



FCC 47 CFR PART 15 SUBPART E

UNII

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n and ANT+

MODEL NUMBER : SM-A600G/DS, SM-A600G

FCC ID: A3LSMA600G

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ACCREDITED*

Testing
Laboratory

TL-637

Revision History

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|-------------|-------------------|-----------------------------------|-------------------|
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n and ANT+
MODEL NUMBER: SM-A600G/DS, SM-A600G
SERIAL NUMBER: R38K108GLMR, R38K108GVGN (RADIATED, Original);
R38K10BCS5W (CONDUCTED, Original);
R38K108KQ3P (RADIATED, Spot check & Additional test);
DATE TESTED: FEB 22, 2018 - MAR 09, 2018 (Original)
MAR 13, 2018 - MAR 29, 2018 (Spot check & Additional test)

| 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.

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1.1. INTRODUCTION OF TEST DATA REUSE

This report referenced from the FCC ID: A3LSMA600GN UNII WLAN(FCC CFR 47 Part 15E). And the applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID.

1.2. DIFFERENCE

The FCC ID: A3LSMA600G shares the same enclosure and circuit board as FCC ID: A3LSMA600GN. The WLAN antennas and surrounding circuitry and layout are identical between these two units.

After confirming through preliminary radiated emissions that the performance of the FCC ID: A3LSMA600GN remains representative of FCC ID: A3LSMA600G. The test data of FCC ID: A3LSMA600GN being submitted for this application to cover WLAN features.

Due to difference of charger, radiated emission under 1GHz and AC line conducted test were performed newly.

1.3. SPOT CHECK VERIFICATION DATA

| Band | Test Item | Mode | Frequency | Test Limit | Original model | | Deviation | Remark |
|------------------------|-----------|---------------|-----------|-------------|----------------------|--|-----------|--------|
| | | | | | SM-A600GN/DS Results | Spot check model | | |
| | | | | | FCC ID : A3LSMA600GN | SM-A600G/DS Results FCC ID : A3LSMA600G | | |
| UNII WLAN (5GHz) | Band Edge | 802.11n HT40 | 5190 MHz | 54 dBuV/m | 51.12 dBuV/m | 47.70 dBuV/m | -3.42 dB | |
| | RSE | 802.11 a | 5200 MHz | 68.2 dBuV/m | 58.25 dBuV/m | 61.06 dBuV/m | 2.81 dB | |
| | Band Edge | 802.11 n HT40 | 5310 MHz | 54 dBuV/m | 48.90 dBuV/m | 48.25 dBuV/m | -0.65 dB | |
| | RSE | 802.11 a | 5260 MHz | 68.2 dBuV/m | 58.32 dBuV/m | 58.51 dBuV/m | 0.19 dB | |
| | Band Edge | 802.11n HT20 | 5500 MHz | 68.2 dBuV/m | 65.83 dBuV/m | 65.77 dBuV/m | -0.06 dB | |
| | RSE | 802.11 a | 5500 MHz | 54 dBuV/m | 44.16 dBuV/m | 44.17 dBuV/m | 0.01 dB | |
| | Band Edge | 802.11 a | 5745 MHz | -27 dBm | -32.56 dBm | -29.66 dBm | 2.90 dB | |
| | RSE | 802.11 a | 5785 MHz | 54 dBuV/m | 47.05 dBuV/m | 41.84 dBuV/m | -5.21 dB | |

Comparison of two models, upper deviation is within 3dB range and all test results are under FCC Technical Limits.

1.4. REFERENCE DETAIL

Reference application that contains the reused reference data.

| Equipment Class | Reference FCC ID | Type Grant/Permissive Change | Reference Application | Folder Test/RF Exposure | Report Title / Section |
|-----------------|------------------|------------------------------|-----------------------|-------------------------|---|
| DTS | A3LSMA600GN | Grant | 4788371667-E1V2 | Test | FCC Report DTS WLAN / All sections (Except section 11.3 and 12) |
| | | | 4788371667-E2V2 | Test | FCC Report BLE All sections (Except section 11.3 and 12) |
| DSS | A3LSMA600GN | Grant | 4788371667-E3V2 | Test | FCC Report BT / All sections (Except section 11.3 and 12) |
| NII | A3LSMA600GN | Grant | 4788371667-E4V2 | Test | FCC Report UNII WALN / All sections (Except section 12 and 13) |
| DXX | A3LSMA600GN | Grant | 4788371667-E5V2 | Test | FCC Report ANT+ / All sections (Except section 7.2.5 and 8) |
| PCE | A3LSMA600GN | Grant | 4788371667-E7V2 | Test | FCC Report WWAN / All sections (Except Conducted Output Power & Test result of LTE Band 66) |

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. KDB 484596 D01 Referencing Test Data DR01-42712
7. 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 |
|---|
| <input checked="" type="checkbox"/> Chamber 1 |
| <input checked="" type="checkbox"/> Chamber 2 |
| <input checked="" type="checkbox"/> Chamber 3 |

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <http://www.iasonline.org/PDF/TL/TL-637.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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

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 | 2.32 dB |
| Radiated Disturbance, Below 1GHz | 3.86 dB |
| Radiated Disturbance, Above 1 GHz | 5.97 dB |

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

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

5.2. MAXIMUM OUTPUT POWER

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

| Frequency Range [MHz] | Mode | Output Power [dBm] | Output Power [mW] |
|-----------------------|--------------|--------------------|-------------------|
| 5180 - 5240 | 802.11a | 16.01 | 39.90 |
| | 802.11n HT20 | 15.57 | 36.09 |
| 5190 - 5230 | 802.11n HT40 | 14.21 | 26.36 |
| 5260 - 5320 | 802.11a | 15.85 | 38.45 |
| | 802.11n HT20 | 16.40 | 43.60 |
| 5270 - 5310 | 802.11n HT40 | 14.31 | 26.97 |
| 5500 - 5720 | 802.11a | 16.29 | 42.60 |
| | 802.11n HT20 | 16.00 | 39.84 |
| 5510 - 5710 | 802.11n HT40 | 13.76 | 23.78 |
| 5745 - 5825 | 802.11a | 16.19 | 41.57 |
| | 802.11n HT20 | 15.76 | 37.69 |
| 5755 - 5795 | 802.11n HT40 | 13.73 | 23.58 |

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

| Frequency Range [MHz] | Antenna Gain [dBi] |
|--------------------------|-----------------------|
| UNII 1 5150 – 5250 | -1.17 |
| UNII 2A 5250 – 5350 | -1.74 |
| UNII 2C 5470 – 5725 | -1.74 |
| UNII 3 5725 – 5850 | -2.12 |

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,Z, it was determined that the Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in the Y orientation.

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

802.11a mode: 6 Mbps
802.11n HT20 mode: MCS0
802.11n HT40 mode: MCS0

Note : All radiated and power line conducted tests were performed connected with earphone and 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-TA50EWE | DW3K115DS/A-E | N/A |
| Data Cable | SAMSUNG | ECB-DU68WE | N/A | N/A |
| Earphone | SAMSUNG | EHS61ASFWE | N/A | N/A |

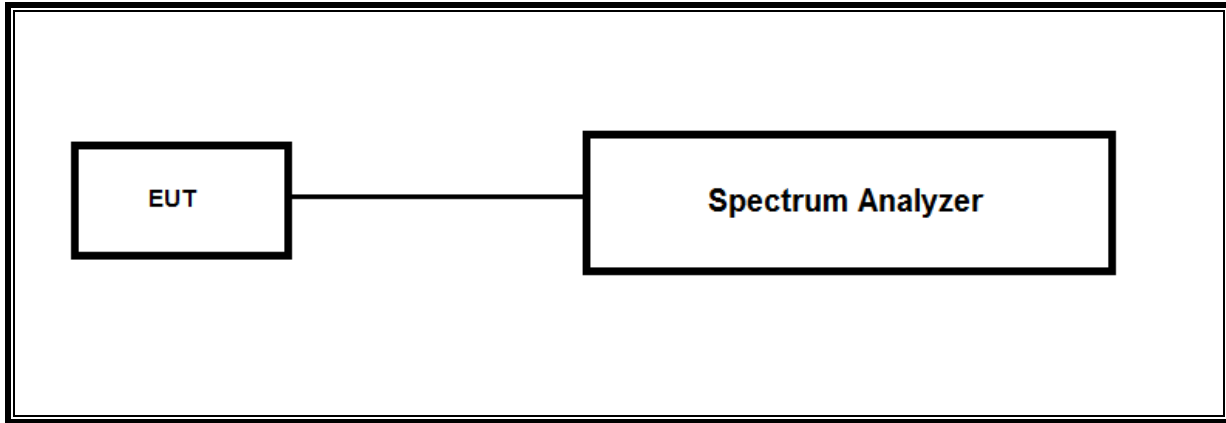
I/O CABLES

| I/O Cable List | | | | | | |
|----------------|----------|----------------------|----------------|------------|------------------|---------|
| Cable No | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | DC Power | 1 | Mini-USB | Shielded | 1.2m | N/A |
| 2 | Audio | 2 | Mini-Jack | Unshielded | 1.2m | N/A |

