**SPORTON International Inc.**
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**Ph: 886-3-327-3456 / FAX: 886-3-327-0973 / www.sporton.com.tw**

# FCC RADIO TEST REPORT

| | |
|---|---|
| Applicant's company | **ALE USA Inc.** |
| Applicant Address | 26801 West Agoura Road, Calabasas, CA 91301 |
| FCC ID | **2AI9TOAW-AP1101** |
| Manufacturer's company | **ALE USA Inc.** |
| Manufacturer Address | 26801 West Agoura Road, Calabasas, CA 91301 |

| | |
|---|---|
| Product Name | Alcatel-Lucent Enterprise Access Point |
| Brand Name | Alcatel-Lucent Enterprise |
| Model No. | OAW-AP1101 |
| Test Rule Part(s) | 47 CFR FCC Part 15 Subpart E § 15.407 |
| Test Freq. Range | 5250 ~ 5350MHz / 5470 ~ 5725MHz |
| Received Date | Jun. 17, 2016 |
| Final Test Date | Aug. 10, 2016 |
| Submission Type | Class II Change |

## Statement

**Test result included is for the IEEE 802.11n and IEEE 802.11a/ac of the product.**

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2013**, **47 CFR FCC Part 15 Subpart E, KDB789033 D02 v01r03, KDB662911 D01 v02r01, KDB644545 D03 v01, ET Docket No. 13-49; FCC 16-24.**

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

Testing Laboratory
1190

# Table of Contents

# History of This Test Report

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|---|---|---|---|
| FR661722-01 | Rev. 01 | Initial issue of report | Sep. 14, 2016 |
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# 1. VERIFICATION OF COMPLIANCE

| | | |
|---|---|---|
| Product Name | : | Alcatel-Lucent Enterprise Access Point |
| Brand Name | : | Alcatel-Lucent Enterprise |
| Model No. | : | OAW-AP1101 |
| Applicant | : | ALE USA Inc. |
| Test Rule Part(s) | : | 47 CFR FCC Part 15 Subpart E § 15.407 |

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jun. 17, 2016 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen
SPORTON INTERNATIONAL INC.

## 2. SUMMARY OF THE TEST RESULT

| Applied Standard: 47 CFR FCC Part 15 Subpart E | | | |
|---|---|---|---|
| **Part** | **Rule Section** | **Description of Test** | **Result** |
| 4.1 | 15.407(a) | 26dB Spectrum Bandwidth and 99% Occupied Bandwidth | Complies |
| 4.3 | 15.407(a) | Maximum Conducted Output Power | Complies |
| 4.2 | 15.407(e) | 6dB Spectrum Bandwidth | Complies |
| 4.4 | 15.407(a) | Power Spectral Density | Complies |
| 4.5 | 15.407(b) | Radiated Emissions | Complies |
| 4.6 | 15.407(b) | Band Edge Emissions | Complies |
| 4.7 | 15.407(g) | Frequency Stability | Complies |
| 4.8 | 15.203 | Antenna Requirements | Complies |
| Note | 15.407(c) | Automatically Discontinue Transmission | Complies |

Note: Data transmission is always initiated by software, which is then passed down through the MAC, through the digital and analog baseband, and finally to the RF chip. Several special packets (ACKs, CTS, PSPoll, etc...) are initiated by the MAC. These are the only ways the digital baseband portion will turn on the RF transmitter, which it then turns off at the end of the packet. Therefore, the transmitter will be on only while one of the aforementioned packets is being transmitted.

# 3. GENERAL INFORMATION

## 3.1. Product Details

| Items | Description |
|---|---|
| Product Type | WLAN (2TX, 2RX) |
| Radio Type | Intentional Transceiver |
| Power Type | From power adapter or PoE |
| Modulation | IEEE 802.11a: OFDM<br>IEEE 802.11n/ac: see the below table |
| Data Modulation | IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM)<br>IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) |
| Data Rate (Mbps) | IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54)<br>IEEE 802.11n/ac: see the below table |
| Frequency Range | 5250 ~ 5350MHz / 5470 ~ 5725MHz |
| Channel Number | 16 for 20MHz bandwidth ; 8 for 40MHz bandwidth<br>4 for 80MHz bandwidth |
| Channel Bandwidth (99%) | U-NII-2A:<br>IEEE 802.11a: 17.02 MHz<br>IEEE 802.11ac MCS0/Nss1 (VHT20): 18.32 MHz<br>IEEE 802.11ac MCS0/Nss1 (VHT40): 37.63 MHz<br>IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz<br>U-NII-2C:<br>IEEE 802.11a: 17.02 MHz<br>IEEE 802.11ac MCS0/Nss1 (VHT20): 18.41 MHz<br>IEEE 802.11ac MCS0/Nss1 (VHT40): 37.92 MHz<br>IEEE 802.11ac MCS0/Nss1 (VHT80): 76.70 MHz |
| Maximum Conducted Output Power | U-NII-2A:<br>IEEE 802.11a: 23.76 dBm<br>IEEE 802.11ac MCS0/Nss1 (VHT20): 23.63 dBm<br>IEEE 802.11ac MCS0/Nss1 (VHT40): 23.94 dBm<br>IEEE 802.11ac MCS0/Nss1 (VHT80): 17.12 dBm<br>U-NII-2C:<br>IEEE 802.11a: 23.86 dBm<br>IEEE 802.11ac MCS0/Nss1 (VHT20): 23.70 dBm<br>IEEE 802.11ac MCS0/Nss1 (VHT40): 23.85 dBm<br>IEEE 802.11ac MCS0/Nss1 (VHT80): 23.92 dBm |
| Carrier Frequencies | Please refer to section 3.4 |

| | |
|---|---|
| Antenna | Please refer to section 3.3 |

| Items | Description | |
|---|---|---|
| Communication Mode | ☒ IP Based (Load Based) | ☐ Frame Based |
| TPC Function | ☒ With TPC | ☐ Without TPC |
| Weather Band (5600~5650MHz) | ☒ With 5600~5650MHz | ☐ Without 5600~5650MHz |
| Beamforming Function | ☐ With beamforming | ☒ Without beamforming |
| Operate Condition | ☒ Indoor | ☐ Outdoor |

**Antenna and Band width**

| Antenna | Two (TX) | | |
|---|---|---|---|
| Band width Mode | 20 MHz | 40 MHz | 80 MHz |
| IEEE 802.11a | V | X | X |
| IEEE 802.11n | V | V | X |
| IEEE 802.11ac | V | V | V |

**IEEE 11n/ac Spec.**

| Protocol | Number of Transmit Chains (NTX) | Data Rate / MCS |
|---|---|---|
| 802.11n (HT20) | 2 | MCS 0-15 |
| 802.11n (HT40) | 2 | MCS 0-15 |
| 802.11ac (VHT20) | 2 | MCS 0-9/Nss1-2 |
| 802.11ac (VHT40) | 2 | MCS 0-9/Nss1-2 |
| 802.11ac (VHT80) | 2 | MCS 0-9/Nss1-2 |

Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT supports HT20 and HT40.

Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT supports VHT20, VHT40 and VHT80.

Note 3: Modulation modes consist of below configuration: HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac

## 3.2. Accessories

N/A

### 3.3. Table for Filed Antenna

| Ant. | Brand | Model No. | Antenna Type | Connector | Gain (dBi) | Remark |
|---|---|---|---|---|---|---|
| 1 | N/A | 3ARAAA101S1-111 | PIFA Antenna | N/A | 2.77 | 2.4GHz |
| 2 | N/A | 3ARAAA101S2-111 | PIFA Antenna | N/A | 3.43 | 2.4GHz |
| 3 | N/A | 3ARAAA101S3-111 | PIFA Antenna | N/A | 2.56 | 5GHz |
| 4 | N/A | 3ARAAA101S4-111 | PIFA Antenna | N/A | 2.17 | 5GHz |

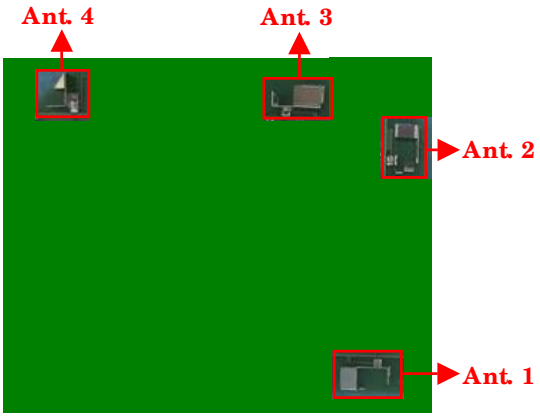
Note: The EUT has four antennas.

**For 2.4GHz WLAN function (2TX/2RX):**

Ant. 1 and Ant. 2 could transmit/receive simultaneously.

**For 5GHz WLAN function (2TX/2RX):**

Ant. 3 and Ant. 4 could transmit/receive simultaneously.



### 3.4. Table for Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144.

For 40MHz bandwidth systems, use Channel 54, 62, 102, 110, 118, 126, 134, 142.

For 80MHz bandwidth systems, use Channel 58, 106, 122, 138.

| Frequency Band | Channel No. | Frequency | Channel No. | Frequency |
|---|---|---|---|---|
| 5250~5350 MHz U-NII-2A | 52 | 5260 MHz | 60 | 5300 MHz |
| | 54 | 5270 MHz | 62 | 5310 MHz |
| | 56 | 5280 MHz | 64 | 5320 MHz |
| | 58 | 5290 MHz | - | - |
| 5470~5725 MHz U-NII-2C | 100 | 5500 MHz | 124 | 5620 MHz |
| | 102 | 5510 MHz | 126 | 5630 MHz |
| | 104 | 5520 MHz | 128 | 5640 MHz |
| | 106 | 5530 MHz | 132 | 5660 MHz |
| | 108 | 5540 MHz | 134 | 5670 MHz |
| | 110 | 5550 MHz | 136 | 5680 MHz |
| | 112 | 5560 MHz | 138 | 5690 MHz |
| | 116 | 5580 MHz | 140 | 5700 MHz |
| | 118 | 5590 MHz | 142 | 5710 MHz |
| | 120 | 5600 MHz | 144 | 5720 MHz |
| | 122 | 5610 MHz | - | - |

## 3.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

| Test Items | Mode | | Data Rate | Channel | Ant. |
|---|---|---|---|---|---|
| Max. Conducted Output Power | 11a/BPSK | U-NII-2A&2C bands | 6Mbps | 52/60/64/100/116/140/144 | 3+4 |
| | 11ac VHT20 | U-NII-2A&2C bands | MCS0/Nss1 | 52/60/64/100/116/140/144 | 3+4 |
| | 11ac VHT40 | U-NII-2A&2C bands | MCS0/Nss1 | 54/62/102/110/134/142 | 3+4 |
| | 11ac VHT80 | U-NII-2A&2C bands | MCS0/Nss1 | 58/106/122/138 | 3+4 |
| Power Spectral Density | 11a/BPSK | U-NII-2A&2C bands | 6Mbps | 52/60/64/100/116/140/144 | 3+4 |
| | 11ac VHT20 | U-NII-2A&2C bands | MCS0/Nss1 | 52/60/64/100/116/140/144 | 3+4 |
| | 11ac VHT40 | U-NII-2A&2C bands | MCS0/Nss1 | 54/62/102/110/134/142 | 3+4 |
| | 11ac VHT80 | U-NII-2A&2C bands | MCS0/Nss1 | 58/106/122/138 | 3+4 |
| 26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement | 11a/BPSK | U-NII-2A&2C bands | 6Mbps | 52/60/64/100/116/140/144 | 3+4 |
| | 11ac VHT20 | U-NII-2A&2C bands | MCS0/Nss1 | 52/60/64/100/116/140/144 | 3+4 |
| | 11ac VHT40 | U-NII-2A&2C bands | MCS0/Nss1 | 54/62/102/110/134/142 | 3+4 |
| | 11ac VHT80 | U-NII-2A&2C bands | MCS0/Nss1 | 58/106/122/138 | 3+4 |
| 6dB Spectrum Bandwidth Measurement | 11a/BPSK | U-NII-3 band | 6Mbps | 144 | 3+4 |
| | 11ac VHT20 | U-NII-3 band | MCS0/Nss1 | 144 | 3+4 |
| | 11ac VHT40 | U-NII-3 band | MCS0/Nss1 | 142 | 3+4 |
| | 11ac VHT80 | U-NII-3 band | MCS0/Nss1 | 138 | 3+4 |

| | | | | | |
|---|---|---|---|---|---|
| Radiated Emission Above 1GHz | 11a/BPSK | U-NII-2A&2C bands | 6Mbps | 52/60/64/100/116/140/144 | 3+4 |
| | 11ac VHT20 | U-NII-2A&2C bands | MCS0/Nss1 | 52/60/64/100/116/140/144 | 3+4 |
| | 11ac VHT40 | U-NII-2A&2C bands | MCS0/Nss1 | 54/62/102/110/134/142 | 3+4 |
| | 11ac VHT80 | U-NII-2A&2C bands | MCS0/Nss1 | 58/106/122/138 | 3+4 |
| Band Edge Emission | 11a/BPSK | U-NII-2A&2C bands | 6Mbps | 52/60/64/100/116/140/144 | 3+4 |
| | 11ac VHT20 | U-NII-2A&2C bands | MCS0/Nss1 | 52/60/64/100/116/140/144 | 3+4 |
| | 11ac VHT40 | U-NII-2A&2C bands | MCS0/Nss1 | 54/62/102/110/134/142 | 3+4 |
| | 11ac VHT80 | U-NII-2A&2C bands | MCS0/Nss1 | 58/106/122/138 | 3+4 |
| Frequency Stability | 20 MHz | U-NII-2A&2C bands | - | 60/116 | 3 |
| | 40 MHz | U-NII-2A&2C bands | - | 62/110 | 3 |
| | 80 MHz | U-NII-2A&2C bands | - | 58/106 | 3 |

Note: 1. The defines from manufacturer, "Console port" for debugging use only.

2. VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.

| Support Unit | Brand | Model | FCC ID |
|---|---|---|---|
| Adapter | LEI | NU36-D480080-I1 | DoC |

The following test modes were performed for all tests:

**For Radiated Emission Above 1GHz test:**

The EUT for Radiated Emissions 1GHz~10th Harmonic test, EUT Y axis and EUT Z axis and the worst case was found from EUT Y axis. So the measurement will follow this same test configuration.

**For Co-location MPE test:**

The EUT could be applied with 2.4GHz WLAN function and 5GHz WLAN function; therefore Co-location Maximum Permissible Exposure (Please refer to FA661722-01) test is added for simultaneously transmit between 2.4GHz WLAN function and 5GHz WLAN function.

## 3.6. Table for Testing Locations

| Test Site Location | | | | | |
|---|---|---|---|---|---|
| Address: | No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C. | | | | |
| TEL: | 886-3-656-9065 | | | | |
| FAX: | 886-3-656-9085 | | | | |
| **Test Site No.** | **Site Category** | **Location** | **FCC Designation No.** | **IC File No.** | **VCCI Reg. No** |
| 03CH01-CB | SAC | Hsin Chu | TW0006 | IC 4086D | - |
| TH01-CB | OVEN Room | Hsin Chu | - | - | - |

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC).

## 3.7. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR661722

Below is the table for the change of the product with respect to the original one.

| Modifications | Performance Checking |
|---|---|
| Adding U-NII-2A and U-NII-2C bands (5250~5350 MHz, 5470~5725 MHz) for this device. | 1. 26dB Spectrum Bandwidth and 99% Occupied Bandwidth.<br>2. 6dB Spectrum Bandwidth Measurement.<br>3. Maximum Conducted Output Power.<br>4. Power Spectral Density.<br>5. Radiated Emissions.<br>6. Band Edge Emissions.<br>7. Frequency Stability. |

### 3.8. Table for Supporting Units

| Support Unit | Brand | Model | FCC ID |
|---|---|---|---|
| NB | DELL | E4300 | DoC |
| Adapter | LEI | NU36-D480080-I1 | DoC |

### 3.9. Table for Parameters of Test Software Setting

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

| Test Software Version | ART2-GUI | | | | | | |
|---|---|---|---|---|---|---|---|
| Mode | Test Frequency (MHz) | | | | | | |
| | NCB: 20MHz | | | | | | |
| | 5260 MHz | 5300 MHz | 5320 MHz | 5500 MHz | 5580 MHz | 5700 MHz | 5720 MHz |
| 802.11a | 20.5 | 20.5 | 20.5 | 20.5 | 20.5 | 19 | 22.5 |
| 802.11ac MCS0/Nss1 VHT20 | 20.5 | 20.5 | 20.5 | 19.5 | 20.5 | 18.5 | 24 |
| Mode | NCB: 40MHz | | | | | | |
| 802.11ac MCS0/Nss1 VHT40 | 5270 MHz | 5310 MHz | 5510 MHz | 5550 MHz | 5670 MHz | 5710 MHz | |
| | 21.5 | 20 | 18 | 21 | 19.5 | 24 | |
| Mode | NCB: 80MHz | | | | | | |
| 802.11ac MCS0/Nss1 VHT80 | 5290 MHz | 5530 MHz | 5610 MHz | 5690 MHz | | | |
| | 15 | 15 | 21.5 | 22.5 | | | |

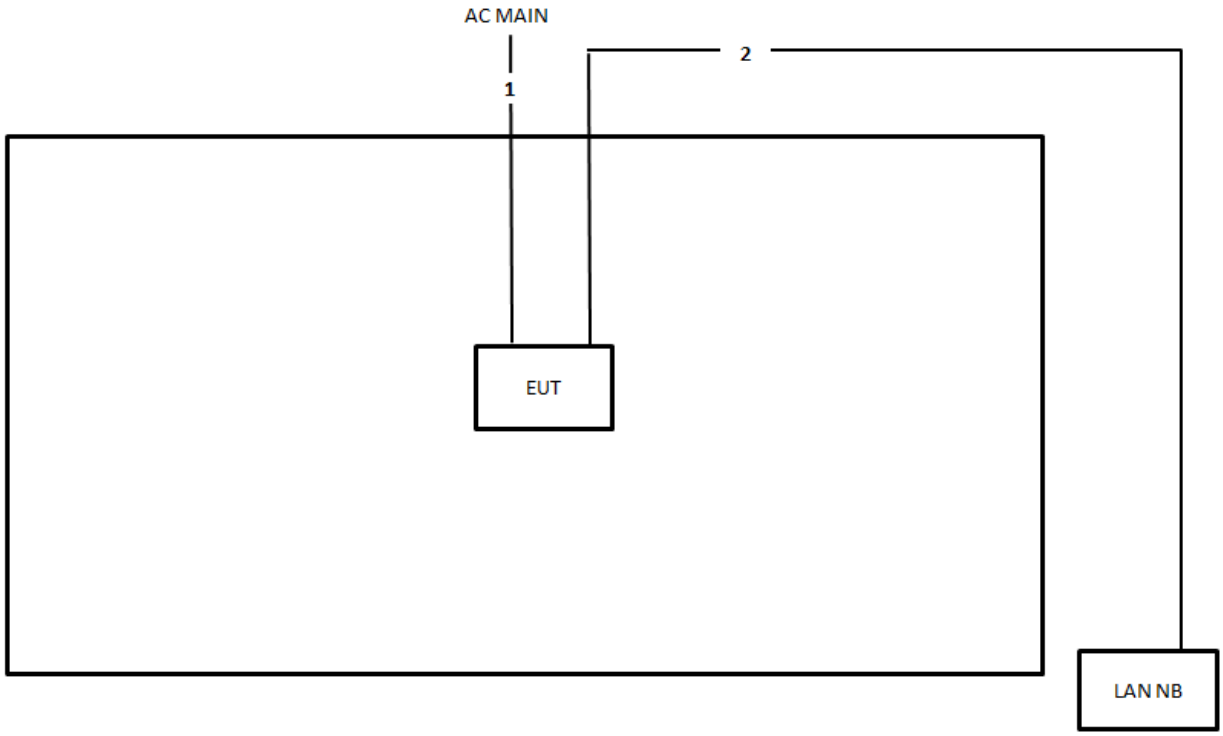
### 3.10. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 3.11. Duty Cycle

| Mode | On Time (ms) | On+Off Time (ms) | Duty Cycle (%) | Duty Factor (dB) | 1/T Minimum VBW (kHz) |
|---|---|---|---|---|---|
| 802.11a | 2.030 | 2.100 | 96.67 | 0.15 | 0.49 |
| 802.11ac MCS0/Nss1 VHT20 | 1.890 | 2.000 | 94.50 | 0.25 | 0.53 |
| 802.11ac MCS0/Nss1 VHT40 | 0.910 | 1.010 | 90.10 | 0.45 | 1.10 |
| 802.11ac MCS0/Nss1 VHT80 | 0.420 | 0.520 | 80.77 | 0.93 | 2.38 |

## 3.12. Test Configurations




| Item | Connection | Shielded | Length |
|---|---|---|---|
| 1 | Power cable | No | 1.5m |
| 2 | RJ-45 cable | No | 10m |

# 4. TEST RESULT

## 4.1. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

### 4.1.1. Limit

No restriction limits.

### 4.1.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

| 26dB Bandwidth | |
|---|---|
| **Spectrum Parameters** | **Setting** |
| Attenuation | Auto |
| Span Frequency | > 26dB Bandwidth |
| RBW | Approximately 1% of the emission bandwidth |
| VBW | VBW > RBW |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |
| **99% Occupied Bandwidth** | |
| **Spectrum Parameters** | **Setting** |
| Span | 1.5 times to 5.0 times the OBW |
| RBW | 1 % to 5 % of the OBW |
| VBW | ≥ 3 x RBW |
| Detector | Peak |
| Trace | Max Hold |

### 4.1.3. Test Procedures

For Radiated 26dB Bandwidth and 99% Occupied Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

### 4.1.4. Test Setup Layout

For Radiated 26dB Bandwidth and 99% Occupied Bandwidth Measurement:

This test setup layout is the same as that shown in section 4.5.4.

### 4.1.5. Test Deviation

There is no deviation with the original standard.

### 4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 4.1.7. Test Result of 26dB Bandwidth and 99% Occupied Bandwidth

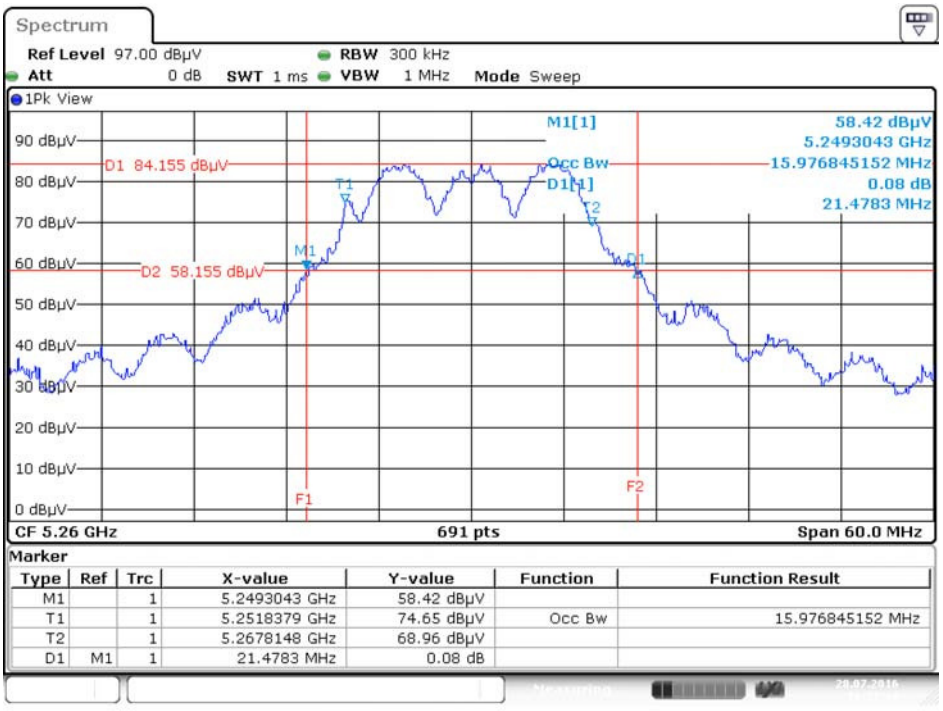
| Temperature | 24℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | Gary Chu | | |

| Mode | Frequency | 26dB Bandwidth (MHz) | 99% Occupied Bandwidth (MHz) |
|---|---|---|---|
| 802.11a | 5260 MHz | 21.48 | 15.98 |
| | 5300 MHz | 21.22 | 15.89 |
| | 5320 MHz | 21.39 | 17.02 |
| | 5500 MHz | 22.70 | 17.02 |
| | 5580 MHz | 21.48 | 16.15 |
| | 5700 MHz | 20.70 | 16.06 |
| 802.11ac MCS0/Nss1 VHT20 | 5260 MHz | 23.30 | 18.32 |
| | 5300 MHz | 23.04 | 18.32 |
| | 5320 MHz | 24.26 | 18.23 |
| | 5500 MHz | 23.04 | 18.23 |
| | 5580 MHz | 24.70 | 18.41 |
| | 5700 MHz | 23.83 | 18.23 |
| 802.11ac MCS0/Nss1 VHT40 | 5270 MHz | 45.94 | 37.63 |
| | 5310 MHz | 44.64 | 37.63 |
| | 5510 MHz | 45.65 | 37.77 |
| | 5550 MHz | 49.28 | 37.92 |
| | 5670 MHz | 45.22 | 37.63 |
| 802.11ac MCS0/Nss1 VHT80 | 5290 MHz | 85.22 | 76.41 |
| | 5530 MHz | 82.32 | 75.54 |
| | 5610 MHz | 88.70 | 76.70 |

**Straddle Channel**

| Mode | Frequency | 26dB BW (MHz) | 99% OBW (MHz) | 26dB BW F1 (MHz) | 99% OBW T1 (MHz) | UNII 2C 26dB BW (MHz) | UNII 3 26dB BW (MHz) | UNII 2C 99% BW (MHz) | UNII 3 99% BW (MHz) |
|---|---|---|---|---|---|---|---|---|---|
| 802.11a | 5720 MHz | 21.57 | 17.02 | 5709.39 | 5711.49 | 15.61 | 5.96 | 13.51 | 3.51 |
| 802.11ac MCS0/Nss1 VHT20 | 5720 MHz | 24.70 | 18.32 | 5707.39 | 5710.88 | 17.61 | 7.09 | 14.12 | 4.20 |
| 802.11ac MCS0/Nss1 VHT40 | 5710 MHz | 45.80 | 37.63 | 5687.10 | 5691.19 | 37.90 | 7.90 | 33.81 | 3.81 |
| 802.11ac MCS0/Nss1 VHT80 | 5690 MHz | 130.73 | 76.12 | 5632.03 | 5652.08 | 92.97 | 37.75 | 72.92 | 3.21 |

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 3 + Ant. 4 / 5260 MHz**

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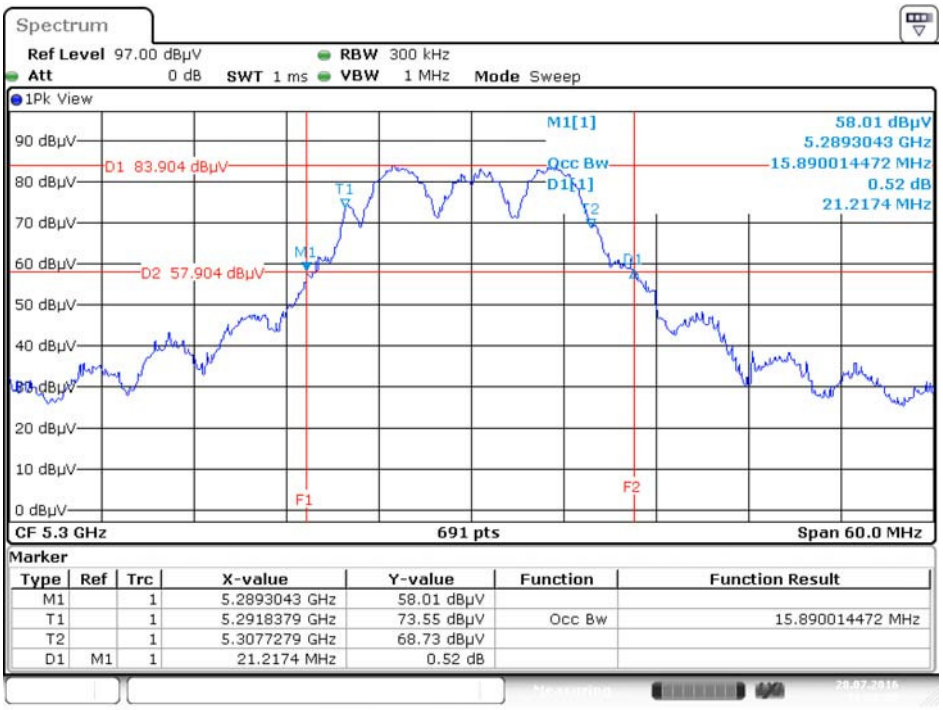
**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 3 + Ant. 4 / 5300 MHz**

