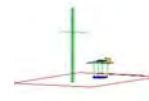


PCTEST ENGINEERING LABORATORY, INC.

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 License Assisted Access (LAA)

Applicant Name:

Qualcomm Technologies, Inc.
5775 Morehouse Drive
San Diego, CA 92121
United States

Date of Testing:

12/23/2015-3/5/2016

Test Site/Location:

PCTEST Lab, Columbia, MD, USA

Test Report Serial No.:

0Y1607131258-R3.J9C

FCC ID:

J9CMTP9900LAA

APPLICANT:

Qualcomm Technologies, Inc.

Application Type:

Certification

Model(s):

MTP9900LAA

EUT Type:

LAA Release 13 Small Cell

FCC Classification:

Unlicensed National Information Infrastructure (UNII)

FCC Rule Part(s):

Part 15.407

Test Procedure(s):

KDB 789033 D02 v01r02, KDB 662911 D01 v02r01

Test Device Serial No.:


49173051545003, 49173051545004

Mode	UNII Band	Channel Bandwidth (MHz)	Frequency (MHz)	Conducted Output Power					
				Chain0		Chain1		Total Power	
				Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)	Max. Power (mW)	Max. Power (dBm)
LAA	1 / 46a	20	5160 - 5240	0.174	22.40	0.173	22.39	0.347	25.41
	3 / 46d	20	5745 - 5825	0.252	24.01	0.246	23.91	0.493	26.93
	1 / 46a	40	5170 - 5230	0.079	18.96	0.083	19.18	0.161	22.08
	3 / 46d	40	5755 - 5815	0.243	23.85	0.238	23.76	0.480	26.82

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 v01r02 and KDB 662911 D01 v02r01. Test results reported herein relate only to the item(s) tested.

This revised Test Report (S/N: 0Y1607131258-R3.J9C) supersedes and replaces the previously issued test report (S/N: 0Y1607131258-R2.J9C) on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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





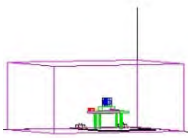
FCC ID: J9CMTP9900LAA		FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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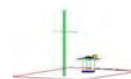
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MEASUREMENT REPORT

FCC Part 15.407



§ 2.1033 General Information

APPLICANT: Qualcomm Technologies, Inc.

APPLICANT ADDRESS: 5775 Morehouse Drive
San Diego, CA 92121, United States

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: MTP9900LAA

SKU NUMBER: 65-F5230-910

MCN NUMBER: 10-F5230-006

FCC ID: J9CMTP9900LAA

FCC CLASSIFICATION: Unlicensed National Information Infrastructure (UNII)

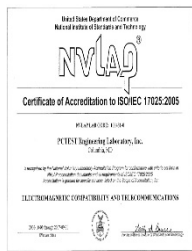
Test Device Serial No.: 49173051545003, ☐ Production ☒ Pre-Production ☐ Engineering
49173051545004

DATE(S) OF TEST: 12/23/2015-3/5/2016


TEST REPORT S/N: 0Y1607131258-R3.J9C

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.

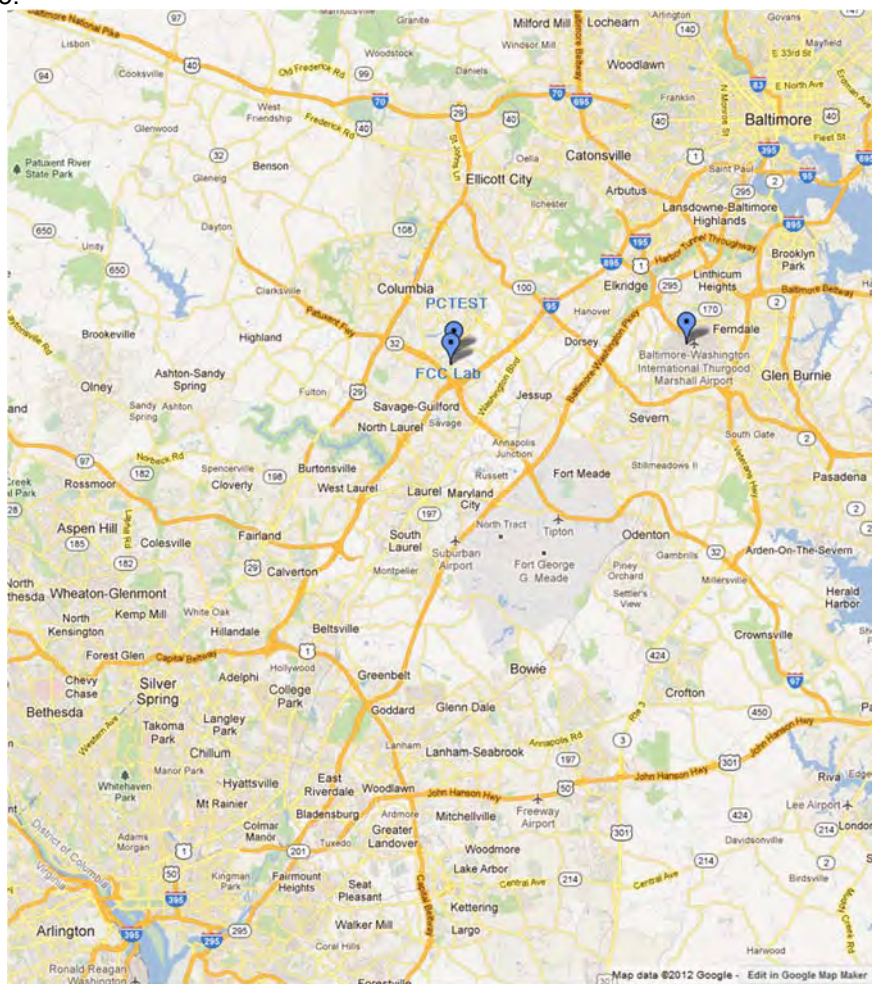


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Qualcomm LAA Release 13 Small Cell FCC ID: J9CMTP9900LAA**. The test hardware SKU identification number is 65-F5230-910. The test data contained in this report pertains only to the emissions due to the EUT's LAA transmitter.

2.2 Device Capabilities

This device contains the following capabilities:

LTE Band 2 (5/10/15/20MHz BW), LTE Band 4 (5/10/15/20MHz BW), LAA (5GHz - UNII-1, UNII-3 (20/40MHz BW)), 802.11a (20MHz BW)

Both LAA and LTE portion of the device are of 2x2 MIMO.


2.3 Test Configuration

The Qualcomm LAA Release 13 Small Cell FCC ID: J9CMTP9900LAA was tested per the guidance of KDB 789033 D02 v01r02. 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, 7.4, and 7.5 for antenna port conducted emissions test setups.

During LAA testing, one LTE carrier operates in either Band 2 (1930 – 1990MHz) or Band 4 (2110 – 2155MHz) while the other LTE carrier operates in the UNII 1 Band (5150 – 5250MHz) or the UNII 3 Band (5725 – 5850MHz). MIMO operation is considered while two LTE carriers are active (Chain0 and Chain1) in the same band on the same channel.

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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3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013) and the guidance provided in KDB 789033 D02 v01r02 were used in the measurement of **Qualcomm LAA Release 13 Small Cell FCC ID: J9CMTP9900LAA**.

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. Each emission was also maximized by varying: power lines, the mode of operation or resolution, clock or data exchange speed, scrolling H pattern to the EUT and/or support equipment whichever determined the worst-case 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 7.11. Automated test software was used to perform the 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. For measurements above 1GHz 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 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 below 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, clock speed, mode of operation or video resolution, if applicable, 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.

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).

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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 LAA Release 13 Small Cell will use a unique coupling and will have a maximum gain of 6dBi.

Conclusion:


The **Qualcomm LAA Release 13 Small Cell FCC ID: J9CMTP9900LAA** unit complies with the requirement of §15.203.

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5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of CISPR 16-4-2. All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95% level of confidence. The measurement data shown herein 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

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6.0 TEST EQUIPMENT CALIBRATION DATA


Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	4/28/2015	Annual	4/28/2016	RE1
-	WL40-1	Conducted Cable Set (40GHz)	4/20/2015	Annual	4/20/2016	WL40-1
Agilent	8447D	Broadband Amplifier	6/12/2015	Annual	6/12/2016	1937A03348
Agilent	N9038A	MXE EMI Receiver	3/24/2015	Annual	3/24/2016	MY51210133
Agilent	N9030A	PXA Signal Analyzer (44GHz)	3/24/2015	Annual	3/24/2016	MY52350166
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Anritsu	MA2411B	Pulse Power Sensor	10/14/2015	Biennial	10/14/2017	846215
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	7/30/2015	Biennial	7/30/2017	121034
Emco	3115	Horn Antenna (1-18GHz)	3/30/2014	Biennial	3/30/2016	9704-5182
Espec	ESX-2CA	Environmental Chamber	3/17/2015	Annual	3/17/2016	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/8/2014	Biennial	4/8/2016	125518
ETS Lindgren	3160-09	18-26.5 GHz Standard Gain Horn	6/17/2014	Biennial	6/17/2016	135427
ETS Lindgren	3160-10	26.5-40 GHz Standard Gain Horn	6/17/2014	Biennial	6/17/2016	130993
ETS-Lindgren	3816/2NM	Line Impedance Stabilization Network	11/11/2014	Biennial	11/11/2016	114451
Huber+Suhner	Sucoflex 102A	40GHz Radiated Cable	4/20/2015	Annual	4/20/2016	251425001
K & L	11SH10-6000/T18000	High Pass Filter	7/18/2015	Annual	7/18/2016	11SH10-6000/T18000-1
K & L	11SH10-3075/U18000	High Pass Filter	7/18/2015	Annual	7/18/2016	11SH10-3075/U18000-2
Pasternack	NMLC-1	Line Conducted Emissions Cable (NM)	4/28/2015	Annual	4/28/2016	NMLC-1
Rhode & Schwarz	TS-PR18	Pre-Amplifier	3/5/2015	Annual	3/5/2016	101622
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	3/5/2015	Annual	3/5/2016	100071
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	3/3/2015	Annual	3/3/2016	100040
Rohde & Schwarz	TS-PR40	26.5-40 GHz Pre-Amplifier	3/3/2015	Annual	3/3/2016	100037
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	3/12/2015	Annual	3/12/2016	100342
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	6/2/2015	Annual	6/2/2016	103200
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/18/2014	Biennial	3/18/2016	N/A
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)	3/28/2014	Biennial	3/28/2016	A051107
Sunol Sciences	DRH-118	Horn Antenna	7/1/2015	Biennial	7/1/2017	A060215
VWR	62344-734	Thermometer with Clock	2/20/2014	Biennial	3/20/2016	140140336

Table 6-1. Annual Test Equipment Calibration Schedule

Note:

Items whose calibration date lies within the test date range (e.g. TS-PR26 and TS-PR40) were not used to make calibrated measurements after their calibration due date.

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7.0 TEST RESULTS

7.1 Summary

Company Name: Qualcomm Technologies, Inc.
 FCC ID: J9CMTP9900LAA
 Method/System: Unlicensed National Information Infrastructure (UNII)

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (TX)					
15.407(a)	26dB Bandwidth	N/A	CONDUCTED	PASS	Section 7.2
15.407(e)	6dB Bandwidth	>500kHz (5725-5850MHz)		PASS	Section 7.3
15.407 (a)(1)	Maximum Conducted Output Power	< 1W (30dBm) (5150-5250MHz, 5725-5850MHz)		PASS	Section 7.4
15.407(a)(1), 15.407(a)(5)	Maximum Power Spectral Density	< 11 dBm/MHz (5150-5250MHz) < 30 dBm/500kHz (5725-5850MHz)		PASS	Section 7.5
15.407(g)	Frequency Stability	N/A		PASS	Section 7.8
15.407(b)(1), 15.407(b)(4)	Undesirable Emissions	< -27 dBm/MHz EIRP (outside 5150-5350MHz, 5470-5725MHz, 5715-5860MHz) < -17 dBm/MHz EIRP (within 5715-5725MHz and 5850-5860MHz)		PASS	Section 7.9
15.209, 15.407(b)(1), 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	CABINET RADIATED	PASS	Section 7.9, 7.10
15.207, 15.407(b)(6)	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits	LINE CONDUCTED	PASS	Section 7.11

Table 7-1. Summary of Test Results

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Notes:

- 1) This device was evaluated for compliance using conducted measurements along with cabinet radiated emission measurements, per KDB 789033.
- 2) All channels, modes, modulations, and channel bandwidths were investigated among all UNII bands. The test results shown in the following sections represent the worst case emissions. The test channels are shown below:

	3GPP R13 Band 46 Freq. (MHz)	3GPP R13 Band 46 Ch #	3GPP R13 Band 46 LAA Signal BW
Sub-band 46a			
UNII-1	5160	46890	20MHz
	5170	46890 47090	40MHz
	5200	47290	20MHz
	5210	47290 47490	40MHz
	5230	47490 47690	40MHz
	5240	47690	20MHz
Sub-band 46d			
UNII-3	5745	52740	20MHz
	5755	52740 52940	40MHz
	5785	53140	20MHz
	5795	53140 53340	40MHz
	5815	53340 53540	40MHz
	5825	53540	20MHz

Table 7-2. LAA Frequency / Channel Operations

- 3) The 3GPP Band 46 supports device operation only in UNII-1 and UNII-3 frequencies.
- 4) 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. Also included in the correction table were offsets to account for array gain which is comprised of the maximum antenna gain of 6dBi and an additional 3dB due to two antennas transmitting simultaneously.
- 5) 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.
- 6) For 40MHz operation, two 20MHz 3GPP channels are used to generate the 40MHz channel.

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7.2 26dB Bandwidth Measurement (UNII Band 1)

§15.407 (a)

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 v01r02, 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 v01r02 – 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.

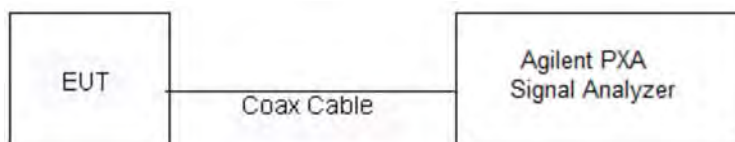



Figure 7-1. Test Instrument & Measurement Setup

Test Notes

None.

FCC ID: J9CMT9900LAA		FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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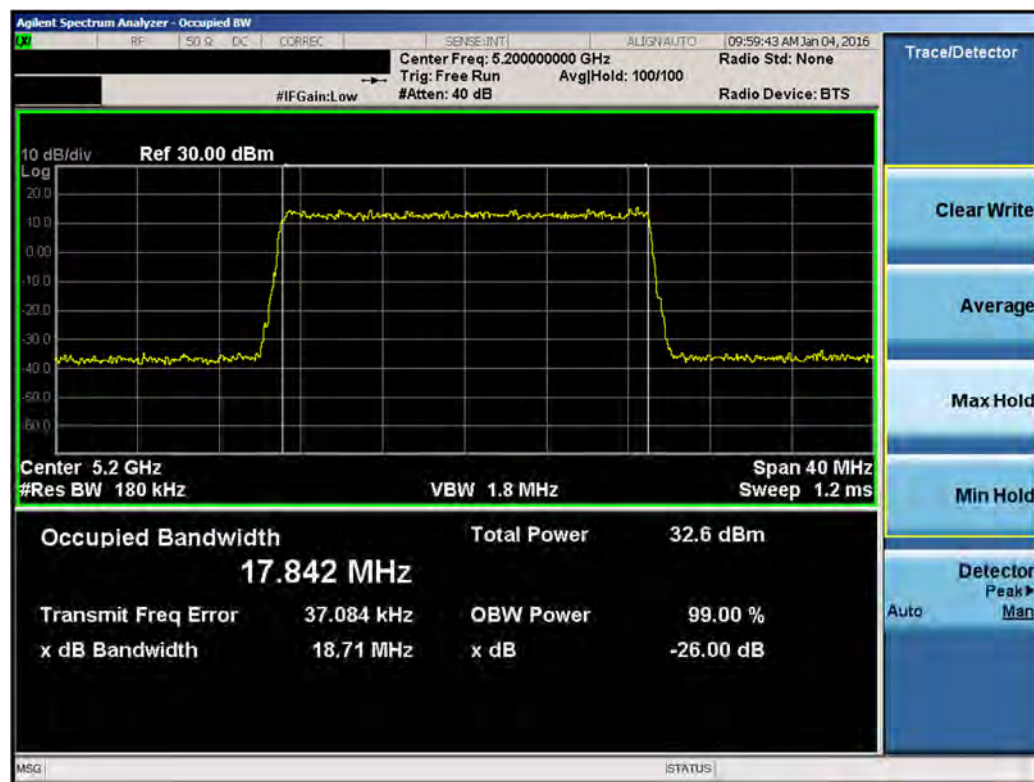
26 dB Bandwidth Measurements (Cont'd)

§15.407 (a)

Chain0

	Frequency [MHz]	3GPP R13 Channel Number(s)	Nominal BW [MHz]	Measured 26dB Bandwidth [MHz]
UNII Band 1	5160	46890	20	-
	5200	47290	20	18.71
	5240	47690	20	-

Table 7-3. Conducted 26dB Bandwidth Measurements (Chain0)



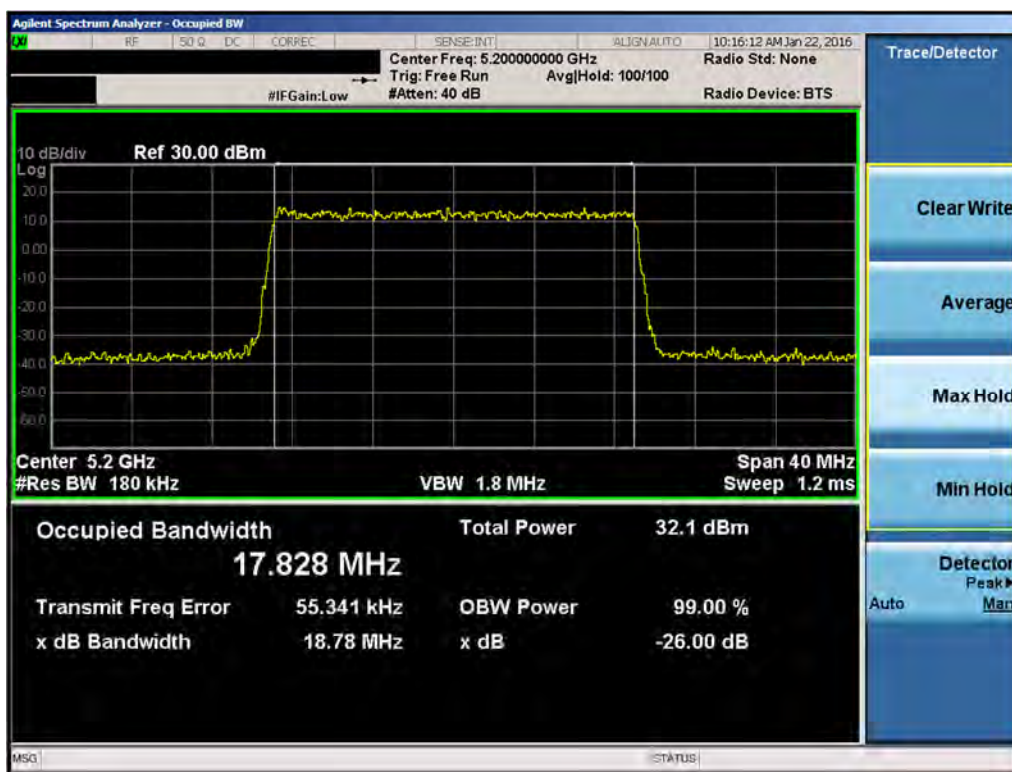
Plot 7-1. 26dB Bandwidth Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47290)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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Chain1

	Frequency [MHz]	3GPP R13 Channel Number(s)	Nominal BW [MHz]	Measured 26dB Bandwidth [MHz]
UNII Band 1	5160	46890	20	-
	5200	47290	20	18.78
	5240	47690	20	-

Table 7-4. Conducted 26dB Bandwidth Measurements (Chain1)



Plot 7-2. 26dB Bandwidth Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47290)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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7.3 6dB Bandwidth Measurement (UNII Band 3)

§15.407 (e)

Test Overview and Limit

The bandwidth at 6dB 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 v01r02, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 6dB bandwidth.

In the 5.725 – 5.850GHz band, the 6dB bandwidth must be ≥ 500 kHz.

Test Procedure Used

KDB 789033 D02 v01r02 – Section C

Test Settings

1. The signal analyzers' automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to $X = 6$. 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 = 100 kHz
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple

Test Setup

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

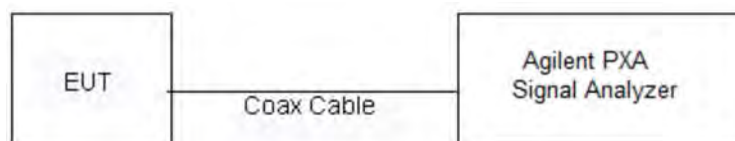



Figure 7-2. Test Instrument & Measurement Setup

Test Notes

None.

FCC ID: J9CMTP9900LAA		FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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6 dB Bandwidth Measurements

Chain0

	Frequency [MHz]	3GPP R13 Channel Number(s)	Nominal BW [MHz]	Measured 6dB Bandwidth [MHz]
UNII Band 3	5745	52740	20	-
	5785	53140	20	18.00
	5825	53540	20	-

Table 7-5. Conducted 6dB Bandwidth Measurements (Chain0)



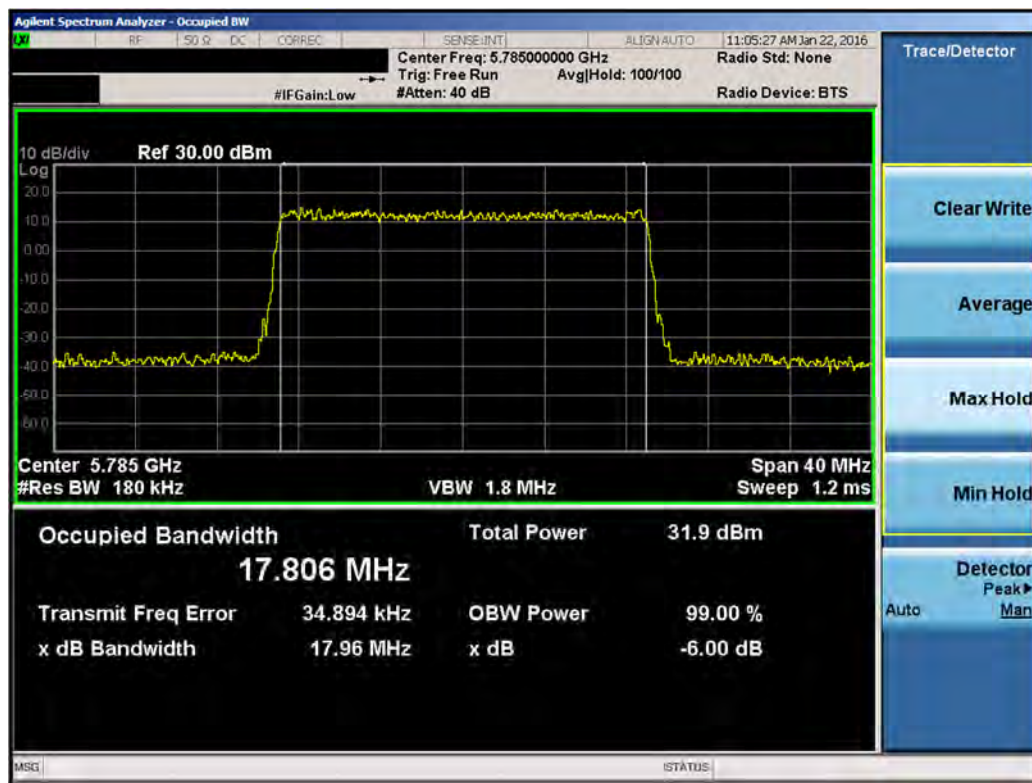
Plot 7-3. 6dB Bandwidth Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53140)

FCC ID: J9CMTP9900LAA		FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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Chain1

	Frequency [MHz]	3GPP R13 Channel Number(s)	Nominal BW [MHz]	Measured 6dB Bandwidth [MHz]
UNII Band 3	5745	52740	20	-
	5785	53140	20	17.96
	5825	53540	20	-

Table 7-6. Conducted 6dB Bandwidth Measurements (Chain1)



Plot 7-4. 6dB Bandwidth Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53140)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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7.4 Output Power Measurement

§15.407 (a.1)

Test Overview and Limits

A transmitter antenna terminal of the EUT is connected to the input of a broadband spectrum analyzer. Measurement is made using the analyzer while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02 v01r02, and at the appropriate frequencies.

For MIMO measurements, the conducted average (RMS) output powers are added linearly via the “Measure and Sum” technique in KDB 662911 D01 v02r01. All modes of operation were investigated and the worst case configuration results are reported in this section.

In the 5.15 – 5.25GHz and 5.725 – 5.850GHz bands, the maximum permissible conducted output power is 1W (30dBm).

Test Procedure Used

KDB 789033 D02 v01r02 – Section E)2)b) Method SA-1
KDB 662911 v02r01 – Section E)1) Measure-and-Sum Technique

Test Settings

1. The signal analyzer’s automatic “Channel Power” function was used to perform the conducted output power measurements. The integration bandwidth is set to at least the emission bandwidth.
2. RBW = 1MHz
3. VBW = 3MHz
4. Number of sweep points $\geq 2 \times (\text{span}/\text{RBW})$
5. Sweep time = auto
6. Detector = power averaging (RMS)
7. Trigger was set to free run for all modes
8. Trace was averaged over 100 sweeps

Test Setup

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

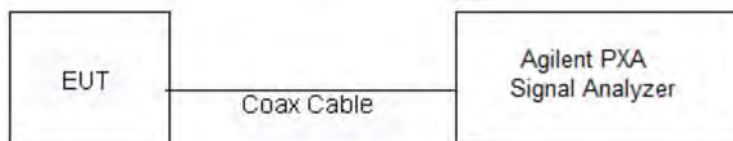



Figure 7-3. Test Instrument & Measurement Setup

Test Notes

The total directional gain is calculated from the maximum 6dBi antenna gain and the 3dB from $N_{\text{ant}} = 2$ (two antennas transmitting simultaneously), per KDB 662911. Since the directional gain is above 6dBi, the output power limit is reduced by 3dB to assess compliance.

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Output Power Measurement (Cont'd)

Chain0 + Chain1 (Total Power) – Conducted Power

UNII Band	BW	Channel Frequency (MHz)	3GPP R13 Channel Number(s)	Directional Gain (dBi)	Chain0 Avg. Conducted Power (dBm)	Chain1 Avg. Conducted Power (dBm)	Total Conducted Power (dBm)	Limit (dBm)	Margin (dB)
UNII-1	20 MHz	5160	46890	9.0	15.55	16.74	19.20	27.00	-7.80
		5200	47290	9.0	22.40	22.39	25.41	27.00	-1.59
		5240	47690	9.0	22.31	22.08	25.21	27.00	-1.79
UNII-3		5745	52740	9.0	23.68	23.81	26.76	27.00	-0.24
		5785	53140	9.0	24.01	23.82	26.93	27.00	-0.07
		5825	53540	9.0	23.87	23.91	26.90	27.00	-0.10
UNII-1	40 MHz	5170	46890 47090	9.0	17.21	16.36	19.82	27.00	-7.18
		5210	47290 47490	9.0	18.96	18.43	21.71	27.00	-5.29
		5230	47490 47690	9.0	18.95	19.18	22.08	27.00	-4.92
UNII-3		5755	52740 52940	9.0	23.74	23.50	26.63	27.00	-0.37
		5795	53140 53340	9.0	23.85	23.76	26.82	27.00	-0.18
		5815	53340 53540	9.0	23.04	22.81	25.94	27.00	-1.06

Table 7-7. Total Conducted Powers (UNII Bands 1 and 3)

Note:

Per KDB 662911 v02r01 Section E2), the power spectral density at Chain0 and Chain1 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.


Directional Gain = $G_{ant} + 10\log_{10}(N_{ant}) = 9\text{dBi}$, where $G_{ant} = 6\text{dBi}$ and $N_{ant} = 2$

Sample Total Power Calculation:

At 5160MHz the average conducted power spectral density was measured to be 15.55 dBm for Chain0 and 16.74 dBm for Chain1.

Antenna 1 + Antenna 2 = Total Power

$$(15.55 \text{ dBm} + 16.74 \text{ dBm}) = (35.9 \text{ mW} + 47.2 \text{ mW}) = 83.11 \text{ mW} = 19.2 \text{ dBm}$$

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7.5 Maximum Power Spectral Density

§15.407(a.1)(a.3)

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 v01r02, and at the appropriate frequencies. Method SA-1, as defined in KDB 789033 D02 v01r02, was used to measure the power spectral density.

In the 5.15 – 5.25GHz, the maximum permissible power spectral density is 17dBm/MHz.

In the 5.725 – 5.850GHz band, the maximum permissible power spectral density is 30dBm/500kHz.

Test Procedure Used

KDB 789033 D02 v01r02 – 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 $\geq 2 \times (\text{span/RBW})$
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.

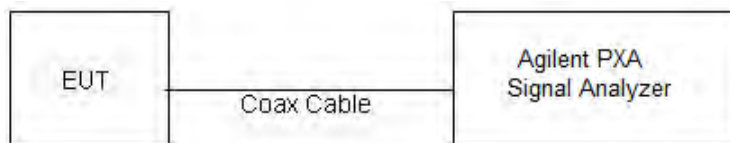



Figure 7-4. Test Instrument & Measurement Setup

Test Notes

The total directional gain is calculated from the maximum 6dBi antenna gain and the 3dB from $N_{\text{ant}} = 2$ (two antennas transmitting simultaneously), per KDB 662911. Since the directional gain is above 6dBi, the power density limit is reduced by 3dB to assess compliance.

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Power Spectral Density Measurements (Cont'd)

	Nominal BW [MHz]	Frequency [MHz]	3GPP R13 Channel Number(s)	Directional Gain (dBi)	Chain0 Power Density [dBm]	Chain1 Power Density [dBm]	Total Power Density [dBm]	Max Permissible Power Density [dBm/MHz]	Margin [dB]
UNII Band 1	20	5160	46890	9.0	4.27	4.83	7.57	14.0	-6.43
		5200	47290	9.0	10.78	10.60	13.70	14.0	-0.30
		5240	47690	9.0	10.71	10.64	13.69	14.0	-0.31
	40	5170	46890 47090	9.0	2.60	2.52	5.57	14.0	-8.43
		5210	47290 47490	9.0	5.18	4.40	7.82	14.0	-6.18
		5230	47490 47690	9.0	4.46	5.28	7.90	14.0	-6.10
UNII Band 3	20	5745	52740	9.0	9.93	10.79	13.39	27.0	-13.61
		5785	53140	9.0	10.16	10.82	13.51	27.0	-13.49
		5825	53540	9.0	10.12	10.53	13.34	27.0	-13.66
	40	5755	52740 52940	9.0	6.96	6.32	9.66	27.0	-17.34
		5795	53140 53340	9.0	7.64	7.71	10.69	27.0	-16.31
		5815	53340 53540	9.0	6.11	6.31	9.22	27.0	-17.78

Table 7-8. Total Conducted Power Spectral Density Measurements (UNII Bands 1 and 3)

Note:


Per KDB 662911 v02r01 Section E)2), the power spectral density at Chain0 and Chain1 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.

