



FCC 47 CFR PART 15 SUBPART E

UNII

CERTIFICATION TEST REPORT

FOR

WCDMA/LTE Tablet + BT/BLE and DTS/UNII a/b/g/n/ac

MODEL NUMBER : SM-W737N0

FCC ID: A3LSMW737N0

REPORT NUMBER: 4788556585-E4V1

ISSUE DATE: SEP 03, 2018

Prepared for
SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
GYEONGGI-DO, 16677, KOREA

Prepared by
UL Korea, Ltd.
26th floor, 152, Teheran-ro, Gangnam-gu Seoul, 06236, Korea

Suwon Test Site: UL Korea, Ltd. Suwon Laboratory
218 Maeyeong-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16675, Korea
TEL: (031) 337-9902
FAX: (031) 213-5433



ACCREDITED*

Testing
Laboratory

TL-637

Revision History

| <u>Rev.</u> | <u>Issue Date</u> | <u>Revisions</u> | <u>Revised By</u> |
|-------------|-------------------|------------------|-------------------|
| V1 | 09/03/18 | Initial issue | Junwhan Lee |

TABLE OF CONTENTS

| | |
|--|-----------|
| 1. ATTESTATION OF TEST RESULTS | 7 |
| 2. TEST METHODOLOGY | 8 |
| 3. FACILITIES AND ACCREDITATION | 8 |
| 4. CALIBRATION AND UNCERTAINTY | 8 |
| 4.1. <i>MEASURING INSTRUMENT CALIBRATION</i> | <i>8</i> |
| 4.2. <i>SAMPLE CALCULATION</i> | <i>8</i> |
| 4.3. <i>MEASUREMENT UNCERTAINTY.....</i> | <i>9</i> |
| 5. EQUIPMENT UNDER TEST..... | 10 |
| 5.1. <i>DESCRIPTION OF EUT</i> | <i>10</i> |
| 5.2. <i>MAXIMUM OUTPUT POWER.....</i> | <i>11</i> |
| 5.3. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i> | <i>12</i> |
| 5.4. <i>List of test reduction and modes covering other modes:</i> | <i>12</i> |
| 5.5. <i>WORST-CASE CONFIGURATION AND MODE.....</i> | <i>14</i> |
| 5.6. <i>DESCRIPTION OF TEST SETUP.....</i> | <i>15</i> |
| 6. TEST AND MEASUREMENT EQUIPMENT | 17 |
| 7. SUMMARY TABLE | 18 |
| 8. MEASUREMENT METHODS | 19 |
| 9. REFERENCE MEASUREMENTS RESULTS | 20 |
| 9.1. <i>ON TIME AND DUTY CYCLE RESULTS.....</i> | <i>20</i> |
| 9.2. <i>DUTY CYCLE PLOTS</i> | <i>20</i> |
| 9.3. <i>26 dB BANDWIDTH.....</i> | <i>23</i> |
| 9.3.1. <i>802.11a MODE IN THE 5.2 GHz BAND.....</i> | <i>24</i> |
| 9.3.2. <i>802.11n HT20 MODE IN THE 5.2 GHz BAND</i> | <i>24</i> |
| 9.3.3. <i>802.11n HT40 MODE IN THE 5.2 GHz BAND</i> | <i>24</i> |
| 9.3.4. <i>802.11ac VHT80 MODE IN THE 5.2 GHz BAND</i> | <i>24</i> |
| 9.3.5. <i>802.11a MODE IN THE 5.3 GHz BAND.....</i> | <i>25</i> |
| 9.3.6. <i>802.11n HT20 MODE IN THE 5.3 GHz BAND</i> | <i>25</i> |
| 9.3.7. <i>802.11n HT40 MODE IN THE 5.3 GHz BAND</i> | <i>25</i> |
| 9.3.8. <i>802.11ac VHT80 MODE IN THE 5.3 GHz BAND</i> | <i>25</i> |
| 9.3.9. <i>802.11a MODE IN THE 5.5 GHz BAND.....</i> | <i>26</i> |
| 9.3.10. <i>802.11n HT20 MODE IN THE 5.5 GHz BAND</i> | <i>26</i> |
| 9.3.11. <i>802.11n HT40 MODE IN THE 5.5 GHz BAND</i> | <i>26</i> |
| 9.3.12. <i>802.11ac VHT80 MODE IN THE 5.5 GHz BAND</i> | <i>26</i> |
| 9.3.13. <i>802.11a MODE IN THE 5.8 GHz BAND.....</i> | <i>27</i> |
| 9.3.14. <i>802.11n HT20 MODE IN THE 5.8 GHz BAND</i> | <i>27</i> |
| 9.3.15. <i>802.11n HT40 MODE IN THE 5.8 GHz BAND</i> | <i>27</i> |

| | | |
|------------|---|-----------|
| 9.3.16. | 802.11ac VHT80 MODE IN THE 5.8 GHz BAND | 27 |
| 9.3.17. | 26 dB BANDWIDTH PLOTS | 28 |
| 9.4. | 99% BANDWIDTH..... | 41 |
| 9.4.1. | 802.11a MODE IN THE 5.2 GHz BAND..... | 41 |
| 9.4.2. | 802.11n HT20 MODE IN THE 5.2 GHz BAND | 42 |
| 9.4.3. | 802.11n HT40 MODE IN THE 5.2 GHz BAND | 42 |
| 9.4.4. | 802.11ac VHT80 MODE IN THE 5.2 GHz BAND | 42 |
| 9.4.5. | 802.11a MODE IN THE 5.3 GHz BAND..... | 42 |
| 9.4.6. | 802.11n HT20 MODE IN THE 5.3 GHz BAND | 43 |
| 9.4.7. | 802.11n HT40 MODE IN THE 5.3 GHz BAND | 43 |
| 9.4.8. | 802.11ac VHT80 MODE IN THE 5.3 GHz BAND | 43 |
| 9.4.9. | 802.11a MODE IN THE 5.5 GHz BAND..... | 44 |
| 9.4.10. | 802.11n HT20 MODE IN THE 5.5 GHz BAND | 44 |
| 9.4.11. | 802.11n HT40 MODE IN THE 5.5 GHz BAND | 44 |
| 9.4.12. | 802.11ac VHT80 MODE IN THE 5.5 GHz BAND | 44 |
| 9.4.13. | 802.11a MODE IN THE 5.8 GHz BAND..... | 45 |
| 9.4.14. | 802.11n HT20 MODE IN THE 5.8 GHz BAND | 45 |
| 9.4.15. | 802.11n HT40 MODE IN THE 5.8 GHz BAND | 45 |
| 9.4.16. | 802.11ac VHT80 MODE IN THE 5.8 GHz BAND | 45 |
| 9.4.17. | 99% BANDWIDTH PLOTS | 46 |
| 10. | ANTENNA PORT TEST RESULTS..... | 59 |
| 10.1. | 6 dB BANDWIDTH..... | 59 |
| 10.1.1. | 802.11a MODE IN THE 5.8 GHz BAND..... | 60 |
| 10.1.2. | 802.11n HT20 MODE IN THE 5.8 GHz BAND | 60 |
| 10.1.3. | 802.11n HT40 MODE IN THE 5.8 GHz BAND | 60 |
| 10.1.4. | 802.11n VHT80 MODE IN THE 5.8 GHz BAND..... | 60 |
| 10.1.5. | 6 dB BANDWIDTH PLOTS | 61 |
| 10.2. | OUTPUT POWER AND PPSD..... | 65 |
| 10.2.1. | 802.11a MODE IN THE 5.2 GHz BAND..... | 66 |
| 10.2.2. | 802.11n HT20 MODE IN THE 5.2 GHz BAND | 67 |
| 10.2.3. | 802.11n HT40 MODE IN THE 5.2 GHz BAND | 68 |
| 10.2.4. | 802.11ac VHT80 MODE IN THE 5.2 GHz BAND | 69 |
| 10.2.5. | 802.11a MODE IN THE 5.3 GHz BAND..... | 70 |
| 10.2.6. | 802.11n HT20 MODE IN THE 5.3 GHz BAND | 71 |
| 10.2.7. | 802.11n HT40 MODE IN THE 5.3 GHz BAND | 72 |
| 10.2.8. | 802.11ac VHT80 MODE IN THE 5.3 GHz BAND | 73 |
| 10.2.9. | 802.11a MODE IN THE 5.5 GHz BAND..... | 74 |
| 10.2.10. | 802.11n HT20 MODE IN THE 5.5 GHz BAND | 75 |
| 10.2.11. | 802.11n HT40 MODE IN THE 5.5 GHz BAND | 76 |
| 10.2.12. | 802.11ac VHT80 MODE IN THE 5.5 GHz BAND | 77 |
| 10.2.13. | 802.11a MODE IN THE 5.8 GHz BAND..... | 78 |
| 10.2.14. | 802.11n HT20 MODE IN THE 5.8 GHz BAND | 79 |
| 10.2.15. | 802.11n HT40 MODE IN THE 5.8 GHz BAND | 80 |
| 10.2.16. | 802.11ac VHT80 MODE IN THE 5.8 GHz BAND | 81 |
| 10.2.17. | 802.11a MODE IN THE STRADDLE CHANNEL..... | 82 |
| 10.2.18. | 802.11n HT20 MODE IN THE STRADDLE CHANNEL | 83 |
| 10.2.19. | 802.11n HT40 MODE IN THE STRADDLE CHANNEL | 84 |
| 10.2.20. | 802.11ac VHT80 MODE IN THE STRADDLE CHANNEL | 85 |
| 10.2.21. | OUTPUT POWER AND PPSD PLOTS..... | 86 |

| | |
|--|------------|
| 11. TRANSMITTER ABOVE 1 GHz..... | 103 |
| 11.1. 5.2 GHz..... | 106 |
| 11.1.1. TX Above 1GHz 802.11a 2Tx CDD MODE IN THE 5.2GHz BAND | 106 |
| 11.1.2. TX Above 1GHz 802.11n HT20 2Tx CDD MODE IN THE 5.2GHz BAND..... | 114 |
| 11.1.3. TX Above 1GHz 802.11n HT40 2Tx CDD MODE IN THE 5.2GHz BAND..... | 122 |
| 11.1.4. TX ABOVE 1GHz 802.11ac VHT80 2Tx CDD MODE IN THE 5.2GHz BAND..... | 128 |
| 11.2. 5.3 GHz..... | 132 |
| 11.2.1. TX ABOVE 1 GHz 802.11a 2Tx CDD MODE IN THE 5.3 GHz BAND | 132 |
| 11.2.2. TX ABOVE 1GHz 802.11n HT20 2Tx CDD MODE IN THE 5.3GHz BAND | 140 |
| 11.2.3. TX ABOVE 1GHz 802.11n HT40 2Tx CDD MODE IN THE 5.3GHz BAND | 148 |
| 11.2.4. TX ABOVE 1GHz 802.11ac VHT80 2Tx CDD MODE IN THE 5.3GHz BAND | 154 |
| RESTRICTED BANDEDGE (High CHANNEL)..... | 154 |
| 11.3. 5.5-5.6 GHz..... | 158 |
| 11.3.1. TX ABOVE 1 GHz 802.11a 2Tx CDD MODE IN THE 5.5 GHz BAND | 158 |
| 11.3.2. TX ABOVE 1GHz 802.11n HT20 2Tx CDD MODE IN THE 5.5GHz BAND | 168 |
| 11.3.3. TX ABOVE 1GHz 802.11n HT40 2Tx CDD MODE IN THE 5.5GHz BAND | 178 |
| 11.3.4. TX ABOVE 1GHz 802.11ac VHT80 2Tx CDD MODE IN THE 5.5GHz BAND..... | 188 |
| 11.3.5. TX ABOVE 1GHz 802.11a 2Tx CDD MODE IN THE STRADDLE CHANNEL | 196 |
| 11.3.6. TX ABOVE 1GHz 802.11n HT20 2Tx CDD MODE IN THE STRADDLE CHANNEL | 198 |
| 11.3.7. TX ABOVE 1GHz 802.11n HT40 2Tx CDD MODE IN THE STRADDLE CHANNEL | 200 |
| 11.3.8. TX ABOVE 1GHz 802.11ac VHT80 2Tx CDD MODE IN THE STRADDLE CHANNEL | 202 |
| 11.4. 5.8 GHz..... | 204 |
| 11.4.1. TX ABOVE 1GHz 802.11a 2Tx CDD MODE IN THE 5.8GHz BAND | 204 |
| 11.4.2. TX ABOVE 1GHz 802.11n HT20 2Tx CDD MODE IN THE 5.8GHz BAND | 214 |
| 11.4.3. TX ABOVE 1GHz 802.11n HT40 2Tx CDD MODE IN THE 5.8GHz BAND | 224 |
| 11.4.4. TX ABOVE 1GHz 802.11ac VHT80 2Tx CDD MODE IN THE 5.8GHz BAND..... | 232 |
| 11.5. <i>Spurious Emissions for Simultaneous Transmission</i> | 238 |
| 11.5.1. Worst test case condition..... | 238 |
| 12. WORST-CASE BELOW 1 GHz | 245 |
| 13. AC POWER LINE CONDUCTED EMISSIONS | 249 |
| 14. DYNAMIC FREQUENCY SELECTION..... | 258 |
| 14.1. OVERVIEW..... | 258 |
| 14.1.1. LIMITS..... | 258 |
| 14.1.1. TEST AND MEASUREMENT SYSTEM | 262 |
| 14.1.2. SETUP OF EUT..... | 265 |
| 14.1.3. DESCRIPTION OF EUT | 266 |
| 14.2. RESULTS FOR 20 MHz BANDWIDTH..... | 267 |
| 14.2.1. TEST CHANNEL | 267 |
| 14.2.2. RADAR WAVEFORM AND TRAFFIC..... | 267 |
| 14.2.3. OVERLAPPING CHANNEL TESTS..... | 269 |
| 14.2.4. MOVE AND CLOSING TIME | 269 |
| 14.3. RESULTS FOR 40 MHz BANDWIDTH..... | 272 |
| 14.3.1. TEST CHANNEL | 272 |

| | | |
|------------|---|------------|
| 14.3.2. | RADAR WAVEFORM AND TRAFFIC | 272 |
| 14.3.3. | OVERLAPPING CHANNEL TESTS | 274 |
| 14.3.4. | MOVE AND CLOSING TIME | 274 |
| 14.4. | <i>RESULTS FOR 80 MHz BANDWIDTH</i> | 277 |
| 14.4.1. | TEST CHANNEL | 277 |
| 14.4.2. | RADAR WAVEFORM AND TRAFFIC | 277 |
| 14.4.3. | OVERLAPPING CHANNEL TESTS | 279 |
| 14.4.4. | MOVE AND CLOSING TIME | 279 |
| 15. | SETUP PHOTOS | 282 |

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: WCDMA/LTE Tablet + BT/BLE and DTS/UNII a/b/g/n/ac
MODEL NUMBER: SM-W737N0
SERIAL NUMBER: BBMGR34K500613H (RADIATED);
BBMGR34K50061VZ (CONDUCTED)
DATE TESTED: JUL 11, 2018 - SEP 03, 2018

| 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:

Tested By:



SungGil Park
Suwon Lab Engineer
UL Korea, Ltd.