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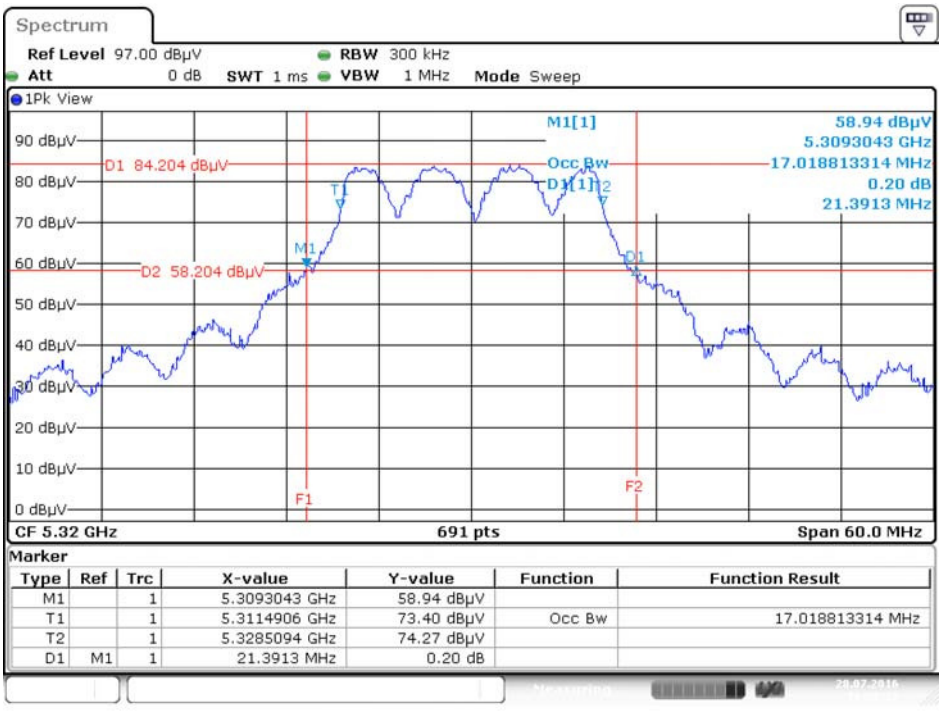
**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 3 + Ant. 4 / 5320 MHz**

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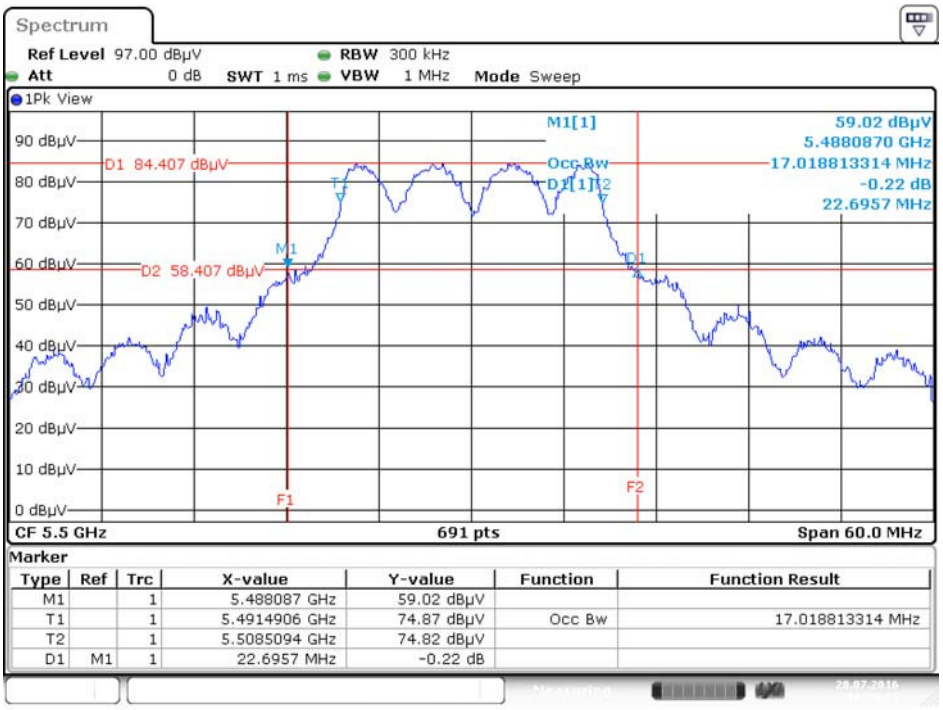
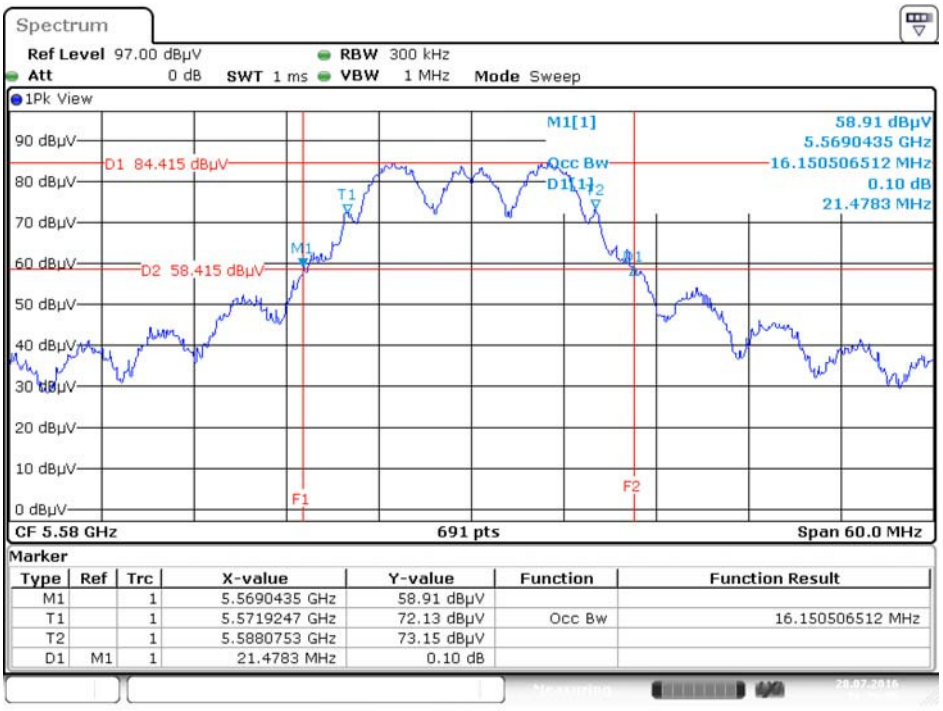
**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 3 + Ant. 4 / 5500 MHz**