Sample Total Power Calculation:

At 5160MHz the average conducted power spectral density was measured to be 4.27 dBm for Chain0 and 4.83 dBm for Chain1.

$$\text{Antenna 1} + \text{Antenna 2} = \text{Total Power}$$

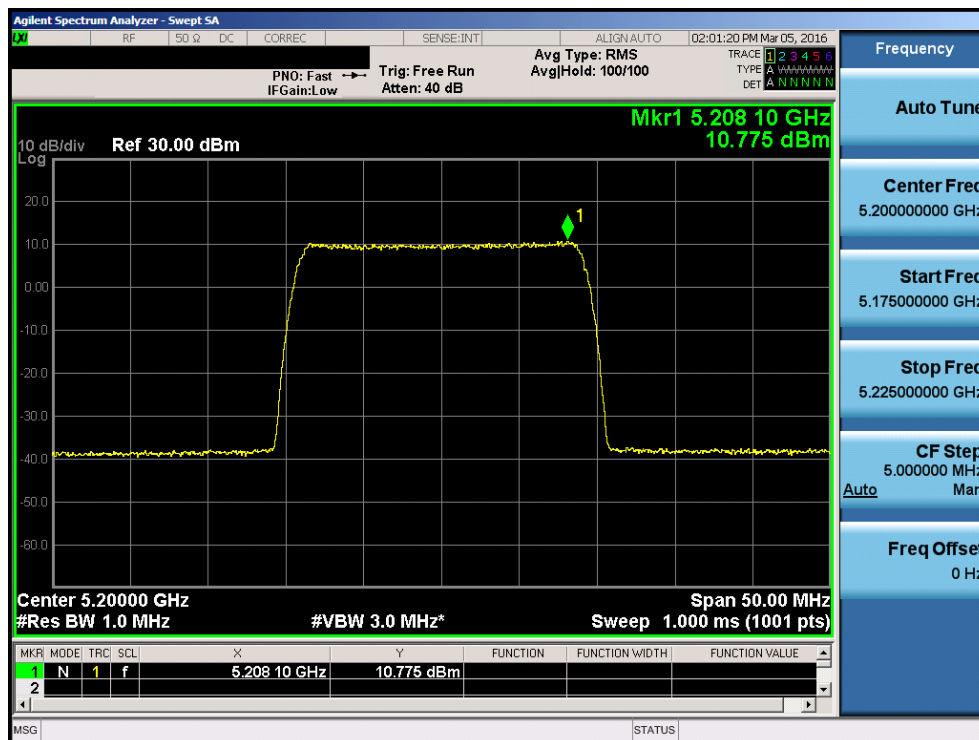
$$(4.27 \text{ dBm} + 4.83 \text{ dBm}) = (2.67 \text{ mW} + 3.04 \text{ mW}) = 5.71 \text{ mW} = 7.57 \text{ dBm}$$

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Chain0

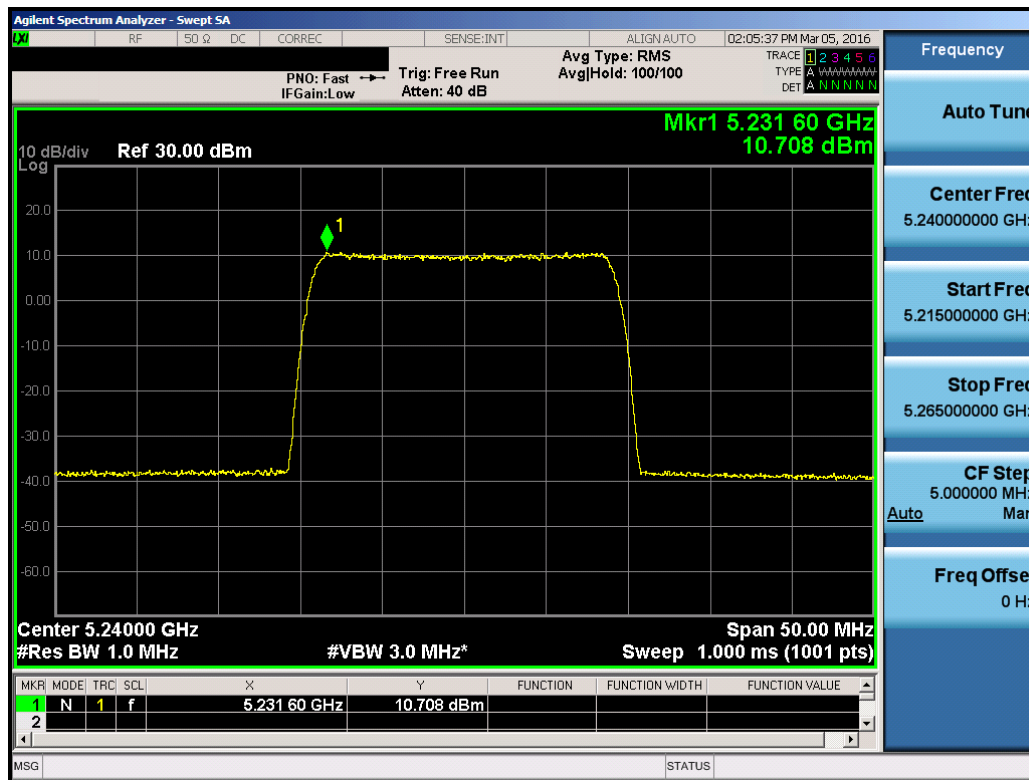


Plot 7-5. Power Spectral Density Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 46890)



Plot 7-6. Power Spectral Density Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47290)


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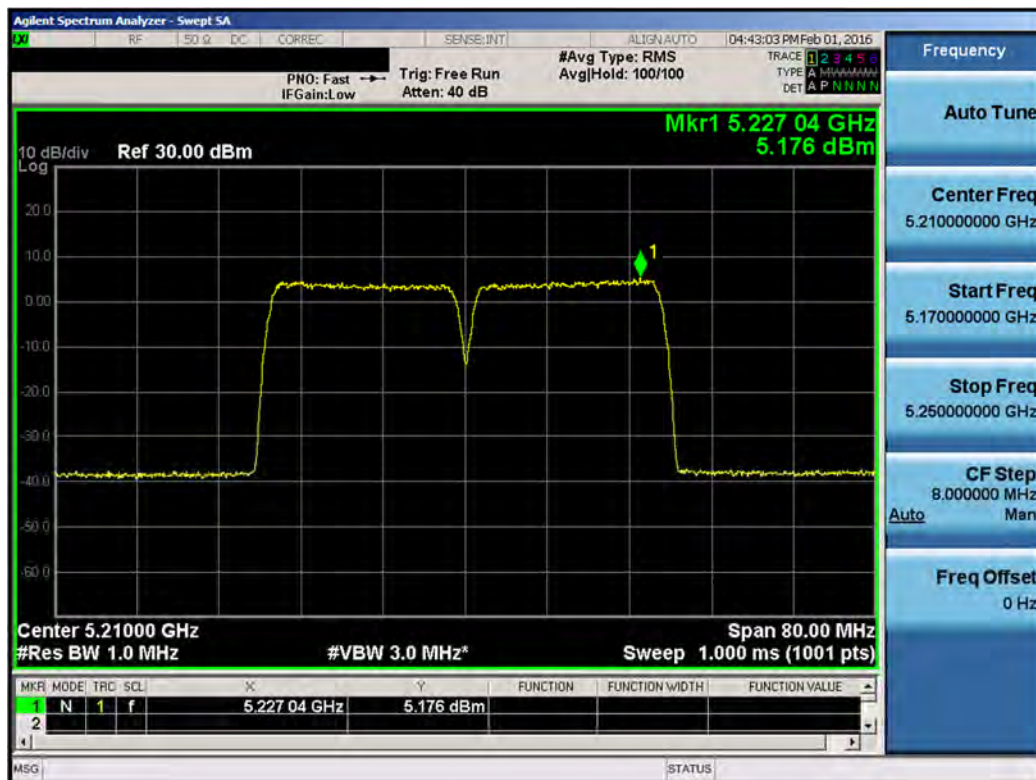


Plot 7-7. Power Spectral Density Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)



Plot 7-8. Power Spectral Density Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 46890, 47090)

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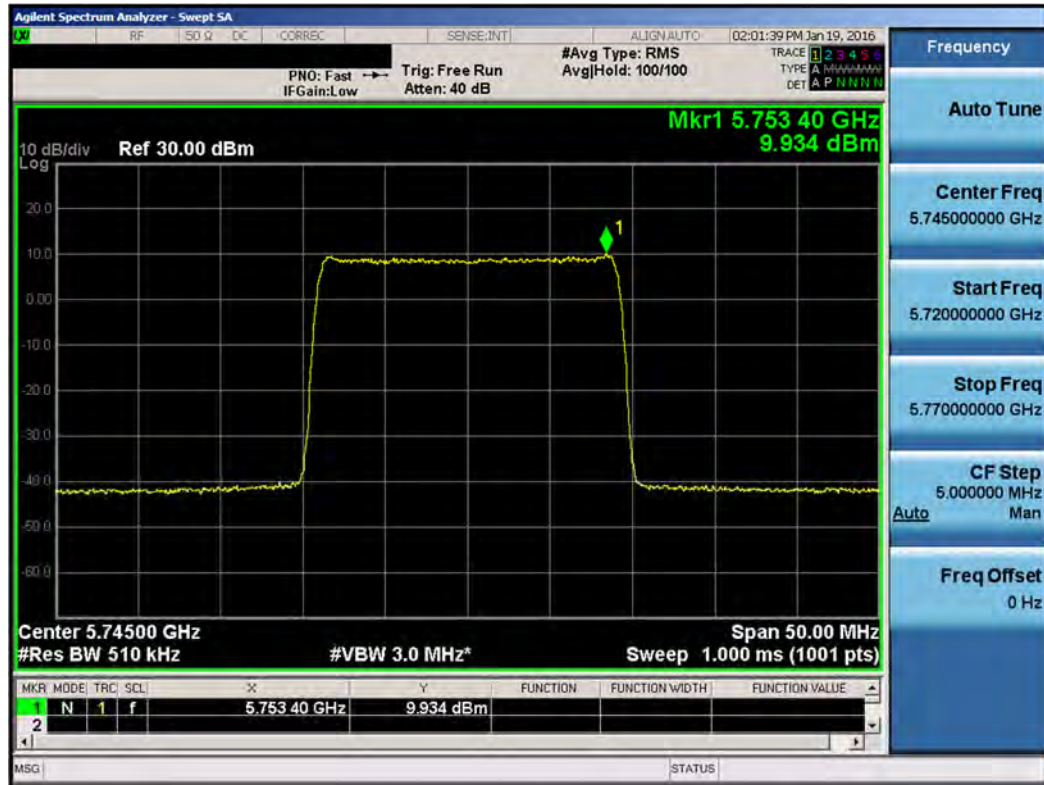


Plot 7-9. Power Spectral Density Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47290, 47490)

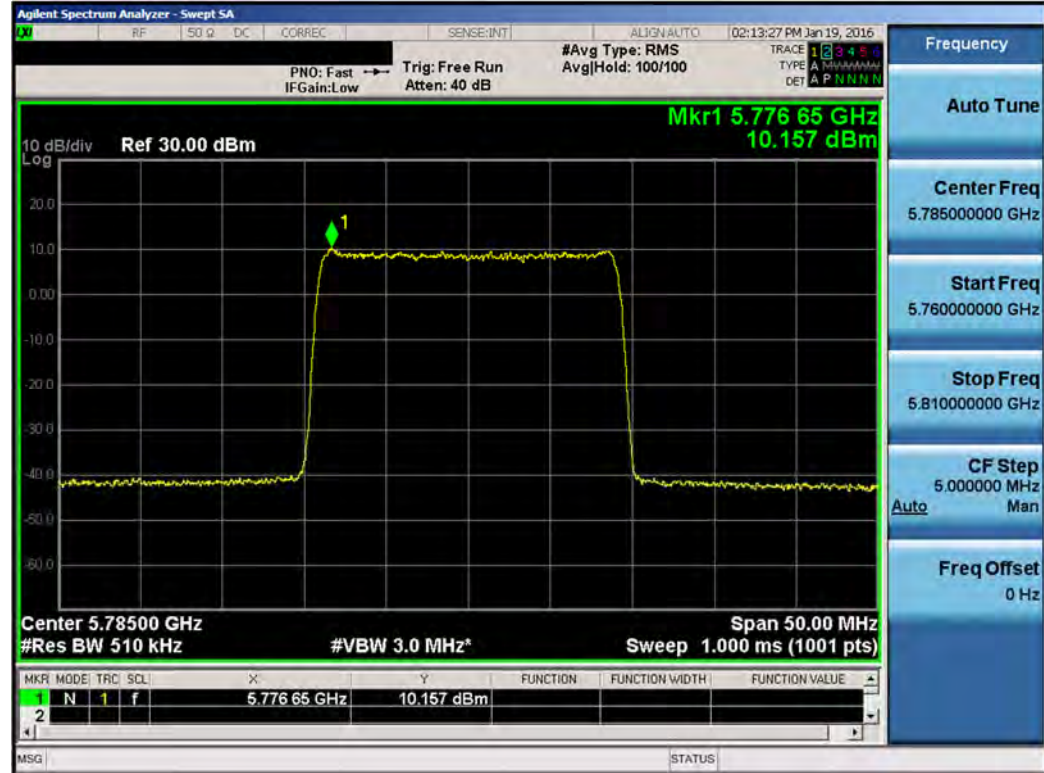


Plot 7-10. Power Spectral Density Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47290, 47490)


FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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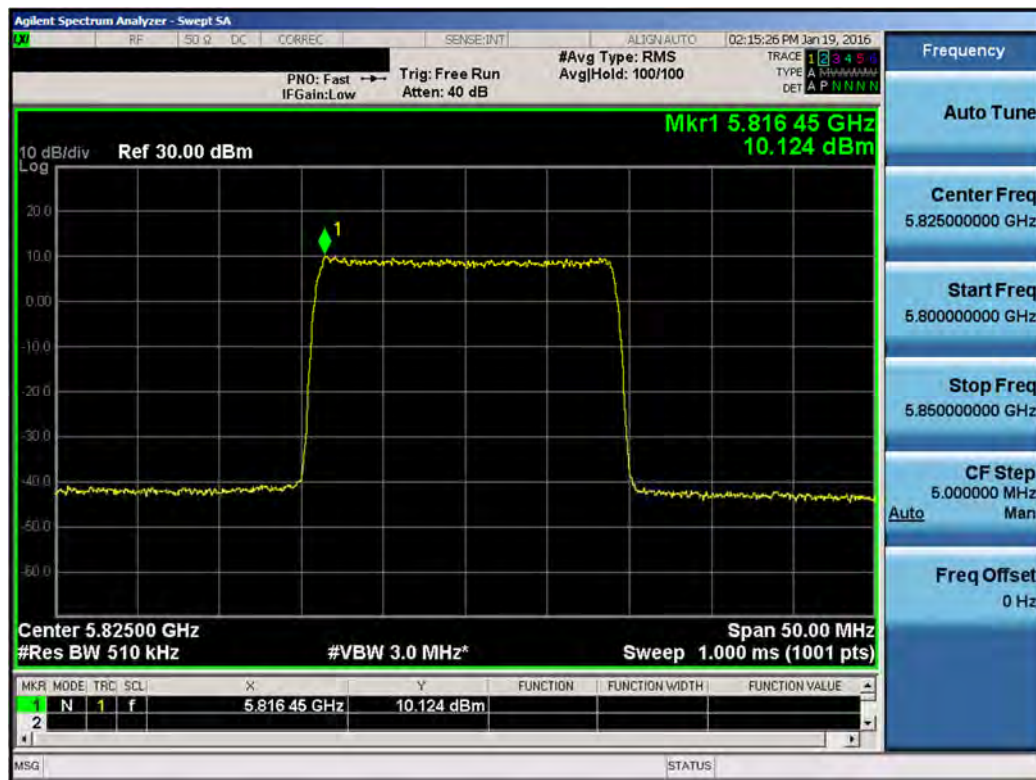


Plot 7-11. Power Spectral Density Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 52740)

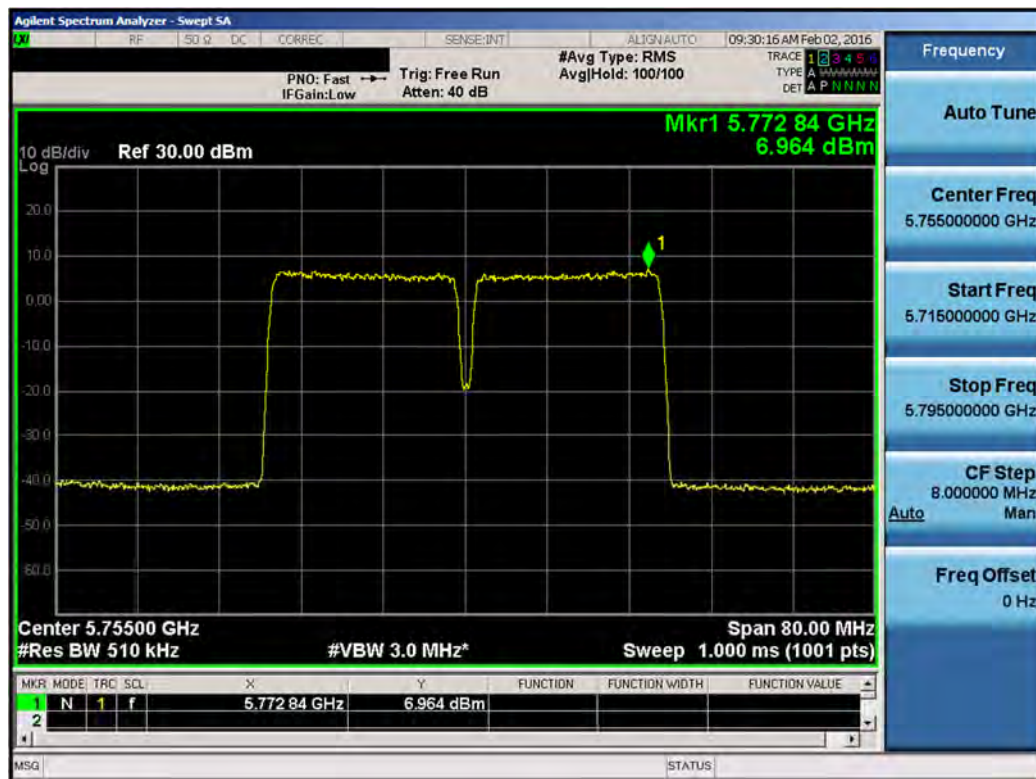


Plot 7-12. Power Spectral Density Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53140)


FCC ID: J9CMT9900LAA			FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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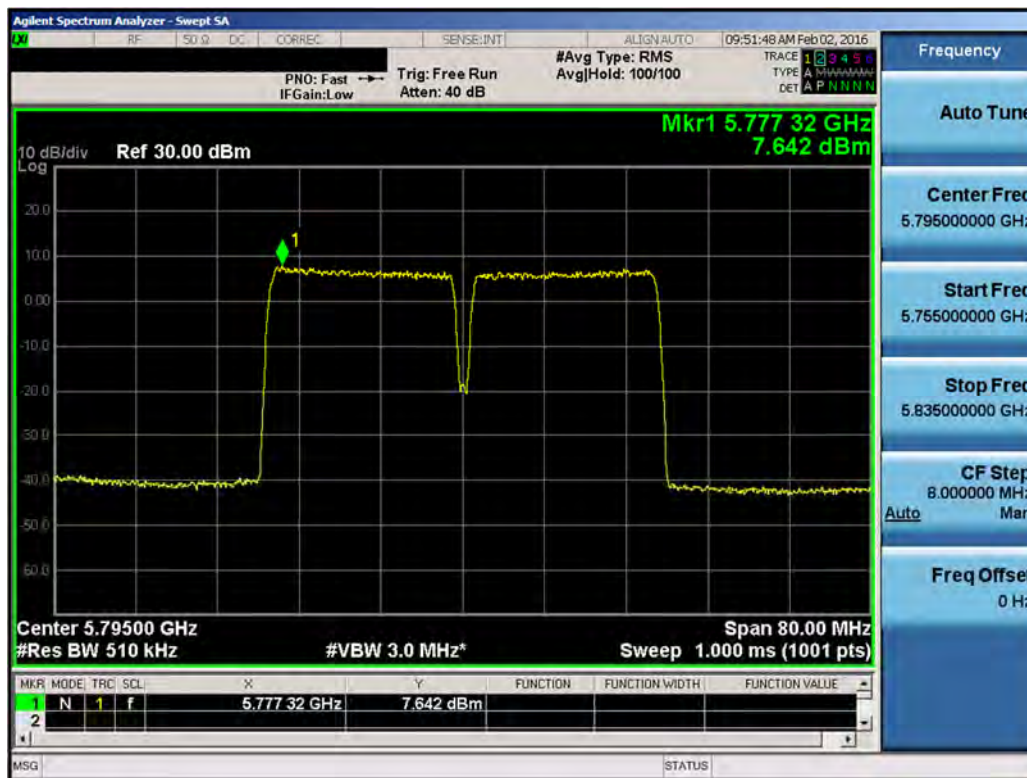


Plot 7-13. Power Spectral Density Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)



Plot 7-14. Power Spectral Density Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 52740, 52940)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 7-15. Power Spectral Density Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53140, 53340)

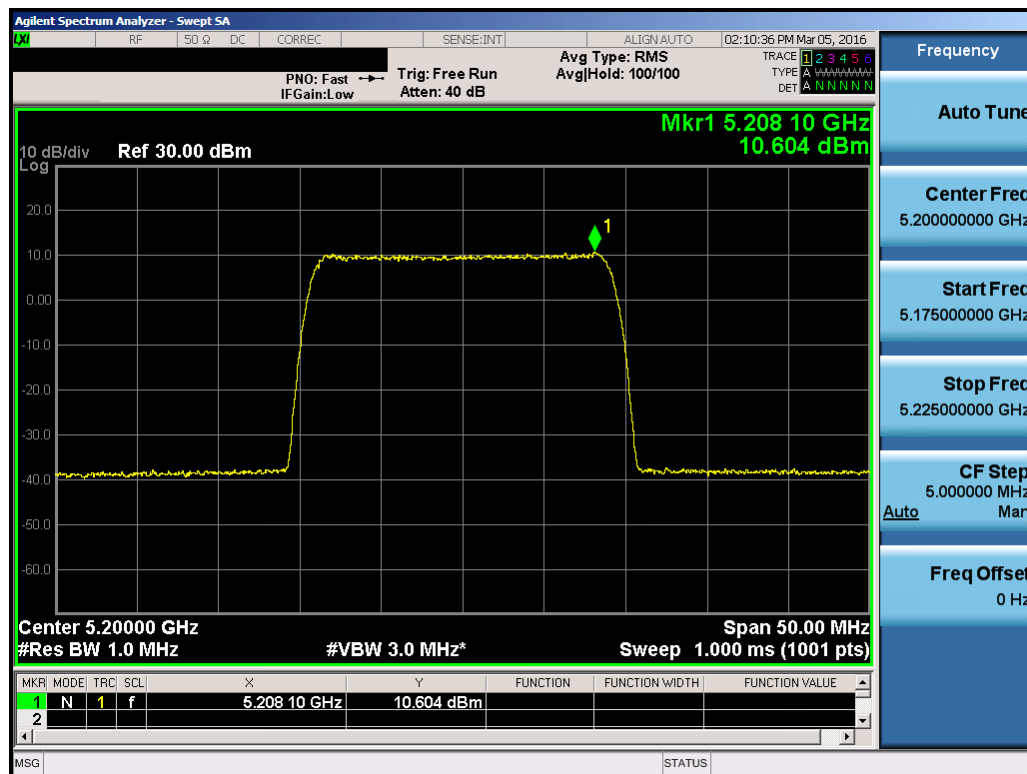


Plot 7-16. Power Spectral Density Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53340, 53540)


FCC ID: J9CMTP9900LAA			FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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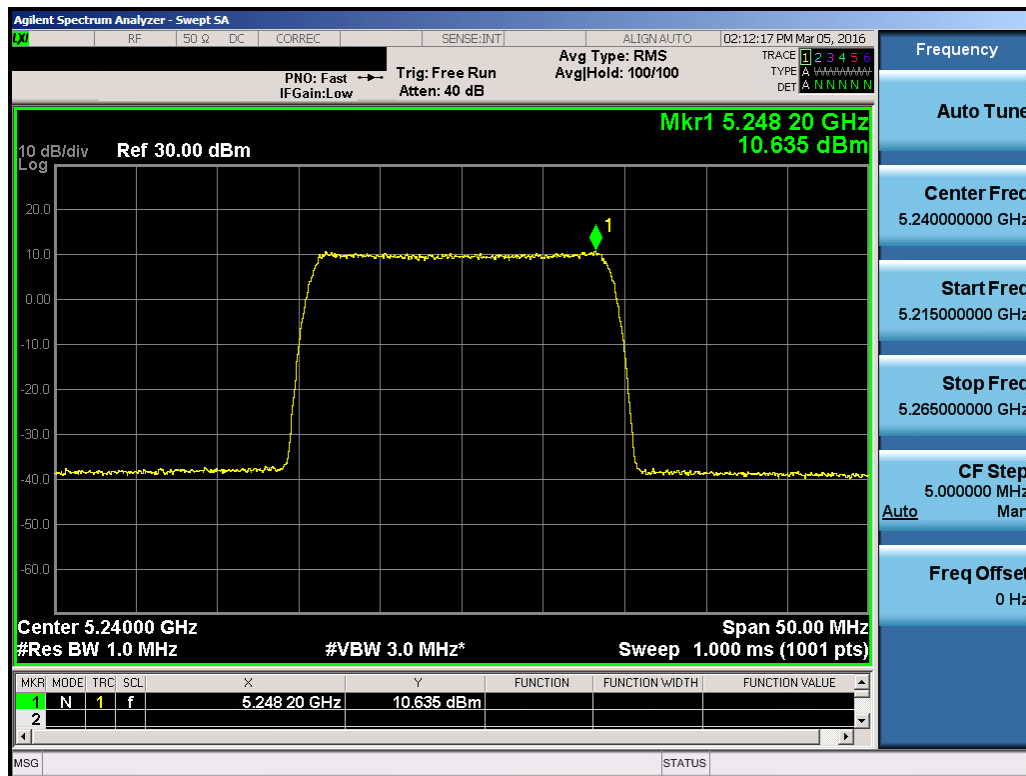


Plot 7-17. Power Spectral Density Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 46890)



Plot 7-18. Power Spectral Density Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47290)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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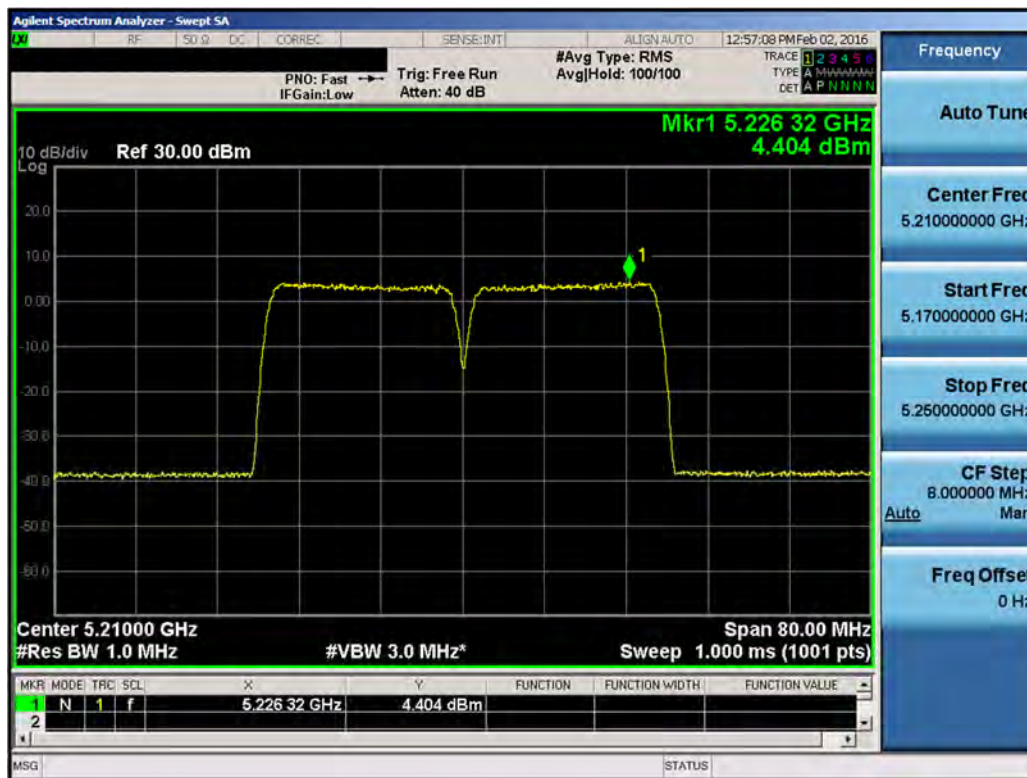


Plot 7-19. Power Spectral Density Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)



Plot 7-20. Power Spectral Density Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 46890, 47090)

FCC ID: J9CMTP9900LAA			FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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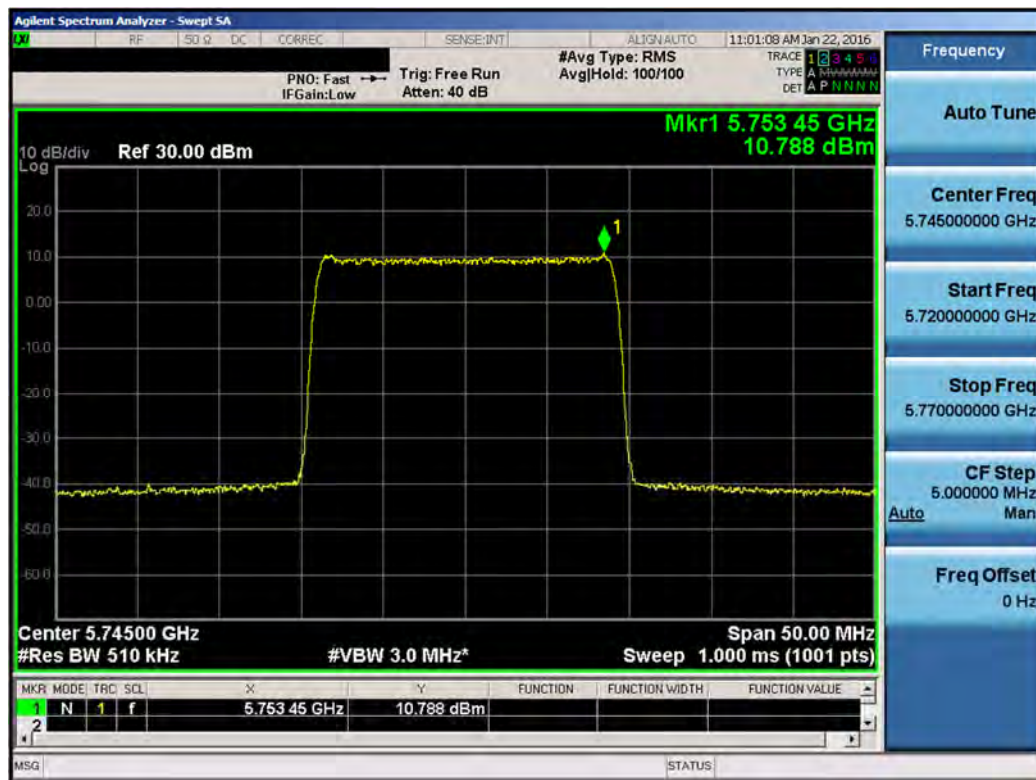


Plot 7-21. Power Spectral Density Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47290, 47490)

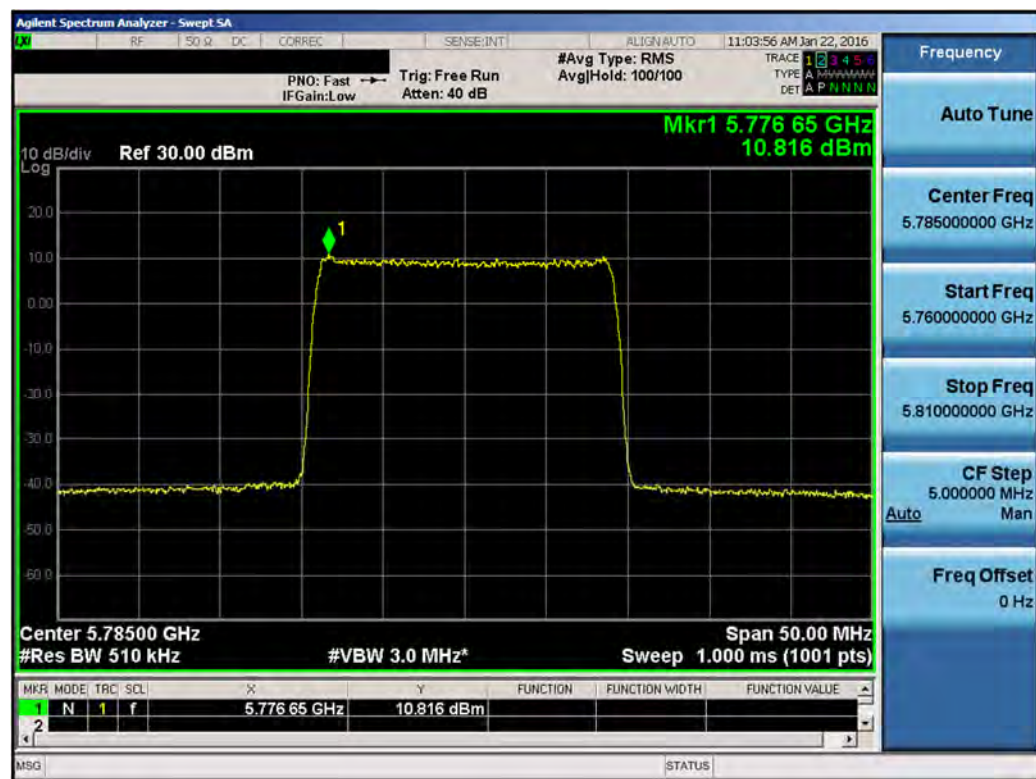


Plot 7-22. Power Spectral Density Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47490, 47690)


FCC ID: J9CMTP9900LAA			FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell		Page 31 of 145

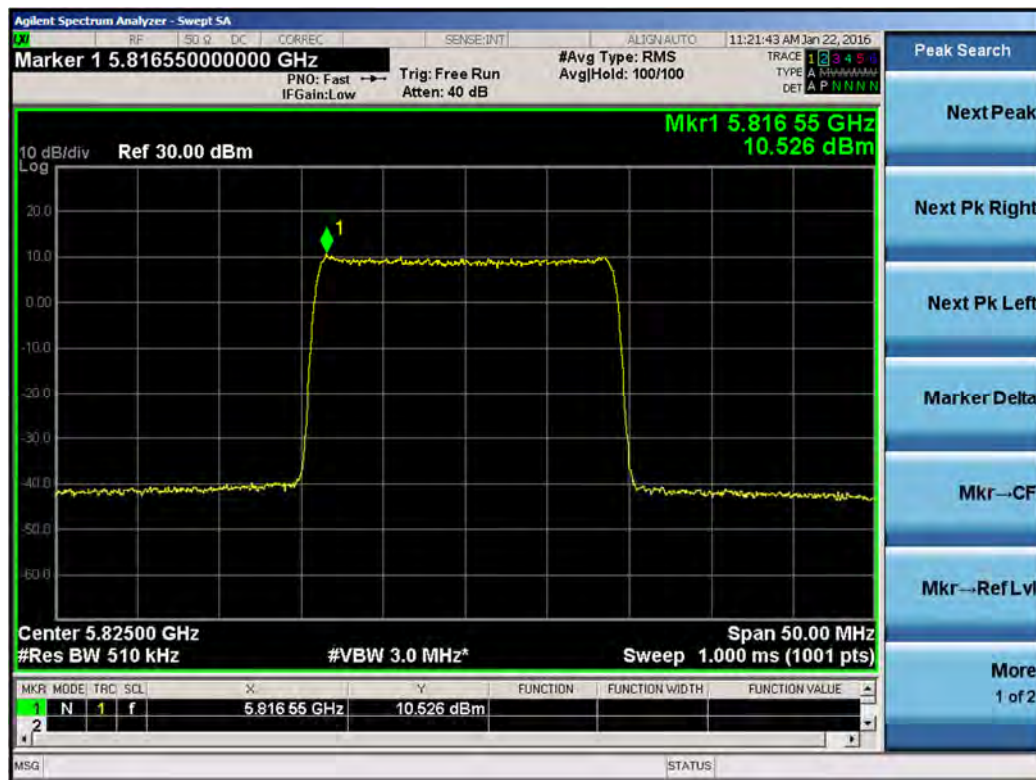


Plot 7-23. Power Spectral Density Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 52740)

