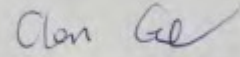


# RF TEST REPORT



Report No.: FCC\_RF\_SL15091701-RUC-034A1\_UNII Rev 1.0  
Supersede Report No.: FCC\_RF\_SL15091701-RUC-034A1\_UNII

|                                                                                                      |   |                                                                           |
|------------------------------------------------------------------------------------------------------|---|---------------------------------------------------------------------------|
| Applicant                                                                                            | : | Ruckus Wireless, Inc.                                                     |
| Product Name                                                                                         | : | ZoneFlex T710 Access Point                                                |
| Model No.                                                                                            | : | T710                                                                      |
| Test Standard                                                                                        | : | 47 CFR 15.407                                                             |
| Test Method                                                                                          | : | ANSI C63.4: 2014<br>789033 D02 General UNII Test Procedures New Rules v01 |
| FCC ID                                                                                               | : | S9GRT710                                                                  |
| IC ID                                                                                                | : | 5912A-T710                                                                |
| Dates of test                                                                                        | : | 11/01/2015 to 11/20/2015                                                  |
| Issue Date                                                                                           | : | 02/09/2016                                                                |
| Test Result                                                                                          | : | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail    |
| Equipment complied with the specification [X]<br>Equipment did not comply with the specification [ ] |   |                                                                           |

| This Test Report is Issued Under the Authority of:                                                                                   |                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                                   |  |
| <b>Gary Chou</b>                                                                                                                     | <b>Chen Ge</b>                                                                       |
| Test Engineer                                                                                                                        | Engineer Reviewer                                                                    |
| This test report may be reproduced in full only<br>Test result presented in this test report is applicable to the tested sample only |                                                                                      |

Issued By:  
SIEMIC Laboratories  
775 Montague Expressway, Milpitas, 95035 CA



775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088

Visit us at: [www.siemic.com](http://www.siemic.com); Follow us at:



## Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

### Accreditations for Conformity Assessment

| Country/Region | Accreditation Body     | Scope                             |
|----------------|------------------------|-----------------------------------|
| USA            | FCC, A2LA              | EMC, RF/Wireless, Telecom         |
| Canada         | IC, A2LA, NIST         | EMC, RF/Wireless, Telecom         |
| Taiwan         | BSMI, NCC, NIST        | EMC, RF, Telecom, Safety          |
| Hong Kong      | OFTA, NIST             | RF/Wireless, Telecom              |
| Australia      | NATA, NIST             | EMC, RF, Telecom, Safety          |
| Korea          | KCC/RRR, NIST          | EMI, EMS, RF, Telecom, Safety     |
| Japan          | VCCI, JATE, TELEC, RFT | EMI, RF/Wireless, Telecom         |
| Mexico         | NOM, COFETEL, Caniety  | Safety, EMC, RF/Wireless, Telecom |
| Europe         | A2LA, NIST             | EMC, RF, Telecom, Safety          |
| Israel         | MOC, NIST              | EMC, RF, Telecom, Safety          |

### Accreditations for Product Certifications

| Country   | Accreditation Body | Scope                 |
|-----------|--------------------|-----------------------|
| USA       | FCC TCB, NIST      | EMC, RF, Telecom      |
| Canada    | IC FCB, NIST       | EMC, RF, Telecom      |
| Singapore | iDA, NIST          | EMC, RF, Telecom      |
| EU        | NB                 | EMC & R&TTE Directive |
| Japan     | MIC (RCB 208)      | RF, Telecom           |
| Hong Kong | OFTA (US002)       | RF, Telecom           |

## **CONTENTS**

|                                            |                                                                    |           |
|--------------------------------------------|--------------------------------------------------------------------|-----------|
| <b>1</b>                                   | <b>REPORT REVISION HISTORY .....</b>                               | <b>4</b>  |
| <b>2</b>                                   | <b>EXECUTIVE SUMMARY .....</b>                                     | <b>5</b>  |
| <b>3</b>                                   | <b>CUSTOMER INFORMATION .....</b>                                  | <b>5</b>  |
| <b>4</b>                                   | <b>TEST SITE INFORMATION .....</b>                                 | <b>5</b>  |
| <b>5</b>                                   | <b>MODIFICATION .....</b>                                          | <b>5</b>  |
| <b>6</b>                                   | <b>EUT INFORMATION .....</b>                                       | <b>6</b>  |
| 6.1                                        | EUT Description .....                                              | 6         |
| 6.2                                        | Radio Description .....                                            | 6         |
| <b>7</b>                                   | <b>SUPPORTING EQUIPMENT/SOFTWARE AND CABLING DESCRIPTION .....</b> | <b>8</b>  |
| 7.1                                        | Supporting Equipment .....                                         | 8         |
| 7.2                                        | Cabling Description .....                                          | 8         |
| 7.3                                        | Test Software Description .....                                    | 8         |
| <b>8</b>                                   | <b>TEST SUMMARY .....</b>                                          | <b>9</b>  |
| <b>9</b>                                   | <b>MEASUREMENT UNCERTAINTY .....</b>                               | <b>10</b> |
| <b>10</b>                                  | <b>MEASUREMENTS, EXAMINATION AND DERIVED RESULTS .....</b>         | <b>11</b> |
| 10.1                                       | Conducted Emissions .....                                          | 11        |
| 10.2                                       | 6dB & 26 dB Bandwidth .....                                        | 16        |
| 10.3                                       | Output Power .....                                                 | 23        |
| 10.4                                       | Peak Power Spectral Density .....                                  | 26        |
| 10.5                                       | Band Edge Measurement .....                                        | 47        |
| 10.6                                       | Radiated Spurious Emissions below 1GHz .....                       | 60        |
| 10.7                                       | Radiated Spurious Emissions above 1GHz .....                       | 62        |
| <b>ANNEX A. TEST INSTRUMENT .....</b>      |                                                                    | <b>72</b> |
| <b>ANNEX B. SIEMIC ACCREDITATION .....</b> |                                                                    | <b>73</b> |

## 1 Report Revision History

| Report No.                               | Report Version | Description              | Issue Date |
|------------------------------------------|----------------|--------------------------|------------|
| FCC_RF_SL15091701-RUC-034A1_UNII         | None           | Original                 | 01/25/2016 |
| FCC_RF_SL15091701-RUC-034A1_UNII Rev 1.0 | 1.0            | Updated per TCB reviewer | 02/09/2016 |
|                                          |                |                          |            |
|                                          |                |                          |            |
|                                          |                |                          |            |

## 2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: Ruckus Wireless, Inc.  
Product: ZoneFlex T710 Access Point  
Model: T710

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1<sup>st</sup> page.

## 3 Customer information

|                      |   |                                                        |
|----------------------|---|--------------------------------------------------------|
| Applicant Name       | : | Ruckus Wireless, Inc.                                  |
| Applicant Address    | : | 350 West Java Drive, Sunnyvale, California 94089 U.S.A |
| Manufacturer Name    | : | Ruckus Wireless, Inc.                                  |
| Manufacturer Address | : | 350 West Java Drive, Sunnyvale, California 94089 U.S.A |

## 4 Test site information

|                      |                                             |
|----------------------|---------------------------------------------|
| Lab performing tests | SIEMIC Laboratories                         |
| Lab Address          | 775 Montague Expressway, Milpitas, CA 95035 |
| FCC Test Site No.    | 881796                                      |
| IC Test Site No.     | 4842D-2                                     |
| VCCI Test Site No.   | A0133                                       |

## 5 Modification

| Index | Item | Description | Note |
|-------|------|-------------|------|
| -     | -    | -           | -    |
|       |      |             |      |
|       |      |             |      |
|       |      |             |      |
|       |      |             |      |
|       |      |             |      |

## 6 EUT Information

### 6.1 EUT Description

|                              |                                                    |
|------------------------------|----------------------------------------------------|
| Product Name                 | ZoneFlex T710 Access Point                         |
| Model No.                    | T710                                               |
| Trade Name                   | Ruckus                                             |
| Serial No.                   | 421506000085                                       |
| Host Model No.               | N/A                                                |
| Input Power                  | 100Vac-240Vac 50-60Hz / 48VDC 1.0A (PoE)           |
| Poe Power Adapter Manu/Model | Ruckus Wireless, Inc. / GRT-480125A(740-64216-001) |
| AC/DC Power Adapter SN       | N/A                                                |
| PoE Power Adapter SN         | 20150129                                           |
| Product Hardware version     | 705-60425-001                                      |
| Product Software version     | 812-72410-002                                      |
| Radio Hardware version       | 705-60425-001                                      |
| Radio Software version       | 812-72410-002                                      |
| Test Software version        | 117-11325-001                                      |
| Date of EUT received         | 11/05/2015                                         |
| Equipment Class/ Category    | DTS, UNII                                          |
| Clock Frequencies            | N/A                                                |
| Port/Connectors              | PoE, Ethernet                                      |

### 6.2 Radio Description

| Radio Type             | 802.11a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 802.11n-20M                     | 802.11n-40M                     | 802.11ac-80M                         |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|--------------------------------------|
| Operating Frequency    | 5260-5320MHz<br>5500-5720MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5260-5320MHz<br>5500-5720MHz    | 5270-5310MHz<br>5510-5710MHz    | 5290MHz, 5530MHz<br>5610MHz, 5690MHz |
| Modulation             | OFDM (BPSK, QPSK, 16QAM, 64QAM)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | OFDM (BPSK, QPSK, 16QAM, 64QAM) | OFDM (BPSK, QPSK, 16QAM, 64QAM) | OFDM (BPSK, QPSK, 16QAM, 64QAM)      |
| Channel Spacing        | 20MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 20MHz                           | 40MHz                           | 80MHz                                |
| Number of Channels     | 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 16                              | 6                               | 4                                    |
| Antenna Type           | Internal Omnidirectional Antenna                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                 |                                 |                                      |
| Antenna Gain (Peak)    | 2.4GHz: Horizontal 1dBi, Vertical 2.5dBi<br>5GHz: Horizontal 2dBi, Vertical 3.5dBi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                 |                                 |                                      |
| Antenna Connector Type | U.FL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                 |                                 |                                      |
| Note                   | <p>EUT has 4 antennas, 2 antennas are in horizontal polarity, and 2 antennas in vertical polarity. The 802.11b/g/a is in CDD mode with all 4 antenna transmit simultaneously.</p> <p>Since they're in 90 deg phase shift between the horizontal and vertical antennas, for radiated limit, the result from different polarization antenna will not be combined. So only the result for 2 vertical poparity antennas and 2 horizontal poparity antennas will be combined for MIMO mode separately. For Cross-polarized antenna, the total gain—including array gain—is computed separately for each of polarizations using the procedures presented in this document. The highest of the total gains shall apply. For this case, the highest of the total gain will be the directional gain of 2 antennas.</p> <p>For conducted limit like power and psd, the result from all 4 chains will be summed.</p> <p>For 802.11b/g/a mode under CDD mode, the array gain for power will be 0 and for PSD will be 10 log (Nant/Nss) dB</p> |                                 |                                 |                                      |

to be calculated separately for horizontal and vertical polarity. Reference to the following KDB for clarification.  
662911 D01 Multiple Transmitter Output v02r01  
662911 D02 MIMO with Cross-Polarized Antennas v01

#### EUT Power level setting

| Mode         | Frequency | Power Setting |
|--------------|-----------|---------------|
| 802.11-a     | 5260      | 17            |
| 802.11-a     | 5280      | 17            |
| 802.11-a     | 5320      | 17            |
| 802.11-n-20  | 5260      | 17            |
| 802.11-n-20  | 5280      | 17            |
| 802.11-n-20  | 5320      | 17            |
| 802.11-n-40  | 5270      | 17            |
| 802.11-n-40  | 5310      | 17            |
| 802.11-ac-80 | 5290      | 17            |
|              |           |               |
| 802.11-a     | 5550      | 17            |
| 802.11-a     | 5580      | 17            |
| 802.11-a     | 5700      | 17            |
| 802.11-n-20  | 5500      | 17            |
| 802.11-n-20  | 5580      | 17            |
| 802.11-n-20  | 5700      | 17            |
| 802.11-n-40  | 5510      | 17            |
| 802.11-n-40  | 5590      | 17            |
| 802.11-n-40  | 5670      | 17            |
| 802.11-ac-80 | 5530      | 17            |
| 802.11-ac-80 | 5530      | 17            |

#### CROSS Band channels power setting

| Mode         | Frequency | Power Setting |
|--------------|-----------|---------------|
| 802.11-a     | 5720      | 17            |
| 802.11-n-20  | 5720      | 17            |
| 802.11-n-40  | 5710      | 17            |
| 802.11-ac-80 | 5690      | 17            |

**Note:** All data rate has been verified and worst case was used for all test items.

## 7 Supporting Equipment/Software and cabling Description

### 7.1 Supporting Equipment

| Item | Supporting Equipment Description | Model               | Serial Number            | Manufacturer | Note |
|------|----------------------------------|---------------------|--------------------------|--------------|------|
| 1    | Laptop                           | PP01L Latitude C610 | CN-06P823-48643-37P-4153 | Dell         | -    |
| 2    | EUT power Supply                 | HK-AD-120A100-US    | 740-64190-011            | Ruckus       | -    |
|      |                                  |                     |                          |              |      |

### 7.2 Cabling Description

| Name | Connection Start |          | Connection Stop |          | Length / shielding Info |            | Note |
|------|------------------|----------|-----------------|----------|-------------------------|------------|------|
|      | From             | I/O Port | To              | I/O Port | Length (m)              | Shielding  |      |
| RJ45 | EUT              | RJ45     | POE             | RJ45     | 2                       | Unshielded | -    |
| RJ45 | POE              | RJ45     | Laptop          | RJ45     | 3                       | Unshielded | -    |

### 7.3 Test Software Description

| Test Item  | Software                | Description                                                |
|------------|-------------------------|------------------------------------------------------------|
| RF Testing | Command Line in windows | Set the EUT to transmit continuously in diferent test mode |
|            |                         |                                                            |
|            |                         |                                                            |

## 8 Test Summary

| Test Item                      | Test standard |           | Test Method/Procedure                                                      | Pass / Fail                                                              |
|--------------------------------|---------------|-----------|----------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Restricted Band of Operation   | FCC           | 15.205    | ANSI C63.4 – 2014<br>789033 D02 General UNII Test Procedures New Rules v01 | <input checked="" type="checkbox"/> Pass<br><input type="checkbox"/> N/A |
| AC Conducted Emissions Voltage | FCC           | 15.207(a) | ANSI C63.4 – 2014                                                          | <input checked="" type="checkbox"/> Pass<br><input type="checkbox"/> N/A |

| Test Item                                 | Test standard                                                                                                                                                                                                                                                                                                                                           |                               | Test Method/Procedure                                                      | Pass / Fail                                                              |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 26 & 6 dB Emission Bandwidth              | FCC                                                                                                                                                                                                                                                                                                                                                     | 15.407 (a) (2)                | 789033 D02 General UNII Test Procedures New Rules v01                      | <input checked="" type="checkbox"/> Pass<br><input type="checkbox"/> N/A |
| Maximum conducted Output Power            | FCC                                                                                                                                                                                                                                                                                                                                                     | 15.407 (a) (2)                | 789033 D02 General UNII Test Procedures New Rules v01                      | <input checked="" type="checkbox"/> Pass<br><input type="checkbox"/> N/A |
| Power reduction (Antenna Gain > 6 dBi)    | FCC                                                                                                                                                                                                                                                                                                                                                     | 15.407 (a) (2)                | -                                                                          | <input type="checkbox"/> Pass<br><input checked="" type="checkbox"/> N/A |
| Band Edge and Radiated Spurious Emissions | FCC                                                                                                                                                                                                                                                                                                                                                     | 15.407(b)(2),<br>15.407(b)(6) | ANSI C63.4 – 2014<br>789033 D02 General UNII Test Procedures New Rules v01 | <input checked="" type="checkbox"/> Pass<br><input type="checkbox"/> N/A |
| Power Spectral Density                    | FCC                                                                                                                                                                                                                                                                                                                                                     | 15.407 (a) (2)                | 789033 D02 General UNII Test Procedures New Rules v01                      | <input checked="" type="checkbox"/> Pass<br><input type="checkbox"/> N/A |
| Frequency Stability                       | FCC                                                                                                                                                                                                                                                                                                                                                     | 15.407 (g)                    | -                                                                          | <input type="checkbox"/> Pass<br><input checked="" type="checkbox"/> N/A |
| Transmit Power Control (TPC)              | FCC                                                                                                                                                                                                                                                                                                                                                     | 15.407 (h)(1)                 | -                                                                          | <input type="checkbox"/> Pass<br><input checked="" type="checkbox"/> N/A |
| User Manual                               | FCC                                                                                                                                                                                                                                                                                                                                                     | -                             | -                                                                          | <input checked="" type="checkbox"/> Pass<br><input type="checkbox"/> N/A |
| Remark                                    | <ol style="list-style-type: none"> <li>All measurement uncertainties are not taken into consideration for all presented test result.</li> <li>The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual.</li> </ol> |                               |                                                                            |                                                                          |

## 9 Measurement Uncertainty

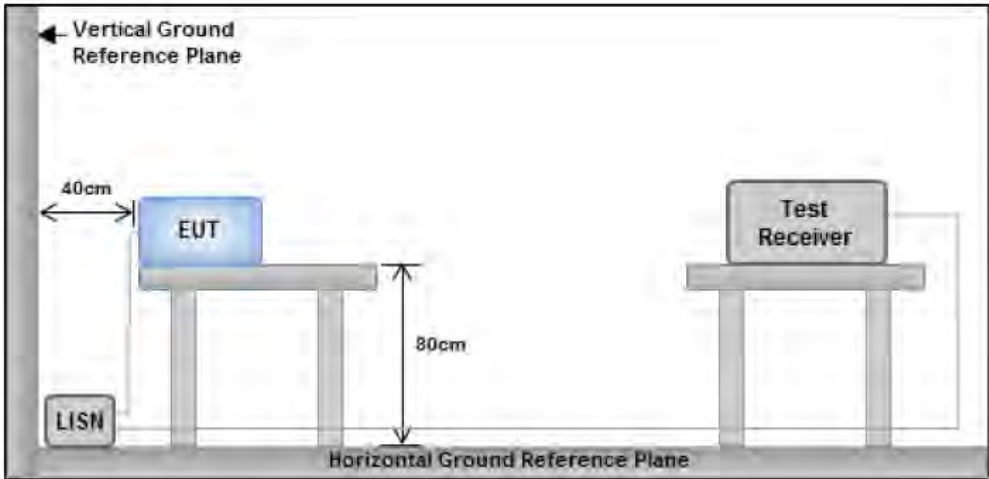
| Emissions                                 |                 |                                                                                                                                                 |               |
|-------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Test Item                                 | Frequency Range | Description                                                                                                                                     | Uncertainty   |
| Band Edge and Radiated Spurious Emissions | 30MHz – 1GHz    | Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m) | +5.6dB/-4.5dB |
| Band Edge and Radiated Spurious Emissions | 1GHz – 40GHz    | Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m) | +4.3dB/-4.1dB |

## 10 Measurements, Examination and Derived Results

### 10.1 Conducted Emissions

#### Conducted Emission Limit

| Frequency ranges (MHz) | Limit (dBuV) |         |
|------------------------|--------------|---------|
|                        | QP           | Average |
| 0.15 ~ 0.5             | 66 – 56      | 56 – 46 |
| 0.5 ~ 5                | 56           | 46      |
| 5 ~ 30                 | 60           | 50      |

| Spec         | Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Applicable                          |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| 47CFR§15.207 | a)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequency ranges. | <input checked="" type="checkbox"/> |
| Test Setup   |  <p>Note: 1. Support units were connected to second LISN.<br/>2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes</p>                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                     |
| Procedure    | <ul style="list-style-type: none"> <li>- The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B.</li> <li>- The power supply for the EUT was fed through a 50<math>\Omega</math>/50<math>\mu</math>H EUT LISN, connected to filtered mains.</li> <li>- The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.</li> <li>- All other supporting equipment was powered separately from another main supply.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                     |
| Remark       | EUT tested with AC 120V 60Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                     |
| Result       | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                     |

