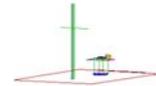


PCTEST ENGINEERING LABORATORY, INC.

7185 Oakland Mills Road, Columbia, MD 21046 USA
 Tel. 410.290.6652 / Fax 410.290.6654
<http://www.pctestlab.com>



MEASUREMENT REPORT FCC Part 15.407 UNII 802.11a/n/ac

Applicant Name:
 Samsung Electronics Co., Ltd.
 129, Samsung-ro,
 Yeongtong-gu, Suwon-si
 Gyeonggi-do, 16677, Korea

Date of Testing:
 3/21-6/5/2017
Test Site/Location:
 PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
 1M1703270127-01.A3L

| | |
|-------------------|--------------------------------------|
| FCC ID: | A3LETWV520 |
| APPLICANT: | Samsung Electronics Co., Ltd. |

Application Type: Class II Permissive Change
Model: ET-WV520
EUT Type: Indoor Access Point
FCC Classification: Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s): Part 15.407
Test Procedure(s): KDB 789033 D02 v01r04, KDB 662911 D01 v02r01
Class II Permissive Change: Please see FCC change document
Original Grant Date: 3/6/2017

| UNII Band | Channel Bandwidth (MHz) | Tx Frequency (MHz) | ANT1 | | ANT2 | | MIMO/CDD | |
|-----------|-------------------------|--------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|
| | | | Max. Power (mW) | Max. Power (dBm) | Max. Power (mW) | Max. Power (dBm) | Max. Power (mW) | Max. Power (dBm) |
| 2A | 20 | 5260 - 5320 | 125.026 | 20.97 | 120.226 | 20.80 | 106.905 | 20.29 |
| 2C | | 5500 - 5720 | 119.950 | 20.79 | 125.314 | 20.98 | 119.399 | 20.77 |
| 2A | 40 | 5270 - 5310 | 110.662 | 20.44 | 92.897 | 19.68 | 111.686 | 20.48 |
| 2C | | 5510 - 5710 | 105.682 | 20.24 | 100.462 | 20.02 | 111.944 | 20.49 |
| 2A | 80 | 5290 | 26.242 | 14.19 | 26.607 | 14.25 | 41.687 | 16.20 |
| 2C | | 5530 - 5690 | 85.901 | 19.34 | 84.918 | 19.29 | 84.140 | 19.25 |

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 789033 D02 v01r04. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Randy Ortanez
 President

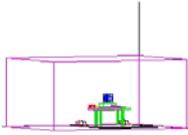


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|--|-------------------------------------|--|---------------|--|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 1 of 136 | |

T A B L E O F C O N T E N T S

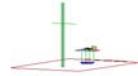
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| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 2 of 136 | |



MEASUREMENT REPORT

FCC Part 15.407



§ 2.1033 General Information

APPLICANT: Samsung Electronics Co., Ltd.

APPLICANT ADDRESS: 129, Samsung-ro,
Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea

TEST SITE: PCTEST ENGINEERING LABORATORY, INC.

TEST SITE ADDRESS: 7185 Oakland Mills Road, Columbia, MD 21046 USA

FCC RULE PART(S): Part 15.407

BASE MODEL: ET-WV520

FCC ID: A3LETWV520

FCC CLASSIFICATION: Unlicensed National Information Infrastructure (UNII)

Test Device Serial No.: 20JAN-2, 20JAN-3, Production Pre-Production Engineering
20JAN-5

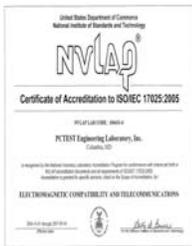
DATE(S) OF TEST: 3/21-6/5/2017

TEST REPORT S/N: 1M1703270127-01.A3L

Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451B-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451B-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.



| | | | | |
|--|--|---|---|--|
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1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2 PCTEST Test Location

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Intern't'l (BWI) airport, the city of Baltimore and the Washington, DC area. (See Figure 1-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2014 on January 22, 2015.

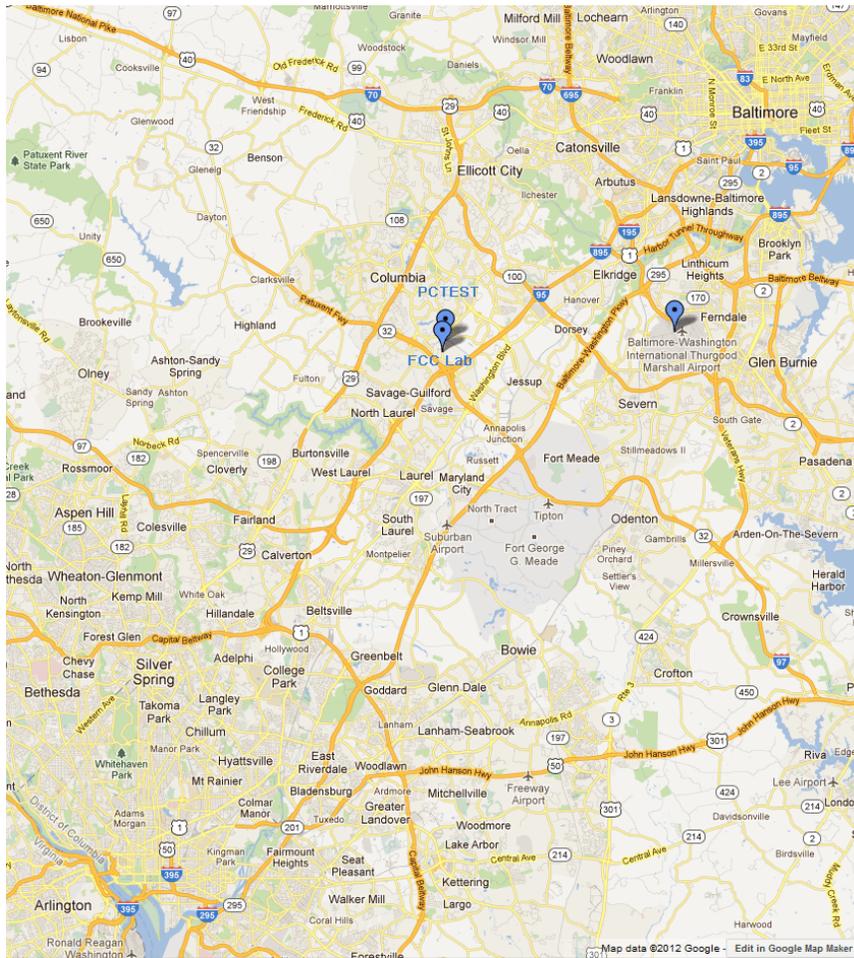


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

| | | | | |
|---|------------------------------|---|---------------|---------------------------------|
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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Indoor Access Point FCC ID: A3LETWV520**. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter.

2.2 Device Capabilities

This device contains the following capabilities:

802.11b/g/n/ac WLAN, 802.11a/n/ac UNII, Bluetooth (LE), Zigbee, Zwave

| Band 1 | | Band 2A | | Band 2C | | Band 3 | |
|--------|-----------------|---------|-----------------|---------|-----------------|--------|-----------------|
| Ch. | Frequency (MHz) | Ch. | Frequency (MHz) | Ch. | Frequency (MHz) | Ch. | Frequency (MHz) |
| 36 | 5180 | 52 | 5260 | 100 | 5500 | 149 | 5745 |
| : | : | : | : | : | : | : | : |
| 42 | 5210 | 56 | 5280 | 120 | 5600 | 157 | 5785 |
| : | : | : | : | : | : | : | : |
| 48 | 5240 | 64 | 5320 | 144 | 5720 | 165 | 5825 |

Table 2-1. 802.11a / 802.11n / 802.11ac (20MHz) Frequency / Channel Operations

| Band 1 | | Band 2A | | Band 2C | | Band 3 | |
|--------|-----------------|---------|-----------------|---------|-----------------|--------|-----------------|
| Ch. | Frequency (MHz) | Ch. | Frequency (MHz) | Ch. | Frequency (MHz) | Ch. | Frequency (MHz) |
| 38 | 5190 | 54 | 5270 | 102 | 5510 | 151 | 5755 |
| : | : | : | : | : | : | : | : |
| 46 | 5230 | 62 | 5310 | 118 | 5590 | : | : |
| | | | | : | : | | |
| | | | | 142 | 5710 | 159 | 5795 |

Table 2-2. 802.11n / 802.11ac (40MHz BW) Frequency / Channel Operations

| Band 1 | | Band 2A | | Band 2C | | Band 3 | |
|--------|-----------------|---------|-----------------|---------|-----------------|--------|-----------------|
| Ch. | Frequency (MHz) | Ch. | Frequency (MHz) | Ch. | Frequency (MHz) | Ch. | Frequency (MHz) |
| 42 | 5210 | 58 | 5290 | 106 | 5530 | 155 | 5775 |
| | | | | : | : | | |
| | | | | 138 | 5690 | | |

Table 2-3. 802.11ac (80MHz BW) Frequency / Channel Operations

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
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Notes:

- 5GHz NII operation is possible in 20MHz, and 40MHz, and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = peak per the guidance of Section B)2)b) of KDB 789033 D02 v01r04. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

| Maximum Achievable Duty Cycles | | | | |
|--------------------------------|-----------|----------------|------|------|
| 802.11 Mode/Band | | Duty Cycle [%] | | |
| | | ANT1 | ANT2 | MIMO |
| 5GHz | a | 97.7 | 98.2 | N/A |
| | n (HT20) | 98.6 | 99.0 | 96.0 |
| | ac (HT20) | 98.6 | 99.0 | 97.4 |
| | n (HT40) | 98.2 | 98.6 | 92.2 |
| | ac (HT40) | 98.2 | 98.6 | 92.2 |
| | ac (HT80) | 94.3 | 93.0 | 94.2 |

Table 2-4. Measured Duty Cycles

- The device employs MIMO technology. Below are the possible configurations.

| WiFi Configurations | | SISO | | SDM | | CDD | |
|---------------------|----------------|------|------|------|------|------|------|
| | | ANT1 | ANT2 | ANT1 | ANT2 | ANT1 | ANT2 |
| 5GHz | 11a | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ |
| | 11n/ac (20MHz) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 11n/ac (40MHz) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 11ac (80MHz) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Table 2-5. Frequency / Channel Operations

✓ = Support ; ✗ = NOT Support
SISO = Single Input Single Output
SDM = Spatial Diversity Multiplexing – MIMO function
CDD = Cyclic Delay Diversity - 2Tx Function

Data Rate(s) Tested: 6, 9, 12, 18, 24, 36, 48, 54Mbps (802.11a)
6.5/7.2, 13/14.4, 19.5/21.7, 26/28.9, 39/43.3, 52/57.8, 58.5/65, 65/72.2 (n – 20MHz)
13.5/15, 27/30, 40.5/45, 54/60, 81/90, 108/120, 121.5/135, 135/150 (n – 40MHz BW)
29.3/32.5, 58.5/65, 87.8/97.5, 117/130, 175.5/195, 234/260, 263.3/292.5, 292.5/325,
351/390, 390/433.3 (ac – 80MHz BW)
13/14.4, 26.28.9, 39/43.3, 52/57.8, 78/86.7, 104/115.6, 117/130, 130/144.4Mbps
(MIMO n/ac – 20MHz) 156/173Mbps (MIMO ac – 20MHz)
27/30, 54/60, 81/90, 108/120, 162/180, 216/240, 243,270, 270/300Mbps (MIMO n/ac –
40MHz) 324/360, 360/400Mbps (MIMO ac – 40MHz)
58.5/65, 117/130, 175.5/195, 234/260, 351/390, 468/520, 526.5/585, 585/650, 702/780,
780/866.7Mbps (MIMO ac – 80MHz)

- This device supports simultaneous transmission operation, which allows for two SISO channels to operate independent of one another in the 2.4GHz and 5GHz bands simultaneously on each antenna.

| | | | | |
|---|---|---|---|---------------------------------|
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2.3 Test Configuration

The EUT was tested per the guidance of KDB 789033 D02 v01r04. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. See Sections 3.2 for AC line conducted emissions test setups, 3.3 for radiated emissions test setups, and 7.2, 7.3, and 7.4 for antenna port conducted emissions test setups.

2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

| | | | | |
|---|---|---|---|---------------------------------|
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| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 7 of 136 | |

3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) and the guidance provided in KDB 789033 D02 v01r04 were used in the measurement of the EUT.

Deviation from measurement procedure.....None

3.2 AC Line Conducted Emissions

The line-conducted facility is located inside a 10'x16'x9' shielded enclosure. The shielded enclosure is manufactured by ETS Lindgren RF Enclosures. The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-5. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. The external power line filter is an ETS Lindgren Model LPRX-4X30 (100dB Attenuation, 14kHz-18GHz) and the two EMI/RFI filters are ETS Lindgren Model LRW-2030-S1 (100dB Minimum Insertion Loss, 14kHz – 10GHz). These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference groundplane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

Line conducted emissions test results are shown in Section 7.7. The EMI Receiver mode of the Agilent MXE was used to perform AC line conducted emissions testing.

| | | | | |
|---|---|---|---|---------------------------------|
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3.3 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. A raised turntable is used for radiated measurement. It is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. A 72.4cm high PVC support structure is placed on top of the turntable. A 3" (~7.6cm) sheet of high density polystyrene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm. For measurements above 1GHz, a high density expanded polystyrene block is placed on top of the test table to bring the total table height to 1.5m.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

3.4 Environmental Conditions

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
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4.0 ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antennas of the EUT are **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The EUT complies with the requirement of §15.203.

| | | | | |
|--|---|---|---|--|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
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5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013. All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

| Contribution | Expanded Uncertainty (\pm dB) |
|----------------------------------|----------------------------------|
| Conducted Bench Top Measurements | 1.13 |
| Line Conducted Disturbance | 3.09 |
| Radiated Disturbance (<1GHz) | 4.98 |
| Radiated Disturbance (>1GHz) | 5.07 |
| Radiated Disturbance (>18GHz) | 5.09 |

| | | | | |
|--|---|---|---|--|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
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6.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2006.

| Manufacturer | Model | Description | Cal Date | Cal Interval | Cal Due | Serial Number |
|-------------------|------------------|--|------------|--------------|------------|---------------|
| - | WL40-1 | Conducted Cable Set (40GHz) | 9/30/2016 | Annual | 9/30/2017 | WL40-1 |
| - | RE1 | Radiated Emissions Cable Set (UHF/EHF) | 7/11/2016 | Annual | 7/11/2017 | RE1 |
| Agilent | N9030A | PXA Signal Analyzer (26.5GHz) | 7/20/2016 | Annual | 7/20/2017 | MY49432391 |
| Agilent | N9038A | MXE EMI Receiver | 4/26/2017 | Annual | 4/26/2018 | MY51210133 |
| Anritsu | MA2411B | Pulse Power Sensor | 10/14/2015 | Biennial | 10/14/2017 | 846215 |
| Anritsu | ML2495A | Power Meter | 10/16/2015 | Biennial | 10/16/2017 | 941001 |
| Com-Power | AL-130 | 9kHz - 30MHz Loop Antenna | 7/30/2015 | Biennial | 7/30/2017 | 121034 |
| Com-Power | PAM-103 | Pre-Amplifier (1-1000MHz) | 7/6/2016 | Annual | 7/6/2017 | 441119 |
| Com-Power | PAM-118A | PREAMPLIFIER 500MHZ TO 18GHZ | 8/9/2016 | Annual | 8/9/2017 | 551079 |
| Emco | 3115 | Horn Antenna (1-18GHz) | 3/10/2016 | Biennial | 3/10/2018 | 9704-5182 |
| EMCO | 3160-09 | Small Horn (18 - 26.5GHz) | 8/23/2016 | Biennial | 8/23/2018 | 135427 |
| EMCO | 3160-10 | Small Horn (26.5 - 40GHz) | 8/23/2016 | Biennial | 8/23/2018 | 130993 |
| Espec | ESX-2CA | Environmental Chamber | 4/11/2017 | Annual | 4/11/2018 | 17620 |
| Huber+Suhner | Sucoflex 102A | 40GHz Radiated Cable | 10/3/2016 | Annual | 10/3/2017 | 251425001 |
| Pasternack | NMLC-1 | Line Conducted Emissions Cable (NM) | 10/5/2016 | Annual | 10/5/2017 | NMLC-1 |
| PCTEST | - | EMC Switch System | 7/6/2016 | Annual | 7/6/2017 | NM2 |
| Rohde & Schwarz | ESU40 | EMI Test Receiver (40GHz) | 7/15/2016 | Annual | 7/15/2017 | 100348 |
| Rohde & Schwarz | FSW67 | Signal / Spectrum Analyzer | 7/27/2016 | Annual | 7/27/2017 | 103200 |
| Rohde & Schwarz | TS-PR18 | 1-18 GHz Pre-Amplifier | 7/11/2016 | Annual | 7/11/2017 | 100071 |
| Rohde & Schwarz | TS-PR26 | 18-26.5 GHz Pre-Amplifier | 6/7/2016 | Annual | 6/7/2017 | 100040 |
| Rohde & Schwarz | TS-PR40 | 26.5-40 GHz Pre-Amplifier | 6/7/2016 | Annual | 6/7/2017 | 100037 |
| Solar Electronics | 8012-50-R-24-BNC | Line Impedance Stabilization Network | 7/30/2015 | Biennial | 7/30/2017 | 310233 |
| Sunol | JB5 | Bi-Log Antenna (30M - 5GHz) | 3/14/2016 | Biennial | 3/14/2018 | A051107 |
| Sunol Sciences | DRH-118 | Horn Antenna | 7/1/2015 | Biennial | 7/1/2017 | A060215 |

Table 6-1. Annual Test Equipment Calibration Schedule

Note:

For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

| | | | | |
|--|---|---|---|--|
| FCC ID: A3LETWV520 |  FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 12 of 136 | |

7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LETWV520
 Method/System: Unlicensed National Information Infrastructure (UNII)

| FCC Part Section(s) | Test Description | Test Limit | Test Condition | Test Result | Reference |
|---------------------|---|--|----------------|-------------|---------------------|
| N/A | 26dB Bandwidth | N/A | CONDUCTED | PASS | Section 7.2 |
| 15.407 (a.2) | Maximum Conducted Output Power | Maximum conducted powers must meet the limits detailed in 15.407 (a) | | PASS | Section 7.3 |
| 15.407 (a.2), (5) | Maximum Power Spectral Density | Maximum power spectral density must meet the limits detailed in 15.407 (a) | | PASS | Section 7.4 |
| 15.407(g) | Frequency Stability | N/A | | PASS | Section 7.5 |
| 15.407(h) | Dynamic Frequency Selection | See DFS Test Report | | PASS | See DFS Test Report |
| 15.407(b.2), (3) | Undesirable Emissions | Undesirable emissions must meet the limits detailed in 15.407(b) | RADIATED | PASS | Section 7.6 |
| 15.205, 15.407(b.6) | General Field Strength Limits (Restricted Bands and Radiated Emission Limits) | Emissions in restricted bands must meet the radiated limits detailed in 15.209 | | PASS | Section 7.6 |
| 15.407 | AC Conducted Emissions 150kHz – 30MHz | < FCC 15.207 limits | LINE CONDUCTED | PASS | Section 7.7 |

Table 7-1. Summary of Test Results

Notes:

- 1) All channels, modes, and modulations/data rates were investigated among all UNII bands. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "UNII Automation," Version 4.4.
- 5) For radiated band edge, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "Chamber Automation," Version 1.1.5.

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 13 of 136 | |

7.2 26dB Bandwidth Measurement – 802.11a/n/ac

Test Overview and Limit

The bandwidth at 26dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02 v01r04, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26dB bandwidth.

The 26dB bandwidth is used to determine the conducted power limits.

Test Procedure Used

KDB 789033 D02 v01r04 – Section C

Test Settings

1. The signal analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to $X = 26$. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = approximately 1% of the emission bandwidth
3. $VBW \geq 3 \times RBW$
4. Detector = Peak
5. Trace mode = max hold

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

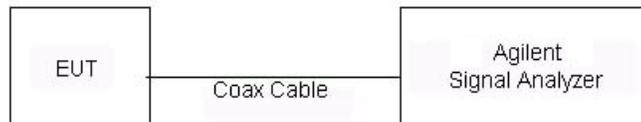


Figure 7-1. Test Instrument & Measurement Setup

Test Notes

None.

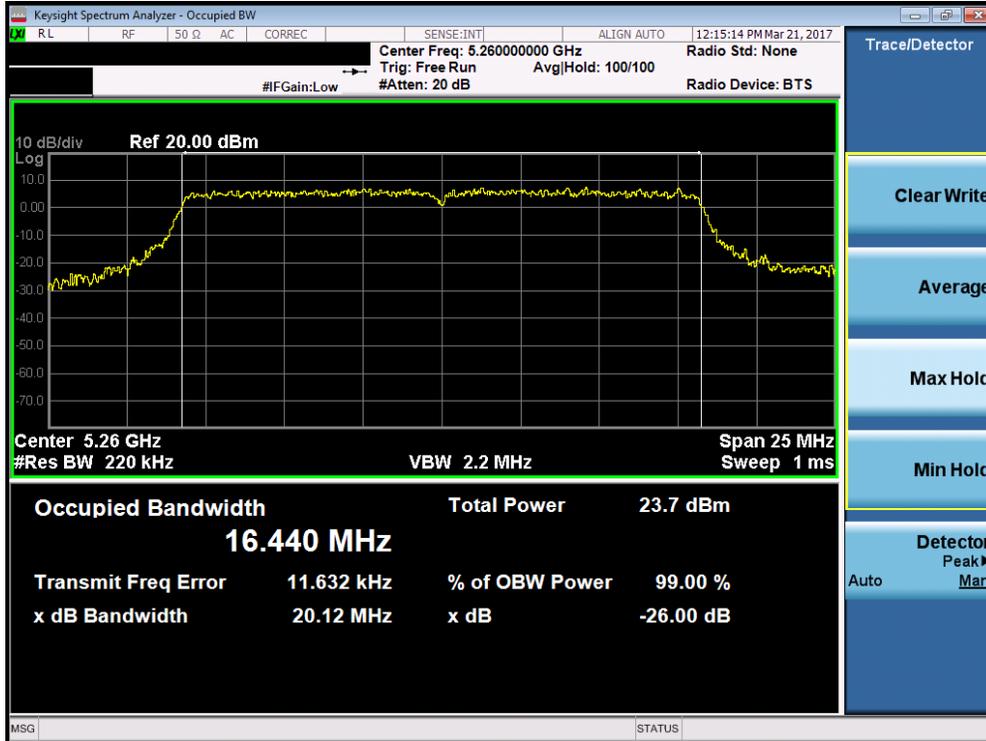
| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 14 of 136 | |

Antenna-1 26 dB Bandwidth Measurements

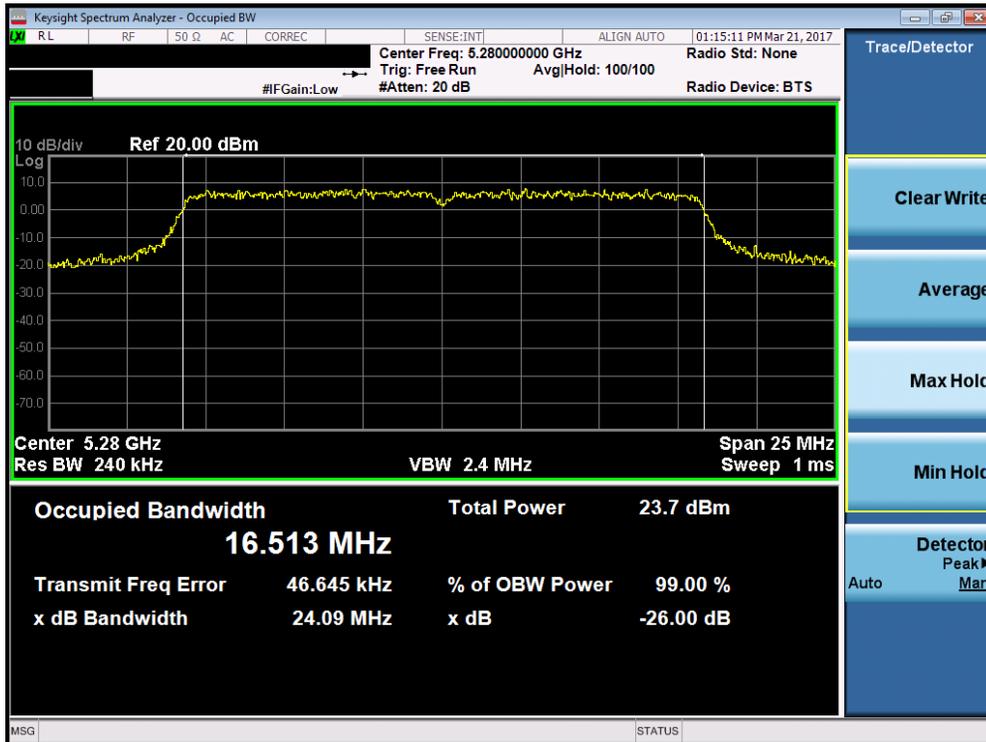
| | Frequency [MHz] | Channel No. | 802.11 Mode | Data Rate [Mbps] | Measured 26dB Bandwidth [MHz] |
|---------|-----------------|-------------|------------------|------------------|-------------------------------|
| Band 2A | 5260 | 52 | a | 6 | 20.12 |
| | 5280 | 56 | a | 6 | 24.09 |
| | 5320 | 64 | a | 6 | 21.29 |
| | 5260 | 52 | n (20MHz) | 6.5/7.2 (MCS0) | 22.62 |
| | 5280 | 56 | n (20MHz) | 6.5/7.2 (MCS0) | 24.73 |
| | 5320 | 64 | n (20MHz) | 6.5/7.2 (MCS0) | 20.23 |
| | 5270 | 54 | n (40MHz) | 13.5/15 (MCS0) | 40.09 |
| | 5310 | 62 | n (40MHz) | 13.5/15 (MCS0) | 77.56 |
| Band 2C | 5290 | 58 | ac (80MHz) | 29.3/32.5 (MCS0) | 87.63 |
| | 5500 | 100 | a | 6 | 24.31 |
| | 5600 | 120 | a | 6 | 29.39 |
| | 5720 | 144 | a | 6 | 32.98 |
| | 5500 | 100 | n (20MHz) | 6.5/7.2 (MCS0) | 22.06 |
| | 5600 | 120 | n (20MHz) | 6.5/7.2 (MCS0) | 23.63 |
| | 5720 | 144 | n (20MHz) | 6.5/7.2 (MCS0) | 38.84 |
| | 5510 | 102 | n (40MHz) | 13.5/15 (MCS0) | 47.54 |
| | 5590 | 118 | n (40MHz) | 13.5/15 (MCS0) | 67.68 |
| | 5710 | 142 | n (40MHz) | 13.5/15 (MCS0) | 77.97 |
| | 5530 | 106 | ac (80MHz) | 29.3/32.5 (MCS0) | 86.30 |
| | 5610 | 122 | ac (80MHz) | 29.3/32.5 (MCS0) | 169.30 |
| 5690 | 138 | ac (80MHz) | 29.3/32.5 (MCS0) | 186.50 | |

Table 7-2. Conducted Bandwidth Measurements

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 15 of 136 | |

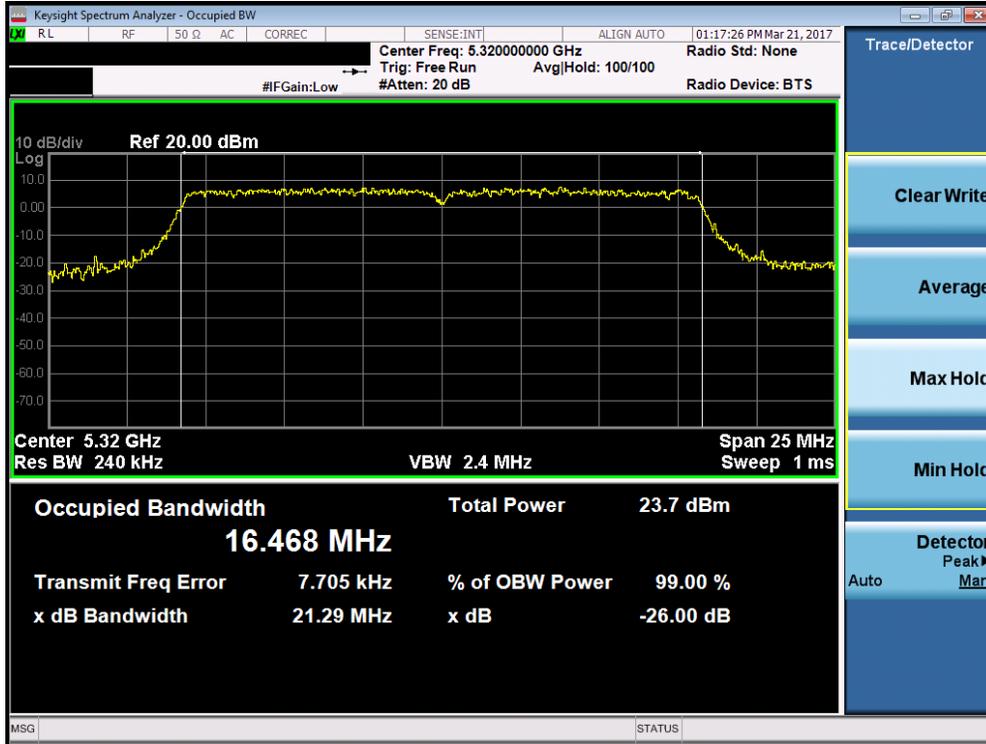


Plot 7-1. 26dB Bandwidth Plot (802.11a (UNII Band 2A) – Ch. 52)

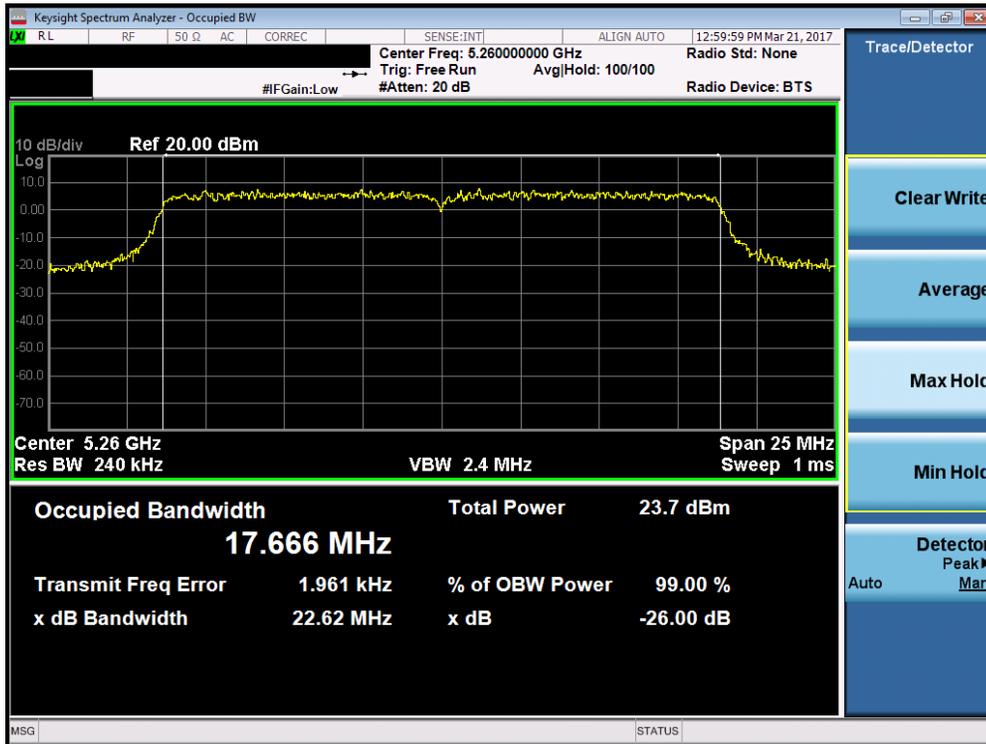


Plot 7-2. 26dB Bandwidth Plot (802.11a (UNII Band 2A) – Ch. 56)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 16 of 136 |

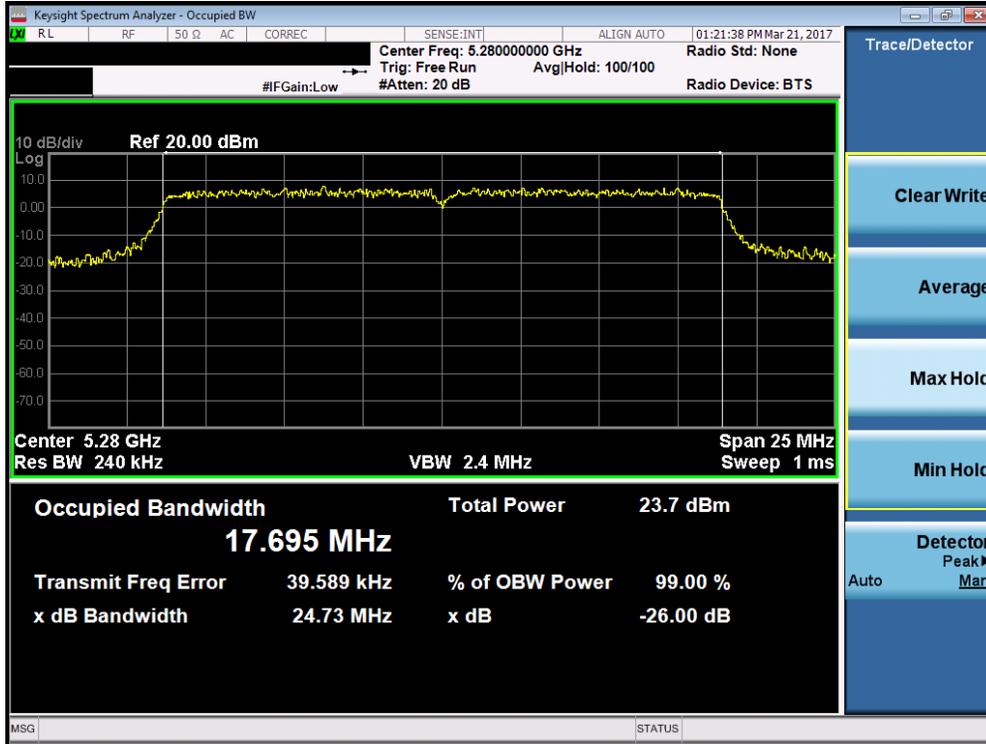


Plot 7-3. 26dB Bandwidth Plot (802.11a (UNII Band 2A) – Ch. 64)

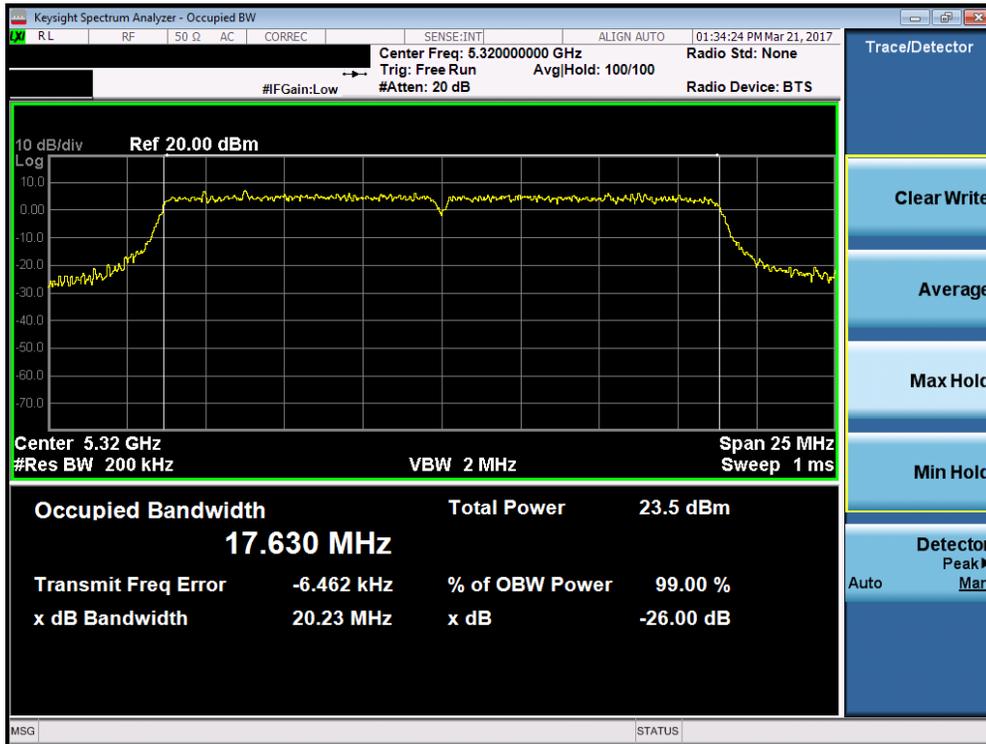


Plot 7-4. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 17 of 136 |

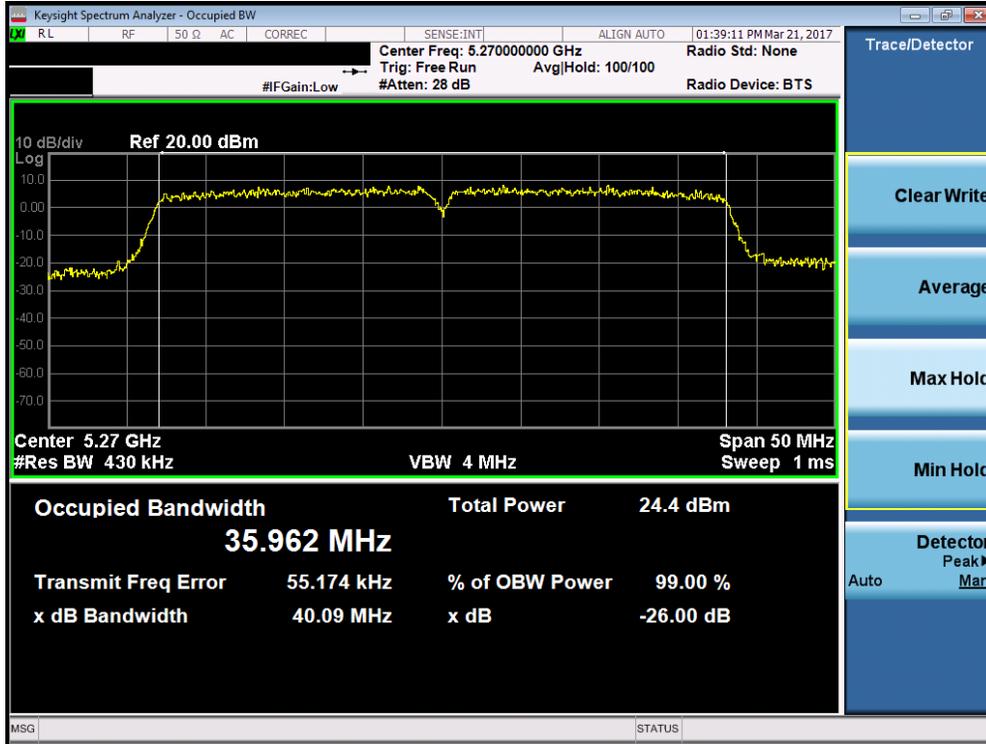


Plot 7-5. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

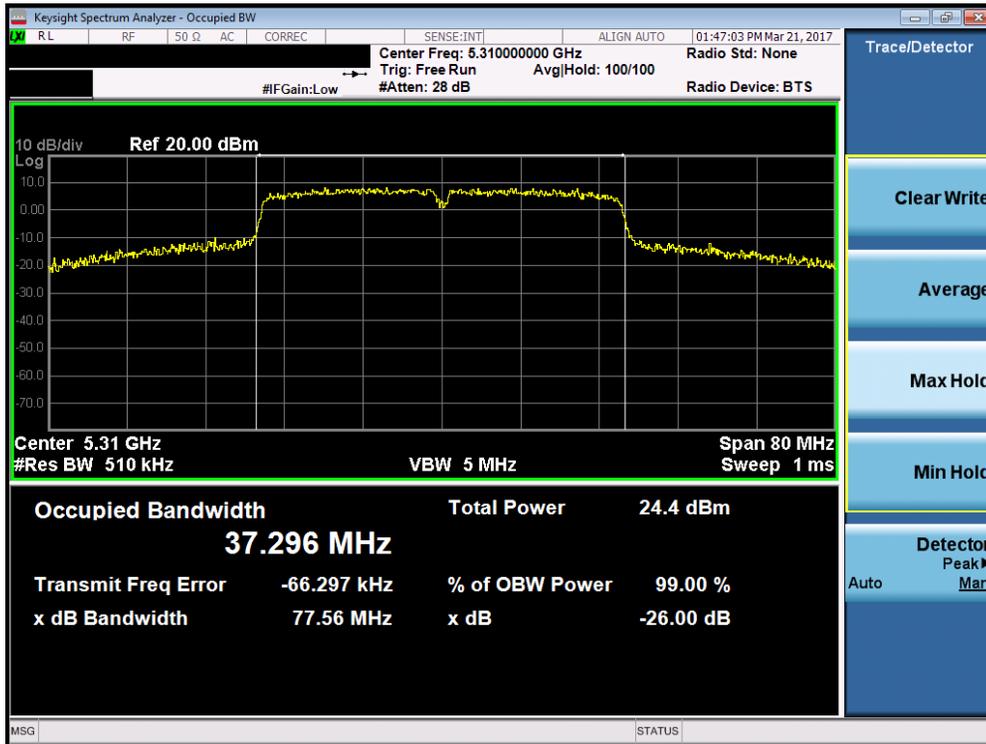


Plot 7-6. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 18 of 136 |

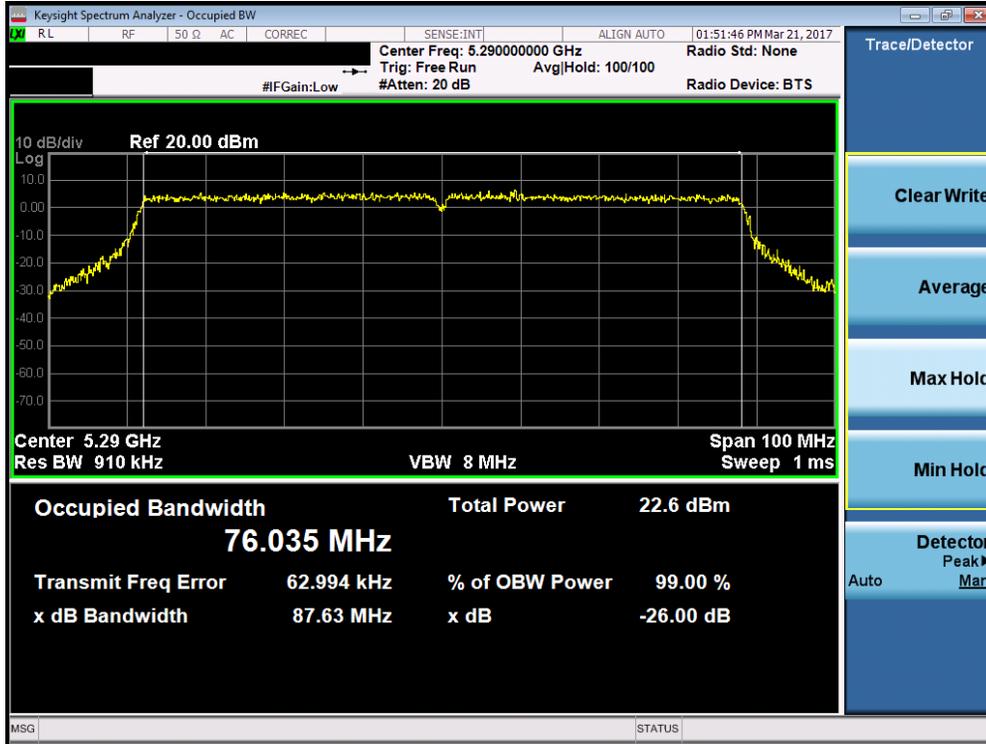


Plot 7-7. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

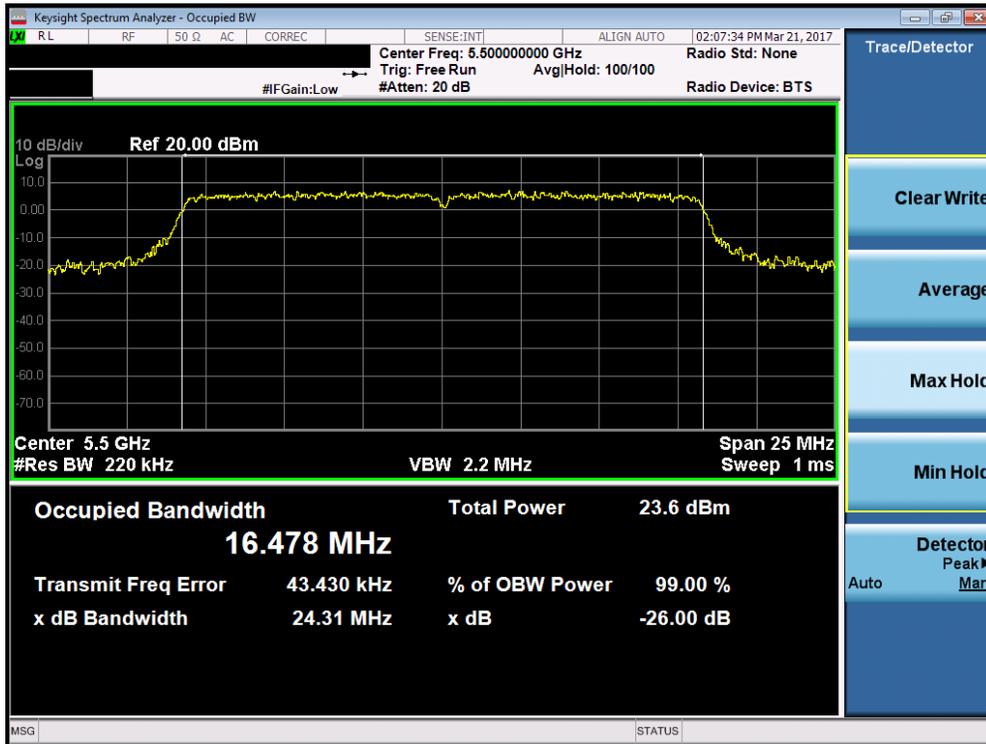


Plot 7-8. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 19 of 136 |

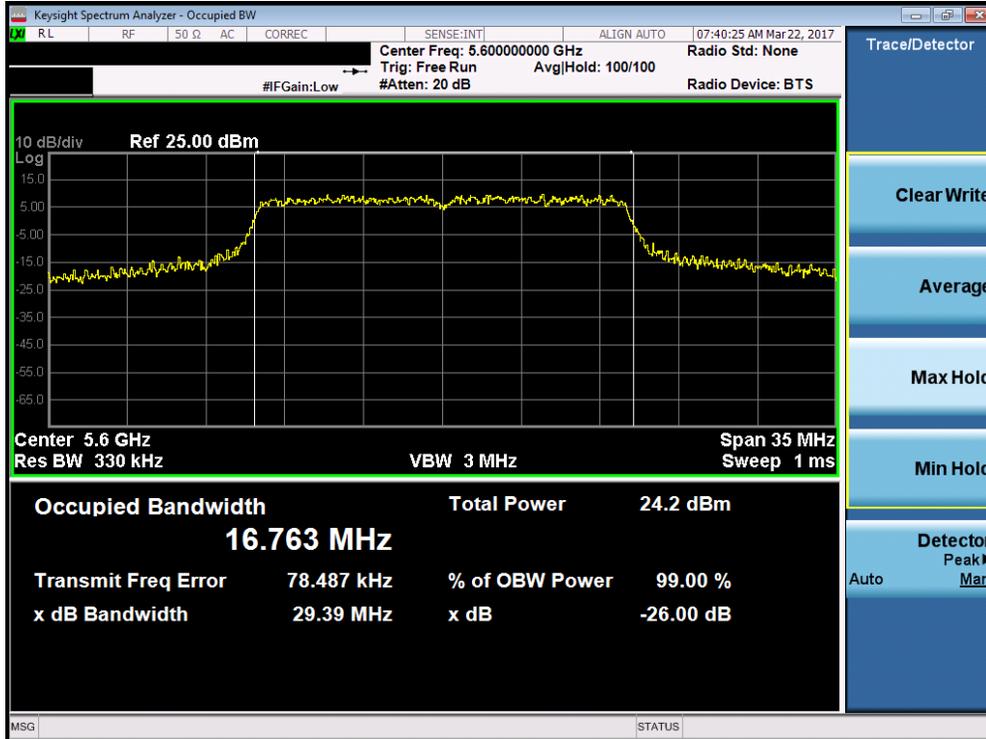


Plot 7-9. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)

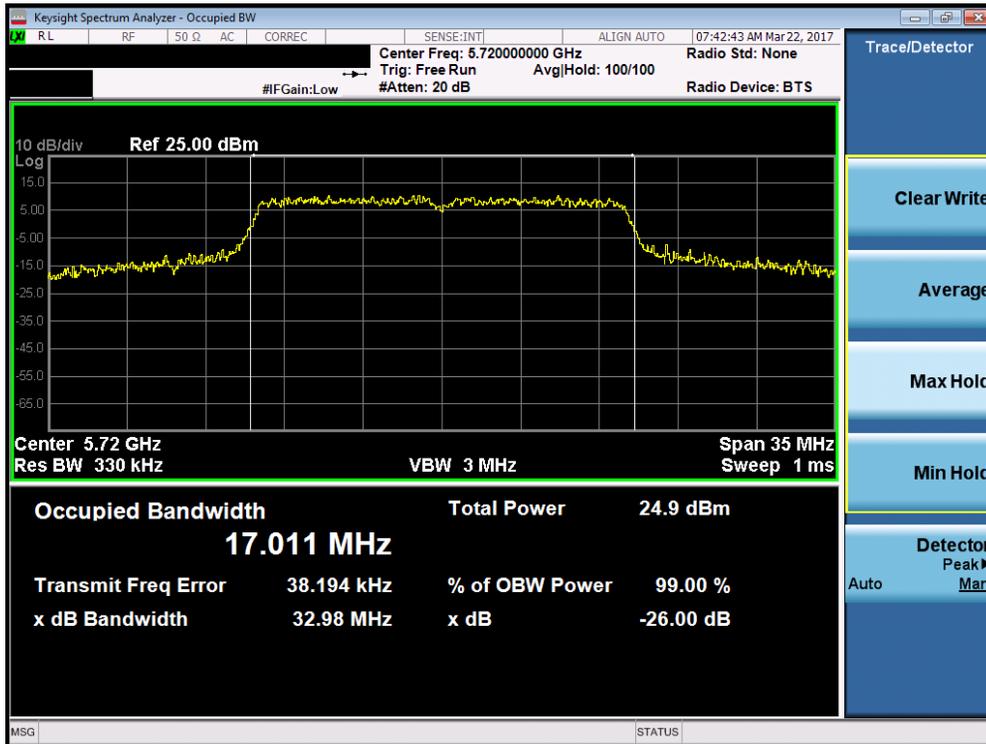


Plot 7-10. 26dB Bandwidth Plot (802.11a (UNII Band 2C) – Ch. 100)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 20 of 136 |

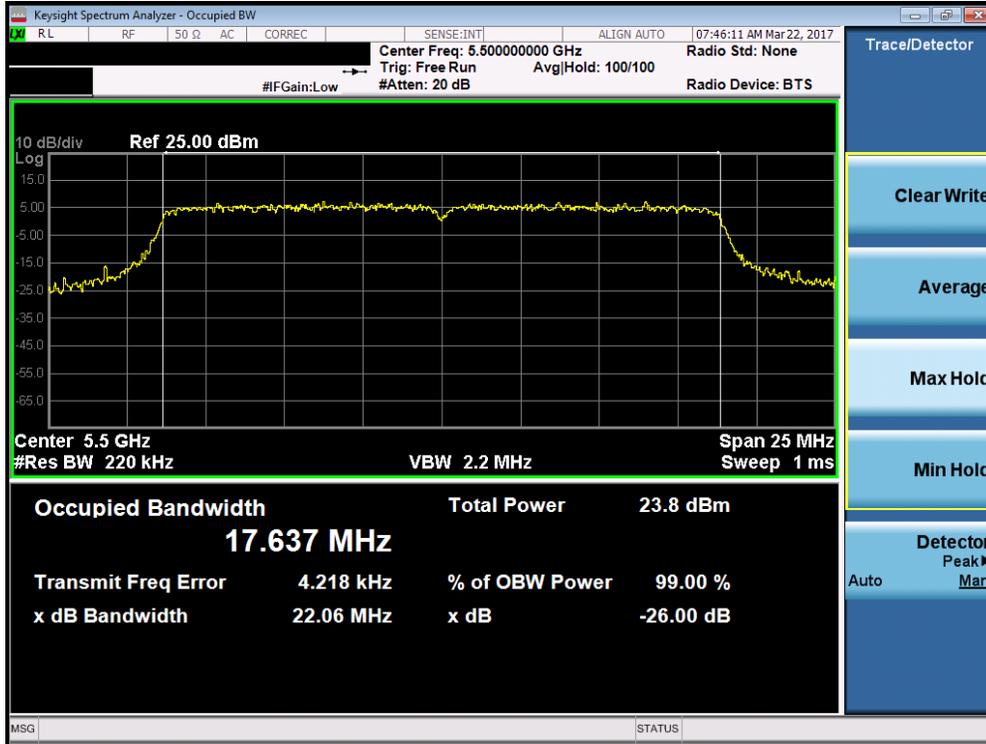


Plot 7-11. 26dB Bandwidth Plot (802.11a (UNII Band 2C) – Ch. 120)

