# CERTIFICATION TEST REPORT

**Report Number. :** 4789793179-E6V2

| | | |
|---|---|---|
| **Applicant** | : | SAMSUNG ELECTRONICS CO., LTD.<br>129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,<br>GYEONGGI-DO, 16677, KOREA |
| **Model** | : | SM-A125U, SM-S127DL, SM-A125U1/DS |
| **FCC ID** | : | A3LSMA125U |
| **EUT Description** | : | GSM/CDMA/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC |
| **Test Standard(s)** | : | FCC 47 CFR PART 15 SUBPART E |

**Date Of Issue:**
March 08, 2021

**Prepared by:**
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IAS ACCREDITED
Testing Laboratory
TL-637

Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V1 | 03/02/21 | Initial issue | Hyunsik Yun |
| V2 | 03/08/21 | Updated to address TCB's question | Hyunsik Yun |

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# 1. ATTESTATION OF TEST RESULTS

| | |
|---|---|
| **COMPANY NAME:** | SAMSUNG ELECTRONICS CO., LTD. |
| **EUT DESCRIPTION:** | GSM/CDMA/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC |
| **MODEL NUMBER:** | SM-A125U, SM-S127DL, SM-A125U1/DS |
| **SERIAL NUMBER:** | R38R100SMVZ (CONDUCTED); R37R100SNBW, R38R100SPAF (RADIATED); |
| **DATE TESTED:** | FEB 10, 2021 –MAR 08, 2021; |

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| CFR 47 Part 15 Subpart E | Pass |

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Korea, Ltd. By:

Junwhan Lee
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:

Hyunsik Yun
Suwon Lab Engineer
UL Korea, Ltd.

# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with following methods.

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. KDB 789033 D02 General UNII Test Procedures New Rules v02r01
4. KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02
5. KDB 905462 D03 UNII Clients Without Radar Detection New Rules v01r02
6. ANSI C63.10-2013.

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

| 218 Maeyeong-ro |
|---|
| ☒ Chamber 1 |
| ☒ Chamber 2 |
| ☒ Chamber 3 |

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf.

# 4. CALIBRATION AND UNCERTAINTY

## 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

## 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

## 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER | UNCERTAINTY |
|---|---|
| Conducted Disturbance, 0.15 to 30 MHz | 3.01 dB |
| Radiated Disturbance, 30 MHz to 1 GHz | 4.26 dB |
| Radiated Disturbance, 1 GHz to 18 GHz | 5.90 dB |
| Radiated Disturbance, 18 GHz to 40 GHz | 5.49 dB |

Uncertainty figures are valid to a confidence level of 95%.

## 4.4. DECISION RULE

Decision rule for statement(s) of conformity is based on Procedure 1, Clause 4.4.2 in IEC Guide 115:2007.


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# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

The EUT is a GSM/CDMA/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC. This test report addresses the NII (UNII 802.11a/n/ac) operational mode.

This report covers the Samsung models SM-A125U, SM-A125U1/DS and SM-S127DL. These models are identical in hardware except SM-A125U1/DS has dual SIM tray and SM-S127DL is not supported CDMA.

With some pre-scan, model SM-A125U was set for final test.

**WiFi operating mode**

| Frequency rage | Mode | ANT1 |
|---|---|---|
| 5GHz (5180 MHz ~ 5825 MHz) | 802.11a SISO | TX/RX |
| | 802.11n SISO | TX/RX |
| | 802.11ac SISO | TX/RX |

## MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted average output power as follows:

**UNII-1**

| Frequency Range [MHz] | Mode | Output Power [dBm] | Output Power [mW] |
|---|---|---|---|
| 5180 - 5240 | 802.11a SISO | 17.72 | 59.16 |
| | 802.11n(HT20) SISO | 18.24 | 66.68 |
| 5190 – 5230 | 802.11n(HT40) SISO | 16.65 | 46.24 |
| 5210 | 802.11ac(VHT80) SISO | 15.23 | 33.34 |

**UNII-2A**

| Frequency Range [MHz] | Mode | Output Power [dBm] | Output Power [mW] |
|---|---|---|---|
| 5260 - 5320 | 802.11a SISO | 18.28 | 67.30 |
| | 802.11n(HT20) SISO | 18.16 | 65.46 |
| 5270 - 5310 | 802.11n(HT40) SISO | 16.42 | 43.85 |
| 5290 | 802.11ac(VHT80) SISO | 15.08 | 32.21 |

**UNII-2C**

| Frequency Range [MHz] | Mode | Output Power [dBm] | Output Power [mW] |
|---|---|---|---|
| 5500 - 5720 | 802.11a SISO | 18.48 | 70.47 |
| | 802.11n(HT20) SISO | 18.41 | 69.34 |
| 5510 - 5710 | 802.11n(HT40) SISO | 16.68 | 46.56 |
| 5530 - 5690 | 802.11ac(VHT80) SISO | 15.42 | 34.83 |

**UNII-3**

| Frequency Range [MHz] | Mode | Output Power [dBm] | Output Power [mW] |
|---|---|---|---|
| 5745 - 5825 | 802.11a SISO | 18.42 | 69.50 |
| | 802.11n(HT20) SISO | 18.15 | 65.31 |
| 5755 - 5795 | 802.11n(HT40) SISO | 16.45 | 44.16 |
| 5775 | 802.11ac(VHT80) SISO | 14.86 | 30.62 |

## 5.2. DESCRIPTION OF AVAILABLE ANTENNAS

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 shall be considered sufficient to comply with the provisions of this section.

**The internal antenna was Permanently attached.**
**Therefore this E.U.T Complies with the requirement of §15.203.**

The radio utilizes a internal antenna, with a maximum gain of:

| Frequency Band [MHz] | Antenna Gain [dBi] |
|---|---|
| UNII 1<br>5150 - 5250 | -2.16 |
| UNII 2A<br>5250 - 5350 | -2.16 |
| UNII 2C<br>5470 - 5725 | -2.05 |
| UNII 3<br>5725 - 5850 | -2.02 |

## 5.3. List of test reduction and modes covering other modes:

The output power on covered modes is equal to or less than one referenced.

| Authorized Frequency Band | | | |
|---|---|---|---|
| **Mode** | **Antenna Stream** | **Mode** | **Covered by** |
| **802.11a** | MIMO | 802.11a 1TX | |
| **802.11n HT20** | | 802.11n HT20 1TX | |
| **802.11ac VHT20** | | 802.11ac VHT20 1TX | 802.11n HT20 1TX |
| **802.11n HT40** | | 802.11n HT40 1TX | |
| **802.11ac VHT40** | | 802.11ac VHT40 1TX | 802.11n HT40 1TX |
| **802.11ac VHT80** | | 802.11ac VHT80 1TX | |

## 5.4. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1GHz and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Radiated emission above 1GHz was performed with the EUT set to transmit low/mid/high channels.

The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that Z orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z orientation.

Based on the baseline scan, the worst-case data rates were:

802.11a mode: 6 Mbps 1Tx
802.11n HT20 mode: MCS0 1Tx
802.11n HT40 mode: MCS0 1Tx
802.11ac VHT80 mode: MCS0 1Tx

Note : All radiated and power line conducted tests were performed connected with charger for evaluation of worst case mode.

## 5.5. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| Support Equipment List | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| Charger | SAMSUNG | EP-TA200 | R37NBH409C3SE3 | N/A |
| Data Cable | SAMSUNG | EP-DR140AWE | N/A | N/A |
| Earphone | SAMSUNG | EHS64AVFWE | N/A | N/A |

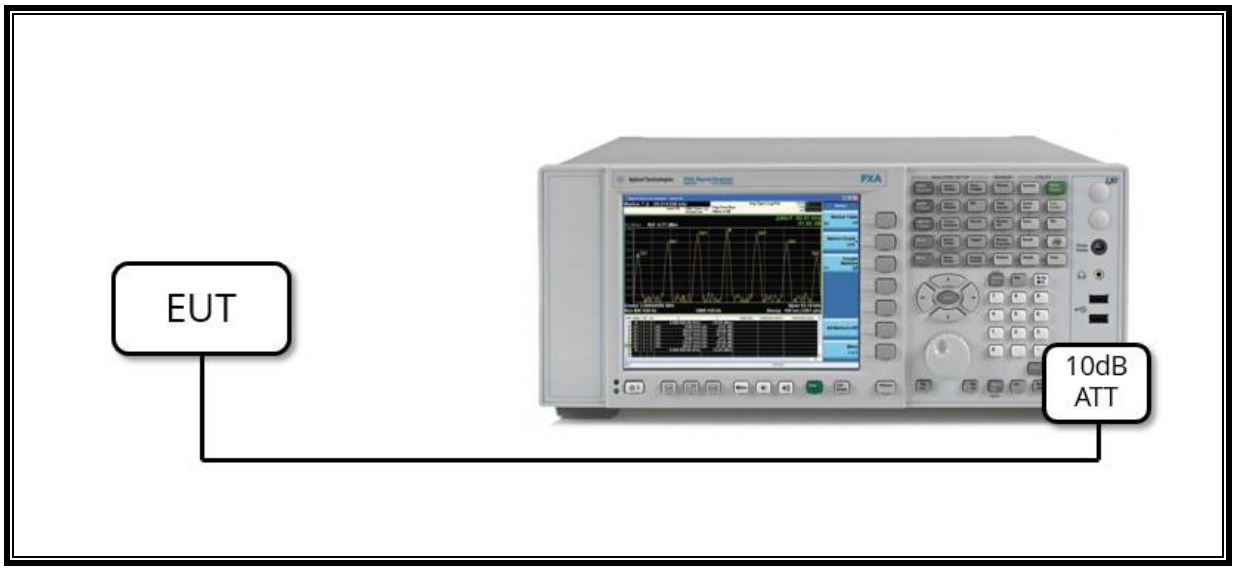
**I/O CABLE**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No.** | **Port** | **# of identical ports** | **Connector Type** | **Cable Type** | **Cable Length (m)** | **Remarks** |
| 1 | DC Power | 1 | C Type | Shielded | 1.0 m | N/A |
| 2 | Audio | 2 | AUX | Unshielded | 1.1 m | N/A |

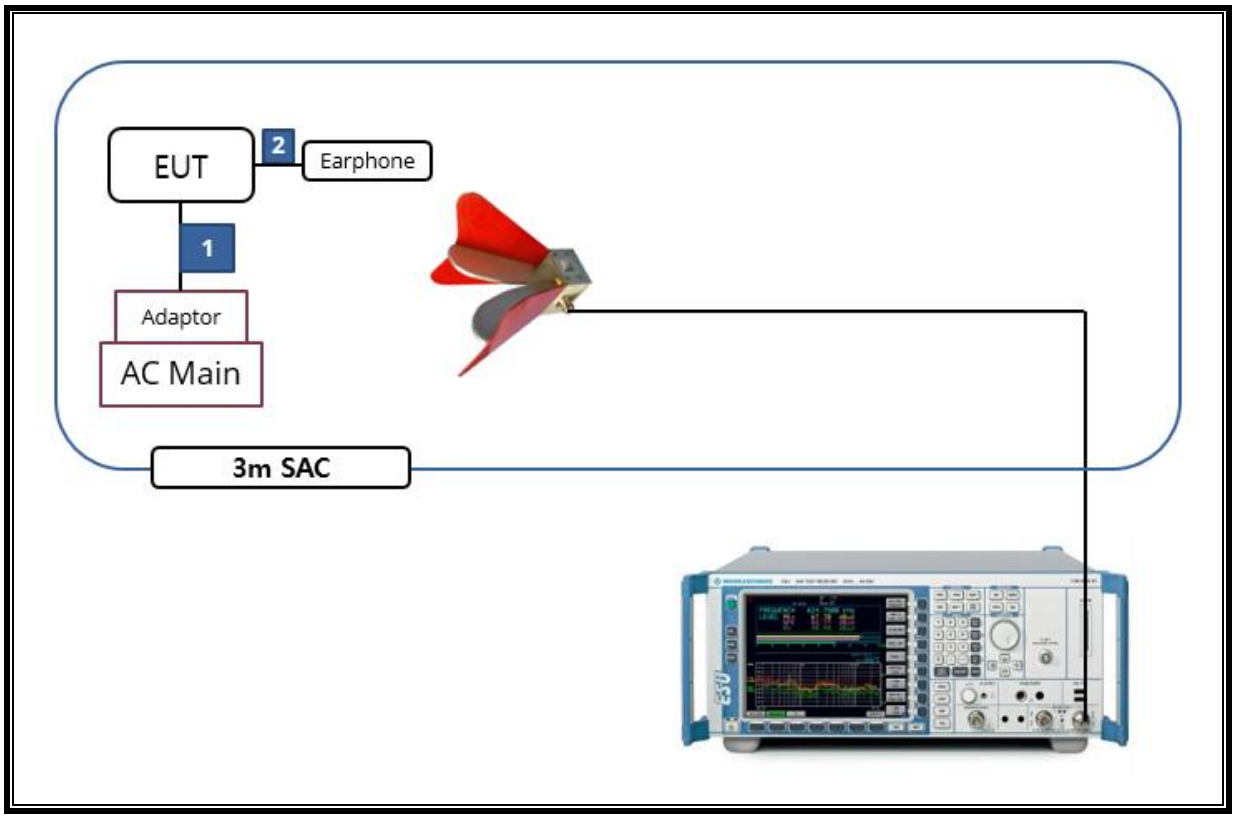
**TEST SETUP**

The EUT is a stand-alone unit during the tests.
Test software exercised the EUT to enable NII mode.

**SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)**




**SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)**



# 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| Test Equipment List | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **S/N** | **Cal Due** |
| Antenna, Bilog, 30MHz-1GHz | SCHWARZBECK | VULB9163 | 750 | 08-19-22 |
| Antenna, Bilog, 30MHz-1GHz | SCHWARZBECK | VULB9163 | 749 | 08-13-22 |
| Antenna, Bilog, 30MHz-1GHz | SCHWARZBECK | VULB9163 | 845 | 08-13-22 |
| Antenna, Horn, 18 GHz | ETS | 3115 | 00167211 | 07-27-22 |
| Antenna, Horn, 18 GHz | ETS | 3115 | 00161451 | 08-15-22 |
| Antenna, Horn, 18 GHz | ETS | 3117 | 00168724 | 07-27-22 |
| Antenna, Horn, 18 GHz | ETS | 3117 | 00168717 | 08-15-22 |
| Antenna, Horn, 18 GHz | ETS | 3117 | 00218957 | 01-15-23 |
| Antenna, Horn, 40 GHz | ETS | 3116C | 00166155 | 01-15-23 |
| Antenna, Horn, 40 GHz | ETS | 3116C | 00168645 | 10-02-21 |
| Preamplifier | ETS | 3116C-PA | 00168841 | 08-06-21 |
| Preamplifier, 1000 MHz | Sonoma | 310N | 341282 | 08-03-21 |
| Preamplifier, 1000 MHz | Sonoma | 310N | 351741 | 08-03-21 |
| Preamplifier, 1000 MHz | Sonoma | 310N | 370599 | 08-06-21 |
| Preamplifier, 18 GHz | Miteq | AFS42-00101800-25-S-42 | 1876511 | 08-03-21 |
| Preamplifier, 18 GHz | Miteq | AFS42-00101800-25-S-42 | 1896138 | 08-03-21 |
| Preamplifier, 18 GHz | Miteq | AFS42-00101800-25-S-42 | 2029169 | 08-04-21 |
| Spectrum Analyzer, 44 GHz | Agilent / HP | N9030A | MY54170614 | 08-05-21 |
| Spectrum Analyzer, 44 GHz | Agilent / HP | N9030A | MY54490312 | 08-05-21 |
| Spectrum Analyzer, 43.5 GHz | R&S | FSW43 | 104089 | 08-06-21 |
| EMI Test Receiver, 44 GHz | R&S | ESW44 | 101590 | 08-04-21 |
| Average Power Sensor | Agilent / HP | U2000 | MY54270007 | 08-05-21 |
| Attenuator | PASTERNACK | PE7087-10 | A001 | 08-03-21 |
| Attenuator | PASTERNACK | PE7087-10 | A008 | 08-03-21 |
| Attenuator | PASTERNACK | PE7004-10 | 2 | 08-04-21 |
| Attenuator | PASTERNACK | PE7087-10 | A009 | 08-05-21 |
| EMI Test Receive, 40 GHz | R&S | ESU40 | 100439 | 08-03-21 |
| EMI Test Receive, 40 GHz | R&S | ESU40 | 100457 | 08-03-21 |
| EMI Test Receive, 3 GHz | R&S | ESR3 | 101832 | 08-03-21 |
| Low Pass Filter 5GHz | Micro-Tronics | LPS17541 | 009 | 08-03-21 |
| Low Pass Filter 5GHz | Micro-Tronics | LPS17541 | 015 | 08-03-21 |
| Low Pass Filter 5GHz | Micro-Tronics | LPS17541 | 020 | 08-04-21 |
| High Pass Filter 3GHz | Micro-Tronics | HPM17543 | 010 | 08-03-21 |
| High Pass Filter 3GHz | Micro-Tronics | HPM17543 | 015 | 08-03-21 |
| High Pass Filter 3GHz | Micro-Tronics | HPM17543 | 020 | 08-04-21 |
| High Pass Filter 6GHz | Micro-Tronics | HPS17542 | 009 | 08-03-21 |
| High Pass Filter 6GHz | Micro-Tronics | HPS17542 | 016 | 08-03-21 |
| High Pass Filter 6GHz | Micro-Tronics | HPS17542 | 021 | 08-04-21 |
| LISN | R&S | ENV-216 | 101837 | 08-06-21 |
| Antenna, Loop, 9kHz-30MHz | R&S | HFH2-Z2 | 100418 | 10-02-21 |
| Termination | WEINSCHEL | M1406A | T01 | 08-05-21 |
| Attenuator | WEINSCHEL | WA76-30-21 | A015 | 08-05-21 |
| **UL Software** | | | | |
| **Description** | **Manufacturer** | **Model** | **Version** | |
| Radiated software | UL | UL EMC | Ver 9.5 | |
| AC Line Conducted software | UL | UL EMC | Ver 9.5 | |