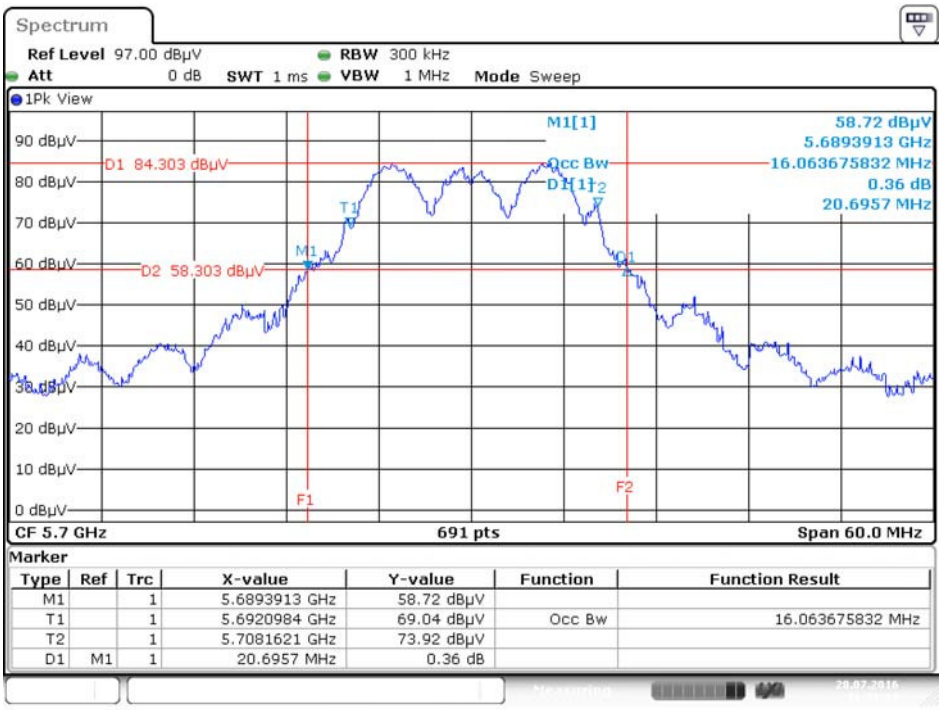

Date: 28.JUL.2016 16:29:15

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 3 + Ant. 4 / 5580 MHz**



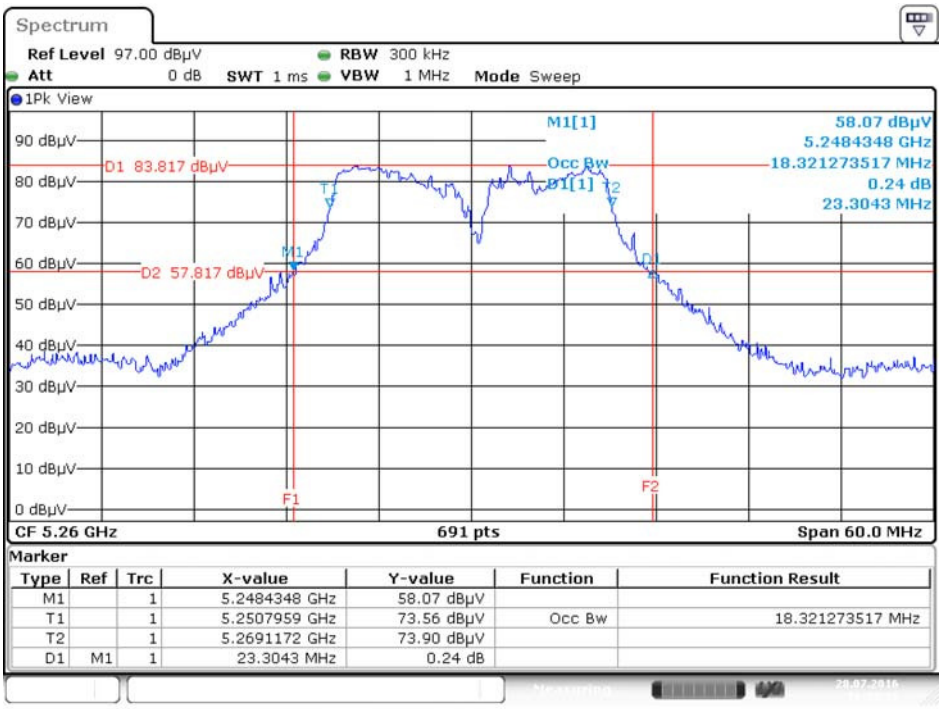

Date: 28.JUL.2016 16:29:55

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 3 + Ant. 4 / 5700 MHz**



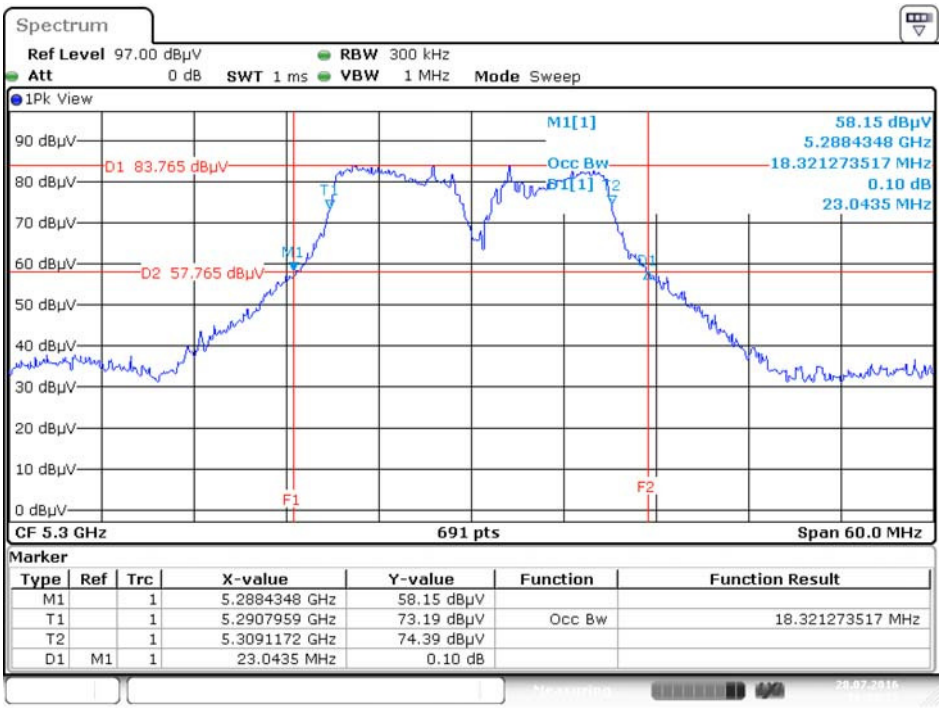

Date: 28.JUL.2016 16:31:18

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 + Ant. 4 / 5260 MHz**



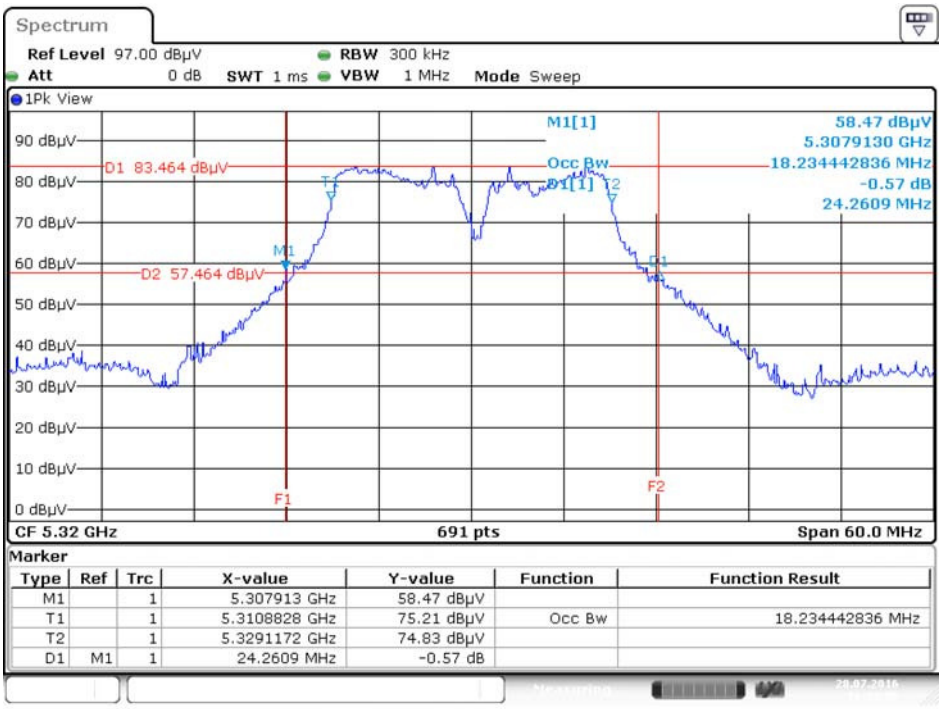

Date: 28.JUL.2016 16:32:11

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 + Ant. 4 / 5300 MHz**



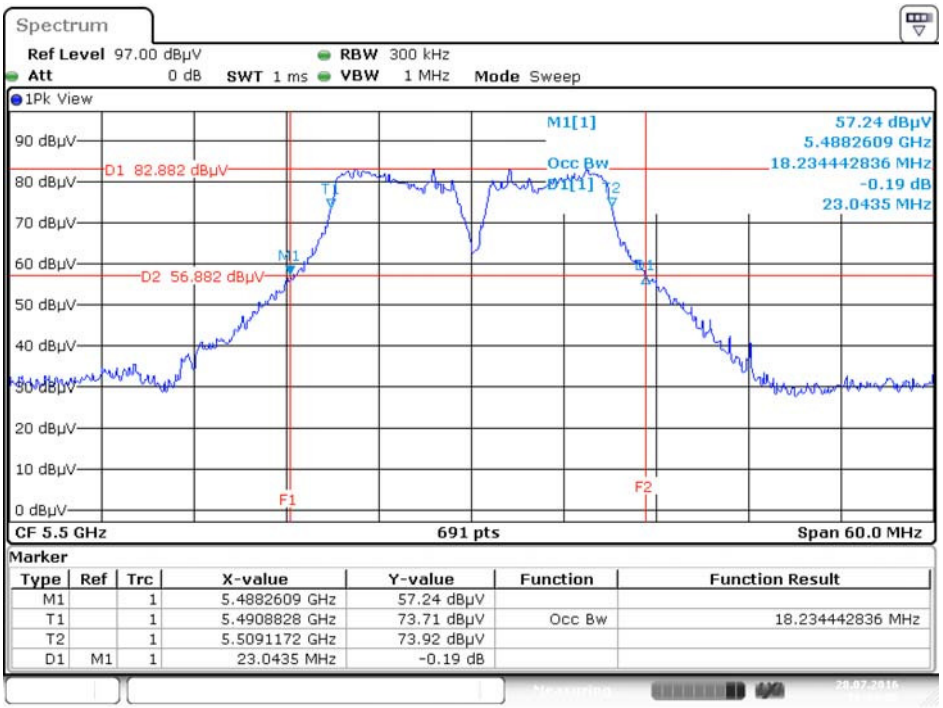

Date: 28.JUL.2016 16:33:22

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 + Ant. 4 / 5320 MHz**



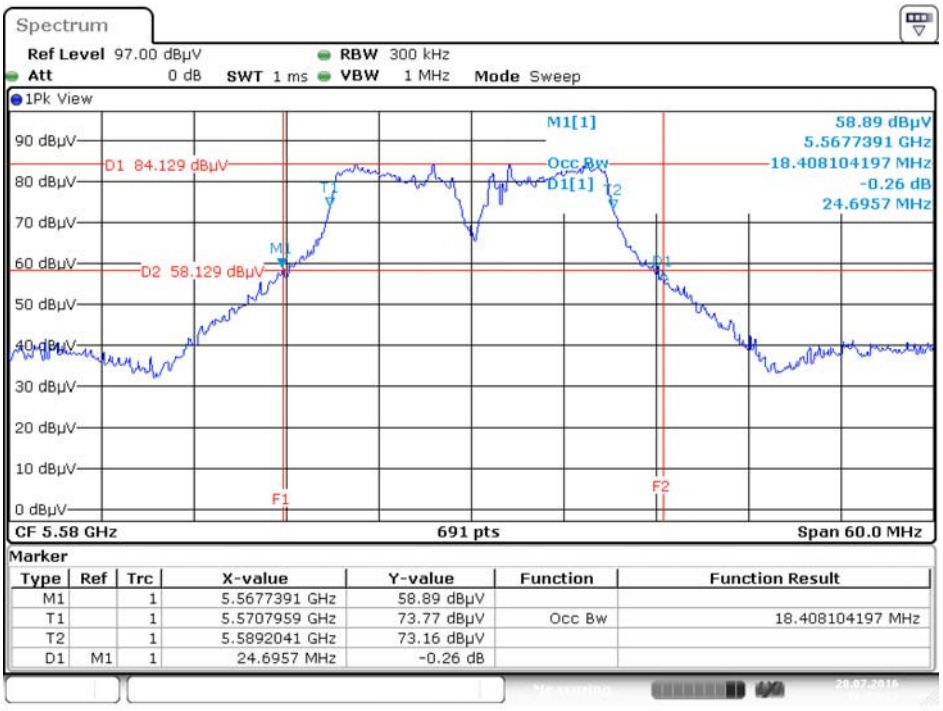

Date: 28.JUL.2016 16:33:56

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 + Ant. 4 / 5500 MHz**



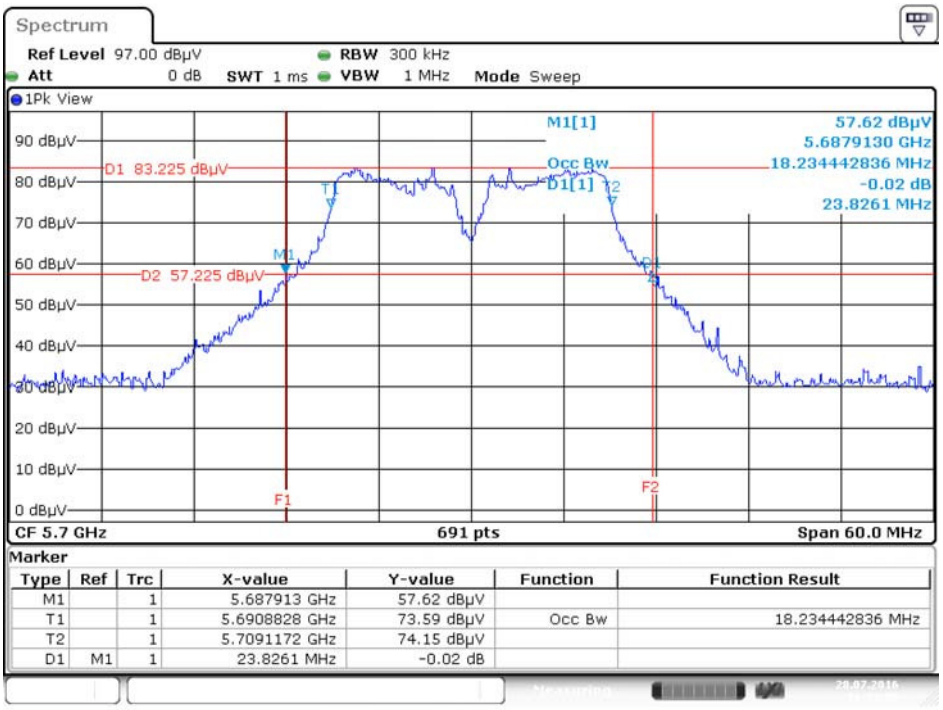

Date: 28.JUL.2016 16:34:36

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 + Ant. 4 / 5580 MHz**



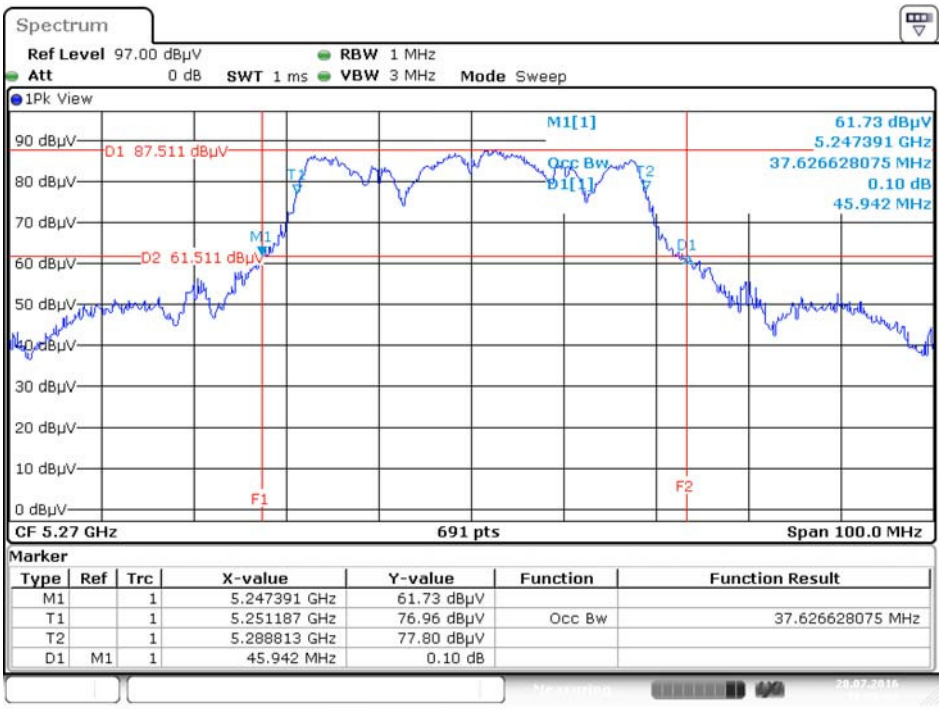

Date: 28.JUL.2016 16:35:16

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 + Ant. 4 / 5700 MHz**



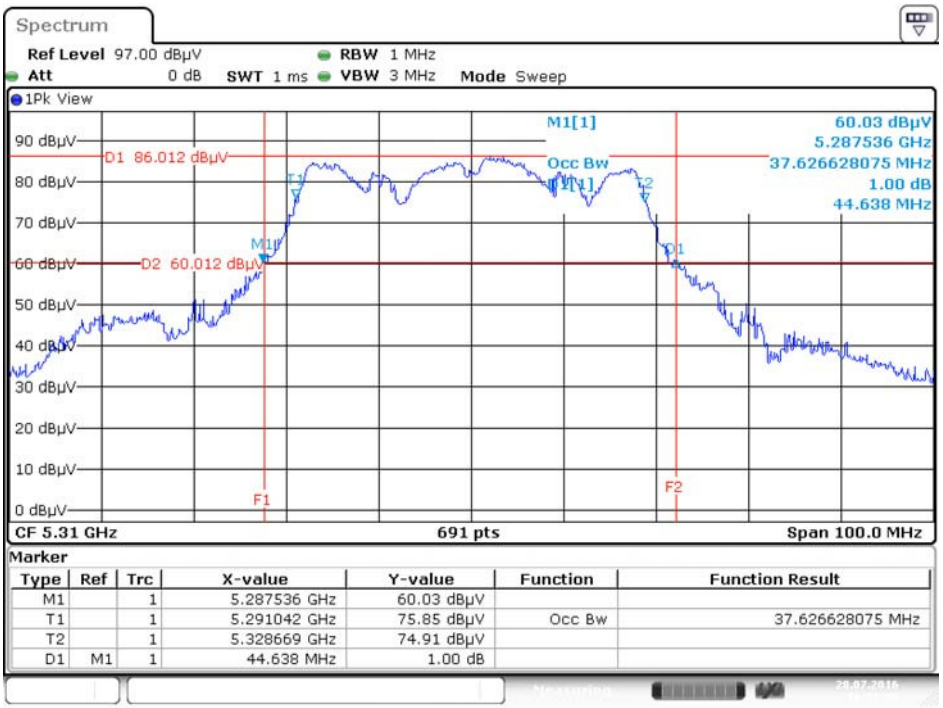

Date: 28.JUL.2016 16:36:00

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 3 + Ant. 4 / 5270 MHz**



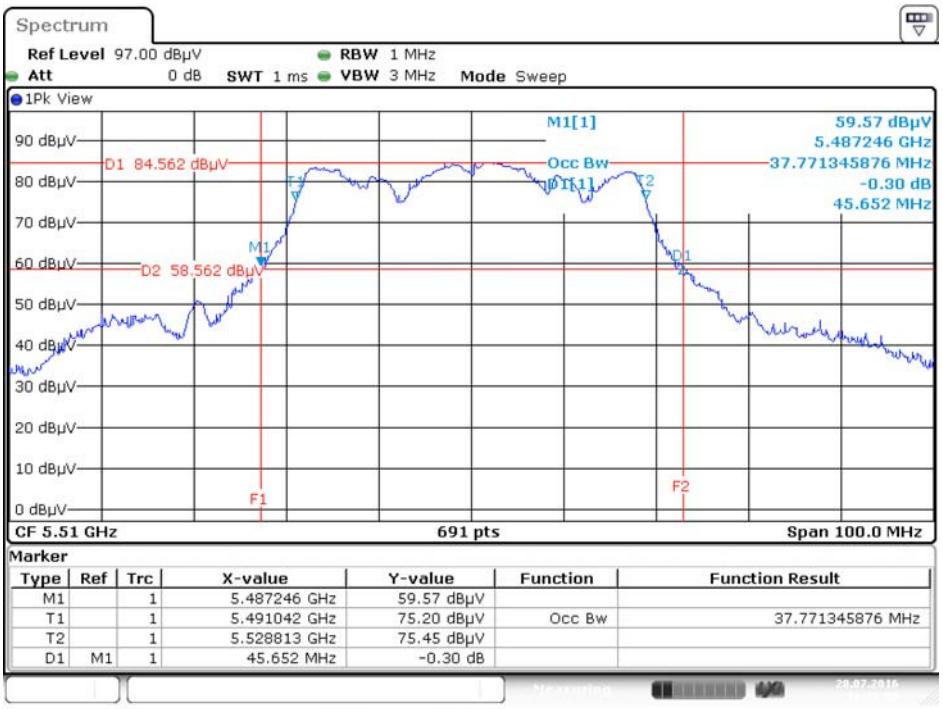

Date: 28.JUL.2016 16:36:47

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 3 + Ant. 4 / 5310 MHz**



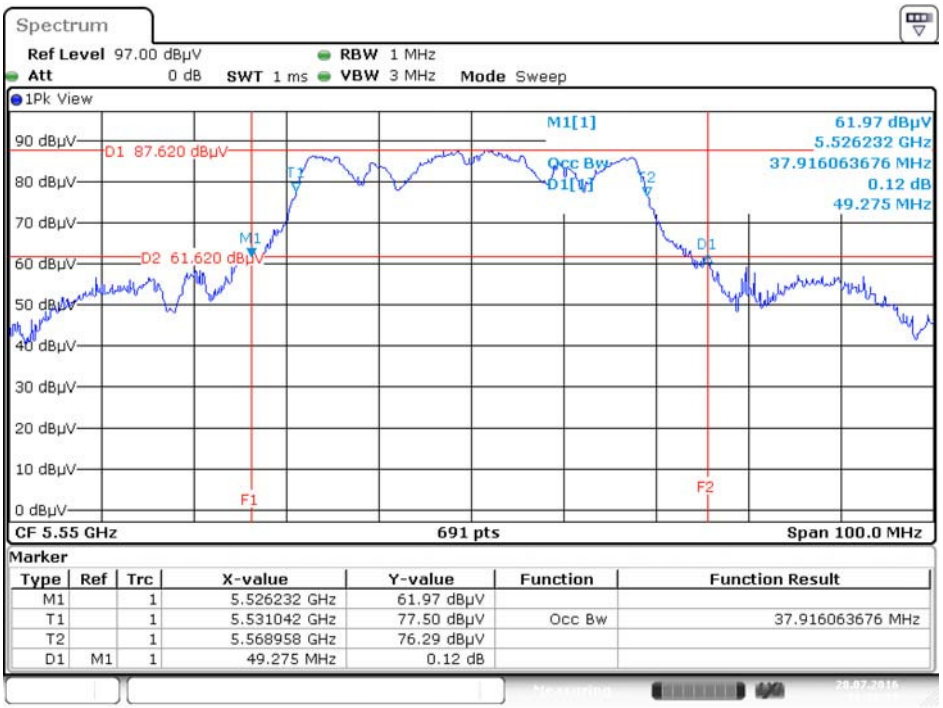

Date: 28.JUL.2016 16:37:25

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 3 + Ant. 4 / 5510 MHz**



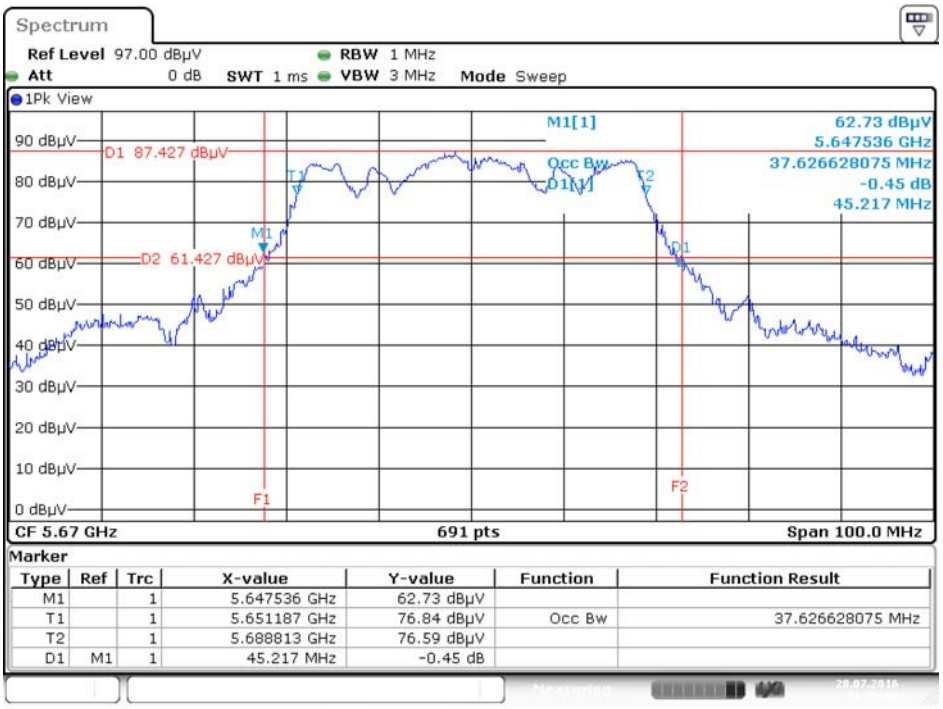

Date: 28.JUL.2016 16:38:00

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 3 + Ant. 4 / 5550 MHz**



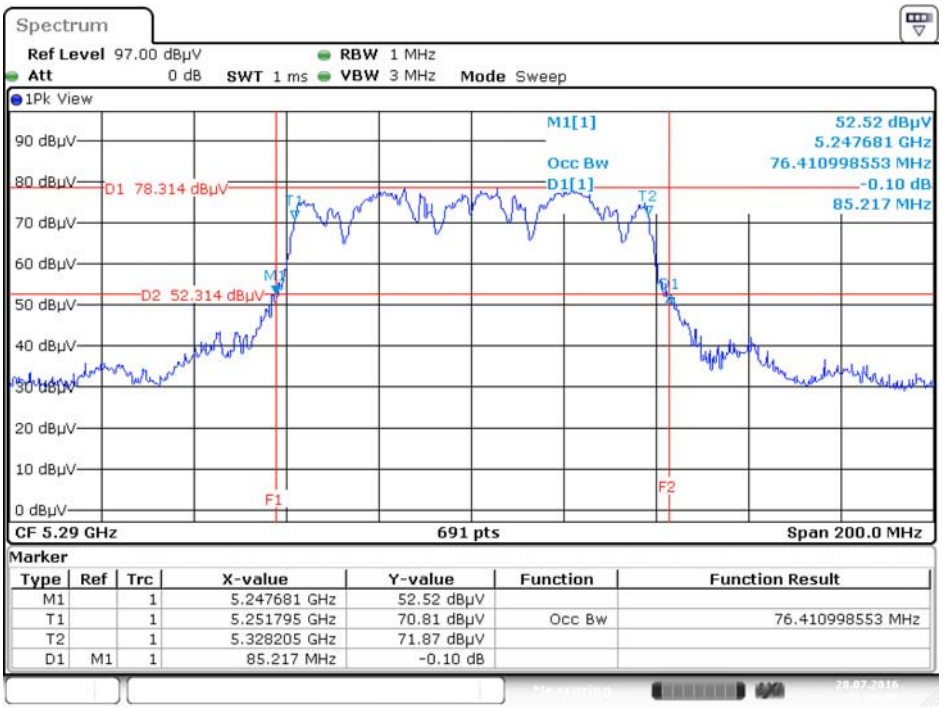

Date: 28.JUL.2016 16:38:39

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 3 + Ant. 4 / 5670 MHz**



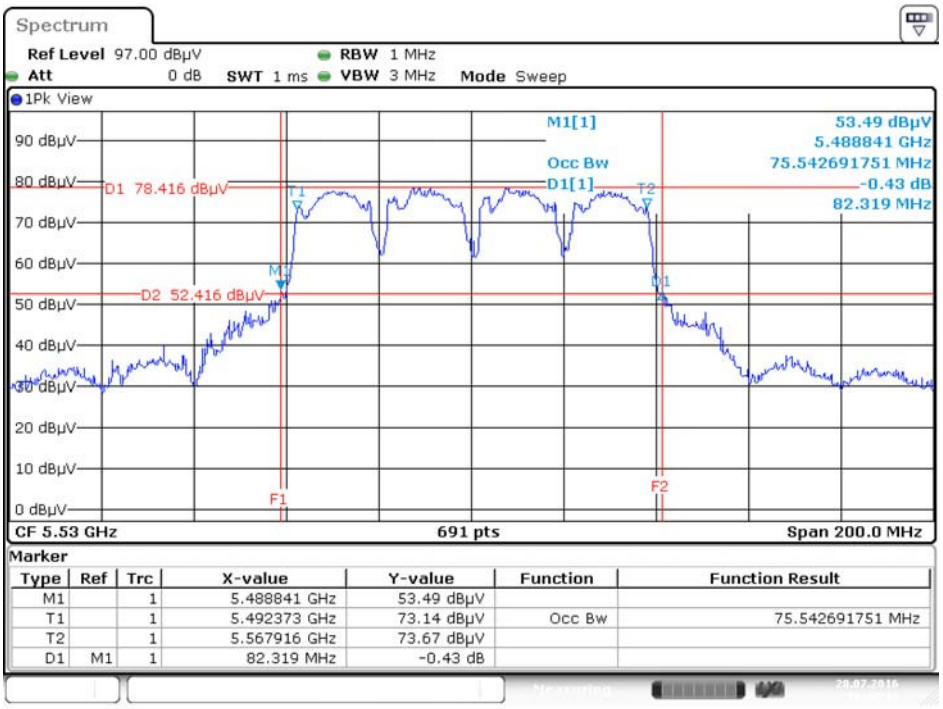

Date: 28.JUL.2016 16:39:28

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 3 + Ant. 4 / 5290 MHz**



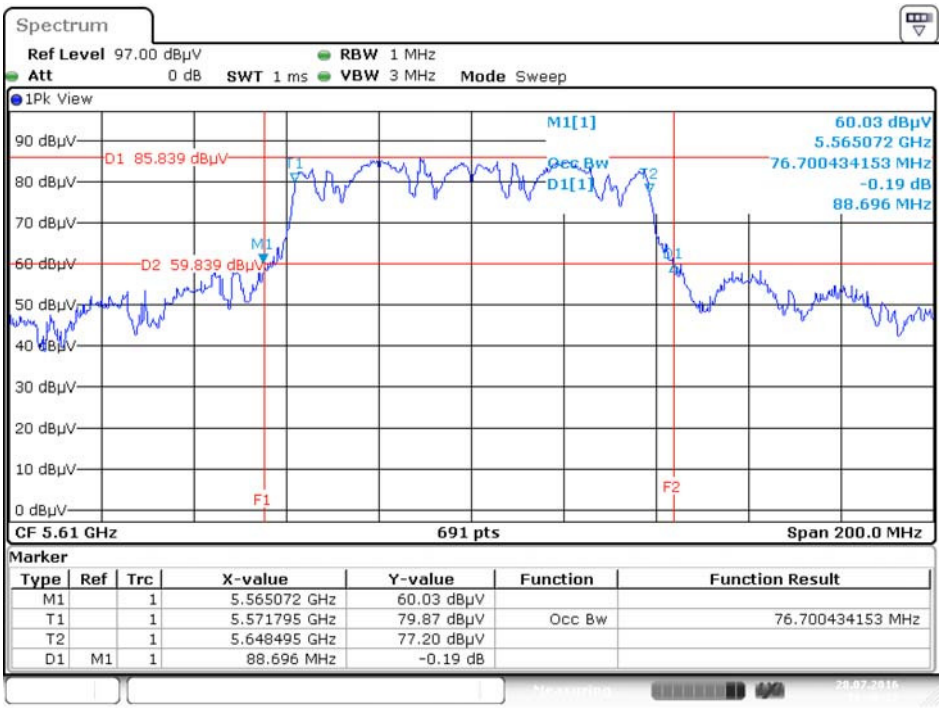

Date: 28.JUL.2016 16:44:58

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 3 + Ant. 4 / 5530 MHz**




Date: 28.JUL.2016 16:45:41

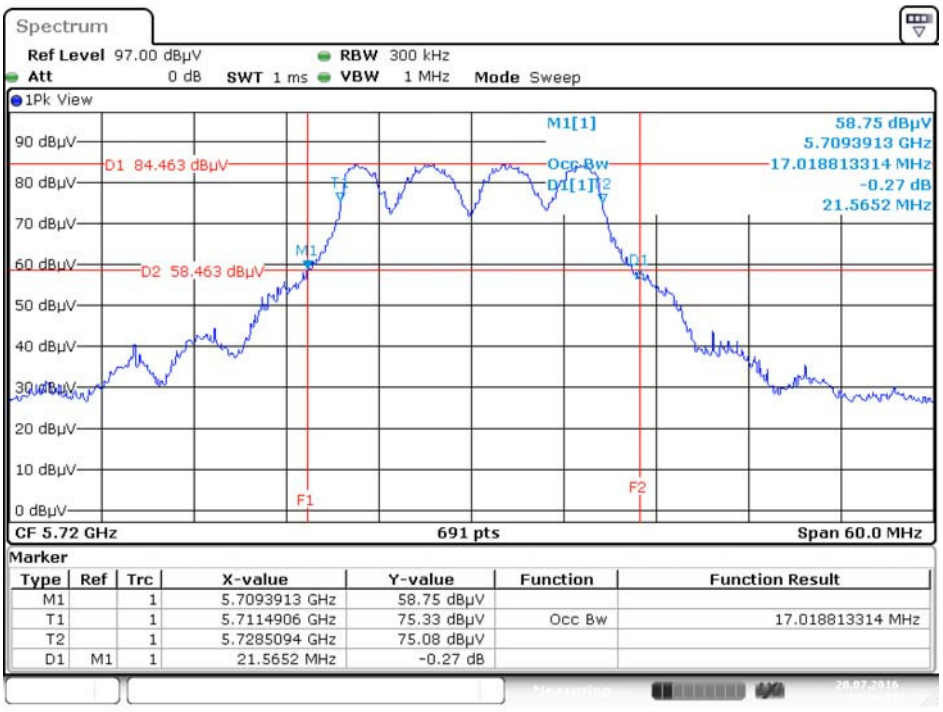
**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 3 + Ant. 4 / 5610 MHz**




Date: 28.JUL.2016 16:46:32

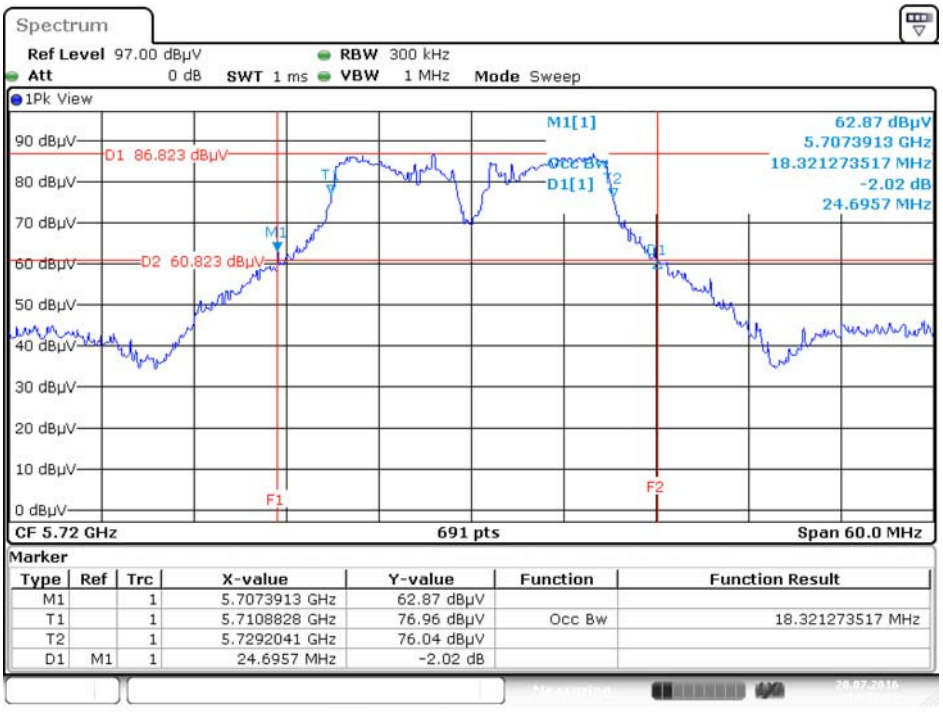
**Straddle Channel**

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 3 + Ant. 4 / 5720 MHz**



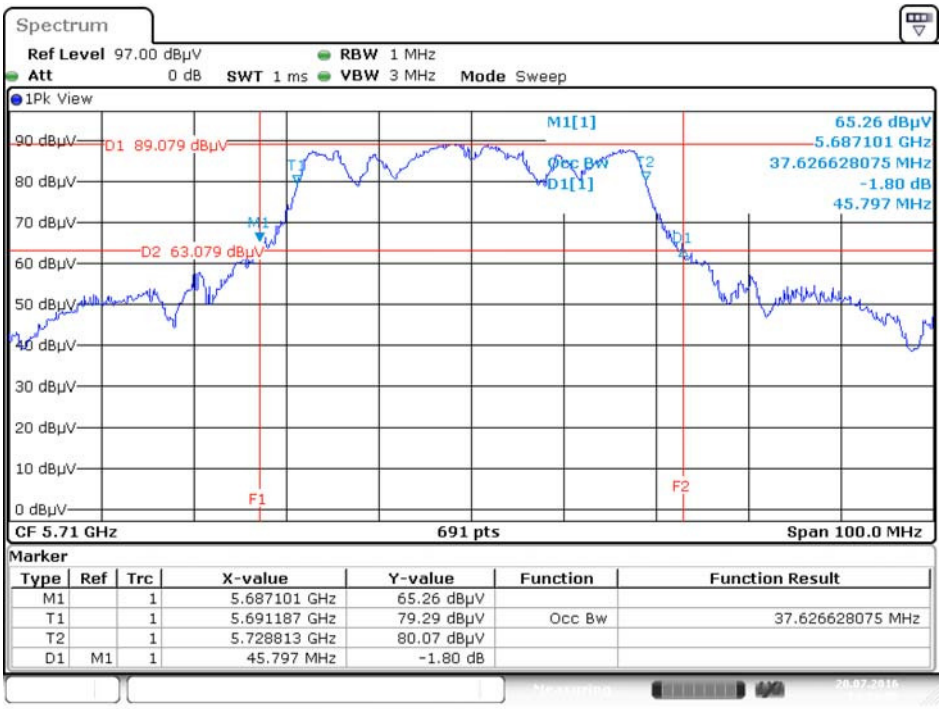

Date: 20.JUL.2016 14:14:34

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 + Ant. 4 / 5720 MHz**



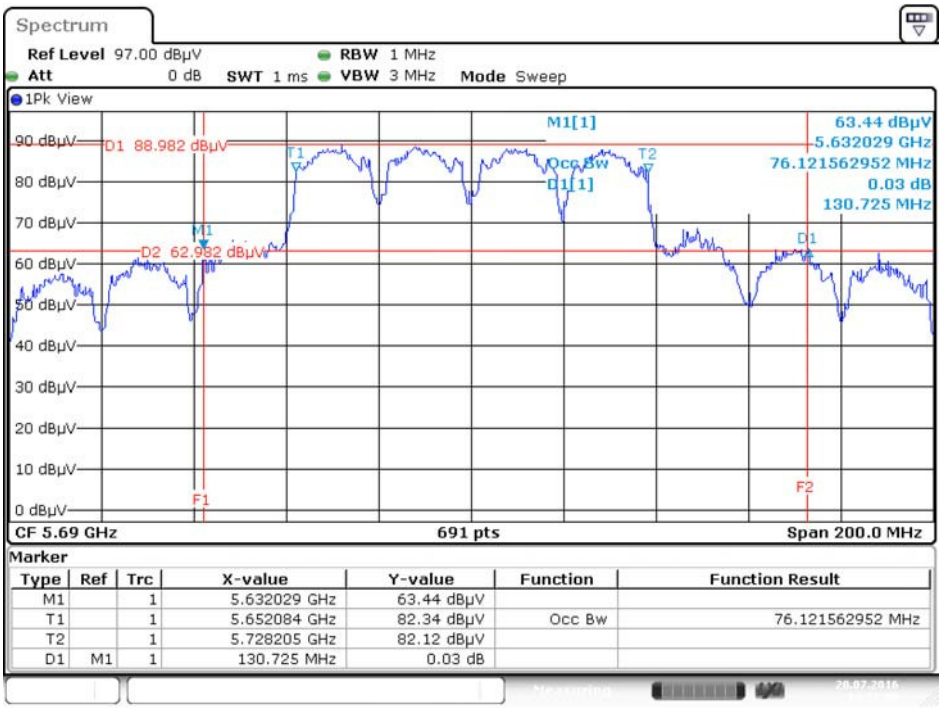

Date: 20.JUL.2016 14:21:37

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 3 + Ant. 4 / 5710 MHz**




Date: 20.JUL.2016 14:24:57

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 3 + Ant. 4 / 5690 MHz**




Date: 20.JUL.2016 14:27:58

## 4.2. 6dB Spectrum Bandwidth Measurement

### 4.2.1. Limit

For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.

### 4.2.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

| 6dB Spectrum Bandwidth | |
|---|---|
| **Spectrum Parameters** | **Setting** |
| Attenuation | Auto |
| Span Frequency | > 6dB Bandwidth |
| RBW | 100kHz |
| VBW | ≥ 3 x RBW |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

### 4.2.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB789033 D02 v01r03 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (C) Emission Bandwidth.
3. Multiple antenna system was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

### 4.2.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

This test setup layout is the same as that shown in section 4.5.4.

#### 4.2.5. Test Deviation

There is no deviation with the original standard.

#### 4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 4.2.7. Test Result of 6dB Spectrum Bandwidth

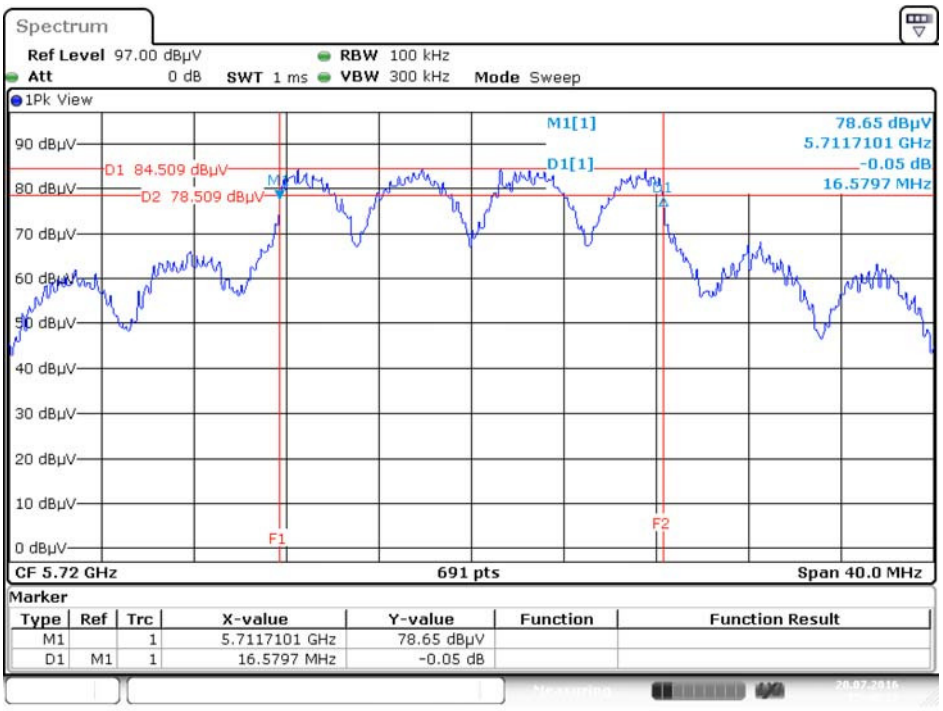
| Temperature | 24℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | Gary Chu | | |

**Straddle Channel**

| Mode | Frequency | 6dB BW (MHz) | 6dB BW M1 (MHz) | UNII 3 BW (MHz) | Min. Limit (kHz) | Test Result |
|---|---|---|---|---|---|---|
| 802.11a | 5720 MHz | 16.58 | 5711.17 | 2.75 | 500 | **Complies** |
| 802.11ac MCS0/Nss1 VHT20 | 5720 MHz | 12.93 | 5713.39 | 1.32 | 500 | **Complies** |
| 802.11ac MCS0/Nss1 VHT40 | 5710 MHz | 35.25 | 5692.38 | 2.62 | 500 | **Complies** |
| 802.11ac MCS0/Nss1 VHT80 | 5690 MHz | 76.52 | 5651.74 | 3.26 | 500 | **Complies** |

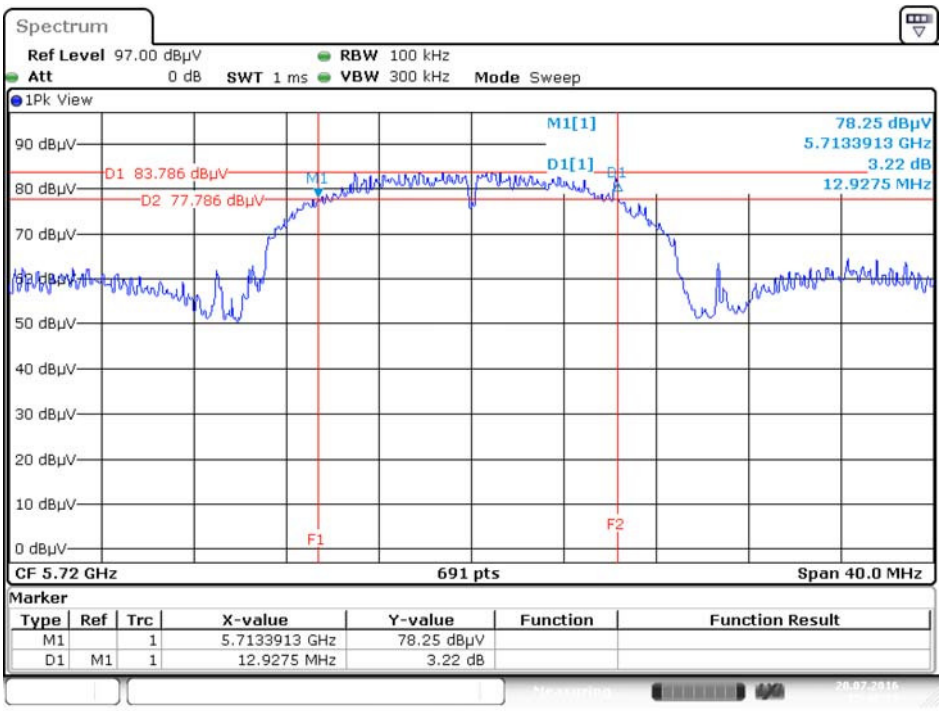
**Straddle Channel**

**6 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 3 + Ant. 4 / 5720 MHz**



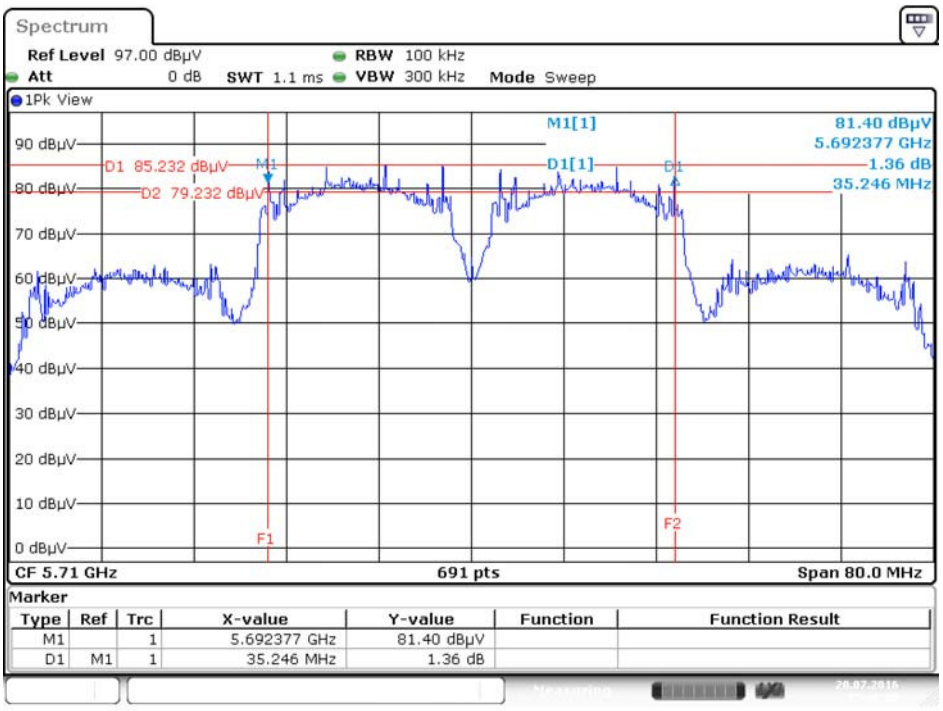

Date: 20.JUL.2016 15:45:22

**6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 + Ant. 4 / 5720 MHz**



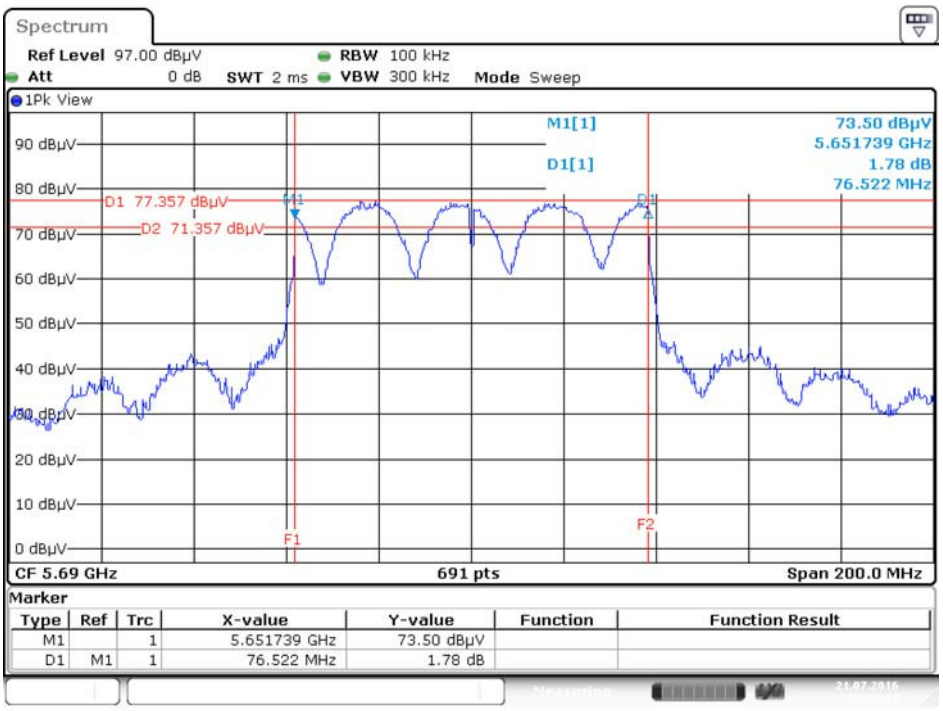

Date: 20.JUL.2016 15:47:13

**6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 3 + Ant. 4 / 5710 MHz**




Date: 20.JUL.2016 15:48:10

**6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 3 + Ant. 4 / 5690 MHz**




Date: 21.JUL.2016 15:20:19

## 4.3. Maximum Conducted Output Power Measurement

### 4.3.1. Limit

| Frequency Band | | Limit |
|---|---|---|
| ☒ | 5.25-5.35 GHz | The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (23.98dBm) or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. 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. |
| ☒ | 5.470-5.725 GHz | |

### 4.3.2. Measuring Instruments and Setting

**For straddle channel:**

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | Encompass the entire emissions bandwidth (EBW) of the signal |
| RBW | 1000 kHz |
| VBW | 3000 kHz |
| Detector | RMS |
| Trace | Average Sweep count 100 |
| Sweep Time | Auto |

**For other channel:**

Please refer to section 5 of equipments list in this report  The following table is the setting of the power meter.

| Power Meter Parameter | Setting |
|---|---|
| Detector | AVERAGE |

### 4.3.3. Test Procedures

**For other channel:**

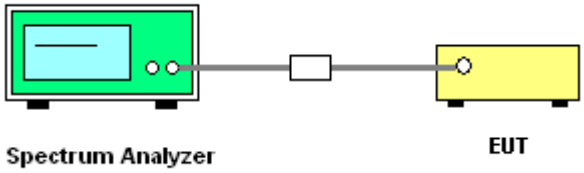
The transmitter output (antenna port) was connected to the spectrum analyzer.