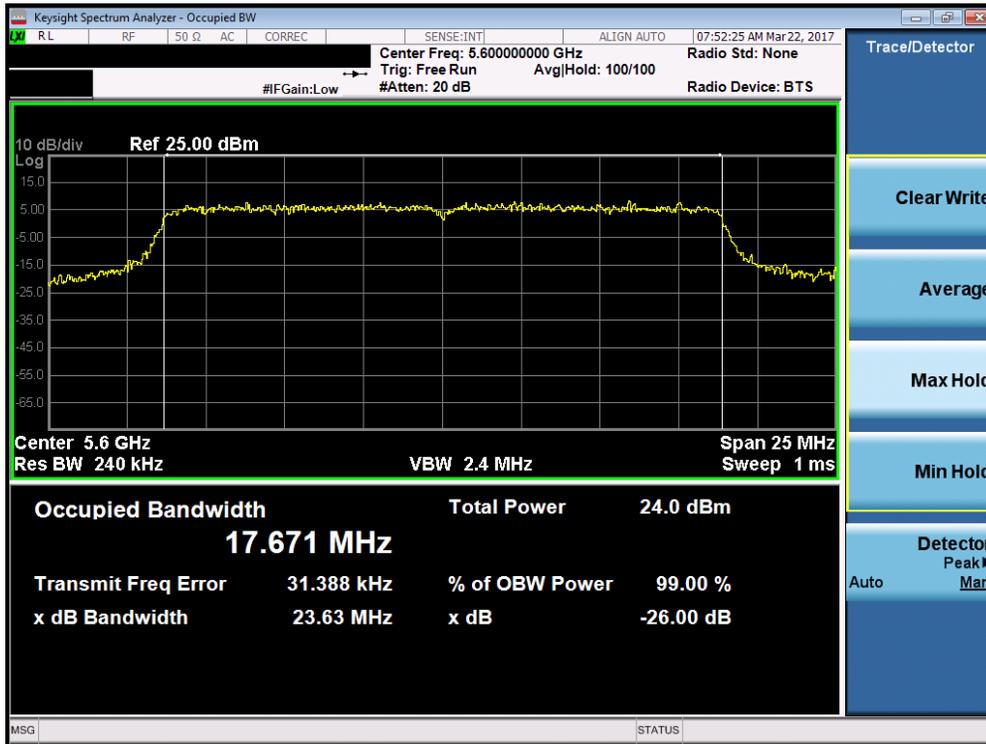


Plot 7-12. 26dB Bandwidth Plot (802.11a (UNII Band 2C) – Ch. 144)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 21 of 136 |

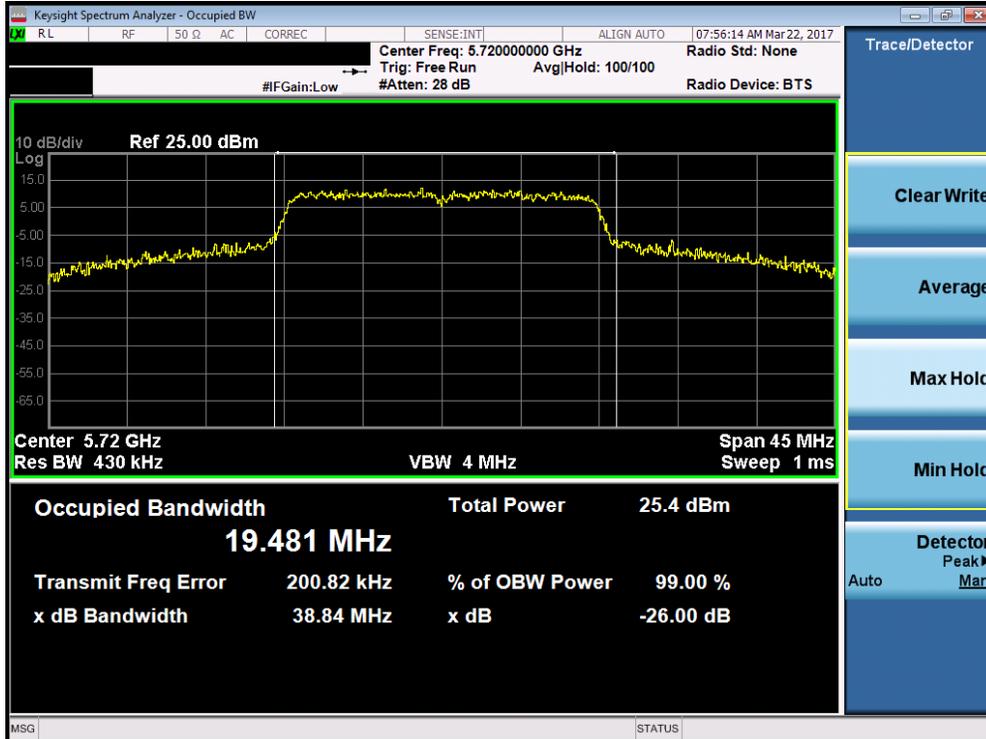


Plot 7-13. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)

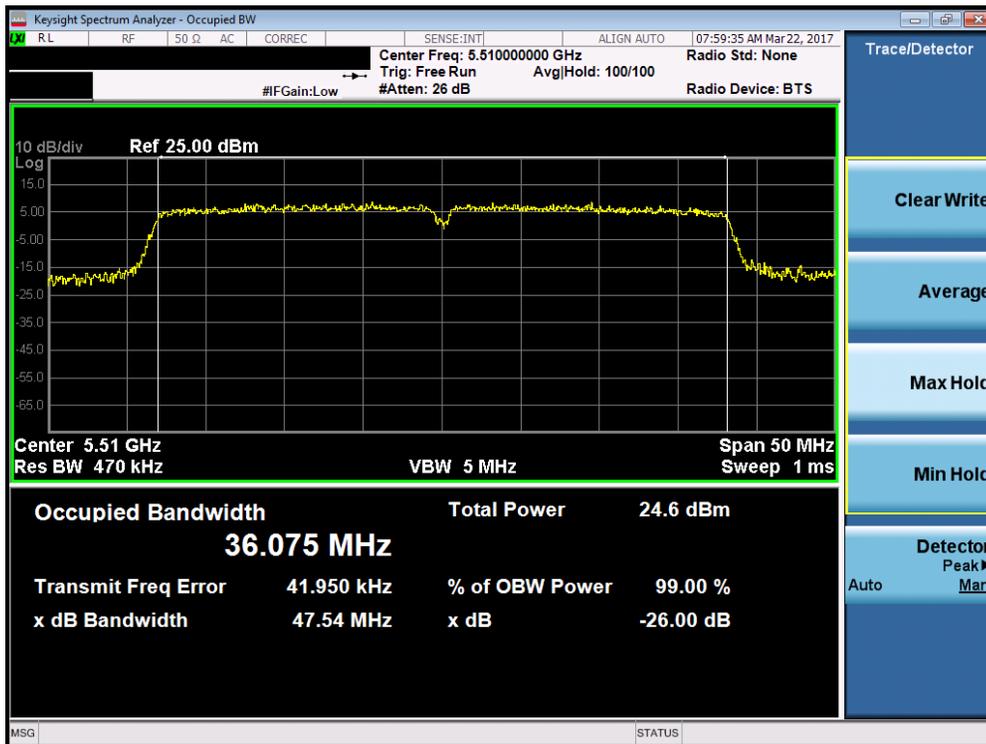


Plot 7-14. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 120)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 22 of 136 |

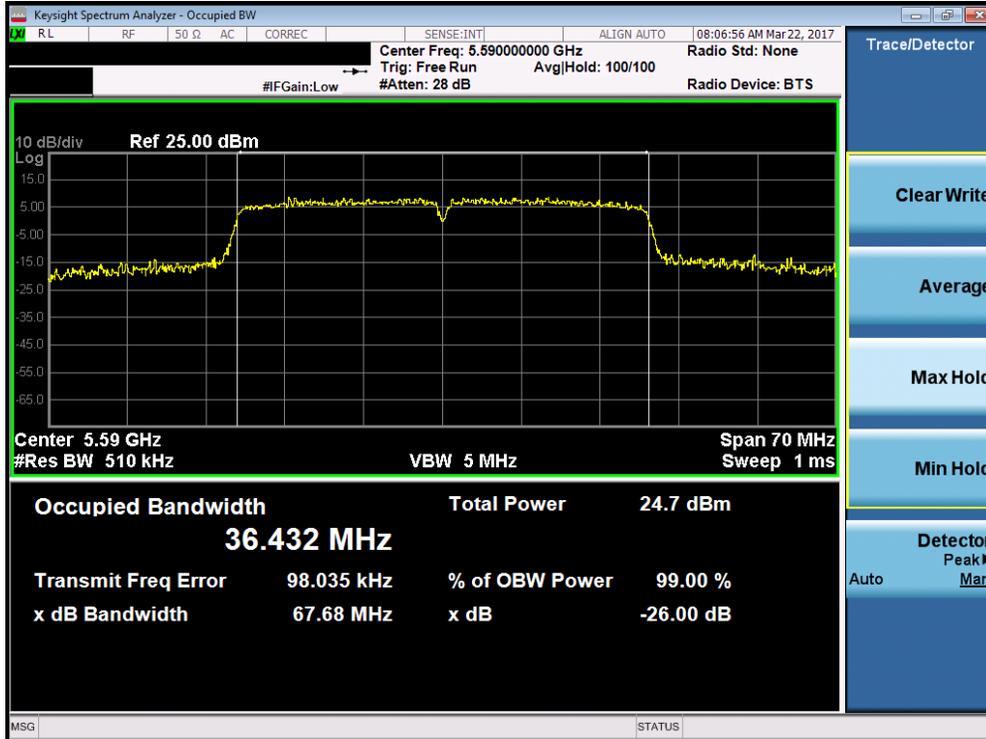


Plot 7-15. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

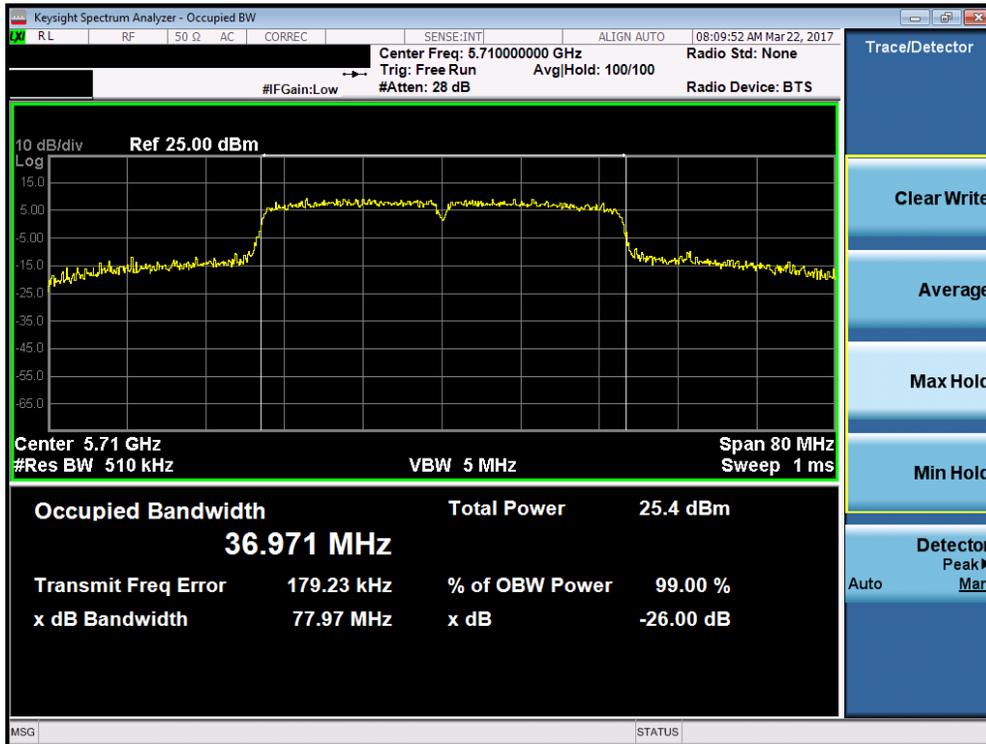


Plot 7-16. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 23 of 136 |

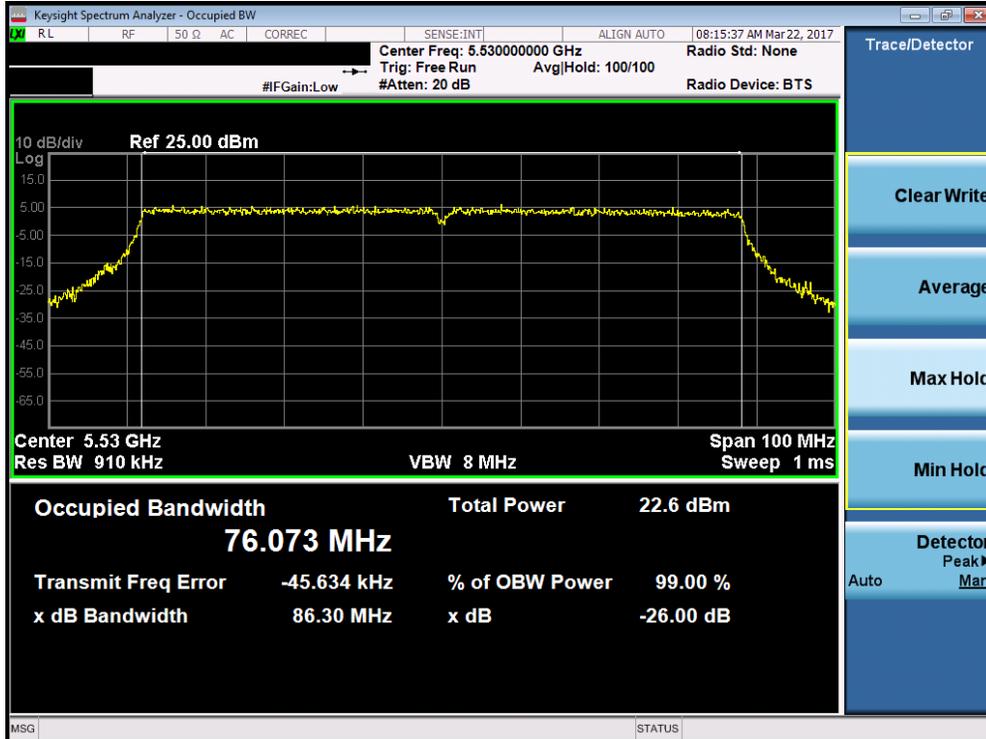


Plot 7-17. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 118)

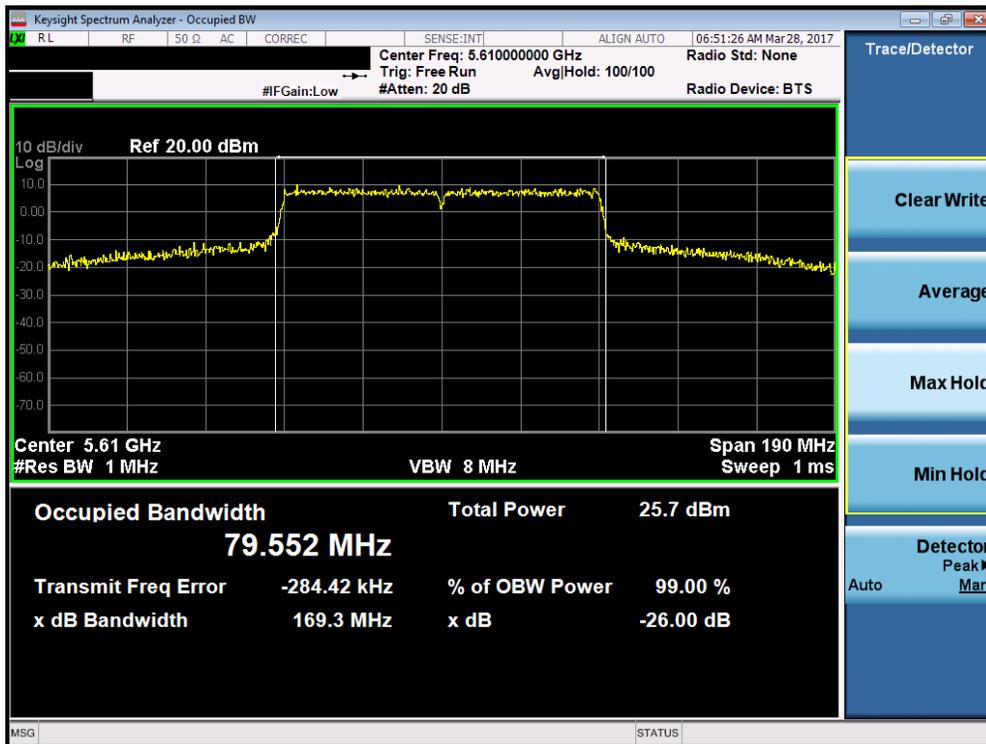


Plot 7-18. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 24 of 136 |

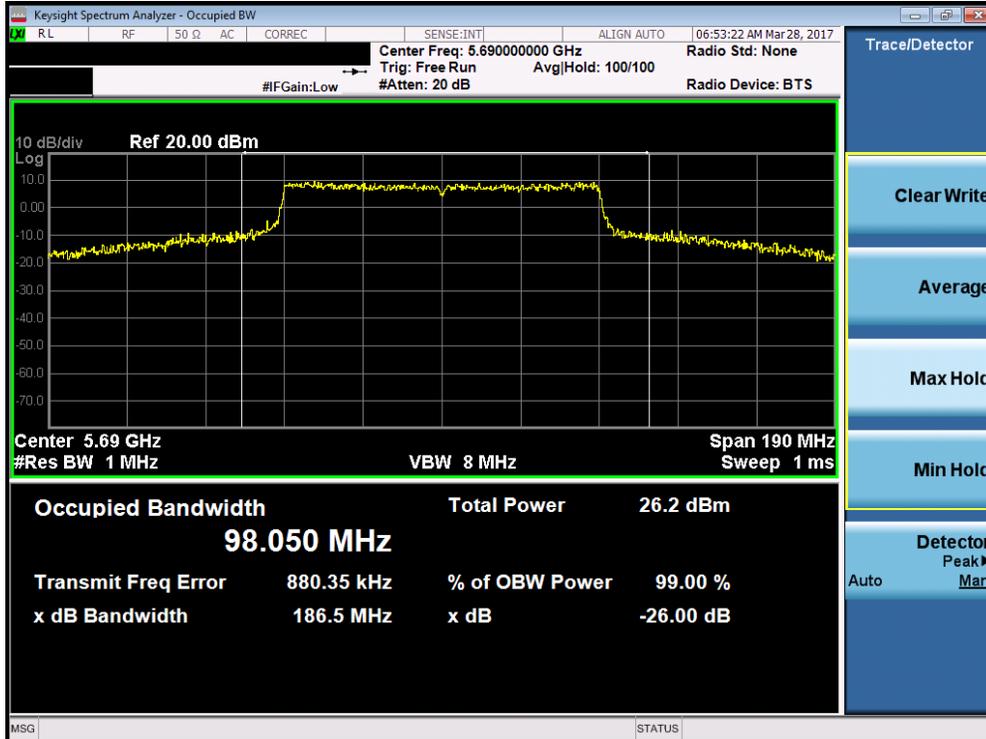


Plot 7-19. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)



Plot 7-20. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 122)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 25 of 136 |



Plot 7-21. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

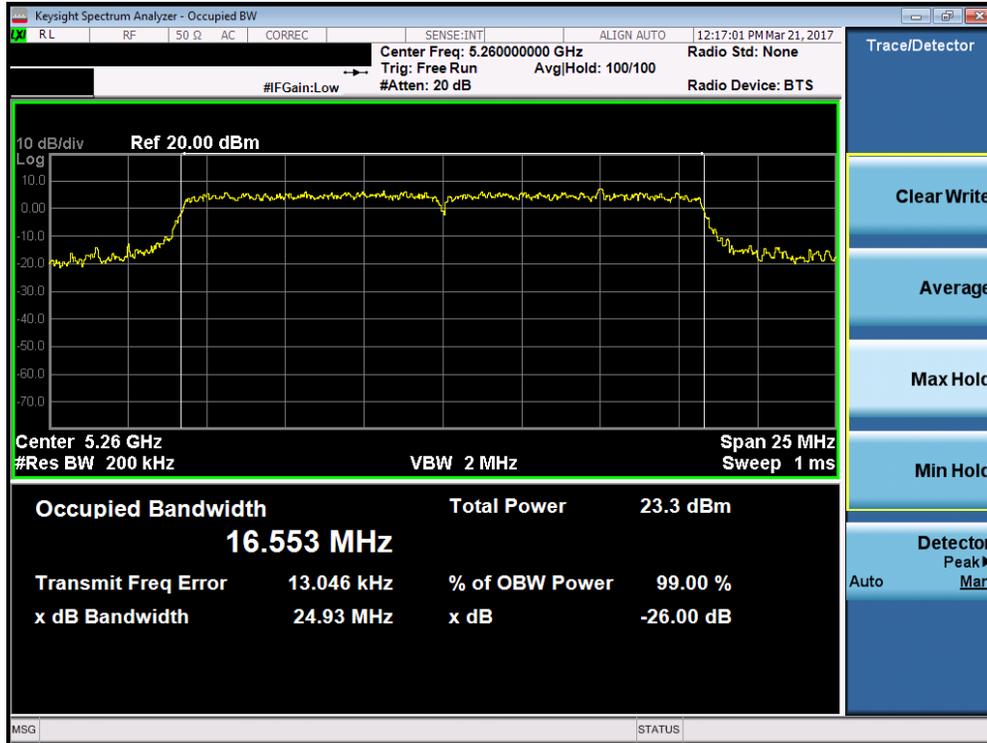
| | | | | |
|---|---|---|----------------|---------------------------------|
| FCC ID: A3LETWV520 | PCTEST ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | SAMSUNG | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 26 of 136 |

Antenna-2 26dB Bandwidth Measurements

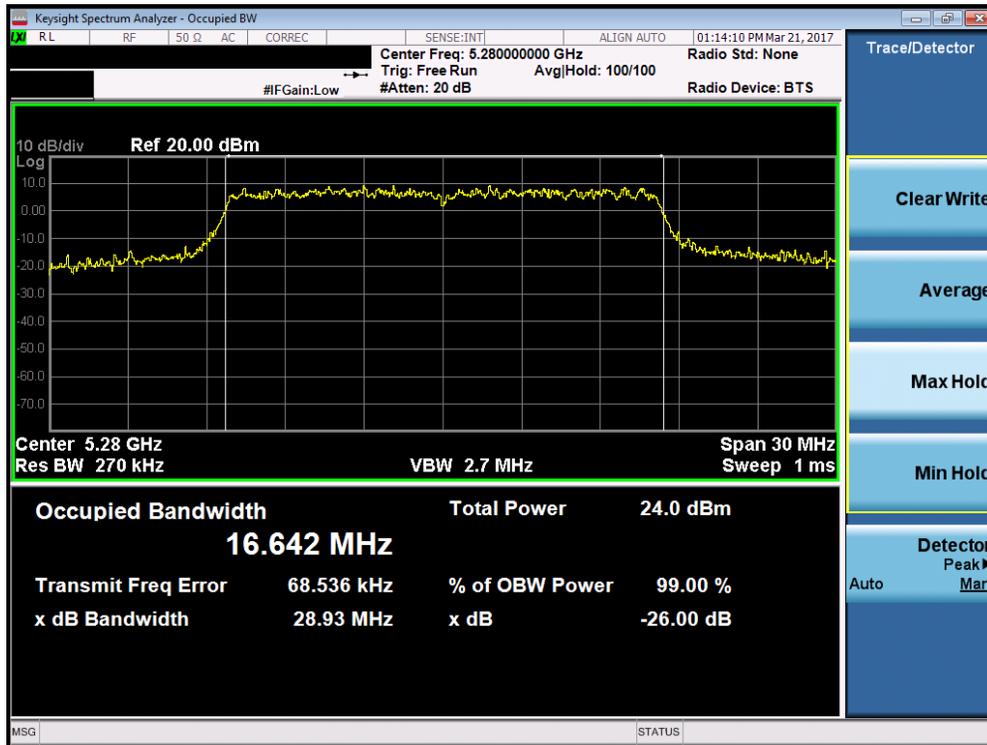
| | Frequency [MHz] | Channel No. | 802.11 Mode | Data Rate [Mbps] | Measured 26dB Bandwidth [MHz] |
|---------|-----------------|-------------|------------------|------------------|-------------------------------|
| Band 2A | 5260 | 52 | a | 6 | 24.93 |
| | 5280 | 56 | a | 6 | 28.93 |
| | 5320 | 64 | a | 6 | 24.77 |
| | 5260 | 52 | n (20MHz) | 6.5/7.2 (MCS0) | 29.66 |
| | 5280 | 56 | n (20MHz) | 6.5/7.2 (MCS0) | 24.16 |
| | 5320 | 64 | n (20MHz) | 6.5/7.2 (MCS0) | 20.45 |
| | 5270 | 54 | n (40MHz) | 13.5/15 (MCS0) | 79.13 |
| | 5310 | 62 | n (40MHz) | 13.5/15 (MCS0) | 73.42 |
| Band 2C | 5290 | 58 | ac (80MHz) | 29.3/32.5 (MCS0) | 87.11 |
| | 5500 | 100 | a | 6 | 30.31 |
| | 5600 | 120 | a | 6 | 30.91 |
| | 5720 | 144 | a | 6 | 31.68 |
| | 5500 | 100 | n (20MHz) | 6.5/7.2 (MCS0) | 32.98 |
| | 5600 | 120 | n (20MHz) | 6.5/7.2 (MCS0) | 33.85 |
| | 5720 | 144 | n (20MHz) | 6.5/7.2 (MCS0) | 33.47 |
| | 5510 | 102 | n (40MHz) | 13.5/15 (MCS0) | 81.29 |
| | 5590 | 118 | n (40MHz) | 13.5/15 (MCS0) | 76.76 |
| | 5710 | 142 | n (40MHz) | 13.5/15 (MCS0) | 65.20 |
| | 5530 | 106 | ac (80MHz) | 29.3/32.5 (MCS0) | 91.98 |
| | 5610 | 122 | ac (80MHz) | 29.3/32.5 (MCS0) | 176.10 |
| 5690 | 138 | ac (80MHz) | 29.3/32.5 (MCS0) | 167.30 | |

Table 7-3. Conducted Bandwidth Measurements

| | | | | |
|--|---|---|---|--|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 27 of 136 | |

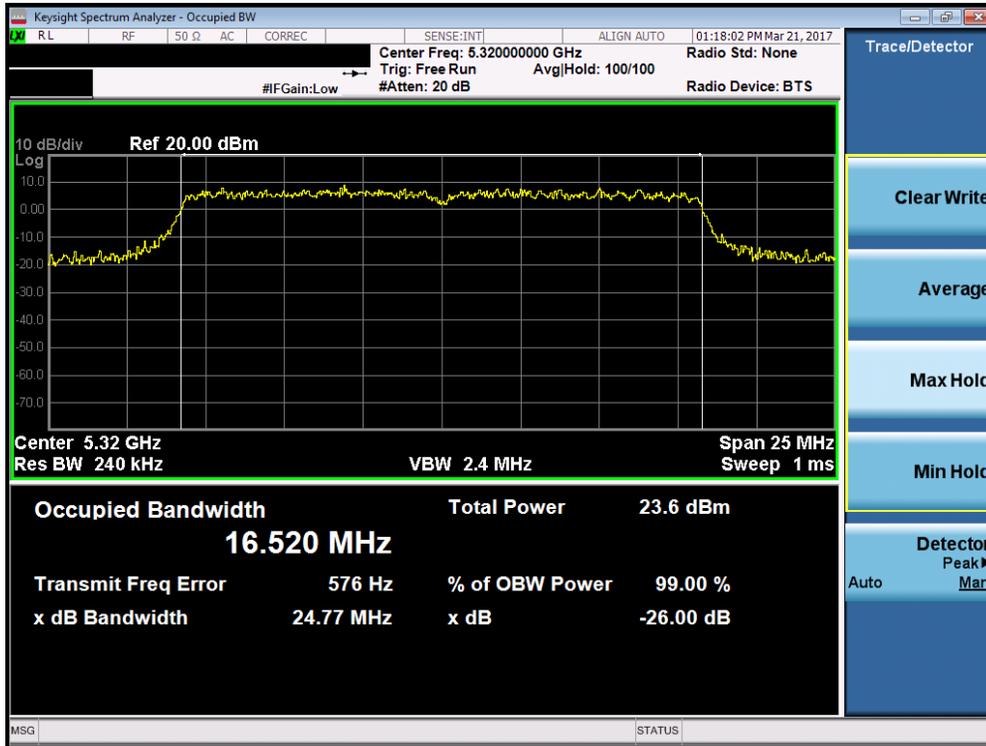


Plot 7-22. 26dB Bandwidth Plot (802.11a (UNII Band 2A) – Ch. 52)

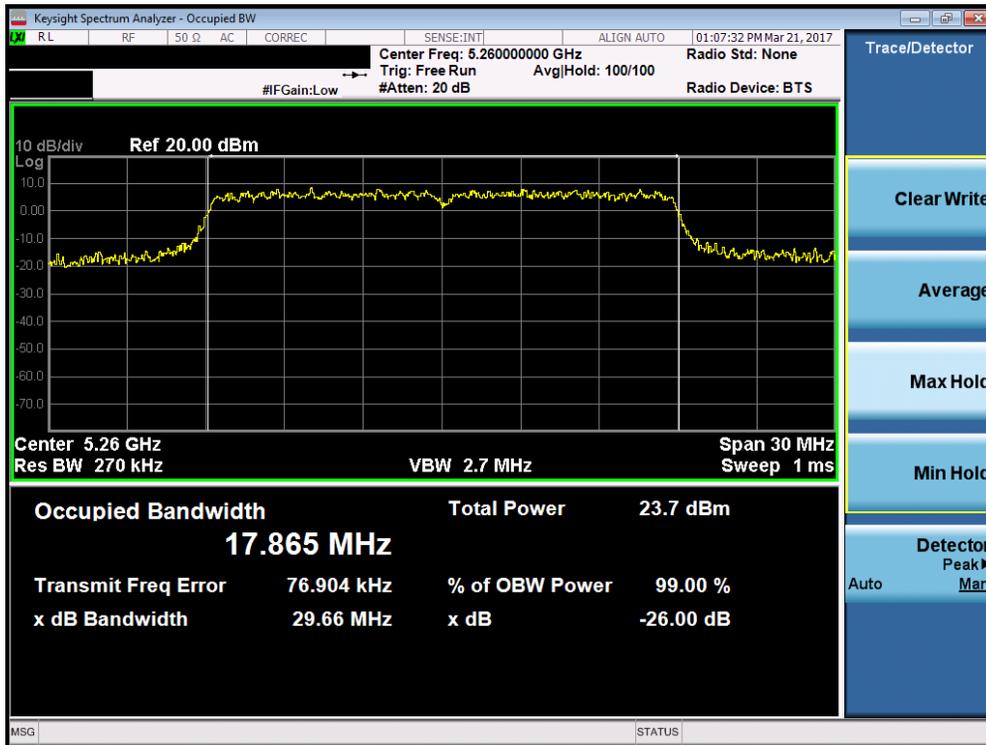


Plot 7-23. 26dB Bandwidth Plot (802.11a (UNII Band 2A) – Ch. 56)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 28 of 136 |

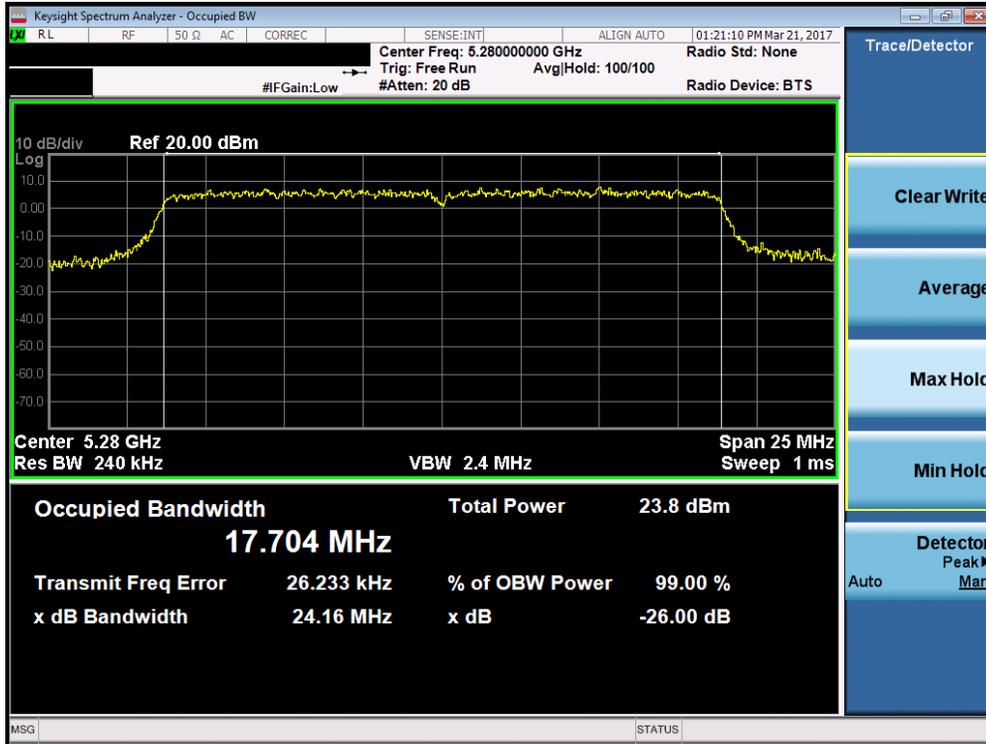


Plot 7-24. 26dB Bandwidth Plot (802.11a (UNII Band 2A) – Ch. 64)

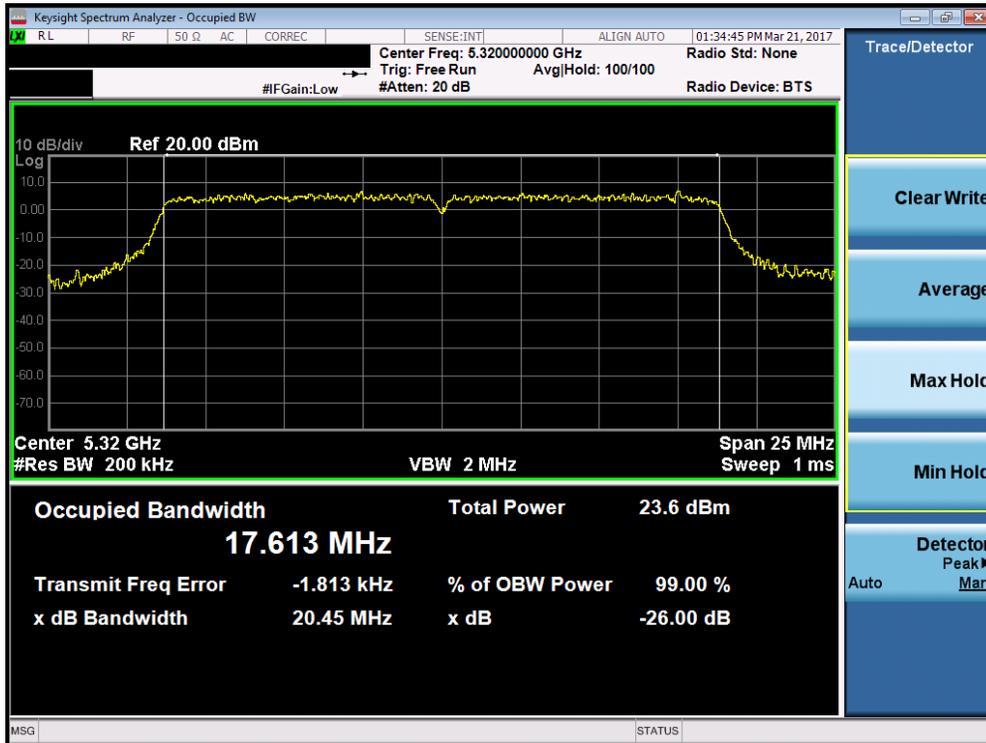


Plot 7-25. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 29 of 136 |

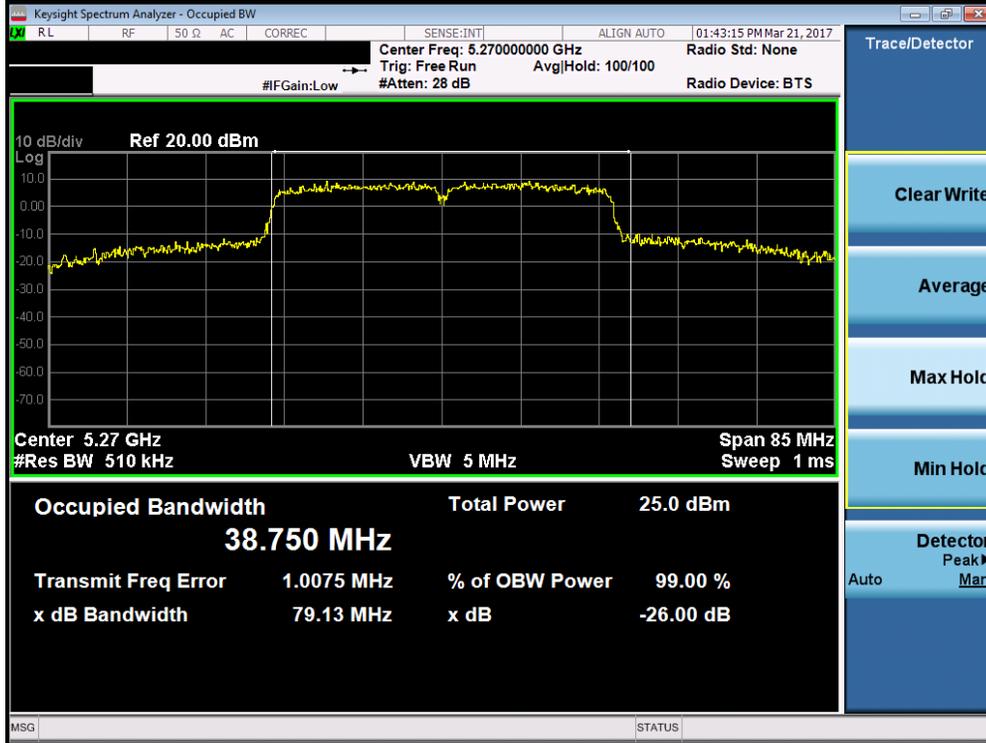


Plot 7-26. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

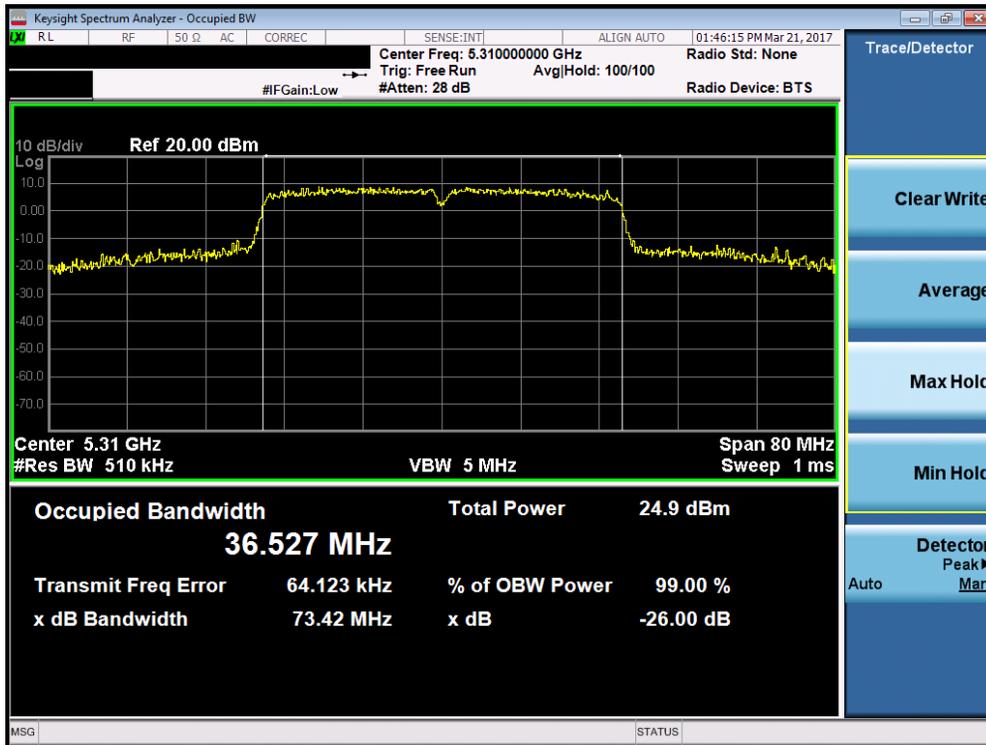


Plot 7-27. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 30 of 136 |

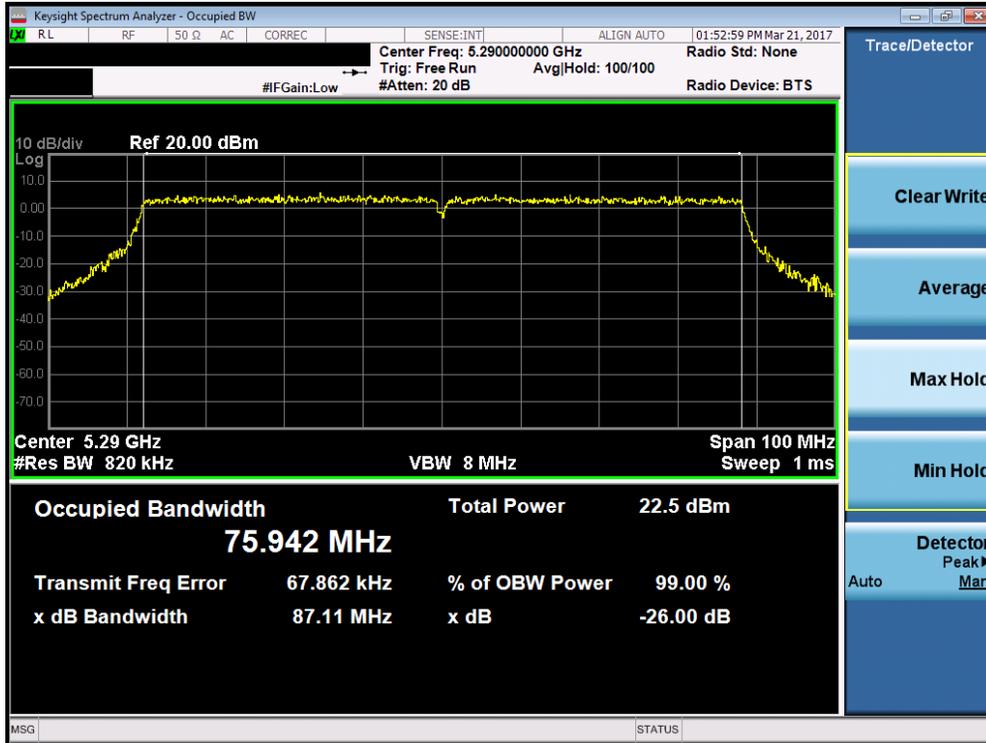


Plot 7-28. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

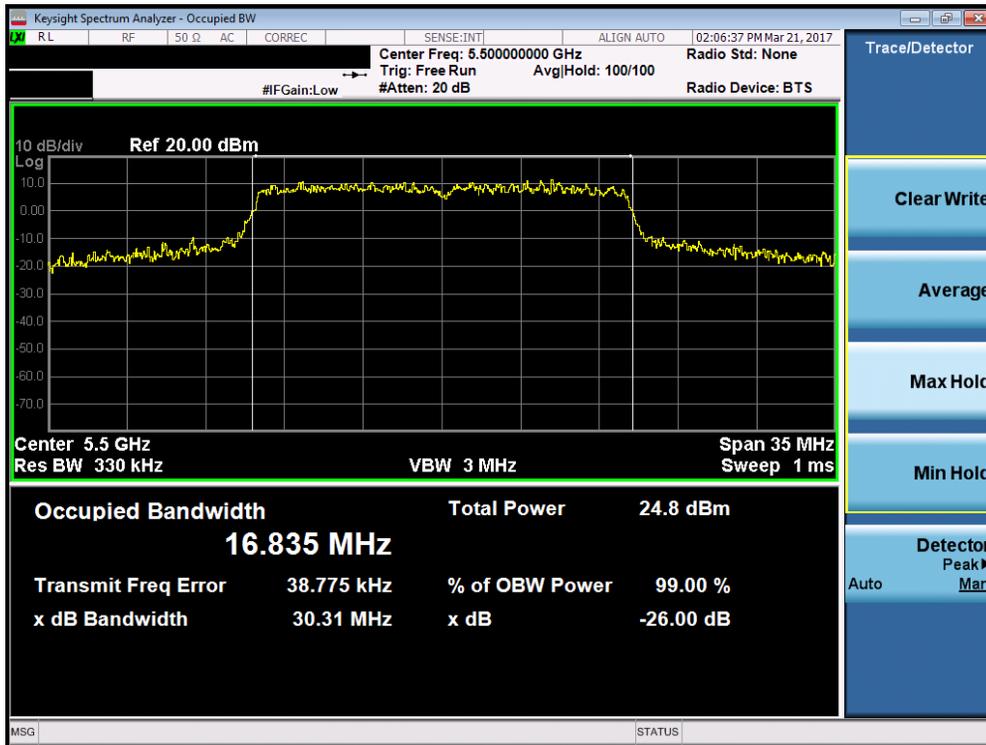


Plot 7-29. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 31 of 136 |

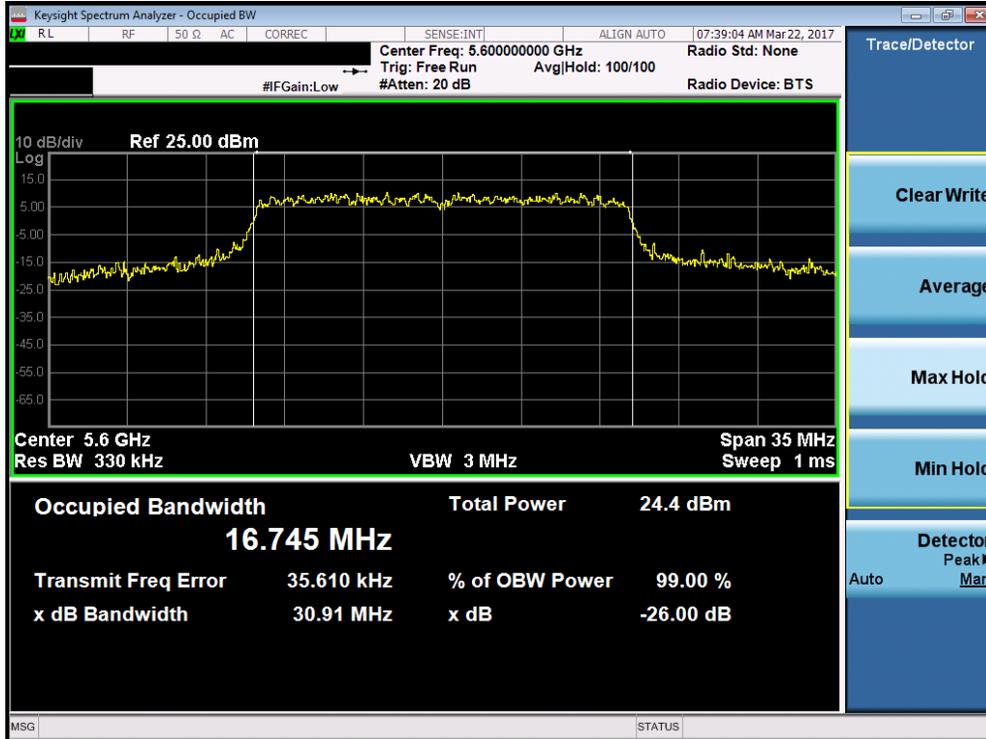


Plot 7-30. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)

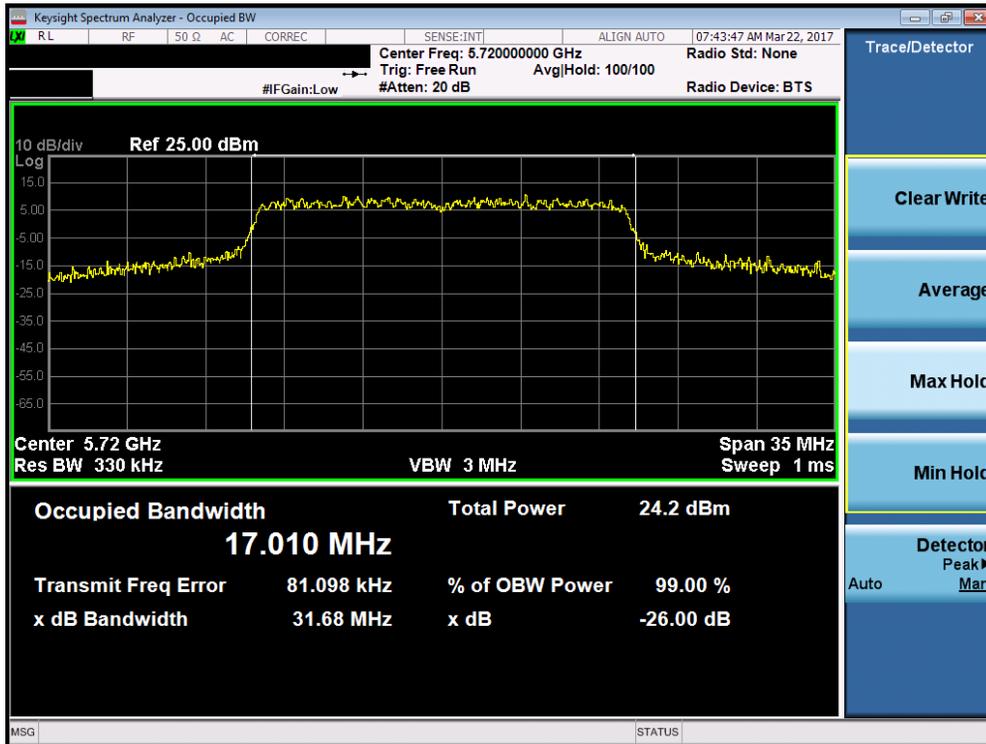


Plot 7-31. 26dB Bandwidth Plot (802.11a (UNII Band 2C) – Ch. 100)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 32 of 136 |

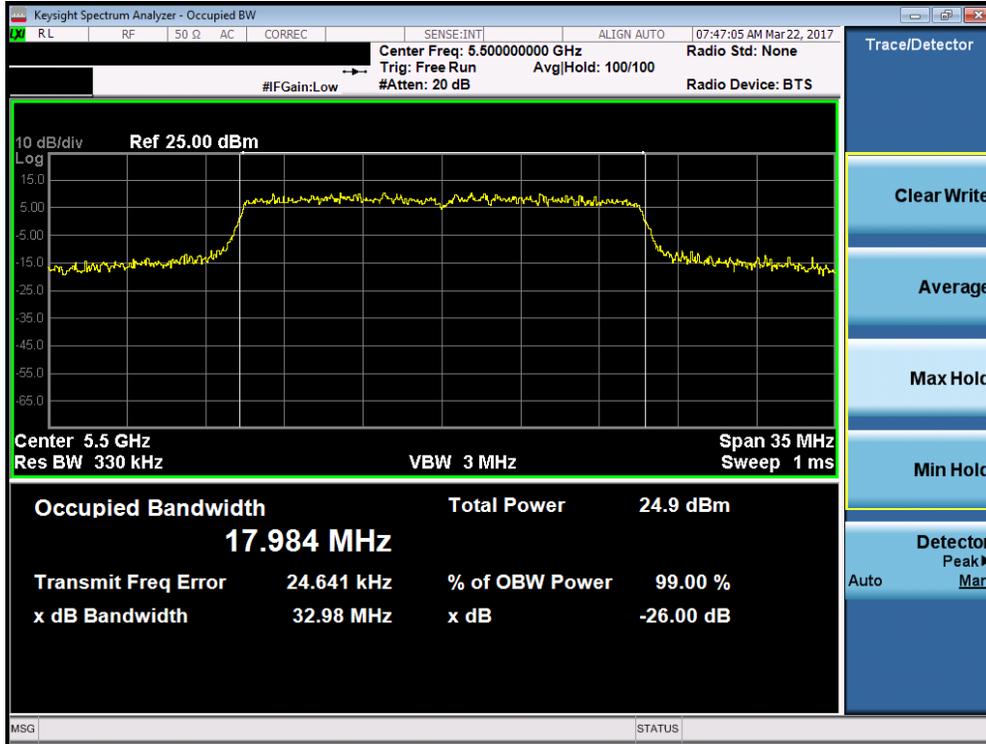


Plot 7-32. 26dB Bandwidth Plot (802.11a (UNII Band 2C) – Ch. 120)