Junwhan Lee
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. KDB 662911 D01 v02r01
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 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 WCDMA/LTE Tablet + BT/BLE and DTS/UNII a/b/g/n/ac.
 This test report addresses the NII (UNII) operational mode.

WiFi MIMO Condition

| Frequency | Mode | Antenna 1 | Antenna 2 |
|-----------|---------------|-----------|-----------|
| 2.4 GHz | 802.11b | TX / RX | TX / RX |
| | 802.11g | TX / RX | TX / RX |
| | 802.11g MIMO | TX / RX | TX / RX |
| | 802.11n | TX / RX | TX / RX |
| | 802.11n MIMO | TX / RX | TX / RX |
| 5 GHz | 802.11a | TX / RX | TX / RX |
| | 802.11a MIMO | TX / RX | TX / RX |
| | 802.11n | TX / RX | TX / RX |
| | 802.11n MIMO | TX / RX | TX / RX |
| | 802.11ac | TX / RX | TX / RX |
| | 802.11ac MIMO | TX / RX | TX / RX |

Simultaneous TX Condition

| Frequency | Supported |
|-------------------------------------|-----------|
| 2.4 GHz Antenna 1 + 5 GHz Antenna 2 | Yes |
| 2.4 GHz Antenna 2 + 5 GHz Antenna 1 | No |
| 2.4 GHz Antenna 1 + 5 GHz Antenna 1 | No |
| 2.4 GHz Antenna 2 + 5 GHz Antenna 2 | No |

Spurious Emissions for Simultaneous Transmission were reported on the section 11.5.

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] | |
|-----------------------|---------------------|--------------------|----------|-------------------|----------|
| | | Antenna1 | Antenna2 | Antenna1 | Antenna2 |
| 5180 - 5240 | 802.11a MIMO | 15.36 | | 34.36 | |
| | 802.11n HT20 MIMO | 14.10 | | 25.70 | |
| 5190 - 5230 | 802.11n HT40 MIMO | 14.58 | | 28.71 | |
| 5210 | 802.11ac VHT80 MIMO | 13.19 | | 20.84 | |
| 5260 - 5320 | 802.11a MIMO | 15.34 | | 34.20 | |
| | 802.11n HT20 MIMO | 14.08 | | 25.59 | |
| 5270 - 5310 | 802.11n HT40 MIMO | 14.66 | | 29.24 | |
| 5290 | 802.11ac VHT80 MIMO | 13.16 | | 20.70 | |
| 5500 - 5720 | 802.11a MIMO | 15.21 | | 33.19 | |
| | 802.11n HT20 MIMO | 13.92 | | 24.66 | |
| 5510 - 5710 | 802.11n HT40 MIMO | 14.62 | | 28.97 | |
| 5530 - 5690 | 802.11ac VHT80 MIMO | 13.16 | | 20.70 | |
| 5745 - 5825 | 802.11a MIMO | 15.38 | | 34.51 | |
| | 802.11n HT20 MIMO | 14.08 | | 25.59 | |
| 5755 - 5795 | 802.11n HT40 MIMO | 14.53 | | 28.38 | |
| 5775 | 802.11ac VHT80 MIMO | 13.13 | | 20.56 | |

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

| Frequency Range [MHz] | Antenna Gain [dBi] | |
|------------------------|--------------------|-----------|
| | Antenna 1 | Antenna 2 |
| UNII 1 5150 – 5250 | -0.2 | -0.1 |
| UNII 2A 5250 – 5350 | -0.4 | -0.3 |
| UNII 2C 5470 – 5725 | -0.3 | -2.9 |
| UNII 3 5725 – 5850 | -2.7 | -4.3 |

5.4. List of test reduction and modes covering other modes:

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

UNII 1

| 5150 - 5250 MHz Authorized Frequency Band (Radiated Testing) | | |
|--|----------------------------|------------------------|
| Frequency Range [MHz] | Mode | Covered by |
| 5180 - 5240 | 802.11a legacy 1TX/CDD 2TX | 802.11a 2TX CDD |
| 5180 - 5240 | 802.11HT20 1TX | 802.11n HT20 2TX CDD |
| 5180 - 5240 | 802.11HT20 2TX SDM/CDD | 802.11n HT20 2TX CDD |
| 5180 - 5240 | 802.11ac VHT20 1TX | 802.11n HT20 2TX CDD |
| 5180 - 5240 | 802.11ac VHT20 2TX SDM/CDD | 802.11n HT20 2TX CDD |
| 5190 - 5230 | 802.11n HT40 1TX | 802.11n HT40 2TX CDD |
| 5190 - 5230 | 802.11n HT40 2TX SDM/CDD | 802.11n HT40 2TX CDD |
| 5190 - 5230 | 802.11ac VHT40 1TX | 802.11n HT40 2TX CDD |
| 5190 - 5230 | 802.11ac VHT40 2TX SDM/CDD | 802.11n HT40 2TX CDD |
| 5210 | 802.11ac VHT80 1TX | 802.11ac VHT80 2TX CDD |
| 5210 | 802.11ac VHT80 2TX SDM/CDD | 802.11ac VHT80 2TX CDD |

UNII 2A

| 5250 - 5350 MHz Authorized Frequency Band (Radiated Testing) | | |
|---|----------------------------|------------------------|
| Frequency Range [MHz] | Mode | Covered by |
| 5260 - 5320 | 802.11a legacy 1TX/CDD 2TX | 802.11a 2TX CDD |
| 5260 - 5320 | 802.11HT20 1TX | 802.11n HT20 2TX CDD |
| 5260 - 5320 | 802.11HT20 2TX SDM/CDD | 802.11n HT20 2TX CDD |
| 5260 - 5320 | 802.11ac VHT20 1TX | 802.11n HT20 2TX CDD |
| 5260 - 5320 | 802.11ac VHT20 2TX SDM/CDD | 802.11n HT20 2TX CDD |
| 5270 - 5310 | 802.11n HT40 1TX | 802.11n HT40 2TX CDD |
| 5270 - 5310 | 802.11n HT40 2TX SDM/CDD | 802.11n HT40 2TX CDD |
| 5270 - 5310 | 802.11ac VHT40 1TX | 802.11n HT40 2TX CDD |
| 5270 - 5310 | 802.11ac VHT40 2TX SDM/CDD | 802.11n HT40 2TX CDD |
| 5290 | 802.11ac VHT80 1TX | 802.11ac VHT80 2TX CDD |
| 5290 | 802.11ac VHT80 2TX SDM/CDD | 802.11ac VHT80 2TX CDD |

UNII 2C

| 5470 - 5725 MHz Authorized Frequency Band (Radiated Testing) | | |
|---|----------------------------|------------------------|
| Frequency Range [MHz] | Mode | Covered by |
| 5500 - 5720 | 802.11a legacy 1TX/CDD 2TX | 802.11a 2TX CDD |
| 5500 - 5720 | 802.11HT20 1TX | 802.11n HT20 2TX CDD |
| 5500 - 5720 | 802.11HT20 2TX SDM/CDD | 802.11n HT20 2TX CDD |
| 5500 - 5720 | 802.11ac VHT20 1TX | 802.11n HT20 2TX CDD |
| 5500 - 5720 | 802.11ac VHT20 2TX SDM/CDD | 802.11n HT20 2TX CDD |
| 5510 - 5710 | 802.11n HT40 1TX | 802.11n HT40 2TX CDD |
| 5510 - 5710 | 802.11n HT40 2TX SDM/CDD | 802.11n HT40 2TX CDD |
| 5510 - 5710 | 802.11ac VHT40 1TX | 802.11n HT40 2TX CDD |
| 5510 - 5710 | 802.11ac VHT40 2TX SDM/CDD | 802.11n HT40 2TX CDD |
| 5530 - 5690 | 802.11ac VHT80 1TX | 802.11ac VHT80 2TX CDD |
| 5530 - 5690 | 802.11ac VHT80 2TX SDM/CDD | 802.11ac VHT80 2TX CDD |

UNII 3

| 5725 - 5850 MHz Authorized Frequency Band (Radiated Testing) | | |
|--|----------------------------|------------------------|
| Frequency Range [MHz] | Mode | Covered by |
| 5745 - 5825 | 802.11a legacy 1TX/CDD 2TX | 802.11a 2TX CDD |
| 5745 - 5825 | 802.11HT20 1TX | 802.11n HT20 2TX CDD |
| 5745 - 5825 | 802.11HT20 2TX SDM/CDD | 802.11n HT20 2TX CDD |
| 5745 - 5825 | 802.11ac VHT20 1TX | 802.11n HT20 2TX CDD |
| 5745 - 5825 | 802.11ac VHT20 2TX SDM/CDD | 802.11n HT20 2TX CDD |
| 5755 - 5795 | 802.11n HT40 1TX | 802.11n HT40 2TX CDD |
| 5755 - 5795 | 802.11n HT40 2TX SDM/CDD | 802.11n HT40 2TX CDD |
| 5755 - 5795 | 802.11ac VHT40 1TX | 802.11n HT40 2TX CDD |
| 5755 - 5795 | 802.11ac VHT40 2TX SDM/CDD | 802.11n HT40 2TX CDD |
| 5775 | 802.11ac VHT80 1TX | 802.11ac VHT80 2TX CDD |
| 5775 | 802.11ac VHT80 2TX SDM/CDD | 802.11ac VHT80 2TX CDD |

5.5. 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 X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

The fundamental level of the EUT was investigated on the condition of equipped with keyboard configuration also, but stand-alone configuration is more worse. So only below 1GHz and AC line conducted test were performed on the condition of equipped with keyboard configuration.

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

- 802.11a mode: 6 Mbps (2Tx CDD)
- 802.11n HT20mode: MCS0 (2Tx CDD)
- 802.11n HT40mode: MCS0 (2Tx CDD)
- 802.11ac VHT80mode: MCS0 (2Tx CDD)

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

| Support Equipment List | | | | |
|------------------------|--------------|-------------|----------------|--------|
| Description | Manufacturer | Model | Serial Number | FCC ID |
| Charger | SAMSUNG | EP-TA300 | R37K3AD0AC3SE3 | N/A |
| Data Cable | SAMSUNG | EP-DW720CWE | N/A | N/A |
| Earphone | SAMSUNG | EO-EG920BW | N/A | N/A |
| Keyboard | SAMSUNG | EJ-CW730 | N/A | N/A |

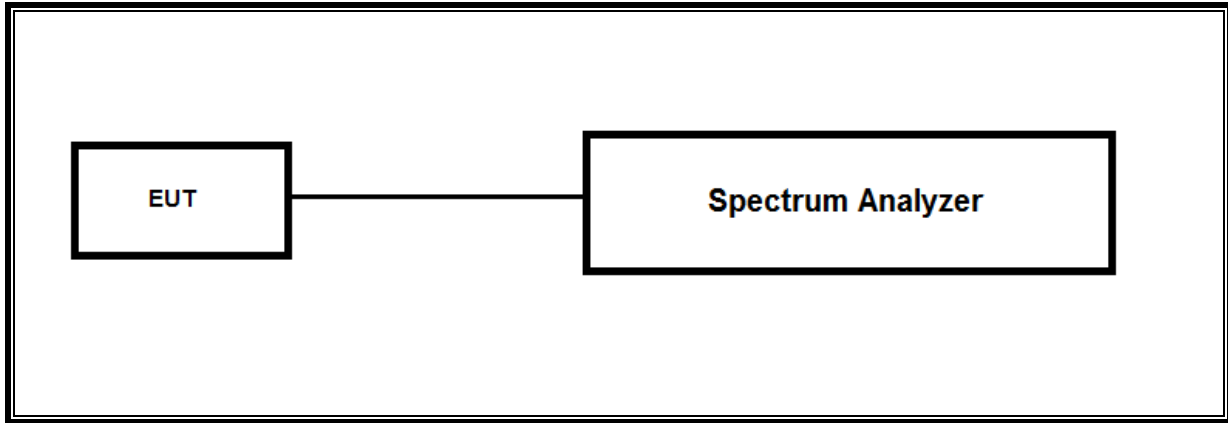
I/O CABLES

| I/O Cable List | | | | | | |
|----------------|----------|----------------------|----------------|------------|------------------|---------|
| Cable No | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | DC Power | 1 | C Type | Shielded | 1.1m | N/A |
| 2 | Audio | 2 | Mini-Jack | Unshielded | 1.2m | N/A |