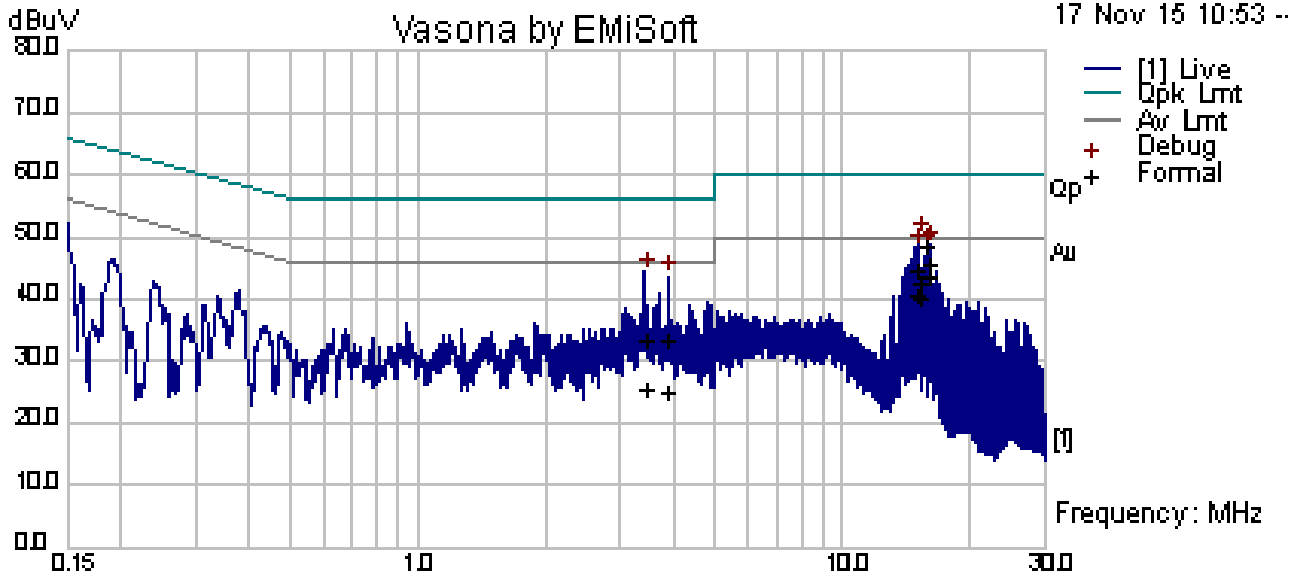
Test Data    ☒ Yes                      ☐ N/A

Test Plot    ☒ Yes (See below)              ☐ N/A

### Conducted Emission Test Results (Line)

|                           |                                       |        |         |                                                                               |
|---------------------------|---------------------------------------|--------|---------|-------------------------------------------------------------------------------|
| Test specification:       | Conducted Emissions                   |        |         |                                                                               |
| Environmental Conditions: | Temp(°C):                             | 22.2   | Result: | <input checked="" type="checkbox"/> Pass<br><br><input type="checkbox"/> Fail |
|                           | Humidity (%):                         | 37.1   |         |                                                                               |
|                           | Atmospheric(mbar):                    | 1020.5 |         |                                                                               |
| Mains Power:              | 120Vac, 60Hz                          |        |         |                                                                               |
| Tested by:                | Teody Manansala                       |        |         |                                                                               |
| Test Date:                | 2015-11-17                            |        |         |                                                                               |
| Remarks:                  | Line – Tested with AC Line Power Cord |        |         |                                                                               |

AC Line – Line Plot @ 120V 60Hz



Power Line Conducted Emissions  
Filename: c:\program files\emisoft - vasona\results\ruc-034 FCC ac source @ Line.emi

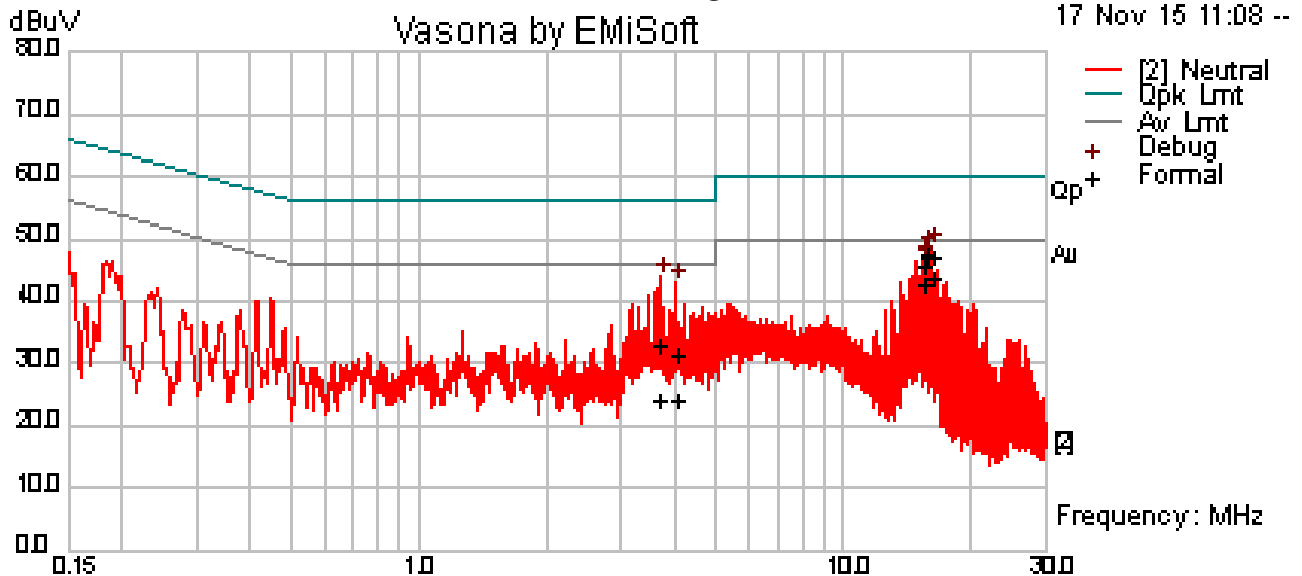
AC Line – Line Measurements @ 120V 60Hz

| Frequency (MHz) | Raw (dBuV) | Cable Loss (dB) | Factors (dB) | Level (dBuV) | Measurement Type | Line/ Neutral | Limit (dBuV) | Margin (dB) | Pass /Fail |
|-----------------|------------|-----------------|--------------|--------------|------------------|---------------|--------------|-------------|------------|
| 15.16           | 32.11      | 10.06           | 0.60         | 42.77        | Quasi Peak       | Line          | 60.00        | -17.23      | Pass       |
| 16.11           | 35.03      | 10.06           | 0.62         | 45.71        | Quasi Peak       | Line          | 60.00        | -14.29      | Pass       |
| 3.43            | 22.84      | 10.03           | 0.55         | 33.42        | Quasi Peak       | Line          | 56.00        | -22.58      | Pass       |
| 14.85           | 33.91      | 10.06           | 0.60         | 44.57        | Quasi Peak       | Line          | 60.00        | -15.43      | Pass       |
| 15.80           | 38.06      | 10.06           | 0.62         | 48.73        | Quasi Peak       | Line          | 60.00        | -11.27      | Pass       |
| 3.90            | 22.92      | 10.03           | 0.55         | 33.50        | Quasi Peak       | Line          | 56.00        | -22.50      | Pass       |
| 15.16           | 29.52      | 10.06           | 0.60         | 40.18        | Average          | Line          | 50.00        | -9.82       | Pass       |
| 16.11           | 32.89      | 10.06           | 0.62         | 43.57        | Average          | Line          | 50.00        | -6.43       | Pass       |
| 3.43            | 14.97      | 10.03           | 0.55         | 25.55        | Average          | Line          | 46.00        | -20.45      | Pass       |
| 14.85           | 29.94      | 10.06           | 0.60         | 40.60        | Average          | Line          | 50.00        | -9.40       | Pass       |
| 15.80           | 37.70      | 10.06           | 0.62         | 48.38        | Average          | Line          | 50.00        | -1.62       | Pass       |
| 3.90            | 14.59      | 10.03           | 0.55         | 25.17        | Average          | Line          | 46.00        | -20.83      | Pass       |

### Conducted Emission Test Results (Neutral)

|                           |                                          |        |         |                                                                               |
|---------------------------|------------------------------------------|--------|---------|-------------------------------------------------------------------------------|
| Test specification:       | Conducted Emissions                      |        |         |                                                                               |
| Environmental Conditions: | Temp(°C):                                | 22.2   | Result: | <input checked="" type="checkbox"/> Pass<br><br><input type="checkbox"/> Fail |
|                           | Humidity (%):                            | 37.1   |         |                                                                               |
|                           | Atmospheric(mbar):                       | 1020.5 |         |                                                                               |
| Mains Power:              | 120Vac, 60Hz                             |        |         |                                                                               |
| Tested by:                | Teody Manansala                          |        |         |                                                                               |
| Test Date:                | 2015-11-17                               |        |         |                                                                               |
| Remarks:                  | Neutral – Tested with AC Line Power Cord |        |         |                                                                               |

#### AC Line – Neutral Plot @ 120V 60Hz



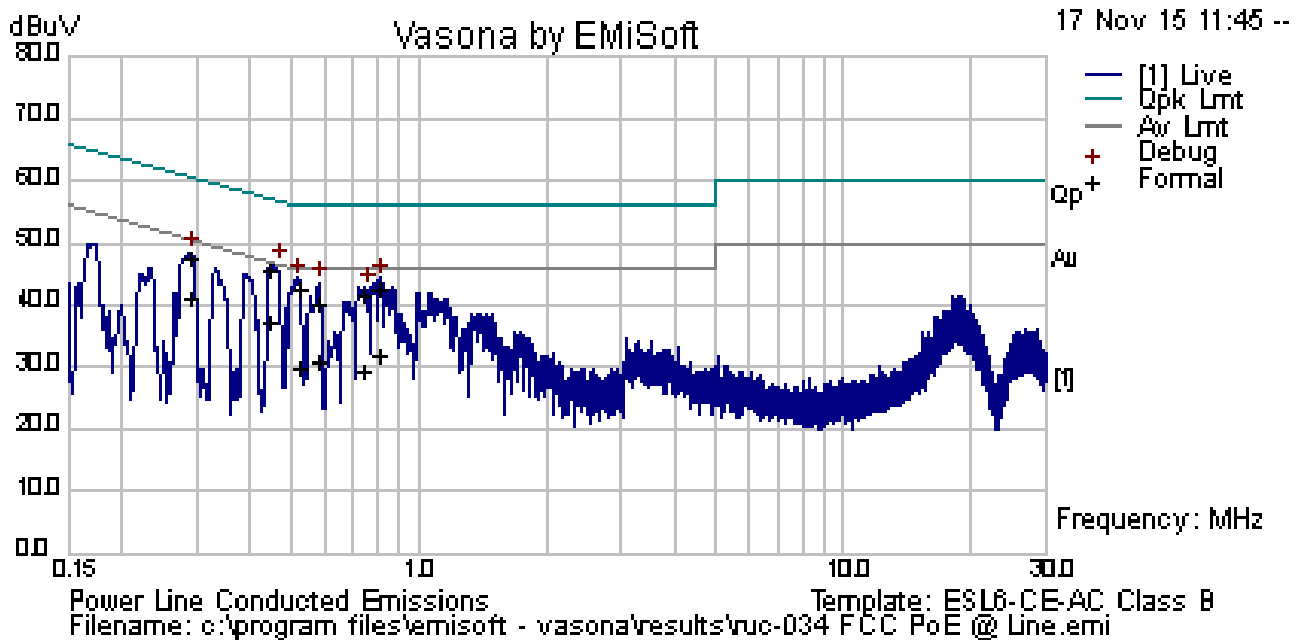
Power Line Conducted Emissions  
Filename: c:\program files\emisoft - vasona\results\ruc-034 FCC ac source @Neutral.emi

#### AC Line - Neutral Measurements @ 120V 60Hz

| Frequency (MHz) | Raw (dBuV) | Cable Loss (dB) | Factors (dB) | Level (dBuV) | Measurement Type | Line/Neutral | Limit (dBuV) | Margin (dB) | Pass/Fail |
|-----------------|------------|-----------------|--------------|--------------|------------------|--------------|--------------|-------------|-----------|
| 16.14           | 36.45      | 10.06           | 0.62         | 47.13        | Quasi Peak       | Neutral      | 60.00        | -12.87      | Pass      |
| 15.80           | 36.86      | 10.06           | 0.62         | 47.54        | Quasi Peak       | Neutral      | 60.00        | -12.46      | Pass      |
| 3.71            | 22.51      | 10.03           | 0.55         | 33.09        | Quasi Peak       | Neutral      | 56.00        | -22.91      | Pass      |
| 4.06            | 20.97      | 10.03           | 0.55         | 31.55        | Quasi Peak       | Neutral      | 56.00        | -24.45      | Pass      |
| 15.48           | 35.04      | 10.06           | 0.61         | 45.71        | Quasi Peak       | Neutral      | 60.00        | -14.29      | Pass      |
| 15.40           | 34.96      | 10.06           | 0.61         | 45.63        | Quasi Peak       | Neutral      | 60.00        | -14.37      | Pass      |
| 16.14           | 33.11      | 10.06           | 0.62         | 43.80        | Average          | Neutral      | 50.00        | -6.20       | Pass      |
| 15.80           | 36.53      | 10.06           | 0.62         | 47.20        | Average          | Neutral      | 50.00        | -2.80       | Pass      |
| 3.71            | 13.40      | 10.03           | 0.55         | 23.98        | Average          | Neutral      | 46.00        | -22.02      | Pass      |
| 4.06            | 13.23      | 10.03           | 0.55         | 23.82        | Average          | Neutral      | 46.00        | -22.18      | Pass      |
| 15.48           | 32.03      | 10.06           | 0.61         | 42.70        | Average          | Neutral      | 50.00        | -7.30       | Pass      |
| 15.40           | 32.06      | 10.06           | 0.61         | 42.73        | Average          | Neutral      | 50.00        | -7.27       | Pass      |

## Conducted Emission Test Results (Line)

|                           |                        |      |         |                                                                               |
|---------------------------|------------------------|------|---------|-------------------------------------------------------------------------------|
| Test specification:       | Conducted Emissions    |      |         |                                                                               |
| Environmental Conditions: | Temp(°C):              | 21   | Result: | <input checked="" type="checkbox"/> Pass<br><br><input type="checkbox"/> Fail |
|                           | Humidity (%):          | 42   |         |                                                                               |
|                           | Atmospheric(mbar):     | 1021 |         |                                                                               |
| Mains Power:              | 120Vac, 60Hz           |      |         |                                                                               |
| Tested by:                | Teody Manansala        |      |         |                                                                               |
| Test Date:                | 11/17/2015             |      |         |                                                                               |
| Remarks                   | Line – Tested with Poe |      |         |                                                                               |

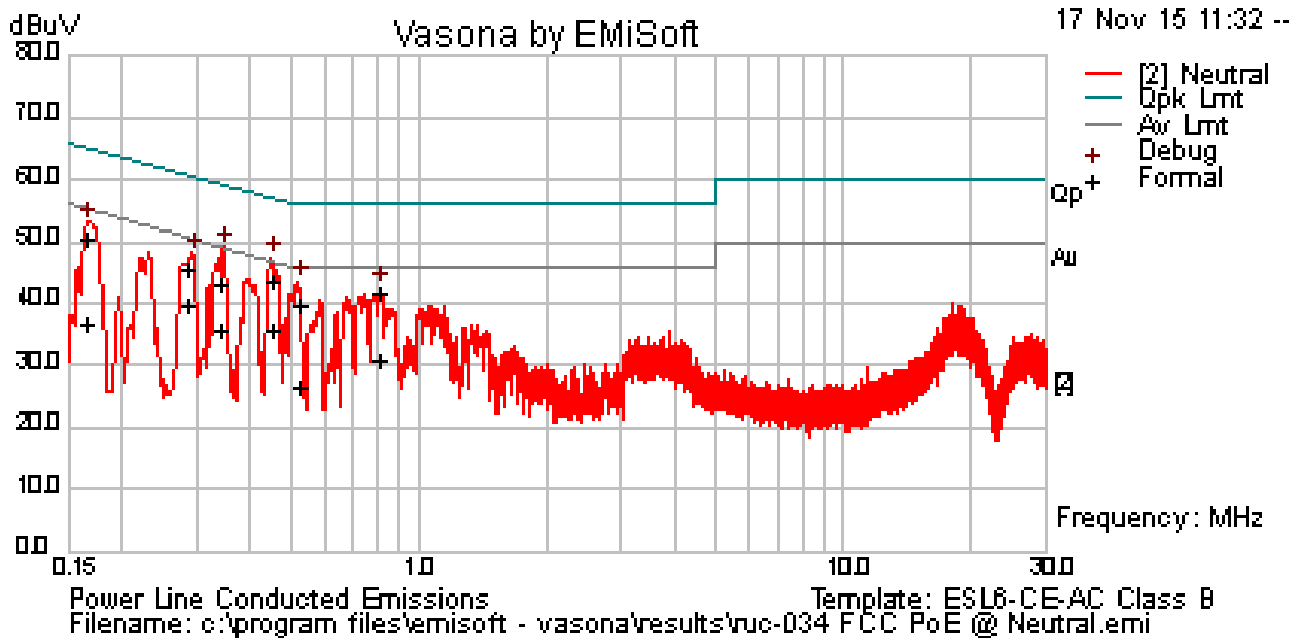


Live Line Plot at 120Vac, 60Hz

| Frequency (MHz) | Raw (dBuV) | Cable Loss (dB) | Factors (dB) | Level (dBuV) | Measurement Type | Line | Limit (dBuV) | Margin (dB) | Pass /Fail |
|-----------------|------------|-----------------|--------------|--------------|------------------|------|--------------|-------------|------------|
| 0.45            | 34.77      | 10.01           | 0.71         | 45.49        | Quasi Peak       | Line | 56.90        | -11.41      | Pass       |
| 0.81            | 31.99      | 10.01           | 0.60         | 42.60        | Quasi Peak       | Line | 56.00        | -13.40      | Pass       |
| 0.53            | 32.18      | 10.01           | 0.67         | 42.86        | Quasi Peak       | Line | 56.00        | -13.14      | Pass       |
| 0.29            | 36.72      | 10.00           | 0.94         | 47.66        | Quasi Peak       | Line | 60.51        | -12.85      | Pass       |
| 0.58            | 29.70      | 10.01           | 0.65         | 40.35        | Quasi Peak       | Line | 56.00        | -15.65      | Pass       |
| 0.74            | 30.86      | 10.01           | 0.61         | 41.48        | Quasi Peak       | Line | 56.00        | -14.52      | Pass       |
| 0.45            | 26.69      | 10.01           | 0.71         | 37.41        | Average          | Line | 46.90        | -9.49       | Pass       |
| 0.81            | 21.06      | 10.01           | 0.60         | 31.67        | Average          | Line | 46.00        | -14.33      | Pass       |
| 0.53            | 19.15      | 10.01           | 0.67         | 29.83        | Average          | Line | 46.00        | -16.17      | Pass       |
| 0.29            | 30.08      | 10.00           | 0.94         | 41.02        | Average          | Line | 50.51        | -9.50       | Pass       |
| 0.58            | 20.03      | 10.01           | 0.65         | 30.68        | Average          | Line | 46.00        | -15.32      | Pass       |
| 0.74            | 19.00      | 10.01           | 0.61         | 29.62        | Average          | Line | 46.00        | -16.38      | Pass       |