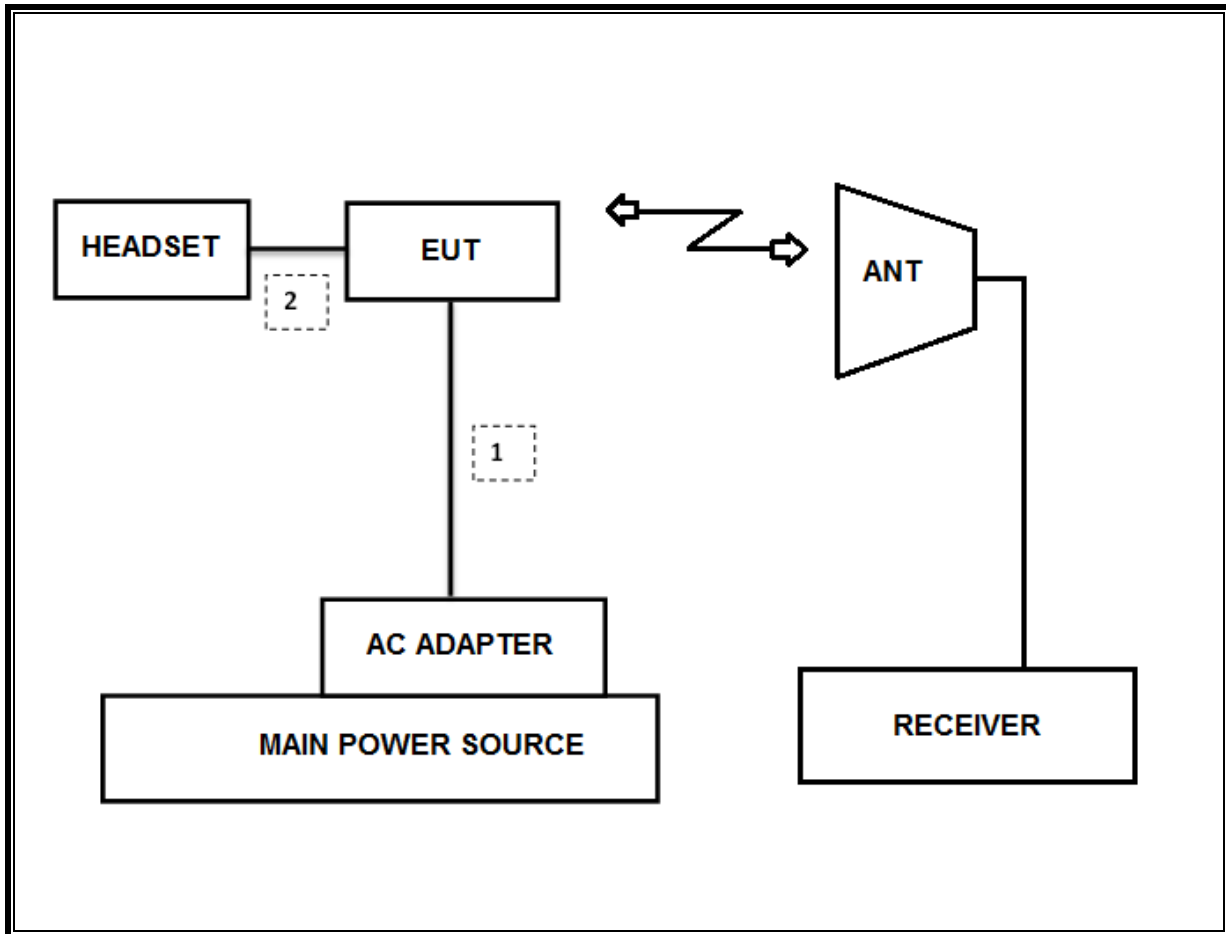
TEST SETUP

The EUT is a stand-alone unit during the tests.
Test software in hidden menu 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 | 08-31-19 |
| Antenna, Bilog, 30MHz-1GHz | SCHWARZBECK | VULB9163 | 749 | 09-14-19 |
| Antenna, Bilog, 30MHz-1GHz | SCHWARZBECK | VULB9163 | 845 | 08-31-19 |
| Antenna, Horn, 18 GHz | ETS | 3115 | 00167211 | 10-14-18 |
| Antenna, Horn, 18 GHz | ETS | 3115 | 00161451 | 03-10-19 |
| Antenna, Horn, 18 GHz | ETS | 3117 | 00168724 | 05-31-19 |
| Antenna, Horn, 18 GHz | ETS | 3117 | 00168717 | 05-31-19 |
| Antenna, Horn, 18 GHz | ETS | 3117 | 00205959 | 11-29-18 |
| Antenna, Horn, 40 GHz | ETS | 3116C | 00166155 | 12-04-19 |
| Antenna, Horn, 40 GHz | ETS | 3116C | 00168645 | 12-04-19 |
| Antenna, Horn, 40 GHz | ETS | 3116C-PA | 00168841 | 11-13-19 |
| Preamplifier, 1000 MHz | Sonoma | 310N | 341282 | 08-09-18 |
| Preamplifier, 1000 MHz | Sonoma | 310N | 351741 | 08-07-18 |
| Preamplifier, 1000 MHz | Sonoma | 310N | 370599 | 08-10-18 |
| Preamplifier, 18 GHz | Miteq | AFS42-00101800-25-S-42 | 1876511 | 08-08-18 |
| Preamplifier, 18 GHz | Miteq | AFS42-00101800-25-S-42 | 1896138 | 08-08-18 |
| Preamplifier, 18 GHz | Miteq | AFS42-00101800-25-S-42 | 2029169 | 08-11-18 |
| Spectrum Analyzer, 44 GHz | Agilent / HP | N9030A | MY54170614 | 08-08-18 |
| Spectrum Analyzer, 44 GHz | Agilent / HP | N9030A | MY54490312 | 08-08-18 |
| Average Power Sensor | Agilent / HP | U2000 | MY54270007 | 08-08-18 |
| Attenuator | PASTERNAK | PE7087-10 | A001 | 08-08-18 |
| Attenuator | PASTERNAK | PE7087-10 | A008 | 08-08-18 |
| Attenuator | PASTERNAK | PE7087-10 | 2 | 08-10-18 |
| Attenuator | PASTERNAK | PE7087-10 | A009 | 08-08-18 |
| EMI Test Receive, 40 GHz | R&S | ESU40 | 100439 | 08-08-18 |
| EMI Test Receive, 40 GHz | R&S | ESU40 | 100457 | 08-08-18 |
| EMI Test Receive, 44 GHz | R&S | ESW44 | 101590 | 08-09-18 |
| EMI Test Receive, 3 GHz | R&S | ESR3 | 101832 | 08-07-18 |
| Low Pass Filter 5GHz | Micro-Tronics | LPS17541 | 009 | 08-08-18 |
| Low Pass Filter 5GHz | Micro-Tronics | LPS17541 | 015 | 08-08-18 |
| Low Pass Filter 5GHz | Micro-Tronics | LPS17541 | 020 | 08-11-18 |
| High Pass Filter 3GHz | Micro-Tronics | HPM17543 | 010 | 08-08-18 |
| High Pass Filter 3GHz | Micro-Tronics | HPM17543 | 015 | 08-08-18 |
| High Pass Filter 3GHz | Micro-Tronics | HPM17543 | 020 | 08-11-18 |
| High Pass Filter 6GHz | Micro-Tronics | HPS17542 | 009 | 08-08-18 |
| High Pass Filter 6GHz | Micro-Tronics | HPS17542 | 016 | 08-08-18 |
| High Pass Filter 6GHz | Micro-Tronics | HPS17542 | 021 | 08-11-18 |
| LISN | R&S | ENV-216 | 101837 | 08-09-18 |
| 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(OBW) | | PASS |
| 15.407 (a)(3) | TX Cond. Power 5.725-5.825 | < 30dBm or 17+10Log(OBW) | | 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 10 | | Radiated |
| 15.407 (b) & 15.209 | Radiated Spurious Emission | < 54dBuV/m | PASS | |
| 15.407 (h)(2) | Dynamic Frequency Selection | N/A | Condcuted | PASS |

8. MEASUREMENT METHODS

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

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

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

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

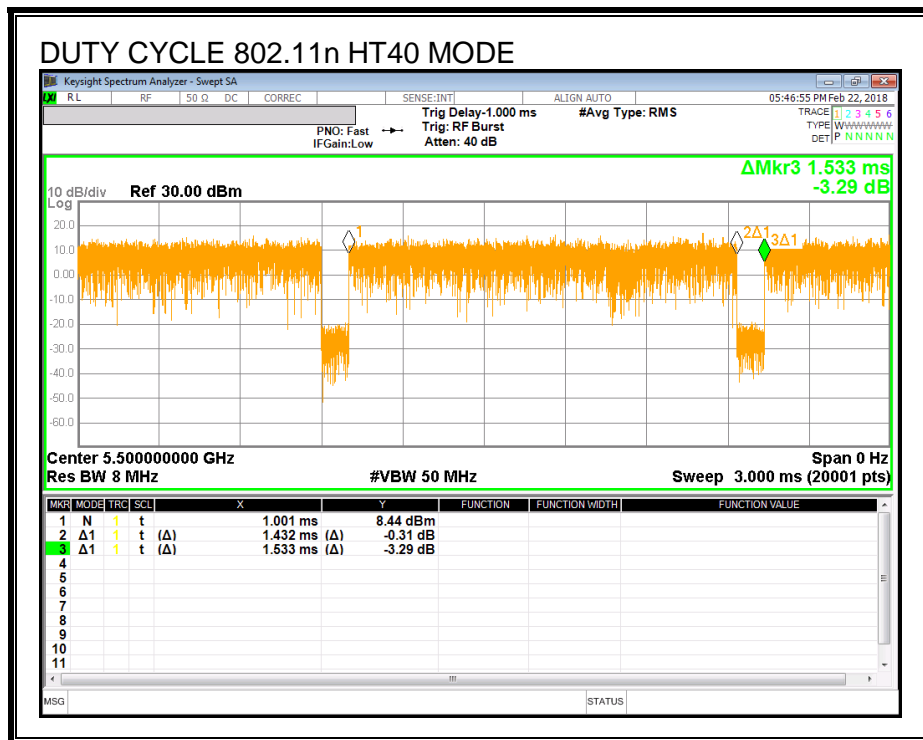
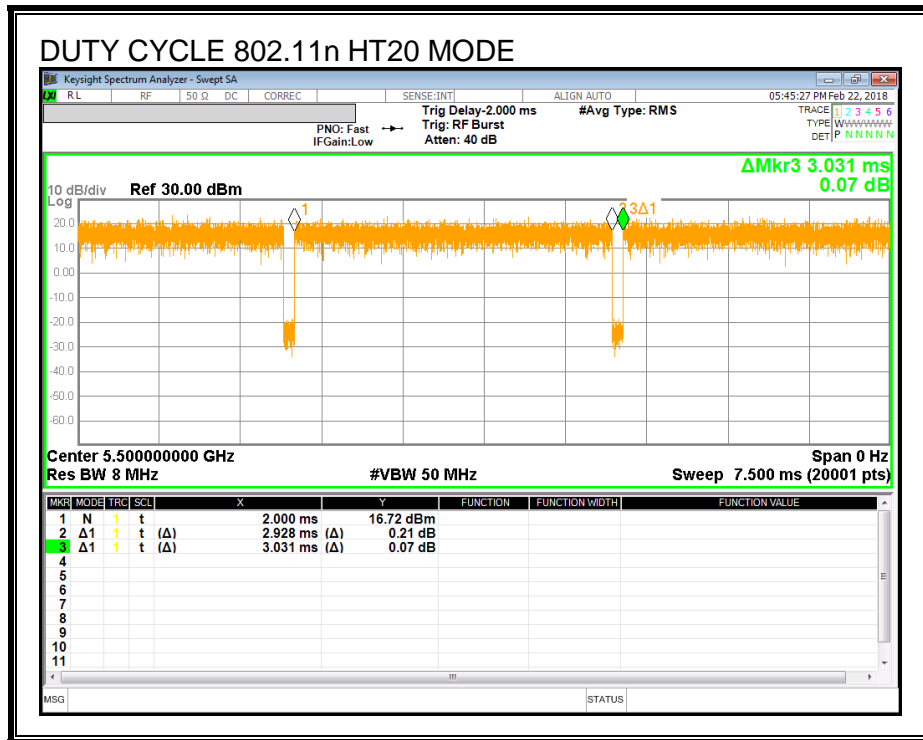
Conducted Output Power : KDB 789033 D02 v02r01, Section E.2.d(Method SA-2)

