PCTEST ENGINEERING LABORATORY, INC.
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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

ACCREDITED
TESTING CERT#2041.01

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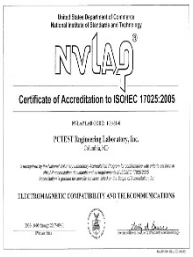
§ 2.1033 General Information

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, 49173051545004 ☐ Production ☒ Pre-Production ☐ Engineering
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 Internt'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 39º 10'23" N latitude and 76º 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.

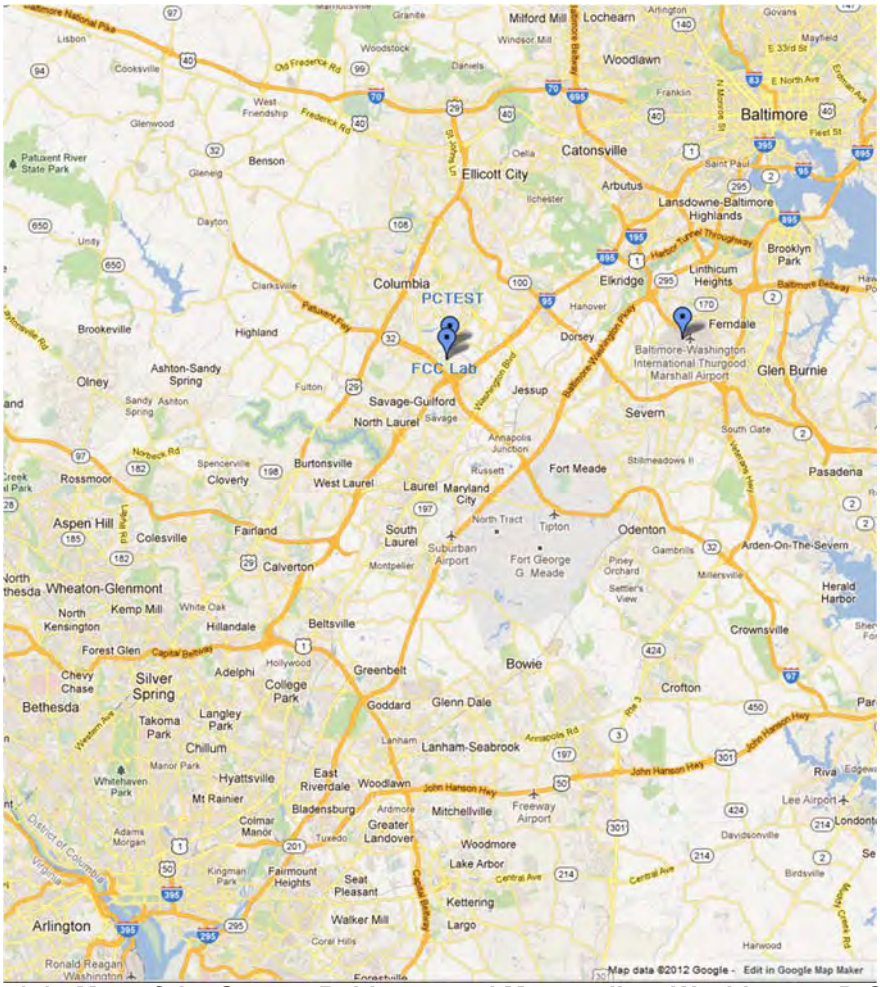

Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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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 (±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 x 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.

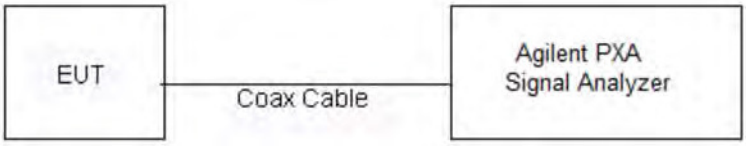

Figure 7-1. Test Instrument & Measurement Setup

Test Notes

None.

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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)

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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)

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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 ≥ 3 x 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.

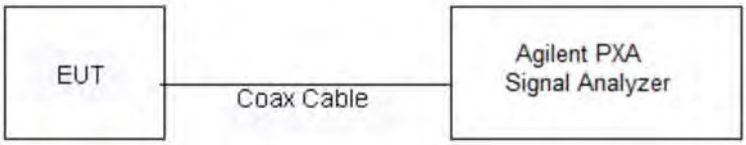

Figure 7-2. Test Instrument & Measurement Setup

Test Notes

None.

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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)

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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)

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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 ≥ 2 x (span/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.

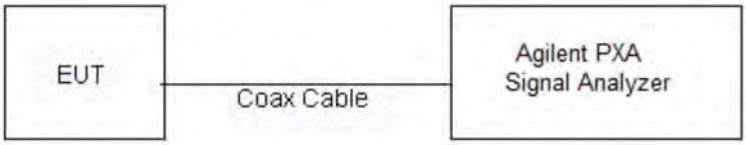

Figure 7-3. Test Instrument & Measurement Setup

Test Notes

The total directional gain is calculated from the maximum 6dBi antenna gain and the 3dB from N_{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 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.

Directional Gain = G_{ant} + 10log$_{10}$(N_{ant}) = 9dBi, where G_{ant} = 6dBi 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 dBm + 16.74 dBm) = (35.9 mW + 47.2 mW) = 83.11 mW = 19.2 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 ≥ 2 x (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.

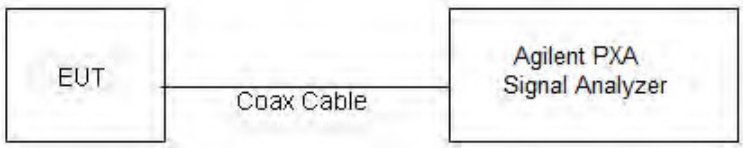

Figure 7-4. Test Instrument & Measurement Setup

Test Notes

The total directional gain is calculated from the maximum 6dBi antenna gain and the 3dB from N_{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.

Antenna 1 + Antenna 2 = Total Power

(4.27 dBm + 4.83 dBm) = (2.67 mW + 3.04 mW) = 5.71 mW = 7.57 dBm

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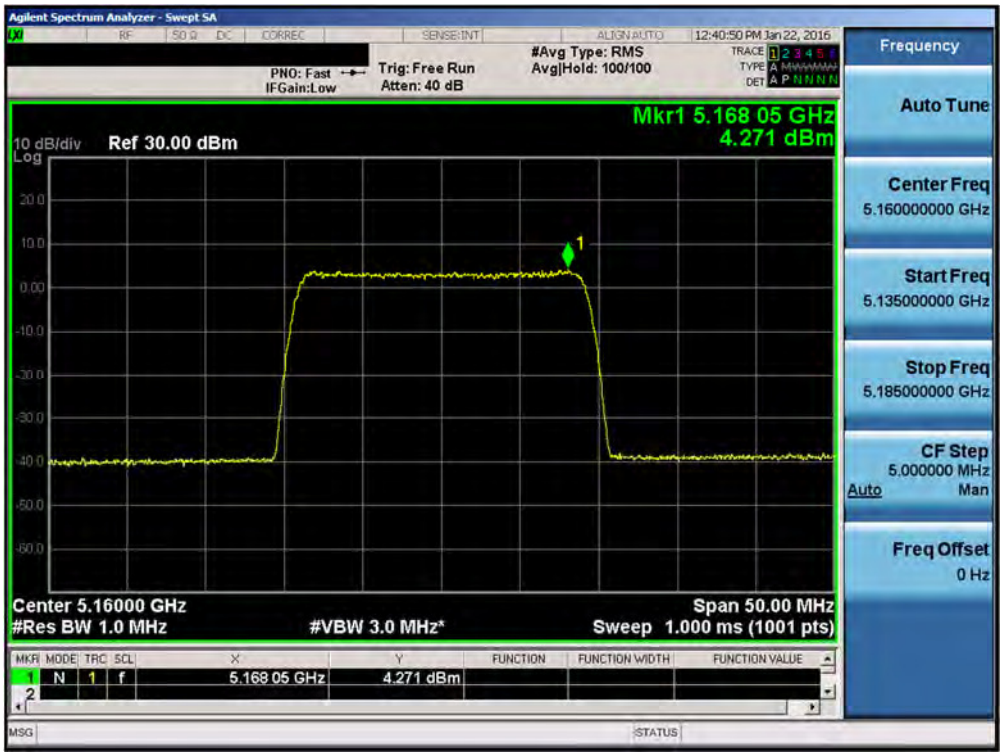
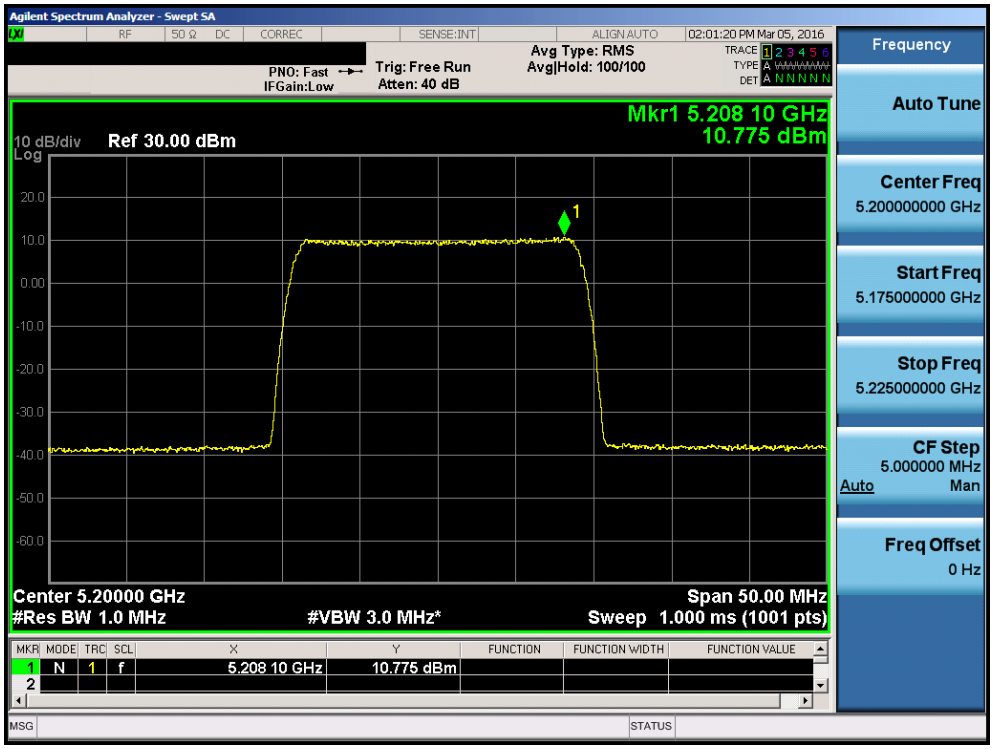
Chain0



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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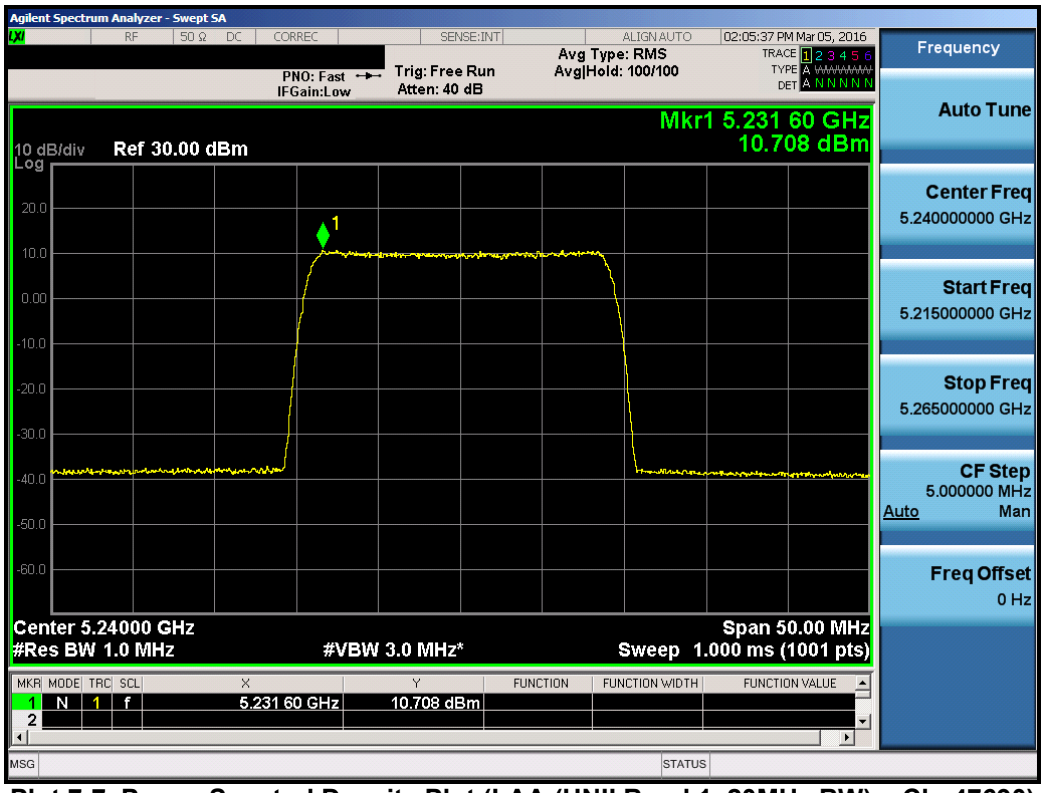

Plot 7-7. Power Spectral Density Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)

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)

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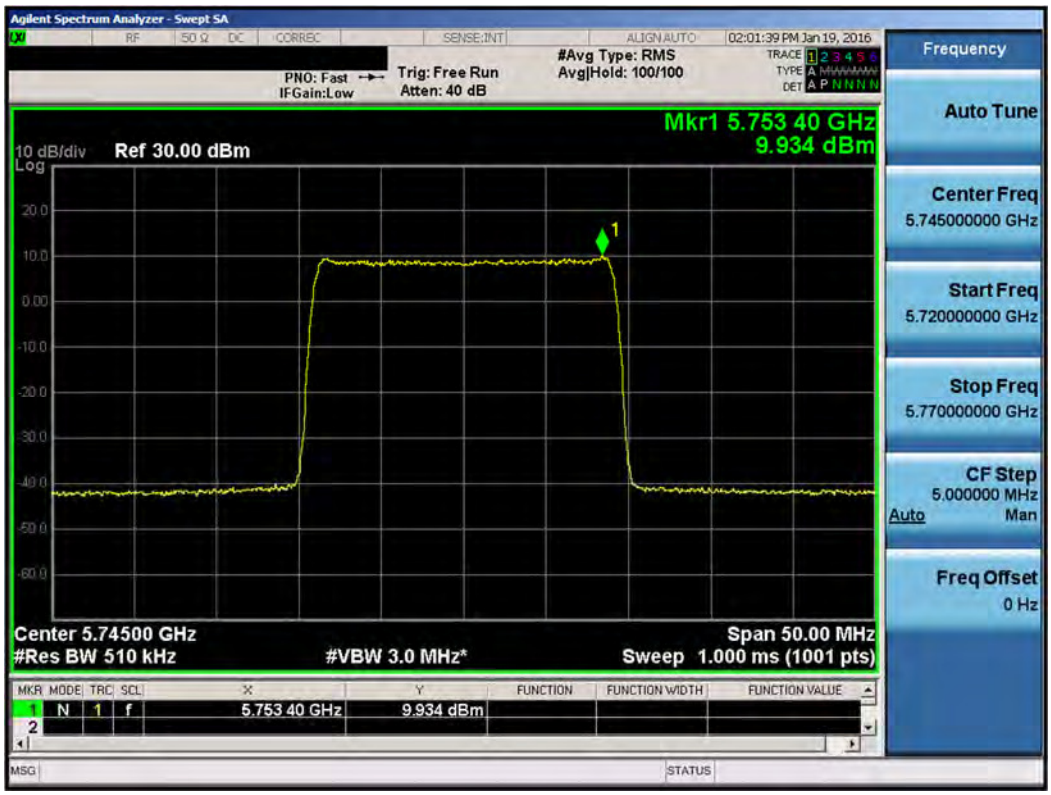
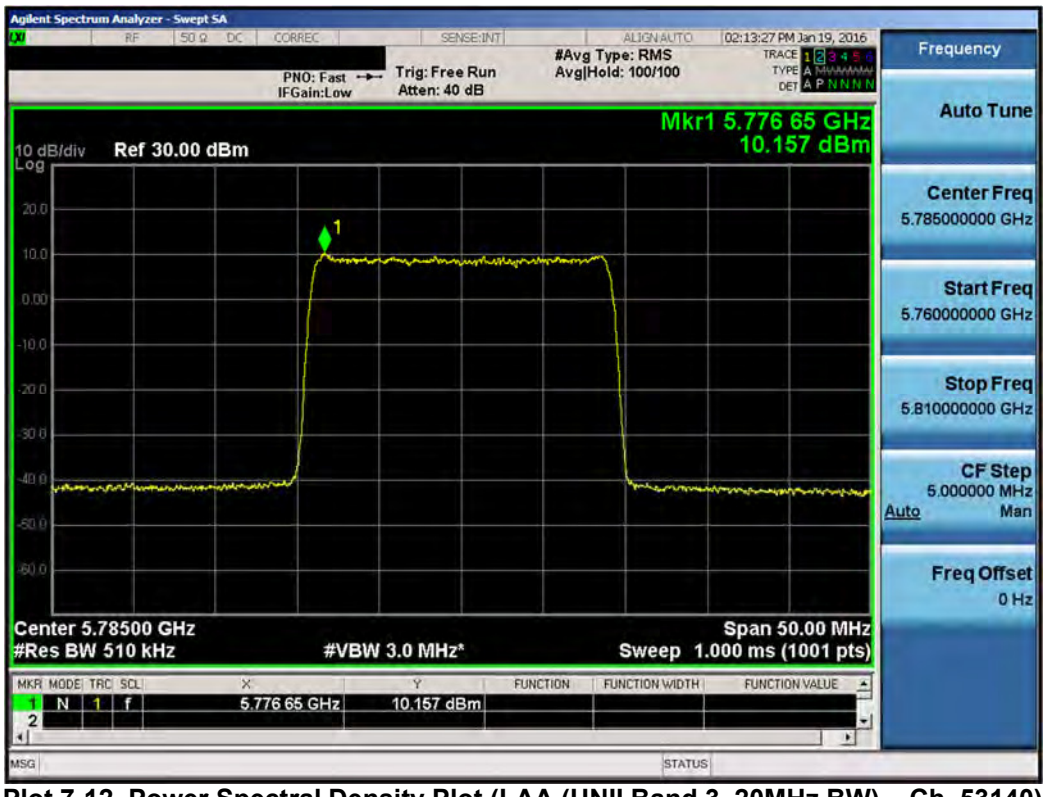


Plot 7-11. Power Spectral Density Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 52740)



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

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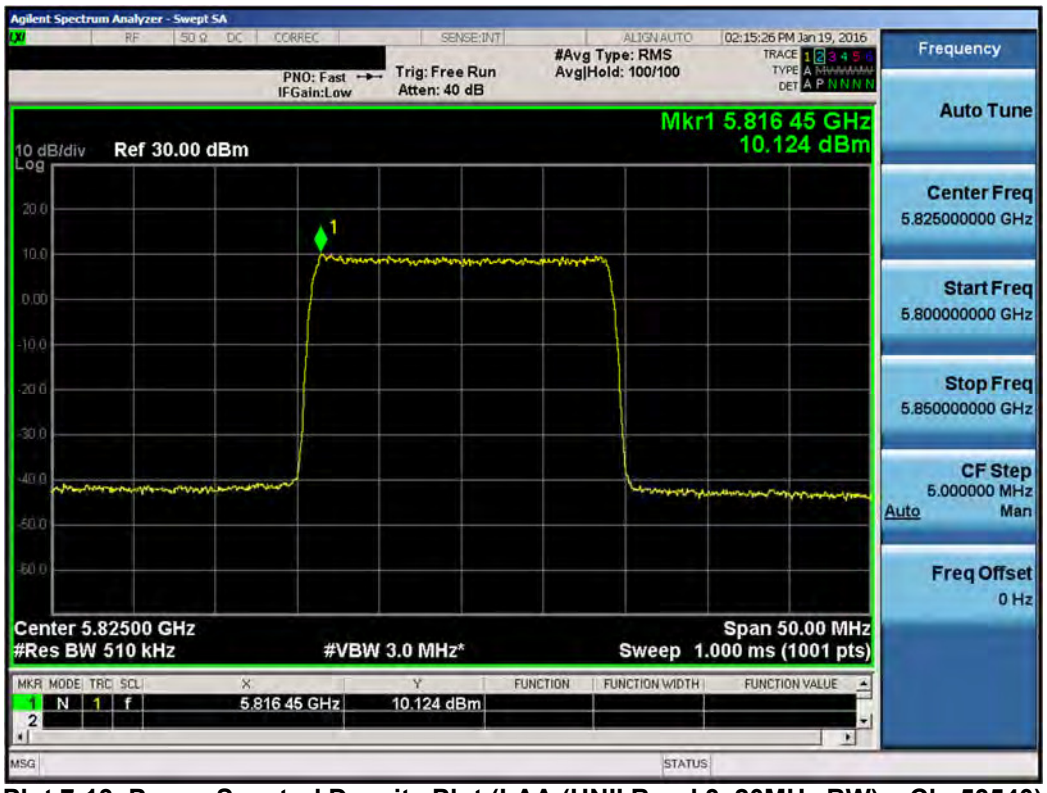

Plot 7-13. Power Spectral Density Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)

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

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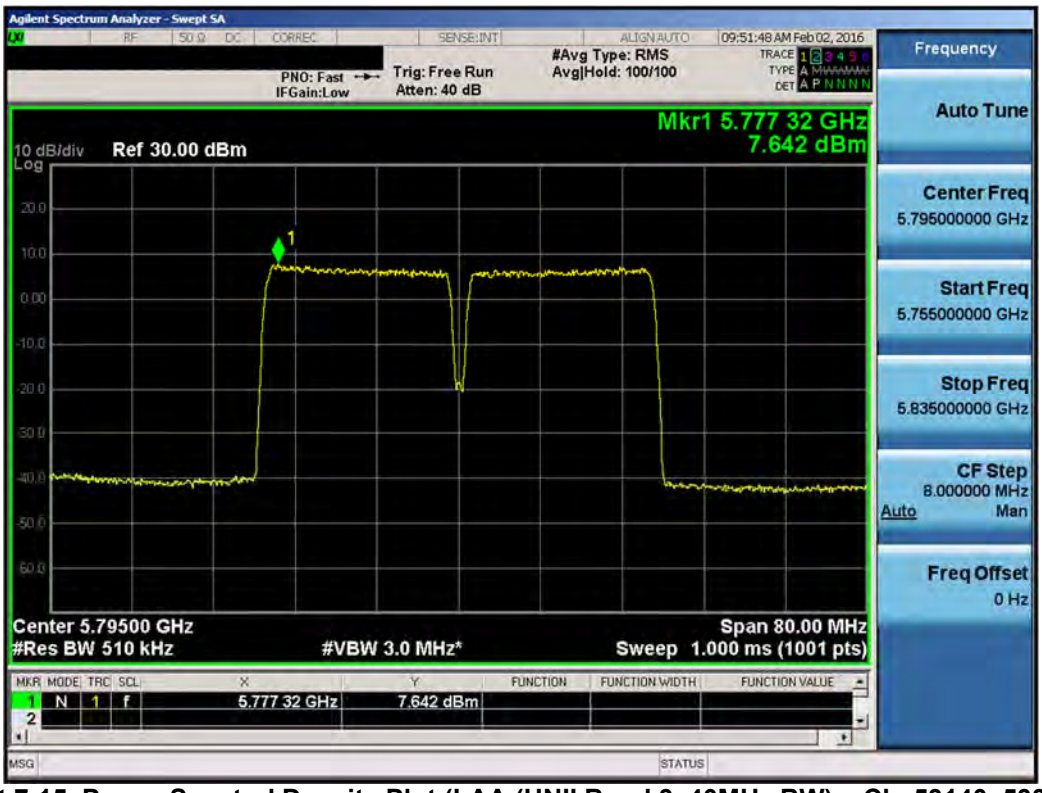

Plot 7-15. Power Spectral Density Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53140, 53340)