## Conducted Emission Test Results (Neutral)

|                           |                           |      |         |                                                                               |
|---------------------------|---------------------------|------|---------|-------------------------------------------------------------------------------|
| Test specification:       | Conducted Emissions       |      |         |                                                                               |
| Environmental Conditions: | Temp(°C):                 | 21   | Result: | <input checked="" type="checkbox"/> Pass<br><br><input type="checkbox"/> Fail |
|                           | Humidity (%):             | 42   |         |                                                                               |
|                           | Atmospheric(mbar):        | 1021 |         |                                                                               |
| Mains Power:              | 120Vac, 60Hz              |      |         |                                                                               |
| Tested by:                | Teody Manansala           |      |         |                                                                               |
| Test Date:                | 11/17/2015                |      |         |                                                                               |
| Remarks                   | Neutral – Tested with Poe |      |         |                                                                               |



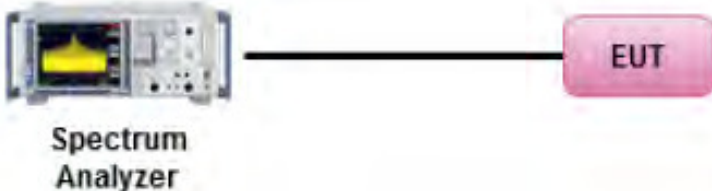
### Neutral Line@ 120Vac, 60Hz

| Frequency (MHz) | Raw (dBuV) | Cable Loss (dB) | Factors (dB) | Level (dBuV) | Measurement Type | Line    | Limit (dBuV) | Margin (dB) | Pass /Fail |
|-----------------|------------|-----------------|--------------|--------------|------------------|---------|--------------|-------------|------------|
| 0.45            | 32.91      | 10.01           | 0.71         | 43.63        | Quasi Peak       | Neutral | 56.84        | -13.21      | Pass       |
| 0.34            | 32.32      | 10.01           | 0.83         | 43.16        | Quasi Peak       | Neutral | 59.22        | -16.06      | Pass       |
| 0.17            | 38.90      | 10.00           | 1.59         | 50.50        | Quasi Peak       | Neutral | 65.14        | -14.64      | Pass       |
| 0.28            | 34.48      | 10.00           | 0.95         | 45.43        | Quasi Peak       | Neutral | 60.68        | -15.25      | Pass       |
| 0.53            | 29.23      | 10.01           | 0.67         | 39.91        | Quasi Peak       | Neutral | 56.00        | -16.09      | Pass       |
| 0.81            | 30.99      | 10.01           | 0.60         | 41.60        | Quasi Peak       | Neutral | 56.00        | -14.40      | Pass       |
| 0.45            | 25.11      | 10.01           | 0.71         | 35.83        | Average          | Neutral | 46.84        | -11.01      | Pass       |
| 0.34            | 25.19      | 10.01           | 0.83         | 36.03        | Average          | Neutral | 49.22        | -13.19      | Pass       |
| 0.17            | 25.06      | 10.00           | 1.59         | 36.66        | Average          | Neutral | 55.14        | -18.48      | Pass       |
| 0.28            | 28.89      | 10.00           | 0.95         | 39.85        | Average          | Neutral | 50.68        | -10.84      | Pass       |
| 0.53            | 15.95      | 10.01           | 0.67         | 26.63        | Average          | Neutral | 46.00        | -19.37      | Pass       |
| 0.81            | 20.22      | 10.01           | 0.60         | 30.83        | Average          | Neutral | 46.00        | -15.17      | Pass       |

Note: The results above show only the worst case.

## 10.2 6dB & 26 dB Bandwidth

### Requirement(s):

| Spec           | Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Requirement                                                 | Applicable                                                                 |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------|
| § 15.407       | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 26 dB Emission BW: Report only for reference.               | <input checked="" type="checkbox"/>                                        |
|                | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6 dB Emission BW: Report only for reference(Cross Band)     | <input checked="" type="checkbox"/>                                        |
|                | a) (2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 26 dB Emission BW: Report only for power limit calculation. | <input type="checkbox"/>                                                   |
| Test Setup     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                             |                                                                            |
| Test Procedure | <p>789033 D02 General UNII Test Procedures New Rules v01</p> <p><u>26dB Emission bandwidth measurement procedure (Other than 5.725-5.85 GHz)</u></p> <ul style="list-style-type: none"> <li>- Use the spectrum analyzer built-in measurement function to determine the 26dB BW. <ul style="list-style-type: none"> <li>o Set RBW = around 1% of emission bandwidth</li> <li>o Set VBW &gt; RBW</li> <li>o Detector = Peak</li> <li>o Trace mode = max hold</li> </ul> </li> <li>- Allow the trace to stabilize.</li> <li>- Capture the plot.</li> <li>- Repeat above steps for different test channel and other modulation type.</li> </ul> <p><u>6dB Emission bandwidth measurement procedure</u></p> <ul style="list-style-type: none"> <li>- Use the spectrum analyzer built-in measurement function to determine the 26dB BW. <ul style="list-style-type: none"> <li>o Set RBW = 100kHz</li> <li>o Set VBW &gt; 3RBW</li> <li>o Detector = Peak</li> <li>o Trace mode = max hold</li> </ul> </li> <li>- Allow the trace to stabilize.</li> <li>- Capture the plot.</li> <li>- Repeat above steps for different test channel and other modulation type.</li> </ul> |                                                             |                                                                            |
| Test Date      | 11/25/2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Environmental condition                                     | Temperature 23°C<br>Relative Humidity 42%<br>Atmospheric Pressure 1021mbar |
| Remark         | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                             |                                                                            |
| Result         | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                             |                                                                            |

**Test Data**    ☒ Yes      ☐ N/A  
**Test Plot**    ☒ Yes      ☐ N/A

#### 26dB Bandwidth measurement result for 5.3GHz

| Type    | Test mode   | Freq (MHz) | CH   | Result (MHz) |
|---------|-------------|------------|------|--------------|
| 26dB BW | 802.11a     | 5260       | Low  | 18.61        |
| 26dB BW | 802.11a     | 5280       | Mid  | 19.02        |
| 26dB BW | 802.11a     | 5320       | High | 18.68        |
| 26dB BW | 802.11n-20  | 5260       | Low  | 19.72        |
| 26dB BW | 802.11n-20  | 5280       | Mid  | 19.45        |
| 26dB BW | 802.11n-20  | 5320       | High | 19.67        |
| 26dB BW | 802.11n-40  | 5270       | Low  | 38.26        |
| 26dB BW | 802.11n-40  | 5310       | High | 38.14        |
| 26dB BW | 802.11ac-80 | 5290       | Mid  | 83.92        |

#### 26dB Bandwidth measurement result for 5.5GHz

| Type    | Test mode   | Freq (MHz) | CH   | Result (MHz) |
|---------|-------------|------------|------|--------------|
| 26dB BW | 802.11a     | 5500       | Low  | 18.76        |
| 26dB BW | 802.11a     | 5580       | Mid  | 18.59        |
| 26dB BW | 802.11a     | 5700       | High | 18.17        |
| 26dB BW | 802.11n-20  | 5500       | Low  | 19.86        |
| 26dB BW | 802.11n-20  | 5580       | Mid  | 19.76        |
| 26dB BW | 802.11n-20  | 5700       | High | 19.95        |
| 26dB BW | 802.11n-40  | 5510       | Low  | 39.05        |
| 26dB BW | 802.11n-40  | 5590       | Mid  | 38.50        |
| 26dB BW | 802.11n-40  | 5670       | High | 38.41        |
| 26dB BW | 802.11ac-80 | 5530       | Low  | 82.29        |

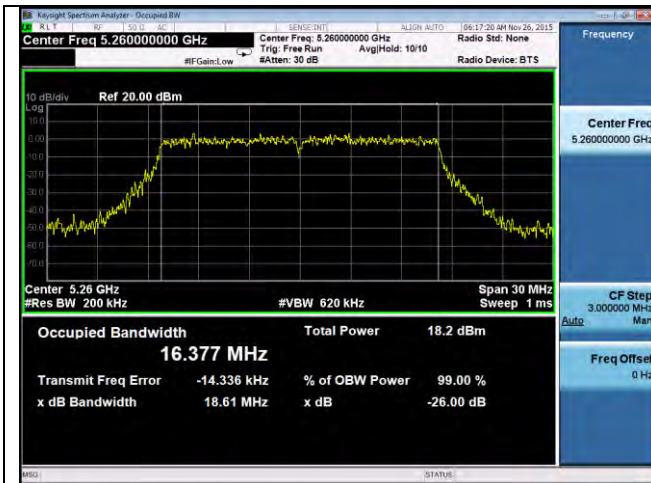
#### 26dB Bandwidth measurement result for cross channels

| Type    | Test mode   | Freq (MHz) | CH    | Result (MHz) |
|---------|-------------|------------|-------|--------------|
| 26dB BW | 802.11a     | 5720       | CROSS | 18.37        |
| 26dB BW | 802.11n-20  | 5720       | CROSS | 19.76        |
| 26dB BW | 802.11n-40  | 5710       | CROSS | 38.34        |
| 26dB BW | 802.11ac-80 | 5690       | CROSS | 82.46        |

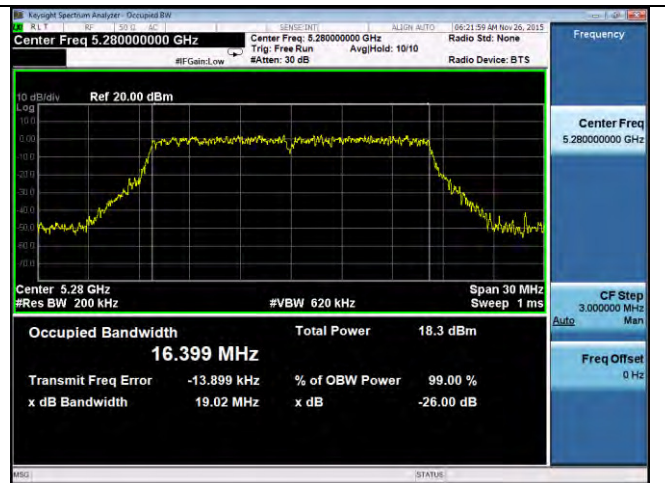
#### 6 Bandwidth measurement result for cross channels

| Type    | Test mode   | Freq (MHz) | CH    | Result (MHz) |
|---------|-------------|------------|-------|--------------|
| 26dB BW | 802.11a     | 5720       | CROSS | 16.44        |
| 26dB BW | 802.11n-20  | 5720       | CROSS | 17.55        |
| 26dB BW | 802.11n-40  | 5710       | CROSS | 35.02        |
| 26dB BW | 802.11ac-80 | 5690       | CROSS | 73.7         |