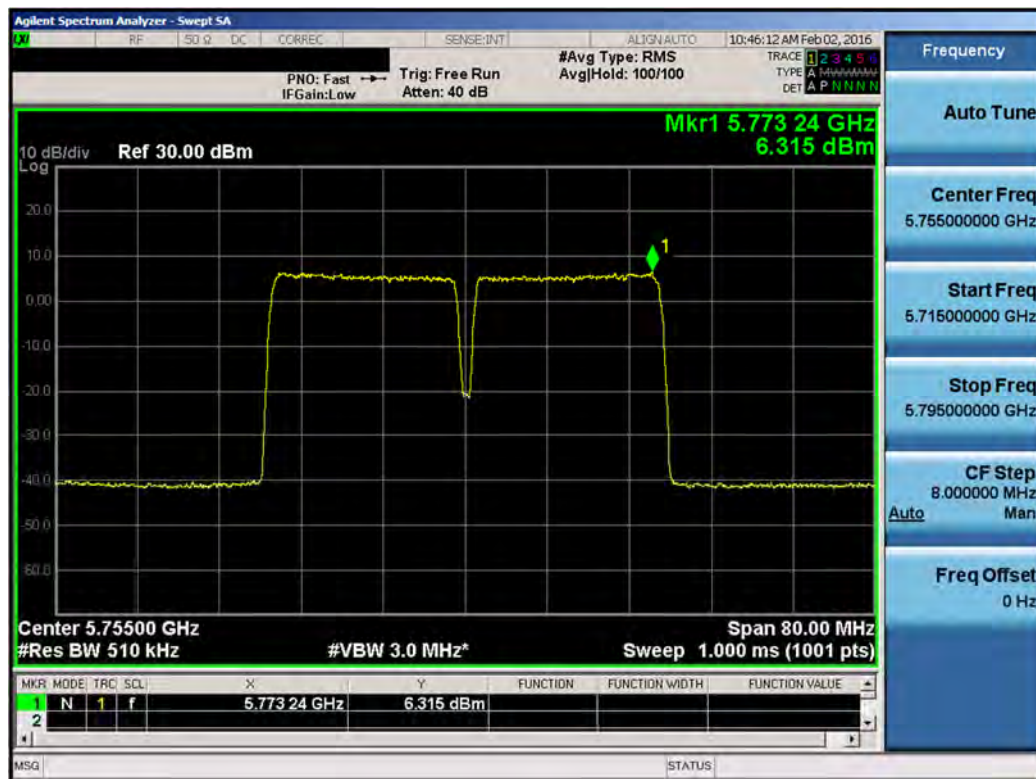


Plot 7-24. Power Spectral Density Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53140)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 32 of 145

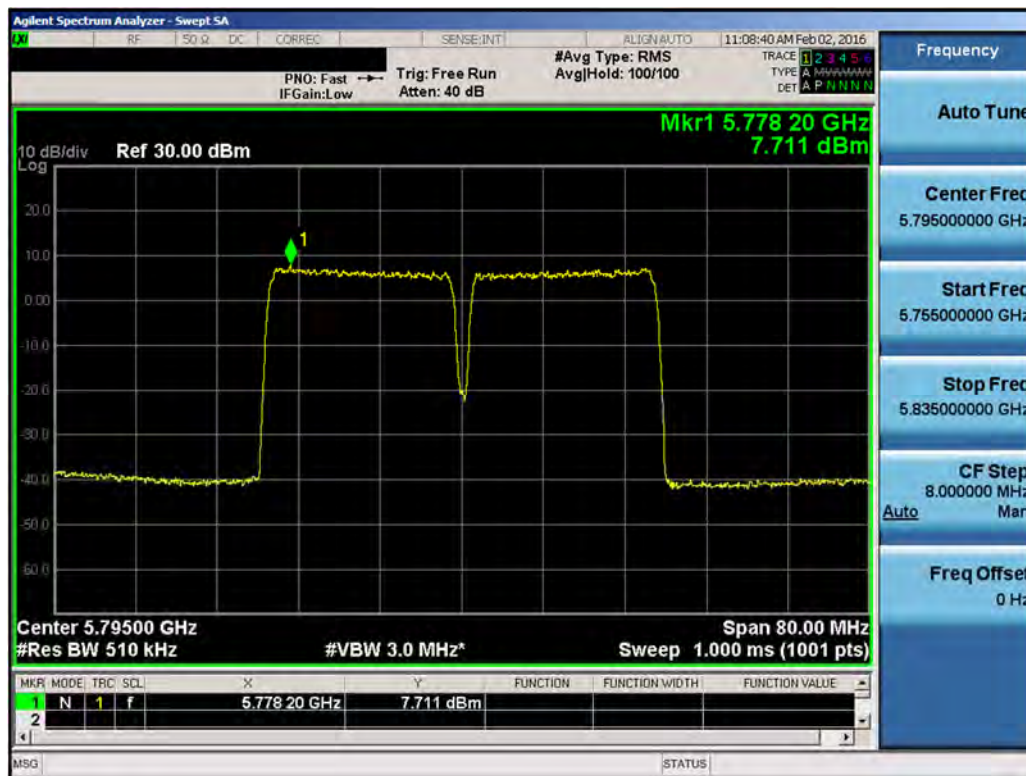


Plot 7-25. Power Spectral Density Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)

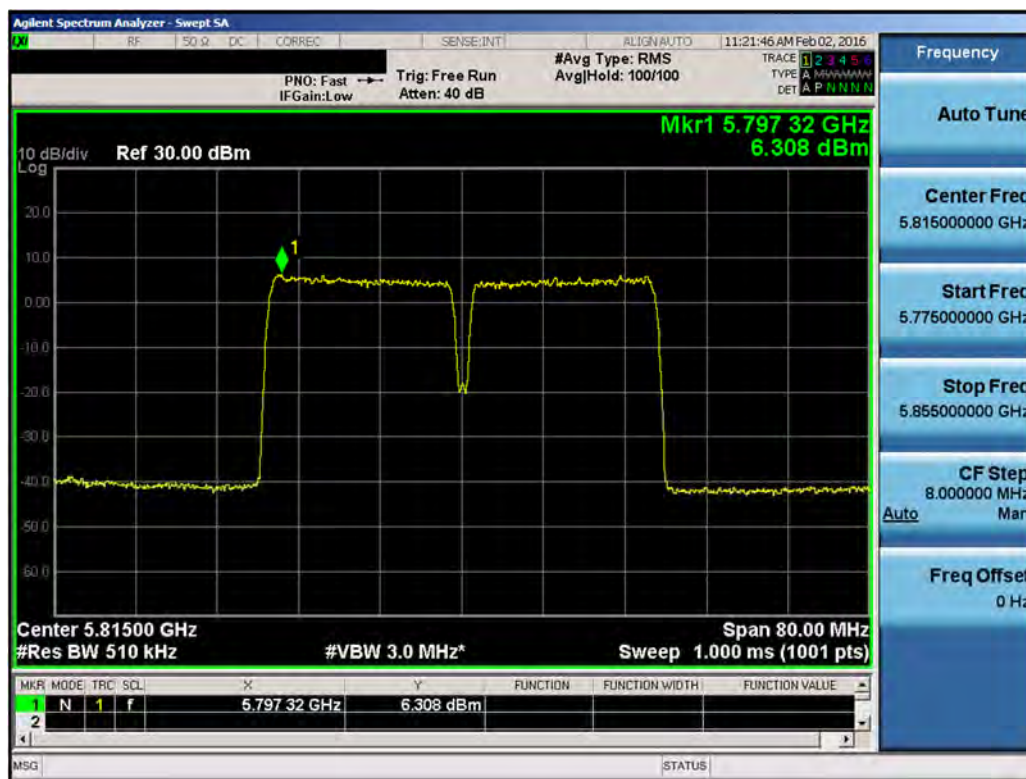


Plot 7-26. Power Spectral Density Plot (LTE -U (UNII Band 3, 40MHz BW) – Ch. 52740, 52940)


FCC ID: J9CMTP9900LAA			FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell		Page 33 of 145



Plot 7-27. Power Spectral Density Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53140, 53340)



Plot 7-28. Power Spectral Density Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53340, 53540)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 34 of 145

7.6 Conducted Band Edge Emissions

§15.407(b.1)(b.6), §15.205, §15.209

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. The EUT is set to transmit one LTE carrier in the respective 5GHz unlicensed band and another carrier in a licensed band. The band edges were measured in a conducted test setup with the appropriate correction factors to assess compliance with the radiated limits. Considerations for MIMO operation and antenna gain are included in the radiated limit as shown in the Notes section below.


When a band edge measurement is made in a restricted band, the average limit is -50.2dBm and the peak limit is -30.2dBm. For non-restricted band measurements, the peak limit is -36dBm. See the "Notes" section for a calculation showing how the limits were derived.

Test Procedure Used

KDB 789033 – Section G)6)c) – Method AD (Average measurements)
 KDB 789033 – Section G)5) – Peak measurements
 KDB 662911 – Section E)3)

Test Settings (Average)

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW = 1MHz
4. VBW = 3MHz
5. Detector = Average (RMS)
6. Number of sweep points $\geq 2 \times \text{Span/RBW}$
7. Trace mode = trace averaging
8. Sweep time = auto couple
9. Trace was averaged over 100 sweeps

FCC ID: J9CMTP9900LAA		FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 35 of 145

Conducted Band Edge Emissions (Cont'd)

Test Settings (Peak)

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW = 1MHz
4. VBW = 3MHz
5. Detector = Peak
6. Number of sweep points $\geq 2 \times \text{Span/RBW}$
7. Trace mode = max hold
8. Sweep time = auto couple
9. Trace was averaged over 100 sweeps

Test Setup

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

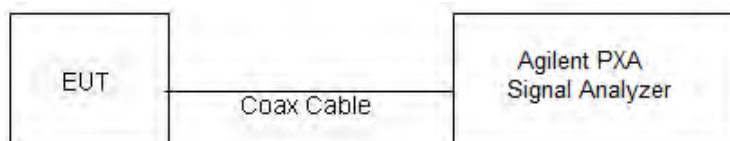



Figure 7-5. Test Instrument & Measurement Setup

Test Notes

1. Per 15.209 and 15.35(b), the average and peak radiated limits in a restricted band are 54dBuV/m and 74dBuV/m, respectively. The non-restricted band peak limit is -27dBm. Combined with the maximum known antenna gain of 6dBi and a “MIMO gain” of 3dB (used for two antennas operating simultaneously) with the conversion factor from a field strength at 3 meters to a conducted power, the revised limits are as follows:

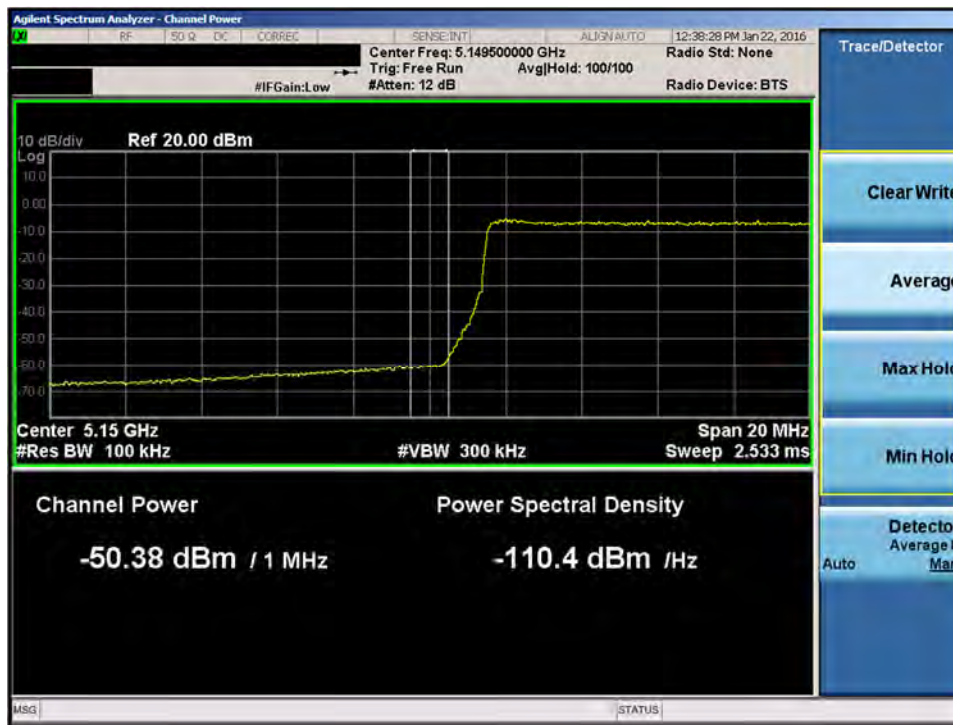
 Average (Restricted): $54\text{dBuV/m} - 95.2\text{dB} - 6\text{dBi} - 3\text{dB} = \mathbf{-50.2\text{dBm}}$
 Peak (Restricted): $74\text{dBuV/m} - 95.2\text{dB} - 6\text{dBi} - 3\text{dB} = \mathbf{-30.2\text{dBm}}$

 Peak (Non-Restr.): $-27\text{dBm} - 6\text{dBi} - 3\text{dB} = \mathbf{-36\text{dBm}}$
2. Some band edge measurements were evaluated using the Channel Integration method, as specified in Section G)3)d)ii) of KDB 789033.

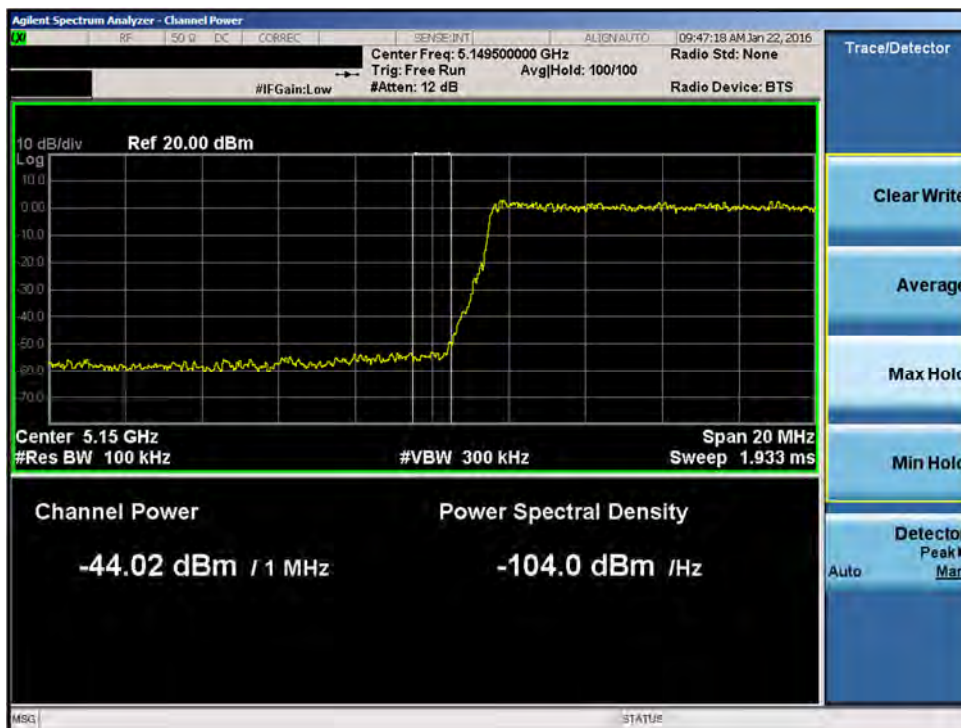
FCC ID: J9CMTTP9900LAA		FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 36 of 145

Conducted Band Edge Emissions (Cont'd)

Chain0

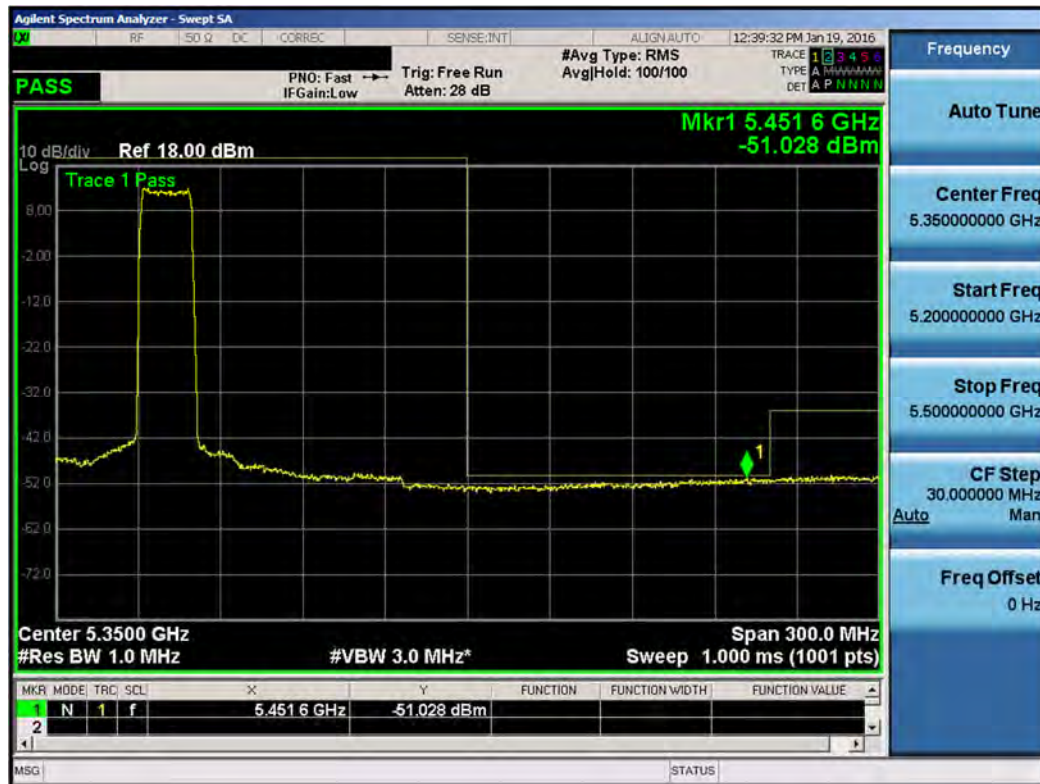


Plot 7-29. Conducted Average Band Edge Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 46890)

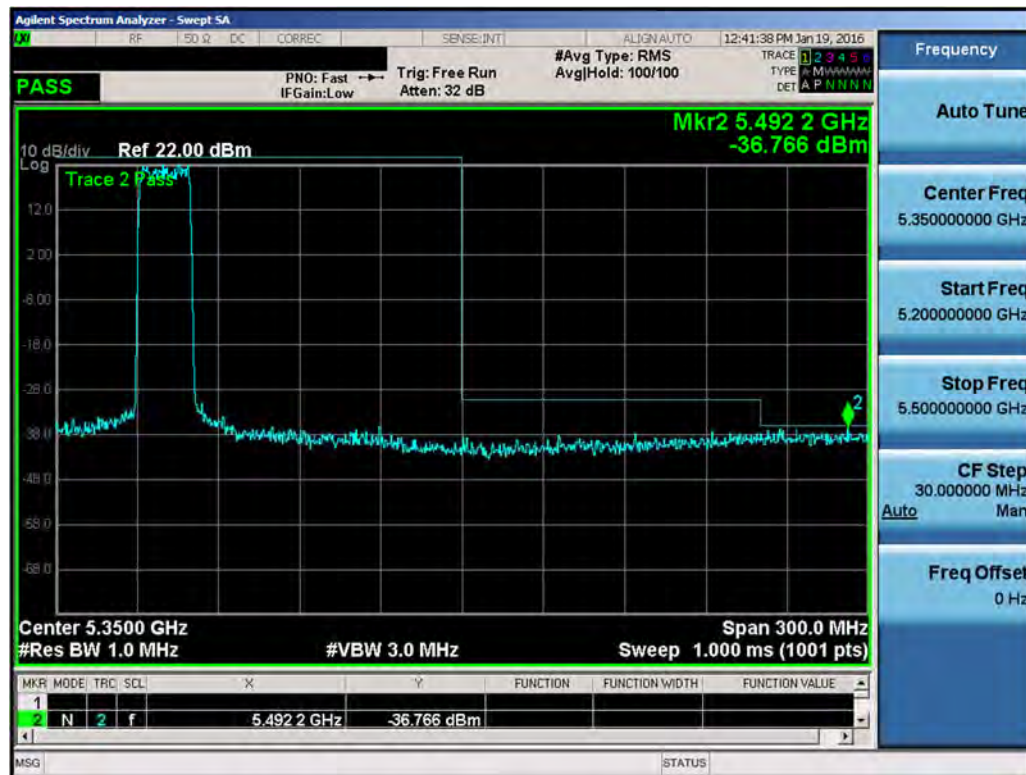


Plot 7-30. Conducted Peak Band Edge Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 46890)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 37 of 145

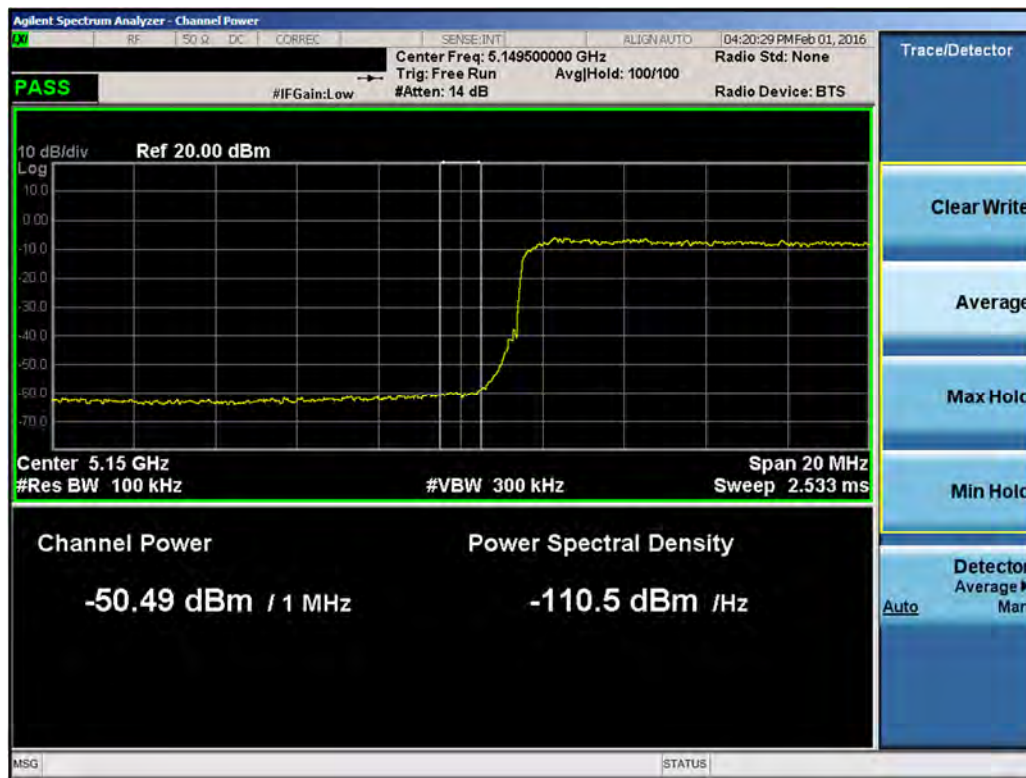


Plot 7-31. Conducted Average Band Edge Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)

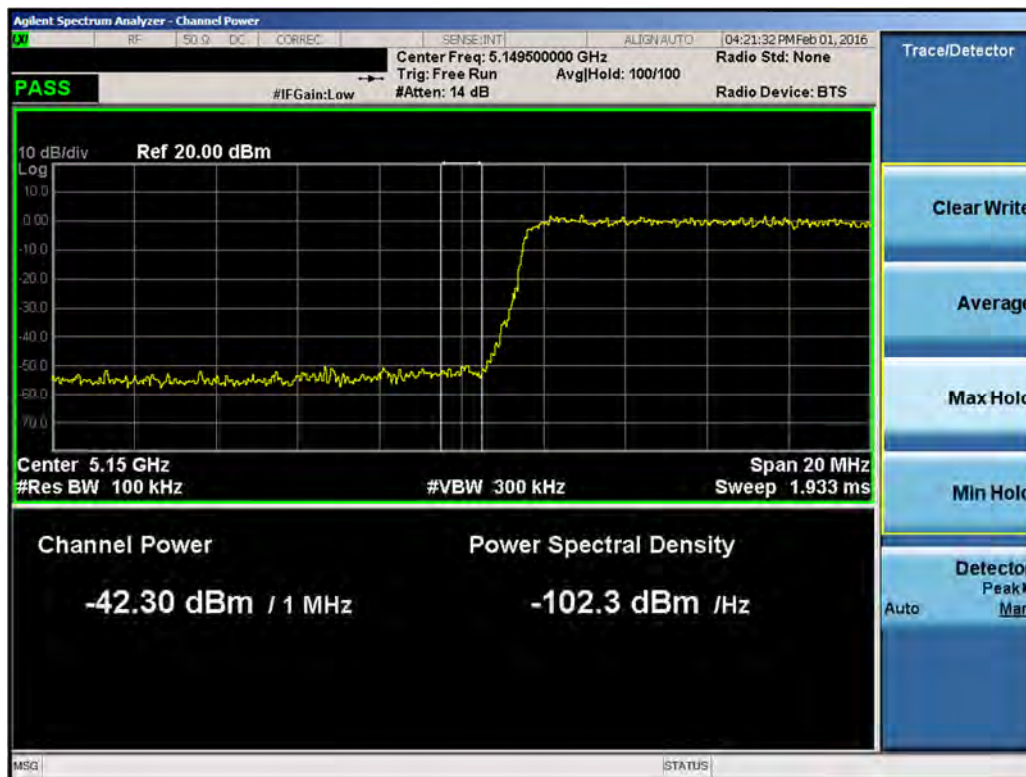


Plot 7-32. Conducted Peak Band Edge Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)

FCC ID: J9CMTP9900LAA			FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 38 of 145	

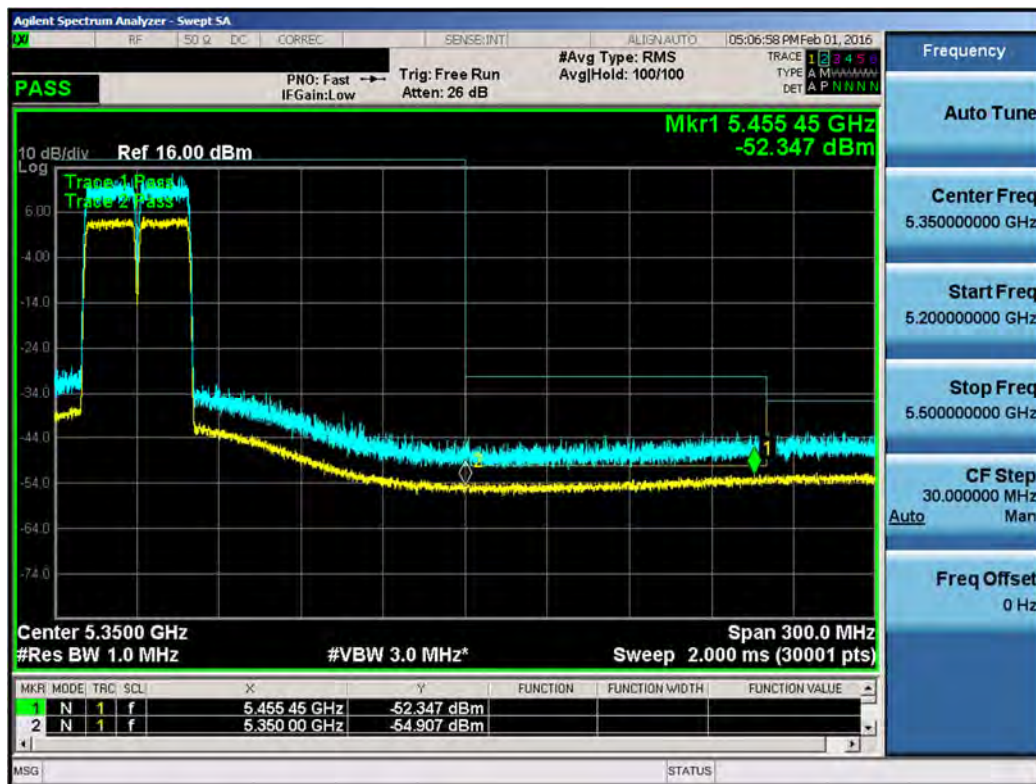


Plot 7-33. Conducted Average Band Edge Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 46890, 47090)

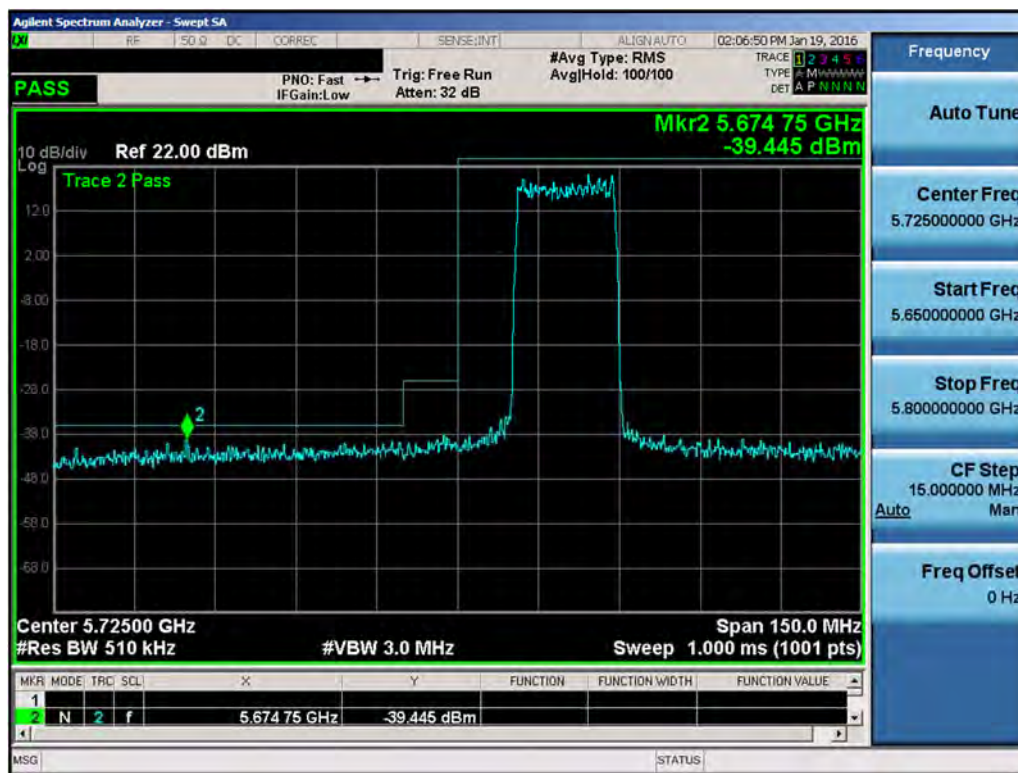


Plot 7-34. Conducted Peak Band Edge Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 46890, 47090)


FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 39 of 145

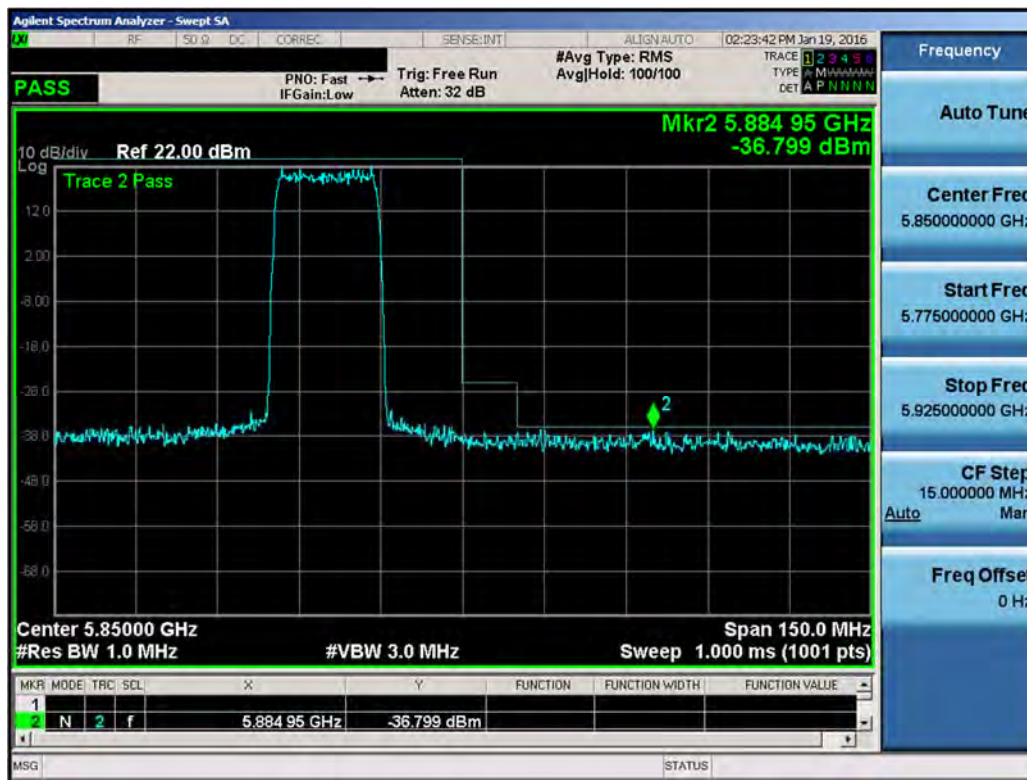


Plot 7-35. Cond. Average-Peak Band Edge Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47490, 47690)