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

Unwanted emissions in restricted bands : KDB 789033 D02 v02r01, Section G.

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

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



9.3. 26 dB 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.

NOTE

- Calculation for 26dB Bandwidth of UNII-2C and UNII-3 Straddle Channel

ex) Fundamental frequency : 5720MHz

- 26dB BW : 21.00MHz
- Turning Frequency : 5725MHz
- 26dB Bandwidth of UNII-2C band Portion
= $(5725 - (5720 - (21.00 / 2))) = 15.50 \text{ MHz}$
- 26dB Bandwidth of UNII-3 band Portion
= $(5720 + (21.00 / 2) - 5725) = 5.50 \text{ MHz}$

RESULTS

9.3.1. 802.11a MODE IN THE 5.2 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] |
|---------|-----------------|-----------------------|
| Low | 5180 | 21.07 |
| Mid | 5200 | 20.98 |
| High | 5240 | 21.35 |
| Worst | | 21.35 |

9.3.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] |
|---------|-----------------|-----------------------|
| Low | 5180 | 21.43 |
| Mid | 5200 | 21.31 |
| High | 5240 | 21.19 |
| Worst | | 21.43 |

9.3.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] |
|---------|-----------------|-----------------------|
| Low | 5190 | 39.41 |
| High | 5230 | 39.45 |
| Worst | | 39.45 |

9.3.4. 802.11a MODE IN THE 5.3 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] |
|---------|-----------------|-----------------------|
| Low | 5260 | 21.06 |
| Mid | 5300 | 21.04 |
| High | 5320 | 20.87 |
| Worst | | 21.06 |

9.3.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] |
|---------|-----------------|-----------------------|
| Low | 5260 | 22.56 |
| Mid | 5300 | 21.86 |
| High | 5320 | 21.86 |
| Worst | | 22.56 |

9.3.6. 802.11n HT40 MODE IN THE 5.3 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] |
|---------|-----------------|-----------------------|
| Low | 5270 | 39.66 |
| High | 5310 | 39.81 |
| Worst | | 39.81 |

9.3.7. 802.11a MODE IN THE 5.5 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] |
|----------|-----------------|-----------------------|
| Low | 5500 | 21.22 |
| Mid | 5580 | 20.99 |
| High | 5700 | 21.05 |
| Straddle | 5720 | 15.58 |
| Worst | | 21.22 |

9.3.8. 802.11n HT20 MODE IN THE 5.5 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] |
|----------|-----------------|-----------------------|
| Low | 5500 | 21.08 |
| Mid | 5580 | 21.36 |
| High | 5700 | 21.23 |
| Straddle | 5720 | 15.70 |
| Worst | | 21.36 |

9.3.9. 802.11n HT40 MODE IN THE 5.5 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] |
|----------|-----------------|-----------------------|
| Low | 5510 | 39.56 |
| Mid | 5590 | 39.65 |
| High | 5670 | 39.82 |
| Straddle | 5710 | 34.68 |
| Worst | | 39.82 |

9.3.10. 802.11a MODE IN THE 5.8 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] |
|----------|-----------------|-----------------------|
| Straddle | 5720 | 5.58 |
| Low | 5745 | 21.28 |
| Mid | 5785 | 21.03 |
| High | 5825 | 21.16 |
| Worst | | 21.28 |

9.3.11. 802.11n HT20 MODE IN THE 5.8 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] |
|----------|-----------------|-----------------------|
| Straddle | 5720 | 5.70 |
| Low | 5745 | 21.07 |
| Mid | 5785 | 21.30 |
| High | 5825 | 21.24 |
| Worst | | 21.30 |

9.3.12. 802.11n HT40 MODE IN THE 5.8 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] |
|----------|-----------------|-----------------------|
| Straddle | 5710 | 4.68 |
| Low | 5755 | 39.58 |
| High | 5795 | 39.80 |
| Worst | | 39.80 |