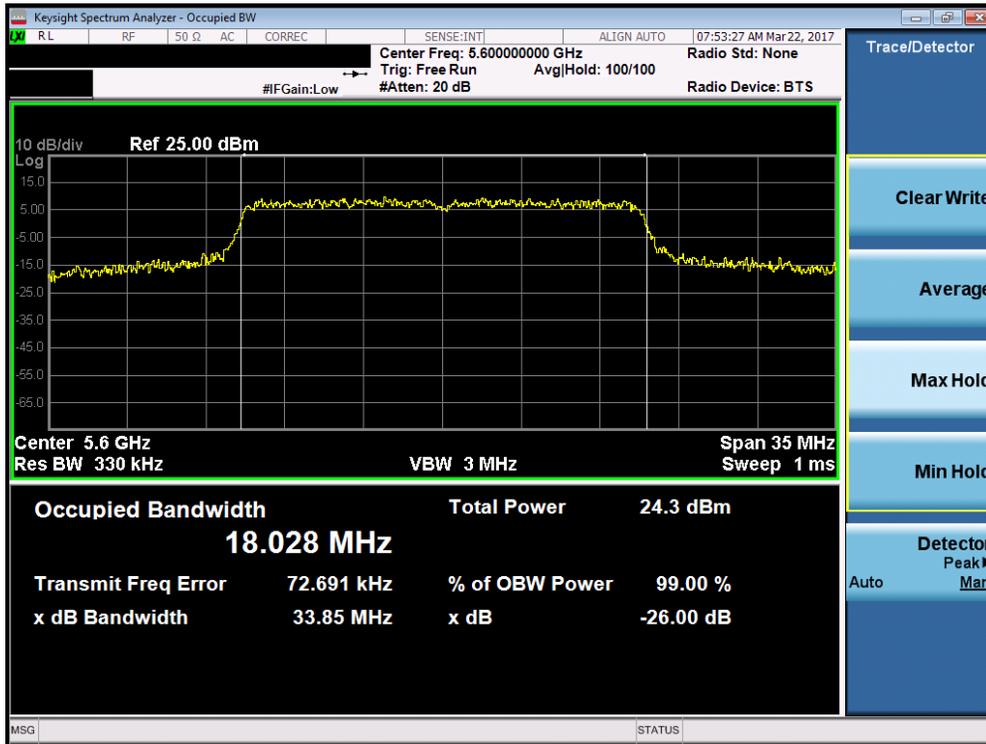


Plot 7-33. 26dB Bandwidth Plot (802.11a (UNII Band 2C) – Ch. 144)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 33 of 136 |

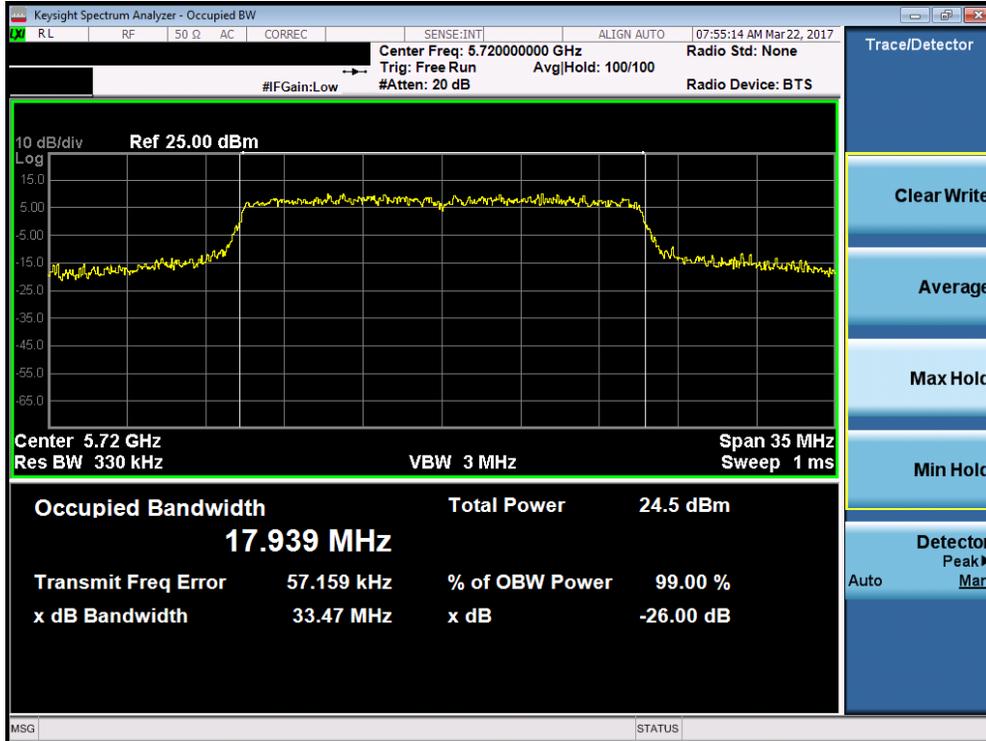


Plot 7-34. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)

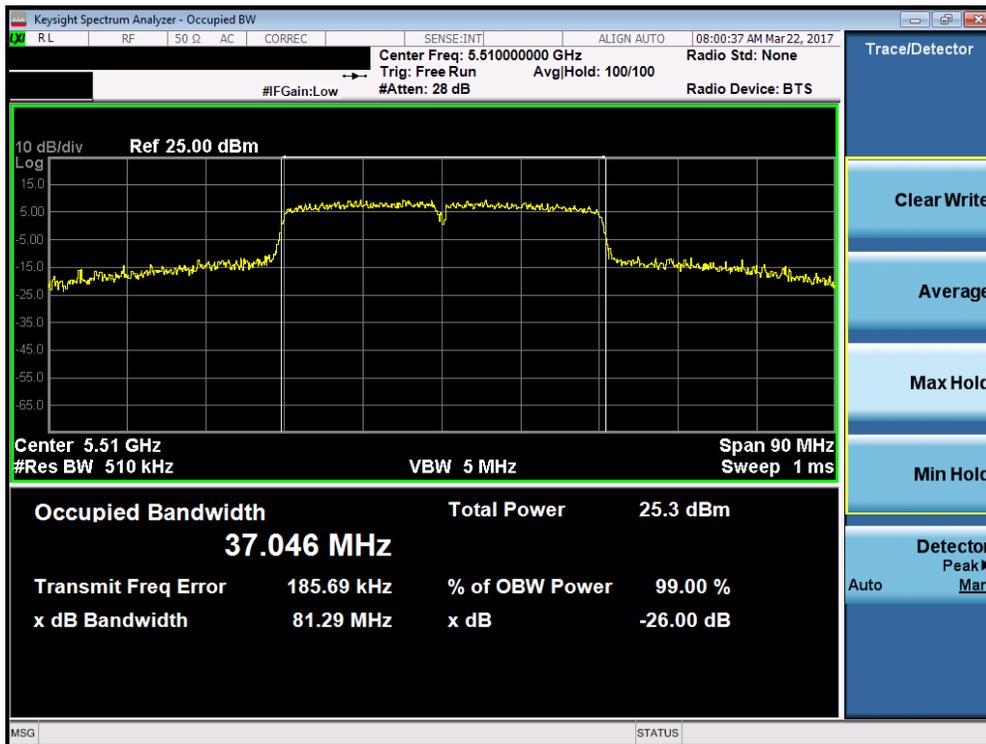


Plot 7-35. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 120)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 34 of 136 |

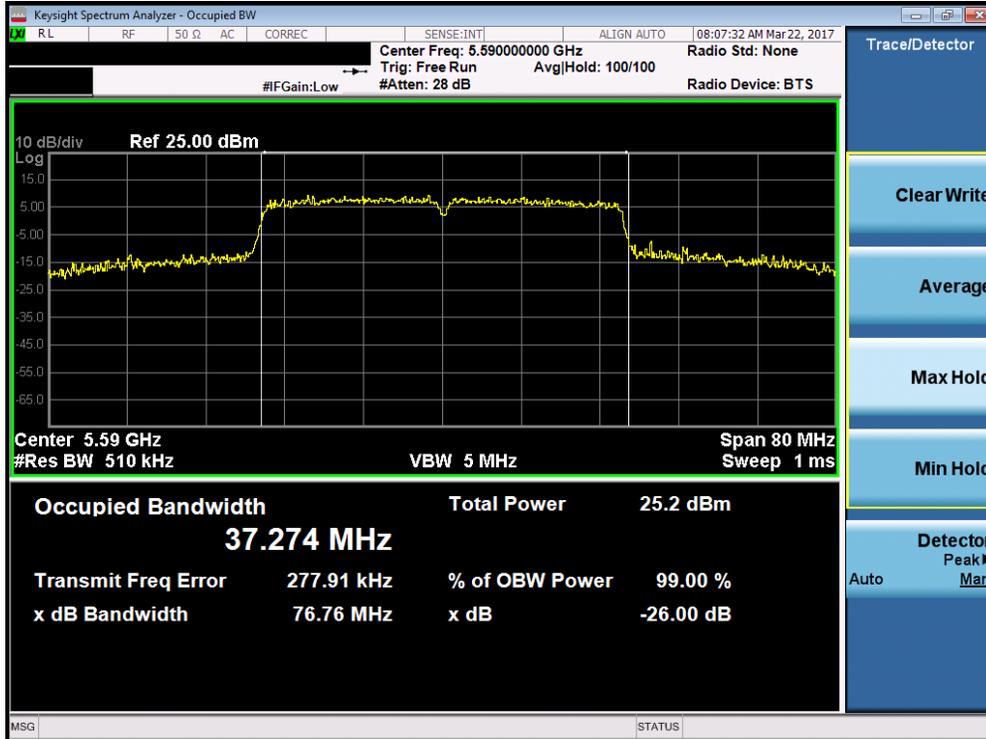


Plot 7-36. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

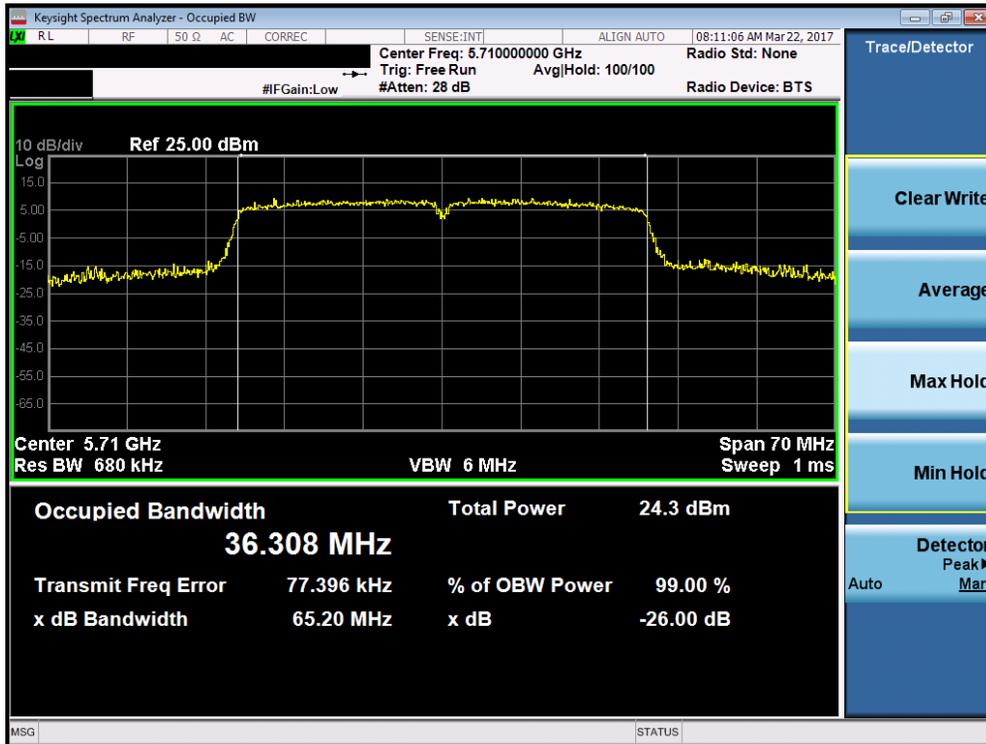


Plot 7-37. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 35 of 136 |

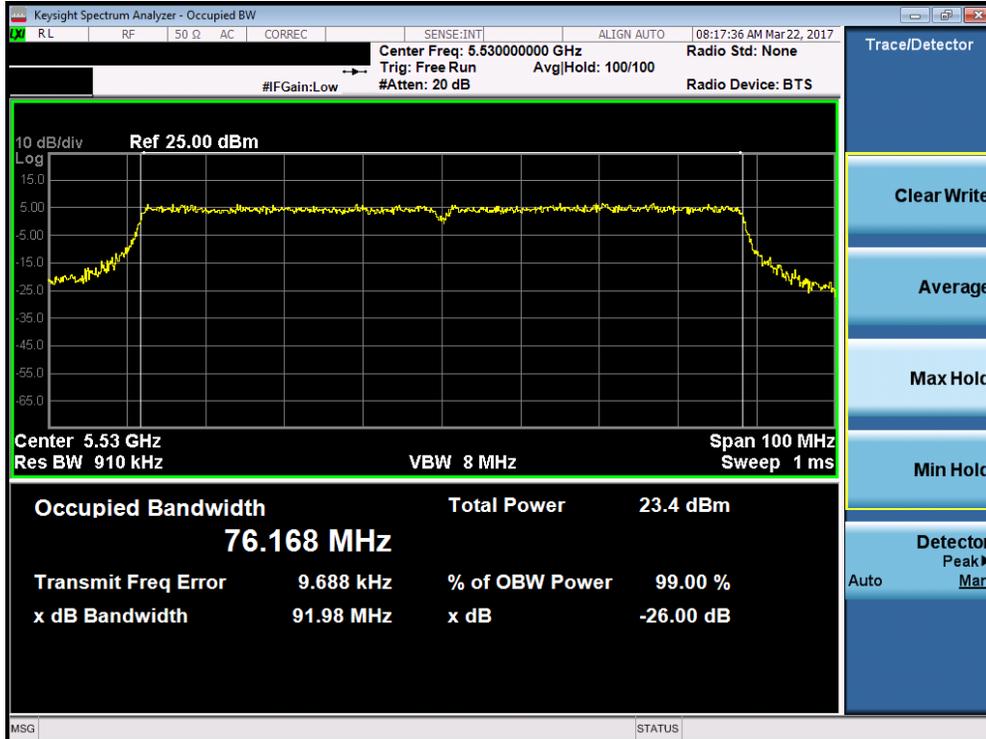


Plot 7-38. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 118)

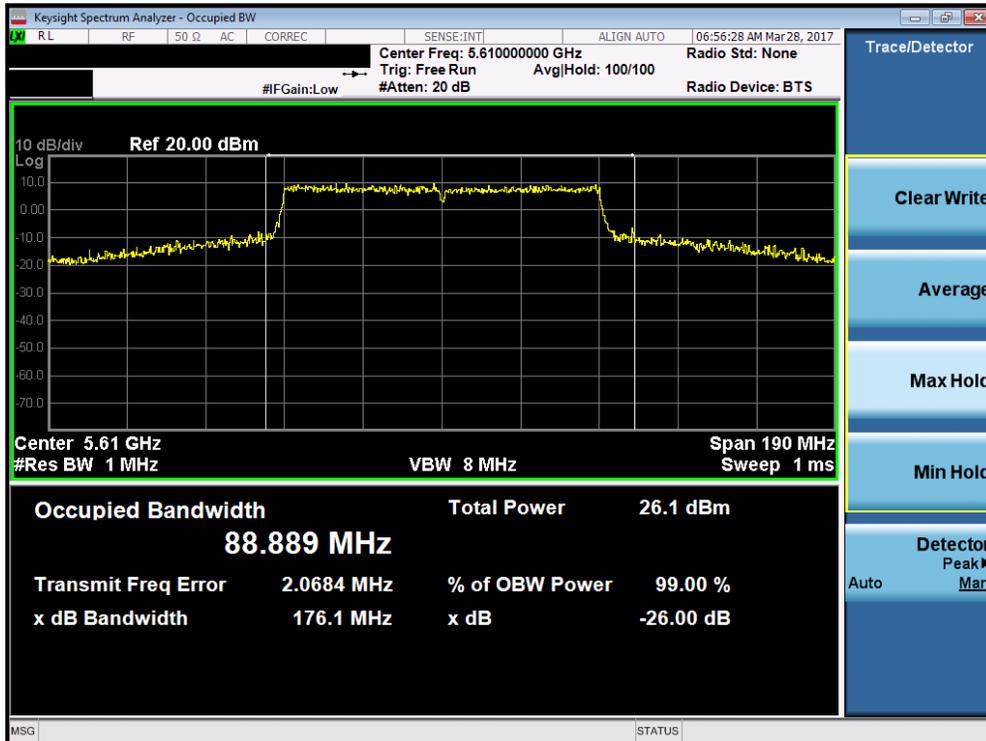


Plot 7-39. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 36 of 136 |

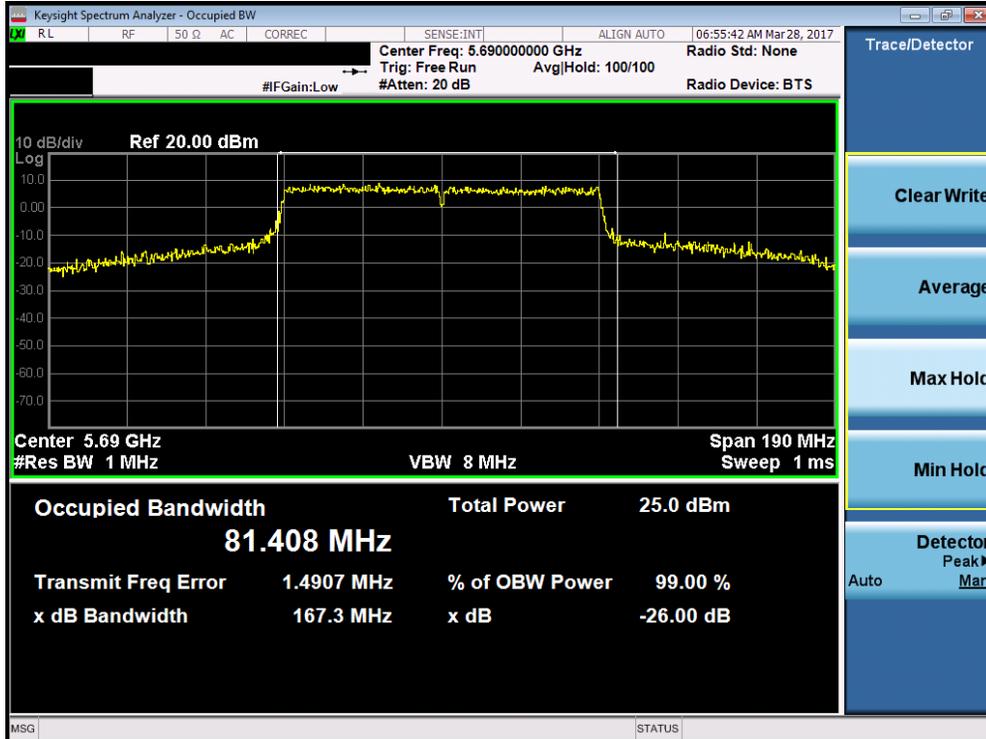


Plot 7-40. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)



Plot 7-41. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 122)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 37 of 136 |



Plot 7-42. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 38 of 136 |

7.3 UNII Output Power Measurement – 802.11a/n/ac §15.407(a.2)

Test Overview and Limits

A transmitter antenna terminal of the EUT is connected to the input of an RF pulse power sensor. Measurement is made using a broadband average power meter while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02 v01r04, and at the appropriate frequencies.

In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) and $11 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 11 \text{ dBm} + 10\log_{10}(20.12) = 24.04\text{dBm}$.

In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) and $11 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 11 \text{ dBm} + 10\log_{10}(22.06) = 24.44\text{dBm}$.

Test Procedure Used

KDB 789033 D02 v01r04 – Section E)3)b) Method PM-G
KDB 662911 v02r01 – Section E)1) Measure-and-Sum Technique

Test Settings

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

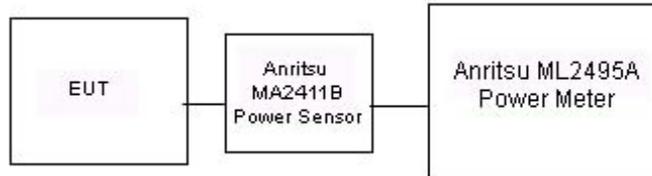


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

None

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 39 of 136 | |

Antenna-1 Conducted Output Power Measurements

| Freq [MHz] | Channel | Detector | 5GHz (20MHz) Conducted Power [dBm] | | |
|------------|---------|----------|------------------------------------|---------|----------|
| | | | IEEE Transmission Mode | | |
| | | | 802.11a | 802.11n | 802.11ac |
| 5260 | 52 | AVG | 20.13 | 20.91 | 20.95 |
| 5280 | 56 | AVG | 20.12 | 20.79 | 20.97 |
| 5300 | 60 | AVG | 20.90 | 20.10 | 20.81 |
| 5320 | 64 | AVG | 16.23 | 16.07 | 16.17 |
| 5500 | 100 | AVG | 17.98 | 18.11 | 18.05 |
| 5600 | 120 | AVG | 20.79 | 20.64 | 20.77 |
| 5620 | 124 | AVG | 20.79 | 20.24 | 20.71 |
| 5720 | 144 | AVG | 20.77 | 20.41 | 20.47 |

Table 7-4. 20MHz BW (UNII) Maximum Conducted Output Power

| Freq [MHz] | Channel | Detector | 5GHz (40MHz) Conducted Power [dBm] | |
|------------|---------|----------|------------------------------------|----------|
| | | | IEEE Transmission Mode | |
| | | | 802.11n | 802.11ac |
| 5270 | 54 | AVG | 20.43 | 20.44 |
| 5310 | 62 | AVG | 14.19 | 14.23 |
| 5510 | 102 | AVG | 14.05 | 14.26 |
| 5590 | 118 | AVG | 20.24 | 19.33 |
| 5630 | 126 | AVG | 20.19 | 19.56 |
| 5710 | 142 | AVG | 20.07 | 20.14 |

Table 7-5. 40MHz BW (UNII) Maximum Conducted Output Power

| 5GHz (80MHz) Conducted Power [dBm] | | | |
|------------------------------------|---------|----------|------------------------|
| Freq [MHz] | Channel | Detector | IEEE Transmission Mode |
| | | | 802.11ac |
| 5290 | 58 | AVG | 14.19 |
| 5530 | 106 | AVG | 13.20 |
| 5610 | 122 | AVG | 19.01 |
| 5690 | 138 | AVG | 19.34 |

Table 7-6. 80MHz BW (UNII) Maximum Conducted Output Power

| | | | | |
|--|---|---|---|--|
| FCC ID: A3LETWV520  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 40 of 136 | |

Antenna-2 Conducted Output Power Measurements

| Freq [MHz] | Channel | Detector | 5GHz (20MHz) Conducted Power [dBm] | | |
|------------|---------|----------|------------------------------------|---------|----------|
| | | | IEEE Transmission Mode | | |
| | | | 802.11a | 802.11n | 802.11ac |
| 5260 | 52 | AVG | 20.71 | 20.44 | 20.79 |
| 5280 | 56 | AVG | 19.98 | 20.05 | 20.80 |
| 5300 | 60 | AVG | 19.87 | 19.22 | 20.45 |
| 5320 | 64 | AVG | 16.26 | 16.19 | 16.27 |
| 5500 | 100 | AVG | 18.49 | 18.35 | 17.69 |
| 5600 | 120 | AVG | 20.09 | 20.06 | 20.98 |
| 5620 | 124 | AVG | 20.77 | 20.07 | 20.97 |
| 5720 | 144 | AVG | 20.16 | 20.09 | 20.53 |

Table 7-7. 20MHz BW (UNII) Maximum Conducted Output Power

| Freq [MHz] | Channel | Detector | 5GHz (40MHz) Conducted Power [dBm] | |
|------------|---------|----------|------------------------------------|----------|
| | | | IEEE Transmission Mode | |
| | | | 802.11n | 802.11ac |
| 5270 | 54 | AVG | 19.67 | 19.68 |
| 5310 | 62 | AVG | 14.45 | 14.49 |
| 5510 | 102 | AVG | 14.69 | 14.61 |
| 5590 | 118 | AVG | 19.96 | 20.02 |
| 5630 | 126 | AVG | 19.76 | 19.73 |
| 5710 | 142 | AVG | 19.81 | 19.64 |

Table 7-8. 40MHz BW (UNII) Maximum Conducted Output Power

| 5GHz (80MHz) Conducted Power [dBm] | | | |
|------------------------------------|---------|----------|------------------------|
| Freq [MHz] | Channel | Detector | IEEE Transmission Mode |
| | | | 802.11ac |
| 5290 | 58 | AVG | 14.25 |
| 5530 | 106 | AVG | 13.23 |
| 5610 | 122 | AVG | 19.29 |
| 5690 | 138 | AVG | 19.26 |

Table 7-9. 80MHz BW (UNII) Maximum Conducted Output Power

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 41 of 136 | |

MIMO Maximum Conducted Output Power Measurements

| Freq [MHz] | Channel | Detector | Directional Gain [dBi] | 5GHz (20MHz) Conducted Power [dBm] | | | Max Permissible Power [dBm] | Adjusted Limit [dBm] | Margin [dB] |
|------------|---------|----------|------------------------|------------------------------------|-------|-------|-----------------------------|----------------------|-------------|
| | | | | IEEE Transmission Mode | | | | | |
| | | | | ANT1 | ANT2 | MIMO | | | |
| 5260 | 52 | AVG | 6.31 | 17.10 | 17.21 | 20.17 | 23.98 | 23.67 | -3.50 |
| 5280 | 56 | AVG | 6.31 | 17.04 | 17.23 | 20.15 | 23.98 | 23.67 | -3.52 |
| 5300 | 60 | AVG | 6.31 | 16.98 | 17.20 | 20.10 | 23.98 | 23.67 | -3.57 |
| 5320 | 64 | AVG | 6.31 | 15.11 | 15.29 | 18.21 | 23.98 | 23.67 | -5.46 |
| 5500 | 100 | AVG | 6.08 | 17.47 | 17.44 | 20.47 | 23.98 | 23.90 | -3.43 |
| 5600 | 120 | AVG | 6.08 | 16.99 | 17.38 | 20.20 | 23.98 | 23.90 | -3.70 |
| 5620 | 124 | AVG | 6.08 | 16.86 | 17.37 | 20.13 | 23.98 | 23.90 | -3.77 |
| 5720 | 144 | AVG | 6.08 | 17.61 | 17.91 | 20.77 | 23.98 | 23.90 | -3.13 |

Table 7-10. MIMO 20MHz BW 802.11n (UNII) Maximum Conducted Output Power

| Freq [MHz] | Channel | Detector | Directional Gain [dBi] | 5GHz (20MHz) Conducted Power [dBm] | | | Max Permissible Power [dBm] | Adjusted Limit [dBm] | Margin [dB] |
|------------|---------|----------|------------------------|------------------------------------|-------|-------|-----------------------------|----------------------|-------------|
| | | | | IEEE Transmission Mode | | | | | |
| | | | | ANT1 | ANT2 | MIMO | | | |
| 5260 | 52 | AVG | 6.31 | 17.16 | 17.39 | 20.29 | 23.98 | 23.67 | -3.38 |
| 5280 | 56 | AVG | 6.31 | 17.17 | 17.32 | 20.26 | 23.98 | 23.67 | -3.41 |
| 5300 | 60 | AVG | 6.31 | 17.06 | 17.23 | 20.16 | 23.98 | 23.67 | -3.51 |
| 5320 | 64 | AVG | 6.31 | 15.16 | 15.35 | 18.27 | 23.98 | 23.67 | -5.40 |
| 5500 | 100 | AVG | 6.08 | 17.45 | 17.50 | 20.49 | 23.98 | 23.90 | -3.41 |
| 5600 | 120 | AVG | 6.08 | 16.97 | 17.44 | 20.22 | 23.98 | 23.90 | -3.68 |
| 5620 | 124 | AVG | 6.08 | 17.05 | 17.37 | 20.22 | 23.98 | 23.90 | -3.68 |
| 5720 | 144 | AVG | 6.08 | 17.67 | 17.42 | 20.56 | 23.98 | 23.90 | -3.34 |

Table 7-11. MIMO 20MHz BW 802.11ac (UNII) Maximum Conducted Output Power

| Freq [MHz] | Channel | Detector | Directional Gain [dBi] | 5GHz (40MHz) Conducted Power [dBm] | | | Max Permissible Power [dBm] | Adjusted Limit [dBm] | Margin [dB] |
|------------|---------|----------|------------------------|------------------------------------|-------|-------|-----------------------------|----------------------|-------------|
| | | | | IEEE Transmission Mode | | | | | |
| | | | | ANT1 | ANT2 | MIMO | | | |
| 5270 | 54 | AVG | 6.31 | 17.29 | 17.53 | 20.42 | 23.98 | 23.67 | -3.25 |
| 5310 | 62 | AVG | 6.31 | 13.07 | 13.43 | 16.26 | 23.98 | 23.67 | -7.41 |
| 5510 | 102 | AVG | 6.08 | 12.98 | 13.71 | 16.37 | 23.98 | 23.90 | -7.53 |
| 5590 | 118 | AVG | 6.08 | 17.09 | 17.84 | 20.49 | 23.98 | 23.90 | -3.41 |
| 5630 | 126 | AVG | 6.08 | 17.02 | 17.72 | 20.39 | 23.98 | 23.90 | -3.51 |
| 5710 | 142 | AVG | 6.08 | 16.89 | 16.62 | 19.77 | 23.98 | 23.90 | -4.13 |

Table 7-12. MIMO 40MHz BW 802.11n (UNII) Maximum Conducted Output Power

| Freq [MHz] | Channel | Detector | Directional Gain [dBi] | 5GHz (40MHz) Conducted Power [dBm] | | | Max Permissible Power [dBm] | Adjusted Limit [dBm] | Margin [dB] |
|------------|---------|----------|------------------------|------------------------------------|-------|-------|-----------------------------|----------------------|-------------|
| | | | | IEEE Transmission Mode | | | | | |
| | | | | ANT1 | ANT2 | MIMO | | | |
| 5270 | 54 | AVG | 6.31 | 17.36 | 17.57 | 20.48 | 23.98 | 23.67 | -3.19 |
| 5310 | 62 | AVG | 6.31 | 13.12 | 13.39 | 16.27 | 23.98 | 23.67 | -7.40 |
| 5510 | 102 | AVG | 6.08 | 12.98 | 13.73 | 16.38 | 23.98 | 23.90 | -7.52 |
| 5590 | 118 | AVG | 6.08 | 16.24 | 16.92 | 19.60 | 23.98 | 23.90 | -4.30 |
| 5630 | 126 | AVG | 6.08 | 16.31 | 16.67 | 19.50 | 23.98 | 23.90 | -4.40 |
| 5710 | 142 | AVG | 6.08 | 16.79 | 16.59 | 19.70 | 23.98 | 23.90 | -4.20 |

Table 7-13. MIMO 40MHz BW 802.11ac (UNII) Maximum Conducted Output Power

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 42 of 136 |

| Freq [MHz] | Channel | Detector | Directional Gain [dBi] | 5GHz (80MHz) Conducted Power [dBm] | | | Max Permissible Power [dBm] | Adjusted Limit [dBm] | Margin [dB] |
|------------|---------|----------|------------------------|------------------------------------|-------|-------|-----------------------------|----------------------|-------------|
| | | | | IEEE Transmission Mode | | | | | |
| | | | | ANT1 | ANT2 | MIMO | | | |
| 5290 | 58 | AVG | 6.31 | 13.17 | 13.21 | 16.20 | 23.98 | 23.67 | -7.47 |
| 5530 | 106 | AVG | 6.08 | 12.04 | 12.22 | 15.14 | 23.98 | 23.90 | -8.76 |
| 5610 | 122 | AVG | 6.08 | 16.01 | 15.83 | 18.93 | 23.98 | 23.90 | -4.97 |
| 5690 | 138 | AVG | 6.08 | 16.43 | 16.04 | 19.25 | 23.98 | 23.90 | -4.65 |

Table 7-14. MIMO 80MHz BW 802.11ac (UNII) Maximum Conducted Output Power

Note:

Per KDB 662911 v02r01 Section E)1), the conducted powers at Antenna 1 and Antenna 2 were first measured separately during MIMO transmission as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

Per KDB 662911 v02r01, Section F)2), the directional gain is calculated using the following formula, where G_n is the gain of the nth antenna and N_{ANT} , the total number of antennas used.

$$\text{Directional gain} = 10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] \text{ dBi}$$

The Max Permissible Power limits were adjusted using the following formula:

$$\text{Max permissible power} - [6 - (\text{Directional gain})]$$

The Power Density limits were adjusted using the following formula:

$$\text{Max permissible power density} - [6 - (\text{Directional gain})]$$

Sample MIMO Calculation:

At 5290MHz in 802.11ac (80MHz BW) mode, the average conducted output power was measured to be 13.17dBm for Antenna-1 and 13.21dBm for Antenna-2.

$$\text{Antenna 1} + \text{Antenna 2} = \text{MIMO}$$

$$(13.17 \text{ dBm} + 13.21 \text{ dBm}) = (20.75 \text{ mW} + 20.94 \text{ mW}) = 41.69 \text{ mW} = 16.20 \text{ dBm}$$

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 43 of 136 | |

7.4 Maximum Power Spectral Density – 802.11a/n/ac §15.407(a.2)

Test Overview and Limit

The spectrum analyzer was connected to the antenna terminal while the EUT was operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02 v01r04, and at the appropriate frequencies. Method SA-1, as defined in KDB 789033 D02 v01r04, was used to measure the power spectral density.

In the 5.25 – 5.35GHz, 5.47 – 5.725GHz bands, the maximum permissible power spectral density is 11dBm/MHz.

Test Procedure Used

KDB 789033 D02 v01r04 – Section F
KDB 662911 v02r01 – Section E)2) Measure-and-Sum Technique

Test Settings

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire emission bandwidth of the signal
3. RBW = 1MHz
4. VBW = 3MHz
5. Number of sweep points $\geq 2 \times$ (span/RBW)
6. Sweep time = auto
7. Detector = power averaging (RMS)
8. Trigger was set to free run for all modes
9. Trace was averaged over 100 sweeps
10. The peak search function of the spectrum analyzer was used to find the peak of the spectrum.

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

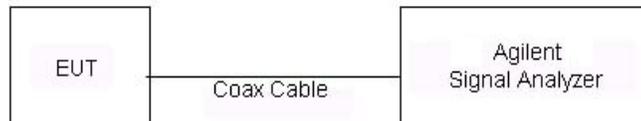


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

None

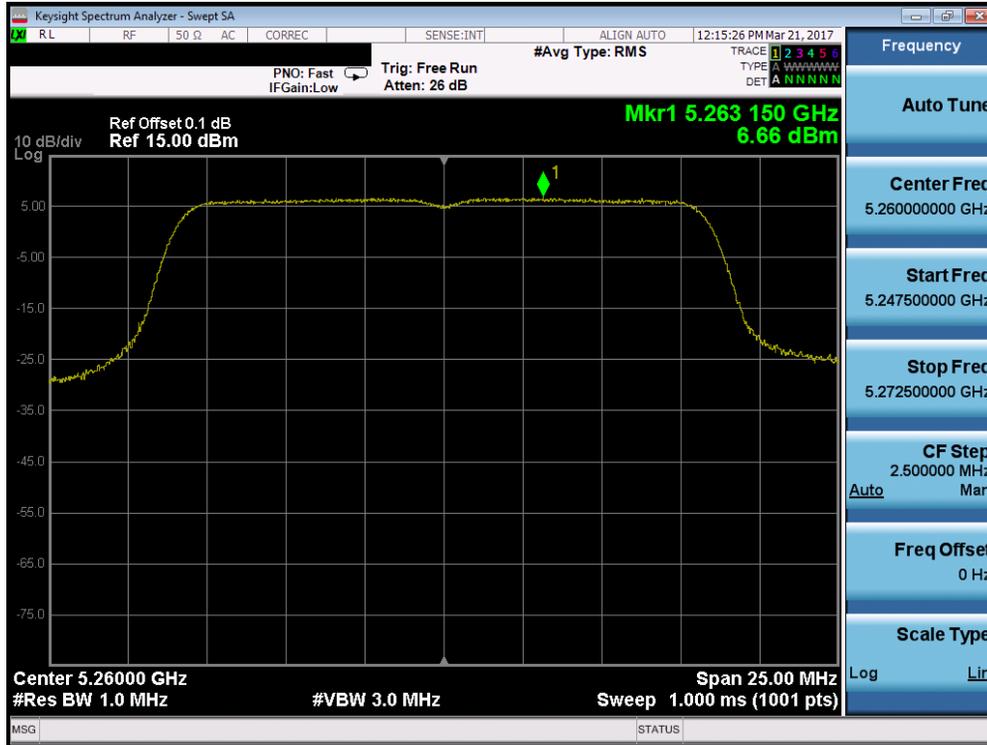
| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 44 of 136 | |

Antenna-1 Power Spectral Density Measurements

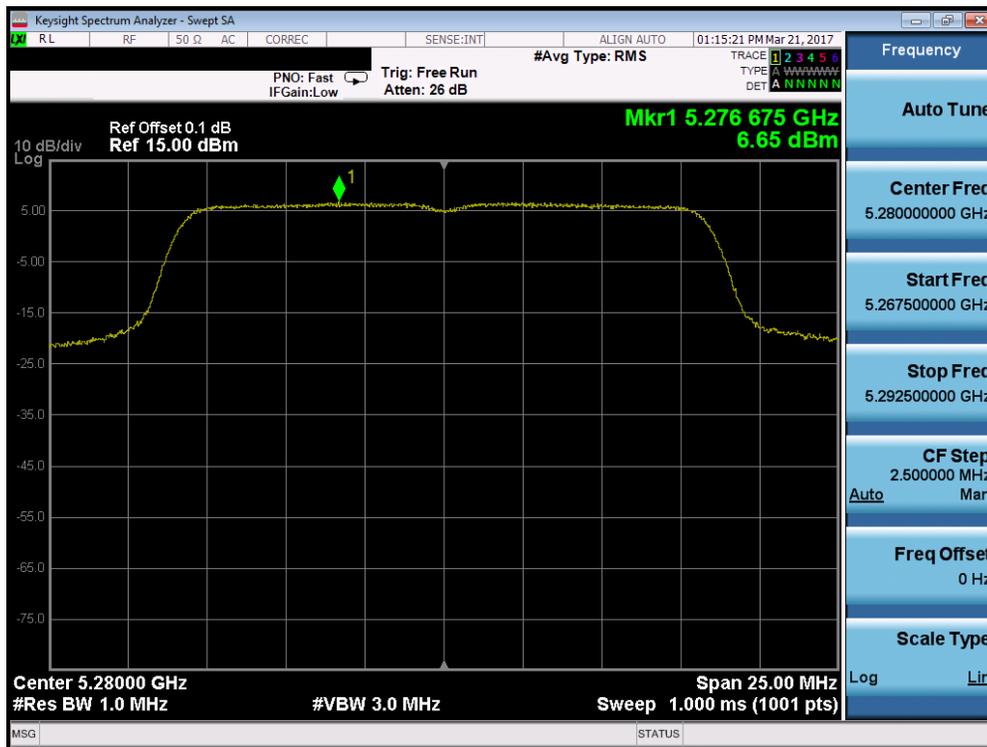
| | Frequency [MHz] | Channel No. | 802.11 Mode | Data Rate [Mbps] | Measured Power Density [dBm] | Max Permissible Power Density [dBm/MHz] | Margin [dB] | Pass / Fail |
|---------|-----------------|-------------|------------------|------------------|------------------------------|---|-------------|-------------|
| Band 2A | 5260 | 52 | a | 6 | 6.66 | 11.0 | -4.34 | Pass |
| | 5280 | 56 | a | 6 | 6.65 | 11.0 | -4.35 | Pass |
| | 5320 | 64 | a | 6 | 6.66 | 11.0 | -4.34 | Pass |
| | 5260 | 52 | n (20MHz) | 6.5/7.2 (MCS0) | 6.26 | 11.0 | -4.74 | Pass |
| | 5280 | 56 | n (20MHz) | 6.5/7.2 (MCS0) | 6.29 | 11.0 | -4.71 | Pass |
| | 5320 | 64 | n (20MHz) | 6.5/7.2 (MCS0) | 6.43 | 11.0 | -4.57 | Pass |
| | 5270 | 54 | n (40MHz) | 13.5/15 (MCS0) | 3.73 | 11.0 | -7.27 | Pass |
| | 5310 | 62 | n (40MHz) | 13.5/15 (MCS0) | 3.67 | 11.0 | -7.33 | Pass |
| Band 2C | 5290 | 58 | ac (80MHz) | 29.3/32.5 (MCS0) | -2.79 | 11.0 | -13.79 | Pass |
| | 5500 | 100 | a | 6 | 6.48 | 11.0 | -4.52 | Pass |
| | 5600 | 120 | a | 6 | 6.75 | 11.0 | -4.25 | Pass |
| | 5720 | 144 | a | 6 | 7.56 | 11.0 | -3.44 | Pass |
| | 5500 | 100 | n (20MHz) | 6.5/7.2 (MCS0) | 6.37 | 11.0 | -4.63 | Pass |
| | 5600 | 120 | n (20MHz) | 6.5/7.2 (MCS0) | 6.41 | 11.0 | -4.59 | Pass |
| | 5720 | 144 | n (20MHz) | 6.5/7.2 (MCS0) | 7.39 | 11.0 | -3.61 | Pass |
| | 5510 | 102 | n (40MHz) | 13.5/15 (MCS0) | 4.40 | 11.0 | -6.60 | Pass |
| | 5590 | 118 | n (40MHz) | 13.5/15 (MCS0) | 4.10 | 11.0 | -6.90 | Pass |
| | 5710 | 142 | n (40MHz) | 13.5/15 (MCS0) | 4.47 | 11.0 | -6.53 | Pass |
| | 5530 | 106 | ac (80MHz) | 29.3/32.5 (MCS0) | -2.93 | 11.0 | -13.93 | Pass |
| | 5610 | 122 | ac (80MHz) | 29.3/32.5 (MCS0) | 0.02 | 11.0 | -10.98 | Pass |
| 5690 | 138 | ac (80MHz) | 29.3/32.5 (MCS0) | -1.74 | 11.0 | -12.74 | Pass | |

Table 7-15. Bands 1, 2A, 2C Conducted Power Spectral Density Measurements

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 45 of 136 | |

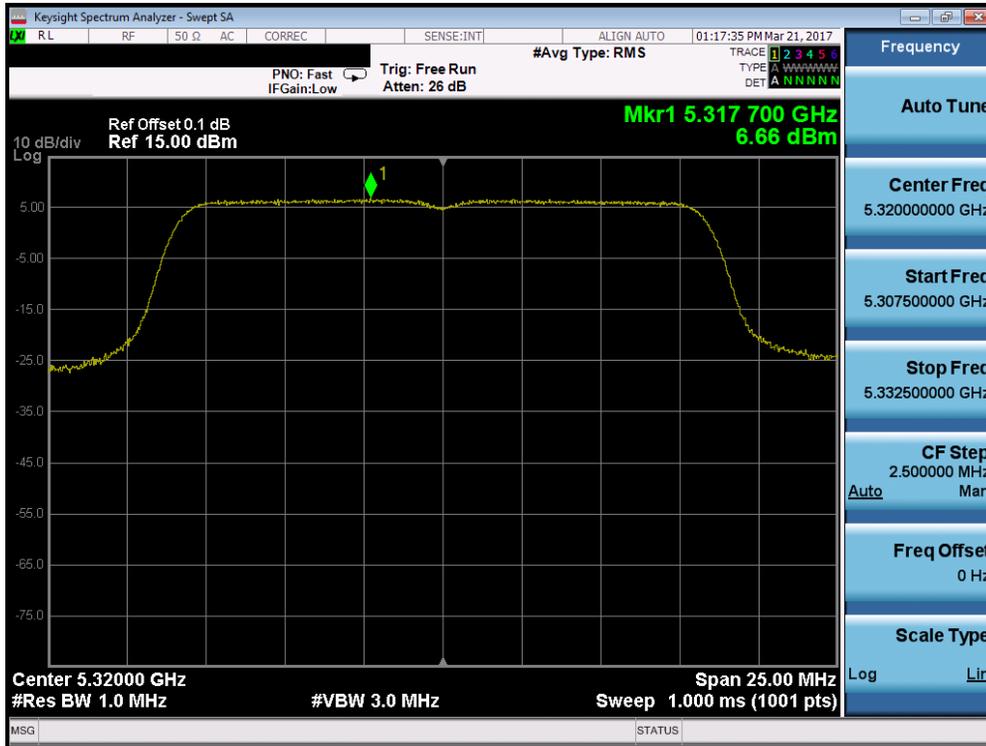


Plot 7-43. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)

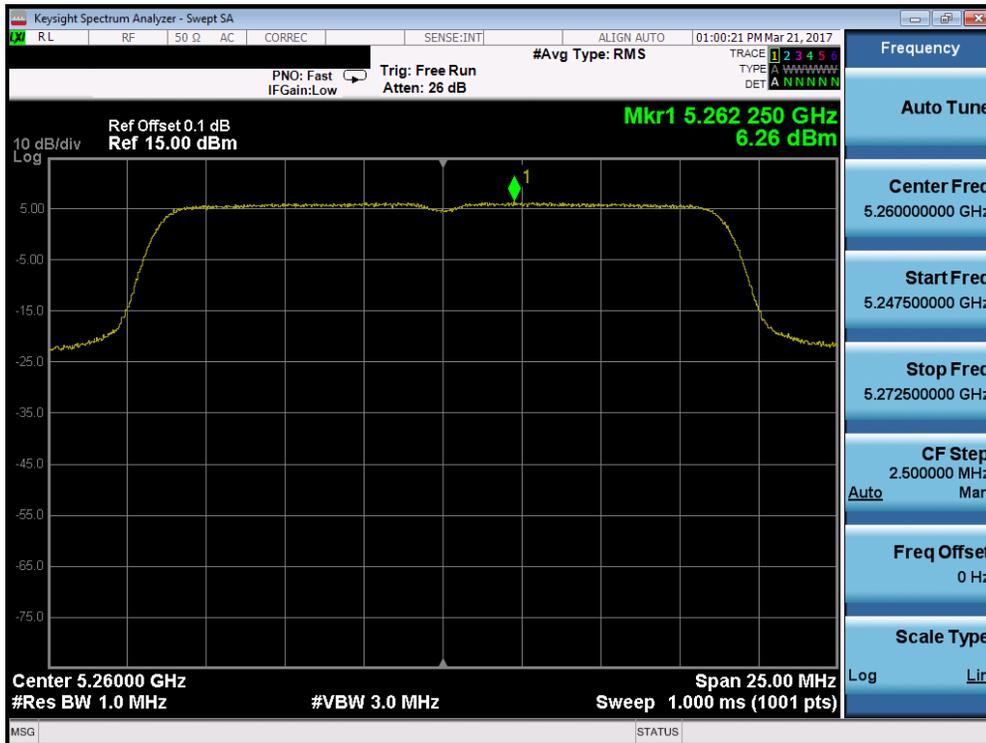


Plot 7-44. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 46 of 136 |

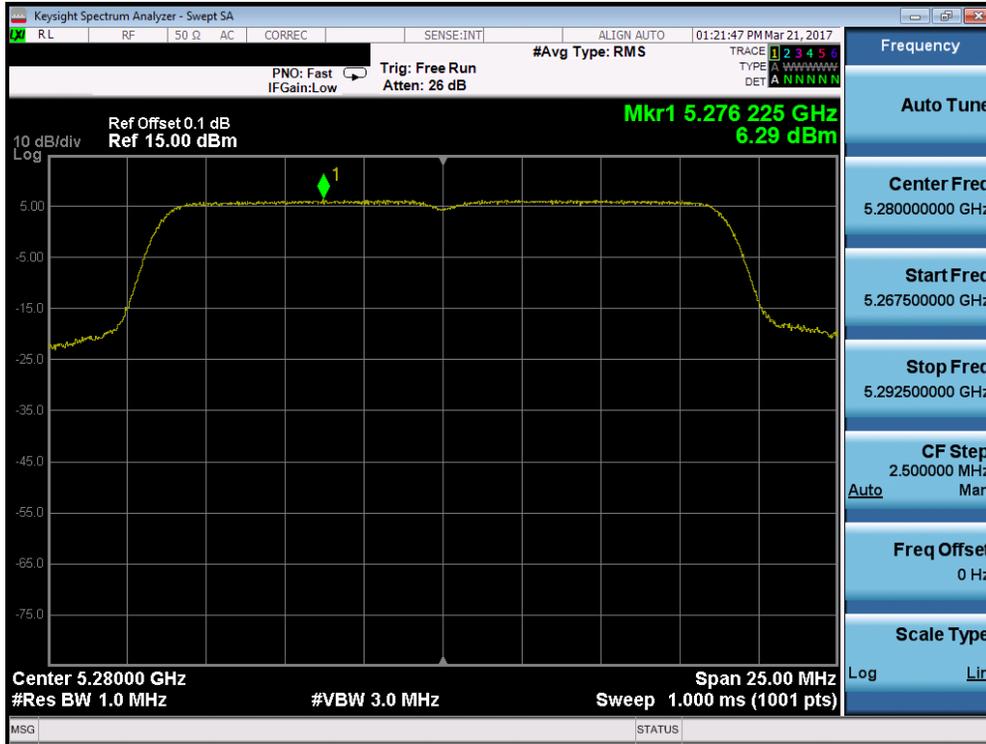


Plot 7-45. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)