**For straddle channel:**

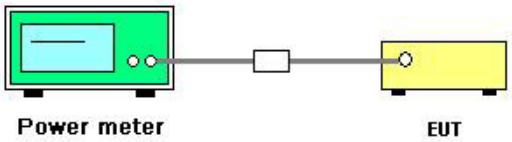
1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v01r03 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).
3. Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. When measuring maximum conducted output power with multiple antenna systems,add every result of the values by mathematic formula.

### 4.3.4. Test Setup Layout

**For straddle channel:**




**For other channel:**




### 4.3.5. Test Deviation

There is no deviation with the original standard.

### 4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 4.3.7. Test Result of Maximum Conducted Output Power

| Temperature | 24℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | Gary Chu | Test Date | Jul. 20, 2016~Jul. 28, 2016 |

| Mode | Frequency | Conducted Power (dBm) | | | Max. Limit (dBm) | Result |
|---|---|---|---|---|---|---|
| | | Ant. 3 | Ant. 4 | Total | | |
| 802.11a | 5260 MHz | 20.30 | 21.16 | 23.76 | 23.98 | Complies |
| | 5300 MHz | 20.64 | 20.81 | 23.74 | 23.98 | Complies |
| | 5320 MHz | 20.66 | 20.70 | 23.69 | 23.98 | Complies |
| | 5500 MHz | 20.67 | 21.03 | 23.86 | 23.98 | Complies |
| | 5580 MHz | 20.76 | 20.56 | 23.67 | 23.98 | Complies |
| | 5700 MHz | 19.81 | 18.03 | 22.02 | 23.98 | Complies |
| 802.11ac MCS0/Nss1 VHT20 | 5260 MHz | 20.22 | 20.98 | 23.63 | 23.98 | Complies |
| | 5300 MHz | 20.48 | 20.68 | 23.59 | 23.98 | Complies |
| | 5320 MHz | 20.56 | 20.49 | 23.54 | 23.98 | Complies |
| | 5500 MHz | 19.69 | 20.03 | 22.87 | 23.98 | Complies |
| | 5580 MHz | 20.63 | 20.75 | 23.70 | 23.98 | Complies |
| | 5700 MHz | 19.23 | 19.44 | 22.35 | 23.98 | Complies |
| 802.11ac MCS0/Nss1 VHT40 | 5270 MHz | 20.88 | 20.97 | 23.94 | 23.98 | Complies |
| | 5310 MHz | 19.23 | 19.56 | 22.41 | 23.98 | Complies |
| | 5510 MHz | 17.91 | 18.01 | 20.97 | 23.98 | Complies |
| | 5550 MHz | 20.65 | 21.03 | 23.85 | 23.98 | Complies |
| | 5670 MHz | 19.62 | 19.81 | 22.73 | 23.98 | Complies |
| 802.11ac MCS0/Nss1 VHT80 | 5290 MHz | 13.91 | 14.31 | 17.12 | 23.98 | Complies |
| | 5530 MHz | 14.32 | 14.29 | 17.32 | 23.98 | Complies |
| | 5610 MHz | 20.58 | 21.21 | 23.92 | 23.98 | Complies |

**Straddle Channel**

| Mode | Frequency | Conducted Power(dBm) | | | Max. Power Limit(dBm) | Result |
|---|---|---|---|---|---|---|
| | | Ant. 3 | Ant. 4 | Total | | |
| 802.11a | 5720 MHz (UNII 2C) | 20.19 | 19.21 | 22.74 | 22.93 | **Complies** |
| | 5720 MHz (UNII 3) | 14.13 | 13.03 | 16.63 | 30.00 | **Complies** |
| 802.11ac MCS0/Nss1 VHT20 | 5720 MHz (UNII 2C) | 20.42 | 19.42 | 22.96 | 23.46 | **Complies** |
| | 5720 MHz (UNII 3) | 14.81 | 13.68 | 17.29 | 30.00 | **Complies** |
| 802.11ac MCS0/Nss1 VHT40 | 5710 MHz (UNII 2C) | 21.17 | 20.07 | 23.67 | 23.98 | **Complies** |
| | 5710 MHz (UNII 3) | 10.51 | 9.23 | 12.93 | 30.00 | **Complies** |
| 802.11ac MCS0/Nss1 VHT80 | 5690 MHz (UNII 2C) | 19.88 | 19.13 | 22.53 | 23.98 | **Complies** |
| | 5690 MHz (UNII 3) | 5.39 | 4.08 | 7.79 | 30.00 | **Complies** |

Note: (UNII 2C) power limit=11+10*log(B) or 23.98dBm.

11a 5720MHz (UNII 2C) power limit=11+10*log(15.61)=22.93dBm<23.98dBm, so the limit=22.93dBm.

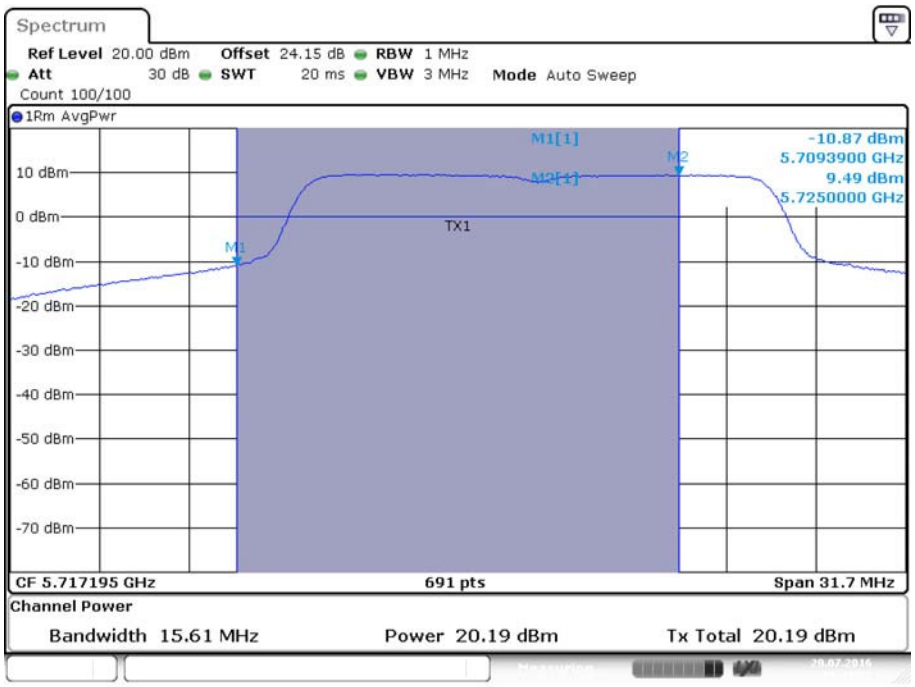
11ac VHT20 5720MHz (UNII 2C) power limit=11+10*log(17.61)=23.46dBm<23.98dBm, so the limit=23.46dBm.

Note: All the test values were listed in the report.

For plots, only the straddle channel result was shown.