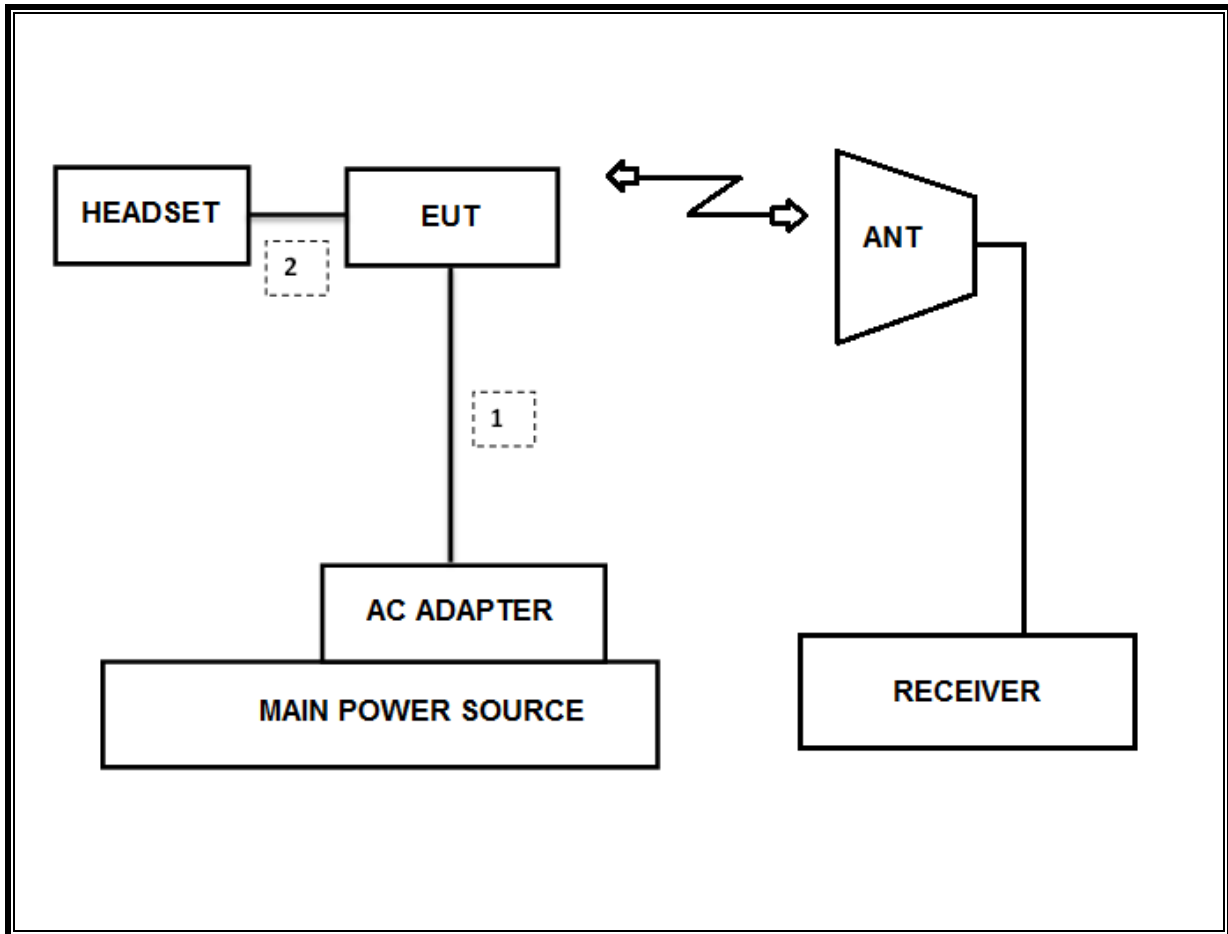
TEST SETUP

The EUT is a stand-alone unit during the tests.
 Test software 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 | Old Cal Due | New Cal Due |
| Antenna, Bilog, 30MHz-1GHz | SCHWARZBECK | VULB9163 | 750 | 08-31-19 | 08-04-20 |
| Antenna, Bilog, 30MHz-1GHz | SCHWARZBECK | VULB9163 | 749 | 09-14-19 | 08-04-20 |
| Antenna, Bilog, 30MHz-1GHz | SCHWARZBECK | VULB9163 | 845 | 08-31-19 | 08-04-20 |
| Antenna, Horn, 18 GHz | ETS | 3115 | 00167211 | 10-14-18 | 08-04-20 |
| Antenna, Horn, 18 GHz | ETS | 3115 | 00161451 | 03-10-19 | 08-04-20 |
| Antenna, Horn, 18 GHz | ETS | 3117 | 00168724 | 05-31-19 | 08-04-20 |
| Antenna, Horn, 18 GHz | ETS | 3117 | 00168717 | 05-31-19 | 08-04-20 |
| Antenna, Horn, 18 GHz | ETS | 3117 | 00205959 | 11-29-18 | 08-04-20 |
| 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 | 11-13-18 | 08-09-19 |
| Preamplifier, 1000 MHz | Sonoma | 310N | 341282 | 08-09-18 | 08-07-19 |
| Preamplifier, 1000 MHz | Sonoma | 310N | 351741 | 08-07-18 | 08-07-19 |
| Preamplifier, 1000 MHz | Sonoma | 310N | 370599 | 08-10-18 | 08-06-19 |
| Preamplifier, 18 GHz | Miteq | AFS42-00101800-25-S-42 | 1876511 | 08-08-18 | 08-07-19 |
| Preamplifier, 18 GHz | Miteq | AFS42-00101800-25-S-42 | 1896138 | 08-08-18 | 08-07-19 |
| Preamplifier, 18 GHz | Miteq | AFS42-00101800-25-S-42 | 2029169 | 08-11-18 | 08-07-19 |
| Spectrum Analyzer, 44 GHz | Agilent / HP | N9030A | MY54170614 | 08-08-18 | 08-07-19 |
| Spectrum Analyzer, 44 GHz | Agilent / HP | N9030A | MY54490312 | 08-08-18 | 08-06-19 |
| Spectrum Analyzer, 43.5 GHz | R&S | FSW43 | 104089 | 08-11-18 | 08-06-19 |
| Average Power Sensor | Agilent / HP | U2000 | MY54270007 | 08-08-18 | 08-07-19 |
| Attenuator | PASTERNAK | PE7087-10 | A001 | 08-08-18 | 08-08-19 |
| Attenuator | PASTERNAK | PE7087-10 | A008 | 08-08-18 | 08-08-19 |
| Attenuator | PASTERNAK | PE7004-10 | 2 | 08-10-18 | 08-07-19 |
| Attenuator | PASTERNAK | PE7087-10 | A009 | 08-08-18 | 08-08-19 |
| EMI Test Receive, 40 GHz | R&S | ESU40 | 100439 | 08-08-18 | 08-06-19 |
| EMI Test Receive, 40 GHz | R&S | ESU40 | 100457 | 08-08-18 | 08-06-19 |
| EMI Test Receive, 44 GHz | R&S | ESW44 | 101590 | 08-09-18 | 08-06-19 |
| EMI Test Receive, 3 GHz | R&S | ESR3 | 101832 | 08-07-18 | 08-06-19 |
| Low Pass Filter 5GHz | Micro-Tronics | LPS17541 | 009 | 08-08-18 | 08-07-19 |
| Low Pass Filter 5GHz | Micro-Tronics | LPS17541 | 015 | 08-08-18 | 08-07-19 |
| Low Pass Filter 5GHz | Micro-Tronics | LPS17541 | 020 | 08-11-18 | 08-06-19 |
| High Pass Filter 3GHz | Micro-Tronics | HPM17543 | 010 | 08-08-18 | 08-07-19 |
| High Pass Filter 3GHz | Micro-Tronics | HPM17543 | 015 | 08-08-18 | 08-07-19 |
| High Pass Filter 3GHz | Micro-Tronics | HPM17543 | 020 | 08-11-18 | 08-06-19 |
| High Pass Filter 6GHz | Micro-Tronics | HPS17542 | 009 | 08-08-18 | 08-07-19 |
| High Pass Filter 6GHz | Micro-Tronics | HPS17542 | 016 | 08-08-18 | 08-07-19 |
| High Pass Filter 6GHz | Micro-Tronics | HPS17542 | 021 | 08-11-18 | 08-06-19 |
| LISN | R&S | ENV-216 | 101837 | 08-09-18 | 08-09-19 |
| 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 | PASS |
| 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.3.a(Method PM)

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

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. REFERENCE MEASUREMENTS RESULTS

9.1. ON TIME AND DUTY CYCLE RESULTS

| Mode | ON Time B [msec] | Period [msec] | Duty Cycle x [linear] | Duty Cycle [%] | Duty Cycle Correction Factor [dB] | 1/T Minimum VBW [kHz] |
|----------------|------------------------|------------------|-----------------------------|----------------------|---|-----------------------------|
| 802.11a | 3.1 | 3.137 | 0.988 | 98.8% | 0.00 | 0.010 |
| 802.11n HT20 | 5.483 | 5.521 | 0.993 | 99.3% | 0.00 | 0.010 |
| 802.11n HT40 | 5.483 | 5.52 | 0.993 | 99.3% | 0.00 | 0.010 |
| 802.11ac VHT80 | 4.523 | 4.561 | 0.992 | 99.2% | 0.00 | 0.010 |

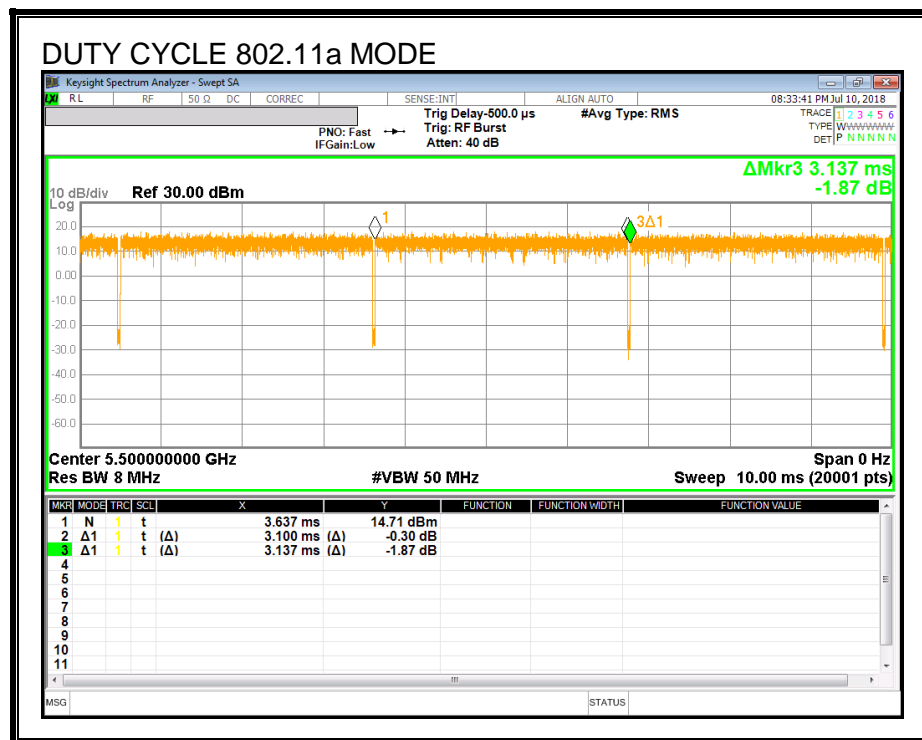
LIMITS

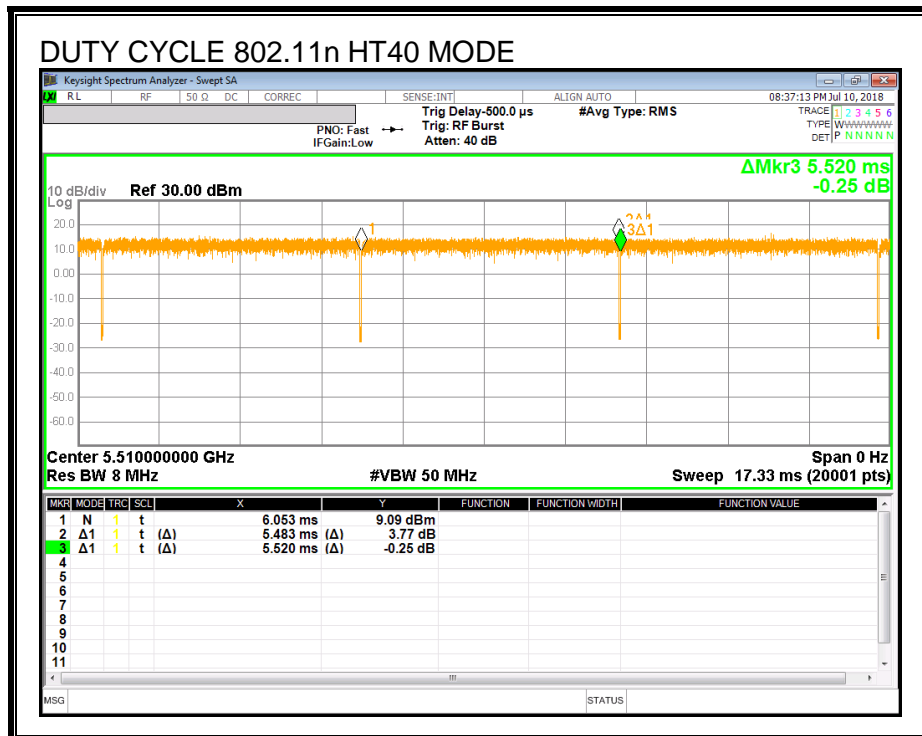
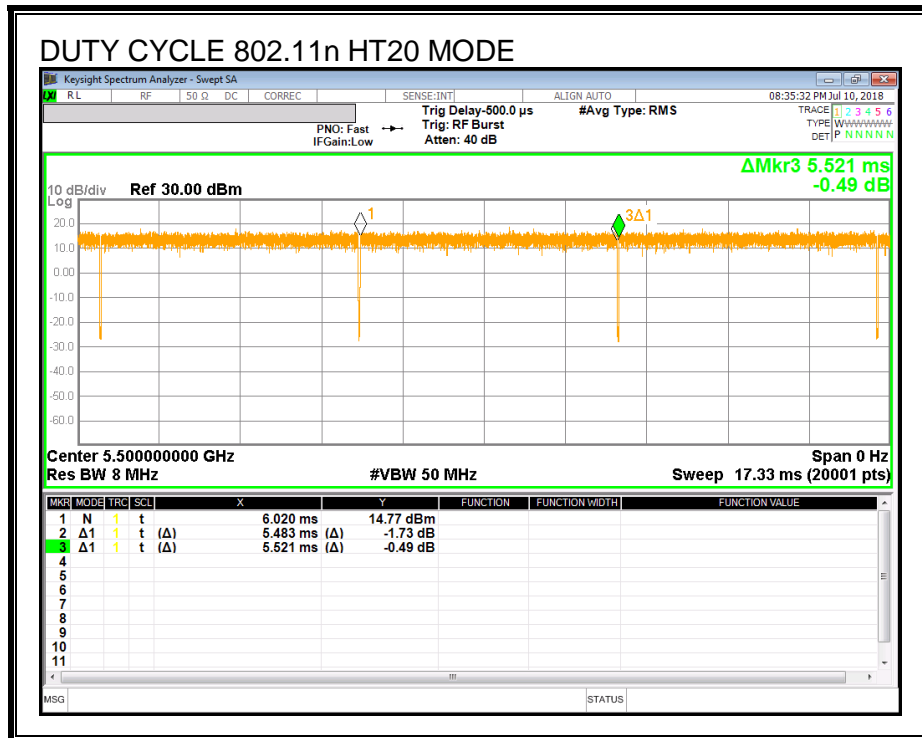
None; for reporting purposes only.