# 7. SUMMARY TABLE

| FCC Part Section | Test Description | Test Limit | Test Condition | Test Result |
|---|---|---|---|---|
| 15.407(e) | 6dB Band width (5.8GHz) | 500kHz | Condcuted | PASS |
| 15.407 (a)(2) | TX Cond. Power 5.15-2.25, 5.25-5.35 & 5.47-5.725 | < 24dBm or 11+10Log(26dB BW) | | PASS |
| 15.407 (a)(3) | TX Cond. Power 5.725-5.825 | < 30dBm | | PASS |
| 15.407 (a)(5) | PSD (5.2,5.3,5.5GHz) | < 11dBm | | PASS |
| 15.407 (a)(5) | PSD (5.8GHz) | 30dBm per 500kHz | | PASS |
| 15.207 (a) | AC Power Line conducted emissions | Section 13 | Radiated | PASS |
| 15.407 (b) & 15.209 | Radiated Spurious Emission | < 54dBuV/m | | PASS |
| 15.407 (h)(2) | Dynamic Frequency Selection | N/A | Condcuted | PASS |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# 8. MEASUREMENT METHODS

On-Time and Duty Cycle : KDB 789033 D02 v02r01, Section II.B.

6dB Emission BW : KDB 789033 D02 v02r01, Section II.C.2.

26dB Emission BW : KDB 789033 D02 v02r01, Section II.C.1.

99% Occupied BW : KDB 789033 D02 v02r01, Section II.D.

Conducted Output Power : KDB 789033 D02 v02r01, Section II.E.3.a(Method PM)

Conducted Output Power for Straddle Channel (ch144/142/138 for 20/40/80MHz BW):

KDB 789033 D02 v02r01, Section II.E.2.b(Method SA-1)

Power Spectral Density : KDB 789033 D02 v02r01, Section II.F.

Unwanted emissions in restricted bands : KDB 789033 D02 v02r01, Section II.G.3 – II.G.6.

Unwanted emissions in non-restricted bands : KDB 789033 D02 v02r01, Section II.G.3 – II.G.6.

AC Power Line Conducted Emission : ANSI C63.10-2013, Section 6.2.


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# 9. REFERENCE MEASUREMENTS RESULTS

## 9.1. ON TIME AND DUTY CYCLE RESULTS

| Mode | On Time [ms] | Period [ms] | Duty Cycle X [Linear] | Duty Cycle X [%] | Duty Cycle Correction Factor[dB] |
|---|---|---|---|---|---|
| 802.11a SISO | 2.756 | 2.800 | 0.984 | 98.429 | - |
| 802.11n(HT20) SISO | 2.560 | 2.604 | 0.983 | 98.310 | - |
| 802.11n(HT40) SISO | 2.292 | 2.336 | 0.981 | 98.116 | - |
| 802.11ac(VHT80) SISO | 1.164 | 1.208 | 0.964 | 96.358 | 0.16 |

Note. If the duty cycle is over 98%, compensation is not included in average measurement.

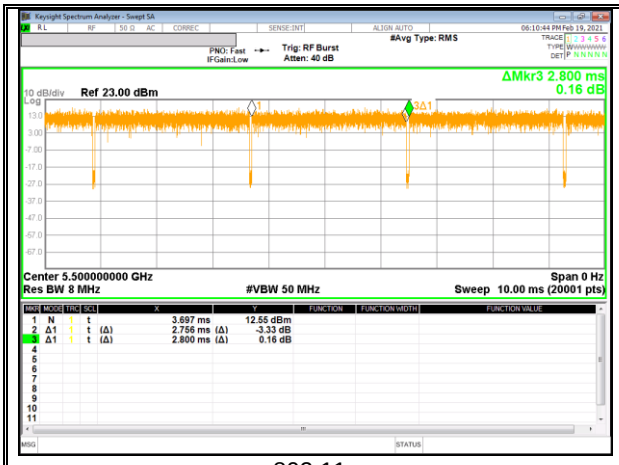
**LIMITS**

None; for reporting purposes only.

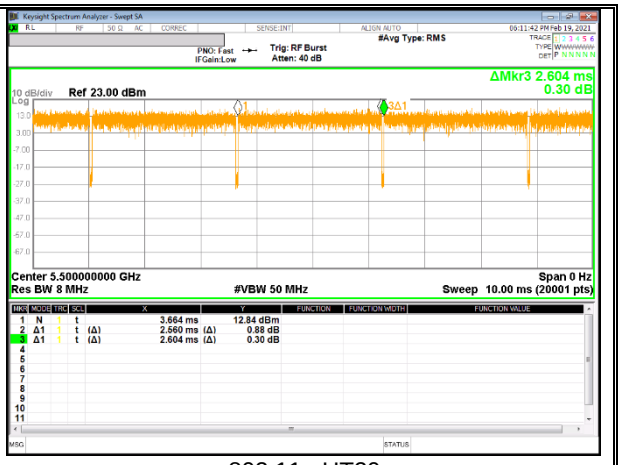
**PROCEDURE**

KDB 789033 D02 v02r01 Zero-Span Spectrum Analyzer Method.

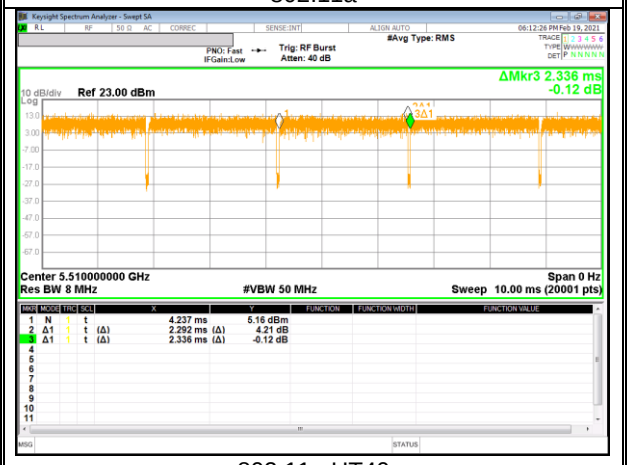
## 9.2. DUTY CYCLE PLOTS



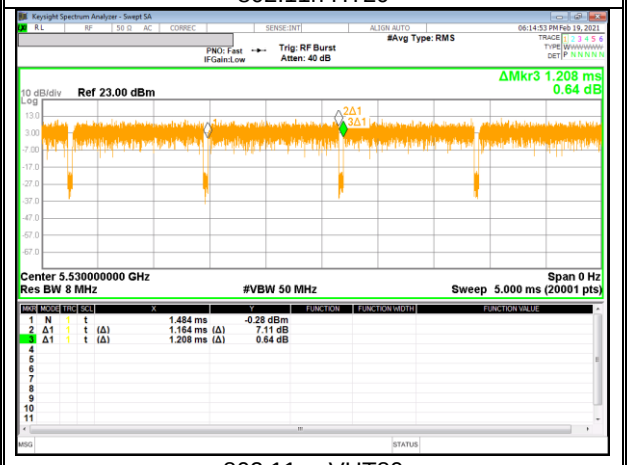

802.11a




802.11n HT20




802.11n HT40




802.11ac VHT80

## 9.3. 26 dB & 99% BANDWIDTH

**LIMITS**

None; for reporting purposes only.

**TEST PROCEDURE**

Reference to 789033 D02 General UNII Test Procedures New Rules v02r01: The transmitter output is connected to a spectrum analyzer with the RBW set to approximately 1% of EBW, the VBW > RBW, peak detector and max hold.

**RESULTS**

### 9.3.1. 5.2 GHz BAND

| Band | Mode | Channel | Center Freq. [MHz] | 26 dB BW [MHz] | Worst | 99% BW [MHz](Note1) |
|---|---|---|---|---|---|---|
| UNII-1 | 802.11a | Low | 5180 | 19.49 | 19.49 | 16.40 |
| | | Mid | 5200 | 19.64 | | 16.40 |
| | | High | 5240 | 19.97 | | 16.39 |
| | 802.11n HT20 | Low | 5180 | 20.12 | 19.72 | 17.59 |
| | | Mid | 5200 | 19.72 | | 17.53 |
| | | High | 5240 | 20.10 | | 17.53 |
| | 802.11n HT40 | Low | 5190 | 39.81 | 39.69 | 35.96 |
| | | High | 5230 | 39.69 | | 35.97 |
| | 802.11ac VHT80 | Mid | 5210 | 80.81 | 80.81 | 75.23 |

Note1. As a result of 99% bandwidth test, the bandwidth of UNII-1 does not interfere with UNII-2A.

### 9.3.2. 5.3 GHz BAND

| Band | Mode | Channel | Center Freq. [MHz] | 26 dB BW [MHz] | Worst | 99% BW [MHz](Note2) |
|---|---|---|---|---|---|---|
| UNII-2A | 802.11a | Low | 5260 | 19.83 | 19.66 | 16.38 |
| | | Mid | 5300 | 19.71 | | 16.44 |
| | | High | 5320 | 19.66 | | 16.40 |
| | 802.11n HT20 | Low | 5260 | 20.12 | 19.87 | 17.56 |
| | | Mid | 5300 | 20.12 | | 17.53 |
| | | High | 5320 | 19.87 | | 17.56 |
| | 802.11n HT40 | Low | 5270 | 39.49 | 39.49 | 35.93 |
| | | High | 5310 | 39.89 | | 36.01 |
| | 802.11ac VHT80 | Mid | 5290 | 80.75 | 80.75 | 75.16 |

Note2. As a result of 99% bandwidth test, the bandwidth of UNII-2A does not interfere with UNII-1.

### 9.3.3. 5.5 GHz BAND

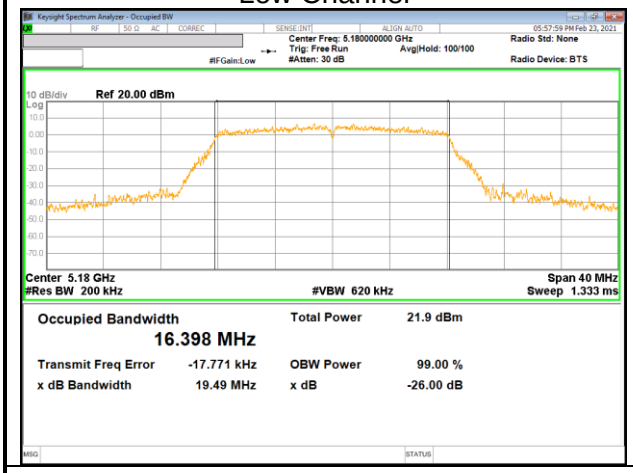
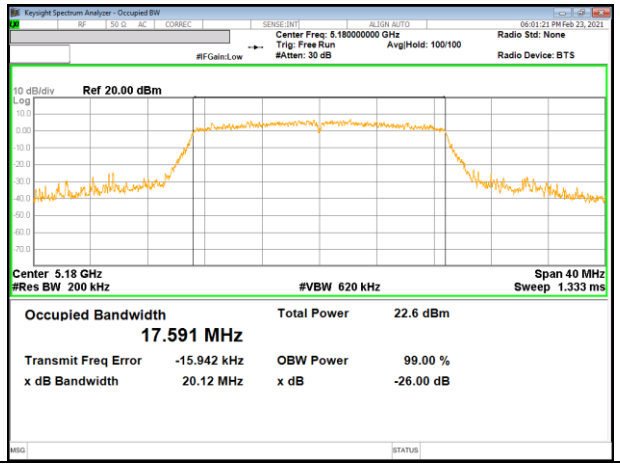
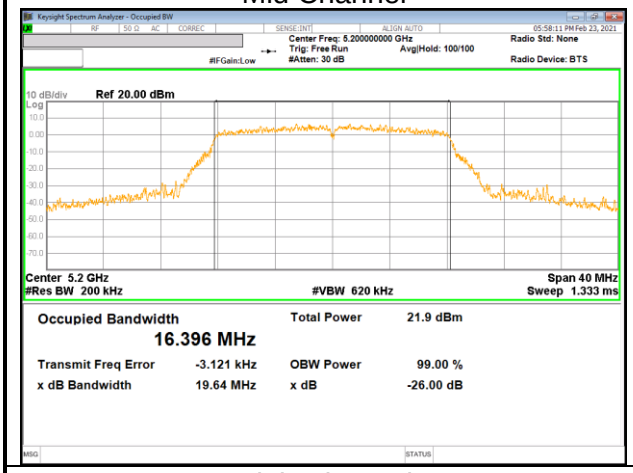
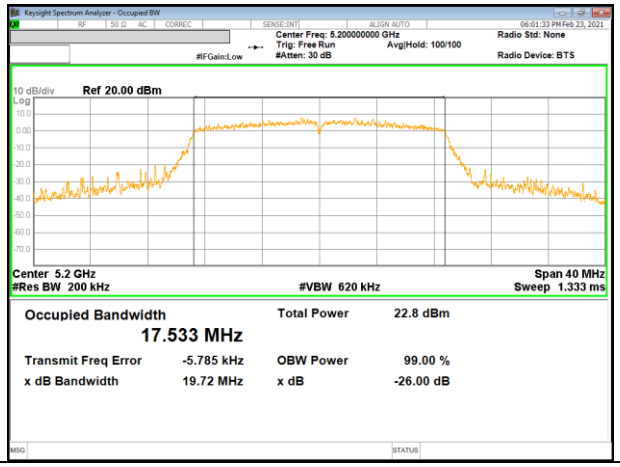
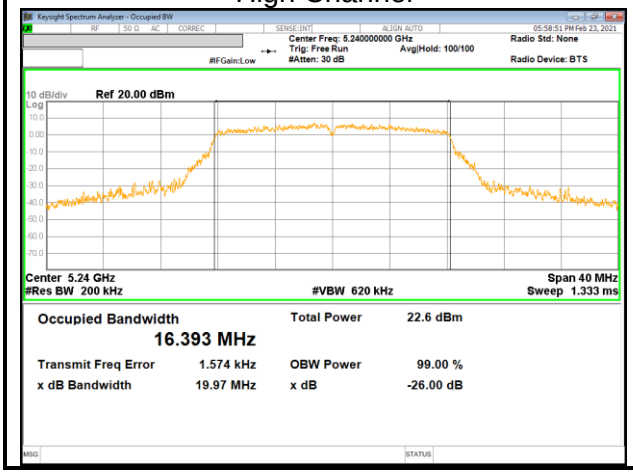
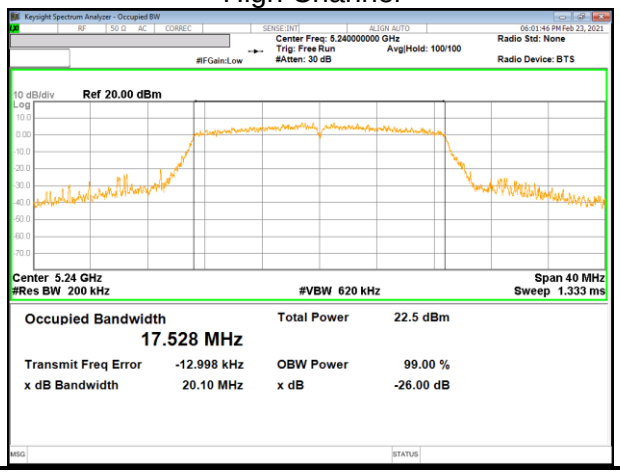
| Band | Mode | Channel | Center Freq. [MHz] | 26 dB BW [MHz] | Worst | 99% BW [MHz] |
|---|---|---|---|---|---|---|
| UNII-2A | 802.11a | Low | 5500 | 19.75 | 19.65 | 16.41 |
| | | Mid | 5580 | 19.75 | | 16.40 |
| | | High | 5700 | 19.65 | | 16.39 |
| | 802.11n HT20 | Low | 5500 | 20.07 | 20.07 | 17.56 |
| | | Mid | 5580 | 20.11 | | 17.57 |
| | | High | 5700 | 20.11 | | 17.56 |
| | 802.11n HT40 | Low | 5510 | 39.90 | 39.90 | 35.90 |
| | | Mid | 5590 | 40.13 | | 35.92 |
| | | High | 5670 | 40.35 | | 35.96 |
| | 802.11ac VHT80 | Low | 5530 | 80.78 | 80.78 | 75.19 |
| | | High | 5610 | 80.89 | | 75.20 |