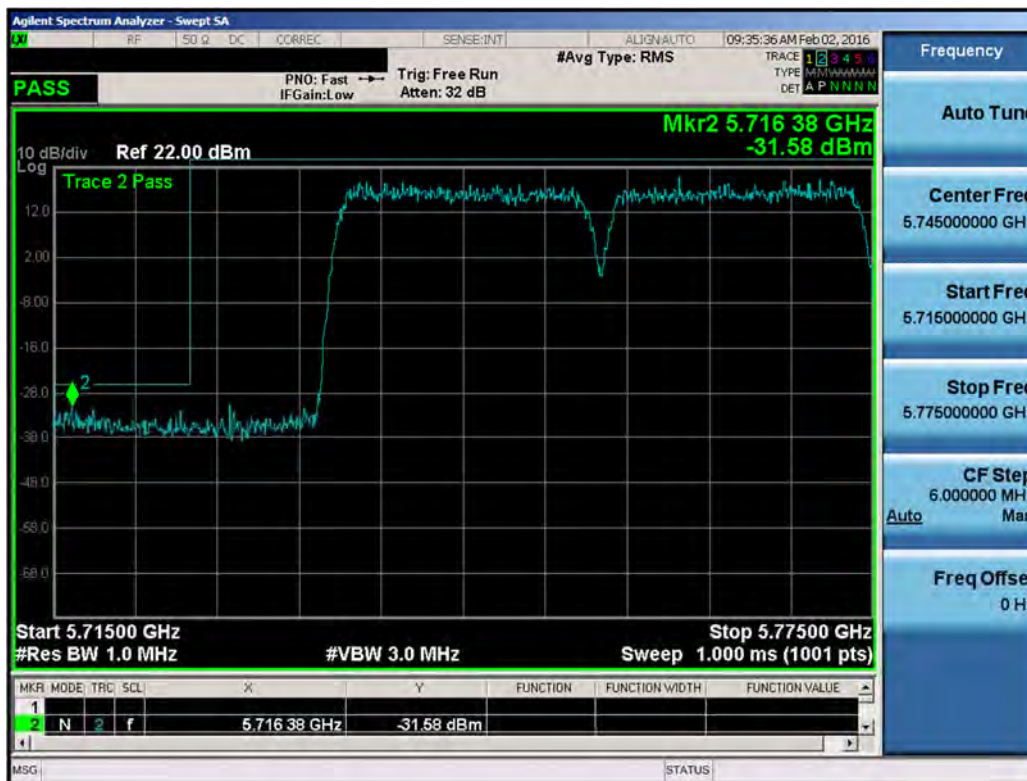


Plot 7-36. Conducted Peak Band Edge Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 52740)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 40 of 145

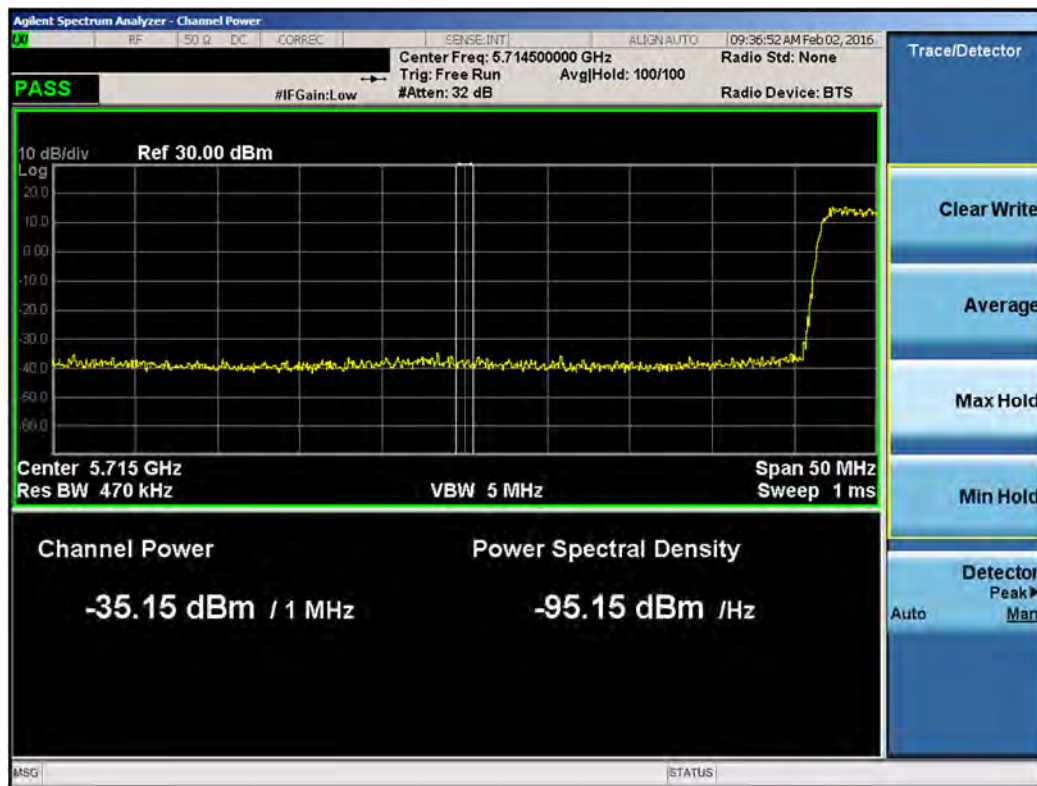


Plot 7-37. Conducted Peak Band Edge Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)



Plot 7-38. Conducted Peak Band Edge Plot #1 (LAA (UNII Band 3, 40MHz BW) – Ch. 52740, 52940)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 41 of 145

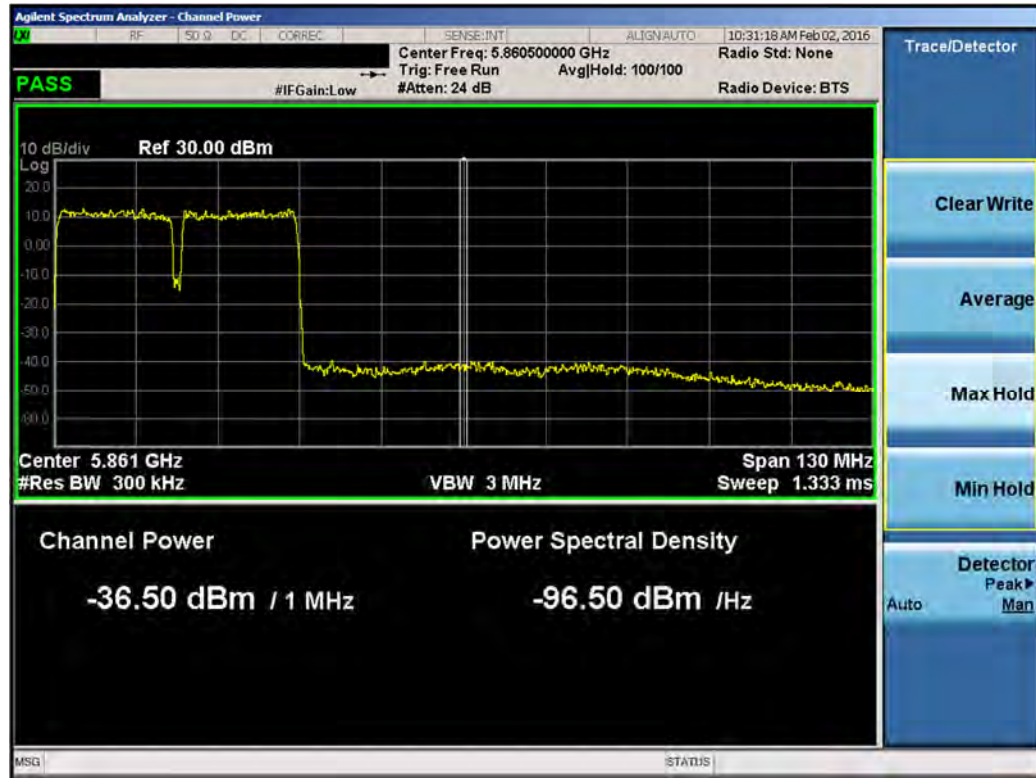


Plot 7-39. Conducted Peak Band Edge Plot #2 (LAA (UNII Band 3, 40MHz BW) – Ch. 52740, 52940)




Plot 7-40. Conducted Peak Band Edge Plot #1 (LAA (UNII Band 3, 40MHz BW) – Ch. 53340, 53540)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 42 of 145

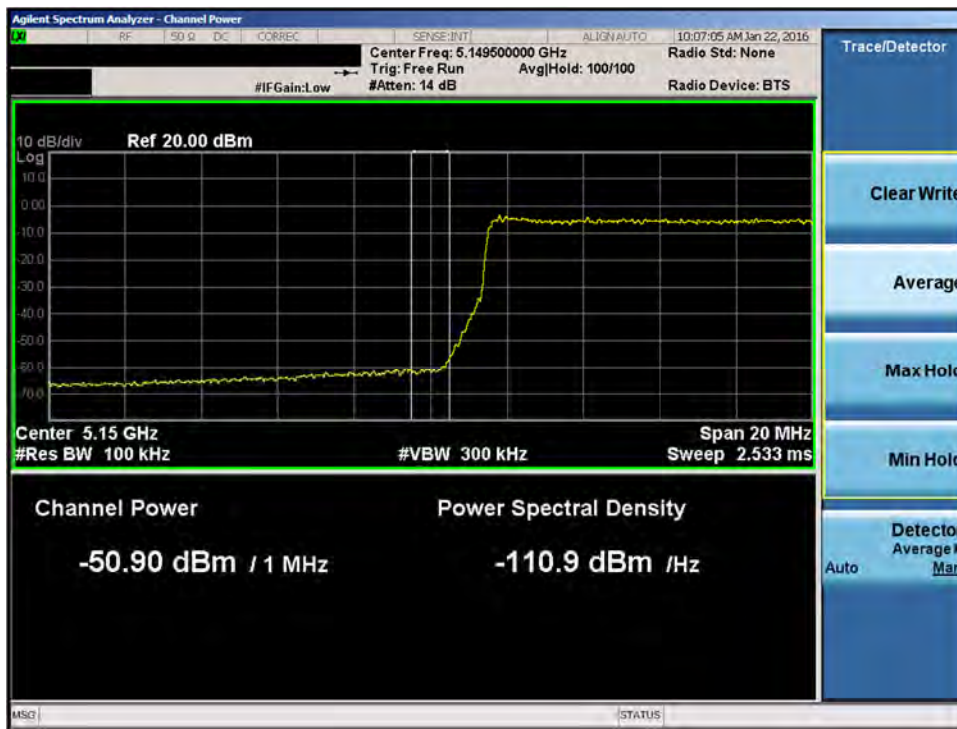


Plot 7-41. Conducted Peak Band Edge Plot #2 (LAA (UNII Band 3, 40MHz BW) – Ch. 53340, 53540)

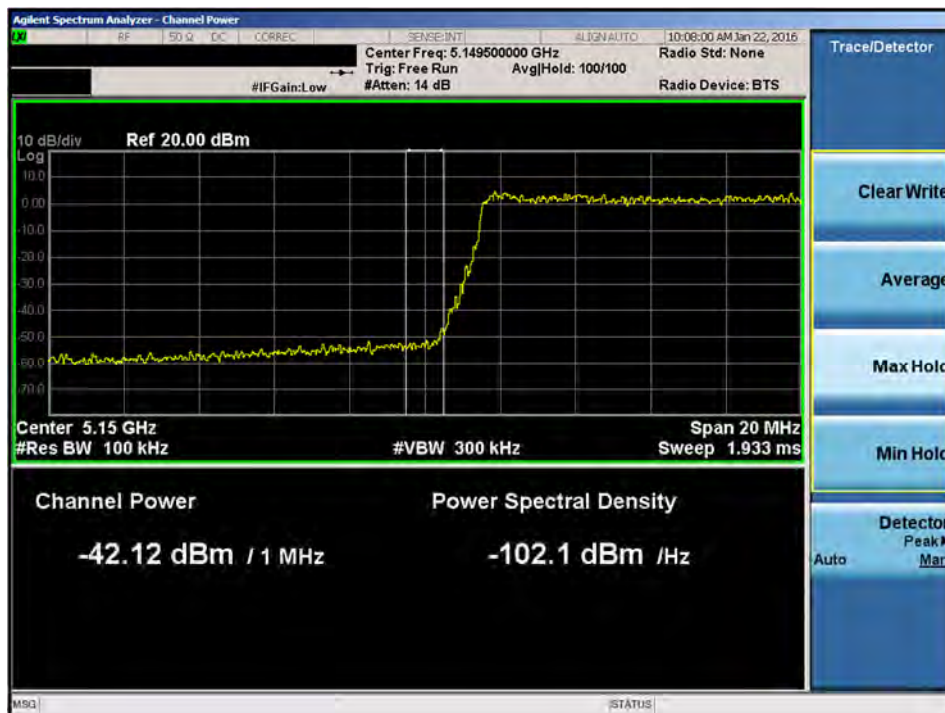
FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 43 of 145

Conducted Band Edge Emissions (Cont'd)

Chain1

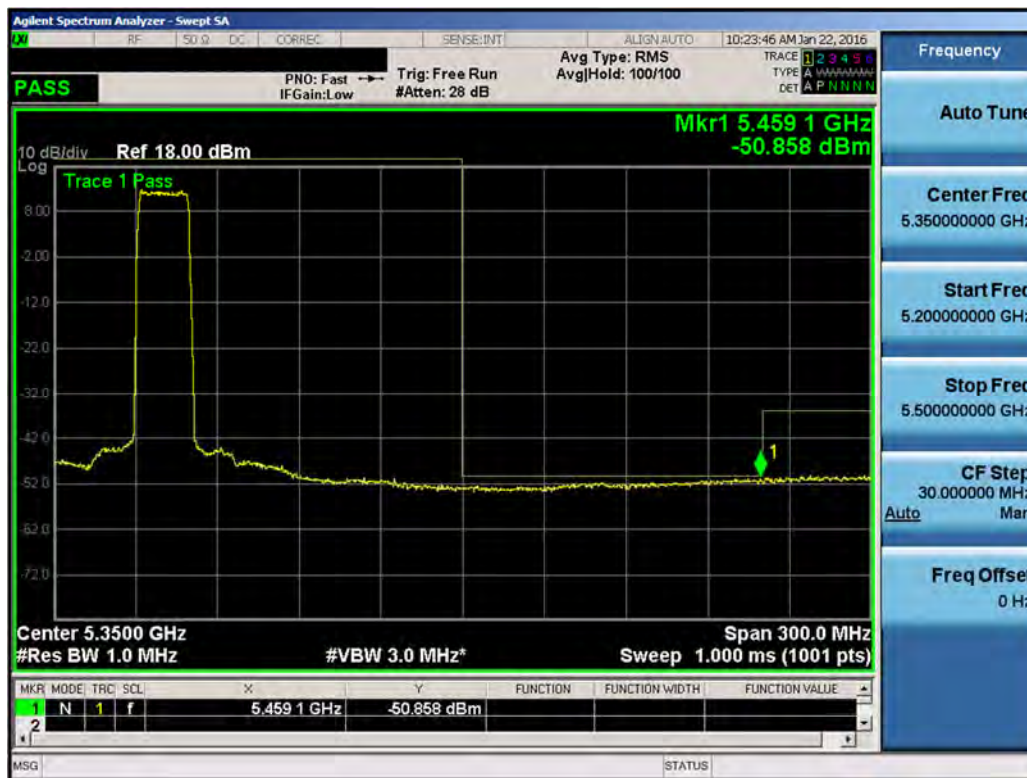


Plot 7-42. Conducted Average Band Edge Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 46890)

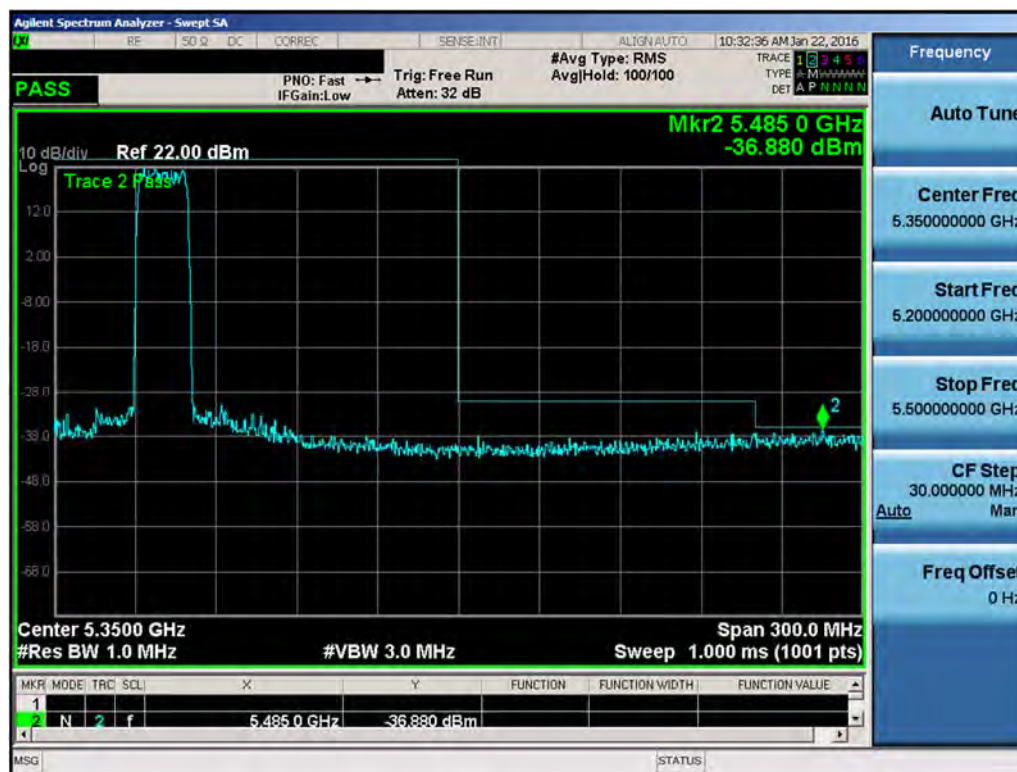


Plot 7-43. Conducted Peak Band Edge Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 46890)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 44 of 145

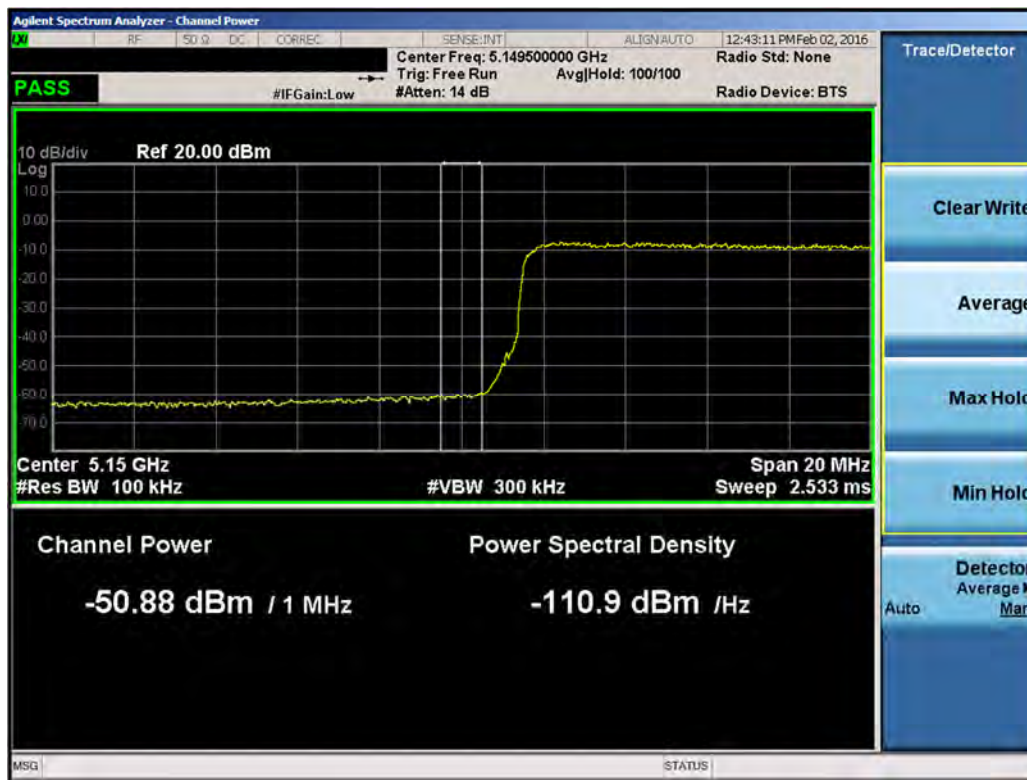


Plot 7-44. Conducted Average Band Edge Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)

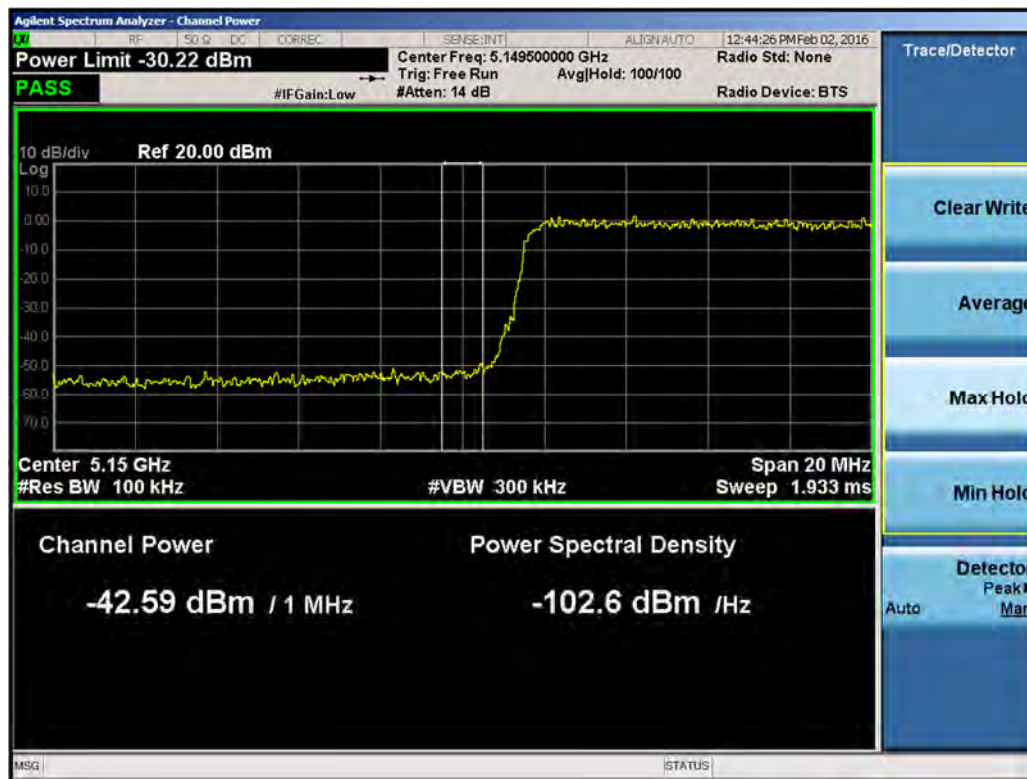


Plot 7-45. Conducted Peak Band Edge Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 45 of 145

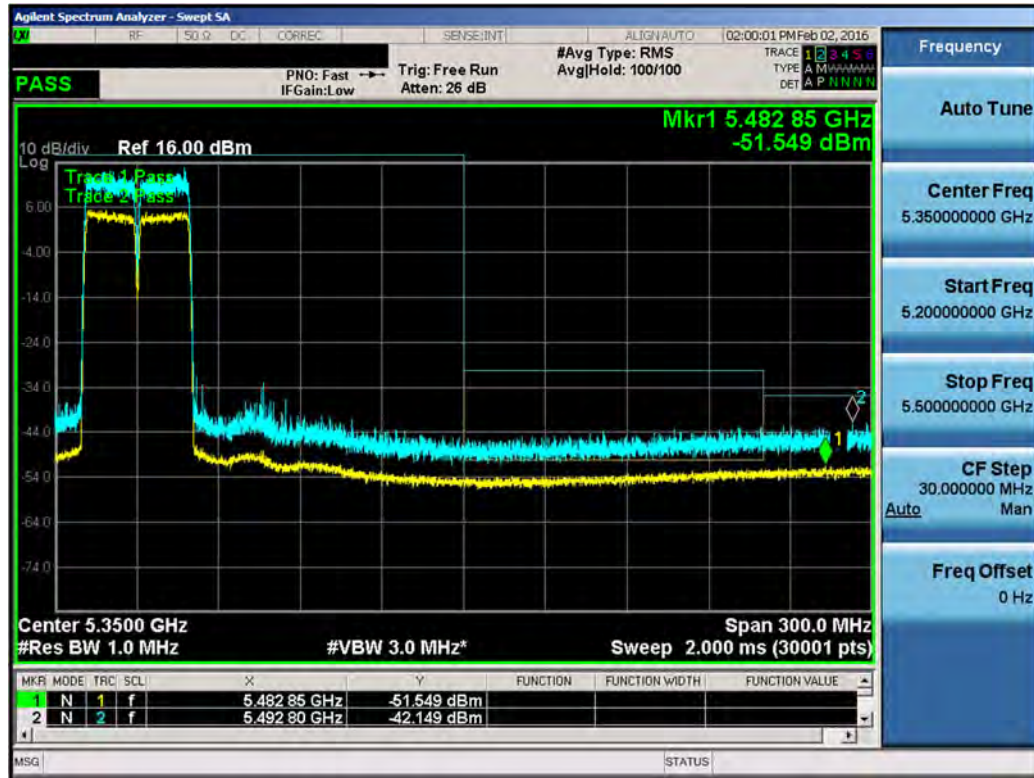


Plot 7-46. Conducted Average Band Edge Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 46890, 47090)

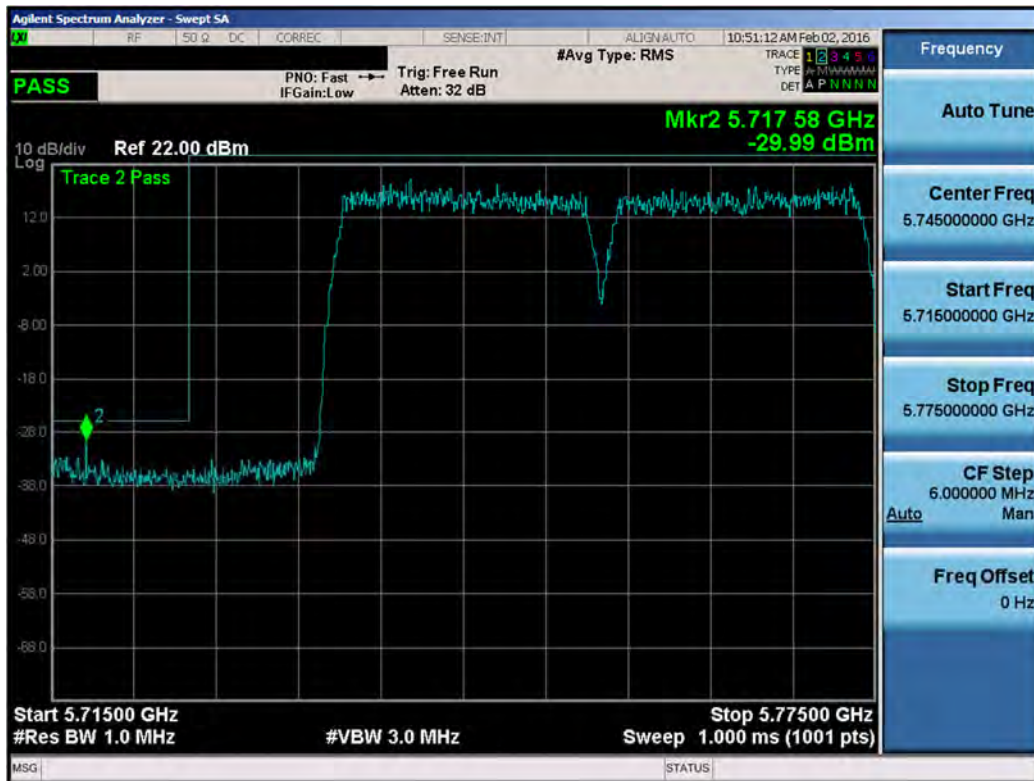


Plot 7-47. Conducted Peak Band Edge Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 46890, 47090)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 46 of 145

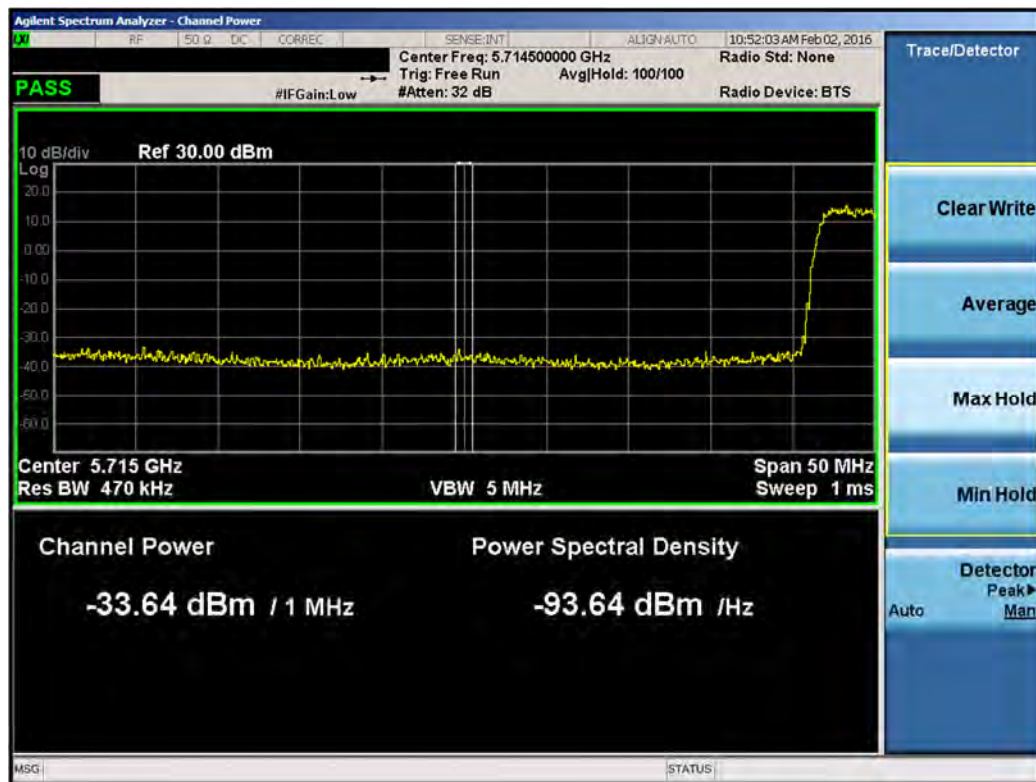


Plot 7-48. Cond. Average-Peak Band Edge Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47490, 47690)

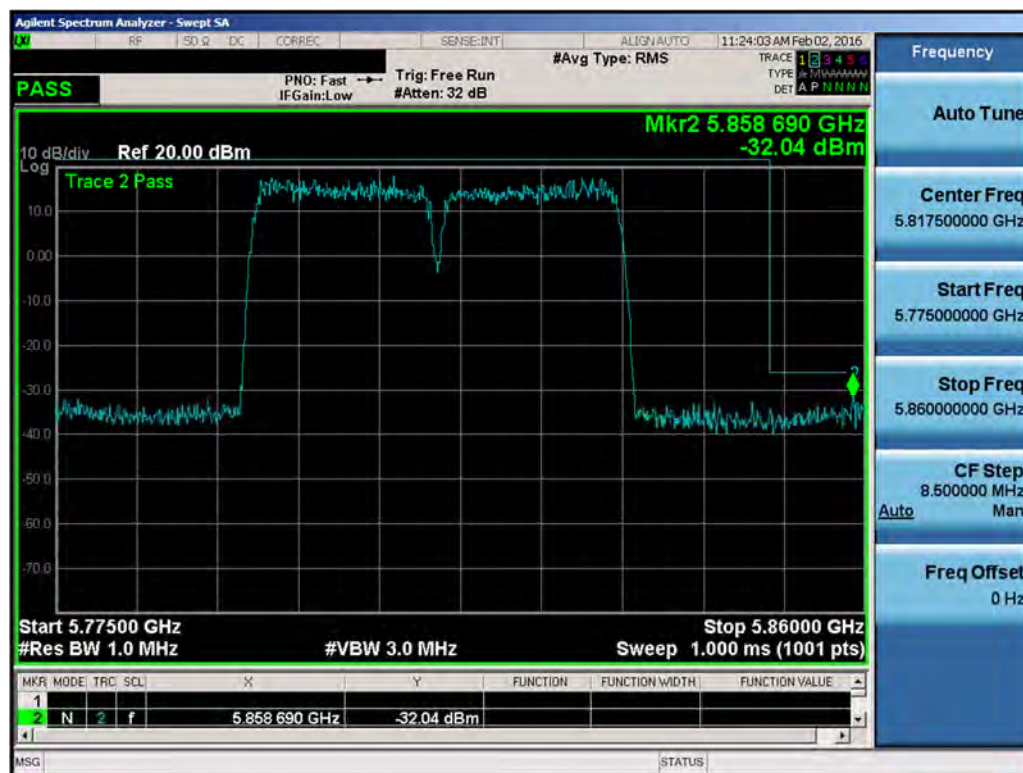


Plot 7-49. Conducted Peak Band Edge Plot #1 (LAA (UNII Band 3, 20MHz BW) – Ch. 52740)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.		FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell		Page 47 of 145

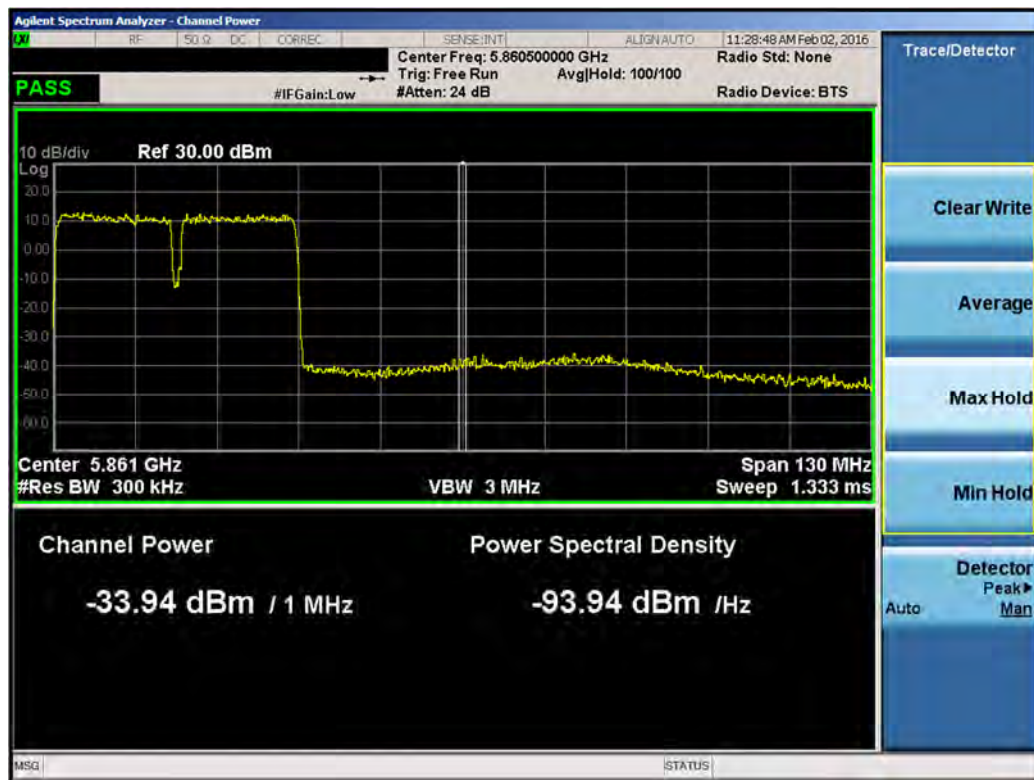


Plot 7-50. Conducted Peak Band Edge Plot #2 (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)



Plot 7-51. Conducted Peak Band Edge Plot #1 (LAA (UNII Band 3, 40MHz BW) – Ch. 52740, 52940)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 48 of 145



Plot 7-52. Conducted Peak Band Edge Plot #2 (LAA (UNII Band 3, 40MHz BW) – Ch. 53340, 53540)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 49 of 145

7.7 Conducted Spurious Emissions

§15.407(b.1)(b.6), §15.205, §15.209

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. The EUT is set to transmit one LTE carrier in the respective 5GHz unlicensed band and another carrier in a licensed band. The spurious emissions were measured in a conducted test setup with the appropriate correction factors to assess compliance with the radiated limits. Considerations for MIMO operation and antenna gain are included in the radiated limit as shown in the Notes section below.