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

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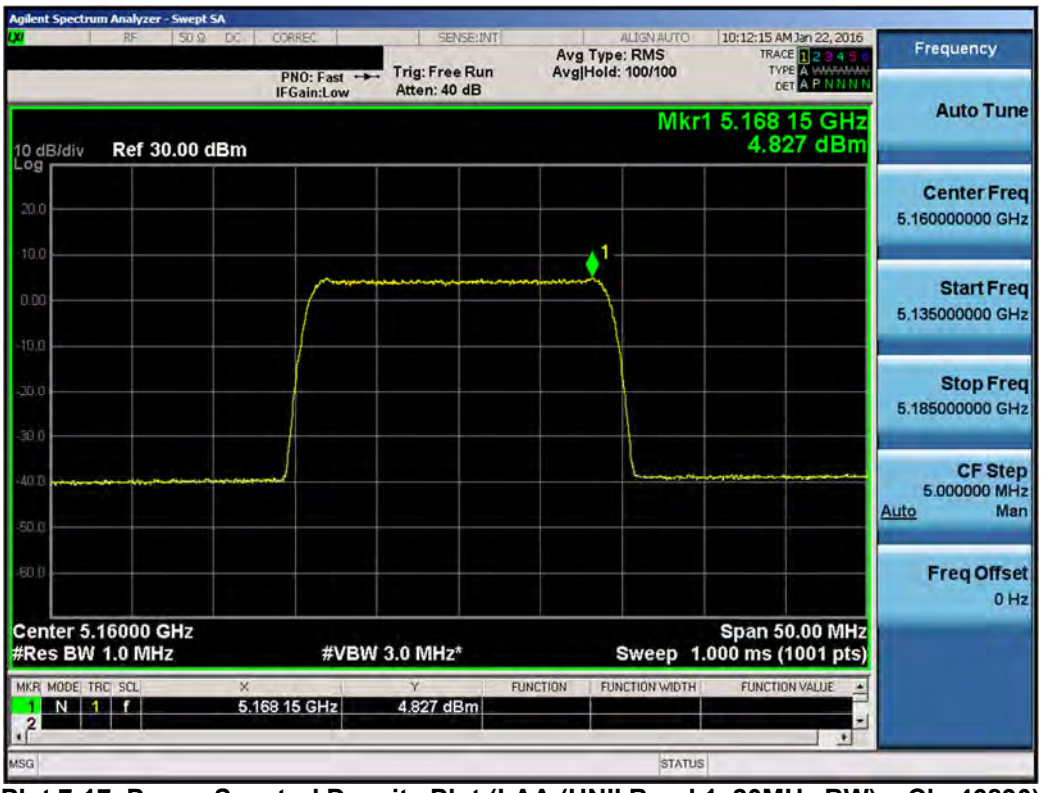
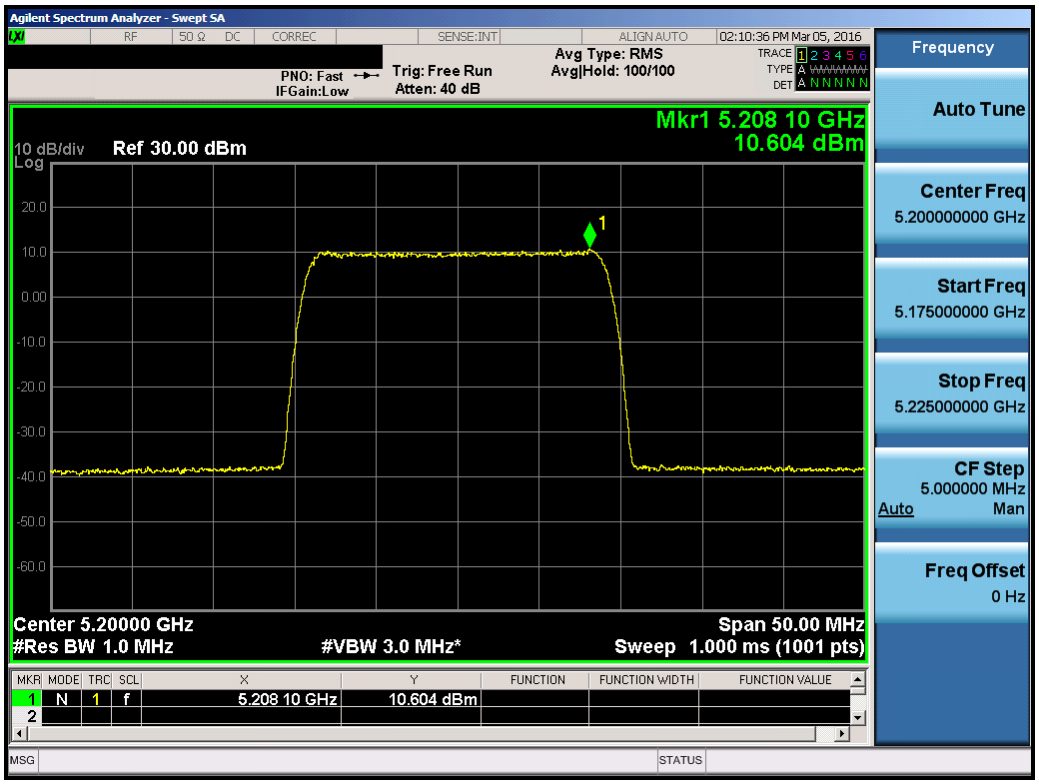


Plot 7-17. Power Spectral Density Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 46890)



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

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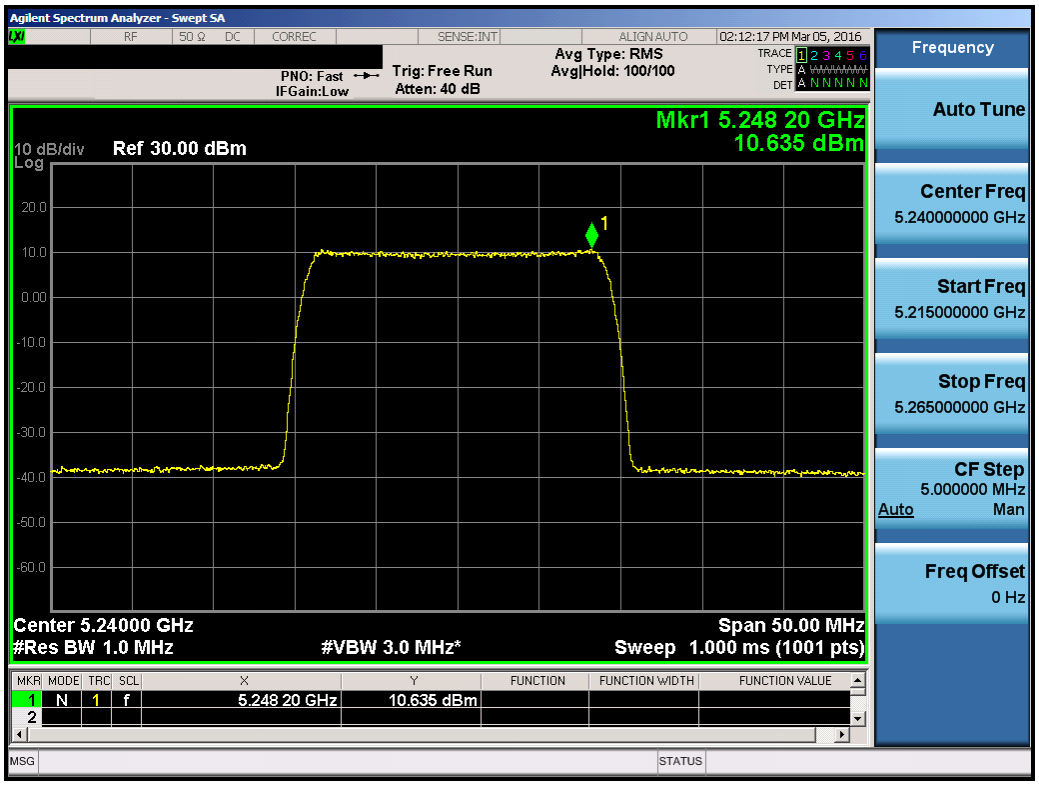

Plot 7-19. Power Spectral Density Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)

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

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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)

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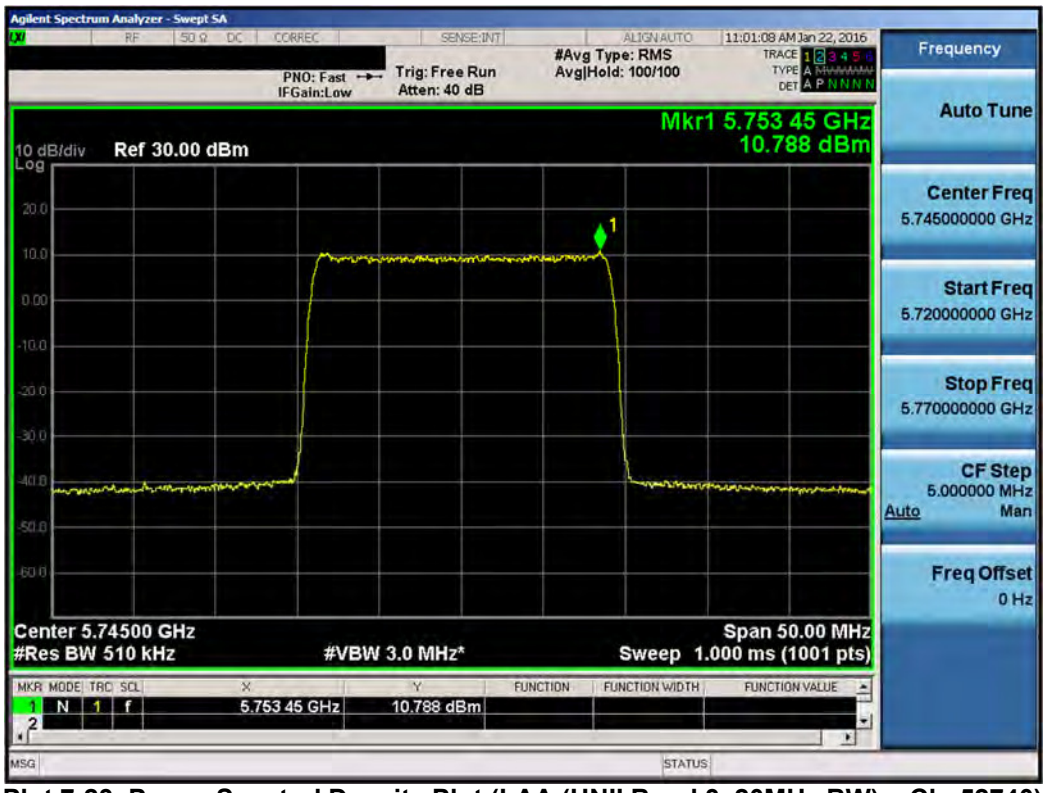
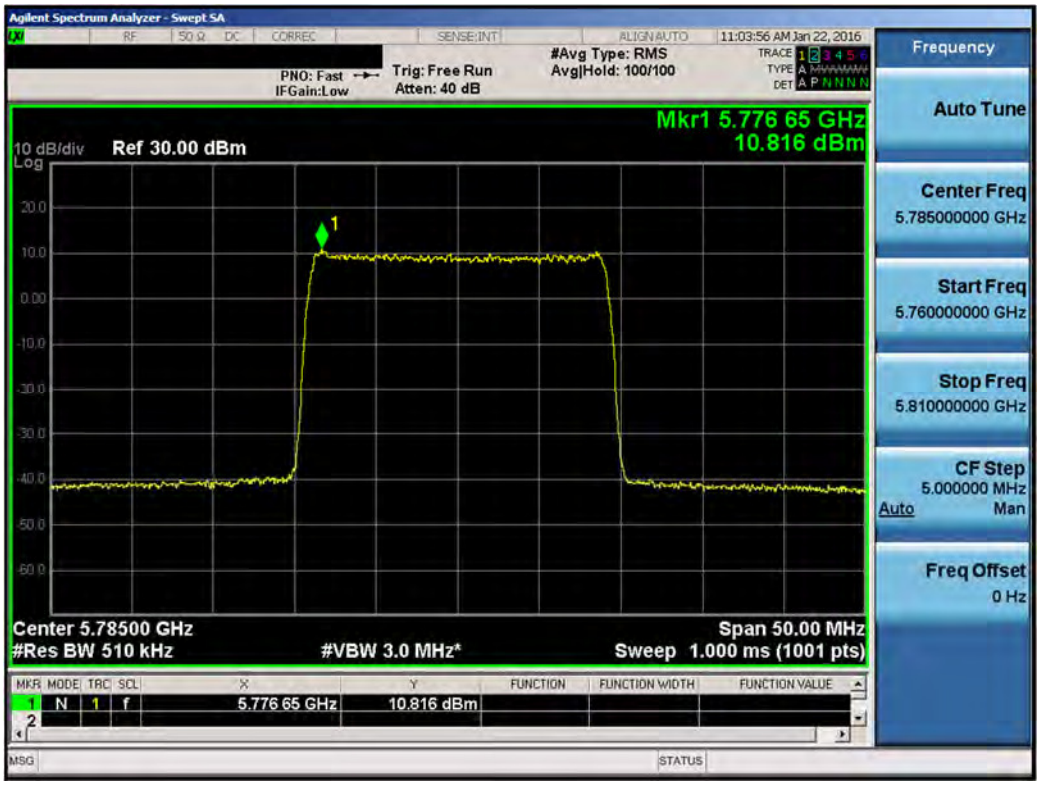


Plot 7-23. Power Spectral Density Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 52740)



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

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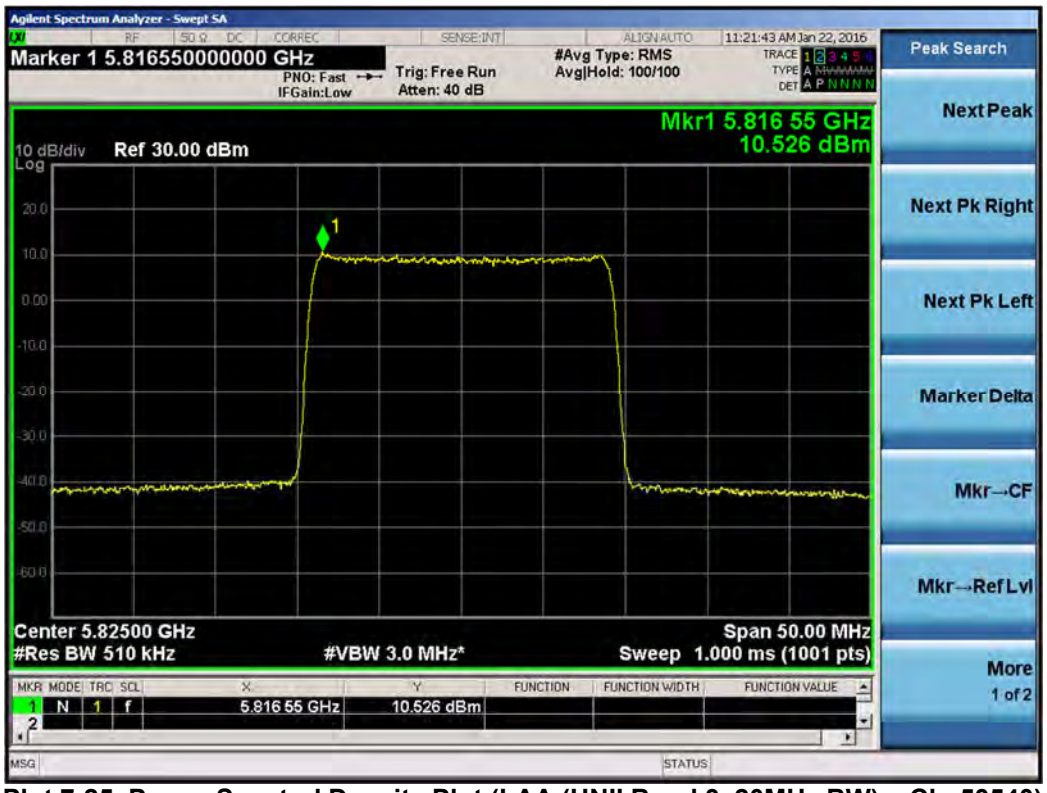
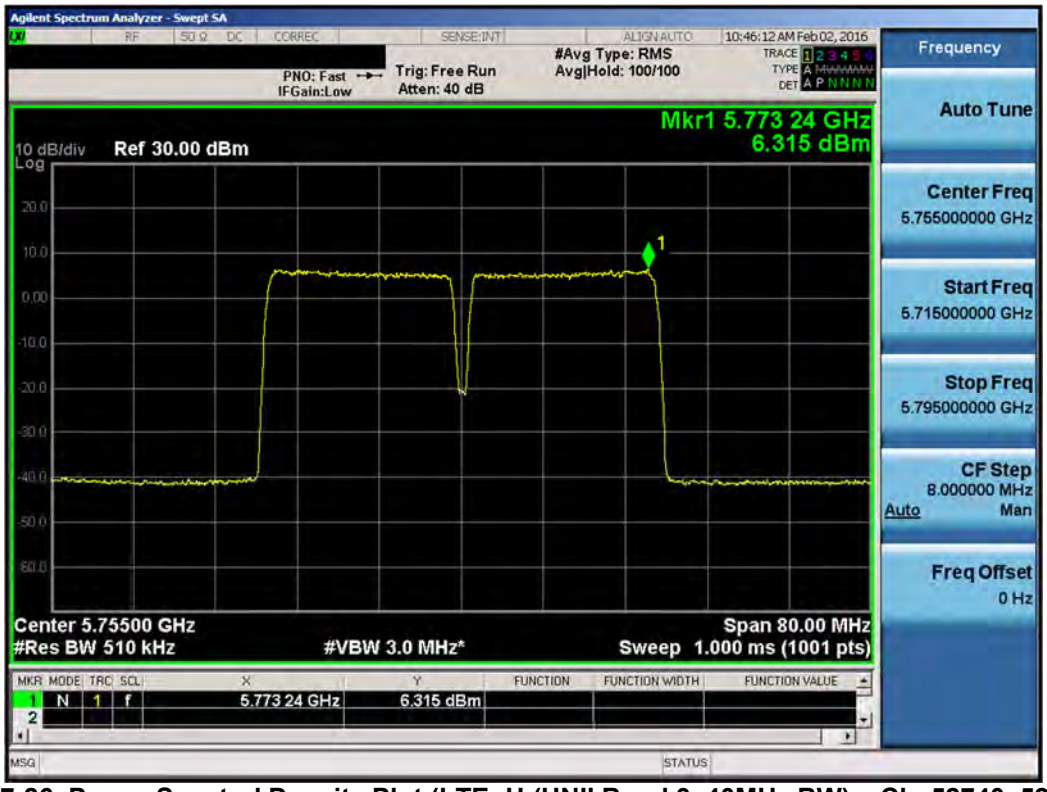


Plot 7-25. Power Spectral Density Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)



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

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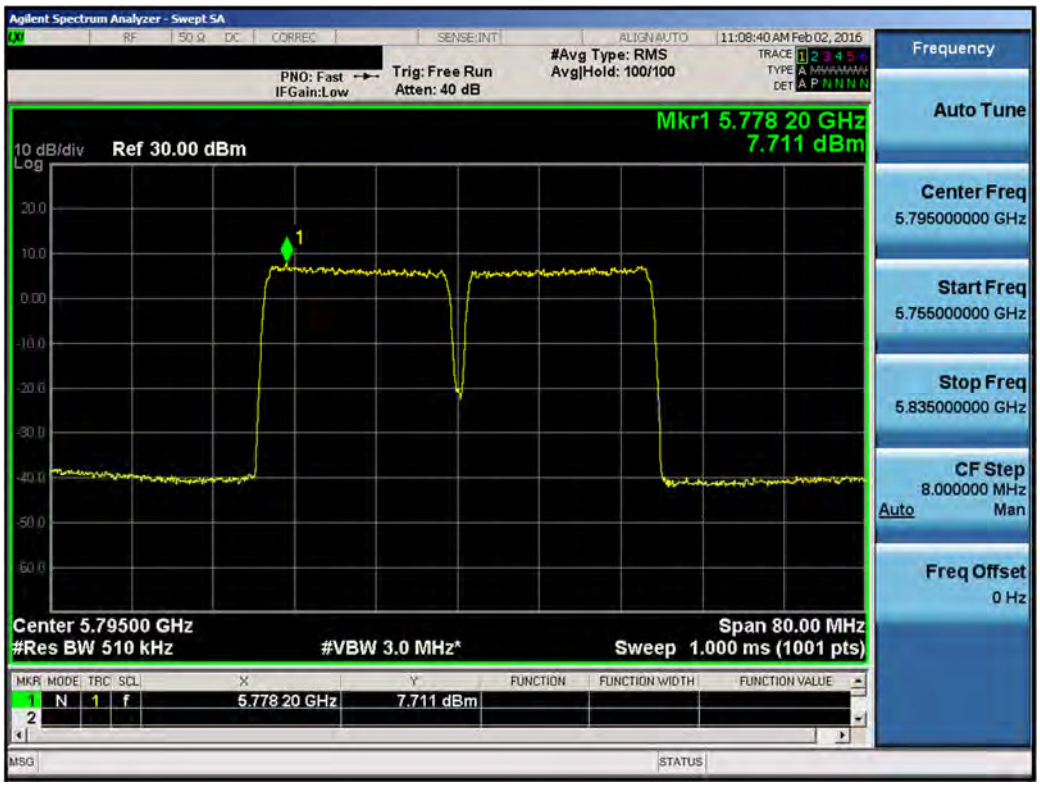

Plot 7-27. Power Spectral Density Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53140, 53340)

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

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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 ≥ 2 x Span/RBW
7. Trace mode = trace averaging
8. Sweep time = auto couple
9. Trace was averaged over 100 sweeps

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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 ≥ 2 x 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.

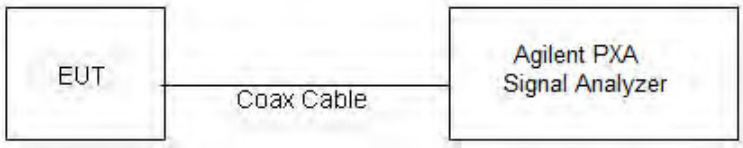

Figure 7-5. Test Instrument & Measurement Setup

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): 54dBuV/m – 95.2dB – 6dBi – 3dB= **-50.2dBm**
   Peak (Restricted): 74dBuV/m – 95.2dB – 6dBi – 3dB= **-30.2dBm**

   Peak (Non-Restr.): -27dBm – 6dBi – 3dB = **-36dBm**

2. Some band edge measurements were evaluated using the Channel Integration method, as specified in Section G)3)d)ii) of KDB 789033.

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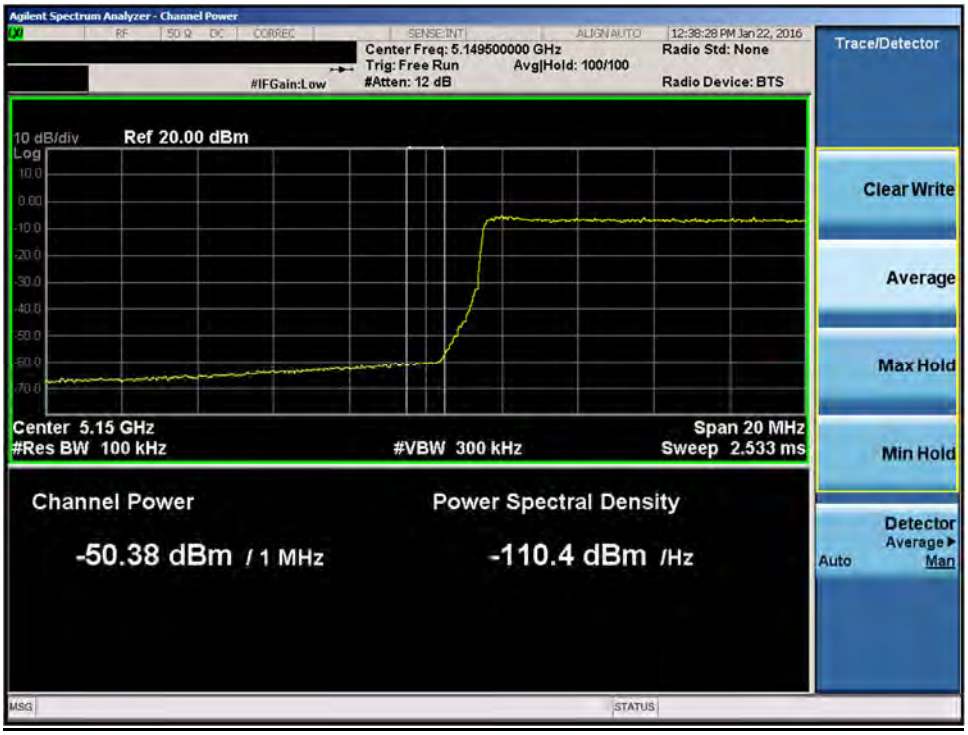
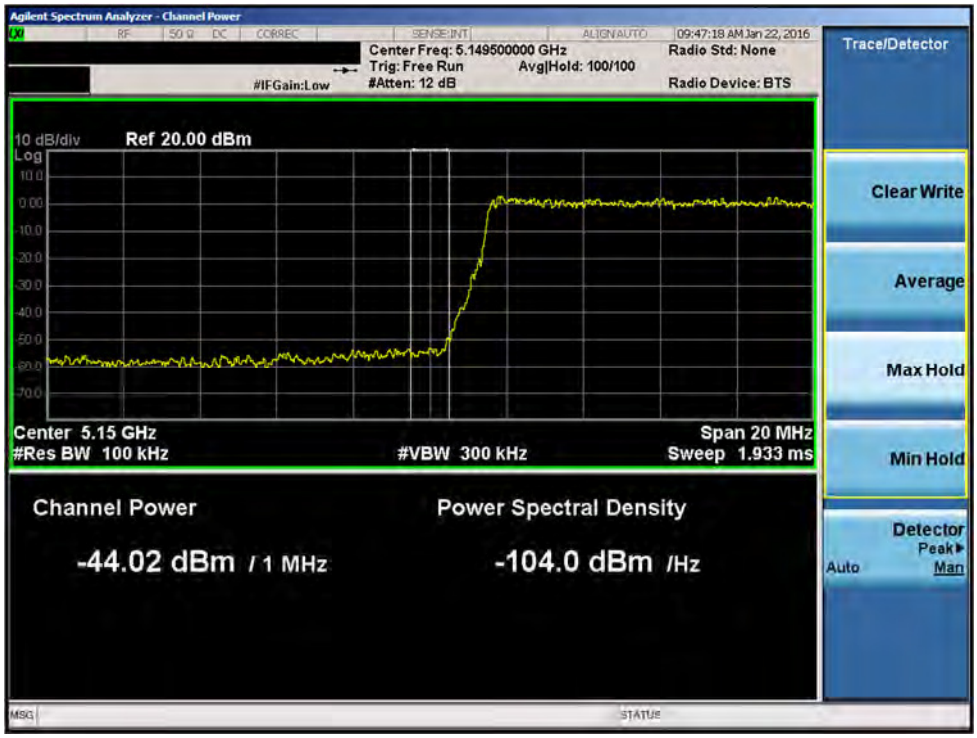
Conducted Band Edge Emissions (Cont'd)

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)

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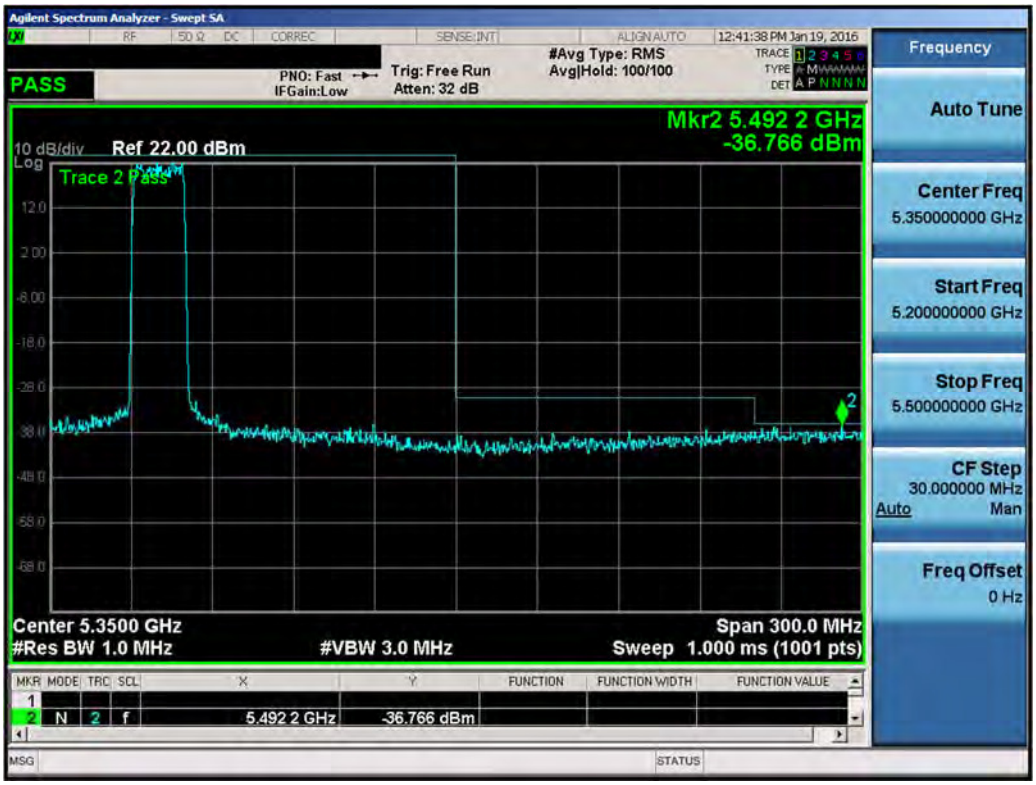
Plot 7-31. Conducted Average Band Edge Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)