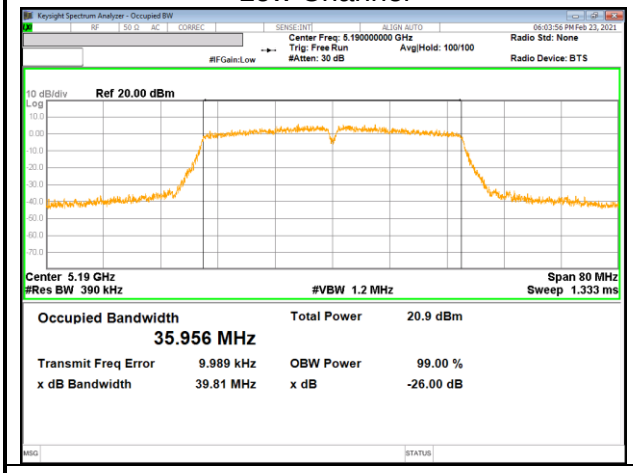
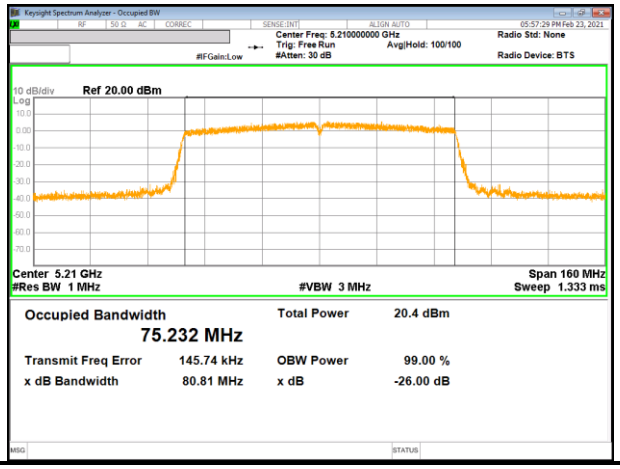
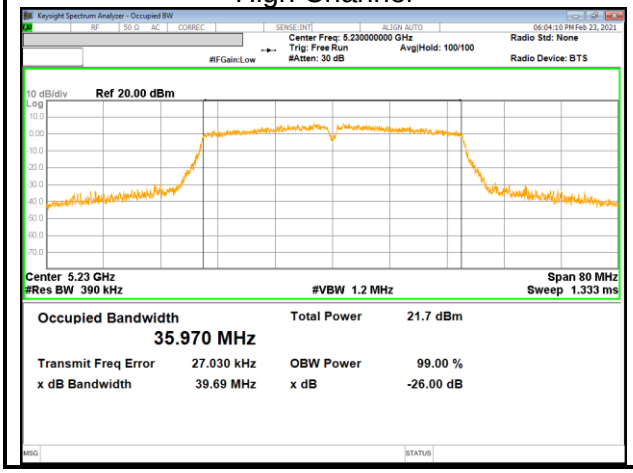
### 9.3.4. STRADDLE CHANNEL

| Band | Mode | Channel | Center Freq. [MHz] | 26 dB BW [MHz] | |
|---|---|---|---|---|---|
| | | | | UNII-2C | UNII-3 |
| Straddle Channel | 802.11a | Straddle | 5720 | 15.014 | 4.862 |
| | 802.11n HT20 | Straddle | 5720 | 14.996 | 4.924 |
| | 802.11n HT40 | Straddle | 5710 | 34.988 | 4.708 |
| | 802.11ac VHT80 | Straddle | 5690 | 75.220 | 5.244 |

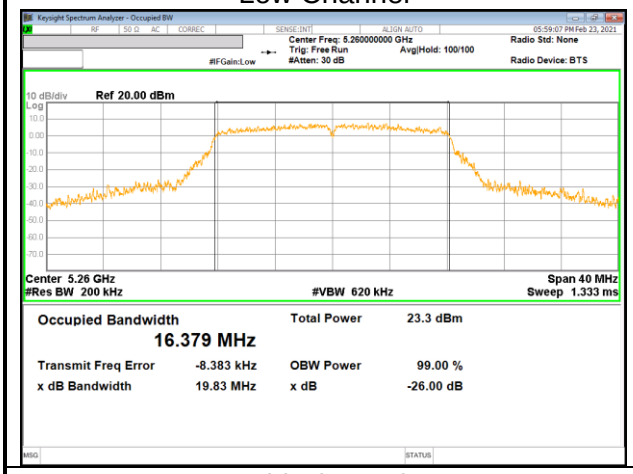
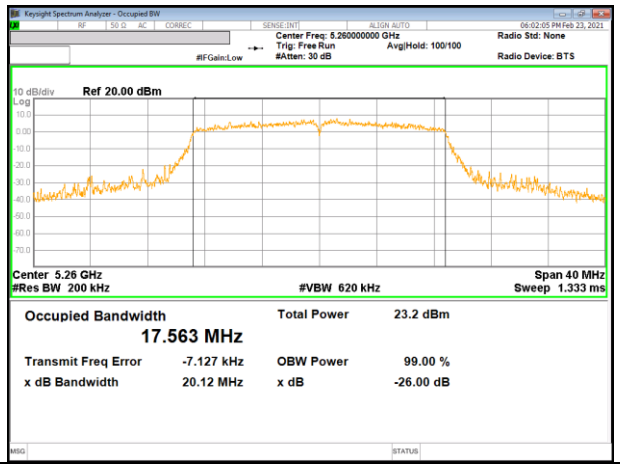
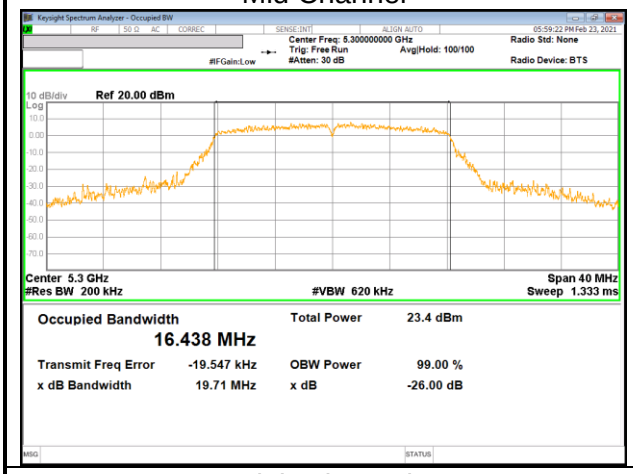
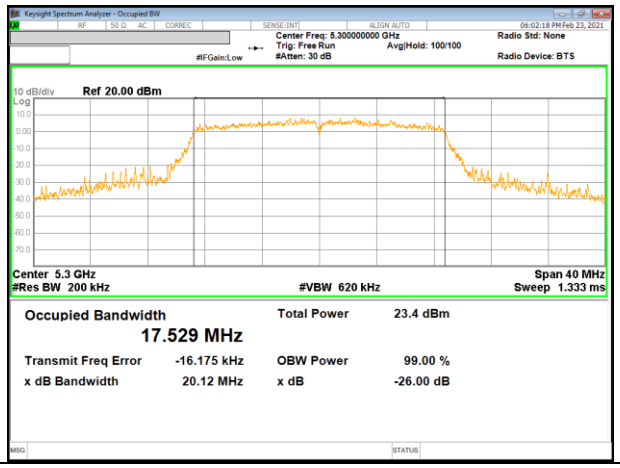
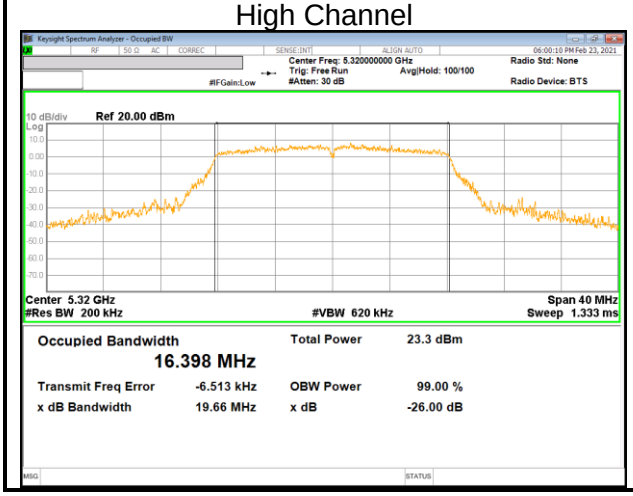
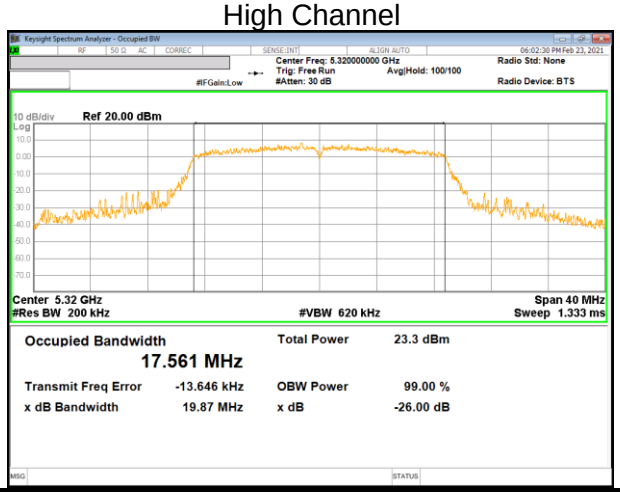
### 9.3.5. 26 dB & 99% BANDWIDTH PLOTS

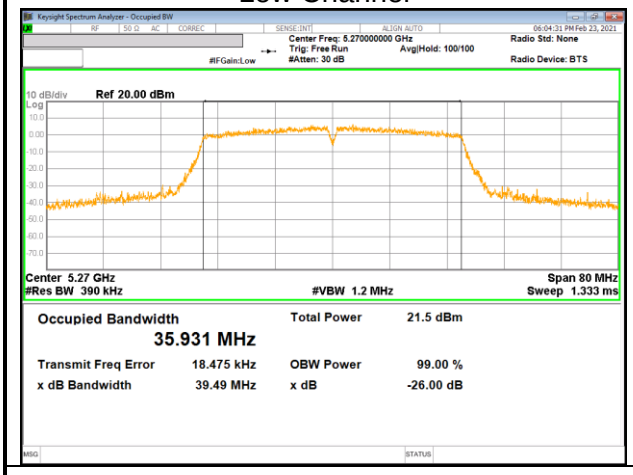
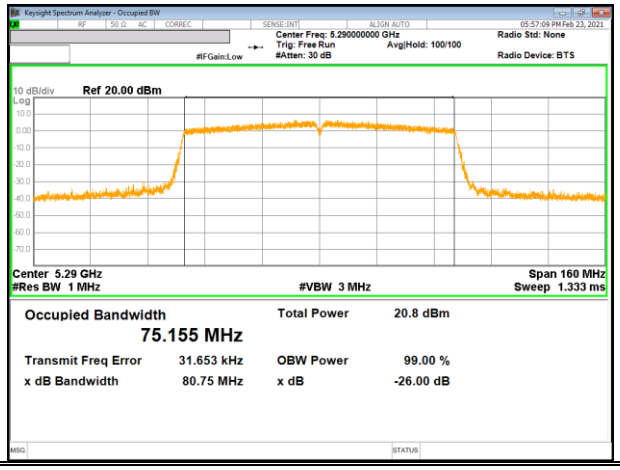
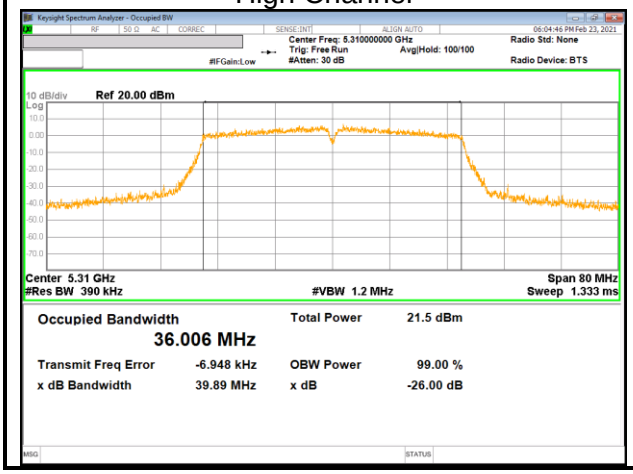
## UNII 5.2 GHz BAND

| 802.11a | 802.11n HT20 |
|---|---|
| Low Channel | Low Channel |
|  |  |
| Mid Channel | Mid Channel |
|  |  |
| High Channel | High Channel |
|  |  |

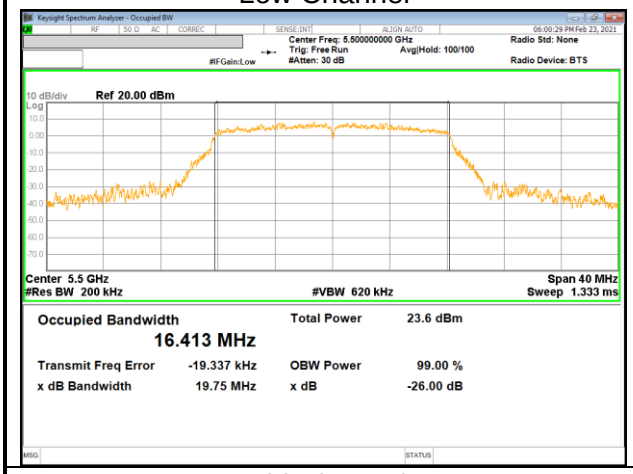
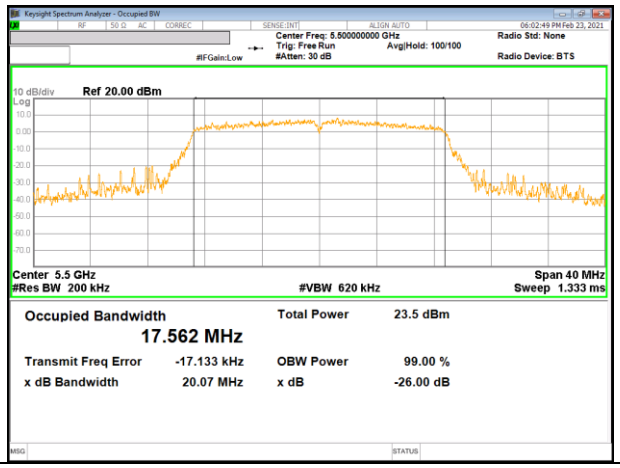
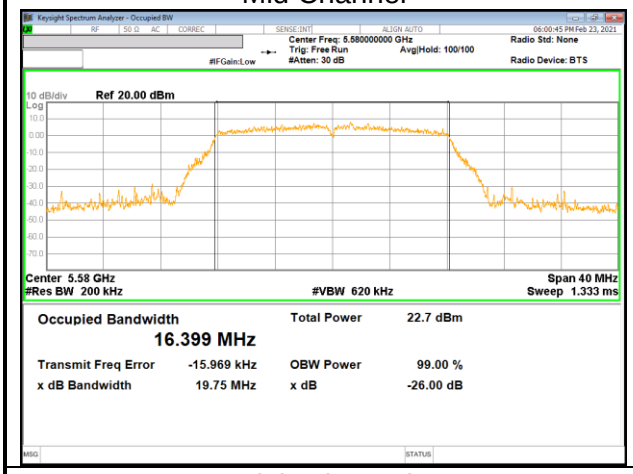
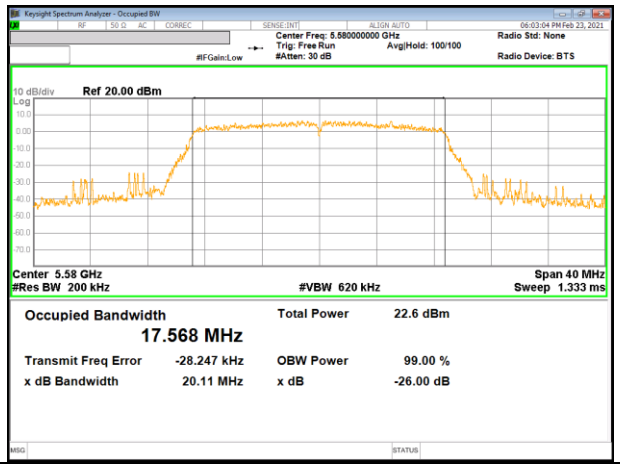
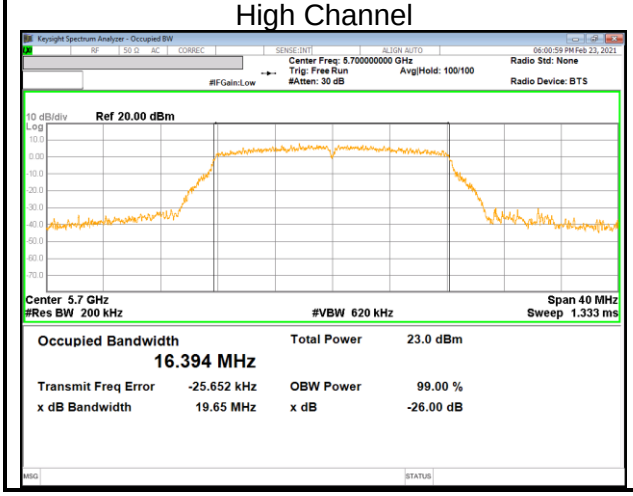
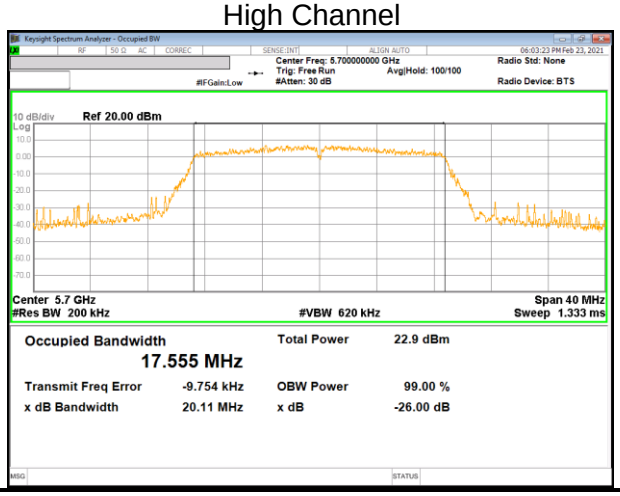
| 802.11n HT40 | 802.11ac VHT80 |
|---|---|
| Low Channel | Mid Channel |
|  |  |
| High Channel | |
|  | |