9.3.13. 26 dB BANDWIDTH PLOTS

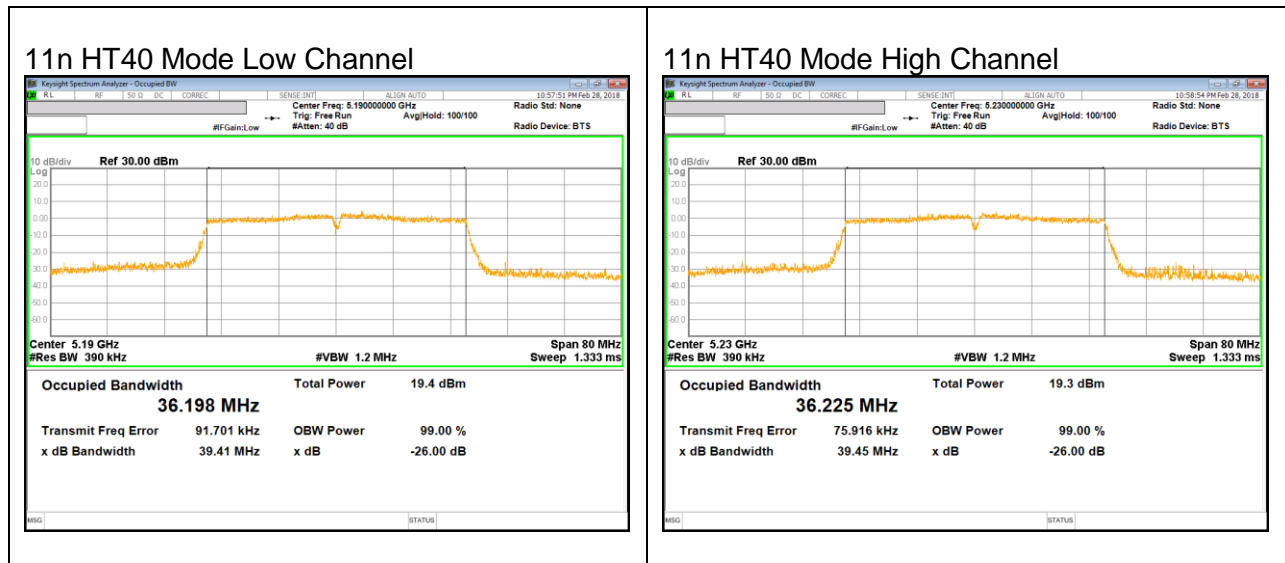
UNII 5.2 GHz IEEE 802.11a mode



UNII 5.2 GHz IEEE 802.11n HT20 mode



UNII 5.2 GHz IEEE 802.11n HT40 mode

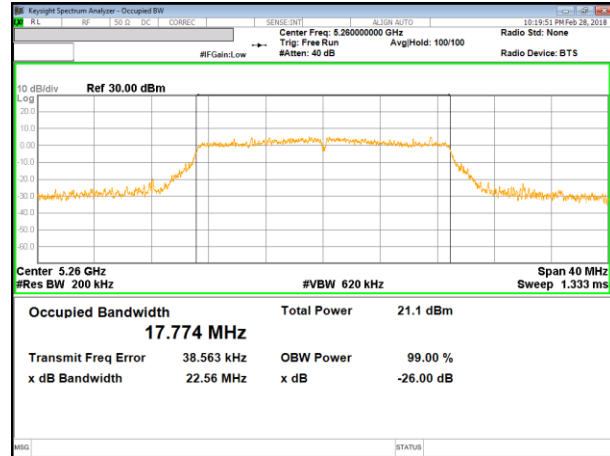


UNII 5.3 GHz IEEE 802.11a mode

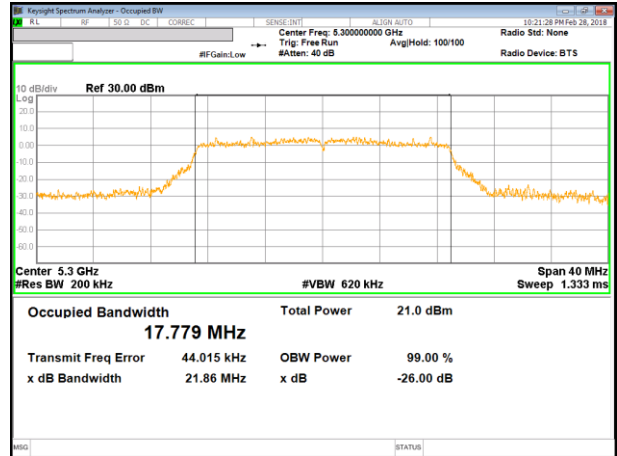


UNII 5.3 GHz IEEE 802.11n HT20 mode

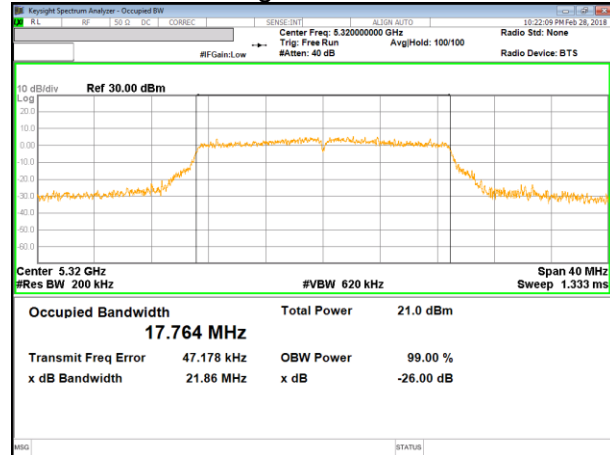
11n HT20 Mode Low Channel



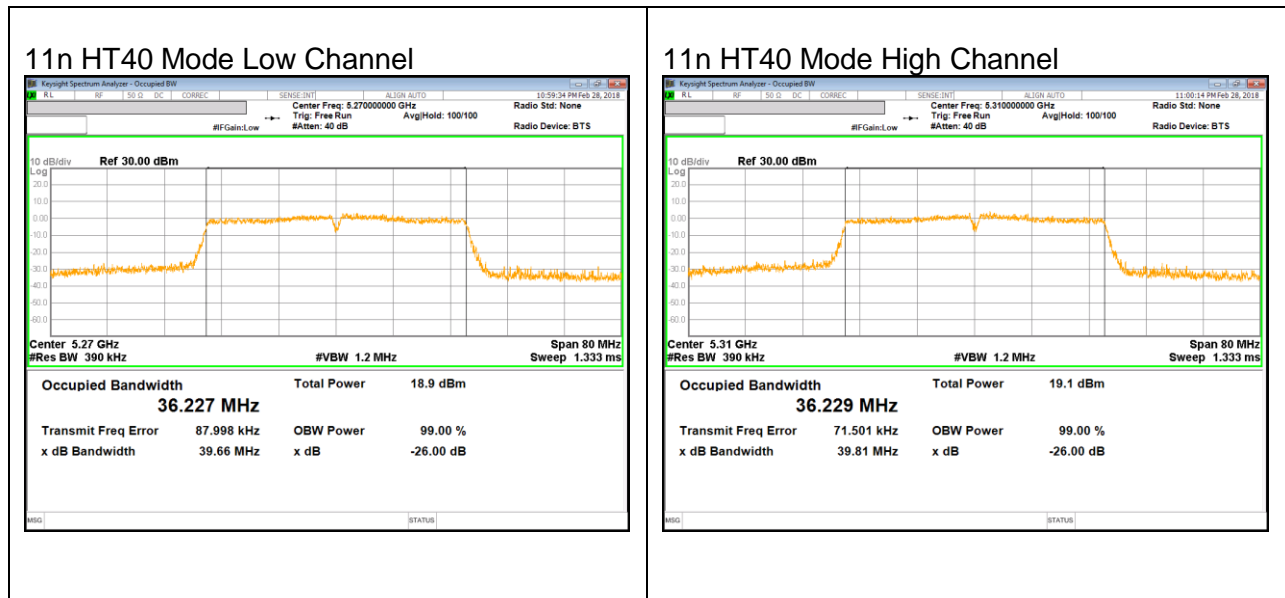
11n HT20 Mode Middle Channel



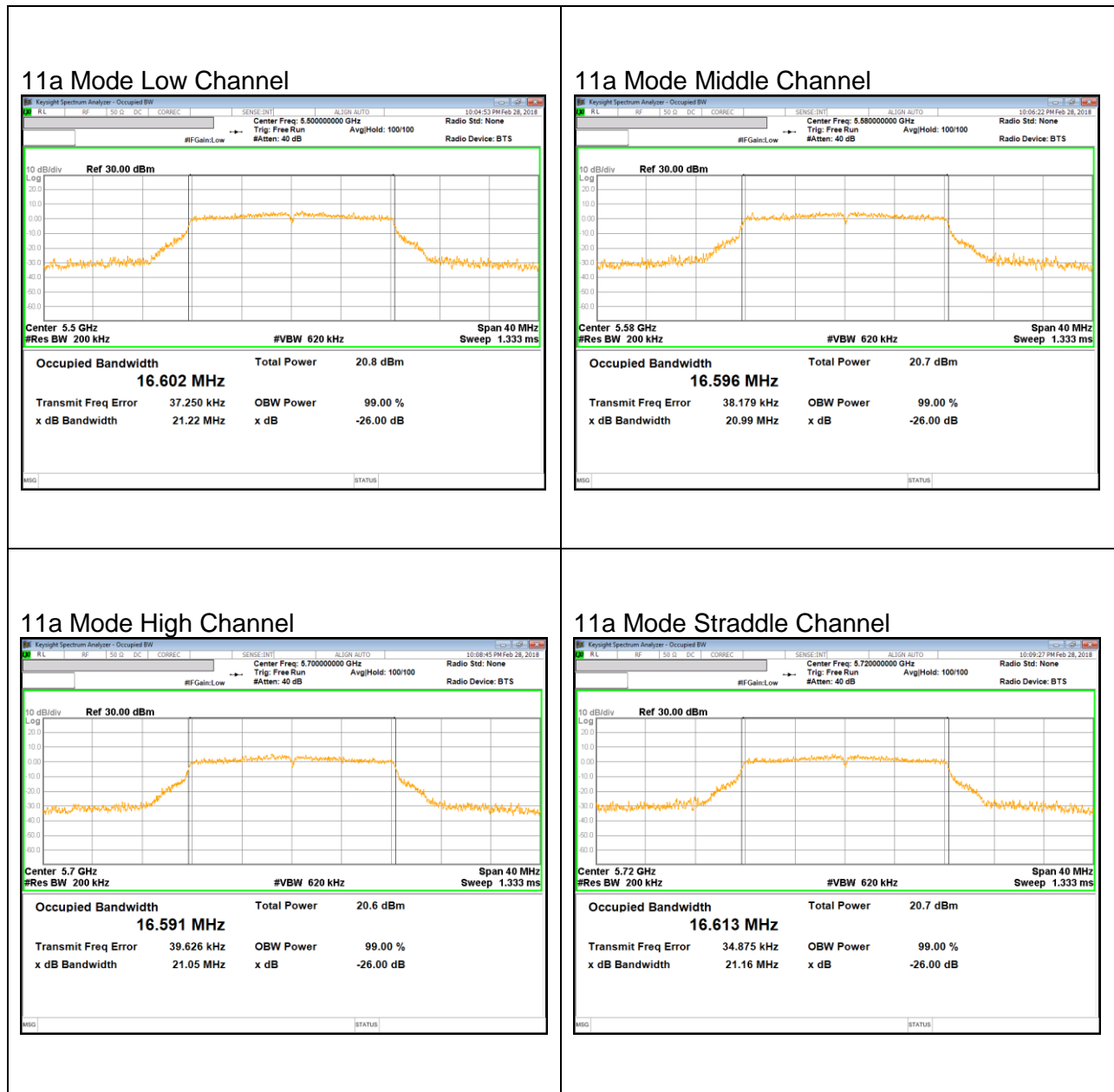
11n HT20 Mode High Channel



UNII 5.3 GHz IEEE 802.11n HT40 mode



UNII 5.5 GHz IEEE 802.11a mode



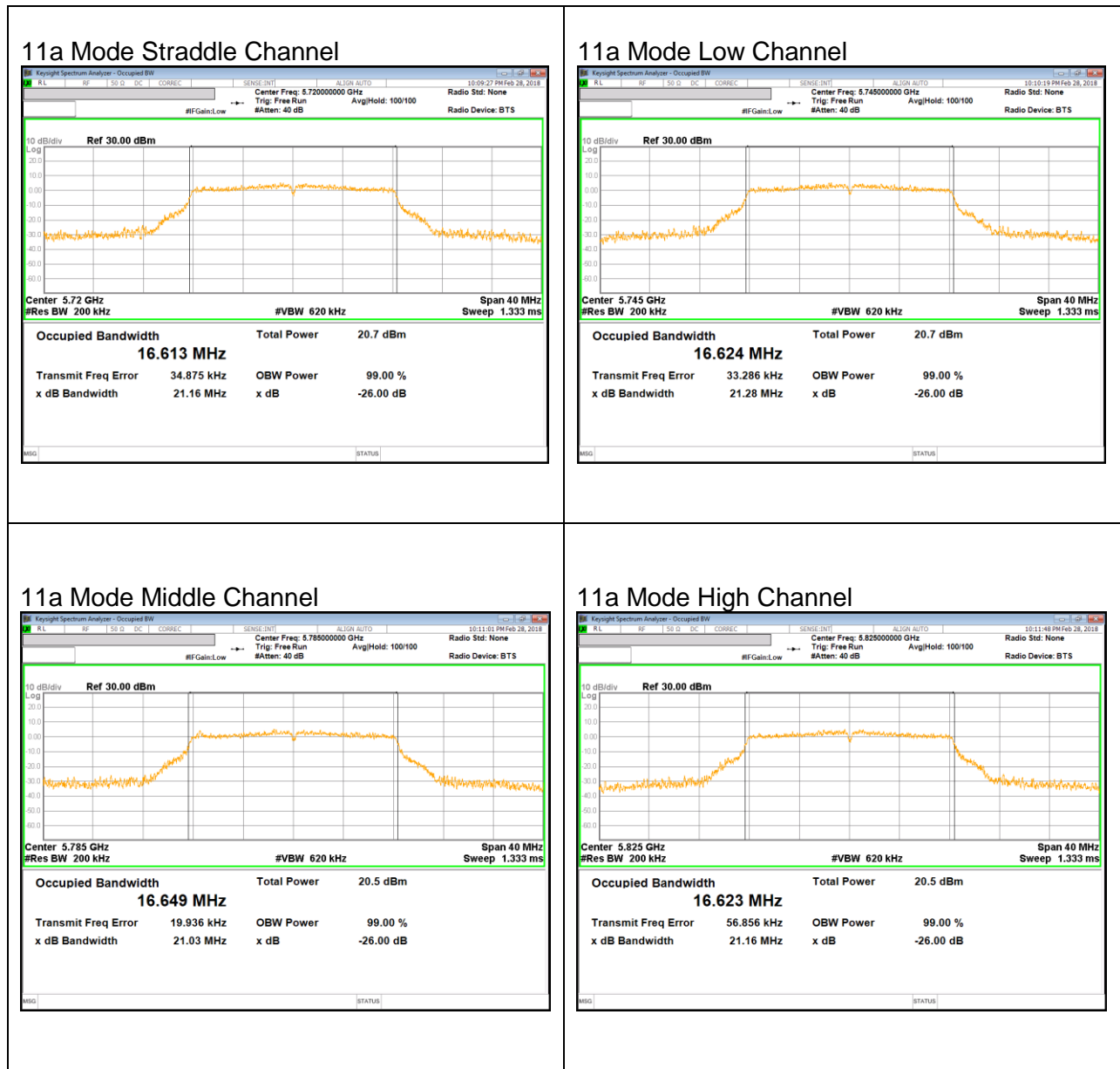
UNII 5.5 GHz IEEE 802.11n HT20 mode



UNII 5.5 GHz IEEE 802.11n HT40 mode



UNII 5.8 GHz IEEE 802.11a mode

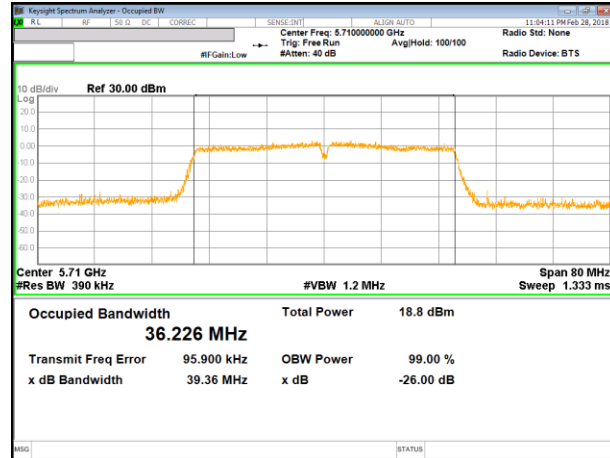


UNII 5.8 GHz IEEE 802.11n HT20 mode

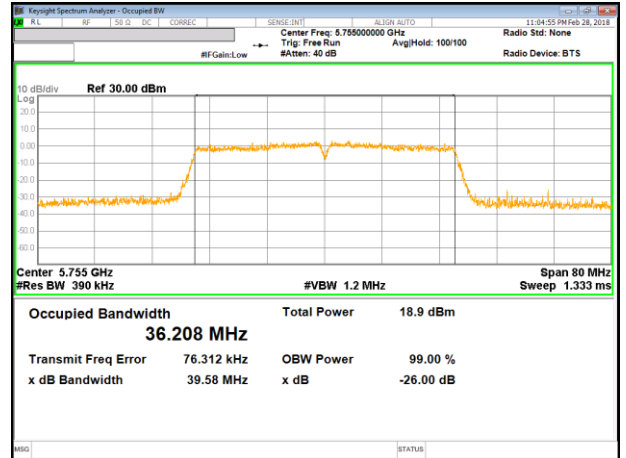


UNII 5.8 GHz IEEE 802.11n HT40 mode

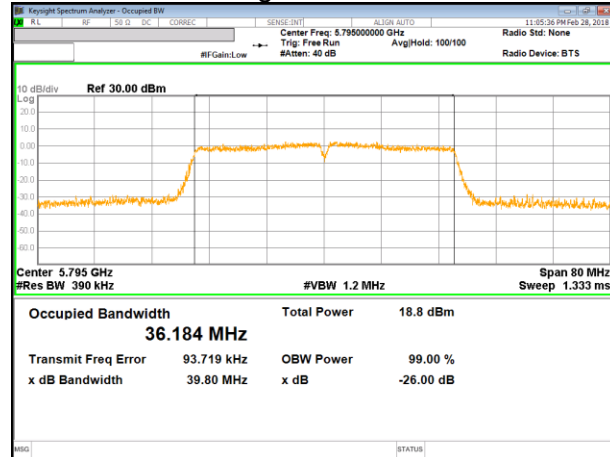
11n HT40 Mode Straddle Channel



11n HT40 Mode Low Channel



11n HT40 Mode High Channel



9.4. 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.

NOTE

- Calculation for 99% Bandwidth of UNII-2C and UNII-3 Straddle Channel

ex) Fundamental frequency : 5720MHz

- 99% BW : 21.00MHz
- Turning Frequency : 5725MHz
- 99% Bandwidth of UNII-2C band Portion
= $(5725 - (5720 - (21.00 / 2))) = 15.50$ MHz
- 99% Bandwidth of UNII-3 band Portion
= $(5720 + (21.00 / 2) - 5725) = 5.50$ MHz

RESULTS

9.4.1. 802.11a MODE IN THE 5.2 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|---------|-----------------|---------------------|
| Low | 5180 | 16.49 |
| Mid | 5200 | 16.48 |
| High | 5240 | 16.51 |
| Worst | | 16.51 |

9.4.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|---------|-----------------|---------------------|
| Low | 5180 | 17.67 |
| Mid | 5200 | 17.67 |
| High | 5240 | 17.68 |
| Worst | | 17.68 |

9.4.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|---------|-----------------|---------------------|
| Low | 5190 | 36.14 |