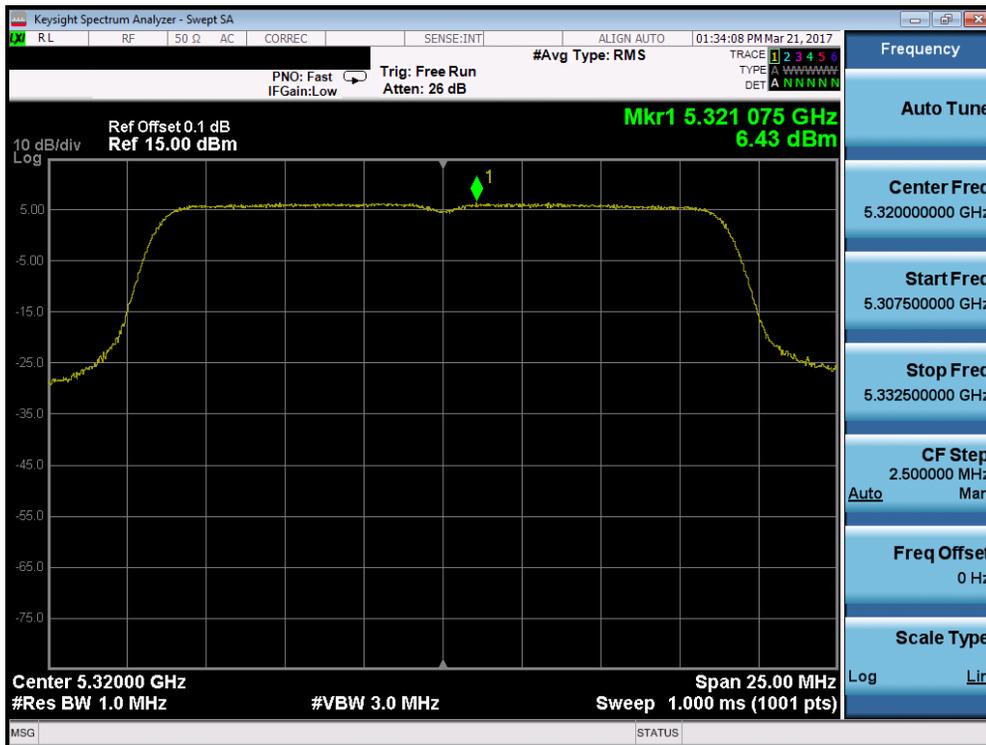


Plot 7-46. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 47 of 136 |

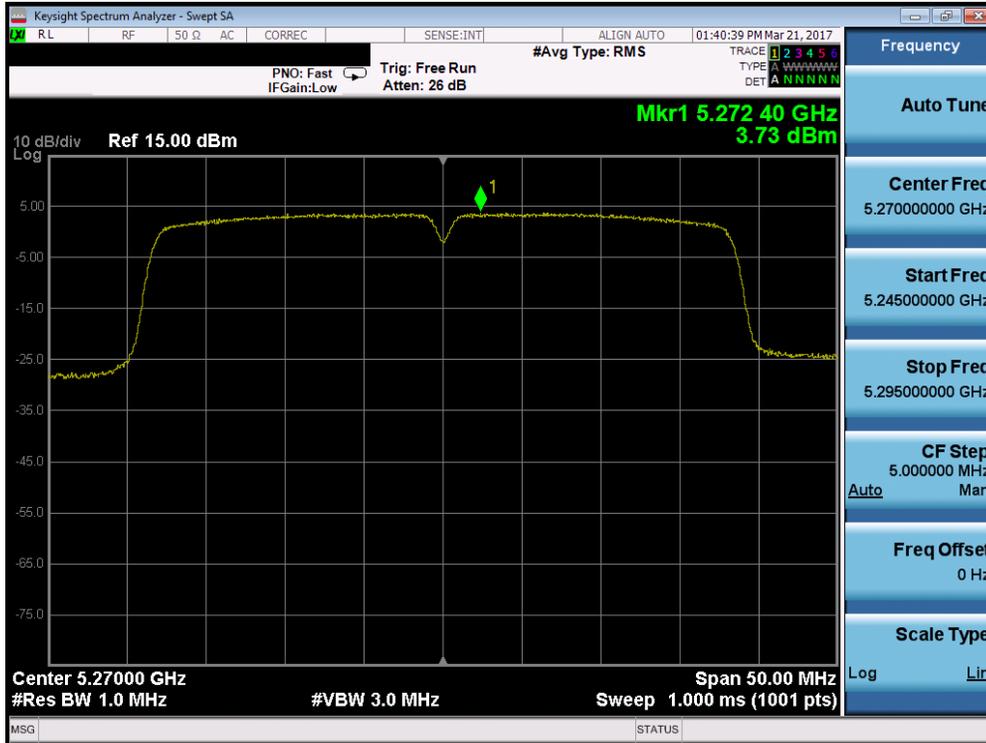


Plot 7-47. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

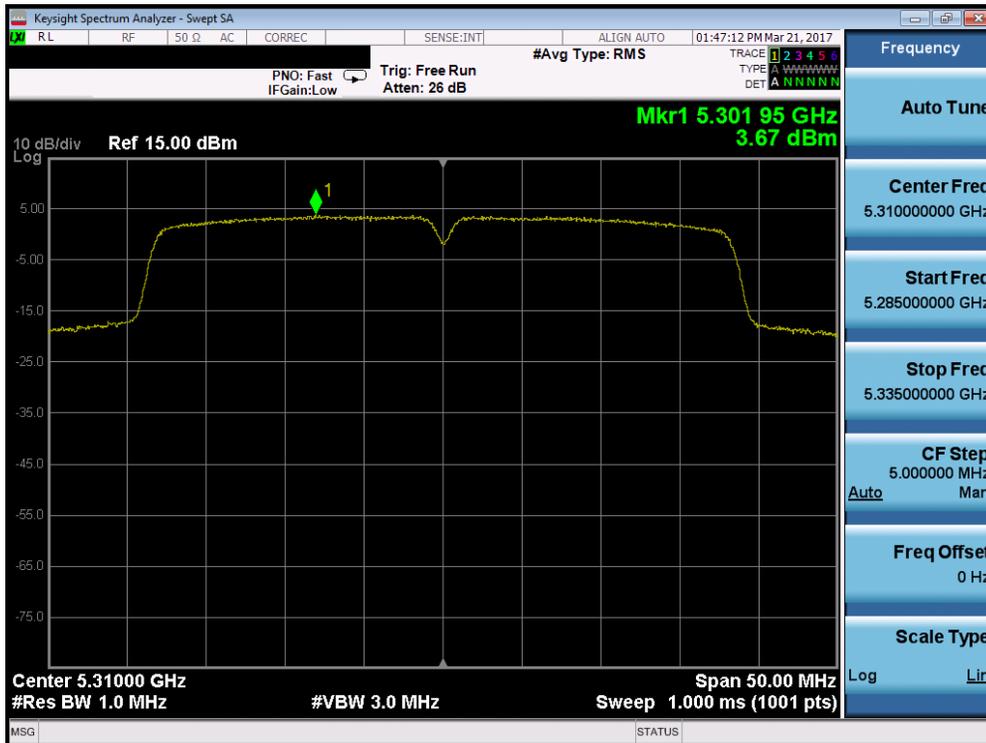


Plot 7-48. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 48 of 136 |

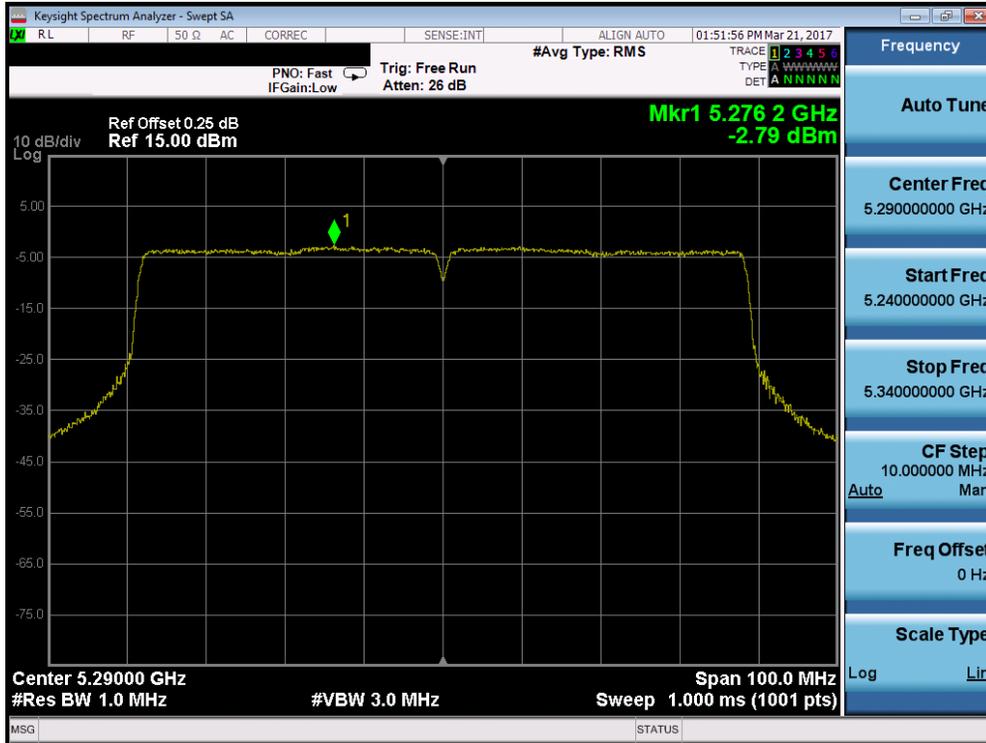


Plot 7-49. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

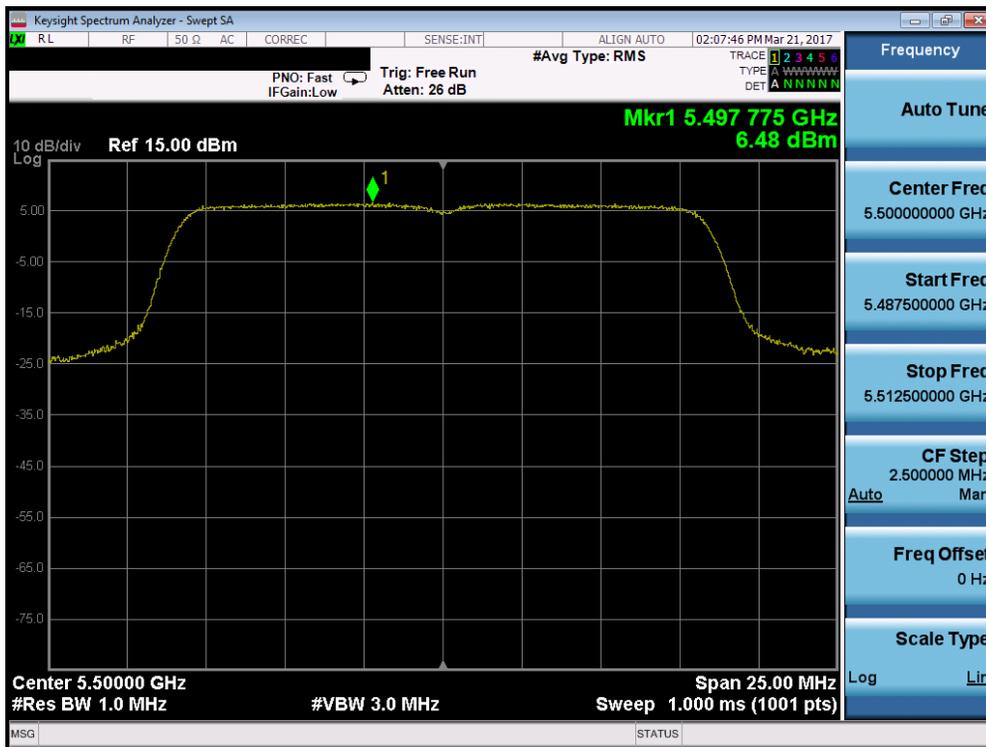


Plot 7-50. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)

| | | | | |
|--|---|---|---|--|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 49 of 136 |

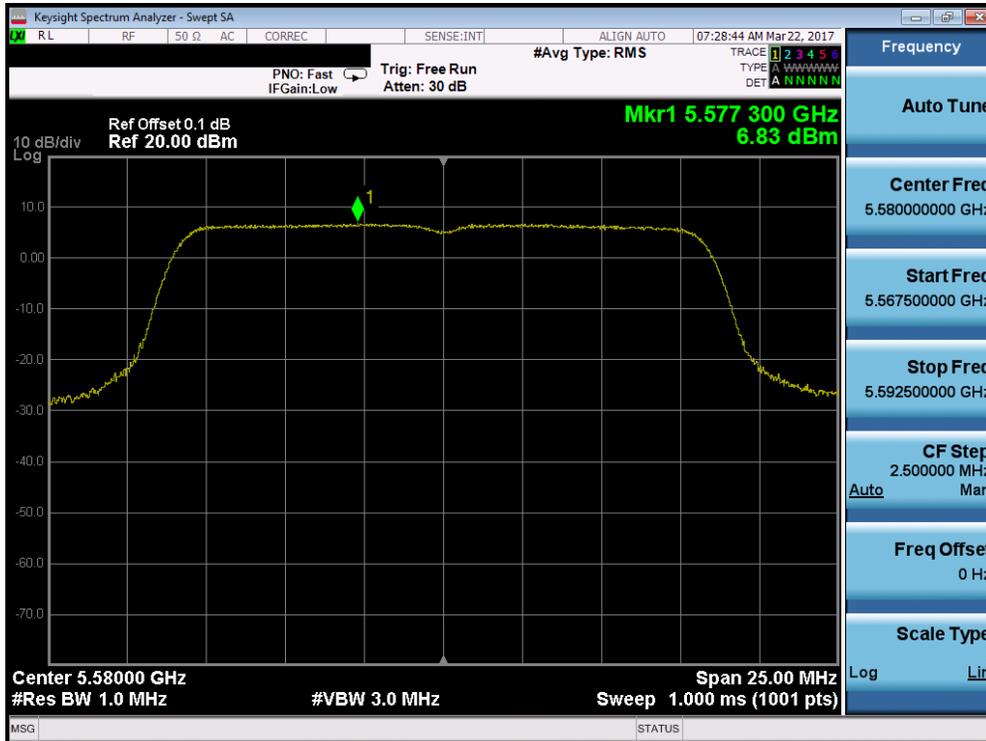


Plot 7-51. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)

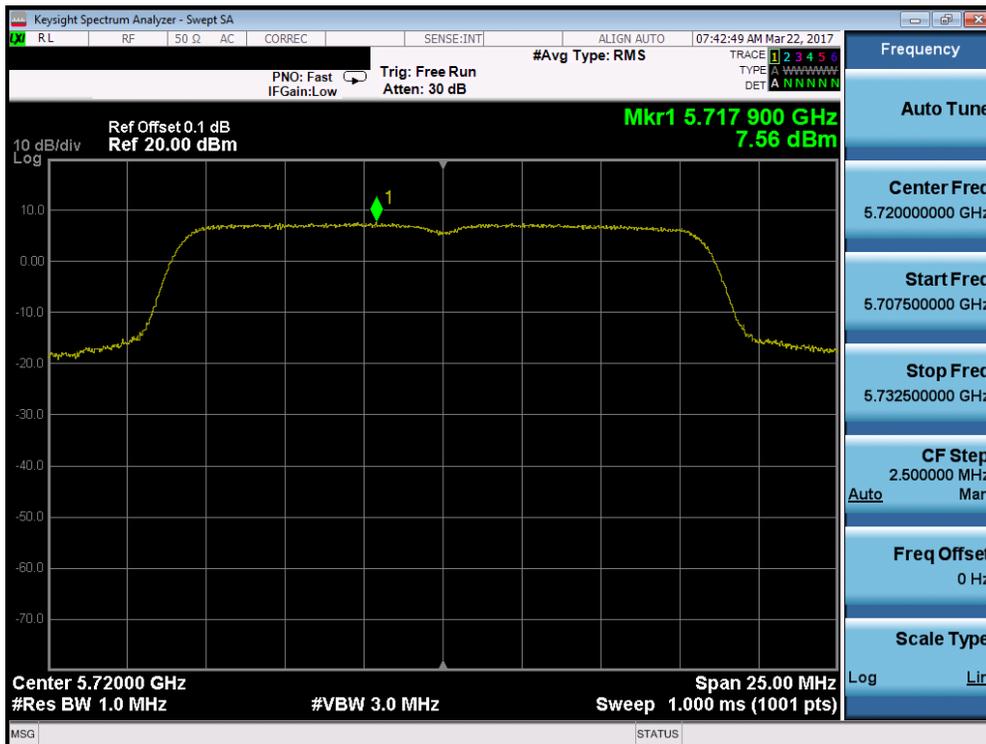


Plot 7-52. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 50 of 136 |

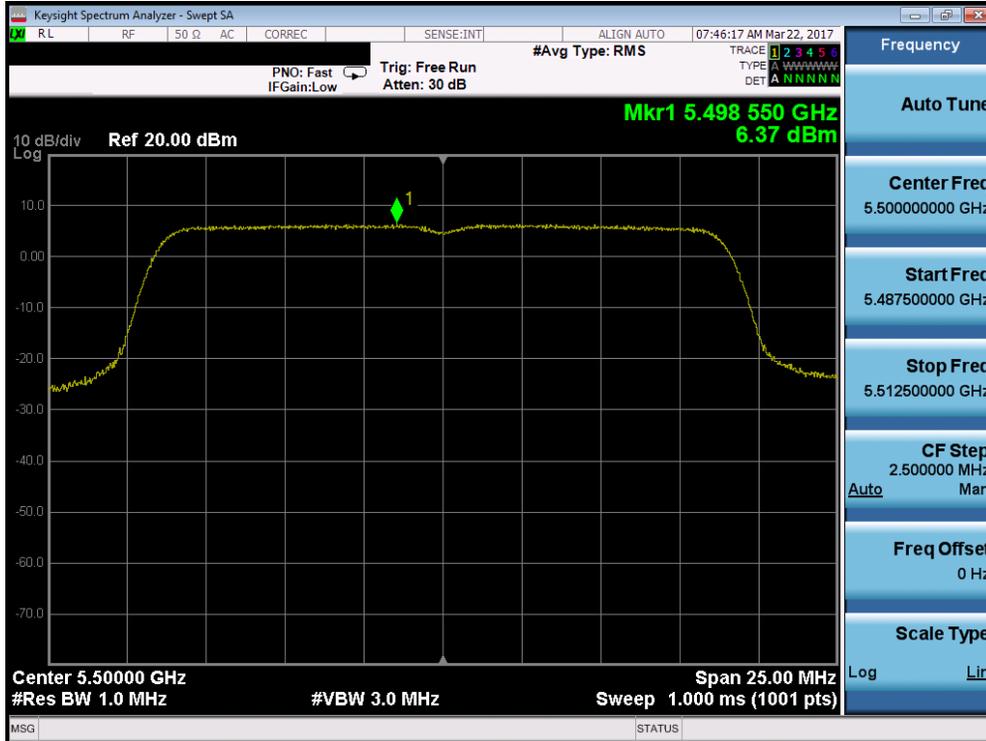


Plot 7-53. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 120)

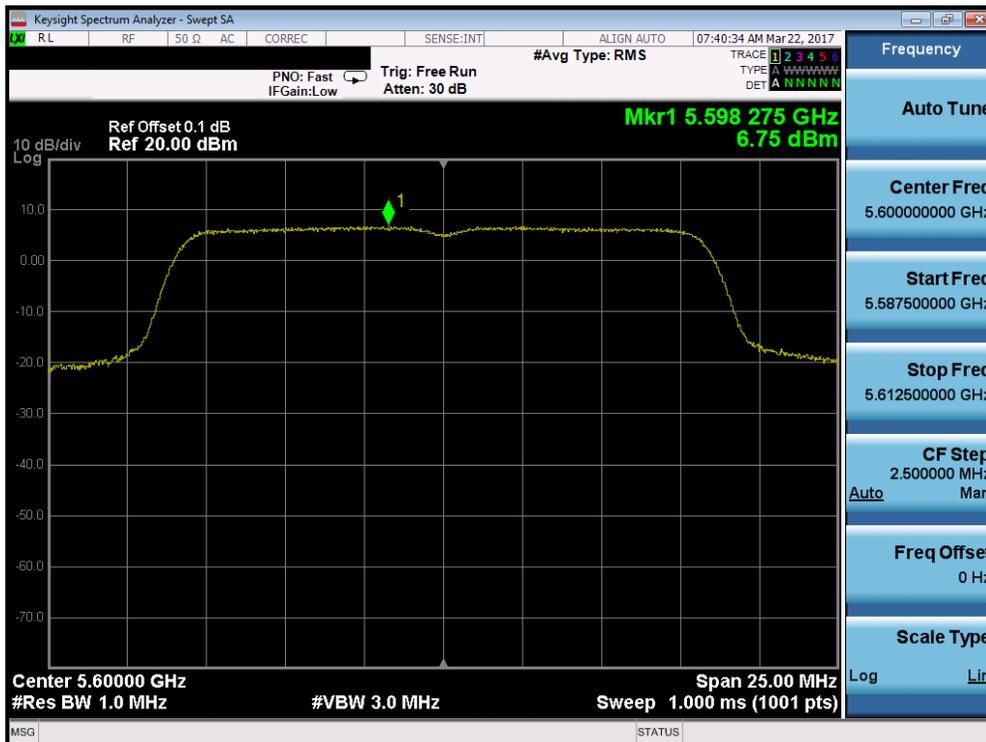


Plot 7-54. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 51 of 136 |

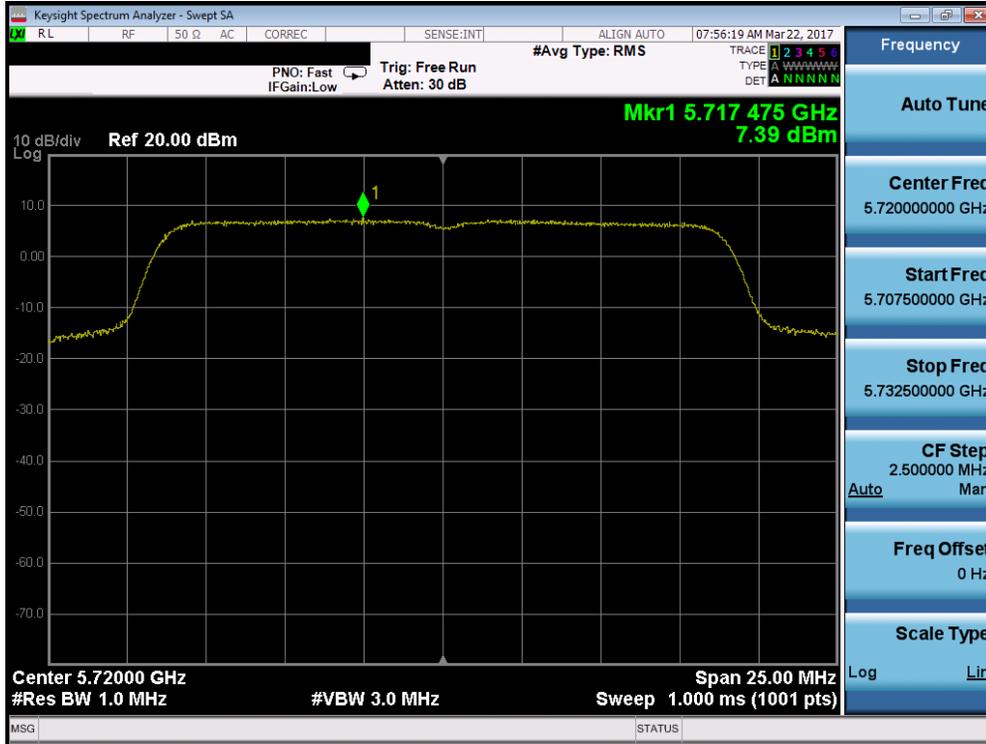


Plot 7-55. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)

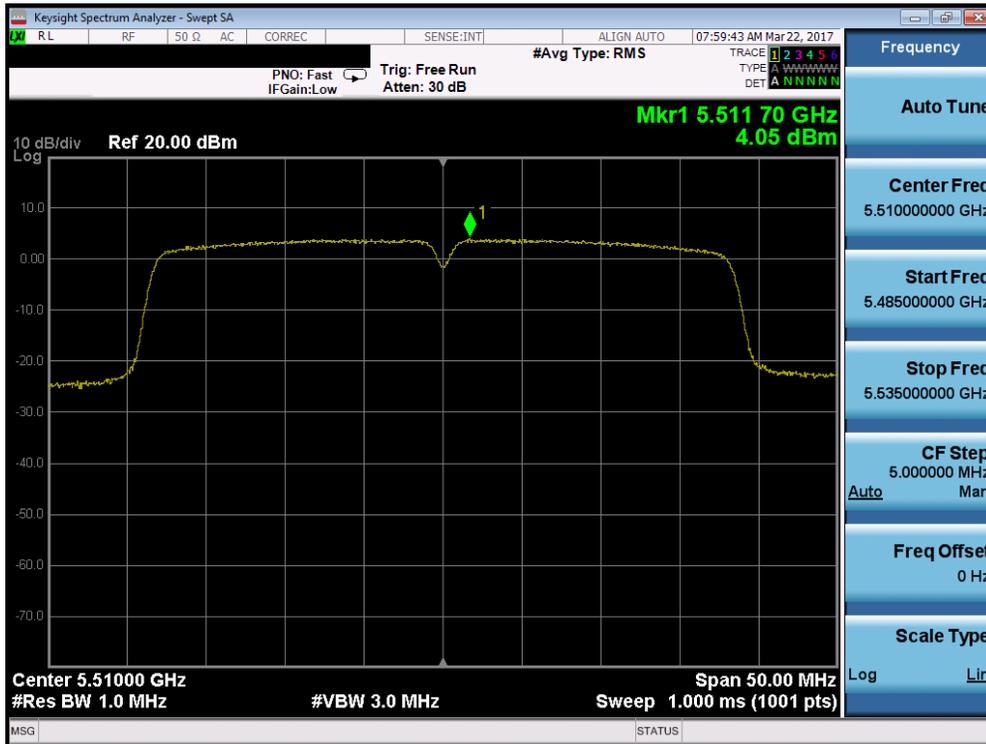


Plot 7-56. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 120)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 52 of 136 |

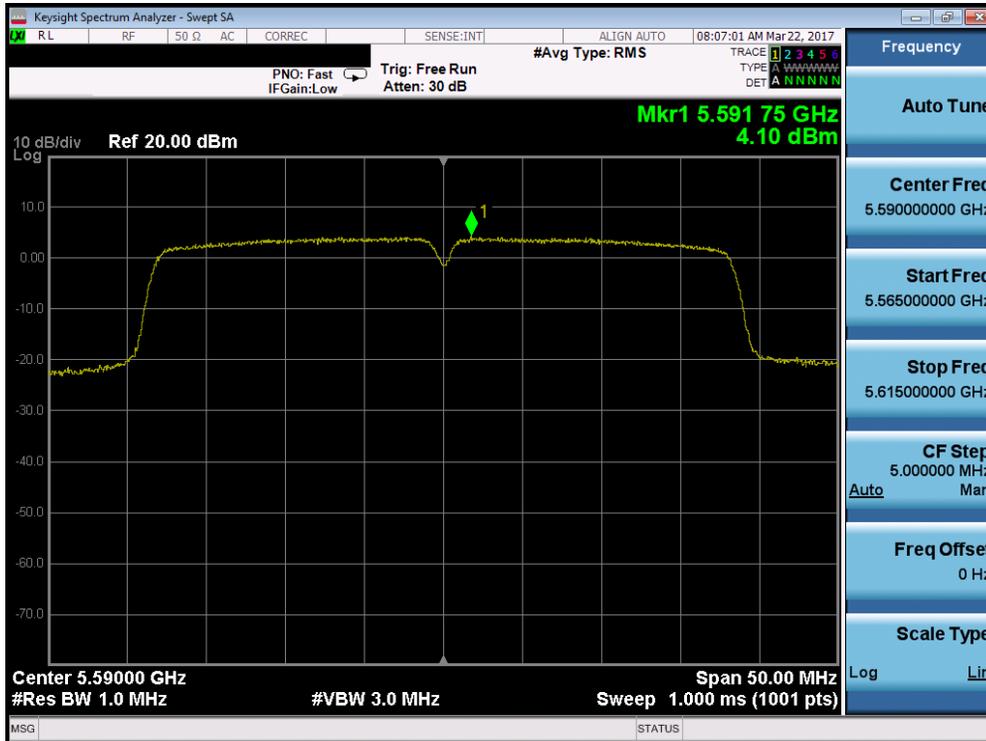


Plot 7-57. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

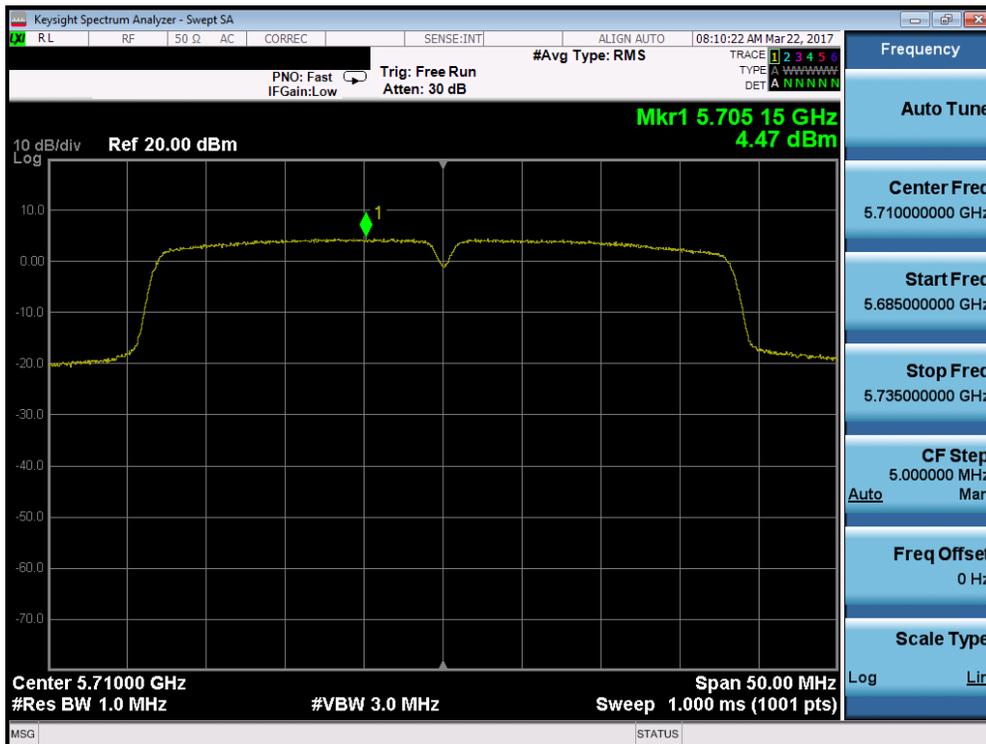


Plot 7-58. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 53 of 136 |

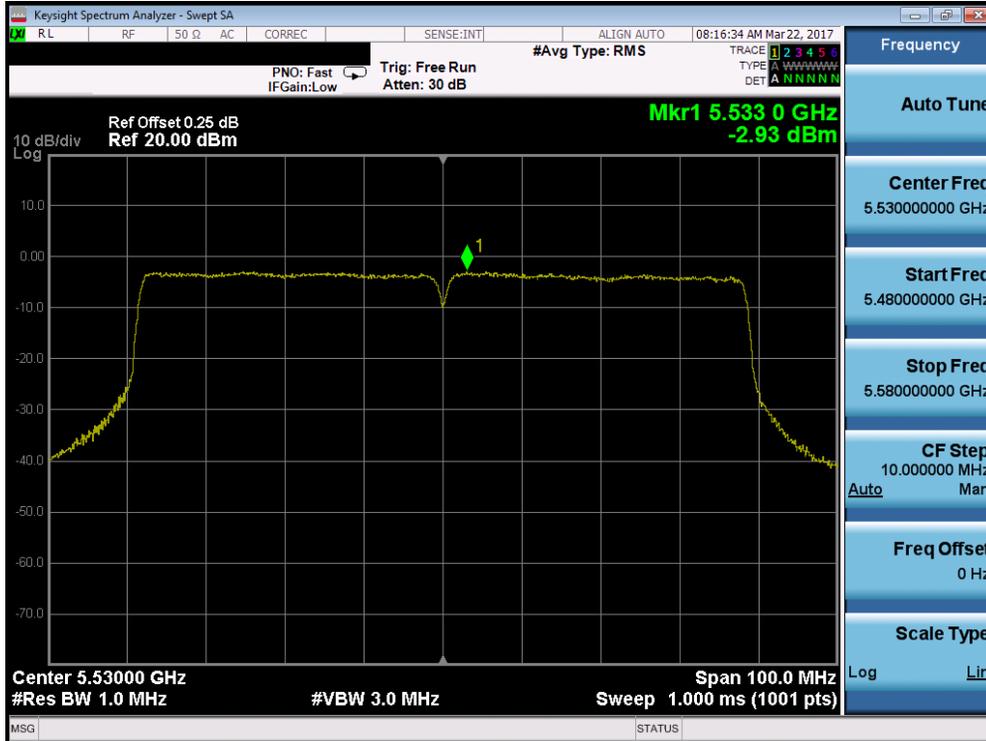


Plot 7-59. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 118)

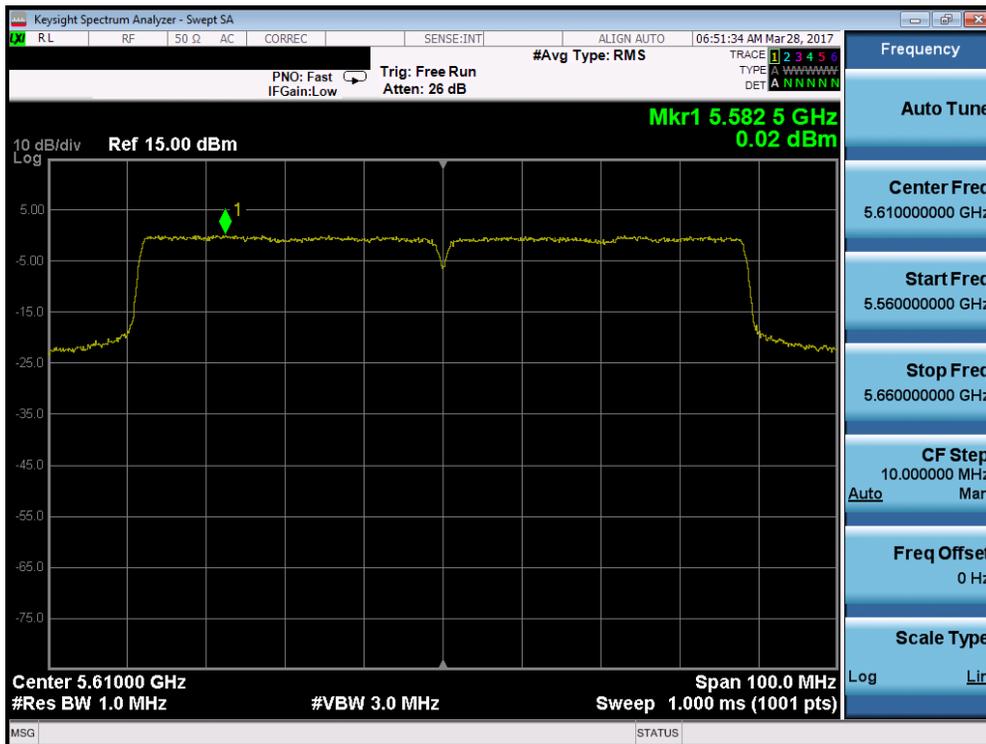


Plot 7-60. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 54 of 136 |

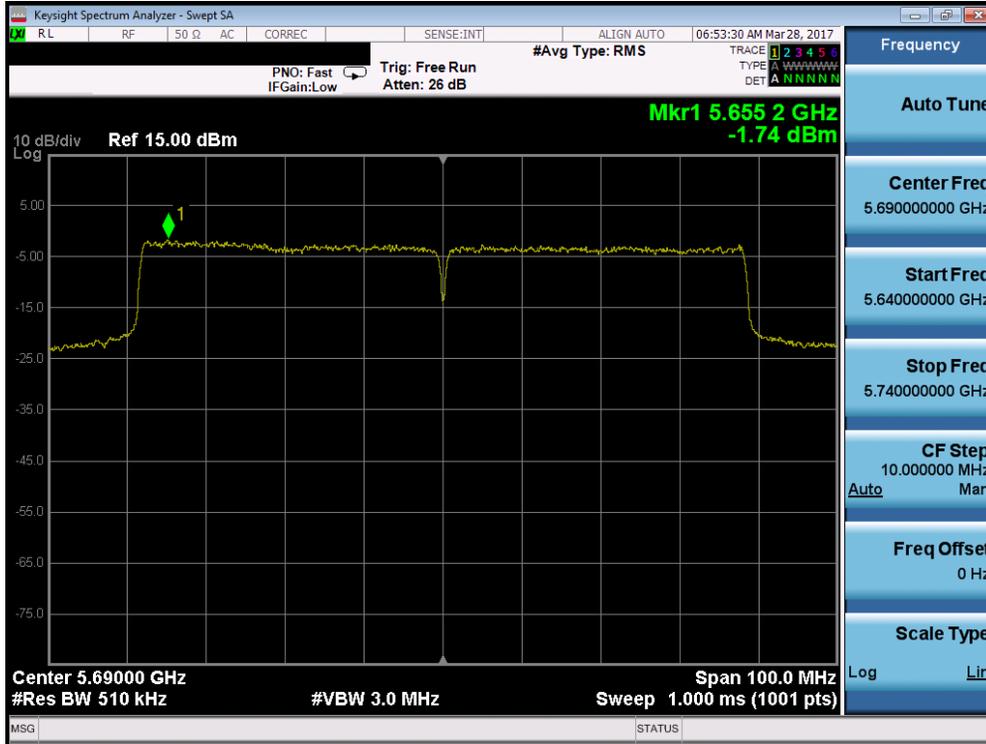


Plot 7-61. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)



Plot 7-62. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 122)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 55 of 136 |



Plot 7-63. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

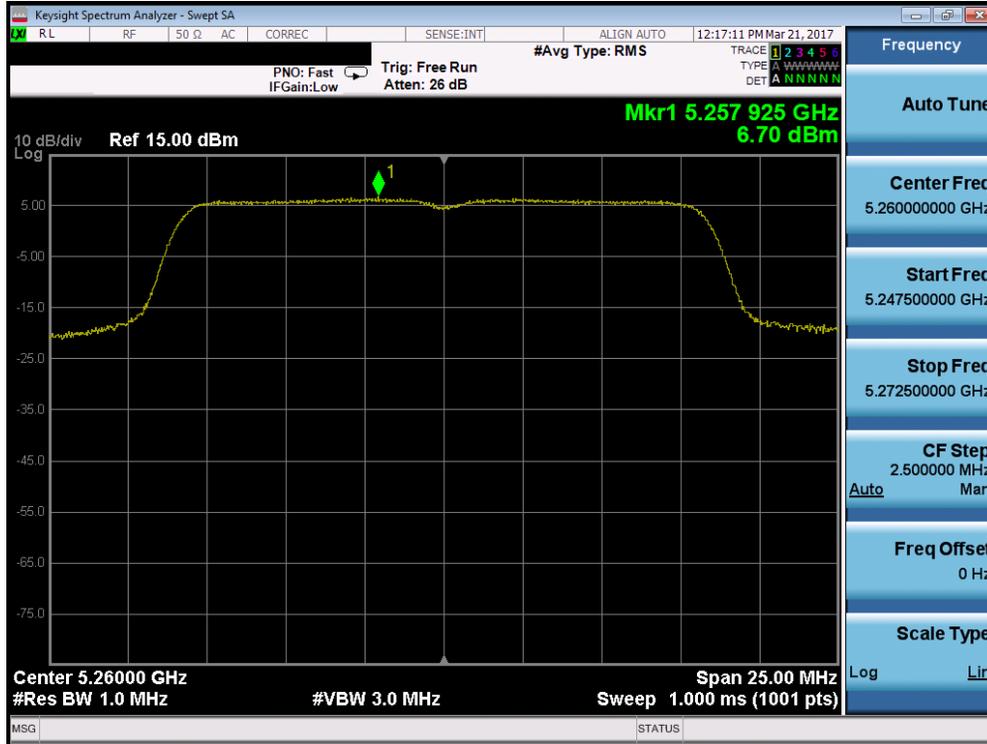
| | | | | |
|--|---|---|---|--|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 56 of 136 | |

Antenna-2 Power Spectral Density Measurements

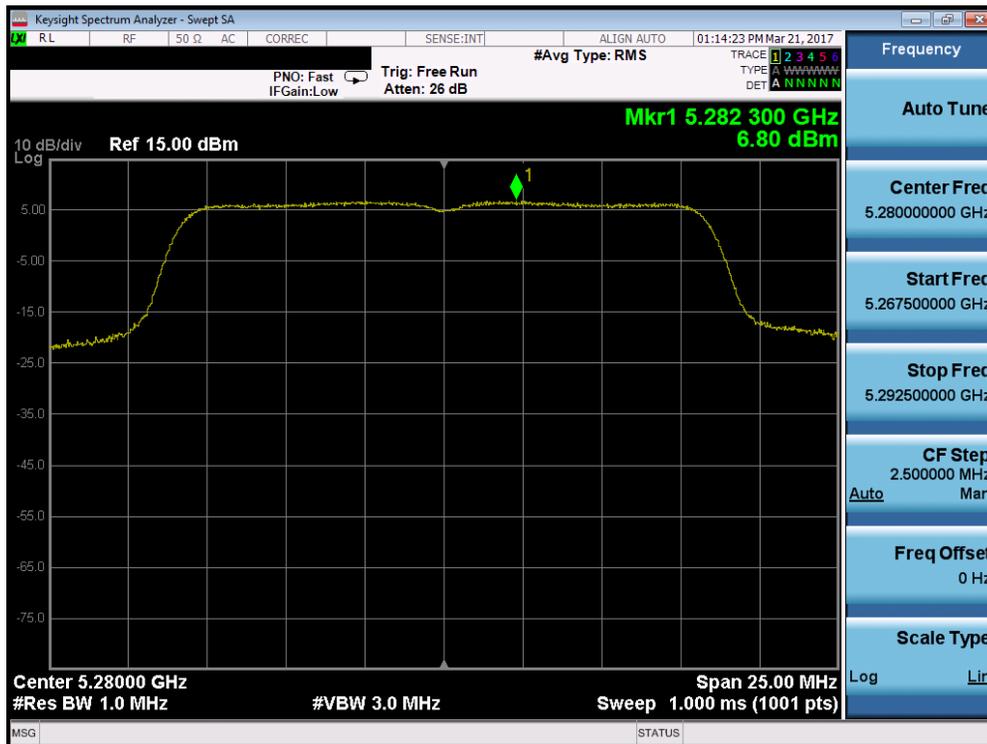
| | Frequency [MHz] | Channel No. | 802.11 Mode | Data Rate [Mbps] | Measured Power Density [dBm] | Max Permissible Power Density [dBm/MHz] | Margin [dB] | Pass / Fail |
|---------|-----------------|-------------|------------------|------------------|------------------------------|---|-------------|-------------|
| Band 2A | 5260 | 52 | a | 6 | 6.70 | 11.0 | -4.30 | Pass |
| | 5280 | 56 | a | 6 | 6.80 | 11.0 | -4.20 | Pass |
| | 5320 | 64 | a | 6 | 6.64 | 11.0 | -4.36 | Pass |
| | 5260 | 52 | n (20MHz) | 6.5/7.2 (MCS0) | 5.97 | 11.0 | -5.03 | Pass |
| | 5280 | 56 | n (20MHz) | 6.5/7.2 (MCS0) | 6.25 | 11.0 | -4.75 | Pass |
| | 5320 | 64 | n (20MHz) | 6.5/7.2 (MCS0) | 6.21 | 11.0 | -4.79 | Pass |
| | 5270 | 54 | n (40MHz) | 13.5/15 (MCS0) | 4.08 | 11.0 | -6.92 | Pass |
| | 5310 | 62 | n (40MHz) | 13.5/15 (MCS0) | 4.02 | 11.0 | -6.98 | Pass |
| Band 2C | 5290 | 58 | ac (80MHz) | 29.3/32.5 (MCS0) | -2.90 | 11.0 | -13.90 | Pass |
| | 5500 | 100 | a | 6 | 7.22 | 11.0 | -3.78 | Pass |
| | 5600 | 120 | a | 6 | 6.77 | 11.0 | -4.23 | Pass |
| | 5720 | 144 | a | 6 | 6.47 | 11.0 | -4.53 | Pass |
| | 5500 | 100 | n (20MHz) | 6.5/7.2 (MCS0) | 7.16 | 11.0 | -3.84 | Pass |
| | 5600 | 120 | n (20MHz) | 6.5/7.2 (MCS0) | 6.57 | 11.0 | -4.43 | Pass |
| | 5720 | 144 | n (20MHz) | 6.5/7.2 (MCS0) | 6.52 | 11.0 | -4.48 | Pass |
| | 5510 | 102 | n (40MHz) | 13.5/15 (MCS0) | 4.48 | 11.0 | -6.52 | Pass |
| | 5590 | 118 | n (40MHz) | 13.5/15 (MCS0) | 4.52 | 11.0 | -6.48 | Pass |
| | 5710 | 142 | n (40MHz) | 13.5/15 (MCS0) | 3.12 | 11.0 | -7.89 | Pass |
| | 5530 | 106 | ac (80MHz) | 29.3/32.5 (MCS0) | -2.01 | 11.0 | -13.01 | Pass |
| | 5610 | 122 | ac (80MHz) | 29.3/32.5 (MCS0) | 0.42 | 11.0 | -10.58 | Pass |
| 5690 | 138 | ac (80MHz) | 29.3/32.5 (MCS0) | -3.19 | 11.0 | -14.19 | Pass | |

Table 7-16. Conducted Power Spectral Density Measurements

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 57 of 136 | |

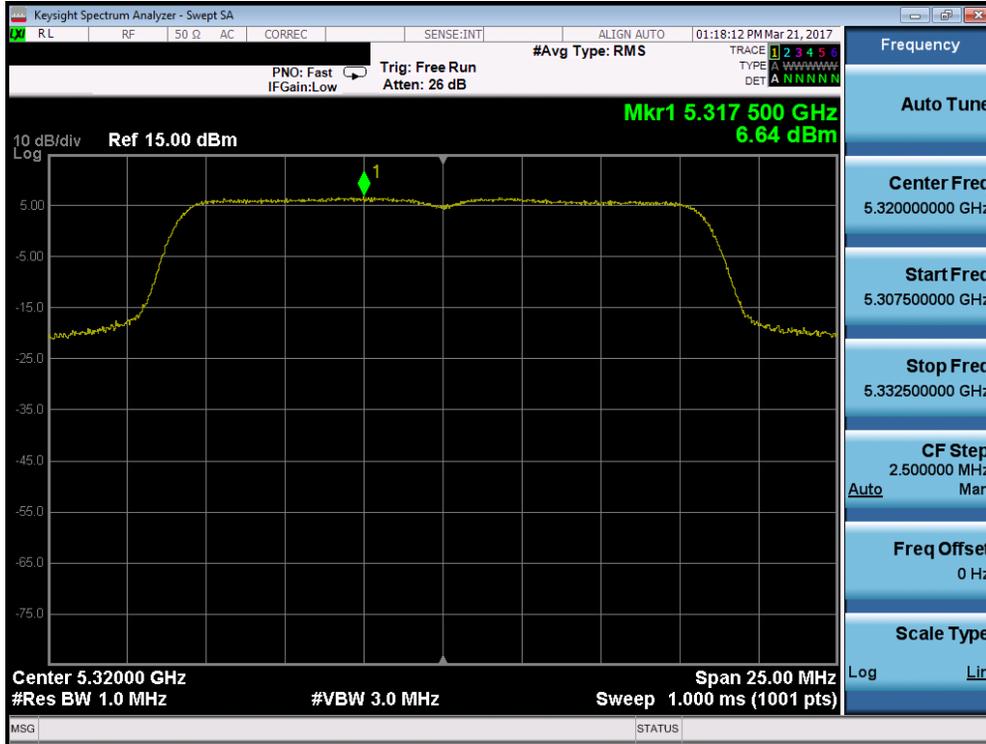


Plot 7-64. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 52)

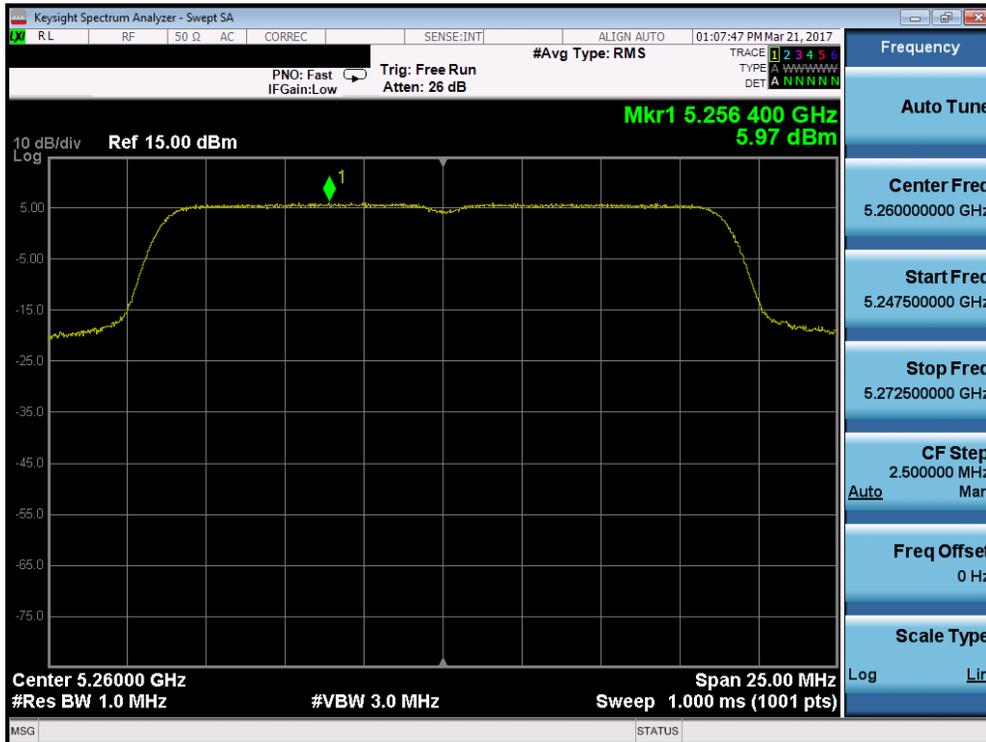


Plot 7-65. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 56)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 58 of 136 |

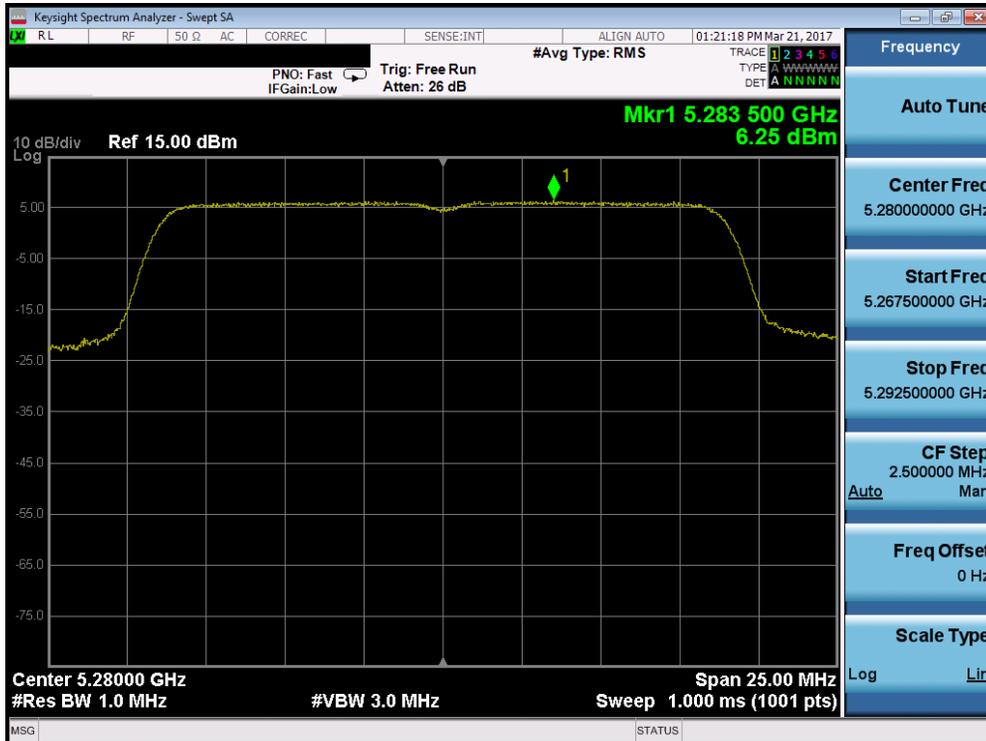


Plot 7-66. Power Spectral Density Plot (802.11a (UNII Band 2A) – Ch. 64)

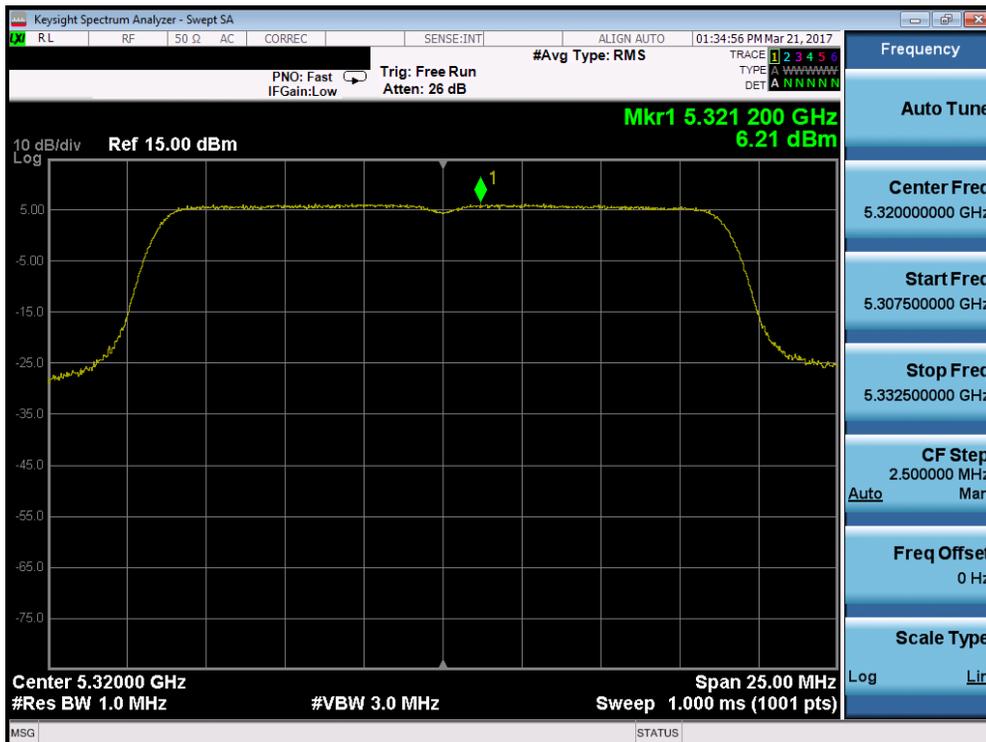


Plot 7-67. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 52)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 59 of 136 |