When a band edge measurement is made in a restricted band, the average limit is -50.2dBm and the peak limit is -30.2dBm. For non-restricted band measurements, the peak limit is -36dBm. See the "Notes" section for a calculation showing how the limits were derived.

Test Procedure Used


KDB 789033 – Section G)6)c) – Method AD (Average measurements)

KDB 789033 – Section G)5) – Peak measurements

KDB 662911 – Section E)3)

Test Settings (Average)

1. Start frequency was set to 30MHz and stop frequency was set to 40GHz (separated into several plots per channel)
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = Average (RMS)
5. Number of sweep points $\geq 2 \times \text{Span/RBW}$
6. Trace mode = trace averaging
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

FCC ID: J9CMTP9900LAA		FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 50 of 145

Conducted Spurious Emissions (Cont'd)

Test Settings (Peak)

1. Start frequency was set to 30MHz and stop frequency was set to 40GHz (separated into several plots per channel)
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = Peak
5. Number of sweep points $\geq 2 \times \text{Span/RBW}$
6. Trace mode = max hold
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

Test Setup

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

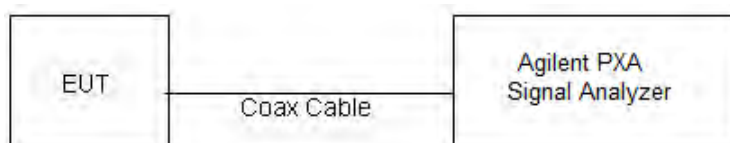



Figure 7-6. Test Instrument & Measurement Setup

Test Notes

1. Per 15.209 and 15.35(b), the average and peak radiated limits in a restricted band are 54dBuV/m and 74dBuV/m, respectively. The non-restricted band peak limit is -27dBm. Combined with the maximum known antenna gain of 6dBi and a “MIMO gain” of 3dB (used for two antennas operating simultaneously) with the conversion factor from a field strength at 3 meters to a conducted power, the revised limits are as follows:

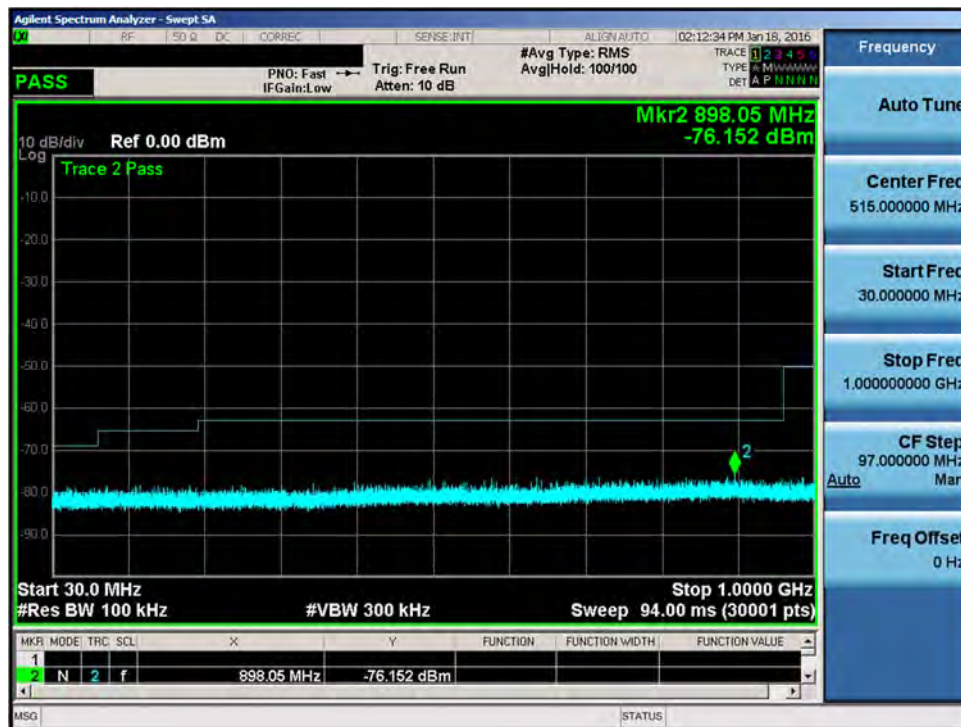
 Average (Restricted): $54\text{dBuV/m} - 95.2\text{dB} - 6\text{dBi} - 3\text{dB} = \mathbf{-50.2\text{dBm}}$
 Peak (Restricted): $74\text{dBuV/m} - 95.2\text{dB} - 6\text{dBi} - 3\text{dB} = \mathbf{-30.2\text{dBm}}$

 Peak (Non-Restr.): $-27\text{dBm} - 6\text{dBi} - 3\text{dB} = \mathbf{-36\text{dBm}}$
2. Below 1GHz, the limit was further adjusted by subtracting 4.7dB to account for ground plane contributions observed on a test site, per KDB 789033.
3. In the plots on the following pages, the yellow trace is the average measurement and the blue trace is the peak measurement.

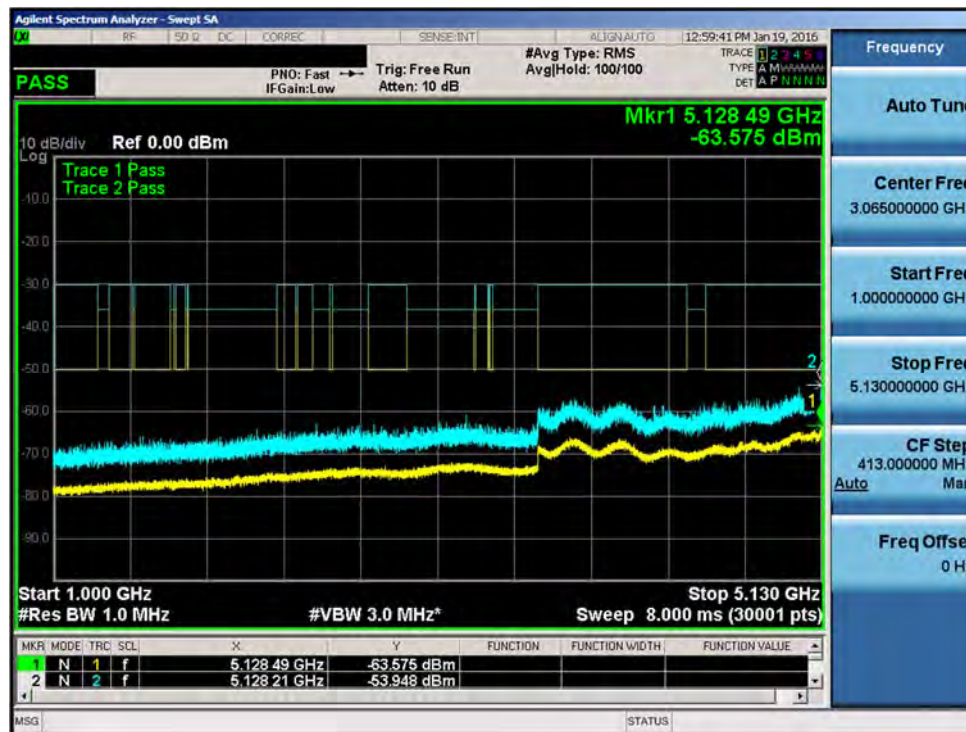
FCC ID: J9CMTP9900LAA		FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 51 of 145

Conducted Band Edge Emissions (Cont'd)

Chain0

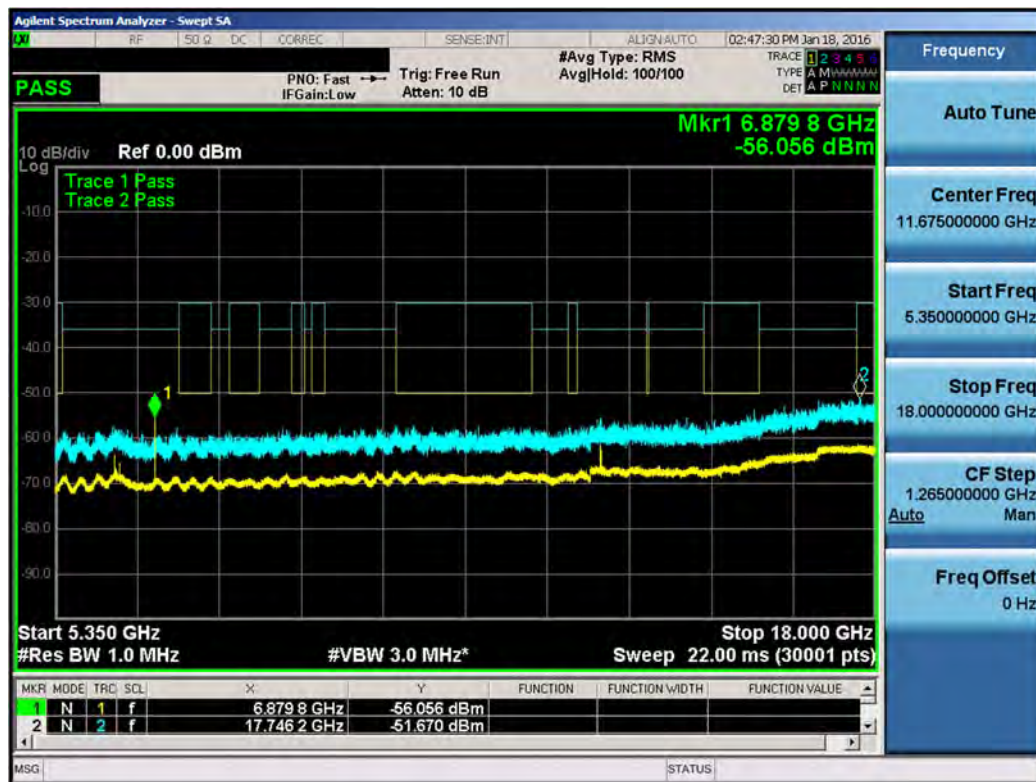


Plot 7-53. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 46890)

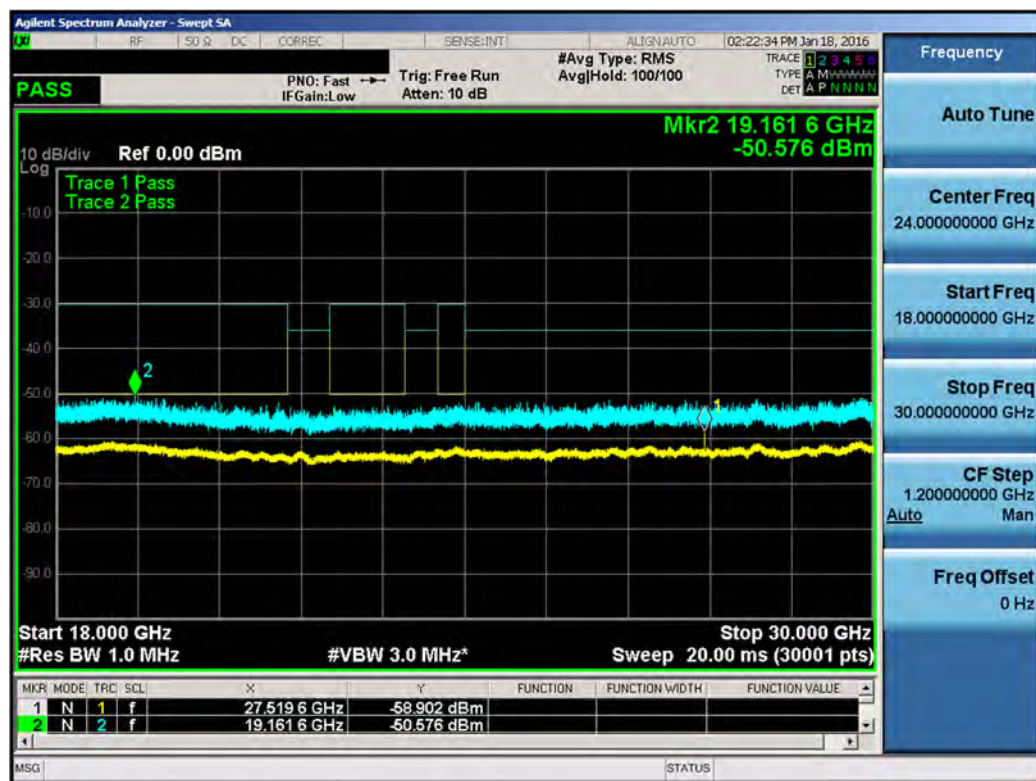


Plot 7-54. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 46890)

FCC ID: J9CMTP9900LAA			FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell		Page 52 of 145

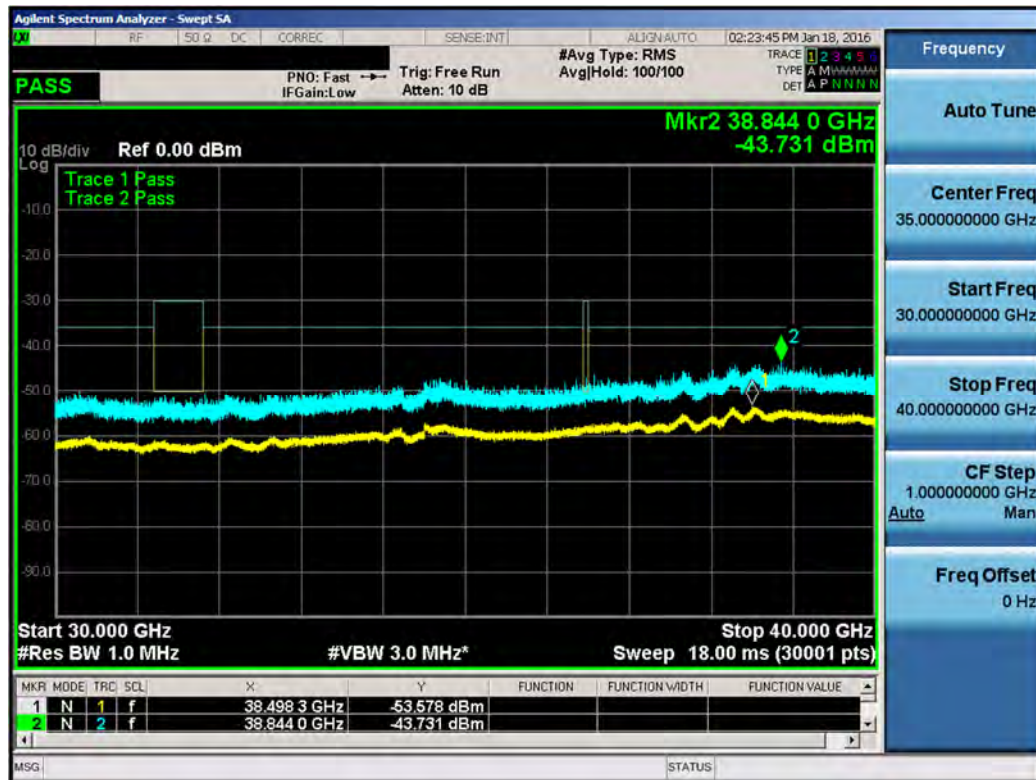


Plot 7-55. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 46890)

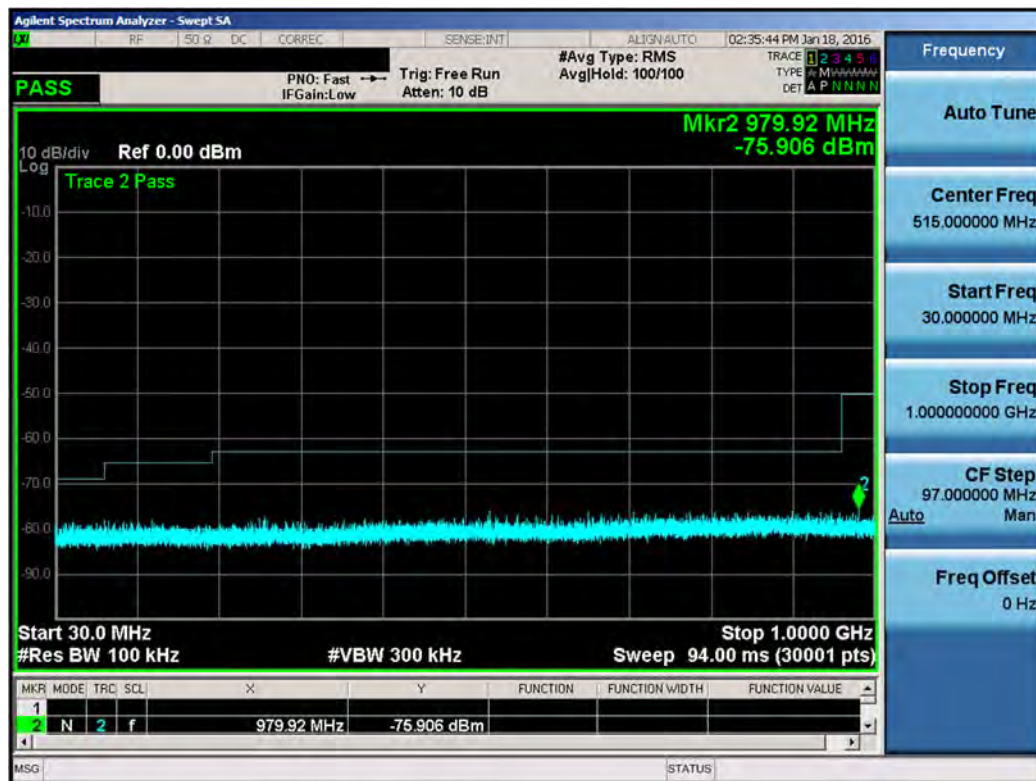


Plot 7-56. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 46890)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 53 of 145



Plot 7-57. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 46890)

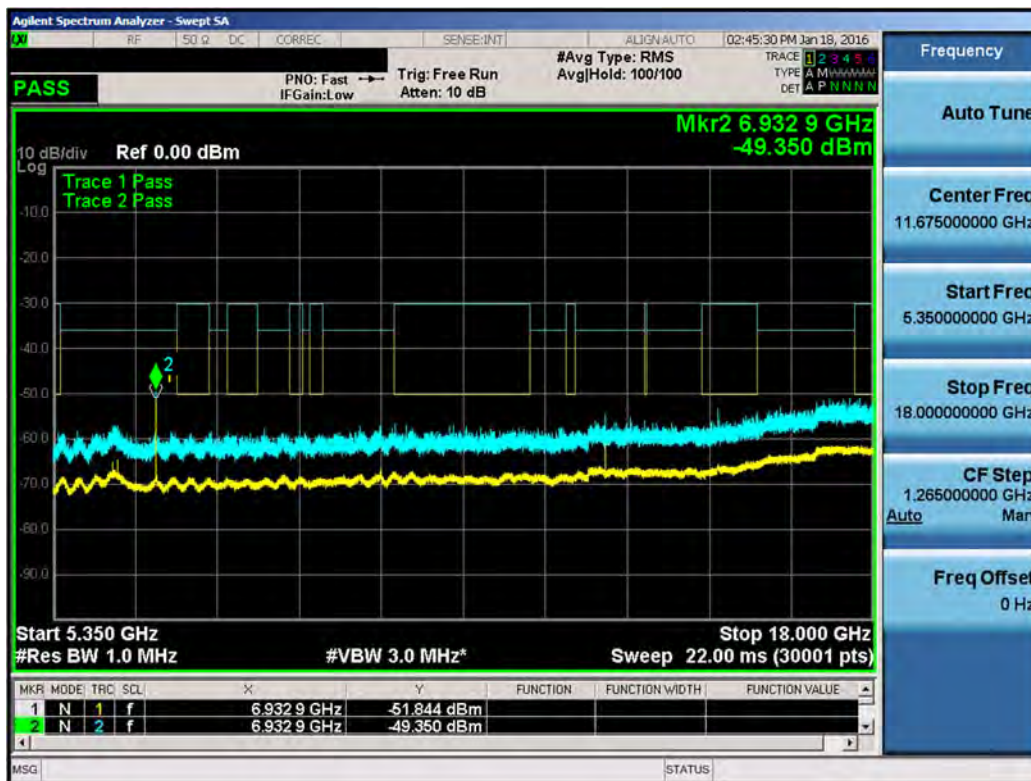


Plot 7-58. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47290)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 54 of 145

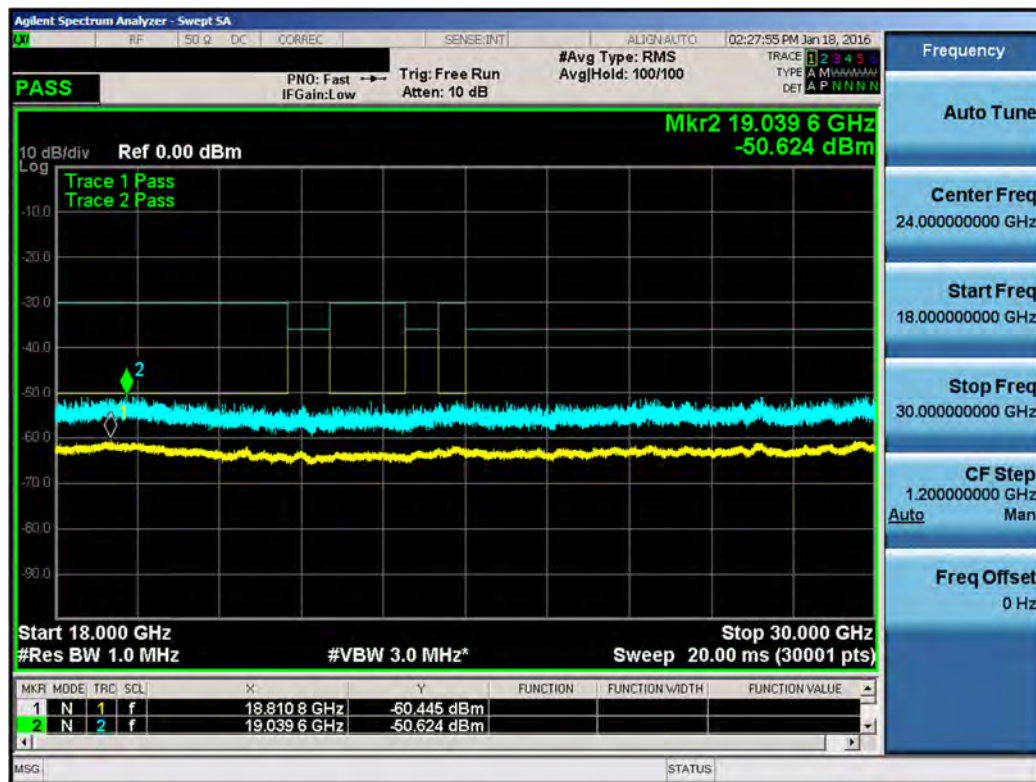


Plot 7-59. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47290)

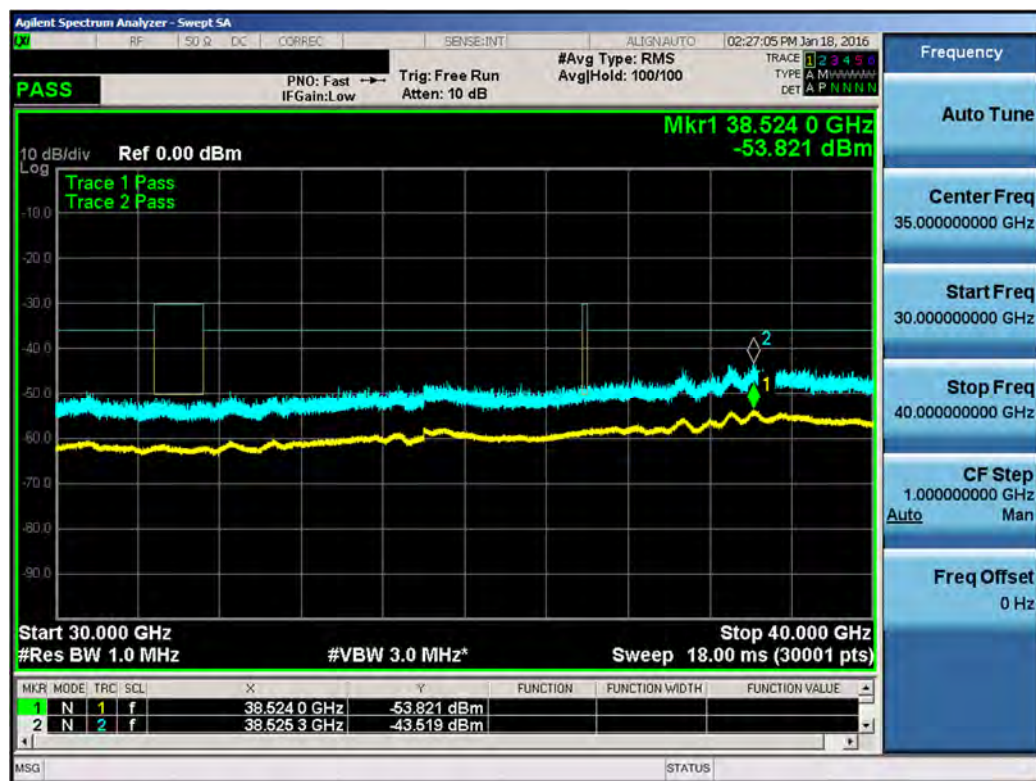


Plot 7-60. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47290)


FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 55 of 145

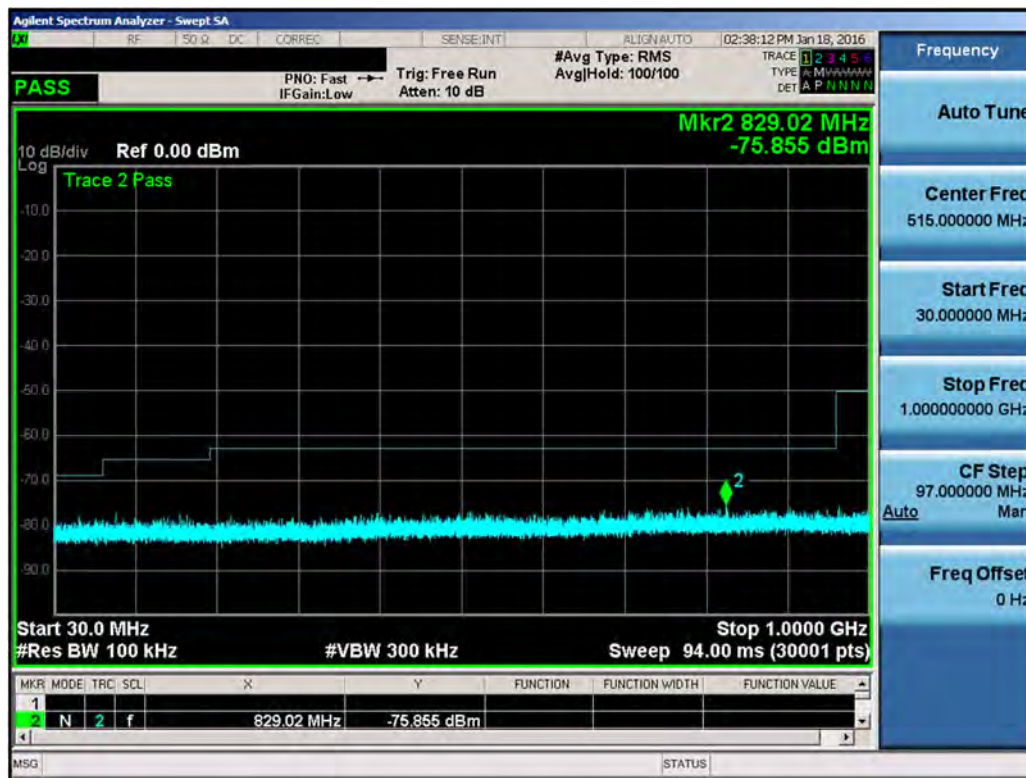


Plot 7-61. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47290)

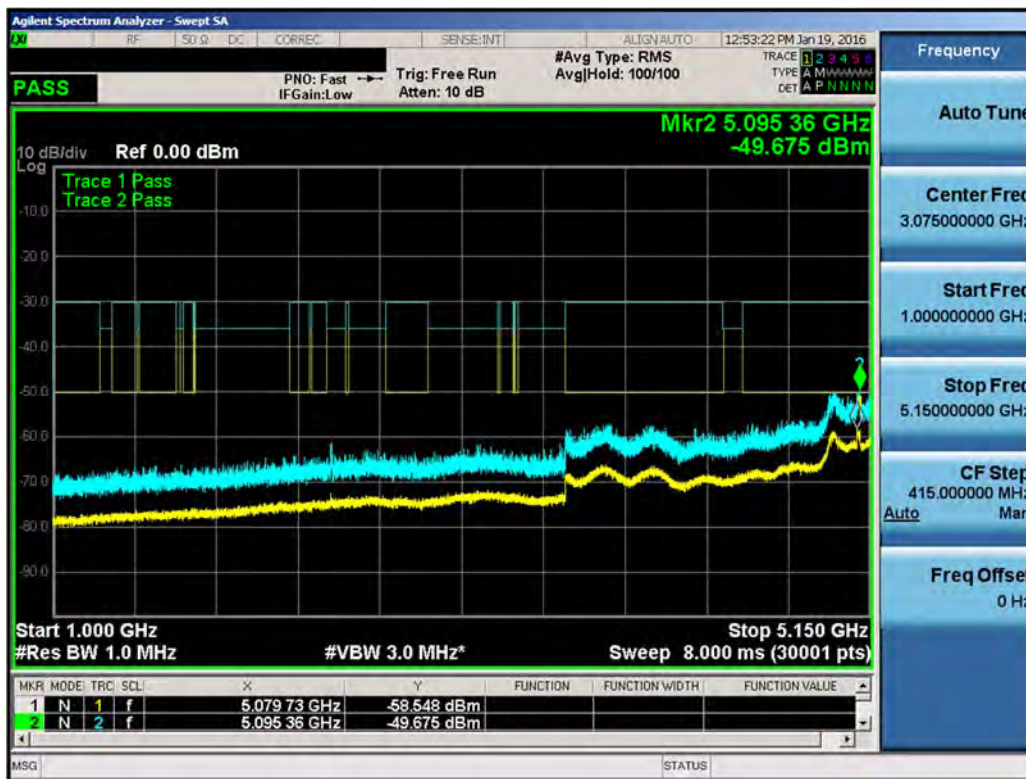


Plot 7-62. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47290)


FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 56 of 145

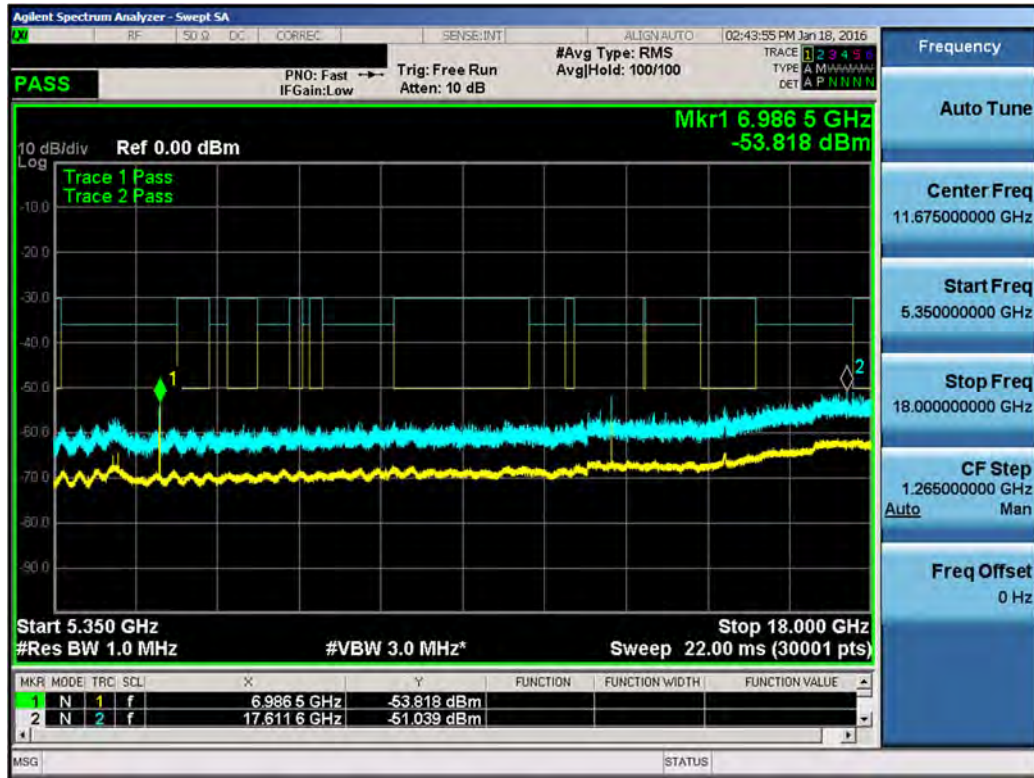


Plot 7-63. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)