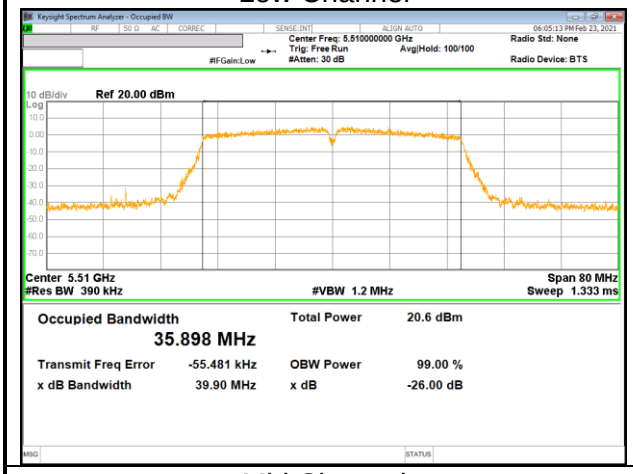
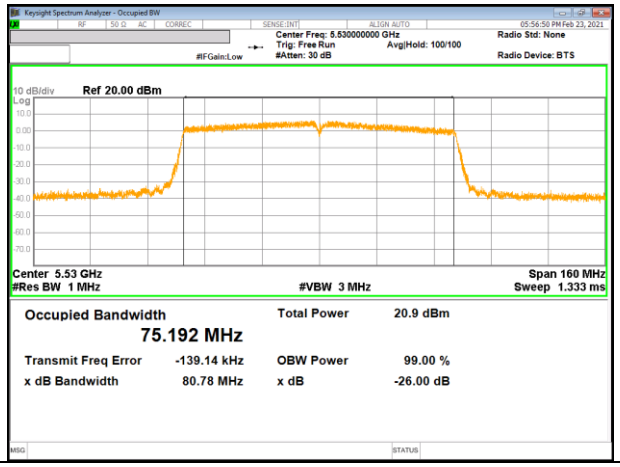
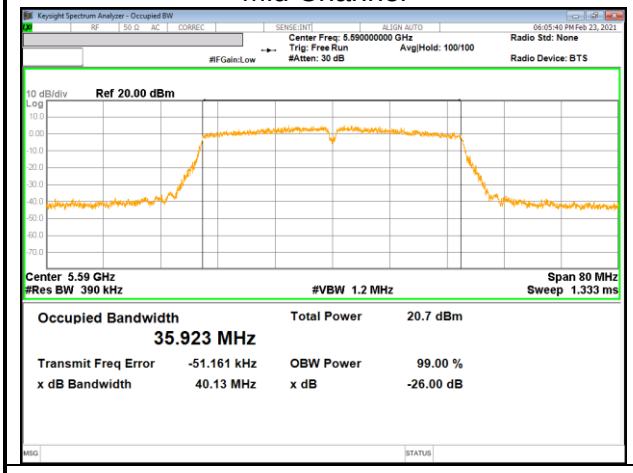
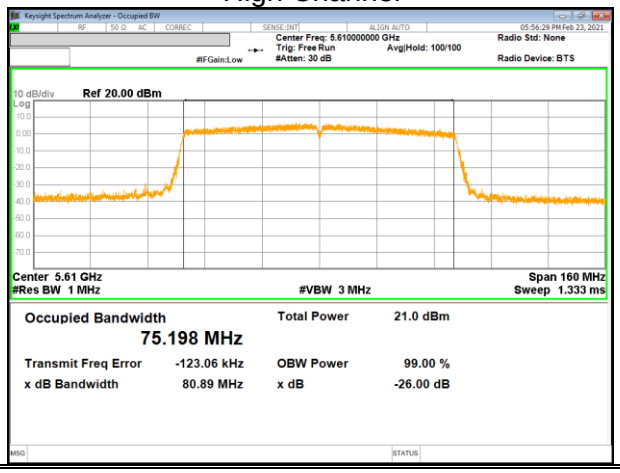
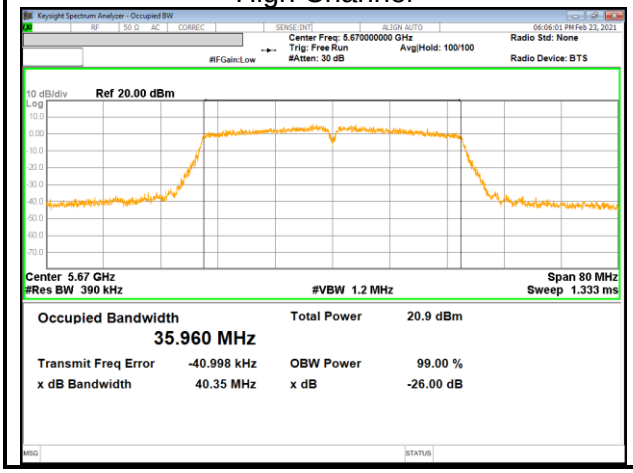
## UNII 5.3 GHz BAND

| 802.11a | 802.11n HT20 |
|---|---|
| Low Channel | Low Channel |
|  |  |
| Mid Channel | Mid Channel |
|  |  |
| High Channel | High Channel |
|  |  |

| 802.11n HT40 | 802.11ac VHT80 |
|---|---|
| Low Channel | Mid Channel |
|  |  |
| High Channel | |
|  | |

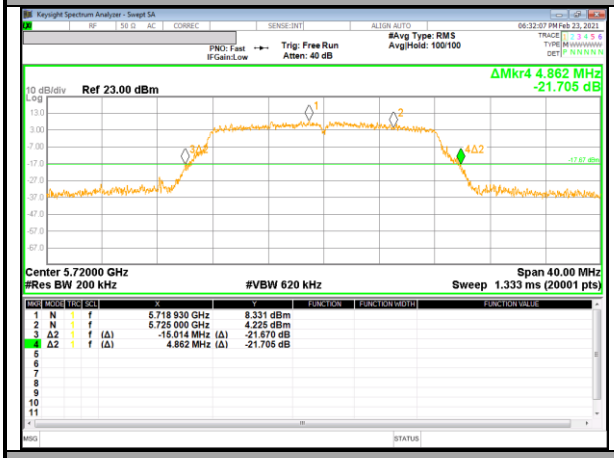
## UNII 5.5 GHz BAND

| 802.11a | 802.11n HT20 |
|---|---|
| Low Channel | Low Channel |
|  |  |
| Mid Channel | Mid Channel |
|  |  |
| High Channel | High Channel |
|  |  |

| 802.11n HT40 | 802.11ac VHT80 |
|---|---|
| Low Channel | Low Channel |
|  |  |
| Mid Channel | High Channel |
|  |  |
| High Channel | |
|  | |

## UNII Straddle Channel IEEE 802.11a / n HT20 / n HT40 / ac VHT80 mode

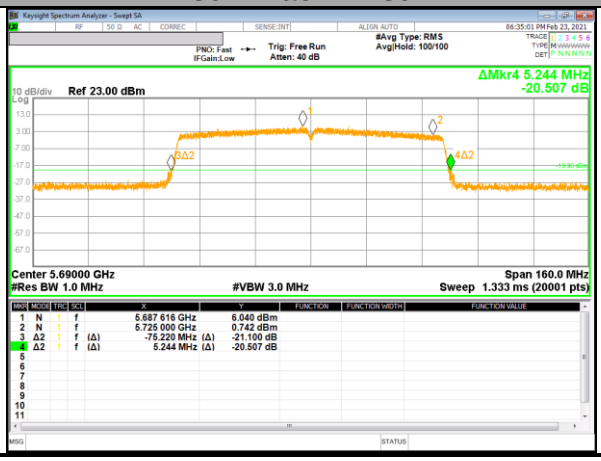
### 802.11a




### 802.11n HT20


### 802.11n HT40


### 802.11ac VHT80



# 10. ANTENNA PORT TEST RESULTS

## 10.1. 6 dB & 99% BANDWIDTH

**LIMITS**

FCC §15.407

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

**TEST PROCEDURE**

Reference to 789033 D02 General UNII Test Procedures New Rules v02r01: The transmitter output is connected to a spectrum analyzer with the RBW set to 100KHz, the VBW >= 3 x RBW, peak detector and max hold.

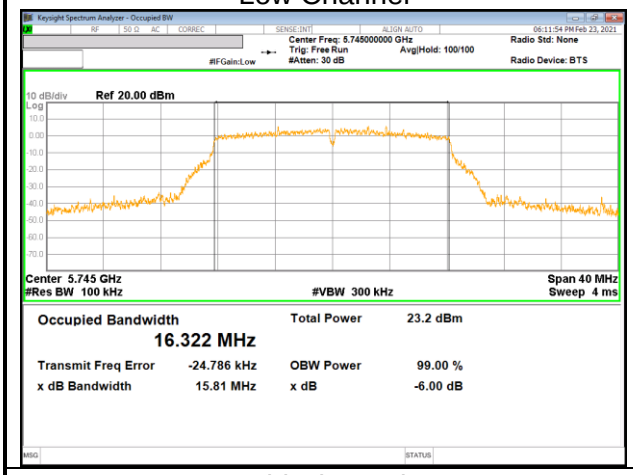
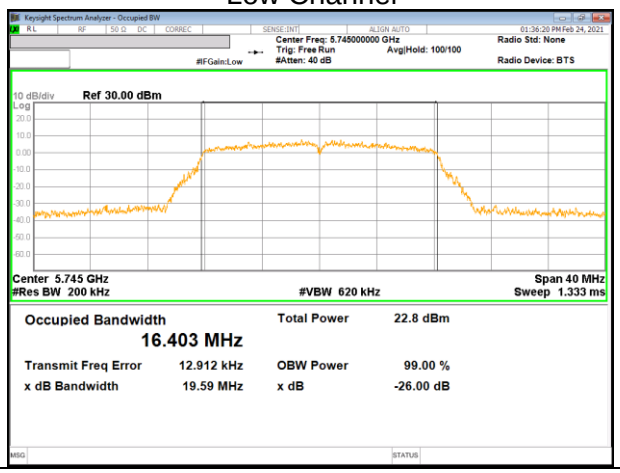
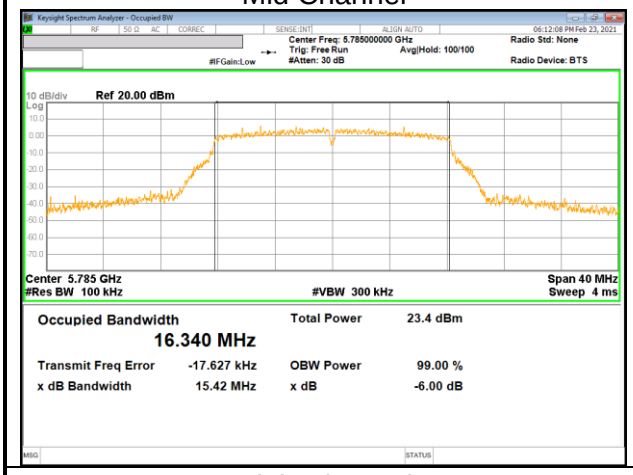
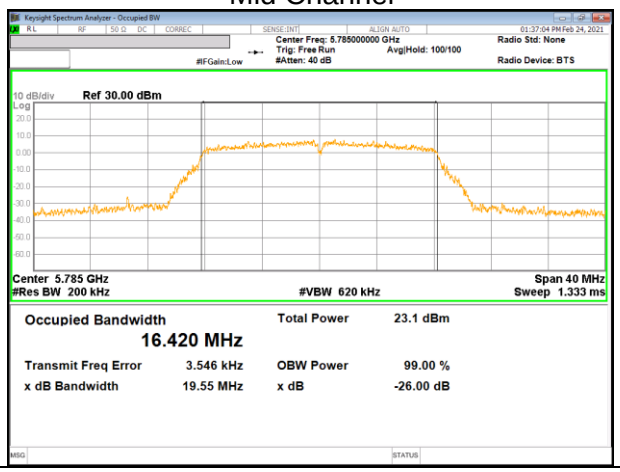
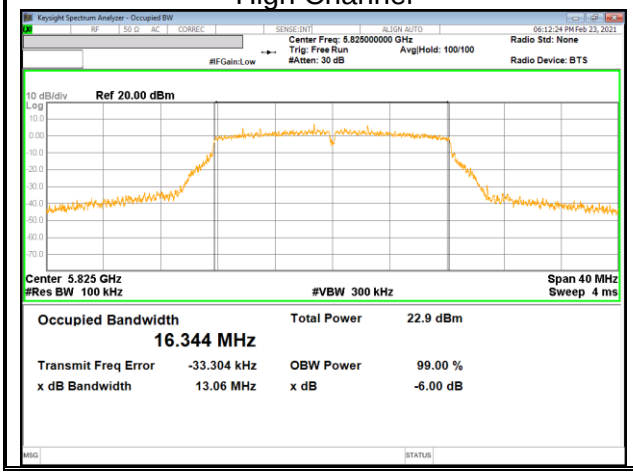
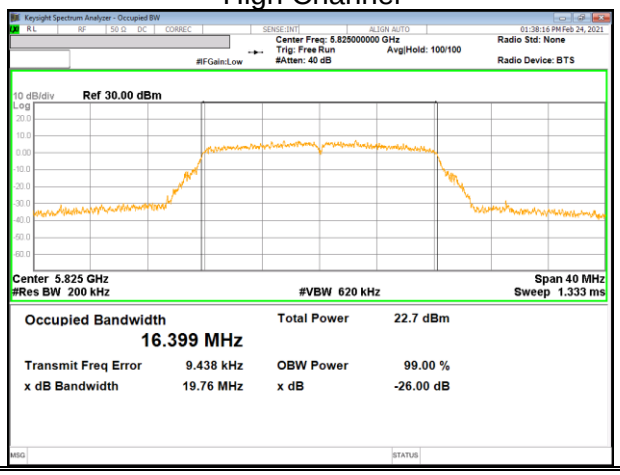
**RESULTS**