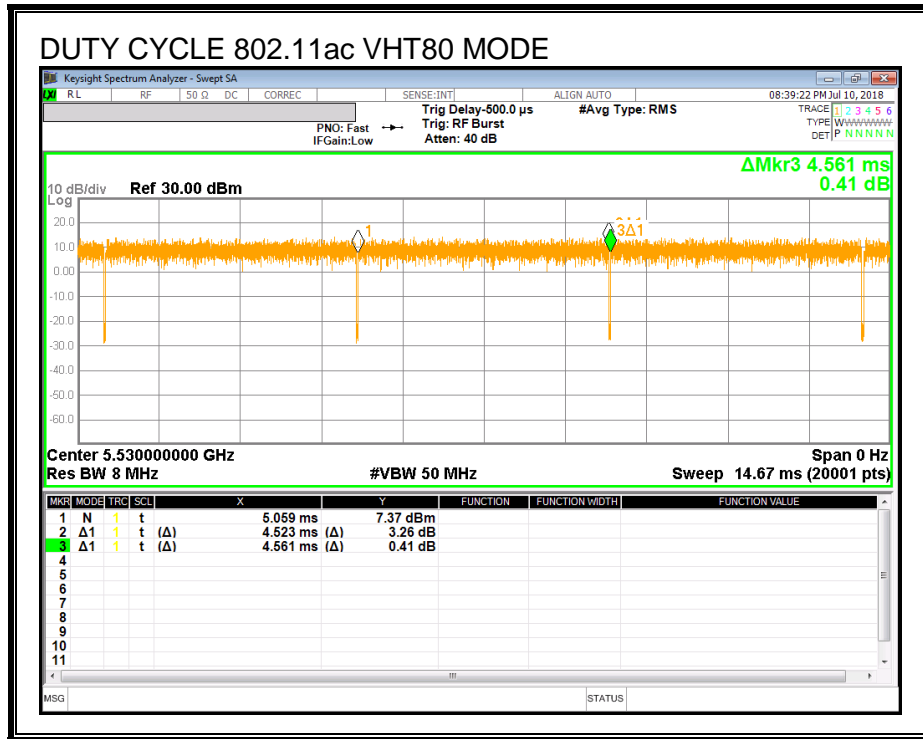
PROCEDURE

KDB 789033 D02 v02r01 Zero-Span Spectrum Analyzer Method.

9.2. DUTY CYCLE PLOTS







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 : 20.58MHz
- Turning Frequency : 5725MHz
- 26dB Bandwidth of UNII-2C band Portion
= $(5725 - (5720 - (20.58 / 2))) = 15.29 \text{ MHz}$
- 26dB Bandwidth of UNII-3 band Portion
= $(5720 + (20.58 / 2) - 5725) = 5.29 \text{ MHz}$

RESULTS

9.3.1.802.11a MODE IN THE 5.2 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|---------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5180 | 20.69 | 20.56 |
| Mid | 5200 | 20.81 | 20.45 |
| High | 5240 | 21.00 | 20.72 |
| Worst | | 21.00 | |

9.3.2.802.11n HT20 MODE IN THE 5.2 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|---------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5180 | 21.37 | 21.16 |
| Mid | 5200 | 21.28 | 20.48 |
| High | 5240 | 22.15 | 21.61 |
| Worst | | 22.15 | |

9.3.3.802.11n HT40 MODE IN THE 5.2 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|---------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5190 | 39.79 | 39.51 |
| High | 5230 | 39.92 | 39.61 |
| Worst | | 39.92 | |

9.3.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|---------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Middle | 5210 | 81.24 | 81.64 |
| Worst | | 81.64 | |

9.3.5.802.11a MODE IN THE 5.3 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|---------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5260 | 20.49 | 20.65 |
| Mid | 5300 | 20.64 | 20.67 |
| High | 5320 | 20.65 | 20.84 |
| Worst | | 20.84 | |

9.3.6.802.11n HT20 MODE IN THE 5.3 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|---------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5260 | 21.10 | 21.70 |
| Mid | 5300 | 21.56 | 20.86 |
| High | 5320 | 20.63 | 21.13 |
| Worst | | 21.70 | |

9.3.7.802.11n HT40 MODE IN THE 5.3 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|---------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5270 | 40.09 | 40.16 |
| High | 5310 | 39.46 | 40.00 |
| Worst | | 40.16 | |

9.3.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|---------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Middle | 5290 | 81.01 | 81.76 |
| Worst | | 81.76 | |

9.3.9. 802.11a MODE IN THE 5.5 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|----------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5500 | 20.96 | 20.76 |
| Mid | 5580 | 21.57 | 20.41 |
| High | 5700 | 21.99 | 21.01 |
| Straddle | 5720 | 15.51 | 15.49 |
| Worst | | 21.99 | |

9.3.10. 802.11n HT20 MODE IN THE 5.5 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|----------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5500 | 21.67 | 21.45 |
| Mid | 5580 | 20.99 | 21.03 |
| High | 5700 | 21.56 | 21.23 |
| Straddle | 5720 | 15.78 | 16.01 |
| Worst | | 21.67 | |

9.3.11. 802.11n HT40 MODE IN THE 5.5 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|----------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5510 | 40.17 | 40.18 |
| Mid | 5590 | 39.80 | 39.71 |
| High | 5670 | 40.21 | 39.98 |
| Straddle | 5710 | 34.99 | 34.81 |
| Worst | | 40.21 | |

9.3.12. 802.11ac VHT80 MODE IN THE 5.5 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|---------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5530 | 81.40 | 80.68 |
| High | 5610 | 81.68 | 81.13 |
| Staddle | 5690 | 75.80 | 75.33 |
| Worst | | 81.68 | |

9.3.13. 802.11a MODE IN THE 5.8 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|----------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Straddle | 5720 | 5.51 | 5.49 |
| Low | 5745 | 21.55 | 21.00 |
| Mid | 5785 | 21.06 | 20.15 |
| High | 5825 | 21.22 | 20.25 |
| Worst | | 21.55 | |

9.3.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|----------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Straddle | 5720 | 5.78 | 6.01 |
| Low | 5745 | 21.38 | 21.96 |
| Mid | 5785 | 20.62 | 21.86 |
| High | 5825 | 22.11 | 21.30 |
| Worst | | 22.11 | |

9.3.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

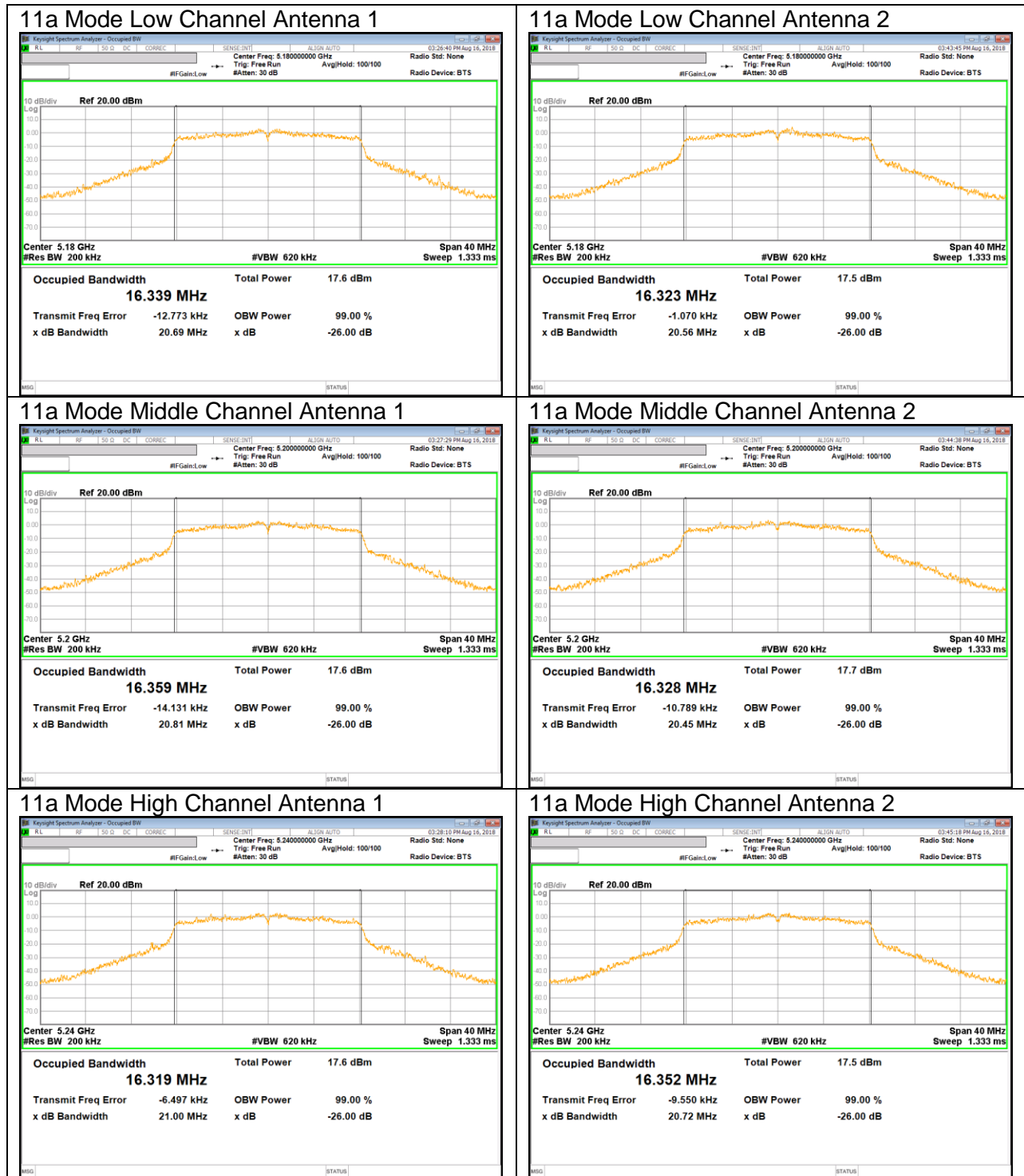
| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|----------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Straddle | 5710 | 4.99 | 4.81 |
| Low | 5755 | 40.12 | 39.85 |
| High | 5795 | 39.70 | 39.89 |
| Worst | | 40.12 | |

