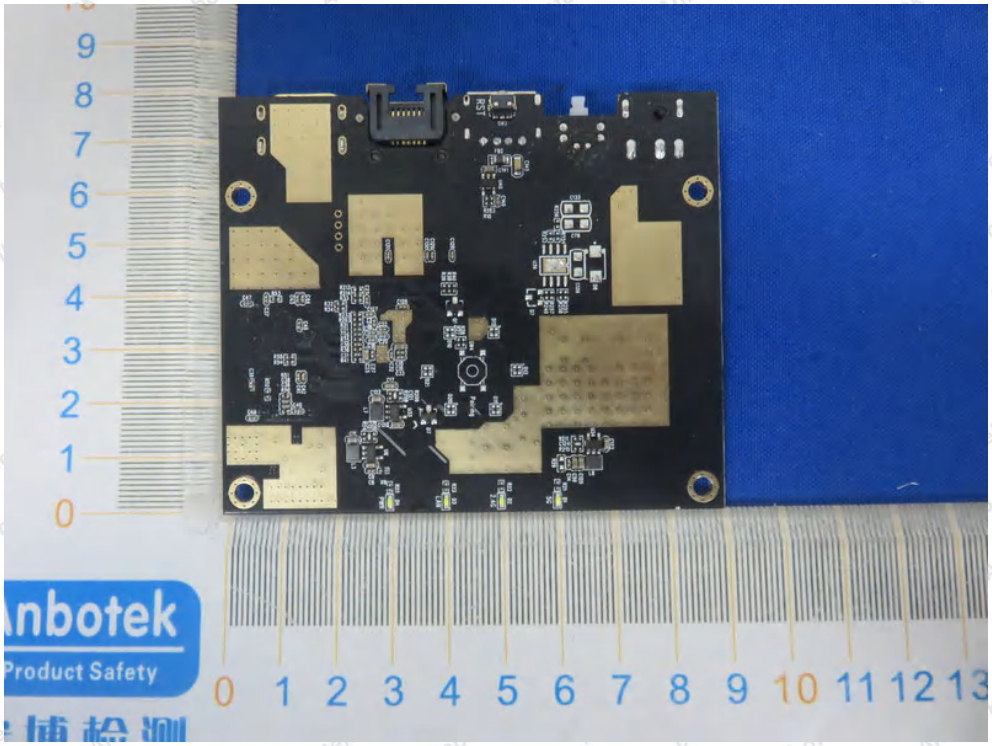
DC IN
POWER
RESET
USB
ETHERNET
HDMI OUT

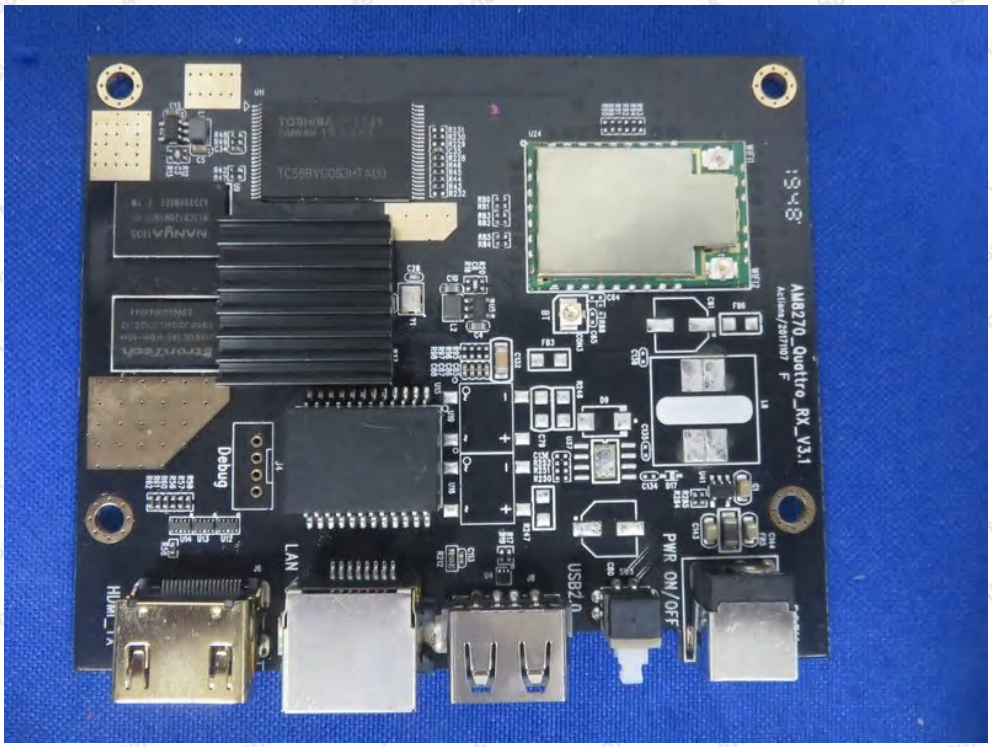


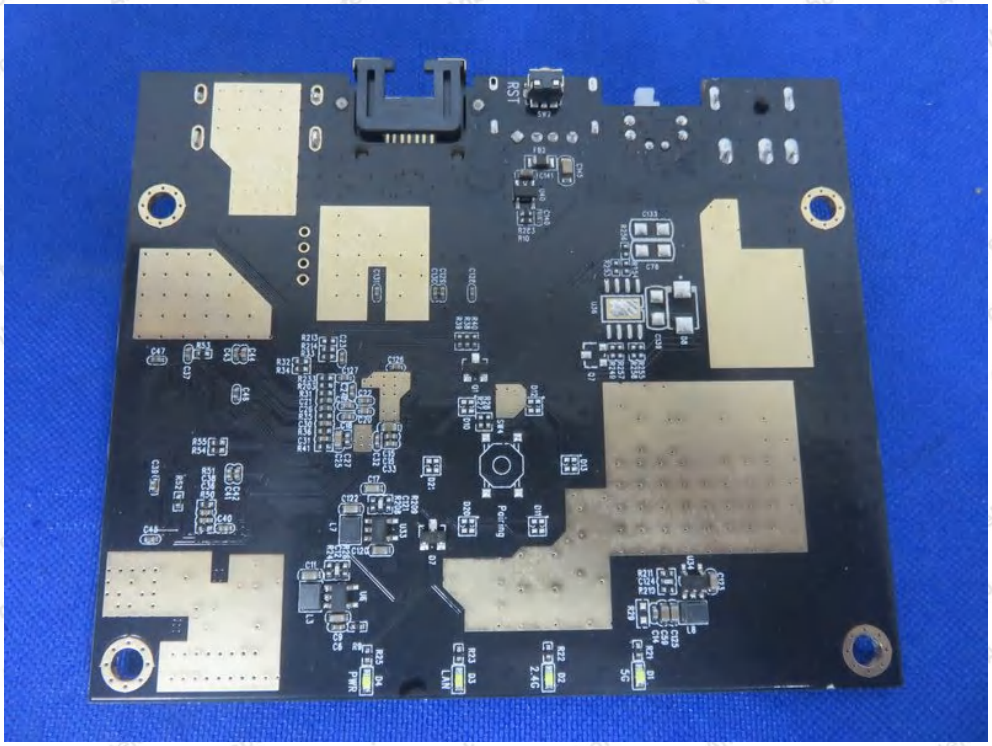