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

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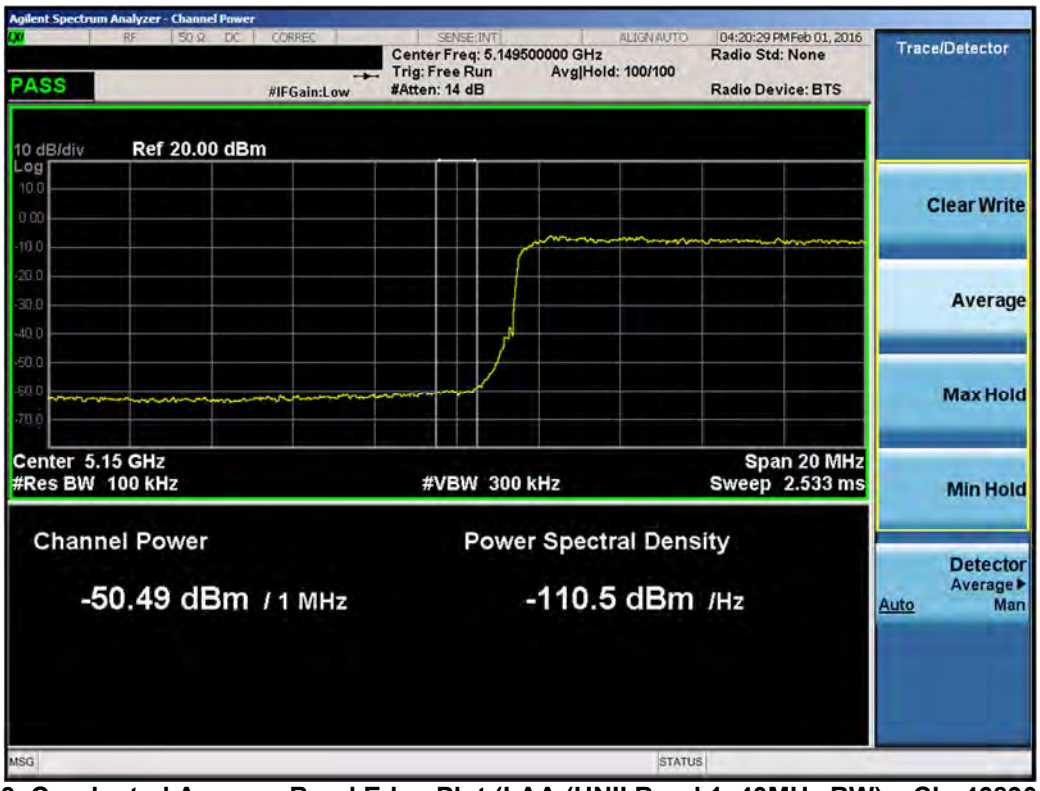
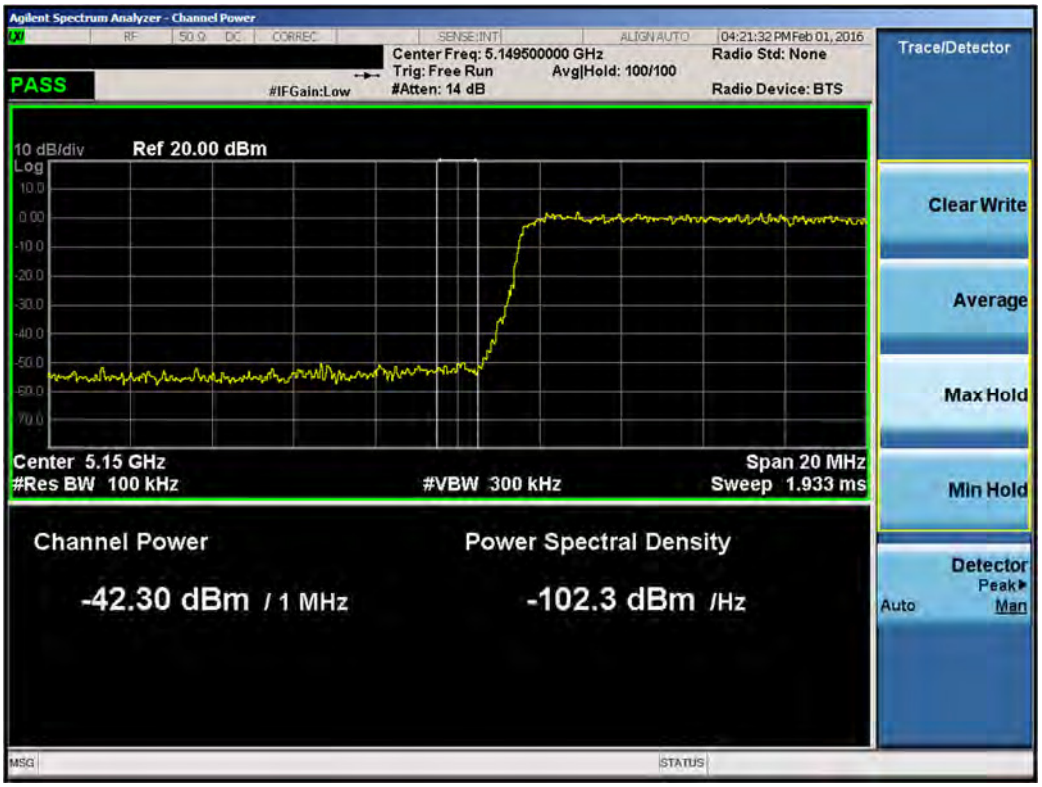


Plot 7-33. Conducted Average Band Edge Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 46890, 47090)



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

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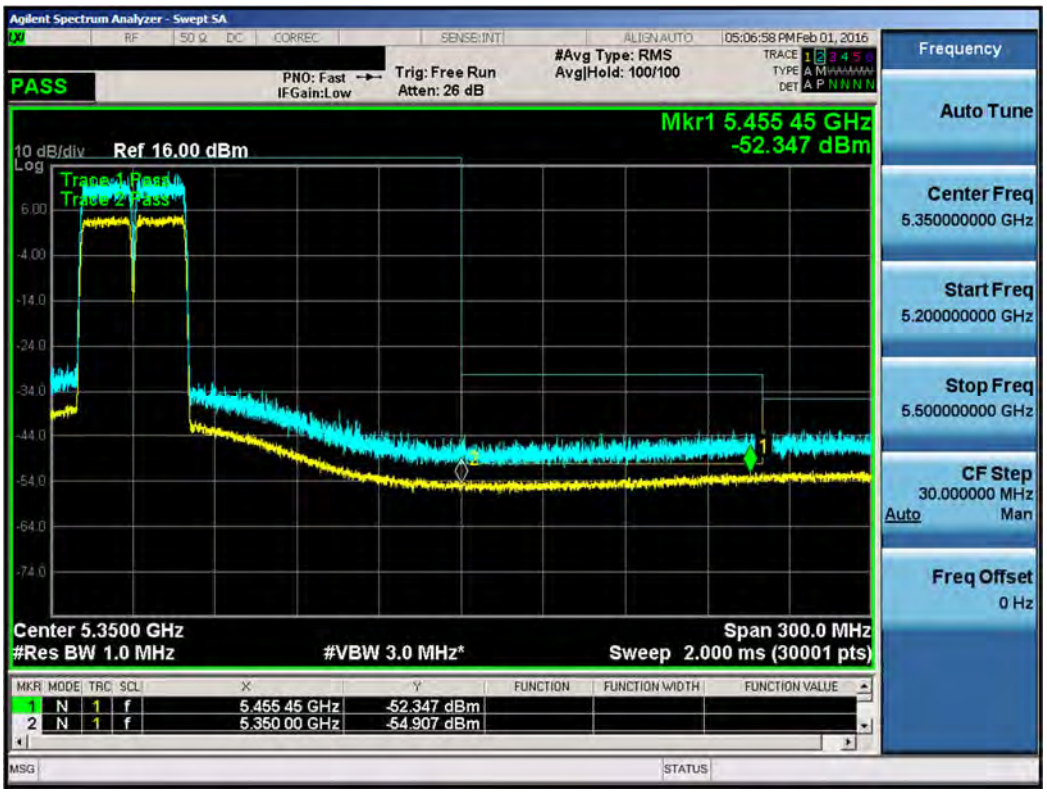
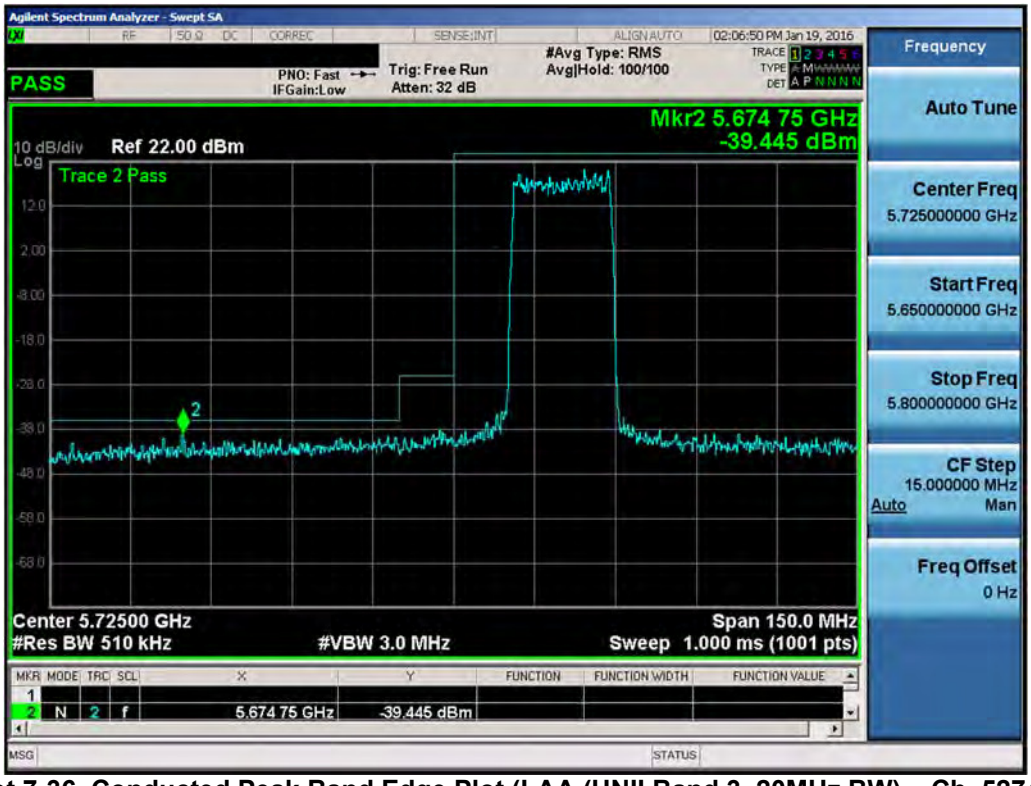


Plot 7-35. Cond. Average-Peak Band Edge Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47490, 47690)



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

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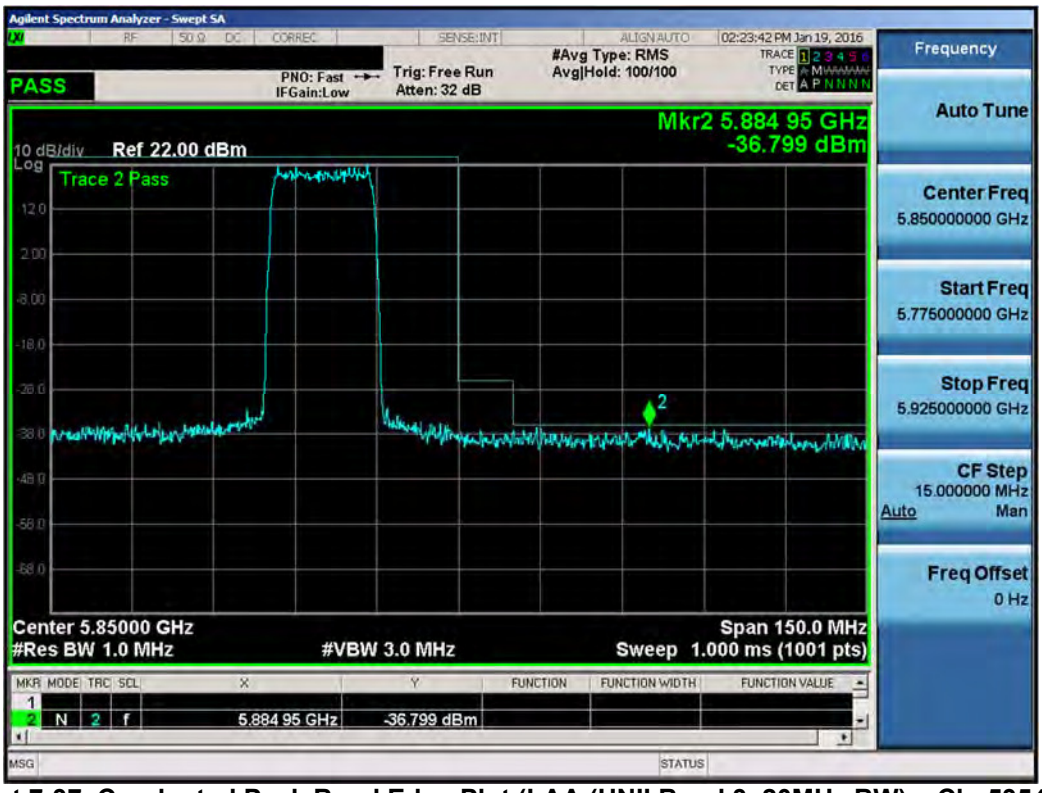
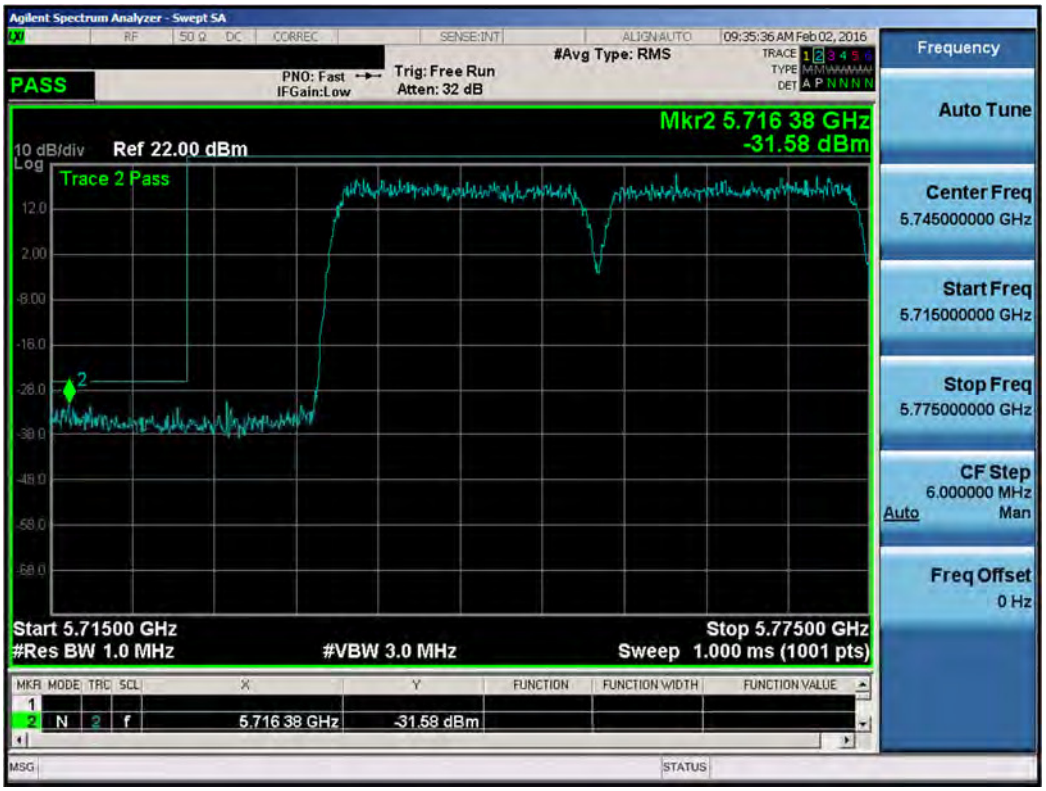


Plot 7-37. Conducted Peak Band Edge Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)



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

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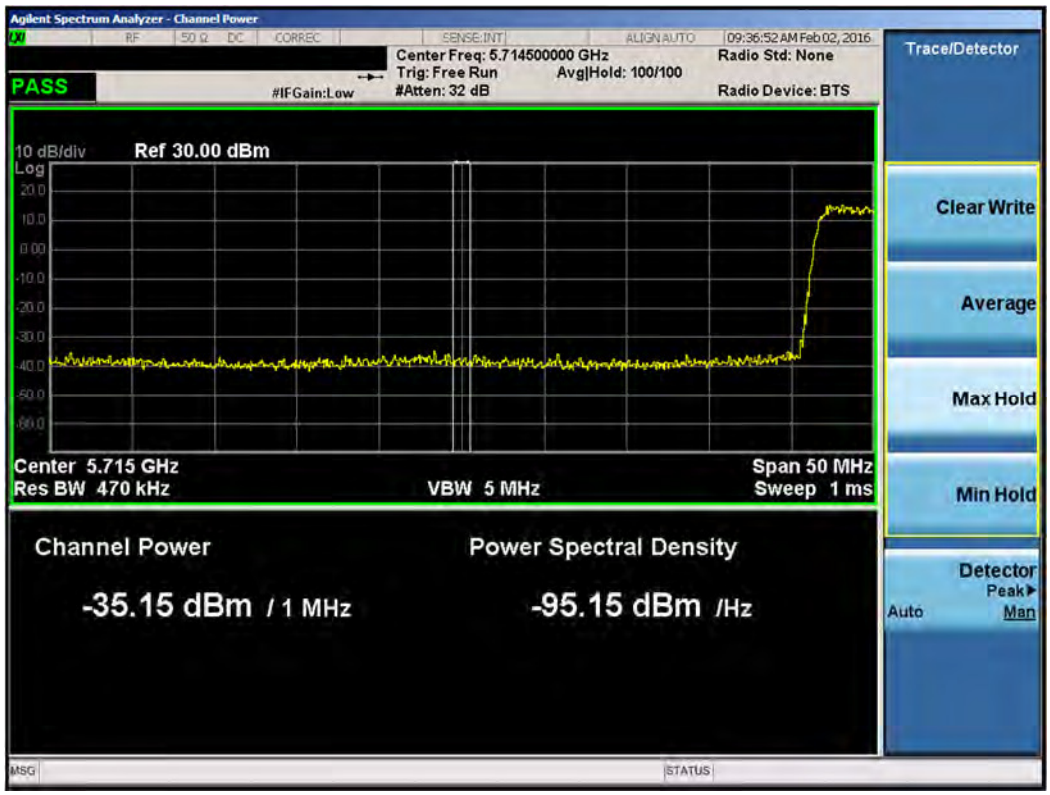

Plot 7-39. Conducted Peak Band Edge Plot #2 (LAA (UNII Band 3, 40MHz BW) – Ch. 52740, 52940)

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

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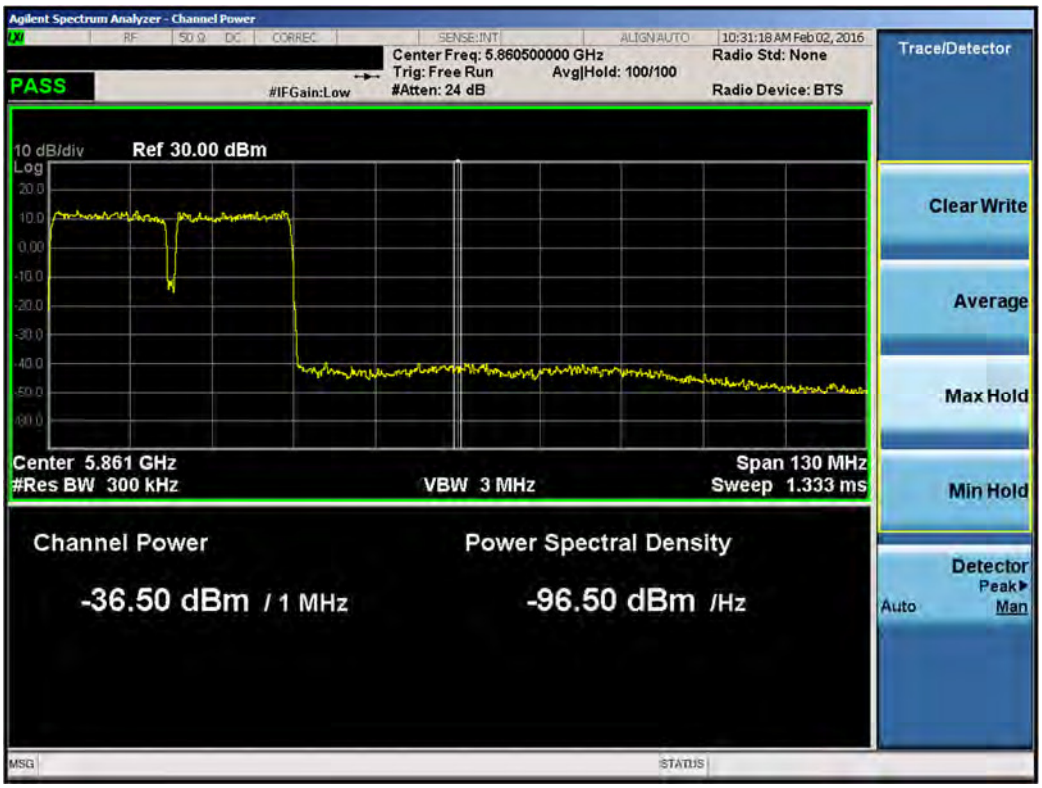

Plot 7-41. Conducted Peak Band Edge Plot #2 (LAA (UNII Band 3, 40MHz BW) – Ch. 53340, 53540)

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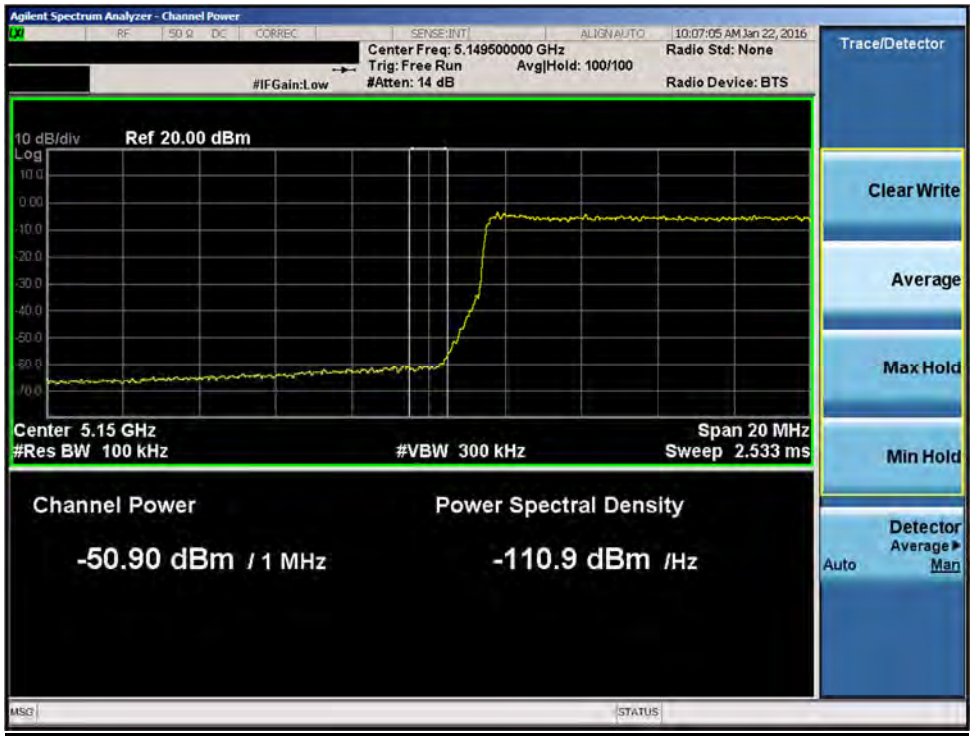
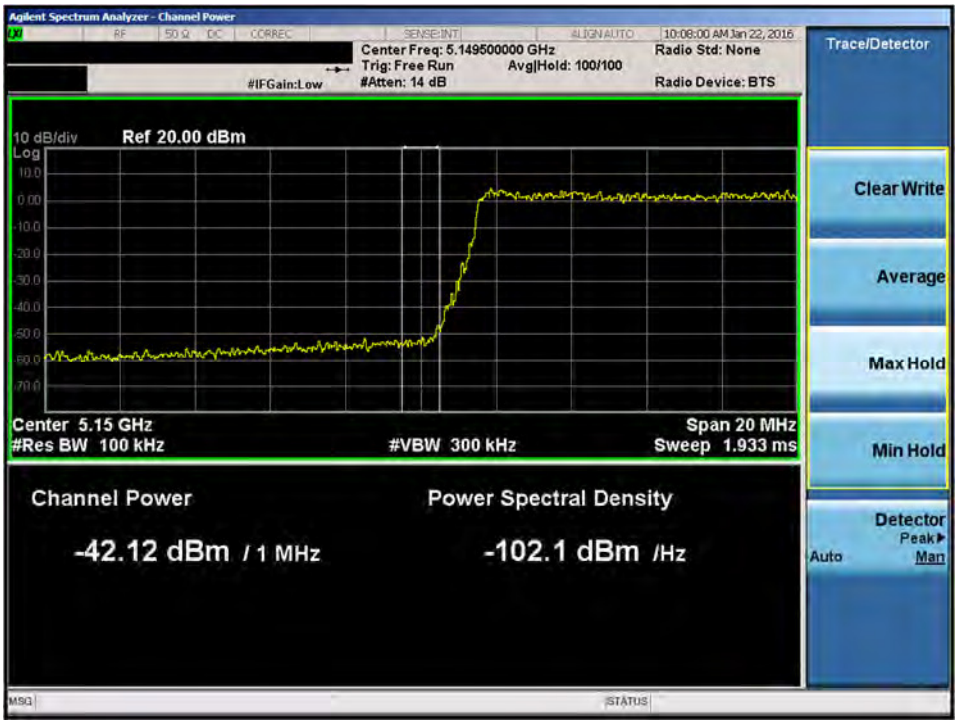
Conducted Band Edge Emissions (Cont'd)