9.3.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

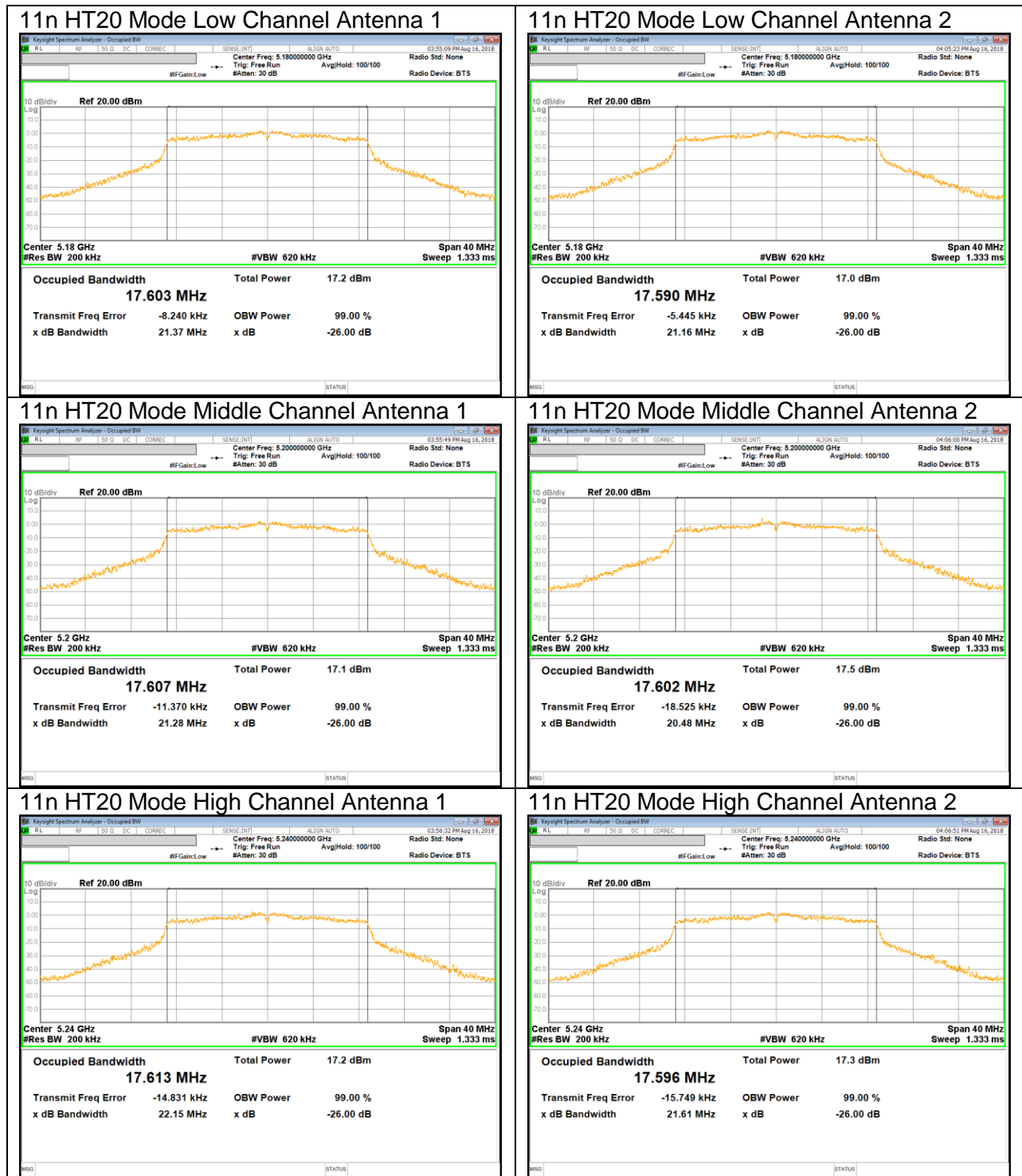
| Channel | Frequency [MHz] | 26 dB Bandwidth [MHz] | |
|----------|--------------------|--------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Straddle | 5690 | 5.80 | 5.33 |
| Middle | 5775 | 81.25 | 81.14 |
| Worst | | 81.25 | |