### 10.1.1. 5.8 GHz BAND

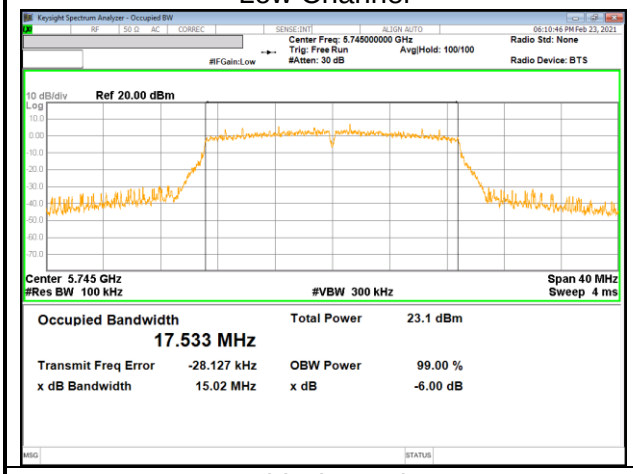
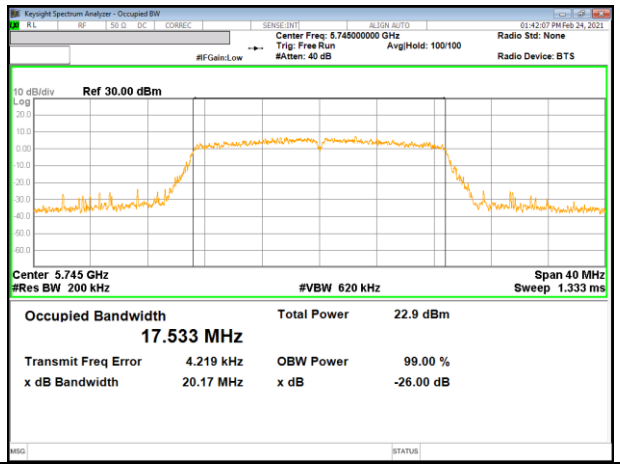
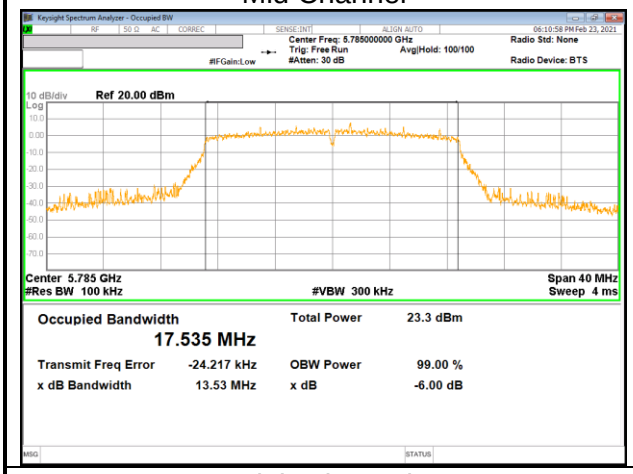
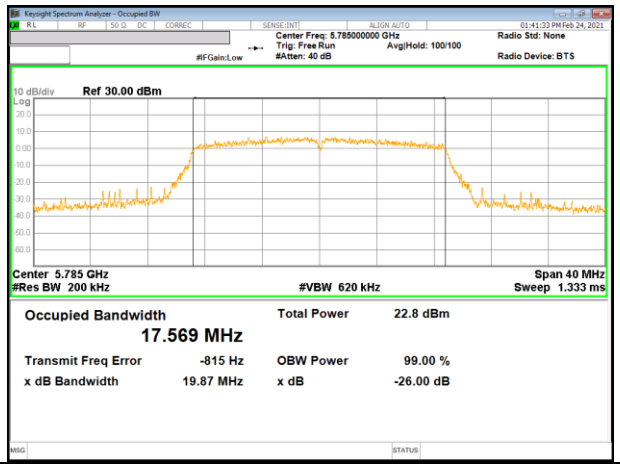
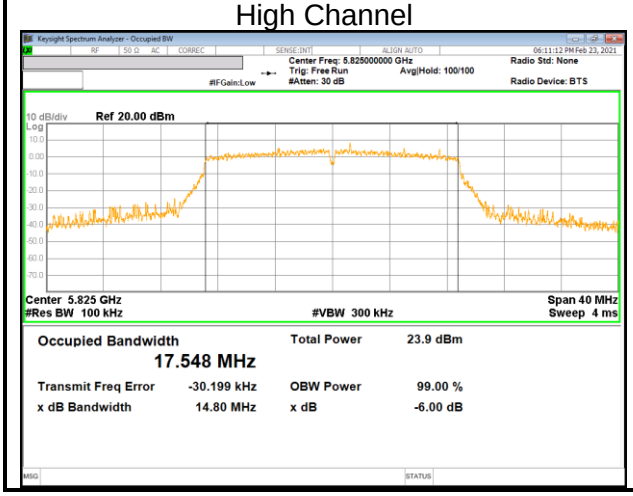
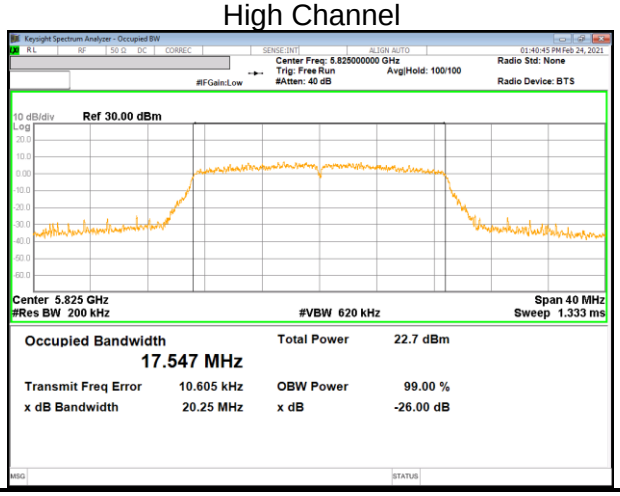
| Band | Mode | Channel | Center Freq. [MHz] | 6 dB BW [MHz] | Worst | Minimum Limit [MHz] | 99% BW [MHz] |
|---|---|---|---|---|---|---|---|
| UNII-3 | 802.11a | Low | 5745 | 15.81 | 13.06 | 0.5 | 16.40 |
| | | Mid | 5785 | 15.42 | | | 16.42 |
| | | High | 5825 | 13.06 | | | 16.40 |
| | 802.11n HT20 | Low | 5745 | 15.02 | 13.53 | | 17.53 |
| | | Mid | 5785 | 13.53 | | | 17.57 |
| | | High | 5825 | 14.80 | | | 17.55 |
| | 802.11n HT40 | Low | 5755 | 29.17 | 29.17 | | 35.95 |
| | | High | 5795 | 31.30 | | | 35.95 |
| | 802.11ac VHT80 | Mid | 5775 | 75.04 | 75.04 | | 75.24 |

### 10.1.2. 6 dB & 99% BANDWIDTH PLOTS

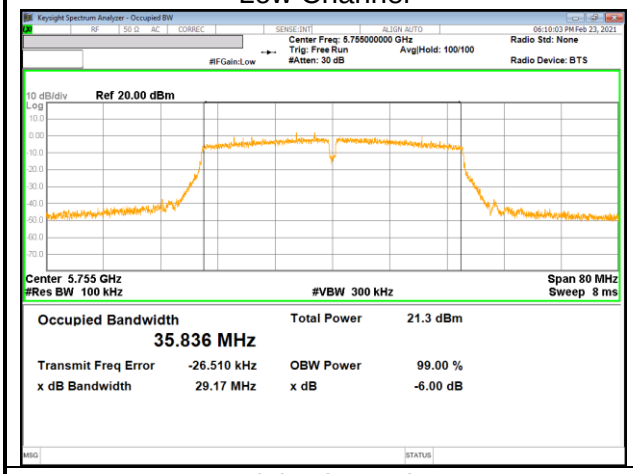
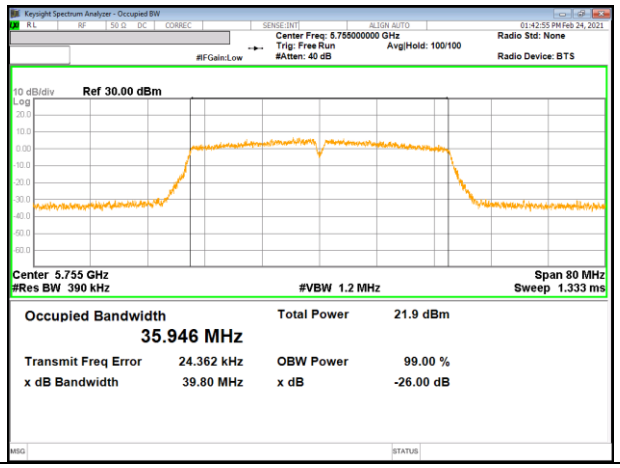
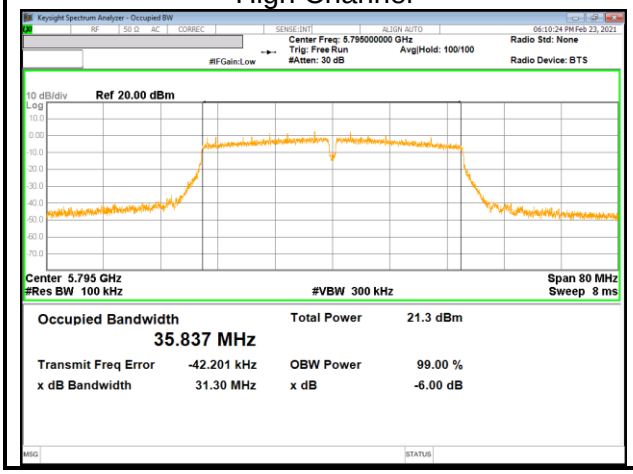
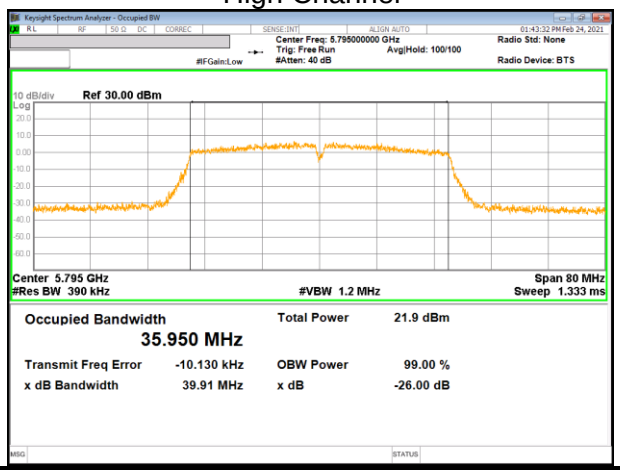
## UNII 5.8 GHz IEEE 802.11a mode

| 6dB Bandwidth | 99% Bandwidth |
|---|---|
| Low Channel | Low Channel |
|  |  |
| Mid Channel | Mid Channel |
|  |  |
| High Channel | High Channel |
|  |  |

## UNII 5.8 GHz IEEE 802.11n HT20 mode

| 6dB Bandwidth | 99% Bandwidth |
|---|---|
| Low Channel | Low Channel |
|  |  |
| Mid Channel | Mid Channel |
|  |  |
| High Channel | High Channel |
|  |  |

## UNII 5.8 GHz IEEE 802.11n HT40 mode

| 6dB Bandwidth | 99% Bandwidth |
|---|---|
| Low Channel | Low Channel |
|  |  |
| High Channel | High Channel |
|  |  |

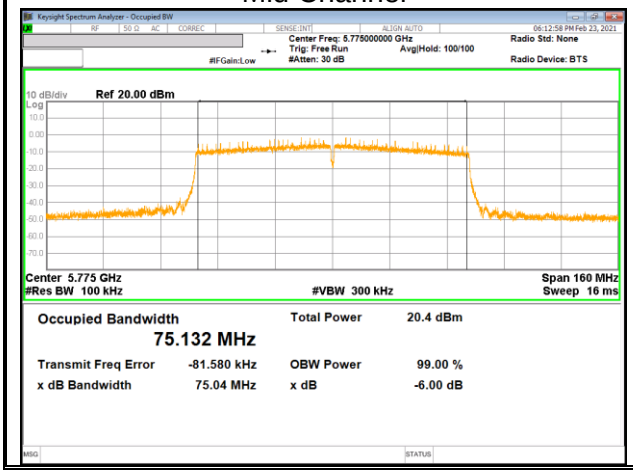
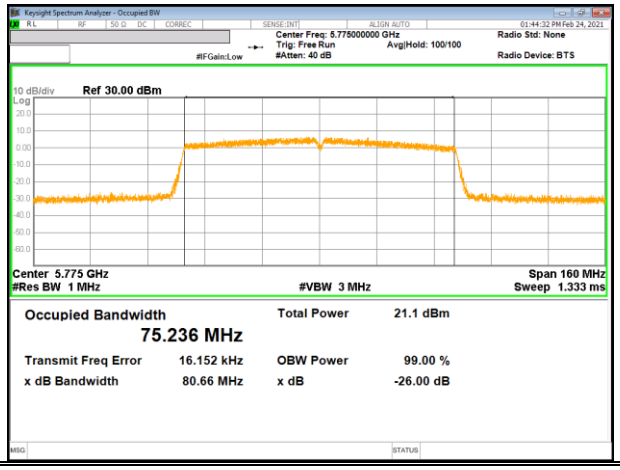








## UNII 5.8 GHz IEEE 802.11ac VHT80 mode

| 6dB Bandwidth | 99% Bandwidth |
|---|---|
| Mid Channel | Mid Channel |
|  |  |

## 10.2. OUTPUT POWER AND PPSD

**LIMITS**

FCC §15.407 (a) (1) (2) (3)

**FCC**

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

**TEST PROCEDURE**

KDB 789033 Method PM is used for output power.

KDB 789033 Method SA-2 is used for only power of straddle Ch. and PPSD. RBW set to 1MHz(500kHz for the band 5.725-5.85 GHz, the VBW >= 3 x RBW, RMS detector and trace averaging). Band power function used for power and peak marker value of the spectrum is used for PSD.

**DIRECTIONAL ANTENNA GAIN**

For OUTPUT POWER and PSD: The TX chains are correlated and the antenna gains are unequal among the chains. The directional gain is:

| Frequency Band [MHz] | Antenna Gain [dBi] |
|---|---|
| UNII 1<br>5150 - 5250 | -2.16 |
| UNII 2A<br>5250 - 5350 | -2.16 |
| UNII 2C<br>5470 - 5725 | -2.05 |
| UNII 3<br>5725 - 5850 | -2.02 |

**RESULTS**

## 10.2.1. 1Tx MODE IN THE 5.2 GHz BAND

**Bandwidth and Antenna Gain, Limits**

| Band | Mode | Channel | Center Freq. [MHz] | Min 26 dB BW [MHz] | Directional Gain [dBi] | Power Limit [dBm] | PPSD Limit [dBm/MHz] |
|---|---|---|---|---|---|---|---|
| UNII-1 | 802.11a | Low | 5180 | 19.49 | -2.16 | 23.98 | 11.00 |
| | | Mid | 5200 | | | | |
| | | High | 5240 | | | | |
| | 802.11n HT20 | Low | 5180 | 19.72 | | 23.98 | 11.00 |
| | | Mid | 5200 | | | | |
| | | High | 5240 | | | | |
| | 802.11n HT40 | Low | 5190 | 39.69 | | 23.98 | 11.00 |
| | | High | 5230 | | | | |
| | 802.11ac VHT80 | Mid | 5210 | 80.81 | | 23.98 | 11.00 |

| Included in Calculations of Corr'd Power & PPSD | | | |
|---|---|---|---|
| Duty Cycle CF [dB] | 802.11a | 0.00 | dB |
| | 802.11n HT20 | 0.00 | dB |
| | 802.11n HT40 | 0.00 | dB |
| | 802.11ac VHT80 | 0.16 | dB |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## Output Power Results

| Band | Mode | Channel | Center Freq. [MHz] | Average Power [dBm] | Power Limit [dBm] |
|---|---|---|---|---|---|
| UNII-1 | 802.11a | Low | 5180 | 17.46 | 23.98 |
| | | Mid | 5200 | 17.46 | |
| | | High | 5240 | 17.72 | |
| | 802.11n HT20 | Low | 5180 | 17.94 | 23.98 |
| | | Mid | 5200 | 18.24 | |
| | | High | 5240 | 17.63 | |
| | 802.11n HT40 | Low | 5190 | 16.41 | 23.98 |
| | | High | 5230 | 16.65 | |
| | 802.11ac VHT80 | Mid | 5210 | 15.23 | 23.98 |

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]

