



## Test Report

# AIR-CAP2702E-A-K9

**FCC ID: LDK102091**  
**IC: 2461B-102091**

Also Covers:

AIR-CAP2702y-D-K9

AIR-CAP2702y-N-K9

AIR-CAP2702y-T-K9

AIR-CAP2702y-Z-K9

y = E (External Antenna) or I (Internal Antenna)

**2400-2483.5 MHz**

**Against the following Specifications:**

**CFR47 Part 15.247**

**RSS210**

**Cisco Systems**

170 West Tasman Drive

San Jose, CA 95134

A handwritten signature in blue ink, appearing to read "Jim Nicholas".

Test Engineer: \_\_\_\_\_



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## Section 1: Overview

### 1.1 Test Summary

The samples were assessed against the tests detailed in section 3 under the requirements of the following specifications:

Emission	Immunity
CFR47 Part 15.247 RSS210	N/A

The specifications listed above represent actual tests performed to demonstrate compliance against the specifications and basic standards listed on the front cover of this report. This list is not a one to one match to the front cover for one or more of the following reasons.

1. Basic standards call up many different test phenomena specifications such as the 61000-4-X series. The basic standards define which elements and levels shall be applied from these specifications and as such it is not appropriate to list the individual specifications on the front cover.
2. A Standard listed on the front cover may be required in a particular country but is not appropriate for the particular technologies included in the equipment under test. E.g. You cannot test a DC product to the mains Harmonics requirements in EN61000-3-2. See section 3.2.
3. Test results against a particular standard or specification may be included in a different test report. See section 3.2 for an EDCS reference of this data.
4. Where appropriate, Cisco may have substituted a later revision of a basic standard to those referenced in the specification on the front sheet of this test report. This decision was based upon improved test methodology and repeatability and/or where the newer revision represented a more stringent test.
5. Where relevant, testing has been carried out to the requirements of both EN and IEC Specifications. This was possible because of the similarities of the test methods involved and the Cisco EMC test procedures.
6. Testing may have been performed to an equivalent test that satisfies the requirements of the standards and specifications listed on the front cover of the report. See section 3.2.
7. Where radiated emissions testing has been performed to EN55022/CISPR22 the additional requirements of VCCI: V- 3/2006.04, EN55022: 1994 +A1/2 and CAN/CSA- CISPR 22-02 have also been evaluated unless otherwise stated.
8. Testing to the requirements of CFR47 Part 15 was performed against the CISPR22 limits. The results are therefore deemed satisfactory evidence of compliance with Industry Canada Interference Causing Equipment Standard ICES-003.
9. Where assessment has been performed to CISPR24, all the applicable test requirements may have not been covered. Refer to the results section for the tests performed.

#### Notes:

- 1) Where a specification listed on the front cover of this report has deviations from the basic standards listed above, the additional technical requirements of the specification were also assessed.
- 2) Where appropriate, Cisco may have substituted a later revision of a basic standard to those referenced in the specification on the front sheet of this test report. This decision was based upon improved test methodology and repeatability and/or where the newer revision represented a more stringent test.
- 3) Where relevant, testing has been carried out to the requirements of both EN and IEC Specifications. This was possible because of the similarities of the test methods involved and the Cisco EMC test procedures.



## **Section 2: Assessment Information**

### **2.1 General**

This report contains an assessment of an apparatus against Electromagnetic Compatibility Standards based upon tests carried out on the samples submitted. The testing was performed by and for the use of Cisco systems Inc:

With regard to this assessment, the following points should be noted:

- a) The results contained in this report relate only to the items tested and were obtained in the period between the date of the initial assessment and the date of issue of the report. Manufactured products will not necessarily give identical results due to production and measurement tolerances.
- b) The apparatus was set up and exercised using the configuration and modes of operation defined in this report only.
- c) Where relevant, the apparatus was only assessed using the susceptibility criteria defined in this report and the Test Assessment Plan (TAP).
- d) All testing was performed under the following environmental conditions:

Temperature	15°C to 35°C (54°F to 95°F)
Atmospheric Pressure	860mbar to 1060mbar (25.4" to 31.3")
Humidity	10% to 75*%

\*[Where applicable] For ESD testing the humidity limits used were 30% to 60% and for EFT/B tests the humidity limits used were 25% to 75%.
- e) All AC testing was performed at one or more of the following supply voltages:

110V 60 Hz (+/-20%)
220V 50 Hz (+/-20%)

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## **2.2 Date of testing**

13-September-2013

## **2.3 Report Issue Date**

Cisco uses an electronic system to issue, store and control the revision of test reports. This system is called the Engineering Document Control System (EDCS). The actual report issue date is embedded into the original file on EDCS. Any copies of this report, either electronic or paper, that are not on EDCS must be considered uncontrolled

## **2.4 Testing facilities**

This assessment was performed by:

### **Testing Laboratory**

Cisco Systems, Inc.,	Cisco Systems, Inc.
4125 Highlander Parkway	170 West Tasman Drive
Richfield, OH 44286	San Jose, CA 95134
USA	USA

### **Test Engineers**

Jim Nicholson

## **2.5 Equipment Assessed (EUT)**

AIR-CAP2702E-A-K9



## 2.6 EUT Description

The 2700 Series Cisco Aironet 802.11ac Dual Band Access Points support the following modes of operation. The modes are further defined in the radio Theory of Operation. The modes included in this report represent the worst case data for all modes.

Legacy CCK, One Antenna, 1 to 11 Mbps  
 Legacy CCK, Two Antennas, 1 to 11 Mbps  
 Legacy CCK, Three Antennas, 1 to 11 Mbps

Non HT-20, One Antenna, 6 to 54 Mbps  
 Non HT-20, Two Antennas, 6 to 54 Mbps  
 Non HT-20, Three Antennas, 6 to 54 Mbps

Non HT-20 Beam Forming, Two Antennas, 6 to 54 Mbps  
 Non HT-20 Beam Forming, Three Antennas, 6 to 54 Mbps

HT-20, One Antenna, M0 to M7  
 HT-20, Two Antennas, M0 to M15  
 HT-20, Three Antennas, M0 to M23

HT-20 STBC, Two Antennas, M0 to M7  
 HT-20 STBC, Three Antennas, M0 to M7

HT-20 Beam Forming, Two Antennas, M0 to M15  
 HT-20 Beam Forming, Three Antennas, M0 to M23

The following antennas are supported by this product series.  
 The data included in this report represent the worst case data for all antennas.

Frequency	Part Number	Antenna Type	Antenna Gain (dBi)
<b>2.4 / 5 GHZ</b>	AIR-ANT2524DB-R	Dual-resonant black dipole	2 / 4
	AIR-ANT2524DW-R	Dual-resonant white dipole	2 / 4
	AIR-ANT2524DG-R	Dual-resonant gray dipole	2 / 4
	AIR-ANT2524V4C-R	Dual-resonant ceiling mount omni (4-pack)	2 / 4
	AIR-ANT2535SDW-R	Dual-resonant "stubby" monopole	3 / 5
	Internal	Omni-Directional	4 / 4
	AIR-ANT2544V4M-R	Dual-resonant omni (4-pack)	4 / 4
	AIR-ANT2566P4W-R	Dual-resonant "directional" antenna (4-pack)	6 / 6



## Section 4: Sample Details

Note: Each sample was evaluated to ensure that its condition was suitable to be used as a test sample prior to the commencement of testing. Please also refer to the "Justification for worst Case test Configuration" section of this report for further details on the selection of EUT samples.

### 4.1 Sample Details (Photographs of the test samples, where appropriate can be found in appendix H)

Sample No.	Equipment Details	Part Number	Manufacturer	Hardware Rev.	Firmware Rev.	Software Rev.	Serial Number
S01	AIR-CAP2702E-A-K9		Cisco Systems	NA	NA	NA	
S02	AIR-PWR-B	341-0306-01	Cisco Systems	NA	NA	NA	

### 4.2 System Details

System #	Description	Samples
1	EUT	S01, S02

### 4.3 Mode of Operation Details

Mode#	Description	Comments
1	Continuous Transmitting	Continuous Transmitting

All tests in this report were performed as described in FCC KDB 662911 D01

**Appendix A: Emission Test Results****Testing Laboratory:** Cisco Systems, Inc., 4125 Highlander Parkway, Richfield, OH, USA**Target Maximum Channel Power**

The following table details the maximum supported Total Channel Power for all operating modes.

Operating Mode	Maximum Channel Power (dBm)		
	Frequency (MHz)		
	2412	2437	2462
CCK, 1 to 11 Mbps	21	21	21
Non HT-20, 6 to 54 Mbps	17	21	17
Non HT-20 Beam Forming, 6 to 54 Mbps	16	21	16
HT-20, M0 to M23	17	21	16
HT-20 Beam Forming, M0 to M23	17	21	16
HT-20 STBC, M0 to M7	17	21	16





## 6dB Bandwidth

15.247 / RSS-210 A8.2: Systems using digital modulation techniques may operate in the 2400-2483.5MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz.

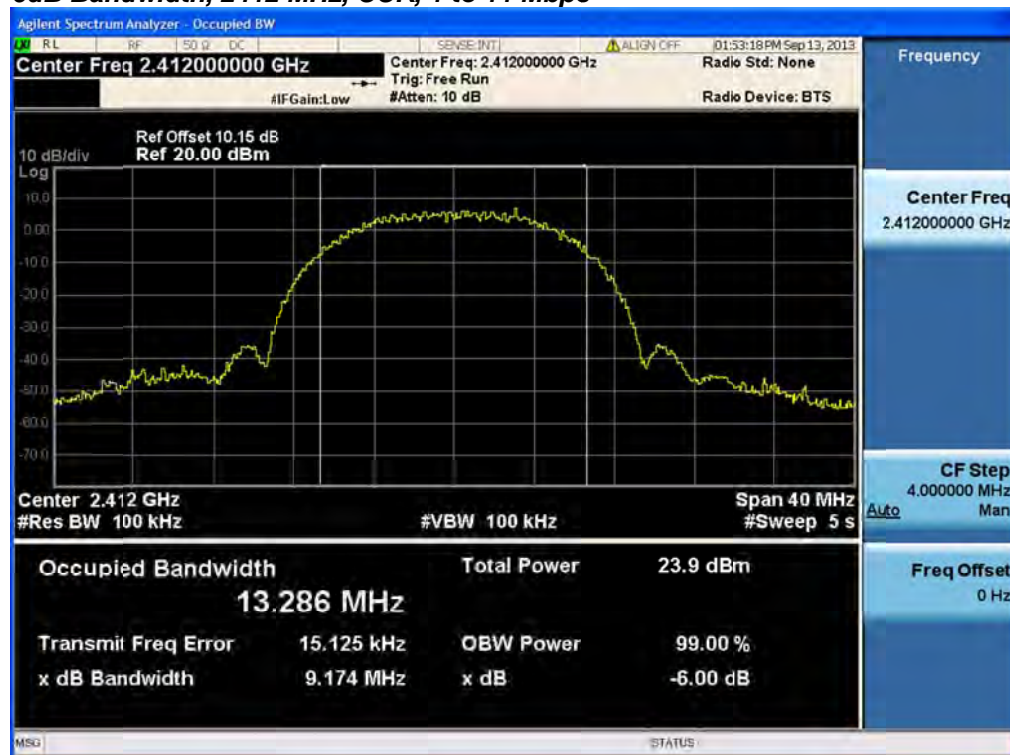
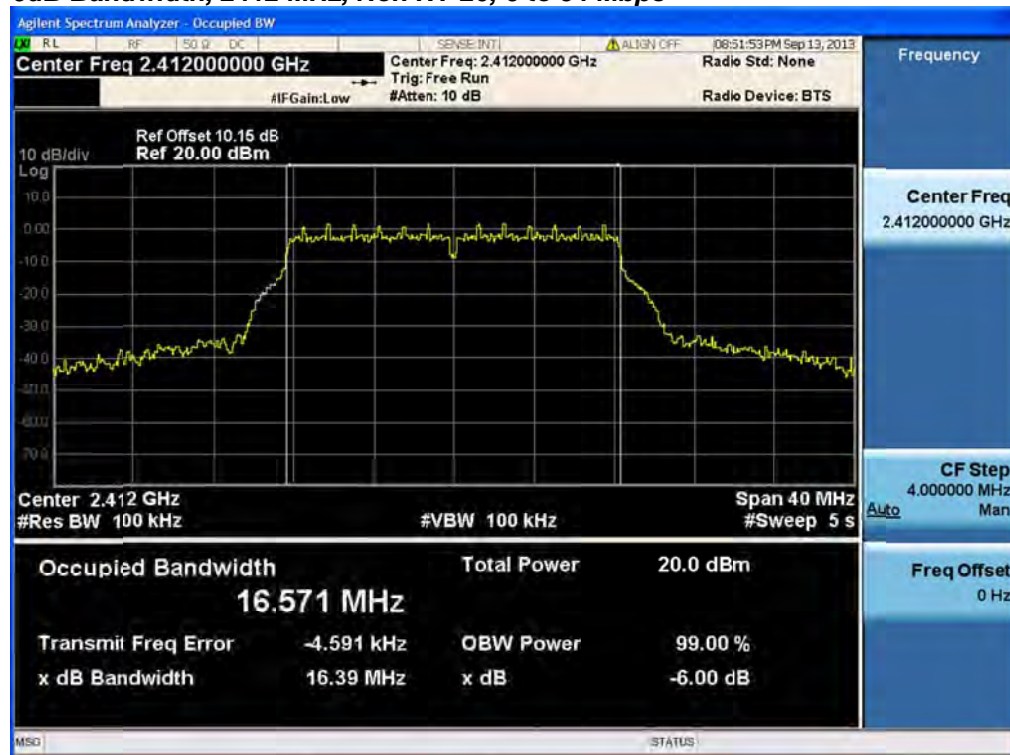
Connect the antenna port(s) to the spectrum analyzer input. Using the spectrum analyzer Channel Bandwidth mode, configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).

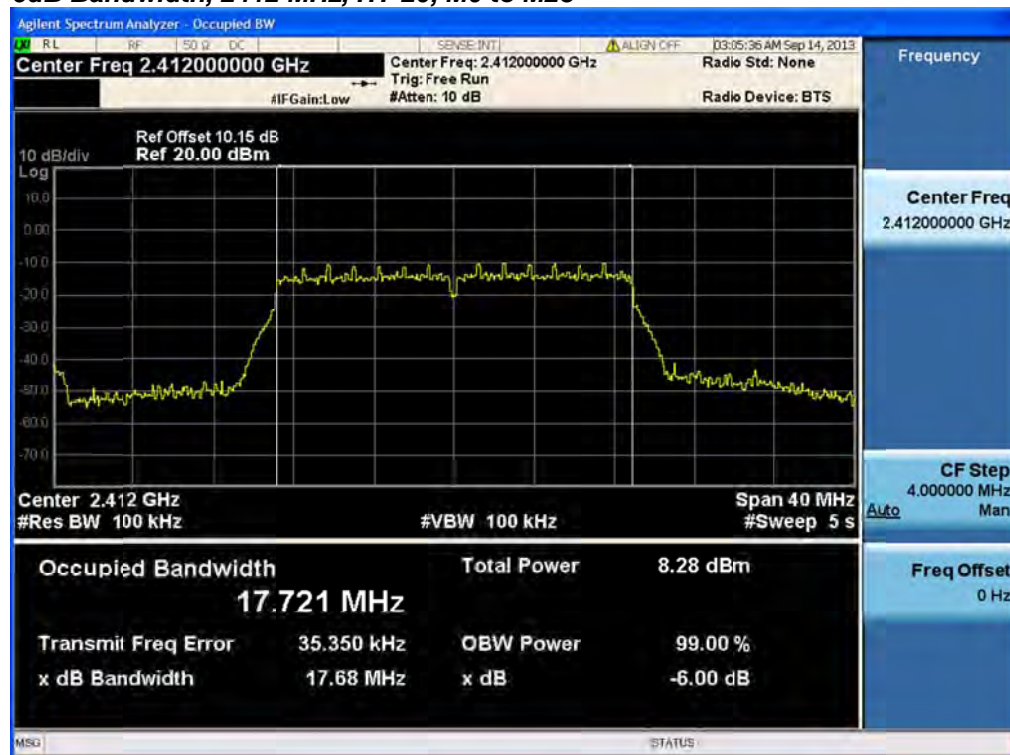
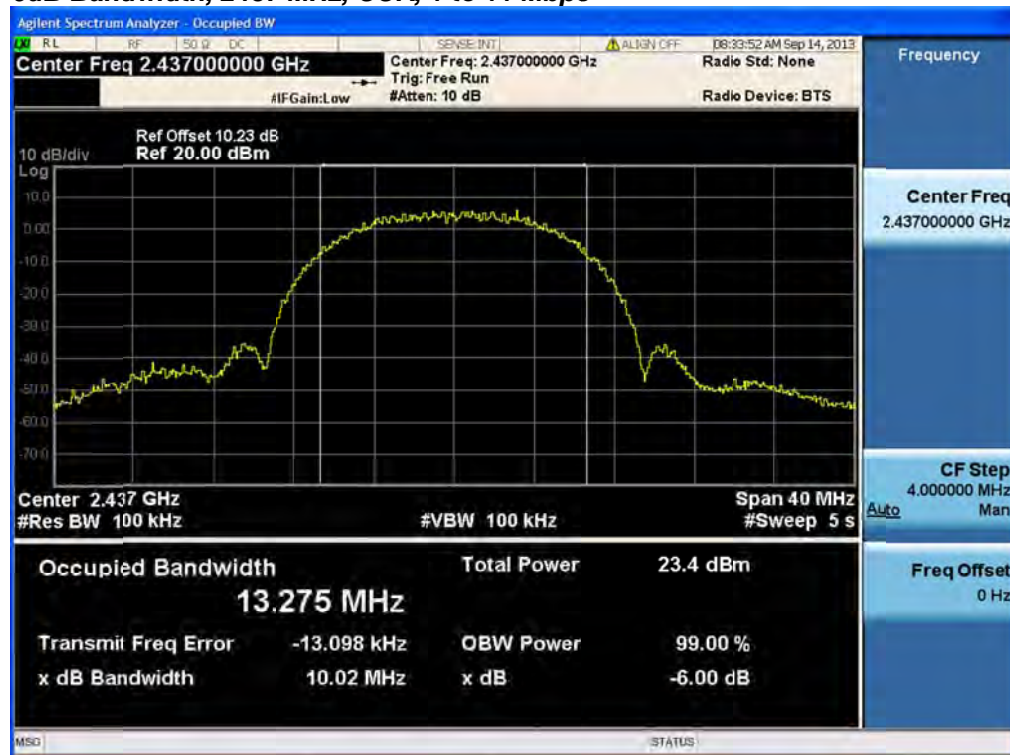
Center Frequency:	Frequency from table below
Span:	2 x Nominal Bandwidth (e.g. 40MHz for a 20MHz channel)
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	5 s
Resolution Bandwidth:	100 kHz
Video Bandwidth:	100 kHz
X dB Bandwidth:	6 dB
Detector:	Peak
Trace:	Single

Place the radio in continuous transmit mode. View the transmitter waveform on the spectrum analyzer, and record the pertinent measurements:

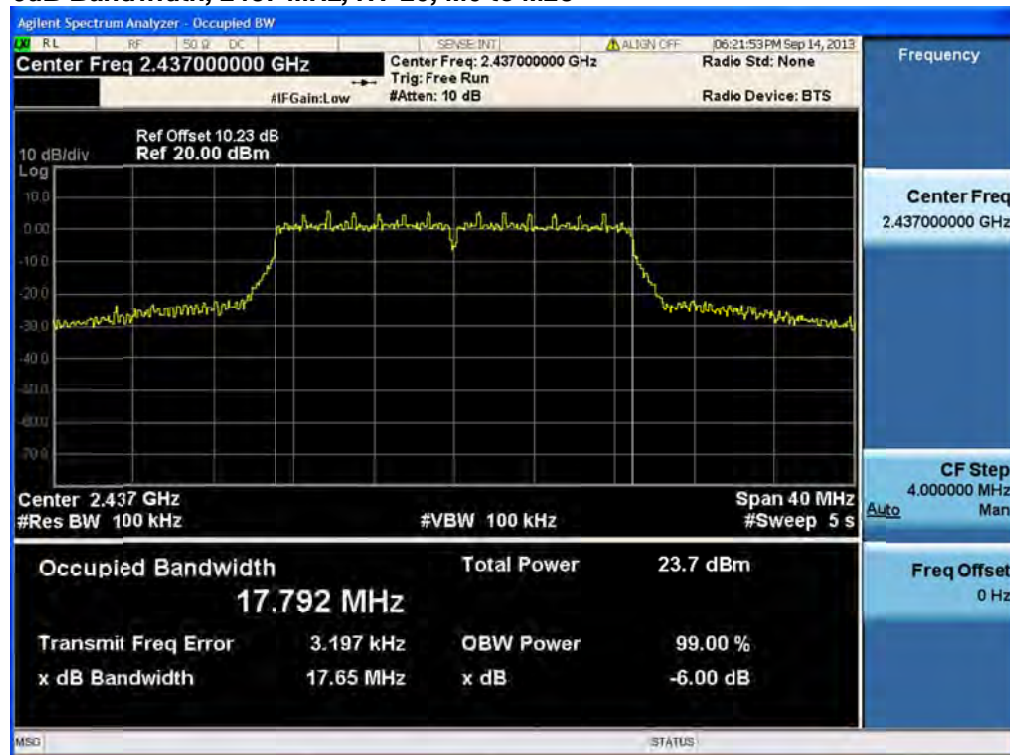


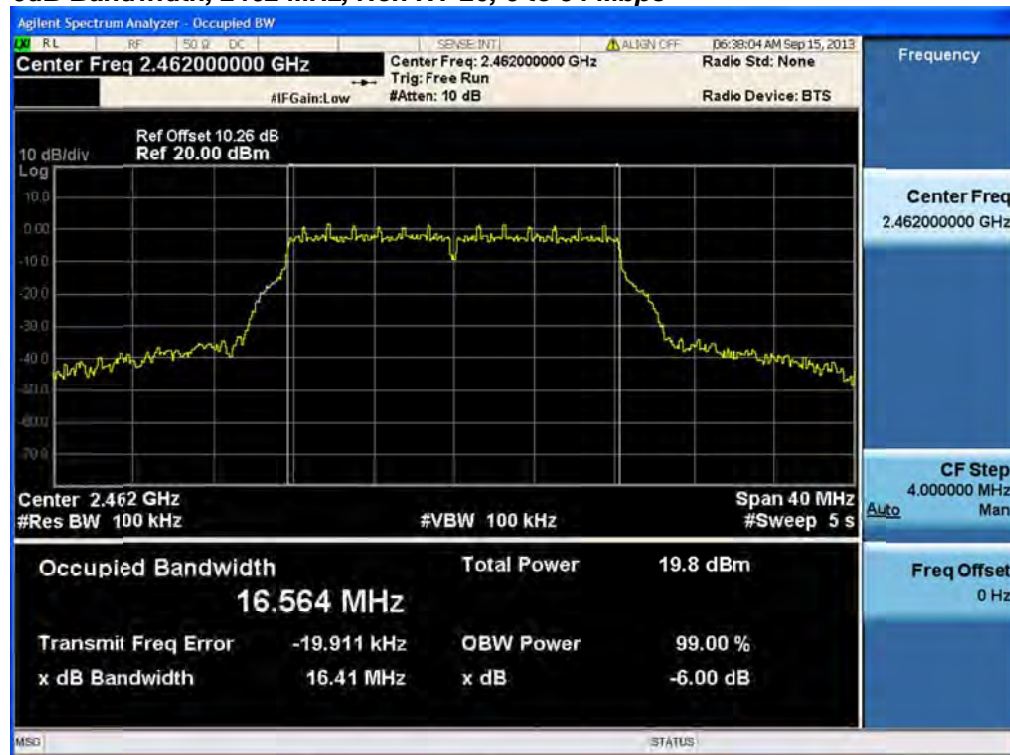
Frequency (MHz)	Mode	Data Rate (Mbps)	6dB BW (MHz)	Limit (kHz)	Margin (MHz)
2412	CCK, 1 to 11 Mbps	11	9.2	>500	8.7
	Non HT-20, 6 to 54 Mbps	6	16.4	>500	15.9
	HT-20, M0 to M23	m0	17.7	>500	17.2
2437	CCK, 1 to 11 Mbps	11	10	>500	9.5
	Non HT-20, 6 to 54 Mbps	6	16.4	>500	15.9
	HT-20, M0 to M23	m0	17.6	>500	17.1
2462	CCK, 1 to 11 Mbps	11	9.2	>500	8.7
	Non HT-20, 6 to 54 Mbps	6	16.4	>500	15.9
	HT-20, M0 to M23	m0	17.7	>500	17.2

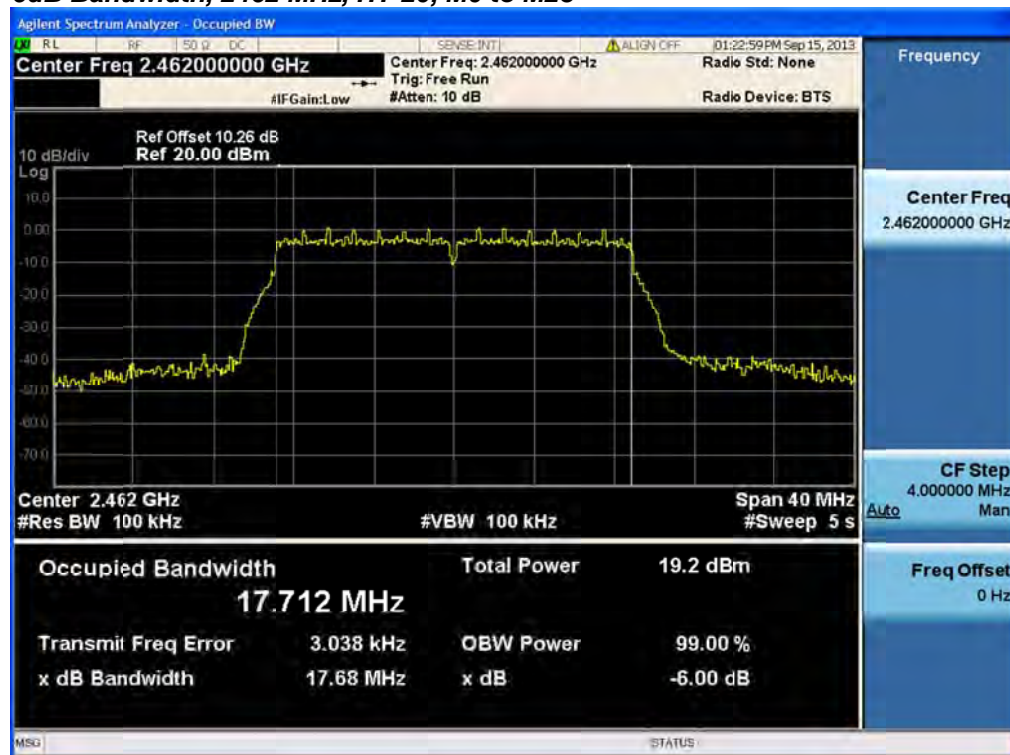
**6dB Bandwidth, 2412 MHz, CCK, 1 to 11 Mbps****6dB Bandwidth, 2412 MHz, Non HT-20, 6 to 54 Mbps**

**6dB Bandwidth, 2412 MHz, HT-20, M0 to M23****6dB Bandwidth, 2437 MHz, CCK, 1 to 11 Mbps**



**6dB Bandwidth, 2437 MHz, Non HT-20, 6 to 54 Mbps****6dB Bandwidth, 2437 MHz, HT-20, M0 to M23**

**6dB Bandwidth, 2462 MHz, CCK, 1 to 11 Mbps****6dB Bandwidth, 2462 MHz, Non HT-20, 6 to 54 Mbps**

**6dB Bandwidth, 2462 MHz, HT-20, M0 to M23**



## 99% and 26dB Bandwidth

Connect the antenna port(s) to the spectrum analyzer input. Using the spectrum analyzer Channel Bandwidth mode, configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).