| High | 5230 | 36.14 |
| Worst | | 36.14 |

9.4.4. 802.11a MODE IN THE 5.3 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|---------|-----------------|---------------------|
| Low | 5260 | 16.47 |
| Mid | 5300 | 16.50 |
| High | 5320 | 16.50 |
| Worst | | 16.50 |

9.4.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|---------|-----------------|---------------------|
| Low | 5260 | 17.70 |
| Mid | 5300 | 17.72 |
| High | 5320 | 17.72 |
| Worst | | 17.72 |

9.4.6. 802.11n HT40 MODE IN THE 5.3 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|---------|-----------------|---------------------|
| Low | 5270 | 36.13 |
| High | 5310 | 36.15 |
| Worst | | 36.15 |

9.4.7. 802.11a MODE IN THE 5.5 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|----------|-----------------|---------------------|
| Low | 5500 | 16.48 |
| Mid | 5580 | 16.49 |
| High | 5700 | 16.48 |
| Straddle | 5720 | 13.25 |
| Worst | | 16.49 |

9.4.8. 802.11n HT20 MODE IN THE 5.5 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|----------|-----------------|---------------------|
| Low | 5500 | 17.68 |
| Mid | 5580 | 17.70 |
| High | 5700 | 17.70 |
| Straddle | 5720 | 13.86 |
| Worst | | 17.70 |

9.4.9. 802.11n HT40 MODE IN THE 5.5 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|----------|-----------------|---------------------|
| Low | 5510 | 36.16 |
| Mid | 5590 | 36.12 |
| High | 5670 | 36.17 |
| Straddle | 5710 | 33.11 |
| Worst | | 36.17 |

9.4.10. 802.11a MODE IN THE 5.8 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|----------|-----------------|---------------------|
| Straddle | 5720 | 3.25 |
| Low | 5745 | 16.49 |
| Mid | 5785 | 16.46 |
| High | 5825 | 16.48 |
| Worst | | 16.49 |

9.4.11. 802.11n HT20 MODE IN THE 5.8 GHz BAND

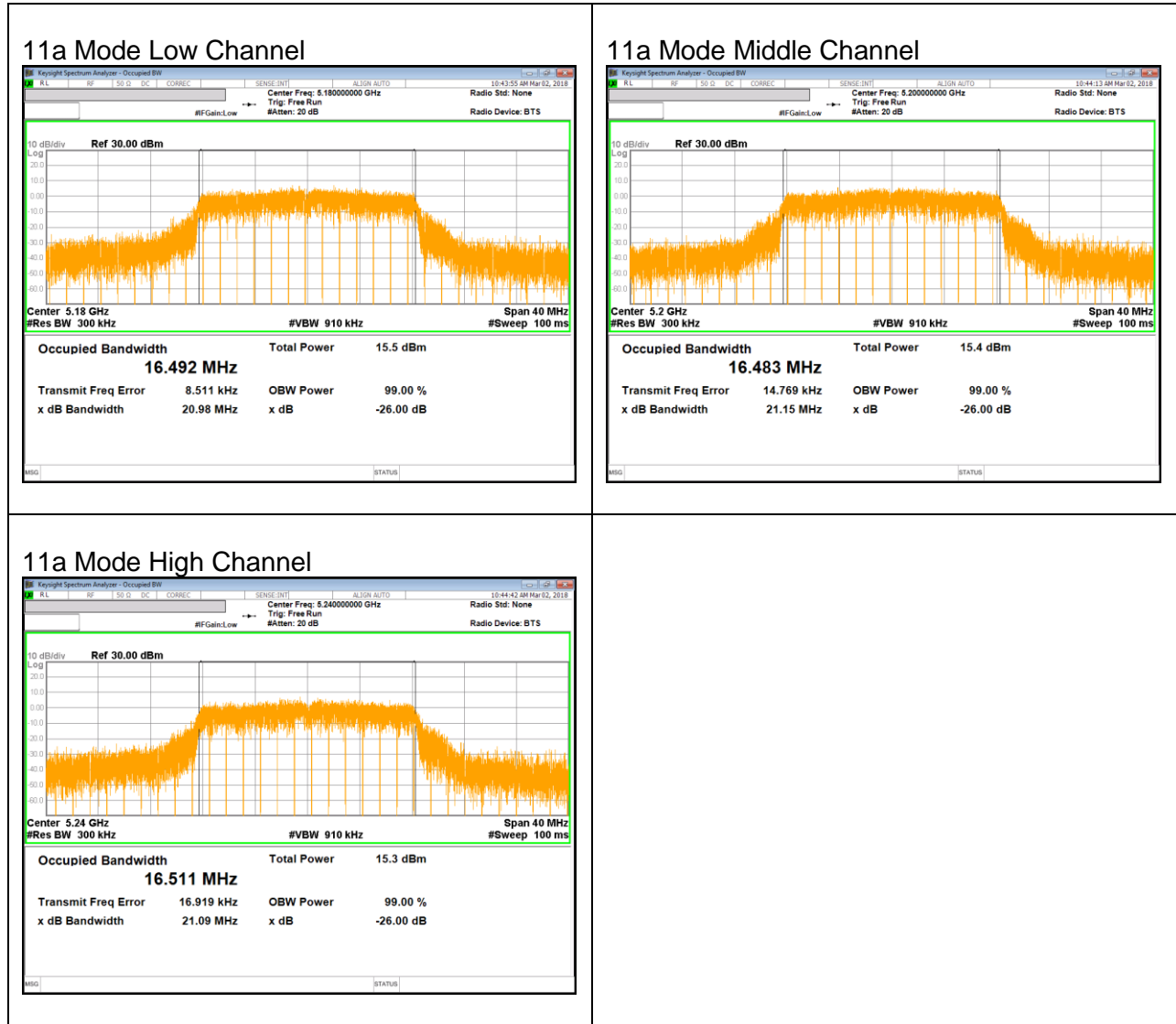
| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|----------|-----------------|---------------------|
| Straddle | 5720 | 3.86 |
| Low | 5745 | 17.72 |
| Mid | 5785 | 17.69 |
| High | 5825 | 17.66 |
| Worst | | 17.72 |