Plot 7-64. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 57 of 145

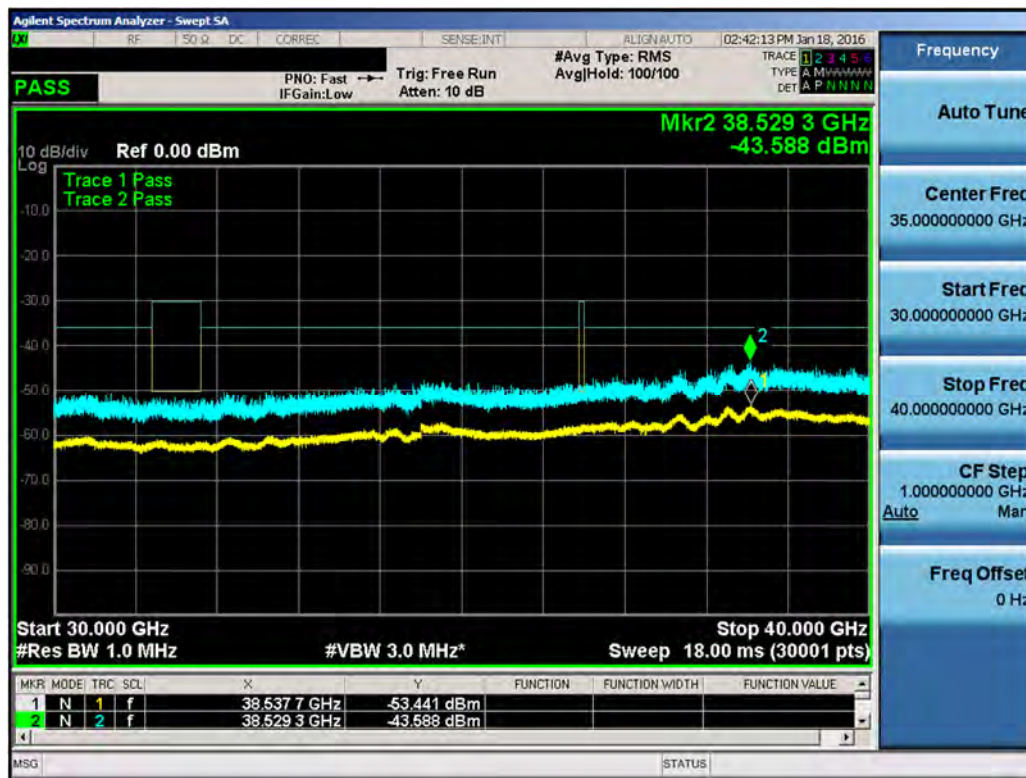


Plot 7-65. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)

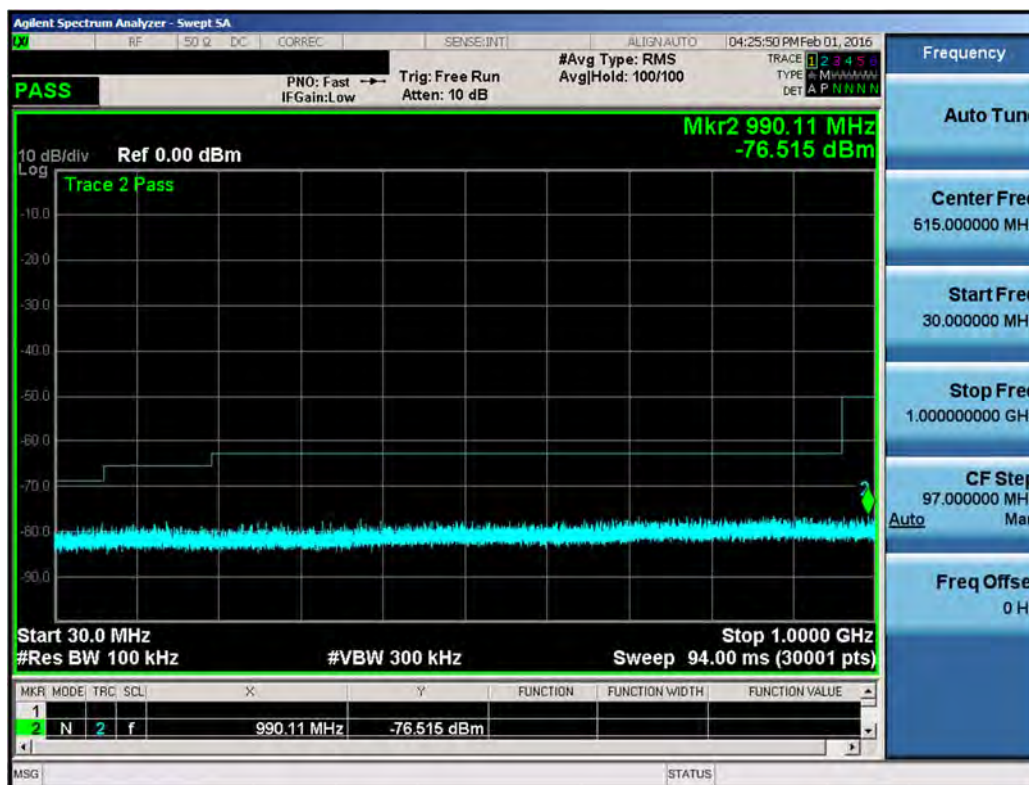


Plot 7-66. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)


FCC ID: J9CMTP9900LAA	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 58 of 145

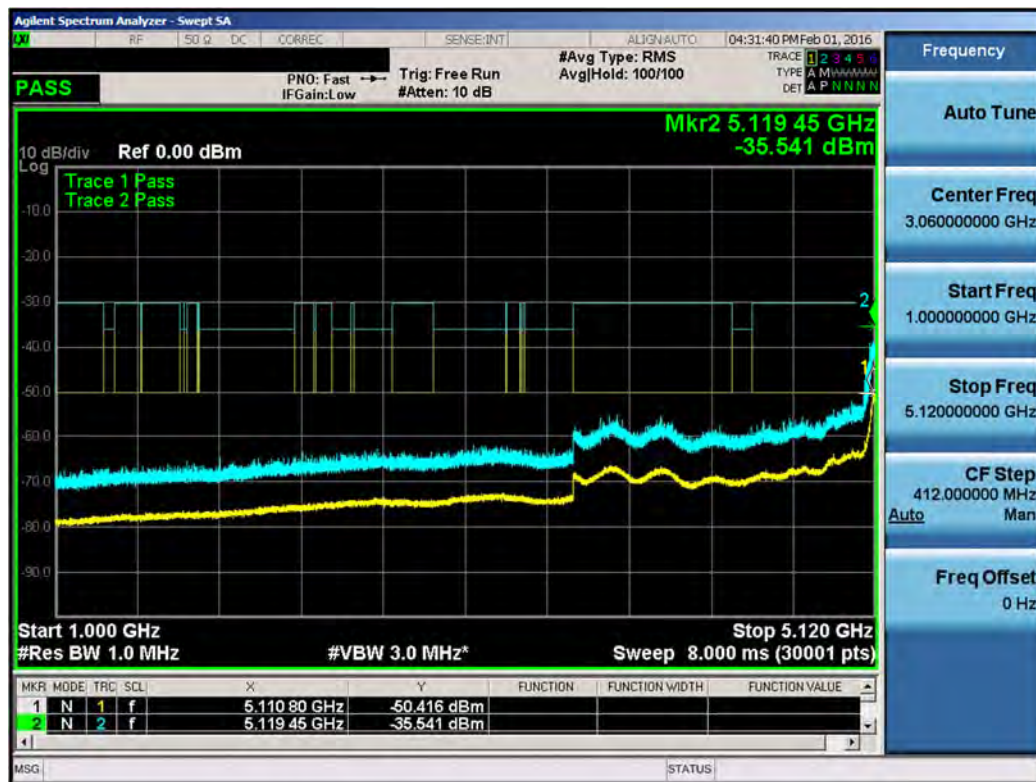


Plot 7-67. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)

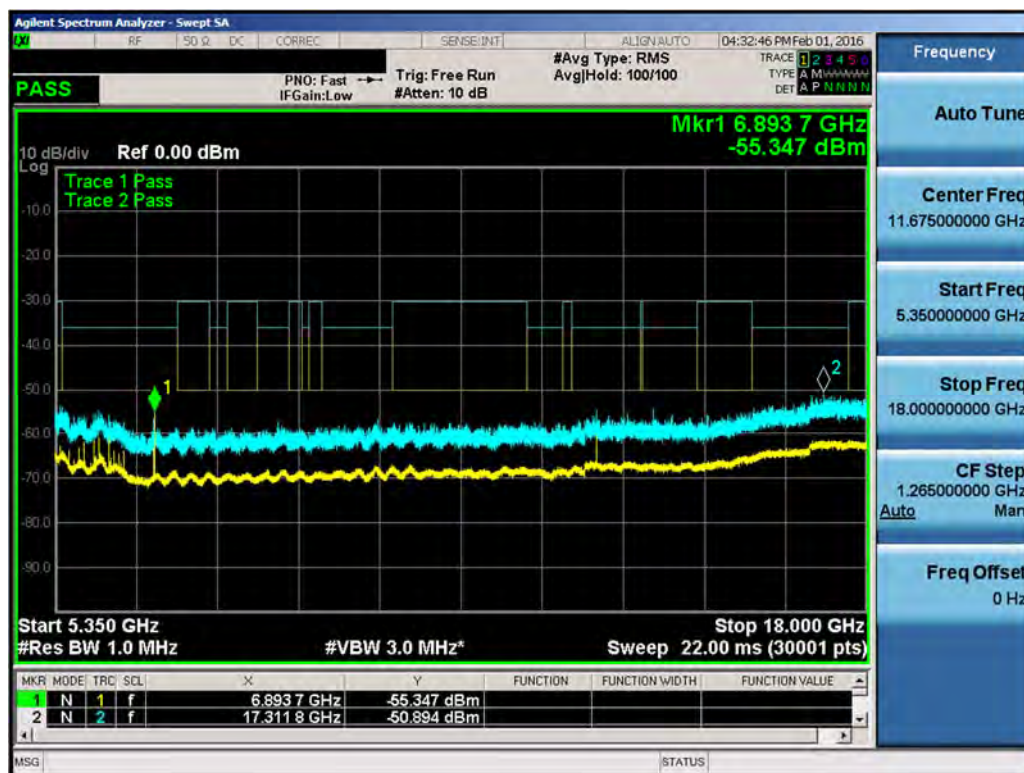


Plot 7-68. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 46890, 47090)


FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 59 of 145

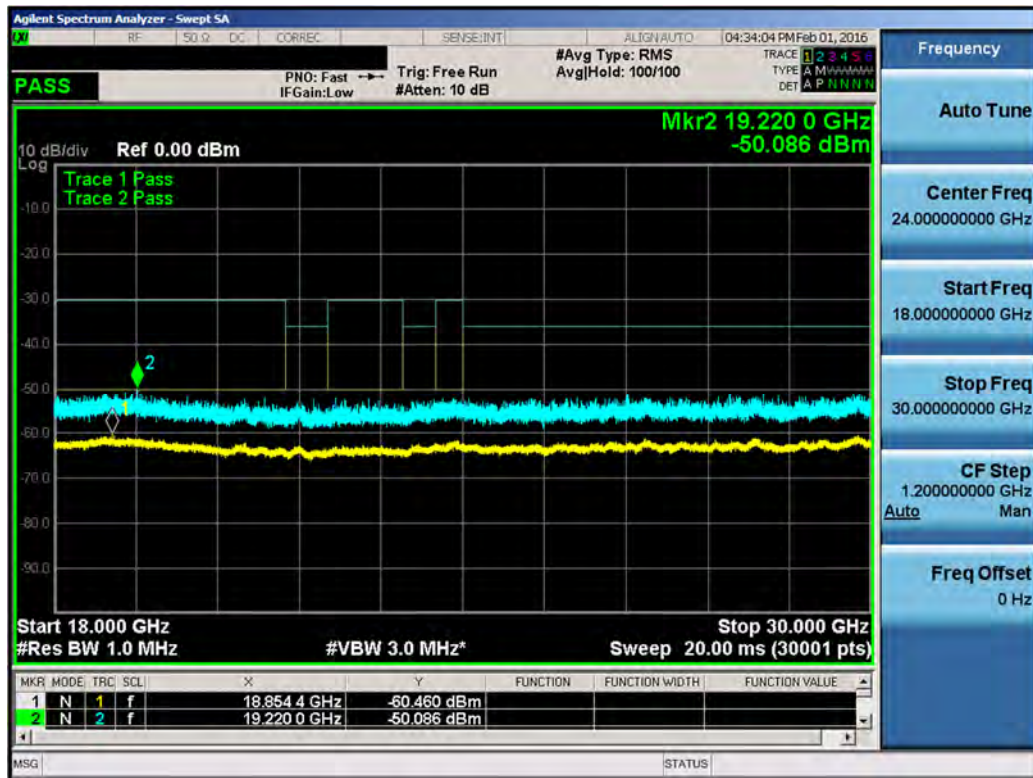


Plot 7-69. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 46890, 47090)



Plot 7-70. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 46890, 47090)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 60 of 145

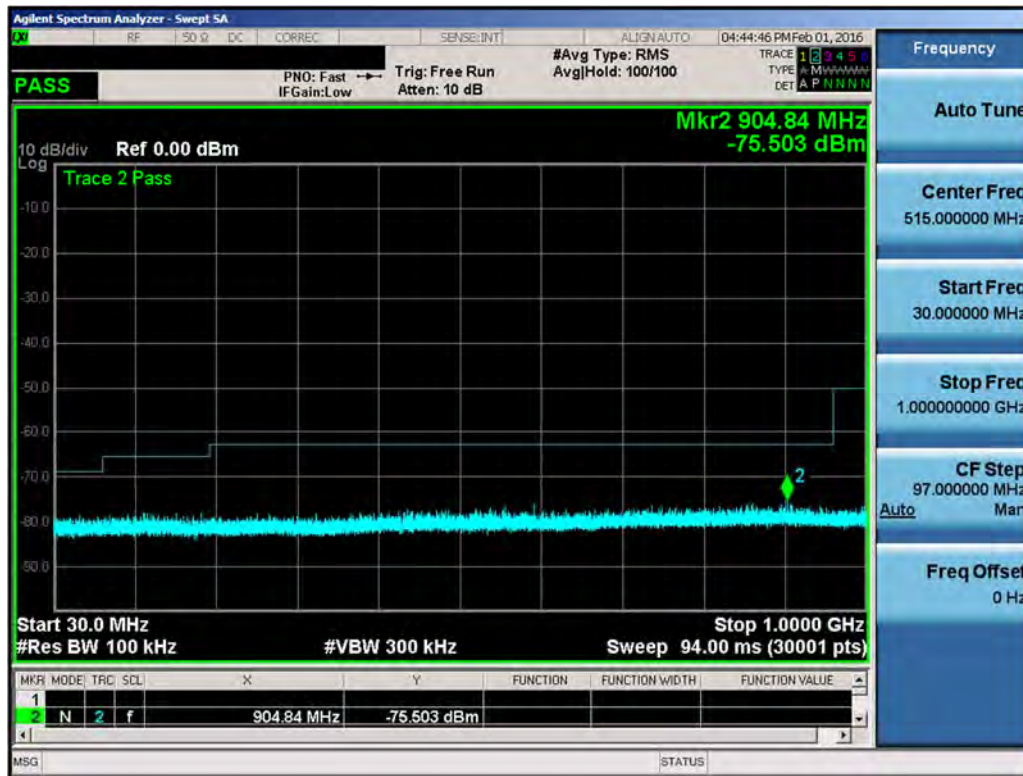


Plot 7-71. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 46890, 47090)

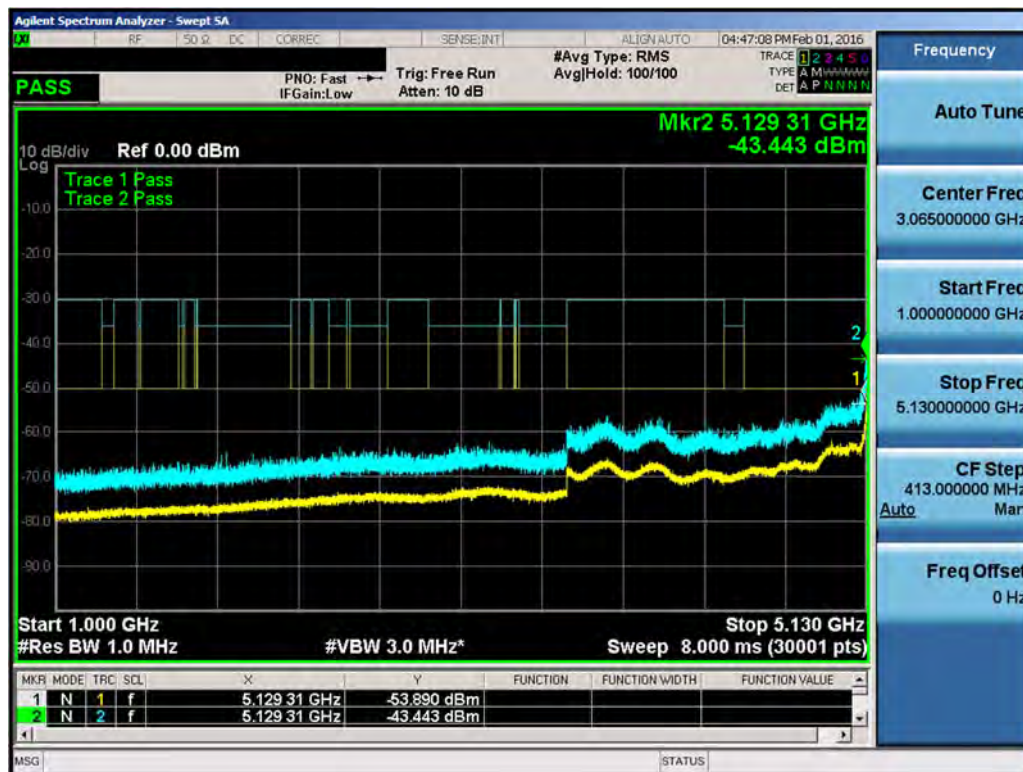


Plot 7-72. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 46890, 47090)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 61 of 145

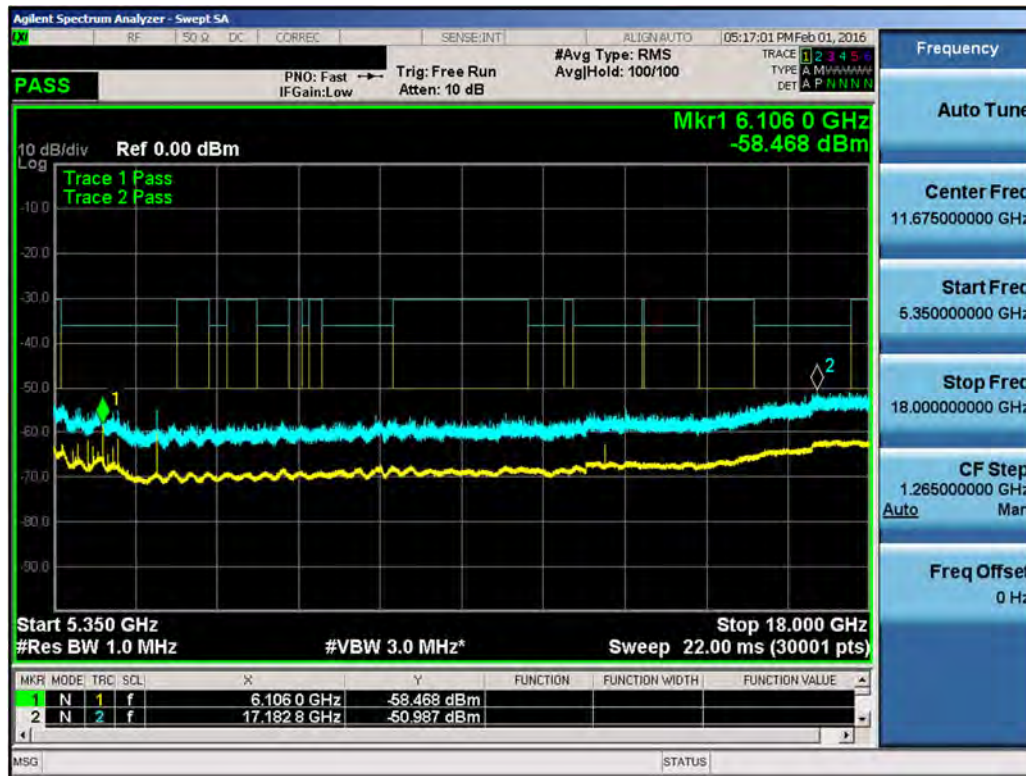


Plot 7-73. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47290, 47490)

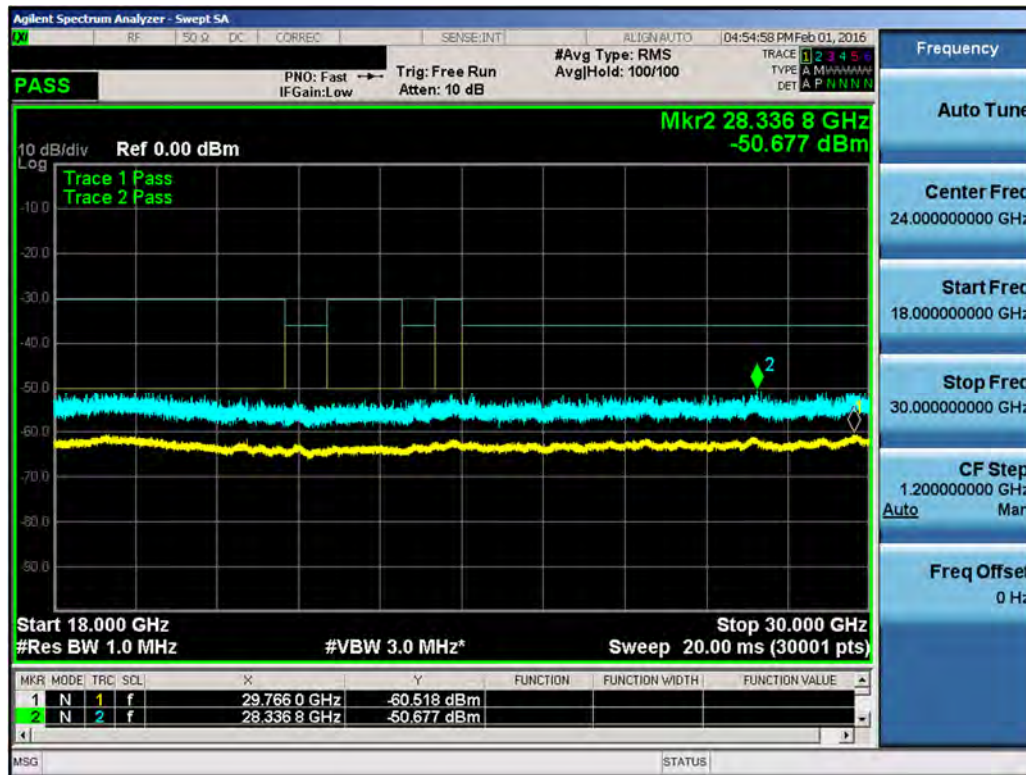


Plot 7-74. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47290, 47490)

FCC ID: J9CMTP9900LAA			FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell		Page 62 of 145



Plot 7-75. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47290, 47490)

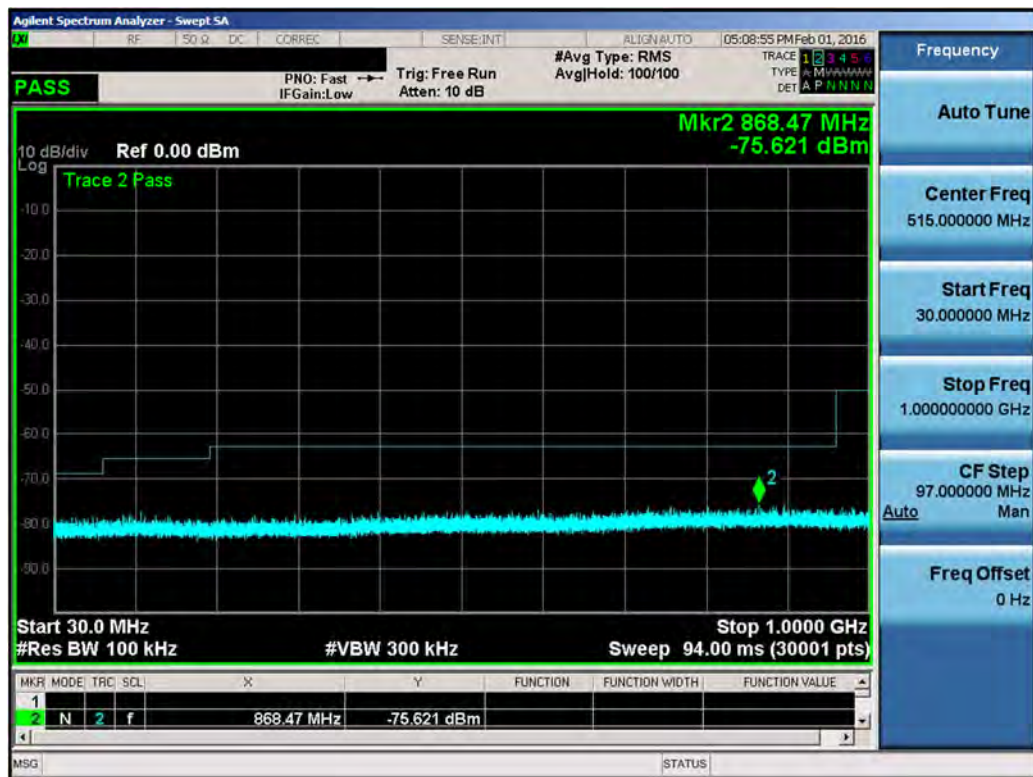


Plot 7-76. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47290, 47490)

FCC ID: J9CMTP9900LAA	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 63 of 145

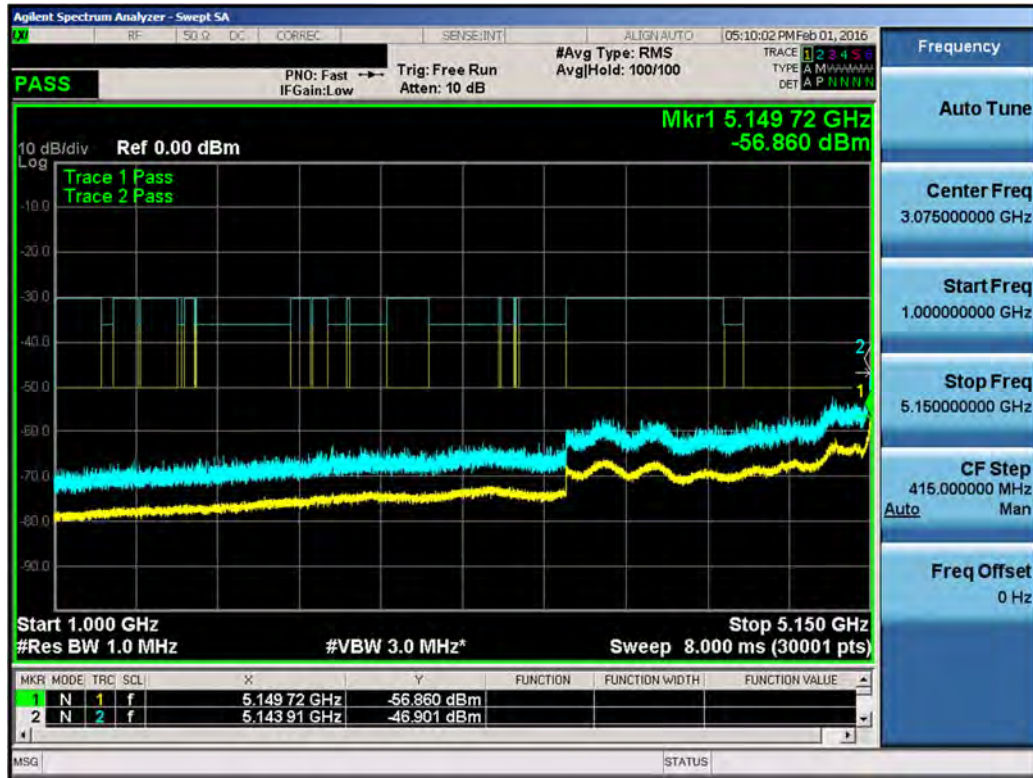


Plot 7-77. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47290, 47490)

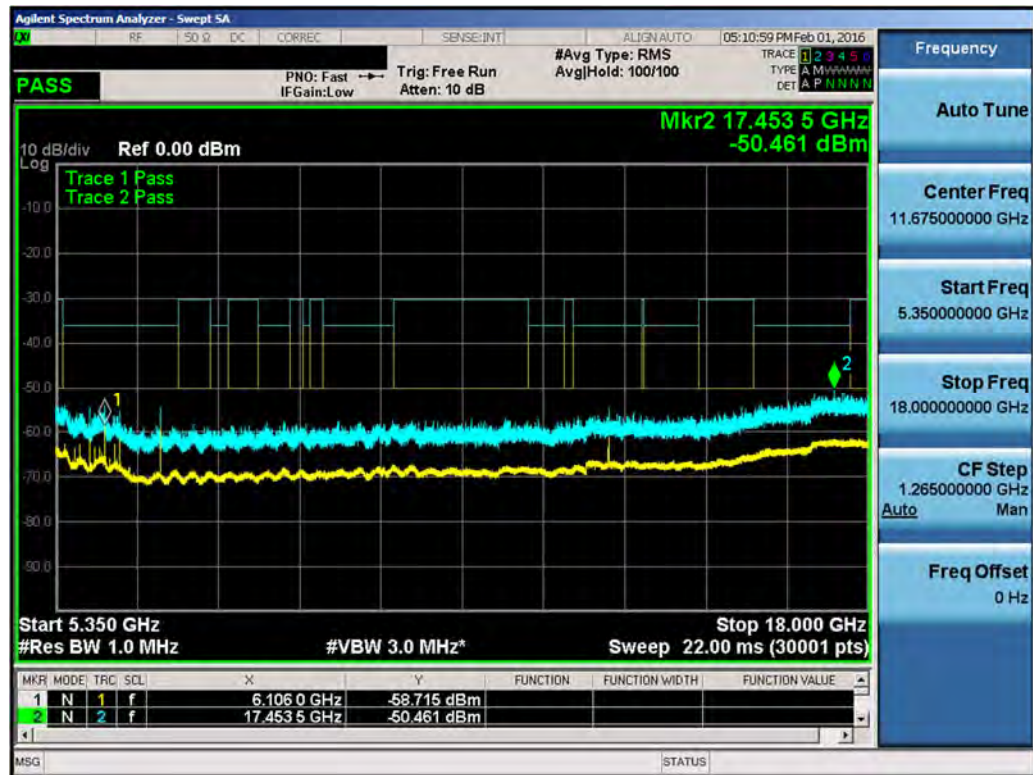


Plot 7-78. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47490, 47690)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 64 of 145

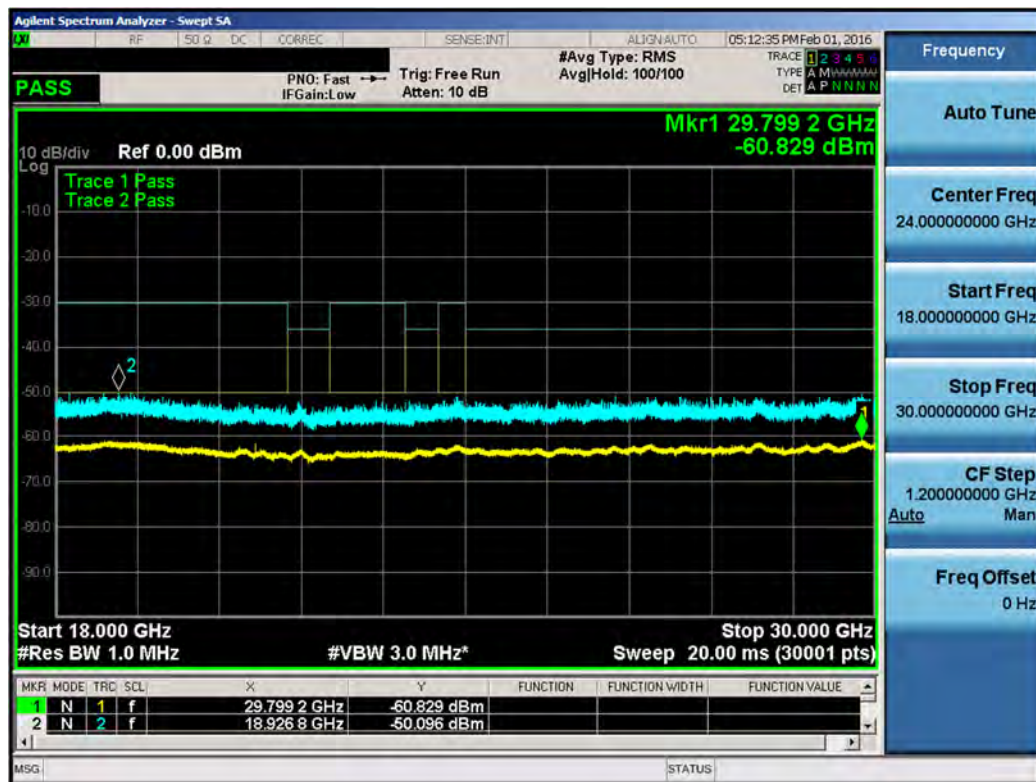


Plot 7-79. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47490, 47690)