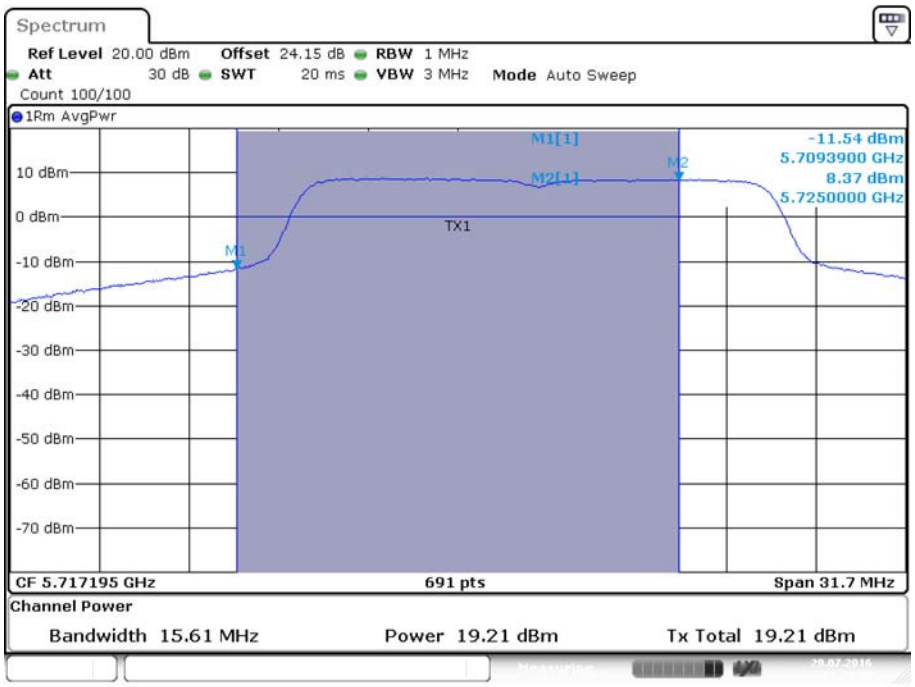
**Straddle Channel**

**Conducted Output Power Plot on Configuration IEEE 802.11a / Ant. 3 / 5720 MHz (UNII 2C)**



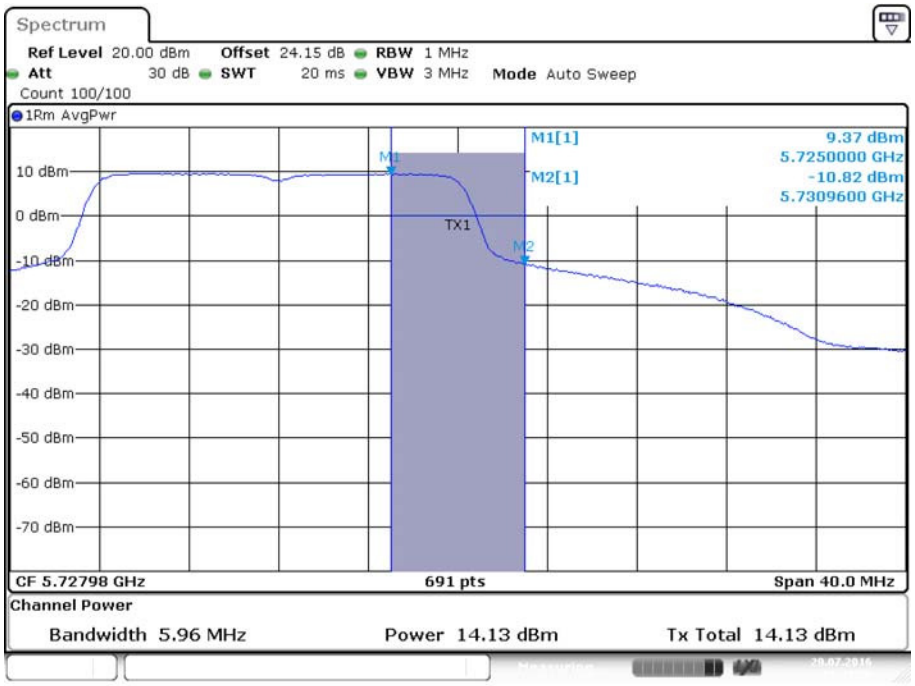

Date: 20.JUL.2016 15:30:52

**Conducted Output Power Plot on Configuration IEEE 802.11a / Ant. 4 / 5720 MHz (UNII 2C)**



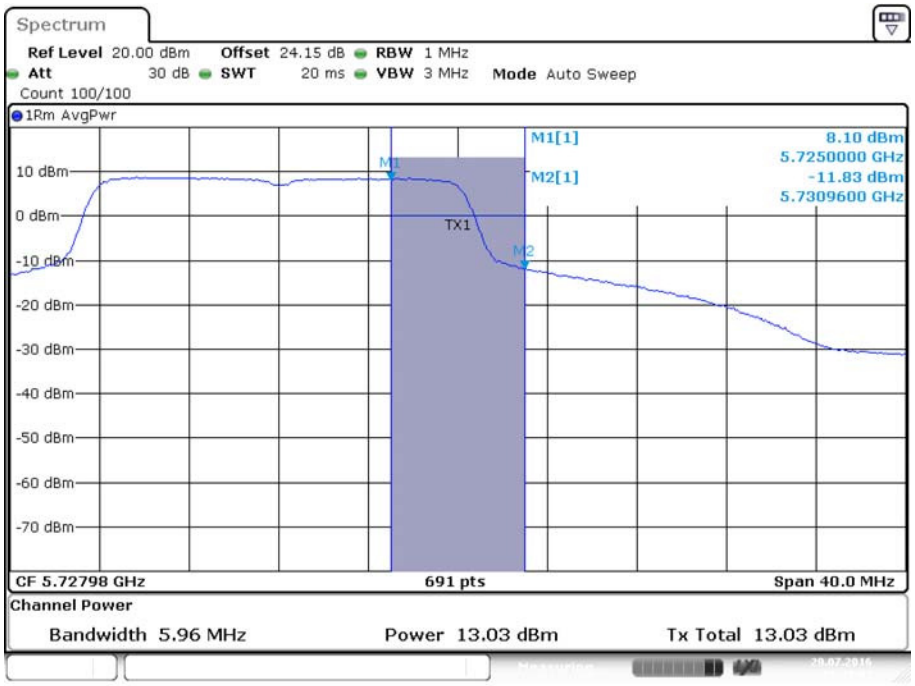

Date: 20.JUL.2016 15:30:59

**Conducted Output Power Plot on Configuration IEEE 802.11a / Ant. 3 / 5720 MHz (UNII 3)**



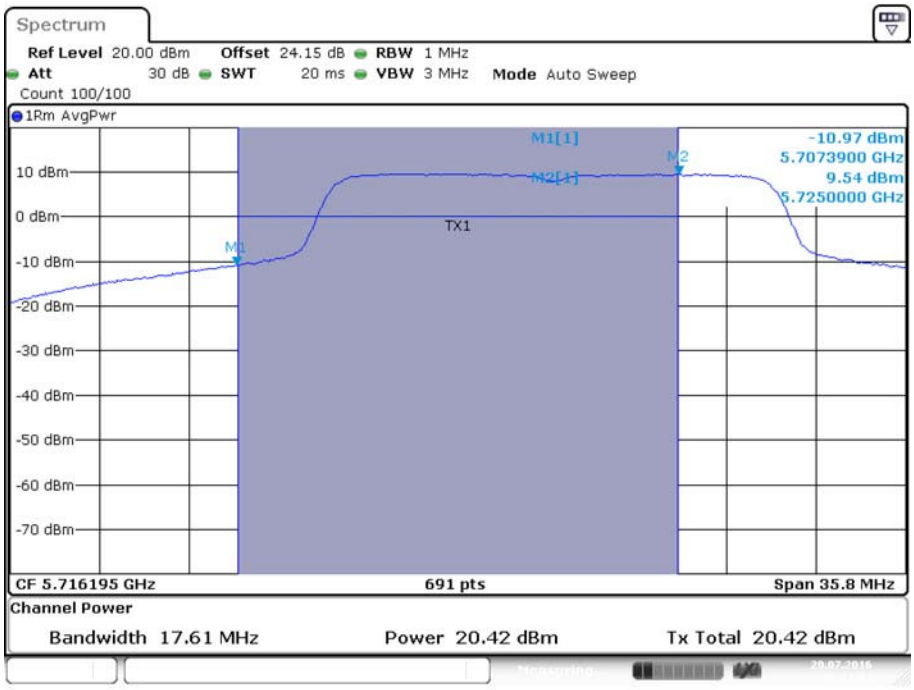

Date: 20.JUL.2016 15:30:56

**Conducted Output Power Plot on Configuration IEEE 802.11a / Ant. 4 / 5720 MHz (UNII 3)**



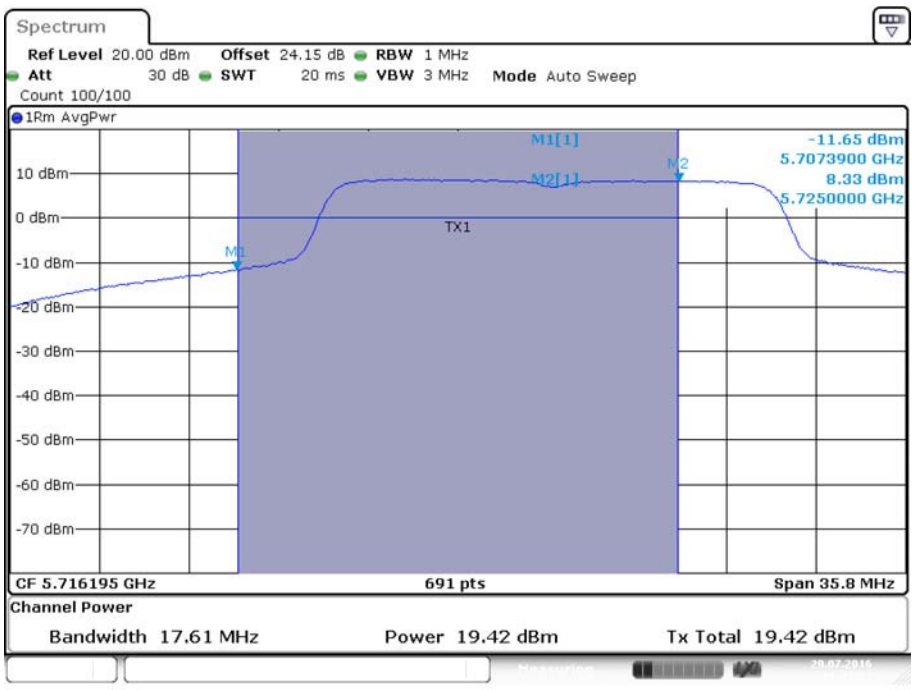

Date: 20.JUL.2016 15:31:03

**Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 / 5720 MHz (UNII 2C)**



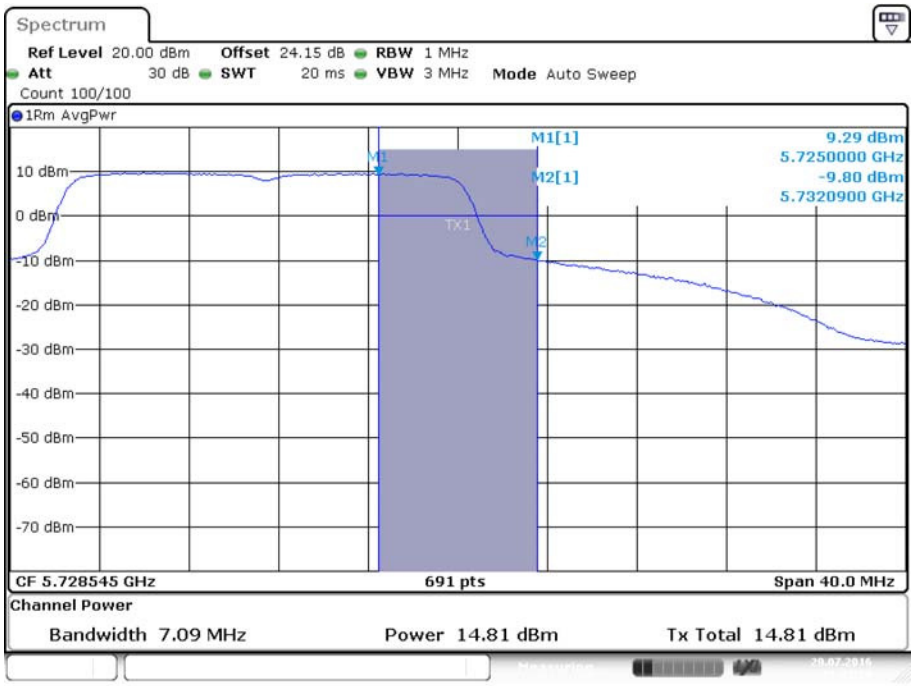

Date: 20.JUL.2016 15:21:06

**Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 4 / 5720 MHz (UNII 2C)**



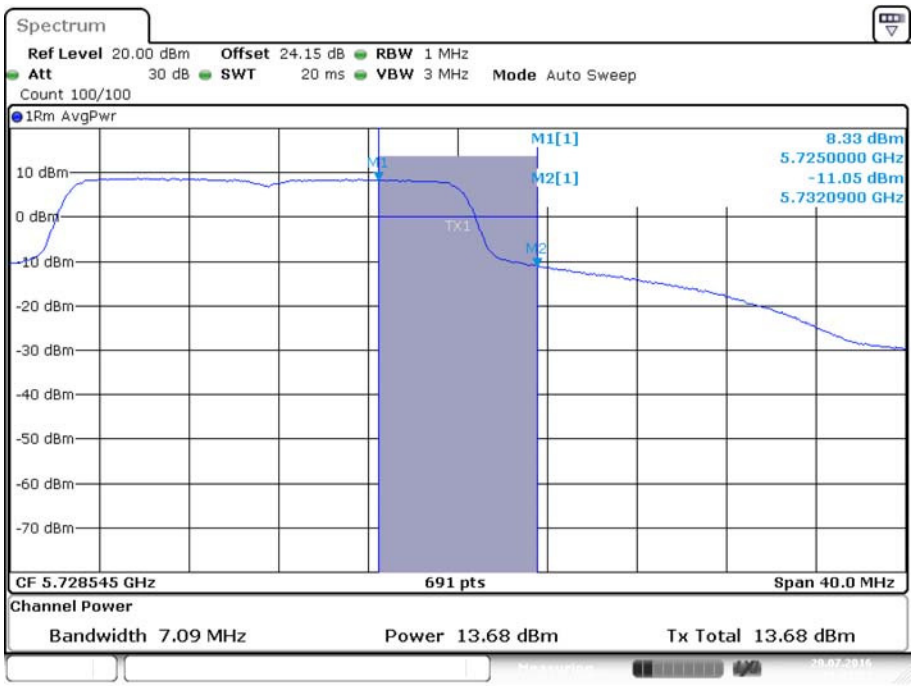

Date: 20.JUL.2016 15:21:13

**Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 / 5720 MHz (UNII 3)**



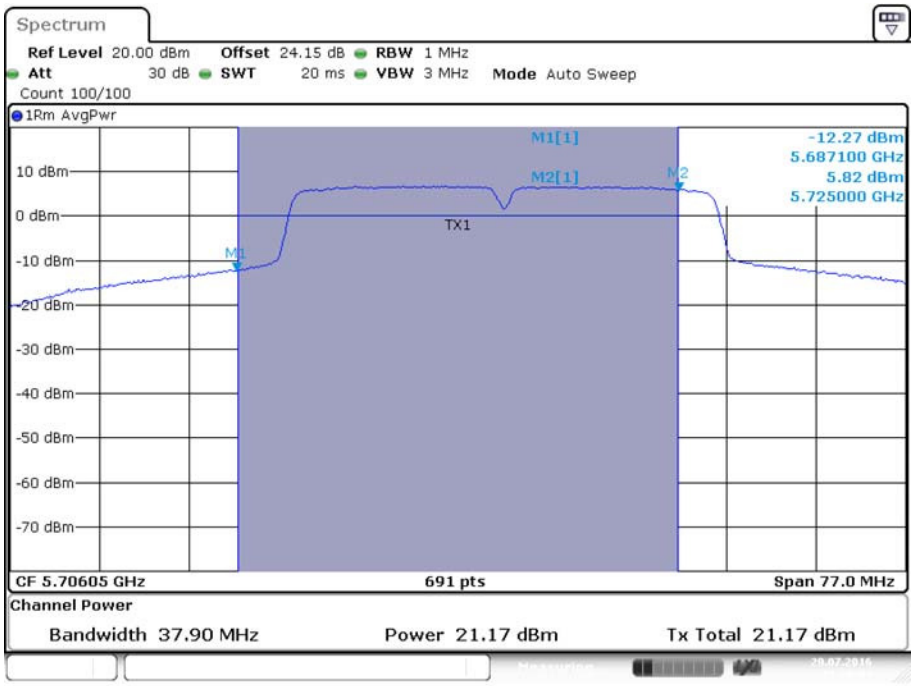

Date: 20.JUL.2016 15:21:10

**Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 4 / 5720 MHz (UNII 3)**



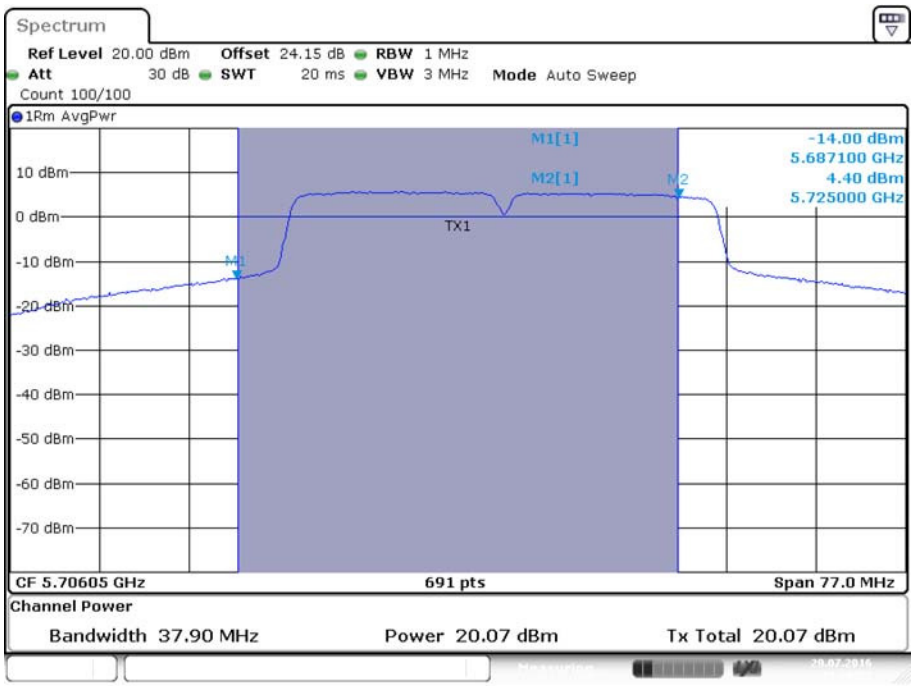

Date: 20.JUL.2016 15:21:17

**Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 3 / 5710 MHz (UNII 2C)**



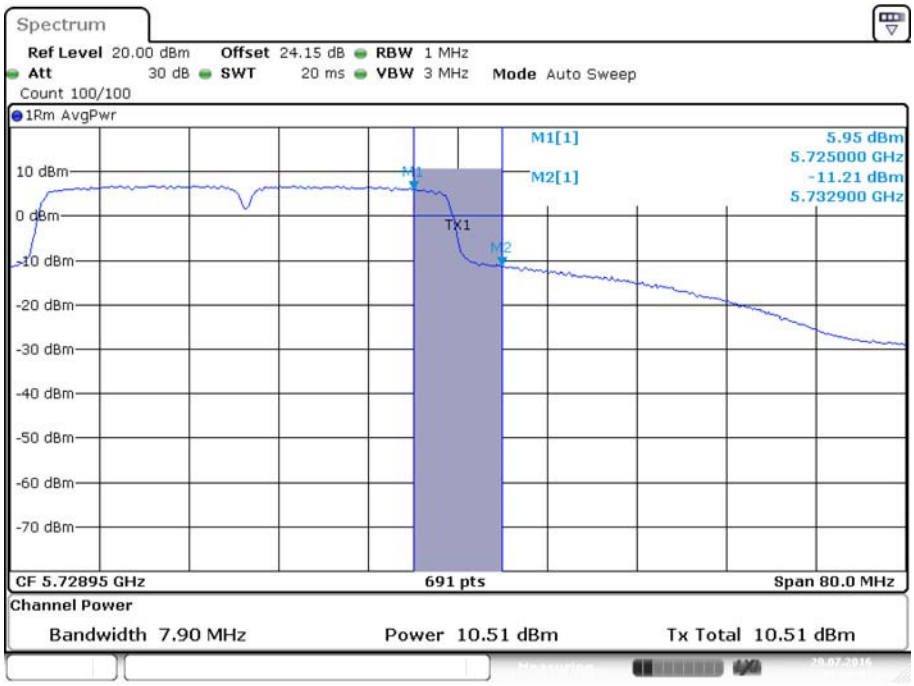

Date: 20.JUL.2016 15:16:04

**Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 4 / 5710 MHz (UNII 2C)**



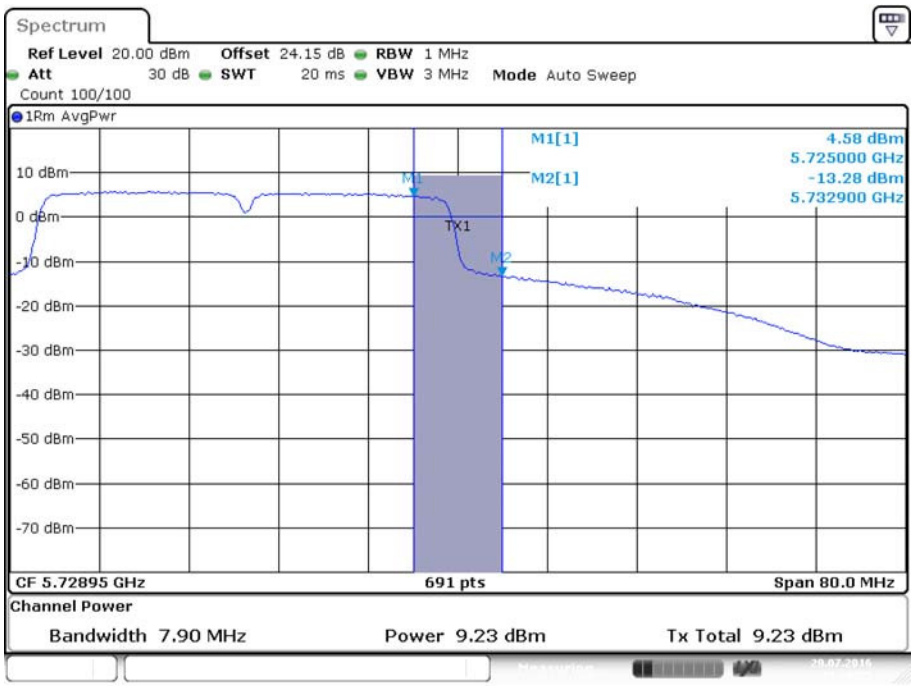

Date: 20.JUL.2016 15:16:11

**Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 3 / 5710 MHz (UNII 3)**



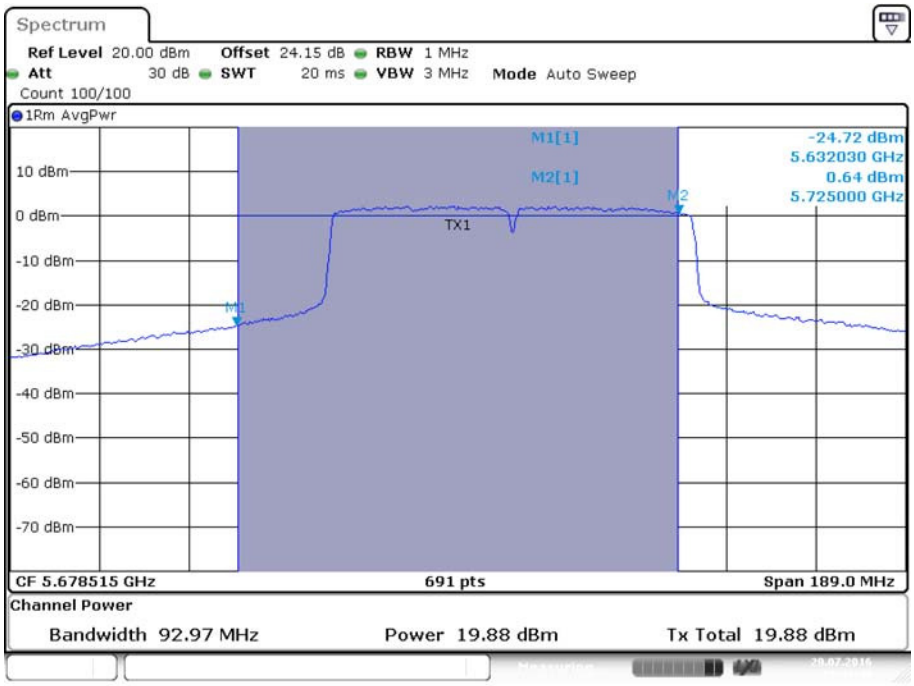

Date: 20.JUL.2016 15:16:08

**Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 4 / 5710 MHz (UNII 3)**



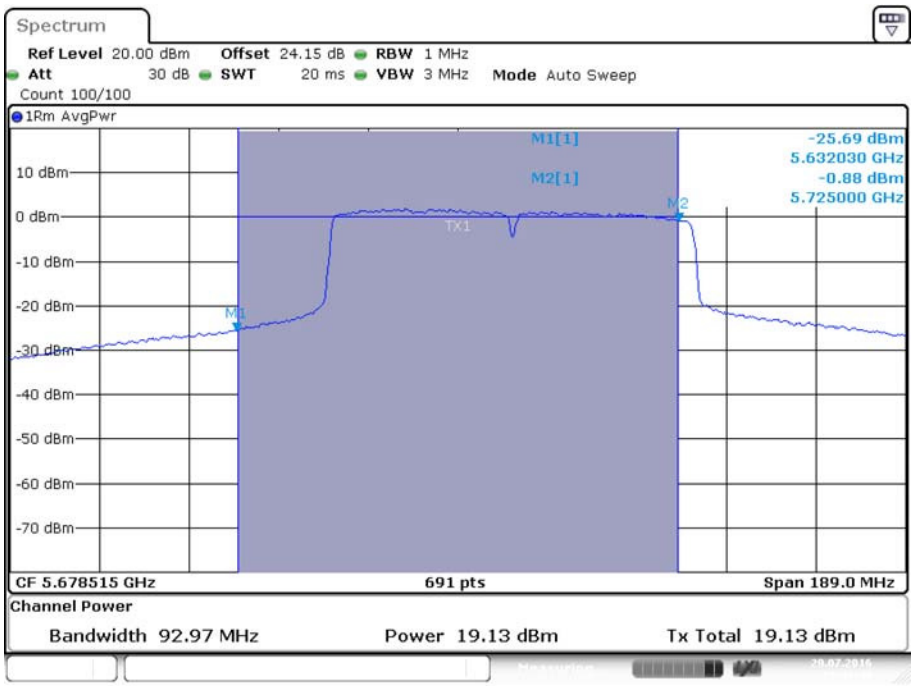

Date: 20.JUL.2016 15:16:15

**Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 3 / 5690 MHz (UNII 2C)**



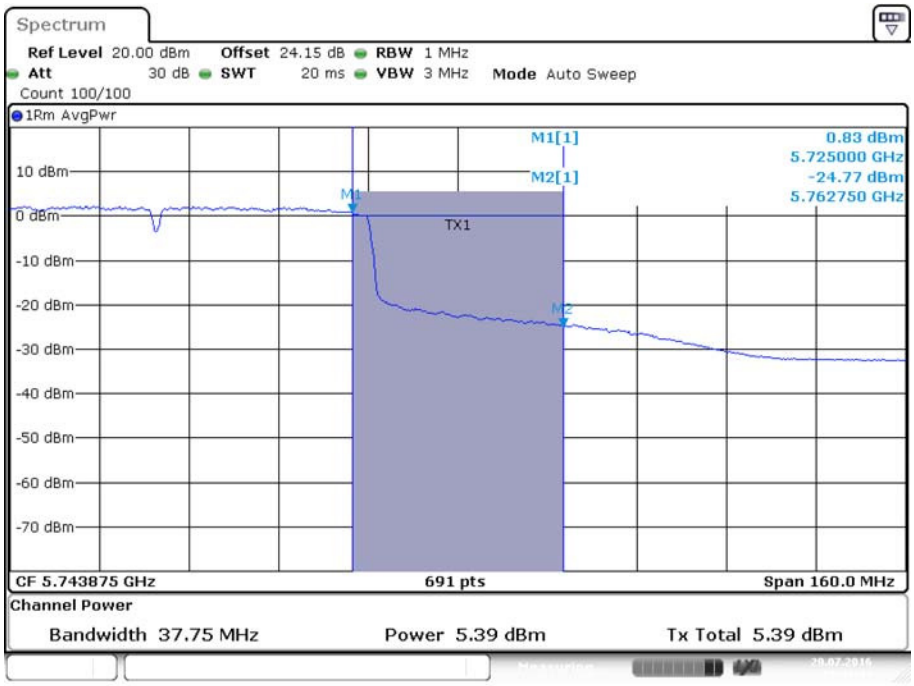

Date: 20.JUL.2016 14:46:40

**Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 4 / 5690 MHz (UNII 2C)**



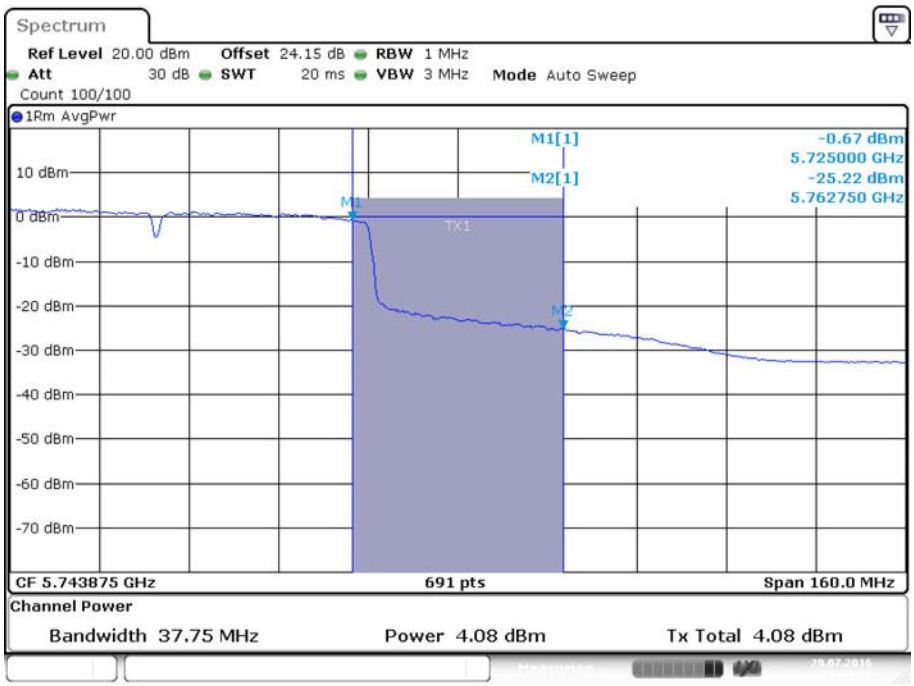

Date: 20.JUL.2016 14:46:48

**Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 3 / 5690 MHz (UNII 3)**




Date: 20.JUL.2016 14:46:44

**Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 4 / 5690 MHz (UNII 3)**




Date: 20.JUL.2016 14:46:51

## 4.4. Power Spectral Density Measurement

### 4.4.1. Limit

The following table is power spectral density limits and decrease power density limit rule refer to section 4.3.1.

| Frequency Band | | Limit |
|---|---|---|
| ☒ | 5.25-5.35 GHz | 11 dBm/MHz |
| ☒ | 5.470-5.725 GHz | 11 dBm/MHz |

### 4.4.2. Measuring Instruments and Setting

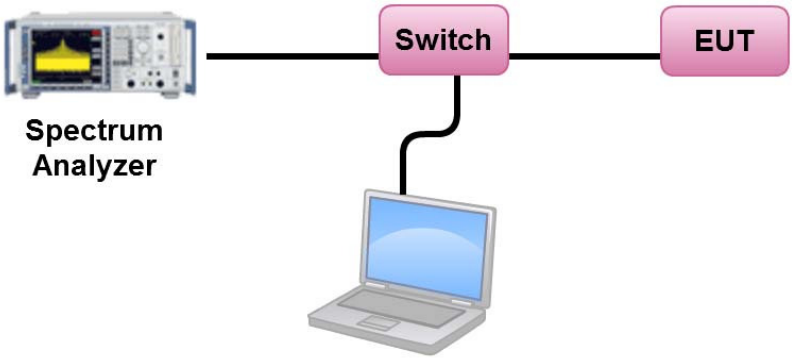
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | Encompass the entire emissions bandwidth (EBW) of the signal |
| RBW | 1000 kHz |
| VBW | 3000 kHz |
| Detector | RMS |
| Trace | AVERAGE |
| Sweep Time | Auto |
| Trace Average | 100 times |

### 4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D02 v01r03 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements and sum the spectra across the outputs.

### 4.4.4. Test Setup Layout




### 4.4.5. Test Deviation

There is no deviation with the original standard.

### 4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 4.4.7. Test Result of Power Spectral Density

| Temperature | 24℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | Gary Chu | Test Date | Jul. 20, 2016~Jul. 28, 2016 |

| Mode | Frequency | Power Density (dBm/MHz) | Max. Limit (dBm/MHz) | Result |
|---|---|---|---|---|
| 802.11a | 5260 MHz | 10.49 | 11.00 | Complies |
| | 5300 MHz | 10.50 | 11.00 | Complies |
| | 5320 MHz | 10.49 | 11.00 | Complies |
| | 5500 MHz | 10.81 | 11.00 | Complies |
| | 5580 MHz | 10.61 | 11.00 | Complies |
| | 5700 MHz | 8.66 | 11.00 | Complies |
| 802.11ac MCS0/Nss1 VHT20 | 5260 MHz | 10.61 | 11.00 | Complies |
| | 5300 MHz | 10.30 | 11.00 | Complies |
| | 5320 MHz | 10.26 | 11.00 | Complies |
| | 5500 MHz | 9.65 | 11.00 | Complies |
| | 5580 MHz | 10.54 | 11.00 | Complies |
| | 5700 MHz | 9.24 | 11.00 | Complies |
| 802.11ac MCS0/Nss1 VHT40 | 5270 MHz | 7.58 | 11.00 | Complies |
| | 5310 MHz | 6.12 | 11.00 | Complies |
| | 5510 MHz | 4.59 | 11.00 | Complies |
| | 5550 MHz | 7.59 | 11.00 | Complies |
| | 5670 MHz | 6.64 | 11.00 | Complies |
| 802.11ac MCS0/Nss1 VHT80 | 5290 MHz | -1.95 | 11.00 | Complies |
| | 5530 MHz | -1.68 | 11.00 | Complies |
| | 5610 MHz | 4.74 | 11.00 | Complies |

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.38dBi <6dBi, so the limit doesn't reduce.

**Straddle Channel**

**Configuration IEEE 802.11a / Ant. 3 + Ant. 4**

| Channel | Frequency | Power Density (dBm/MHz) | | Max. Limit (dBm/MHz) | | Result |
|---|---|---|---|---|---|---|
| 144 | 5720 MHz (UNII 2C) | 9.70 | | 11.00 | | Complies |
| **Channel** | **Frequency** | **Power Density (dBm/MHz)** | **10log(500kHz/RBW) Factor(dB)** | **Power Density (dBm/500kHz)** | **Power Density Limit (dBm/500kHz)** | **Result** |
| 144 | 5720 MHz (UNII 3) | 9.55 | -3.01 | 6.54 | 30.00 | Complies |

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.38dBi <6dBi, so the limit doesn't reduce.

**Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 + Ant. 4**

| Channel | Frequency | Power Density (dBm/MHz) | | Max. Limit (dBm/MHz) | | Result |
|---|---|---|---|---|---|---|
| 144 | 5720 MHz (UNII 2C) | 9.93 | | 11.00 | | Complies |
| **Channel** | **Frequency** | **Power Density (dBm/MHz)** | **10log(500kHz/RBW) Factor(dB)** | **Power Density (dBm/500kHz)** | **Power Density Limit (dBm/500kHz)** | **Result** |
| 144 | 5720 MHz (UNII 3) | 9.42 | -3.01 | 6.41 | 30.00 | Complies |

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.38dBi <6dBi, so the limit doesn't reduce.

**Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 3 + Ant. 4**

| Channel | Frequency | Power Density (dBm/MHz) | | Max. Limit (dBm/MHz) | | Result |
|---|---|---|---|---|---|---|
| 142 | 5710 MHz (UNII 2C) | 7.74 | | 11.00 | | Complies |
| **Channel** | **Frequency** | **Power Density (dBm/MHz)** | **10log(500kHz/RBW) Factor(dB)** | **Power Density (dBm/500kHz)** | **Power Density Limit (dBm/500kHz)** | **Result** |
| 142 | 5710 MHz (UNII 3) | 7.50 | -3.01 | 4.49 | 30.00 | Complies |

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.38dBi <6dBi, so the limit doesn't reduce.

**Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 3 + Ant. 4**

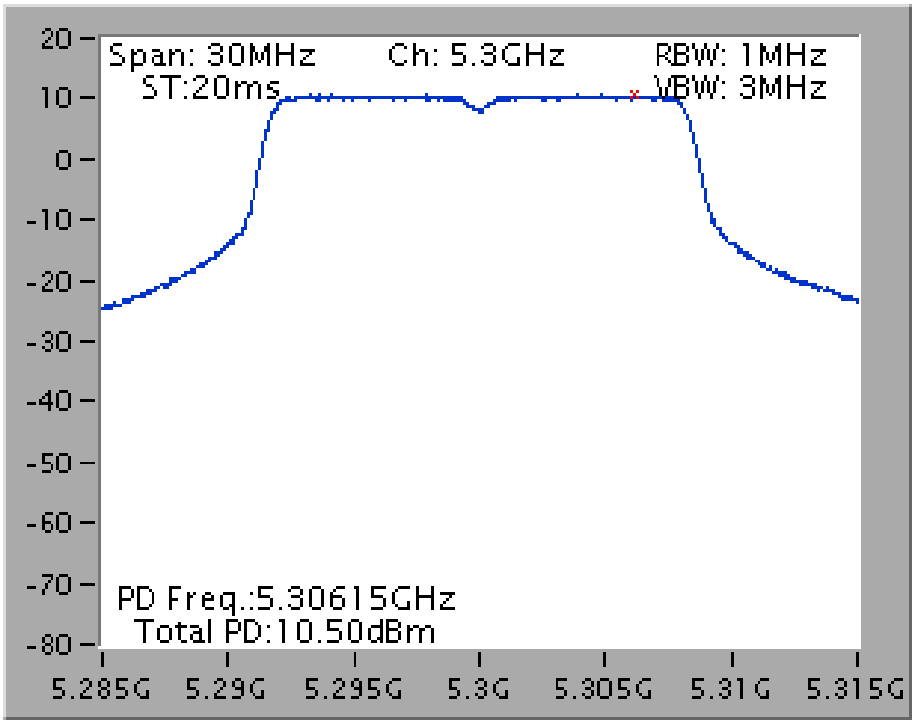
| Channel | Frequency | Power Density (dBm/MHz) | | Max. Limit (dBm/MHz) | | Result |
|---|---|---|---|---|---|---|
| 138 | 5690 MHz (UNII 2C) | 3.51 | | 11.00 | | Complies |
| **Channel** | **Frequency** | **Power Density (dBm/MHz)** | **10log(500kHz/RBW) Factor(dB)** | **Power Density (dBm/500kHz)** | **Power Density Limit (dBm/500kHz)** | **Result** |
| 138 | 5690 MHz (UNII 3) | 1.55 | -3.01 | -1.46 | 30.00 | Complies |

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.38dBi <6dBi, so the limit doesn't reduce.

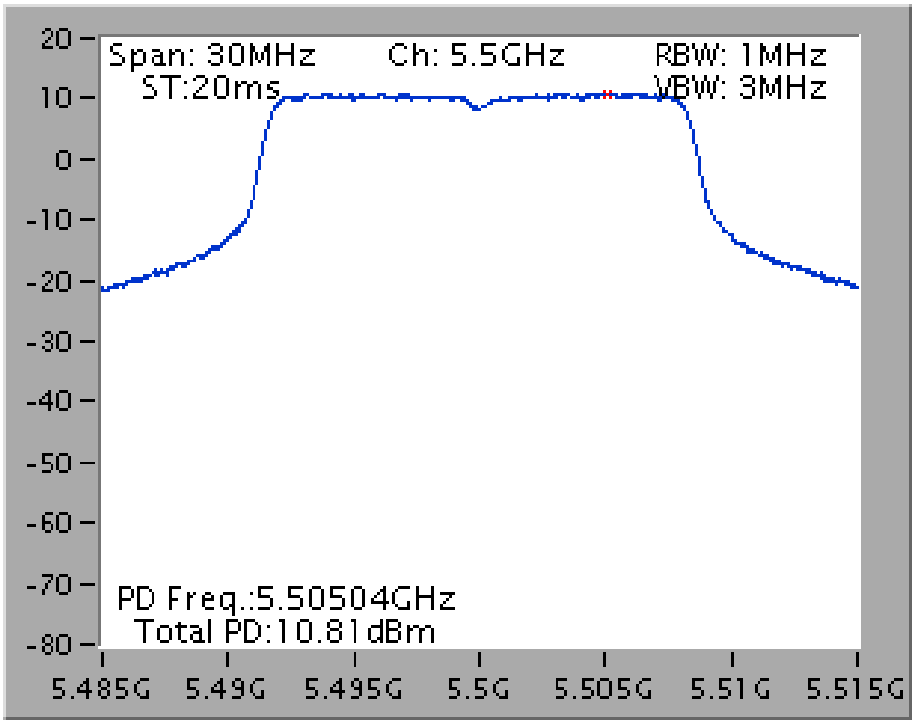
Note: All the test values were listed in the report.

For plots, only the channel with worse result was shown.

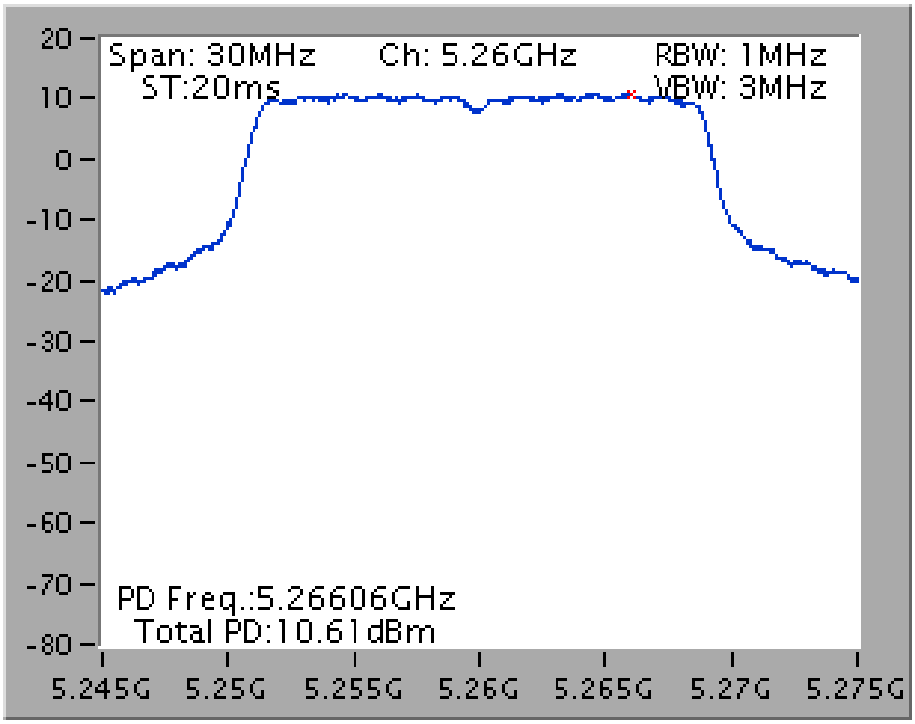
**Power Density Plot on Configuration IEEE 802.11a / Ant. 3 + Ant. 4 / 5300 MHz**



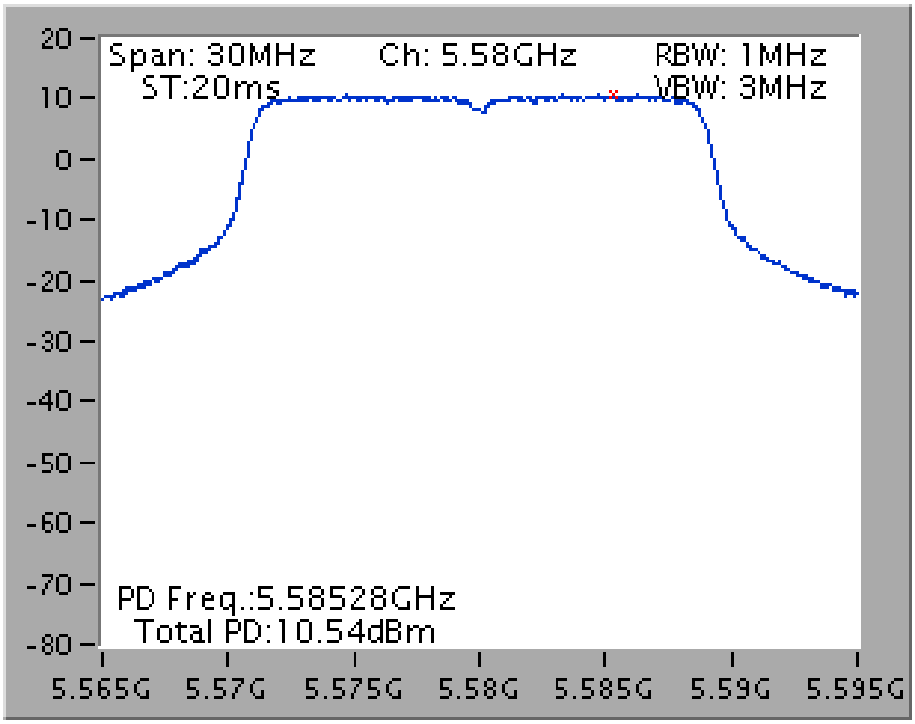

**Power Density Plot on Configuration IEEE 802.11a / Ant. 3 + Ant. 4 / 5500 MHz**



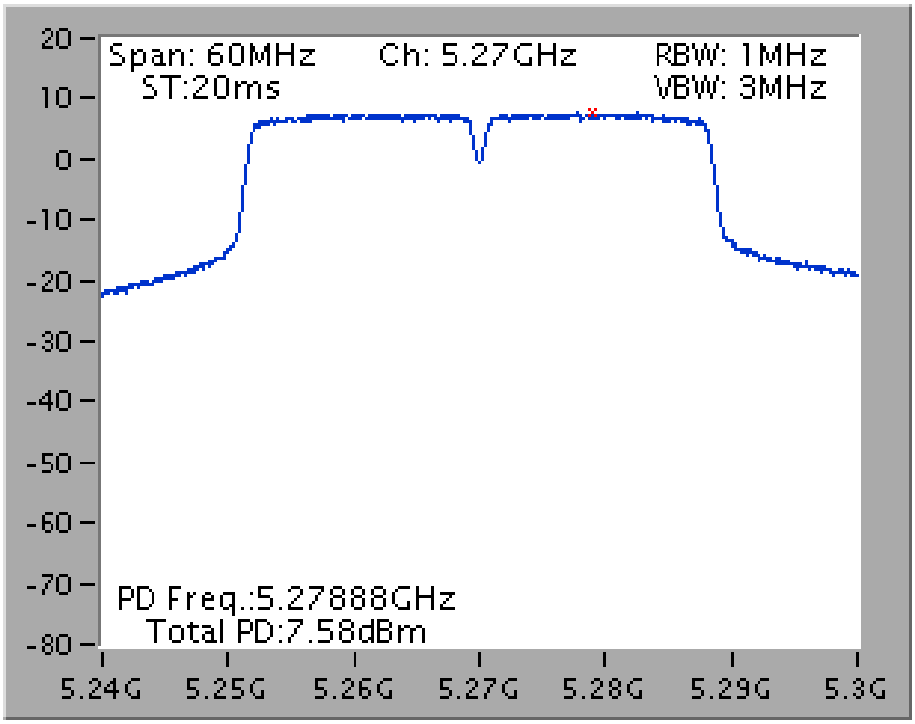
**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 + Ant. 4 / 5260 MHz**



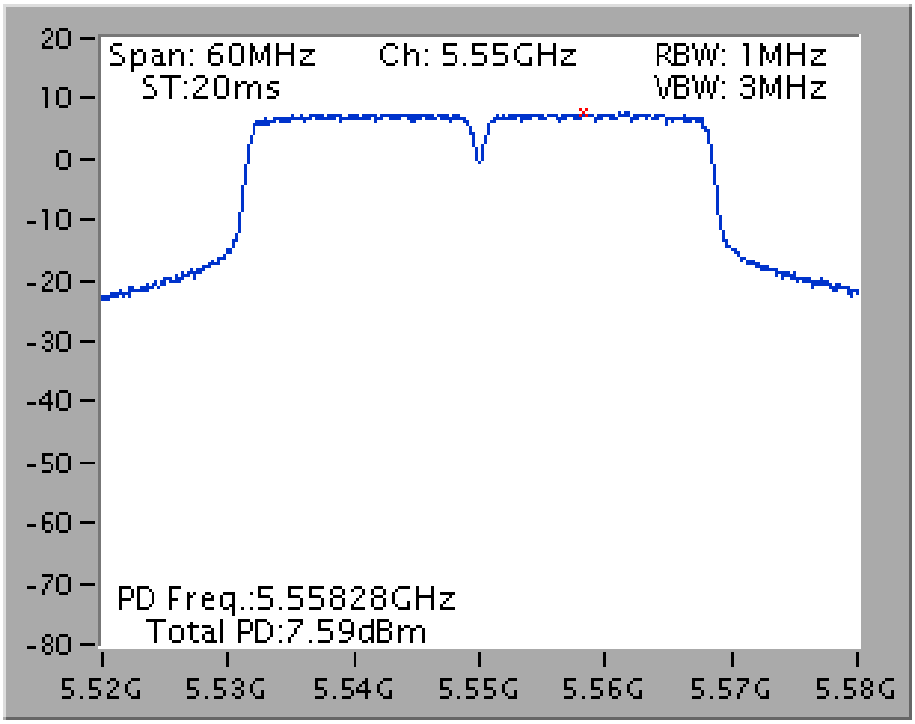

**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 + Ant. 4 / 5580 MHz**



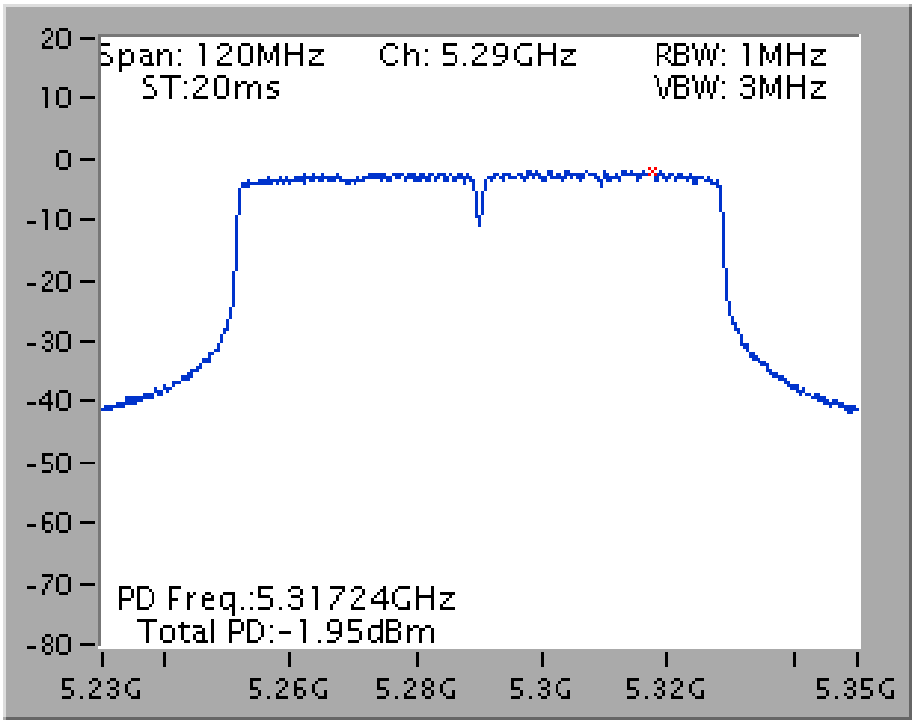
**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 3 + Ant. 4 / 5270 MHz**