9.4.12. 802.11n HT40 MODE IN THE 5.8 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|----------|-----------------|---------------------|
| Straddle | 5710 | 3.11 |
| Low | 5755 | 36.15 |
| High | 5795 | 36.21 |
| Worst | | 36.21 |

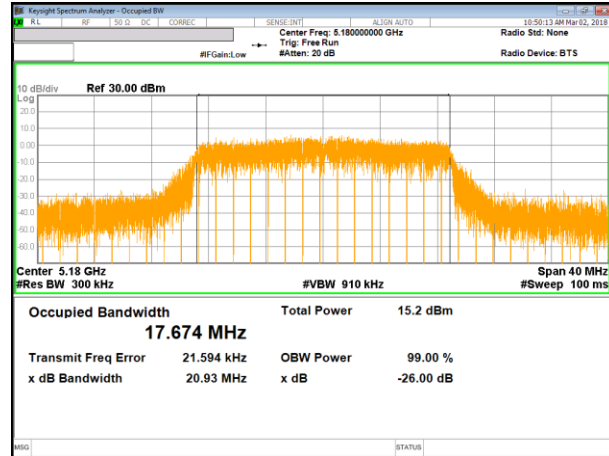
9.4.13. 99% BANDWIDTH PLOTS

UNII 5.2 GHz IEEE 802.11a mode

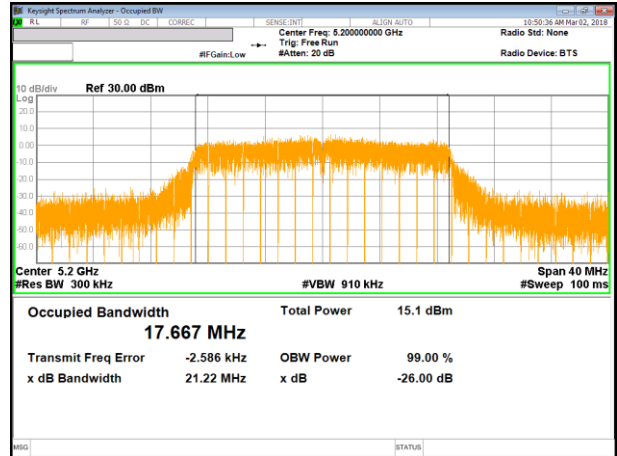