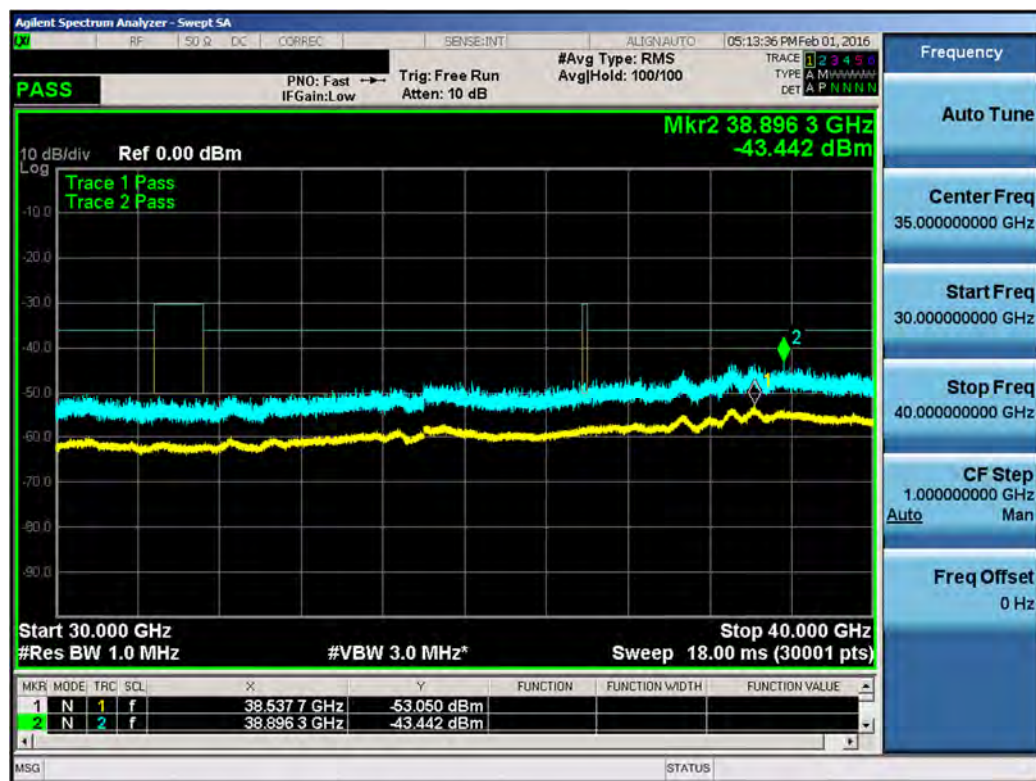


Plot 7-80. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47490, 47690)


FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 65 of 145

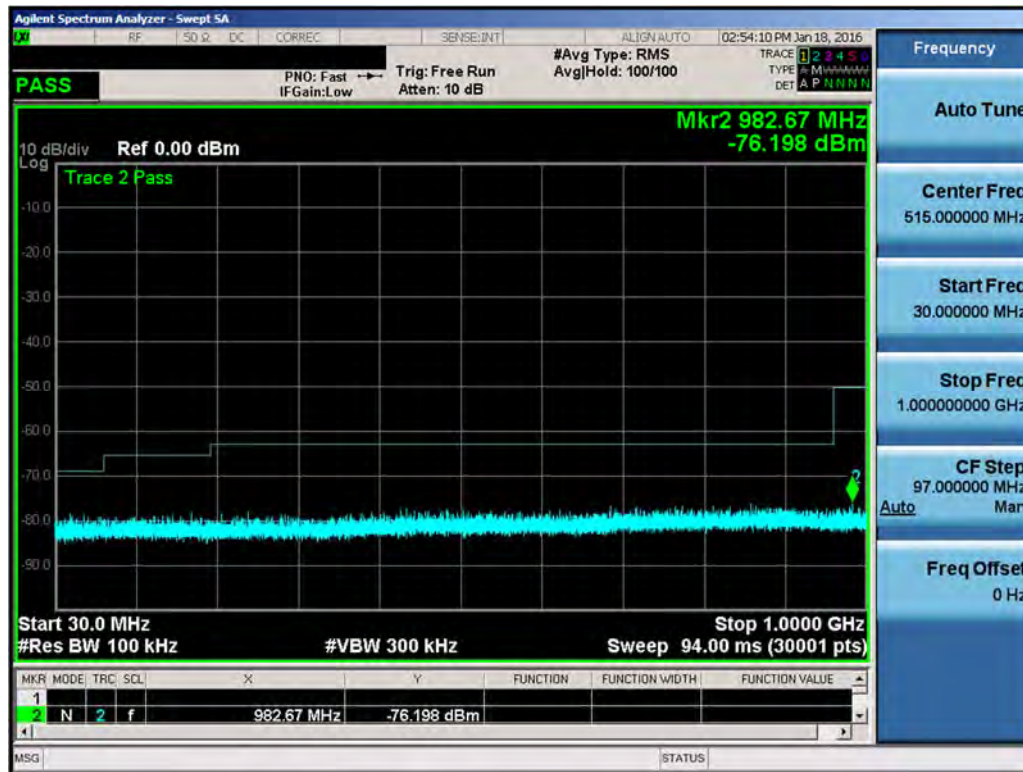


Plot 7-81. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47490, 47690)

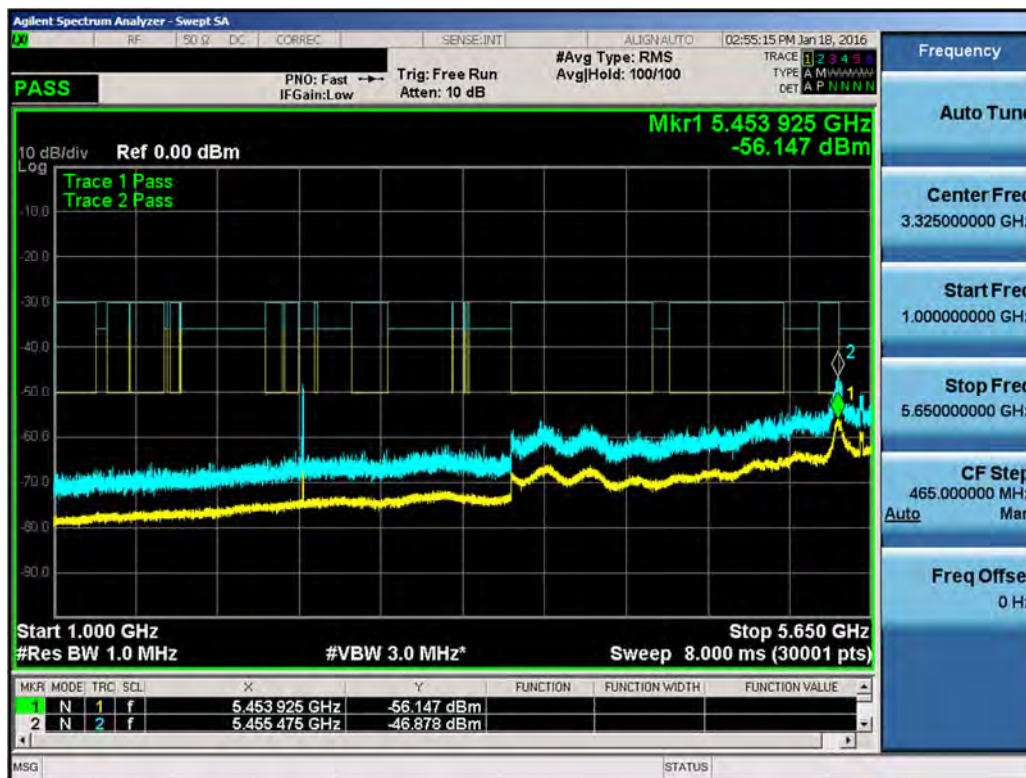


Plot 7-82. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47490, 47690)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 66 of 145

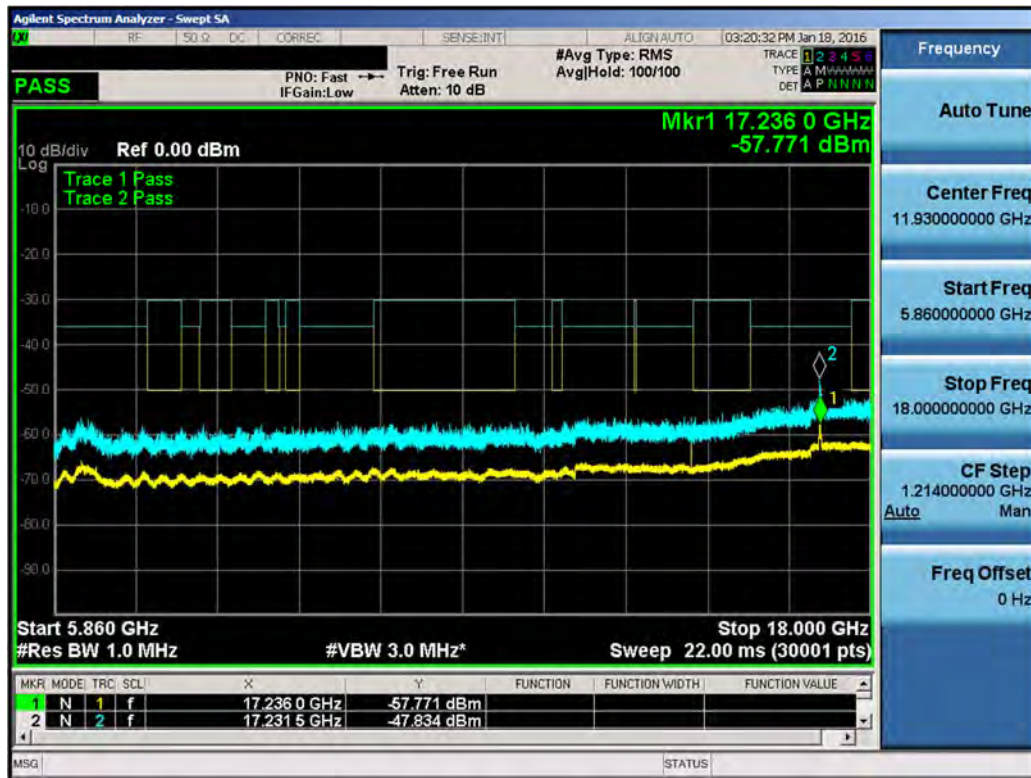


Plot 7-83. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 52740)

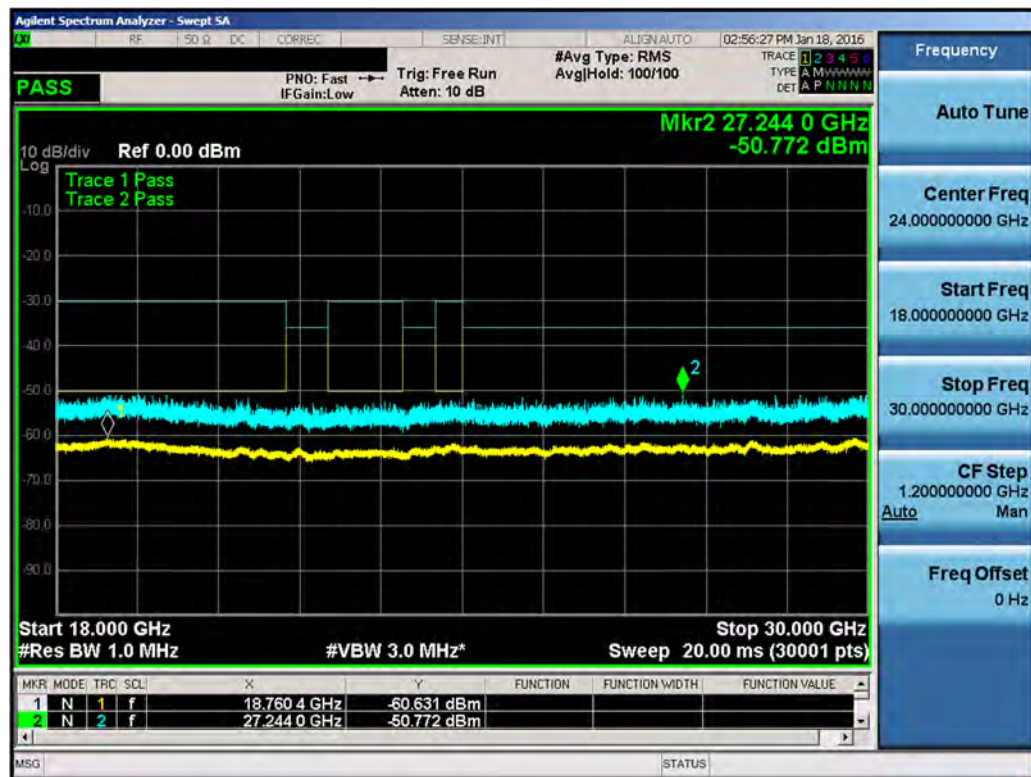


Plot 7-84. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 52740)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 67 of 145

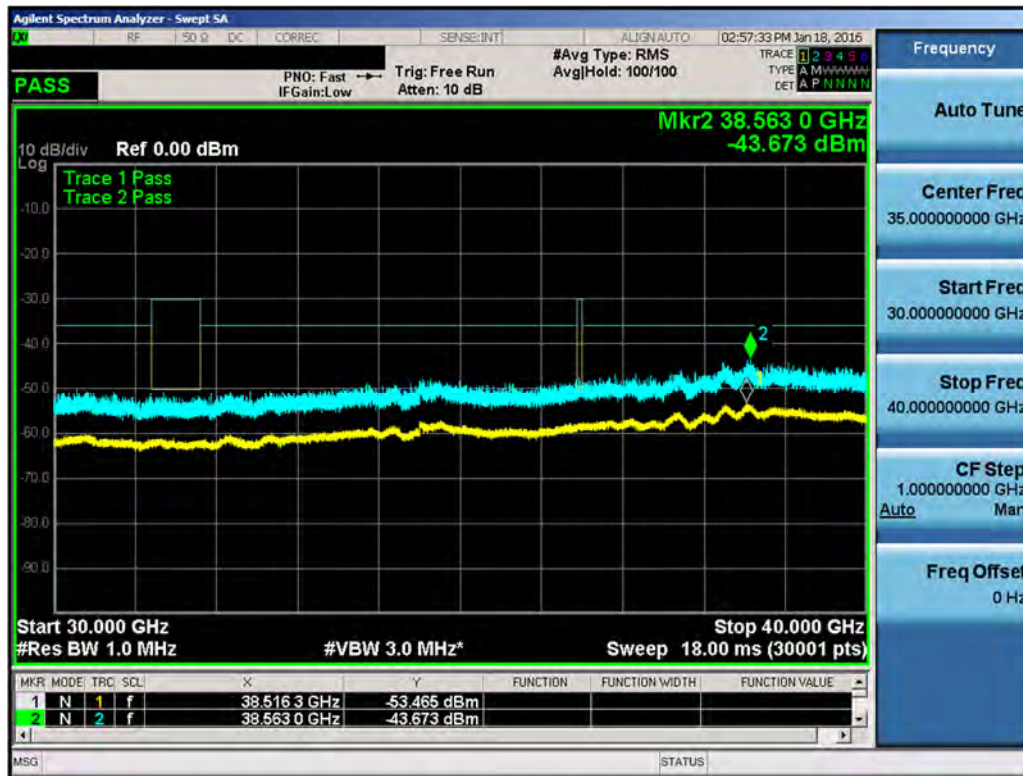


Plot 7-85. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 52740)

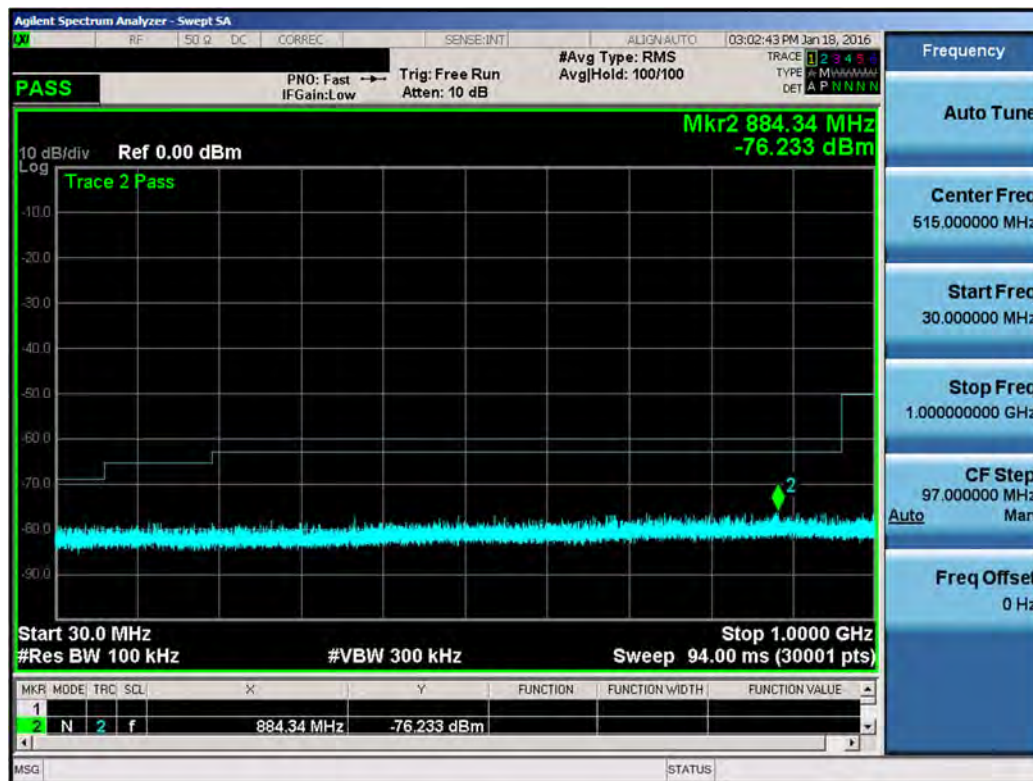


Plot 7-86. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 52740)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 68 of 145

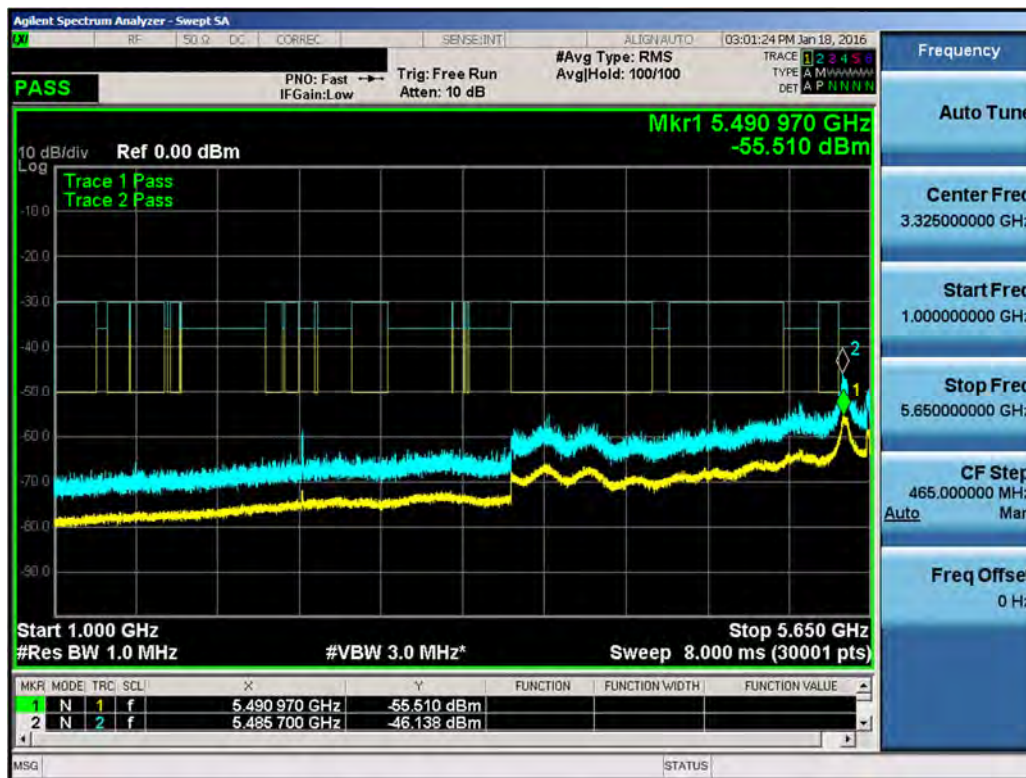


Plot 7-87. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 52740)

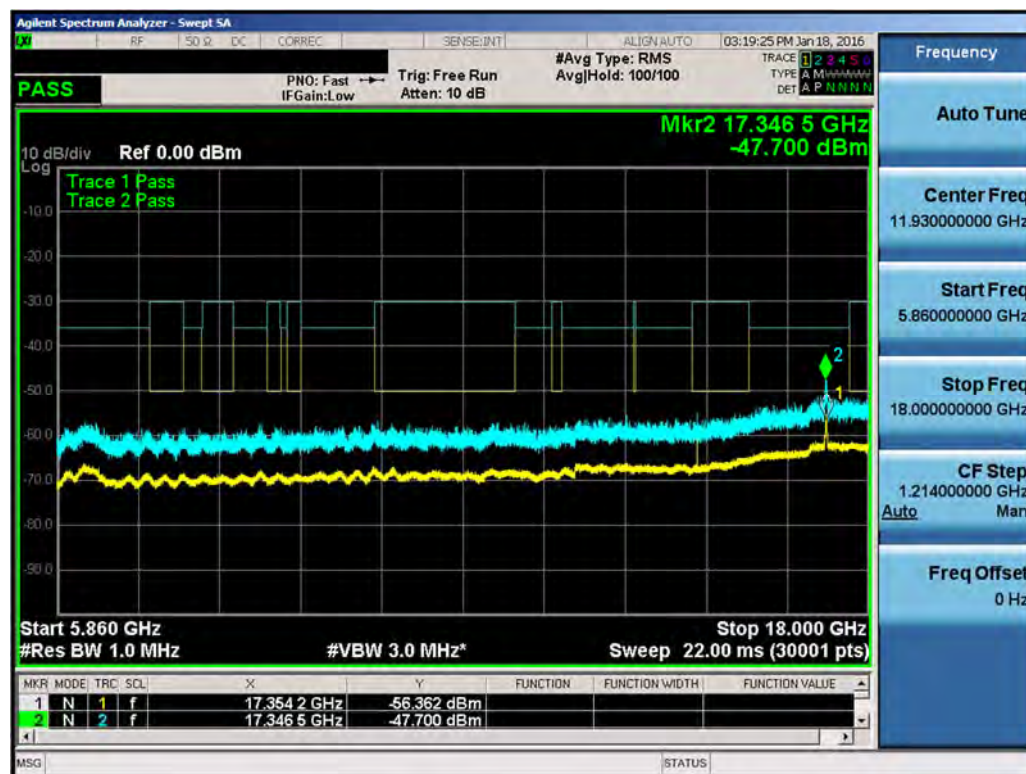


Plot 7-88. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53140)


FCC ID: J9CMTP9900LAA			FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 69 of 145	

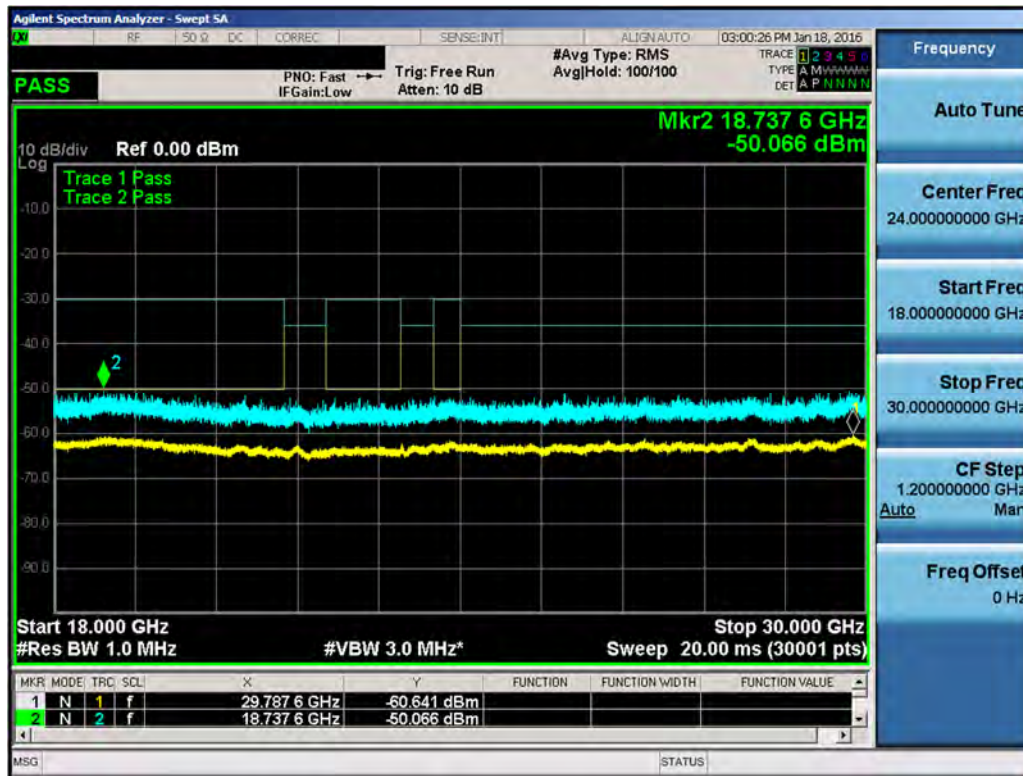


Plot 7-89. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53140)

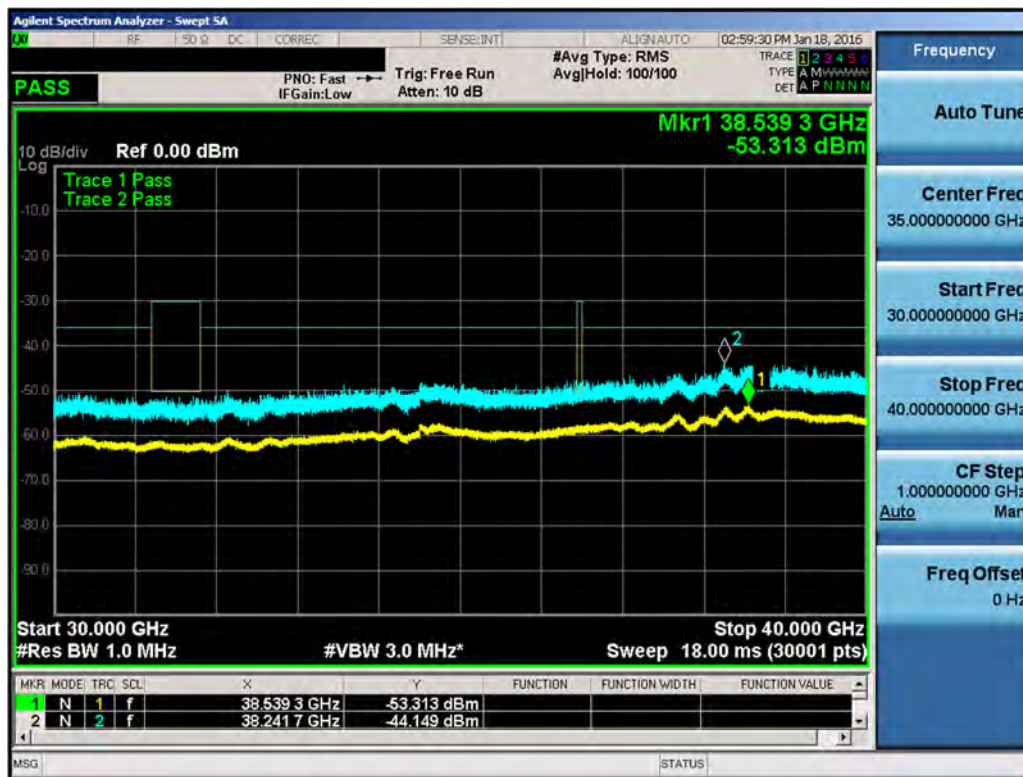


Plot 7-90. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53140)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 70 of 145

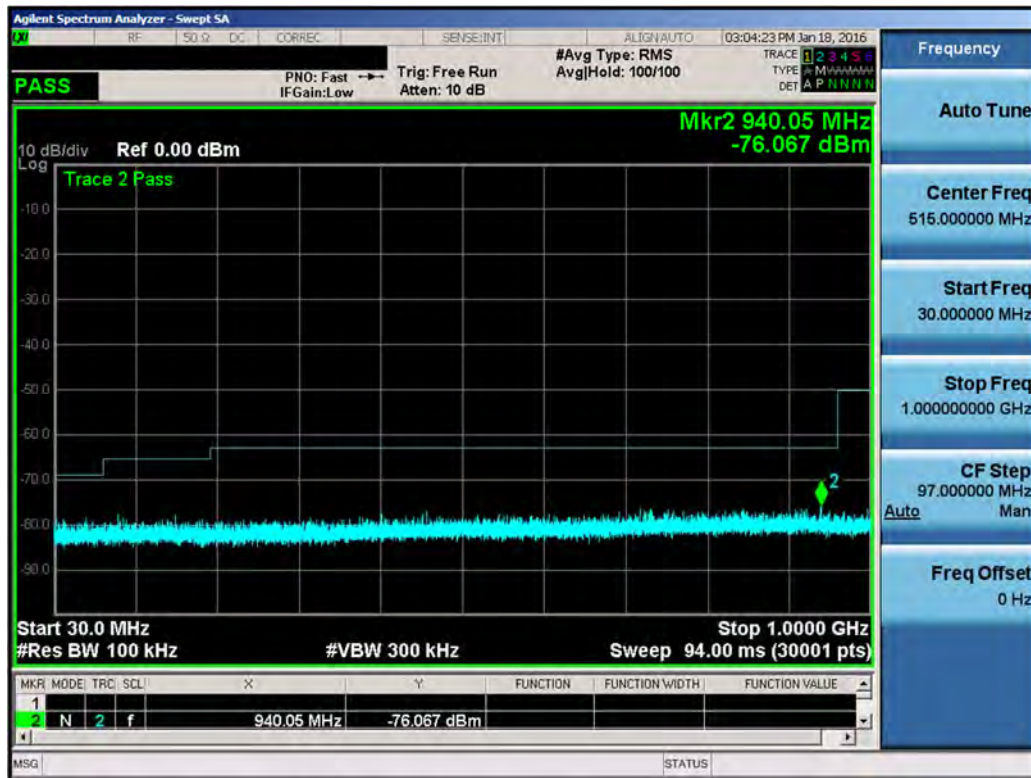


Plot 7-91. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53140)

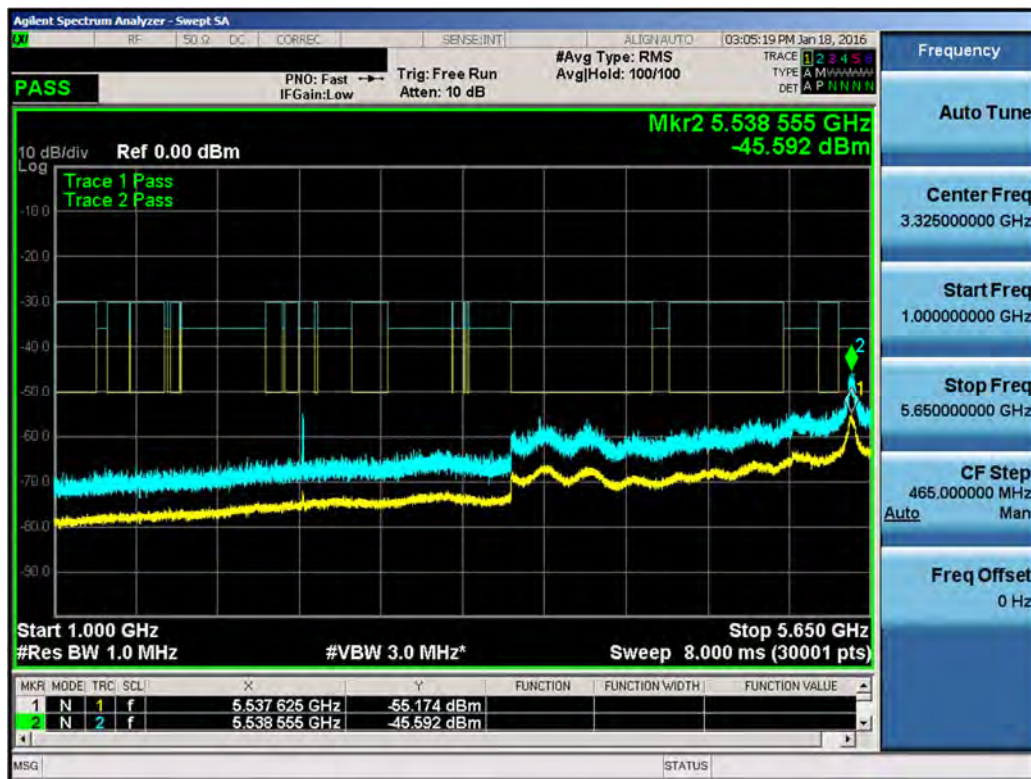


Plot 7-92. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53140)


FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 71 of 145

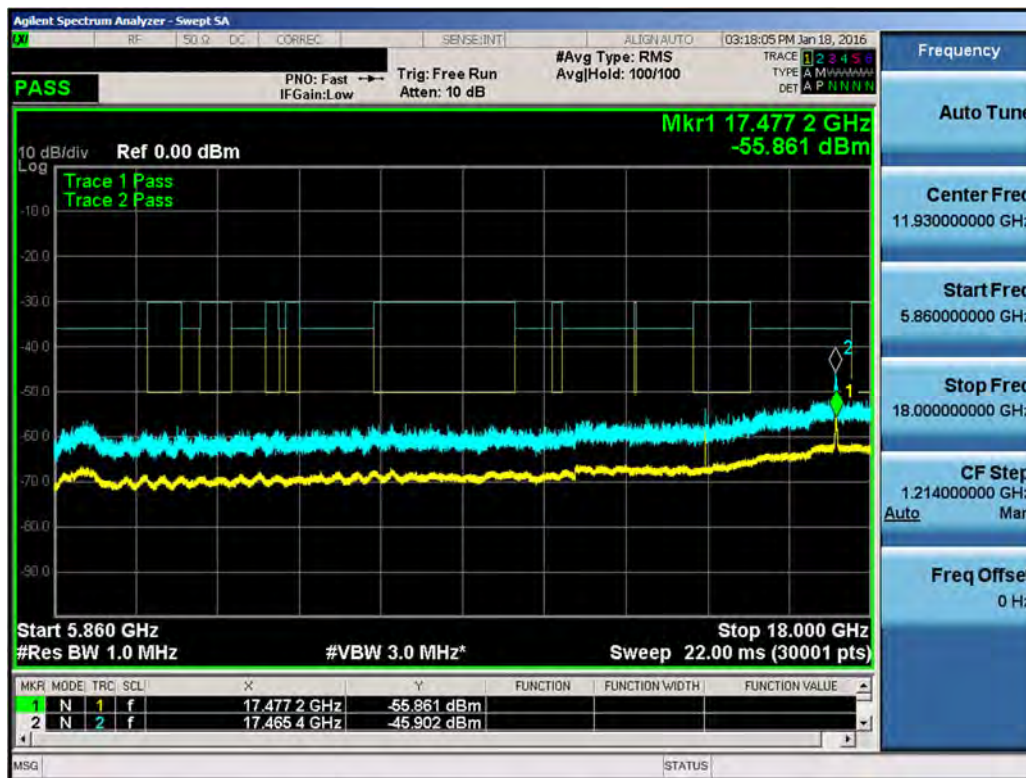


Plot 7-93. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)