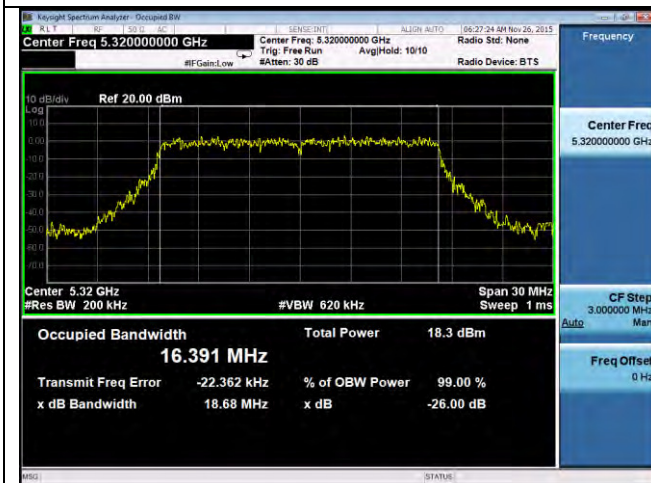
## 26dB Bandwidth Test Plots



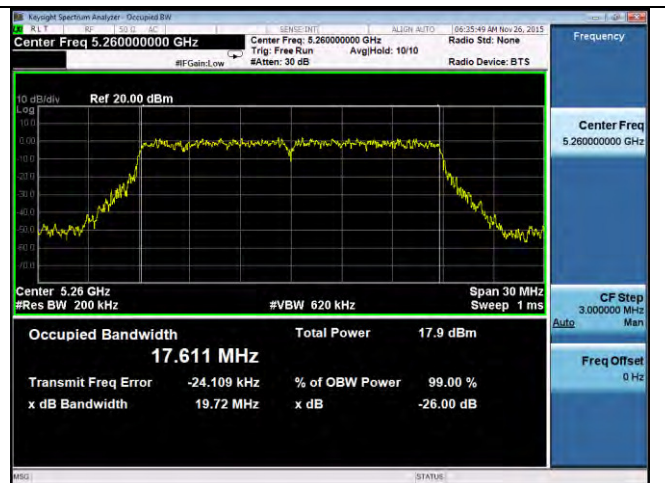
26dB BW -802.11a 5260MHz



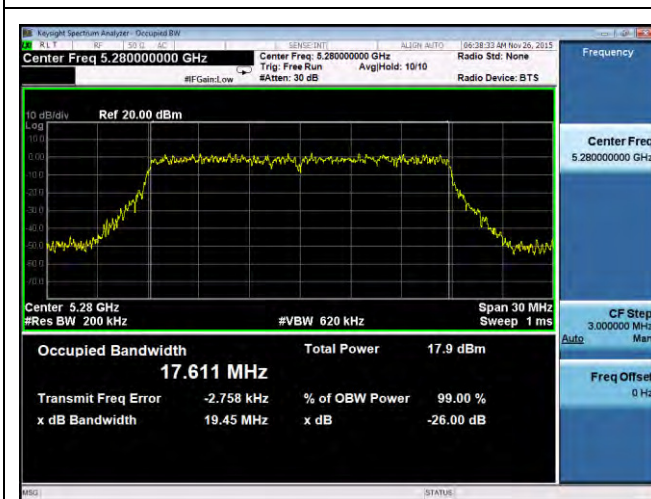
26dB BW -802.11a 5280MHz



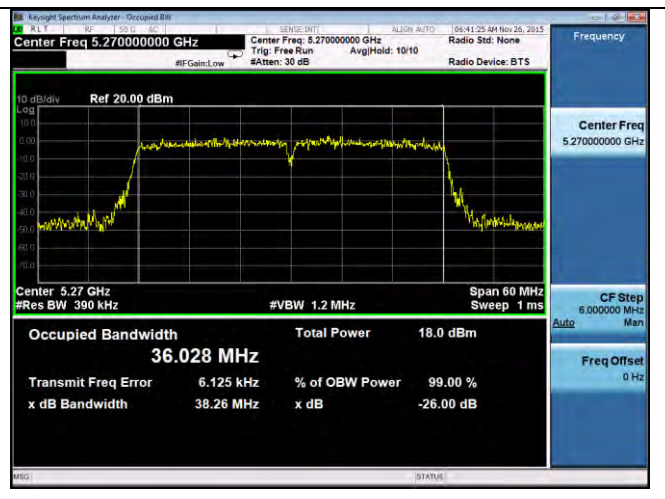
26dB BW -802.11a 5320MHz



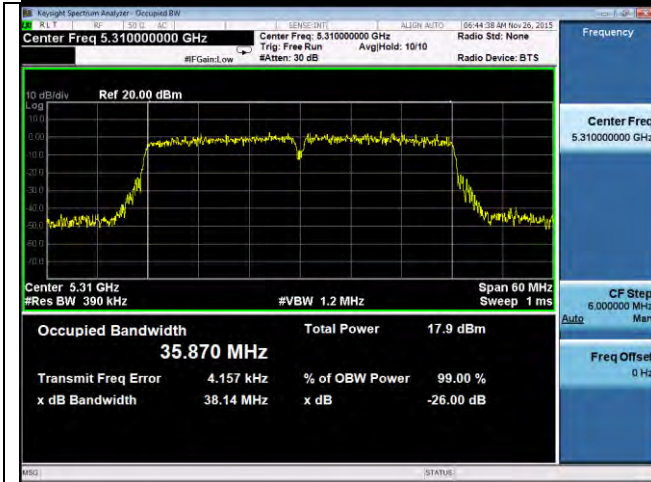
26dB BW -802.11n-20M 5260MHz



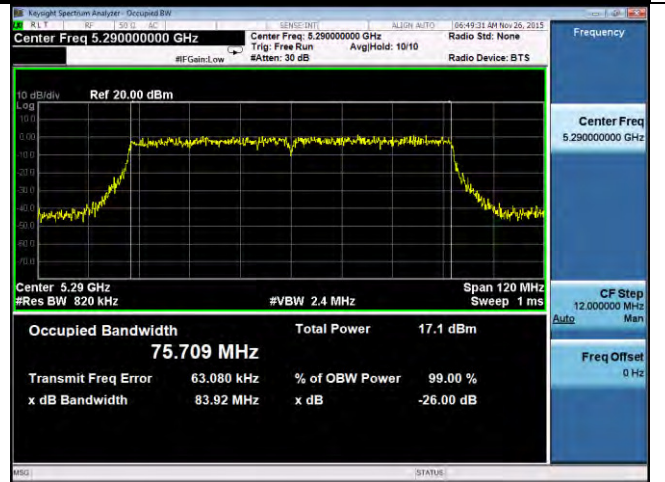
26dB BW -802.11n-20M 5280MHz



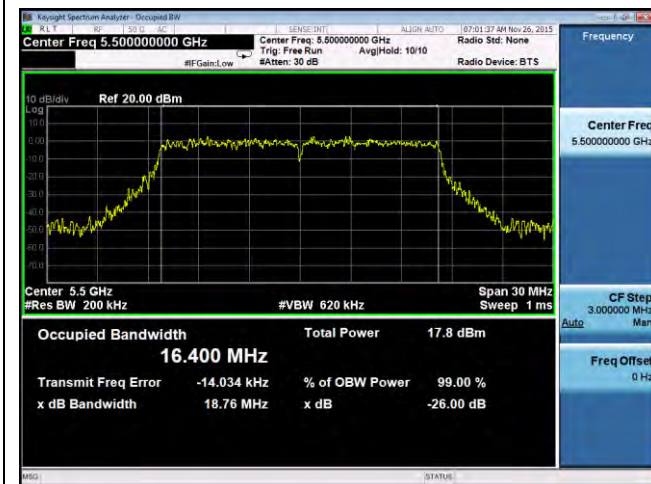
26dB BW -802.11n-40M 5270MHz



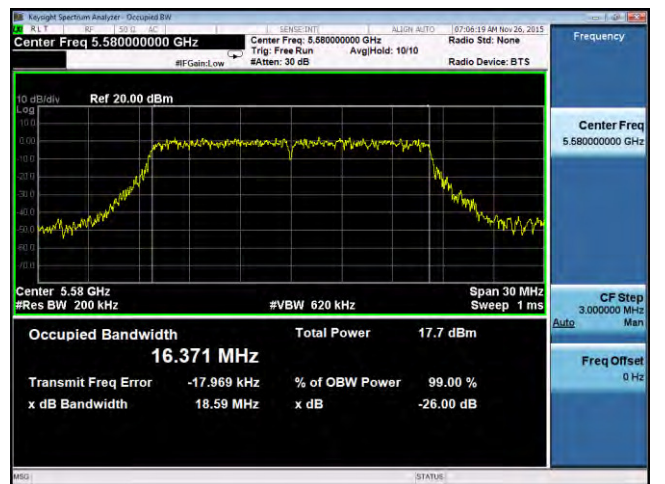
26dB BW -802.11n-40M 5310MHz



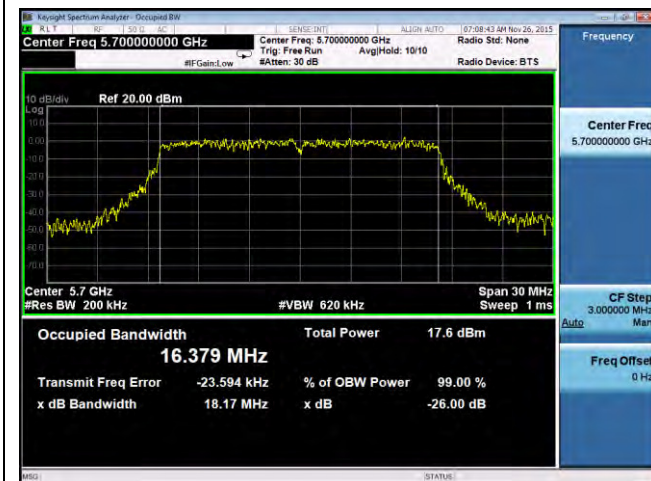
26dB BW -802.11ac-80M 5290MHz



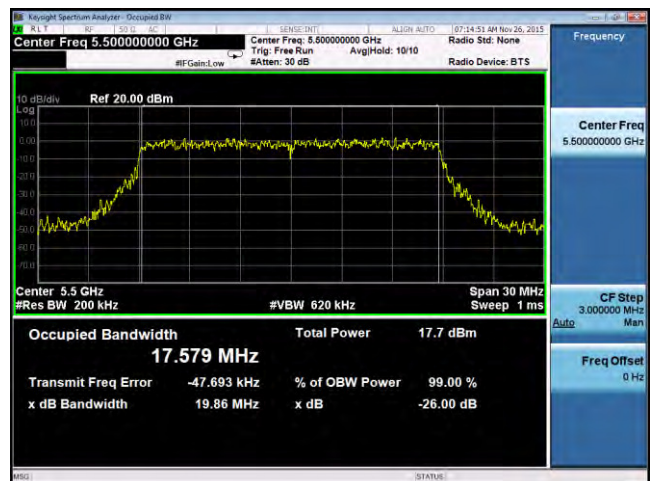
26dB BW -802.11a 5500MHz



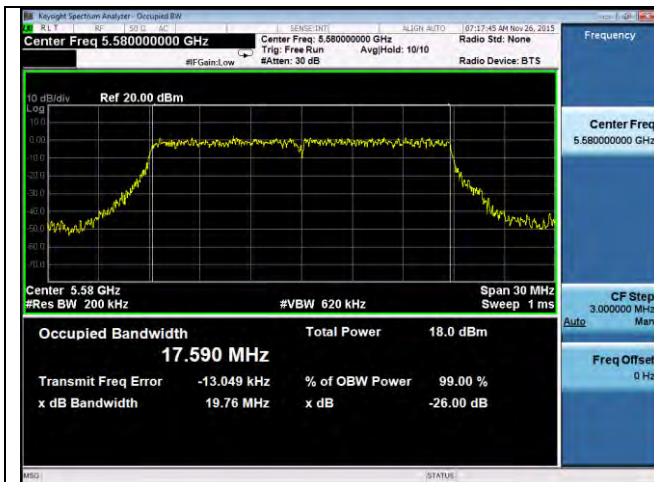
26dB BW -802.11a 5580MHz



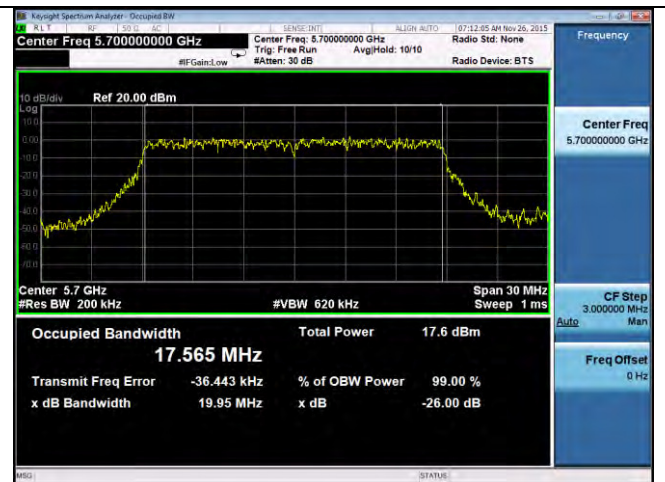
26dB BW -802.11a 5700MHz



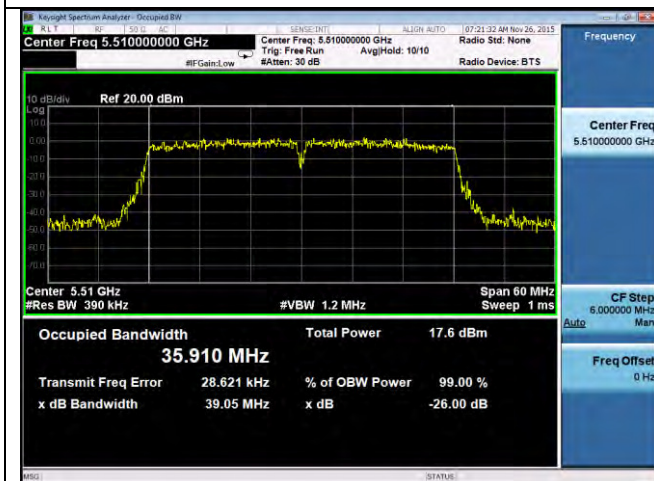
26dB BW -802.11n-20M 5500MHz



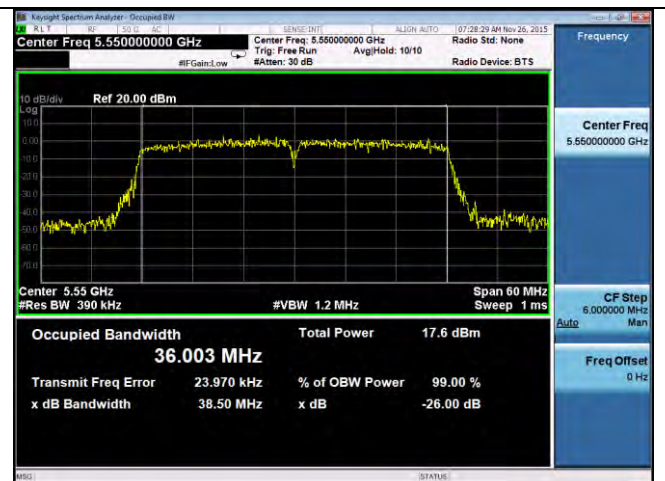
26dB BW -802.11n-20M 5580MHz



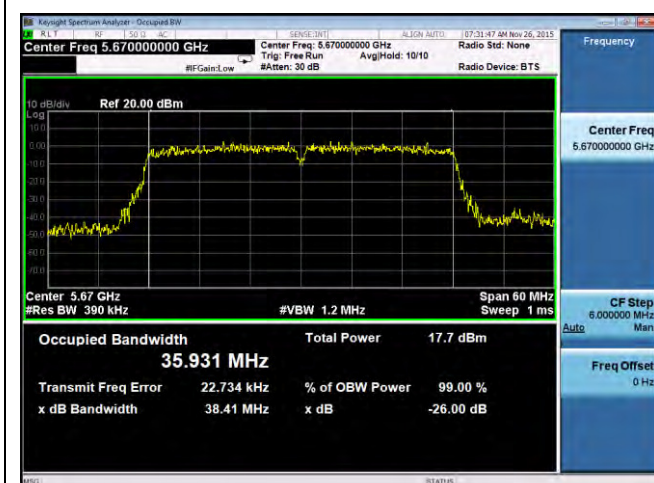
26dB BW -802.11n-20M 5700MHz



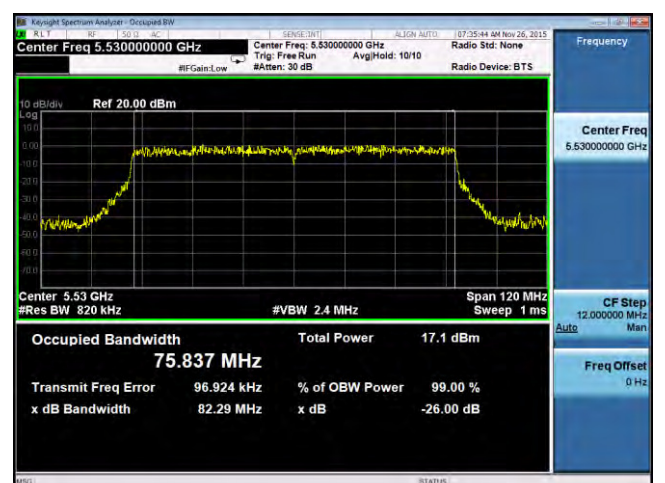
26dB BW -802.11n-40M 5510MHz



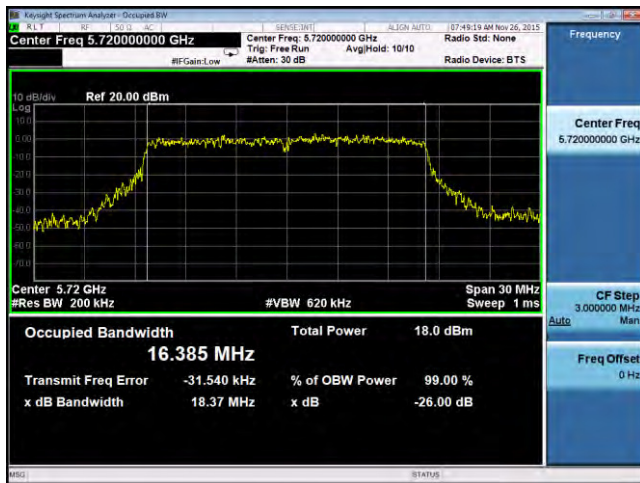
26dB BW -802.11n-40M 5550MHz



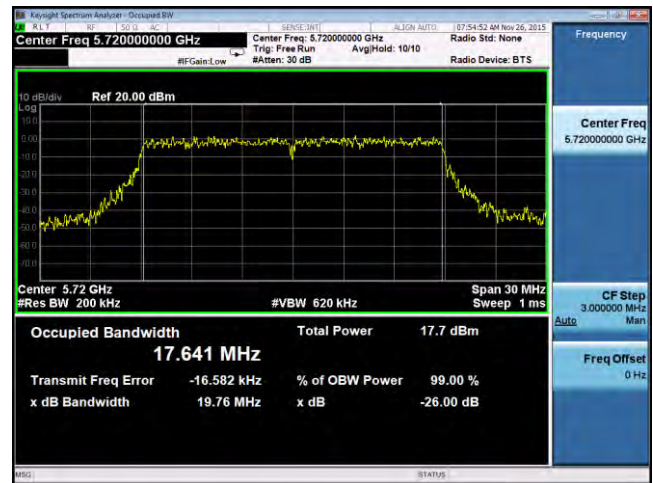
26dB BW -802.11n-40M 5670MHz



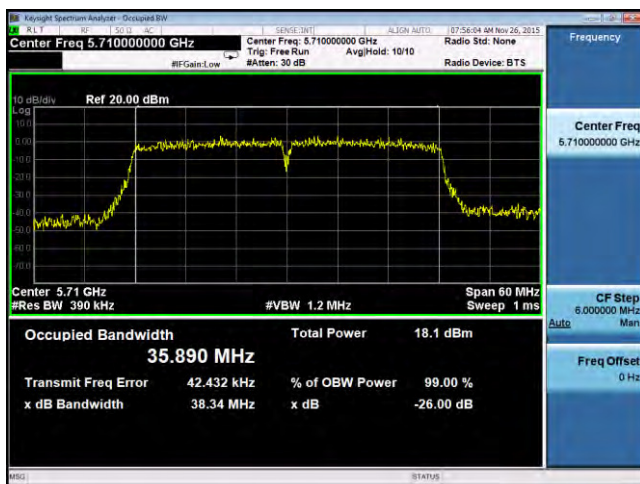
26dB BW -802.11ac-80M 5530MHz



26dB BW -802.11a CROSS 5720MHz



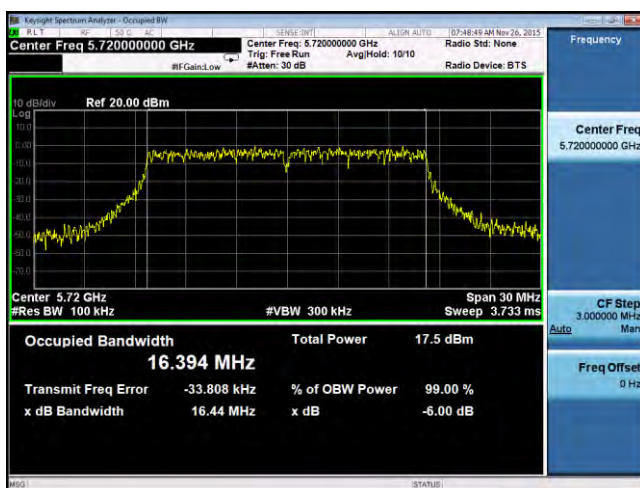
26dB BW -802.11n-20M 5720MHz



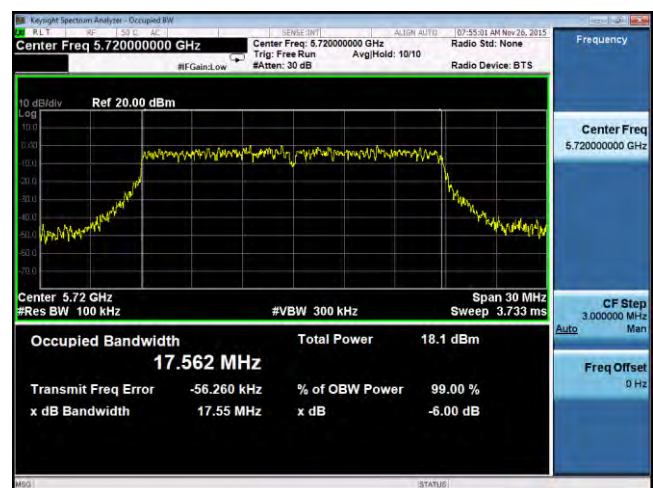
26dB BW -802.11n-40M CROSS 5710MHz



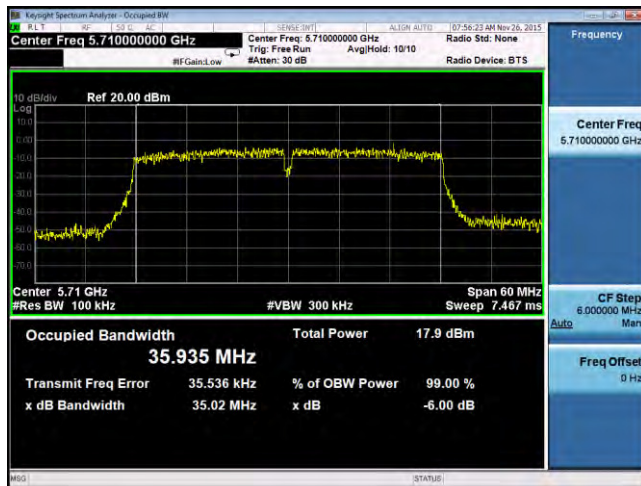
26dB BW -802.11ac CROSS 5690MHz



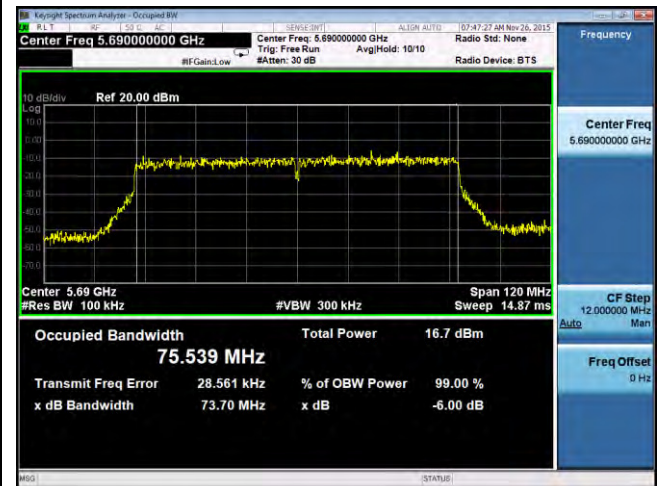
6dB BW -802.11a CROSS 5720MHz



6dB BW -802.11n-20M CROSS 5720MHz



6dB BW -802.11n-40M CROSS 5710MHz



6dB BW -802.11ac CROSS 5690MHz

### 10.3 Output Power

#### Requirement(s):

| Spec           | Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Requirement                                                                                                                                                                                                                                                                                                                                       | Applicable                                                                 |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| § 15.407       | a)(1)(i)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm). | <input type="checkbox"/>                                                   |
|                | a)(1)(ii)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.                                                                                                                             | <input type="checkbox"/>                                                   |
|                | a)(1)(iv)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.                                                                                                                        | <input type="checkbox"/>                                                   |
|                | a)(2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz.                                                                                                          | <input checked="" type="checkbox"/>                                        |
|                | a)(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.                                                                                                                                                                                                                        | <input checked="" type="checkbox"/>                                        |
| Test Setup     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                   |                                                                            |
| Test Procedure | <p>789033 D02 General UNII Test Procedures New Rules v01</p> <p><u>Measurement using a Power Meter (PM)</u></p> <p>Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.</p> <ul style="list-style-type: none"> <li>- Connect EUT's RF output power to power meter</li> <li>- Set EUT to be continuous transmission mode</li> <li>- Measurement the average output power using power meter and record the result</li> <li>- Repeat above steps for different test channel and other modulation type.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                   |                                                                            |
| Test Date      | 11/25/2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Environmental condition                                                                                                                                                                                                                                                                                                                           | Temperature 23°C<br>Relative Humidity 44%<br>Atmospheric Pressure 1021mbar |
| Remark         | <p>Per KDB 662911 D01 Multiple Transmitter Output v02r01, the direction gain for horizontal polarization and vertical polarization is calculated separately. For 5Ghz band, peak antenna gain = 3.5 dBi, directional gain = 3 dB, total gain = 6.5 dBi</p> <p>Highest of total directional gain is 6.5 dBi. The power limit and PSD limit will be reduced by amount of 0.5 dB.</p> <p>For the Cross band channels, the output power of full bandwidth is compared to the power limit in 5.5G and 5.8G as the worst case.</p>                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                   |                                                                            |
| Result         | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                   |                                                                            |

**Test Data**    ☒ Yes                      ☐ N/A  
**Test Plot**    ☐ Yes (See below)      ☒ N/A

### Output Power measurement result for 5.3GHz

| Type   | Test mode    | Freq (MHz) | CH   | Conducted Power (dBm) |        |        |        |                | Limit (dBm) | Result |
|--------|--------------|------------|------|-----------------------|--------|--------|--------|----------------|-------------|--------|
|        |              |            |      | Chain1                | Chain2 | Chain3 | Chain4 | Combined Power |             |        |
| Output | 802.11a      | 5260       | Low  | 14.80                 | 15.05  | 15.81  | 14.75  | 21.14          | 23.5        | Pass   |
| Output | 802.11a      | 5280       | Mid  | 14.78                 | 15.09  | 15.91  | 14.75  | 21.18          | 23.5        | Pass   |
| Output | 802.11a      | 5320       | High | 15.04                 | 15.07  | 15.82  | 14.99  | 21.26          | 23.5        | Pass   |
| Output | 802.11n-20M  | 5260       | Low  | 14.83                 | 15.24  | 16.03  | 14.95  | 21.31          | 23.5        | Pass   |
| Output | 802.11n-20M  | 5280       | Mid  | 14.86                 | 15.19  | 16.04  | 14.95  | 21.31          | 23.5        | Pass   |
| Output | 802.11n-20M  | 5320       | High | 15.16                 | 15.17  | 15.93  | 15.18  | 21.39          | 23.5        | Pass   |
| Output | 802.11n-40M  | 5270       | Low  | 14.90                 | 15.25  | 16.16  | 15.02  | 21.38          | 23.5        | Pass   |
| Output | 802.11n-40M  | 5310       | Mid  | 14.95                 | 15.24  | 16.17  | 14.96  | 21.38          | 23.5        | Pass   |
| Output | 802.11ac-80M | 5290       | High | 14.25                 | 14.56  | 15.51  | 14.23  | 20.69          | 23.5        | Pass   |