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)

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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)

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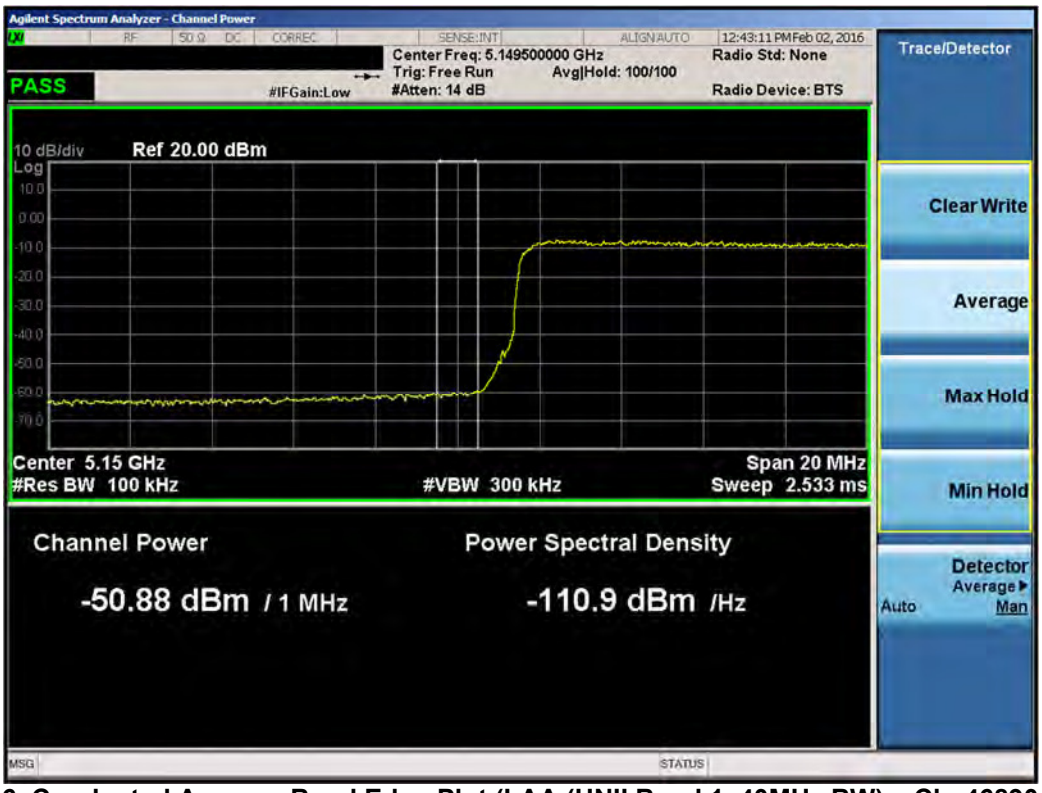
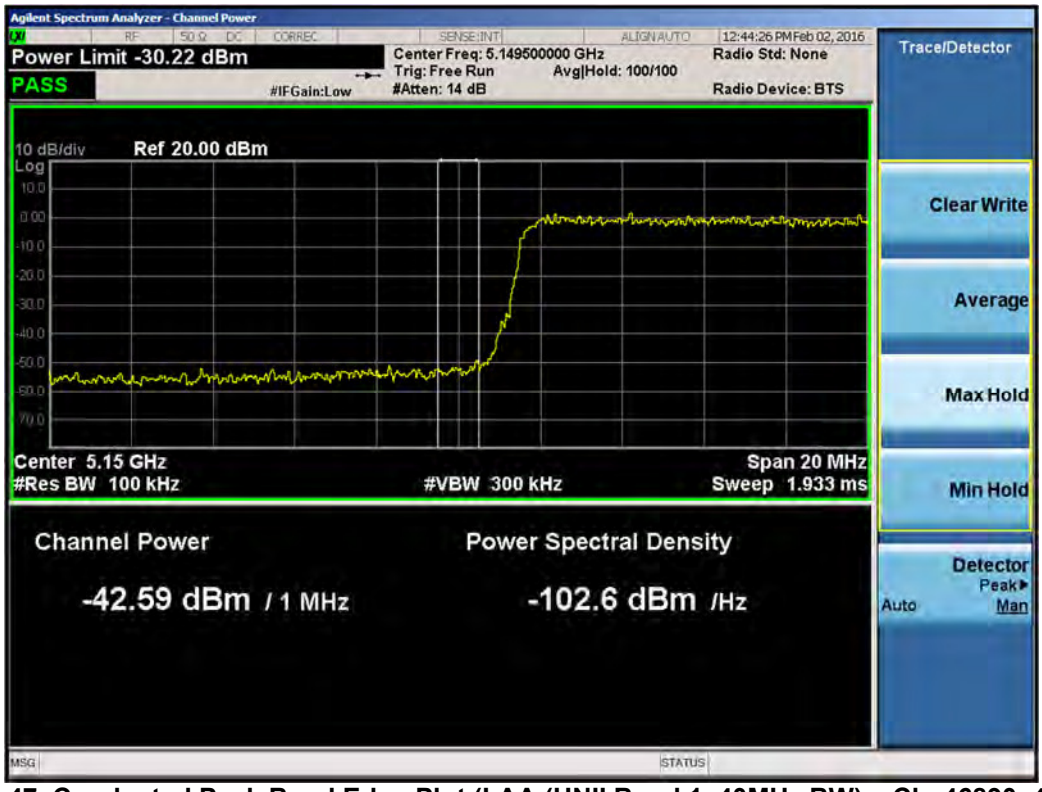


Plot 7-46. Conducted Average Band Edge Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 46890, 47090)



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

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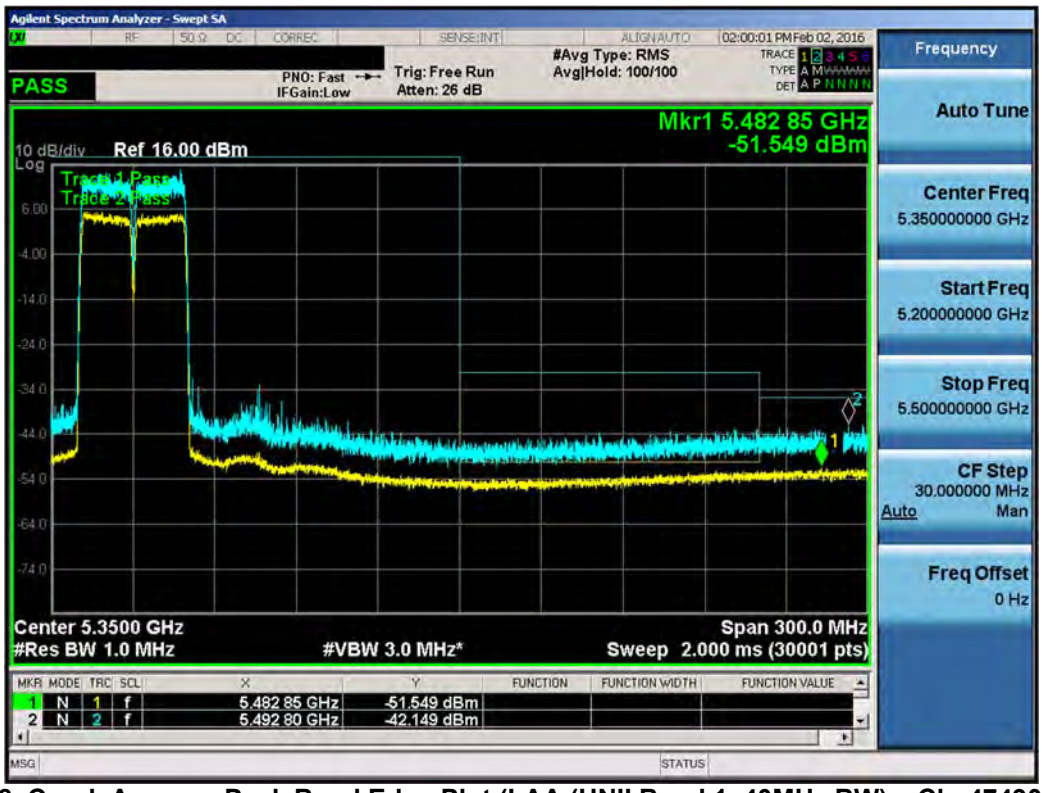
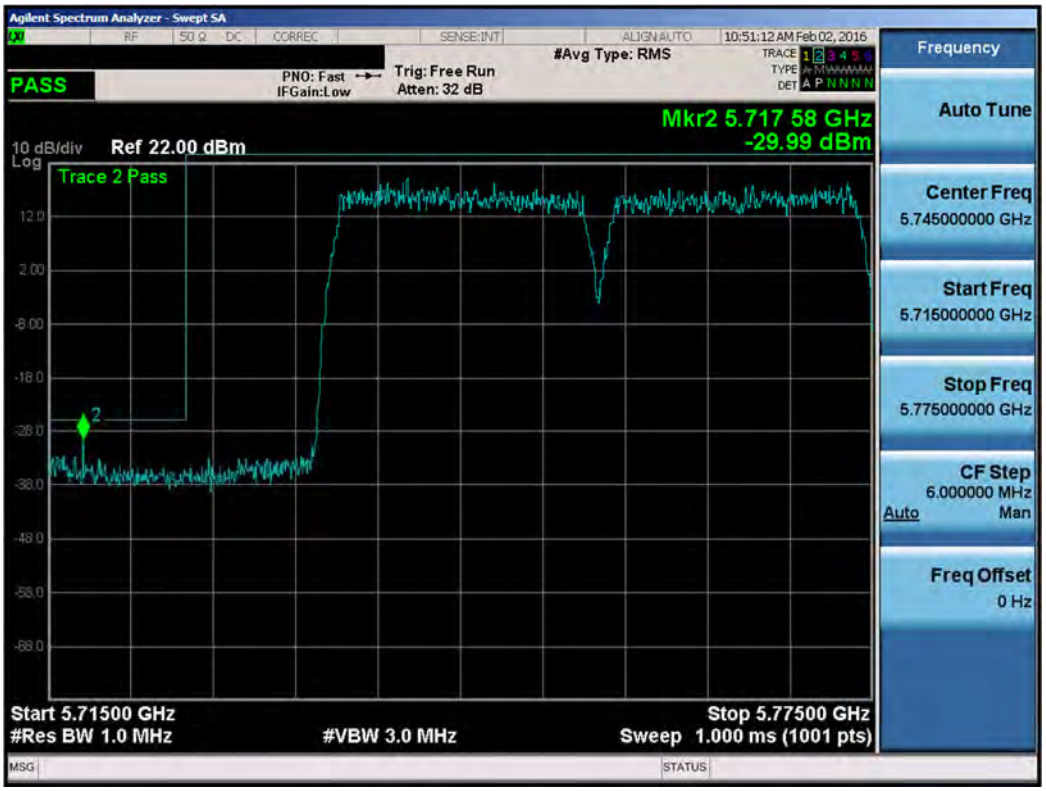


Plot 7-48. Cond. Average-Peak Band Edge Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47490, 47690)



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

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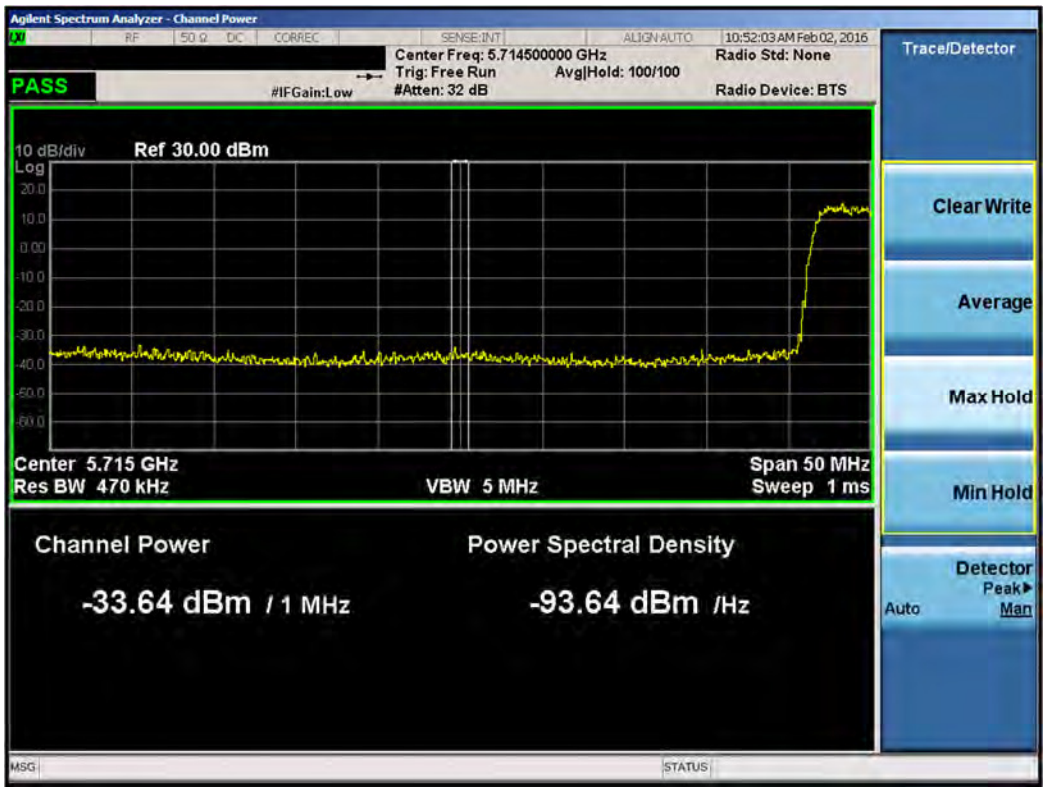
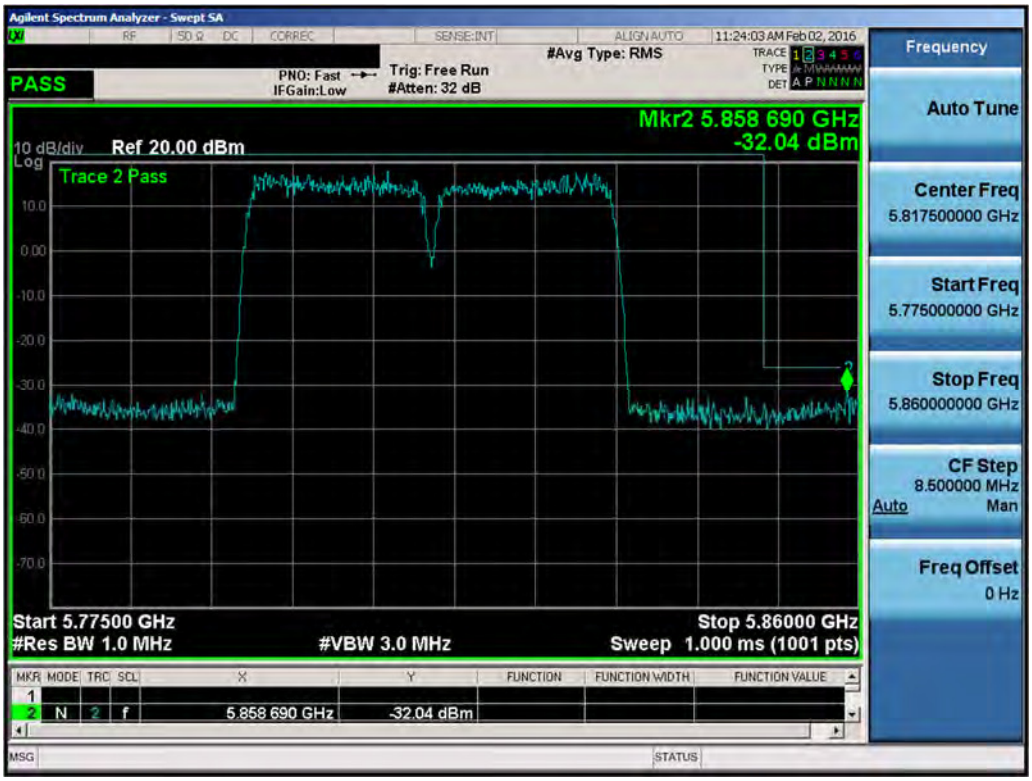


Plot 7-50. Conducted Peak Band Edge Plot #2 (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)



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

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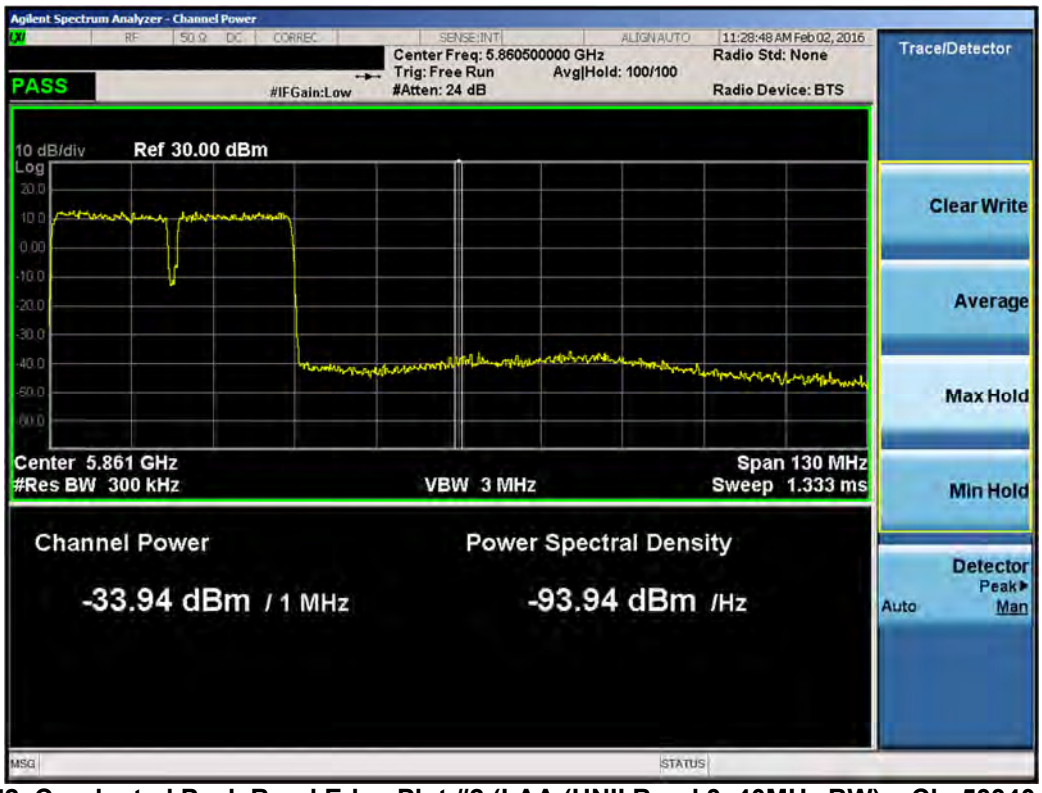

Plot 7-52. Conducted Peak Band Edge Plot #2 (LAA (UNII Band 3, 40MHz BW) – Ch. 53340, 53540)

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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 ≥ 2 x Span/RBW
6. Trace mode = trace averaging
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

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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 ≥ 2 x 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.

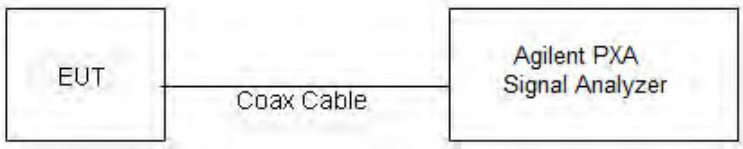

Figure 7-6. Test Instrument & Measurement Setup

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): 54dBuV/m – 95.2dB – 6dBi – 3dB= **-50.2dBm**
   Peak (Restricted): 74dBuV/m – 95.2dB – 6dBi – 3dB= **-30.2dBm**

   Peak (Non-Restr.): -27dBm – 6dBi – 3dB = **-36dBm**

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.

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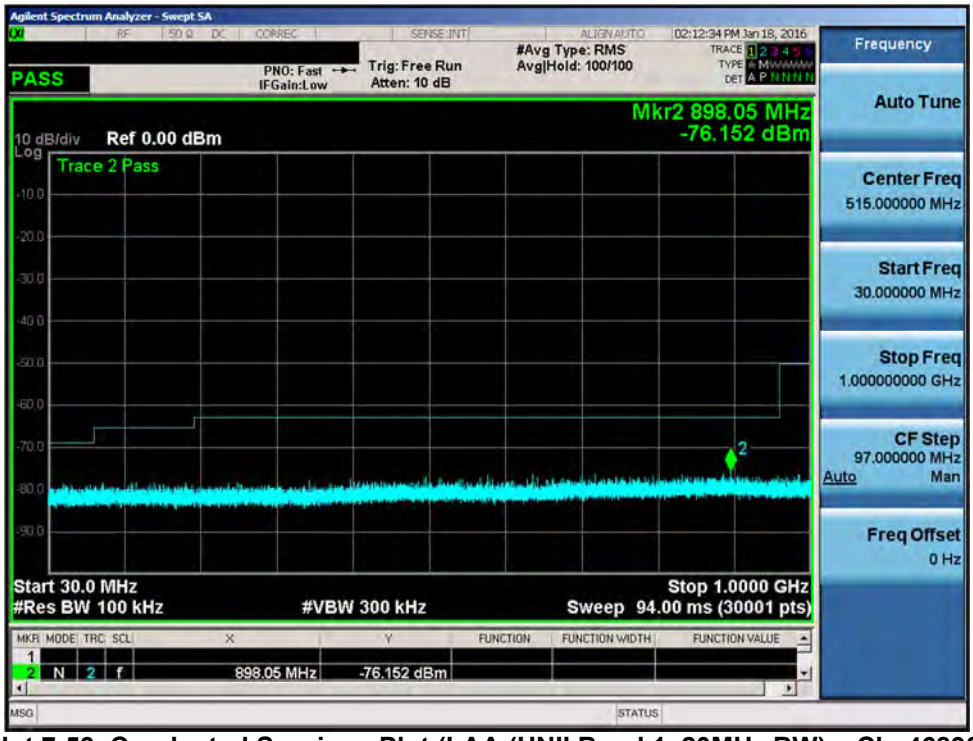
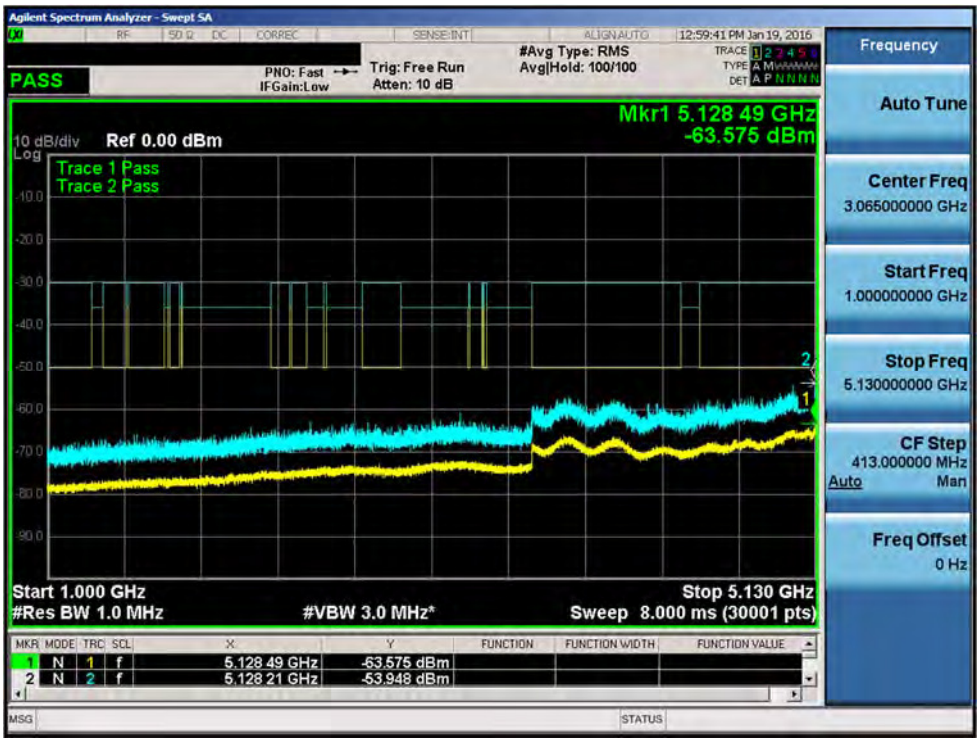
Conducted Band Edge Emissions (Cont'd)

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)