9.3.17. 26 dB BANDWIDTH PLOTS

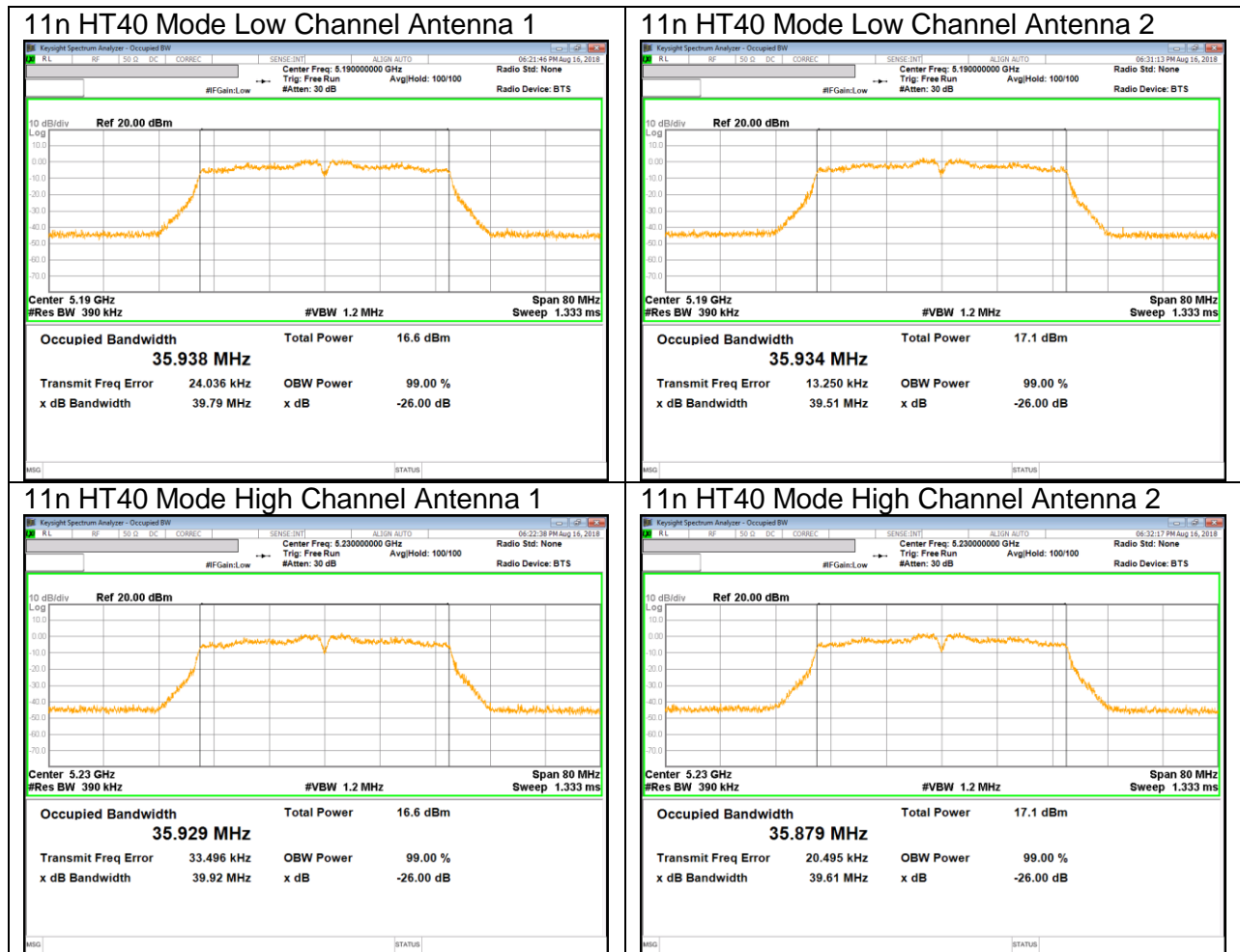
UNII 5.2 GHz IEEE 802.11a mode



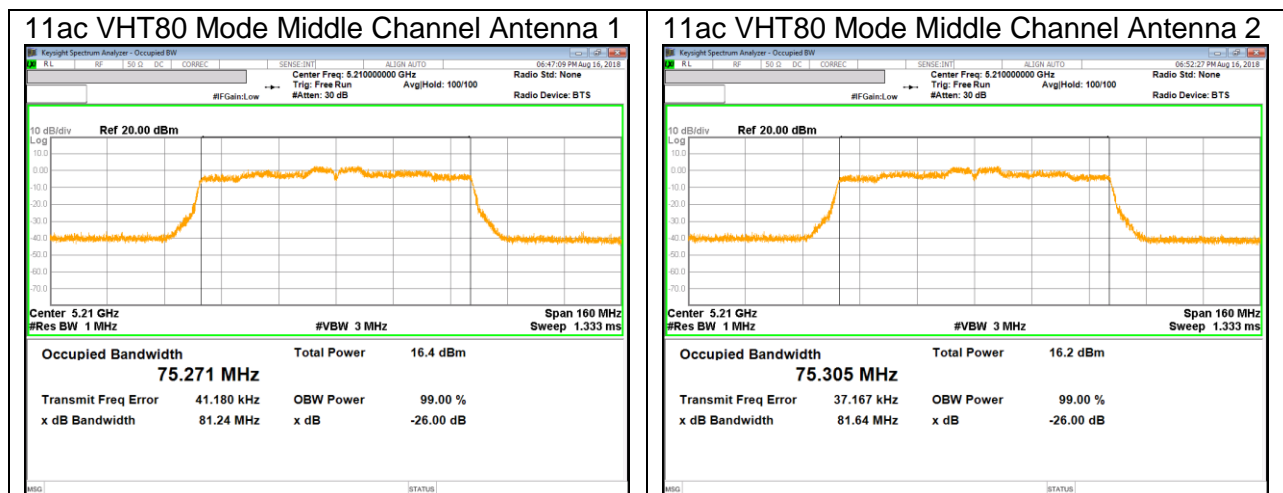
UNII 5.2 GHz IEEE 802.11n HT20 mode



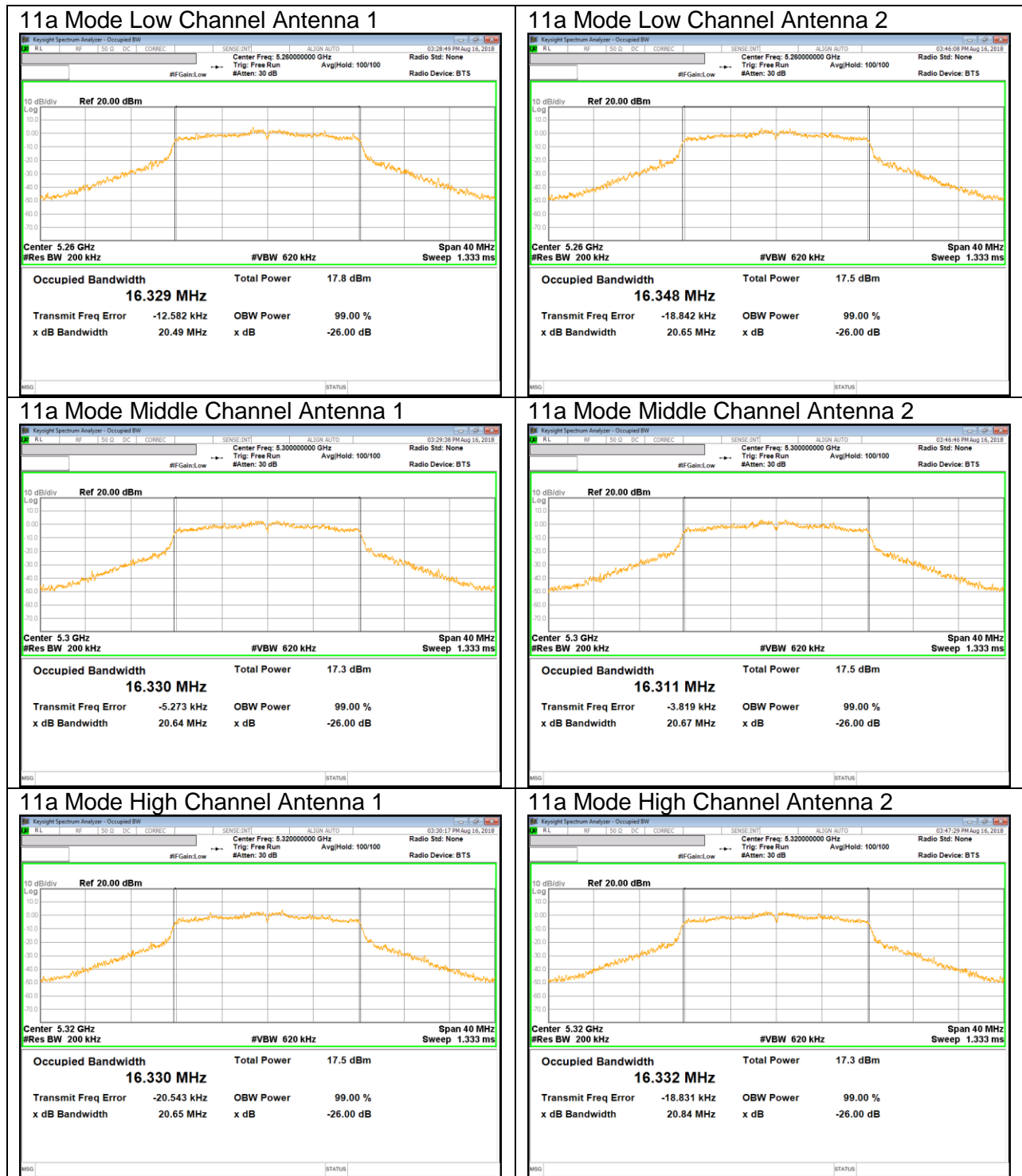
UNII 5.2 GHz IEEE 802.11n HT40 mode



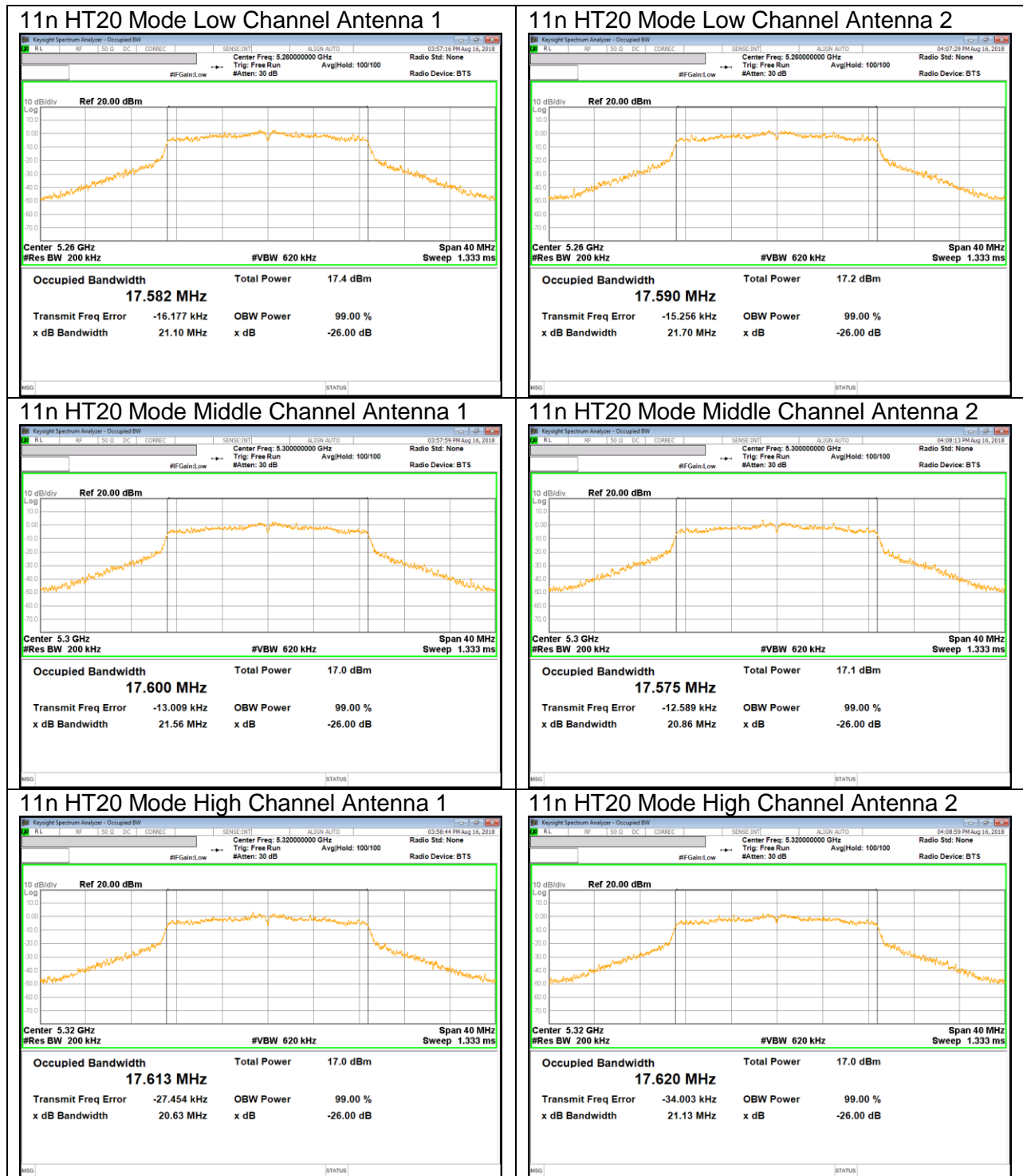
UNII 5.2 GHz IEEE 802.11ac VHT80 mode



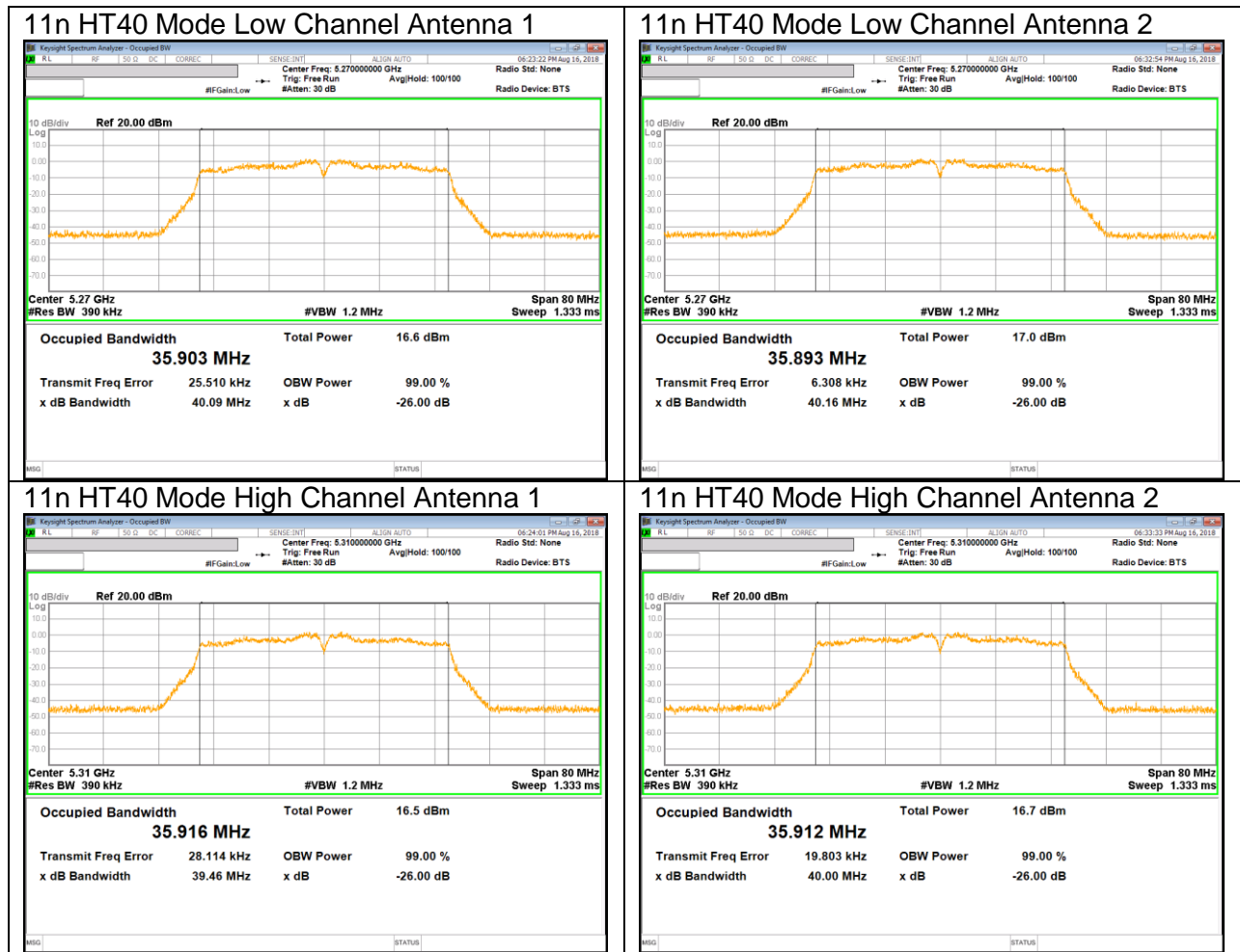
UNII 5.3 GHz IEEE 802.11a mode



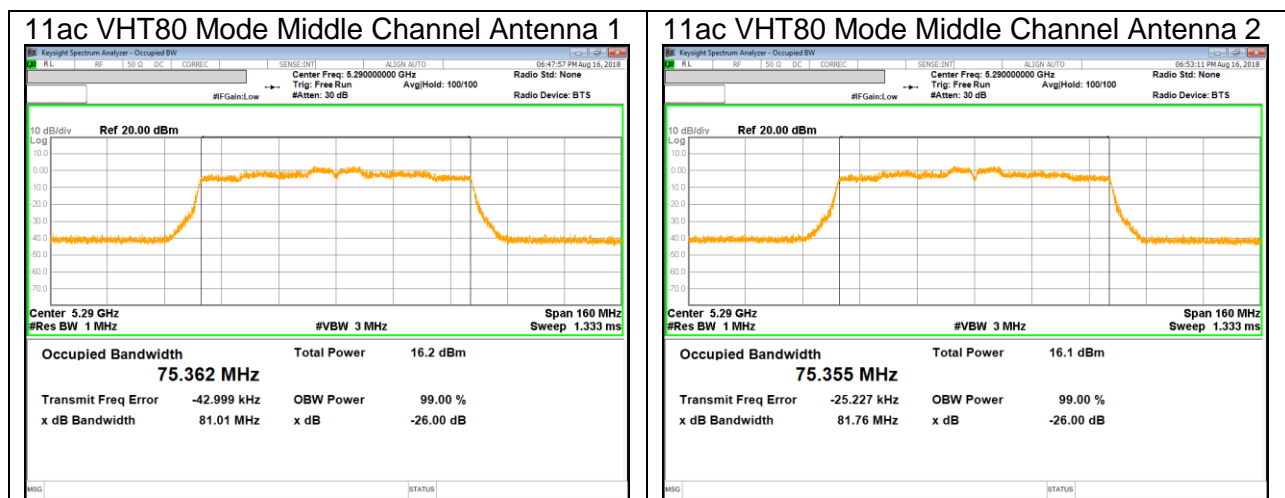
UNII 5.3 GHz IEEE 802.11n HT20 mode



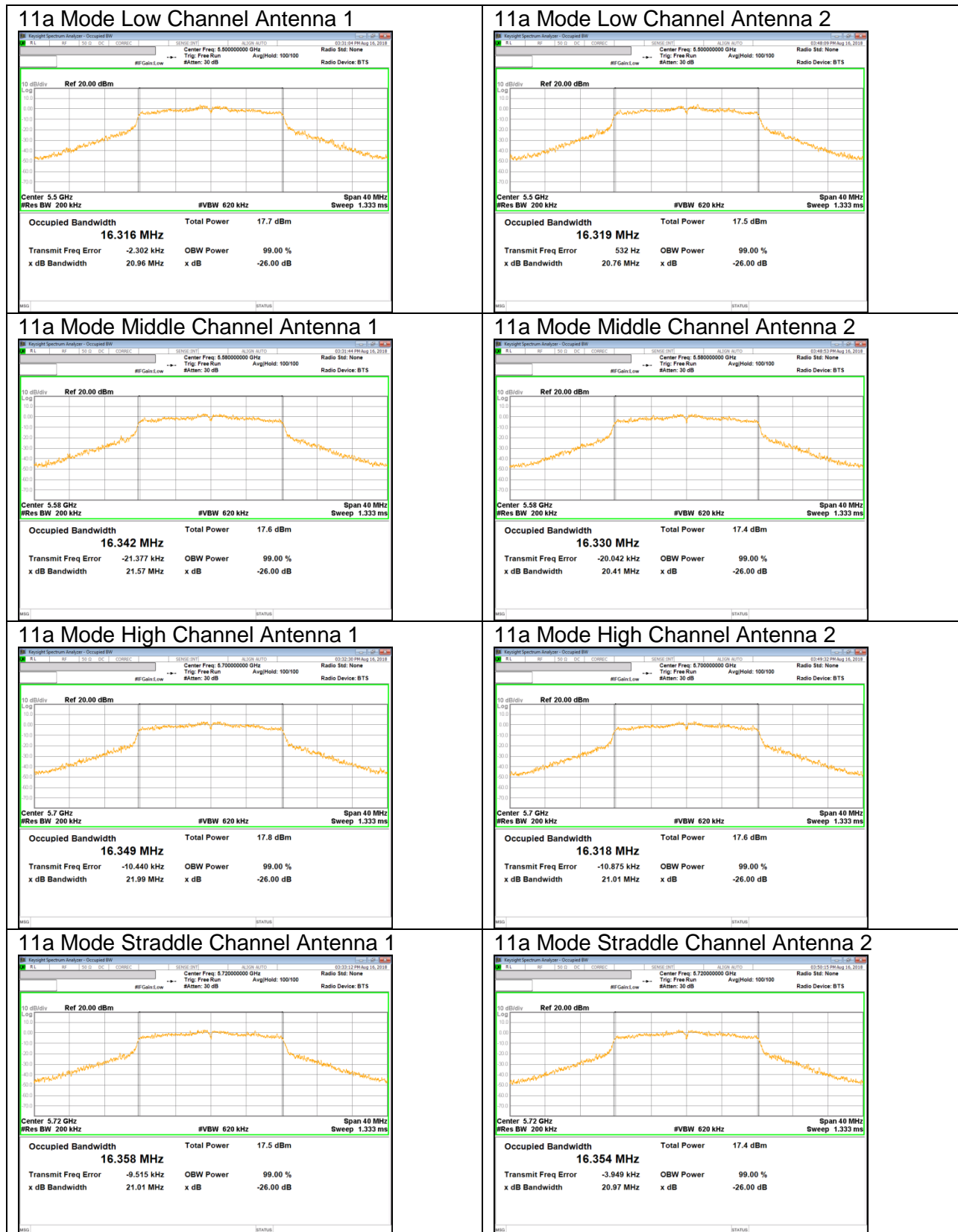
UNII 5.3 GHz IEEE 802.11n HT40 mode



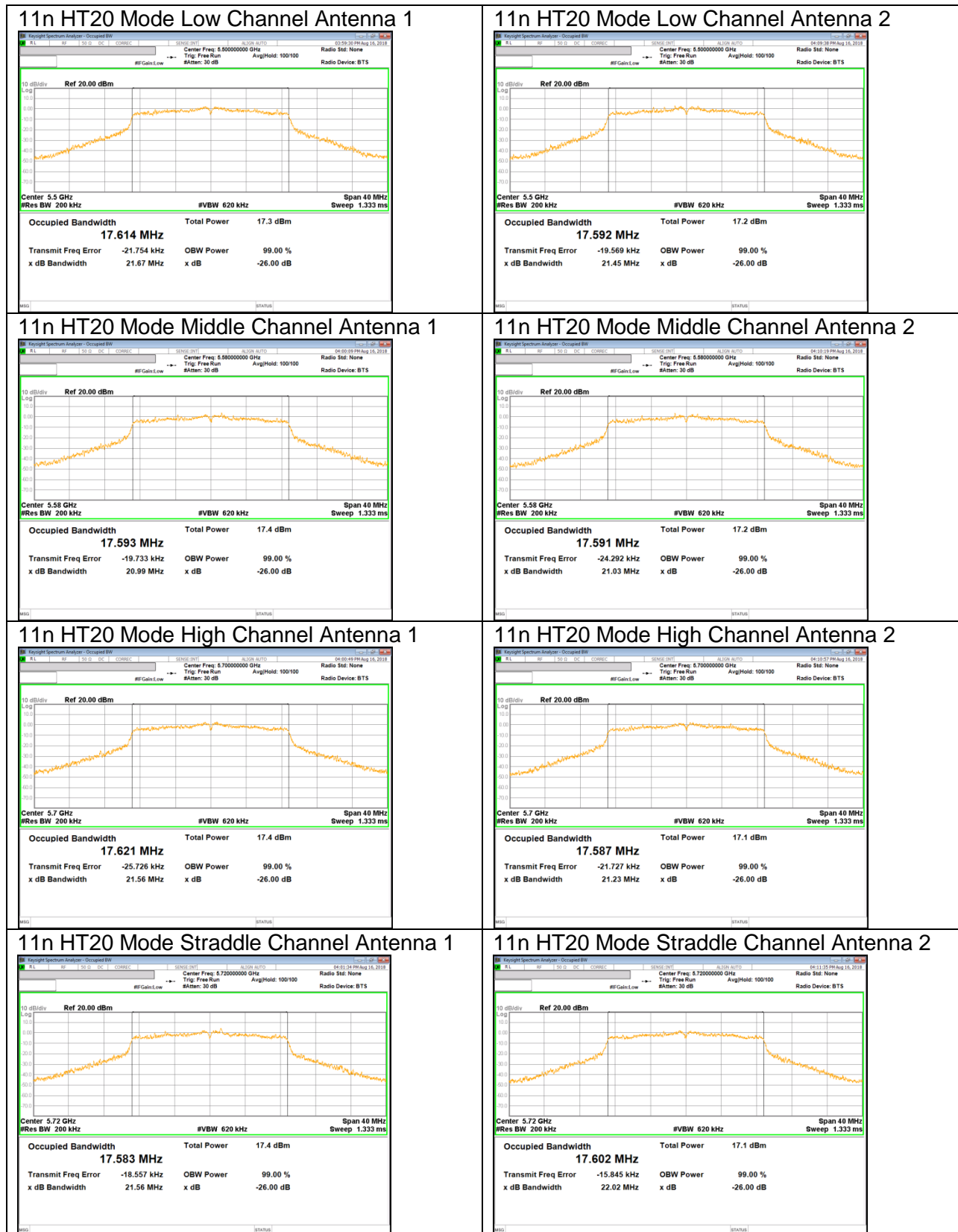
UNII 5.3 GHz IEEE 802.11ac VHT80 mode



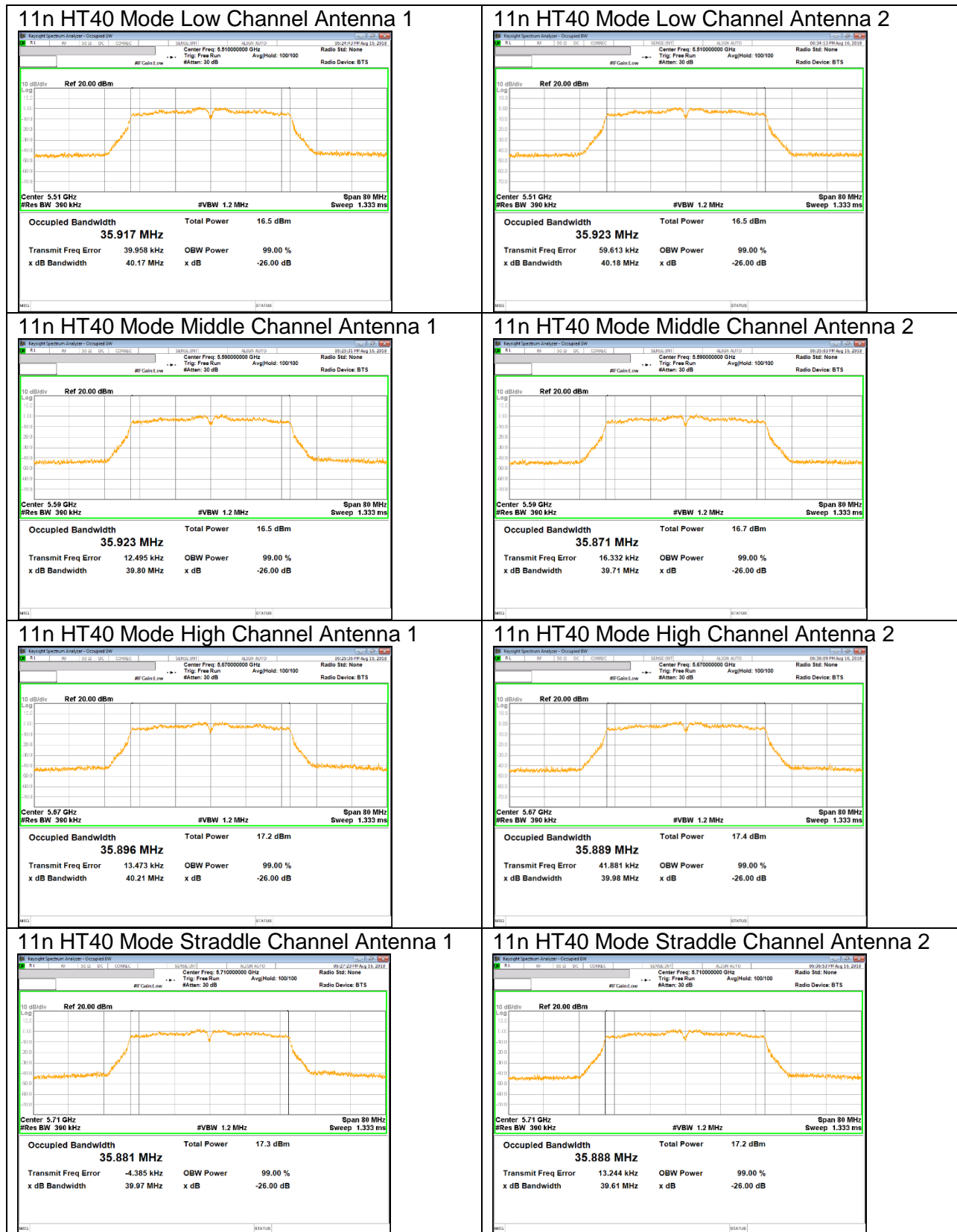
UNII 5.5 GHz IEEE 802.11a mode



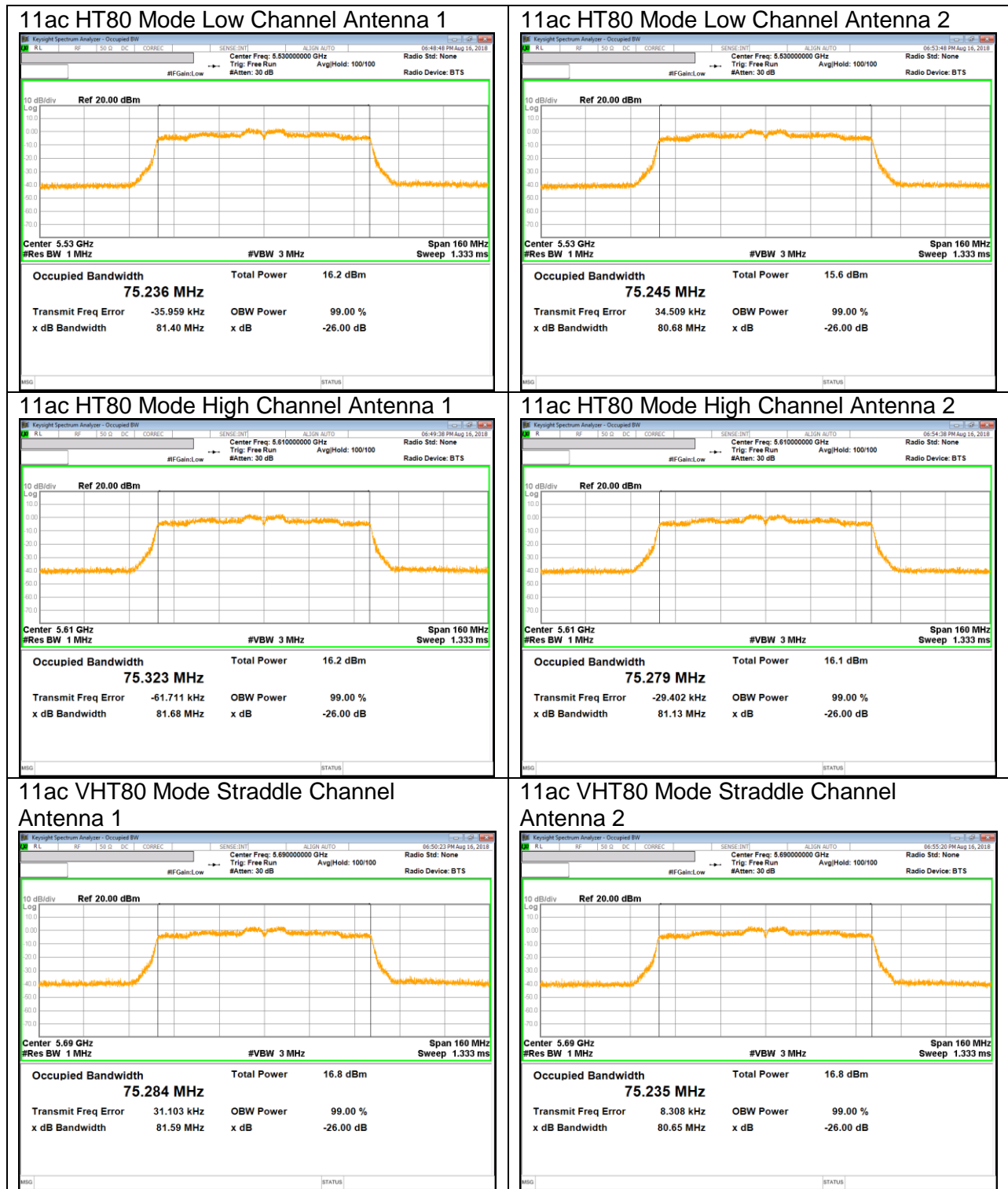
UNII 5.5 GHz IEEE 802.11n HT20 mode



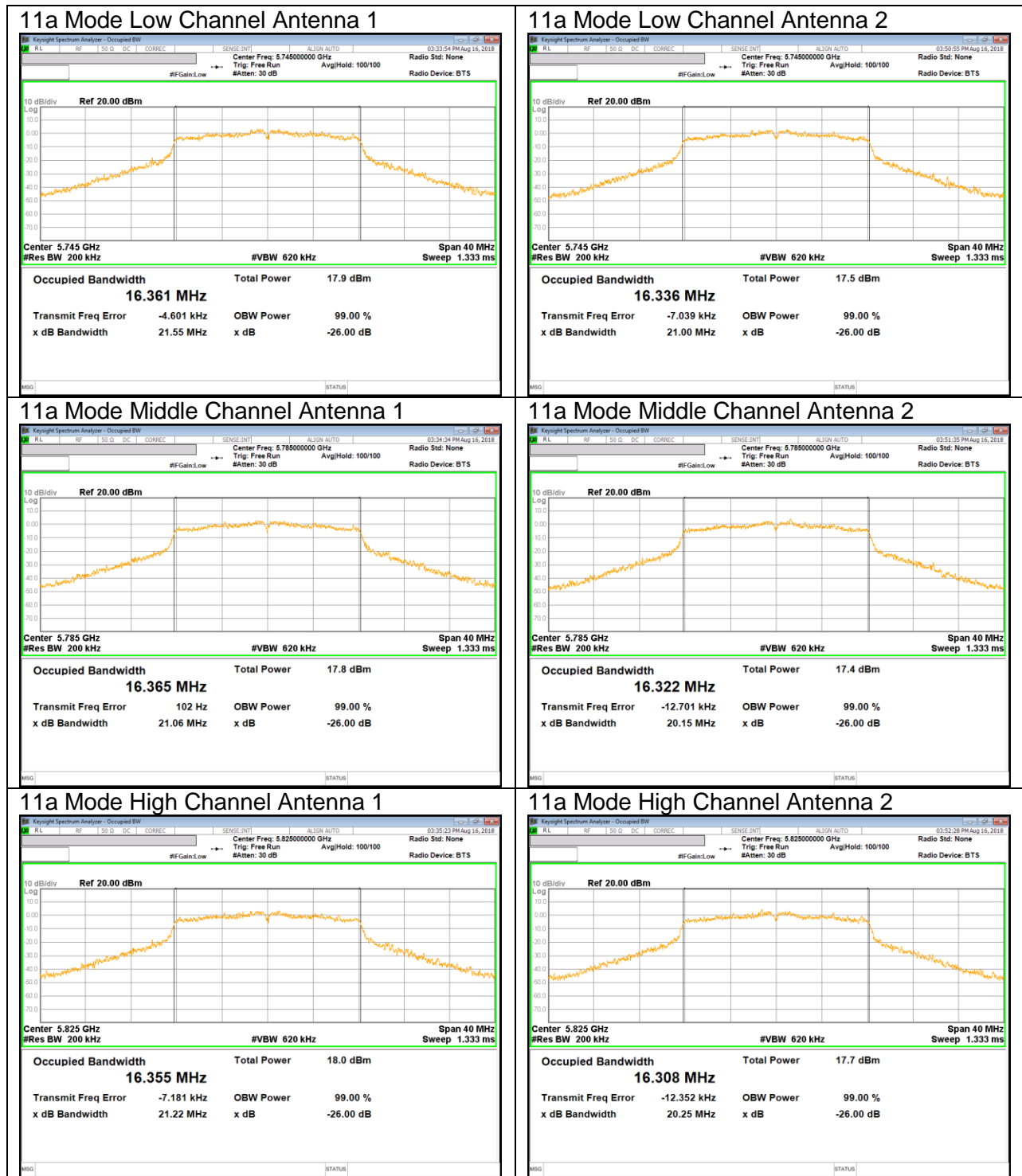
UNII 5.5 GHz IEEE 802.11n HT40 mode



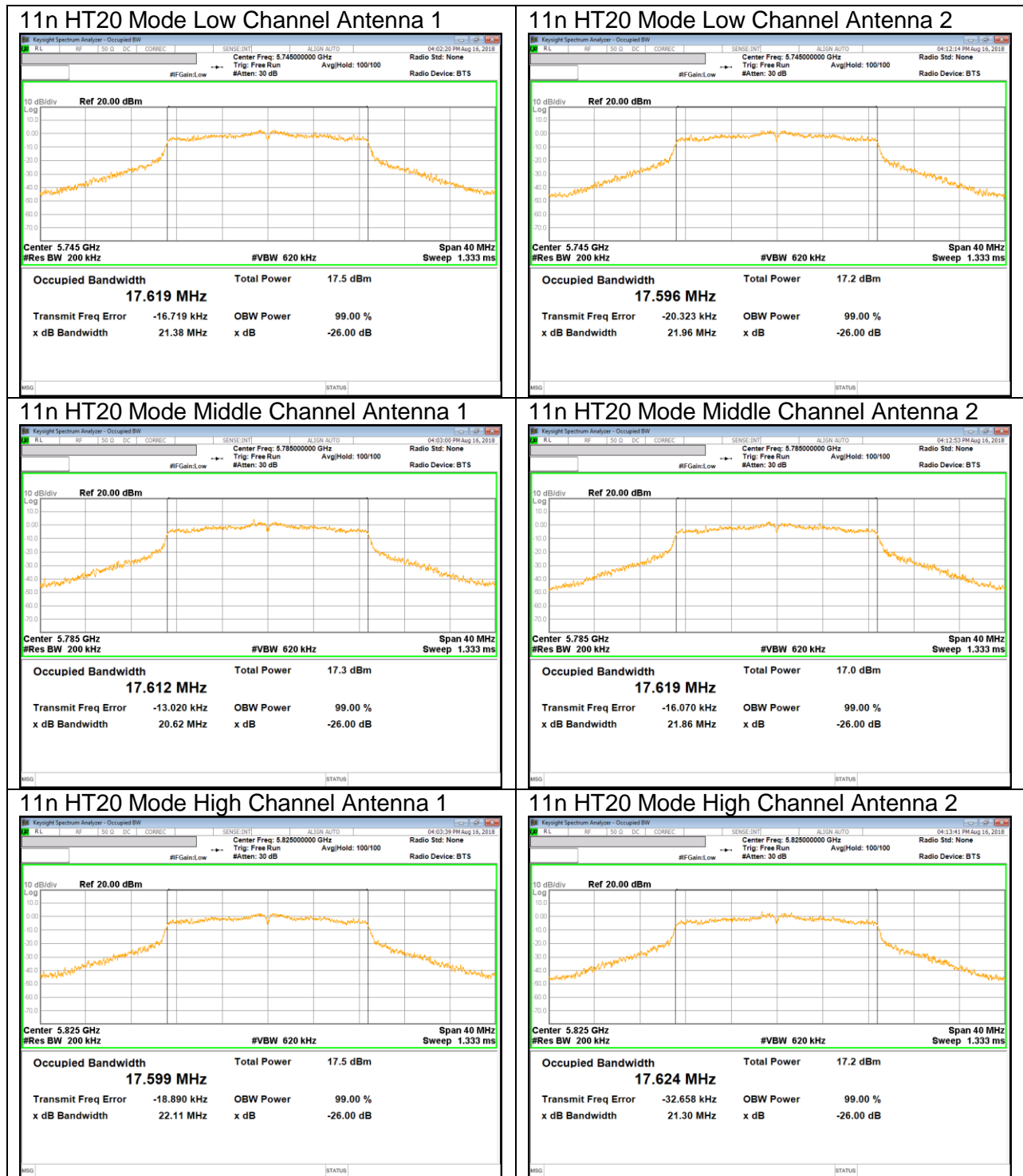
UNII 5.5 GHz IEEE 802.11ac VHT80 mode



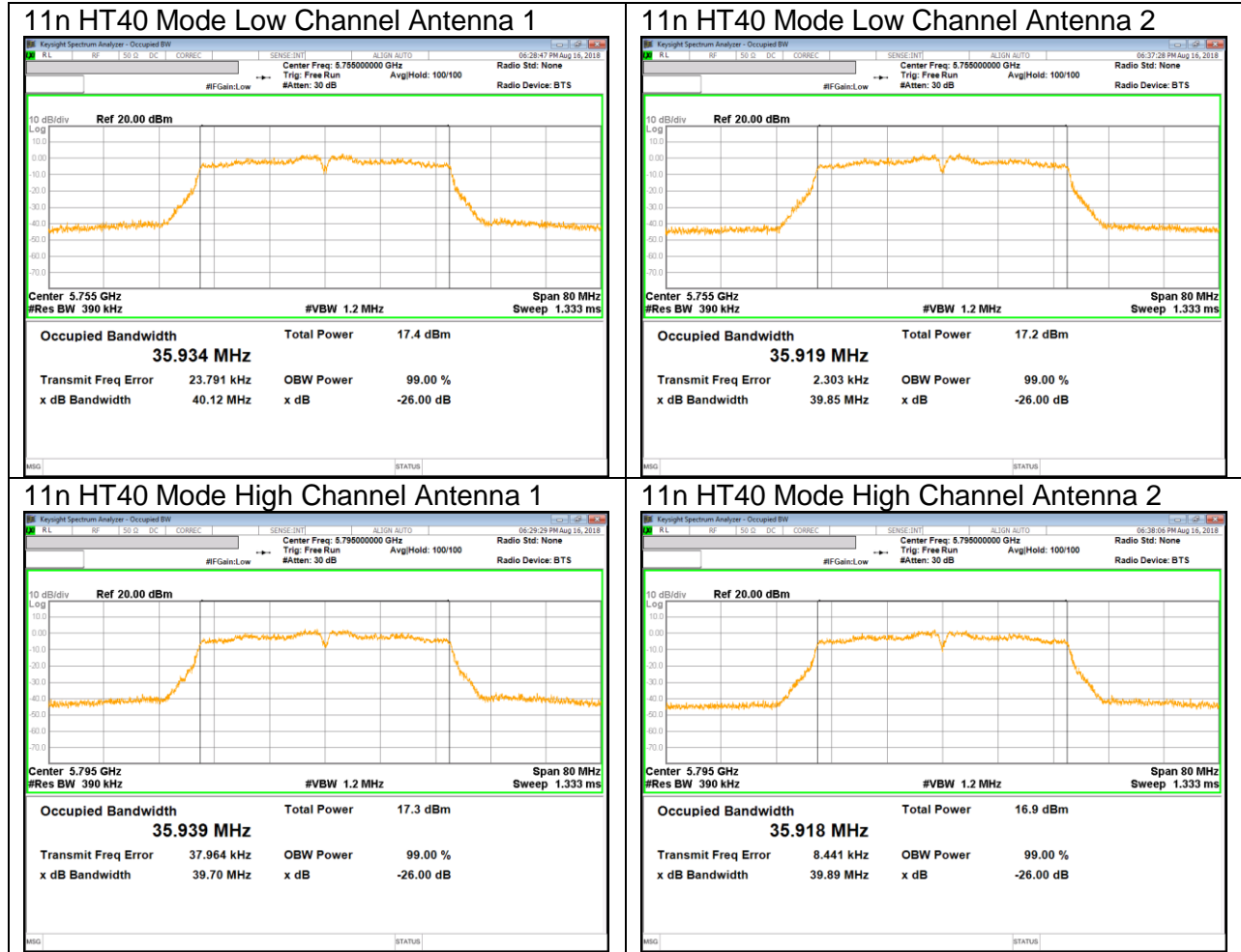
UNII 5.8 GHz IEEE 802.11a mode



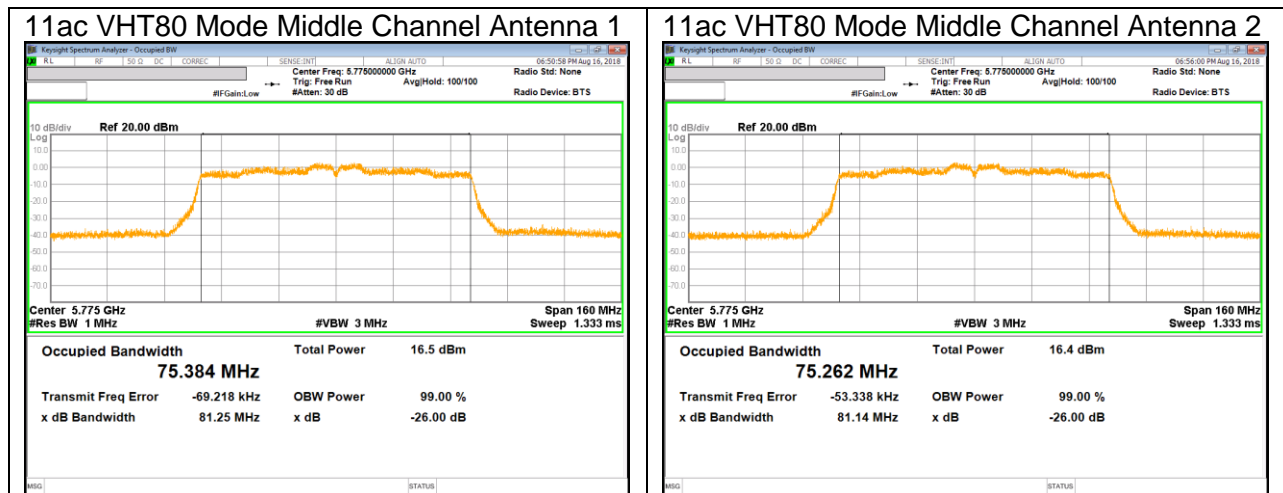
UNII 5.8 GHz IEEE 802.11n HT20 mode



UNII 5.8 GHz IEEE 802.11n HT40 mode



UNII 5.8 GHz IEEE 802.11ac VHT80 mode



9.4. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Reference to 789033 D02 General UNII Test Procedures New Rules v01r04: The transmitter output is connected to a spectrum analyzer with the RBW set to approximately 1% to 5% of OBW, the VBW $\geq 3 \times$ RBW, single sweep.

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] | |
|---------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5180 | 16.370 | 16.372 |
| Mid | 5200 | 16.374 | 16.363 |
| High | 5240 | 16.358 | 16.377 |
| Worst | | 16.377 | |

9.4.2.802.11n HT20 MODE IN THE 5.2 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|---------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5180 | 17.595 | 17.587 |