### Output Power measurement result for 5.5GHz

| Type   | Test mode    | Freq (MHz) | CH   | Conducted Power (dBm) |        |        |        |                | Limit (dBm) | Result |
|--------|--------------|------------|------|-----------------------|--------|--------|--------|----------------|-------------|--------|
|        |              |            |      | Chain1                | Chain2 | Chain3 | Chain4 | Combined Power |             |        |
| Output | 802.11a      | 5500       | Low  | 14.67                 | 14.91  | 15.81  | 14.77  | 21.09          | 23.5        | Pass   |
| Output | 802.11a      | 5580       | Mid  | 14.54                 | 14.76  | 15.82  | 14.63  | 20.99          | 23.5        | Pass   |
| Output | 802.11a      | 5700       | High | 14.31                 | 14.35  | 14.93  | 14.33  | 20.51          | 23.5        | Pass   |
| Output | 802.11n-20M  | 5500       | Low  | 14.68                 | 14.92  | 15.97  | 14.88  | 21.16          | 23.5        | Pass   |
| Output | 802.11n-20M  | 5580       | Mid  | 14.55                 | 14.79  | 15.99  | 14.76  | 21.08          | 23.5        | Pass   |
| Output | 802.11n-20M  | 5700       | High | 14.37                 | 14.43  | 15.02  | 14.48  | 20.60          | 23.5        | Pass   |
| Output | 802.11n-40M  | 5510       | Low  | 14.63                 | 14.86  | 15.93  | 14.89  | 21.13          | 23.5        | Pass   |
| Output | 802.11n-40M  | 5550       | Mid  | 14.65                 | 14.9   | 16.04  | 14.84  | 21.16          | 23.5        | Pass   |
| Output | 802.11n-40M  | 5670       | High | 14.45                 | 14.52  | 15.64  | 14.62  | 20.86          | 23.5        | Pass   |
| Output | 802.11ac-80M | 5530       | Low  | 14.01                 | 14.28  | 15.47  | 14.19  | 20.55          | 23.5        | Pass   |
| Output | 802.11ac-80M | 5610       | High | 13.90                 | 14.22  | 15.10  | 14.15  | 20.39          | 23.5        | Pass   |

**Output Power measurement result for CROSS channels (in band 5470-5725MHz)**

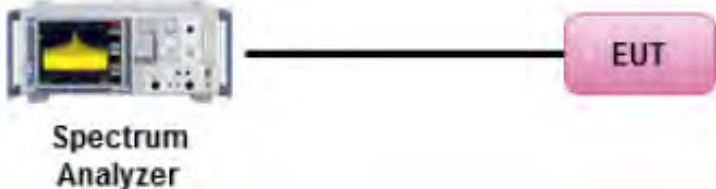
| Type   | Test mode    | Freq (MHz) | CH    | Conducted Power (dBm) |        |        |        |                | Limit (dBm) | Result |
|--------|--------------|------------|-------|-----------------------|--------|--------|--------|----------------|-------------|--------|
|        |              |            |       | Chain1                | Chain2 | Chain3 | Chain4 | Combined Power |             |        |
| Output | 802.11a      | 5720       | CROSS | 14.51                 | 14.34  | 15.01  | 14.58  | 20.64          | 23.5        | Pass   |
| Output | 802.11n-20M  | 5720       | CROSS | 14.75                 | 14.44  | 15.06  | 14.76  | 20.78          | 23.5        | Pass   |
| Output | 802.11n-40M  | 5710       | CROSS | 14.82                 | 14.58  | 15.2   | 14.73  | 20.86          | 23.5        | Pass   |
| Output | 802.11ac-80M | 5690       | CROSS | 14.04                 | 13.99  | 15.01  | 14.19  | 20.35          | 23.5        | Pass   |

**Output Power measurement result for CROSS channels (in band 5725-5850MHz)**

| Type   | Test mode    | Freq (MHz) | CH    | Conducted Power (dBm) |        |        |        |                | Limit (dBm) | Result |
|--------|--------------|------------|-------|-----------------------|--------|--------|--------|----------------|-------------|--------|
|        |              |            |       | Chain1                | Chain2 | Chain3 | Chain4 | Combined Power |             |        |
| Output | 802.11a      | 5720       | CROSS | 14.48                 | 14.35  | 14.97  | 14.56  | 20.62          | 29.5        | Pass   |
| Output | 802.11n-20M  | 5720       | CROSS | 14.74                 | 14.43  | 15.06  | 14.74  | 20.77          | 29.5        | Pass   |
| Output | 802.11n-40M  | 5710       | CROSS | 14.82                 | 14.58  | 15.24  | 14.70  | 20.86          | 29.5        | Pass   |
| Output | 802.11ac-80M | 5690       | CROSS | 14.10                 | 14.01  | 15.00  | 14.20  | 20.37          | 29.5        | Pass   |

## 10.4 Peak Power Spectral Density

### Requirement(s):

| Spec           | Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Requirement                                                                                                                                          | Applicable                                                                 |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| § 15.407       | a)(1)(i)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. | <input type="checkbox"/>                                                   |
|                | a)(1)(ii)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.  | <input type="checkbox"/>                                                   |
|                | a)(2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.                  | <input checked="" type="checkbox"/>                                        |
|                | a)(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.                                         | <input checked="" type="checkbox"/>                                        |
| Test Setup     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                      |                                                                            |
| Test Procedure | <p>789033 D02 General UNII Test Procedures New Rules v01, II.F. Method SA-1</p> <p><u>Maximum spectral density measurement procedure</u></p> <ul style="list-style-type: none"> <li>- Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.</li> <li>- Set RBW = 1 MHz</li> <li>- Set VBW ≥ 3 MHz</li> <li>- Detector = RMS.</li> <li>- Sweep time = auto couple.</li> <li>- Trace mode = max hold.</li> <li>- Trace average at least 100 traces in power averaging</li> <li>- Use the peak marker function to determine the maximum amplitude level within the RBW.</li> </ul> <p>Apply correction to the result if different RBW is used.</p> |                                                                                                                                                      |                                                                            |
| Test Date      | 11/25/2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Environmental condition                                                                                                                              | Temperature 22°C<br>Relative Humidity 46%<br>Atmospheric Pressure 1020mbar |
| Remark         | <p>Per KDB 662911 D01 Multiple Transmitter Output v02r01, the direction gain for horizontal polarization and vertical polarization is calculated separately.</p> <p>For 5Ghz band, peak antenna gain = 3.5 dBi, directional gain = 3 dB, total gain = 6.5 dBi</p> <p>Highest of total gain is 6.5 dBi. The power limit and PSD limit will be reduced by amount of 0.5 dB.</p> <p>For the Cross band channels, the PSD of full bandwidth is compared to the PSD limit in 5.5G and 5.8G as the worst case. For 5.8GHz band, the PSD measurement on Cross band channel is using 1MHz BW as the worst case.</p>                                                                                                               |                                                                                                                                                      |                                                                            |
| Result         | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                      |                                                                            |

Test Data    ☒ Yes                      ☐ N/A

Test Plot    ☒ Yes (See below)              ☐ N/A

### PSD measurement result for 5.3GHz

| Type | Test mode    | Freq (MHz) | CH   | Conducted PSD (dBm/MHz) |        |        |        |                | Limit (dBm) | Result |
|------|--------------|------------|------|-------------------------|--------|--------|--------|----------------|-------------|--------|
|      |              |            |      | Chain1                  | Chain2 | Chain3 | Chain4 | Combined Power |             |        |
| PSD  | 802.11a      | 5260       | Low  | 3.44                    | 4.08   | 5.03   | 3.46   | 10.07          | 10.5        | Pass   |
| PSD  | 802.11a      | 5280       | Mid  | 3.59                    | 3.84   | 4.56   | 3.67   | 9.95           | 10.5        | Pass   |
| PSD  | 802.11a      | 5320       | High | 3.95                    | 4.08   | 4.71   | 3.68   | 10.14          | 10.5        | Pass   |
| PSD  | 802.11n-20M  | 5260       | Low  | 3.37                    | 3.76   | 4.49   | 3.54   | 9.83           | 10.5        | Pass   |
| PSD  | 802.11n-20M  | 5280       | Mid  | 3.25                    | 3.62   | 4.71   | 3.34   | 9.79           | 10.5        | Pass   |
| PSD  | 802.11n-20M  | 5320       | High | 3.6                     | 3.69   | 4.72   | 3.87   | 10.01          | 10.5        | Pass   |
| PSD  | 802.11n-40M  | 5270       | Low  | 0.52                    | 1.08   | 2.02   | 0.67   | 7.13           | 10.5        | Pass   |
| PSD  | 802.11n-40M  | 5310       | Mid  | 0.64                    | 1.05   | 1.83   | 0.86   | 7.14           | 10.5        | Pass   |
| PSD  | 802.11ac-80M | 5290       | High | -3.37                   | -3.28  | -2.32  | -3.41  | 2.95           | 10.5        | Pass   |

### PSD measurement result for 5.5GHz

| Type | Test mode    | Freq (MHz) | CH   | Conducted PSD (dBm/MHz) |        |        |        |                | Limit (dBm) | Result |
|------|--------------|------------|------|-------------------------|--------|--------|--------|----------------|-------------|--------|
|      |              |            |      | Chain1                  | Chain2 | Chain3 | Chain4 | Combined Power |             |        |
| PSD  | 802.11a      | 5500       | Low  | 3.66                    | 3.82   | 4.58   | 3.44   | 9.92           | 10.5        | Pass   |
| PSD  | 802.11a      | 5580       | Mid  | 3.46                    | 3.66   | 4.65   | 3.58   | 9.89           | 10.5        | Pass   |
| PSD  | 802.11a      | 5700       | High | 3.37                    | 3.09   | 3.6    | 3.19   | 9.34           | 10.5        | Pass   |
| PSD  | 802.11n-20M  | 5500       | Low  | 3.18                    | 3.54   | 4.52   | 3.55   | 9.75           | 10.5        | Pass   |
| PSD  | 802.11n-20M  | 5580       | Mid  | 3.26                    | 3.13   | 4.27   | 3.49   | 9.58           | 10.5        | Pass   |
| PSD  | 802.11n-20M  | 5700       | High | 3.10                    | 3.07   | 3.33   | 3.06   | 9.16           | 10.5        | Pass   |
| PSD  | 802.11n-40M  | 5510       | Low  | 0.33                    | 0.68   | 1.57   | 0.55   | 6.83           | 10.5        | Pass   |
| PSD  | 802.11n-40M  | 5550       | Mid  | 0.40                    | 0.71   | 1.62   | 0.51   | 6.86           | 10.5        | Pass   |
| PSD  | 802.11n-40M  | 5670       | High | 0.32                    | -0.18  | 1.13   | 0.44   | 6.47           | 10.5        | Pass   |
| PSD  | 802.11ac-80M | 5530       | Low  | -3.68                   | -3.68  | -1.96  | -3.30  | 2.93           | 10.5        | Pass   |
| PSD  | 802.11ac-80M | 5610       | High | -3.83                   | -3.33  | -2.70  | -3.14  | 2.79           | 10.5        | Pass   |

### PSD measurement result for cross channels (in band 5470-5725MHz)

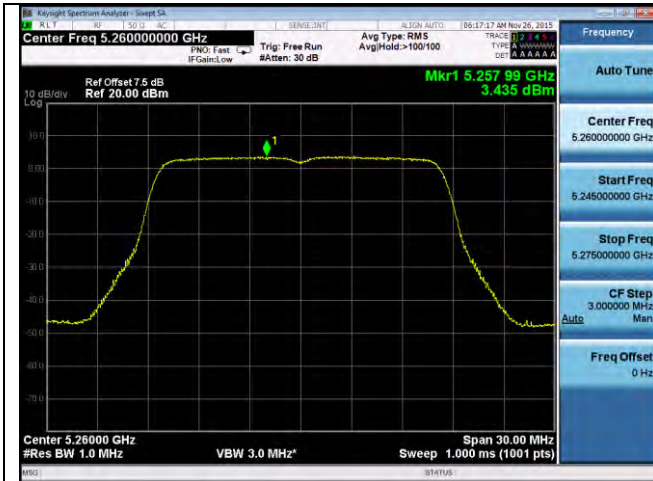
| Type | Test mode    | Freq (MHz) | CH    | Conducted PSD (dBm/MHz) |        |        |        |                | Limit (dBm) | Result |
|------|--------------|------------|-------|-------------------------|--------|--------|--------|----------------|-------------|--------|
|      |              |            |       | Chain1                  | Chain2 | Chain3 | Chain4 | Combined Power |             |        |
| PSD  | 802.11a      | 5720       | CROSS | 3.23                    | 3.09   | 3.84   | 3.32   | 9.40           | 10.5        | Pass   |
| PSD  | 802.11n-20M  | 5720       | CROSS | 3.17                    | 3.00   | 3.75   | 2.87   | 9.23           | 10.5        | Pass   |
| PSD  | 802.11n-40M  | 5710       | CROSS | 0.53                    | 0.35   | 0.86   | 0.39   | 6.56           | 10.5        | Pass   |
| PSD  | 802.11ac-80M | 5690       | CROSS | -3.21                   | -3.47  | -2.5   | -3.47  | 2.88           | 10.5        | Pass   |

**PSD measurement result for cross channels (in band 5725-5850MHz)**

| Test mode    | Freq (MHz) | CH    | Conducted PSD (dBm/MHz) |        |        |        |              | Corrected Level (dBm/500kHz) | Limit (dBm/500kHz) | Result |
|--------------|------------|-------|-------------------------|--------|--------|--------|--------------|------------------------------|--------------------|--------|
|              |            |       | Chain1                  | Chain2 | Chain3 | Chain4 | Combined PSD |                              |                    |        |
| 802.11a      | 5720       | CROSS | -5.44                   | -5.96  | -5.35  | -5.70  | 0.41         | 7.4                          | 30                 | Pass   |
| 802.11n-20M  | 5720       | CROSS | -5.26                   | -5.71  | -5.31  | -5.56  | 0.56         | 7.55                         | 30                 | Pass   |
| 802.11n-40M  | 5710       | CROSS | -8.23                   | -8.39  | -8.13  | -8.84  | -2.37        | 4.62                         | 30                 | Pass   |
| 802.11ac-80M | 5690       | CROSS | -12.41                  | -12.75 | -11.65 | -12.59 | -6.31        | 0.68                         | 30                 | Pass   |