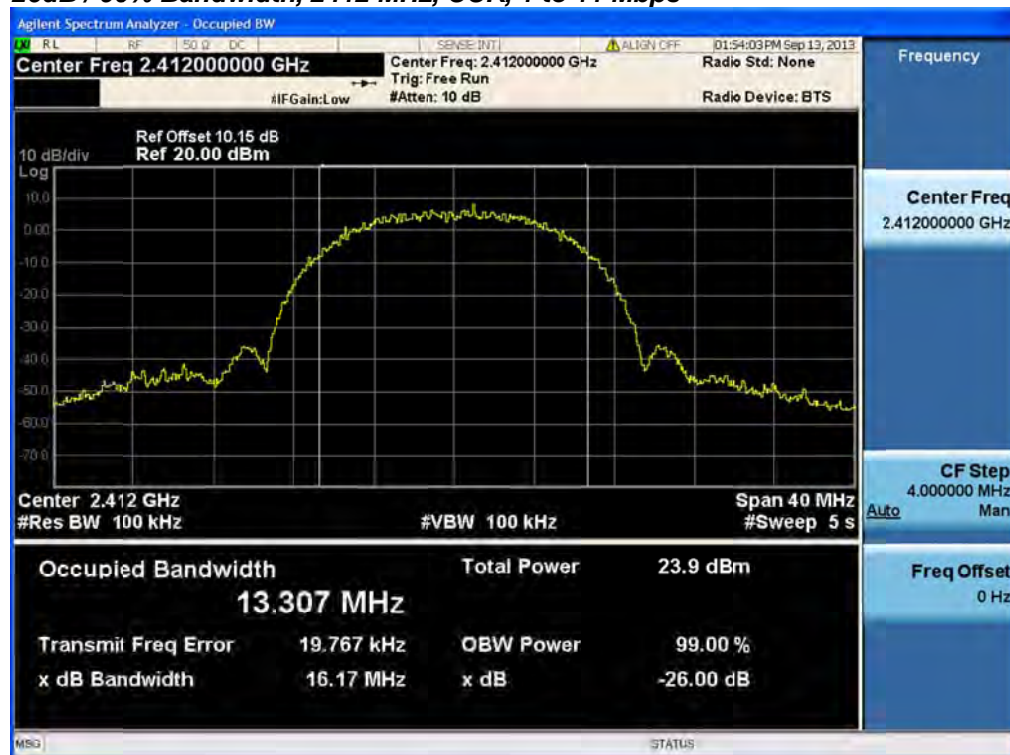
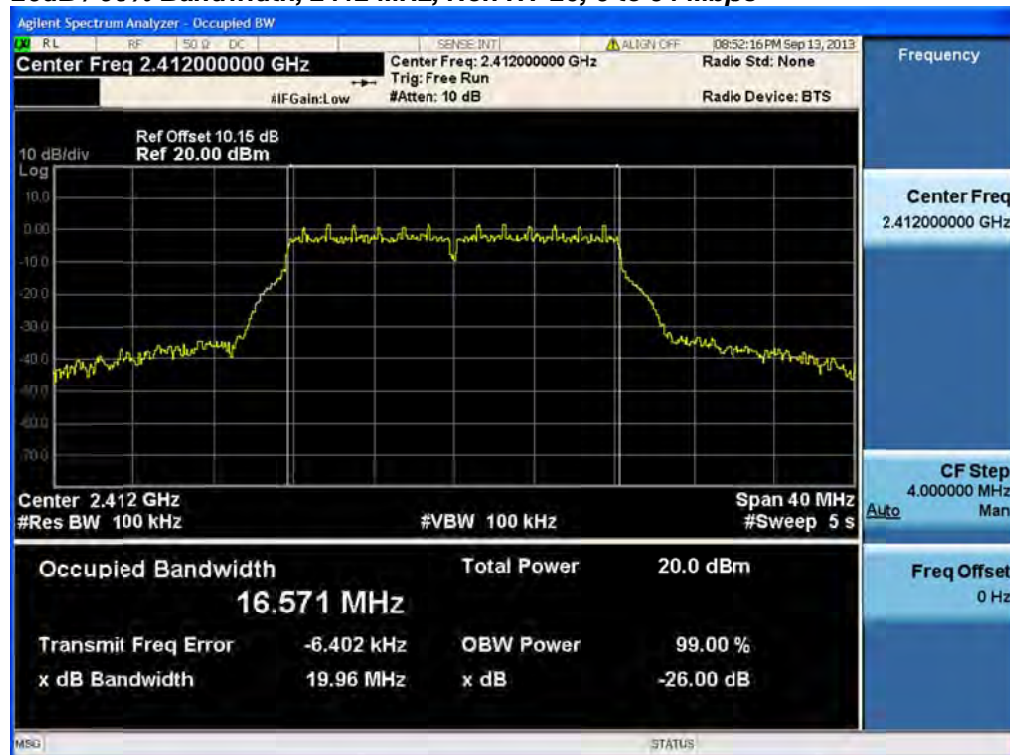
Center Frequency:	Frequency from table below
Span:	2 x Nominal Bandwidth (e.g. 40MHz for a 20MHz channel)
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	5 s
Resolution Bandwidth:	1%-3% of 26 dB Bandwidth
Video Bandwidth:	≥Resolution Bandwidth
X dB Bandwidth:	26 dB
Detector:	Peak
Trace:	Single

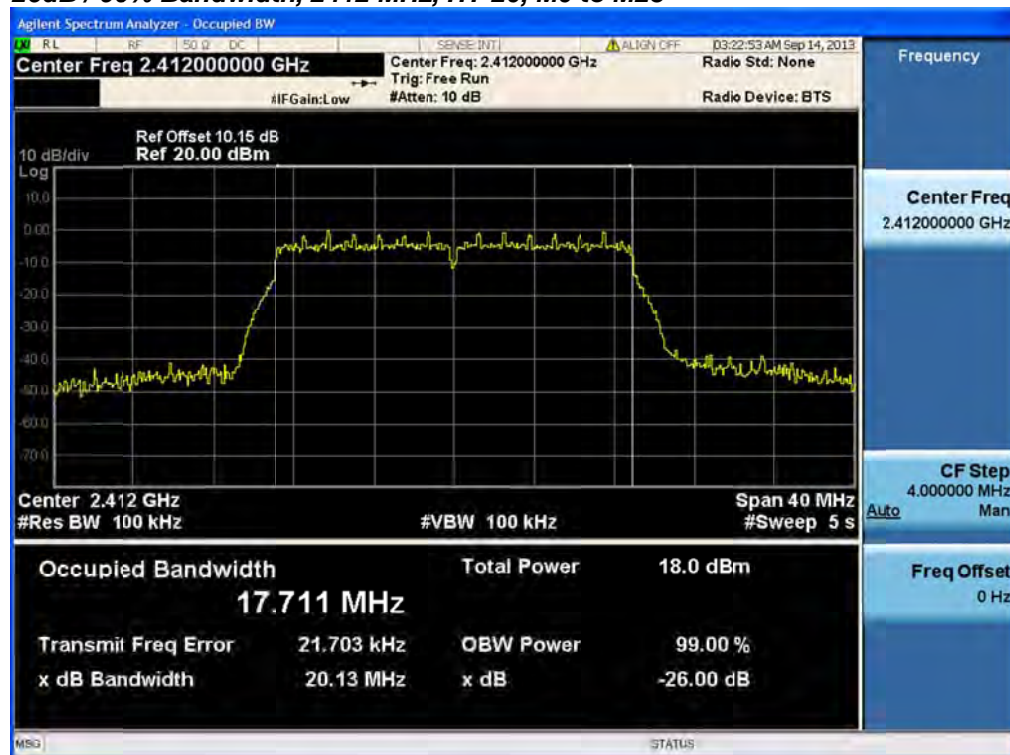
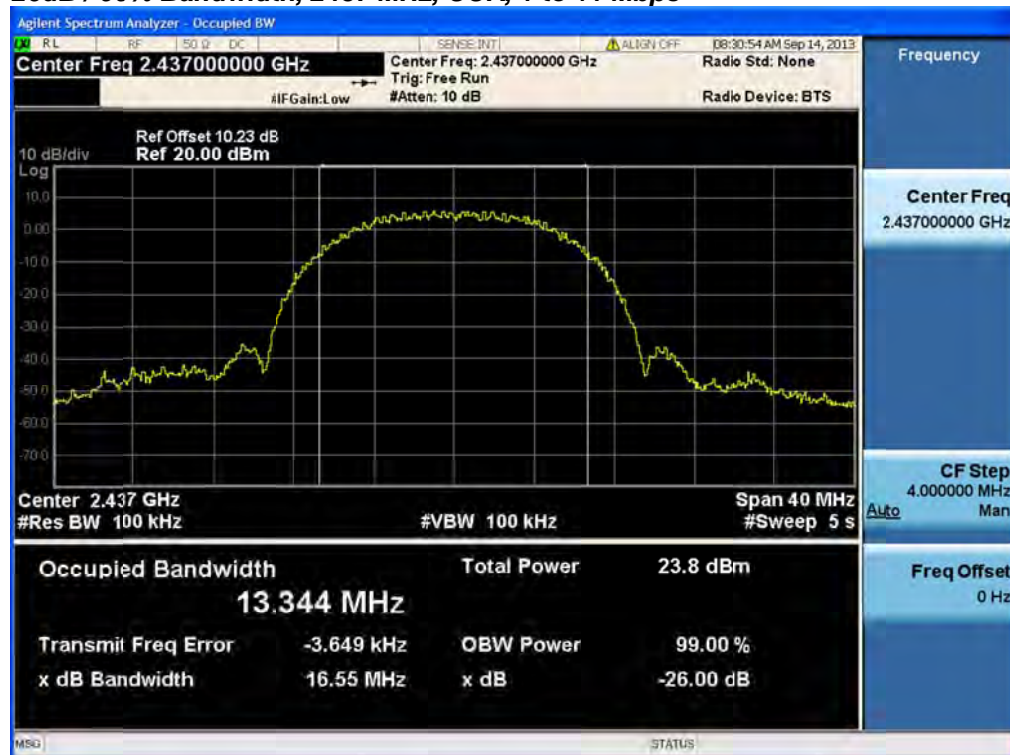
Place the radio in continuous transmit mode. View the transmitter waveform on the spectrum analyzer, and record the pertinent measurements:

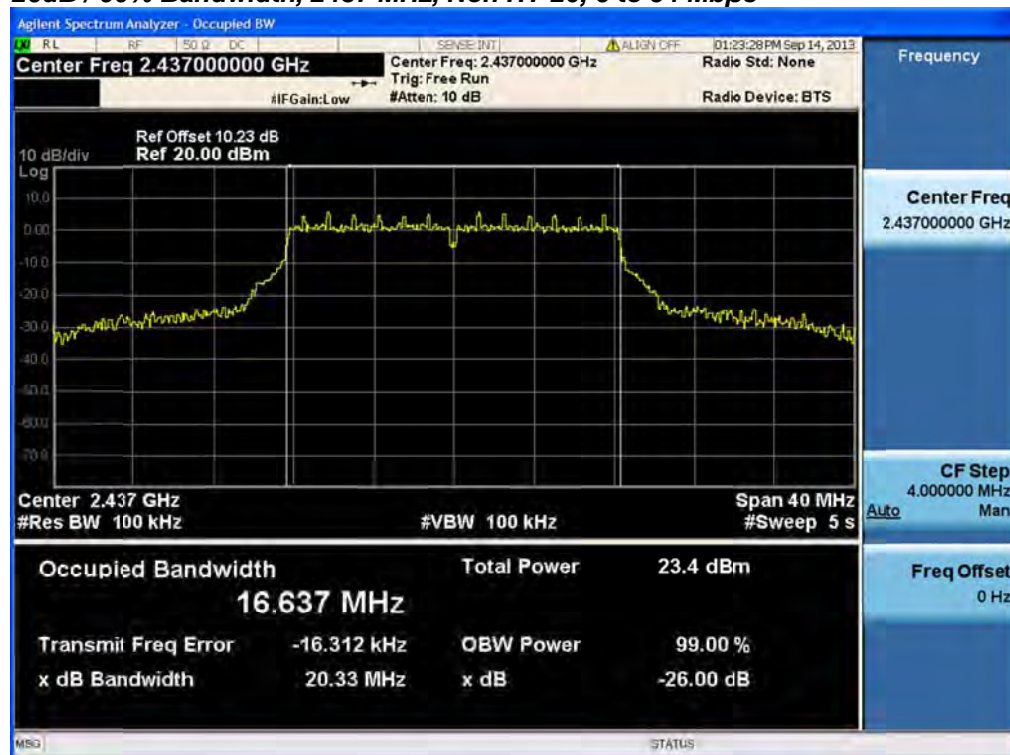
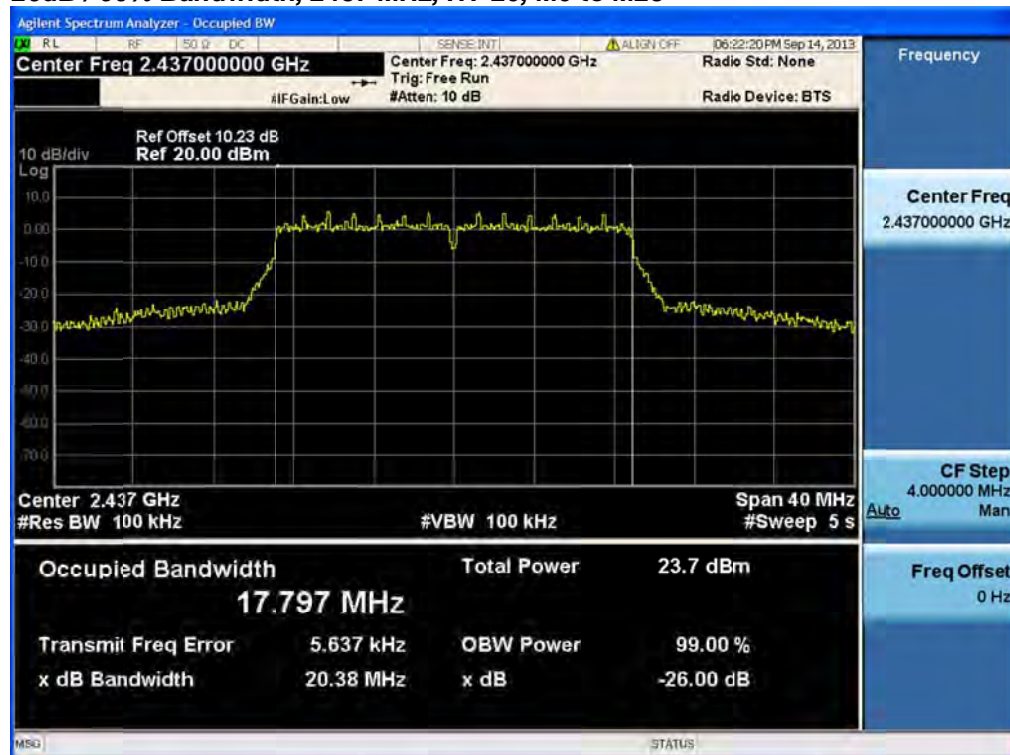




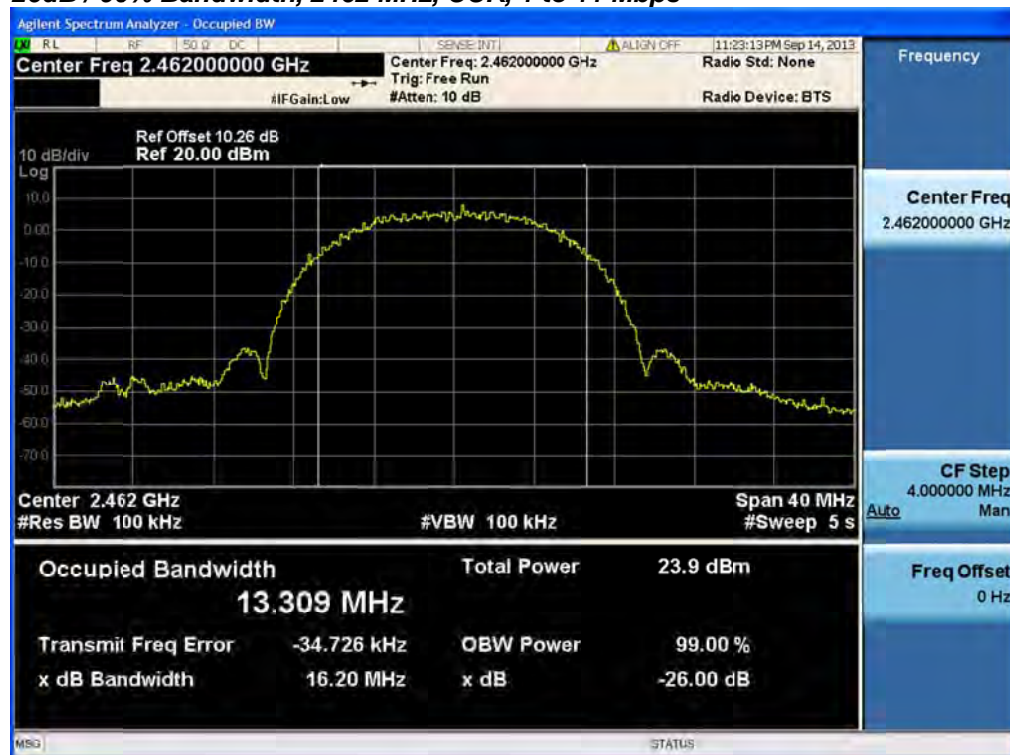
Frequency (MHz)	Mode	Data Rate (Mbps)	26dB BW (MHz)	99% BW (MHz)
2412	CCK, 1 to 11 Mbps	11	16.3	13.3
	Non HT-20, 6 to 54 Mbps	6	20	16.6
	HT-20, M0 to M23	m0	20.1	17.7
2437	CCK, 1 to 11 Mbps	11	16.5	13.3
	Non HT-20, 6 to 54 Mbps	6	20.3	16.6
	HT-20, M0 to M23	m0	20.4	17.8
2462	CCK, 1 to 11 Mbps	11	16.2	13.3
	Non HT-20, 6 to 54 Mbps	6	19.9	16.6
	HT-20, M0 to M23	m0	20.1	17.7

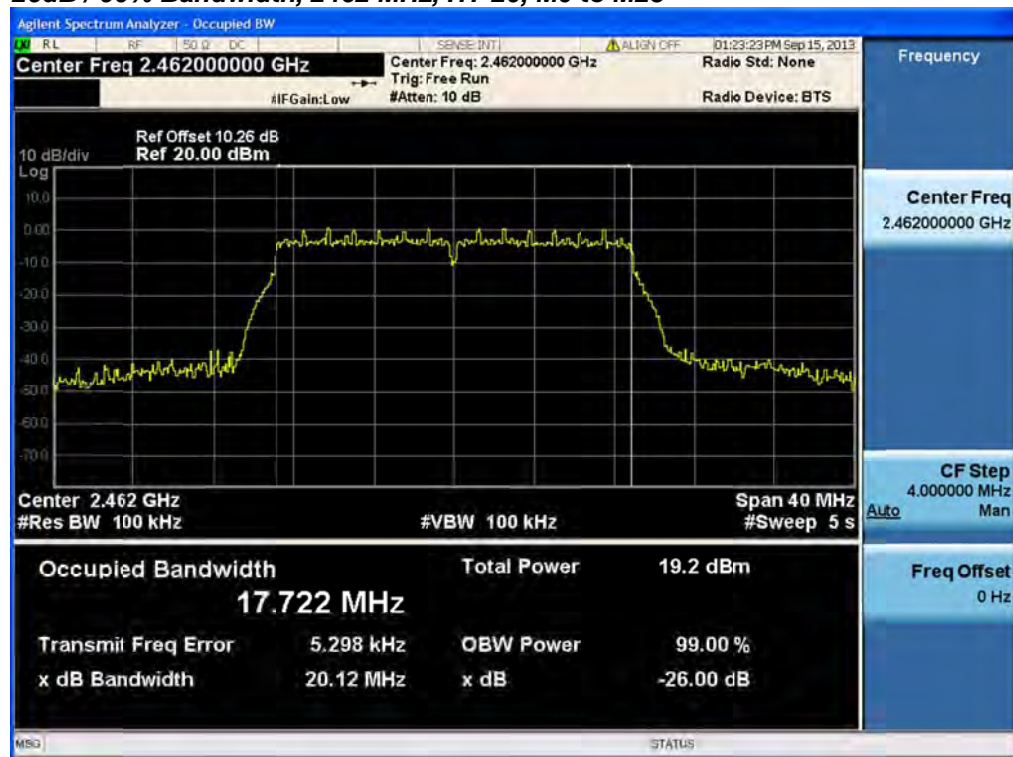
**26dB / 99% Bandwidth, 2412 MHz, CCK, 1 to 11 Mbps****26dB / 99% Bandwidth, 2412 MHz, Non HT-20, 6 to 54 Mbps**

**26dB / 99% Bandwidth, 2412 MHz, HT-20, M0 to M23****26dB / 99% Bandwidth, 2437 MHz, CCK, 1 to 11 Mbps**

**26dB / 99% Bandwidth, 2437 MHz, Non HT-20, 6 to 54 Mbps****26dB / 99% Bandwidth, 2437 MHz, HT-20, M0 to M23**



**26dB / 99% Bandwidth, 2462 MHz, CCK, 1 to 11 Mbps****26dB / 99% Bandwidth, 2462 MHz, Non HT-20, 6 to 54 Mbps**

**26dB / 99% Bandwidth, 2462 MHz, HT-20, M0 to M23**



## Peak Output Power

15.247 / RSS-210 A8.4: The maximum conducted output power of the intentional radiator for systems using digital modulation in the 2400-2483.5 MHz band shall not exceed 1 Watt (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum supported antenna gain is 6dBi. The peak correlated gain for each mode is listed in the table below. See the Theory of Operation for details on the correlated gain for each mode.

Connect the antenna port(s) to the spectrum analyzer input. Place the radio in continuous transmit mode. Configure the spectrum analyzer as shown below.

Enable "Channel Power" function of analyzer	
Center Frequency:	Frequency from table below
Span:	20 MHz (must be greater than 26dB bandwidth, adjust as necessary)
Ref Level Offset:	Correct for attenuator and cable loss.
Reference Level:	20 dBm
Attenuation:	20 dB
Sweep Time:	100ms, Single sweep
Resolution Bandwidth:	1 MHz
Video Bandwidth:	3 MHz
Detector:	Sample
Trace:	Trace Average 100 traces in Power Averaging Mode
Integration BW:	=26 dB BW from 26 dB Bandwidth Data

After averaging 100 traces of the transmitter waveform on the spectrum analyzer, record the spectrum analyzer Channel Power.

The "measure-and-sum technique" is used for measuring in-band transmit power of a device. In the measure-and-sum approach, the conducted emission level is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in linear power units.



Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Tx 2 Max Power (dBm)	Tx 3 Max Power (dBm)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
2412	CCK, 1 to 11 Mbps	1	6	16.6			16.6	30	13.4
	CCK, 1 to 11 Mbps	2	6	16.6	16.9		19.8	30	10.2
	CCK, 1 to 11 Mbps	3	6	16.6	16.9	16.4	21.4	30	8.6
	Non HT-20, 6 to 54 Mbps	1	6	13.2			13.2	30	16.8
	Non HT-20, 6 to 54 Mbps	2	6	12.2	13.0		15.6	30	14.4
	Non HT-20, 6 to 54 Mbps	3	6	12.2	13.0	12.4	17.3	30	12.7
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	12.2	13.0		15.6	27	11.4
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	11.3	11.5	11.5	16.2	25.2	9.0
	HT-20, M0 to M7	1	6	13.0			13.0	30	17.0
	HT-20, M0 to M7	2	6	12.0	12.5		15.3	30	14.7
	HT-20, M8 to M15	2	6	12.0	12.5		15.3	30	14.7
	HT-20, M0 to M7	3	6	12.0	12.5	12.0	16.9	30	13.1
	HT-20, M8 to M15	3	6	12.0	12.5	12.0	16.9	30	13.1
	HT-20, M16 to M23	3	6	12.0	12.5	12.0	16.9	30	13.1
	HT-20 Beam Forming, M0 to M7	2	9	12.0	12.5		15.3	27	11.7
	HT-20 Beam Forming, M8 to M15	2	6	12.0	12.5		15.3	30	14.7
	HT-20 Beam Forming, M0 to M7	3	11	11.0	11.5	11.0	15.9	25.2	9.3
	HT-20 Beam Forming, M8 to M15	3	8	12.0	12.5	12.0	16.9	28.2	11.3
	HT-20 Beam Forming, M16 to M23	3	6	12.0	12.5	12.0	16.9	30	13.1
	HT-20 STBC, M0 to M7	2	6	12.0	12.5		15.3	30	14.7
	HT-20 STBC, M0 to M7	3	6	12.0	12.5	12.0	16.9	30	13.1
2437	CCK, 1 to 11 Mbps	1	6	16.8			16.8	30	13.2
	CCK, 1 to 11 Mbps	2	6	16.8	16.5		19.7	30	10.3
	CCK, 1 to 11 Mbps	3	6	16.8	16.5	16.1	21.2	30	8.8
	Non HT-20, 6 to 54 Mbps	1	6	16.6			16.6	30	13.4
	Non HT-20, 6 to 54 Mbps	2	6	16.6	16.6		19.6	30	10.4
	Non HT-20, 6 to 54 Mbps	3	6	16.6	16.6	16.3	21.3	30	8.7
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	16.6	16.6		19.6	27	7.4
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	16.6	16.6	16.3	21.3	25.2	3.9
	HT-20, M0 to M7	1	6	16.7			16.7	30	13.3
	HT-20, M0 to M7	2	6	16.7	16.4		19.6	30	10.4
	HT-20, M8 to M15	2	6	16.7	16.4		19.6	30	10.4
	HT-20, M0 to M7	3	6	16.7	16.4	16.4	21.3	30	8.7
	HT-20, M8 to M15	3	6	16.7	16.4	16.4	21.3	30	8.7





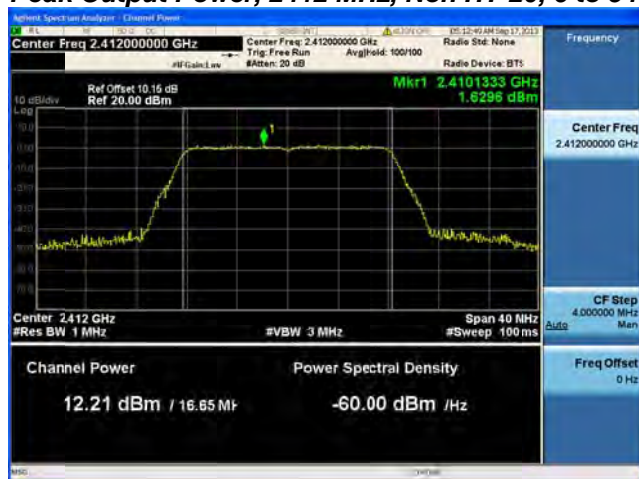
	HT-20, M16 to M23	3	6	16.7	16.4	16.4	21.3	30	8.7
	HT-20 Beam Forming, M0 to M7	2	9	16.7	16.4		19.6	27	7.4
	HT-20 Beam Forming, M8 to M15	2	6	16.7	16.4		19.6	30	10.4
	HT-20 Beam Forming, M0 to M7	3	11	16.7	16.4	16.4	21.3	25.2	3.9
	HT-20 Beam Forming, M8 to M15	3	8	16.7	16.4	16.4	21.3	28.2	6.9
	HT-20 Beam Forming, M16 to M23	3	6	16.7	16.4	16.4	21.3	30	8.7
	HT-20 STBC, M0 to M7	2	6	16.7	16.4		19.6	30	10.4
	HT-20 STBC, M0 to M7	3	6	16.7	16.4	16.4	21.3	30	8.7
2462	CCK, 1 to 11 Mbps	1	6	16.6			16.6	30	13.4
	CCK, 1 to 11 Mbps	2	6	16.6	16.8		19.7	30	10.3
	CCK, 1 to 11 Mbps	3	6	16.6	16.8	16.4	21.4	30	8.6
	Non HT-20, 6 to 54 Mbps	1	6	13.1			13.1	30	16.9
	Non HT-20, 6 to 54 Mbps	2	6	12.1	12.4		15.3	30	14.7
	Non HT-20, 6 to 54 Mbps	3	6	12.1	12.4	12.3	17.0	30	13.0
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	12.1	12.4		15.3	27	11.7
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	11.1	11.2	11.2	15.9	25.2	9.3
	HT-20, M0 to M7	1	6	12.3			12.3	30	17.7
	HT-20, M0 to M7	2	6	11.3	11.4		14.4	30	15.6
	HT-20, M8 to M15	2	6	11.3	11.4		14.4	30	15.6
	HT-20, M0 to M7	3	6	11.3	11.4	11.5	16.2	30	13.8
	HT-20, M8 to M15	3	6	11.3	11.4	11.5	16.2	30	13.8
	HT-20, M16 to M23	3	6	11.3	11.4	11.5	16.2	30	13.8
	HT-20 Beam Forming, M0 to M7	2	9	10.3	10.5		13.4	27	13.6
	HT-20 Beam Forming, M8 to M15	2	6	11.3	11.4		14.4	30	15.6
	HT-20 Beam Forming, M0 to M7	3	11	10.3	10.5	10.5	15.2	25.2	10.0
	HT-20 Beam Forming, M8 to M15	3	8	10.3	10.5	10.5	15.2	28.2	13.0
	HT-20 Beam Forming, M16 to M23	3	6	11.3	11.4	11.5	16.2	30	13.8
	HT-20 STBC, M0 to M7	2	6	11.3	11.4		14.4	30	15.6
	HT-20 STBC, M0 to M7	3	6	11.3	11.4	11.5	16.2	30	13.8

**Peak Output Power, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A**

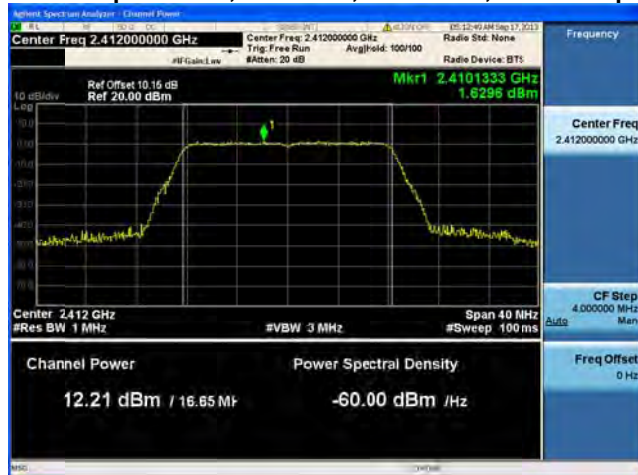
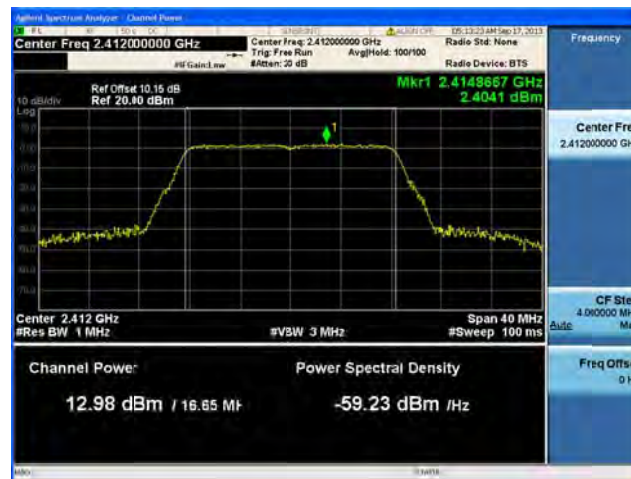
**Peak Output Power, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B**

**Peak Output Power, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B****Antenna C**

**Peak Output Power, 2412 MHz, Non HT-20, 6 to 54 Mbps****Antenna A**

**Peak Output Power, 2412 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B**

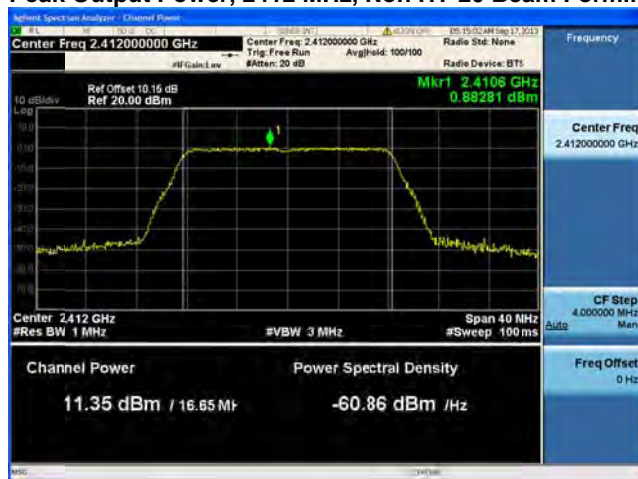


**Peak Output Power, 2412 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

**Peak Output Power, 2412 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B**



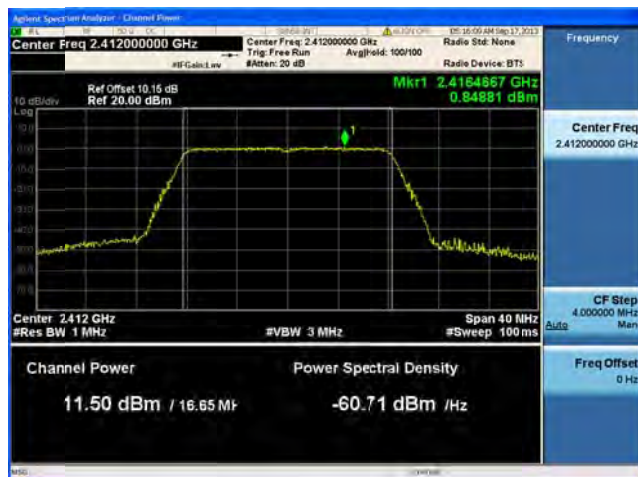
## Peak Output Power, 2412 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps



Antenna A

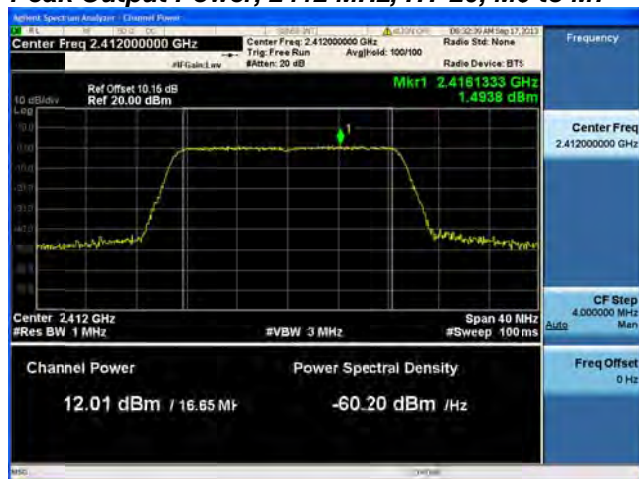
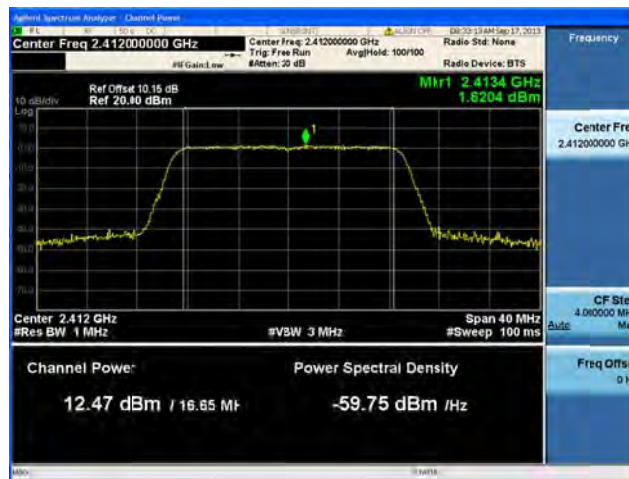


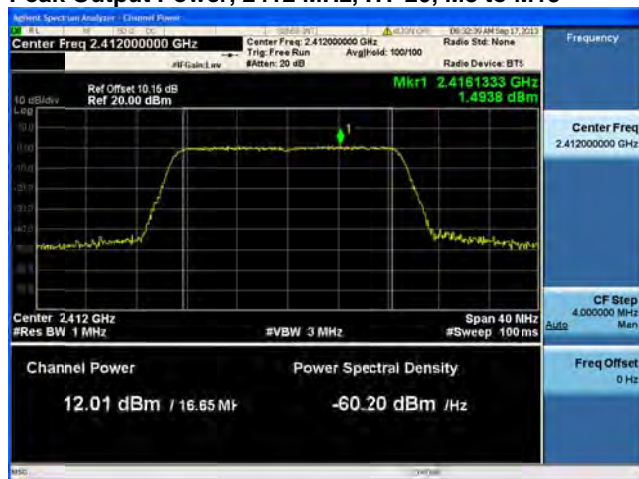
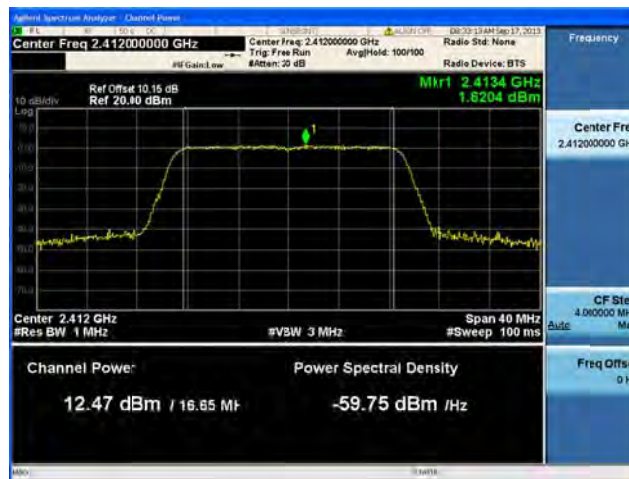
Antenna B

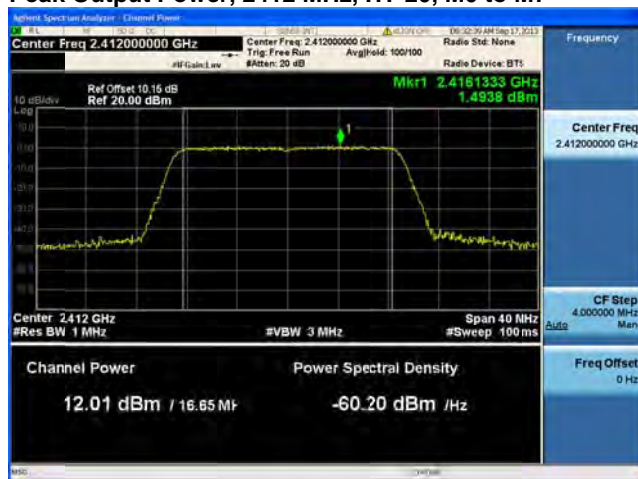
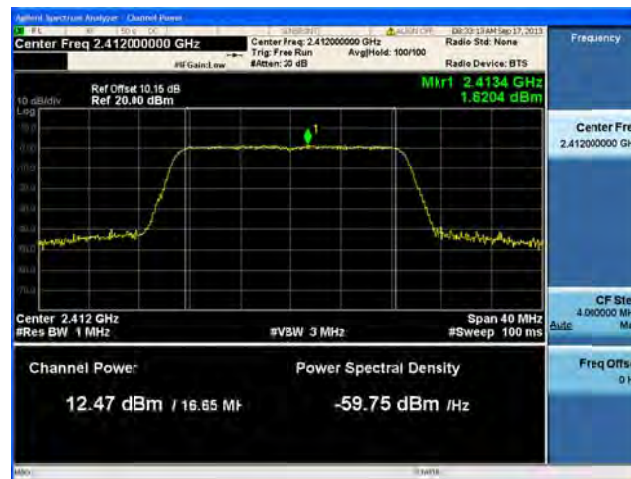


Antenna C

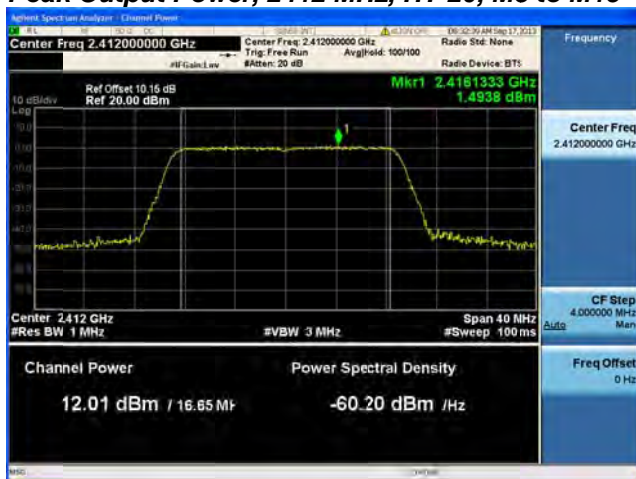
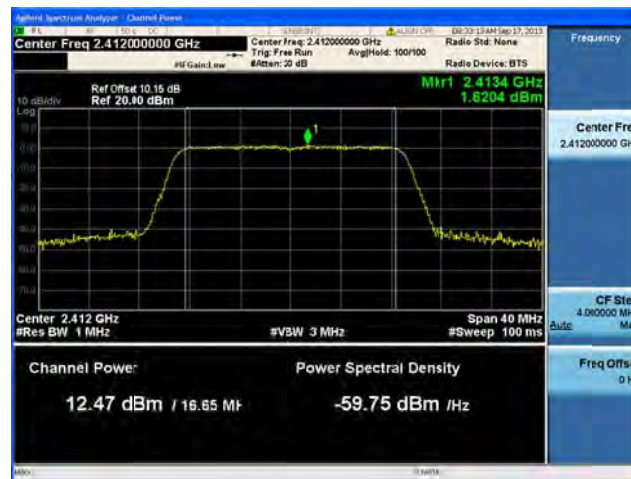
**Peak Output Power, 2412 MHz, HT-20, M0 to M7****Antenna A**

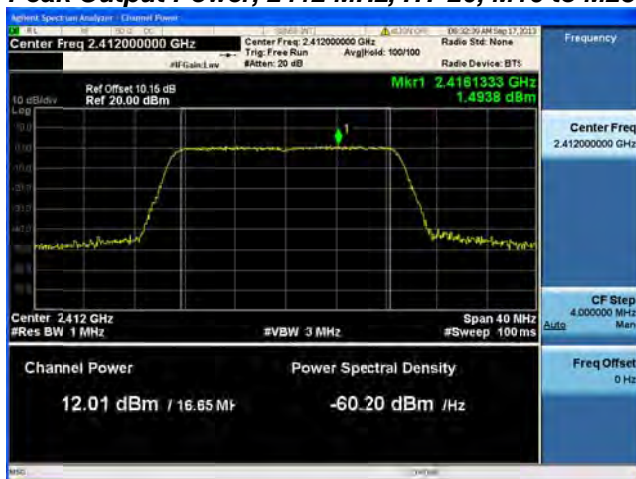
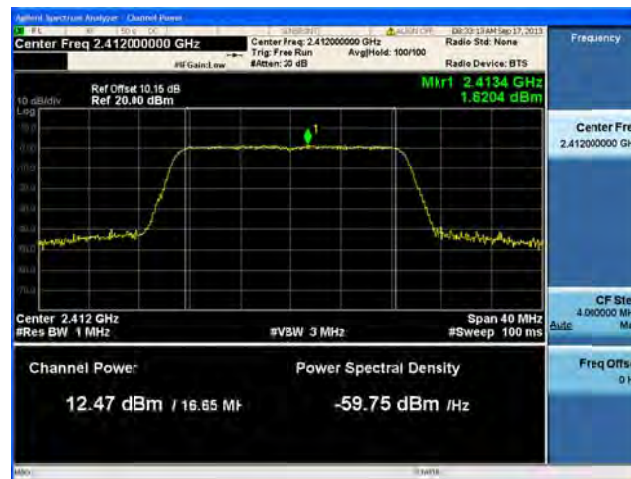
**Peak Output Power, 2412 MHz, HT-20, M0 to M7****Antenna A****Antenna B**

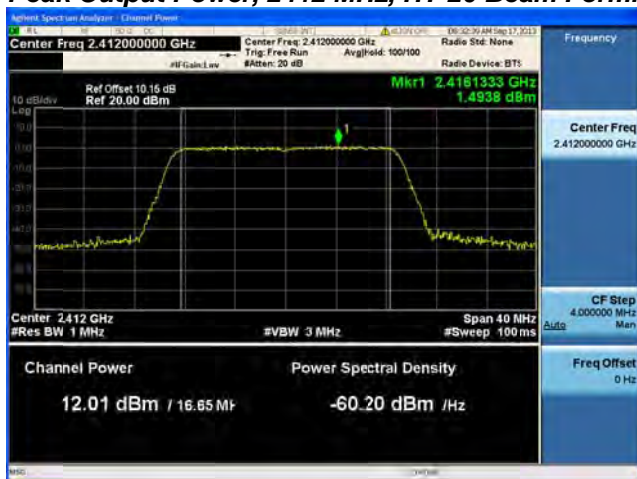
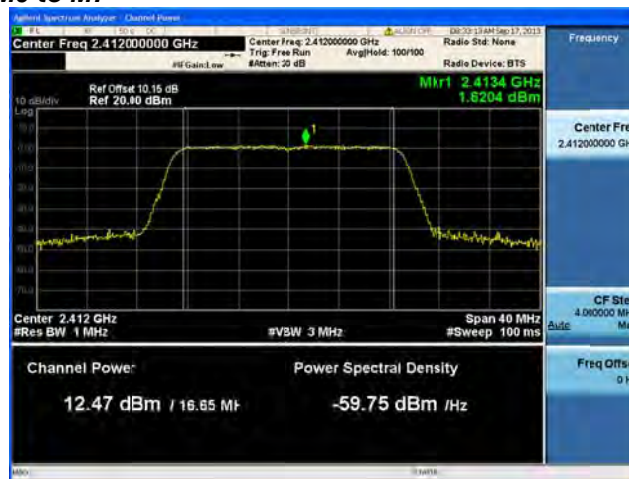
**Peak Output Power, 2412 MHz, HT-20, M8 to M15****Antenna A****Antenna B**

**Peak Output Power, 2412 MHz, HT-20, M0 to M7****Antenna A****Antenna B****Antenna C**

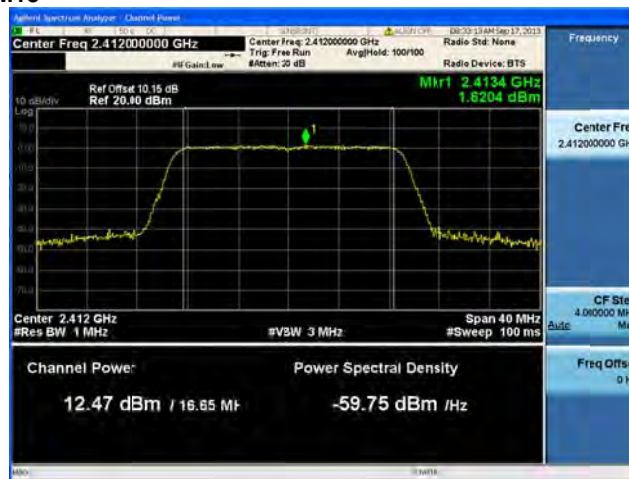


**Peak Output Power, 2412 MHz, HT-20, M8 to M15****Antenna A****Antenna B****Antenna C**

**Peak Output Power, 2412 MHz, HT-20, M16 to M23****Antenna A****Antenna B****Antenna C**

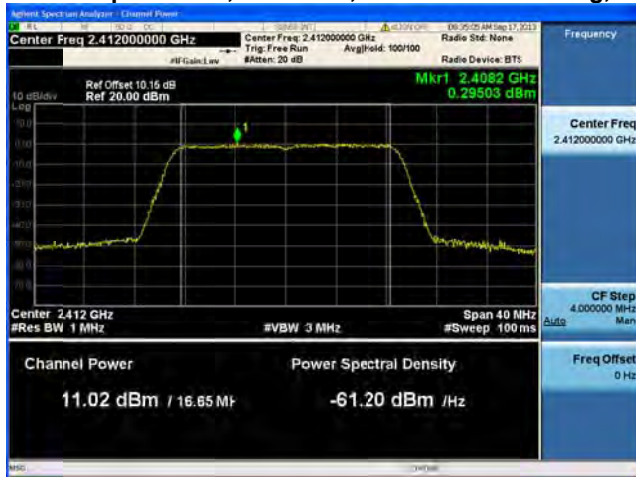
**Peak Output Power, 2412 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**



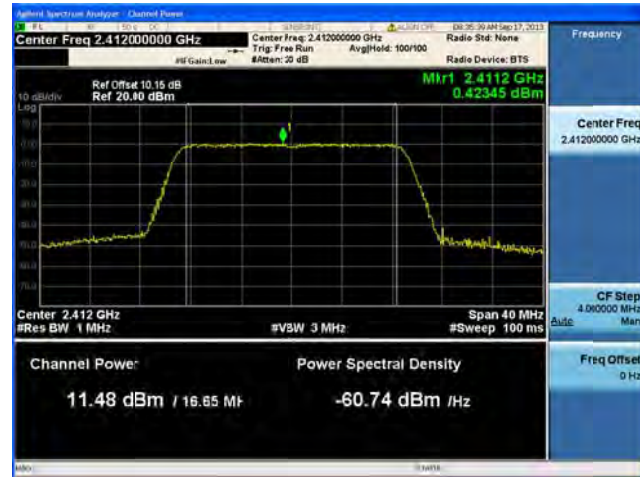
**Peak Output Power, 2412 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B**