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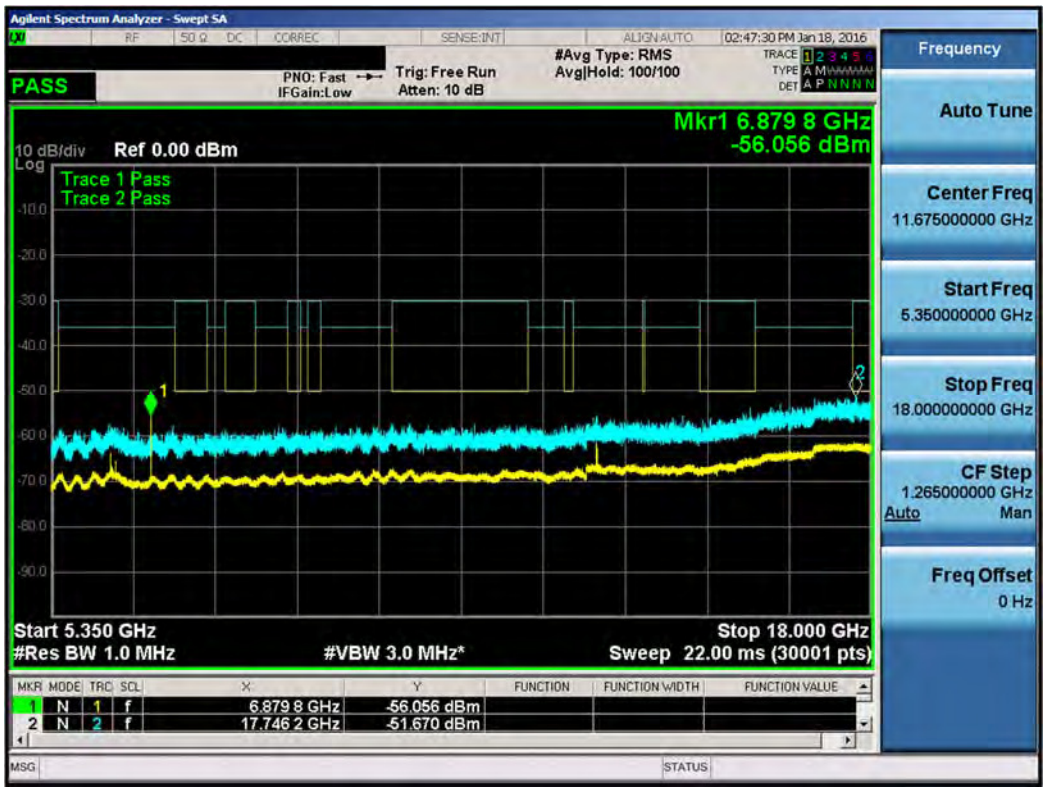
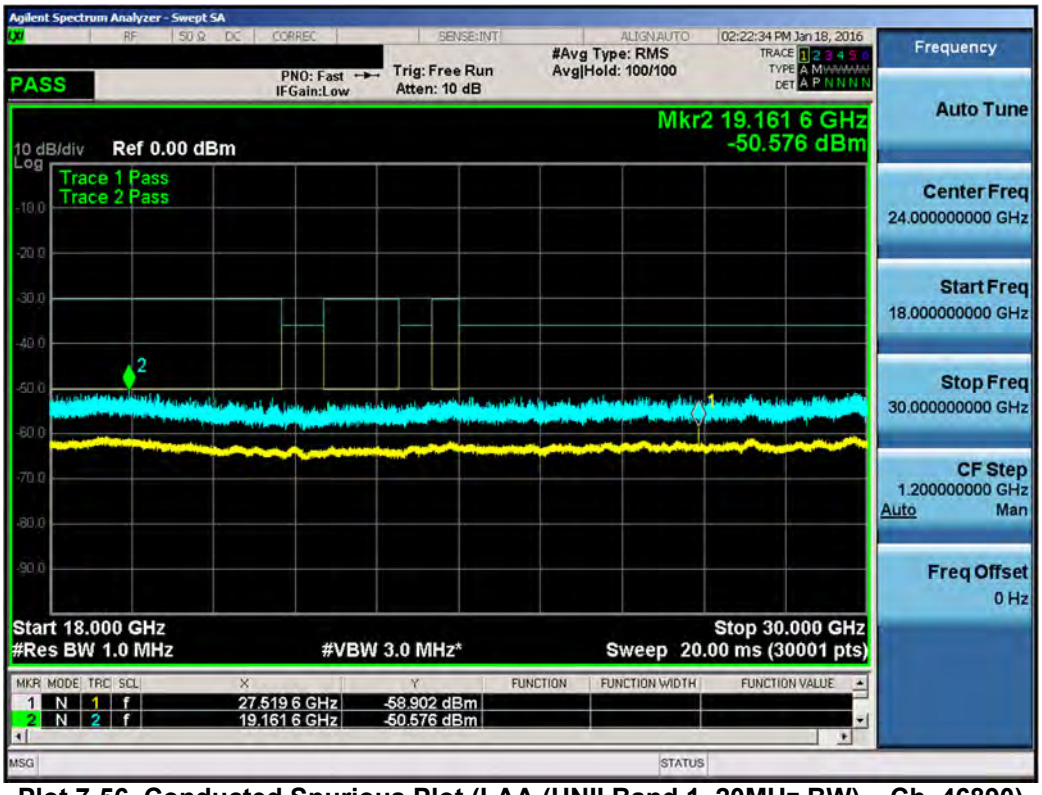


Plot 7-55. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 46890)



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

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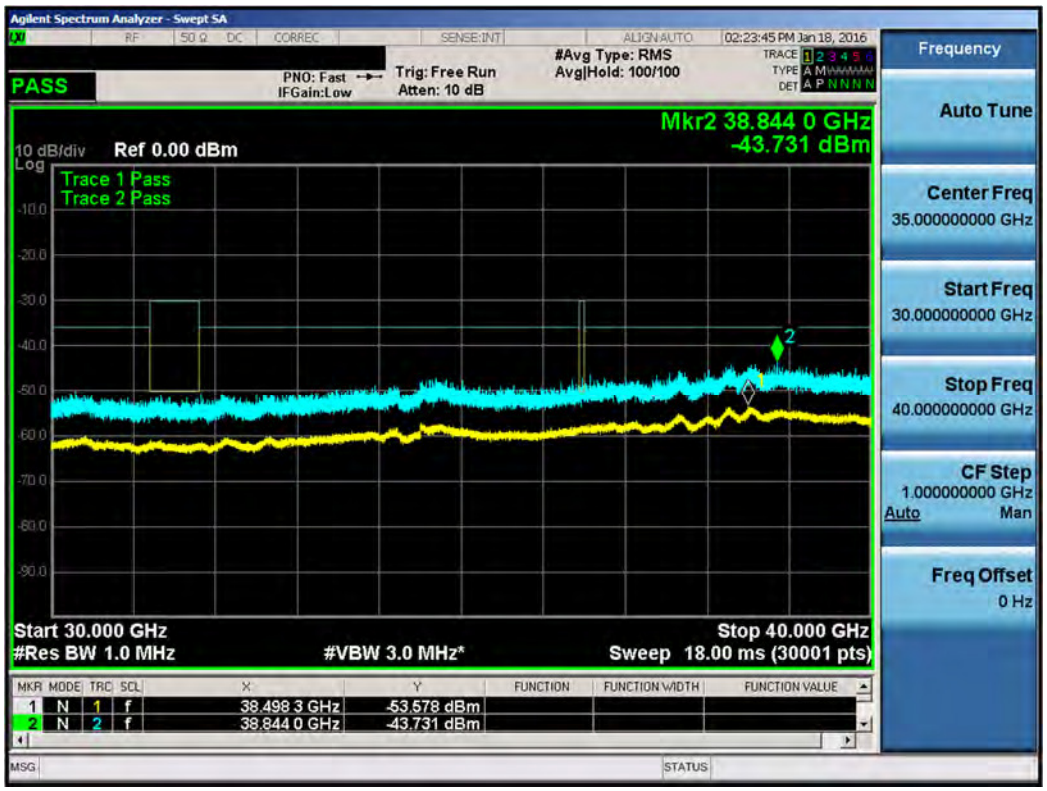
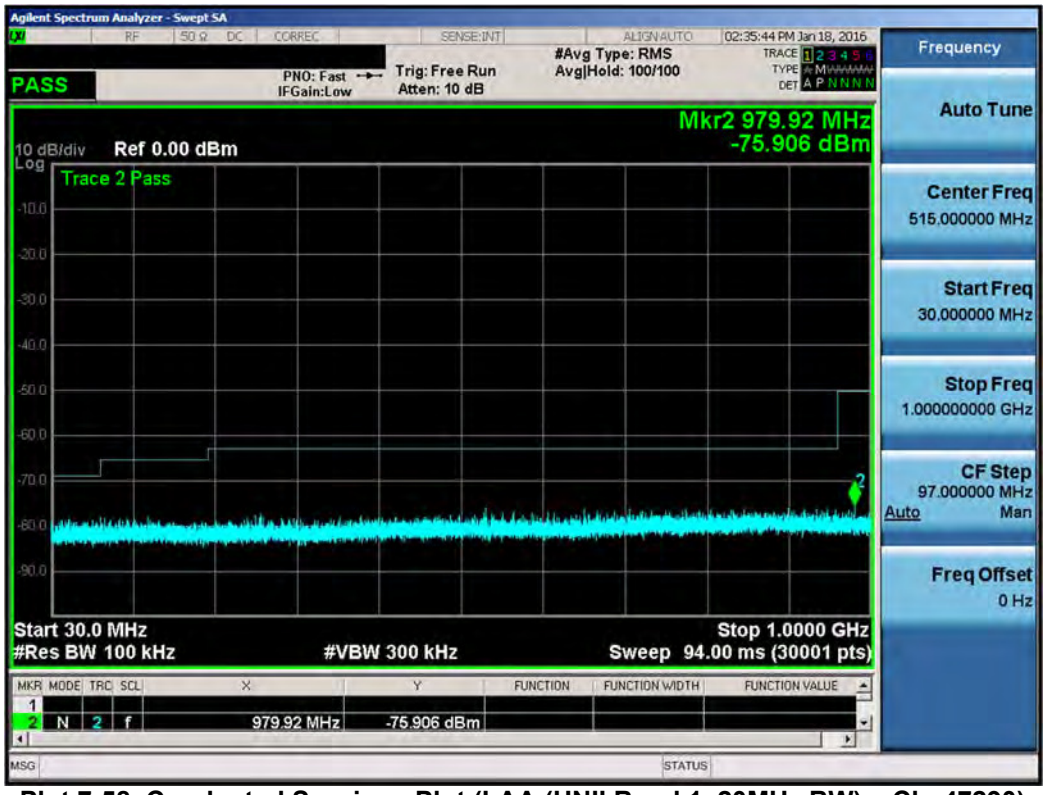


Plot 7-57. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 46890)



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

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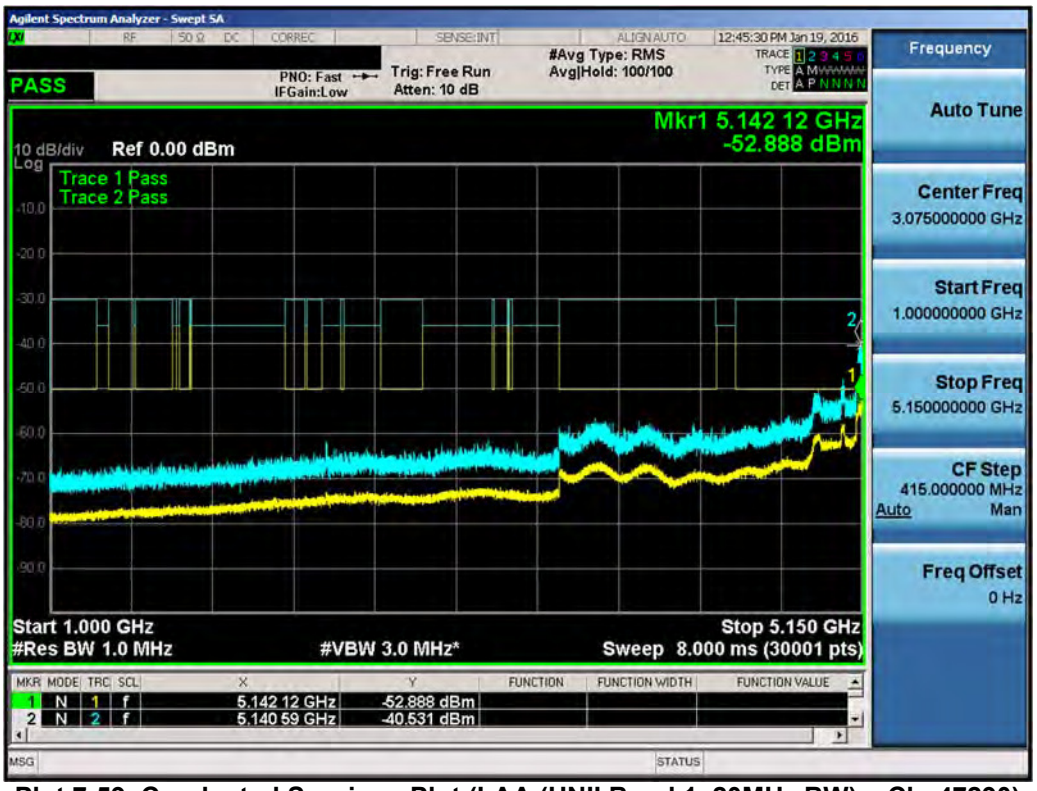
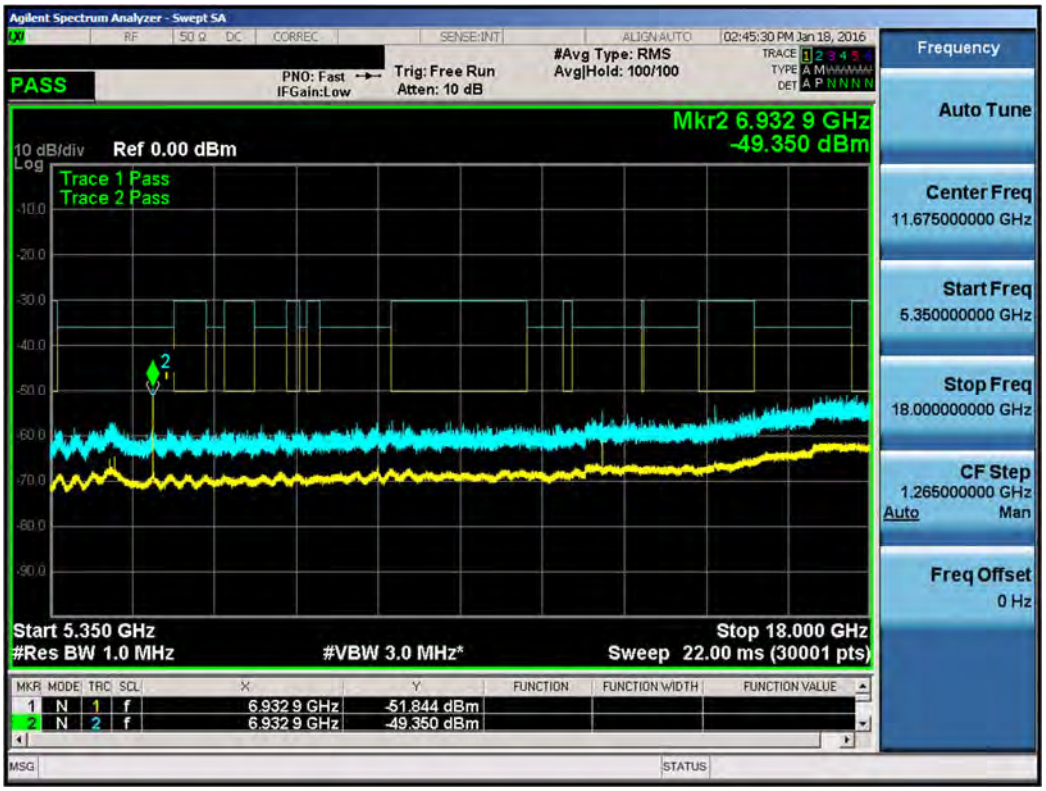


Plot 7-59. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47290)



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

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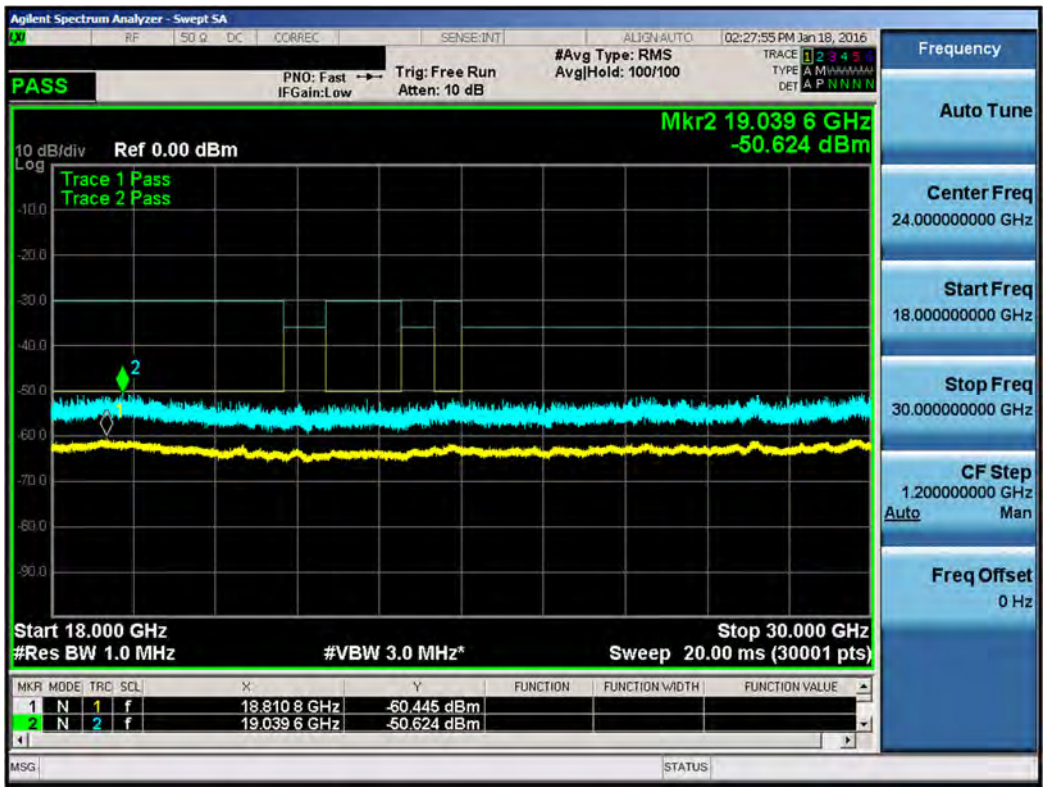
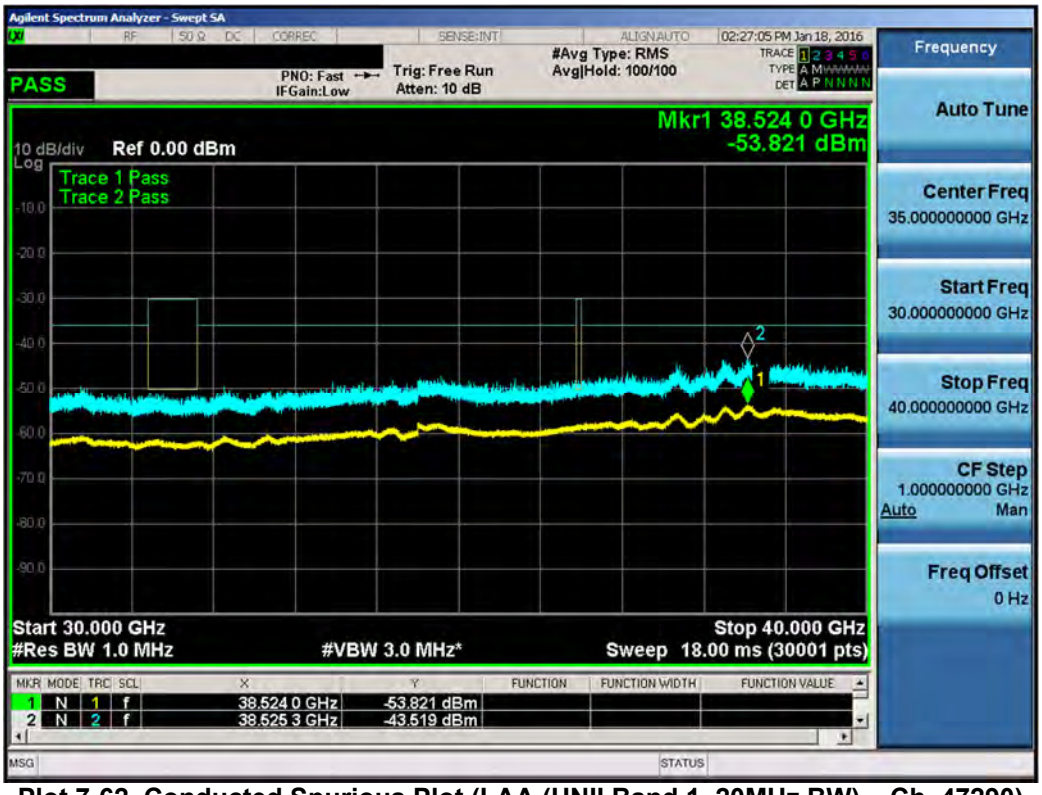


Plot 7-61. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47290)



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

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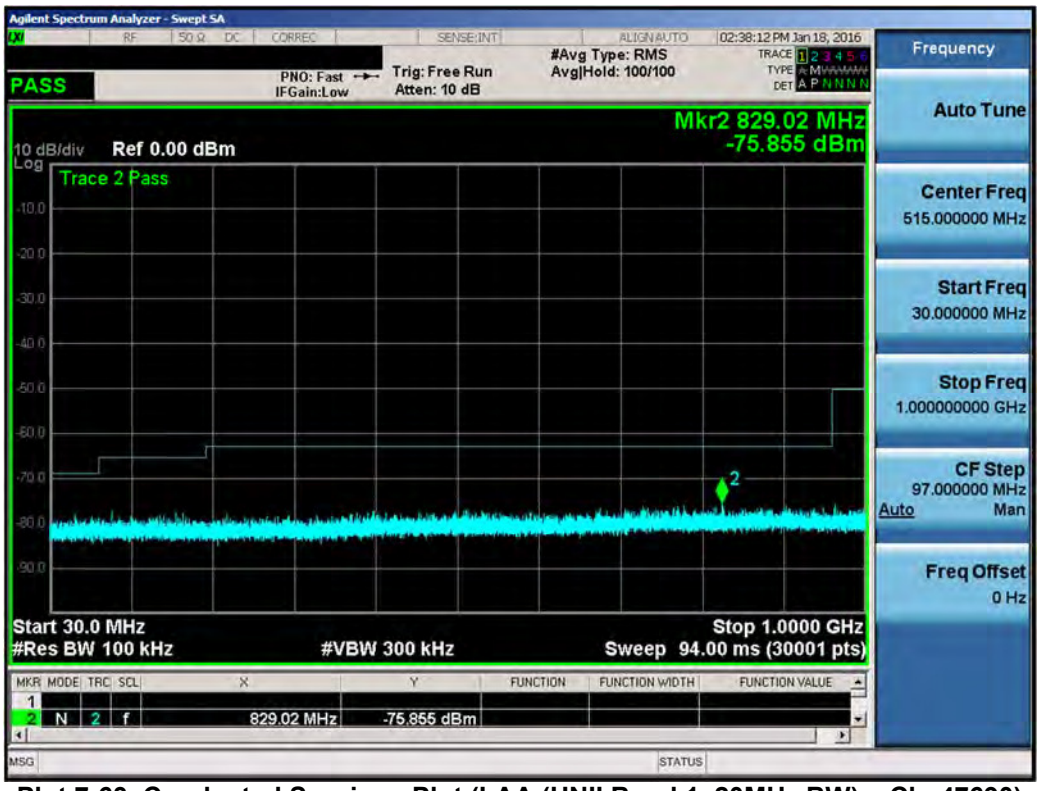
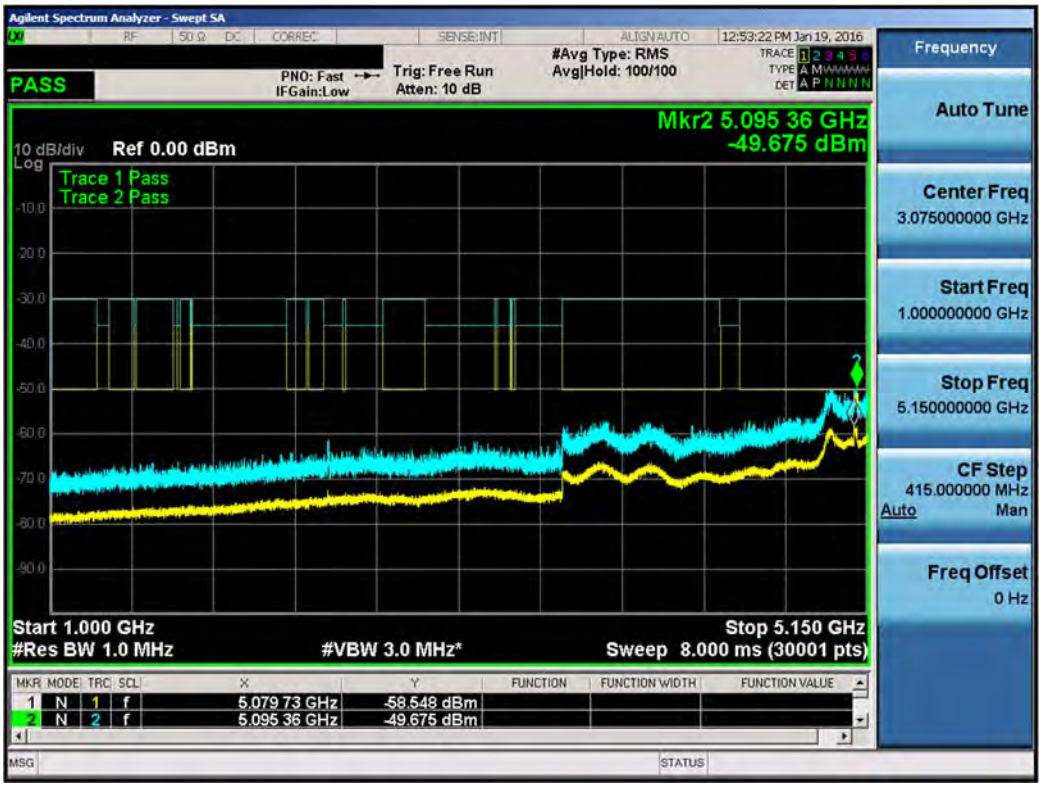


Plot 7-63. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)