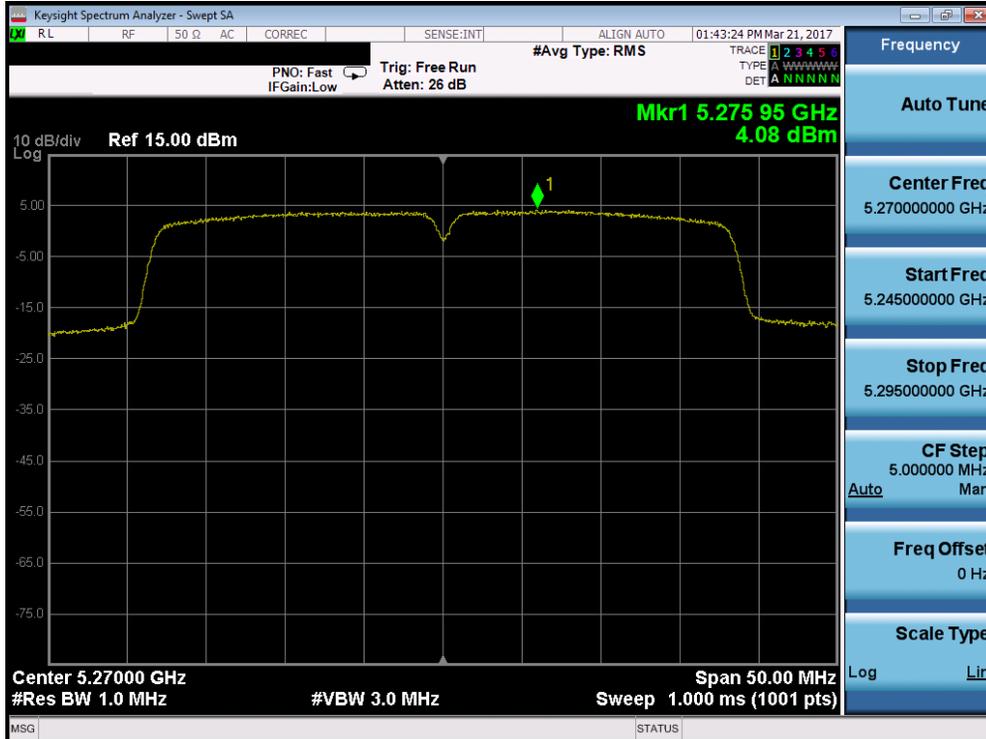


Plot 7-68. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 56)

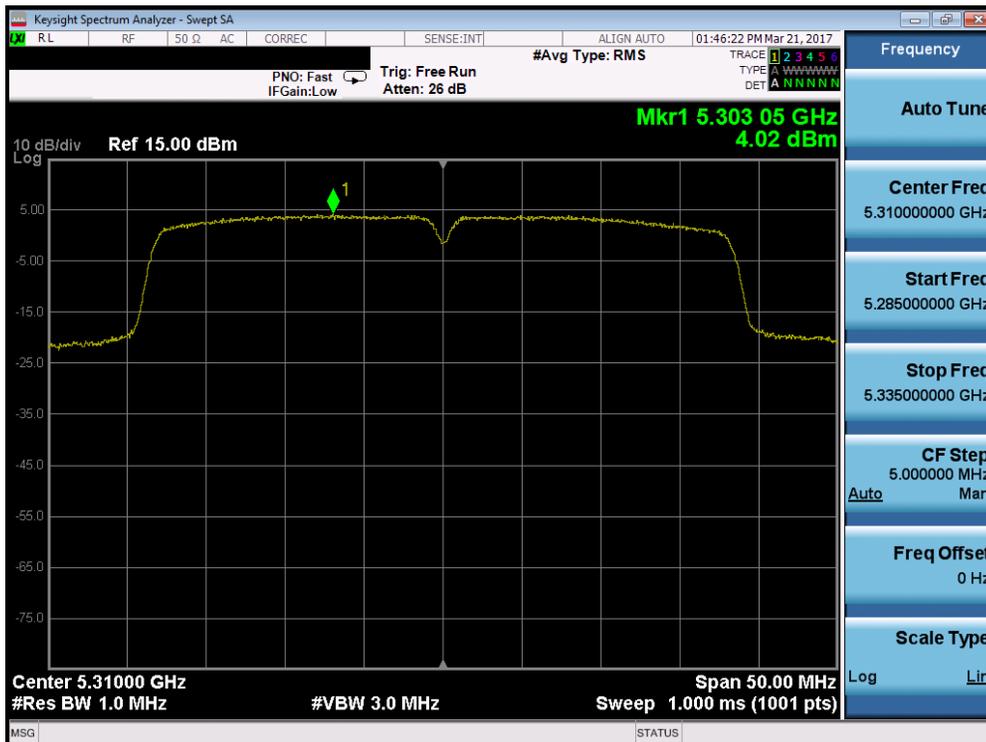


Plot 7-69. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2A) – Ch. 64)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
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| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 60 of 136 |

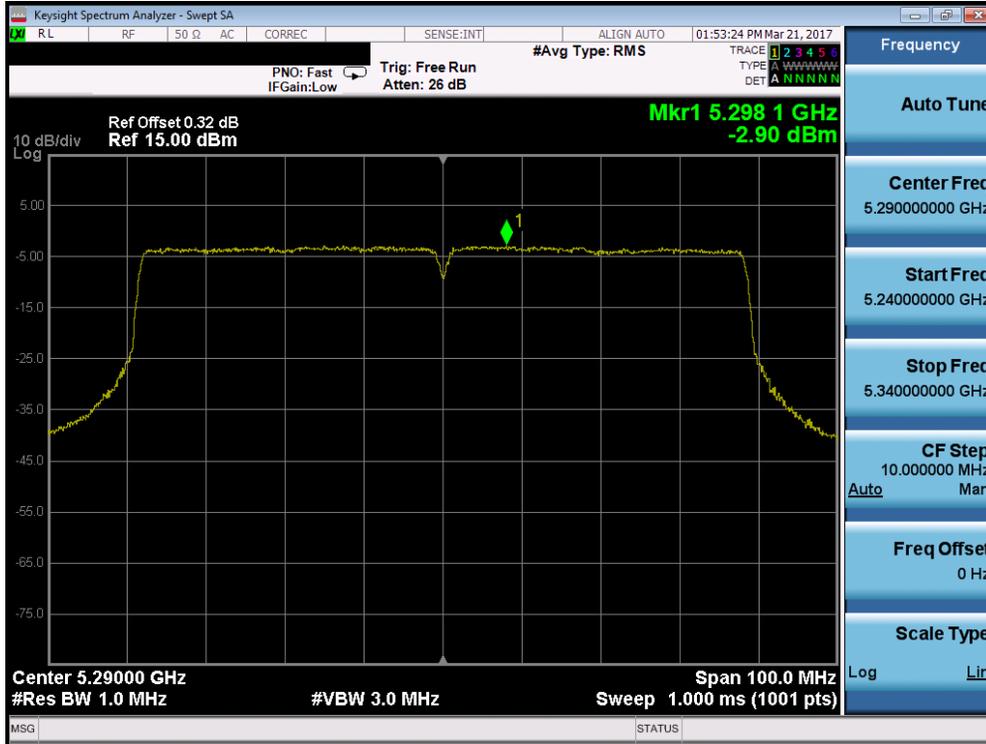


Plot 7-70. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 54)

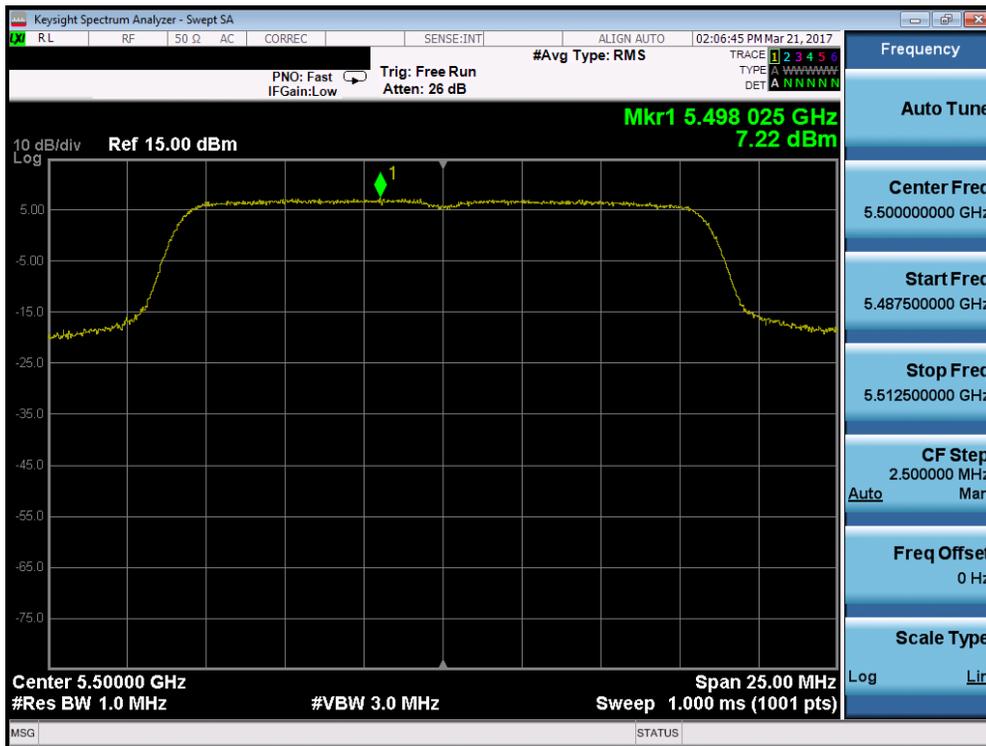


Plot 7-71. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2A) – Ch. 62)

| | | | | |
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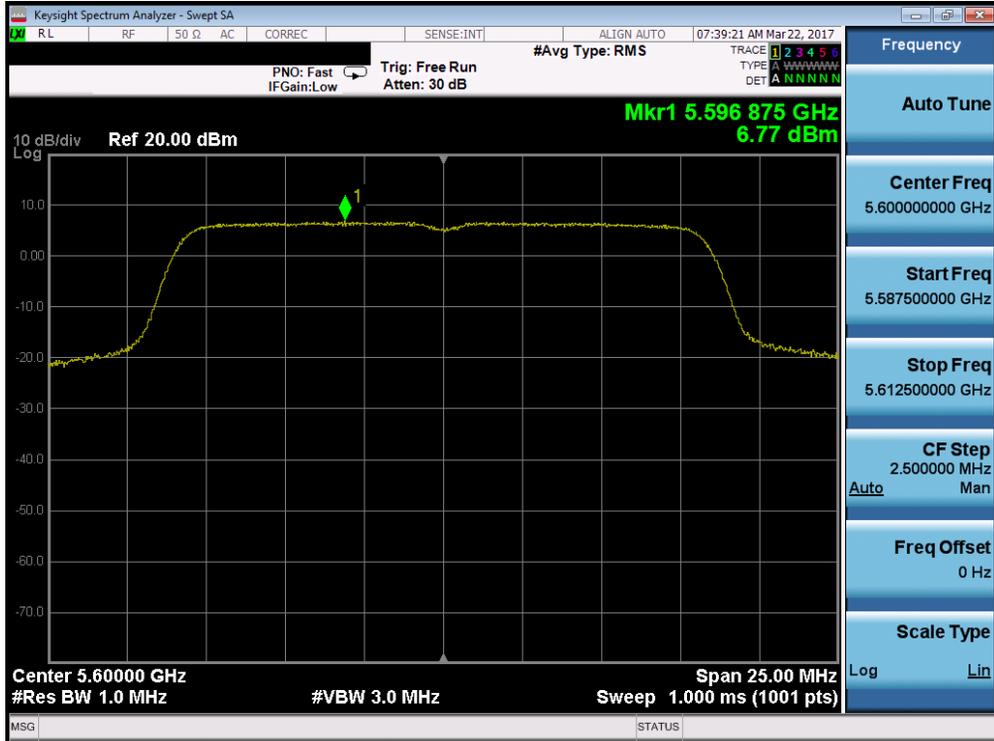


Plot 7-72. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2A) – Ch. 58)

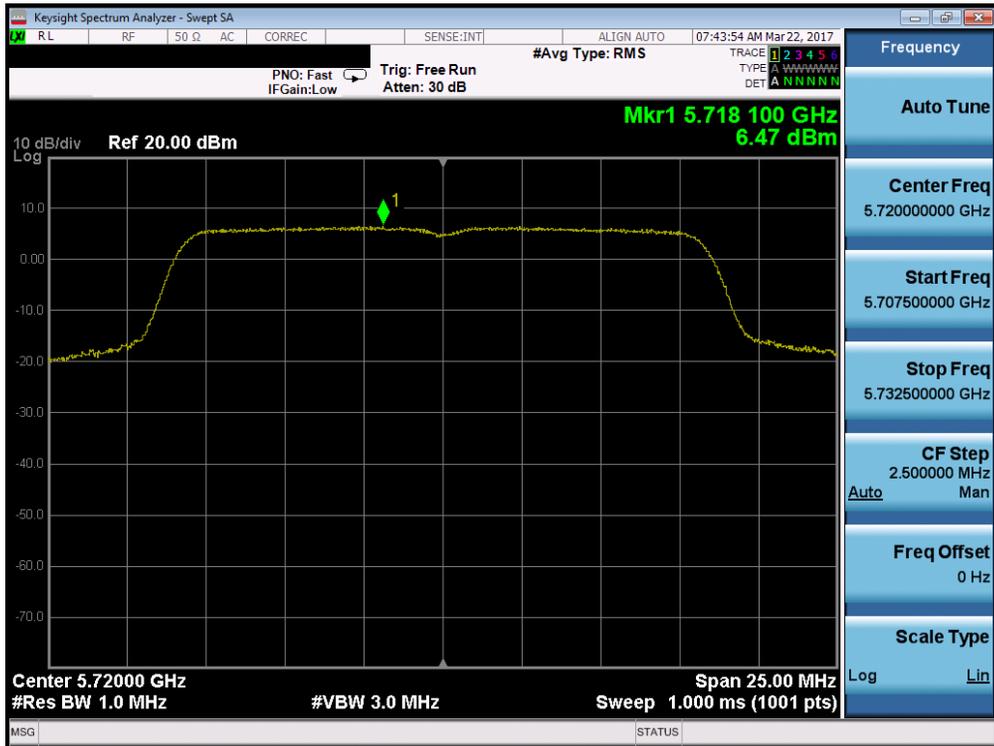


Plot 7-73. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 100)

| | | | | |
|---|---|---|----------------|---------------------------------|
| FCC ID: A3LETWV520 | PCTEST ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | SAMSUNG | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 62 of 136 |

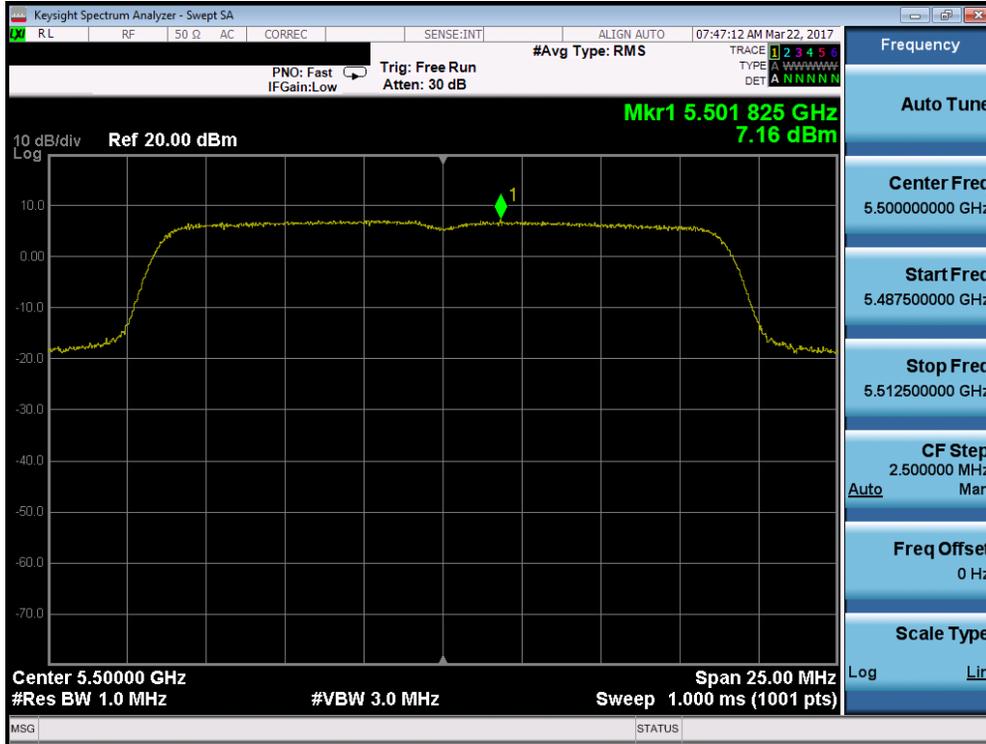


Plot 7-74. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 120)

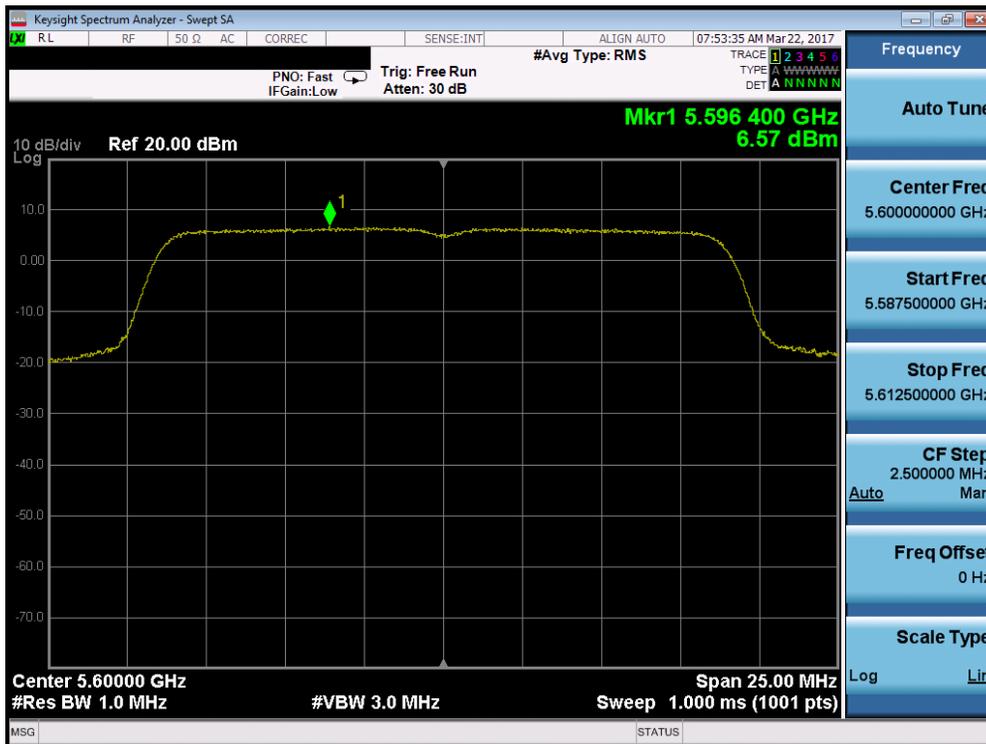


Plot 7-75. Power Spectral Density Plot (802.11a (UNII Band 2C) – Ch. 144)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
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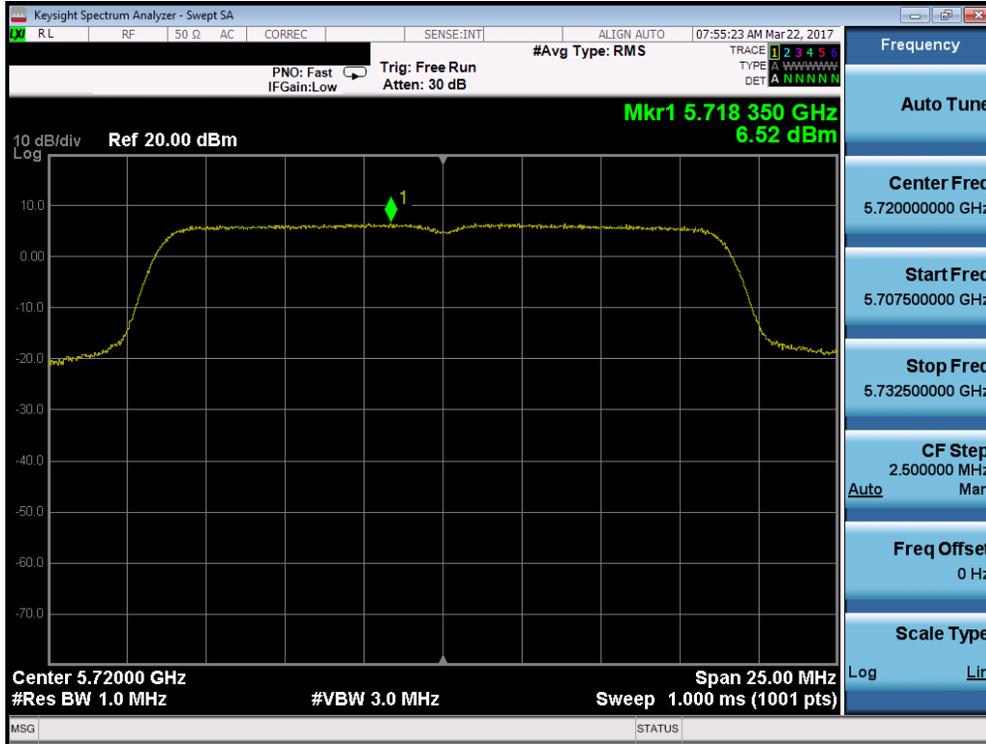


Plot 7-76. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 100)

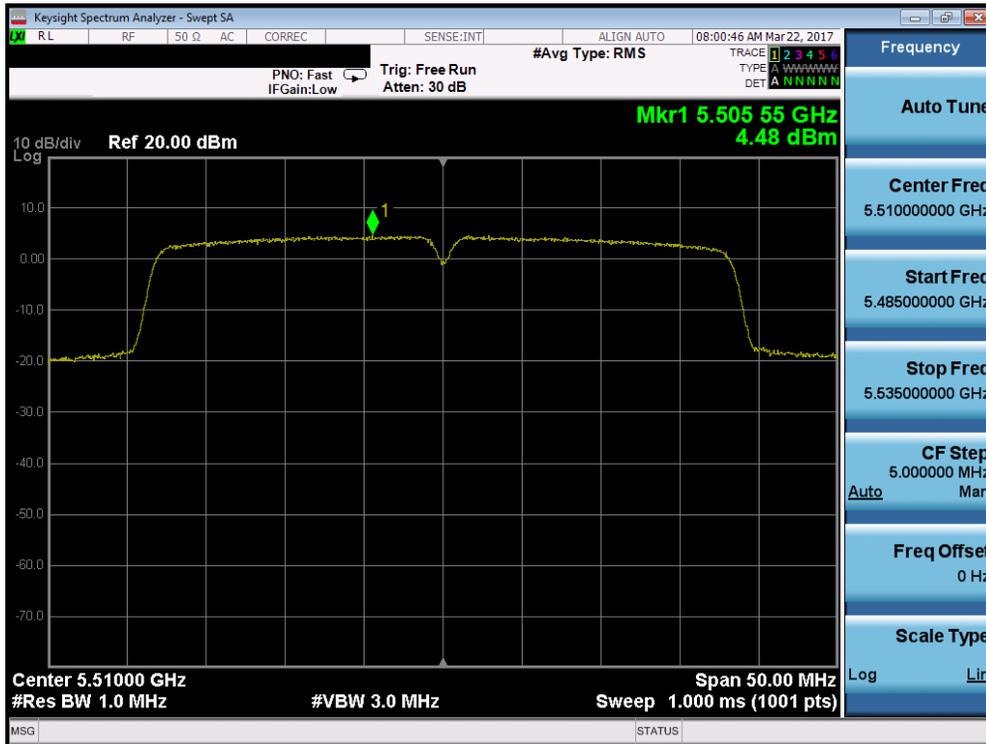


Plot 7-77. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 120)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
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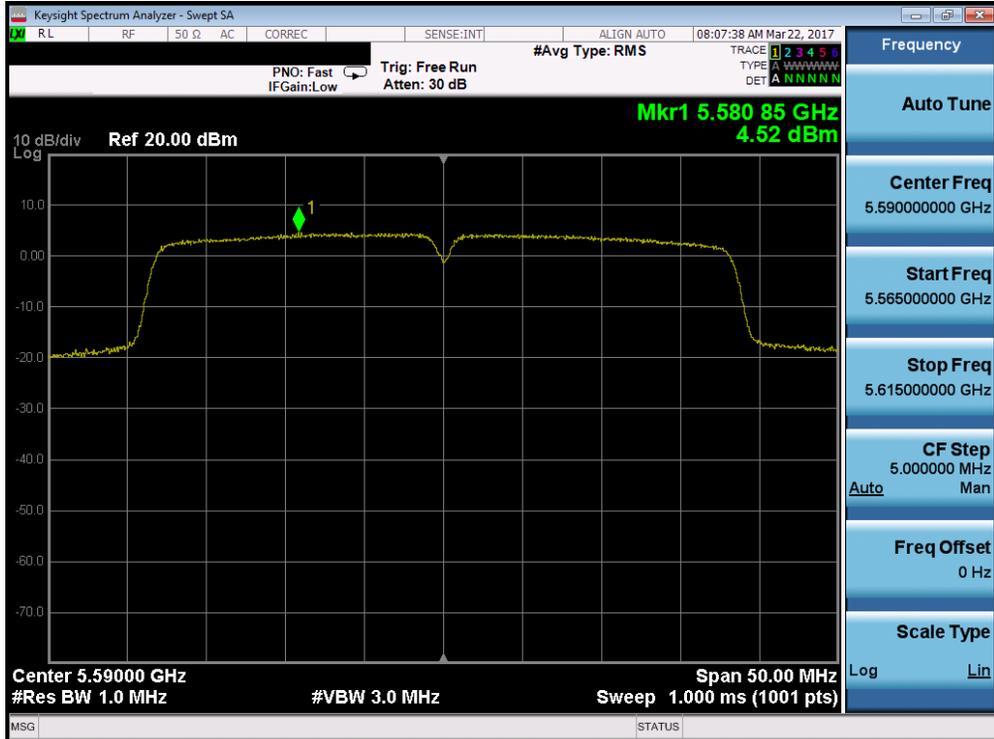


Plot 7-78. Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2C) – Ch. 144)

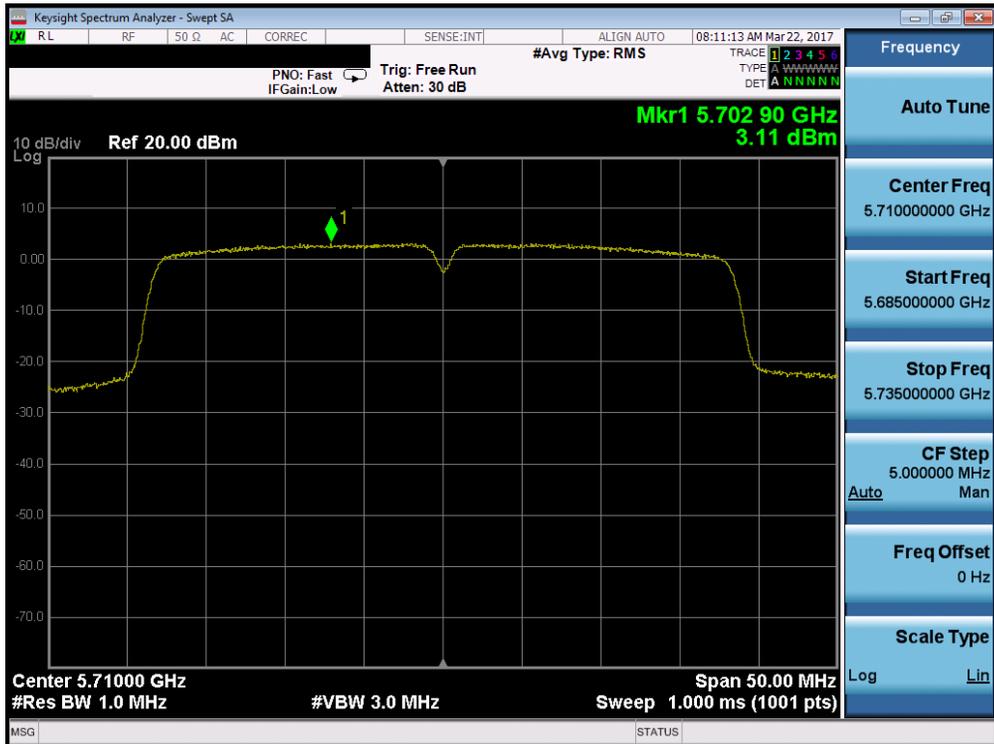


Plot 7-79. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 102)

| | | | | |
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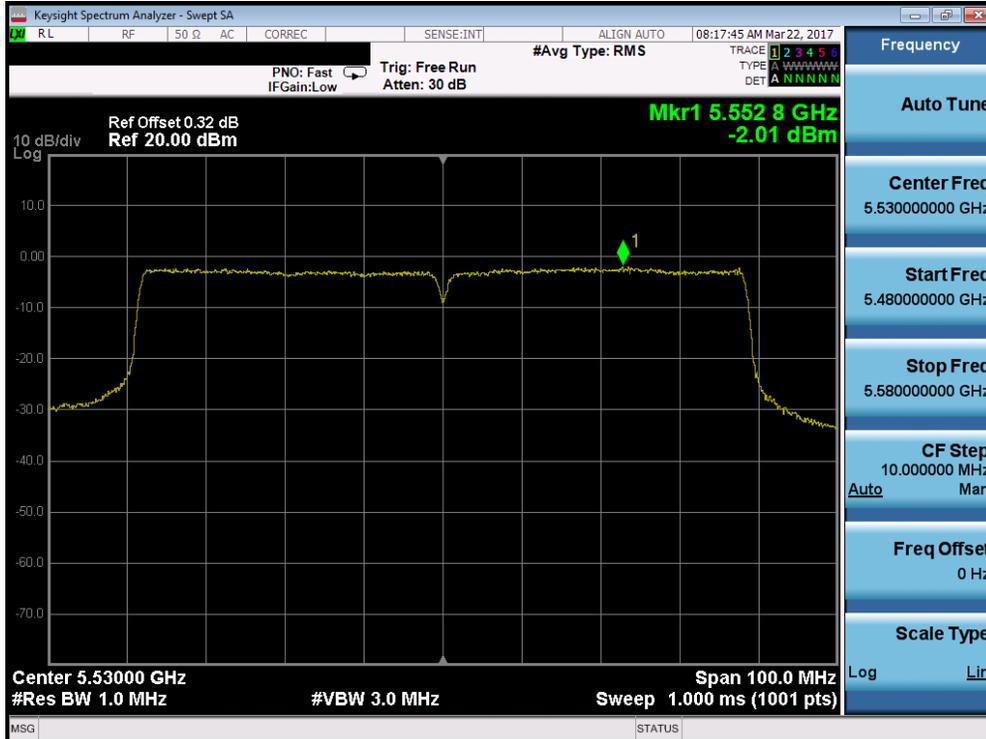


Plot 7-80. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 118)

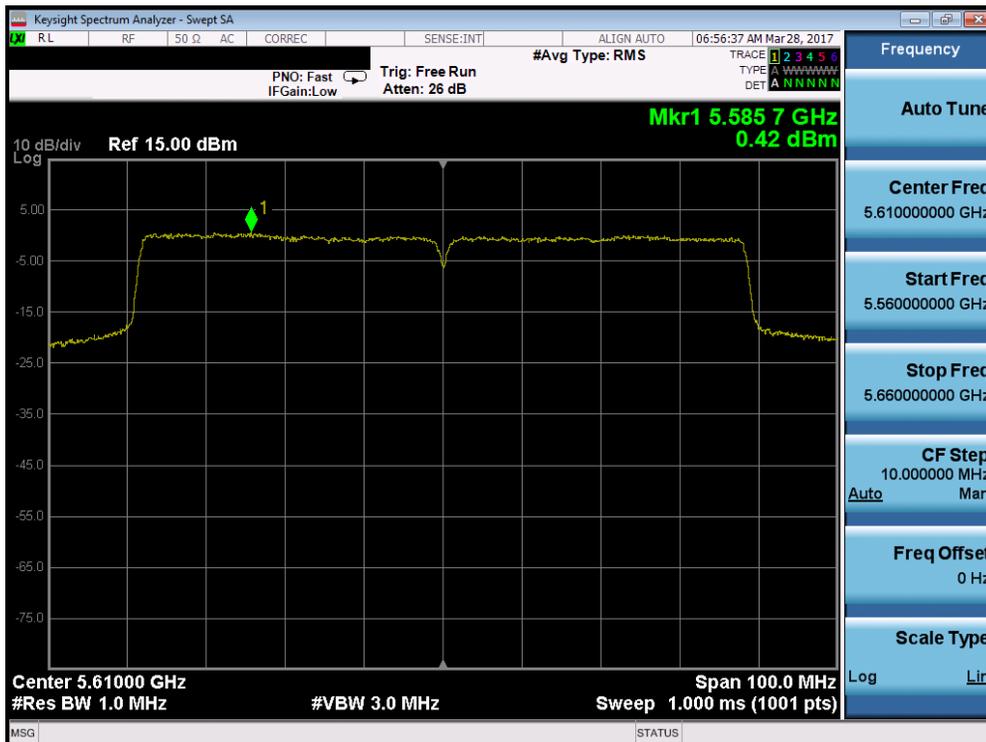


Plot 7-81. Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2C) – Ch. 142)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
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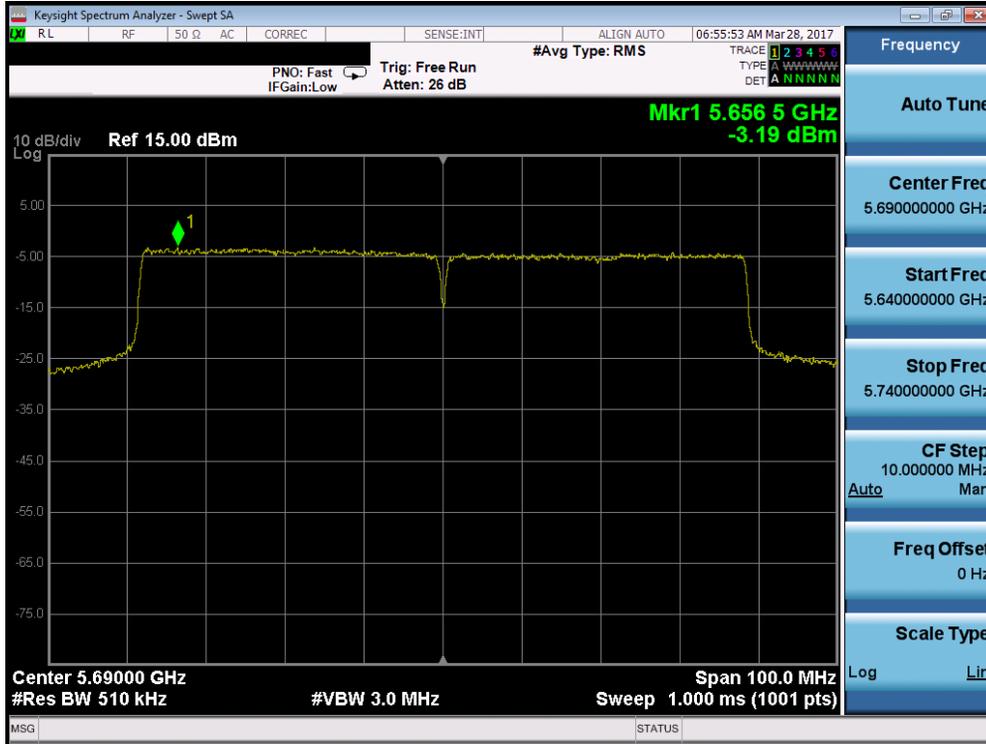


Plot 7-82. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 106)



Plot 7-83. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 122)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
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Plot 7-84. Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2C) – Ch. 138)

| | | | | |
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Summed MIMO Power Spectral Density Measurements

| | Frequency [MHz] | Channel No. | 802.11 Mode | Data Rate [Mbps] | Directional Gain [dBi] | Antenna-1 Power Density [dBm] | Antenna-2 Power Density [dBm] | Summed MIMO Power Density [dBm] | Max Permissible Power Density [dBm/MHz] | Adjusted Limit [dBm/MHz] | Margin [dB] | Pass / Fail |
|---------|-----------------|-------------|-------------|------------------|------------------------|-------------------------------|-------------------------------|---------------------------------|---|--------------------------|-------------|-------------|
| Band 2A | 5260 | 52 | n (20MHz) | 6.5/7.2 (MCS0) | 6.31 | 6.26 | 5.97 | 9.13 | 11.0 | 10.69 | -1.56 | Pass |
| | 5280 | 56 | n (20MHz) | 6.5/7.2 (MCS0) | 6.31 | 6.29 | 6.25 | 9.28 | 11.0 | 10.69 | -1.41 | Pass |
| | 5320 | 64 | n (20MHz) | 6.5/7.2 (MCS0) | 6.31 | 6.43 | 6.21 | 9.33 | 11.0 | 10.69 | -1.36 | Pass |
| | 5270 | 54 | n (40MHz) | 13.5/15 (MCS0) | 6.31 | 3.73 | 4.08 | 6.92 | 11.0 | 10.69 | -3.77 | Pass |
| | 5310 | 62 | n (40MHz) | 13.5/15 (MCS0) | 6.31 | 3.67 | 4.02 | 6.86 | 11.0 | 10.69 | -3.83 | Pass |
| | 5290 | 58 | ac (80MHz) | 29.3/32.5 (MCS0) | 6.31 | -2.79 | -2.90 | 0.17 | 11.0 | 10.69 | -10.52 | Pass |
| Band 2C | 5500 | 100 | n (20MHz) | 6.5/7.2 (MCS0) | 6.08 | 6.37 | 7.16 | 9.79 | 11.0 | 10.92 | -1.13 | Pass |
| | 5600 | 120 | n (20MHz) | 6.5/7.2 (MCS0) | 6.08 | 6.41 | 6.57 | 9.50 | 11.0 | 10.92 | -1.42 | Pass |
| | 5720 | 144 | n (20MHz) | 6.5/7.2 (MCS0) | 6.08 | 7.39 | 6.52 | 9.99 | 11.0 | 10.92 | -0.93 | Pass |
| | 5510 | 102 | n (40MHz) | 13.5/15 (MCS0) | 6.08 | 4.40 | 4.48 | 7.45 | 11.0 | 10.92 | -3.47 | Pass |
| | 5590 | 118 | n (40MHz) | 13.5/15 (MCS0) | 6.08 | 4.10 | 4.52 | 7.33 | 11.0 | 10.92 | -3.59 | Pass |
| | 5710 | 142 | n (40MHz) | 13.5/15 (MCS0) | 6.08 | 4.47 | 3.12 | 6.86 | 11.0 | 10.92 | -4.06 | Pass |
| | 5530 | 106 | ac (80MHz) | 29.3/32.5 (MCS0) | 6.08 | -2.93 | -2.01 | 0.56 | 11.0 | 10.92 | -10.36 | Pass |
| | 5610 | 122 | ac (80MHz) | 29.3/32.5 (MCS0) | 6.08 | 0.02 | 0.42 | 3.24 | 11.0 | 10.92 | -7.68 | Pass |
| | 5690 | 138 | ac (80MHz) | 29.3/32.5 (MCS0) | 6.08 | -1.74 | -3.19 | 0.61 | 11.0 | 10.92 | -10.31 | Pass |

Table 7-17. Bands 2A & 2C MIMO Conducted Power Spectral Density Measurements

Note:

Per KDB 662911 v02r01 Section E)2), the power spectral density at Antenna 1 and Antenna 2 were first measured separately as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

Per KDB 662911 v02r01, Section F)2), the directional gain is calculated using the following formula, where G_n is the gain of the nth antenna and N_{ANT} , the total number of antennas used.

$$\text{Directional gain} = 10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] \text{ dBi}$$

The Power Density limits were then adjusted using the following formula:

$$\text{Max permissible power density} - [6 - (\text{Directional gain})]$$

Sample MIMO Calculation:

At 5260MHz in 802.11n (20MHz BW) mode, the average conducted power spectral density was measured to be 6.26 dBm for Antenna-1 and 5.97 dBm for Antenna-2.

$$\text{Antenna 1} + \text{Antenna 2} = \text{MIMO}$$

$$(6.26 \text{ dBm} + 5.97 \text{ dBm}) = (4.23 \text{ mW} + 3.95 \text{ mW}) = 8.18 \text{ mW} = 9.13 \text{ dBm}$$

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7.5 Frequency Stability

§15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,260,000,000 Hz
 CHANNEL: 52
 REFERENCE VOLTAGE: 12.00 VDC

| VOLTAGE (%) | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|-------------|-------------|------------|----------------|-----------------|---------------|
| 100 % | 12.00 | + 20 (Ref) | 5,259,999,705 | -295 | -0.00000561 |
| 100 % | | - 30 | 5,259,999,542 | -458 | -0.00000871 |
| 100 % | | - 20 | 5,260,000,058 | 58 | 0.00000110 |
| 100 % | | - 10 | 5,260,000,056 | 56 | 0.00000106 |
| 100 % | | 0 | 5,259,999,734 | -266 | -0.00000506 |
| 100 % | | + 10 | 5,260,000,004 | 4 | 0.00000008 |
| 100 % | | + 20 | 5,260,000,055 | 55 | 0.00000105 |
| 100 % | | + 30 | 5,259,999,817 | -183 | -0.00000348 |
| 100 % | | + 40 | 5,260,000,335 | 335 | 0.00000637 |
| 100 % | | + 50 | 5,259,999,575 | -425 | -0.00000808 |
| 85 % | | 10.20 | + 20 | 5,259,999,816 | -184 |
| 115 % | 13.80 | + 20 | 5,259,999,794 | -206 | -0.00000392 |

Table 7-18. Frequency Stability Measurements for UNII Band 2A (Ch. 52)

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore, the device is determined to remain operating in band over the temperature and voltage range as tested.

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Frequency Stability

§15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,500,000,000 Hz
 CHANNEL: 100
 REFERENCE VOLTAGE: 12.00 VDC

| VOLTAGE (%) | POWER (VDC) | TEMP (°C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|-------------|-------------|------------|----------------|-----------------|---------------|
| 100 % | 12.00 | + 20 (Ref) | 5,500,000,065 | 65 | 0.00000118 |
| 100 % | | - 30 | 5,500,000,076 | 76 | 0.00000138 |
| 100 % | | - 20 | 5,499,999,853 | -147 | -0.00000267 |
| 100 % | | - 10 | 5,500,000,100 | 100 | 0.00000182 |
| 100 % | | 0 | 5,499,999,669 | -331 | -0.00000602 |
| 100 % | | + 10 | 5,499,999,930 | -70 | -0.00000127 |
| 100 % | | + 20 | 5,499,999,934 | -66 | -0.00000120 |
| 100 % | | + 30 | 5,499,999,752 | -248 | -0.00000451 |
| 100 % | | + 40 | 5,499,999,894 | -106 | -0.00000193 |
| 100 % | | + 50 | 5,499,999,916 | -84 | -0.00000153 |
| 85 % | | 10.20 | + 20 | 5,499,999,969 | -31 |
| 115 % | 13.80 | + 20 | 5,500,000,224 | 224 | 0.00000407 |

Table 7-19. Frequency Stability Measurements for UNII Band 2C (Ch. 100)

Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore, the device is determined to remain operating in band over the temperature and voltage range as tested.

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7.6 Radiated Spurious Emission Measurements – Above 1GHz

§15.407(b) §15.205 §15.209

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02 v01r04, and at the appropriate frequencies. All channels, modes (e.g. 802.11a, 802.11n (20MHz BW), 802.11n (40MHz BW), and 802.11ac (80MHz)), and modulations/data rates were investigated among all UNII bands. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.25-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 7-20 per Section 15.209.

| Frequency | Field Strength [μ V/m] | Measured Distance [Meters] |
|-----------------|--------------------------------|-------------------------------|
| Above 960.0 MHz | 500 | 3 |

Table 7-20. Radiated Limits

Test Procedures Used

KDB 789033 D02 v01r04 – Section G

Test Settings

Average Measurements above 1GHz (Method AD)

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be $\geq 2 \times \text{span/RBW}$)
6. Averaging type = power (RMS)
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

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Peak Measurements above 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 120kHz
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

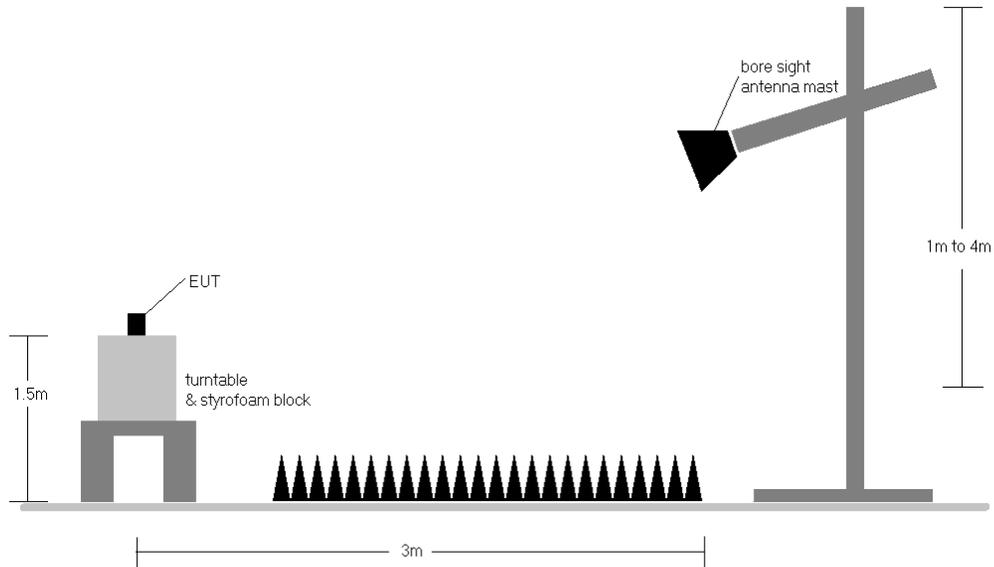


Figure 7-4. Test Instrument & Measurement Setup

| | | | | |
|--|---|---|---|--|
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Test Notes

1. All radiated spurious emissions levels were measured in a radiated test setup per the guidance of KDB 789033 D02 v01r04 Section G.
2. All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 are below the limit shown in Table 7-20.
3. All spurious emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 7-20. All spurious emissions that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in dB μ V/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dB μ V/m.
4. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
5. This unit was tested while powered by an AC adapter.
6. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
7. All final emissions were measured at a 1 meter test distance with the application of a distance correction factor.
8. Radiated spurious emissions were investigated while operating in MIMO mode, however, it was determined that single antenna operation produced the worst case emissions. Since the emissions produced from MIMO operation were found to be more than 20dB below the limit, the MIMO emissions are not reported.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section. Rohde & Schwarz EMC32, Version 9.15.00 automated test software was used to perform the Radiated Spurious Emissions Pre-Scan testing.
10. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

Sample Calculations

Determining Spurious Emissions Levels

- Field Strength Level [dB μ V/m] = Analyzer Level [dBm] + 107 + AFCL [dB/m]
- AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB]
- Margin [dB] = Field Strength Level [dB μ V/m] – Limit [dB μ V/m]

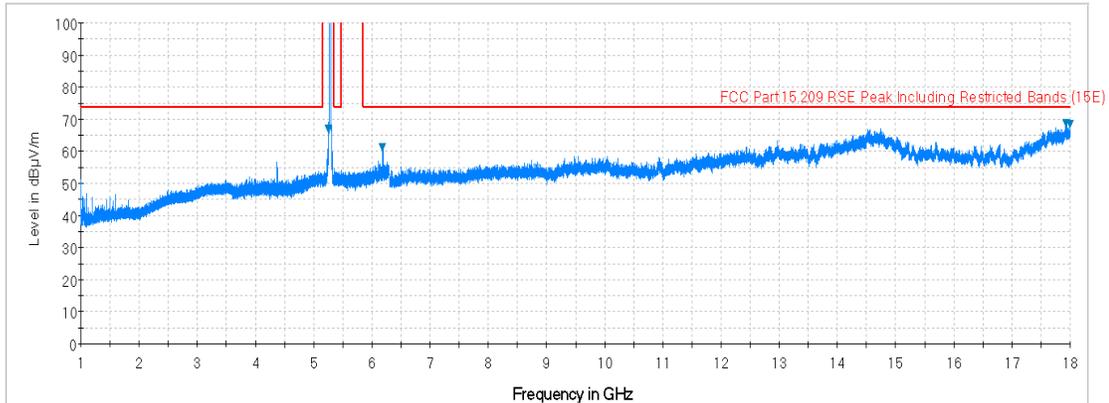
Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots in Section 7.6 was calculated using the formula:

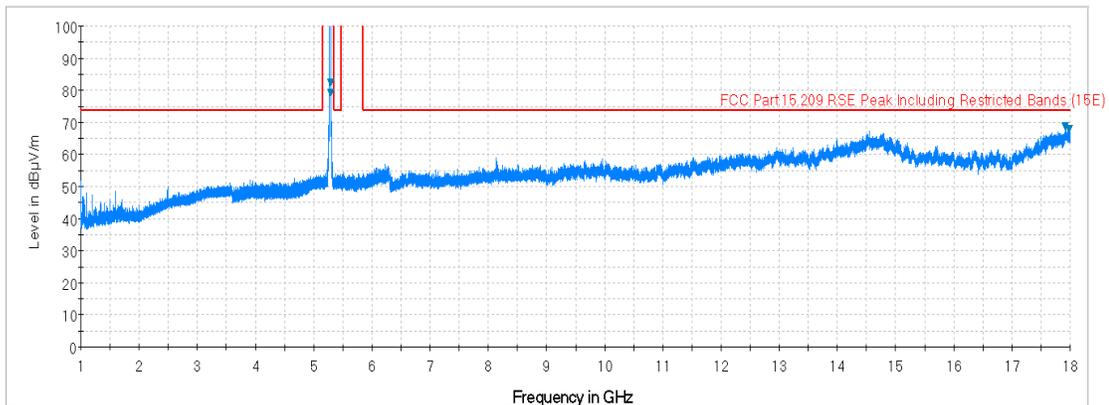
$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + \text{Attenuator}) - \text{Preamplifier Gain}$$

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| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 74 of 136 | |

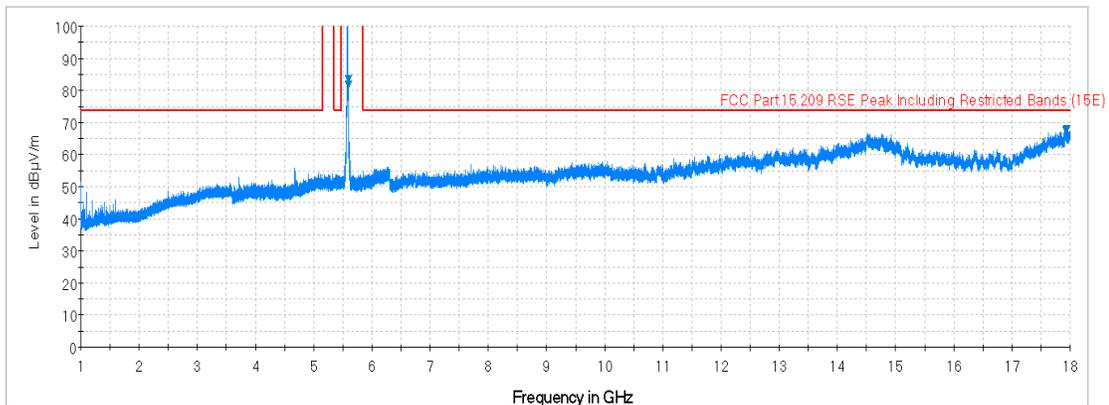
7.6.1 Antenna-1 Radiated Spurious Emission Measurements



Plot 7-85. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)

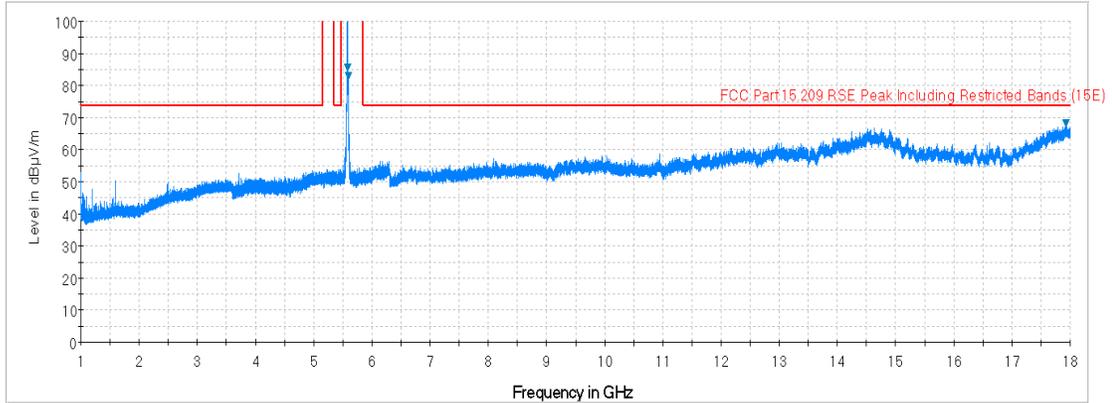


Plot 7-86. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)



Plot 7-87. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 120, Ant. Pol. H)