## Peak Output Power, 2412 MHz, HT-20 Beam Forming, M0 to M7



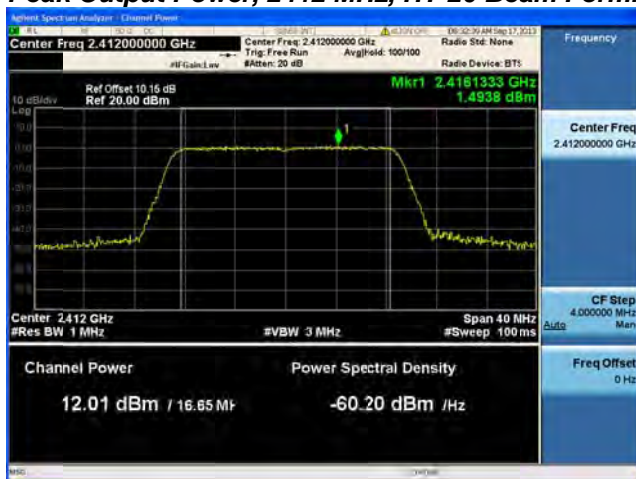
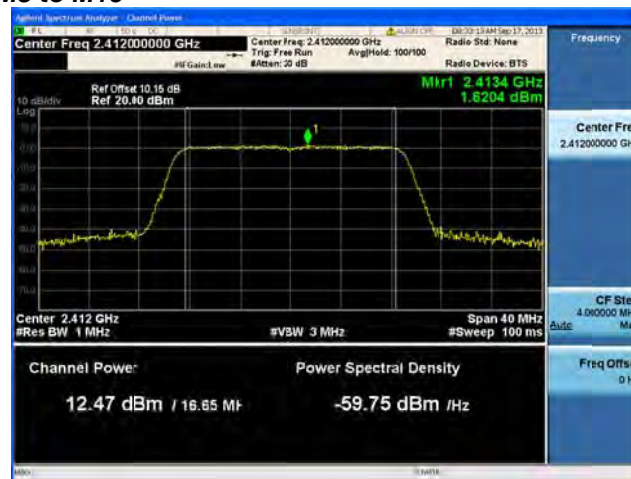
Antenna A

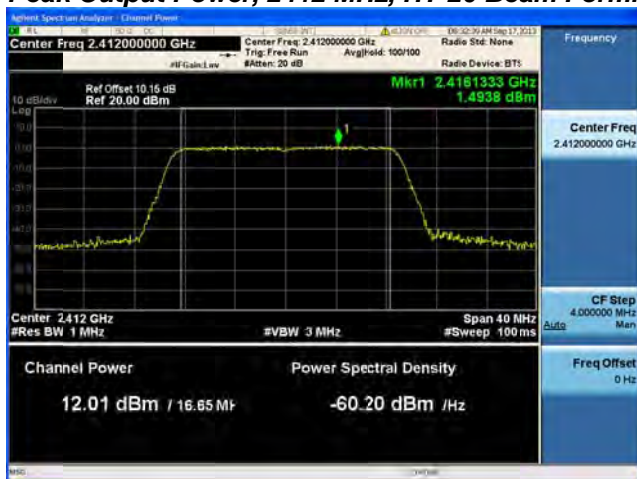
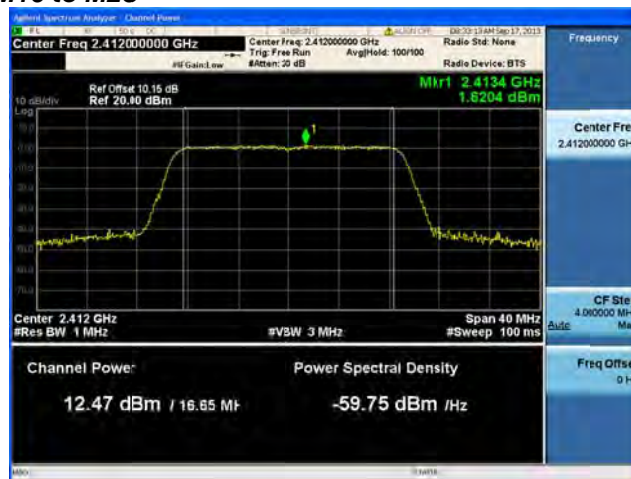
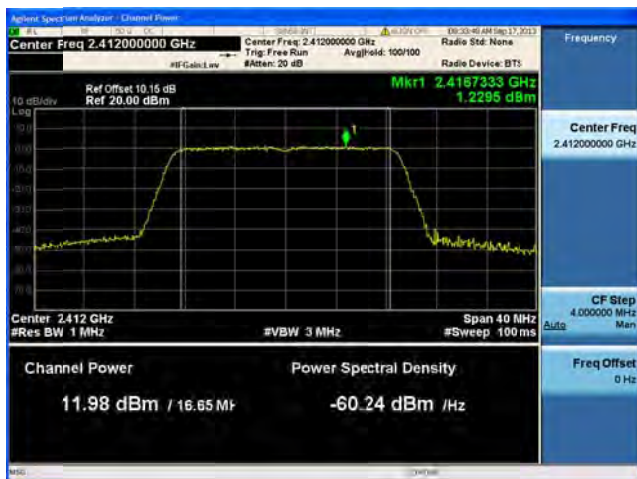


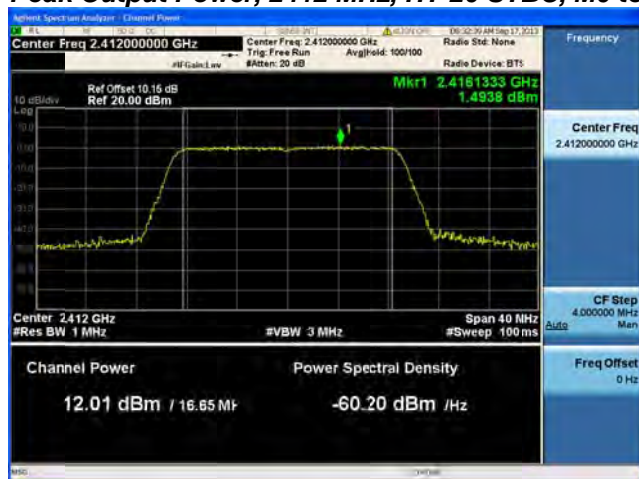
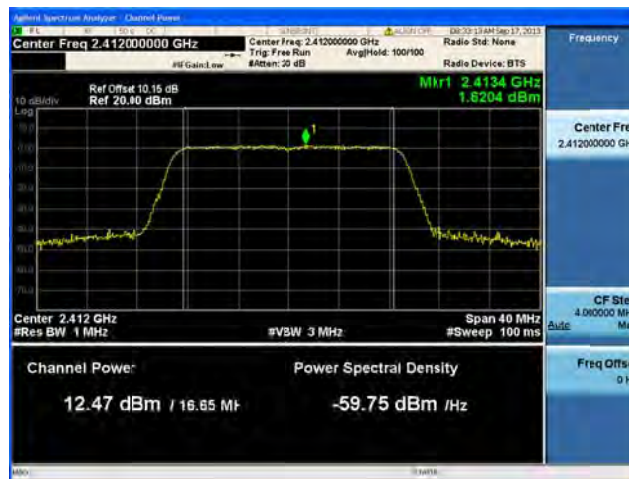
Antenna B



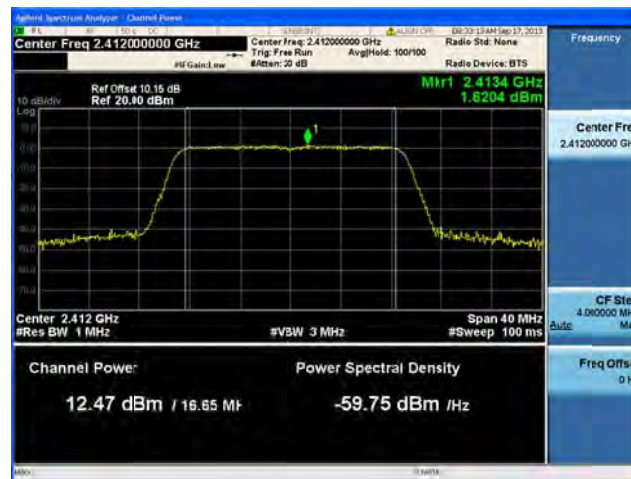
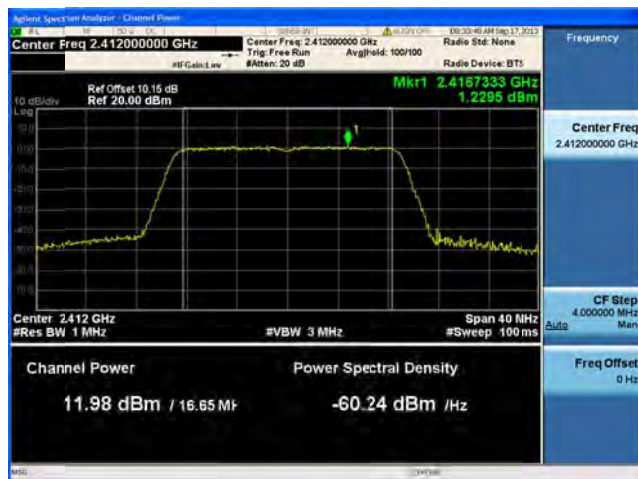
Antenna C

**Peak Output Power, 2412 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B****Antenna C**

**Peak Output Power, 2412 MHz, HT-20 Beam Forming, M16 to M23****Antenna A****Antenna B****Antenna C**

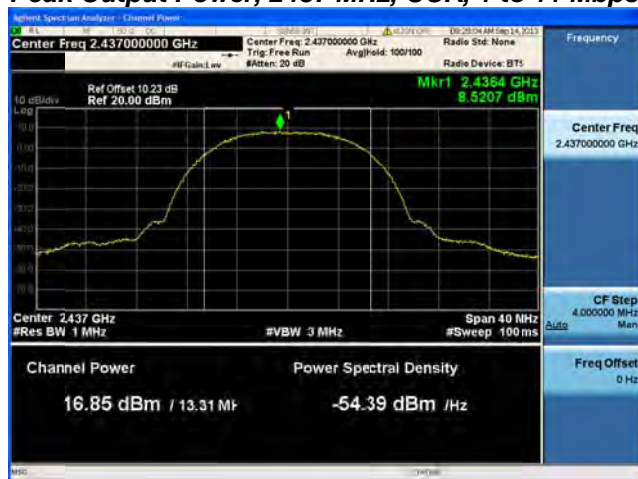
**Peak Output Power, 2412 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B**

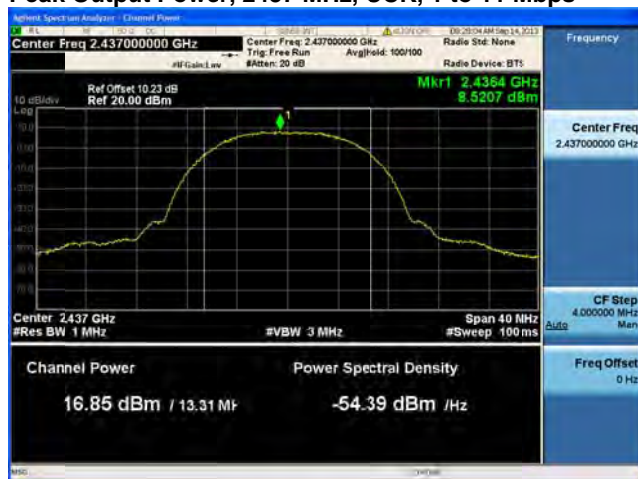
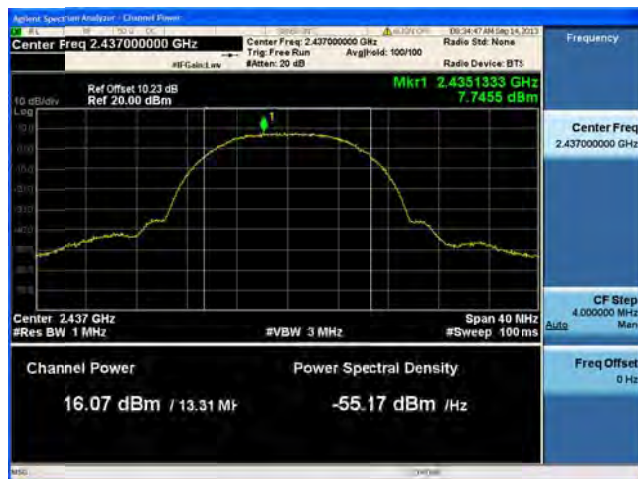


**Peak Output Power, 2412 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B****Antenna C**



**Peak Output Power, 2437 MHz, CCK, 1 to 11 Mbps****Antenna A**

**Peak Output Power, 2437 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B**

**Peak Output Power, 2437 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B****Antenna C**

**Peak Output Power, 2437 MHz, Non HT-20, 6 to 54 Mbps****Antenna A**

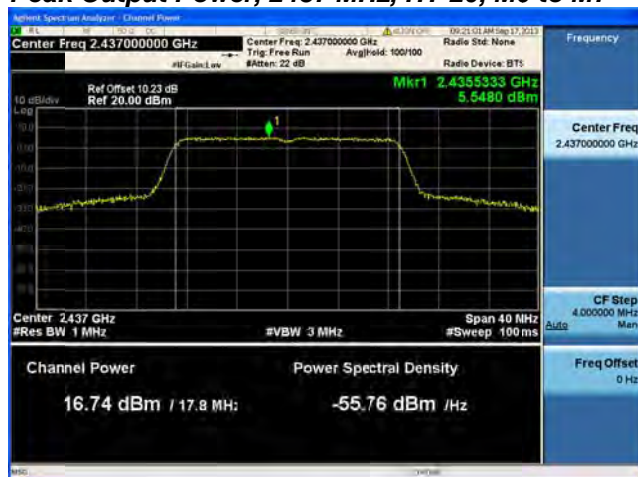
**Peak Output Power, 2437 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B**

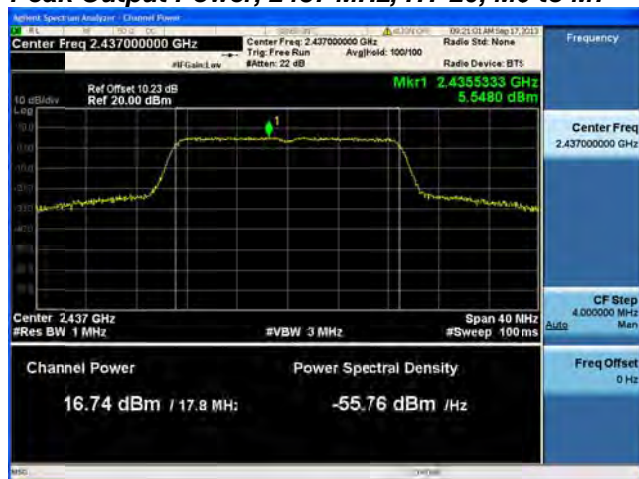
**Peak Output Power, 2437 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**



**Peak Output Power, 2437 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B**

**Peak Output Power, 2437 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

**Peak Output Power, 2437 MHz, HT-20, M0 to M7****Antenna A**

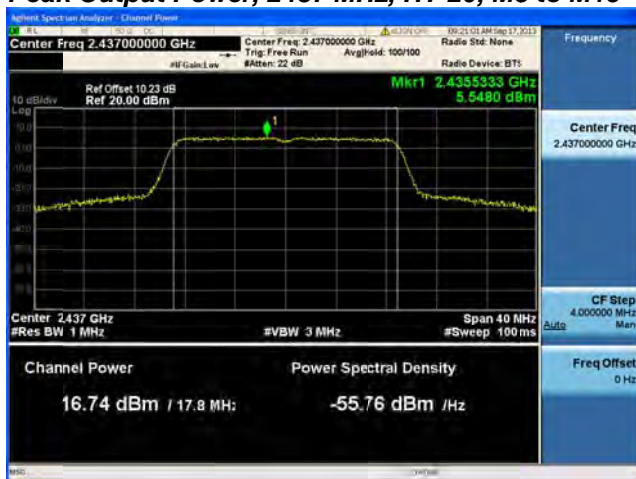
**Peak Output Power, 2437 MHz, HT-20, M0 to M7****Antenna A****Antenna B**

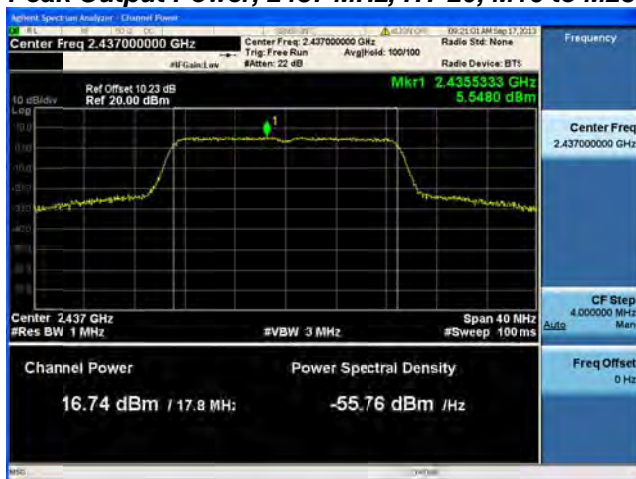
**Peak Output Power, 2437 MHz, HT-20, M8 to M15****Antenna A****Antenna B**

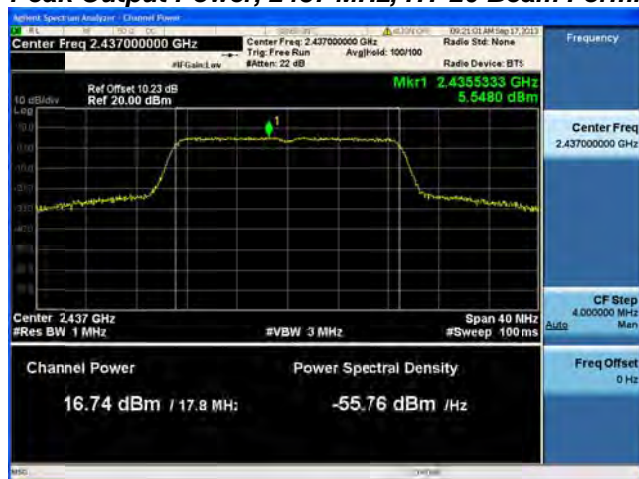


**Peak Output Power, 2437 MHz, HT-20, M0 to M7****Antenna A****Antenna B****Antenna C**



**Peak Output Power, 2437 MHz, HT-20, M8 to M15****Antenna A****Antenna B****Antenna C**

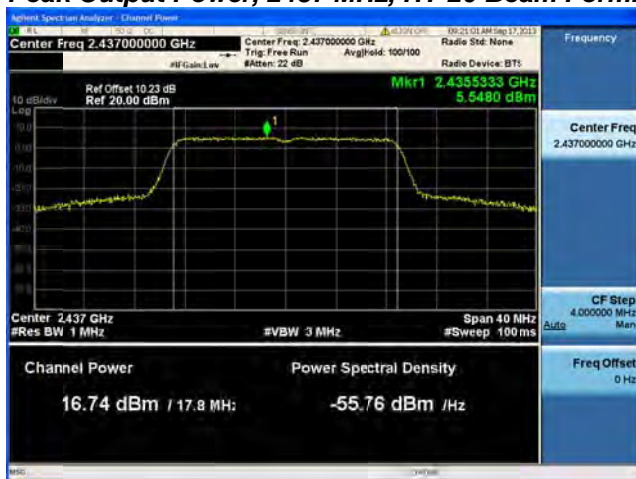
**Peak Output Power, 2437 MHz, HT-20, M16 to M23****Antenna A****Antenna B****Antenna C**

**Peak Output Power, 2437 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**

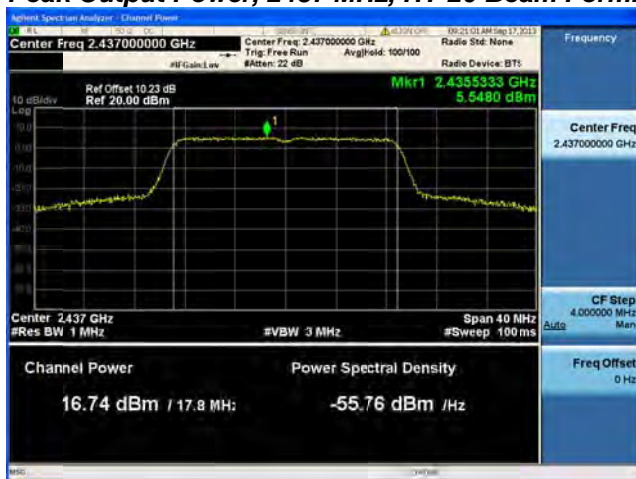
**Peak Output Power, 2437 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B**

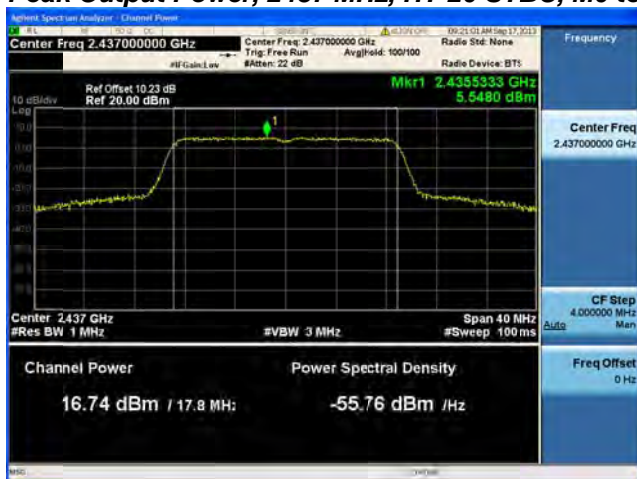
**Peak Output Power, 2437 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B****Antenna C**



**Peak Output Power, 2437 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B****Antenna C**



**Peak Output Power, 2437 MHz, HT-20 Beam Forming, M16 to M23****Antenna A****Antenna B****Antenna C**

**Peak Output Power, 2437 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B**

**Peak Output Power, 2437 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B****Antenna C**

**Peak Output Power, 2462 MHz, CCK, 1 to 11 Mbps****Antenna A**

**Peak Output Power, 2462 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B**



**Peak Output Power, 2462 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B****Antenna C**



**Peak Output Power, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A**

**Peak Output Power, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B**

**Peak Output Power, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

**Peak Output Power, 2462 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B**

## Peak Output Power, 2462 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps



Antenna A

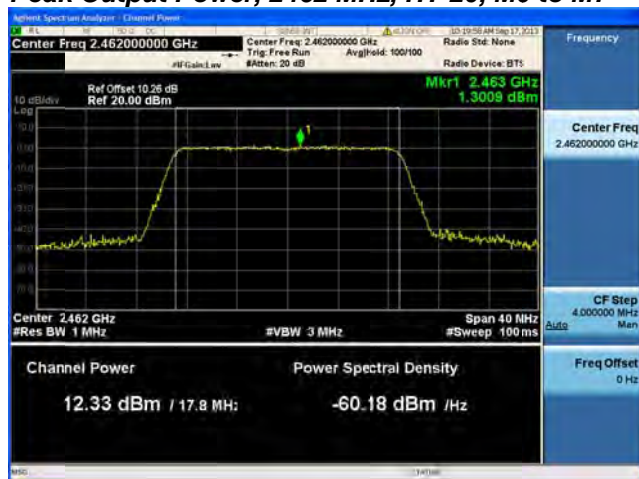


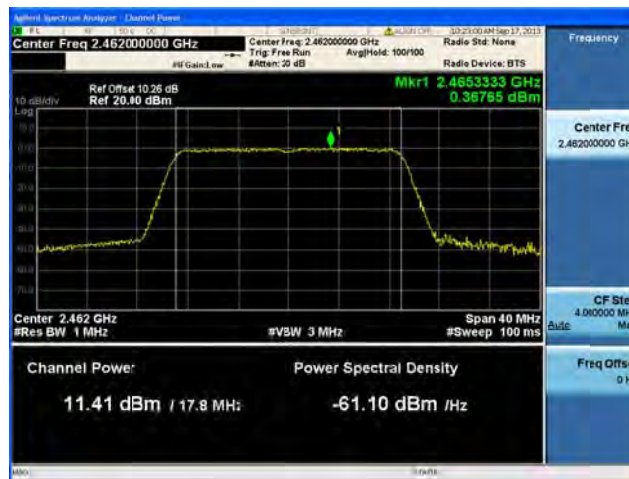
Antenna B



Antenna C

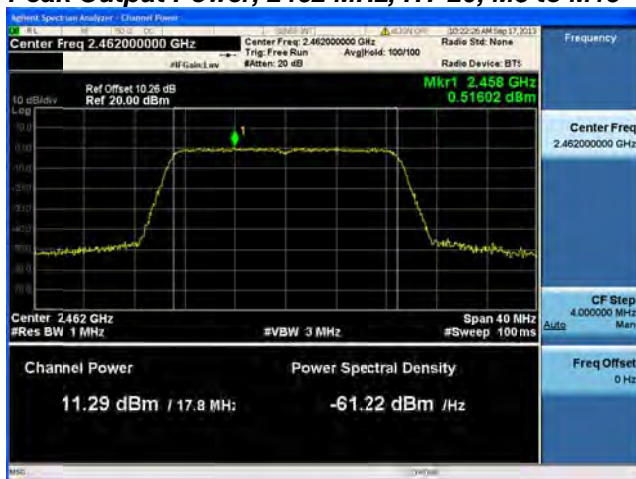


**Peak Output Power, 2462 MHz, HT-20, M0 to M7****Antenna A**

**Peak Output Power, 2462 MHz, HT-20, M0 to M7****Antenna A****Antenna B**

**Peak Output Power, 2462 MHz, HT-20, M8 to M15****Antenna A****Antenna B**

**Peak Output Power, 2462 MHz, HT-20, M0 to M7****Antenna A****Antenna B****Antenna C**

**Peak Output Power, 2462 MHz, HT-20, M8 to M15****Antenna A****Antenna B****Antenna C**



Agilent Spectrum Analyzer - Channel Power

Center Freq 2.462000000 GHz  
 Ref Offset 10.26 dB  
 Ref 20.00 dBm  
 Mkr1 2.458 GHz  
 0.51502 dBm  
 Span 40 MHz  
 #Res BW 1 MHz  
 #VBW 3 MHz  
 #Sweep 100 ms