## PPSD Results

| Band | Mode | Channel | Center Freq. [MHz] | Meas PPSD [dBm/MHz] | Corr'd PPSD [dBm/MHz] | PPSD Limit [dBm/MHz] |
|---|---|---|---|---|---|---|
| UNII-1 | 802.11a | Low | 5180 | 6.536 | 6.536 | 11.00 |
| | | Mid | 5200 | 6.714 | 6.714 | |
| | | High | 5240 | 7.239 | 7.239 | |
| | 802.11n HT20 | Low | 5180 | 7.194 | 7.194 | |
| | | Mid | 5200 | 7.175 | 7.175 | |
| | | High | 5240 | 6.946 | 6.946 | |
| | 802.11n HT40 | Low | 5190 | 2.258 | 2.258 | |
| | | High | 5230 | 3.099 | 3.099 | |
| | 802.11ac VHT80 | Mid | 5210 | -2.062 | -1.902 | |

* Calculation of PPSD result : Corr'd PPSD = Meas PPSD + Duty CF [dB]

### 10.2.2. 1Tx MODE IN THE 5.3 GHz BAND

**Bandwidth and Antenna Gain, Limits**

| Band | Mode | Channel | Center Freq. [MHz] | Min 26 dB BW [MHz] | Directional Gain [dBi] | Power Limit [dBm] | PPSD Limit [dBm/MHz] |
|---|---|---|---|---|---|---|---|
| UNII-2A | 802.11a | Low | 5260 | 19.66 | -2.16 | 23.98 | 11.00 |
| | | Mid | 5300 | | | | |
| | | High | 5320 | | | | |
| | 802.11n HT20 | Low | 5260 | 19.87 | | 23.98 | 11.00 |
| | | Mid | 5300 | | | | |
| | | High | 5320 | | | | |
| | 802.11n HT40 | Low | 5270 | 39.49 | | 23.98 | 11.00 |
| | | High | 5310 | | | | |
| | 802.11ac VHT80 | Mid | 5290 | 80.75 | | 23.98 | 11.00 |

| Included in Calculations of Corr'd Power & PPSD | | | |
|---|---|---|---|
| Duty Cycle CF [dB] | 802.11a | 0.00 | dB |
| | 802.11n HT20 | 0.00 | dB |
| | 802.11n HT40 | 0.00 | dB |
| | 802.11ac VHT80 | 0.16 | dB |


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## Output Power Results

| Band | Mode | Channel | Center Freq. [MHz] | Average Power [dBm] | Power Limit [dBm] |
|---|---|---|---|---|---|
| UNII-2A | 802.11a | Low | 5260 | 18.14 | 23.98 |
| | | Mid | 5300 | 18.25 | |
| | | High | 5320 | 18.28 | |
| | 802.11n HT20 | Low | 5260 | 18.16 | 23.98 |
| | | Mid | 5300 | 18.13 | |
| | | High | 5320 | 18.13 | |
| | 802.11n HT40 | Low | 5270 | 16.38 | 23.98 |
| | | High | 5310 | 16.42 | |
| | 802.11ac VHT80 | Mid | 5290 | 15.08 | 23.98 |

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]

## PPSD Results

| Band | Mode | Channel | Center Freq. [MHz] | Meas PPSD [dBm/MHz] | Corr'd PPSD [dBm/MHz] | PPSD Limit [dBm/MHz] |
|---|---|---|---|---|---|---|
| UNII-2A | 802.11a | Low | 5260 | 7.793 | 7.793 | 11.00 |
| | | Mid | 5300 | 7.965 | 7.965 | |
| | | High | 5320 | 8.084 | 8.084 | |
| | 802.11n HT20 | Low | 5260 | 7.546 | 7.546 | |
| | | Mid | 5300 | 7.671 | 7.671 | |
| | | High | 5320 | 7.809 | 7.809 | |
| | 802.11n HT40 | Low | 5270 | 2.996 | 2.996 | |
| | | High | 5310 | 3.183 | 3.183 | |
| | 802.11ac VHT80 | Mid | 5290 | -1.042 | -0.882 | |

* Calculation of PPSD result : Corr'd PPSD = Meas PPSD + Duty CF [dB]


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### 10.2.3. 1Tx MODE IN THE 5.5 GHz BAND

**Bandwidth and Antenna Gain, Limits**

| Band | Mode | Channel | Center Freq. [MHz] | Min 26 dB BW [MHz] | Directional Gain [dBi] | Power Limit [dBm] | PPSD Limit [dBm/MHz] |
|---|---|---|---|---|---|---|---|
| UNII-2C | 802.11a | Low | 5500 | 19.65 | -2.05 | 23.98 | 11.00 |
| | | Mid | 5580 | | | | |
| | | High | 5700 | | | | |
| | 802.11n HT20 | Low | 5500 | 20.07 | | 23.98 | 11.00 |
| | | Mid | 5580 | | | | |
| | | High | 5700 | | | | |
| | 802.11n HT40 | Low | 5510 | 39.90 | | 23.98 | 11.00 |
| | | Mid | 5590 | | | | |
| | | High | 5670 | | | | |
| | 802.11ac VHT80 | Low | 5530 | 80.78 | | 23.98 | 11.00 |
| | | High | 5610 | | | | |

| Included in Calculations of Corr'd Power & PPSD | | | |
|---|---|---|---|
| Duty Cycle CF [dB] | 802.11a | 0.00 | dB |
| | 802.11n HT20 | 0.00 | dB |
| | 802.11n HT40 | 0.00 | dB |
| | 802.11ac VHT80 | 0.16 | dB |

## Output Power Results

| Band | Mode | Channel | Center Freq. [MHz] | Average Power [dBm] | Power Limit [dBm] |
|---|---|---|---|---|---|
| UNII-2C | 802.11a | Low | 5500 | 18.48 | 23.98 |
| | | Mid | 5580 | 17.71 | |
| | | High | 5700 | 18.43 | |
| | 802.11n HT20 | Low | 5500 | 18.41 | 23.98 |
| | | Mid | 5580 | 17.76 | |
| | | High | 5700 | 18.10 | |
| | 802.11n HT40 | Low | 5510 | 16.68 | 23.98 |
| | | Mid | 5590 | 15.70 | |
| | | High | 5670 | 16.30 | |
| | 802.11ac VHT80 | Low | 5530 | 15.24 | 23.98 |
| | | High | 5610 | 15.42 | |

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]

## PPSD Results

| Band | Mode | Channel | Center Freq. [MHz] | Meas PPSD [dBm/MHz] | Corr'd PPSD [dBm/MHz] | PPSD Limit [dBm/MHz] |
|---|---|---|---|---|---|---|
| UNII-2C | 802.11a | Low | 5500 | 8.416 | 8.416 | 11.00 |
| | | Mid | 5580 | 7.636 | 7.636 | |
| | | High | 5700 | 7.706 | 7.706 | |
| | 802.11n HT20 | Low | 5500 | 8.139 | 8.139 | |
| | | Mid | 5580 | 6.987 | 6.987 | |
| | | High | 5700 | 7.603 | 7.603 | |
| | 802.11n HT40 | Low | 5510 | 3.397 | 3.397 | |
| | | Mid | 5590 | 2.613 | 2.613 | |
| | | High | 5670 | 2.274 | 2.274 | |
| | 802.11ac VHT80 | Low | 5530 | -1.170 | -1.010 | |
| | | High | 5610 | -1.138 | -0.978 | |

* Calculation of PPSD result : Corr'd PPSD = Meas PPSD + Duty CF [dB]


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## 10.2.4. 1Tx MODE IN THE 5.8 GHz BAND

**Bandwidth and Antenna Gain, Limits**

| Included in Calculations of Corr'd Power & PPSD | | | |
|---|---|---|---|
| Duty Cycle CF [dB] | 802.11a | 0.00 | dB |
| | 802.11n HT20 | 0.00 | dB |
| | 802.11n HT40 | 0.00 | dB |
| | 802.11ac VHT80 | 0.16 | dB |

**Output Power Results**

| Band | Mode | Channel | Center Freq. [MHz] | Average Power [dBm] | Power Limit [dBm] |
|---|---|---|---|---|---|
| UNII-3 | 802.11a | Low | 5745 | 18.42 | 30.00 |
| | | Mid | 5785 | 18.30 | |
| | | High | 5825 | 18.29 | |
| | 802.11n HT20 | Low | 5745 | 17.91 | 30.00 |
| | | Mid | 5785 | 18.15 | |
| | | High | 5825 | 17.87 | |
| | 802.11n HT40 | Low | 5755 | 16.14 | 30.00 |
| | | High | 5795 | 16.45 | |
| | 802.11ac VHT80 | Mid | 5775 | 14.86 | 30.00 |

* Calculation of Output Power : Average Power = Meas Power + Duty CF[dB]

**PPSD Results**

| Band | Mode | Channel | Center Freq. [MHz] | Meas PPSD [dBm/500kHz] | Corr'd PPSD [dBm/500kHz] | PPSD Limit [dBm/500kHz] |
|---|---|---|---|---|---|---|
| UNII-3 | 802.11a | Low | 5745 | 4.820 | 4.820 | 30.00 |
| | | Mid | 5785 | 4.953 | 4.953 | |
| | | High | 5825 | 4.428 | 4.428 | |
| | 802.11n HT20 | Low | 5745 | 4.426 | 4.426 | |
| | | Mid | 5785 | 4.667 | 4.667 | |
| | | High | 5825 | 4.283 | 4.283 | |
| | 802.11n HT40 | Low | 5755 | -0.483 | -0.483 | |
| | | High | 5795 | -0.235 | -0.235 | |
| | 802.11ac VHT80 | Mid | 5775 | -4.576 | -4.416 | |

* Calculation of PPSD result : Corr'd PPSD = Meas PPSD + Duty CF [dB]

## 10.2.5. 1Tx Mode Straddle channel IN THE 5.5 GHz BAND

**Bandwidth and Antenna Gain, Limits**

| Band | Mode | Channel | Center Freq. [MHz] | Min 26 dB BW [MHz] | Directional Gain [dBi] | Power Limit [dBm] | PPSD Limit [dBm/MHz] |
|---|---|---|---|---|---|---|---|
| UNII-2C | 802.11a | Straddle | 5720 | 15.014 | -2.05 | 22.76 | 11.00 |
| | 802.11n HT20 | Straddle | 5720 | 14.996 | | 22.76 | 11.00 |
| | 802.11n HT40 | Straddle | 5710 | 34.988 | | 23.98 | 11.00 |
| | 802.11ac VHT80 | Straddle | 5690 | 75.220 | | 23.98 | 11.00 |
| Included in Calculations of Corr'd Power & PPSD | | | | | | | |
| Duty Cycle CF [dB] | | | 802.11a | | | 0.00 | dB |
| | | | 802.11n HT20 | | | 0.00 | dB |
| | | | 802.11n HT40 | | | 0.00 | dB |
| | | | 802.11ac VHT80 | | | 0.16 | dB |

**Output Power Results**

| Band | Mode | Channel | Center Freq. [MHz] | Meas Power [dBm] | Corr'd Power [dBm] | Power Limit [dBm] |
|---|---|---|---|---|---|---|
| UNII-2C | 802.11a | Straddle | 5720 | 17.535 | 17.535 | 22.76 |
| | 802.11n HT20 | Straddle | 5720 | 17.316 | 17.316 | 22.76 |
| | 802.11n HT40 | Straddle | 5710 | 15.329 | 15.329 | 23.98 |
| | 802.11ac VHT80 | Straddle | 5690 | 13.946 | 14.106 | 23.98 |

* Calculation of Output Power : Corr'd Power = Meas Power + Duty CF [dB]

**PPSD Results**

| Band | Mode | Channel | Center Freq. [MHz] | Meas PPSD [dBm/MHz] | Corr'd PPSD [dBm/MHz] | PPSD Limit [dBm/MHz] |
|---|---|---|---|---|---|---|
| UNII-2C | 802.11a | Straddle | 5720 | 8.182 | 8.182 | 11.00 |
| | 802.11n HT20 | Straddle | 5720 | 7.887 | 7.887 | |
| | 802.11n HT40 | Straddle | 5710 | 2.858 | 2.858 | |
| | 802.11ac VHT80 | Straddle | 5690 | -1.946 | -1.786 | |

* Calculation of PPSD result : Corr'd PPSD = Meas PPSD + Duty CF

### 10.2.6. 1Tx Mode Straddle channel IN THE 5.8 GHz BAND

**Bandwidth and Antenna Gain, Limits**

| Band | Mode | Channel | Center Freq. [MHz] | Min 26 dB BW [MHz] | Directional Gain [dBi] | Power Limit [dBm] | PPSD Limit [dBm/500kHz] |
|---|---|---|---|---|---|---|---|
| UNII-3 | 802.11a | Straddle | 5720 | 4.862 | -2.02 | 30.00 | 30.00 |
| | 802.11n HT20 | Straddle | 5720 | 4.924 | | | |
| | 802.11n HT40 | Straddle | 5710 | 4.708 | | | |
| | 802.11ac VHT80 | Straddle | 5690 | 5.244 | | | |
| Included in Calculations of Corr'd Power & PPSD | | | | | | | |
| Duty Cycle CF [dB] | | | 802.11a | | | 0.00 | dB |
| | | | 802.11n HT20 | | | 0.00 | dB |
| | | | 802.11n HT40 | | | 0.00 | dB |
| | | | 802.11ac VHT80 | | | 0.16 | dB |

**Output Power Results**

| Band | Mode | Channel | Center Freq. [MHz] | Meas Power [dBm] | Corr'd Power [dBm] | Power Limit [dBm] |
|---|---|---|---|---|---|---|
| UNII-3 | 802.11a | Straddle | 5720 | 9.880 | 9.880 | 30.00 |
| | 802.11n HT20 | Straddle | 5720 | 10.072 | 10.072 | |
| | 802.11n HT40 | Straddle | 5710 | 2.673 | 2.673 | |
| | 802.11ac VHT80 | Straddle | 5690 | -2.319 | -2.159 | |

* Calculation of Output Power : Corr'd Power = Meas Power + Duty CF [dB]

**PPSD Results**

| Band | Mode | Channel | Center Freq. [MHz] | Meas PPSD [dBm/500kHz] | Corr'd PPSD [dBm/500kHz] | PPSD Limit [dBm/500kHz] |
|---|---|---|---|---|---|---|
| UNII-3 | 802.11a | Straddle | 5720 | 3.043 | 3.043 | 30.00 |
| | 802.11n HT20 | Straddle | 5720 | 2.961 | 2.961 | |
| | 802.11n HT40 | Straddle | 5710 | -3.573 | -3.573 | |
| | 802.11ac VHT80 | Straddle | 5690 | -8.848 | -8.688 | |