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 75 of 136 | |

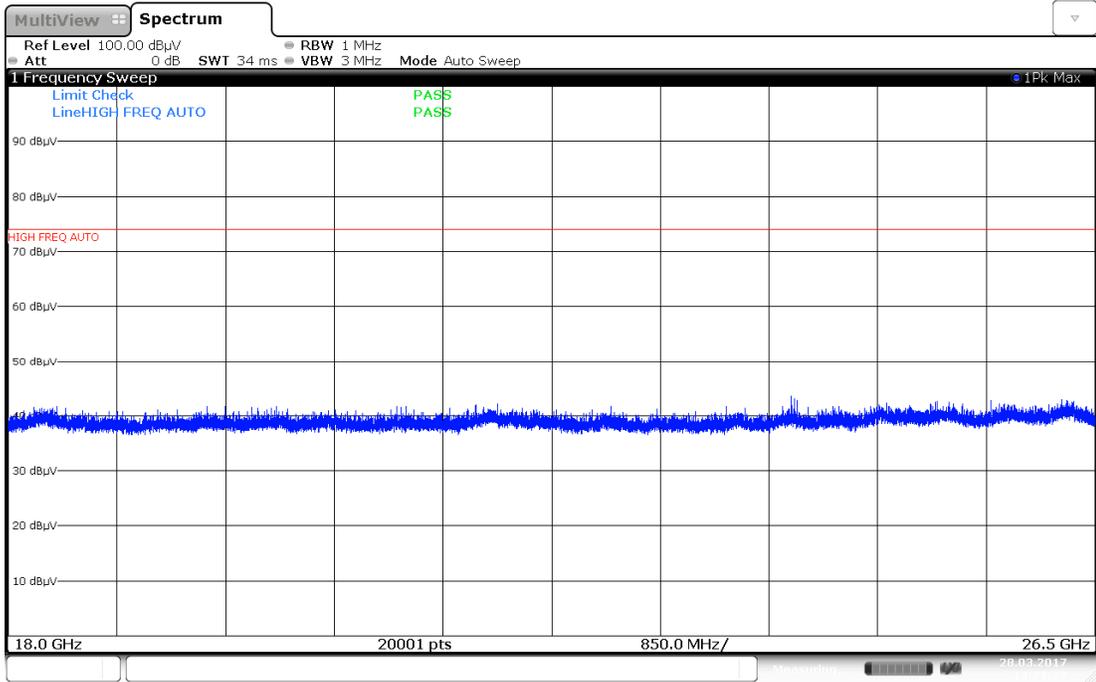


Plot 7-88. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 120, Ant. Pol. V)

| | | | | |
|--|---|---|---|--|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 76 of 136 | |

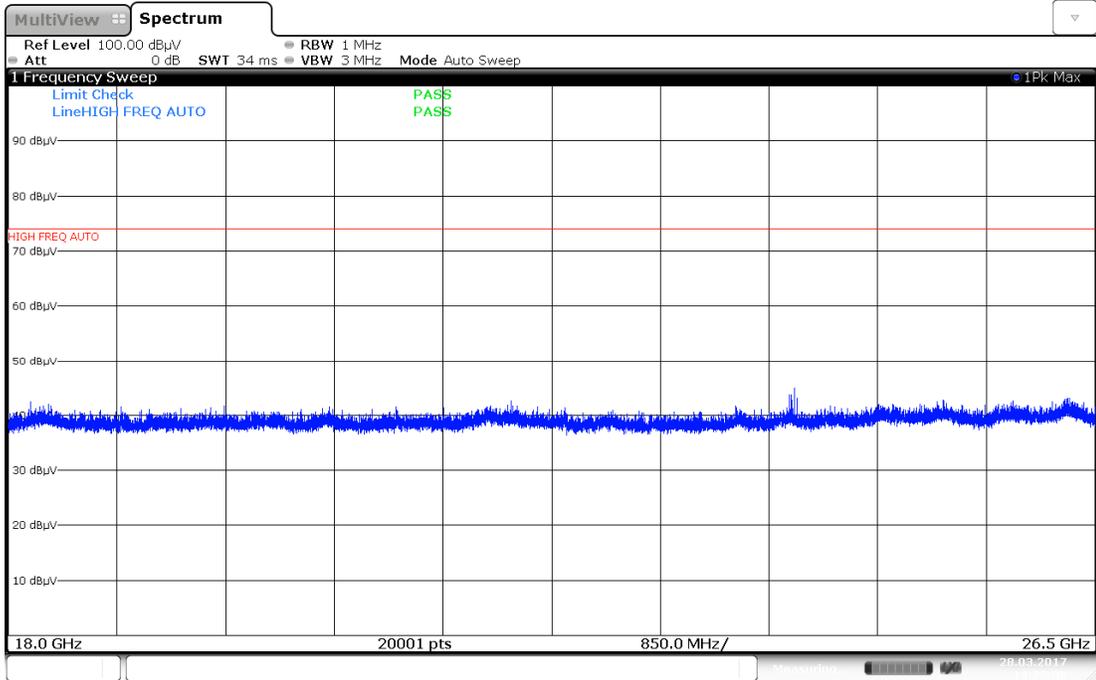
Antenna-1 Radiated Spurious Emissions Measurements (Above 18GHz)

§15.209



14:21:38 28.03.2017

Plot 7-89. Radiated Spurious Plot 18GHz - 26.5GHz (802.11a Ch. 120 – Ant. Pol. H)

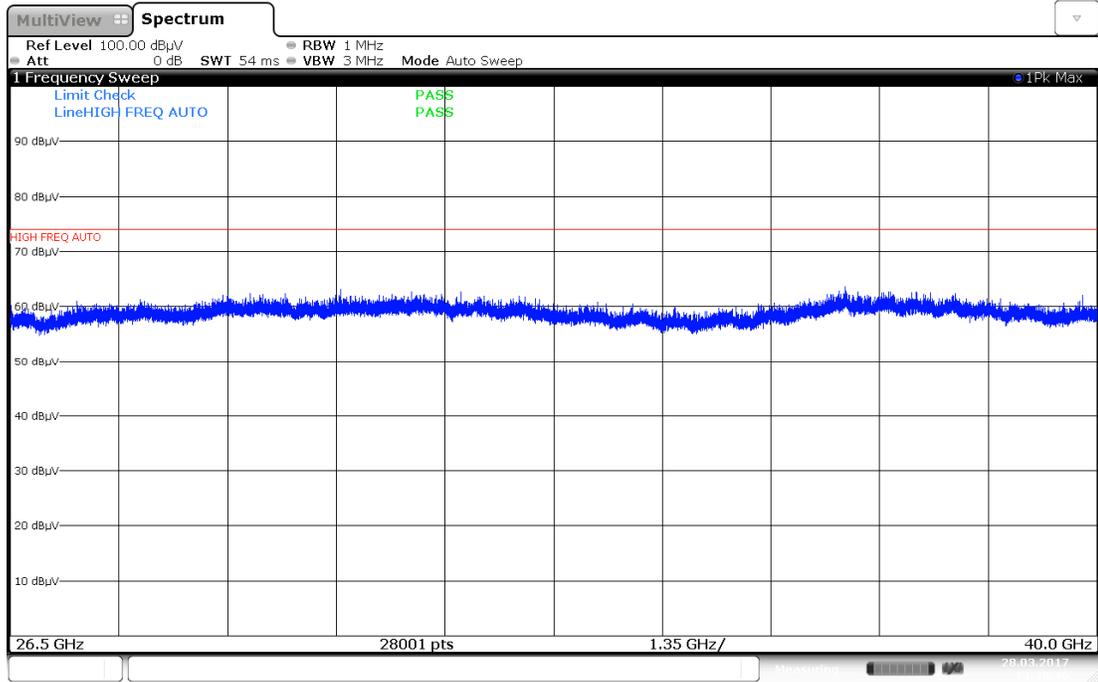


14:23:00 28.03.2017

Plot 7-90. Radiated Spurious Plot above 18GHz - 26.5GHz (802.11a Ch. 120 – Ant. Pol. V)

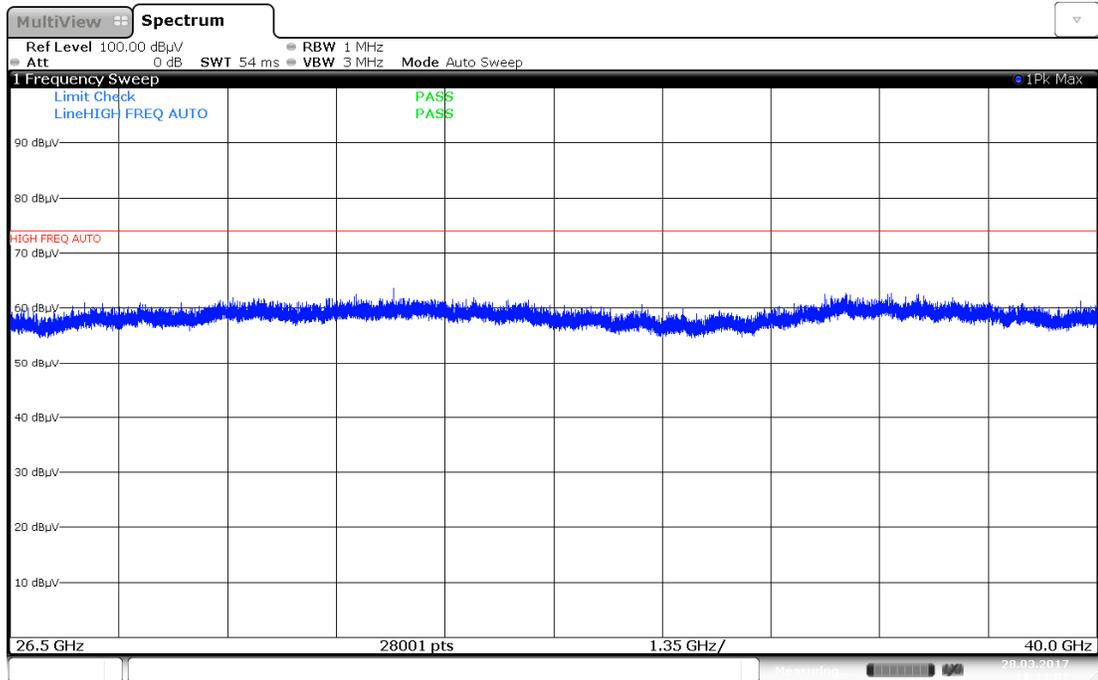
| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 77 of 136 |

Antenna-1 Radiated Spurious Emissions Measurements (Above 18GHz) §15.209



14:40:47 28.03.2017

Plot 7-91. Radiated Spurious Plot 26.5GHz - 40GHz (802.11a Ch. 120 – Ant. Pol. H)



14:44:08 28.03.2017

Plot 7-92. Radiated Spurious Plot above 26.5GHz - 40GHz (802.11a Ch. 120– Ant. Pol. V)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 78 of 136 |

Antenna-1 Radiated Spurious Emission Measurements

§15.247(d) §15.205 & §15.209

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5260MHz
 Channel: 52

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10520.00 | Peak | H | 100 | 165 | -54.33 | 9.32 | -9.54 | 52.44 | 68.20 | -15.76 |
| * 15780.00 | Average | H | 100 | 155 | -71.87 | 11.92 | -9.54 | 37.51 | 53.98 | -16.47 |
| * 15780.00 | Peak | H | 100 | 155 | -61.42 | 11.92 | -9.54 | 47.96 | 73.98 | -26.02 |
| * 21040.00 | Average | H | 100 | 113 | -70.78 | 8.10 | -9.54 | 34.78 | 53.98 | -19.20 |
| * 21040.00 | Peak | H | 100 | 113 | -60.92 | 8.10 | -9.54 | 44.64 | 73.98 | -29.34 |
| 26300.00 | Peak | H | - | - | -58.71 | 8.76 | -9.54 | 47.51 | 68.20 | -20.69 |

Table 7-21. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5280MHz
 Channel: 56

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10560.00 | Peak | H | 100 | 156 | -54.28 | 9.32 | -9.54 | 52.50 | 68.20 | -15.70 |
| * 15840.00 | Average | H | 100 | 123 | -72.36 | 12.08 | -9.54 | 37.18 | 53.98 | -16.80 |
| * 15840.00 | Peak | H | 100 | 123 | -61.03 | 12.08 | -9.54 | 48.51 | 73.98 | -25.47 |
| * 21120.00 | Average | H | - | - | -70.86 | 8.09 | -9.54 | 34.68 | 53.98 | -19.30 |
| * 21120.00 | Peak | H | - | - | -59.47 | 8.09 | -9.54 | 46.07 | 73.98 | -27.91 |
| 26400.00 | Peak | H | - | - | -58.09 | 8.99 | -9.54 | 48.36 | 68.20 | -19.84 |

Table 7-22. Radiated Measurements

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 79 of 136 | |

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5320MHz
 Channel: 64

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 10640.00 | Average | H | 100 | 167 | -66.32 | 9.34 | -9.54 | 40.48 | 53.98 | -13.50 |
| * 10640.00 | Peak | H | 100 | 167 | -54.98 | 9.34 | -9.54 | 51.82 | 73.98 | -22.16 |
| * 15960.00 | Average | H | 100 | 167 | -73.91 | 12.19 | -9.54 | 35.73 | 53.98 | -18.25 |
| * 15960.00 | Peak | H | 100 | 167 | -62.52 | 12.19 | -9.54 | 47.12 | 73.98 | -26.86 |
| * 21280.00 | Average | H | 100 | 157 | -70.69 | 8.07 | -9.54 | 34.84 | 53.98 | -19.14 |
| * 21280.00 | Peak | H | 100 | 157 | -59.46 | 8.07 | -9.54 | 46.07 | 73.98 | -27.91 |
| 26600.00 | Peak | H | - | - | -50.44 | -8.30 | -9.54 | 38.72 | 68.20 | -29.48 |

Table 7-23. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5500MHz
 Channel: 100

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11000.00 | Average | H | 100 | 136 | -66.45 | 9.50 | -9.54 | 40.51 | 53.98 | -13.47 |
| * 11000.00 | Peak | H | 100 | 136 | -54.33 | 9.50 | -9.54 | 52.63 | 73.98 | -21.35 |
| 16500.00 | Peak | H | - | - | -61.97 | 12.94 | -9.54 | 48.42 | 68.20 | -19.78 |
| 22000.00 | Peak | H | - | - | -58.83 | 8.35 | -9.54 | 46.97 | 68.20 | -21.23 |
| 27500.00 | Peak | H | - | - | -49.37 | -8.93 | -9.54 | 39.16 | 68.20 | -29.04 |

Table 7-24. Radiated Measurements

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 80 of 136 | |

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5600MHz
 Channel: 120

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11200.00 | Average | H | 100 | 147 | -64.86 | 9.87 | -9.54 | 42.47 | 53.98 | -11.51 |
| * 11200.00 | Peak | H | 100 | 147 | -52.41 | 9.87 | -9.54 | 54.92 | 73.98 | -19.06 |
| 16800.00 | Peak | H | - | - | -61.96 | 13.46 | -9.54 | 48.96 | 68.20 | -19.24 |
| * 22400.00 | Average | H | - | - | -70.11 | 8.20 | -9.54 | 35.55 | 53.98 | -18.43 |
| * 22400.00 | Peak | H | - | - | -59.79 | 8.20 | -9.54 | 45.87 | 73.98 | -28.11 |
| 28000.00 | Peak | H | - | - | -49.24 | -9.24 | -9.54 | 38.98 | 68.20 | -29.22 |

Table 7-25. Radiated Measurements

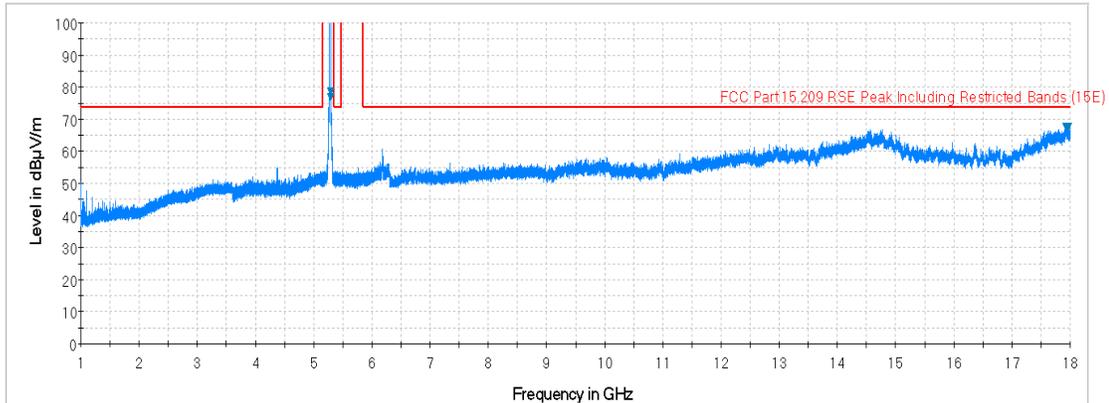
Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5720MHz
 Channel: 144

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11440.00 | Average | H | 100 | 154 | -65.63 | 10.49 | -9.54 | 42.32 | 53.98 | -11.66 |
| * 11440.00 | Peak | H | 100 | 154 | -54.22 | 10.49 | -9.54 | 53.73 | 73.98 | -20.25 |
| 17160.00 | Peak | H | - | - | -61.38 | 13.08 | -9.54 | 49.15 | 68.20 | -19.05 |
| * 22880.00 | Average | H | - | - | -71.76 | 8.29 | -9.54 | 33.98 | 53.98 | -20.00 |
| * 22880.00 | Peak | H | - | - | -60.51 | 8.29 | -9.54 | 45.23 | 73.98 | -28.75 |
| 28600.00 | Peak | H | - | - | -49.72 | -9.03 | -9.54 | 38.71 | 68.20 | -29.49 |

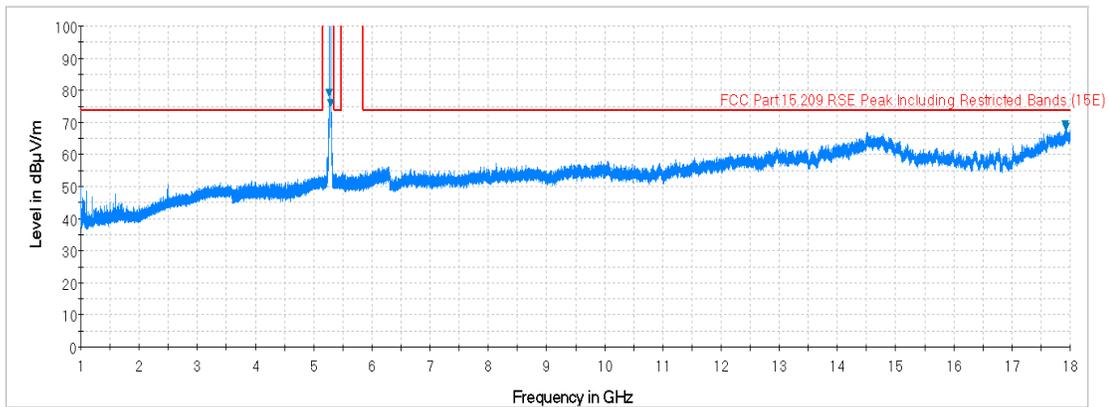
Table 7-26. Radiated Measurements

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 81 of 136 | |

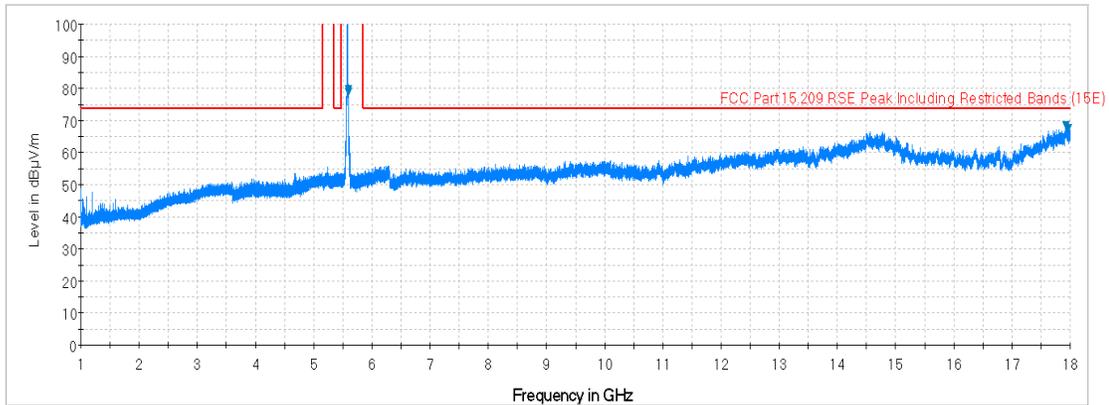
7.6.2 Antenna-2 Radiated Spurious Emission Measurements



Plot 7-93. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. H)

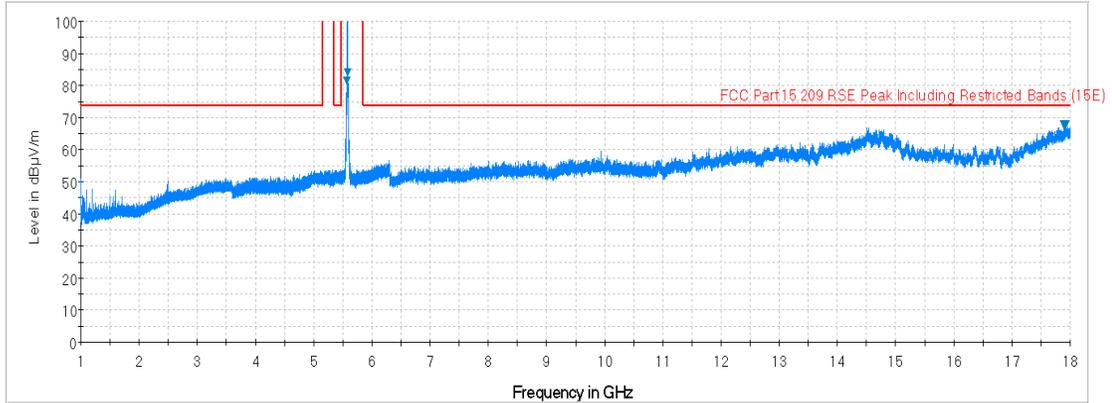


Plot 7-94. Radiated Spurious Plot above 1GHz (802.11a – U2A Ch. 56, Ant. Pol. V)



Plot 7-95. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 120, Ant. Pol. H)

| | | | | |
|---|------------------------------|---|----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 82 of 136 | |

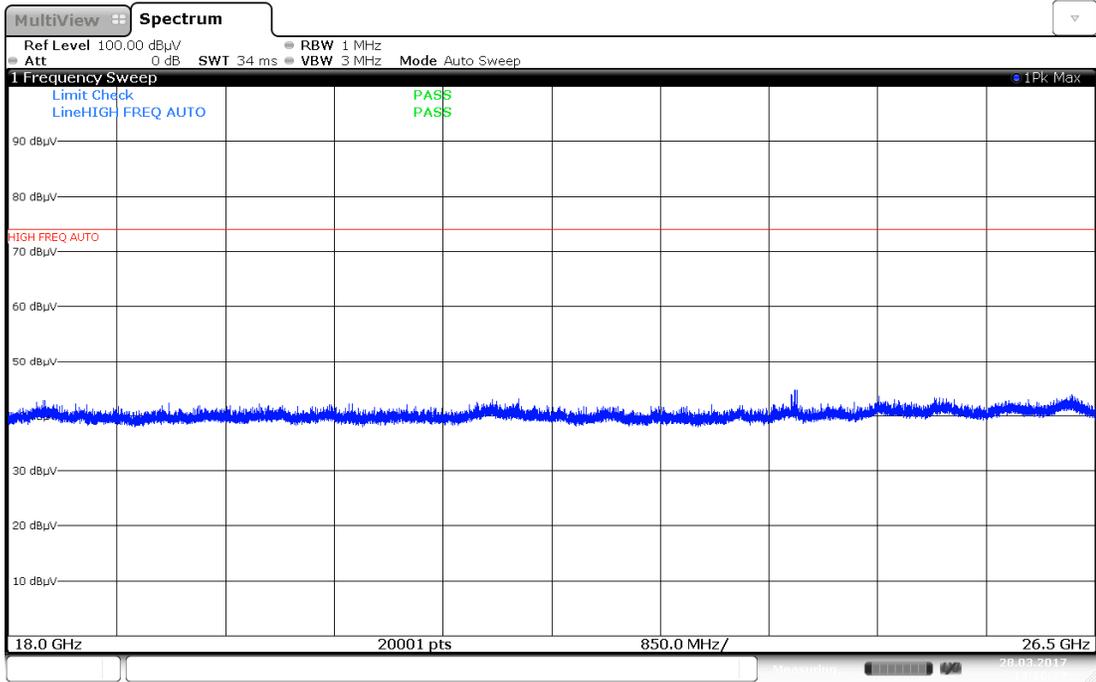


Plot 7-96. Radiated Spurious Plot above 1GHz (802.11a – U2C Ch. 120, Ant. Pol. V)

| | | | | |
|--|---|---|---|--|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 83 of 136 | |

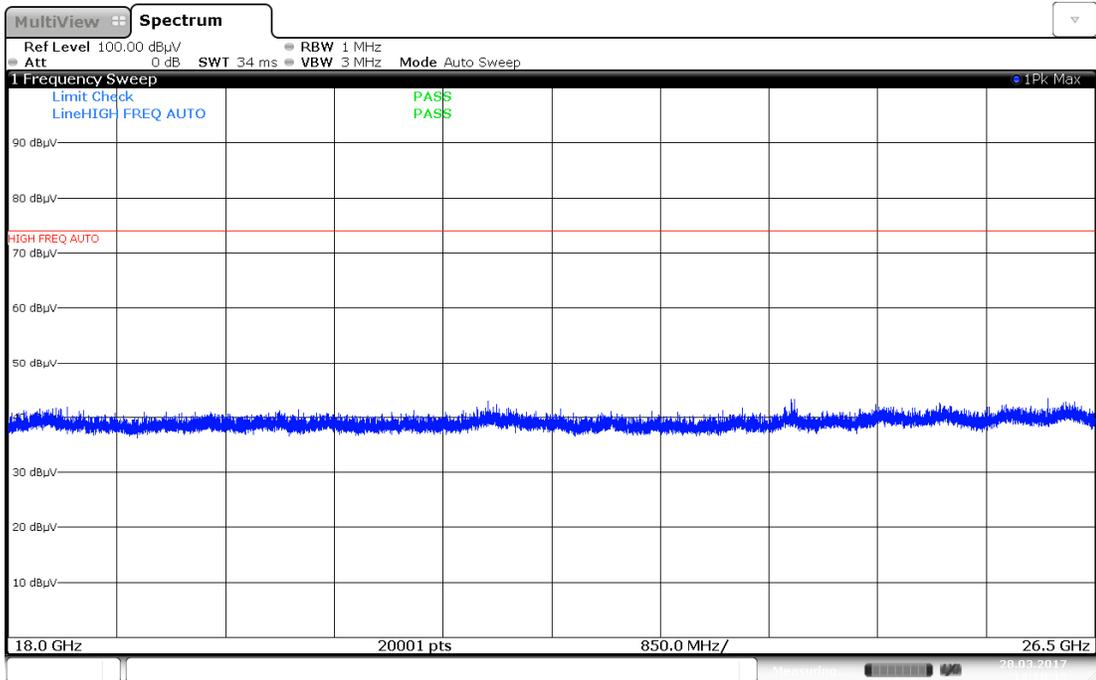
Antenna-2 Radiated Spurious Emissions Measurements (Above 18GHz)

§15.209



14:16:33 28.03.2017

Plot 7-97. Radiated Spurious Plot above 18GHz - 26.5GHz (802.11a Ch. 120- Ant. Pol. H)



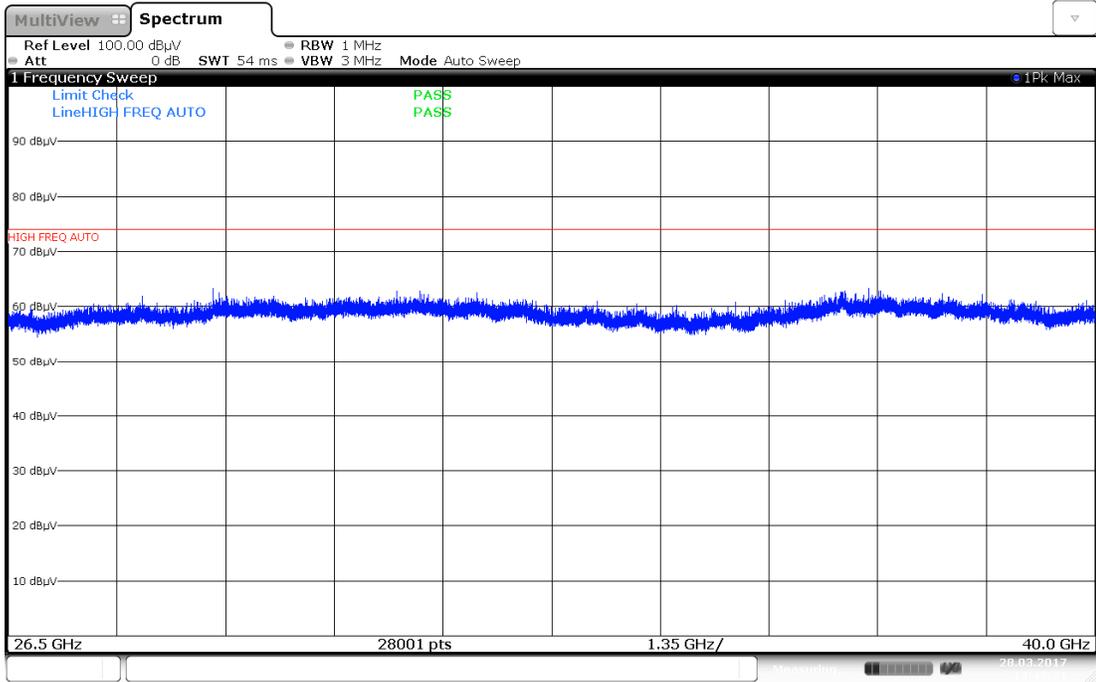
14:18:44 28.03.2017

Plot 7-98. Radiated Spurious Plot above 18GHz - 26.5GHz (802.11a Ch. 120 - Ant. Pol. V)

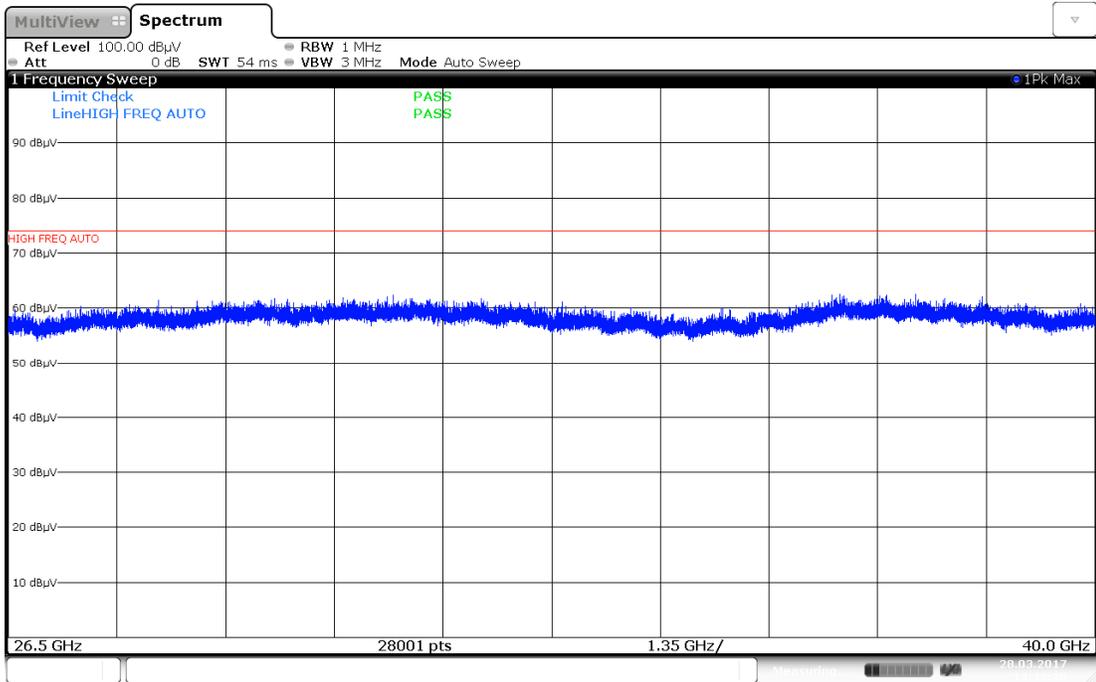
| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 84 of 136 |

Antenna-2 Radiated Spurious Emissions Measurements (Above 18GHz)

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Plot 7-99. Radiated Spurious Plot 26.5GHz - 40GHz (802.11a Ch. 120 – Ant. Pol. H)



Plot 7-100. Radiated Spurious Plot above 26.5GHz - 40GHz (802.11a Ch. 120 – Ant. Pol. V)

| | | | | |
|---|------------------------------|---|----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 85 of 136 | |

Antenna-2 Radiated Spurious Emission Measurements

§15.247(d) §15.205 & §15.209

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5260MHz
 Channel: 52

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10520.00 | Peak | H | 100 | 154 | -51.79 | 9.32 | -9.54 | 54.98 | 68.20 | -13.22 |
| * 15780.00 | Average | H | - | - | -75.37 | 11.92 | -9.54 | 34.01 | 53.98 | -19.97 |
| * 15780.00 | Peak | H | - | - | -63.23 | 11.92 | -9.54 | 46.15 | 73.98 | -27.83 |
| * 21040.00 | Average | H | - | - | -71.98 | 8.10 | -9.54 | 33.58 | 53.98 | -20.40 |
| * 21040.00 | Peak | H | - | - | -60.55 | 8.10 | -9.54 | 45.01 | 73.98 | -28.97 |
| 26300.00 | Peak | H | - | - | -58.95 | 8.76 | -9.54 | 47.27 | 68.20 | -20.93 |

Table 7-27. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5280MHz
 Channel: 56

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| 10560.00 | Peak | H | 100 | 113 | -49.29 | 9.32 | -9.54 | 57.49 | 68.20 | -10.71 |
| * 15840.00 | Average | H | - | - | -74.56 | 12.08 | -9.54 | 34.98 | 53.98 | -19.00 |
| * 15840.00 | Peak | H | - | - | -62.63 | 12.08 | -9.54 | 46.91 | 73.98 | -27.07 |
| * 21120.00 | Average | H | - | - | -71.52 | 8.09 | -9.54 | 34.02 | 53.98 | -19.96 |
| * 21120.00 | Peak | H | - | - | -59.38 | 8.09 | -9.54 | 46.16 | 73.98 | -27.82 |
| 26400.00 | Peak | H | - | - | -57.71 | 8.99 | -9.54 | 48.74 | 68.20 | -19.46 |

Table 7-28. Radiated Measurements

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 86 of 136 | |

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5320MHz
 Channel: 64

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 10640.00 | Average | H | 100 | 114 | -61.07 | 9.34 | -9.54 | 45.73 | 53.98 | -8.25 |
| * 10640.00 | Peak | H | 100 | 114 | -48.11 | 9.34 | -9.54 | 58.69 | 73.98 | -15.29 |
| * 15960.00 | Average | H | - | - | -74.58 | 12.19 | -9.54 | 35.06 | 53.98 | -18.92 |
| * 15960.00 | Peak | H | - | - | -62.65 | 12.19 | -9.54 | 46.99 | 73.98 | -26.99 |
| * 21280.00 | Average | H | - | - | -71.40 | 8.07 | -9.54 | 34.13 | 53.98 | -19.85 |
| * 21280.00 | Peak | H | - | - | -59.80 | 8.07 | -9.54 | 45.73 | 73.98 | -28.25 |
| 26600.00 | Peak | H | - | - | -49.15 | -8.30 | -9.54 | 40.01 | 68.20 | -28.19 |

Table 7-29. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5500MHz
 Channel: 100

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11000.00 | Average | H | 100 | 114 | -73.02 | 9.50 | -9.54 | 33.94 | 53.98 | -20.04 |
| * 11000.00 | Peak | H | 100 | 114 | -48.08 | 9.50 | -9.54 | 58.88 | 73.98 | -15.10 |
| 16500.00 | Peak | H | - | - | -60.54 | 12.94 | -9.54 | 49.85 | 68.20 | -18.35 |
| 22000.00 | Peak | H | - | - | -57.77 | 8.35 | -9.54 | 48.03 | 68.20 | -20.17 |
| 27500.00 | Peak | H | - | - | -49.34 | -8.93 | -9.54 | 39.19 | 68.20 | -29.01 |

Table 7-30. Radiated Measurements

| | | | | | |
|---|---|----------------------------------|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | | Page 87 of 136 |

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5600MHz
 Channel: 120

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11200.00 | Average | H | 100 | 114 | -68.72 | 9.87 | -9.54 | 38.60 | 53.98 | -15.38 |
| * 11200.00 | Peak | H | 100 | 114 | -56.12 | 9.87 | -9.54 | 51.21 | 73.98 | -22.77 |
| 16800.00 | Peak | H | - | - | -62.50 | 13.46 | -9.54 | 48.42 | 68.20 | -19.78 |
| * 22400.00 | Average | H | - | - | -70.98 | 8.20 | -9.54 | 34.68 | 53.98 | -19.30 |
| * 22400.00 | Peak | H | - | - | -58.73 | 8.20 | -9.54 | 46.93 | 73.98 | -27.05 |
| 28000.00 | Peak | H | - | - | -49.62 | -9.24 | -9.54 | 38.60 | 68.20 | -29.60 |

Table 7-31. Radiated Measurements

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 1 Meter
 Operating Frequency: 5720MHz
 Channel: 144

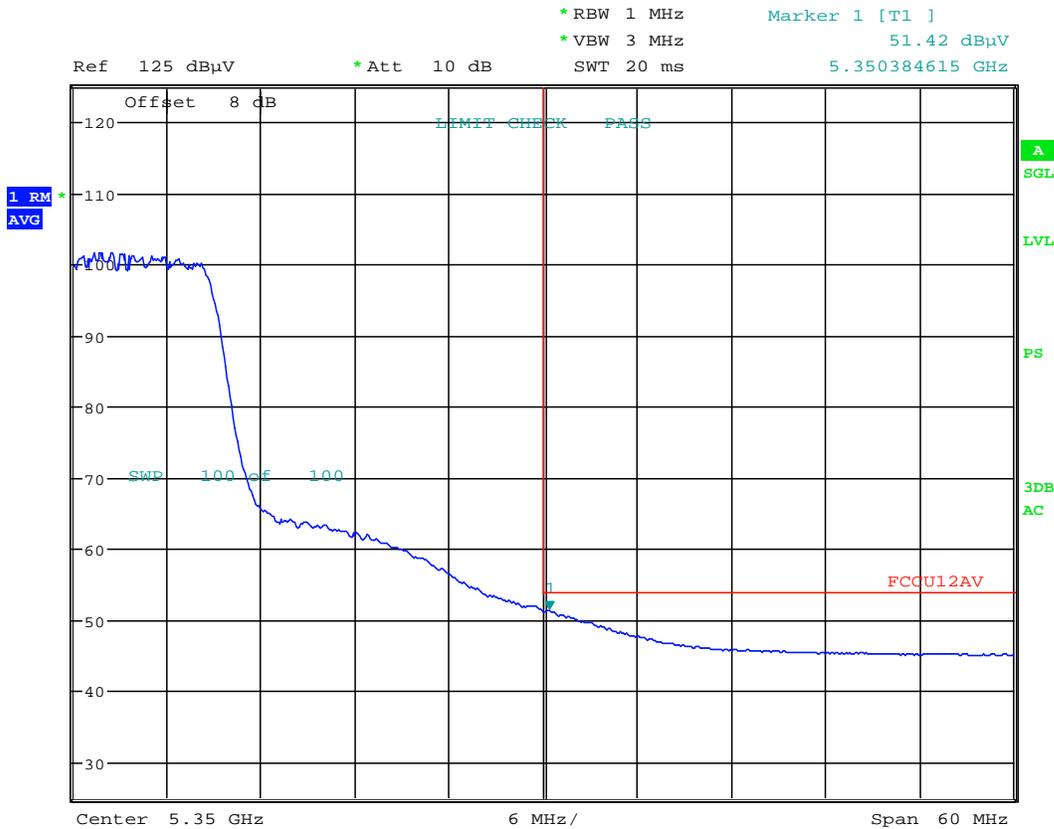
| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBm] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------|-----------------|---------------------|----------------------------|----------------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11440.00 | Average | H | 100 | 147 | -66.21 | 10.49 | -9.54 | 41.74 | 53.98 | -12.24 |
| * 11440.00 | Peak | H | 100 | 147 | -53.97 | 10.49 | -9.54 | 53.98 | 73.98 | -20.00 |
| 17160.00 | Peak | H | - | - | -62.28 | 13.08 | -9.54 | 48.25 | 68.20 | -19.95 |
| * 22880.00 | Average | H | - | - | -72.15 | 8.29 | -9.54 | 33.59 | 53.98 | -20.39 |
| * 22880.00 | Peak | H | - | - | -60.66 | 8.29 | -9.54 | 45.08 | 73.98 | -28.90 |
| 28600.00 | Peak | H | - | - | -49.58 | -9.03 | -9.54 | 38.85 | 68.20 | -29.35 |

Table 7-32. Radiated Measurements

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 88 of 136 | |

7.6.3 Antenna-1 Radiated Band Edge Measurements (20MHz BW) §15.407(b.2)(b.3) §15.205 §15.209

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 3 Meters
 Operating Frequency: 5320MHz
 Channel: 64



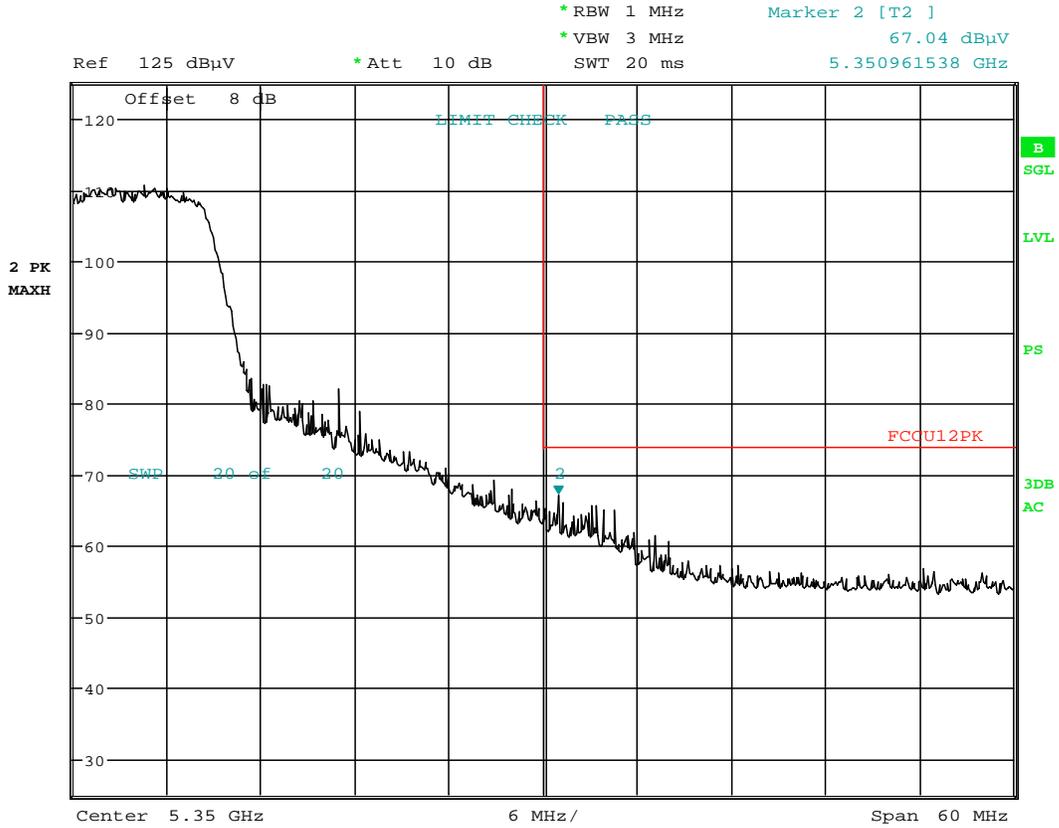
Date: 22.MAR.2017 09:36:07

Plot 7-101. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

| | | | | |
|---|------------------------------|---|----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 89 of 136 | |

Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.2)(b.3) §15.205 §15.209



Date: 22.MAR.2017 09:35:07

Plot 7-102. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 90 of 136 |

Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.2)(b.3) §15.205 §15.209

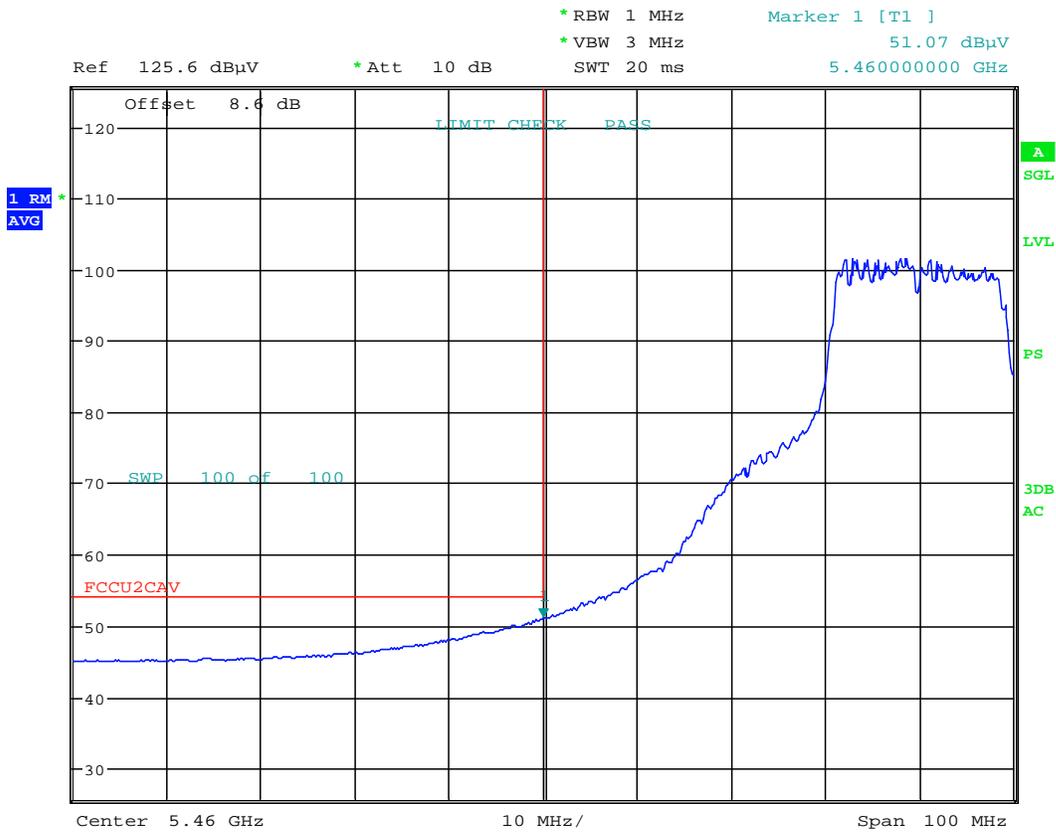
Worst Case Mode: 802.11a

Worst Case Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5500MHz

Channel: 100



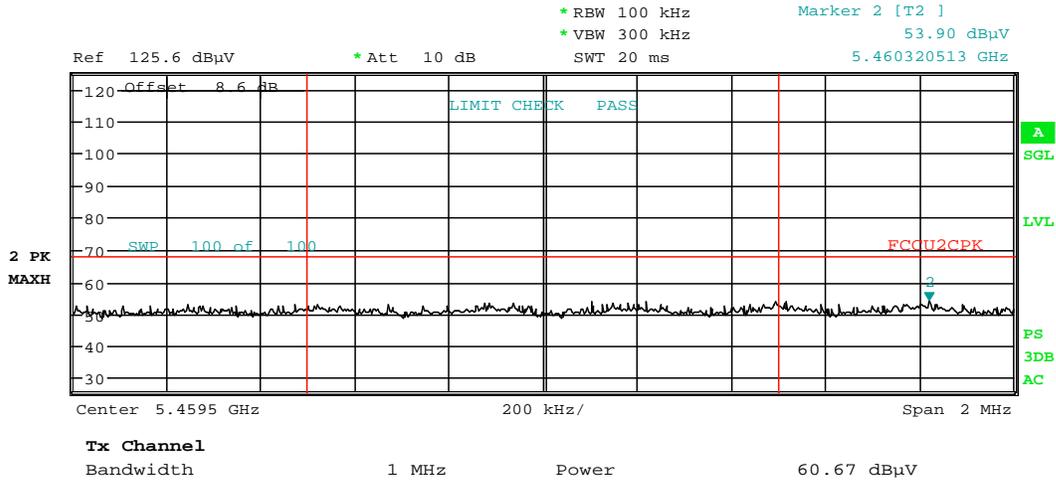
Date: 23.MAR.2017 09:46:07

Plot 7-103. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 91 of 136 |

Antenna-1 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.2)(b.3) §15.205 §15.209



Date: 23.MAR.2017 09:58:41

Plot 7-104. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

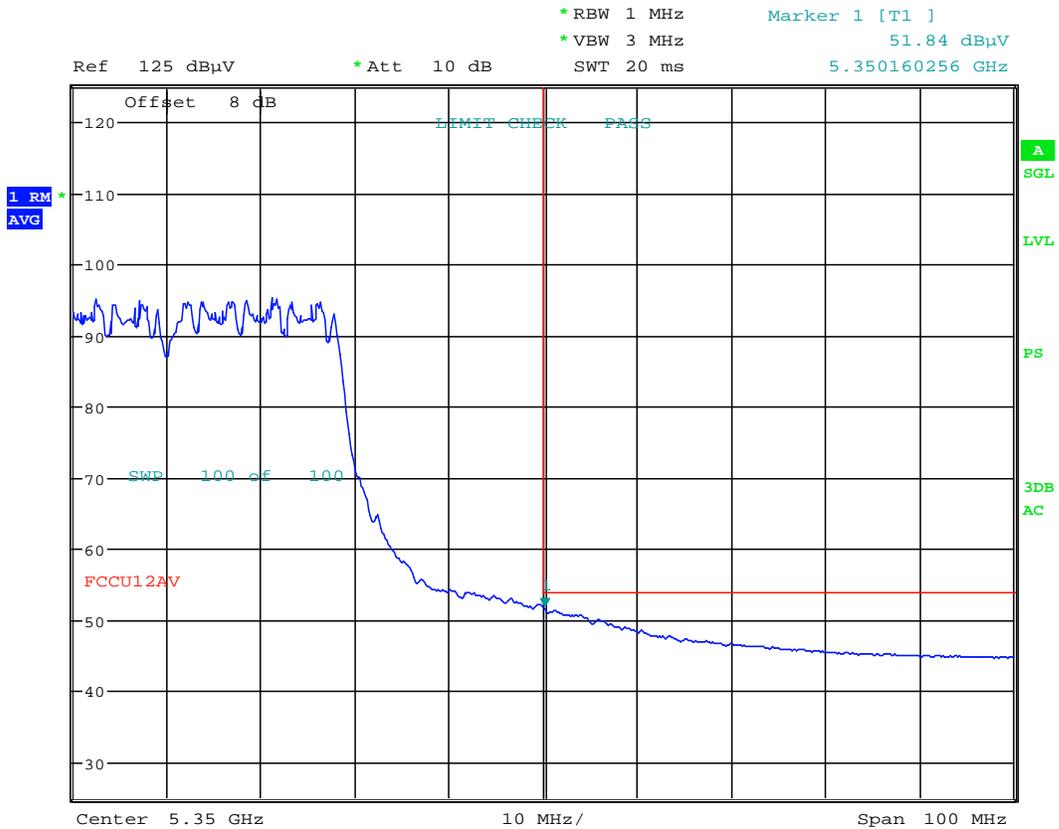
Note:

Per KDB 789033 Section II)G)3)d)ii, the Integration method was used to determine compliance with the out-of-band emission limits.

| | | | | |
|---|------------------------------|---|----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 92 of 136 | |

7.6.4 Antenna-1 Radiated Band Edge Measurements (40MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209

Worst Case Mode: 802.11n (40MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5310MHz
 Channel: 62