Channel Power  
 11.29 dBm / 17.9 MHz

Power Spectral Density  
 -61.22 dBm / Hz

Vector Signal Analyzer - Channel Power  
 Center Freq 2.462000000 GHz  
 # Gain Low  
 Center Freq 2.462000000 GHz  
 Trig: Free Run  
 #atten: 20 dB  
 AvgHold: 100/100  
 Radio Std: None  
 Radio Device: BTS  
 Mkr1 2.4653333 GHz  
 0.36795 dBm  
 10 dB/div  
 Log  
 Ref Offset 10.26 dB  
 Ref 20.40 dBm  
 Center 2.462 GHz  
 #Res BW 1 MHz  
 #VSW 3 MHz  
 Span 40 MHz  
 #Sweep 100 ms  
 Channel Power:  
 11.41 dBm / 17.8 MHz:  
 Power Spectral Density  
 -61.10 dBm /Hz  
 CF Std: 4.000000 MHz  
 Aud: Ma  
 Freq Offset: 0 Hz

Agilent Spectrum Analyzer - Channel Power

Center Freq 2.462000000 GHz

Ref Offset 10.26 dB

Ref 20.00 dBm

Log

10 dBm

0 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

-80 dBm

2.458 GHz

2.460 GHz

Center 2.462 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 40 MHz

#Sweep 100 ms

Channel Power

11.46 dBm / 17.8 MHz

Power Spectral Density

-61.04 dBm / Hz

Mkr1 2.4594 GHz

0.58976 dBm

Frequency

Center Freq 2.462000000 GHz

CF Step 4.000000 MHz

Freq Offset 0 Hz

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**Peak Output Power, 2462 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**

**Peak Output Power, 2462 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B**

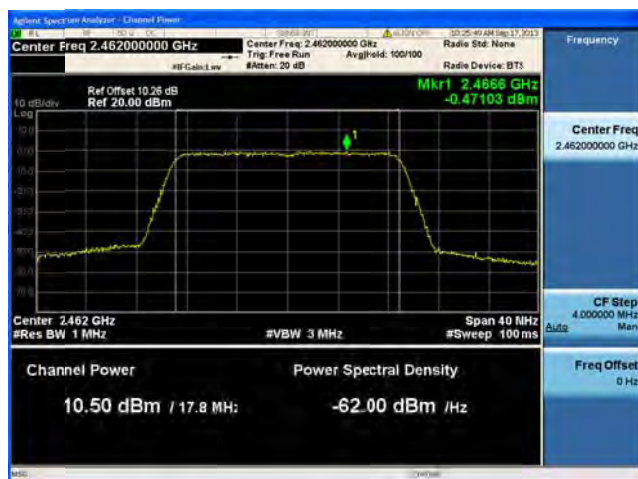
## Peak Output Power, 2462 MHz, HT-20 Beam Forming, M0 to M7



Antenna A

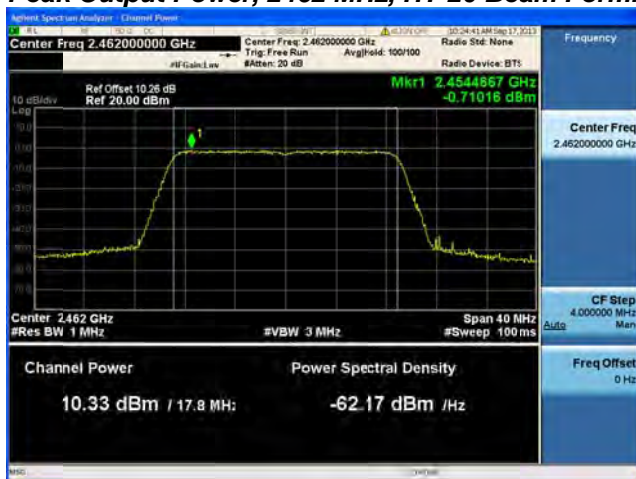
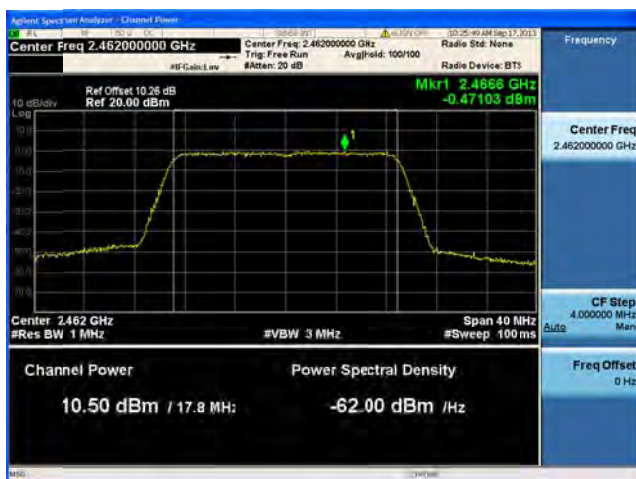


Antenna B



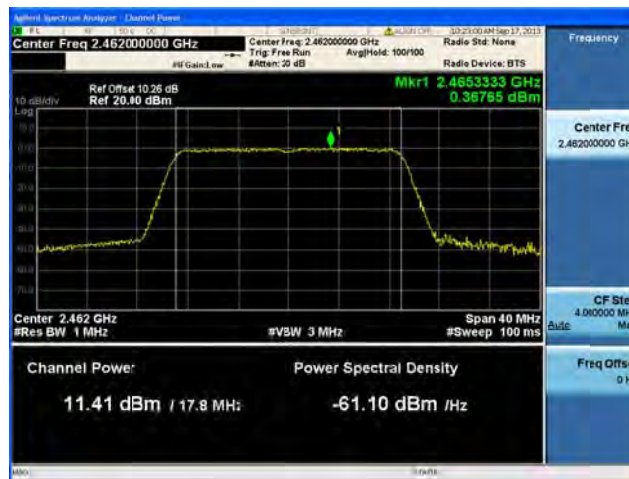
Antenna C



**Peak Output Power, 2462 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B****Antenna C**



**Peak Output Power, 2462 MHz, HT-20 Beam Forming, M16 to M23****Antenna A****Antenna B****Antenna C**

**Peak Output Power, 2462 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B**

Ref Offset 10.26 dB  
Ref 20.00 dBm

Center Freq 2.462000000 GHz  
Trig: Free Run  
AvgHold: 100/100  
Radio Std: None  
Radio Device: BT5

Mkr1 2.458 GHz  
0.51002 dBm

Center 2.462 GHz  
#Res BW 1 MHz  
#VBW 3 MHz  
Span 40 MHz  
#Sweep 100 ms

Channel Power  
11.29 dBm / 17.9 MHz

Power Spectral Density  
-61.22 dBm /Hz

Frequency  
Center Freq  
2.462000000 GHz

CF Step  
4.000000 MHz  
Marker  
Auto

Freq Offset  
0 Hz

Channel Power: **11.41 dBm** / 17.8 MHz  
 Power Spectral Density: **-61.10 dBm /Hz**

Center Freq: 2.462000000 GHz  
 Span: 40 MHz  
 Resolution Bandwidth: 1 MHz  
 Sweep: 100 ms

Active Spectrum Analyzer - Ethernet Front

Center Freq 2.46200000 GHz

Center Freq: 2.462000000 GHz  
 Trig: Free Run  
 #Attm: 20 dB

Radio Std: None  
 AvgHold: 100/100  
 Radio Device: BT5

Ref Offset 10.26 dB  
 Ref 20.00 dBm

Mkr1 2.4594 GHz  
 0.58976 dBm

Center 2.462 GHz  
 #Res BW 1 MHz

#VBW 3 MHz

Span 40 MHz  
 #Sweep 100 ms

Channel Power  
 11.46 dBm / 17.8 MHz

Power Spectral Density  
 -61.04 dBm / Hz

Frequency  
 2.46200000 GHz

Center Freq  
 2.46200000 GHz

CF Step  
 4.000000 MHz

Freq Offset  
 0 Hz

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## Power Spectral Density

15.247 / RSS-210 A8.2: For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Connect the antenna port(s) to the spectrum analyzer input. Place the radio in continuous transmit mode. Configure the spectrum analyzer as shown below.

Center Frequency:	Frequency from table below
Span:	20 MHz
Ref Level Offset:	Correct for attenuator and cable loss.
Reference Level:	20 dBm
Attenuation:	20 dB
Sweep Time:	10s
Resolution Bandwidth:	3 kHz
Video Bandwidth:	10 kHz
Detector:	Peak
Trace:	Single
Marker:	Peak Search

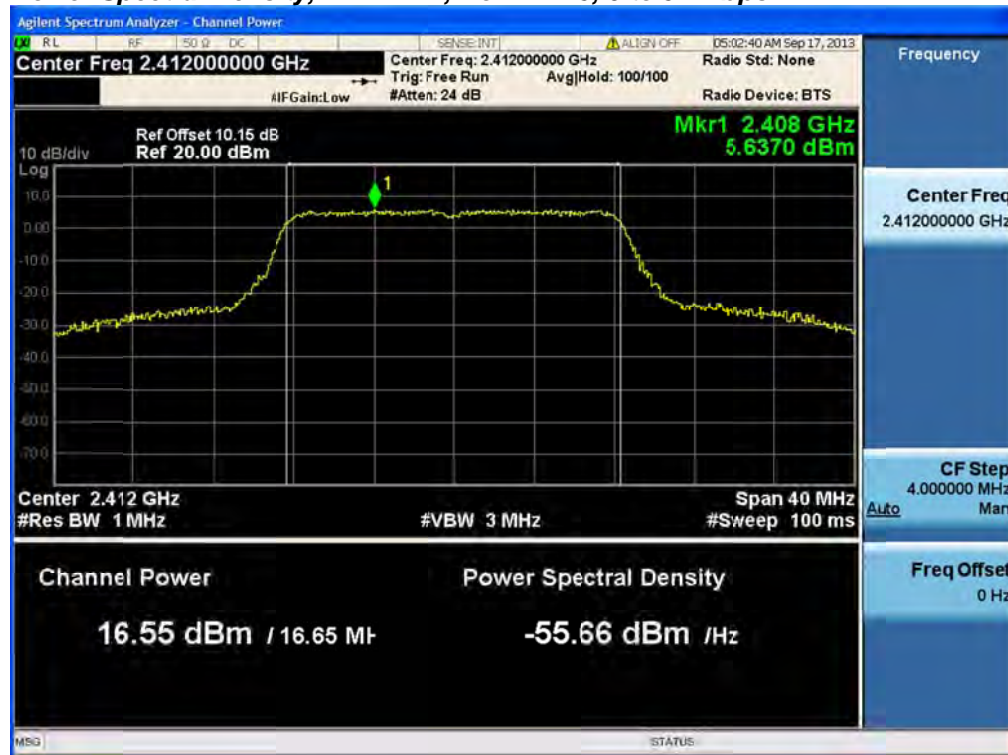
Record the Marker value.

The “Measure and add  $10 \log(N)$  dB technique”, where N is the number of outputs, is used for measuring in-band Power Spectral Density. With this technique, spectrum measurements are performed at each output of the device, and the quantity  $10 \log(4)$  (or 6dB) is added to the worst case spectrum value before comparing to the emission limit.



Frequency (MHz)	Mode	Data Rate (Mbps)	PSD / Antenna (dBm/3kHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
2412	CCK, 1 to 11 Mbps	11	<u>-7</u>	-2.2	8.0	10.2
	Non HT-20, 6 to 54 Mbps	6	<u>-9.6</u>	-4.8	8.0	12.8
	HT-20, M0 to M23	m0	<u>-9.9</u>	-5.1	8.0	13.1
2437	CCK, 1 to 11 Mbps	11	<u>-7.6</u>	-2.8	8.0	10.8
	Non HT-20, 6 to 54 Mbps	6	<u>-10.8</u>	-6.0	8.0	14.0
	HT-20, M0 to M23	m0	<u>-10.3</u>	-5.5	8.0	13.5
2462	CCK, 1 to 11 Mbps	11	<u>-6.5</u>	-1.7	8.0	9.7
	Non HT-20, 6 to 54 Mbps	6	<u>-10</u>	-5.2	8.0	13.2
	HT-20, M0 to M23	m0	<u>-10</u>	-5.2	8.0	13.2



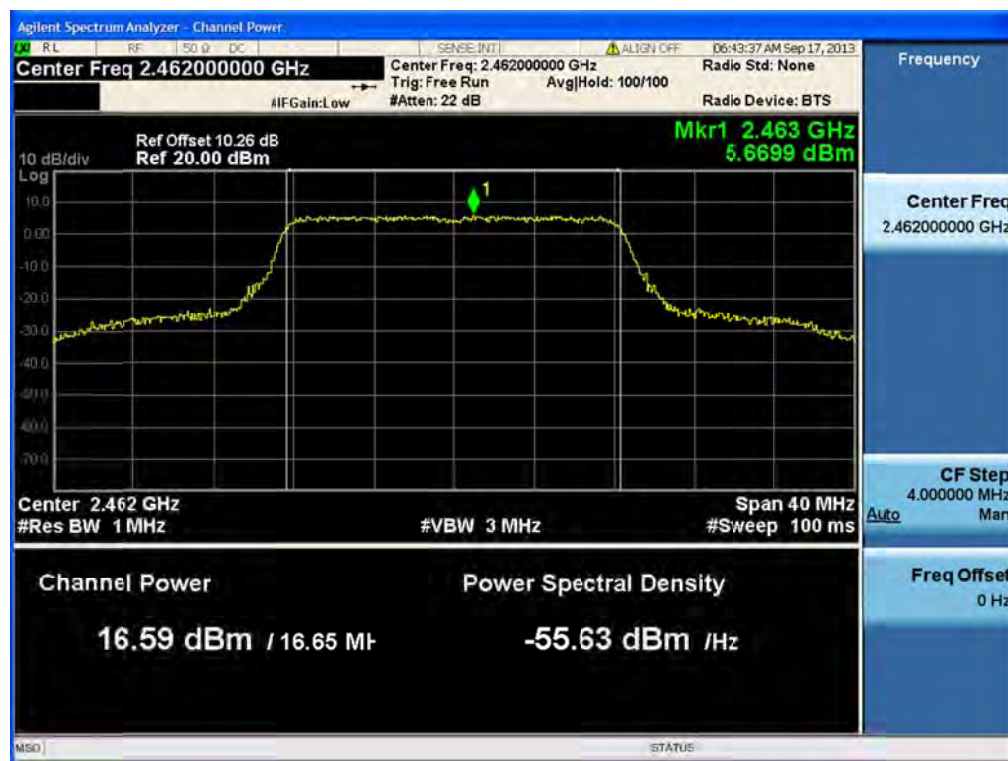
**Power Spectral Density, 2412 MHz, CCK, 1 to 11 Mbps****Power Spectral Density, 2412 MHz, Non HT-20, 6 to 54 Mbps**

**Power Spectral Density, 2412 MHz, HT-20, M0 to M23****Power Spectral Density, 2437 MHz, CCK, 1 to 11 Mbps**

**Power Spectral Density, 2437 MHz, Non HT-20, 6 to 54 Mbps****Power Spectral Density, 2437 MHz, HT-20, M0 to M23**



**Power Spectral Density, 2462 MHz, CCK, 1 to 11 Mbps****Power Spectral Density, 2462 MHz, Non HT-20, 6 to 54 Mbps**

**Power Spectral Density, 2462 MHz, HT-20, M0 to M23**





## Conducted Spurious Emissions

15.247 / RSS-210 A8.5: In any 100 kHz bandwidth outside the frequency band in which the digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

Connect the antenna port(s) to the spectrum analyzer input. Place the radio in continuous transmit mode. Configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer).

Span:	30 MHz-26 GHz
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	5s
Resolution Bandwidth:	100 kHz
Video Bandwidth:	300 kHz
Detector:	Peak
Trace:	Single
Marker:	Peak

Record the marker waveform peak to spur difference

Out-of-band and spurious emissions tests are performed on each output individually without summing or adding  $10 \log(N)$  since the measurements are made relative to the in-band emissions on the individual outputs. The worst case output is recorded.



Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Tx 2 Spur Power (dBm)	Tx 3 Spur Power (dBm)	Total Conducted Spur (dBm)	Limit (dBm)	Margin (dB)
2412	CCK, 1 to 11 Mbps	1	6	-59.1			-53.1	-41.25	11.9
	CCK, 1 to 11 Mbps	2	6	-59.1	-59.6		-50.3	-41.25	9.1
	CCK, 1 to 11 Mbps	3	6	-59.1	-59.6	-56.1	-47.2	-41.25	6.0
	Non HT-20, 6 to 54 Mbps	1	6	-59.4			-53.4	-41.25	12.2
	Non HT-20, 6 to 54 Mbps	2	6	-59.5	-59.5		-50.5	-41.25	9.2
	Non HT-20, 6 to 54 Mbps	3	6	-59.5	-59.5	-59.3	-48.7	-41.25	7.4
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	-59.5	-59.5		-47.5	-41.25	6.2
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	-59.5	-59.3	-59.5	-43.9	-41.25	2.6
	HT-20, M0 to M7	1	6	-59.4			-53.4	-41.25	12.2
	HT-20, M0 to M7	2	6	-59.5	-59.4		-50.4	-41.25	9.2
	HT-20, M8 to M15	2	6	-59.5	-59.4		-50.4	-41.25	9.2
	HT-20, M0 to M7	3	6	-59.5	-59.4	-59.3	-48.6	-41.25	7.4
	HT-20, M8 to M15	3	6	-59.5	-59.4	-59.3	-48.6	-41.25	7.4
	HT-20, M16 to M23	3	6	-59.5	-59.4	-59.3	-48.6	-41.25	7.4
	HT-20 Beam Forming, M0 to M7	2	9	-59.5	-59.4		-47.4	-41.25	6.2
	HT-20 Beam Forming, M8 to M15	2	6	-59.5	-59.4		-50.4	-41.25	9.2
	HT-20 Beam Forming, M0 to M7	3	11	-59.5	-59.4	-59.3	-43.8	-41.25	2.6
	HT-20 Beam Forming, M8 to M15	3	8	-59.5	-59.4	-59.3	-46.8	-41.25	5.6
	HT-20 Beam Forming, M16 to M23	3	6	-59.5	-59.4	-59.3	-48.6	-41.25	7.4
	HT-20 STBC, M0 to M7	2	6	-59.5	-59.4		-50.4	-41.25	9.2
	HT-20 STBC, M0 to M7	3	6	-59.5	-59.4	-59.3	-48.6	-41.25	7.4
2437	CCK, 1 to 11 Mbps	1	6	-59.4			-53.4	-41.25	12.2
	CCK, 1 to 11 Mbps	2	6	-59.4	-59.4		-50.4	-41.25	9.1
	CCK, 1 to 11 Mbps	3	6	-59.4	-59.4	-58.2	-48.2	-41.25	6.9
	Non HT-20, 6 to 54 Mbps	1	6	-59.3			-53.3	-41.25	12.1
	Non HT-20, 6 to 54 Mbps	2	6	-59.3	-59.5		-50.4	-41.25	9.1
	Non HT-20, 6 to 54 Mbps	3	6	-59.3	-59.5	-59.4	-48.6	-41.25	7.4
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	-59.3	-59.5		-47.4	-41.25	6.1
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	-59.3	-59.5	-59.4	-43.8	-41.25	2.6
	HT-20, M0 to M7	1	6	-59.5			-53.5	-41.25	12.3
	HT-20, M0 to M7	2	6	-59.5	-59.5		-50.5	-41.25	9.2
	HT-20, M8 to M15	2	6	-59.5	-59.5		-50.5	-41.25	9.2
	HT-20, M0 to M7	3	6	-59.5	-59.5	-59.3	-48.7	-41.25	7.4
	HT-20, M8 to M15	3	6	-59.5	-59.5	-59.3	-48.7	-41.25	7.4



	HT-20, M16 to M23	3	6	-59.5	-59.5	-59.3	-48.7	-41.25	7.4
	HT-20 Beam Forming, M0 to M7	2	9	-59.5	-59.5		-47.5	-41.25	6.2
	HT-20 Beam Forming, M8 to M15	2	6	-59.5	-59.5		-50.5	-41.25	9.2
	HT-20 Beam Forming, M0 to M7	3	11	-59.5	-59.5	-59.3	-43.9	-41.25	2.6
	HT-20 Beam Forming, M8 to M15	3	8	-59.5	-59.5	-59.3	-46.9	-41.25	5.6
	HT-20 Beam Forming, M16 to M23	3	6	-59.5	-59.5	-59.3	-48.7	-41.25	7.4
	HT-20 STBC, M0 to M7	2	6	-59.5	-59.5		-50.5	-41.25	9.2
	HT-20 STBC, M0 to M7	3	6	-59.5	-59.5	-59.3	-48.7	-41.25	7.4
2462	CCK, 1 to 11 Mbps	1	6	-57.3			-51.3	-41.25	10.1
	CCK, 1 to 11 Mbps	2	6	-57.3	-57.0		-48.1	-41.25	6.9
	CCK, 1 to 11 Mbps	3	6	-57.3	-57.0	-58.7	-46.8	-41.25	5.6
	Non HT-20, 6 to 54 Mbps	1	6	-58.9			-52.9	-41.25	11.7
	Non HT-20, 6 to 54 Mbps	2	6	-59.0	-59.1		-50.0	-41.25	8.8
	Non HT-20, 6 to 54 Mbps	3	6	-59.0	-59.1	-59.0	-48.3	-41.25	7.0
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	-59.0	-59.1		-47.0	-41.25	5.8
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	-59.0	-59.1	-58.8	-43.4	-41.25	2.1
	HT-20, M0 to M7	1	6	-59.2			-53.2	-41.25	12.0
	HT-20, M0 to M7	2	6	-59.1	-59.1		-50.1	-41.25	8.8
	HT-20, M8 to M15	2	6	-59.1	-59.1		-50.1	-41.25	8.8
	HT-20, M0 to M7	3	6	-59.1	-59.1	-59.1	-48.3	-41.25	7.1
	HT-20, M8 to M15	3	6	-59.1	-59.1	-59.1	-48.3	-41.25	7.1
	HT-20, M16 to M23	3	6	-59.1	-59.1	-59.1	-48.3	-41.25	7.1
	HT-20 Beam Forming, M0 to M7	2	9	-58.9	-59.0		-46.9	-41.25	5.7
	HT-20 Beam Forming, M8 to M15	2	6	-59.1	-59.1		-50.1	-41.25	8.8
	HT-20 Beam Forming, M0 to M7	3	11	-58.9	-59.0	-58.9	-43.4	-41.25	2.1
	HT-20 Beam Forming, M8 to M15	3	8	-58.9	-59.0	-58.9	-46.4	-41.25	5.1
	HT-20 Beam Forming, M16 to M23	3	6	-59.1	-59.1	-59.1	-48.3	-41.25	7.1
	HT-20 STBC, M0 to M7	2	6	-59.1	-59.1		-50.1	-41.25	8.8
	HT-20 STBC, M0 to M7	3	6	-59.1	-59.1	-59.1	-48.3	-41.25	7.1

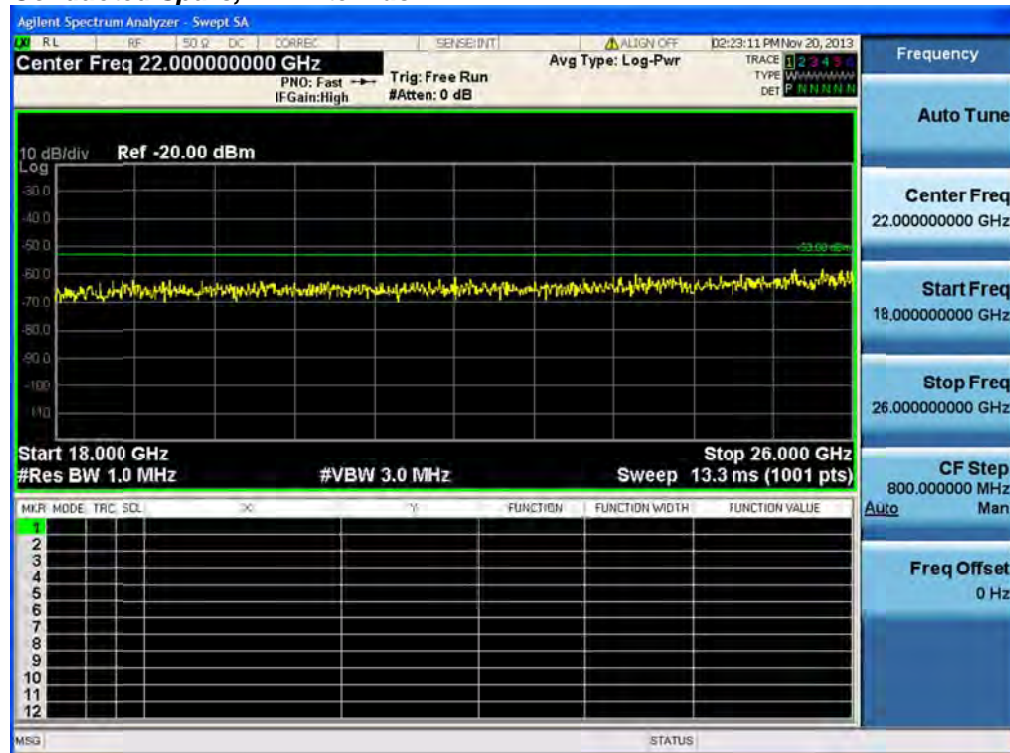


Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Tx 2 Spur Power (dBm)	Tx 3 Spur Power (dBm)	Total Conducted Spur (dBm)	Limit (dBm)	Margin (dB)
2412	CCK, 1 to 11 Mbps	1	6	-49.9			-43.9	-27	16.9
	CCK, 1 to 11 Mbps	2	6	-49.9	-51.6		-41.7	-27	14.7
	CCK, 1 to 11 Mbps	3	6	-49.9	-51.6	-50.9	-40.0	-27	13.0
	Non HT-20, 6 to 54 Mbps	1	6	-51.7			-45.7	-27	18.7
	Non HT-20, 6 to 54 Mbps	2	6	-49.5	-50.5		-41.0	-27	14.0
	Non HT-20, 6 to 54 Mbps	3	6	-49.5	-50.5	-51.0	-39.5	-27	12.5
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	-49.5	-50.5		-38.0	-27	11.0
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	-50.7	-50.0	-50.3	-34.8	-27	7.8
	HT-20, M0 to M7	1	6	-49.9			-43.9	-27	16.9
	HT-20, M0 to M7	2	6	-50.8	-52.4		-42.5	-27	15.5
	HT-20, M8 to M15	2	6	-50.8	-52.4		-42.5	-27	15.5
	HT-20, M0 to M7	3	6	-50.8	-52.4	-50.5	-40.4	-27	13.4
	HT-20, M8 to M15	3	6	-50.8	-52.4	-50.5	-40.4	-27	13.4
	HT-20, M16 to M23	3	6	-50.8	-52.4	-50.5	-40.4	-27	13.4
	HT-20 Beam Forming, M0 to M7	2	9	-50.8	-52.4		-39.5	-27	12.5
	HT-20 Beam Forming, M8 to M15	2	6	-50.8	-52.4		-42.5	-27	15.5
	HT-20 Beam Forming, M0 to M7	3	11	-48.9	-50.5	-50.0	-34.2	-27	7.2
	HT-20 Beam Forming, M8 to M15	3	8	-50.8	-52.4	-50.5	-38.6	-27	11.6
	HT-20 Beam Forming, M16 to M23	3	6	-50.8	-52.4	-50.5	-40.4	-27	13.4
	HT-20 STBC, M0 to M7	2	6	-50.8	-52.4		-42.5	-27	15.5
	HT-20 STBC, M0 to M7	3	6	-50.8	-52.4	-50.5	-40.4	-27	13.4
2437	CCK, 1 to 11 Mbps	1	6	-51.8			-45.8	-27	18.8
	CCK, 1 to 11 Mbps	2	6	-51.8	-50.3		-42.0	-27	15.0
	CCK, 1 to 11 Mbps	3	6	-51.8	-50.3	-50.5	-40.0	-27	13.0
	Non HT-20, 6 to 54 Mbps	1	6	-50.9			-44.9	-27	17.9
	Non HT-20, 6 to 54 Mbps	2	6	-50.9	-49.7		-41.2	-27	14.2
	Non HT-20, 6 to 54 Mbps	3	6	-50.9	-49.7	-50.6	-39.6	-27	12.6
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	-50.9	-49.7		-38.2	-27	11.2
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	-50.9	-49.7	-50.6	-34.8	-27	7.8
	HT-20, M0 to M7	1	6	-52.7			-46.7	-27	19.7
	HT-20, M0 to M7	2	6	-52.7	-50.6		-42.5	-27	15.5
	HT-20, M8 to M15	2	6	-52.7	-50.6		-42.5	-27	15.5
	HT-20, M0 to M7	3	6	-52.7	-50.6	-51.8	-40.8	-27	13.8
	HT-20, M8 to M15	3	6	-52.7	-50.6	-51.8	-40.8	-27	13.8