**Correction factor=10\*log(500/100)=6.99**

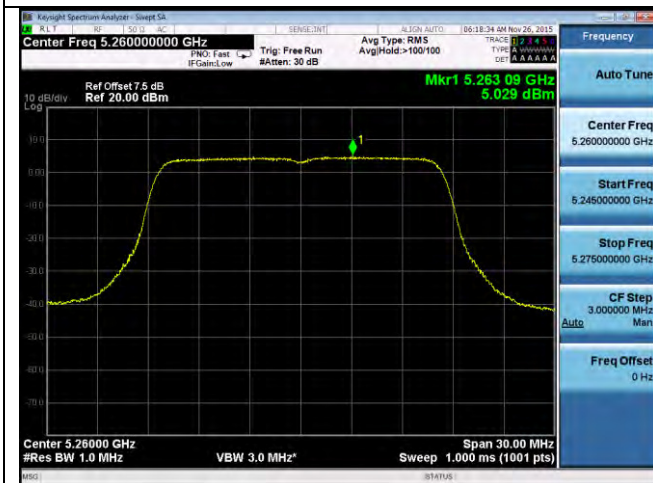
## Test Plots



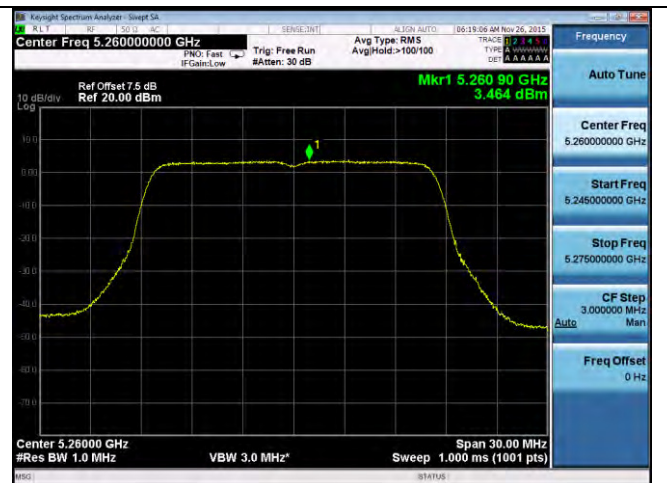
PSD-802.11a-5260M-chain1



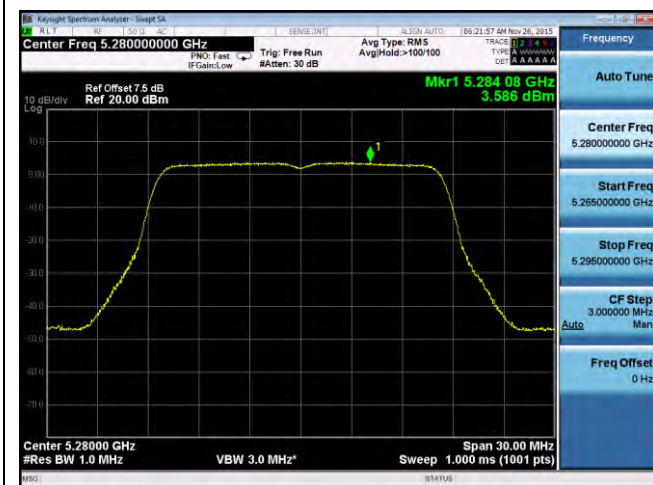
PSD-802.11a-5260M-chain2



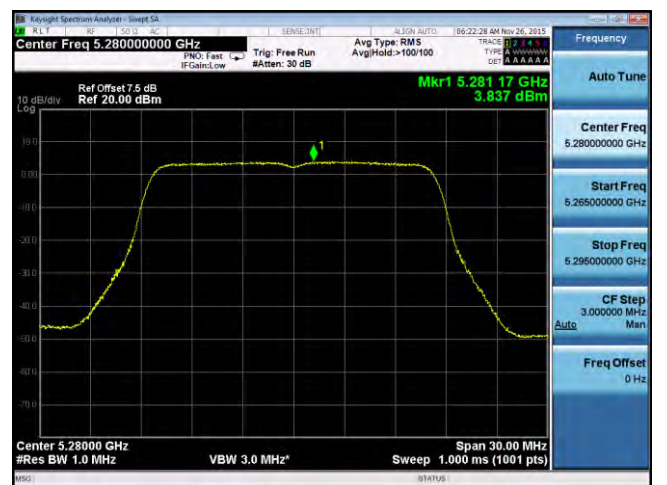
PSD-802.11a-5260M-chain3



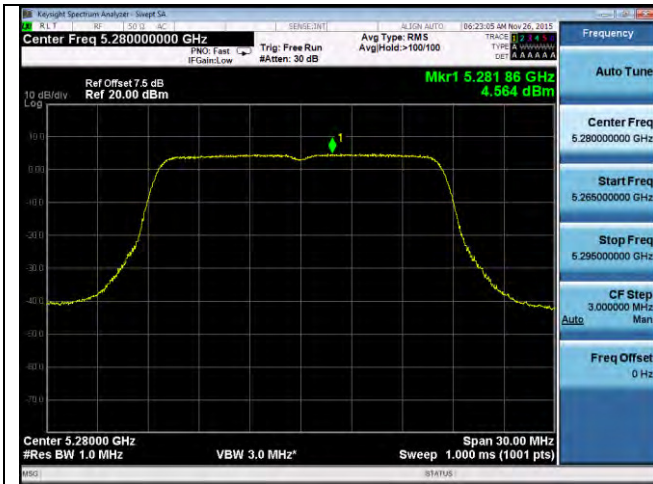
PSD-802.11a-5260M-chain4



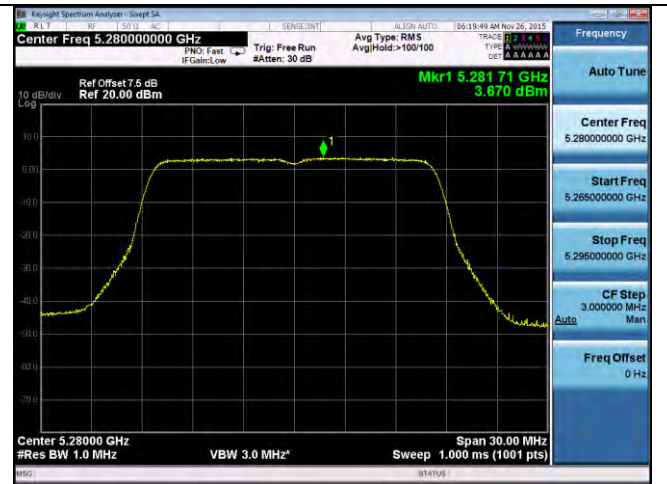
PSD-802.11a-5280M-chain1



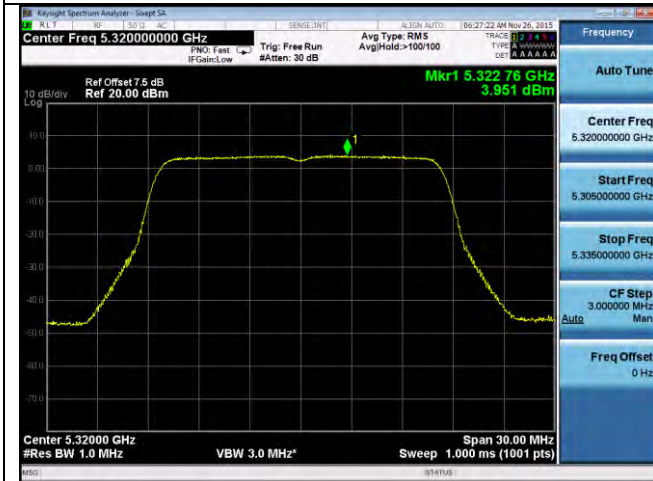
PSD-802.11a-5280M-chain2



PSD-802.11a-5280M-chain3



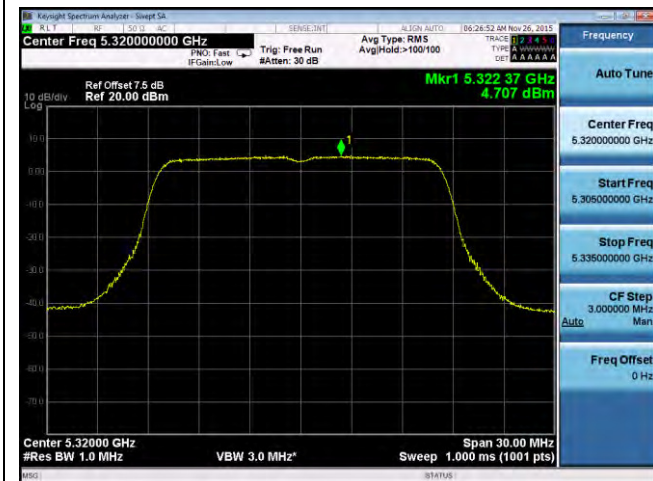
PSD-802.11a-5280M-chain4



PSD-802.11a-5320M-chain1



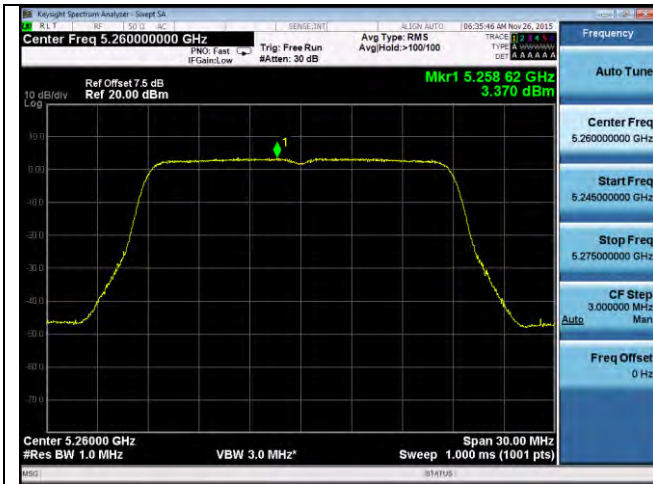
PSD-802.11a-5320M-chain2



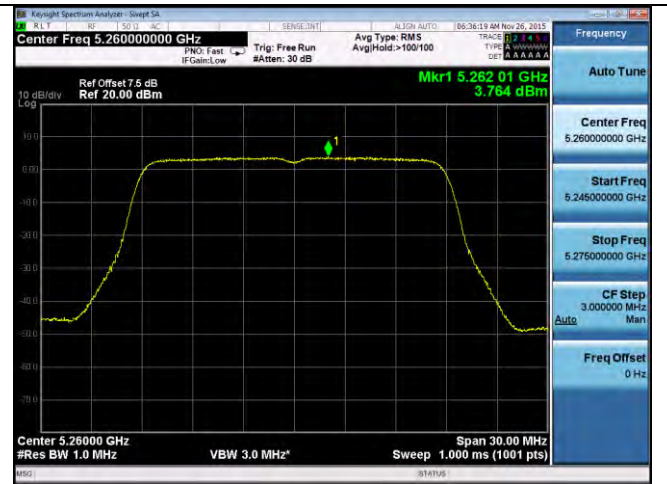
PSD-802.11a-5320M-chain3



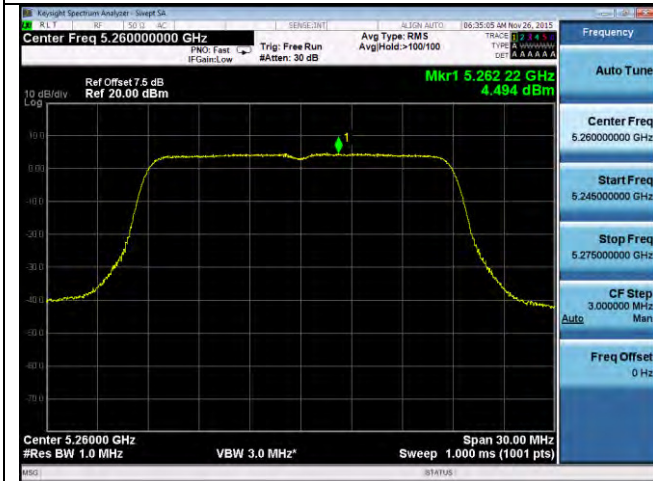
PSD-802.11a-5320M-chain4



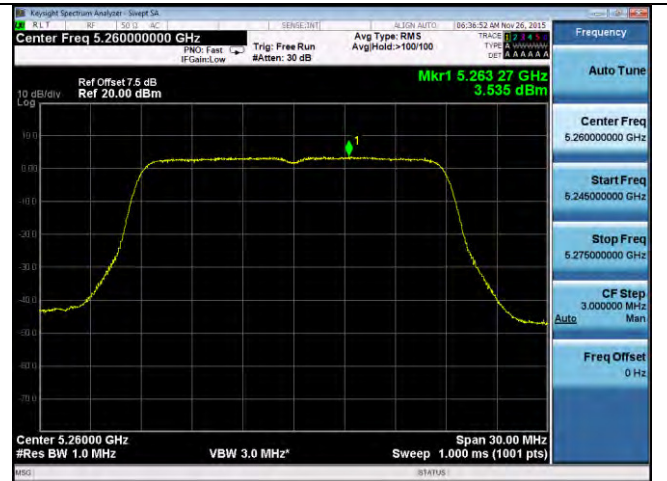
PSD-802.11n-20M-5260M-chain1



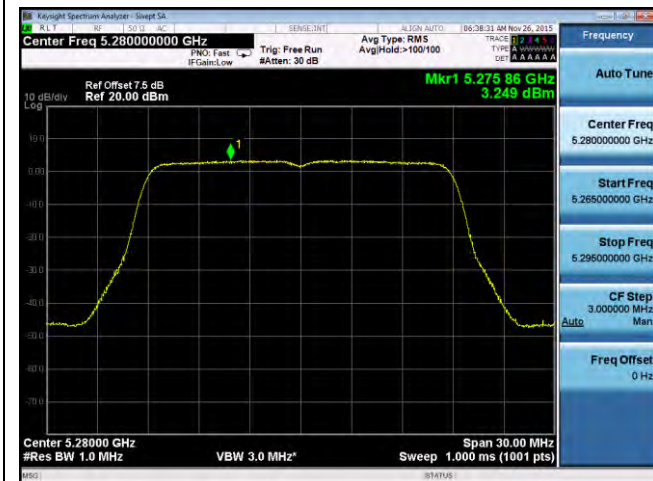
PSD-802.11n-20M-5260M-chain2



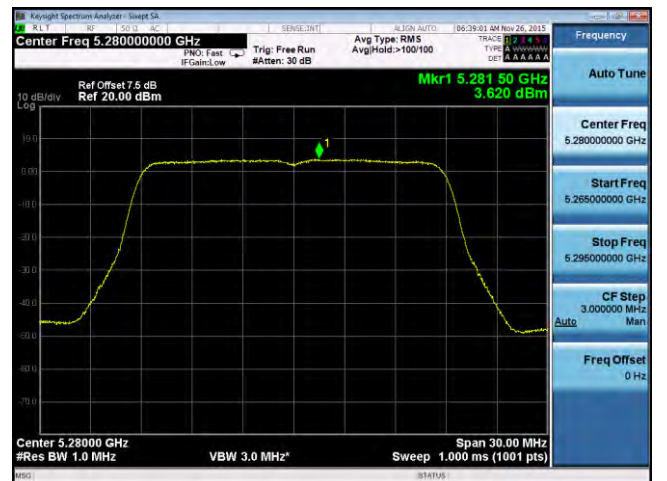
PSD-802.11n-20M-5260M-chain3



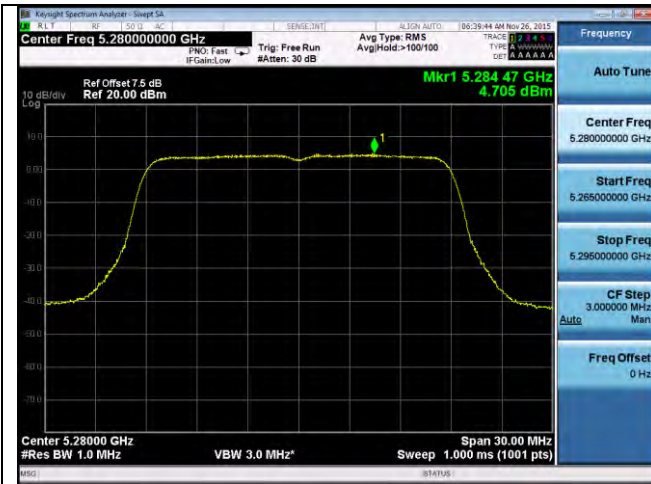
PSD-802.11n-20M-5260M-chain4



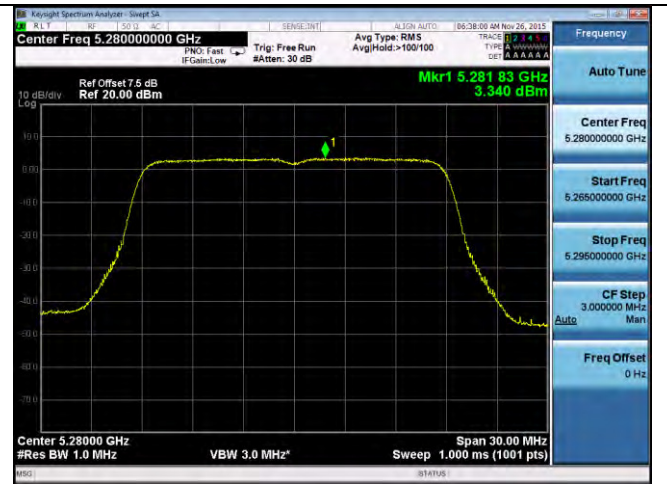
PSD-802.11n-20M-5280M-chain1



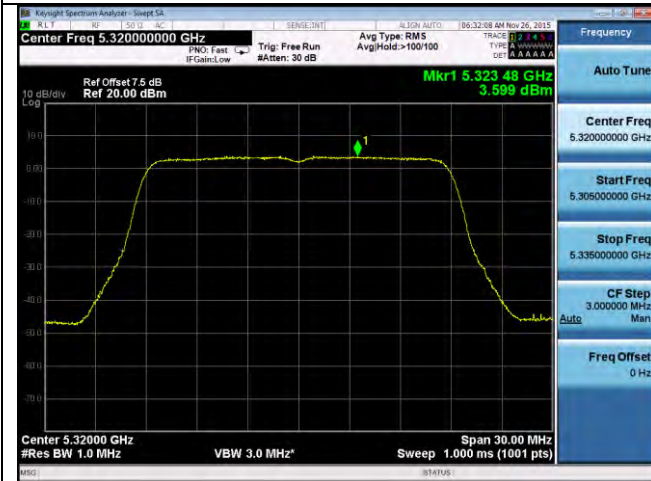
PSD-802.11n-20M-5280M-chain2



PSD-802.11n-20M-5280M-chain3



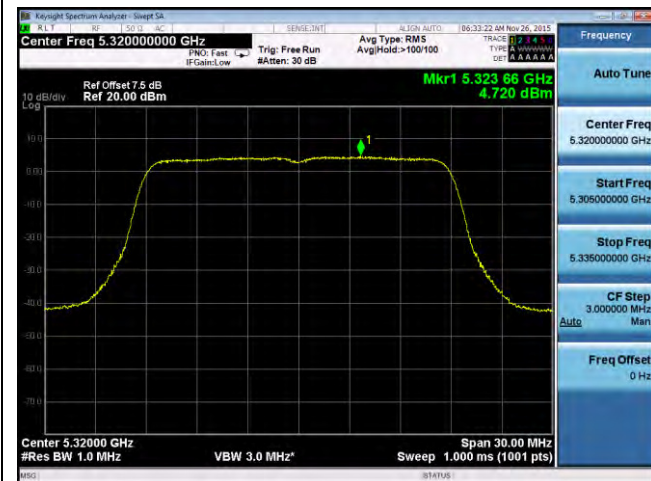
PSD-802.11n-20M-5280M-chain4



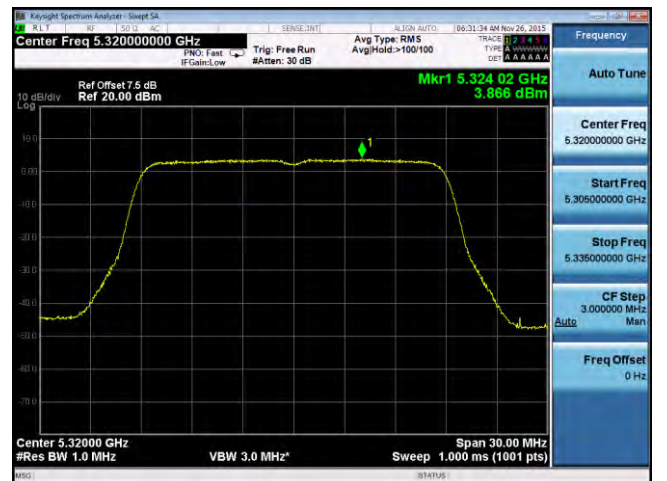
PSD-802.11n-20M-5320M-chain1



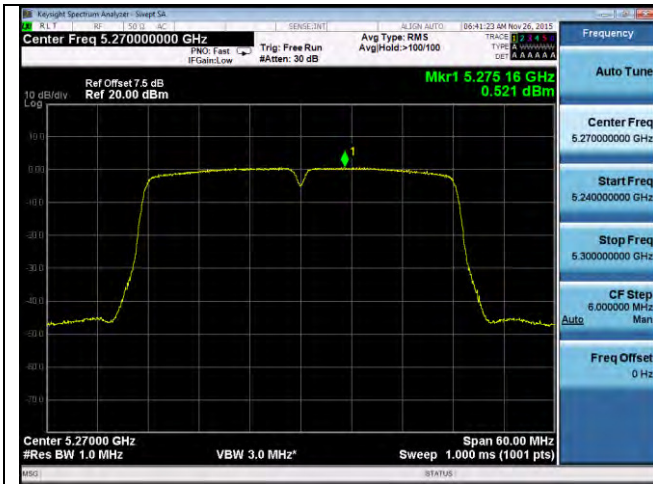
PSD-802.11n-20M-5320M-chain2