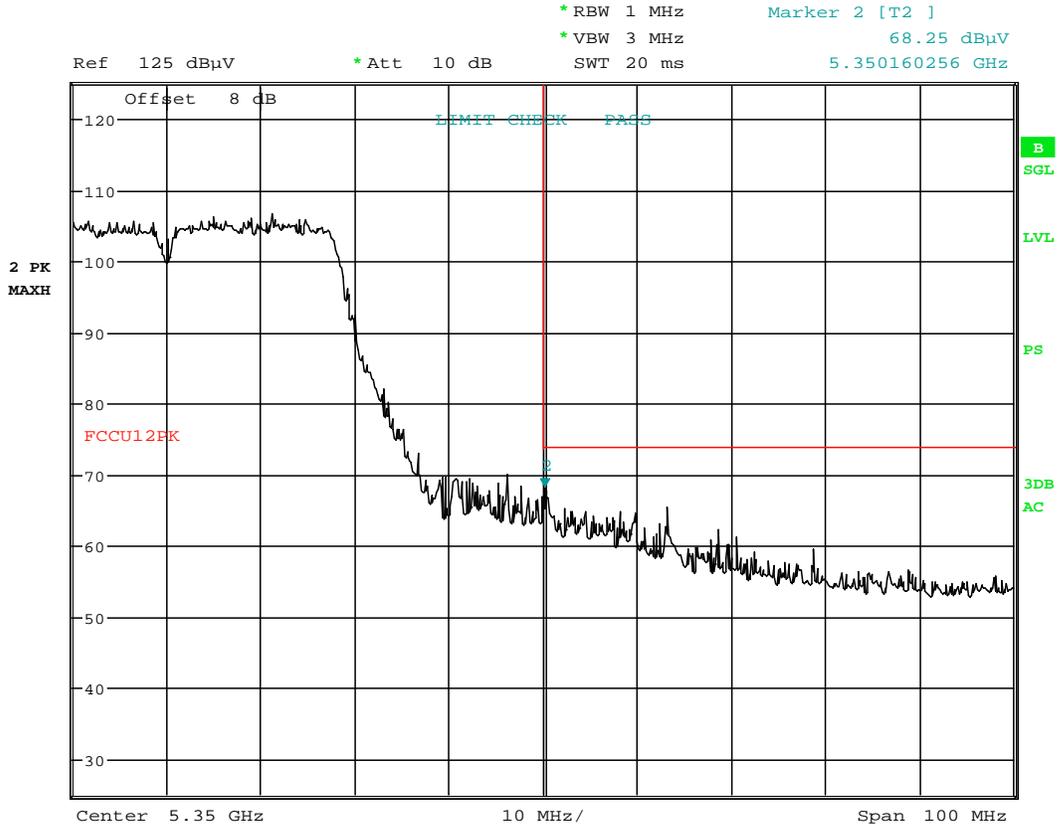


Date: 24.MAR.2017 06:58:34

Plot 7-105. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 93 of 136 |

Antenna-1 Radiated Band Edge Measurements (40MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209



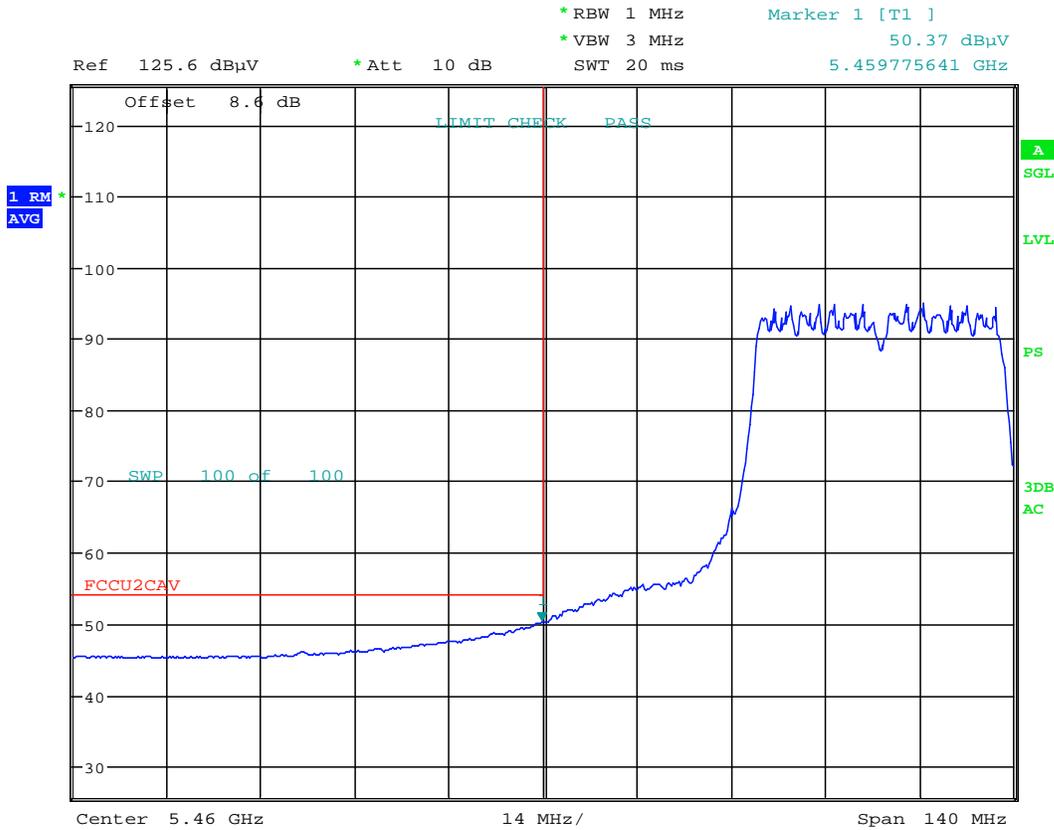
Date: 24.MAR.2017 06:58:08

Plot 7-106. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

| | | | | |
|---|------------------------------|---|----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 94 of 136 | |

Antenna-1 Radiated Band Edge Measurements (40MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209

Worst Case Mode: 802.11n (40MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5510MHz
 Channel: 102



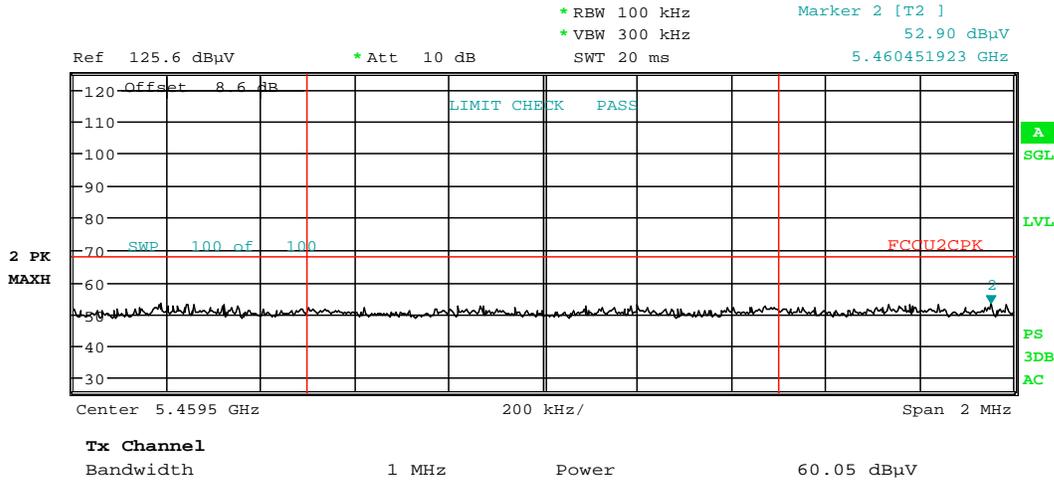
Date: 24.MAR.2017 07:07:32

Plot 7-107. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

| | | | | |
|--|-------------------------------------|--|----------------|--|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 95 of 136 | |

Antenna-1 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.2)(b.3) §15.205 §15.209



Date: 24.MAR.2017 07:10:19

Plot 7-108. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

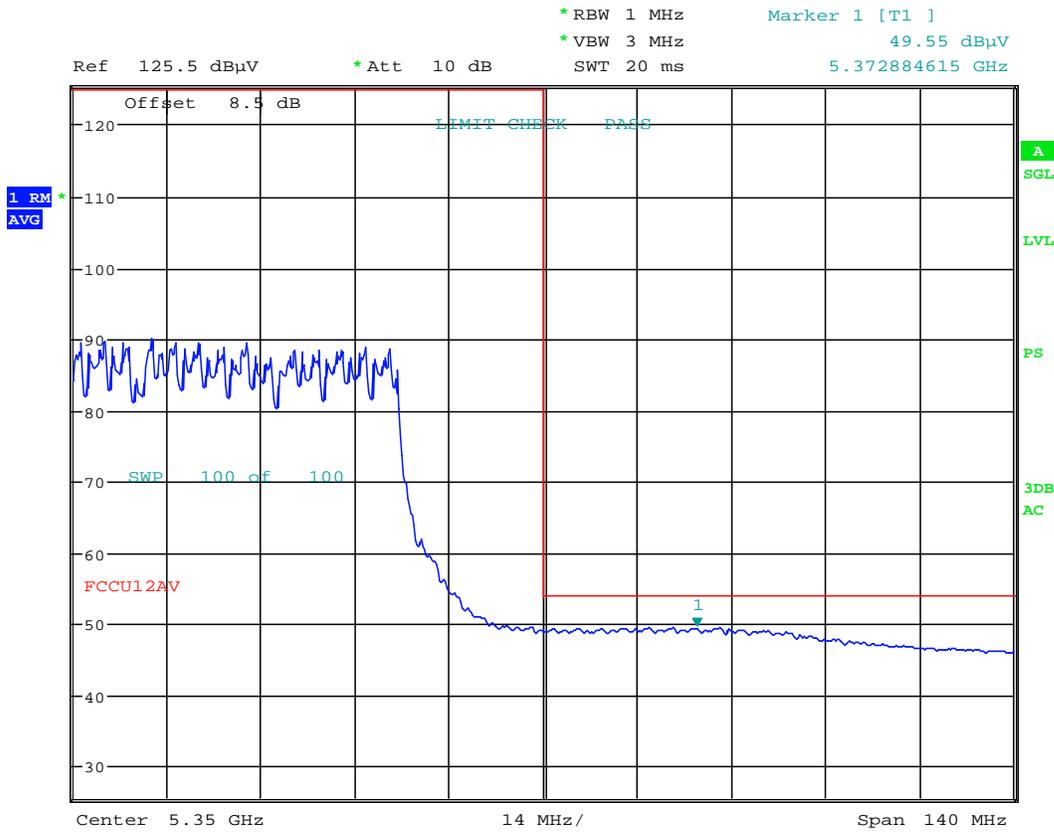
Note:

Per KDB 789033 Section II)G)3)d)ii, the Integration method was used to determine compliance with the out-of-band emission limits.

| | | | | |
|---|------------------------------|---|----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 96 of 136 | |

7.6.5 Antenna-1 Radiated Band Edge Measurements (80MHz BW) §15.407(b.2)(b.3) §15.205 §15.209

Worst Case Mode: 802.11ac (80MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5290MHz
 Channel: 58

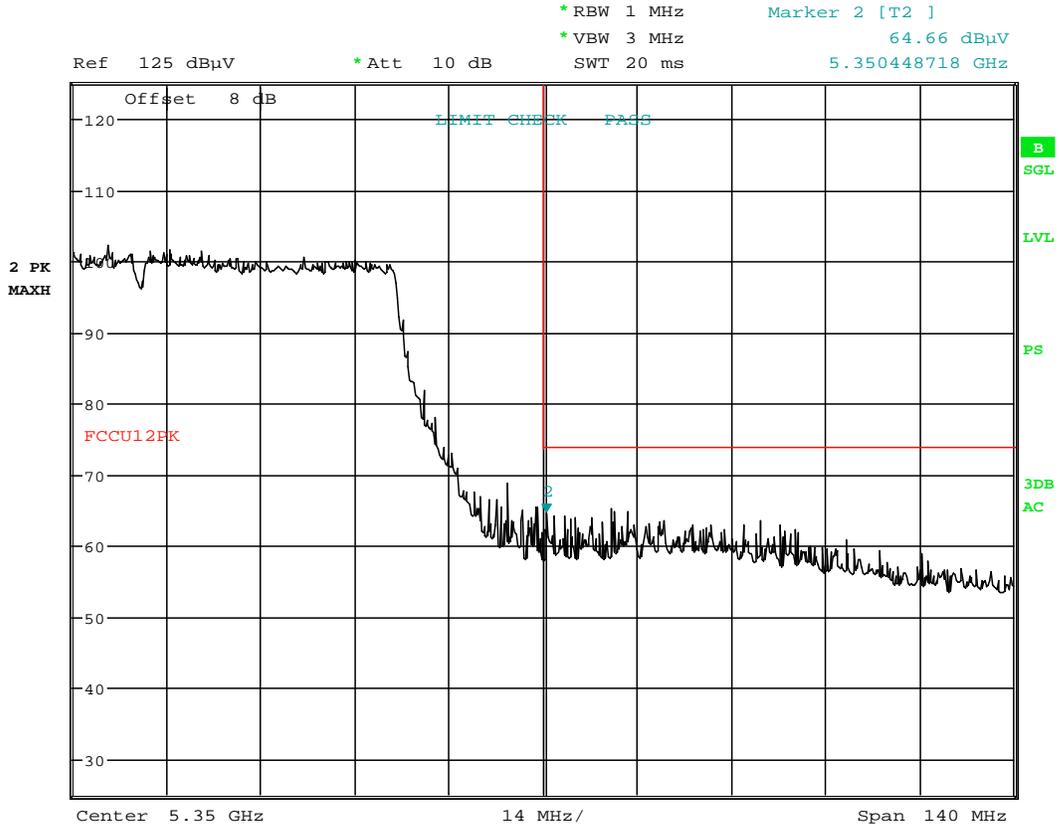


Date: 24.MAR.2017 08:47:18

Plot 7-109. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

| | | | | |
|--|-------------------------------------|---|----------------|--|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 97 of 136 | |

Antenna-1 Radiated Band Edge Measurements (80MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209

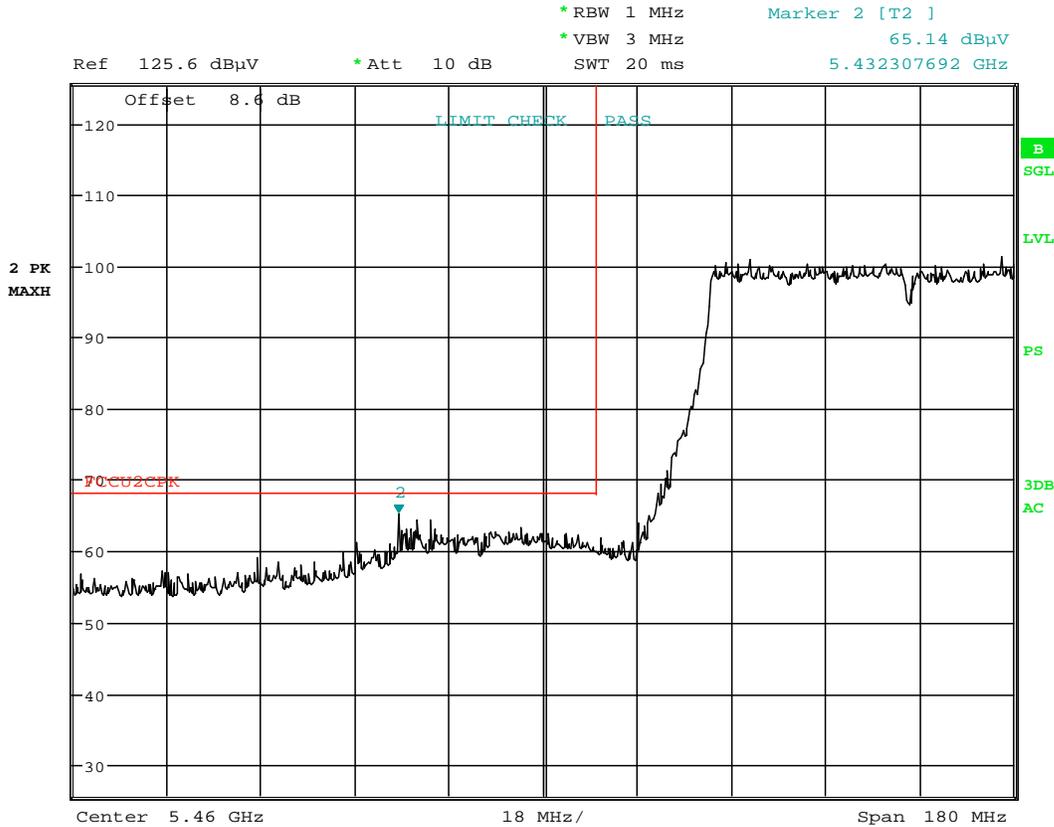


Date: 24.MAR.2017 08:48:23

Plot 7-110. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 98 of 136 |

Antenna-1 Radiated Band Edge Measurements (80MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209



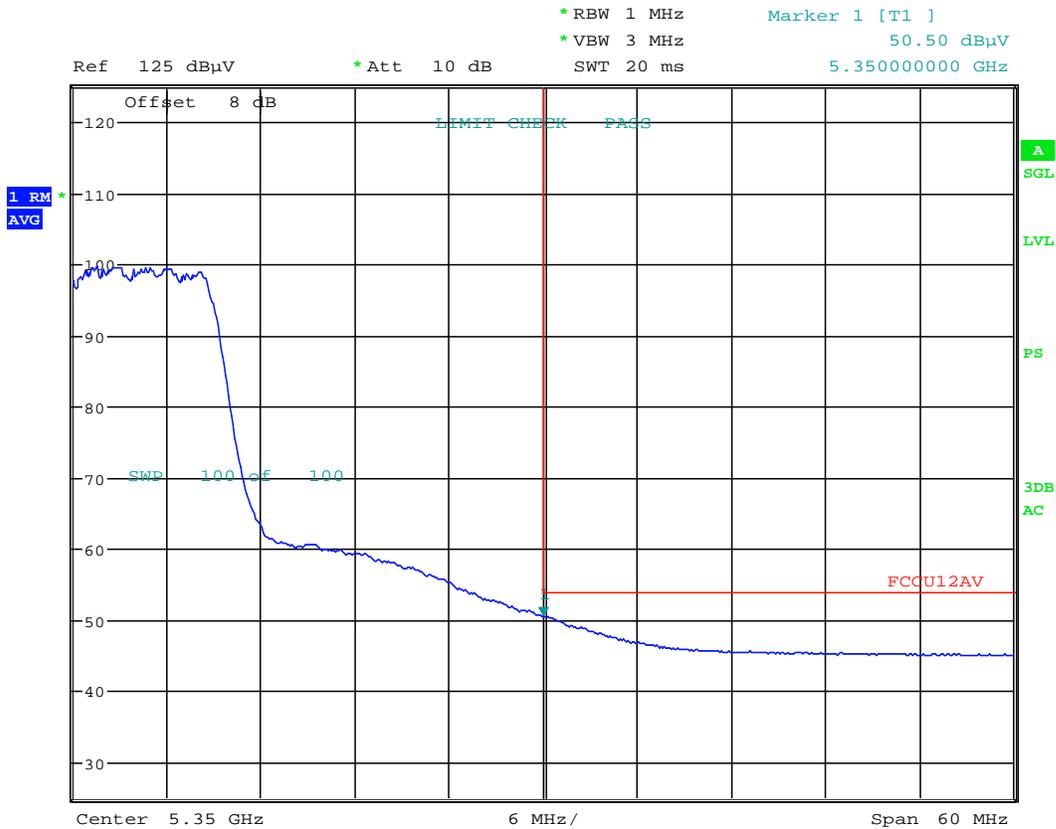
Date: 24.MAR.2017 09:00:41

Plot 7-112. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

| | | | | |
|--|---|---|---|--|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 100 of 136 | |

7.6.6 Antenna-2 Radiated Band Edge Measurements (20MHz BW) §15.407(b.2)(b.3) §15.205 §15.209

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 3 Meters
 Operating Frequency: 5320MHz
 Channel: 64

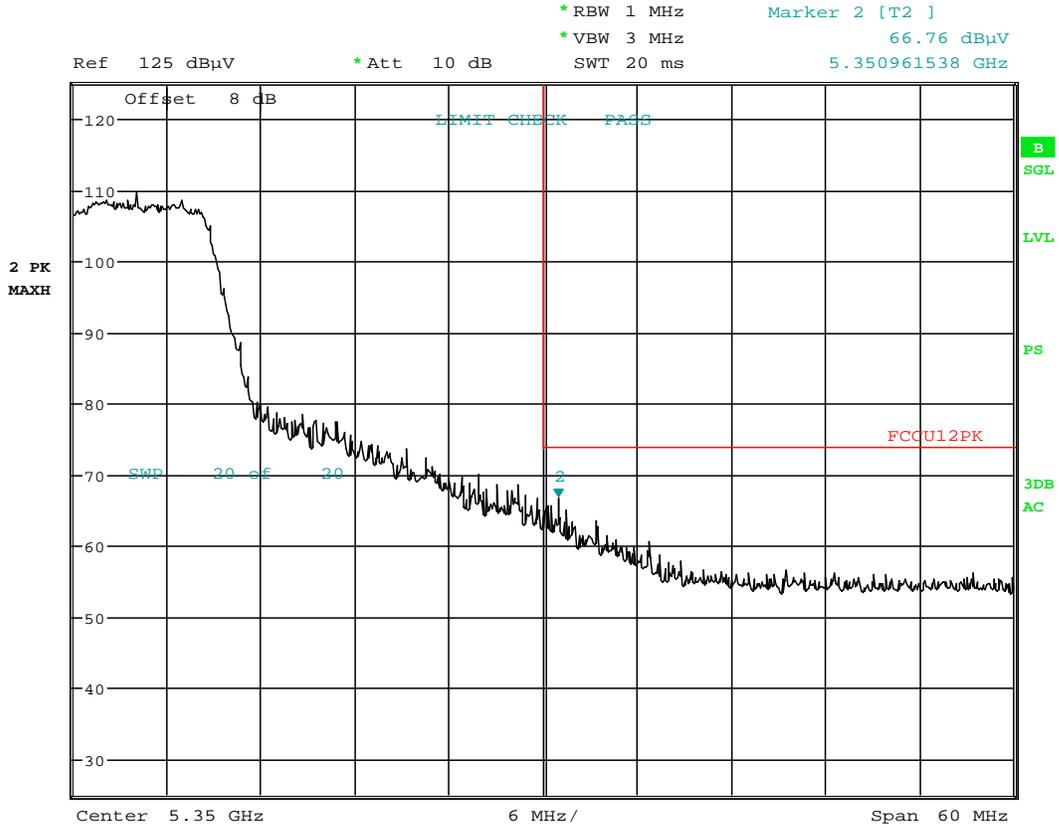


Date: 22.MAR.2017 10:14:24

Plot 7-113. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

| | | | | |
|---|------------------------------|---|-----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 101 of 136 | |

Antenna-2 Radiated Band Edge Measurements (20MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209



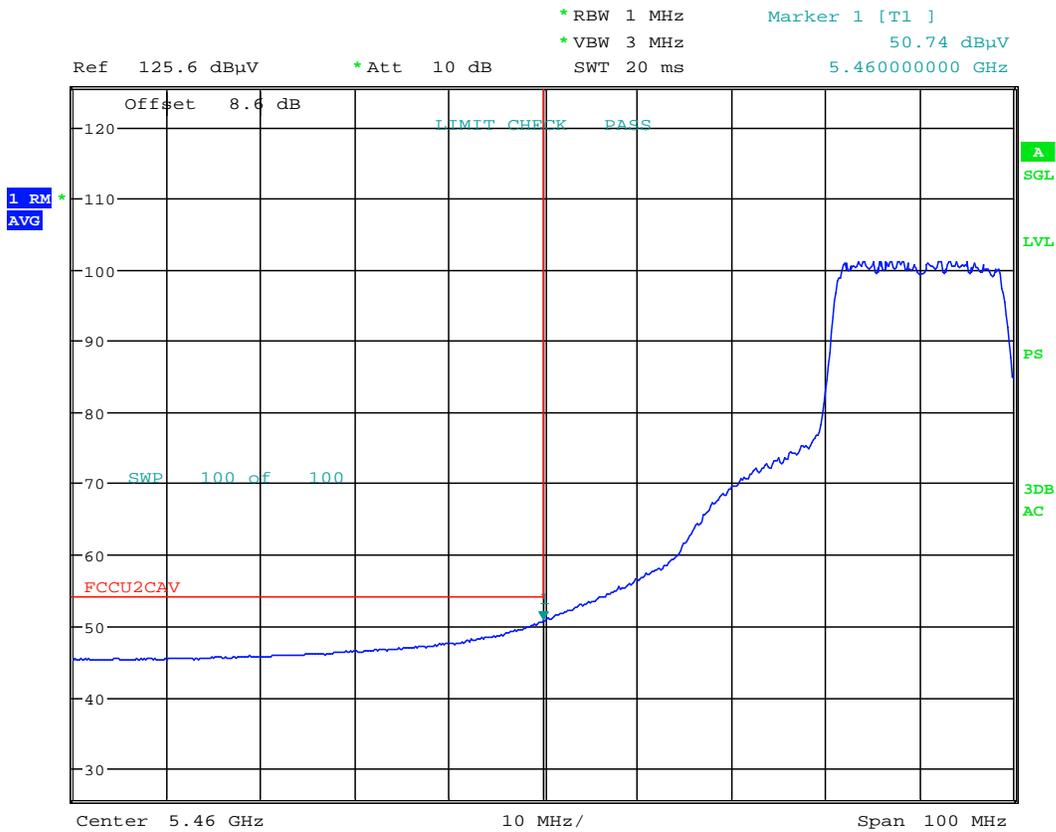
Date: 22.MAR.2017 10:15:07

Plot 7-114. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

| | | | | |
|--|-------------------------------------|---|-----------------|--|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 102 of 136 | |

Antenna-2 Radiated Band Edge Measurements (20MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209

Worst Case Mode: 802.11a
 Worst Case Transfer Rate: 6 Mbps
 Distance of Measurements: 3 Meters
 Operating Frequency: 5500MHz
 Channel: 100



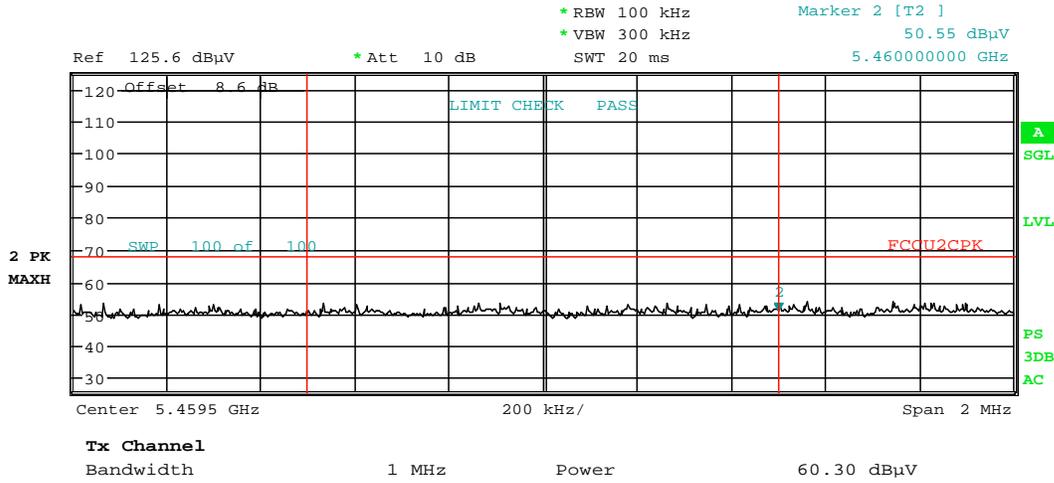
Date: 22.MAR.2017 10:21:59

Plot 7-115. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

| | | | | |
|--|-------------------------------------|--|-----------------|--|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 103 of 136 | |

Antenna-2 Radiated Band Edge Measurements (20MHz BW)

§15.407(b.2)(b.3) §15.205 §15.209



Date: 22.MAR.2017 10:34:48

Plot 7-116. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

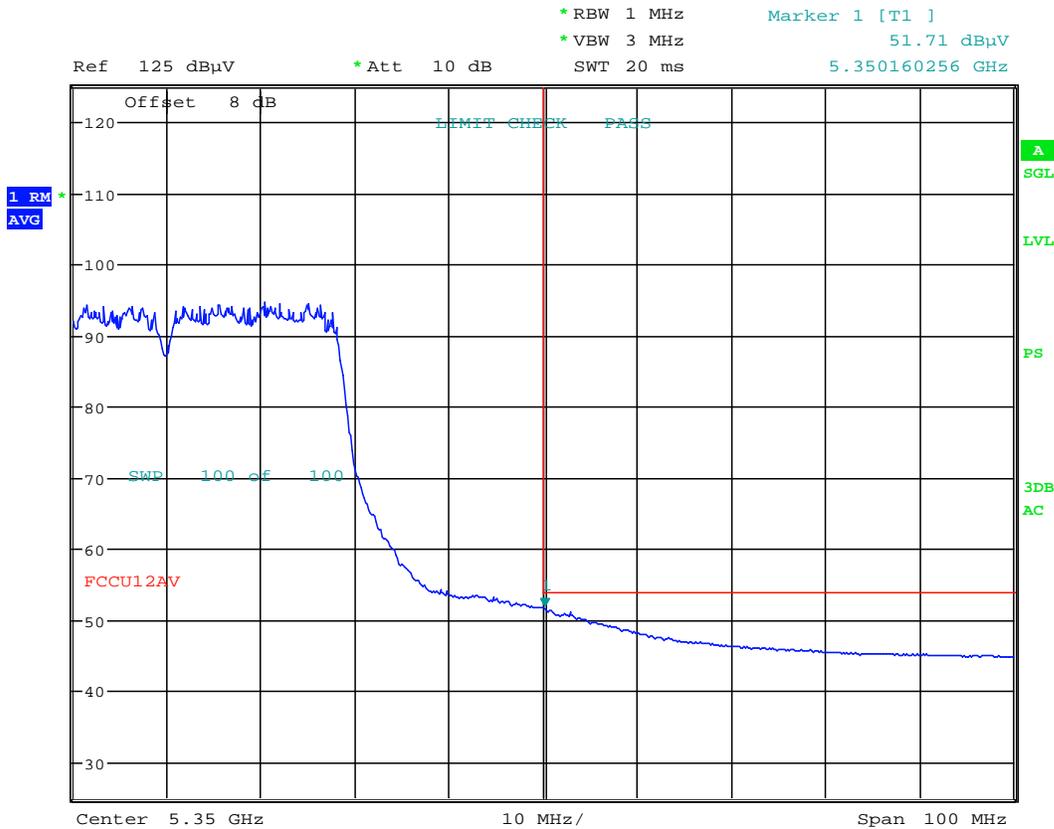
Note:

Per KDB 789033 Section II)G)3)d)ii, the Integration method was used to determine compliance with the out-of-band emission limits.

| | | | | |
|---|------------------------------|---|-----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 104 of 136 | |

7.6.7 Antenna-2 Radiated Band Edge Measurements (40MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209

Worst Case Mode: 802.11n (40MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5310MHz
 Channel: 62



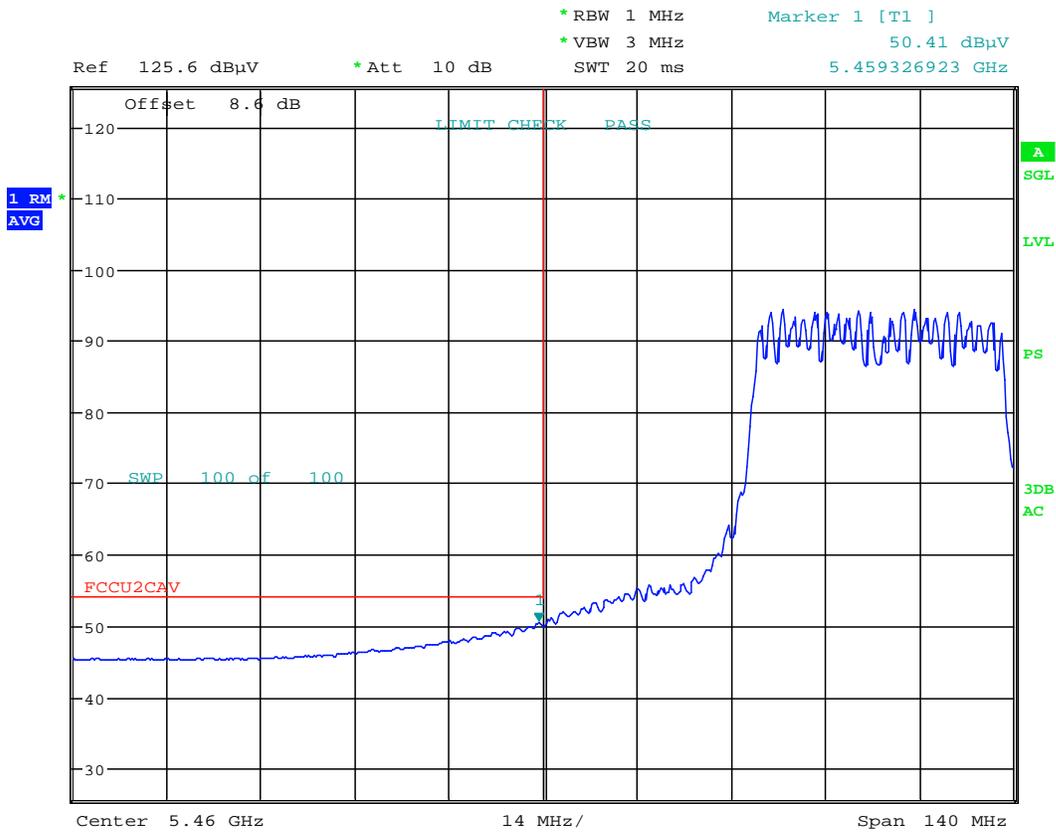
Date: 24.MAR.2017 07:30:32

Plot 7-117. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 105 of 136 |

Antenna-2 Radiated Band Edge Measurements (40MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209

Worst Case Mode: 802.11n (40MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5510MHz
 Channel: 102



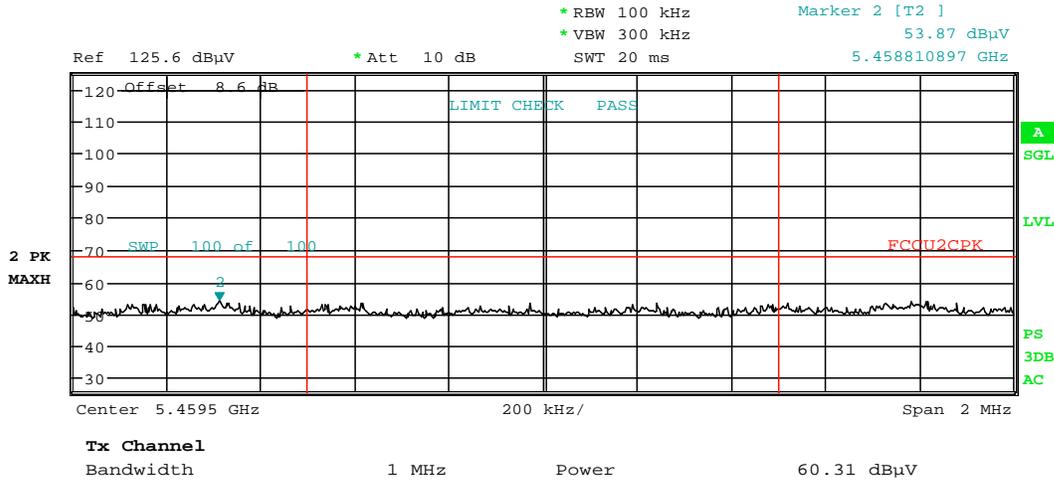
Date: 24.MAR.2017 07:46:26

Plot 7-119. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

| | | | | |
|--|-------------------------------------|--|-----------------|--|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 107 of 136 | |

Antenna-2 Radiated Band Edge Measurements (40MHz BW)

§15.407(b.2)(b.3) §15.205 §15.209



Date: 24.MAR.2017 07:49:04

Plot 7-120. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

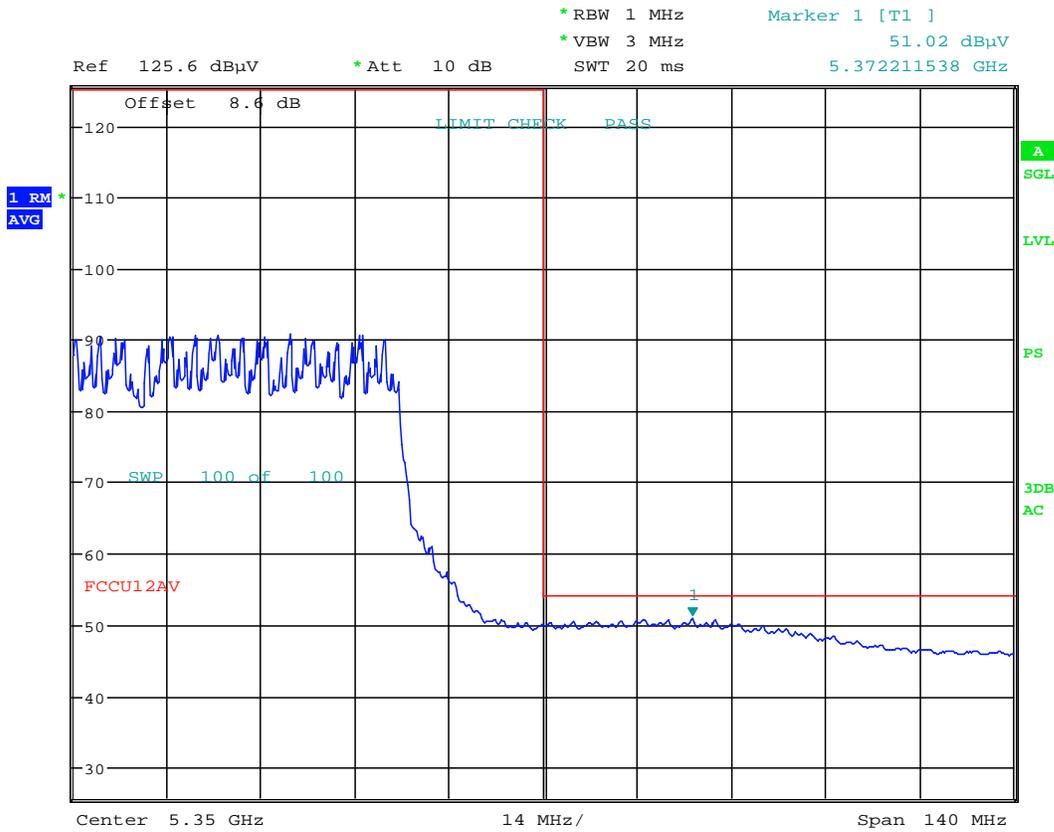
Note:

Per KDB 789033 Section II)G)3)d)ii, the Integration method was used to determine compliance with the out-of-band emission limits.

| | | | | |
|---|------------------------------|---|-----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 108 of 136 | |

7.6.8 Antenna-2 Radiated Band Edge Measurements (80MHz BW) §15.407(b.2)(b.3) §15.205 §15.209

Worst Case Mode: 802.11ac (80MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5290MHz
 Channel: 58

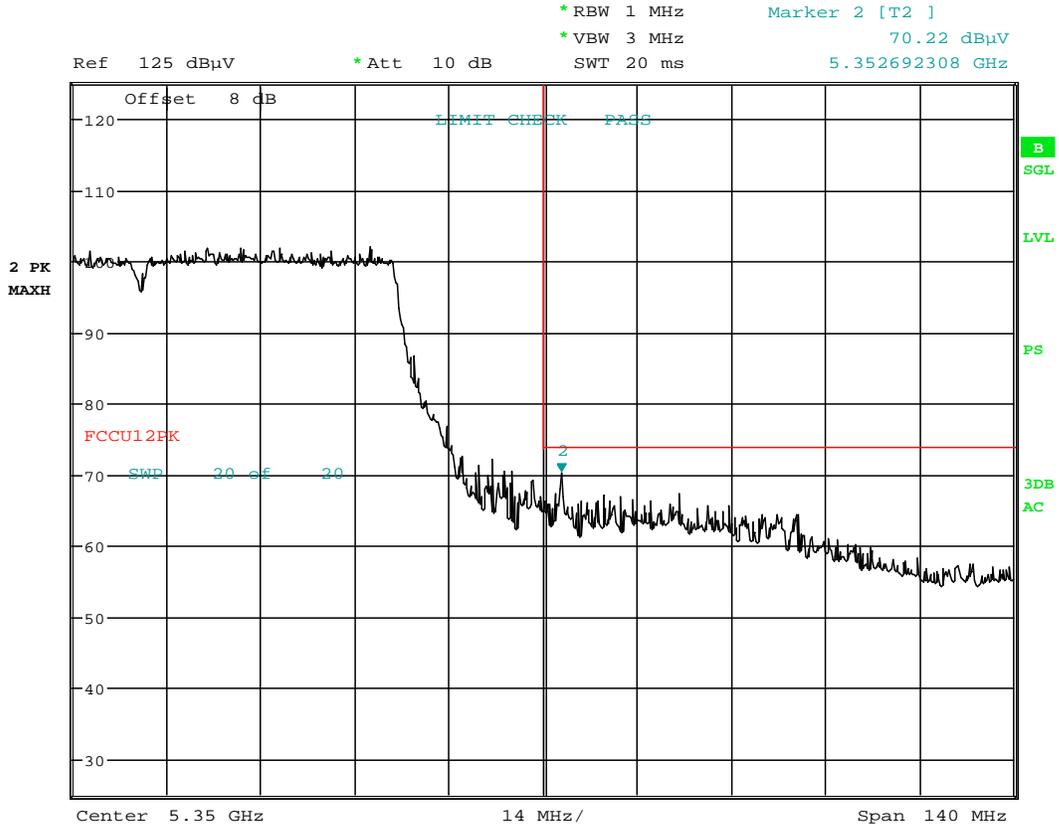


Date: 24.MAR.2017 09:08:51

Plot 7-121. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

| | | | | |
|---|---|---|----------------|---------------------------------|
| FCC ID: A3LETWV520 | PCTEST ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | SAMSUNG | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 109 of 136 |

Antenna-2 Radiated Band Edge Measurements (80MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209



Date: 24.MAR.2017 09:08:34

Plot 7-122. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

| | | | | |
|--|---|---|---|--|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 110 of 136 | |

Antenna-2 Radiated Band Edge Measurements (80MHz BW) §15.407(b.2)(b.3) §15.205 §15.209

Worst Case Mode: 802.11ac (80MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5530MHz
 Channel: 106



Date: 24.MAR.2017 09:18:35

Plot 7-123. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

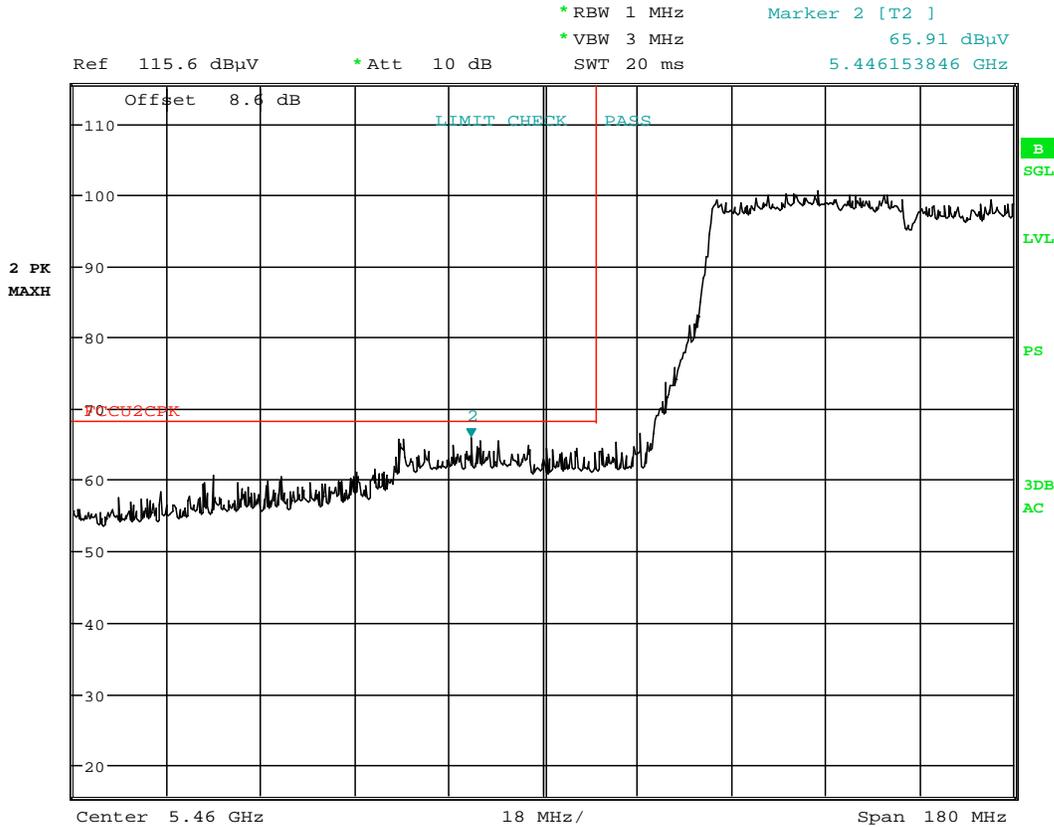
Note:

Per KDB 789033 Section II)G)3)d)ii, the Integration method was used to determine compliance with the out-of-band emission limits.

| | | | | |
|---|------------------------------|---|-----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 111 of 136 | |

Antenna-2 Radiated Band Edge Measurements (80MHz BW)

\$15.407(b.2)(b.3) \$15.205 \$15.209



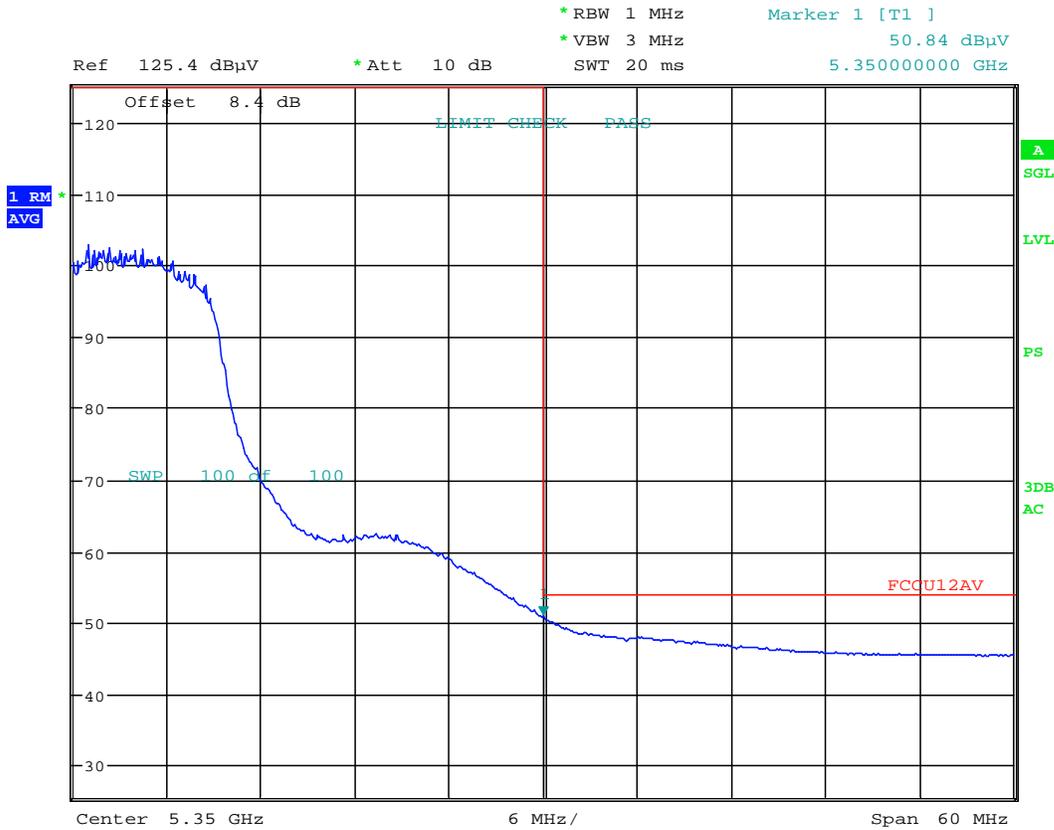
Date: 24.MAR.2017 09:19:29

Plot 7-124. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

| | | | | |
|--|-------------------------------------|---|-----------------|--|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 112 of 136 | |

7.6.9 MIMO Radiated Band Edge Measurements (20MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209

Worst Case Mode: 802.11n (20MHz)
 Worst Case Transfer Rate: MCS8
 Distance of Measurements: 3 Meters
 Operating Frequency: 5320MHz
 Channel: 64

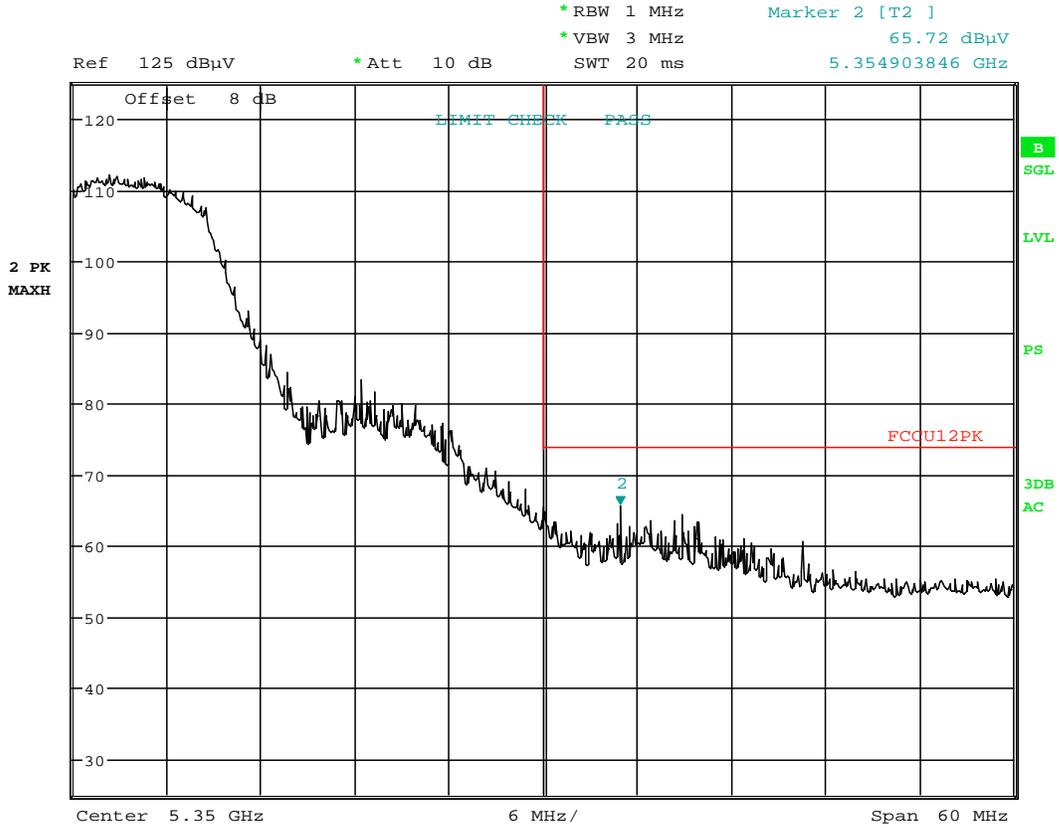


Date: 23.MAR.2017 11:29:29

Plot 7-125. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

| | | | | |
|--|-------------------------------------|--|-----------------|--|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 113 of 136 | |

MIMO Radiated Band Edge Measurements (20MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209



Date: 23.MAR.2017 11:30:29

Plot 7-126. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

| | | | | |
|--|-------------------------------------|---|-----------------|--|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 114 of 136 | |

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.2)(b.3) §15.205 §15.209

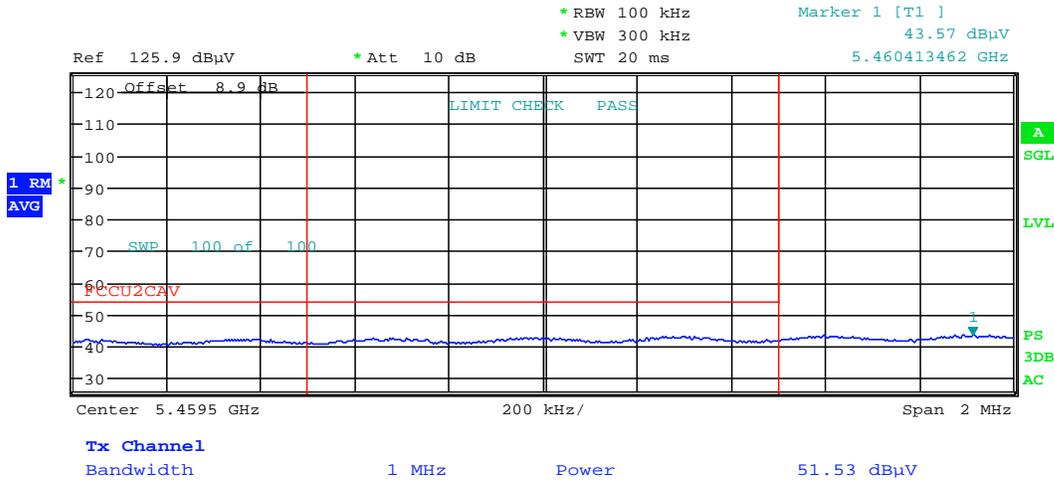
Worst Case Mode: 802.11n (20MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5500MHz