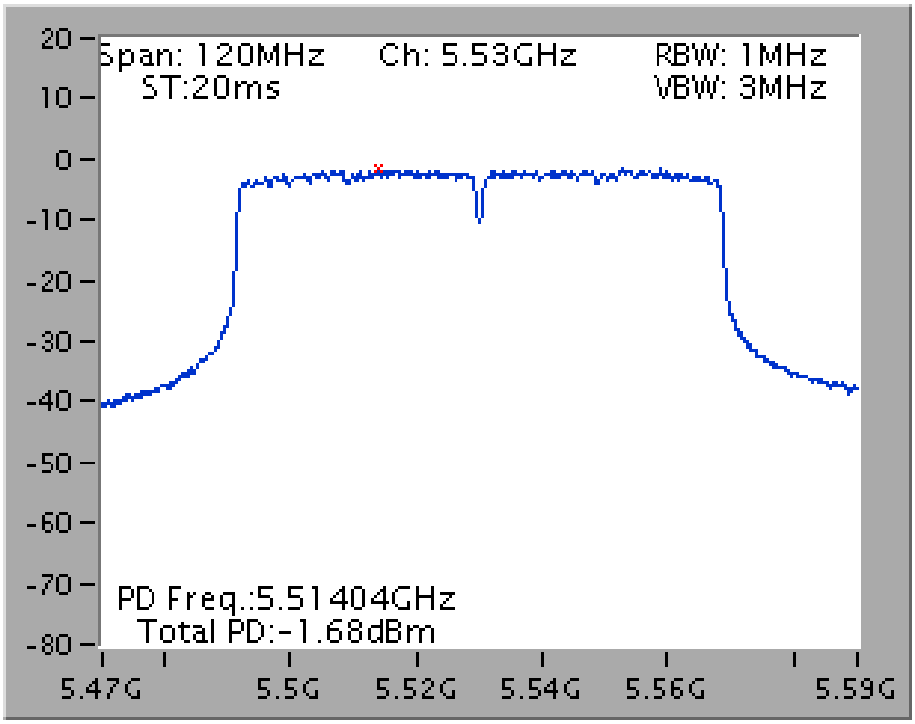

**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 3 + Ant. 4 / 5550 MHz**



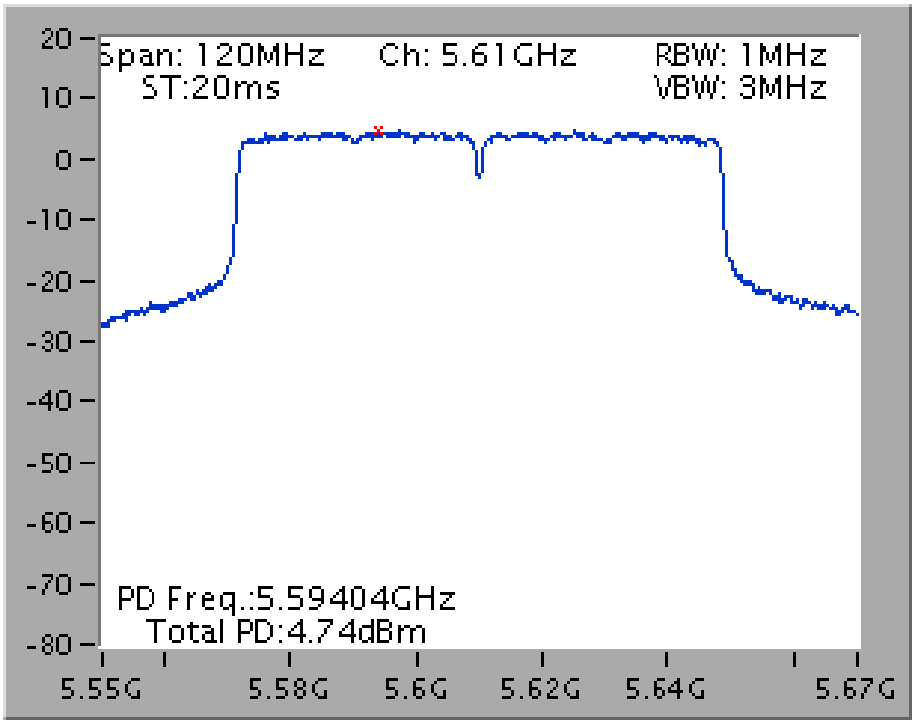
**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 3 + Ant. 4 / 5290 MHz**




**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 3 + Ant. 4 / 5530 MHz**

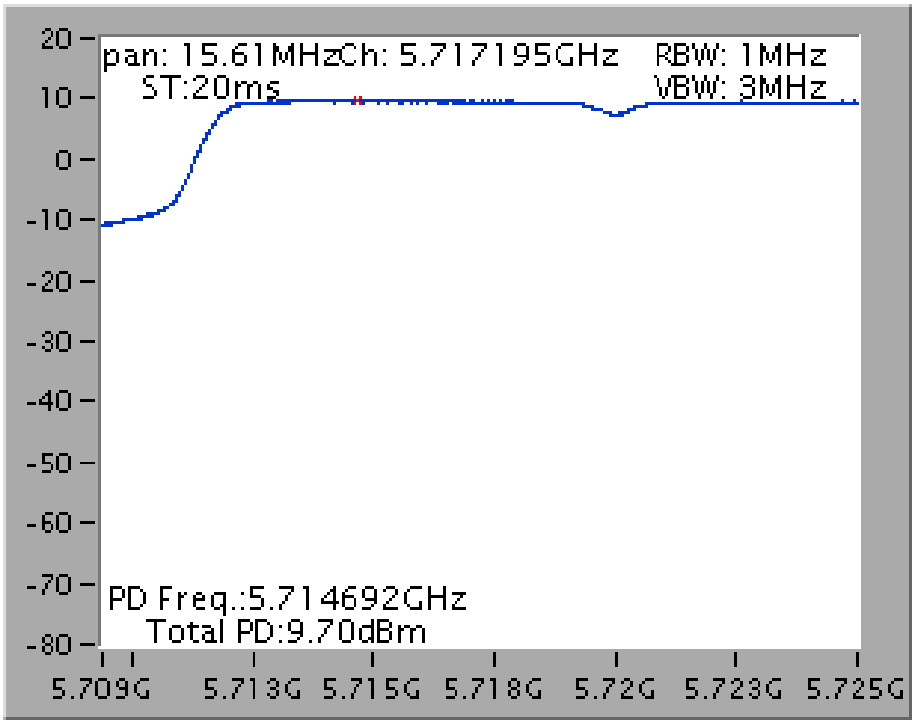


**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 3 + Ant. 4 / 5610 MHz**

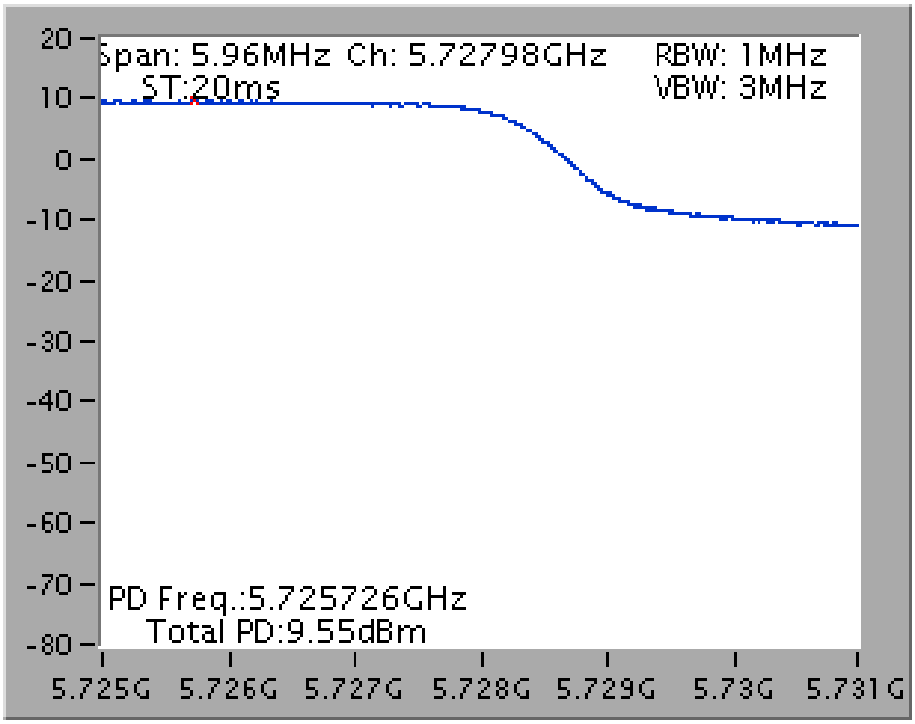


**Straddle Channel**

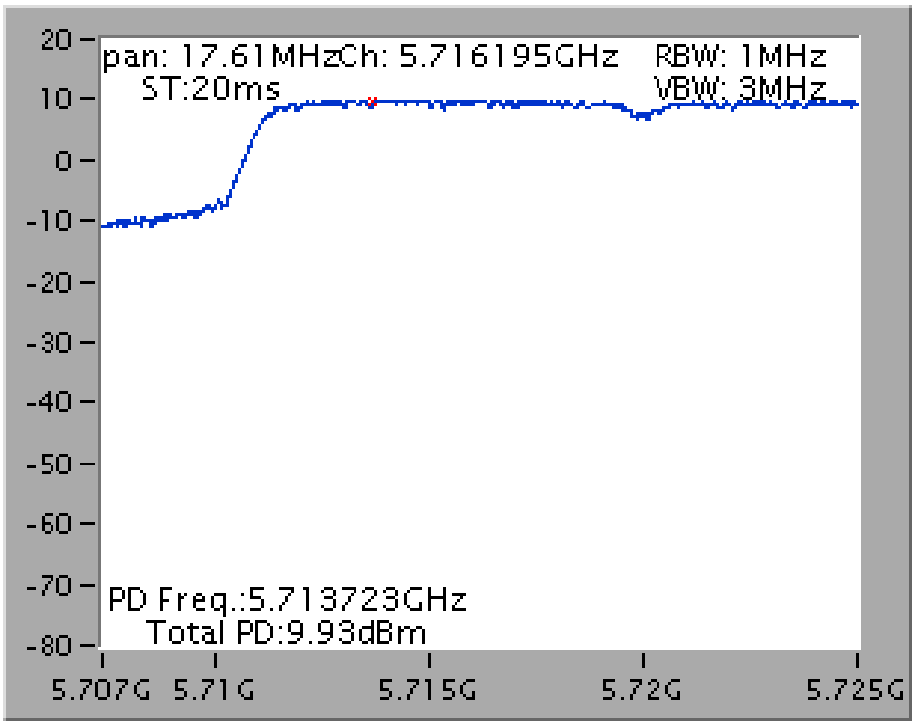
**Power Density Plot on Configuration IEEE 802.11a / Ant. 3 + Ant. 4 / 5720 MHz (UNII 2C)**



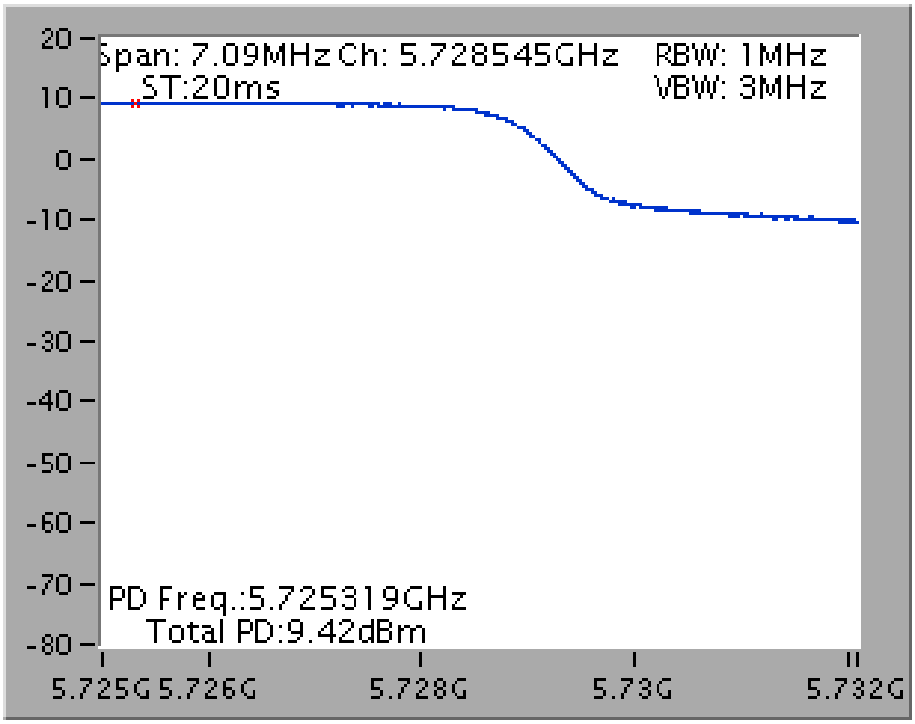

**Power Density Plot on Configuration IEEE 802.11a / Ant. 3 + Ant. 4 / 5720 MHz (UNII 3)**



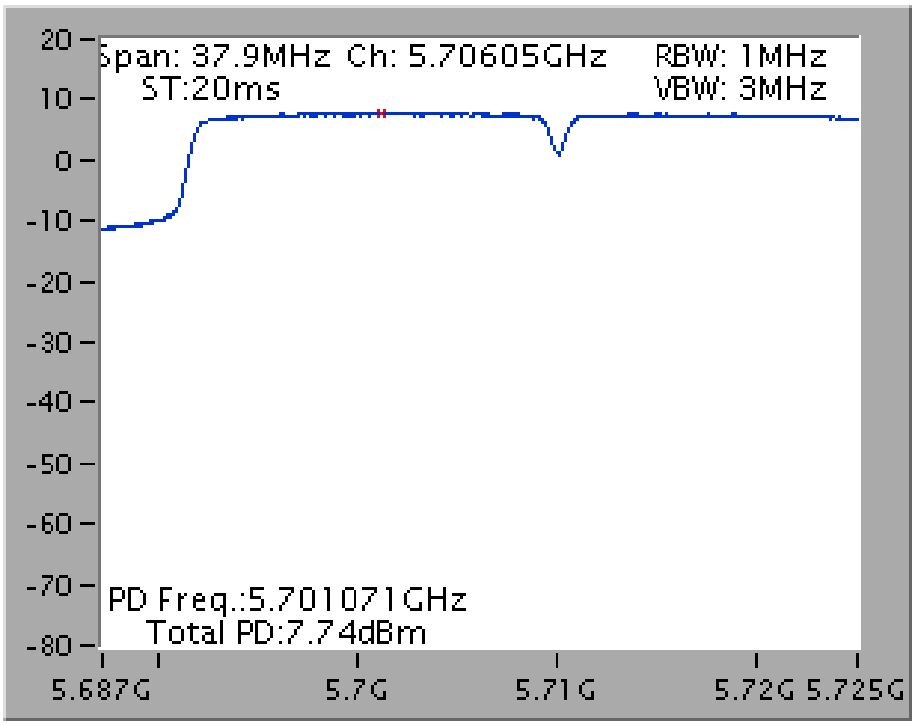
**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 + Ant. 4 / 5720 MHz (UNII 2C)**



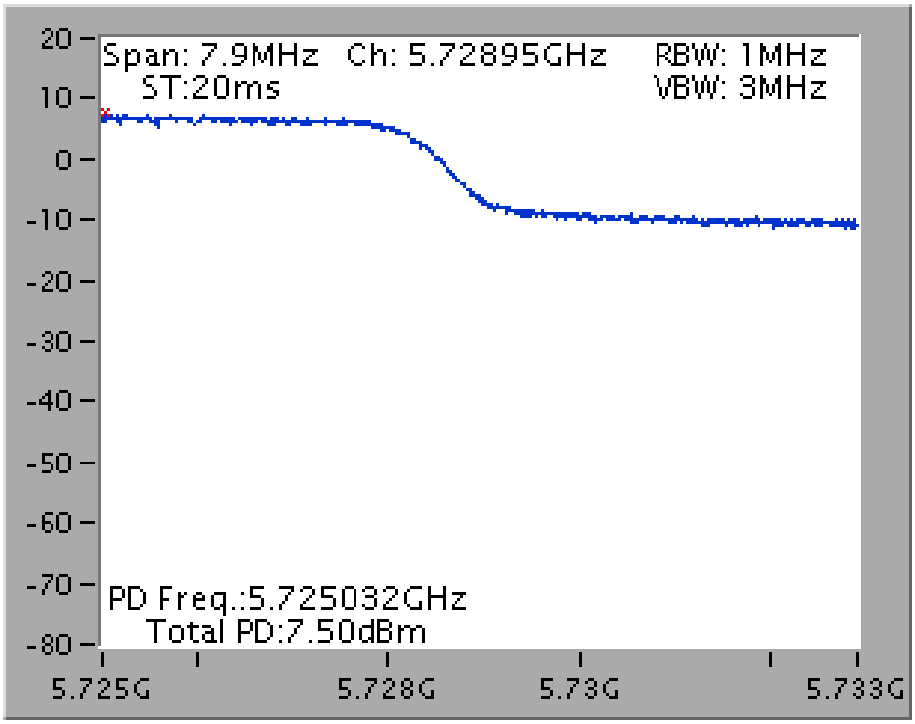

**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 3 + Ant. 4 / 5720 MHz (UNII 3)**



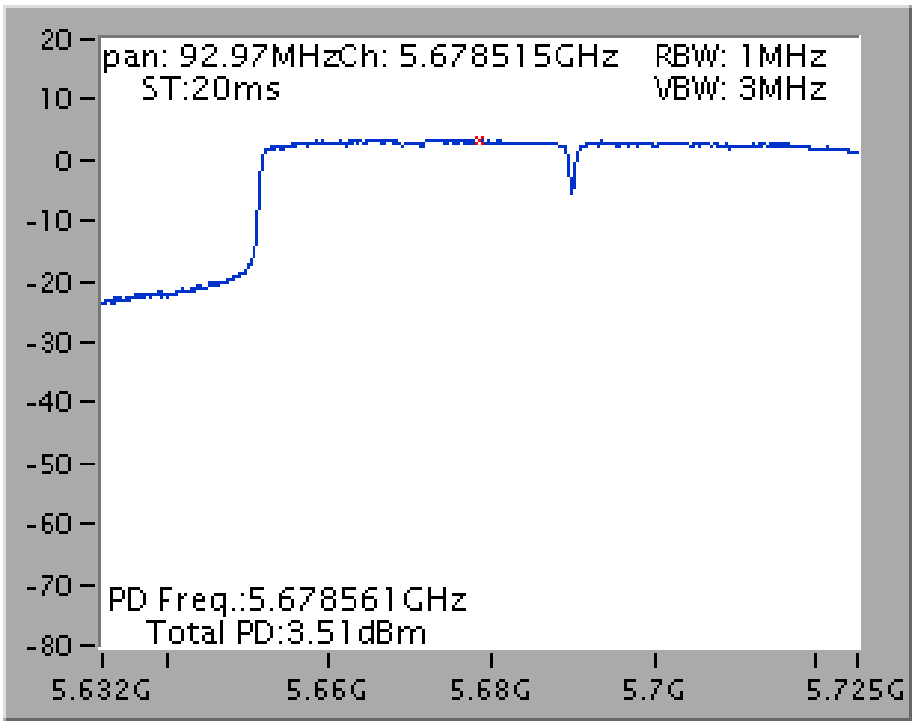
**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 3 + Ant. 4 / 5710 MHz (UNII 2C)**



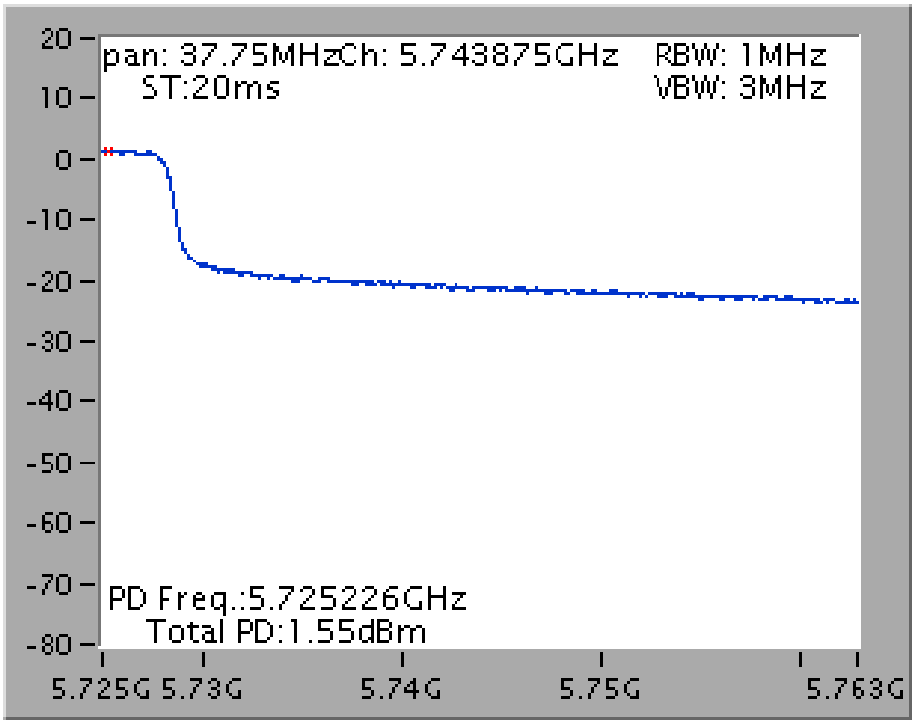

**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 3 + Ant. 4 / 5710 MHz (UNII 3)**



**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 3 + Ant. 4 / 5690 MHz (UNII 2C)**




**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 3 + Ant. 4 / 5690 MHz (UNII 3)**



## 4.5. Radiated Emissions Measurement

### 4.5.1. Limit

For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

### 4.5.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

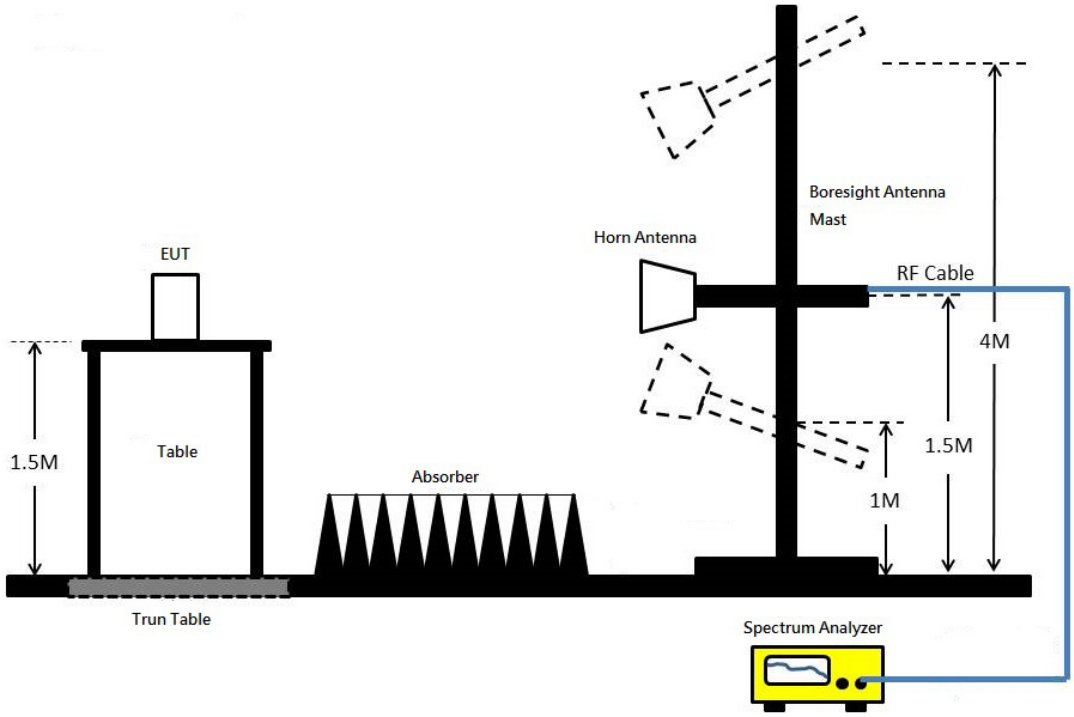
| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 40 GHz |
| RBW / VBW (Emission in restricted band) | 1MHz / 3MHz for Peak,<br>1MHz / 1/T for Average |
| RBW / VBW (Emission in non-restricted band) | 1MHz / 3MHz for peak |

| Receiver Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start ~ Stop Frequency | 9kHz~150kHz / RBW 200Hz for QP |
| Start ~ Stop Frequency | 150kHz~30MHz / RBW 9kHz for QP |
| Start ~ Stop Frequency | 30MHz~1000MHz / RBW 120kHz for QP |

### 4.5.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 1/T VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

### 4.5.4. Test Setup Layout




### 4.5.5. Test Deviation

There is no deviation with the original standard.

### 4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 4.5.7. Results for Radiated Emissions (1GHz~40GHz)

| Temperature | 22℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11a CH 52 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 15778.90 | 50.10 | 54.00 | -3.90 | 35.18 | 11.29 | 38.48 | 34.85 | 257 | 299 | Average | HORIZONTAL |
| 2 | 15783.60 | 70.78 | 74.00 | -3.22 | 55.78 | 11.30 | 38.55 | 34.85 | 257 | 299 | Peak | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 15780.80 | 49.70 | 54.00 | -4.30 | 34.78 | 11.29 | 38.48 | 34.85 | 232 | 40 | Average | VERTICAL |
| 2 | 15783.00 | 73.76 | 74.00 | -0.24 | 58.76 | 11.30 | 38.55 | 34.85 | 232 | 40 | Peak | VERTICAL |

| Temperature | 22℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11a CH 60 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 10598.75 | 45.29 | 54.00 | -8.71 | 32.00 | 9.74 | 38.50 | 34.95 | 161 | 128 | Average | HORIZONTAL |
| 2 | 10599.16 | 58.91 | 74.00 | -15.09 | 45.62 | 9.74 | 38.50 | 34.95 | 161 | 128 | Peak | HORIZONTAL |
| 3 | 15897.48 | 49.78 | 54.00 | -4.22 | 34.73 | 11.32 | 38.67 | 34.94 | 180 | 303 | Average | HORIZONTAL |
| 4 | 15902.05 | 68.61 | 74.00 | -5.39 | 53.56 | 11.32 | 38.67 | 34.94 | 180 | 303 | Peak | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 10598.18 | 48.38 | 54.00 | -5.62 | 35.09 | 9.74 | 38.50 | 34.95 | 187 | 263 | Average | VERTICAL |
| 2 | 10603.36 | 61.55 | 74.00 | -12.45 | 48.26 | 9.74 | 38.50 | 34.95 | 187 | 263 | Peak | VERTICAL |
| 3 | 15896.47 | 69.35 | 74.00 | -4.65 | 54.30 | 11.32 | 38.67 | 34.94 | 165 | 244 | Peak | VERTICAL |
| 4 | 15896.76 | 49.03 | 54.00 | -4.97 | 33.98 | 11.32 | 38.67 | 34.94 | 165 | 244 | Average | VERTICAL |