	HT-20, M16 to M23	3	6	-52.7	-50.6	-51.8	-40.8	-27	13.8
	HT-20 Beam Forming, M0 to M7	2	9	-52.7	-50.6		-39.5	-27	12.5
	HT-20 Beam Forming, M8 to M15	2	6	-52.7	-50.6		-42.5	-27	15.5
	HT-20 Beam Forming, M0 to M7	3	11	-52.7	-50.6	-51.8	-36.0	-27	9.0
	HT-20 Beam Forming, M8 to M15	3	8	-52.7	-50.6	-51.8	-39.0	-27	12.0
	HT-20 Beam Forming, M16 to M23	3	6	-52.7	-50.6	-51.8	-40.8	-27	13.8
	HT-20 STBC, M0 to M7	2	6	-52.7	-50.6		-42.5	-27	15.5
	HT-20 STBC, M0 to M7	3	6	-52.7	-50.6	-51.8	-40.8	-27	13.8
2462	CCK, 1 to 11 Mbps	1	6	-50.3			-44.3	-27	17.3
	CCK, 1 to 11 Mbps	2	6	-50.3	-50.2		-41.2	-27	14.2
	CCK, 1 to 11 Mbps	3	6	-50.3	-50.2	-51.6	-39.9	-27	12.9
	Non HT-20, 6 to 54 Mbps	1	6	-49.0			-43.0	-27	16.0
	Non HT-20, 6 to 54 Mbps	2	6	-49.9	-50.2		-41.0	-27	14.0
	Non HT-20, 6 to 54 Mbps	3	6	-49.9	-50.2	-50.4	-39.4	-27	12.4
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	-49.9	-50.2		-38.0	-27	11.0
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	-51.6	-50.9	-49.4	-35.0	-27	8.0
	HT-20, M0 to M7	1	6	-49.7			-43.7	-27	16.7
	HT-20, M0 to M7	2	6	-49.1	-49.0		-40.0	-27	13.0
	HT-20, M8 to M15	2	6	-49.1	-49.0		-40.0	-27	13.0
	HT-20, M0 to M7	3	6	-49.1	-49.0	-49.3	-38.4	-27	11.4
	HT-20, M8 to M15	3	6	-49.1	-49.0	-49.3	-38.4	-27	11.4
	HT-20, M16 to M23	3	6	-49.1	-49.0	-49.3	-38.4	-27	11.4
	HT-20 Beam Forming, M0 to M7	2	9	-50.7	-49.8		-38.2	-27	11.2
	HT-20 Beam Forming, M8 to M15	2	6	-49.1	-49.0		-40.0	-27	13.0
	HT-20 Beam Forming, M0 to M7	3	11	-50.7	-49.8	-51.7	-35.1	-27	8.1
	HT-20 Beam Forming, M8 to M15	3	8	-50.7	-49.8	-51.7	-38.1	-27	11.1
	HT-20 Beam Forming, M16 to M23	3	6	-49.1	-49.0	-49.3	-38.4	-27	11.4
	HT-20 STBC, M0 to M7	2	6	-49.1	-49.0		-40.0	-27	13.0
	HT-20 STBC, M0 to M7	3	6	-49.1	-49.0	-49.3	-38.4	-27	11.4



**Conducted Spurs, All Antennas**

**Conducted Spurs Average, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A**

**Conducted Spurs Average, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B**

**Conducted Spurs Average, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Average, 2412 MHz, Non HT-20, 6 to 54 Mbps****Antenna A**



**Conducted Spurs Average, 2412 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B**

**Conducted Spurs Average, 2412 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Average, 2412 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B**

**Conducted Spurs Average, 2412 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Average, 2412 MHz, HT-20, M0 to M7****Antenna A**



**Conducted Spurs Average, 2412 MHz, HT-20, M0 to M7****Antenna A****Antenna B**

**Conducted Spurs Average, 2412 MHz, HT-20, M8 to M15****Antenna A****Antenna B**

**Conducted Spurs Average, 2412 MHz, HT-20, M0 to M7****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Average, 2412 MHz, HT-20, M8 to M15****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Average, 2412 MHz, HT-20, M16 to M23****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Average, 2412 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**

**Conducted Spurs Average, 2412 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B**

**Conducted Spurs Average, 2412 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Average, 2412 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Average, 2412 MHz, HT-20 Beam Forming, M16 to M23****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Average, 2412 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B**

**Conducted Spurs Average, 2412 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Average, 2437 MHz, CCK, 1 to 11 Mbps****Antenna A**

**Conducted Spurs Average, 2437 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B**



**Conducted Spurs Average, 2437 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Average, 2437 MHz, Non HT-20, 6 to 54 Mbps****Antenna A**

**Conducted Spurs Average, 2437 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B**

**Conducted Spurs Average, 2437 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Average, 2437 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B**



**Conducted Spurs Average, 2437 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Average, 2437 MHz, HT-20, M0 to M7****Antenna A**

**Conducted Spurs Average, 2437 MHz, HT-20, M0 to M7****Antenna A****Antenna B**

**Conducted Spurs Average, 2437 MHz, HT-20, M8 to M15****Antenna A****Antenna B**

**Conducted Spurs Average, 2437 MHz, HT-20, M0 to M7****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Average, 2437 MHz, HT-20, M8 to M15****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Average, 2437 MHz, HT-20, M16 to M23****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Average, 2437 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**

**Conducted Spurs Average, 2437 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B**

**Conducted Spurs Average, 2437 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Average, 2437 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Average, 2437 MHz, HT-20 Beam Forming, M16 to M23****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Average, 2437 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B**

**Conducted Spurs Average, 2437 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B****Antenna C**

Lighted Spectrum Analyzer - Span 3.34

Center Freq 9.015000000 GHz

PRO: Low # Gated: on

Trig: Free Run #Atten: 10 dB

Avg Type: Log-Pwr

UNIT: dBm SPAN: 30.0 MHz TRIG: FREE RUN TYPE: SPECTRUM ZAT: 0.000 MHz

Ref Offset 10.26 dB Ref 10.00 dBm

Mkr2 4.924 GHz -57.29 dBm

10 dBm

Start 30 MHz #Res BW 1.0 MHz #BW 1.0 kHz Stop 18.000 GHz Sweep 14.0 s (1001 pts)

Mkr	Freq	Power	Unit	Function	Function Width	Function Value
1	N	I	F			
2	N	I	F			
3	N	I	F			
4						
5						
6						
7						
8						
9						
10						
11						
12						

Mkr1 4.924 GHz -57.29 dBm

Mkr2 4.924 GHz -57.29 dBm

Mkr3 4.924 GHz -57.29 dBm

Mkr4 4.924 GHz -57.29 dBm

Mkr5 4.924 GHz -57.29 dBm

Mkr6 4.924 GHz -57.29 dBm

Mkr7 4.924 GHz -57.29 dBm

Mkr8 4.924 GHz -57.29 dBm

Mkr9 4.924 GHz -57.29 dBm

Mkr10 4.924 GHz -57.29 dBm

Mkr11 4.924 GHz -57.29 dBm

Mkr12 4.924 GHz -57.29 dBm

Frequency

Auto Tune

Center Freq 9.015000000 GHz

Start Freq 30.00000000 MHz

Stop Freq 18.000000000 GHz

CF Step 1.797000000 GHz

Autoscale

Man

Freq Offset 0 Hz

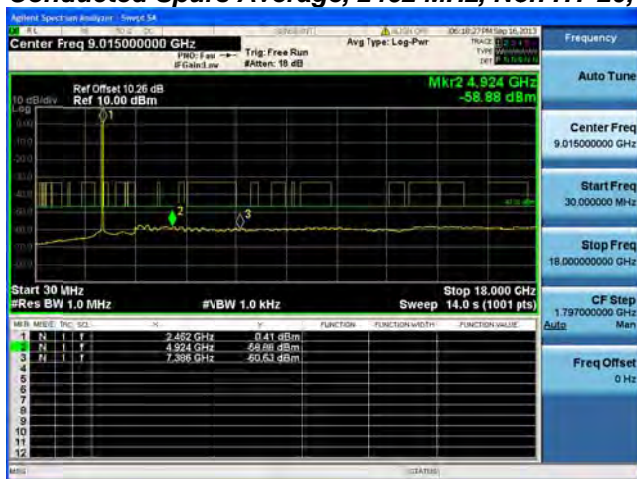
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**Conducted Spurs Average, 2462 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B**



**Conducted Spurs Average, 2462 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Average, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A**

**Conducted Spurs Average, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B**

**Conducted Spurs Average, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Average, 2462 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B**



**Conducted Spurs Average, 2462 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Average, 2462 MHz, HT-20, M0 to M7****Antenna A**

**Conducted Spurs Average, 2462 MHz, HT-20, M0 to M7****Antenna A****Antenna B**

**Conducted Spurs Average, 2462 MHz, HT-20, M8 to M15****Antenna A****Antenna B**



**Conducted Spurs Average, 2462 MHz, HT-20, M0 to M7****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Average, 2462 MHz, HT-20, M8 to M15****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Average, 2462 MHz, HT-20, M16 to M23****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Average, 2462 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**

**Conducted Spurs Average, 2462 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B**



**Conducted Spurs Average, 2462 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B****Antenna C**



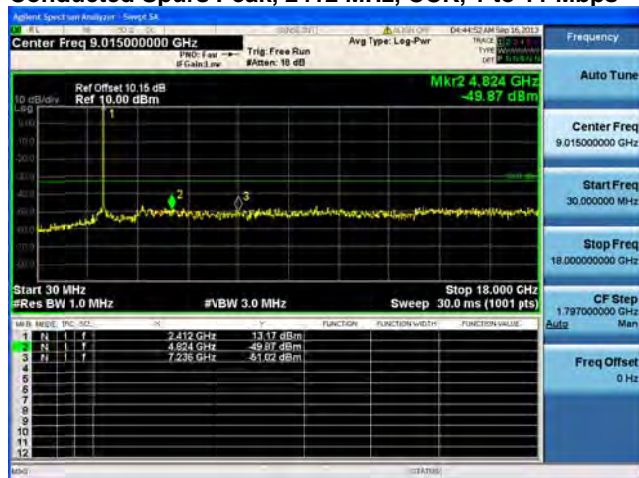
**Conducted Spurs Average, 2462 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Average, 2462 MHz, HT-20 Beam Forming, M16 to M23****Antenna A****Antenna B****Antenna C**

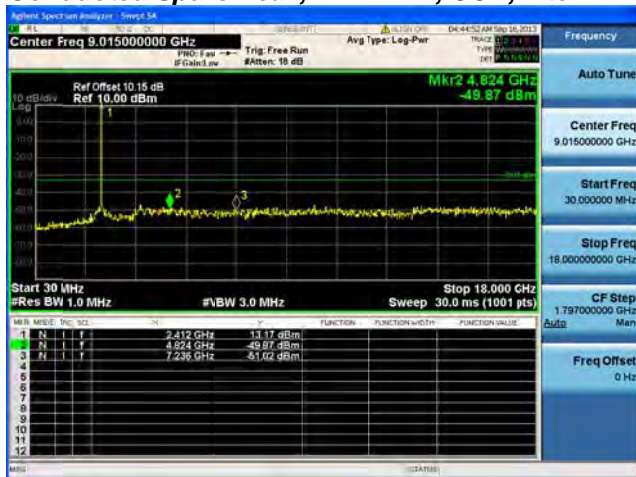
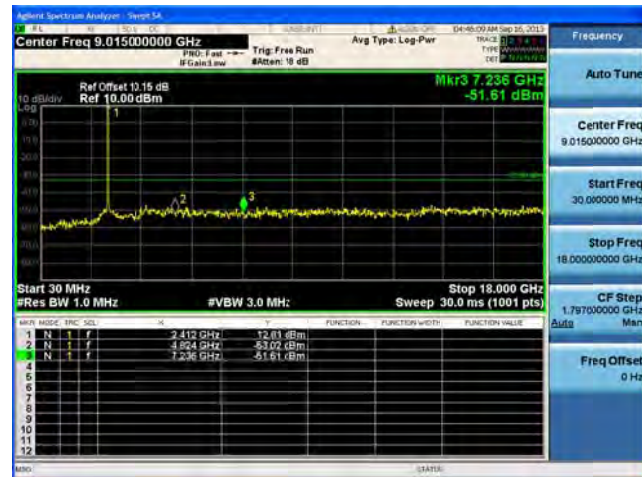
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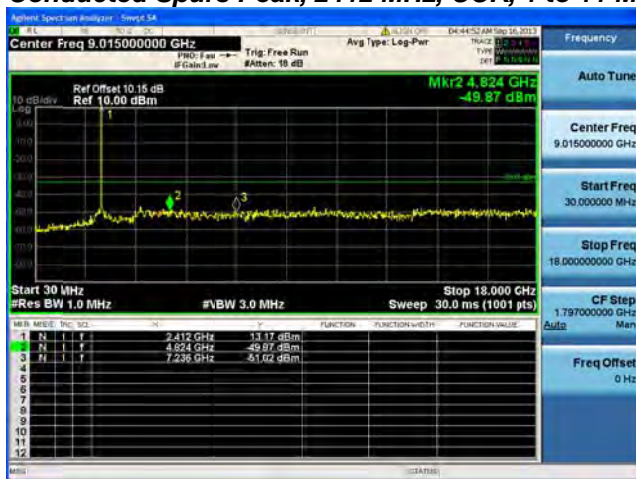
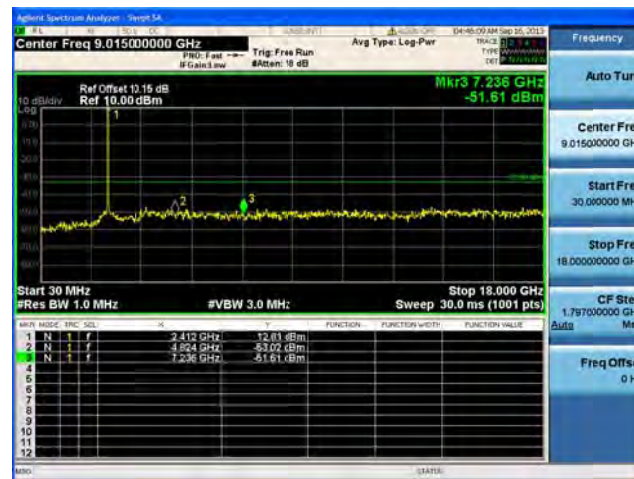
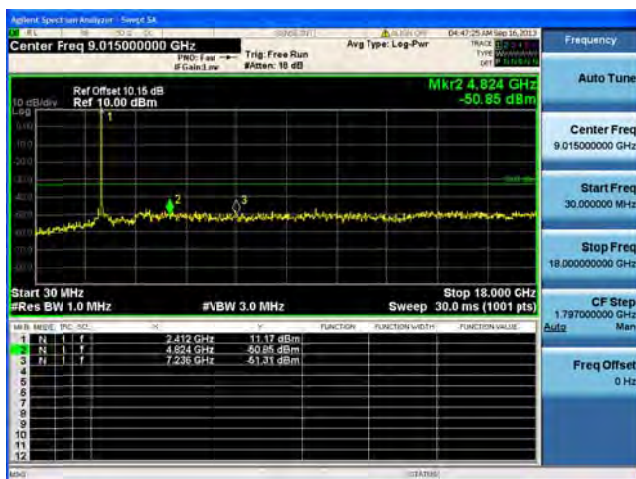
**Conducted Spurs Average, 2462 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B****Antenna C**

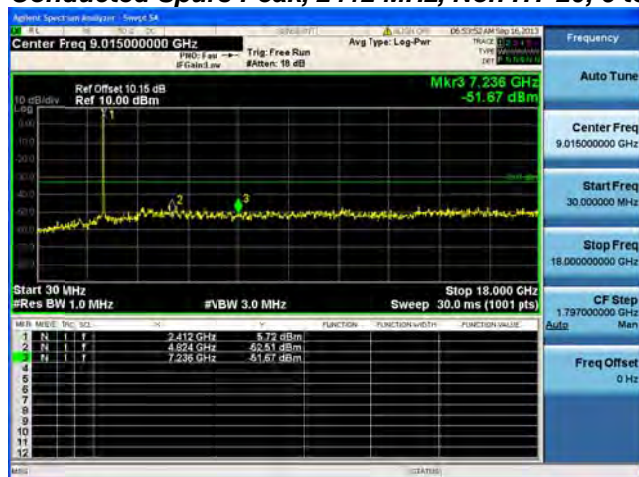


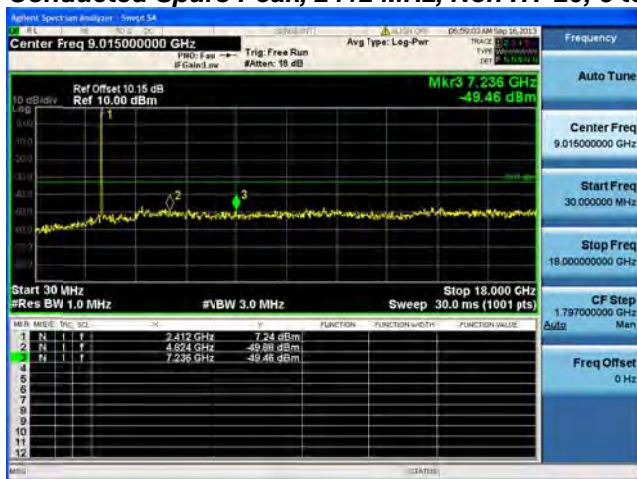
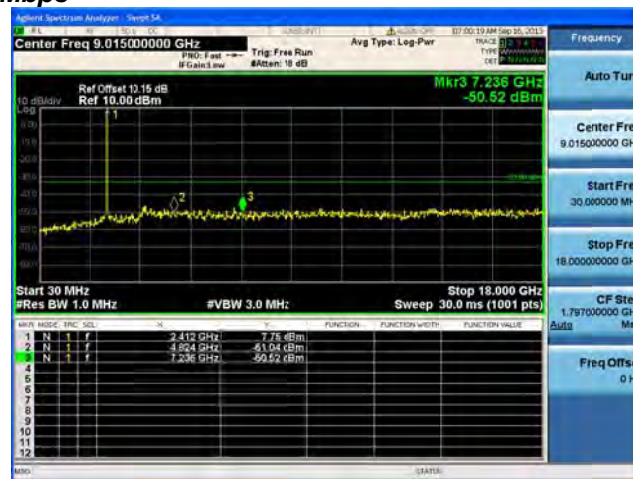
**Conducted Spurs Peak, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A**



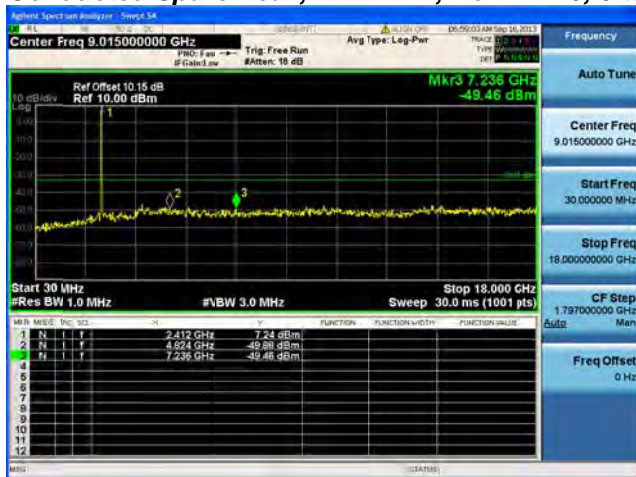
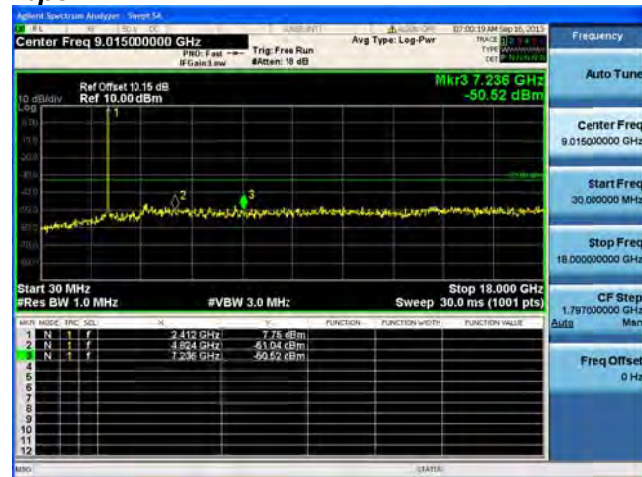
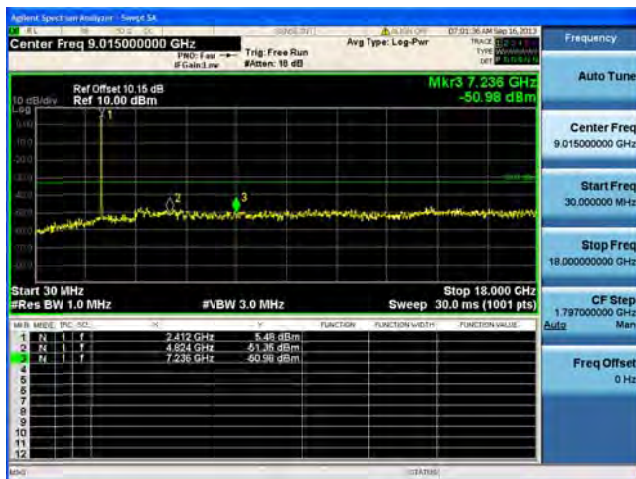
**Conducted Spurs Peak, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B**