UNII 5.2 GHz IEEE 802.11n HT20 mode

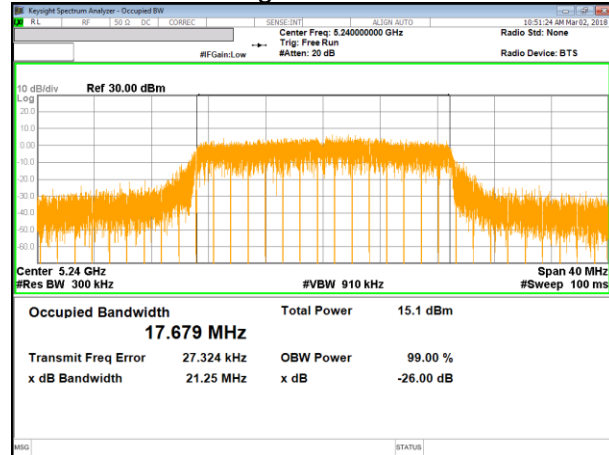
11n HT20 Mode Low Channel



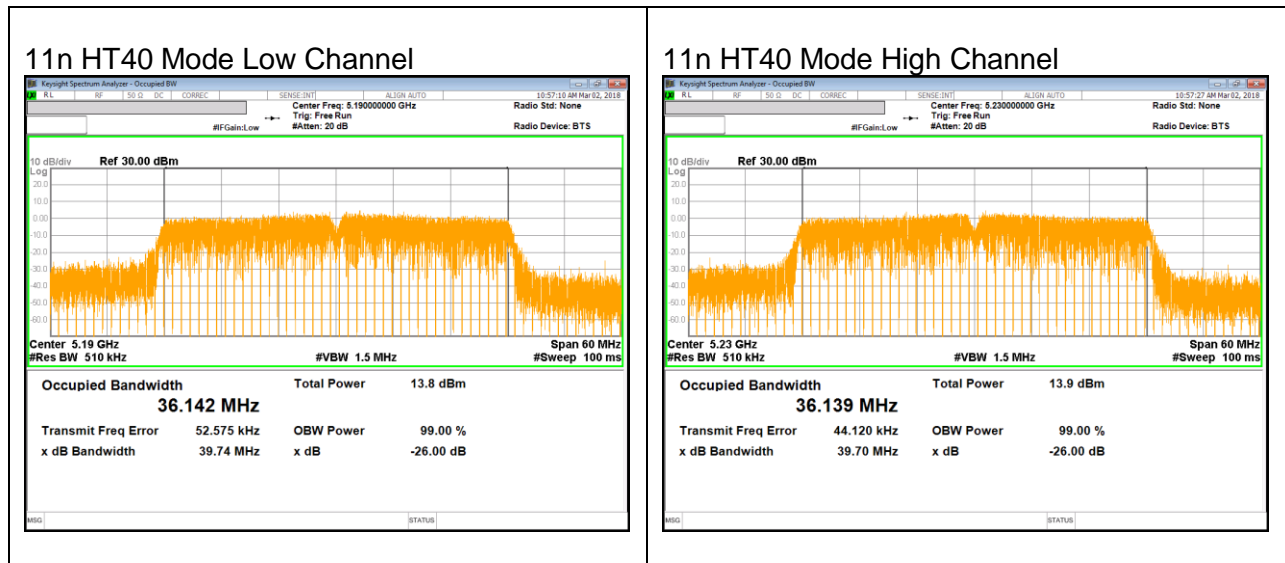
11n HT20 Mode Middle Channel



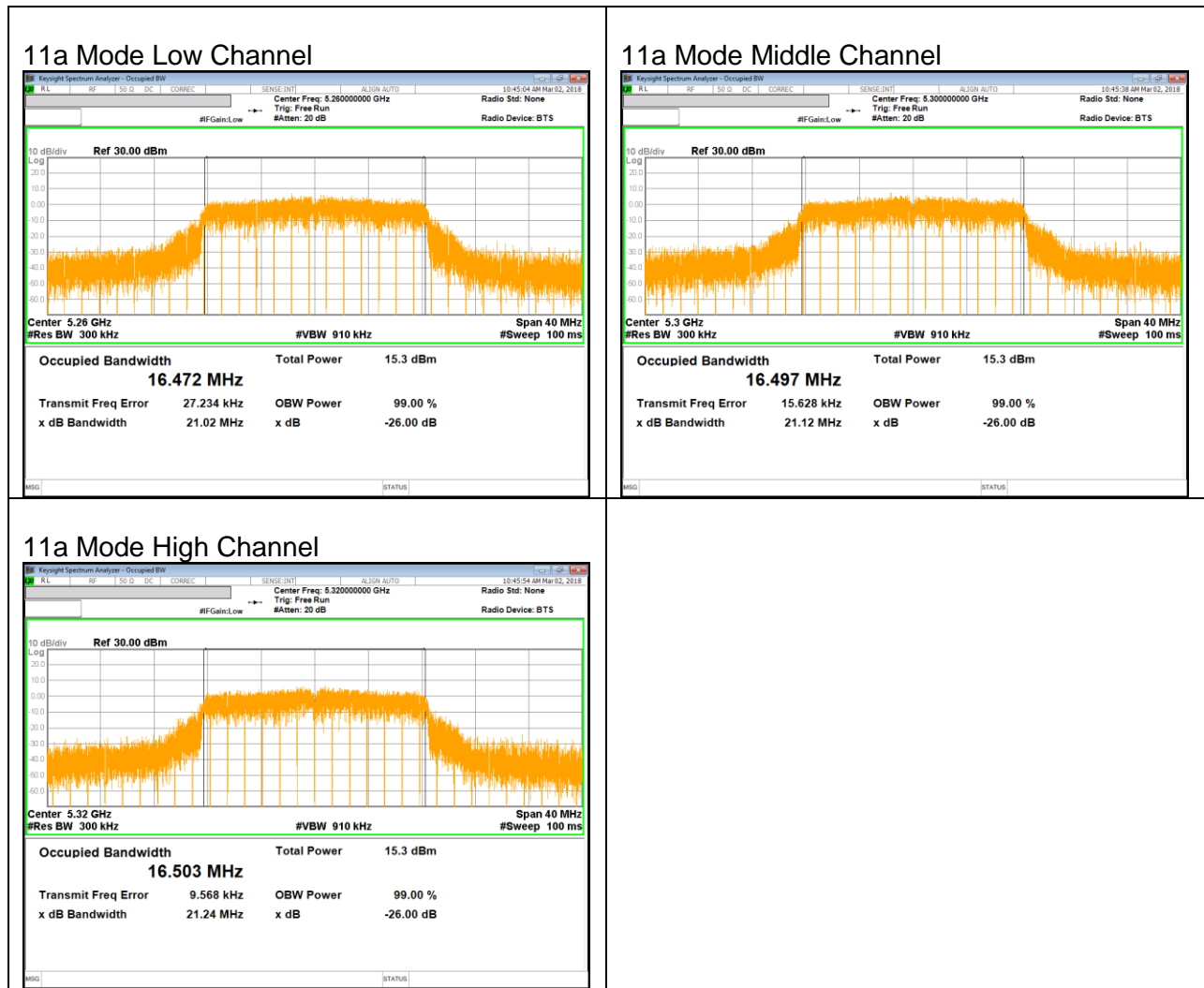
11n HT20 Mode High Channel



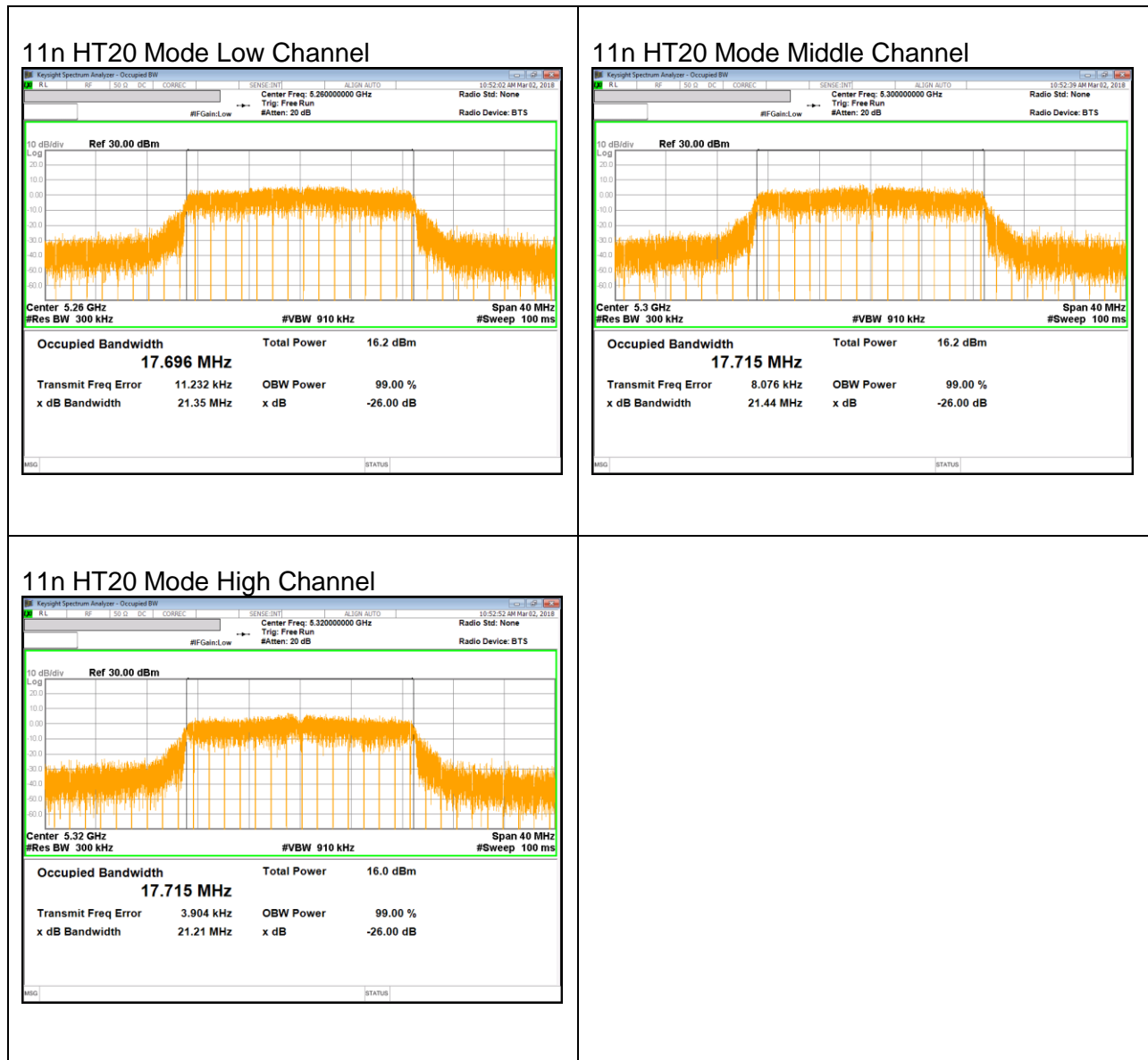
UNII 5.2 GHz IEEE 802.11n HT40 mode



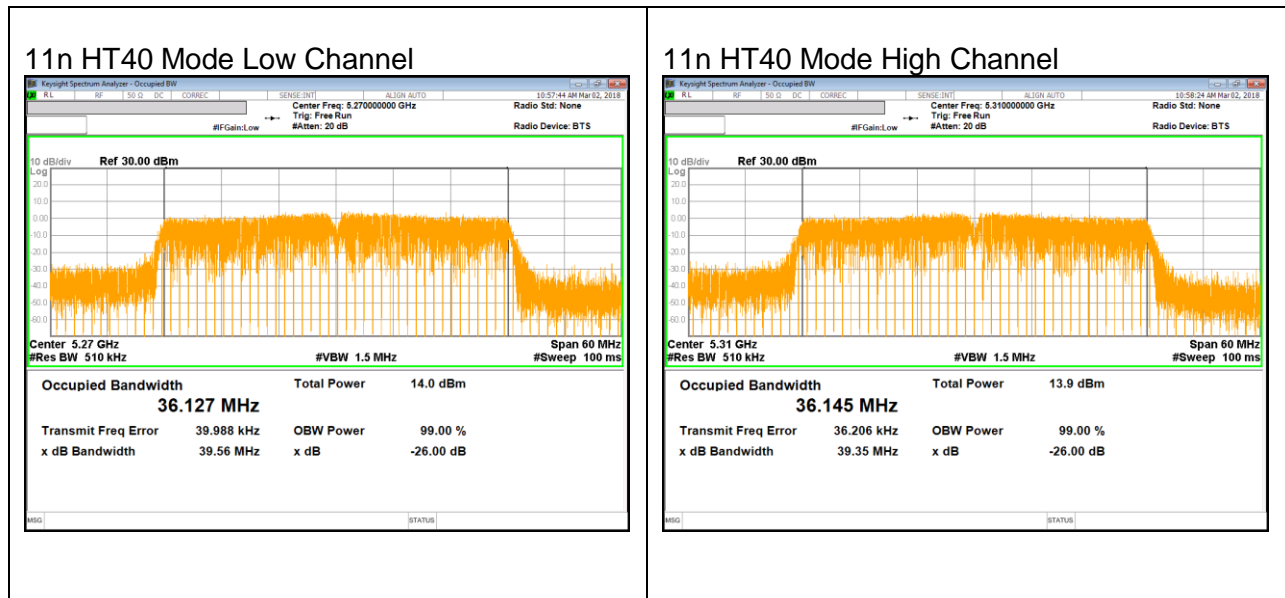
UNII 5.3 GHz IEEE 802.11a mode