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

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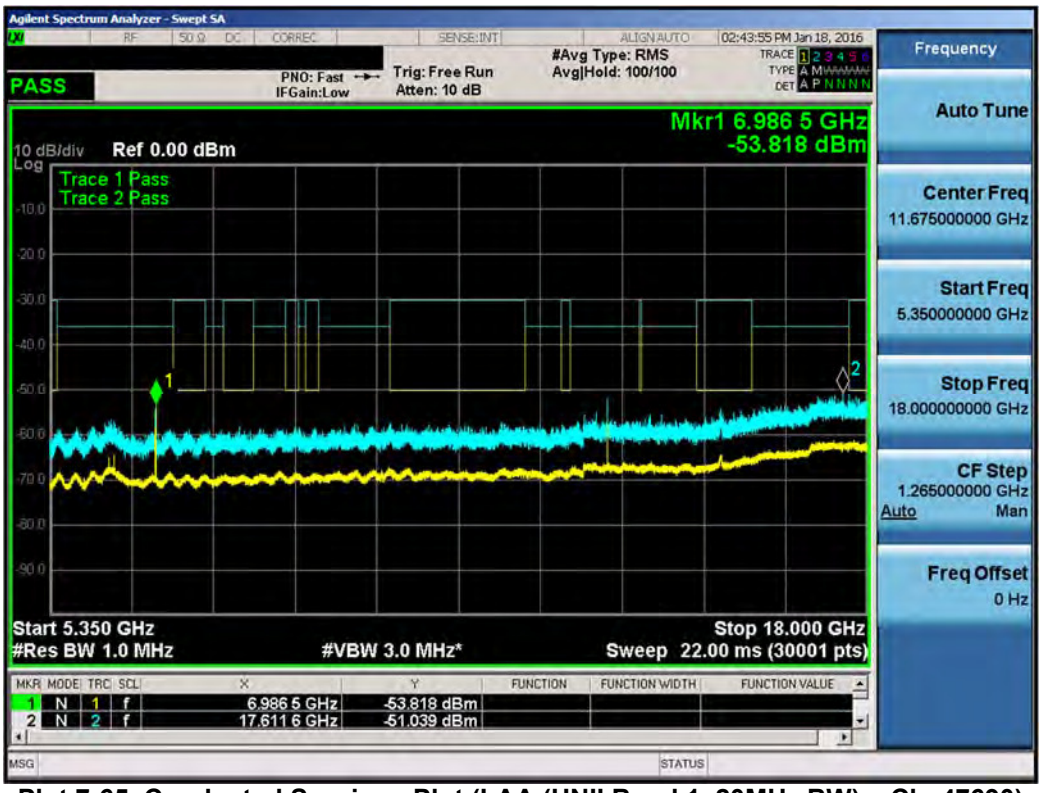
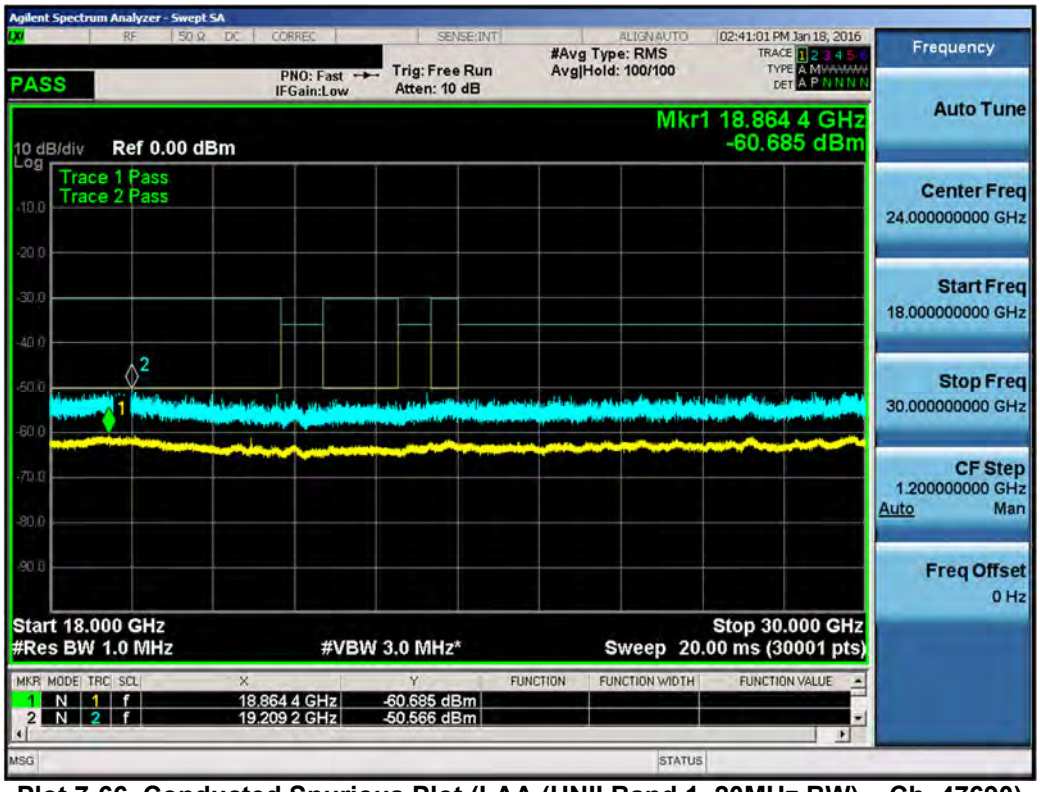


Plot 7-65. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)



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

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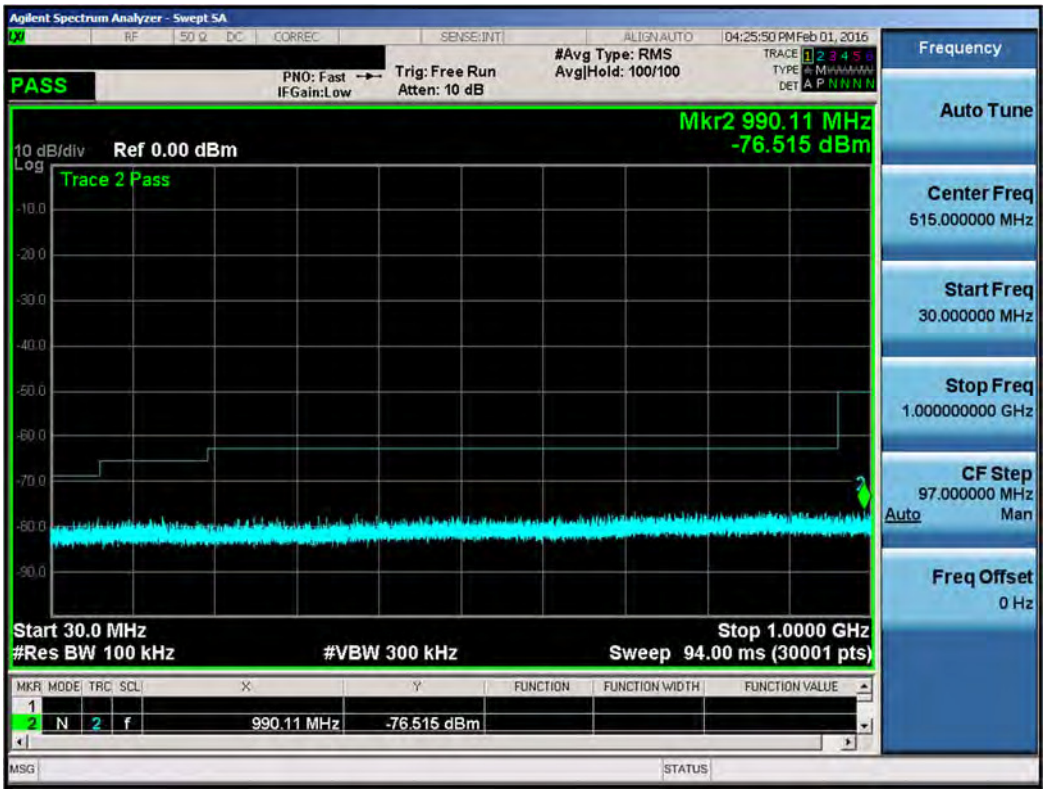
Plot 7-67. Conducted Spurious Plot (LAA (UNII Band 1, 20MHz BW) – Ch. 47690)



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

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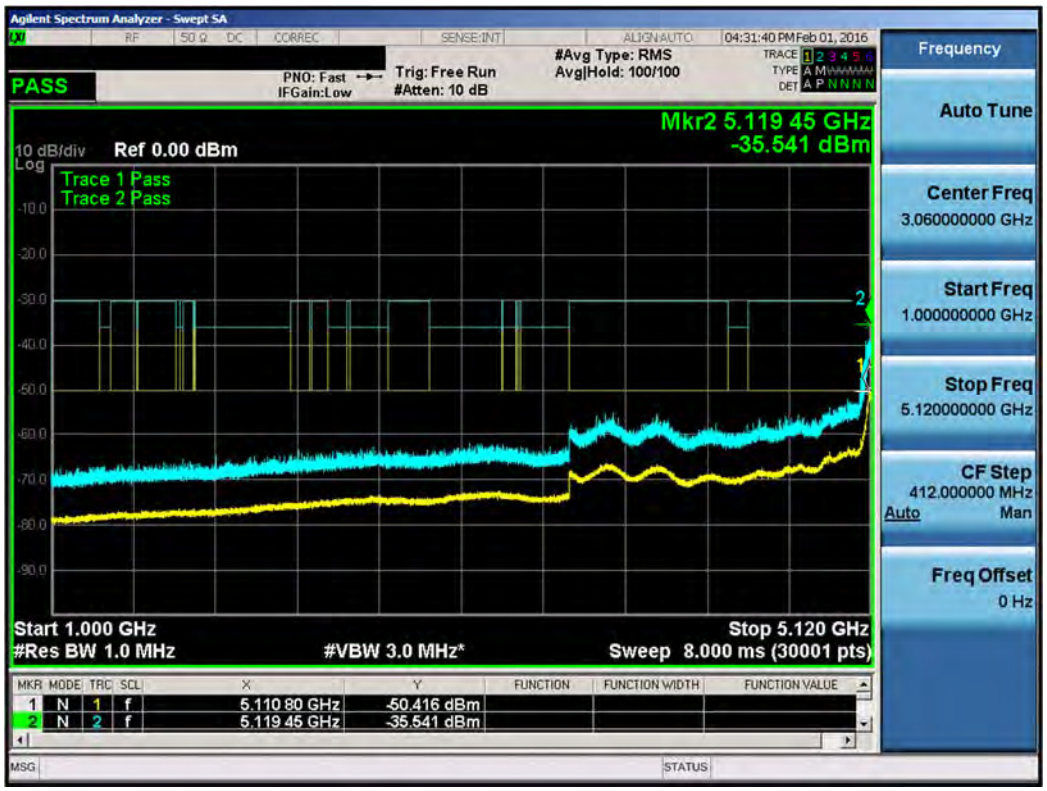

Plot 7-69. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 46890, 47090)

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

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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)

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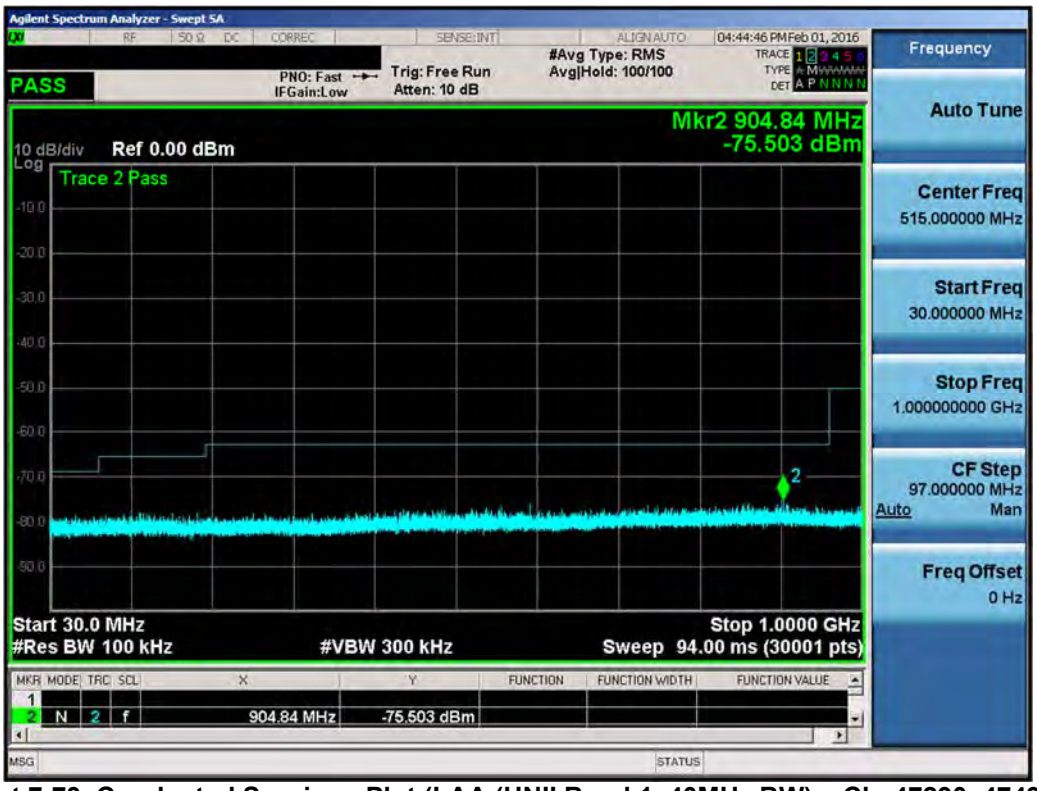

Plot 7-73. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47290, 47490)

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

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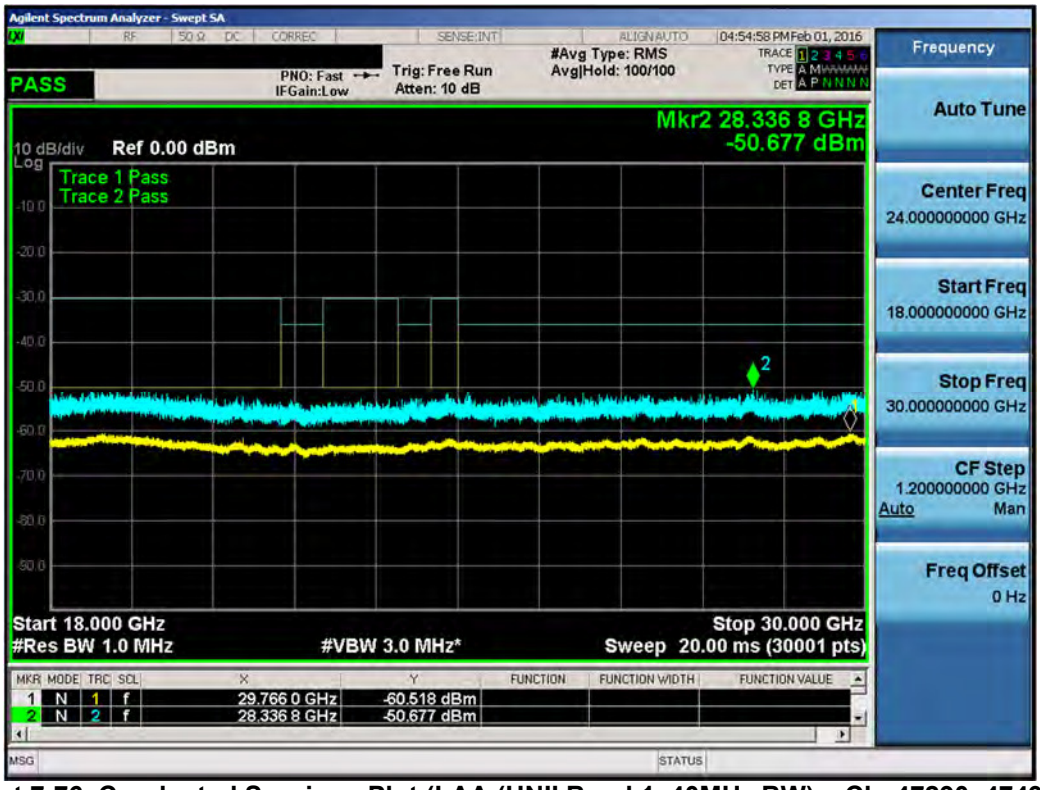
Plot 7-75. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47290, 47490)



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

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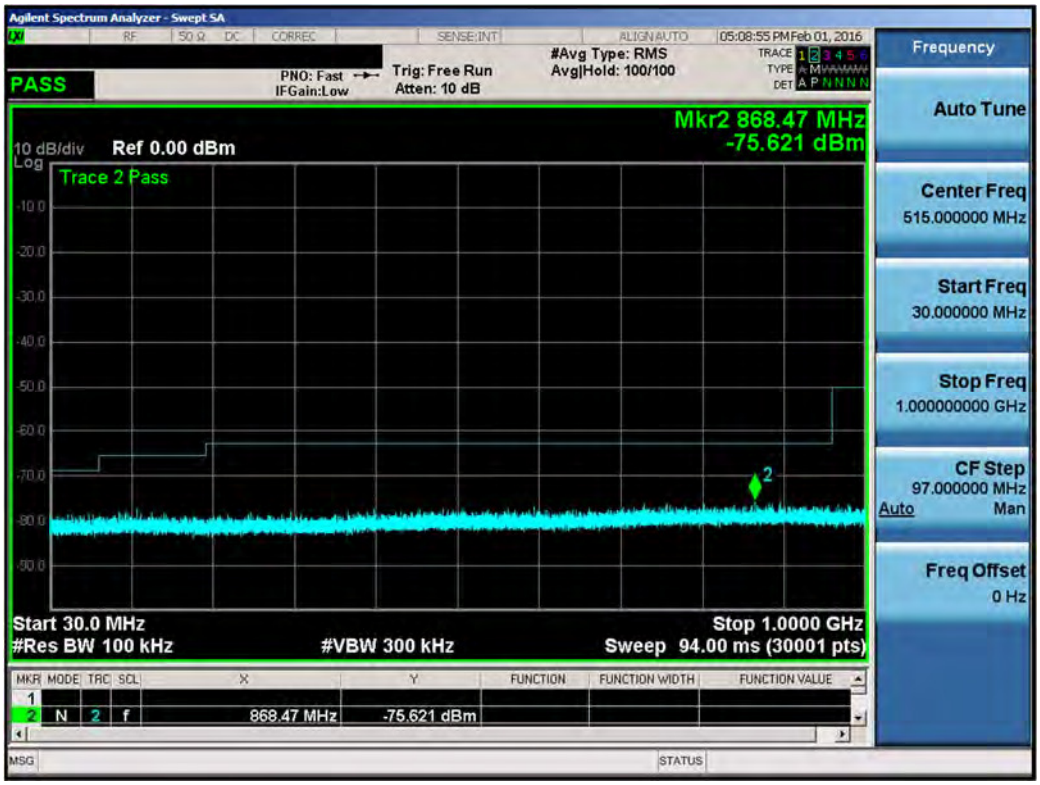
Plot 7-77. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47290, 47490)



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

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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)

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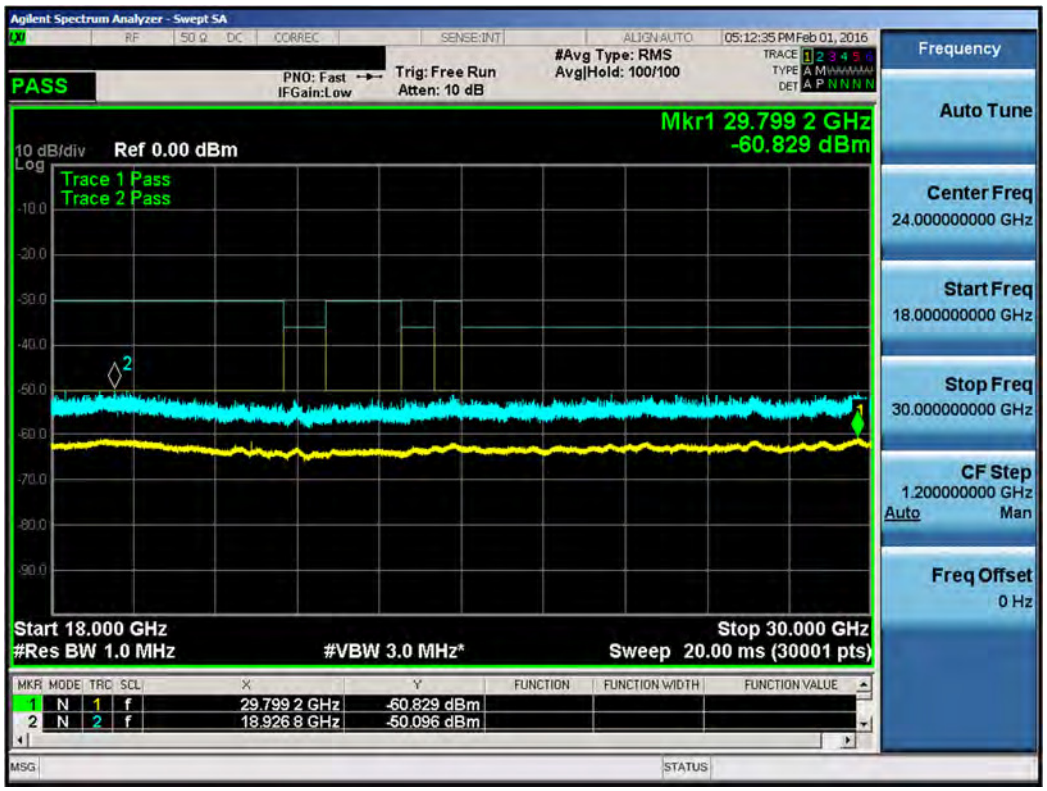

Plot 7-81. Conducted Spurious Plot (LAA (UNII Band 1, 40MHz BW) – Ch. 47490, 47690)

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

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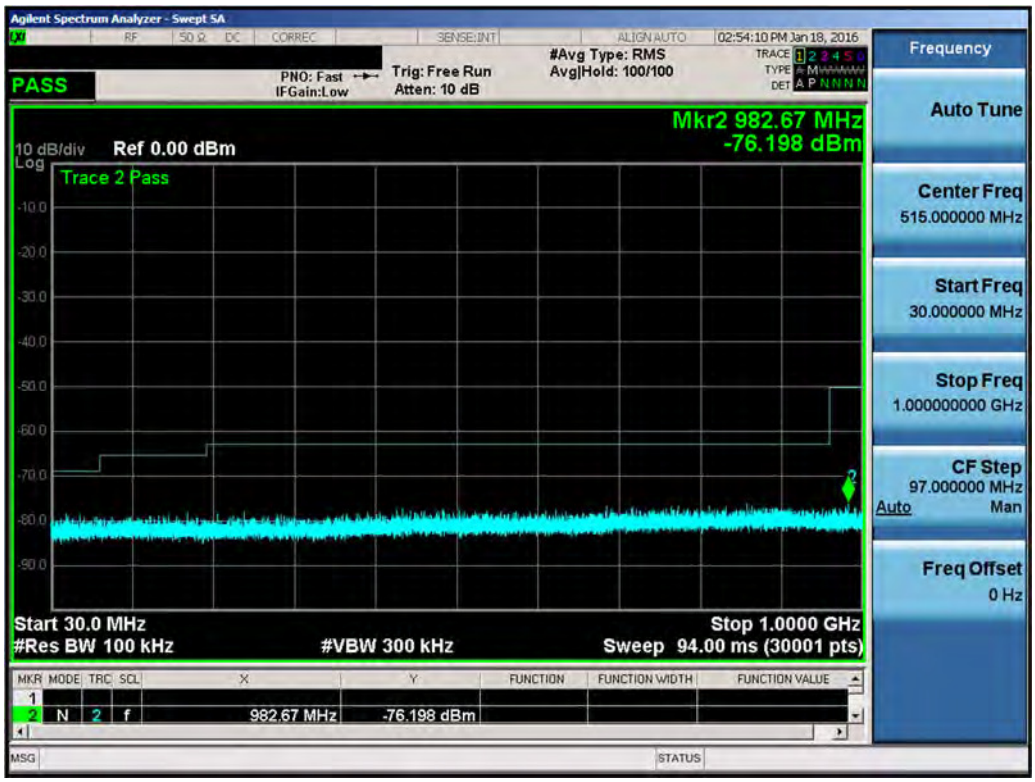
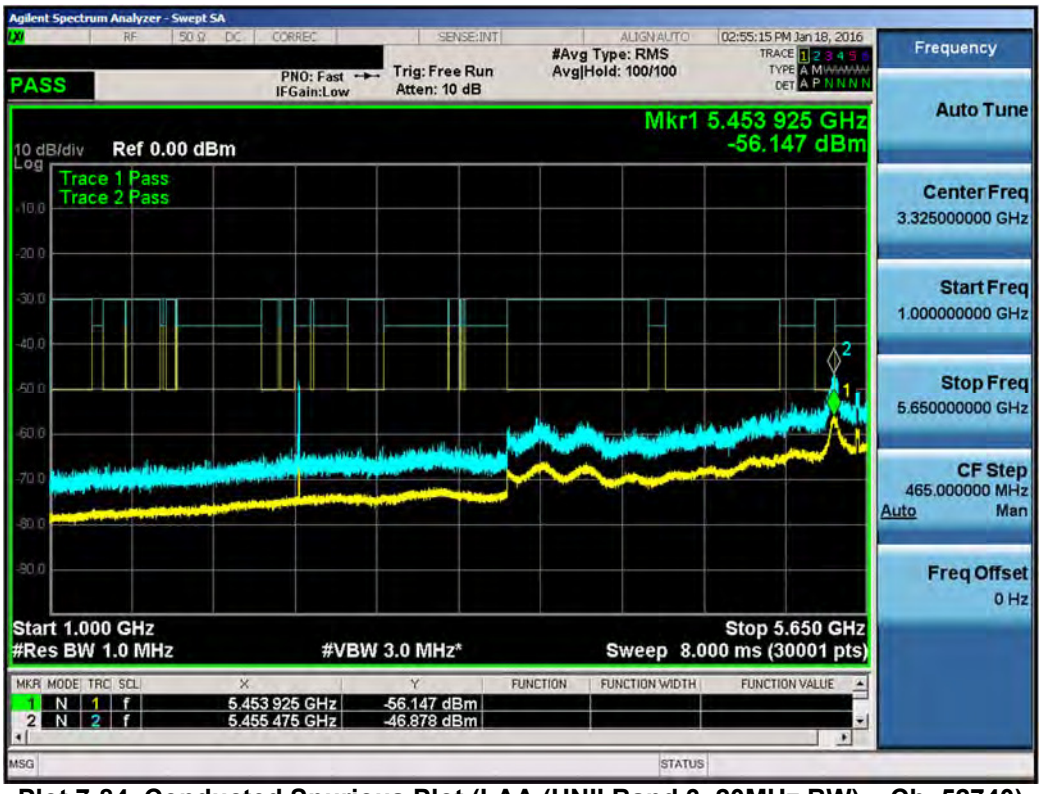


Plot 7-83. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 52740)