| Temperature | 22℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11a CH 64 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 10636.64 | 57.00 | 74.00 | -17.00 | 43.70 | 9.73 | 38.50 | 34.93 | 178 | 101 | Peak | HORIZONTAL |
| 2 | 10636.82 | 43.25 | 54.00 | -10.75 | 29.95 | 9.73 | 38.50 | 34.93 | 178 | 101 | Average | HORIZONTAL |
| 3 | 15963.96 | 59.91 | 74.00 | -14.09 | 44.82 | 11.33 | 38.74 | 34.98 | 185 | 58 | Peak | HORIZONTAL |
| 4 | 15965.01 | 46.06 | 54.00 | -7.94 | 30.97 | 11.33 | 38.74 | 34.98 | 185 | 58 | Average | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 10640.41 | 59.42 | 74.00 | -14.58 | 46.09 | 9.73 | 38.50 | 34.90 | 162 | 245 | Peak | VERTICAL |
| 2 | 10640.81 | 45.40 | 54.00 | -8.60 | 32.07 | 9.73 | 38.50 | 34.90 | 162 | 245 | Average | VERTICAL |
| 3 | 15951.58 | 60.07 | 74.00 | -13.93 | 44.98 | 11.33 | 38.74 | 34.98 | 195 | 32 | Peak | VERTICAL |
| 4 | 15961.68 | 46.03 | 54.00 | -7.97 | 30.94 | 11.33 | 38.74 | 34.98 | 195 | 32 | Average | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11a CH 100 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 10991.58 | 42.77 | 54.00 | -11.23 | 29.26 | 9.69 | 38.50 | 34.68 | 186 | 129 | Average | HORIZONTAL |
| 2 | 11006.97 | 55.61 | 74.00 | -18.39 | 42.09 | 9.68 | 38.50 | 34.66 | 186 | 129 | Peak | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 10997.83 | 42.58 | 54.00 | -11.42 | 29.06 | 9.68 | 38.50 | 34.66 | 184 | 125 | Average | VERTICAL |
| 2 | 11002.40 | 56.10 | 74.00 | -17.90 | 42.58 | 9.68 | 38.50 | 34.66 | 184 | 125 | Peak | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11a CH 116 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11157.50 | 49.99 | 54.00 | -4.01 | 36.48 | 9.66 | 38.50 | 34.65 | 146 | 238 | Average | HORIZONTAL |
| 2 | 11162.80 | 62.78 | 74.00 | -11.22 | 49.27 | 9.66 | 38.50 | 34.65 | 146 | 238 | Peak | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11159.00 | 53.78 | 54.00 | -0.22 | 40.27 | 9.66 | 38.50 | 34.65 | 151 | 266 | Average | VERTICAL |
| 2 | 11159.70 | 64.89 | 74.00 | -9.11 | 51.38 | 9.66 | 38.50 | 34.65 | 151 | 266 | Peak | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11a CH 140 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11396.84 | 56.14 | 74.00 | -17.86 | 42.64 | 9.63 | 38.50 | 34.63 | 183 | 138 | Peak | HORIZONTAL |
| 2 | 11402.98 | 42.62 | 54.00 | -11.38 | 29.12 | 9.63 | 38.50 | 34.63 | 183 | 138 | Average | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11393.23 | 42.58 | 54.00 | -11.42 | 29.08 | 9.63 | 38.50 | 34.63 | 188 | 135 | Average | VERTICAL |
| 2 | 11401.39 | 56.16 | 74.00 | -17.84 | 42.66 | 9.63 | 38.50 | 34.63 | 188 | 135 | Peak | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT20 CH 52 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 15775.60 | 50.24 | 54.00 | -3.76 | 35.32 | 11.29 | 38.48 | 34.85 | 257 | 298 | Average | HORIZONTAL |
| 2 | 15783.40 | 69.63 | 74.00 | -4.37 | 54.63 | 11.30 | 38.55 | 34.85 | 257 | 298 | Peak | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 15776.80 | 73.67 | 74.00 | -0.33 | 58.75 | 11.29 | 38.48 | 34.85 | 204 | 51 | Peak | VERTICAL |
| 2 | 15786.20 | 50.15 | 54.00 | -3.85 | 35.15 | 11.30 | 38.55 | 34.85 | 204 | 51 | Average | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT20 CH 60 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 10600.12 | 62.10 | 74.00 | -11.90 | 48.81 | 9.74 | 38.50 | 34.95 | 179 | 233 | Peak | HORIZONTAL |
| 2 | 10600.46 | 47.60 | 54.00 | -6.40 | 34.31 | 9.74 | 38.50 | 34.95 | 179 | 233 | Average | HORIZONTAL |
| 3 | 15893.34 | 65.17 | 74.00 | -8.83 | 50.12 | 11.32 | 38.67 | 34.94 | 185 | 265 | Peak | HORIZONTAL |
| 4 | 15898.90 | 48.43 | 54.00 | -5.57 | 33.38 | 11.32 | 38.67 | 34.94 | 185 | 265 | Average | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 10603.16 | 47.65 | 54.00 | -6.35 | 34.36 | 9.74 | 38.50 | 34.95 | 178 | 242 | Average | VERTICAL |
| 2 | 10605.18 | 61.85 | 74.00 | -12.15 | 48.54 | 9.74 | 38.50 | 34.93 | 178 | 242 | Peak | VERTICAL |
| 3 | 15897.28 | 48.07 | 54.00 | -5.93 | 33.02 | 11.32 | 38.67 | 34.94 | 181 | 257 | Average | VERTICAL |
| 4 | 15904.23 | 64.86 | 74.00 | -9.14 | 49.81 | 11.32 | 38.67 | 34.94 | 181 | 257 | Peak | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT20 CH 64 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 10638.70 | 43.06 | 54.00 | -10.94 | 29.73 | 9.73 | 38.50 | 34.90 | 184 | 238 | Average | HORIZONTAL |
| 2 | 10641.30 | 55.82 | 74.00 | -18.18 | 42.49 | 9.73 | 38.50 | 34.90 | 184 | 238 | Peak | HORIZONTAL |
| 3 | 15961.25 | 46.06 | 54.00 | -7.94 | 30.97 | 11.33 | 38.74 | 34.98 | 188 | 234 | Average | HORIZONTAL |
| 4 | 15969.29 | 59.29 | 74.00 | -14.71 | 44.13 | 11.34 | 38.80 | 34.98 | 188 | 234 | Peak | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 10637.13 | 56.00 | 74.00 | -18.00 | 42.70 | 9.73 | 38.50 | 34.93 | 182 | 214 | Peak | VERTICAL |
| 2 | 10639.80 | 43.03 | 54.00 | -10.97 | 29.70 | 9.73 | 38.50 | 34.90 | 182 | 214 | Average | VERTICAL |
| 3 | 15961.56 | 46.17 | 54.00 | -7.83 | 31.08 | 11.33 | 38.74 | 34.98 | 184 | 222 | Average | VERTICAL |
| 4 | 15962.00 | 58.40 | 74.00 | -15.60 | 43.31 | 11.33 | 38.74 | 34.98 | 184 | 222 | Peak | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 10991.52 | 55.08 | 74.00 | -18.92 | 41.57 | 9.69 | 38.50 | 34.68 | 191 | 251 | Peak | HORIZONTAL |
| 2 | 11007.00 | 42.17 | 54.00 | -11.83 | 28.65 | 9.68 | 38.50 | 34.66 | 191 | 251 | Average | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 10995.86 | 41.99 | 54.00 | -12.01 | 28.46 | 9.69 | 38.50 | 34.66 | 189 | 241 | Average | VERTICAL |
| 2 | 11006.37 | 55.18 | 74.00 | -18.82 | 41.66 | 9.68 | 38.50 | 34.66 | 189 | 241 | Peak | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11159.20 | 61.47 | 74.00 | -12.53 | 47.96 | 9.66 | 38.50 | 34.65 | 189 | 249 | Peak | HORIZONTAL |
| 2 | 11159.20 | 50.17 | 54.00 | -3.83 | 36.66 | 9.66 | 38.50 | 34.65 | 189 | 249 | Average | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11156.40 | 65.89 | 74.00 | -8.11 | 52.38 | 9.66 | 38.50 | 34.65 | 189 | 274 | Peak | VERTICAL |
| 2 | 11158.40 | 53.74 | 54.00 | -0.26 | 40.23 | 9.66 | 38.50 | 34.65 | 189 | 274 | Average | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11396.56 | 55.98 | 74.00 | -18.02 | 42.48 | 9.63 | 38.50 | 34.63 | 189 | 298 | Peak | HORIZONTAL |
| 2 | 11400.55 | 42.68 | 54.00 | -11.32 | 29.18 | 9.63 | 38.50 | 34.63 | 189 | 298 | Average | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11394.47 | 42.48 | 54.00 | -11.52 | 28.98 | 9.63 | 38.50 | 34.63 | 187 | 258 | Average | VERTICAL |
| 2 | 11405.01 | 55.50 | 74.00 | -18.50 | 42.00 | 9.63 | 38.50 | 34.63 | 187 | 258 | Peak | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 15812.98 | 59.67 | 74.00 | -14.33 | 44.67 | 11.30 | 38.55 | 34.85 | 184 | 278 | Peak | HORIZONTAL |
| 2 | 15816.77 | 46.05 | 54.00 | -7.95 | 31.09 | 11.30 | 38.55 | 34.89 | 184 | 278 | Average | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 15809.51 | 59.50 | 74.00 | -14.50 | 44.50 | 11.30 | 38.55 | 34.85 | 186 | 287 | Peak | VERTICAL |
| 2 | 15814.46 | 45.93 | 54.00 | -8.07 | 30.93 | 11.30 | 38.55 | 34.85 | 186 | 287 | Average | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT40 CH 62 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 10615.01 | 43.18 | 54.00 | -10.82 | 29.87 | 9.74 | 38.50 | 34.93 | 182 | 255 | Average | HORIZONTAL |
| 2 | 10624.23 | 56.96 | 74.00 | -17.04 | 43.66 | 9.73 | 38.50 | 34.93 | 182 | 255 | Peak | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 10615.01 | 43.56 | 54.00 | -10.44 | 30.25 | 9.74 | 38.50 | 34.93 | 179 | 264 | Average | VERTICAL |
| 2 | 10615.83 | 56.44 | 74.00 | -17.56 | 43.13 | 9.74 | 38.50 | 34.93 | 179 | 264 | Peak | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT40 CH 102 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11015.11 | 43.17 | 54.00 | -10.83 | 29.65 | 9.68 | 38.50 | 34.66 | 182 | 245 | Average | HORIZONTAL |
| 2 | 11017.06 | 56.57 | 74.00 | -17.43 | 43.05 | 9.68 | 38.50 | 34.66 | 182 | 245 | Peak | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11016.82 | 56.18 | 74.00 | -17.82 | 42.66 | 9.68 | 38.50 | 34.66 | 179 | 241 | Peak | VERTICAL |
| 2 | 11024.14 | 42.97 | 54.00 | -11.03 | 29.45 | 9.68 | 38.50 | 34.66 | 179 | 241 | Average | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT40 CH 110 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11095.01 | 56.91 | 74.00 | -17.09 | 43.39 | 9.67 | 38.50 | 34.65 | 186 | 271 | Peak | HORIZONTAL |
| 2 | 11104.37 | 42.97 | 54.00 | -11.03 | 29.45 | 9.67 | 38.50 | 34.65 | 186 | 271 | Average | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11097.11 | 55.85 | 74.00 | -18.15 | 42.33 | 9.67 | 38.50 | 34.65 | 184 | 267 | Peak | VERTICAL |
| 2 | 11099.07 | 43.03 | 54.00 | -10.97 | 29.51 | 9.67 | 38.50 | 34.65 | 184 | 267 | Average | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT40 CH 134 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11344.59 | 43.22 | 54.00 | -10.78 | 29.71 | 9.64 | 38.50 | 34.63 | 183 | 292 | Average | HORIZONTAL |
| 2 | 11344.95 | 57.35 | 74.00 | -16.65 | 43.84 | 9.64 | 38.50 | 34.63 | 183 | 292 | Peak | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11337.99 | 56.18 | 74.00 | -17.82 | 42.67 | 9.64 | 38.50 | 34.63 | 185 | 281 | Peak | VERTICAL |
| 2 | 11344.44 | 43.05 | 54.00 | -10.95 | 29.54 | 9.64 | 38.50 | 34.63 | 185 | 281 | Average | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT80 CH 58 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 15871.98 | 46.33 | 54.00 | -7.67 | 31.35 | 11.31 | 38.61 | 34.94 | 176 | 284 | Average | HORIZONTAL |
| 2 | 15874.34 | 60.00 | 74.00 | -14.00 | 44.95 | 11.32 | 38.67 | 34.94 | 176 | 284 | Peak | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 15871.66 | 59.02 | 74.00 | -14.98 | 44.04 | 11.31 | 38.61 | 34.94 | 178 | 297 | Peak | VERTICAL |
| 2 | 15874.05 | 46.66 | 54.00 | -7.34 | 31.61 | 11.32 | 38.67 | 34.94 | 178 | 297 | Average | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT80 CH 106 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11057.95 | 56.14 | 74.00 | -17.86 | 42.62 | 9.68 | 38.50 | 34.66 | 177 | 274 | Peak | HORIZONTAL |
| 2 | 11064.53 | 43.10 | 54.00 | -10.90 | 29.59 | 9.67 | 38.50 | 34.66 | 177 | 274 | Average | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11061.59 | 55.96 | 74.00 | -18.04 | 42.45 | 9.67 | 38.50 | 34.66 | 182 | 281 | Peak | VERTICAL |
| 2 | 11064.25 | 42.74 | 54.00 | -11.26 | 29.23 | 9.67 | 38.50 | 34.66 | 182 | 281 | Average | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT80 CH 122 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11218.42 | 56.22 | 74.00 | -17.78 | 42.70 | 9.66 | 38.50 | 34.64 | 179 | 271 | Peak | HORIZONTAL |
| 2 | 11221.11 | 42.62 | 54.00 | -11.38 | 29.11 | 9.65 | 38.50 | 34.64 | 179 | 271 | Average | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11223.47 | 42.55 | 54.00 | -11.45 | 29.04 | 9.65 | 38.50 | 34.64 | 175 | 268 | Average | VERTICAL |
| 2 | 11224.21 | 55.60 | 74.00 | -18.40 | 42.09 | 9.65 | 38.50 | 34.64 | 175 | 268 | Peak | VERTICAL |

**Straddle Channel**

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11a CH 144 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11439.90 | 50.43 | 54.00 | -3.57 | 36.92 | 9.63 | 38.50 | 34.62 | 194 | 220 | Average | HORIZONTAL |
| 2 | 11441.30 | 63.49 | 74.00 | -10.51 | 49.98 | 9.63 | 38.50 | 34.62 | 194 | 220 | Peak | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11439.00 | 53.79 | 54.00 | -0.21 | 40.28 | 9.63 | 38.50 | 34.62 | 199 | 264 | Average | VERTICAL |
| 2 | 11443.90 | 66.78 | 74.00 | -7.22 | 53.27 | 9.63 | 38.50 | 34.62 | 199 | 264 | Peak | VERTICAL |

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT20 CH 144 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11438.60 | 63.76 | 74.00 | -10.24 | 50.25 | 9.63 | 38.50 | 34.62 | 194 | 217 | Peak | HORIZONTAL |
| 2 | 11439.00 | 51.14 | 54.00 | -2.86 | 37.63 | 9.63 | 38.50 | 34.62 | 194 | 217 | Average | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11437.60 | 66.00 | 74.00 | -8.00 | 52.49 | 9.63 | 38.50 | 34.62 | 188 | 276 | Peak | VERTICAL |
| 2 | 11437.60 | 53.78 | 54.00 | -0.22 | 40.27 | 9.63 | 38.50 | 34.62 | 188 | 276 | Average | VERTICAL |

| Temperature | 22℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT40 CH 142 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11416.60 | 64.51 | 74.00 | -9.49 | 51.01 | 9.63 | 38.50 | 34.63 | 194 | 219 | Peak | HORIZONTAL |
| 2 | 11419.00 | 51.86 | 54.00 | -2.14 | 38.36 | 9.63 | 38.50 | 34.63 | 194 | 219 | Average | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11419.40 | 53.90 | 54.00 | -0.10 | 40.40 | 9.63 | 38.50 | 34.63 | 194 | 360 | Average | VERTICAL |
| 2 | 11420.60 | 66.41 | 74.00 | -7.59 | 52.91 | 9.63 | 38.50 | 34.63 | 194 | 360 | Peak | VERTICAL |

| Temperature | 22℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT80 CH 138 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 18, 2016 | | |

***Horizontal***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11377.86 | 46.92 | 54.00 | -7.08 | 33.42 | 9.63 | 38.50 | 34.63 | 175 | 264 | Average | HORIZONTAL |
| 2 | 11378.48 | 59.84 | 74.00 | -14.16 | 46.34 | 9.63 | 38.50 | 34.63 | 175 | 264 | Peak | HORIZONTAL |

***Vertical***

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 11378.21 | 59.77 | 74.00 | -14.23 | 46.27 | 9.63 | 38.50 | 34.63 | 177 | 265 | Peak | VERTICAL |
| 2 | 11381.63 | 46.71 | 54.00 | -7.29 | 33.21 | 9.63 | 38.50 | 34.63 | 177 | 265 | Average | VERTICAL |

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

## 4.6. Band Edge Emissions Measurement

### 4.6.1. Limit

For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

### 4.6.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | 100 MHz |
| RBW / VBW (Emission in restricted band) | 1MHz / 3MHz for Peak,<br>1MHz / 1/T for Average |
| RBW / VBW (Emission in non-restricted band) | 1MHz / 3MHz for Peak |

### 4.6.3. Test Procedures

1. The test procedure is the same as section 4.5.3.

### 4.6.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.5.4.

### 4.6.5. Test Deviation

There is no deviation with the original standard.

### 4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 4.6.7. Test Result of Band Edge and Fundamental Emissions

| Temperature | 22℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11a CH 52, 60, 64 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

**Channel 52**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5149.00 | 59.72 | 74.00 | -14.28 | 52.98 | 7.90 | 33.31 | 34.47 | 252 | 279 | Peak | VERTICAL |
| 2 | 5150.00 | 47.10 | 54.00 | -6.90 | 40.36 | 7.90 | 33.31 | 34.47 | 252 | 279 | Average | VERTICAL |
| 3 | 5261.00 | 118.54 | | | 111.61 | 7.94 | 33.46 | 34.47 | 252 | 279 | Peak | VERTICAL |
| 4 | 5266.00 | 108.68 | | | 101.74 | 7.93 | 33.48 | 34.47 | 252 | 279 | Average | VERTICAL |
| 5 | 5350.00 | 61.95 | 74.00 | -12.05 | 54.94 | 7.89 | 33.59 | 34.47 | 252 | 279 | Peak | VERTICAL |
| 6 | 5351.00 | 48.85 | 54.00 | -5.15 | 41.84 | 7.89 | 33.59 | 34.47 | 252 | 279 | Average | VERTICAL |

Item 3, 4 are the fundamental frequency at 5260 MHz.

**Channel 60**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5296.00 | 118.48 | | | 111.52 | 7.91 | 33.52 | 34.47 | 246 | 278 | Peak | VERTICAL |
| 2 | 5306.00 | 108.71 | | | 101.75 | 7.91 | 33.52 | 34.47 | 246 | 278 | Average | VERTICAL |
| 3 | 5350.00 | 68.25 | 74.00 | -5.75 | 61.24 | 7.89 | 33.59 | 34.47 | 246 | 278 | Peak | VERTICAL |
| 4 | 5351.00 | 53.70 | 54.00 | -0.30 | 46.69 | 7.89 | 33.59 | 34.47 | 246 | 278 | Average | VERTICAL |

Item 1, 2 are the fundamental frequency at 5300 MHz.

**Channel 64**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5316.40 | 117.30 | | | 110.31 | 7.91 | 33.55 | 34.47 | 248 | 276 | Peak | VERTICAL |
| 2 | 5326.40 | 106.78 | | | 99.78 | 7.90 | 33.57 | 34.47 | 248 | 276 | Average | VERTICAL |
| 3 | 5350.80 | 53.93 | 54.00 | -0.07 | 46.92 | 7.89 | 33.59 | 34.47 | 248 | 276 | Average | VERTICAL |
| 4 | 5351.20 | 69.28 | 74.00 | -4.72 | 62.27 | 7.89 | 33.59 | 34.47 | 248 | 276 | Peak | VERTICAL |

Item 1, 2 are the fundamental frequency at 5320 MHz.

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11a CH 100, 116, 140 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

**Channel 100**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5458.80 | 63.49 | 74.00 | -10.51 | 56.33 | 7.89 | 33.74 | 34.47 | 256 | 273 | Peak | VERTICAL |
| 2 | 5458.80 | 48.98 | 54.00 | -5.02 | 41.82 | 7.89 | 33.74 | 34.47 | 256 | 273 | Average | VERTICAL |
| 3 | 5468.80 | 71.19 | 74.00 | -2.81 | 64.00 | 7.90 | 33.76 | 34.47 | 256 | 273 | Peak | VERTICAL |
| 4 | 5468.80 | 53.78 | 54.00 | -0.22 | 46.59 | 7.90 | 33.76 | 34.47 | 256 | 273 | Average | VERTICAL |
| 5 | 5503.60 | 116.13 | | | 108.89 | 7.91 | 33.80 | 34.47 | 256 | 273 | Peak | VERTICAL |
| 6 | 5504.00 | 106.03 | | | 98.79 | 7.91 | 33.80 | 34.47 | 256 | 273 | Average | VERTICAL |

Item 5, 6 are the fundamental frequency at 5500 MHz.

**Channel 116**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5456.00 | 61.62 | 74.00 | -12.38 | 54.46 | 7.89 | 33.74 | 34.47 | 244 | 282 | Peak | VERTICAL |
| 2 | 5460.00 | 48.71 | 54.00 | -5.29 | 41.55 | 7.89 | 33.74 | 34.47 | 244 | 282 | Average | VERTICAL |
| 3 | 5468.00 | 60.86 | 74.00 | -13.14 | 53.67 | 7.90 | 33.76 | 34.47 | 244 | 282 | Peak | VERTICAL |
| 4 | 5470.00 | 48.75 | 54.00 | -5.25 | 41.56 | 7.90 | 33.76 | 34.47 | 244 | 282 | Average | VERTICAL |
| 5 | 5574.00 | 118.88 | | | 111.42 | 7.94 | 34.00 | 34.48 | 244 | 282 | Peak | VERTICAL |
| 6 | 5574.00 | 108.67 | | | 101.21 | 7.94 | 34.00 | 34.48 | 244 | 282 | Average | VERTICAL |
| 7 | 5725.00 | 48.12 | 54.00 | -5.88 | 40.26 | 7.87 | 34.50 | 34.51 | 244 | 282 | Average | VERTICAL |
| 8 | 5727.00 | 60.30 | 74.00 | -13.70 | 52.45 | 7.87 | 34.50 | 34.52 | 244 | 282 | Peak | VERTICAL |

Item 5, 6 are the fundamental frequency at 5580 MHz.

**Channel 140**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5696.00 | 102.79 | | | 95.01 | 7.89 | 34.40 | 34.51 | 252 | 283 | Average | VERTICAL |
| 2 | 5706.00 | 112.56 | | | 104.74 | 7.88 | 34.45 | 34.51 | 252 | 283 | Peak | VERTICAL |
| 3 | 5725.60 | 53.95 | 54.00 | -0.05 | 46.09 | 7.87 | 34.50 | 34.51 | 252 | 283 | Average | VERTICAL |
| 4 | 5726.40 | 67.85 | 74.00 | -6.15 | 60.00 | 7.87 | 34.50 | 34.52 | 252 | 283 | Peak | VERTICAL |

Item 1, 2 are the fundamental frequency at 5700 MHz.

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT20 CH 52, 60, 64 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

**Channel 52**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5146.00 | 59.89 | 74.00 | -14.11 | 53.15 | 7.90 | 33.31 | 34.47 | 250 | 277 | Peak | VERTICAL |
| 2 | 5150.00 | 46.87 | 54.00 | -7.13 | 40.13 | 7.90 | 33.31 | 34.47 | 250 | 277 | Average | VERTICAL |
| 3 | 5263.00 | 119.68 | | | 112.74 | 7.93 | 33.48 | 34.47 | 250 | 277 | Peak | VERTICAL |
| 4 | 5265.00 | 109.31 | | | 102.37 | 7.93 | 33.48 | 34.47 | 250 | 277 | Average | VERTICAL |
| 5 | 5350.00 | 60.20 | 74.00 | -13.80 | 53.19 | 7.89 | 33.59 | 34.47 | 250 | 277 | Peak | VERTICAL |
| 6 | 5350.00 | 48.16 | 54.00 | -5.84 | 41.15 | 7.89 | 33.59 | 34.47 | 250 | 277 | Average | VERTICAL |

Item 3, 4 are the fundamental frequency at 5260 MHz.

**Channel 60**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5293.00 | 118.86 | | | 111.90 | 7.91 | 33.52 | 34.47 | 271 | 276 | Peak | VERTICAL |
| 2 | 5293.00 | 108.74 | | | 101.78 | 7.91 | 33.52 | 34.47 | 271 | 276 | Average | VERTICAL |
| 3 | 5351.00 | 53.78 | 54.00 | -0.22 | 46.77 | 7.89 | 33.59 | 34.47 | 271 | 276 | Average | VERTICAL |
| 4 | 5357.00 | 69.00 | 74.00 | -5.00 | 61.98 | 7.88 | 33.61 | 34.47 | 271 | 276 | Peak | VERTICAL |

Item 1, 2 are the fundamental frequency at 5300 MHz.

**Channel 64**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5314.40 | 116.93 | | | 109.94 | 7.91 | 33.55 | 34.47 | 247 | 278 | Peak | VERTICAL |
| 2 | 5314.80 | 104.25 | | | 97.26 | 7.91 | 33.55 | 34.47 | 247 | 278 | Average | VERTICAL |
| 3 | 5351.20 | 53.88 | 54.00 | -0.12 | 46.87 | 7.89 | 33.59 | 34.47 | 247 | 278 | Average | VERTICAL |
| 4 | 5353.20 | 72.03 | 74.00 | -1.97 | 65.02 | 7.89 | 33.59 | 34.47 | 247 | 278 | Peak | VERTICAL |

Item 1, 2 are the fundamental frequency at 5320 MHz.

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT20 CH 100, 116, 140 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

**Channel 100**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5454.80 | 63.47 | 74.00 | -10.53 | 56.31 | 7.89 | 33.74 | 34.47 | 256 | 278 | Peak | VERTICAL |
| 2 | 5460.00 | 49.70 | 54.00 | -4.30 | 42.54 | 7.89 | 33.74 | 34.47 | 256 | 278 | Average | VERTICAL |
| 3 | 5469.60 | 68.58 | 74.00 | -5.42 | 61.39 | 7.90 | 33.76 | 34.47 | 256 | 278 | Peak | VERTICAL |
| 4 | 5470.00 | 53.37 | 54.00 | -0.63 | 46.18 | 7.90 | 33.76 | 34.47 | 256 | 278 | Average | VERTICAL |
| 5 | 5494.40 | 106.42 | | | 99.21 | 7.90 | 33.78 | 34.47 | 256 | 278 | Average | VERTICAL |
| 6 | 5495.20 | 115.93 | | | 108.69 | 7.91 | 33.80 | 34.47 | 256 | 278 | Peak | VERTICAL |

Item 5, 6 are the fundamental frequency at 5500 MHz.

**Channel 116**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5450.00 | 61.67 | 74.00 | -12.33 | 54.51 | 7.89 | 33.74 | 34.47 | 249 | 276 | Peak | VERTICAL |
| 2 | 5460.00 | 48.62 | 54.00 | -5.38 | 41.46 | 7.89 | 33.74 | 34.47 | 249 | 276 | Average | VERTICAL |
| 3 | 5463.00 | 61.19 | 74.00 | -12.81 | 54.03 | 7.89 | 33.74 | 34.47 | 249 | 276 | Peak | VERTICAL |
| 4 | 5470.00 | 48.97 | 54.00 | -5.03 | 41.78 | 7.90 | 33.76 | 34.47 | 249 | 276 | Average | VERTICAL |
| 5 | 5575.00 | 108.55 | | | 101.09 | 7.94 | 34.00 | 34.48 | 249 | 276 | Average | VERTICAL |
| 6 | 5576.00 | 119.01 | | | 111.50 | 7.94 | 34.05 | 34.48 | 249 | 276 | Peak | VERTICAL |
| 7 | 5727.00 | 48.06 | 54.00 | -5.94 | 40.21 | 7.87 | 34.50 | 34.52 | 249 | 276 | Average | VERTICAL |
| 8 | 5734.00 | 61.37 | 74.00 | -12.63 | 53.52 | 7.87 | 34.50 | 34.52 | 249 | 276 | Peak | VERTICAL |

Item 5, 6 are the fundamental frequency at 5580 MHz.

**Channel 140**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5704.40 | 112.75 | | | 104.97 | 7.89 | 34.40 | 34.51 | 235 | 291 | Peak | VERTICAL |
| 2 | 5706.00 | 102.52 | | | 94.70 | 7.88 | 34.45 | 34.51 | 235 | 291 | Average | VERTICAL |
| 3 | 5725.00 | 53.49 | 54.00 | -0.51 | 45.63 | 7.87 | 34.50 | 34.51 | 235 | 291 | Average | VERTICAL |
| 4 | 5726.00 | 69.81 | 74.00 | -4.19 | 61.95 | 7.87 | 34.50 | 34.51 | 235 | 291 | Peak | VERTICAL |

Item 1, 2 are the fundamental frequency at 5700 MHz.

| Temperature | 22℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT40 CH 54, 62 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

**Channel 54**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5266.00 | 114.65 | | | 107.71 | 7.93 | 33.48 | 34.47 | 254 | 281 | Peak | VERTICAL |
| 2 | 5285.00 | 105.53 | | | 98.58 | 7.92 | 33.50 | 34.47 | 254 | 281 | Average | VERTICAL |
| 3 | 5350.00 | 53.74 | 54.00 | -0.26 | 46.73 | 7.89 | 33.59 | 34.47 | 254 | 281 | Average | VERTICAL |
| 4 | 5365.00 | 66.31 | 74.00 | -7.69 | 59.29 | 7.88 | 33.61 | 34.47 | 254 | 281 | Peak | VERTICAL |

Item 1, 2 are the fundamental frequency at 5270 MHz.

**Channel 62**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5314.00 | 112.51 | | | 105.52 | 7.91 | 33.55 | 34.47 | 246 | 277 | Peak | VERTICAL |
| 2 | 5315.00 | 101.36 | | | 94.37 | 7.91 | 33.55 | 34.47 | 246 | 277 | Average | VERTICAL |
| 3 | 5350.00 | 66.65 | 74.00 | -7.35 | 59.64 | 7.89 | 33.59 | 34.47 | 246 | 277 | Peak | VERTICAL |
| 4 | 5351.00 | 53.63 | 54.00 | -0.37 | 46.62 | 7.89 | 33.59 | 34.47 | 246 | 277 | Average | VERTICAL |

Item 1, 2 are the fundamental frequency at 5310 MHz.

| Temperature | 22°C | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT40 CH 102, 110, 134 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

**Channel 102**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5452.00 | 48.42 | 54.00 | -5.58 | 41.26 | 7.89 | 33.74 | 34.47 | 192 | 313 | Average | HORIZONTAL |
| 2 | 5455.00 | 60.39 | 74.00 | -13.61 | 53.23 | 7.89 | 33.74 | 34.47 | 192 | 313 | Peak | HORIZONTAL |
| 3 | 5469.00 | 67.54 | 74.00 | -6.46 | 60.35 | 7.90 | 33.76 | 34.47 | 192 | 313 | Peak | HORIZONTAL |
| 4 | 5470.00 | 53.97 | 54.00 | -0.03 | 46.78 | 7.90 | 33.76 | 34.47 | 192 | 313 | Average | HORIZONTAL |
| 5 | 5511.00 | 95.76 | | | 88.52 | 7.91 | 33.80 | 34.47 | 192 | 313 | Average | HORIZONTAL |
| 6 | 5512.00 | 105.22 | | | 97.92 | 7.92 | 33.85 | 34.47 | 192 | 313 | Peak | HORIZONTAL |

Item 5, 6 are the fundamental frequency at 5510 MHz.