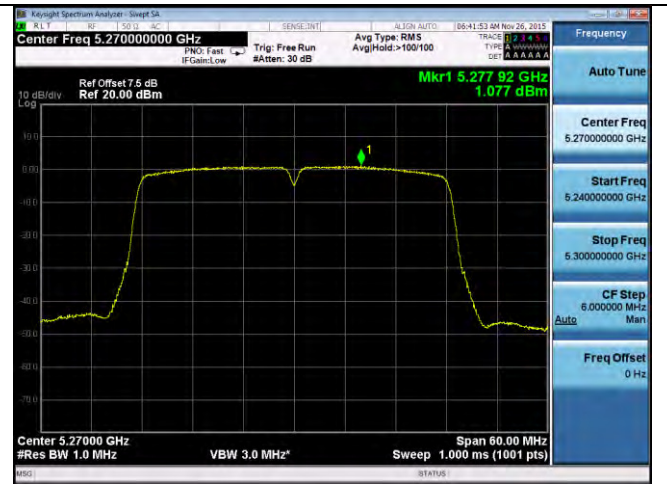
PSD-802.11n-20M-5320M-chain3



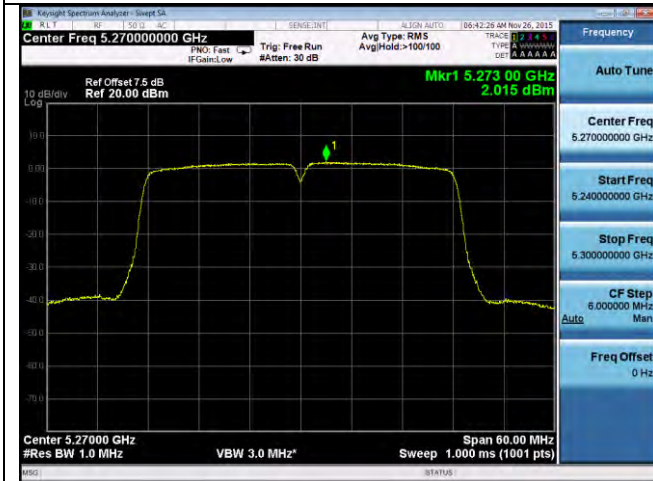
PSD-802.11n-20M-5320M-chain4



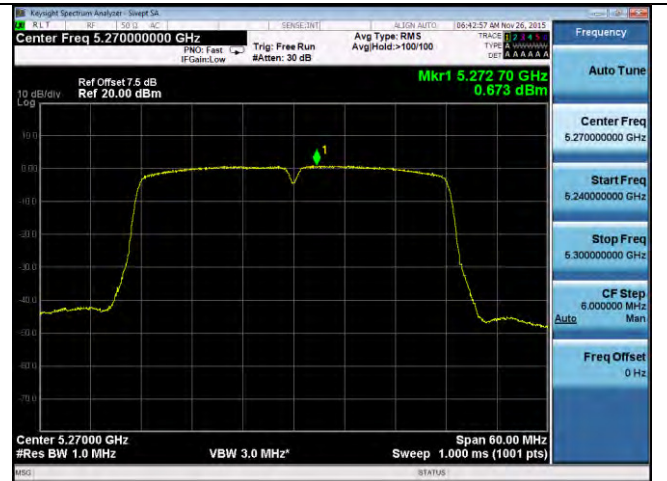
PSD-802.11n-40M-5270M-chain1



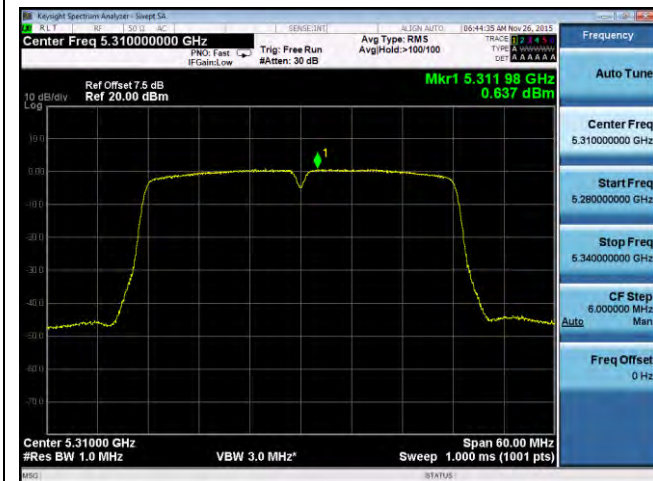
PSD-802.11n-40M-5270M-chain2



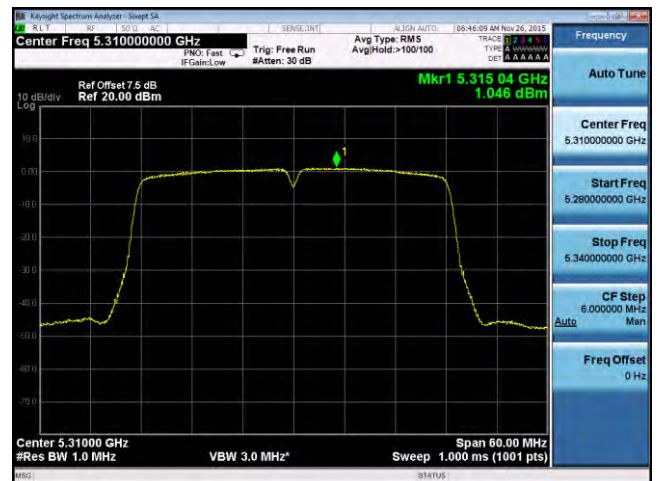
PSD-802.11n-40M-5270M-chain3



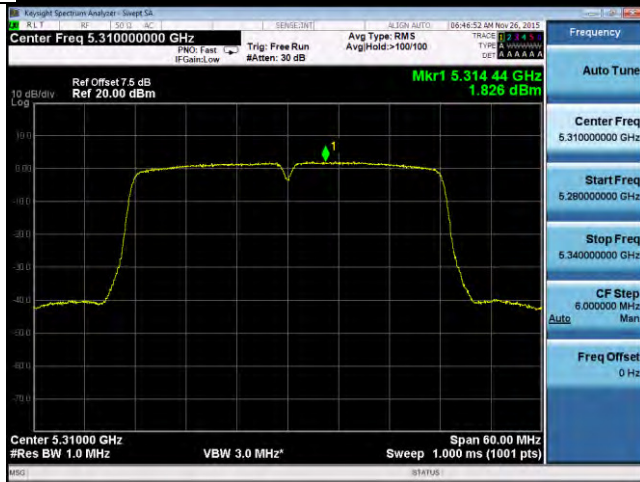
PSD-802.11n-40M-5270M-chain4



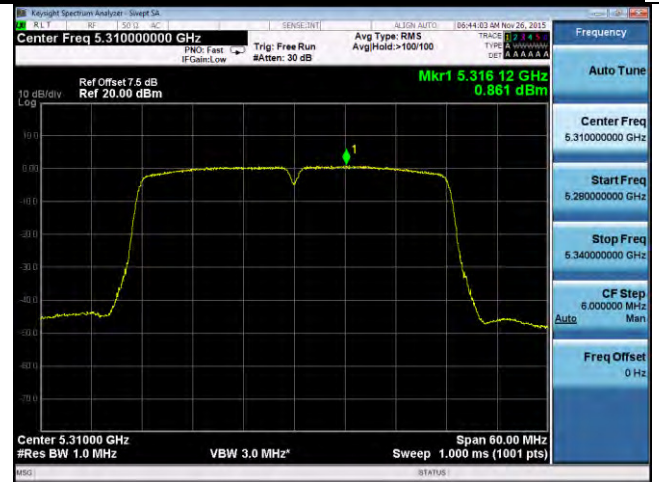
PSD-802.11n-40M-5310M-chain1



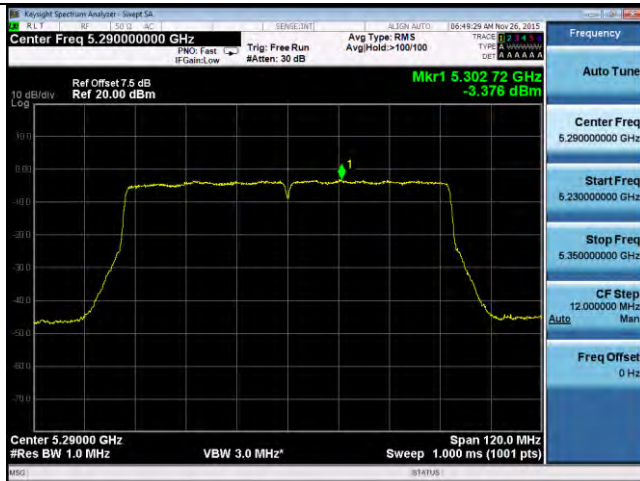
PSD-802.11n-40M-5310M-chain2



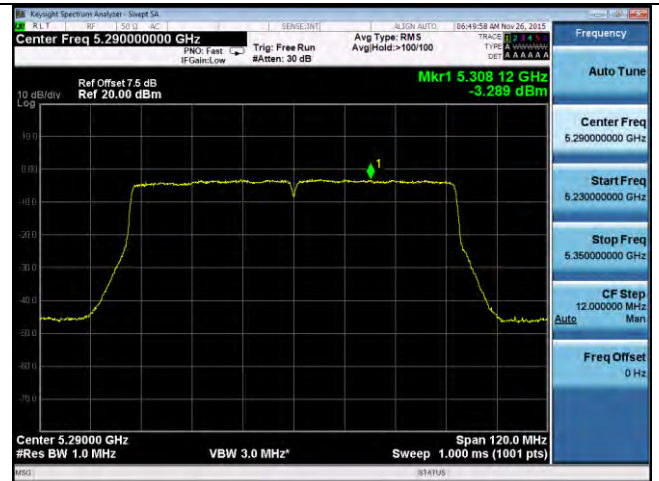
PSD-802.11n-40M-5310M-chain3



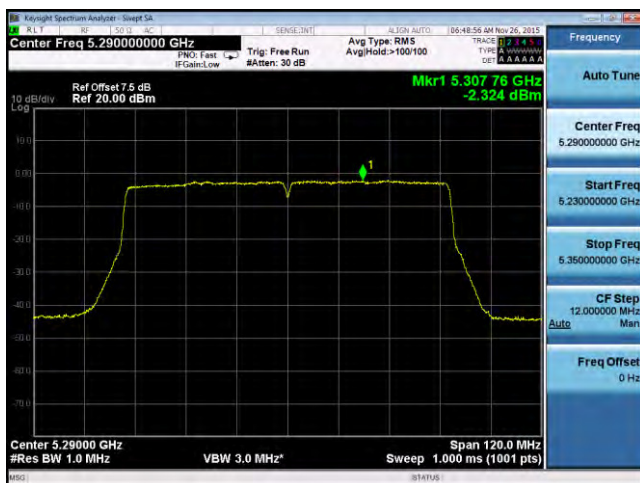
PSD-802.11n-40M-5310M-chain4



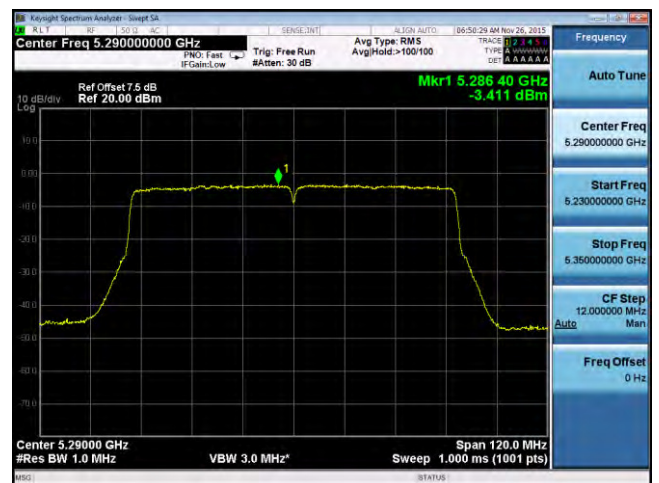
PSD-802.11ac-80M-5290M-chain1



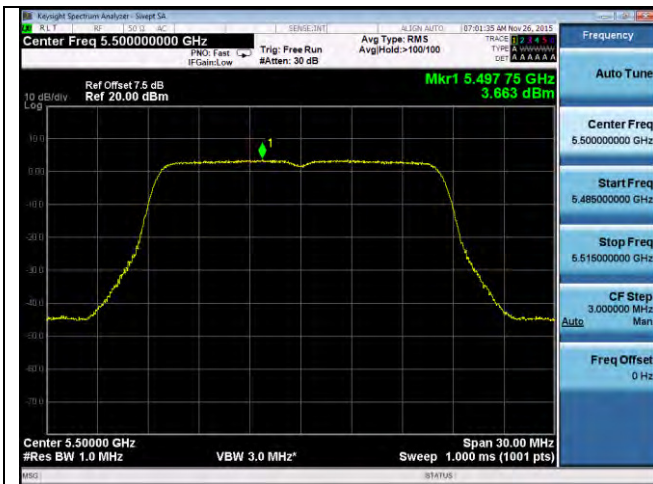
PSD-802.11ac-80M-5290M-chain2



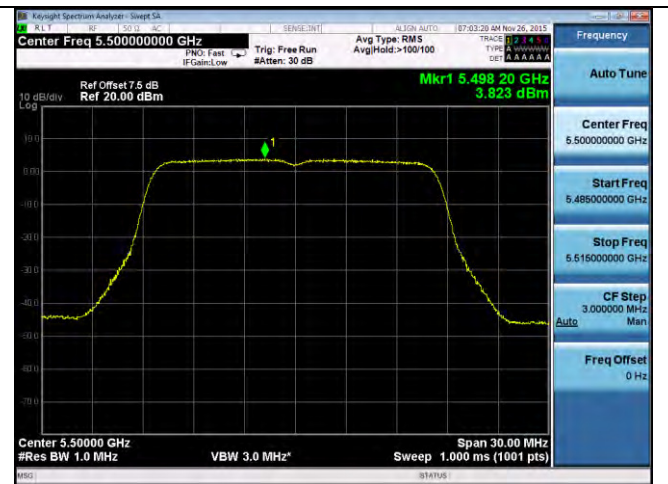
PSD-802.11ac-80M-5290M-chain3



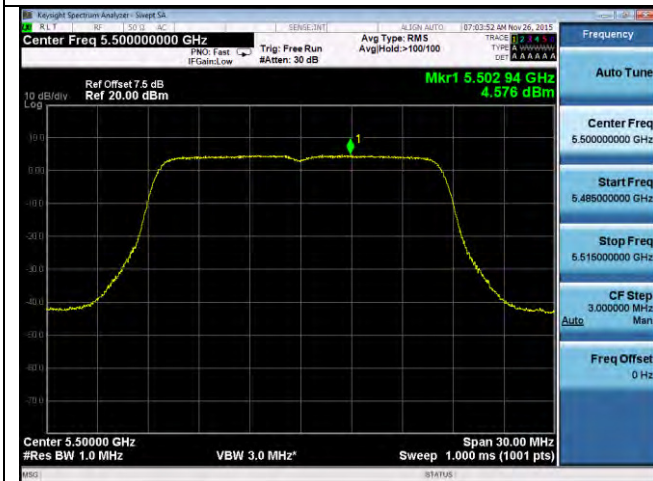
PSD-802.11ac-80M-5290M-chain4



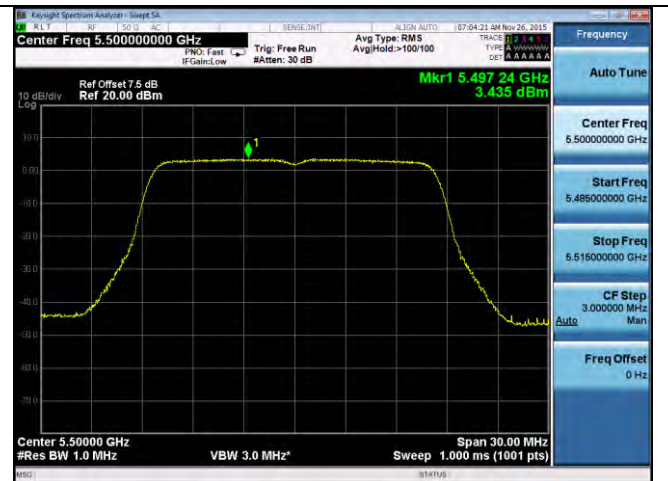
PSD-802.11a-5500M-chain1



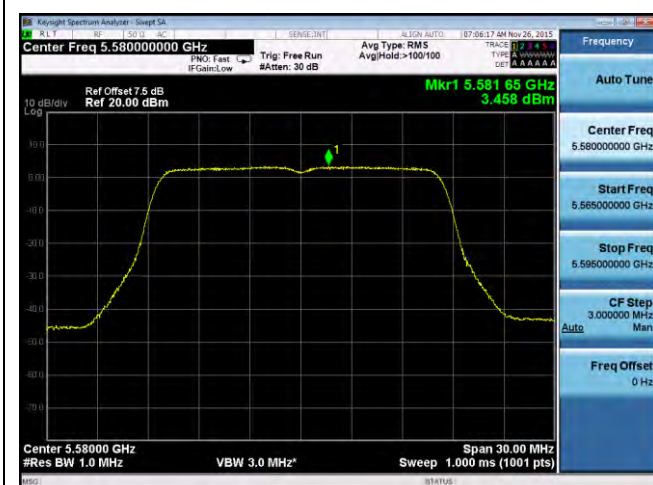
PSD-802.11a-5500M-chain2



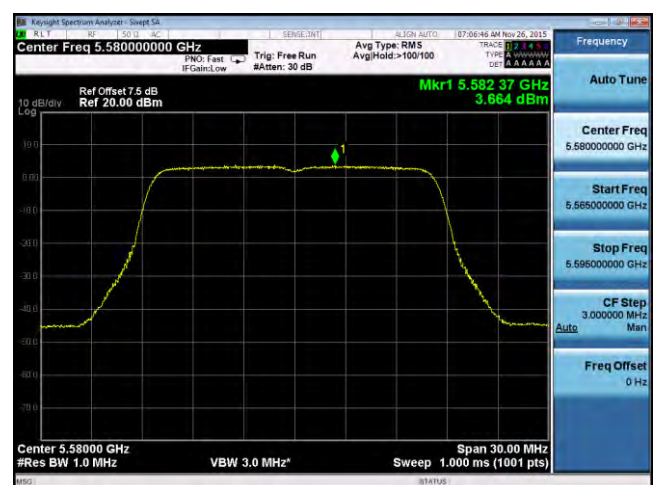
PSD-802.11a-5500M-chain3



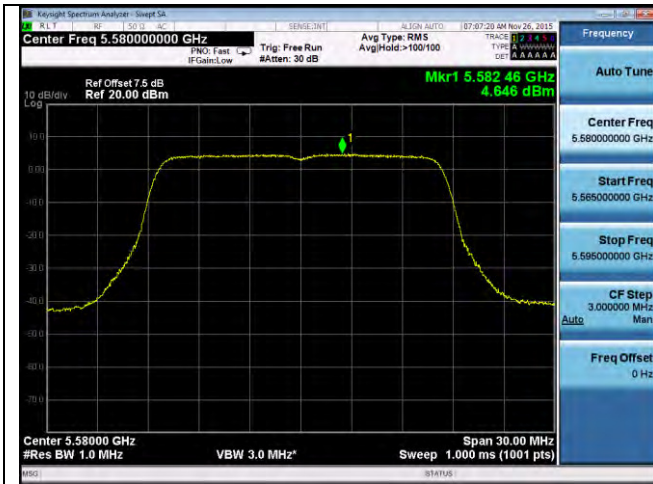
PSD-802.11a-5500M-chain4



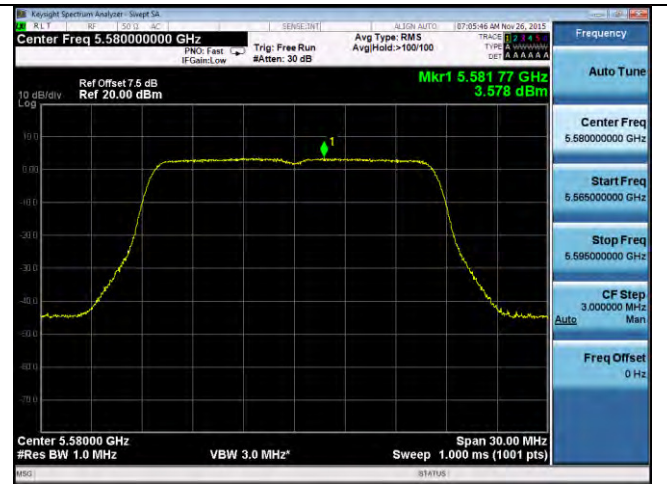
PSD-802.11a-5580M-chain1



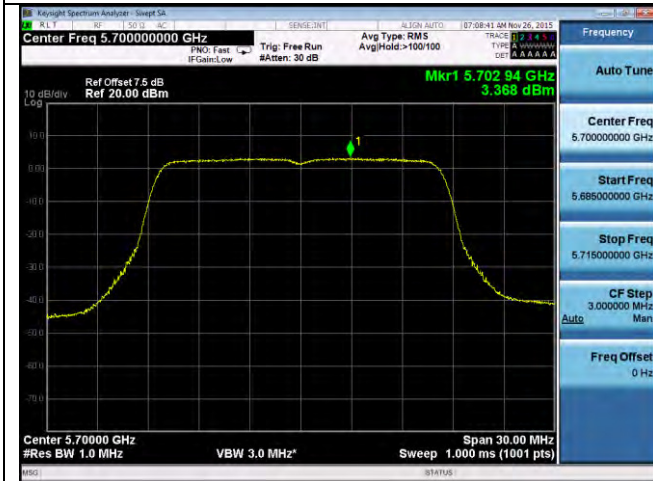
PSD-802.11a-5580M-chain2



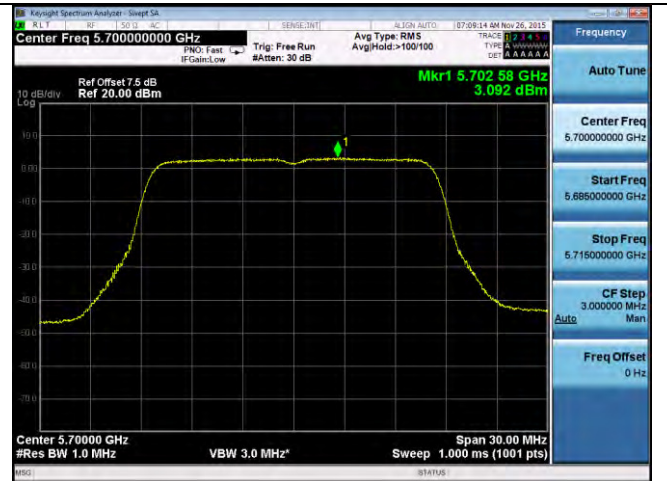
PSD-802.11a-5580M-chain3



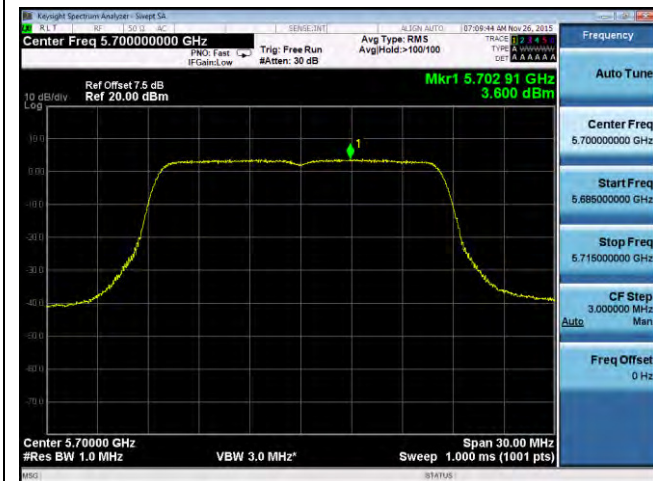