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

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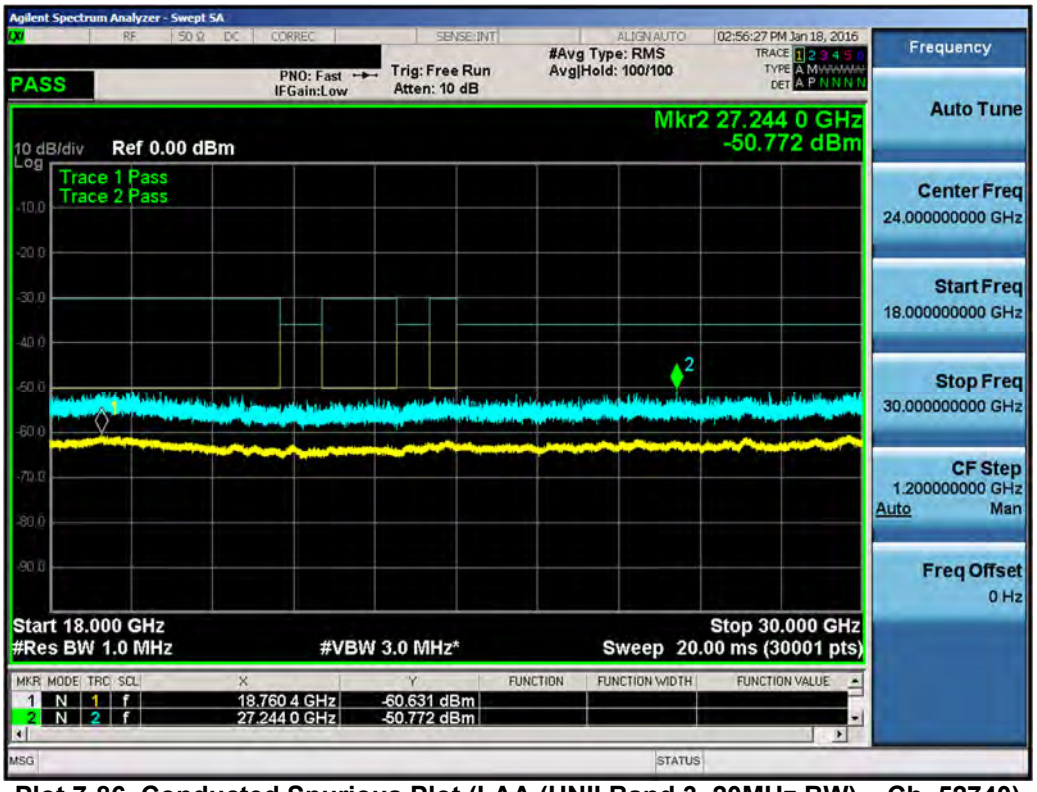
Plot 7-85. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 52740)



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

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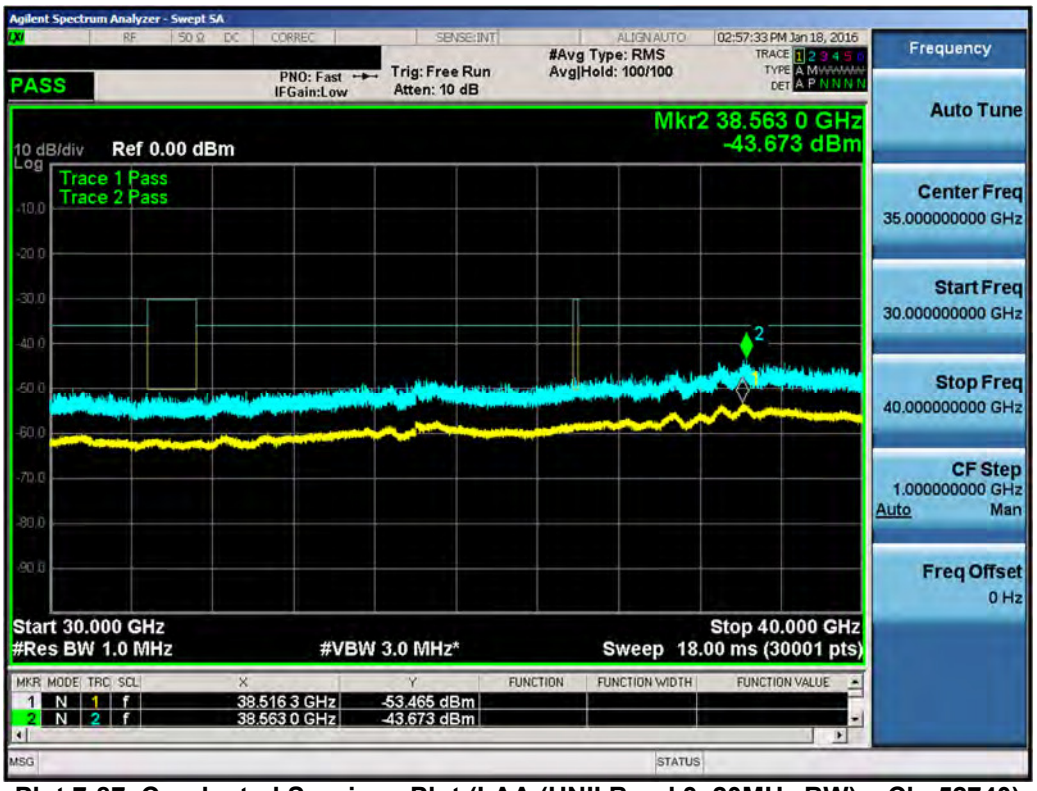
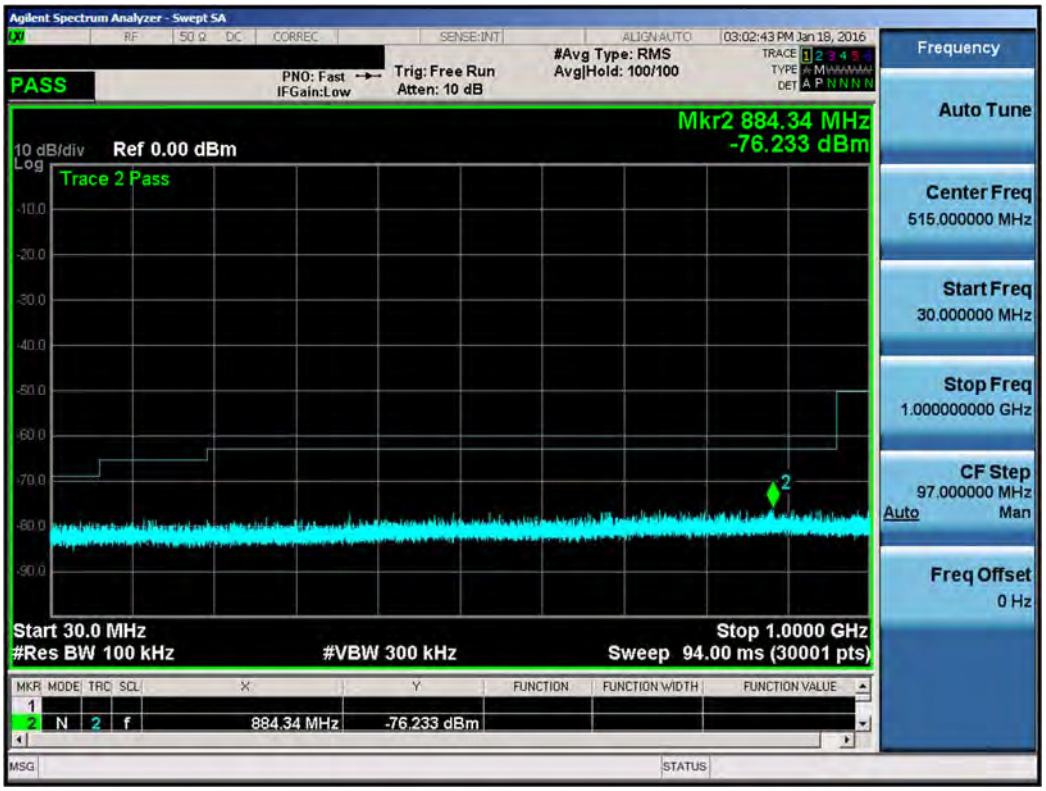


Plot 7-87. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 52740)



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

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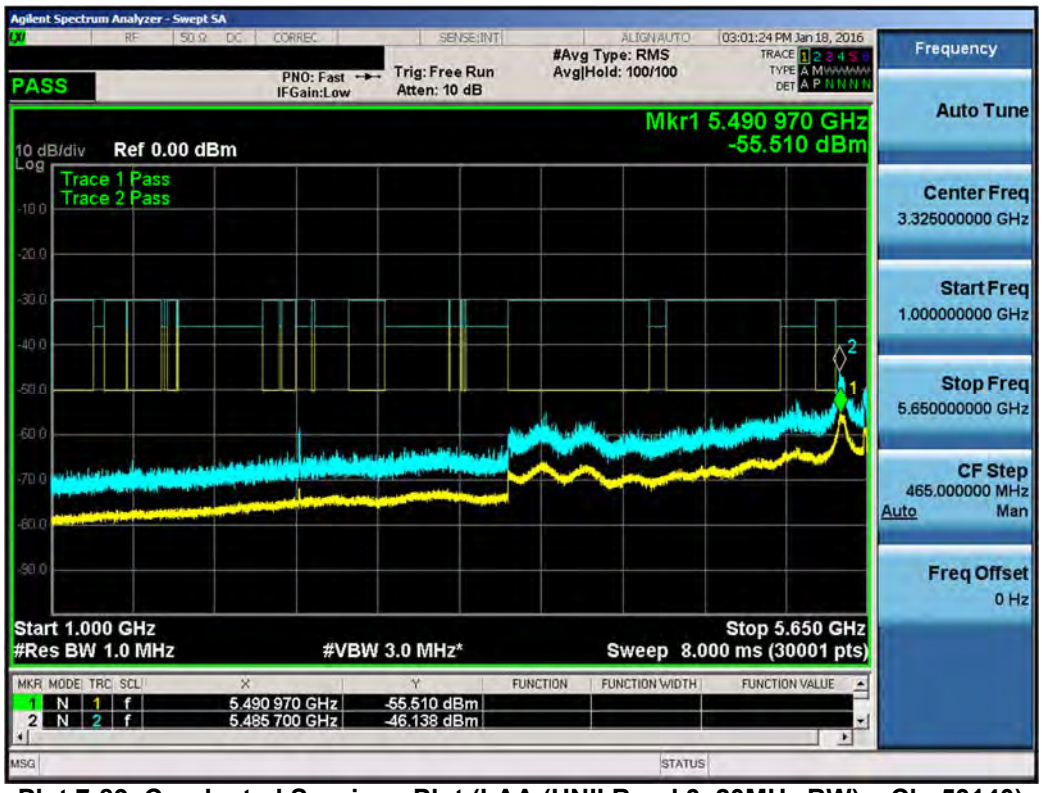

Plot 7-89. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53140)

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

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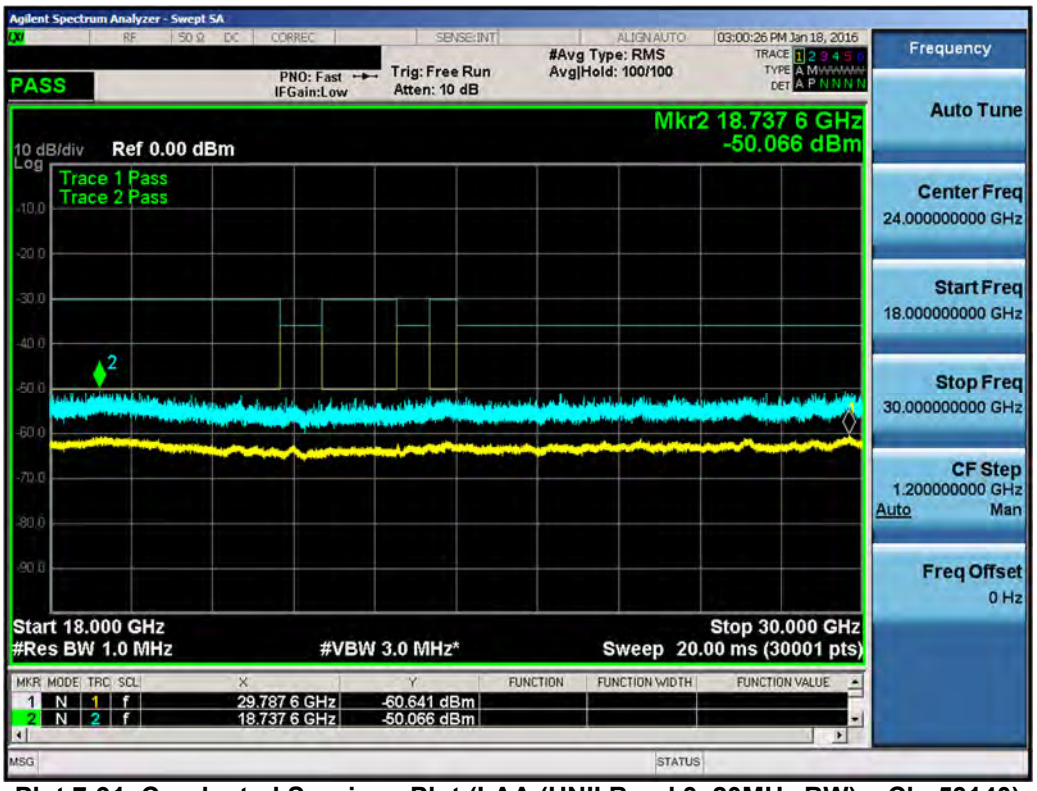
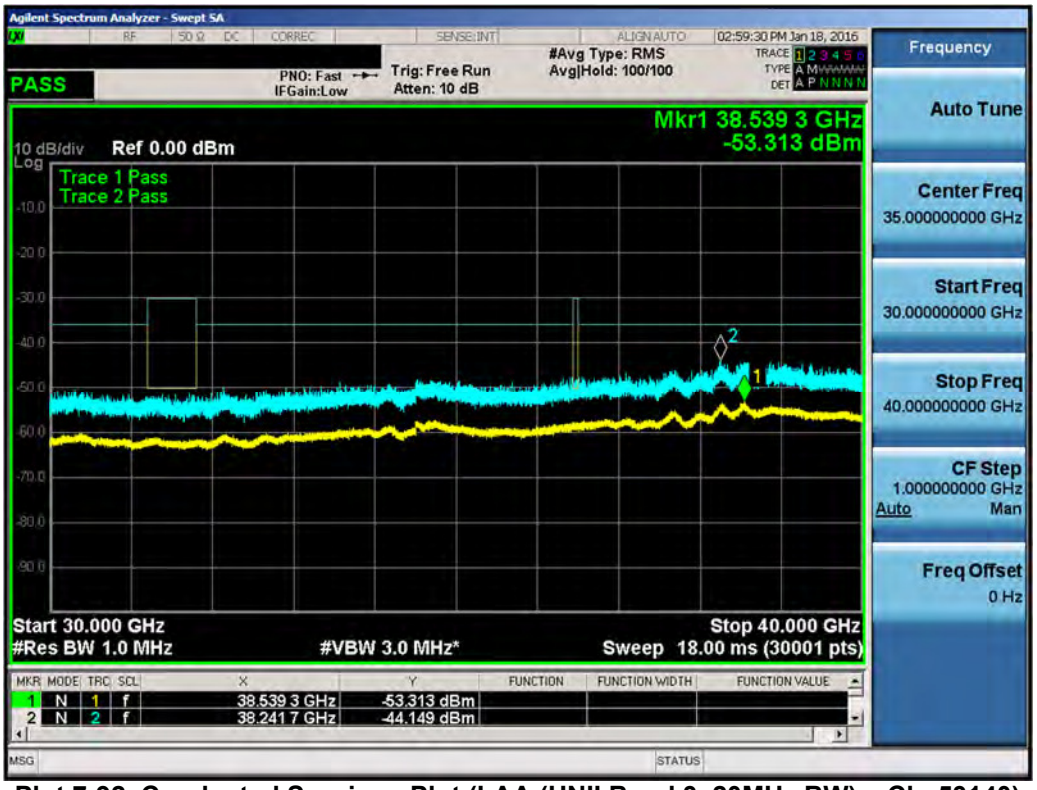


Plot 7-91. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53140)



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

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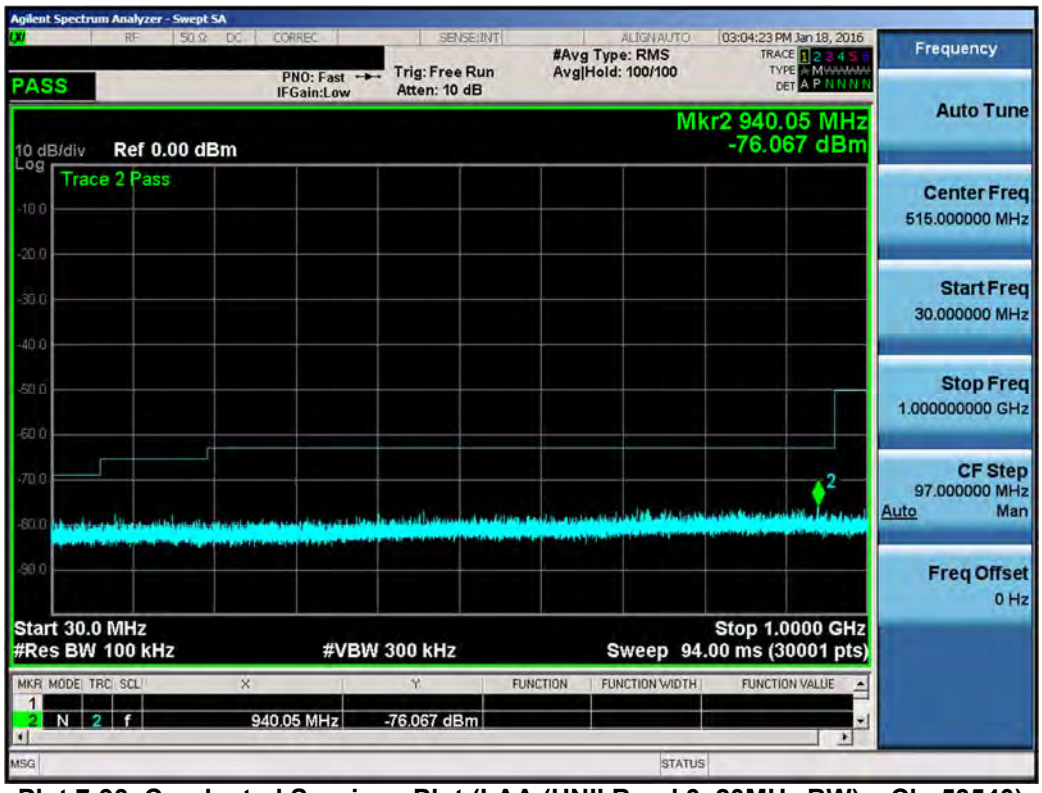
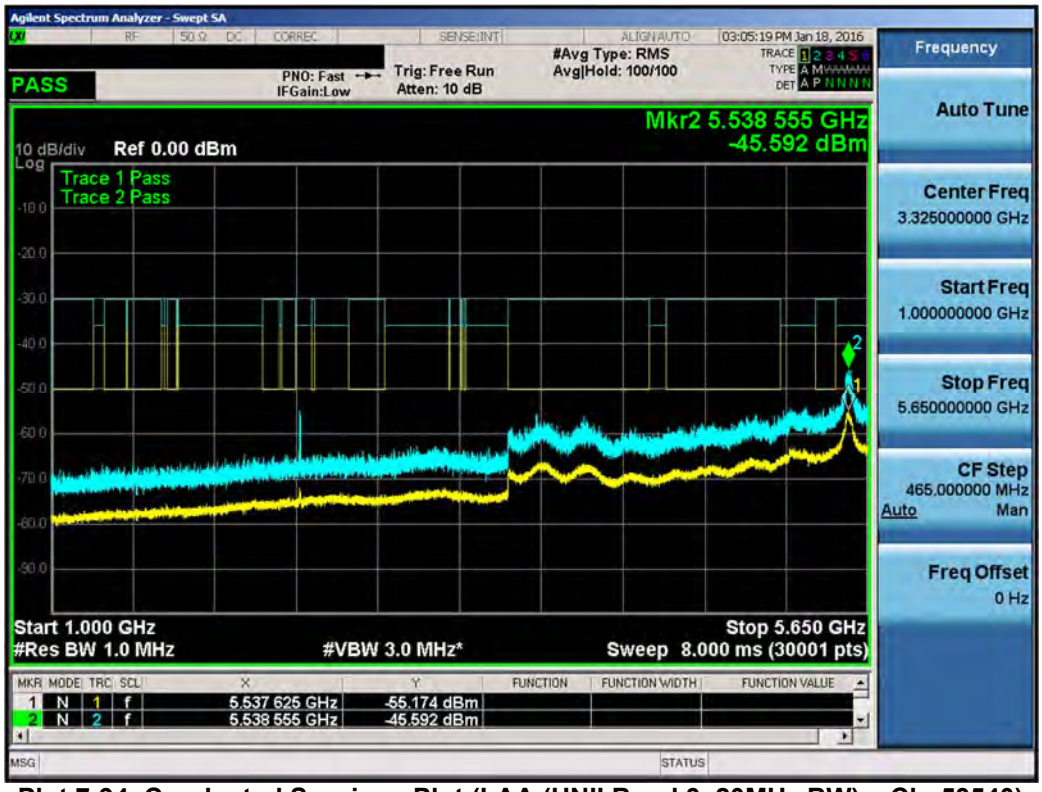


Plot 7-93. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)



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

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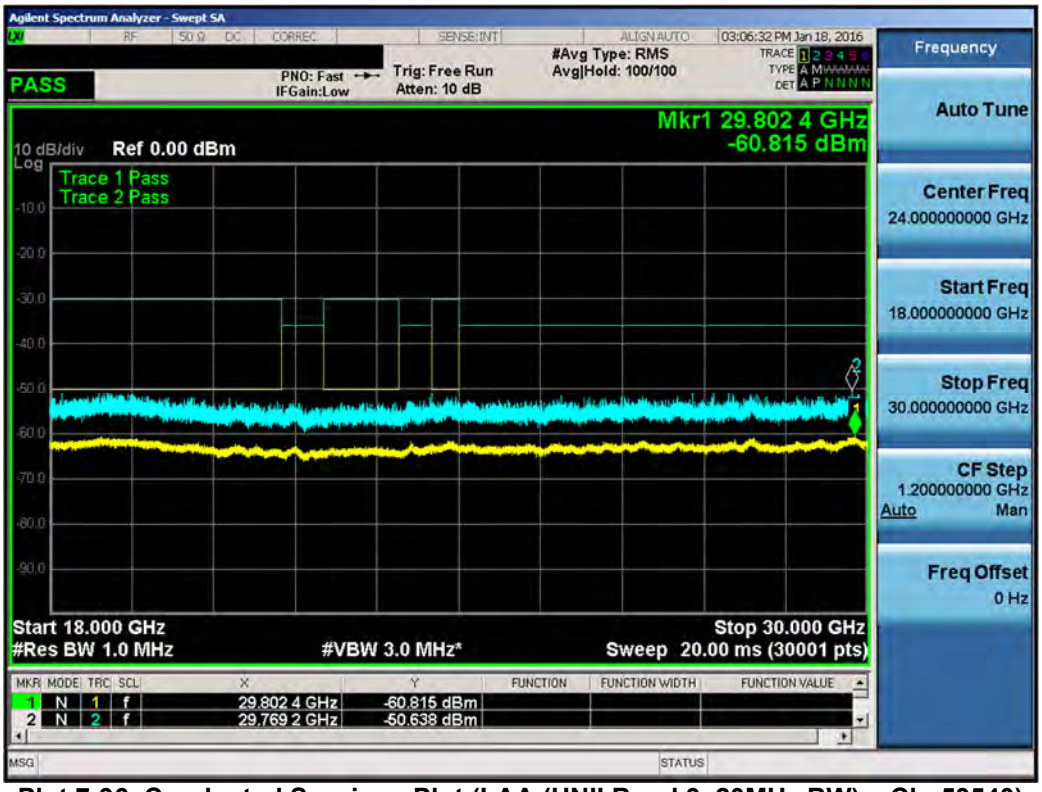
Plot 7-95. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)



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

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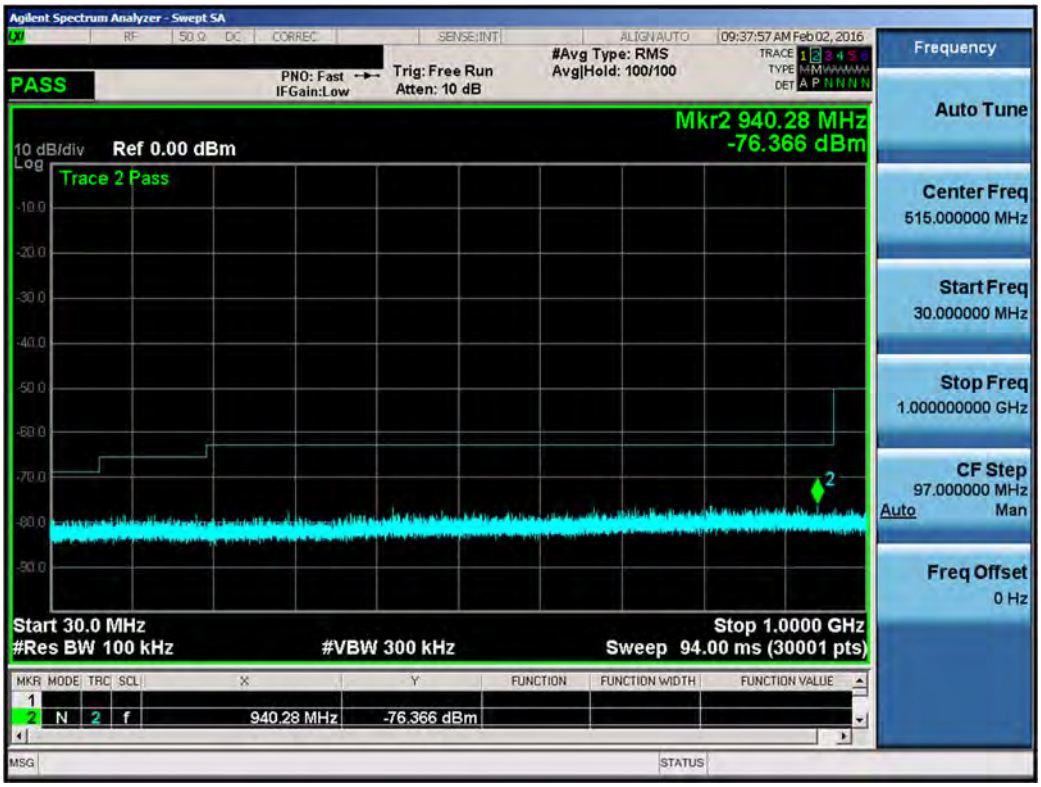
Plot 7-97. Conducted Spurious Plot (LAA (UNII Band 3, 20MHz BW) – Ch. 53540)