**Conducted Spurs Peak, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B****Antenna C**

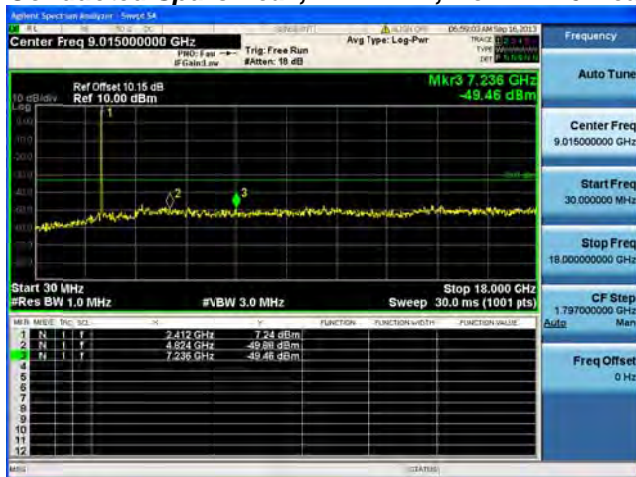
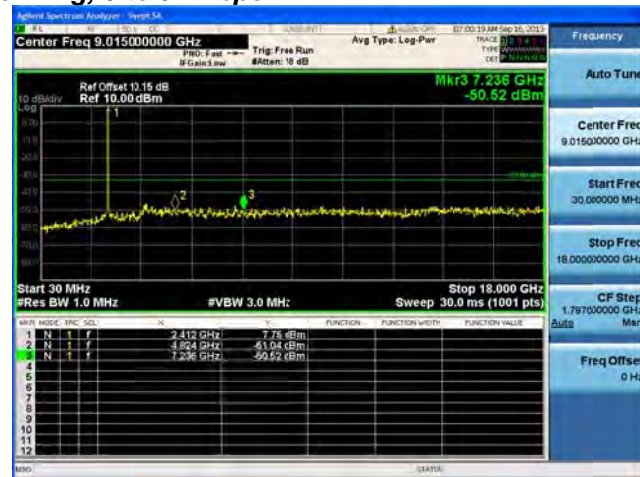
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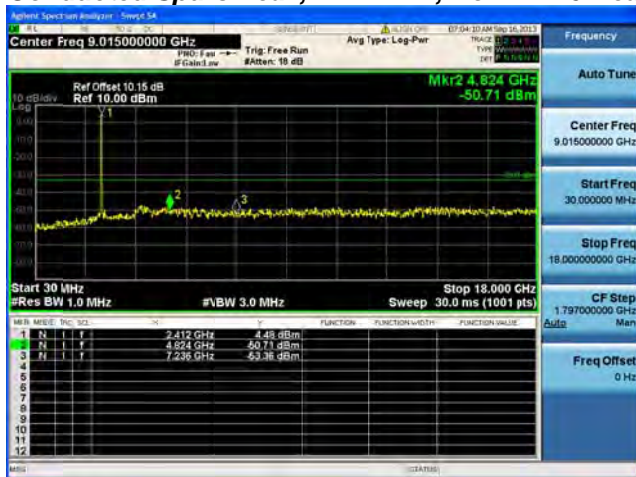
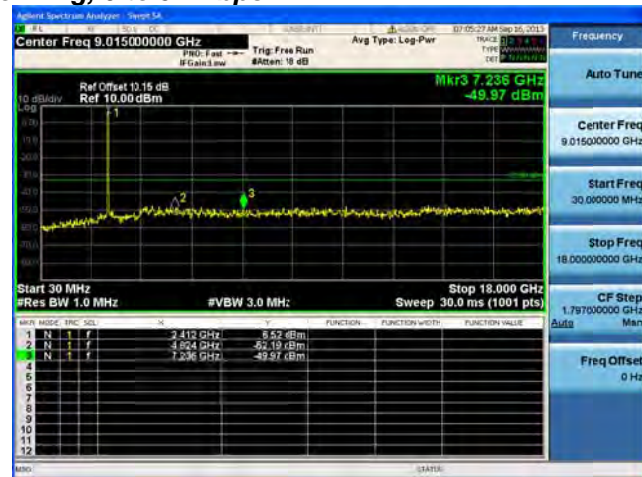
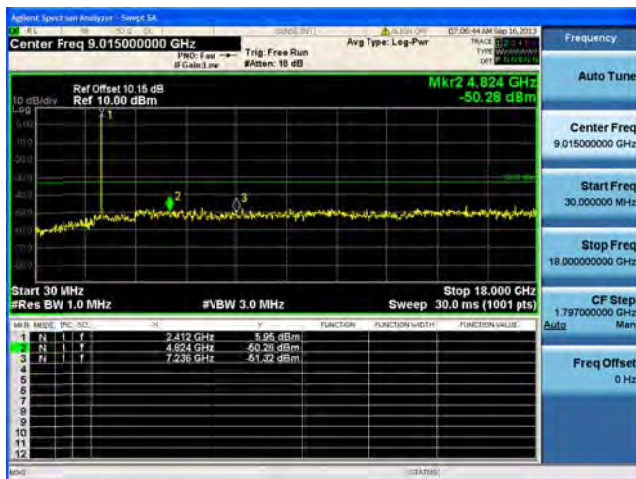
**Conducted Spurs Peak, 2412 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B**

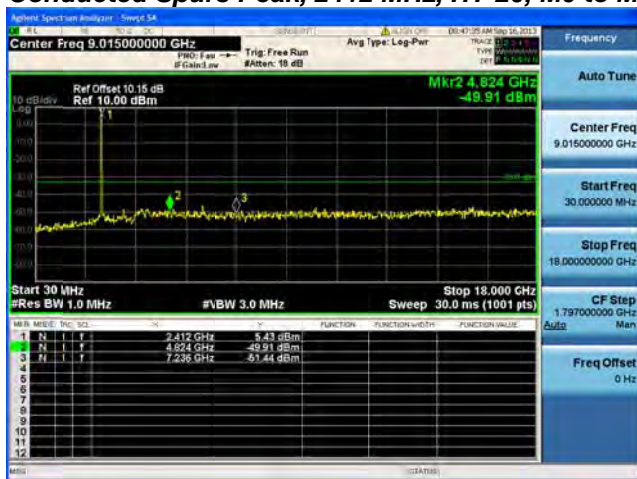


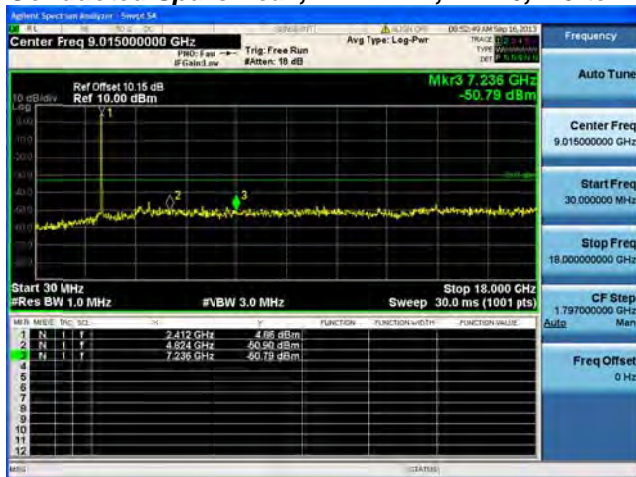
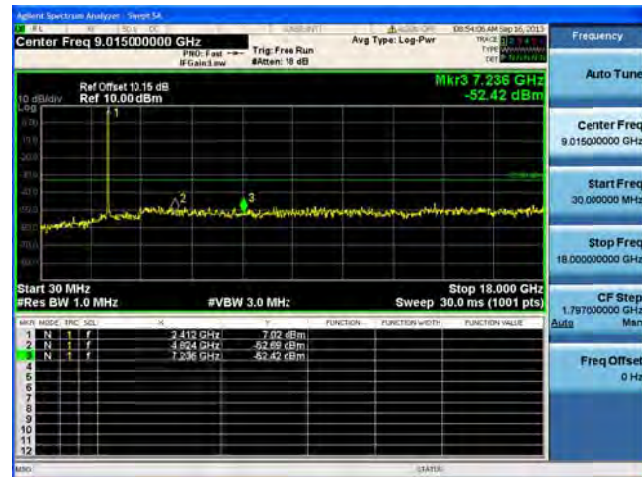
**Conducted Spurs Peak, 2412 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

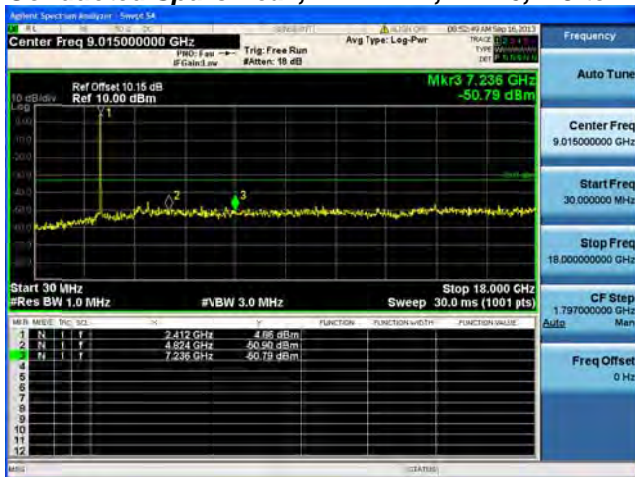
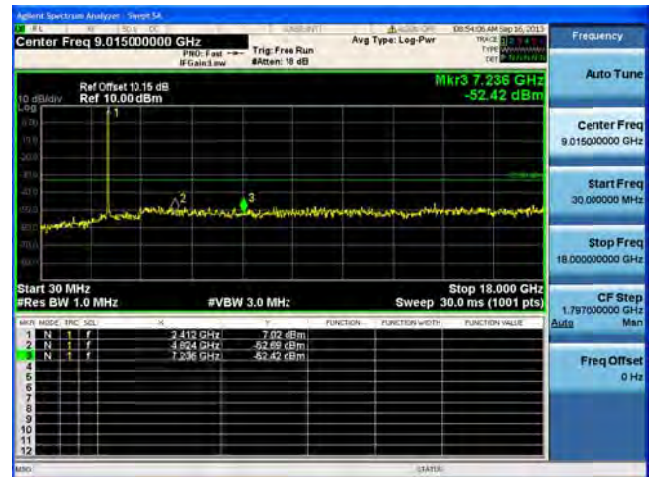


**Conducted Spurs Peak, 2412 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B**

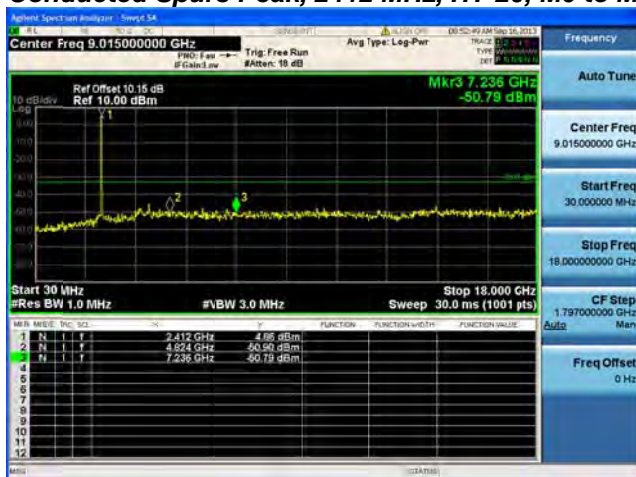
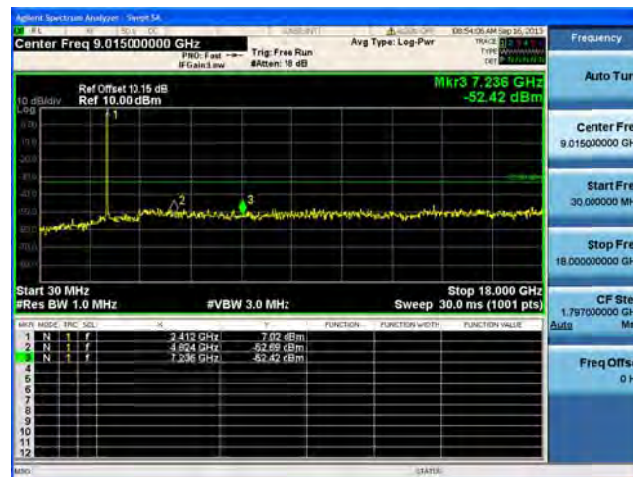
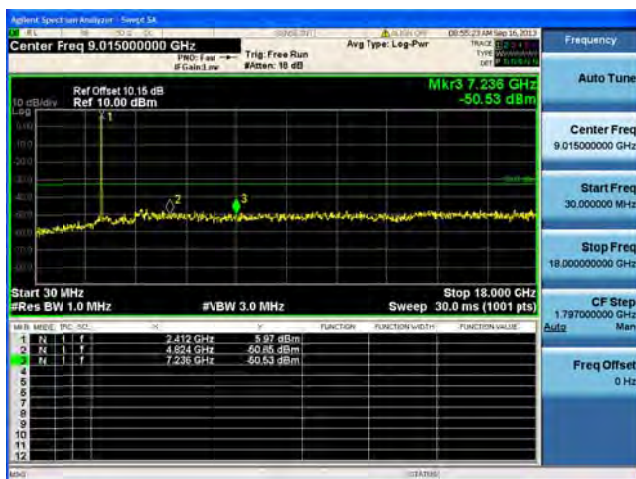
**Conducted Spurs Peak, 2412 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

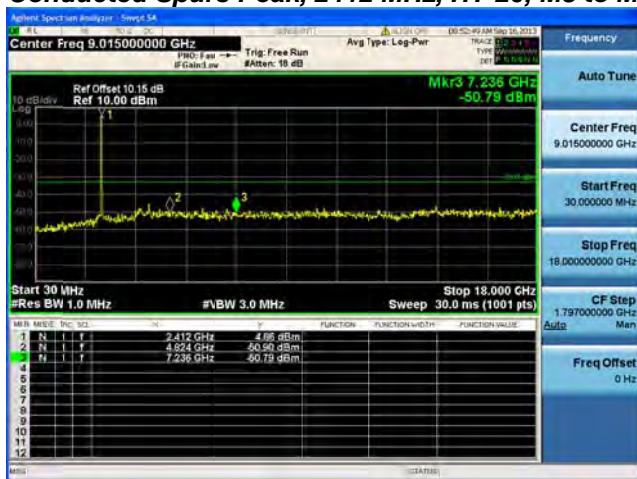
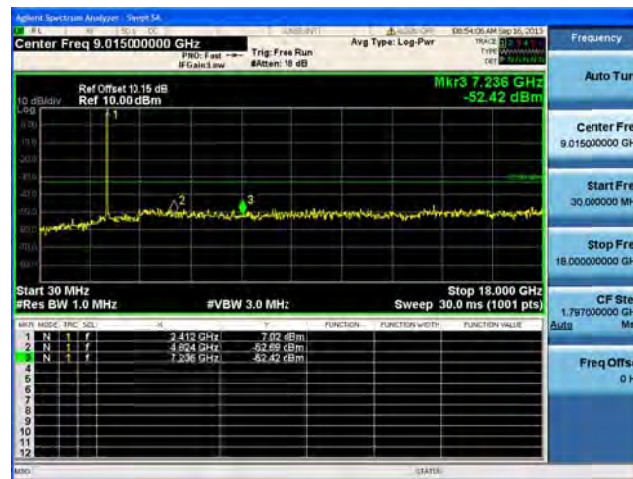
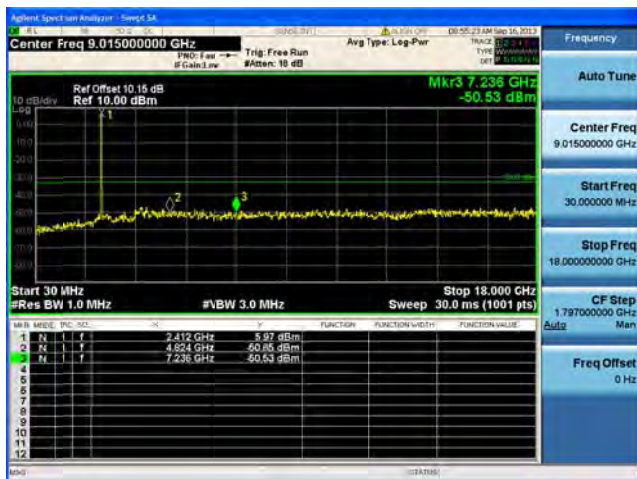
**Conducted Spurs Peak, 2412 MHz, HT-20, M0 to M7****Antenna A**

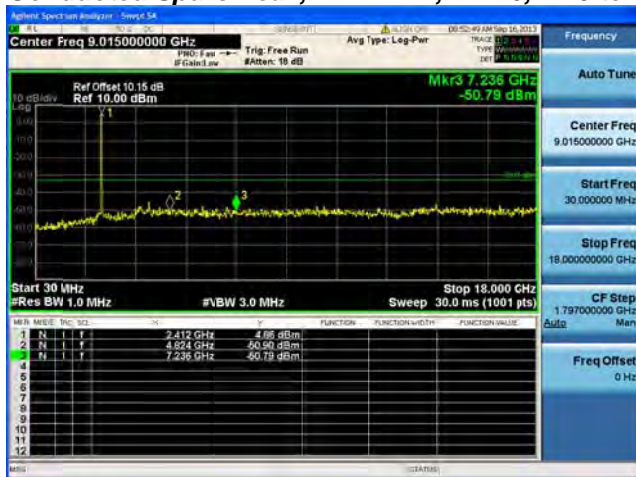
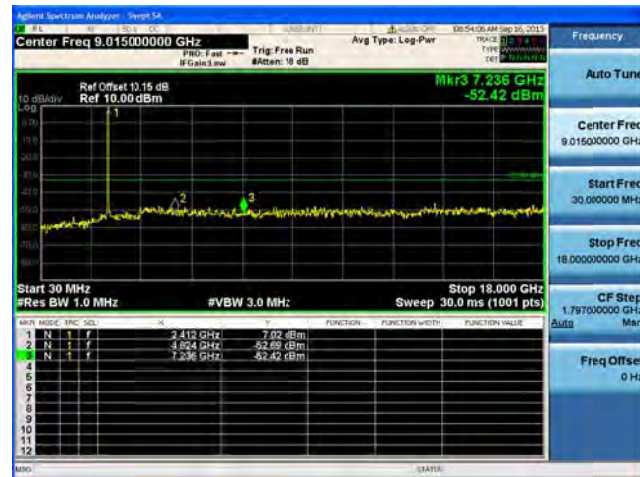
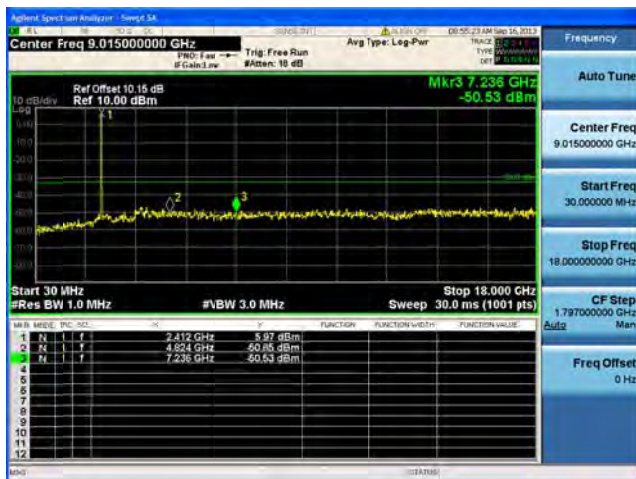
**Conducted Spurs Peak, 2412 MHz, HT-20, M0 to M7****Antenna A****Antenna B**

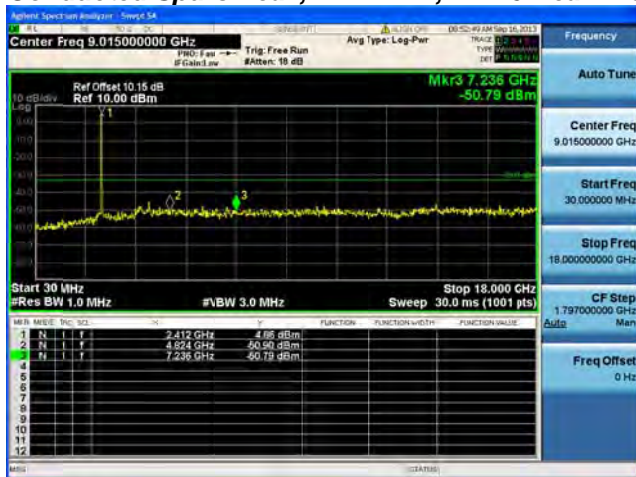
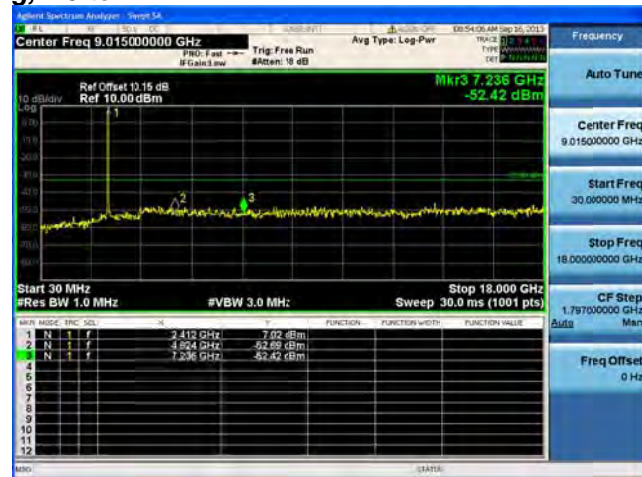
**Conducted Spurs Peak, 2412 MHz, HT-20, M8 to M15****Antenna A****Antenna B**



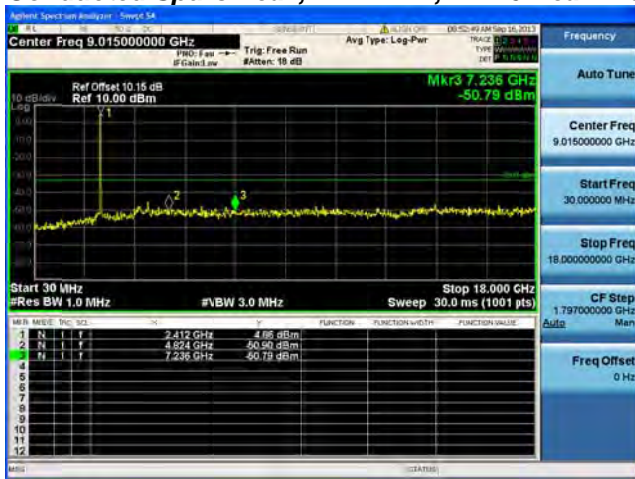
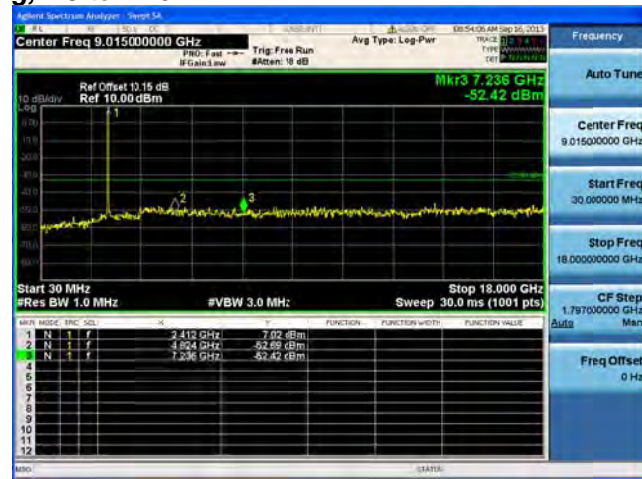
**Conducted Spurs Peak, 2412 MHz, HT-20, M0 to M7****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Peak, 2412 MHz, HT-20, M8 to M15****Antenna A****Antenna B****Antenna C**

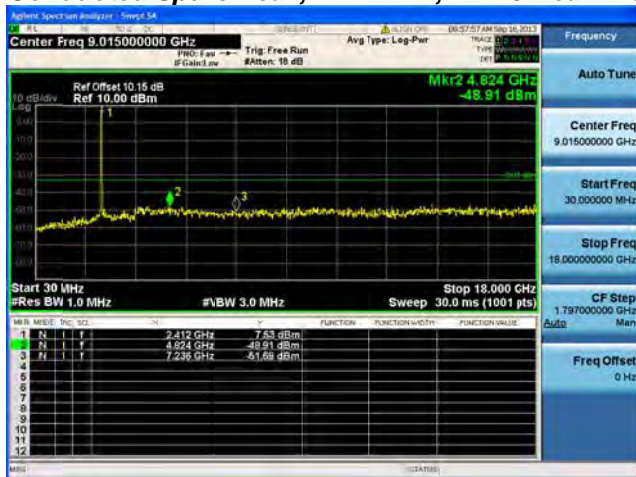
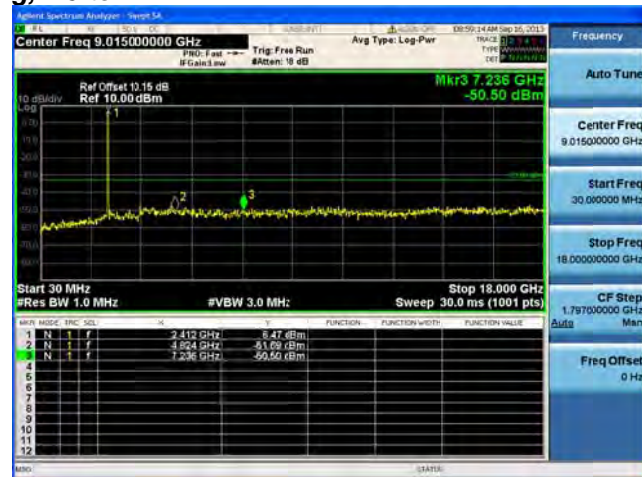
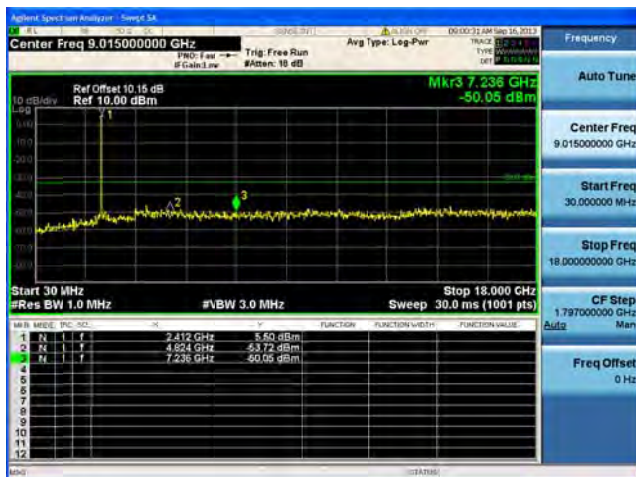
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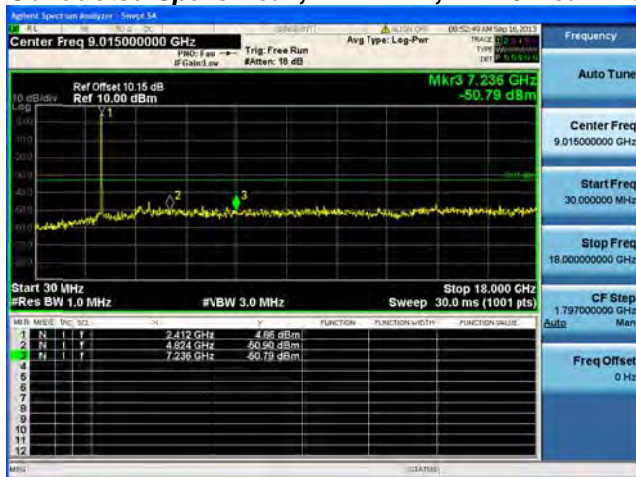
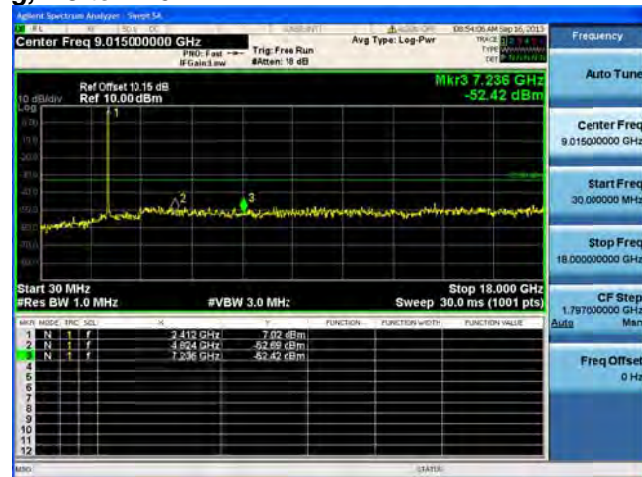
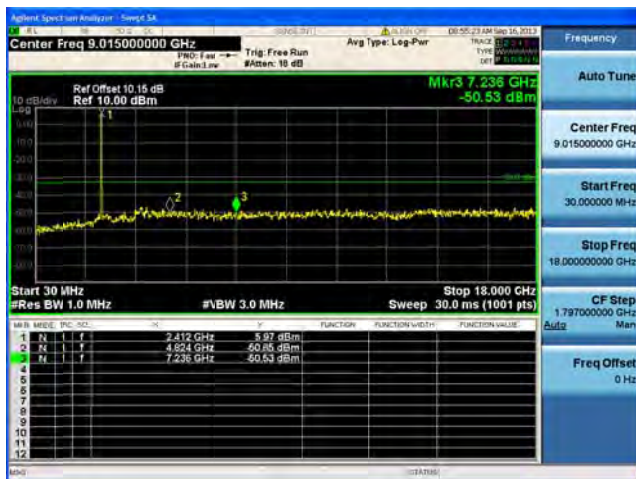
**Conducted Spurs Peak, 2412 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**