**Channel 110**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5453.00 | 64.74 | 74.00 | -9.26 | 57.58 | 7.89 | 33.74 | 34.47 | 253 | 288 | Peak | VERTICAL |
| 2 | 5455.00 | 51.44 | 54.00 | -2.56 | 44.28 | 7.89 | 33.74 | 34.47 | 253 | 288 | Average | VERTICAL |
| 3 | 5470.00 | 68.49 | 74.00 | -5.51 | 61.30 | 7.90 | 33.76 | 34.47 | 253 | 288 | Peak | VERTICAL |
| 4 | 5470.00 | 53.56 | 54.00 | -0.44 | 46.37 | 7.90 | 33.76 | 34.47 | 253 | 288 | Average | VERTICAL |
| 5 | 5552.00 | 114.35 | | | 106.95 | 7.93 | 33.95 | 34.48 | 253 | 288 | Peak | VERTICAL |
| 6 | 5553.00 | 104.83 | | | 97.43 | 7.93 | 33.95 | 34.48 | 253 | 288 | Average | VERTICAL |

Item 5, 6 are the fundamental frequency at 5550 MHz.

**Channel 134**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5661.00 | 109.87 | | | 102.16 | 7.91 | 34.30 | 34.50 | 263 | 298 | Peak | VERTICAL |
| 2 | 5662.00 | 101.26 | | | 93.55 | 7.91 | 34.30 | 34.50 | 263 | 298 | Average | VERTICAL |
| 3 | 5725.00 | 65.08 | 74.00 | -8.92 | 57.22 | 7.87 | 34.50 | 34.51 | 263 | 298 | Peak | VERTICAL |
| 4 | 5725.00 | 53.53 | 54.00 | -0.47 | 45.67 | 7.87 | 34.50 | 34.51 | 263 | 298 | Average | VERTICAL |

Item 1, 2 are the fundamental frequency at 5670 MHz.

| Temperature | 22℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT80 CH 58 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016 | | |

**Channel 58**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5145.00 | 58.82 | 74.00 | -15.18 | 52.08 | 7.90 | 33.31 | 34.47 | 249 | 282 | Peak | VERTICAL |
| 2 | 5149.00 | 47.35 | 54.00 | -6.65 | 40.61 | 7.90 | 33.31 | 34.47 | 249 | 282 | Average | VERTICAL |
| 3 | 5299.00 | 105.97 | | | 99.01 | 7.91 | 33.52 | 34.47 | 249 | 282 | Peak | VERTICAL |
| 4 | 5325.00 | 95.40 | | | 88.40 | 7.90 | 33.57 | 34.47 | 249 | 282 | Average | VERTICAL |
| 5 | 5350.00 | 68.97 | 74.00 | -5.03 | 61.96 | 7.89 | 33.59 | 34.47 | 249 | 282 | Peak | VERTICAL |
| 6 | 5350.00 | 53.54 | 54.00 | -0.46 | 46.53 | 7.89 | 33.59 | 34.47 | 249 | 282 | Average | VERTICAL |

Item 3, 4 are the fundamental frequency at 5290 MHz.

| Temperature | 22℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT80 CH 106, 122 / Ant. 3 + Ant. 4 |
| Test Date | Jul. 15, 2016~Jul. 16, 2016 | | |

**Channel 106**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5454.00 | 65.83 | 74.00 | -8.17 | 58.67 | 7.89 | 33.74 | 34.47 | 256 | 280 | Peak | VERTICAL |
| 2 | 5455.00 | 53.71 | 54.00 | -0.29 | 46.55 | 7.89 | 33.74 | 34.47 | 256 | 280 | Average | VERTICAL |
| 3 | 5470.00 | 68.31 | 74.00 | -5.69 | 61.12 | 7.90 | 33.76 | 34.47 | 256 | 280 | Peak | VERTICAL |
| 4 | 5470.00 | 53.35 | 54.00 | -0.65 | 46.16 | 7.90 | 33.76 | 34.47 | 256 | 280 | Average | VERTICAL |
| 5 | 5515.00 | 95.67 | | | 88.37 | 7.92 | 33.85 | 34.47 | 256 | 280 | Average | VERTICAL |
| 6 | 5517.00 | 105.75 | | | 98.45 | 7.92 | 33.85 | 34.47 | 256 | 280 | Peak | VERTICAL |
| 7 | 5725.00 | 48.20 | 54.00 | -5.80 | 40.34 | 7.87 | 34.50 | 34.51 | 256 | 280 | Average | VERTICAL |
| 8 | 5728.00 | 60.42 | 74.00 | -13.58 | 52.57 | 7.87 | 34.50 | 34.52 | 256 | 280 | Peak | VERTICAL |

Item 5, 6 are the fundamental frequency at 5530 MHz.

**Channel 122**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5673.00 | 98.64 | | | 90.90 | 7.90 | 34.35 | 34.51 | 254 | 285 | Average | VERTICAL |
| 2 | 5676.00 | 109.60 | | | 101.86 | 7.90 | 34.35 | 34.51 | 254 | 285 | Peak | VERTICAL |
| 3 | 5851.00 | 68.79 | 74.00 | -5.21 | 60.68 | 7.80 | 34.85 | 34.54 | 254 | 285 | Peak | VERTICAL |
| 4 | 5852.00 | 53.06 | 54.00 | -0.94 | 44.95 | 7.80 | 34.85 | 34.54 | 254 | 285 | Average | VERTICAL |

Item 1, 2 are the fundamental frequency at 5610 MHz.

**Straddle Channel**

| Temperature | 22℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11a CH 144 / Ant. 3 + Ant. 4 |
| Test Date | Aug. 09, 2016~Aug. 10, 2016 | | |

**Channel 144 (UNII 2C)**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5458.80 | 60.38 | 74.00 | -13.62 | 53.18 | 8.33 | 31.75 | 32.88 | 283 | 291 | Peak | VERTICAL |
| 2 | 5460.00 | 47.06 | 54.00 | -6.94 | 39.86 | 8.33 | 31.75 | 32.88 | 283 | 291 | Average | VERTICAL |
| 3 | 5470.00 | 47.28 | 54.00 | -6.72 | 40.05 | 8.33 | 31.77 | 32.87 | 283 | 291 | Average | VERTICAL |
| 4 | 5470.00 | 59.39 | 74.00 | -14.61 | 52.16 | 8.33 | 31.77 | 32.87 | 283 | 291 | Peak | VERTICAL |
| 5 0 | 5712.80 | 106.70 | | | 98.71 | 8.82 | 32.06 | 32.89 | 283 | 291 | Average | VERTICAL |
| 6 0 | 5723.60 | 116.71 | | | 108.62 | 8.90 | 32.08 | 32.89 | 283 | 291 | Peak | VERTICAL |
| 7 | 5850.00 | 48.10 | 54.00 | -5.90 | 39.81 | 8.98 | 32.22 | 32.91 | 283 | 291 | Average | VERTICAL |
| 8 | 5850.00 | 59.64 | 74.00 | -14.36 | 51.35 | 8.98 | 32.22 | 32.91 | 283 | 291 | Peak | VERTICAL |

Item 5, 6 are the fundamental frequency at 5720 MHz.

**Channel 144 (UNII 3)**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5712.80 | 106.70 | | | 98.71 | 8.82 | 32.06 | 32.89 | 283 | 291 | Average | VERTICAL |
| 2 | 5723.60 | 116.71 | | | 108.62 | 8.90 | 32.08 | 32.89 | 283 | 291 | Peak | VERTICAL |
| 3 | 5937.20 | 62.27 | 68.20 | -5.93 | 54.22 | 8.64 | 32.32 | 32.91 | 283 | 291 | Peak | VERTICAL |

Item 1, 2 are the fundamental frequency at 5720 MHz.

| Temperature | 22℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT20 CH 144 / Ant. 3 + Ant. 4 |
| Test Date | Aug. 09, 2016~Aug. 10, 2016 | | |

**Channel 144 (UNII 2C)**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5458.80 | 59.39 | 74.00 | -14.61 | 52.19 | 8.33 | 31.75 | 32.88 | 280 | 282 | Peak | VERTICAL |
| 2 | 5460.00 | 46.82 | 54.00 | -7.18 | 39.62 | 8.33 | 31.75 | 32.88 | 280 | 282 | Average | VERTICAL |
| 3 | 5465.20 | 59.90 | 74.00 | -14.10 | 52.68 | 8.33 | 31.77 | 32.88 | 280 | 282 | Peak | VERTICAL |
| 4 | 5470.00 | 47.00 | 54.00 | -7.00 | 39.77 | 8.33 | 31.77 | 32.87 | 280 | 282 | Average | VERTICAL |
| 5 0 | 5714.00 | 105.89 | | | 97.90 | 8.82 | 32.06 | 32.89 | 280 | 282 | Average | VERTICAL |
| 6 0 | 5715.20 | 116.29 | | | 108.30 | 8.82 | 32.06 | 32.89 | 280 | 282 | Peak | VERTICAL |
| 7 | 5850.00 | 47.76 | 54.00 | -6.24 | 39.47 | 8.98 | 32.22 | 32.91 | 280 | 282 | Average | VERTICAL |
| 8 | 5850.00 | 59.79 | 74.00 | -14.21 | 51.50 | 8.98 | 32.22 | 32.91 | 280 | 282 | Peak | VERTICAL |

Item 5, 6 are the fundamental frequency at 5720 MHz.

**Channel 144 (UNII 3)**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5714.00 | 105.89 | | | 97.90 | 8.82 | 32.06 | 32.89 | 280 | 282 | Average | VERTICAL |
| 2 0 | 5715.20 | 116.29 | | | 108.30 | 8.82 | 32.06 | 32.89 | 280 | 282 | Peak | VERTICAL |
| 3 | 5934.80 | 60.79 | 68.20 | -7.41 | 52.74 | 8.64 | 32.32 | 32.91 | 280 | 282 | Peak | VERTICAL |

Item 1, 2 are the fundamental frequency at 5720 MHz.

| Temperature | 22℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT40 CH 142 / Ant. 3 + Ant. 4 |
| Test Date | Aug. 09, 2016~Aug. 10, 2016 | | |

**Channel 142 (UNII 2C)**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5442.40 | 61.19 | 74.00 | -12.81 | 53.99 | 8.34 | 31.74 | 32.88 | 250 | 297 | Peak | VERTICAL |
| 2 | 5460.00 | 48.76 | 54.00 | -5.24 | 41.56 | 8.33 | 31.75 | 32.88 | 250 | 297 | Average | VERTICAL |
| 3 | 5470.00 | 48.66 | 54.00 | -5.34 | 41.43 | 8.33 | 31.77 | 32.87 | 250 | 297 | Average | VERTICAL |
| 4 | 5470.00 | 58.83 | 74.00 | -15.17 | 51.60 | 8.33 | 31.77 | 32.87 | 250 | 297 | Peak | VERTICAL |
| 5 0 | 5701.60 | 113.32 | | | 105.42 | 8.75 | 32.04 | 32.89 | 250 | 297 | Peak | VERTICAL |
| 6 0 | 5704.00 | 104.22 | | | 96.32 | 8.75 | 32.04 | 32.89 | 250 | 297 | Average | VERTICAL |
| 7 | 5850.00 | 53.54 | 54.00 | -0.46 | 45.25 | 8.98 | 32.22 | 32.91 | 250 | 297 | Average | VERTICAL |
| 8 | 5854.00 | 68.50 | 74.00 | -5.50 | 60.21 | 8.98 | 32.22 | 32.91 | 250 | 297 | Peak | VERTICAL |

Item 5, 6 are the fundamental frequency at 5710 MHz.

**Channel 142 (UNII 3)**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 0 | 5701.60 | 113.32 | | | 105.42 | 8.75 | 32.04 | 32.89 | 250 | 297 | Peak | VERTICAL |
| 2 | 5704.00 | 104.22 | | | 96.32 | 8.75 | 32.04 | 32.89 | 250 | 297 | Average | VERTICAL |
| 3 | 5960.80 | 61.44 | 68.20 | -6.76 | 53.49 | 8.51 | 32.36 | 32.92 | 250 | 297 | Peak | VERTICAL |

Item 1, 2 are the fundamental frequency at 5710 MHz.

| Temperature | 22℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | John Tang | Configurations | IEEE 802.11ac MCS0/Nss1 VHT80 CH 138 / Ant. 3 + Ant. 4 |
| Test Date | Aug. 09, 2016~Aug. 10, 2016 | | |

**Channel 138 (UNII 2C)**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 5432.00 | 47.50 | 54.00 | -6.50 | 40.32 | 8.34 | 31.72 | 32.88 | 320 | 270 | Average | VERTICAL |
| 2 | 5439.20 | 60.58 | 74.00 | -13.42 | 53.38 | 8.34 | 31.74 | 32.88 | 320 | 270 | Peak | VERTICAL |
| 3 | 5470.00 | 47.70 | 54.00 | -6.30 | 40.47 | 8.33 | 31.77 | 32.87 | 320 | 270 | Average | VERTICAL |
| 4 | 5470.00 | 61.94 | 74.00 | -12.06 | 54.71 | 8.33 | 31.77 | 32.87 | 320 | 270 | Peak | VERTICAL |
| 5 0 | 5673.20 | 98.67 | | | 90.86 | 8.68 | 32.02 | 32.89 | 320 | 270 | Average | VERTICAL |
| 6 0 | 5675.60 | 109.60 | | | 101.79 | 8.68 | 32.02 | 32.89 | 320 | 270 | Peak | VERTICAL |
| 7 | 5852.00 | 53.59 | 54.00 | -0.41 | 45.30 | 8.98 | 32.22 | 32.91 | 320 | 270 | Average | VERTICAL |
| 8 | 5853.20 | 68.87 | 74.00 | -5.13 | 60.58 | 8.98 | 32.22 | 32.91 | 320 | 270 | Peak | VERTICAL |

Item 5, 6 are the fundamental frequency at 5690 MHz.

**Channel 138 (UNII 3)**

| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 0 | 5668.40 | 94.26 | | | 86.55 | 8.60 | 32.00 | 32.89 | 175 | 63 | Average | HORIZONTAL |
| 2 0 | 5679.20 | 107.27 | | | 99.46 | 8.68 | 32.02 | 32.89 | 175 | 63 | Peak | HORIZONTAL |
| 3 | 5954.40 | 61.56 | 68.20 | -6.64 | 53.55 | 8.58 | 32.34 | 32.91 | 175 | 63 | Peak | HORIZONTAL |

Item 1, 2 are the fundamental frequency at 5690 MHz.

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

## 4.7. Frequency Stability Measurement

### 4.7.1. Limit

In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification).

### 4.7.2. Measuring Instruments and Setting

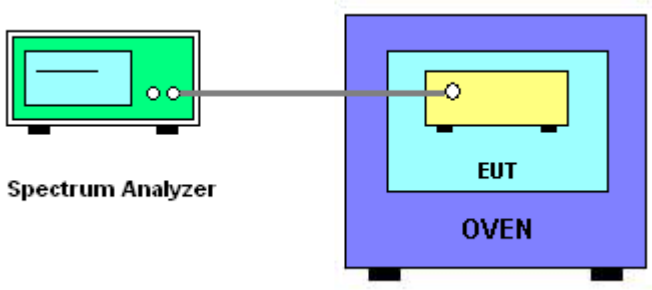
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | Entire absence of modulation emissions bandwidth |
| RBW | 10 kHz |
| VBW | 10 kHz |
| Sweep Time | Auto |

### 4.7.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × $10^6$ ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).
6. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
7. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
8. Extreme temperature is 0°C~45°C.

### 4.7.4. Test Setup Layout



### 4.7.5. Test Deviation

There is no deviation with the original standard.

### 4.7.6. EUT Operation during Test

The EUT was programmed to be in continuously un-modulation transmitting mode.

### 4.7.7. Test Result of Frequency Stability

| Temperature | 24℃ | Humidity | 54% |
|---|---|---|---|
| Test Engineer | Gary Chu | Test Date | Jul. 20, 2016~Jul. 28, 2016 |

**Mode: 20 MHz / Ant. 3**

**Voltage vs. Frequency Stability**

| Voltage | Measurement Frequency (MHz) | | | |
|---|---|---|---|---|
| (V) | 5300 MHz | | | |
| | 0 Minute | 2 Minute | 5 Minute | 10 Minute |
| 126.50 | 5299.9964 | 5299.9961 | 5299.9951 | 5299.9950 |
| 110.00 | 5299.9963 | 5299.9960 | 5299.9956 | 5299.9946 |
| 93.50 | 5299.9953 | 5299.9948 | 5299.9944 | 5299.9943 |
| Max. Deviation (MHz) | 0.0047 | 0.0052 | 0.0056 | 0.0057 |
| Max. Deviation (ppm) | 0.88 | 0.98 | 1.05 | 1.07 |
| Result | Complies | | | |

**Temperature vs. Frequency Stability**

| Temperature | Measurement Frequency (MHz) | | | |
|---|---|---|---|---|
| (℃) | 5300 MHz | | | |
| | 0 Minute | 2 Minute | 5 Minute | 10 Minute |
| 0 | 5299.9948 | 5299.9942 | 5299.9932 | 5299.9928 |
| 10 | 5299.9962 | 5299.9952 | 5299.9943 | 5299.9939 |
| 20 | 5299.9963 | 5299.9954 | 5299.9951 | 5299.9944 |
| 30 | 5299.9968 | 5299.9963 | 5299.9961 | 5299.9958 |
| 40 | 5299.9977 | 5299.9968 | 5299.9966 | 5299.9962 |
| 45 | 5299.9990 | 5299.9983 | 5299.9974 | 5299.9967 |
| Max. Deviation (MHz) | 0.0052 | 0.0058 | 0.0068 | 0.0072 |
| Max. Deviation (ppm) | 0.98 | 1.09 | 1.28 | 1.36 |
| Result | Complies | | | |

**Voltage vs. Frequency Stability**

| Voltage | Measurement Frequency (MHz) | | | |
|---|---|---|---|---|
| (V) | 5580 MHz | | | |
| | 0 Minute | 2 Minute | 5 Minute | 10 Minute |
| 126.50 | 5579.9972 | 5579.9969 | 5579.9965 | 5579.9955 |
| 110.00 | 5579.9963 | 5579.9954 | 5579.9947 | 5579.9941 |
| 93.50 | 5579.9953 | 5579.9950 | 5579.9949 | 5579.9946 |
| Max. Deviation (MHz) | 0.0047 | 0.0050 | 0.0053 | 0.0059 |
| Max. Deviation (ppm) | 0.84 | 0.89 | 0.95 | 1.06 |
| Result | Complies | | | |

**Temperature vs. Frequency Stability**

| Temperature | Measurement Frequency (MHz) | | | |
|---|---|---|---|---|
| (°C) | 5580 MHz | | | |
| | 0 Minute | 2 Minute | 5 Minute | 10 Minute |
| 0 | 5579.9942 | 5579.9941 | 5579.9939 | 5579.9937 |
| 10 | 5579.9947 | 5579.9940 | 5579.9933 | 5579.9928 |
| 20 | 5579.9963 | 5579.9955 | 5579.9946 | 5579.9939 |
| 30 | 5579.9968 | 5579.9958 | 5579.9950 | 5579.9943 |
| 40 | 5579.9984 | 5579.9981 | 5579.9980 | 5579.9979 |
| 45 | 5579.9998 | 5579.9989 | 5579.9985 | 5579.9981 |
| Max. Deviation (MHz) | 0.0058 | 0.0060 | 0.0067 | 0.0072 |
| Max. Deviation (ppm) | 1.04 | 1.07 | 1.20 | 1.29 |
| Result | Complies | | | |

**Mode: 40 MHz / Ant. 3**

**Voltage vs. Frequency Stability**

| Voltage | Measurement Frequency (MHz) | | | |
|---|---|---|---|---|
| (V) | 5310 MHz | | | |
| | 0 Minute | 2 Minute | 5 Minute | 10 Minute |
| 126.50 | 5309.9971 | 5309.9964 | 5309.9961 | 5309.9951 |
| 110.00 | 5309.9963 | 5309.9960 | 5309.9955 | 5309.9953 |
| 93.50 | 5309.9953 | 5309.9947 | 5309.9946 | 5309.9942 |
| Max. Deviation (MHz) | 0.0047 | 0.0053 | 0.0054 | 0.0058 |
| Max. Deviation (ppm) | 0.88 | 1.00 | 1.02 | 1.09 |
| Result | Complies | | | |

**Temperature vs. Frequency Stability**

| Temperature | Measurement Frequency (MHz) | | | |
|---|---|---|---|---|
| (°C) | 5310 MHz | | | |
| | 0 Minute | 2 Minute | 5 Minute | 10 Minute |
| 0 | 5309.9931 | 5309.9924 | 5309.9921 | 5309.9918 |
| 10 | 5309.9946 | 5309.9945 | 5309.9938 | 5309.9928 |
| 20 | 5309.9963 | 5309.9958 | 5309.9949 | 5309.9946 |
| 30 | 5309.9968 | 5309.9960 | 5309.9953 | 5309.9943 |
| 40 | 5309.9983 | 5309.9978 | 5309.9969 | 5309.9963 |
| 45 | 5309.9999 | 5309.9990 | 5309.9985 | 5309.9979 |
| Max. Deviation (MHz) | 0.0069 | 0.0076 | 0.0079 | 0.0082 |
| Max. Deviation (ppm) | 1.30 | 1.43 | 1.49 | 1.54 |
| Result | Complies | | | |

**Voltage vs. Frequency Stability**

| Voltage | Measurement Frequency (MHz) | | | |
|---|---|---|---|---|
| (V) | 5550 MHz | | | |
| | 0 Minute | 2 Minute | 5 Minute | 10 Minute |
| 126.50 | 5549.9971 | 5549.9967 | 5549.9957 | 5549.9954 |
| 110.00 | 5549.9963 | 5549.9960 | 5549.9953 | 5549.9949 |
| 93.50 | 5549.9957 | 5549.9954 | 5549.9944 | 5549.9937 |
| Max. Deviation (MHz) | 0.0043 | 0.0046 | 0.0056 | 0.0063 |
| Max. Deviation (ppm) | 0.77 | 0.83 | 1.01 | 1.13 |
| Result | Complies | | | |

**Temperature vs. Frequency Stability**

| Temperature | Measurement Frequency (MHz) | | | |
|---|---|---|---|---|
| (°C) | 5550 MHz | | | |
| | 0 Minute | 2 Minute | 5 Minute | 10 Minute |
| 0 | 5549.9929 | 5549.9927 | 5549.9920 | 5549.9914 |
| 10 | 5549.9949 | 5549.9945 | 5549.9942 | 5549.9941 |
| 20 | 5549.9963 | 5549.9958 | 5549.9957 | 5549.9955 |
| 30 | 5549.9968 | 5549.9963 | 5549.9962 | 5549.9953 |
| 40 | 5549.9975 | 5549.9967 | 5549.9960 | 5549.9951 |
| 45 | 5549.9981 | 5549.9980 | 5549.9978 | 5549.9975 |
| Max. Deviation (MHz) | 0.0071 | 0.0073 | 0.0080 | 0.0086 |
| Max. Deviation (ppm) | 1.28 | 1.31 | 1.44 | 1.55 |
| Result | Complies | | | |

**Mode: 80 MHz / Ant. 3**

**Voltage vs. Frequency Stability**

| Voltage | Measurement Frequency (MHz) | | | |
|---|---|---|---|---|
| (V) | 5290 MHz | | | |
| | 0 Minute | 2 Minute | 5 Minute | 10 Minute |
| 126.50 | 5289.9971 | 5289.9963 | 5289.9958 | 5289.9948 |
| 110.00 | 5289.9963 | 5289.9961 | 5289.9957 | 5289.9954 |
| 93.50 | 5289.9954 | 5289.9950 | 5289.9941 | 5289.9937 |
| Max. Deviation (MHz) | 0.0046 | 0.0050 | 0.0059 | 0.0063 |
| Max. Deviation (ppm) | 0.87 | 0.94 | 1.11 | 1.19 |
| Result | Complies | | | |

**Temperature vs. Frequency Stability**

| Temperature | Measurement Frequency (MHz) | | | |
|---|---|---|---|---|
| (°C) | 5290 MHz | | | |
| | 0 Minute | 2 Minute | 5 Minute | 10 Minute |
| 0 | 5289.9955 | 5289.9953 | 5289.9948 | 5289.9939 |
| 10 | 5289.9958 | 5289.9950 | 5289.9942 | 5289.9937 |
| 20 | 5289.9963 | 5289.9954 | 5289.9945 | 5289.9944 |
| 30 | 5289.9968 | 5289.9961 | 5289.9957 | 5289.9947 |
| 40 | 5289.9974 | 5289.9964 | 5289.9960 | 5289.9956 |
| 45 | 5289.9989 | 5289.9982 | 5289.9975 | 5289.9971 |
| Max. Deviation (MHz) | 0.0045 | 0.0050 | 0.0058 | 0.0063 |
| Max. Deviation (ppm) | 0.85 | 0.94 | 1.09 | 1.19 |
| Result | Complies | | | |

**Voltage vs. Frequency Stability**

| Voltage | Measurement Frequency (MHz) | | | |
|---|---|---|---|---|
| (V) | 5530 MHz | | | |
| | 0 Minute | 2 Minute | 5 Minute | 10 Minute |
| 126.50 | 5529.9966 | 5529.9957 | 5529.9950 | 5529.9944 |
| 110.00 | 5529.9963 | 5529.9958 | 5529.9953 | 5529.9944 |
| 93.50 | 5529.9954 | 5529.9946 | 5529.9938 | 5529.9933 |
| Max. Deviation (MHz) | 0.0046 | 0.0054 | 0.0062 | 0.0067 |
| Max. Deviation (ppm) | 0.83 | 0.97 | 1.12 | 1.21 |
| Result | Complies | | | |

**Temperature vs. Frequency Stability**

| Temperature | Measurement Frequency (MHz) | | | |
|---|---|---|---|---|
| (°C) | 5530 MHz | | | |
| | 0 Minute | 2 Minute | 5 Minute | 10 Minute |
| 0 | 5529.9926 | 5529.9920 | 5529.9918 | 5529.9910 |
| 10 | 5529.9945 | 5529.9943 | 5529.9936 | 5529.9934 |
| 20 | 5529.9963 | 5529.9954 | 5529.9953 | 5529.9944 |
| 30 | 5529.9968 | 5529.9966 | 5529.9963 | 5529.9960 |
| 40 | 5529.9975 | 5529.9970 | 5529.9962 | 5529.9953 |
| 45 | 5529.9980 | 5529.9974 | 5529.9966 | 5529.9960 |
| Max. Deviation (MHz) | 0.0074 | 0.0080 | 0.0082 | 0.0074 |
| Max. Deviation (ppm) | 1.34 | 1.44 | 1.48 | 1.34 |
| Result | Complies | | | |

## 4.8. Antenna Requirements

### 4.8.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

### 4.8.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

# 5. LIST OF MEASURING EQUIPMENTS

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|---|---|---|---|---|---|---|
| Horn Antenna | EMCO | 3115 | 00075790 | 750MHz ~ 18GHz | Oct. 22, 2015 | Radiation (03CH01-CB) |
| Horn Antenna | Schwarzbeck | BBHA 9170 | BBHA9170252 | 15GHz ~ 40GHz | Jul. 21, 2015 | Radiation (03CH01-CB) |
| Horn Antenna | Schwarzbeck | BBHA 9170 | BBHA9170252 | 15GHz ~ 40GHz | Jul. 25, 2016 | Radiation (03CH01-CB) |
| Pre-Amplifier | Agilent | 8449B | 3008A02310 | 1GHz ~ 26.5GHz | Jan. 18, 2016 | Radiation (03CH01-CB) |
| Pre-Amplifier | WM | TF-130N-R1 | 923365 | 26GHz ~ 40GHz | Nov. 13, 2015 | Radiation (03CH01-CB) |
| Spectrum Analyzer | R&S | FSP40 | 100056 | 9kHz ~ 40GHz | Oct. 27, 2015 | Radiation (03CH01-CB) |
| RF Cable-high | Woken | High Cable-16 | N/A | 1 GHz ~ 18 GHz | Nov. 02, 2015 | Radiation (03CH01-CB) |
| RF Cable-high | Woken | High Cable-17 | N/A | 1 GHz ~ 18 GHz | Nov. 02, 2015 | Radiation (03CH01-CB) |
| RF Cable-high | Woken | High Cable-40G-1 | N/A | 18GHz ~ 40 GHz | Nov. 02, 2015 | Radiation (03CH01-CB) |
| RF Cable-high | Woken | High Cable-40G-2 | N/A | 18GHz ~ 40 GHz | Nov. 02, 2015 | Radiation (03CH01-CB) |
| Test Software | Audix | E3 | 6.2009-l0-7 | N/A | N/A | Radiation (03CH01-CB) |
| Spectrum analyzer | R&S | FSV40 | 100979 | 9kHz~40GHz | Dec. 09, 2015 | Conducted (TH01-CB) |
| Temp. and Humidity Chamber | Ten Billion | TTH-D3SP | TBN-931011 | -30~100 degree | Jun. 03, 2016 | Conducted (TH01-CB) |
| RF Cable-high | Woken | RG402 | High Cable-6 | 1 GHz – 26.5 GHz | Nov. 02, 2015 | Conducted (TH01-CB) |
| RF Cable-high | Woken | RG402 | High Cable-7 | 1 GHz – 26.5 GHz | Nov. 02, 2015 | Conducted (TH01-CB) |
| RF Cable-high | Woken | RG402 | High Cable-8 | 1 GHz – 26.5 GHz | Nov. 02, 2015 | Conducted (TH01-CB) |
| RF Cable-high | Woken | RG402 | High Cable-9 | 1 GHz – 26.5 GHz | Nov. 02, 2015 | Conducted (TH01-CB) |
| RF Cable-high | Woken | RG402 | High Cable-10 | 1 GHz – 26.5 GHz | Nov. 02, 2015 | Conducted (TH01-CB) |
| Power Sensor | Agilent | U2021XA | MY53410001 | 50MHz~18GHz | Nov. 02, 2015 | Conducted (TH01-CB) |

Note: Calibration Interval of instruments listed above is one year.

# 6. MEASUREMENT UNCERTAINTY

| Test Items | Uncertainty | Remark |
|---|---|---|
| Radiated Emission (1GHz ~ 18GHz) | 3.7 dB | Confidence levels of 95% |
| Radiated Emission (18GHz ~ 40GHz) | 3.5 dB | Confidence levels of 95% |
| Conducted Emission | 1.7 dB | Confidence levels of 95% |