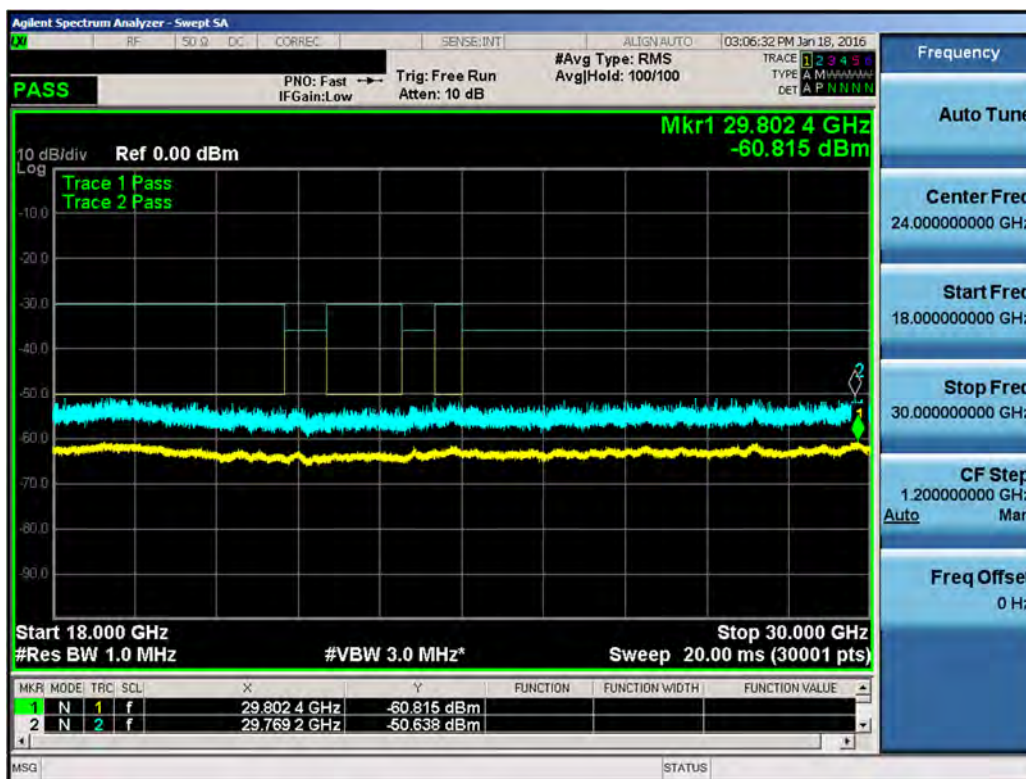


Plot 7-94. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 72 of 145

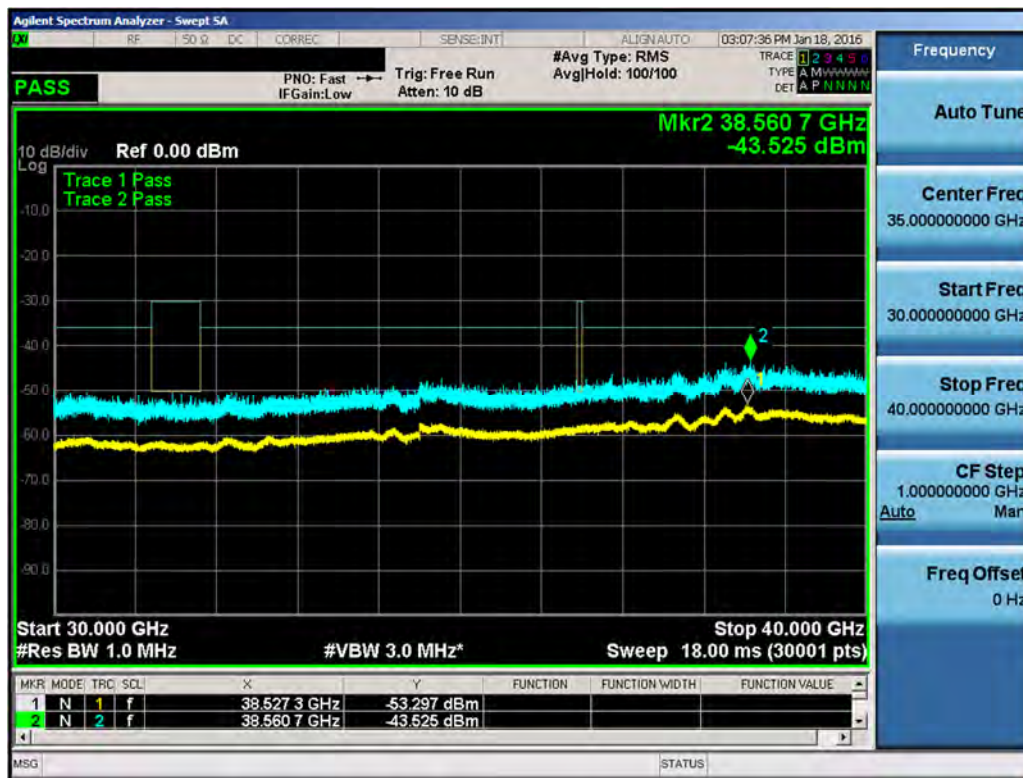


Plot 7-95. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)

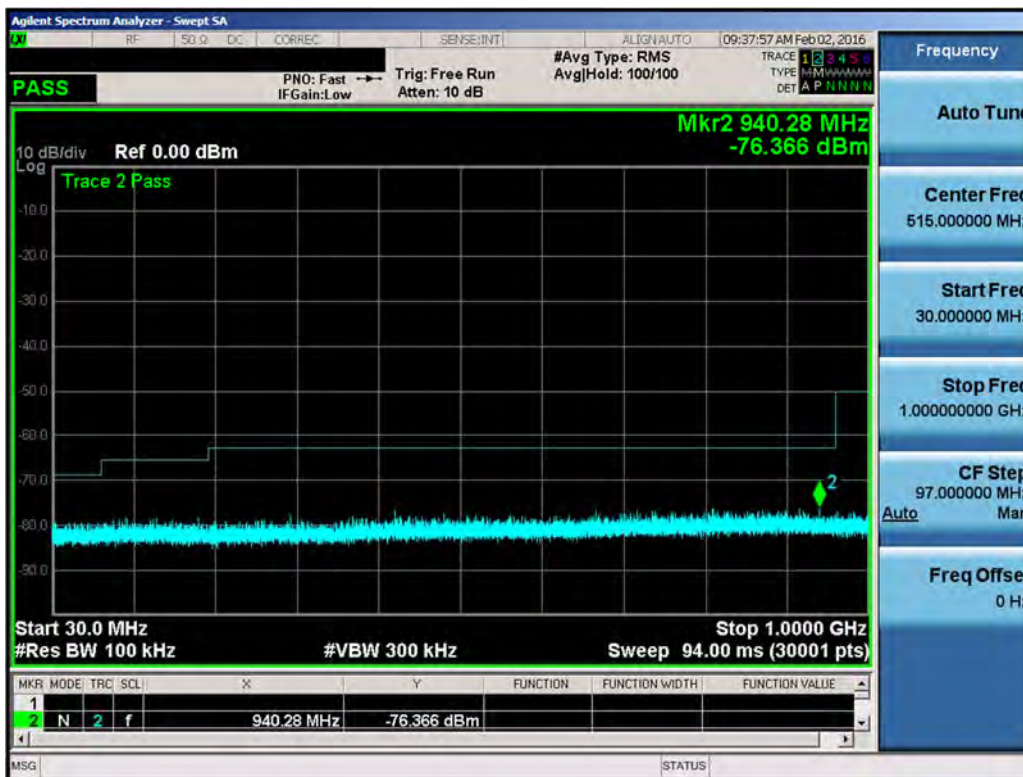


Plot 7-96. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)

FCC ID: J9CMTP9900LAA	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 73 of 145

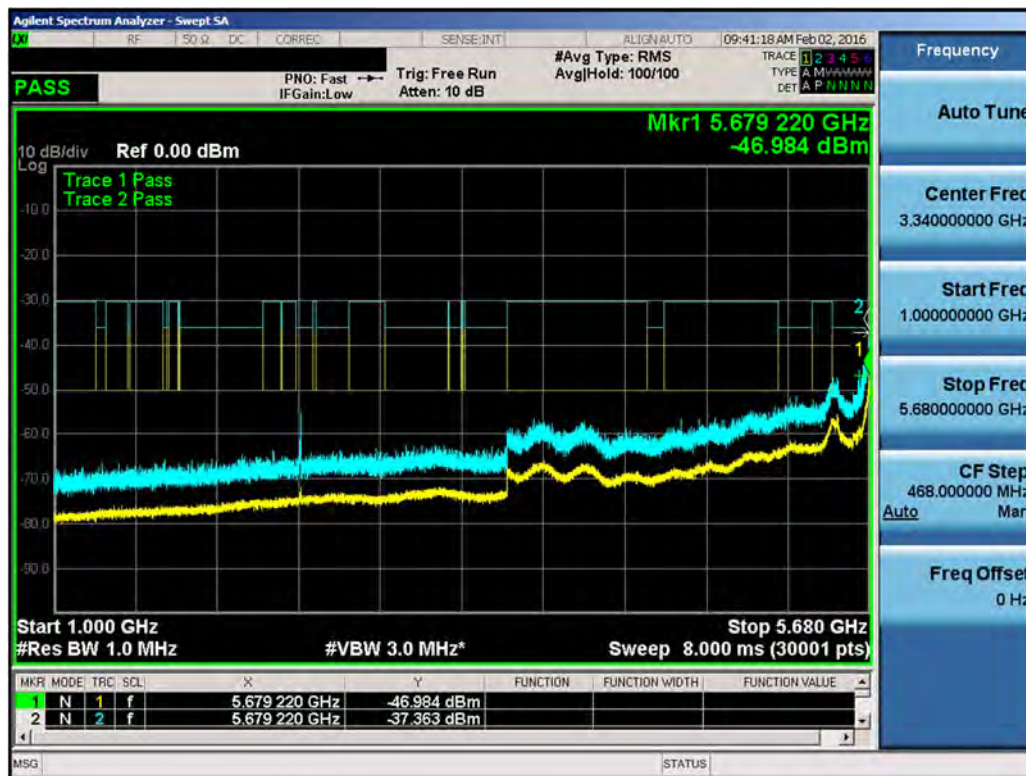


Plot 7-97. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)

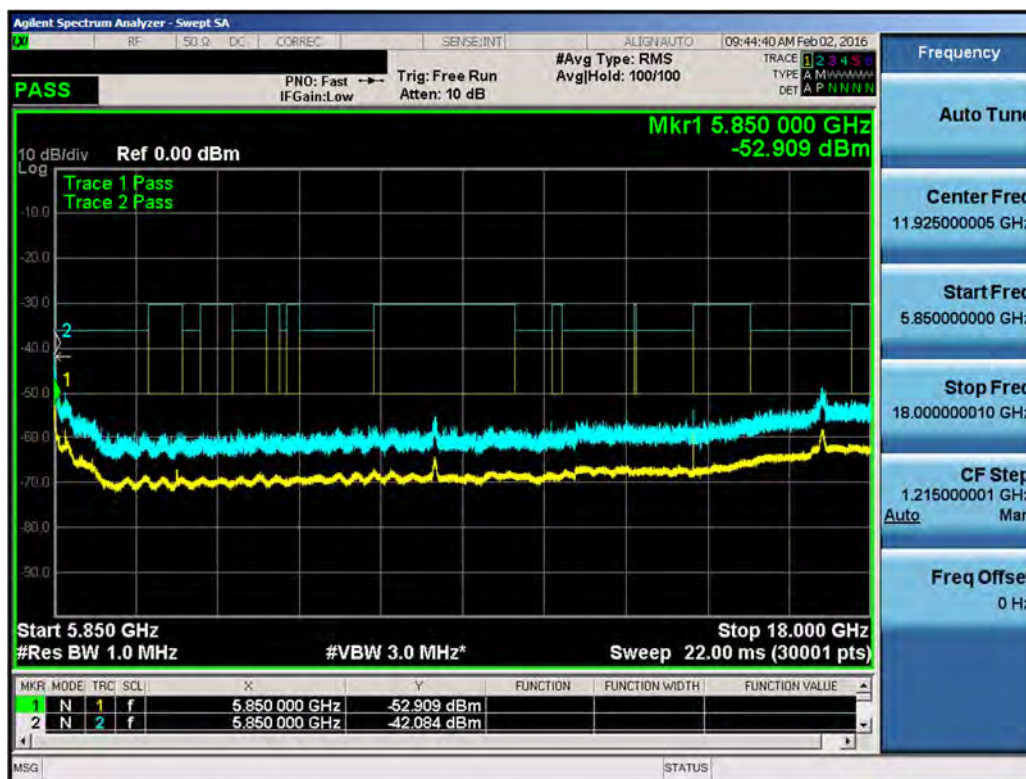


Plot 7-98. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 52740, 52940)


FCC ID: J9CMTP9900LAA			FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell		Page 74 of 145

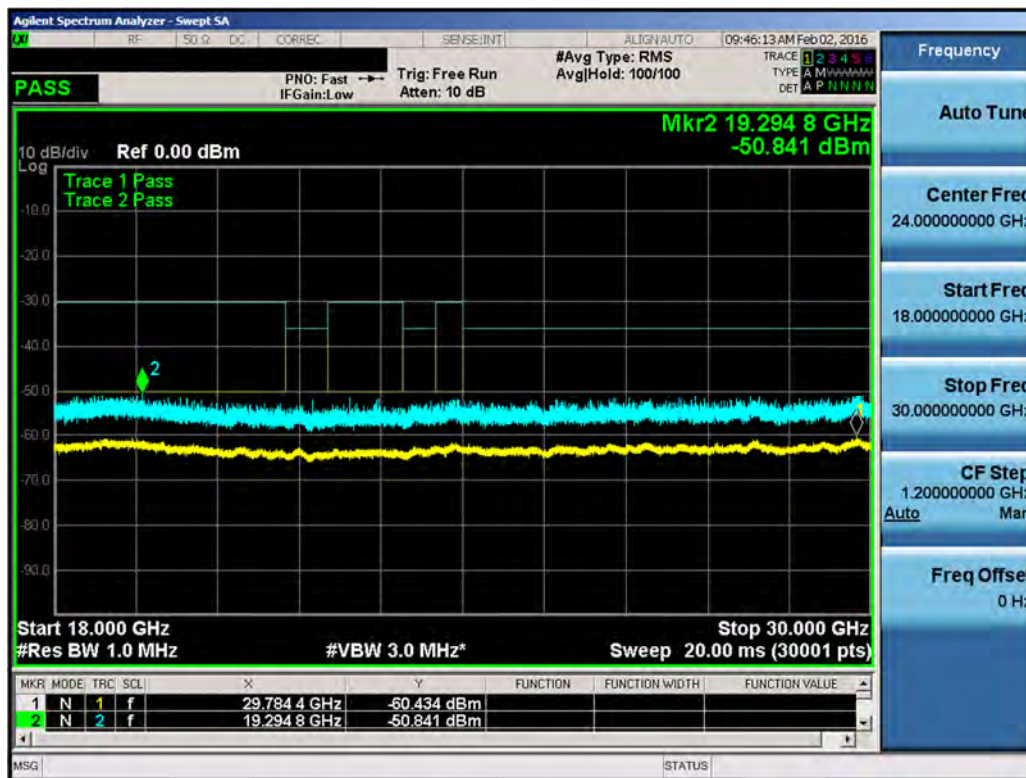


Plot 7-99. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 52740, 52940)



Plot 7-100. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 52740, 52940)


FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 75 of 145

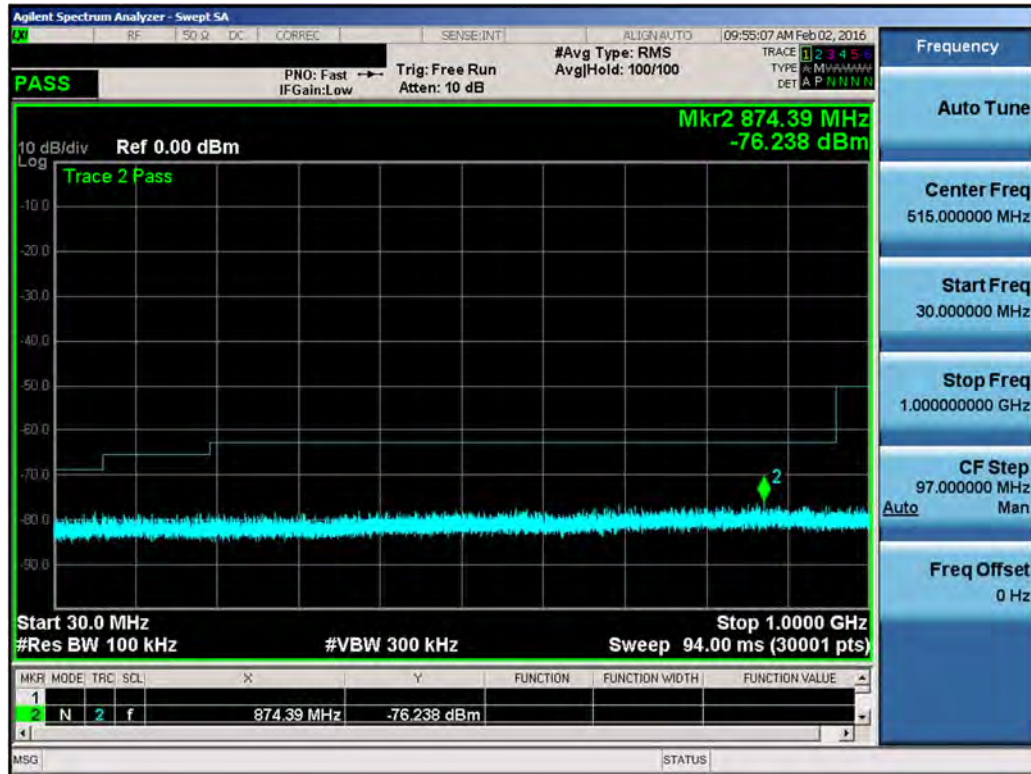


Plot 7-101. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 52740, 52940)

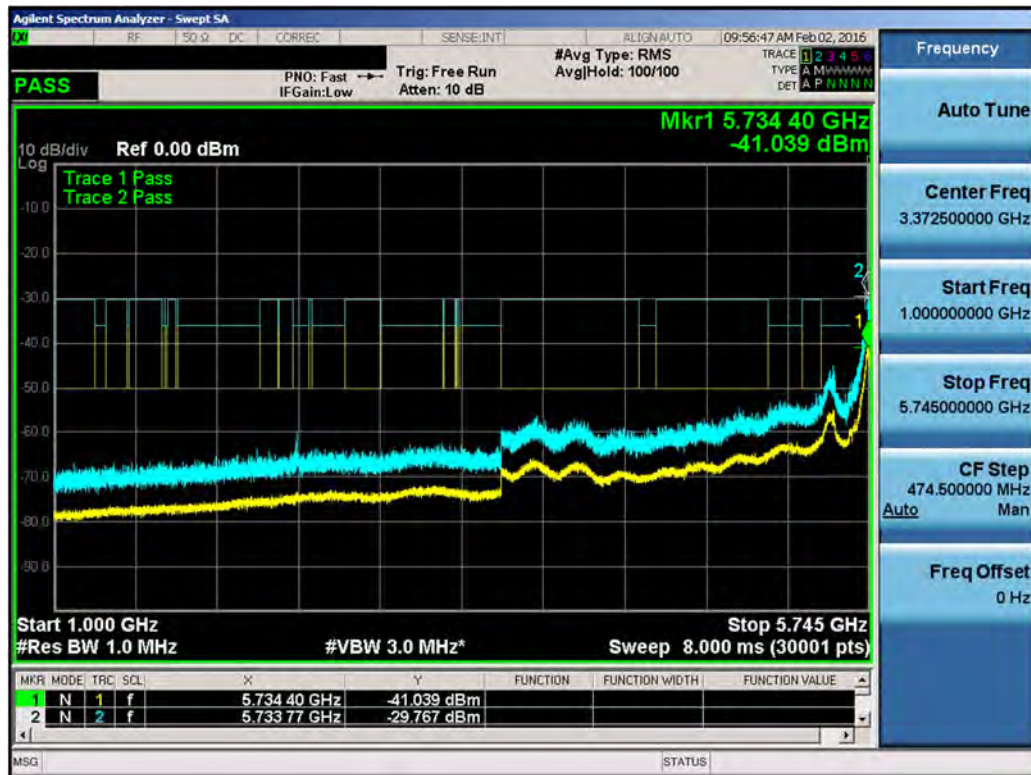


Plot 7-102. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 52740, 52940)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 76 of 145



Plot 7-103. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53140, 53340)

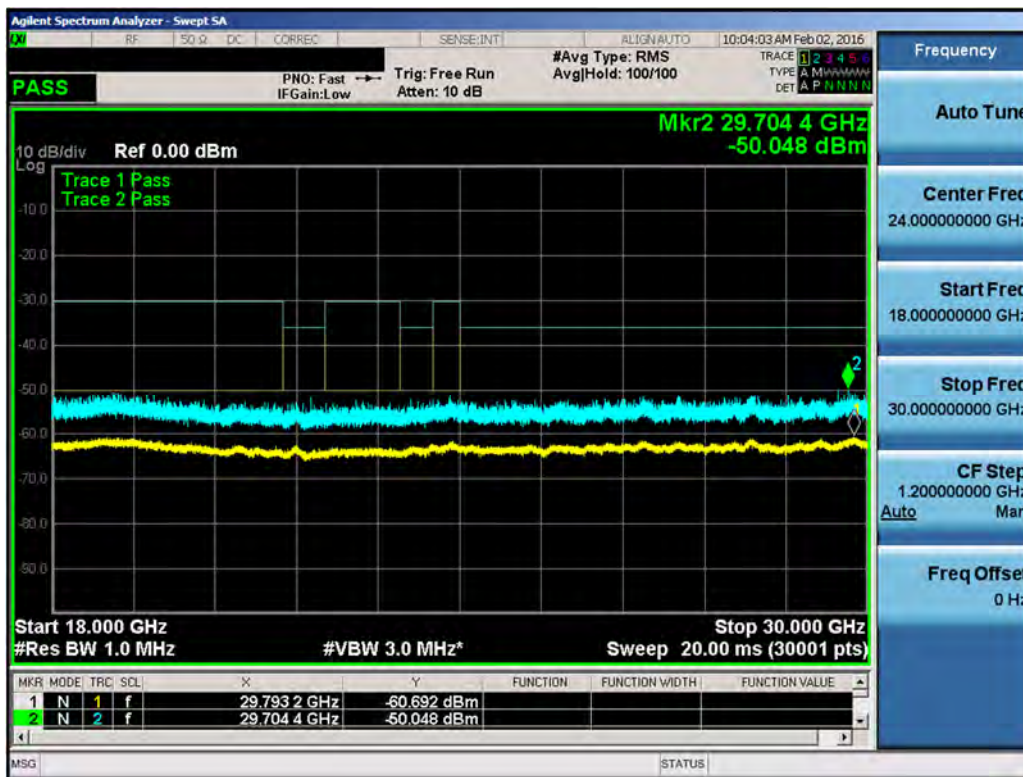


Plot 7-104. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53140, 53340)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 77 of 145



Plot 7-105. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53140, 53340)

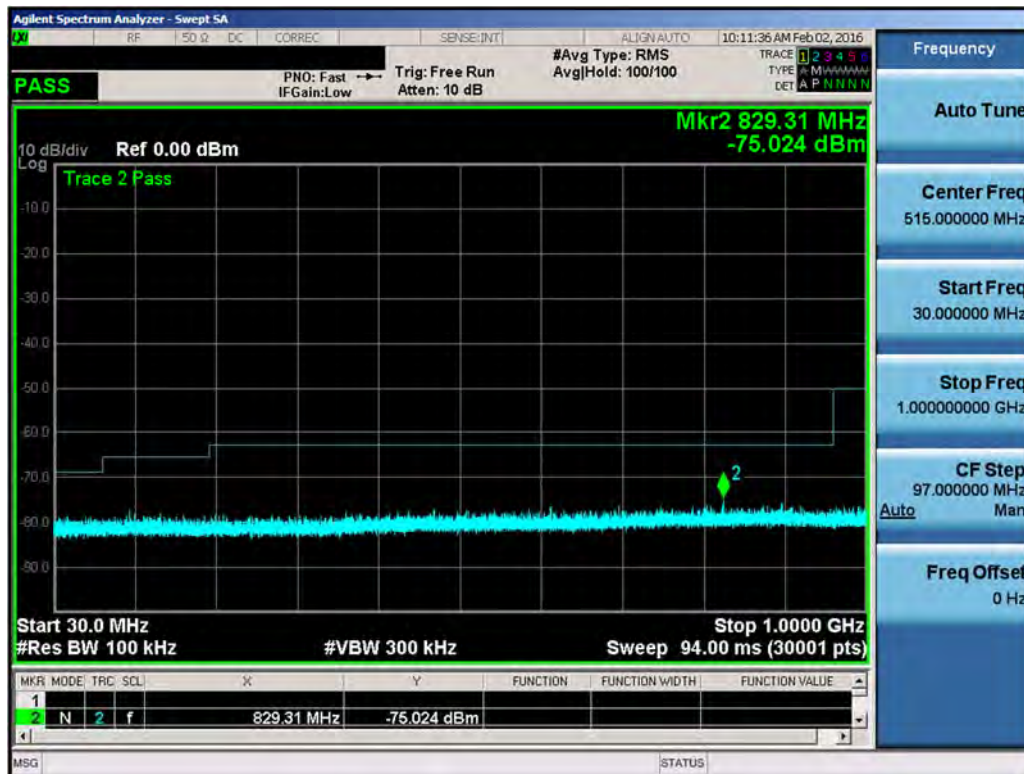


Plot 7-106. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53140, 53340)

FCC ID: J9CMTP9900LAA	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1607131258-R3.J9C	Test Dates: 12/23/2015-3/5/2016	EUT Type: LAA Release 13 Small Cell	Page 78 of 145

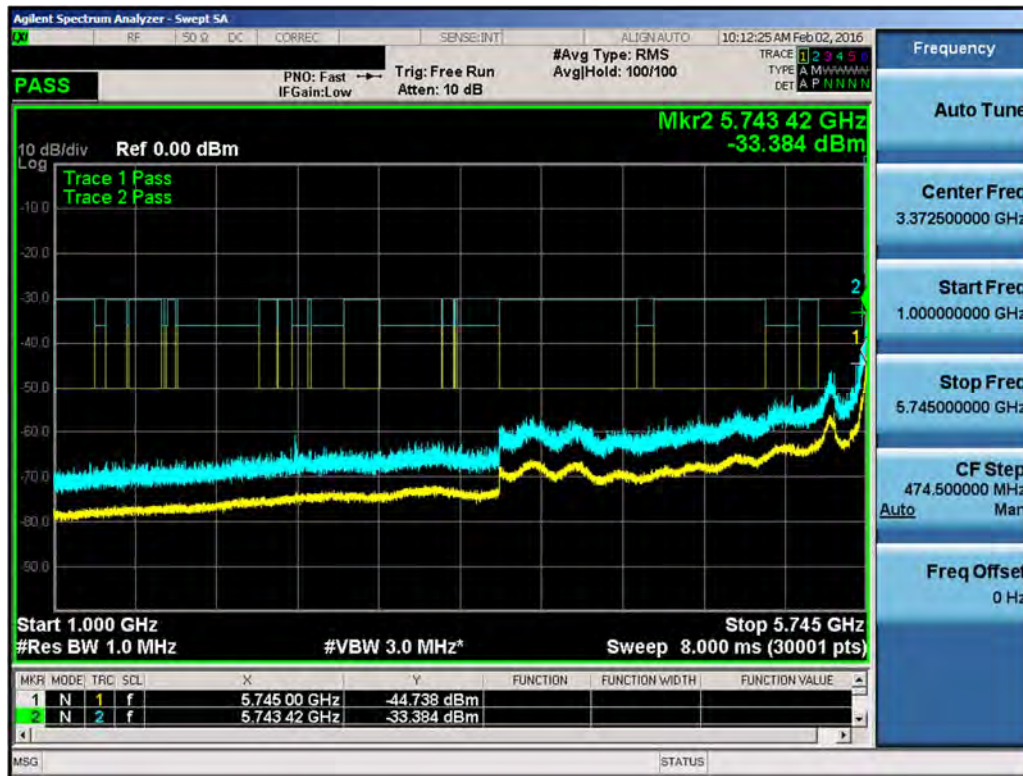


Plot 7-107. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53140, 53340)

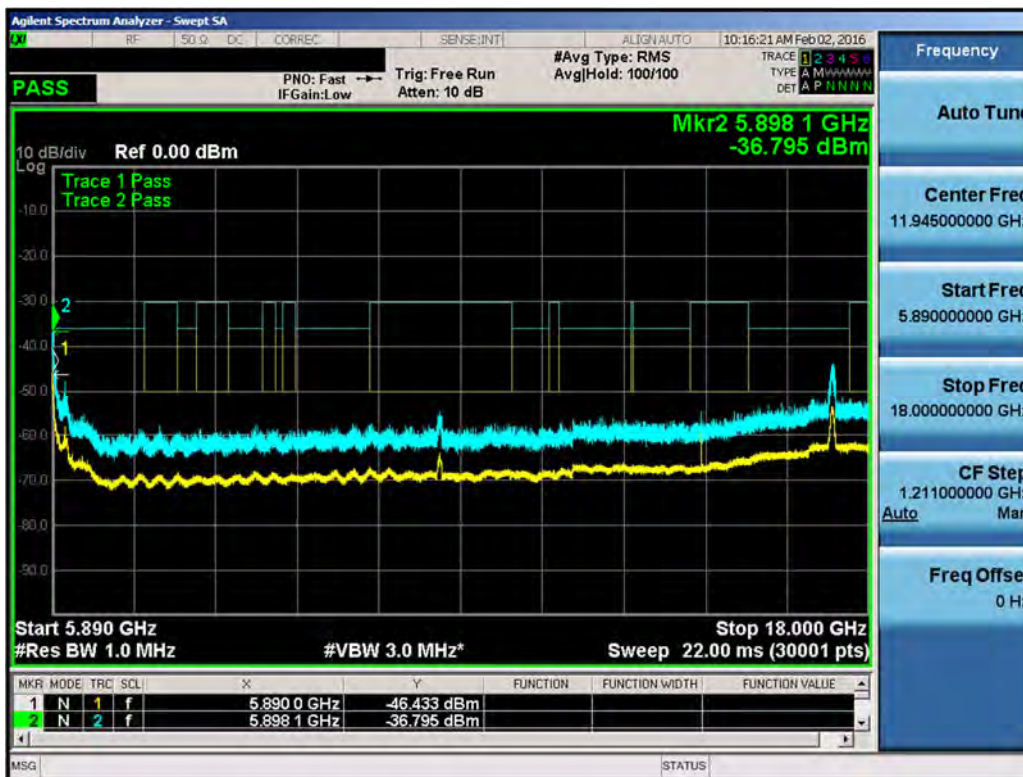


Plot 7-108. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53340, 53540)


FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 7-109. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53340, 53540)

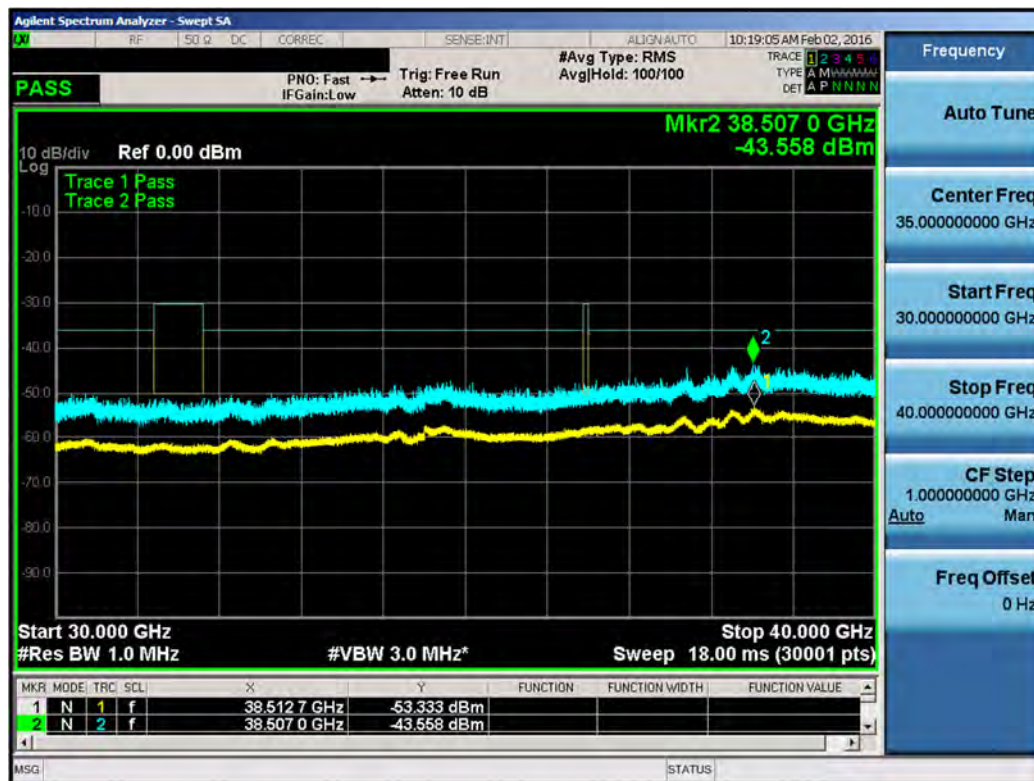


Plot 7-110. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53340, 53540)


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Plot 7-111. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53340, 53540)



Plot 7-112. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53340, 53540)

FCC ID: J9CMTP9900LAA	 FCC Pt. 15.407 LAA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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