UNII 5.3 GHz IEEE 802.11n HT20 mode



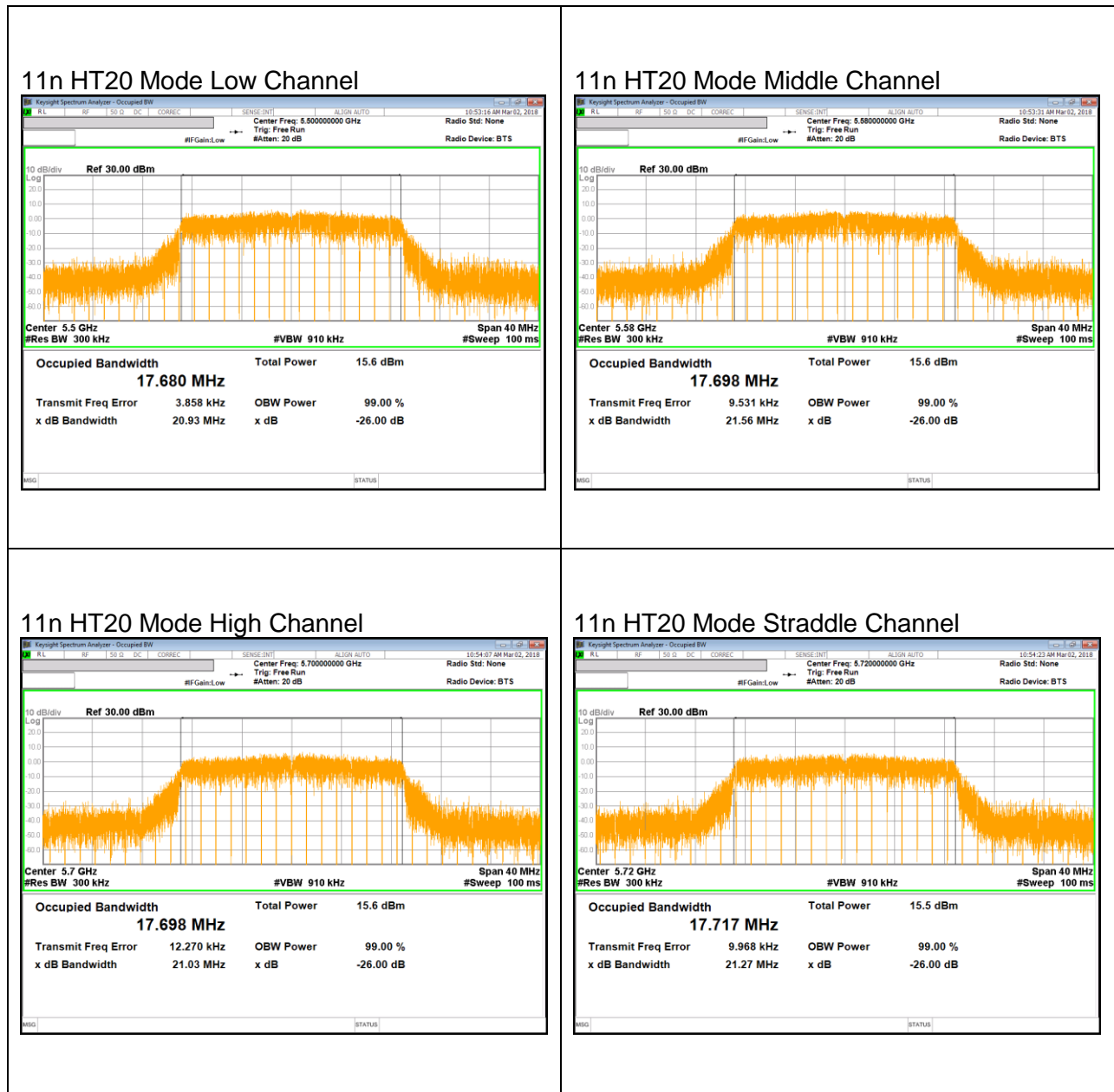
UNII 5.3 GHz IEEE 802.11n HT40 mode



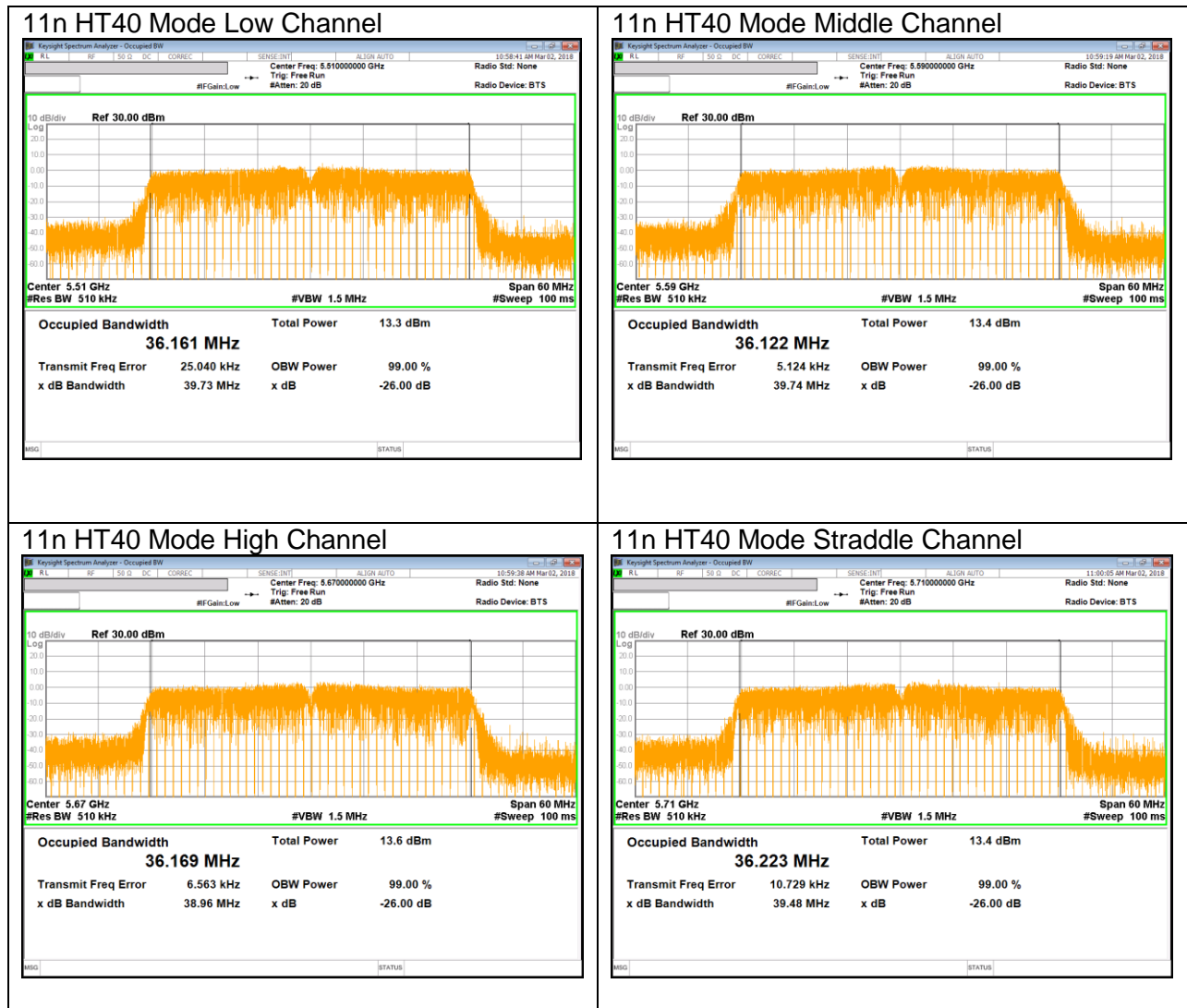
UNII 5.5 GHz IEEE 802.11a mode



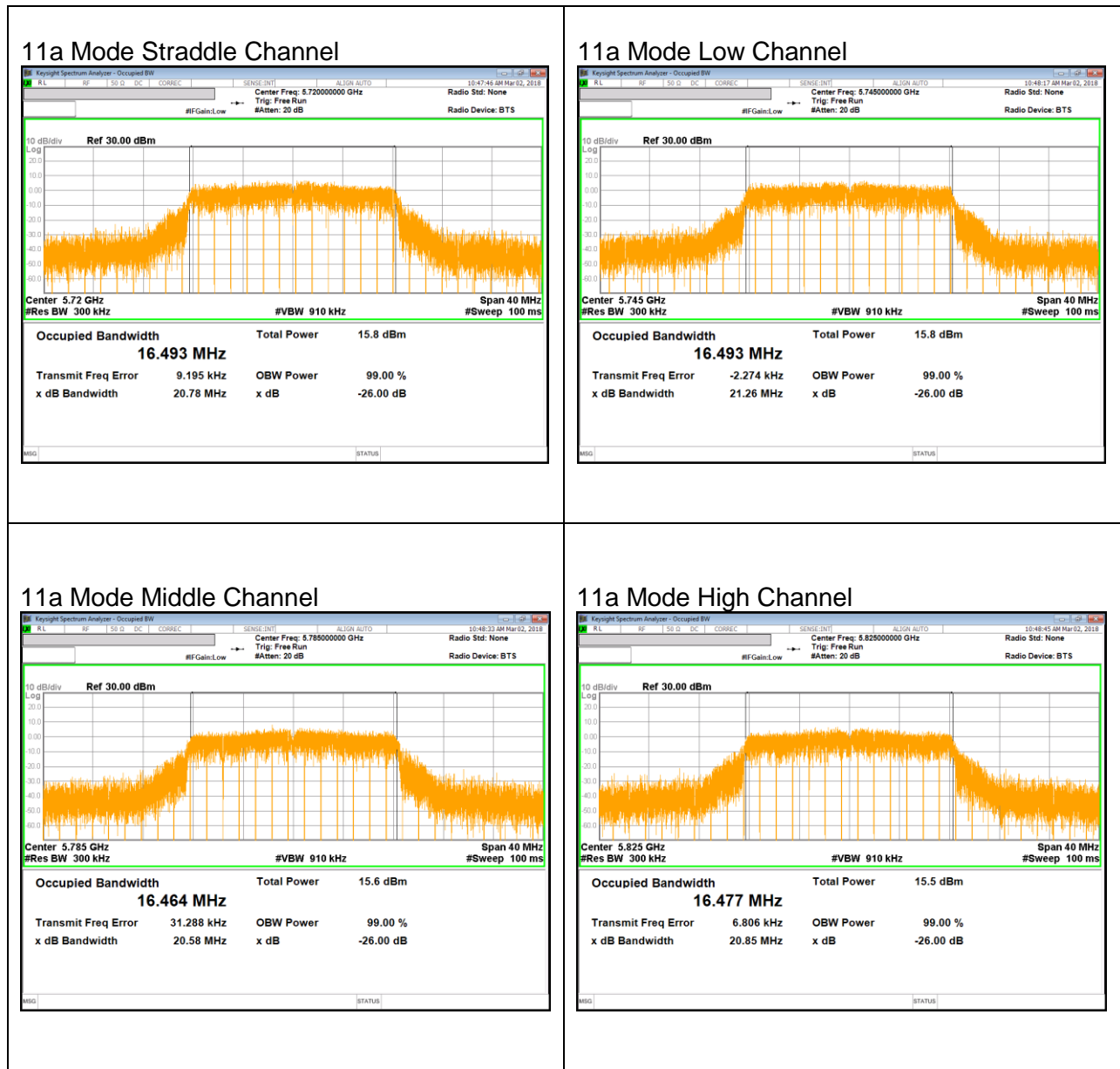
UNII 5.5 GHz IEEE 802.11n HT20 mode



UNII 5.5 GHz IEEE 802.11n HT40 mode



UNII 5.8 GHz IEEE 802.11a mode



UNII 5.8 GHz IEEE 802.11n HT20 mode