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

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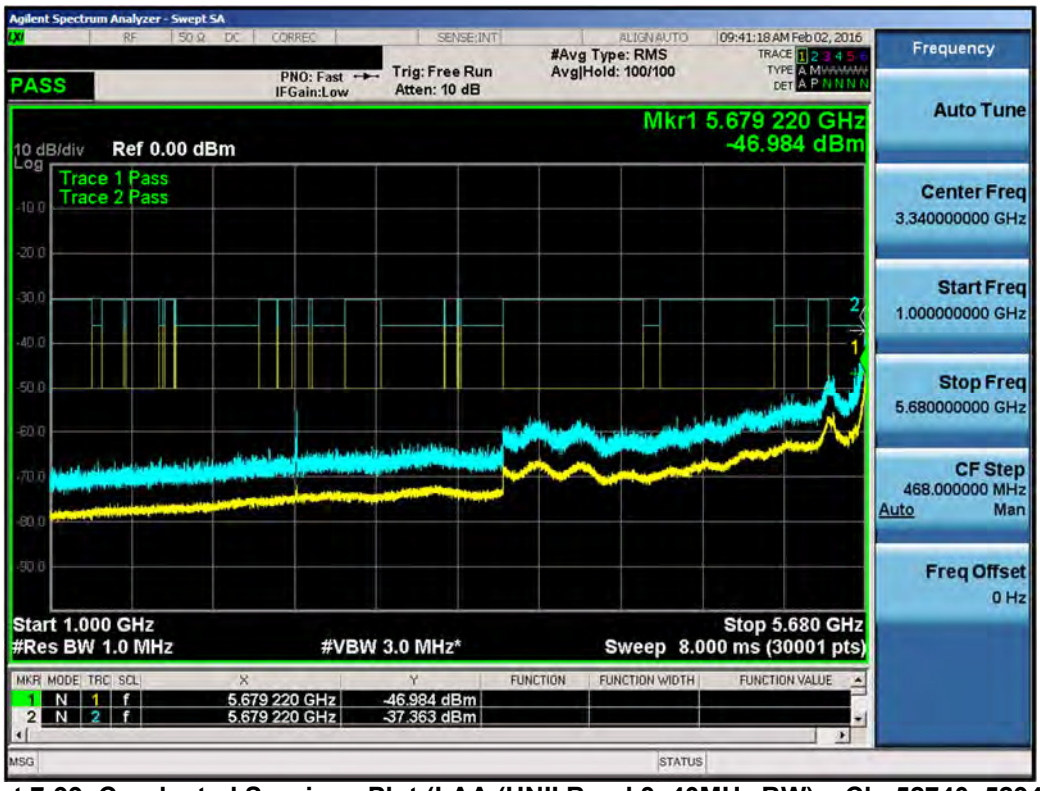

Plot 7-99. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 52740, 52940)

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

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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)

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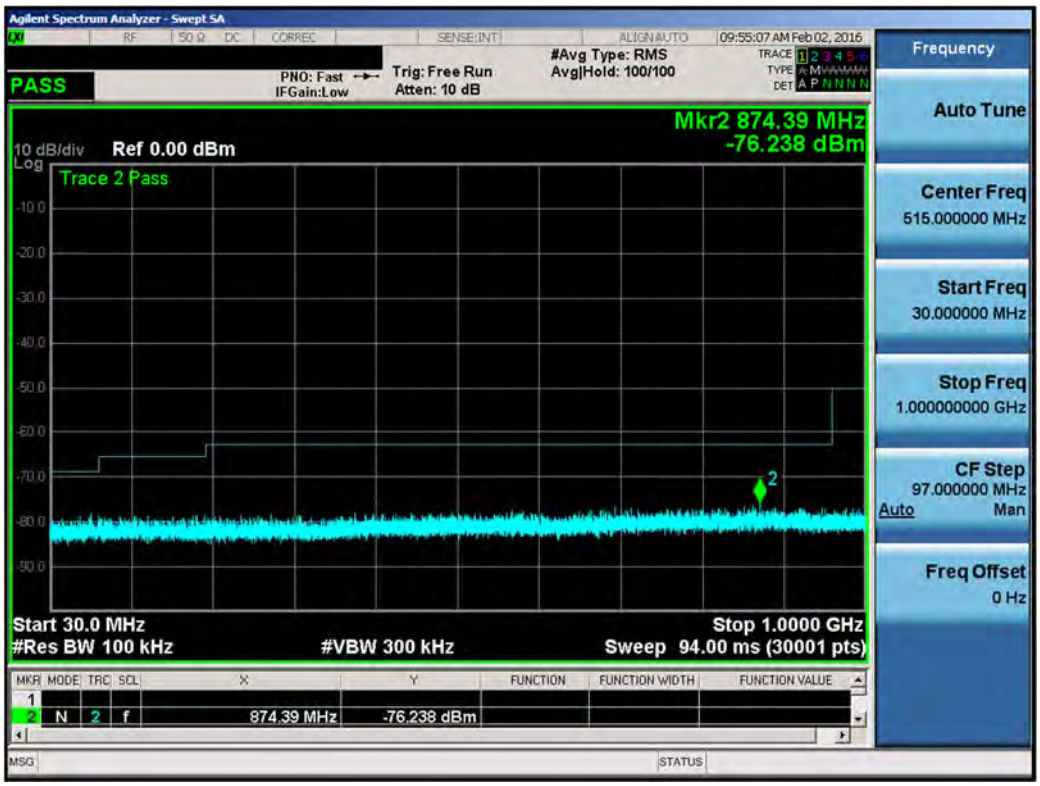
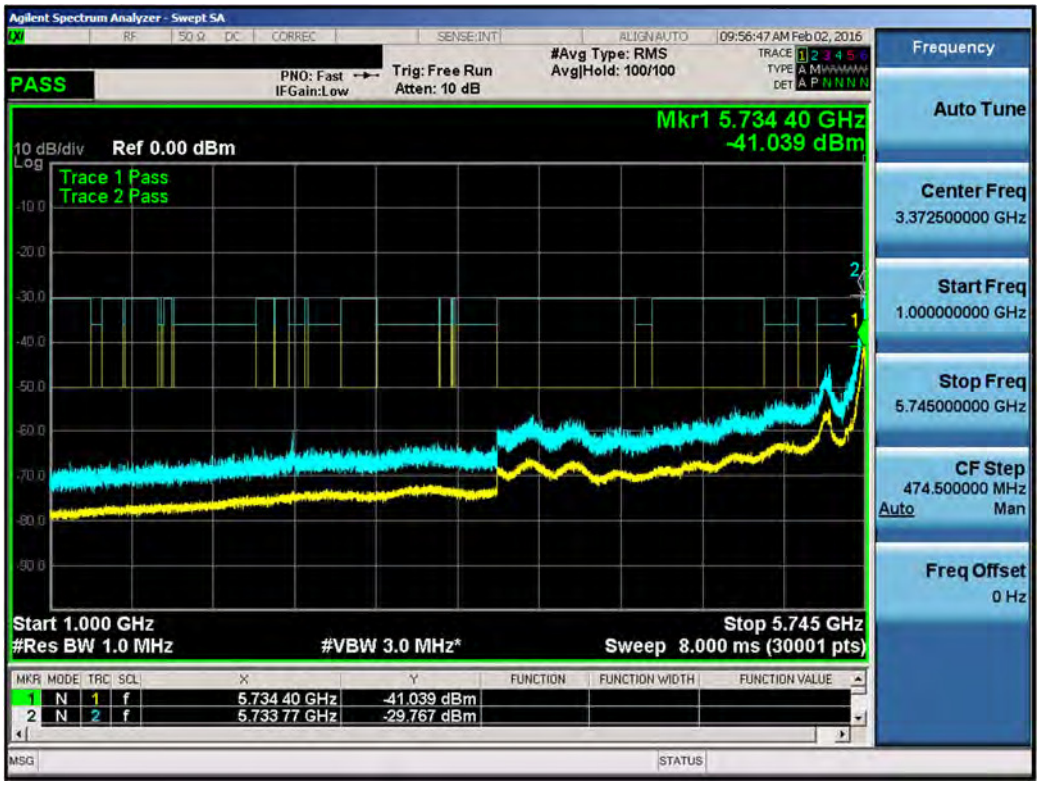


Plot 7-103. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53140, 53340)



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

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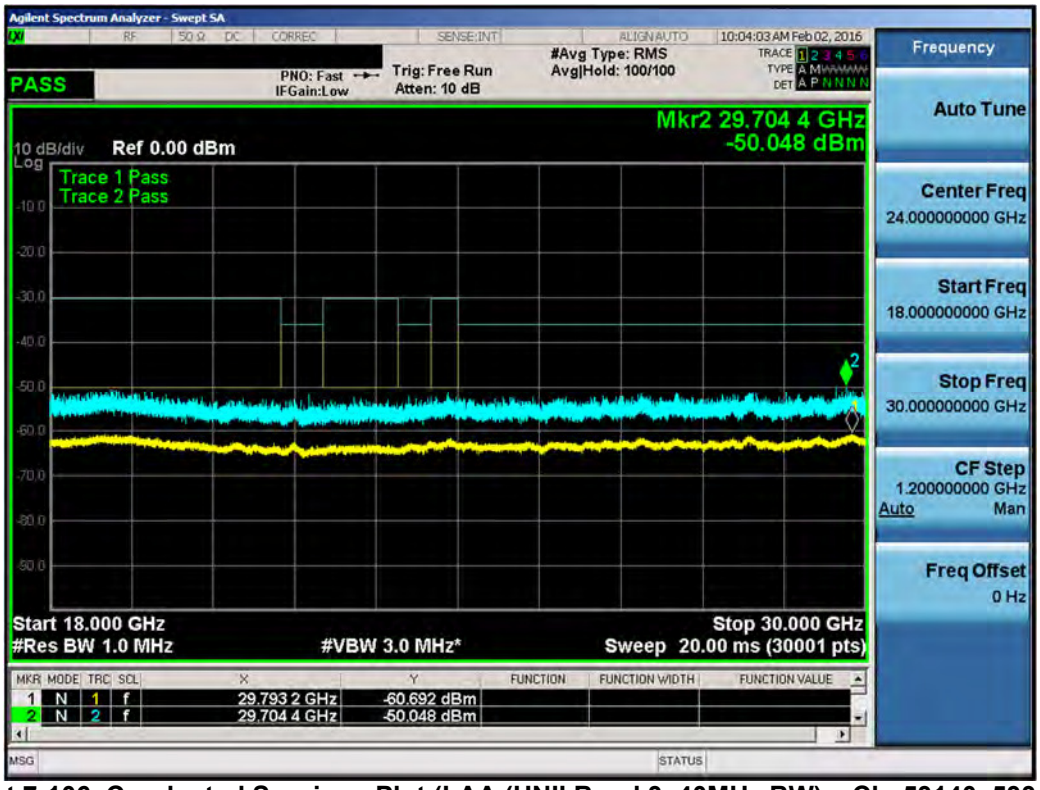
Plot 7-105. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53140, 53340)



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

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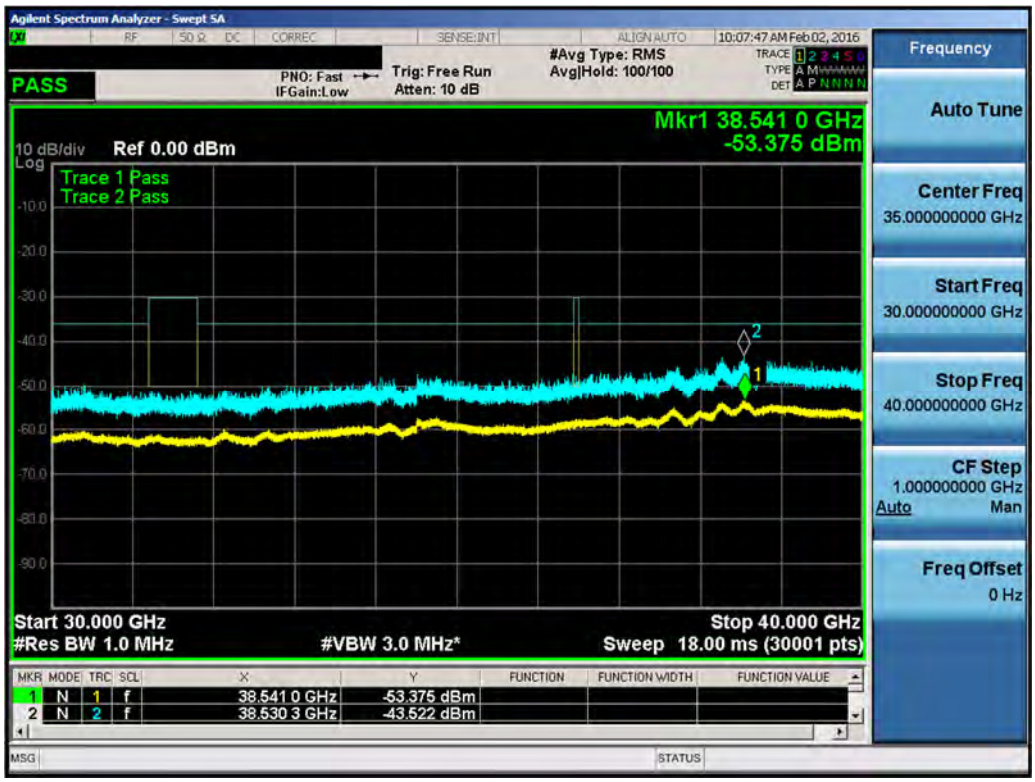
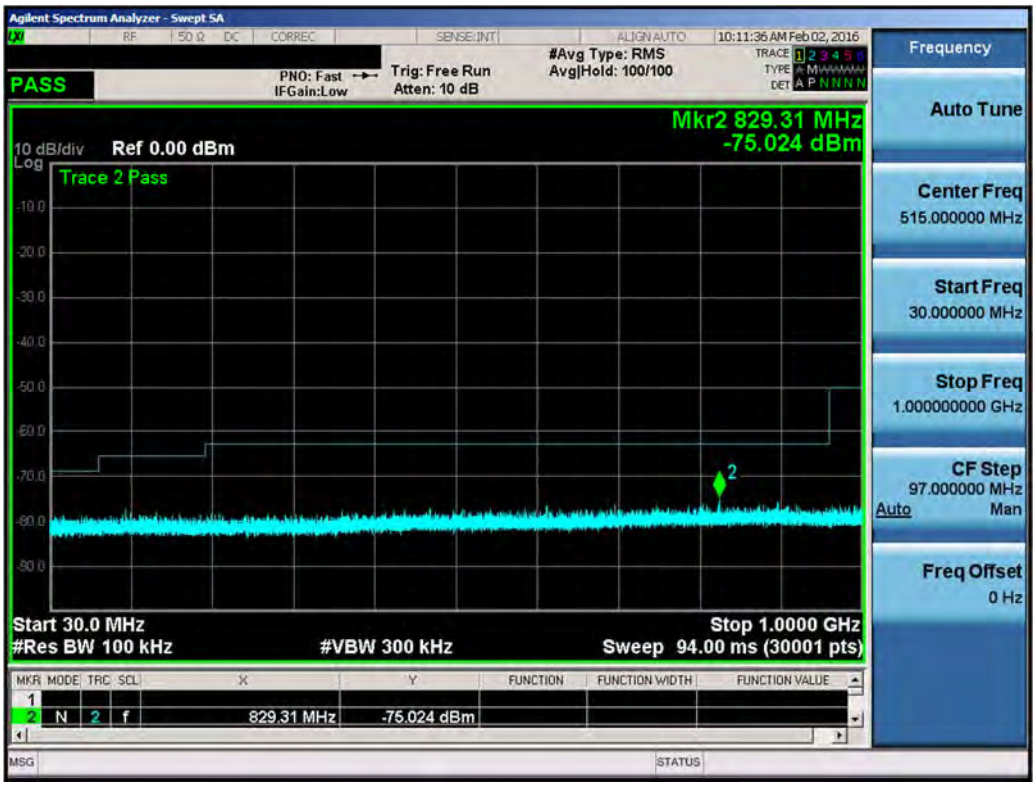


Plot 7-107. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53140, 53340)



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

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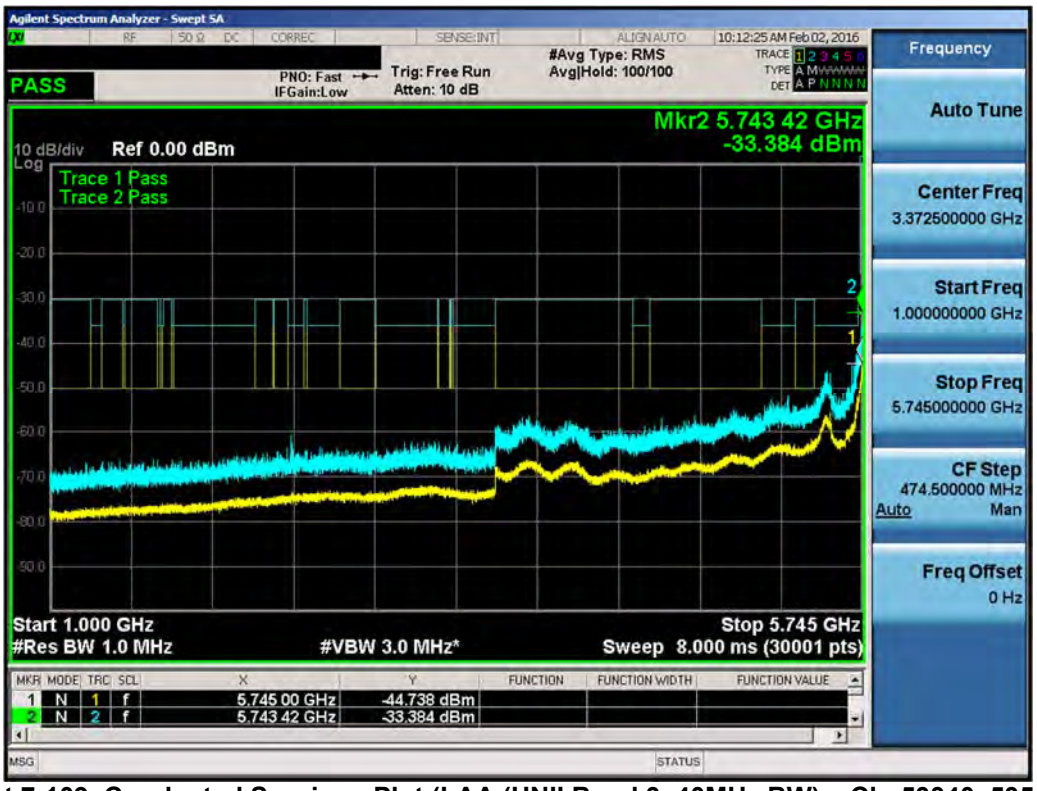
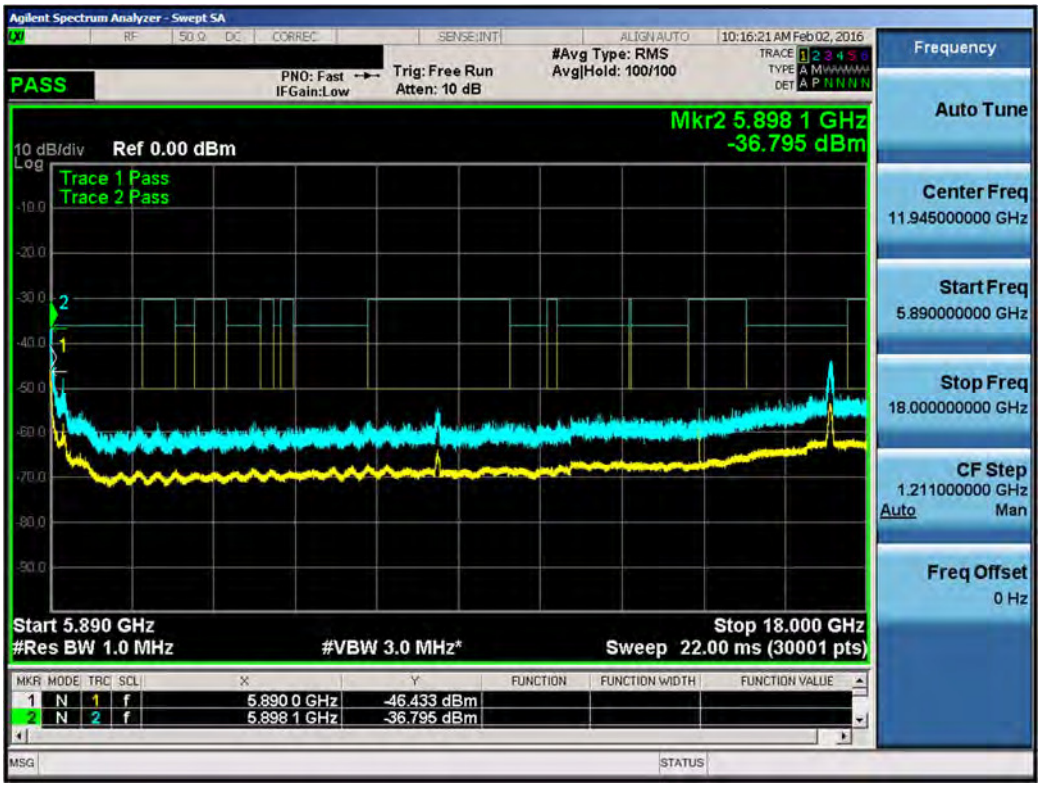


Plot 7-109. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53340, 53540)



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

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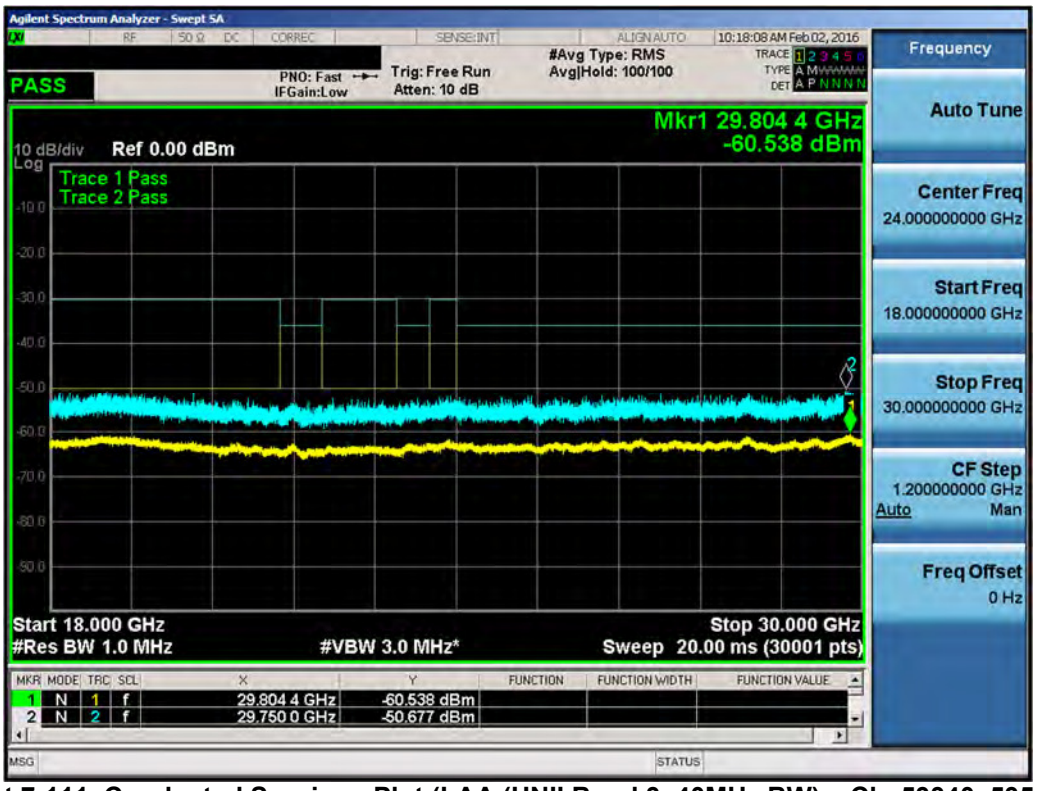
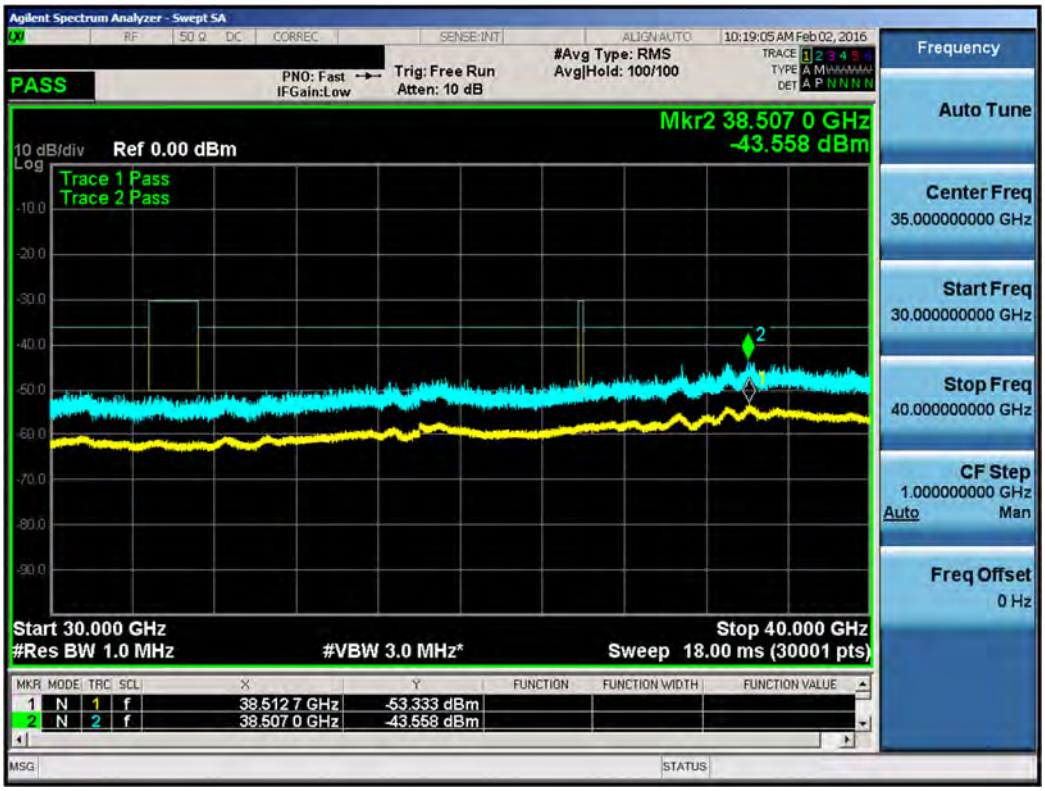


Plot 7-111. Conducted Spurious Plot (LAA (UNII Band 3, 40MHz BW) – Ch. 53340, 53540)



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

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