Channel: 100



Date: 23.MAR.2017 11:16:05

Plot 7-127. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

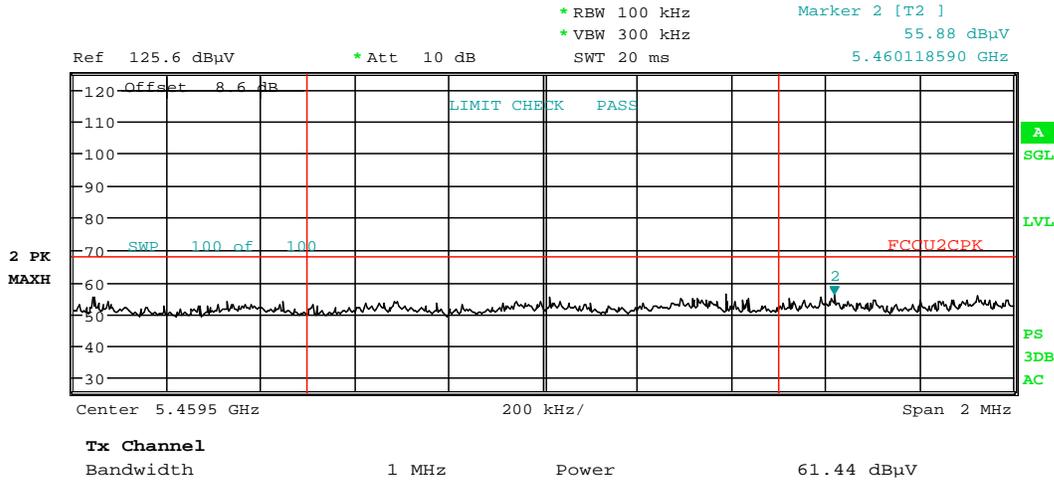
Note:

Per KDB 789033 Section II)G)3)d)ii, the Integration method was used to determine compliance with the out-of-band emission limits.

| | | | | |
|---|------------------------------|---|-----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 115 of 136 | |

MIMO Radiated Band Edge Measurements (20MHz BW)

§15.407(b.2)(b.3) §15.205 §15.209



Date: 23.MAR.2017 11:18:35

Plot 7-128. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

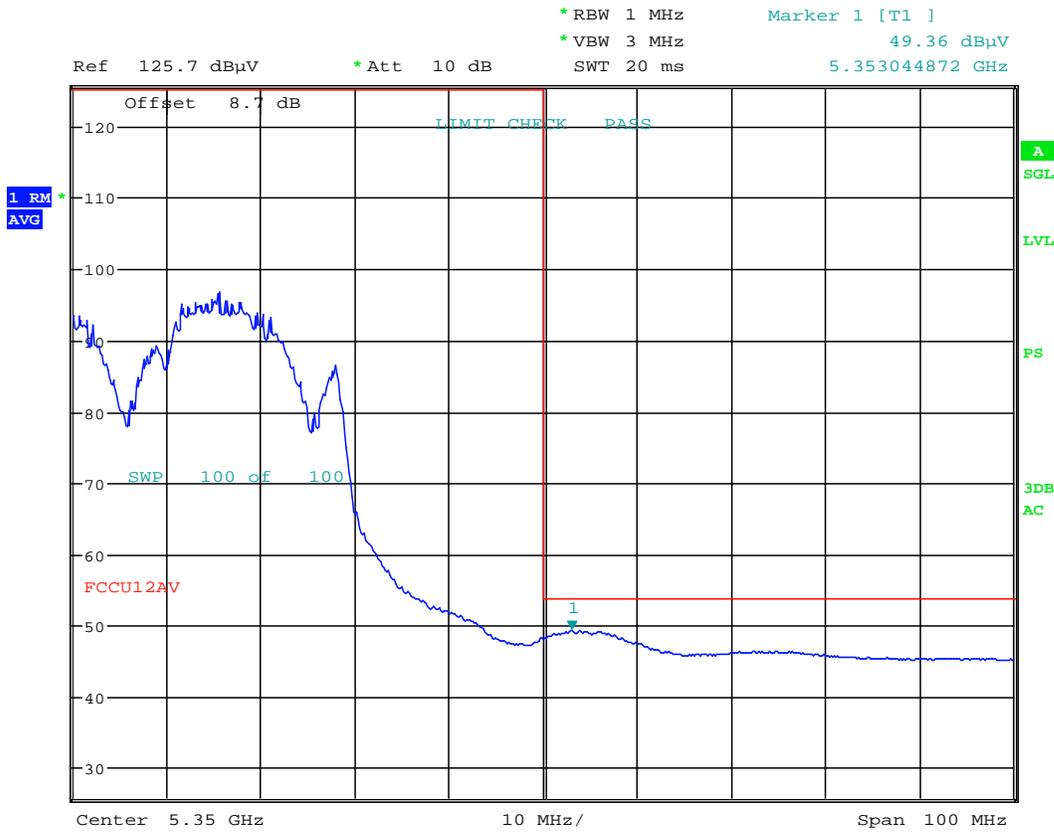
Note:

Per KDB 789033 Section II)G)3)d)ii, the Integration method was used to determine compliance with the out-of-band emission limits.

| | | | | |
|---|------------------------------|---|-----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 116 of 136 | |

7.6.10 MIMO Radiated Band Edge Measurements (40MHz BW) §15.407(b.2)(b.3) §15.205 §15.209

Worst Case Mode: 802.11n (40MHz)
 Worst Case Transfer Rate: MCS8
 Distance of Measurements: 3 Meters
 Operating Frequency: 5310MHz
 Channel: 62



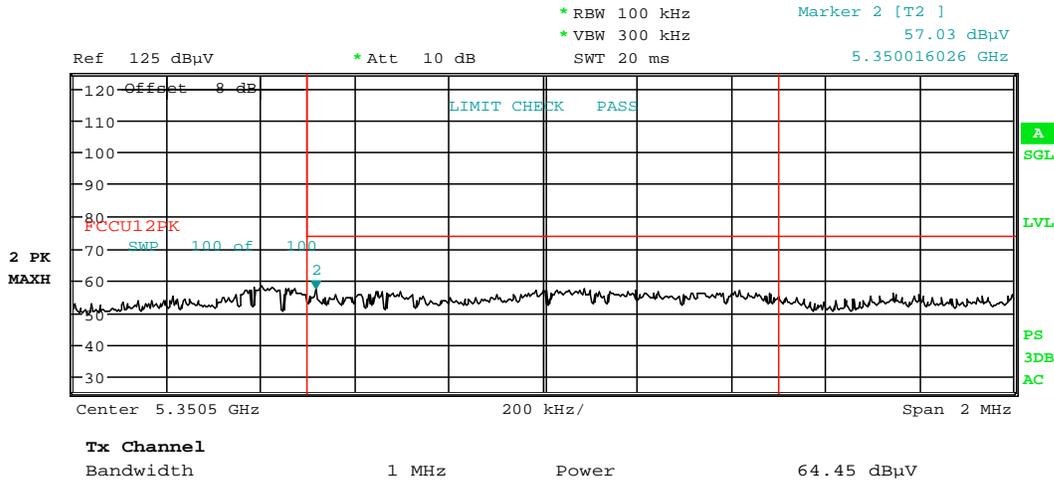
Date: 24.MAR.2017 08:11:01

Plot 7-129. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 117 of 136 |

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.2)(b.3) §15.205 §15.209



Date: 24.MAR.2017 08:06:44

Plot 7-130. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

Note:

Per KDB 789033 Section II(G)3)d)ii, the Integration method was used to determine compliance with the out-of-band emission limits.

| | | | | |
|---|------------------------------|---|-----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 118 of 136 | |

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.2)(b.3) §15.205 §15.209

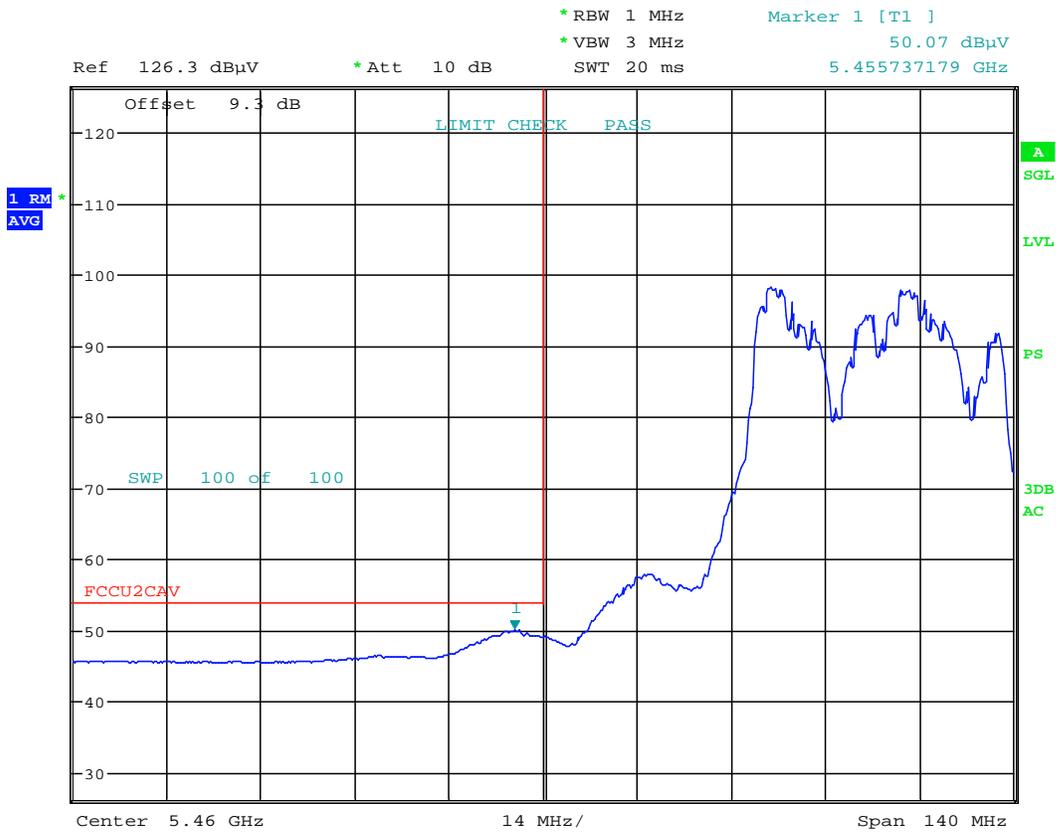
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS8

Distance of Measurements: 3 Meters

Operating Frequency: 5510MHz

Channel: 102



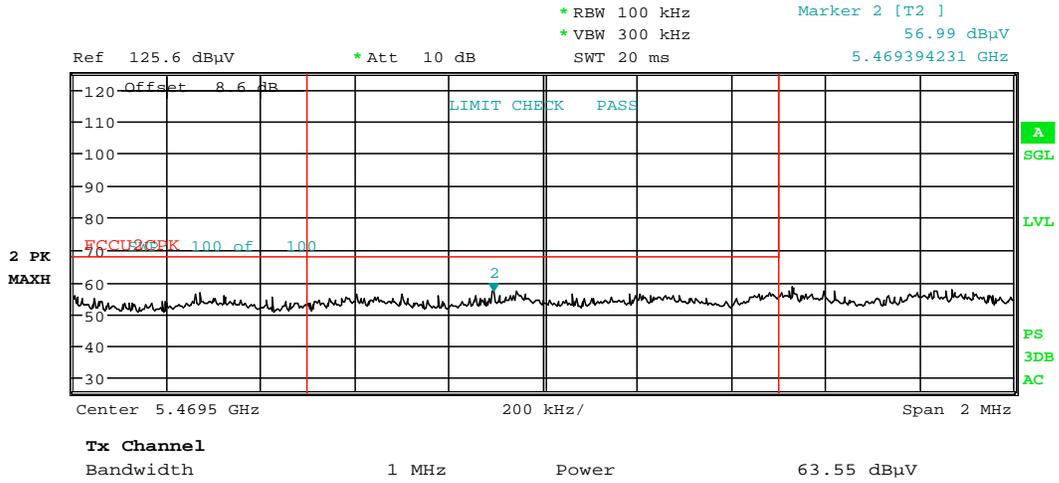
Date: 24.MAR.2017 08:28:38

Plot 7-131. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 119 of 136 |

MIMO Radiated Band Edge Measurements (40MHz BW)

§15.407(b.2)(b.3) §15.205 §15.209



Date: 24.MAR.2017 08:27:24

Plot 7-132. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

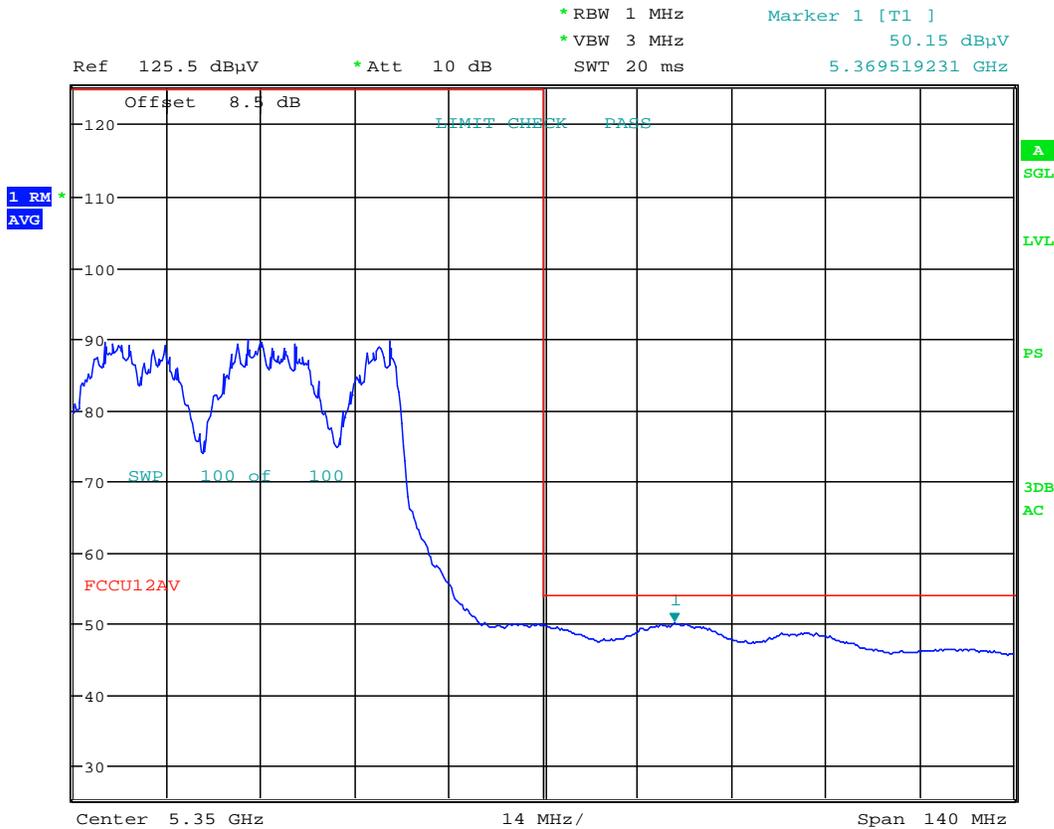
Note:

Per KDB 789033 Section II)G)3)d)ii, the Integration method was used to determine compliance with the out-of-band emission limits.

| | | | | |
|---|------------------------------|---|-----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 120 of 136 | |

7.6.11 MIMO Radiated Band Edge Measurements (80MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209

Worst Case Mode: 802.11ac (80MHz)
 Worst Case Transfer Rate: MCS0
 Distance of Measurements: 3 Meters
 Operating Frequency: 5290MHz
 Channel: 58

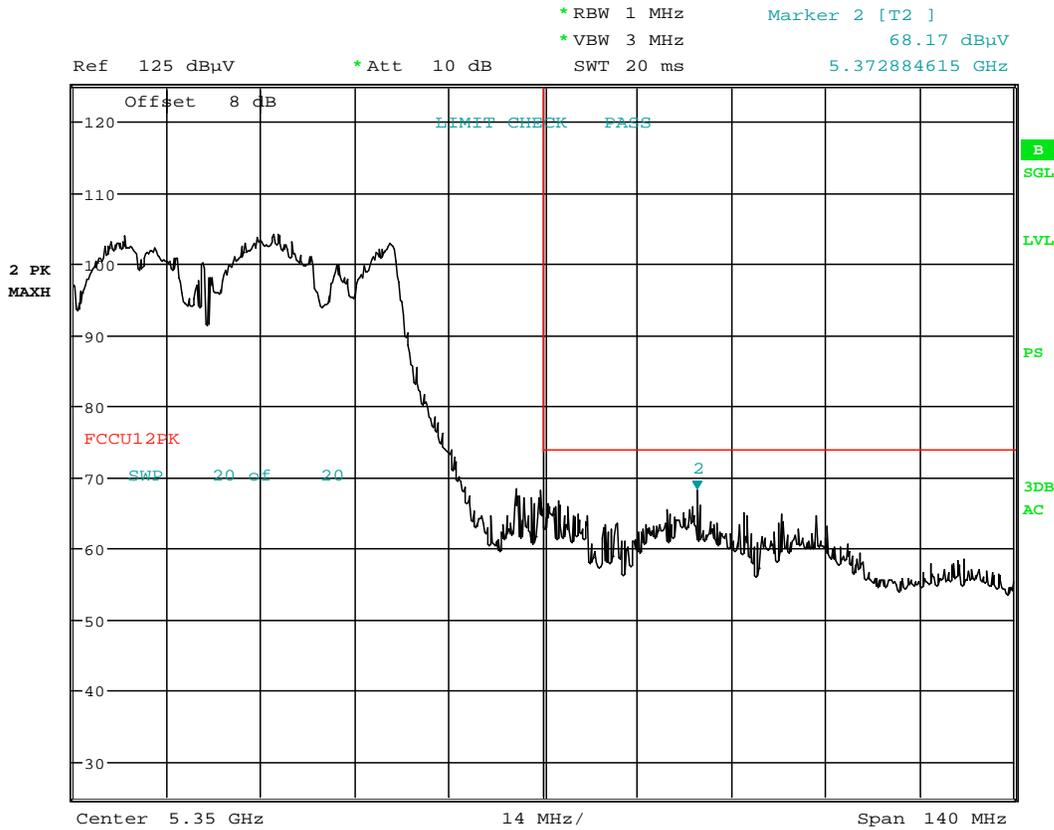


Date: 24.MAR.2017 09:25:22

Plot 7-133. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

| | | | | |
|---|---|---|----------------|---------------------------------|
| FCC ID: A3LETWV520 | PCTEST ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | SAMSUNG | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 121 of 136 |

MIMO Radiated Band Edge Measurements (80MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209

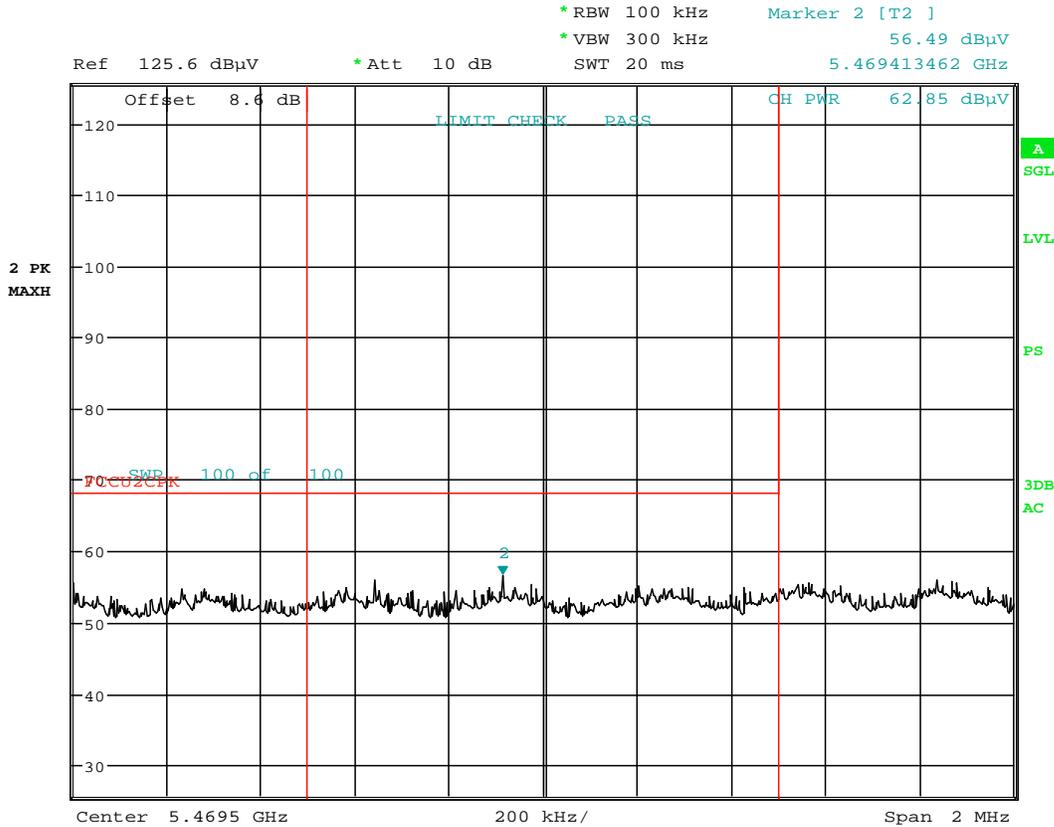


Date: 24.MAR.2017 09:25:52

Plot 7-134. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

| | | | | |
|---|---|---|----------------|---------------------------------|
| FCC ID: A3LETWV520 | PCTEST ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | SAMSUNG | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 122 of 136 |

MIMO Radiated Band Edge Measurements (80MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209



Date: 24.MAR.2017 09:50:17

Plot 7-136. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

Note:

Per KDB 789033 Section II(G)3)d)ii, the Integration method was used to determine compliance with the out-of-band emission limits.

| | | | | |
|---|---|---|-----------------|---------------------------------|
| FCC ID: A3LETWV520 | PCTEST ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | SAMSUNG | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 124 of 136 | |

7.7 Line-Conducted Test Data

§15.407

Test Overview and Limit

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.

All conducted emissions must not exceed the limits shown in the table below, per Section 15.207.

| Frequency of emission (MHz) | Conducted Limit (dB μ V) | |
|-----------------------------|------------------------------|-----------|
| | Quasi-peak | Average |
| 0.15 – 0.5 | 66 to 56* | 56 to 46* |
| 0.5 – 5 | 56 | 46 |
| 5 – 30 | 60 | 50 |

Table 7-33. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = RMS
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

| | | | | |
|--|---|---|---|--|
| FCC ID: A3LETWV520  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 125 of 136 | |

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

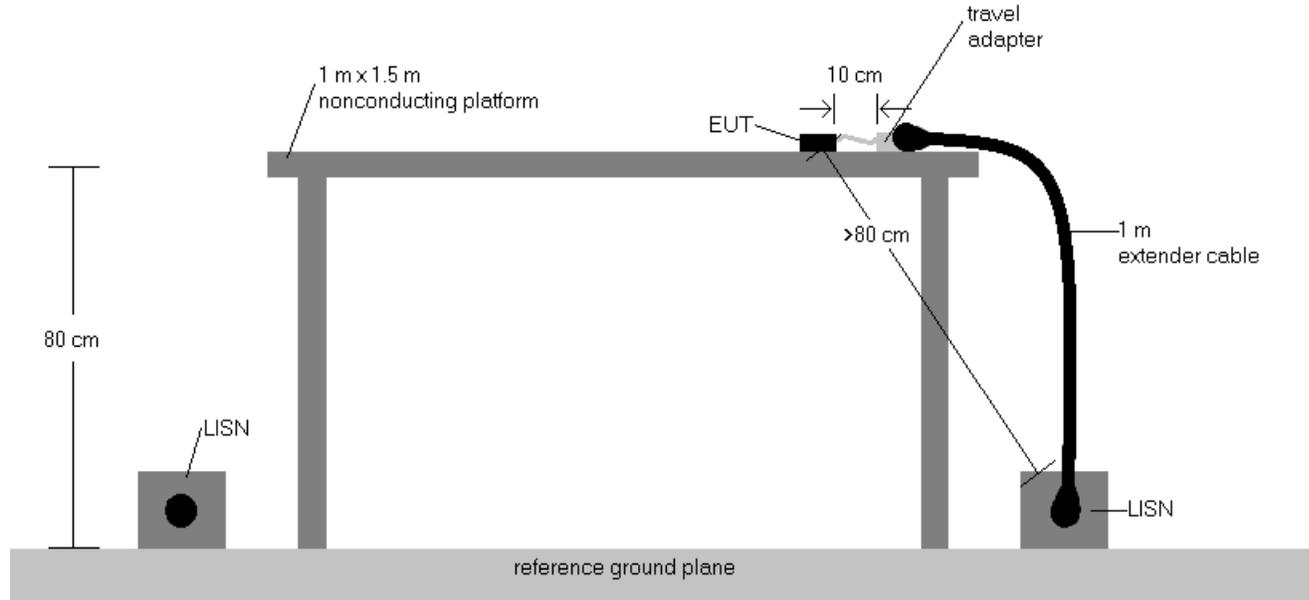
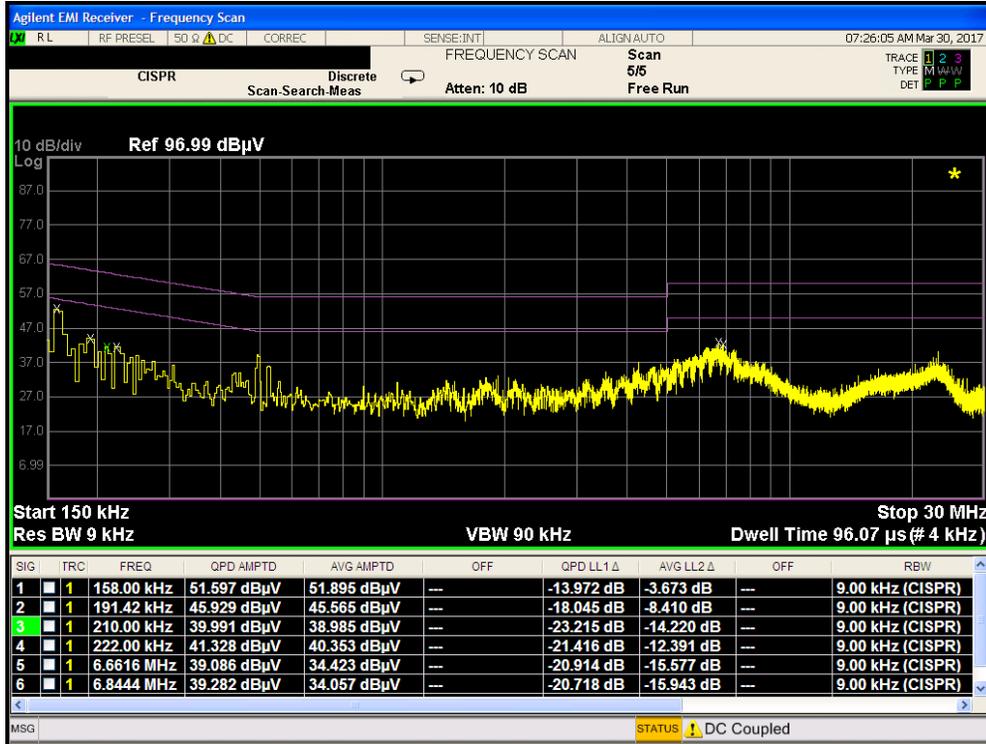


Figure 7-5. Test Instrument & Measurement Setup

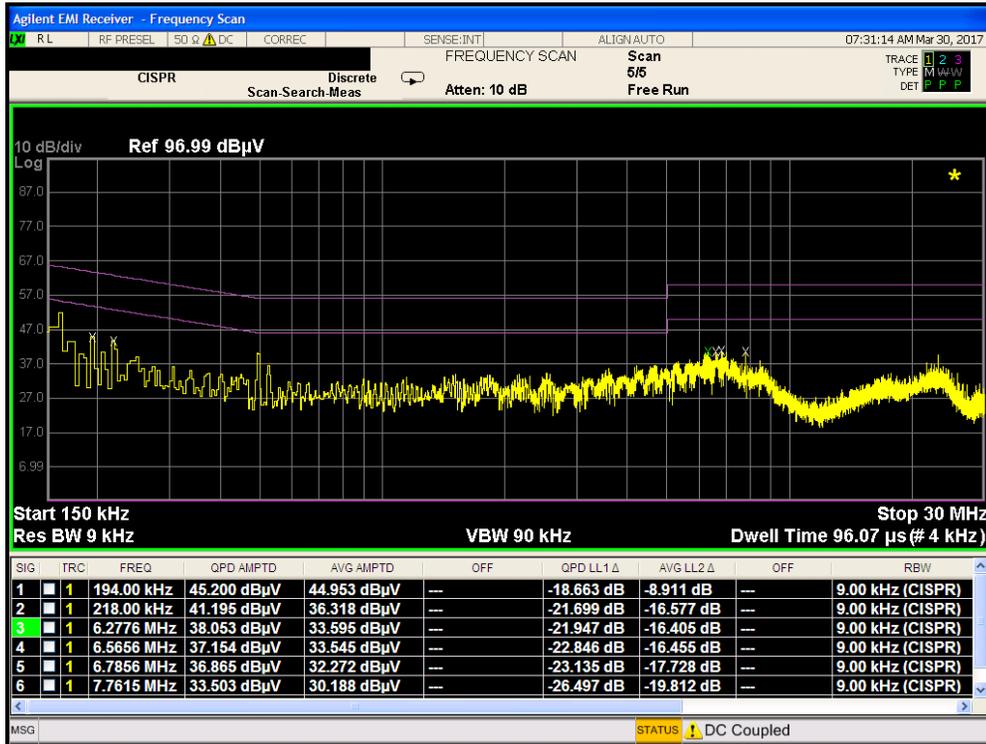
Test Notes

1. All modes of operation were investigated and the worst-case emissions are reported using mid channel. The emissions found were not affected by the choice of channel used during testing.
2. The limit for an intentional radiator from 150kHz to 30MHz are specified in 15.207.
3. $\text{Corr. (dB)} = \text{Cable loss (dB)} + \text{LISN insertion factor (dB)}$
4. $\text{QP/AV Level (dB}\mu\text{V)} = \text{QP/AV Analyzer/Receiver Level (dB}\mu\text{V)} + \text{Corr. (dB)}$
5. $\text{Margin (dB)} = \text{QP/AV Limit (dB}\mu\text{V)} - \text{QP/AV Level (dB}\mu\text{V)}$
6. Traces shown in plot are made using a peak detector.
7. Deviations to the Specifications: None.

| | | | | |
|--|---|---|---|--|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 126 of 136 | |

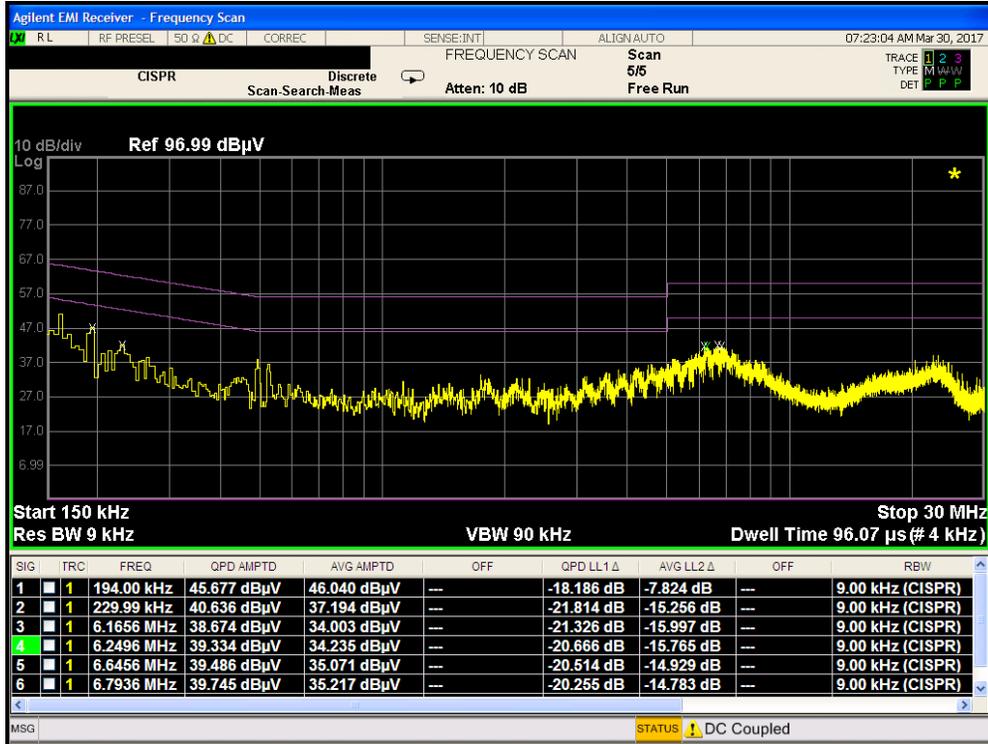


Plot 7-137. Line Conducted Plot with 802.11a UNII Band 2A (L1)

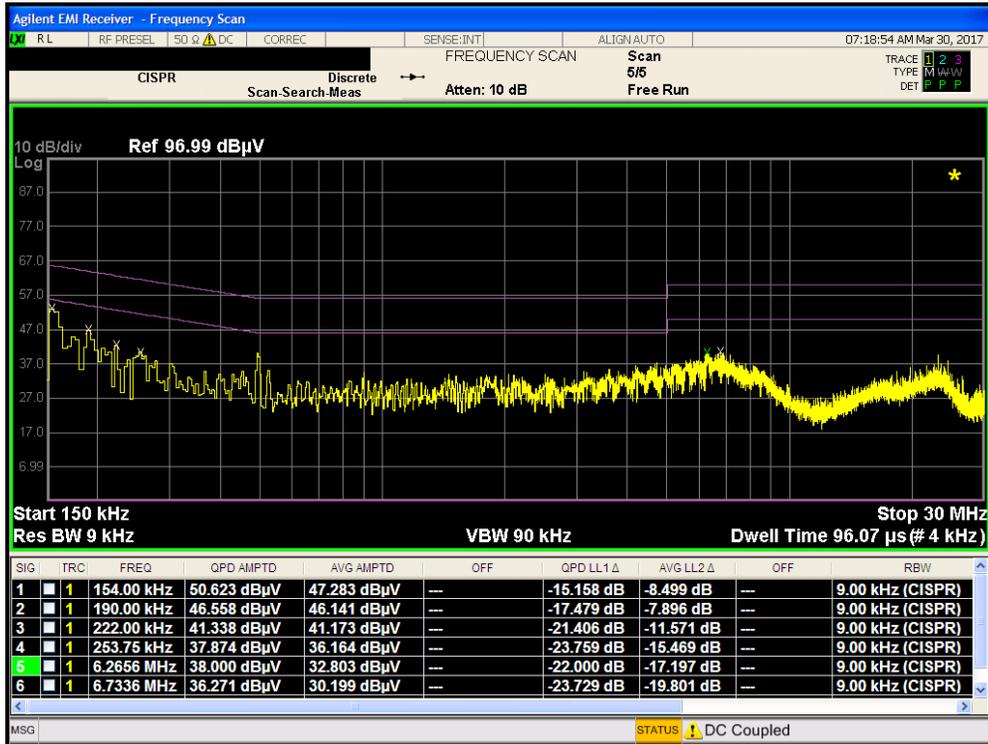


Plot 7-138. Line Conducted Plot with 802.11a UNII Band 2A (N)

| | | | | | |
|---|------------------------------|----------------------------------|---|-----------------|---------------------------------|
| FCC ID: A3LETWV520 | | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 127 of 136 | |



Plot 7-139. Line Conducted Plot with 802.11a UNII Band 2C (L1)



Plot 7-140. Line Conducted Plot with 802.11a UNII Band 2C (N)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 128 of 136 |

8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Samsung Indoor Access Point FCC ID: A3LETWV520** is in compliance with Part 15E of the FCC Rules.

| | | | | |
|--|---|---|---|--|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 129 of 136 | |

APPENDIX A. 802.11A DUAL TX

A.1 Summary

| FCC Part Section(s) | Test Description | Test Limit | Test Condition | Test Result | Reference |
|------------------------------|---|--|----------------|-------------|-------------|
| TRANSMITTER MODE (TX) | | | | | |
| 15.407 (a.2) | Maximum Conducted Output Power | Maximum conducted powers must meet limits detailed in 15.407(a) | CONDUCTED | PASS | Section A.2 |
| 15.407 (a.2), (5) | Maximum Power Spectral Density | Maximum power spectral density must meet the limits detailed in 15.407(a) | | PASS | Section A.3 |
| 15.205, 15.407(b.6) | General Field Strength Limits (Restricted Bands and Radiated Emission Limits) | Emissions in restricted bands must meet the radiated limits detailed in 15.209 | RADIATED | PASS | Section A.4 |

Table A.1-1. Summary of Test Results

Notes:

1. This device employs dual transmission in 802.11a and 802.11g modes using Cyclic Delay Diversity. For all test cases, the device was set to transmit from four antennas simultaneously. The data in this section demonstrates compliance to the dual-transmission requirements specified in KDB 662911 v02r01.
2. All data found in this section is compiled from plots found in the main body of this test report.
3. Since this device is able to transmit the same data through two of its antennas in a given symbol period, then, by the definition specified in KDB 662911 v02r01 Section F)1), the transmission symbols are correlated.
4. Per KDB 662911 v02r01, for CDD operation where $N_{ss} = 1$, the array gain for power density measurements is equal to $10\log(N_{ANT}/N_{SS})$ dB and the array gain for power measurements is 0dB.

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 130 of 136 | |

A.2 Output Power Measurement

§15.407 (a.2)

Test Overview

Using the “Measure and Sum” technique, the measured conducted power values were summed in linear power units then converted back to dBm. Original measured values are found in Section 7.4 of this report.

| Freq [MHz] | Channel | Detector | Directional Gain [dBi] | 5GHz (20MHz) Conducted Power [dBm] | | | Max Permissible Power [dBm] | Adjusted Limit [dBm] | Margin [dB] |
|------------|---------|----------|------------------------|------------------------------------|-------|-------|-----------------------------|----------------------|-------------|
| | | | | IEEE Transmission Mode | | | | | |
| | | | | ANT1 | ANT2 | CDD | | | |
| 5260 | 52 | AVG | 6.31 | 17.15 | 17.34 | 20.26 | 23.98 | 23.67 | -3.41 |
| 5280 | 56 | AVG | 6.31 | 17.13 | 17.34 | 20.25 | 23.98 | 23.67 | -3.42 |
| 5300 | 60 | AVG | 6.31 | 17.04 | 17.19 | 20.13 | 23.98 | 23.67 | -3.54 |
| 5320 | 64 | AVG | 6.31 | 15.01 | 15.12 | 18.08 | 23.98 | 23.67 | -5.59 |
| 5500 | 100 | AVG | 6.08 | 16.84 | 17.65 | 20.27 | 23.98 | 23.90 | -3.63 |
| 5600 | 120 | AVG | 6.08 | 16.96 | 17.36 | 20.17 | 23.98 | 23.90 | -3.73 |
| 5620 | 124 | AVG | 6.08 | 16.98 | 17.33 | 20.17 | 23.98 | 23.90 | -3.73 |
| 5720 | 144 | AVG | 6.08 | 17.59 | 17.41 | 20.51 | 23.98 | 23.90 | -3.39 |

Table A.2-1. Dual Tx 802.11a-mode Conducted Output Power Measurements

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
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A.3 Power Spectral Density

§15.407 (a.2) (5)

Test Overview

Using the “Measure and Sum” technique, the measured conducted power density values were summed in linear power units then converted back to dBm. Original measured values are found in Section 7.5 of this report.

| | Frequency [MHz] | Channel No. | 802.11 Mode | Data Rate [Mbps] | Directional Gain [dBi] | Antenna-1 Power Density [dBm] | Antenna-2 Power Density [dBm] | Summed MIMO Power Density [dBm] | Max Permissible Power Density [dBm/MHz] | Adjusted Limit [dBm/MHz] | Margin [dB] | Pass / Fail |
|---------|-----------------|-------------|-------------|------------------|------------------------|-------------------------------|-------------------------------|---------------------------------|---|--------------------------|-------------|-------------|
| Band 2A | 5260 | 52 | a | 6 | 6.31 | 6.66 | 6.70 | 9.69 | 11.0 | 10.69 | -1.00 | Pass |
| | 5280 | 56 | a | 6 | 6.31 | 6.65 | 6.80 | 9.74 | 11.0 | 10.69 | -0.95 | Pass |
| | 5320 | 64 | a | 6 | 6.31 | 6.66 | 6.64 | 9.66 | 11.0 | 10.69 | -1.03 | Pass |
| Band 2C | 5500 | 100 | a | 6 | 6.08 | 6.48 | 7.22 | 9.88 | 11.0 | 10.92 | -1.04 | Pass |
| | 5600 | 120 | a | 6 | 6.08 | 6.75 | 6.77 | 9.77 | 11.0 | 10.92 | -1.15 | Pass |
| | 5720 | 144 | a | 6 | 6.08 | 7.56 | 6.47 | 10.06 | 11.0 | 10.92 | -0.86 | Pass |

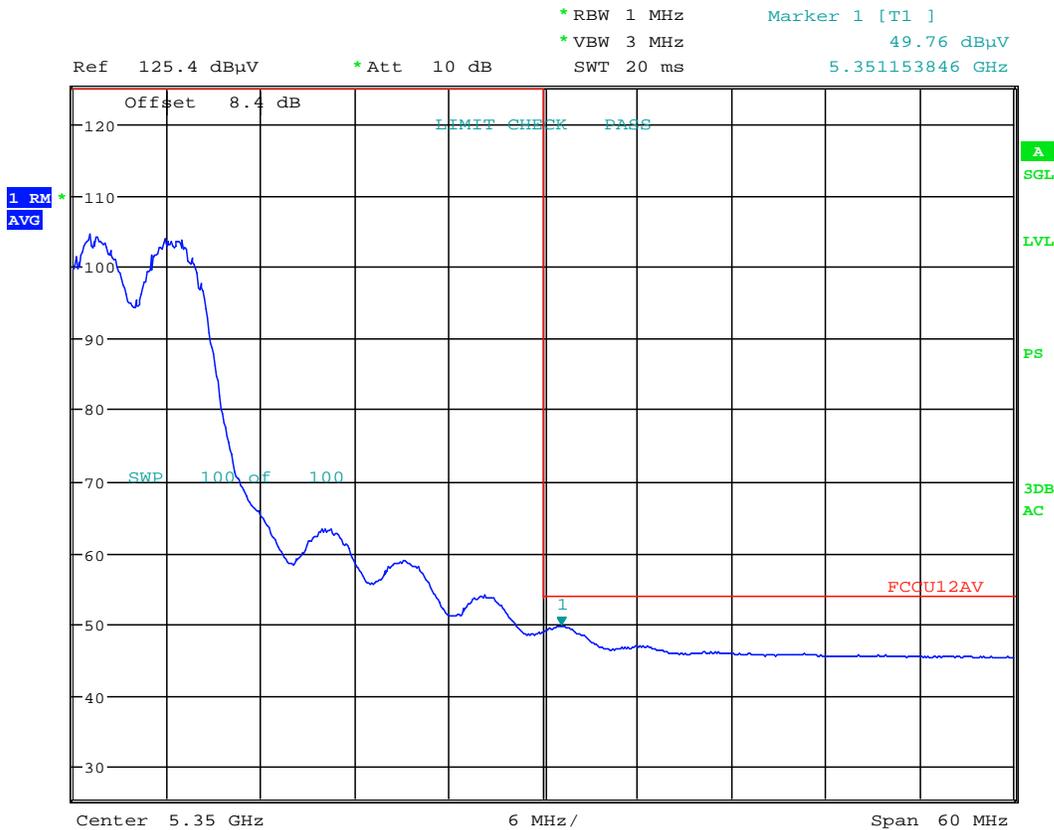
Table A.3-1.802.11a Dual Tx Conducted Power Density Measurements

| | | | | |
|---|---|---|---|---------------------------------|
| FCC ID: A3LETWV520 |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) |  | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 132 of 136 | |

A.4 Dual Tx Radiated Restricted Band Edge Measurements §15.205 §15.209

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting on both outputs in 802.11a mode.

Worst Case Mode: 802.11a (20MHz)
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 3 Meters
 Operating Frequency: 5320MHz
 Channel: 64

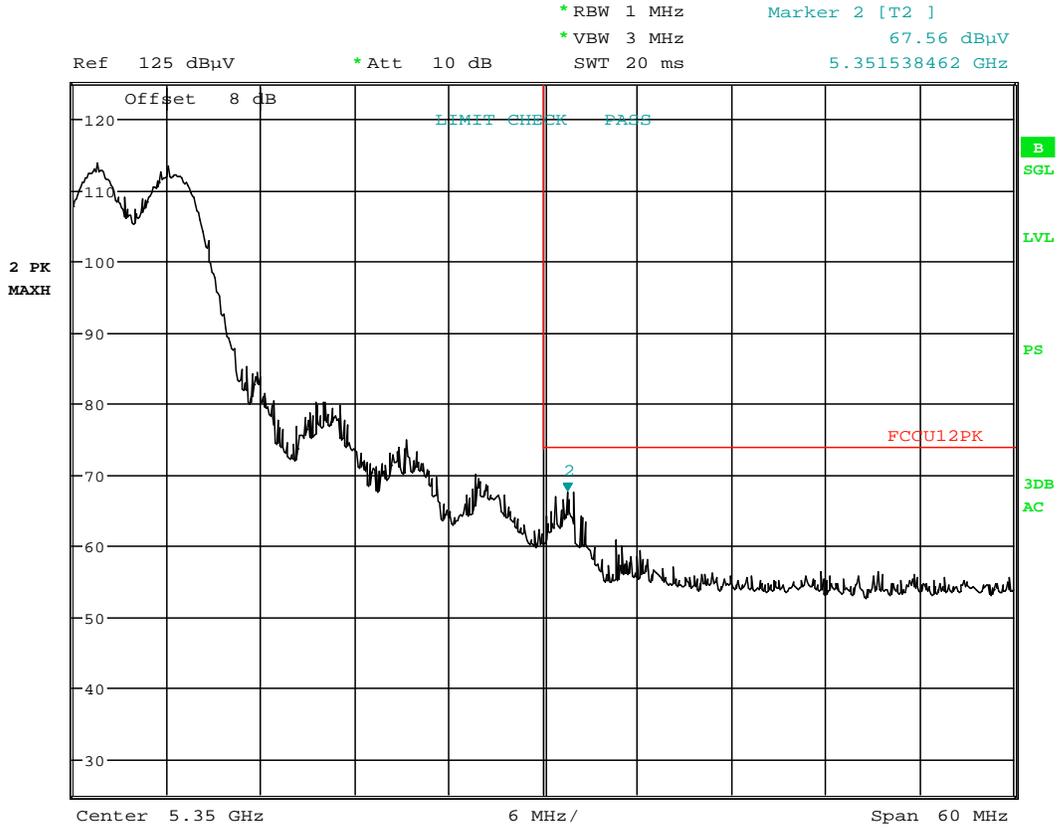


Date: 23.MAR.2017 10:52:14

Plot A.4-1. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2A)

| | | | | |
|---|------------------------------|---|--|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 133 of 136 |

Dual-Tx Radiated Band Edge Measurements (20MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209



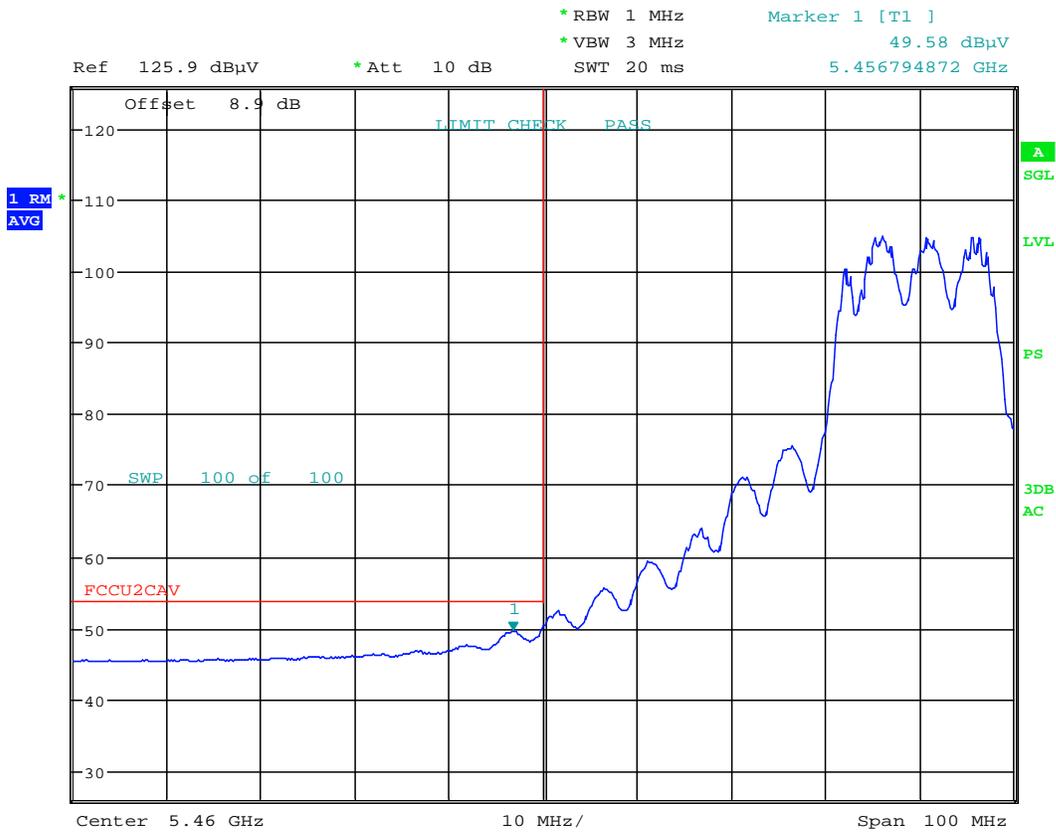
Date: 23.MAR.2017 10:52:35

Plot A.4-2. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2A)

| | | | | |
|--|-------------------------------------|--|-----------------|--|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 134 of 136 | |

Dual-Tx Radiated Band Edge Measurements (20MHz BW)
§15.407(b.2)(b.3) §15.205 §15.209

Worst Case Mode: 802.11a (20MHz)
 Worst Case Transfer Rate: 6Mbps
 Distance of Measurements: 3 Meters
 Operating Frequency: 5500MHz
 Channel: 100



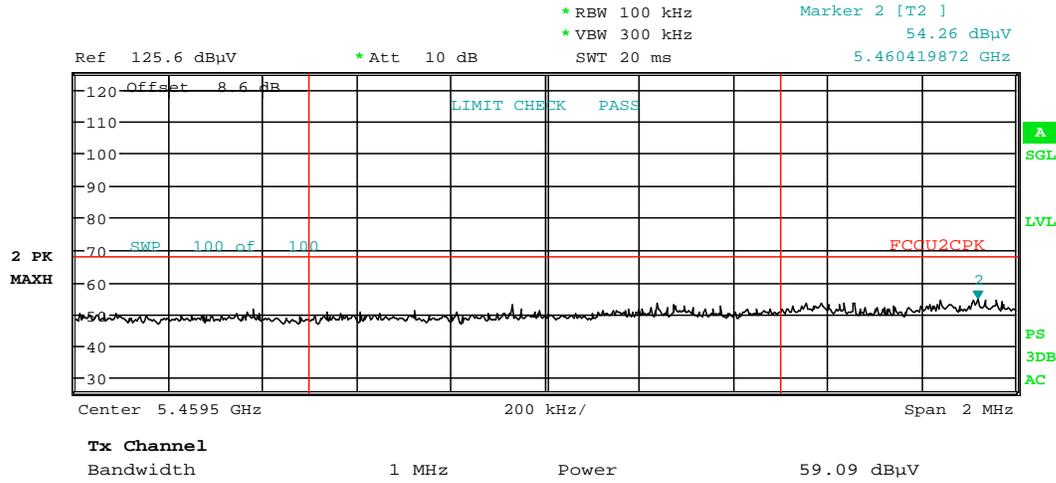
Date: 23.MAR.2017 11:04:04

Plot A.4-3. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 2C)

| | | | | |
|---|---|---|----------------|---------------------------------|
| FCC ID: A3LETWV520 | PCTEST ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | SAMSUNG | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | | Page 135 of 136 |

Dual-Tx Radiated Band Edge Measurements (20MHz BW)

§15.407(b.2)(b.3) §15.205 §15.209



Date: 23.MAR.2017 11:05:59

Plot A.4-4. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 2C)

Note:

Per KDB 789033 Section II)G)3)d)ii, the Integration method was used to determine compliance with the out-of-band emission limits.

| | | | | |
|---|------------------------------|---|-----------------|---------------------------------|
| FCC ID: A3LETWV520 | | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE) | | Approved by: Quality Manager |
| Test Report S/N: 1M1703270127-01.A3L | Test Dates: 3/21-6/5/2017 | EUT Type: Indoor Access Point | Page 136 of 136 | |