* Calculation of PPSD result : Corr'd PPSD = Meas PPSD + Duty CF


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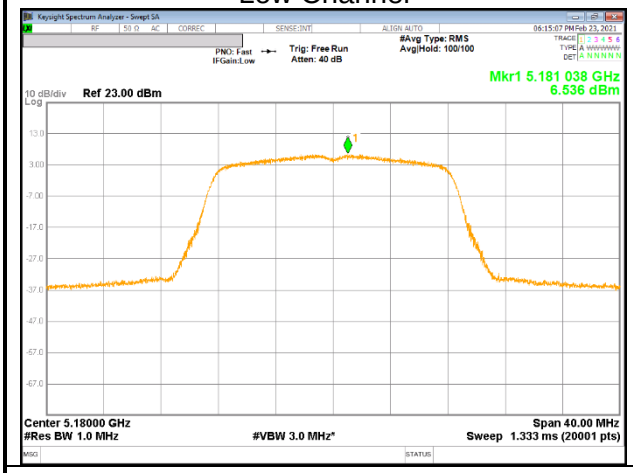
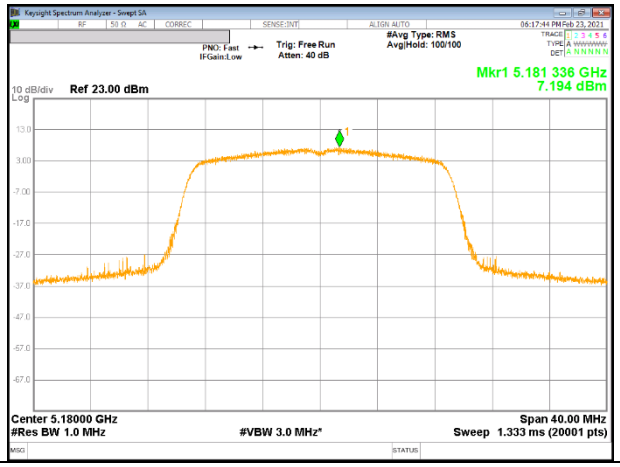
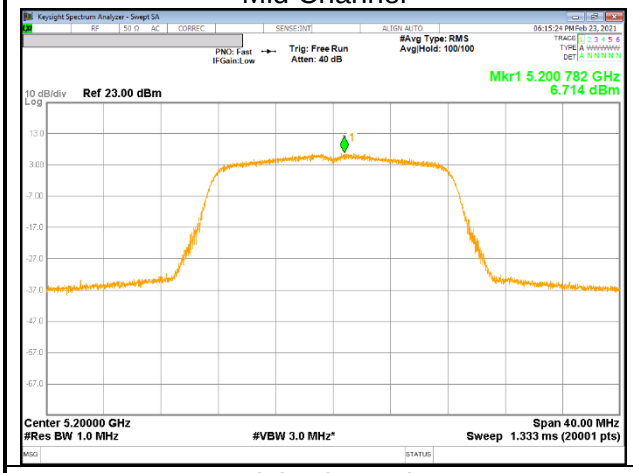
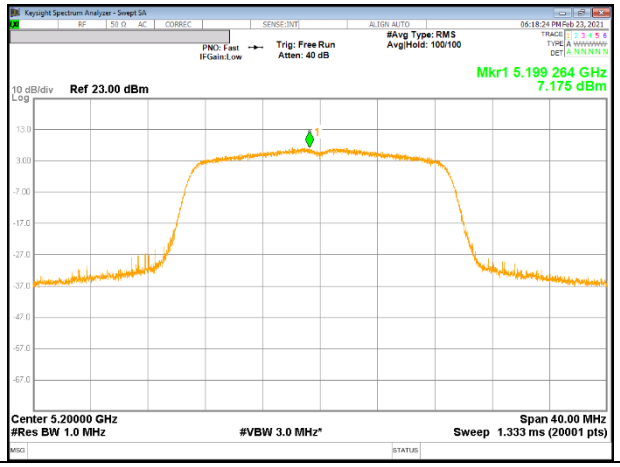
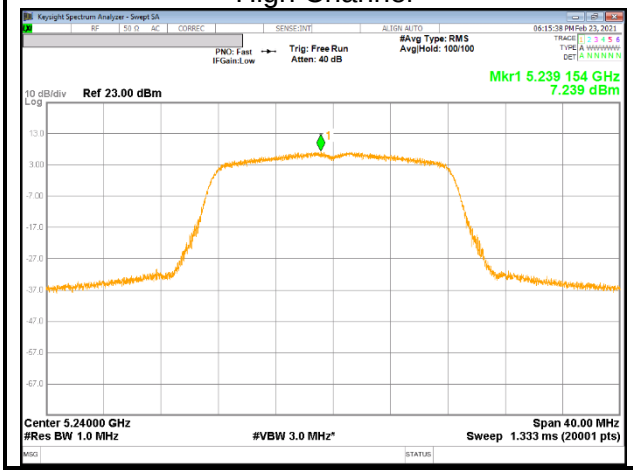
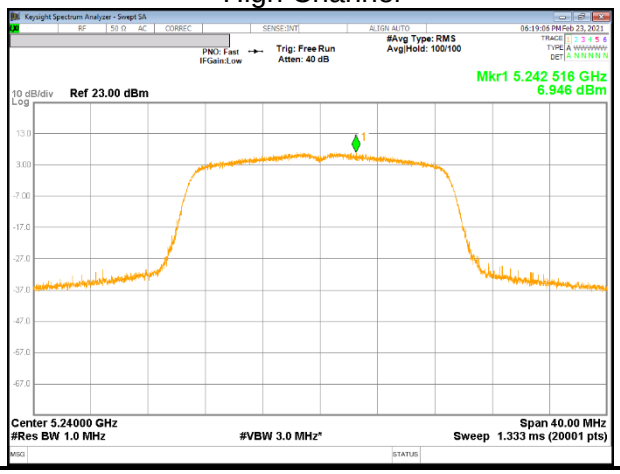
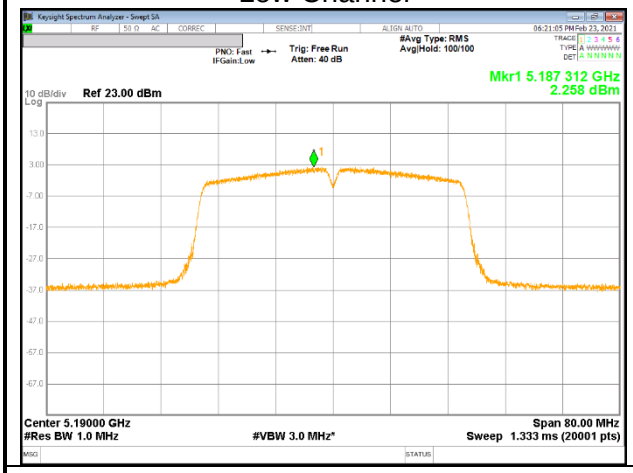
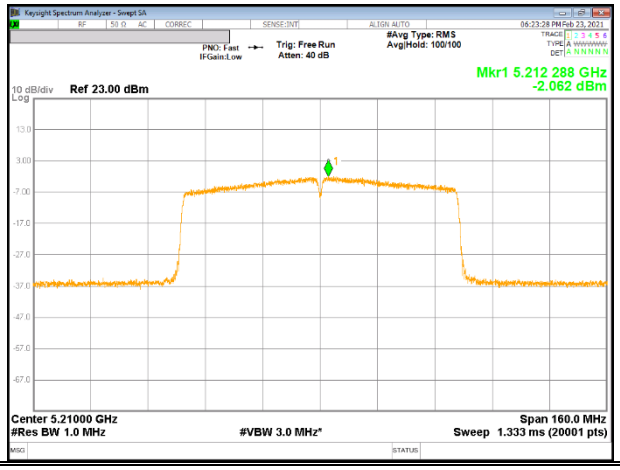
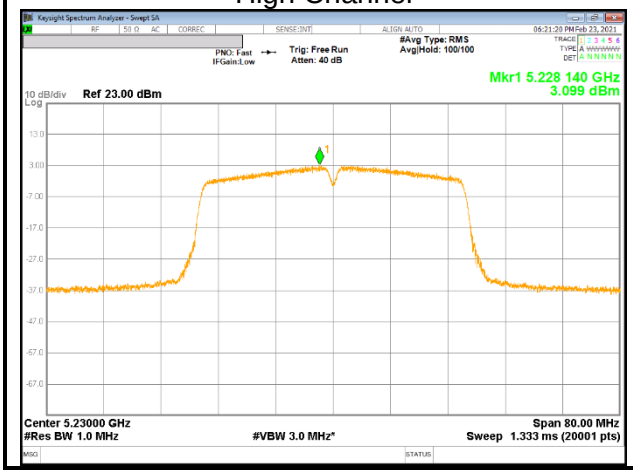
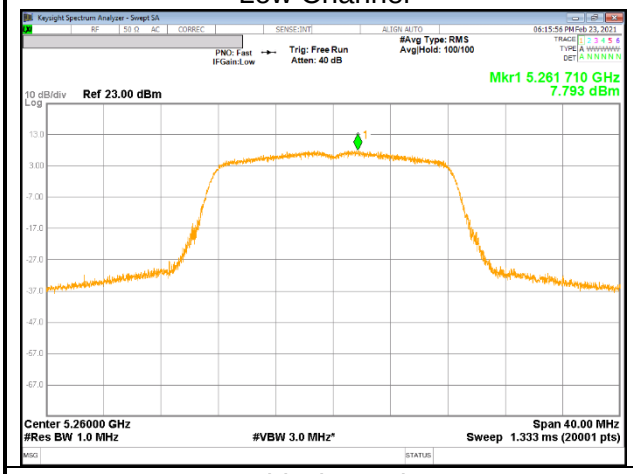
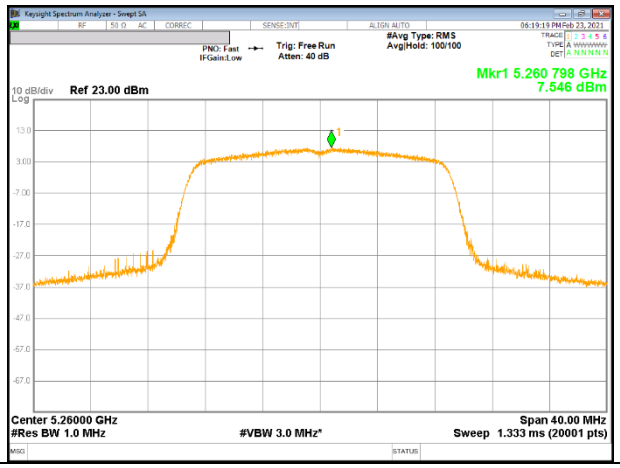
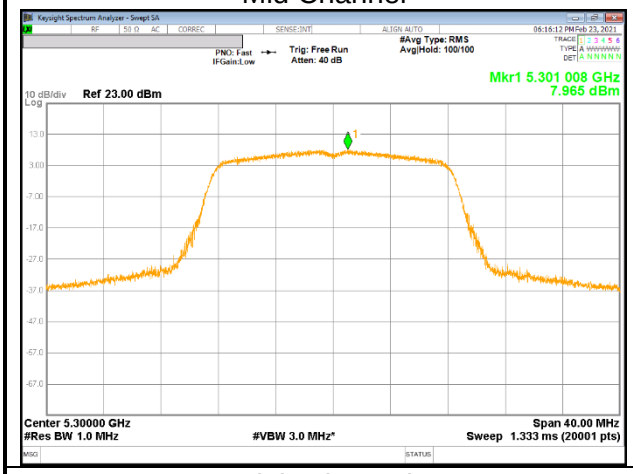
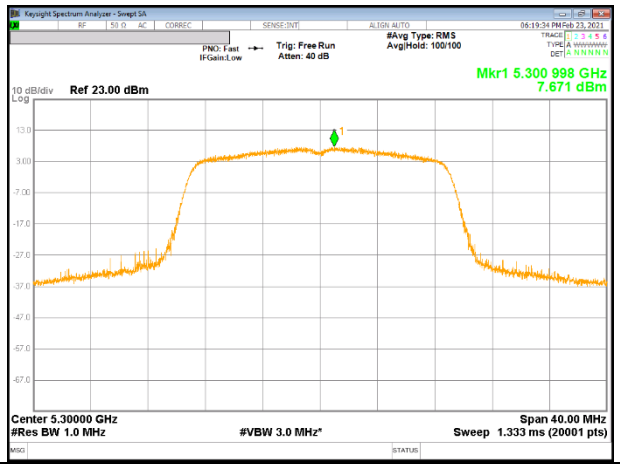
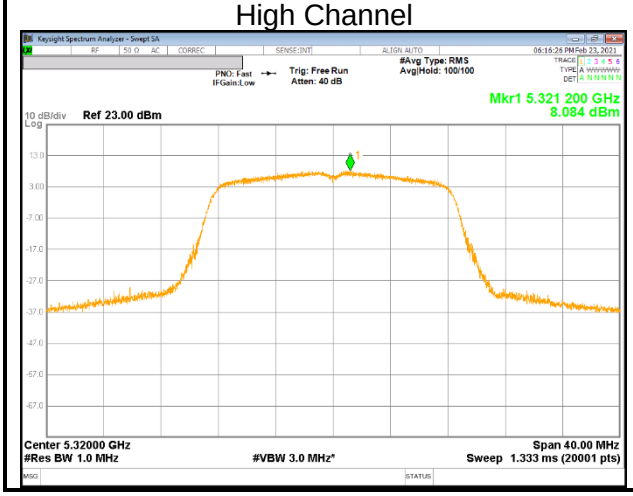
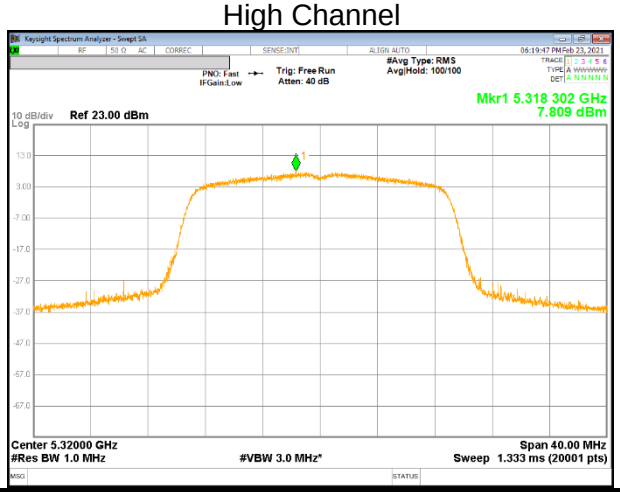
## 10.2.7. OUTPUT POWER AND PPSD PLOTS

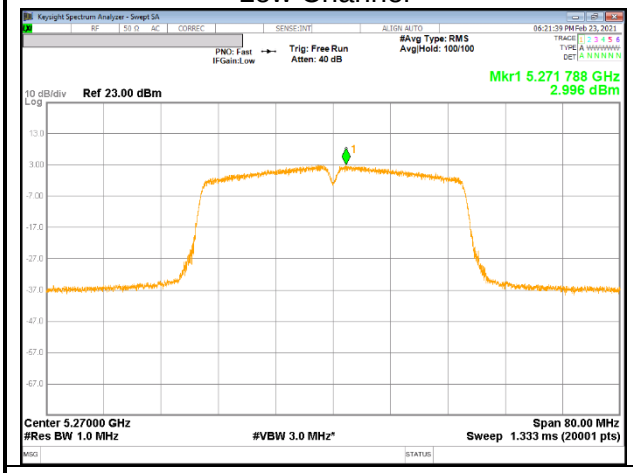
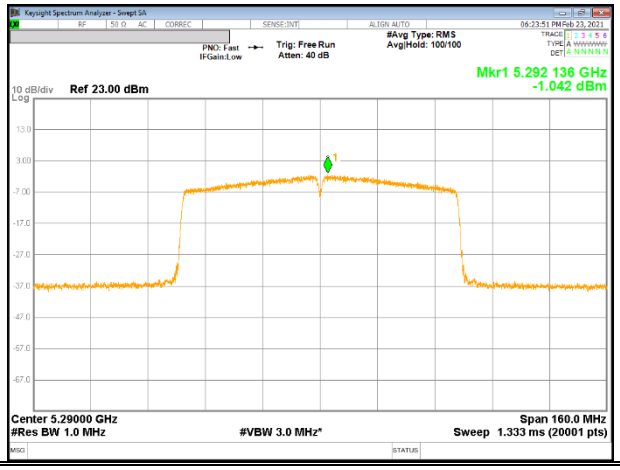
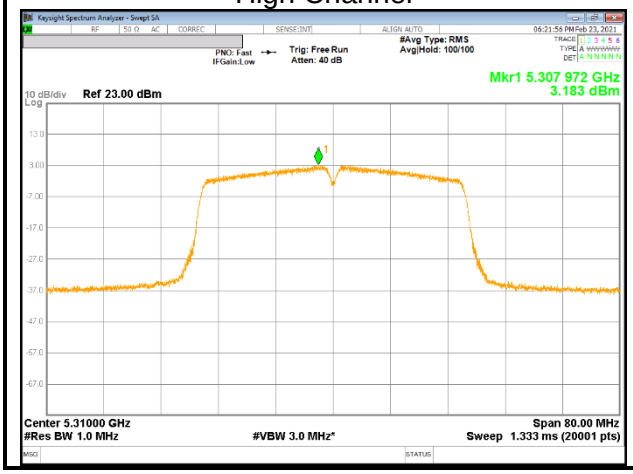
## UNII 5.2 GHz BAND

| 802.11a | 802.11n HT20 |
|---|---|
| Low Channel | Low Channel |
|  |  |
| Mid Channel | Mid Channel |
|  |  |
| High Channel | High Channel |
|  |  |