| Mid | 5200 | 17.603 | 17.607 |
| High | 5240 | 17.615 | 17.604 |
| Worst | | 17.615 | |

9.4.3.802.11n HT40 MODE IN THE 5.2 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|---------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5190 | 36.005 | 35.999 |
| High | 5230 | 36.019 | 35.986 |
| Worst | | 36.019 | |

9.4.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|---------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Middle | 5210 | 75.189 | 75.244 |
| Worst | | 75.244 | |

9.4.5.802.11a MODE IN THE 5.3 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|---------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5260 | 16.348 | 16.343 |
| Mid | 5300 | 16.369 | 16.361 |
| High | 5320 | 16.378 | 16.357 |
| Worst | | 16.378 | |

9.4.6.802.11n HT20 MODE IN THE 5.3 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|---------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5260 | 17.615 | 17.607 |
| Mid | 5300 | 17.604 | 17.610 |
| High | 5320 | 17.609 | 17.603 |
| Worst | | 17.615 | |

9.4.7.802.11n HT40 MODE IN THE 5.3 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|---------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5270 | 36.021 | 36.002 |
| High | 5310 | 35.990 | 35.990 |
| Worst | | 36.021 | |

9.4.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|---------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Middle | 5290 | 75.243 | 75.373 |
| Worst | | 75.373 | |

9.4.9. 802.11a MODE IN THE 5.5 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|----------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5500 | 16.371 | 16.371 |
| Mid | 5580 | 16.368 | 16.367 |
| High | 5700 | 16.361 | 16.371 |
| Straddle | 5720 | 13.187 | 13.184 |
| Worst | | 16.371 | |

9.4.10. 802.11n HT20 MODE IN THE 5.5 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|----------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5500 | 17.592 | 17.598 |