PSD-802.11a-5580M-chain4



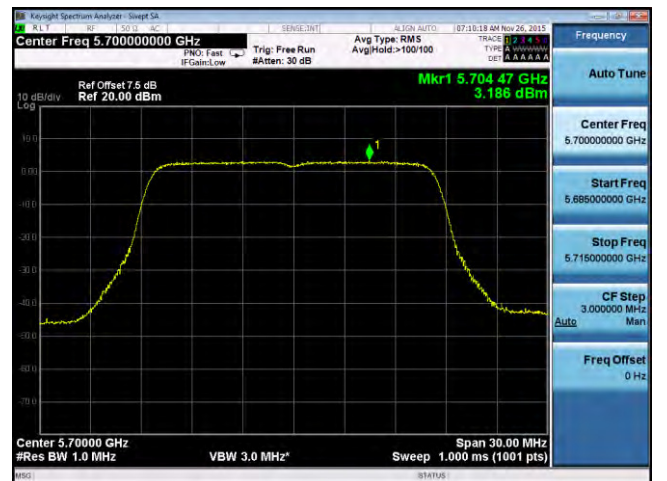
PSD-802.11a-5700M-chain1



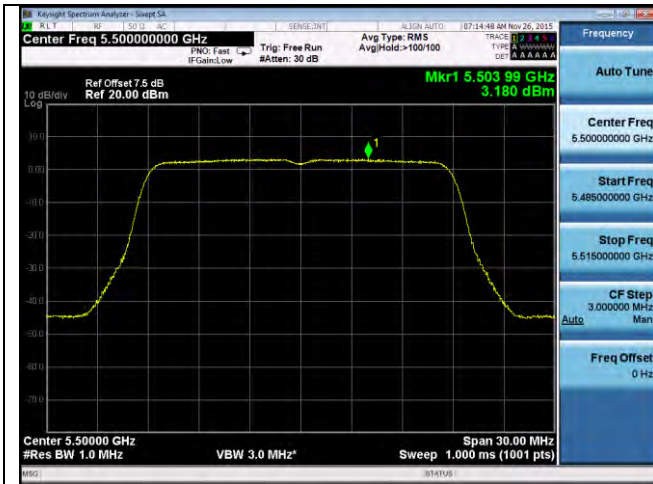
PSD-802.11a-5700M-chain2



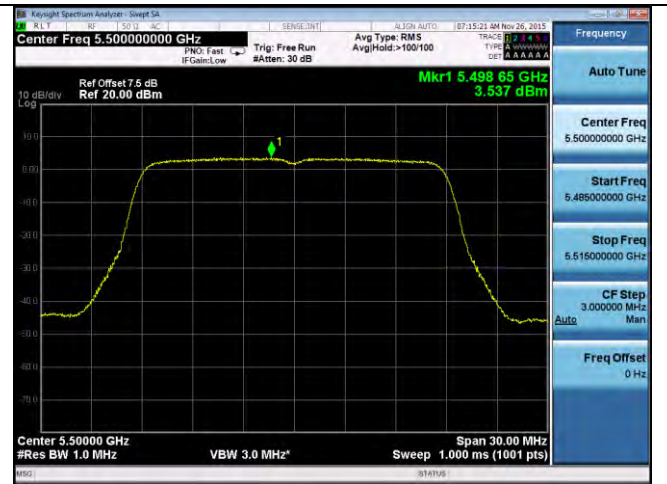
PSD-802.11a-5700M-chain3



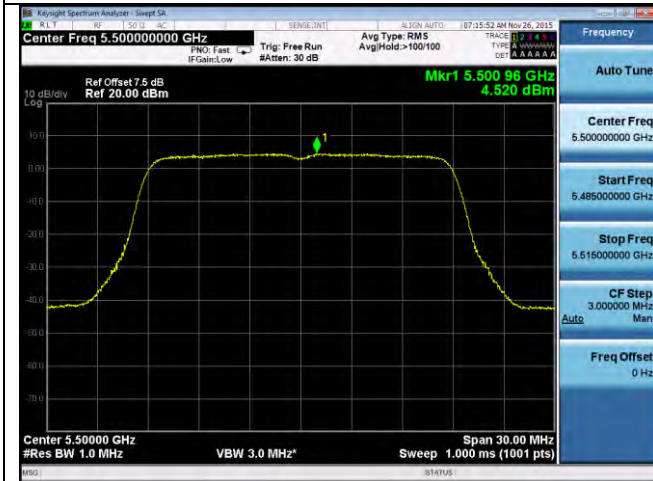
PSD-802.11a-5700M-chain4



PSD-802.11n-20M-5500M-chain1



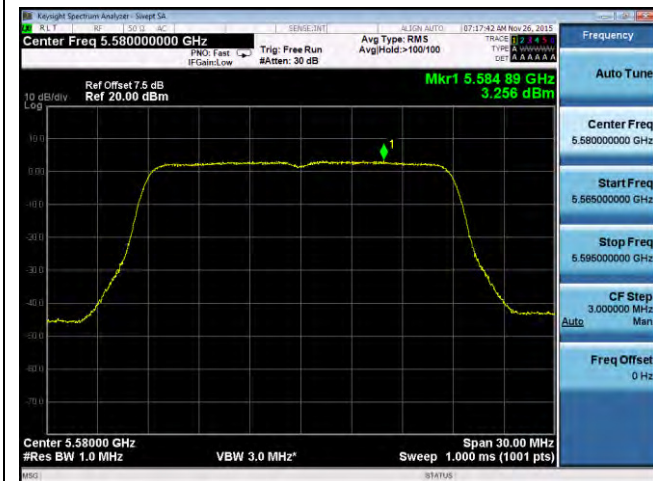
PSD-802.11n-20M-5500M-chain2



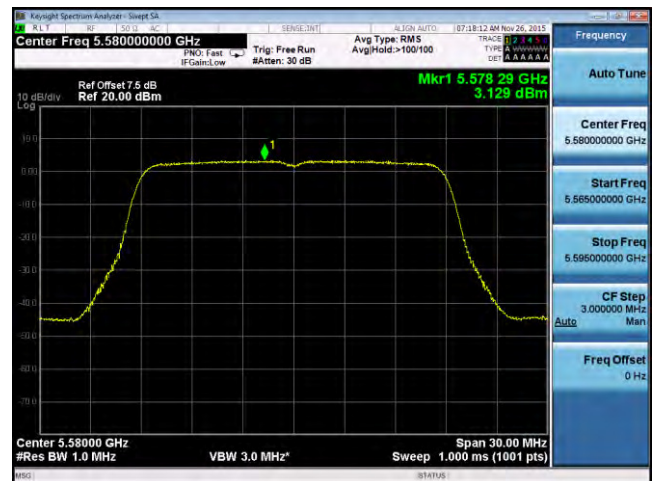
PSD-802.11n-20M-5500M-chain3



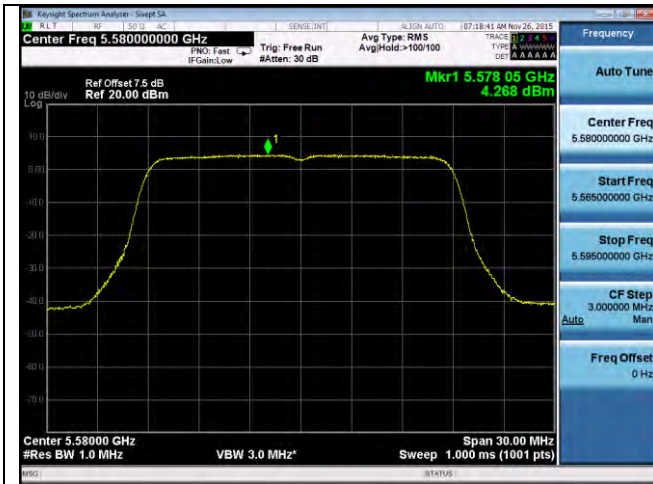
PSD-802.11n-20M-5500M-chain4



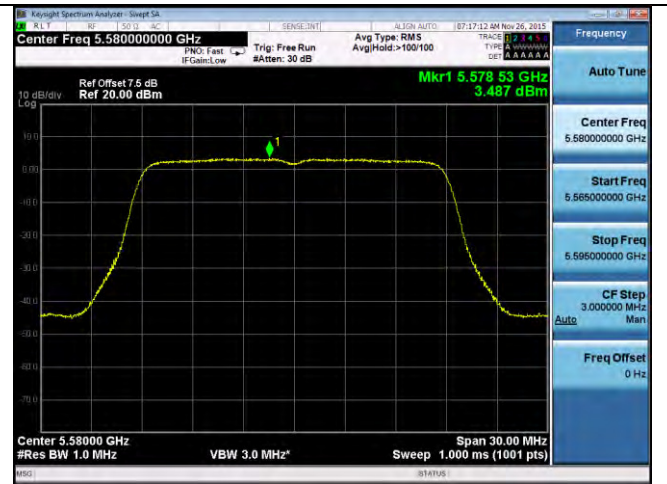
PSD-802.11n-20M-5580M-chain1



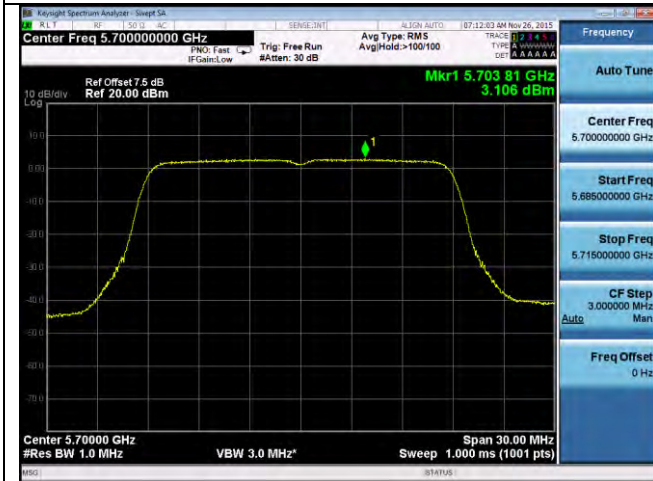
PSD-802.11n-20M-5580M-chain2



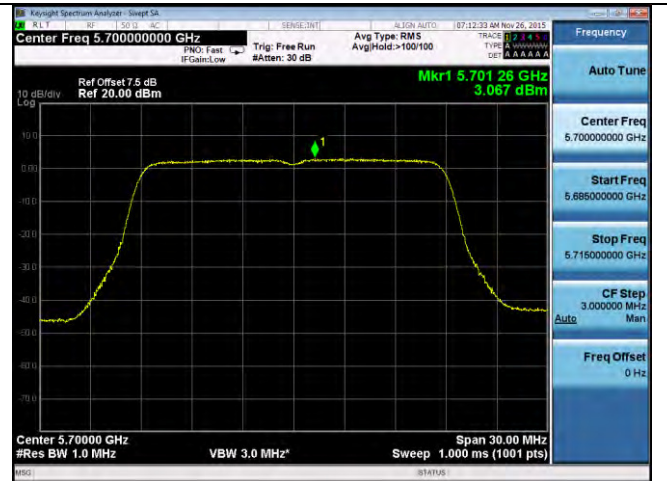
PSD-802.11n-20M-5580M-chain3



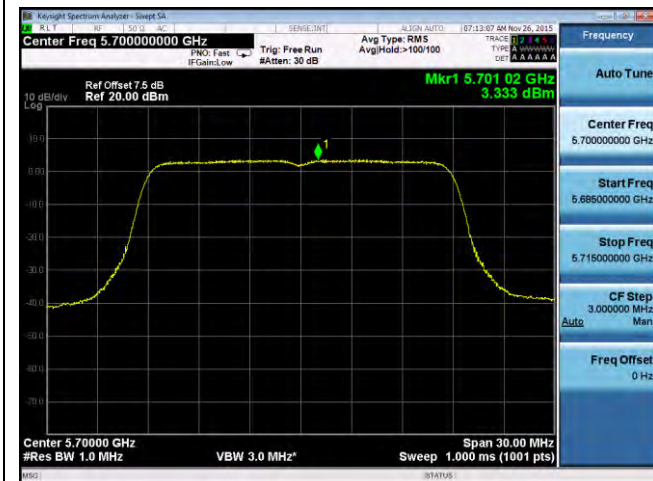
PSD-802.11n-20M-5580M-chain4



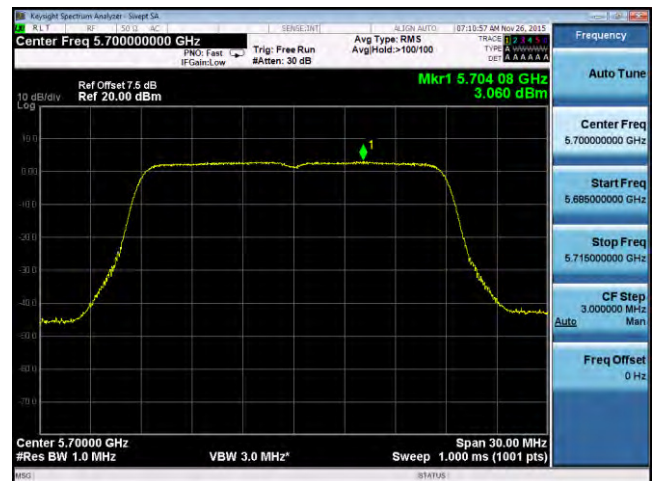
PSD-802.11n-20M-5700M-chain1



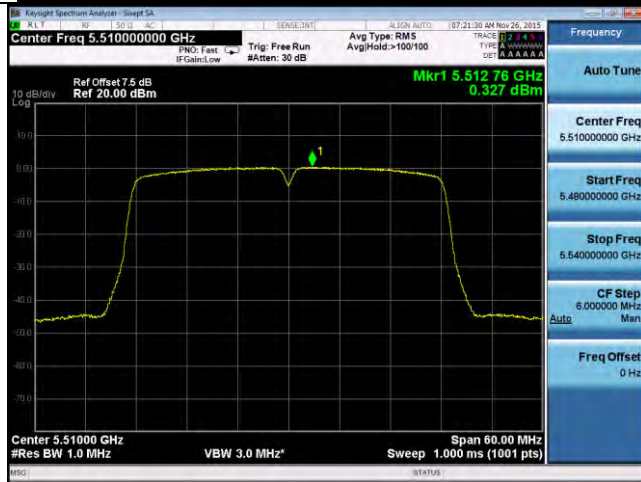
PSD-802.11n-20M-5700M-chain2



PSD-802.11n-20M-5700M-chain3



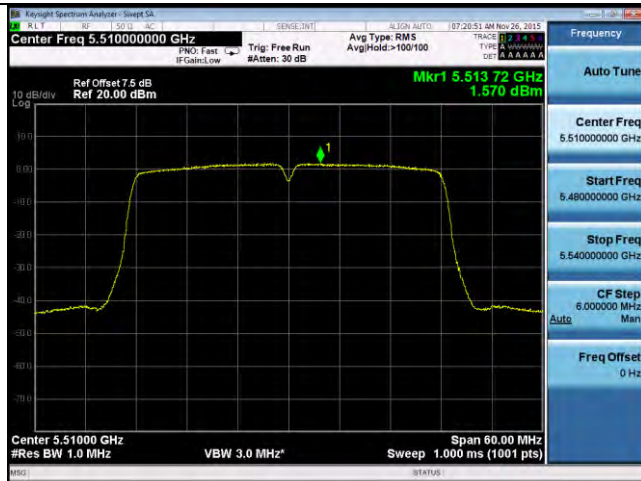
PSD-802.11n-20M-5700M-chain4



PSD-802.11n-40M-5510M-chain1



PSD-802.11n-40M-5510M-chain2



PSD-802.11n-40M-5510M-chain3



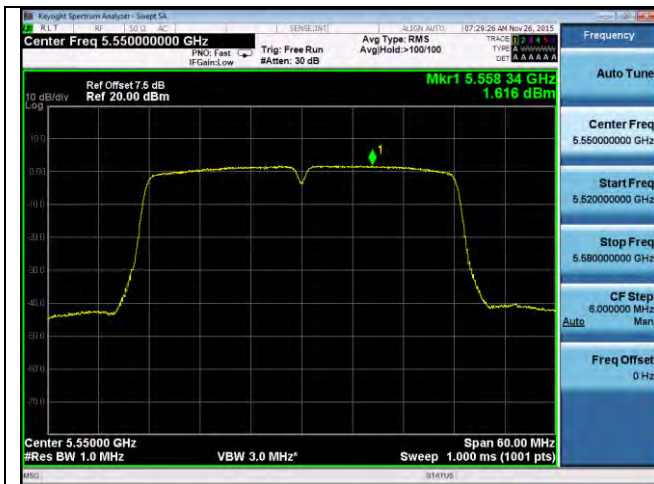
PSD-802.11n-40M-5510M-chain4



PSD-802.11n-40M-5550M-chain1



PSD-802.11n-40M-5550M-chain2



PSD-802.11n-40M-5550M-chain3



PSD-802.11n-40M-5550M-chain4



PSD-802.11n-40M-5670M-chain1



PSD-802.11n-40M-5670M-chain2



PSD-802.11n-40M-5670M-chain3



PSD-802.11n-40M-5670M-chain4