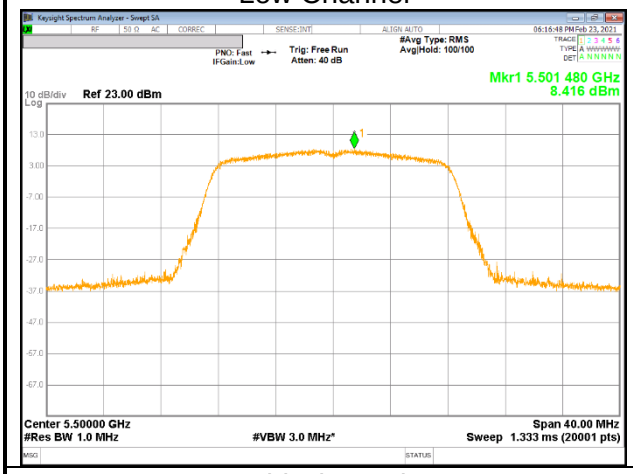
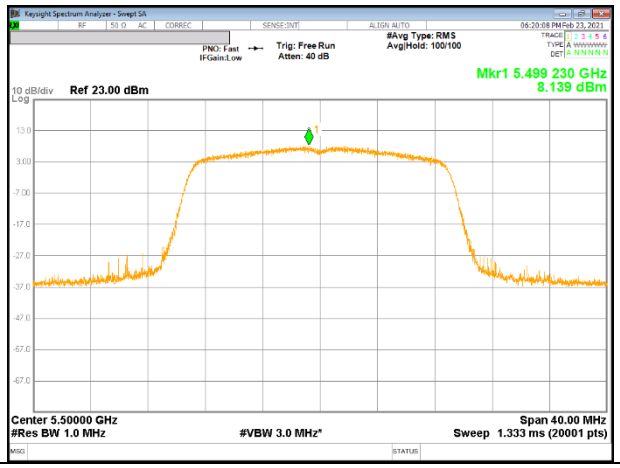
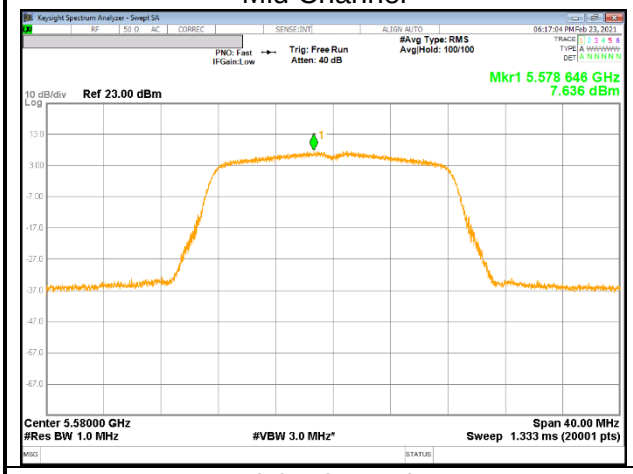
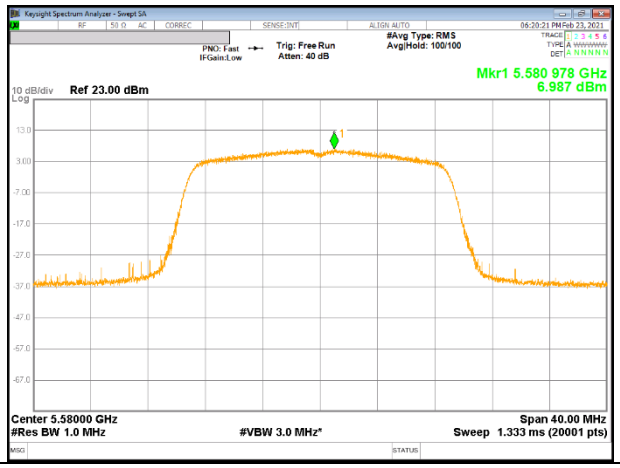
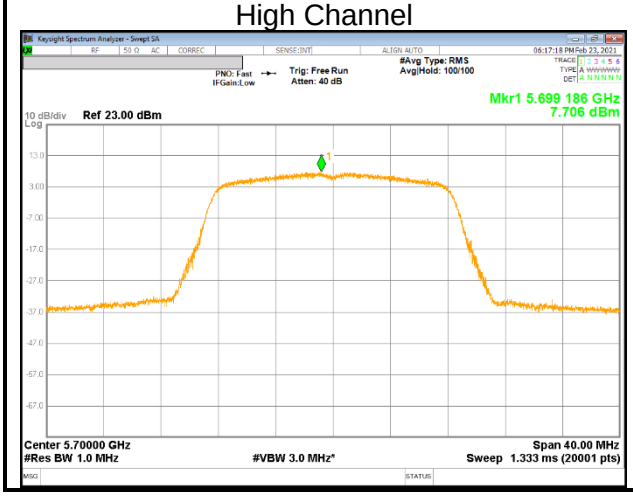
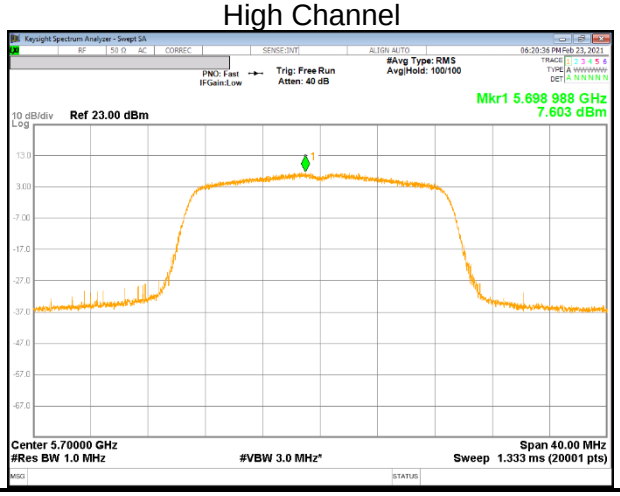
| 802.11n HT40 | 802.11ac VHT80 |
|---|---|
| Low Channel | Mid Channel |
|  |  |
| High Channel | |
|  | |

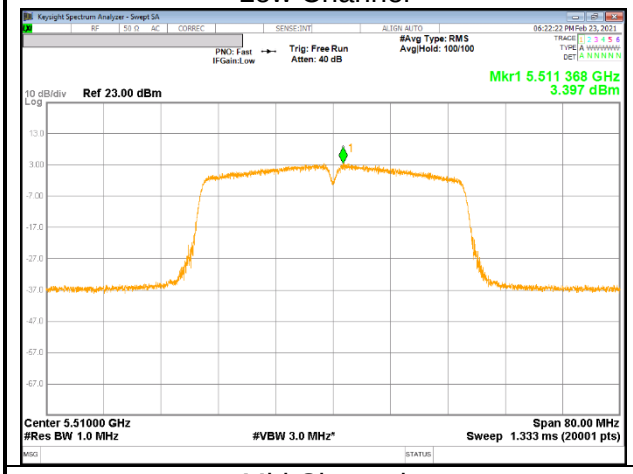
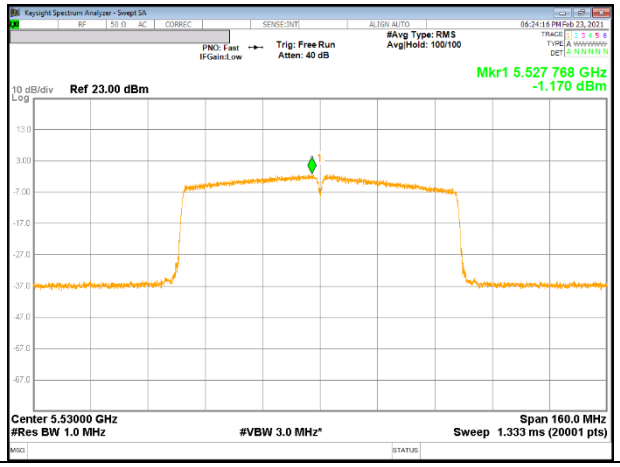
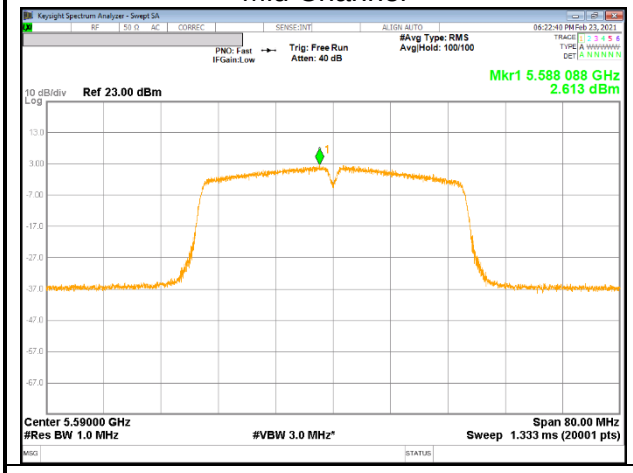
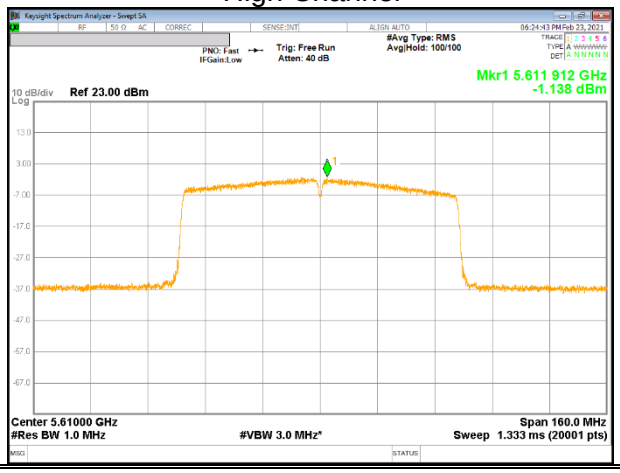
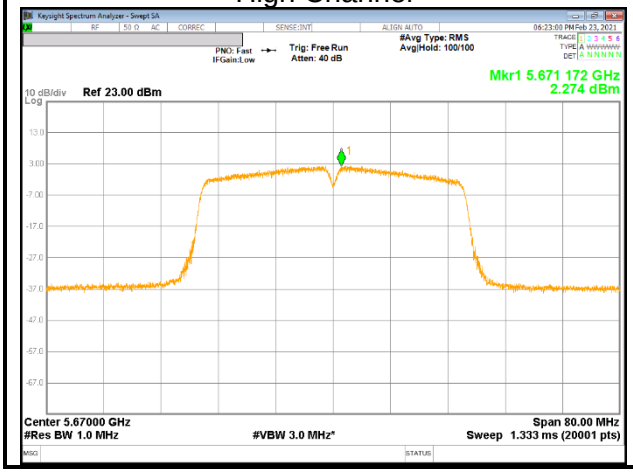
## UNII 5.3 GHz BAND

| 802.11a | 802.11n HT20 |
|---|---|
| Low Channel | Low Channel |
|  |  |
| Mid Channel | Mid Channel |
|  |  |
| High Channel | High Channel |
|  |  |

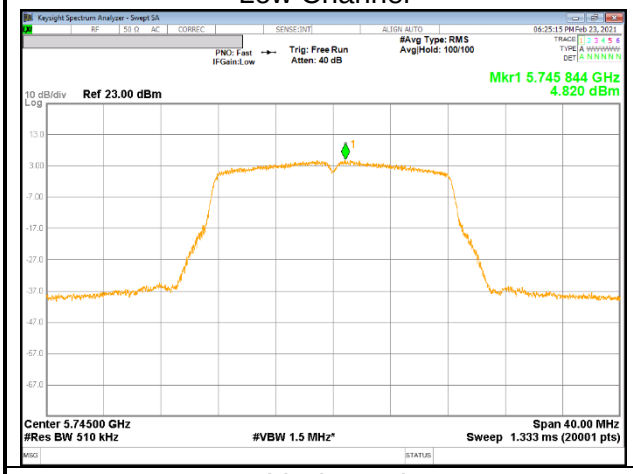
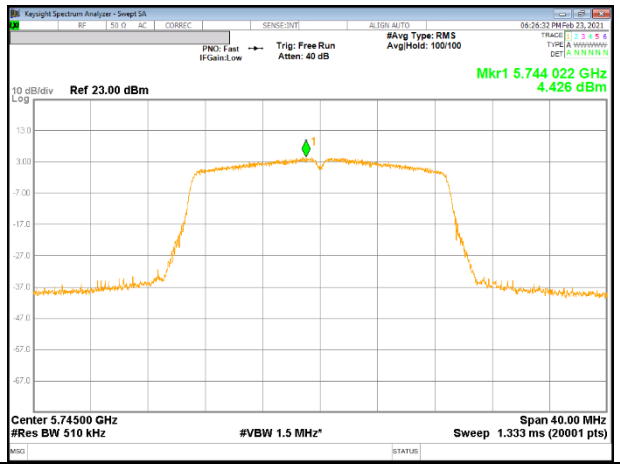
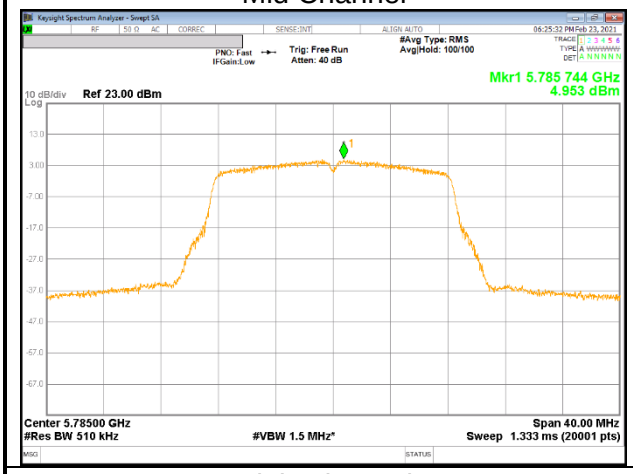
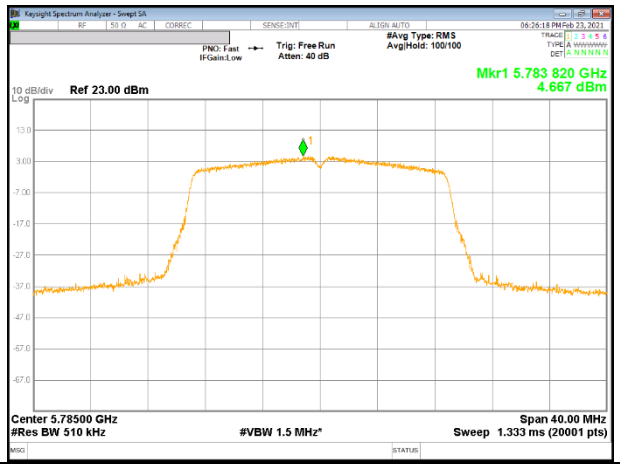
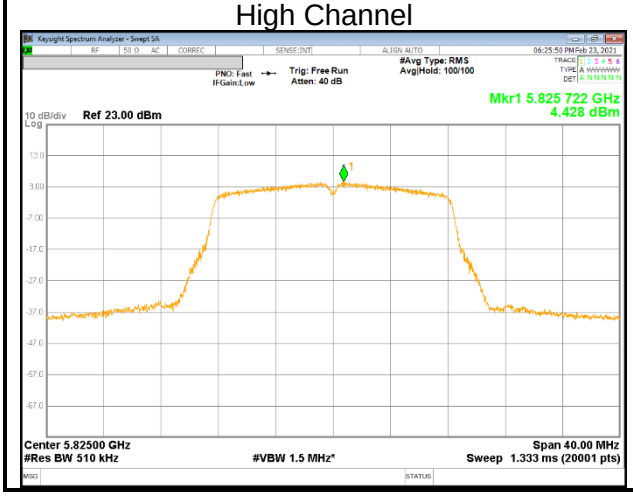
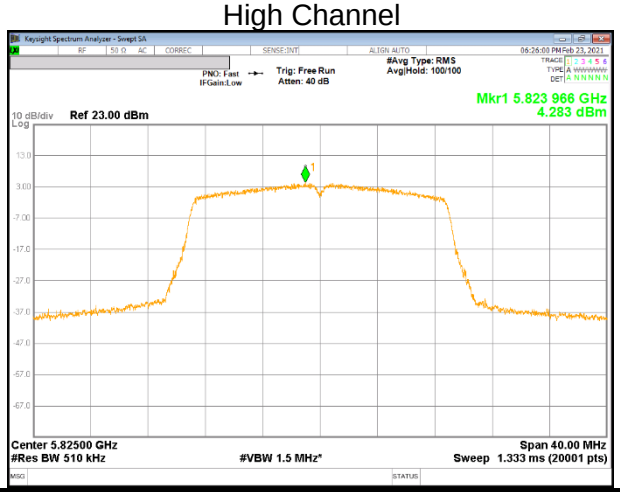
| 802.11n HT40 | 802.11ac VHT80 |
|---|---|
| Low Channel | Mid Channel |
|  |  |
| High Channel | |
|  | |

## UNII 5.5 GHz BAND

| 802.11a | 802.11n HT20 |
|---|---|
| Low Channel | Low Channel |
|  |  |
| Mid Channel | Mid Channel |
|  |  |
| High Channel | High Channel |
|  |  |

| 802.11n HT40 | 802.11ac VHT80 |
|---|---|
| Low Channel | Low Channel |
|  |  |
| Mid Channel | High Channel |
|  |  |
| High Channel | |
|  | |

## UNII 5.8 GHz BAND

| 802.11a | 802.11n HT20 |
|---|---|
| Low Channel | Low Channel |
|  |  |
| Mid Channel | Mid Channel |
|  |  |
| High Channel | High Channel |
|  |  |