# APPENDIX III -- INTERNAL PHOTOGRAPH

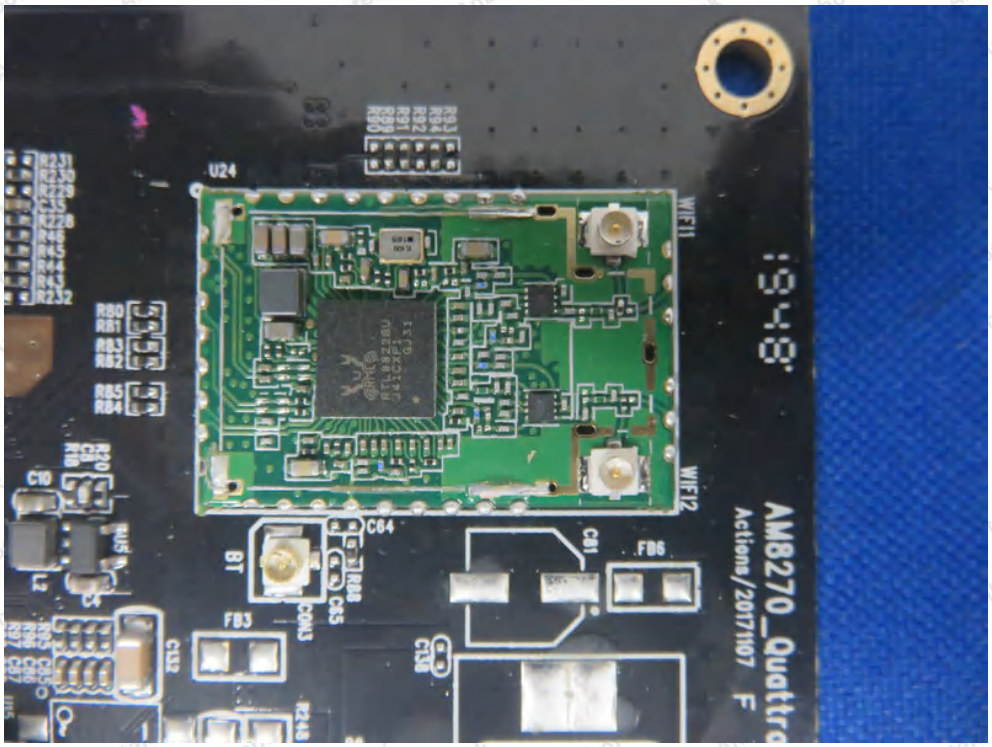
Anbotek
Product Safety
安博检测

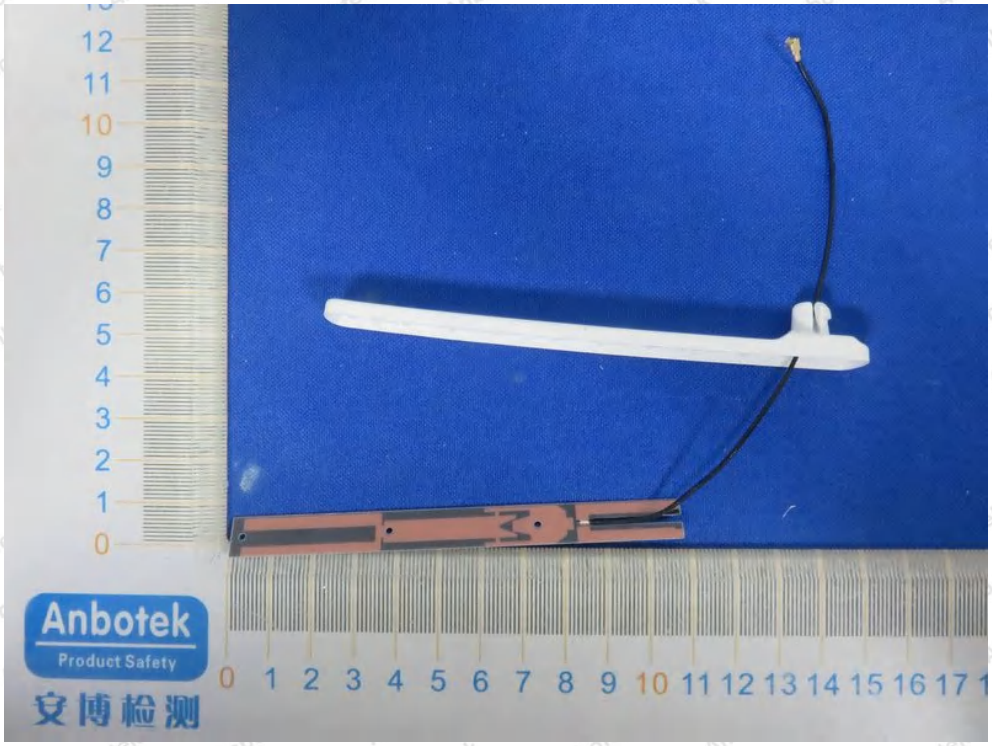
Anbotek
Product Safety


Anbotek
Product Safety


Debug
LAN
USB2.0
PWR ON/OFF
AM8270_Quattro_RX_V3.1




U24
WIFI1
WIFI2
BT
AM8270_Quattro
Actions/20171107 F




---------- End of Report ----------