| Mid | 5580 | 17.604 | 17.619 |
| High | 5700 | 17.606 | 17.609 |
| Straddle | 5720 | 13.807 | 13.810 |
| Worst | | 17.619 | |

9.4.11. 802.11n HT40 MODE IN THE 5.5 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|----------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5510 | 36.029 | 35.986 |
| Mid | 5550 | 36.022 | 36.031 |
| High | 5670 | 36.028 | 36.009 |
| Straddle | 5710 | 32.995 | 33.004 |
| Worst | | 36.031 | |

9.4.12. 802.11ac VHT80 MODE IN THE 5.5 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|----------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Low | 5530 | 75.288 | 75.199 |
| High | 5610 | 75.264 | 75.191 |
| Straddle | 5690 | 72.657 | 72.612 |
| Worst | | 75.288 | |

9.4.13. 802.11a MODE IN THE 5.8 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|----------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Straddle | 5720 | 3.187 | 3.185 |
| Low | 5745 | 16.394 | 16.367 |
| Mid | 5785 | 16.384 | 16.389 |
| High | 5825 | 16.395 | 16.383 |
| Worst | | 16.395 | |

9.4.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|----------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Straddle | 5720 | 3.807 | 3.810 |
| Low | 5745 | 17.615 | 17.588 |
| Mid | 5785 | 17.605 | 17.607 |
| High | 5825 | 17.618 | 17.609 |
| Worst | | 17.618 | |

9.4.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|----------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Straddle | 5710 | 2.994 | 3.003 |
| Low | 5755 | 36.031 | 35.996 |
| High | 5795 | 36.008 | 36.033 |
| Worst | | 36.033 | |

9.4.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] | |
|----------|--------------------|------------------------|-----------|
| | | Antenna 1 | Antenna 2 |
| Straddle | 5690 | 2.657 | 2.612 |
| Middle | 5775 | 75.252 | 75.379 |
| Worst | | 75.379 | |