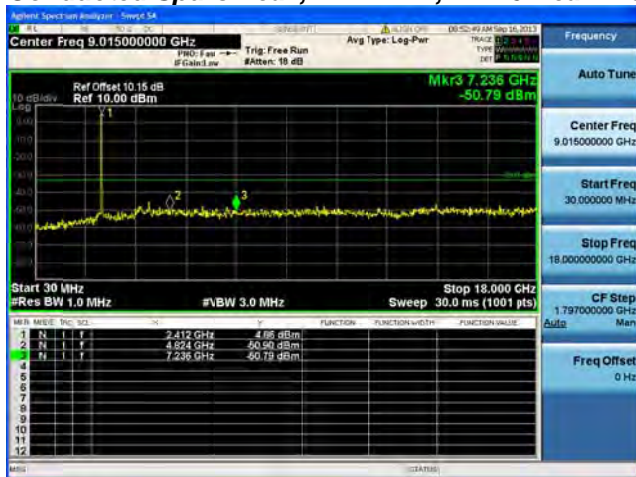
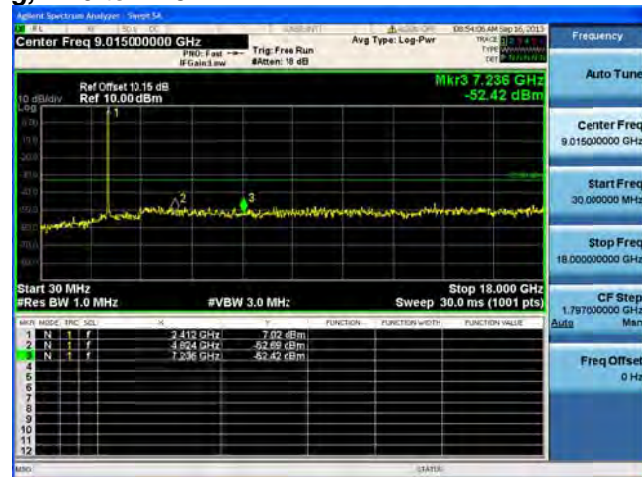
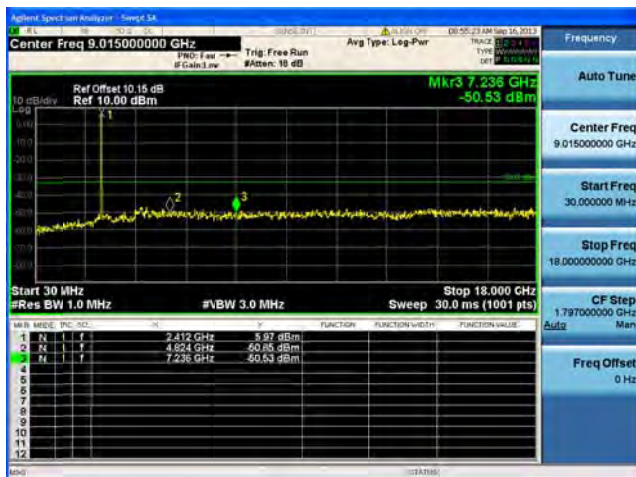


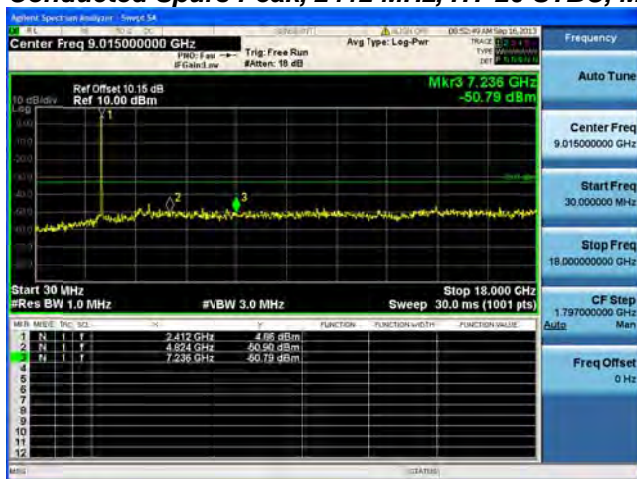
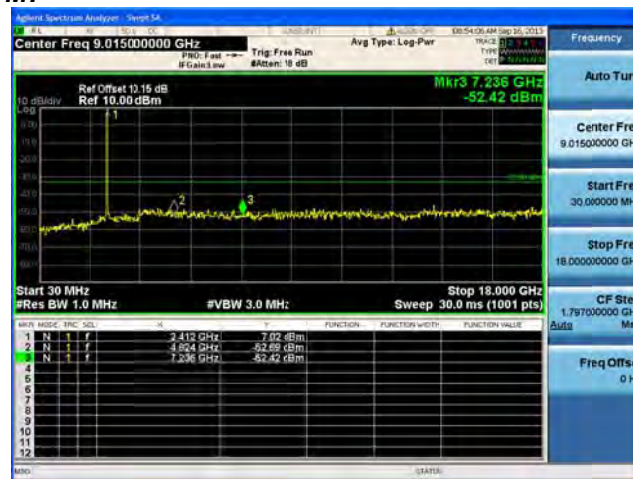
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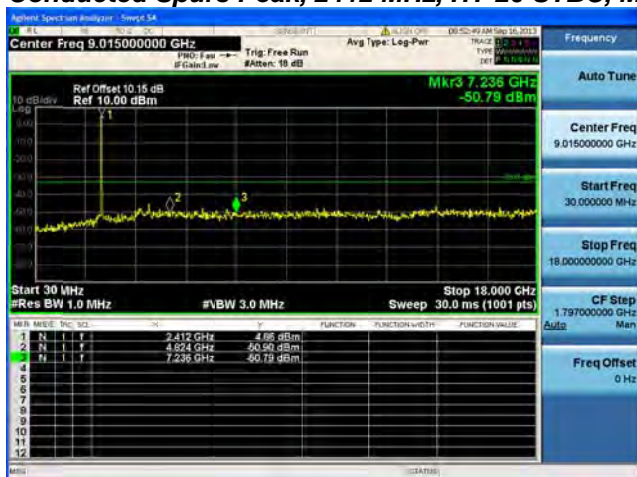
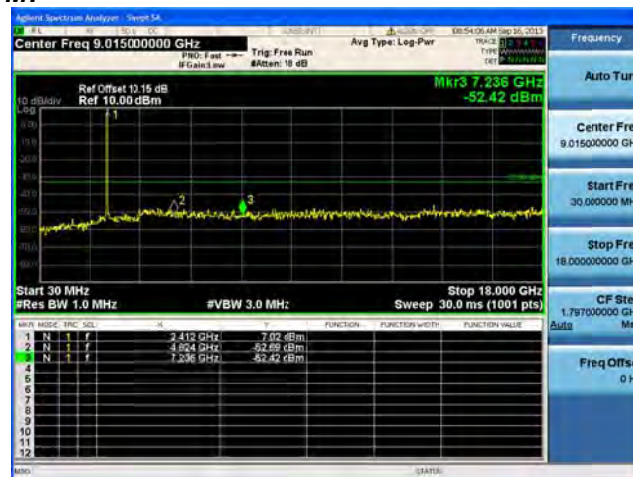
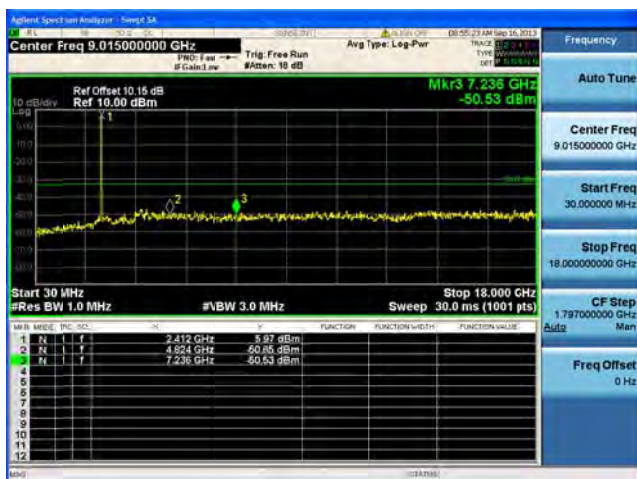
**Conducted Spurs Peak, 2412 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Peak, 2412 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B****Antenna C**

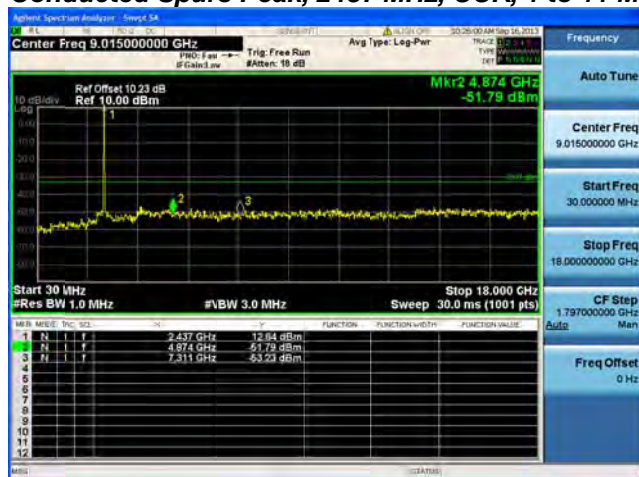
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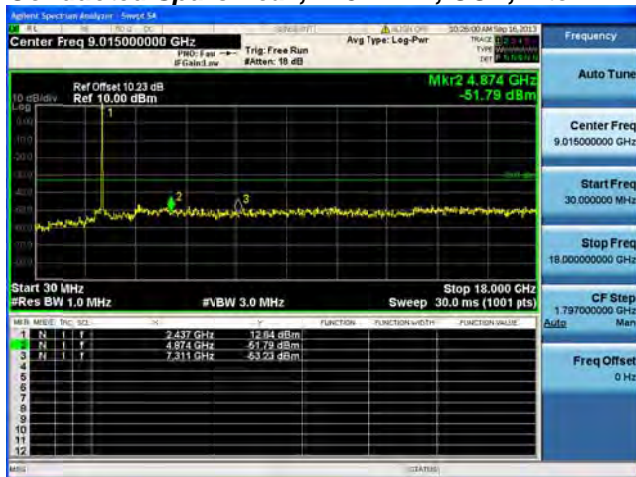
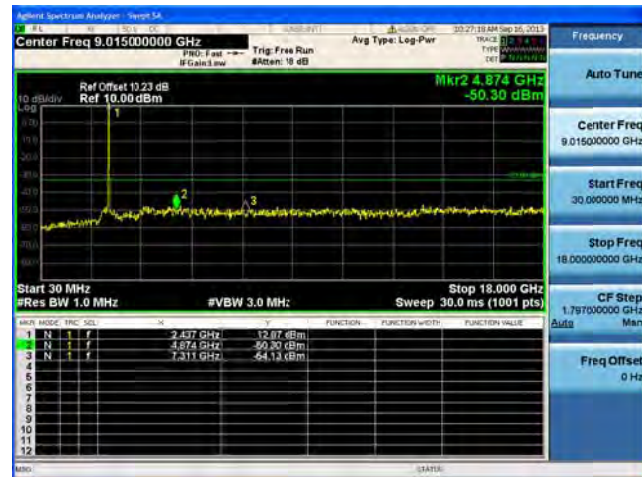
**Conducted Spurs Peak, 2412 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B**

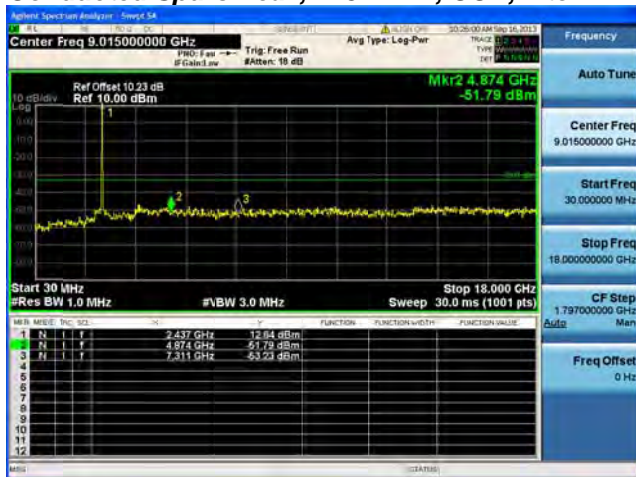
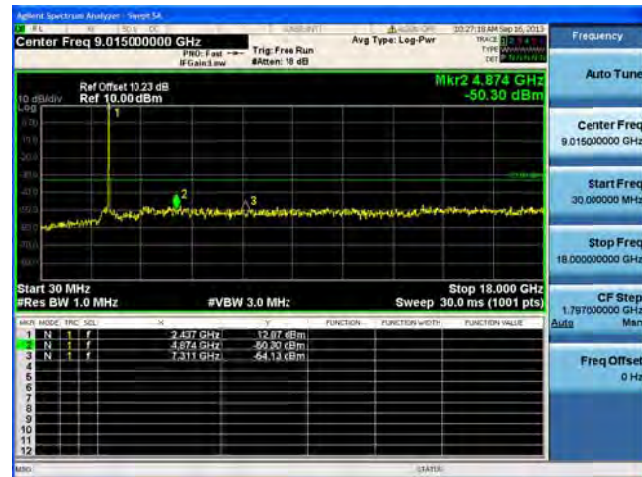
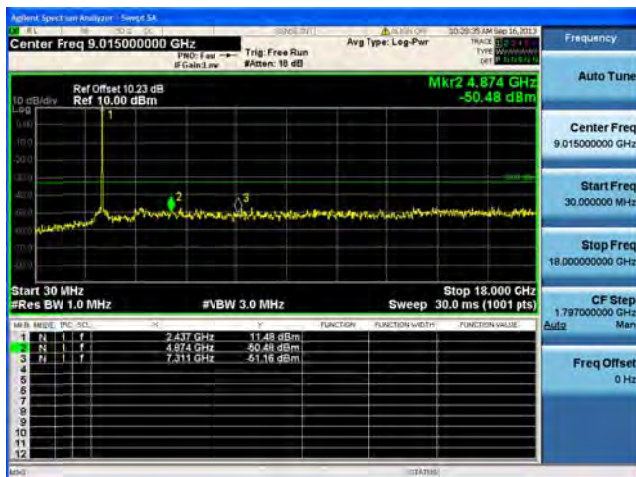


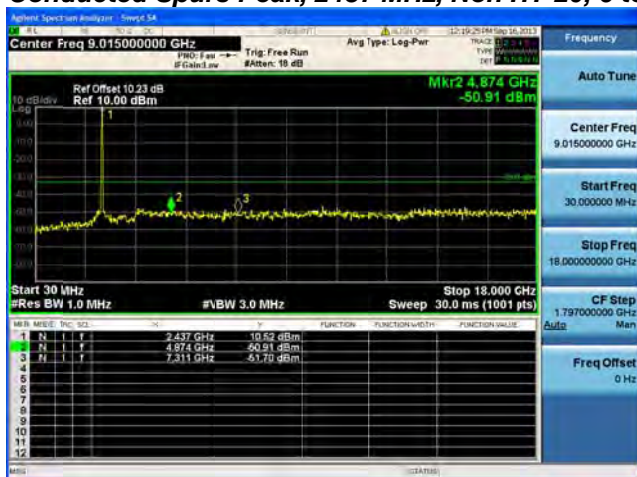
**Conducted Spurs Peak, 2412 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B****Antenna C**

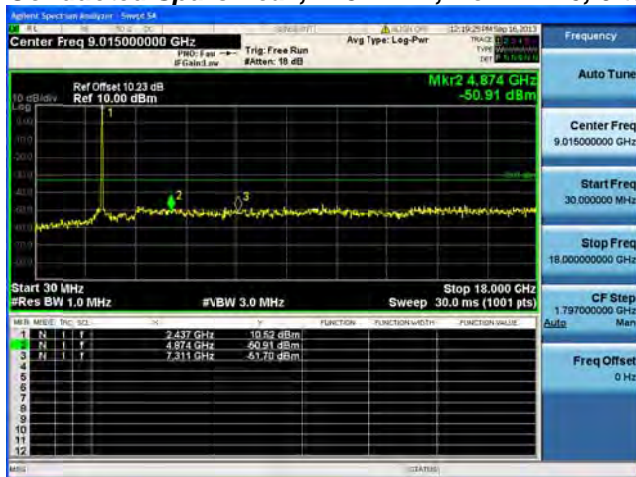
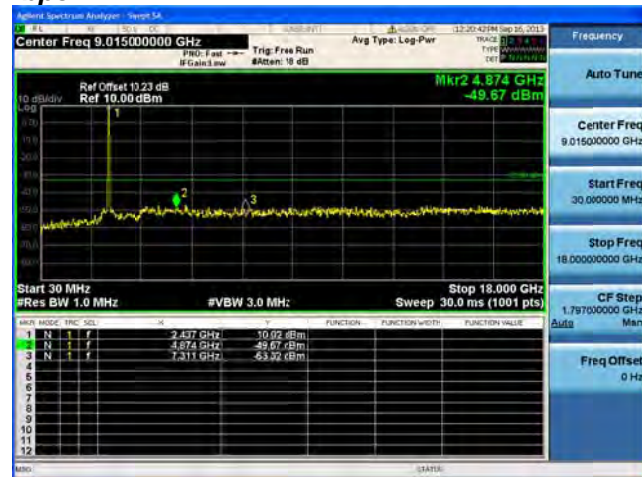


**Conducted Spurs Peak, 2437 MHz, CCK, 1 to 11 Mbps****Antenna A**

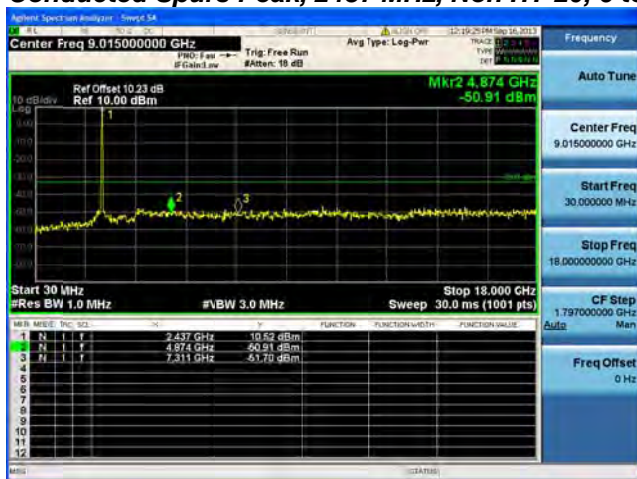
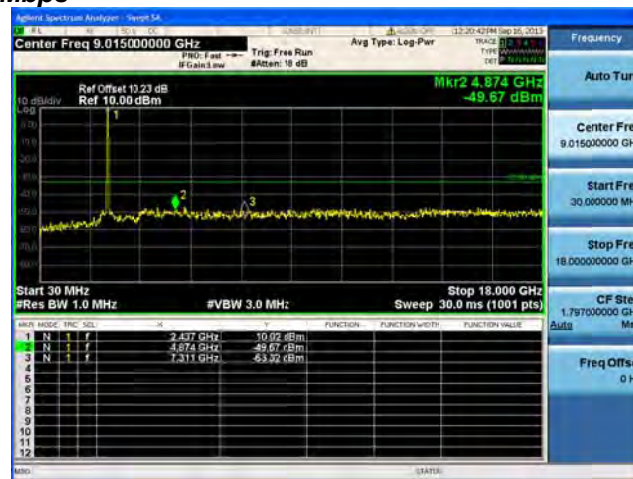
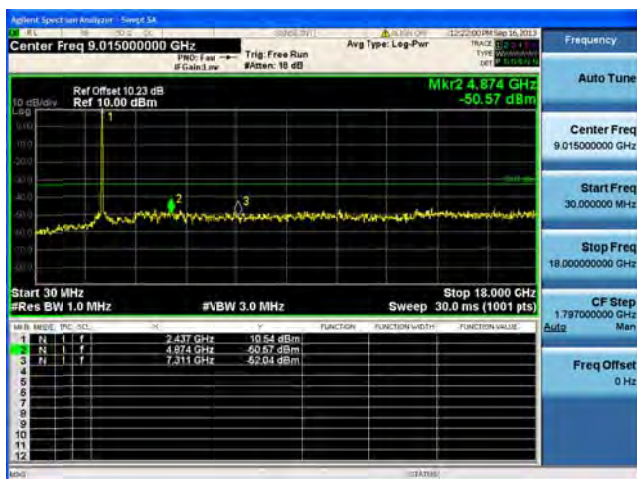
**Conducted Spurs Peak, 2437 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B**

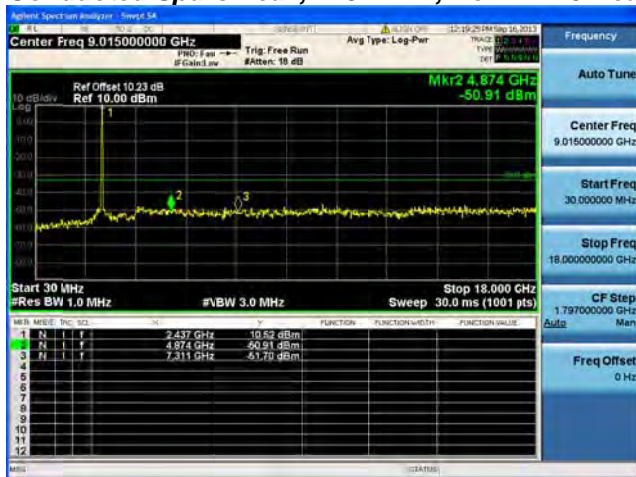
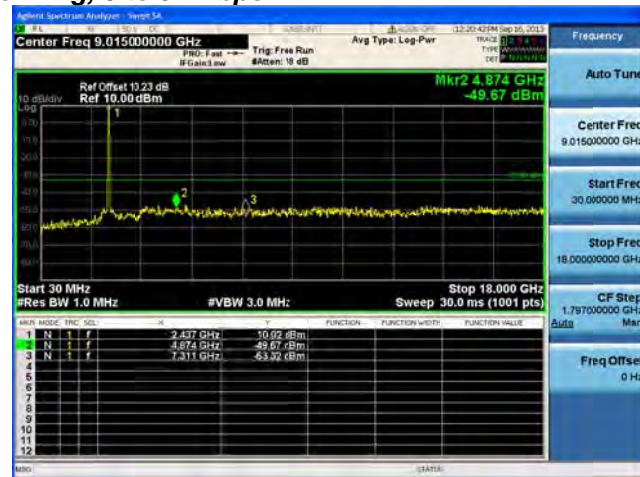
**Conducted Spurs Peak, 2437 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B****Antenna C**

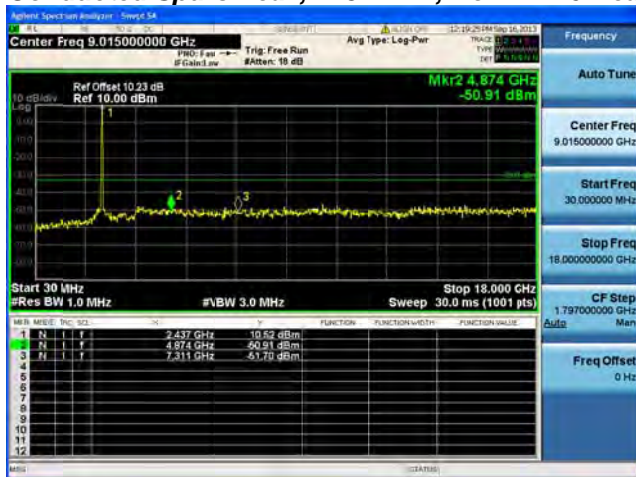
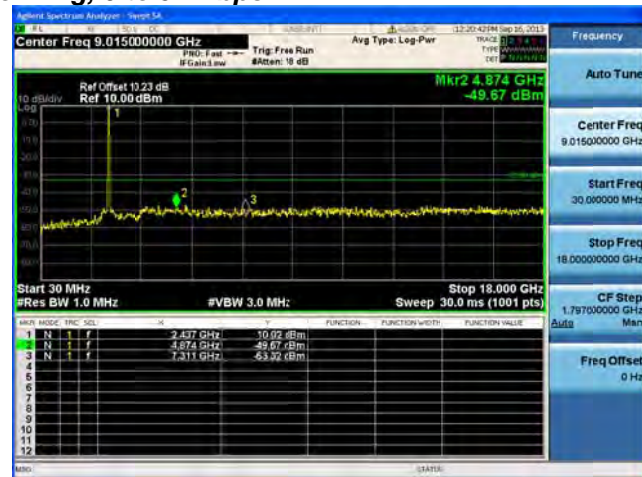
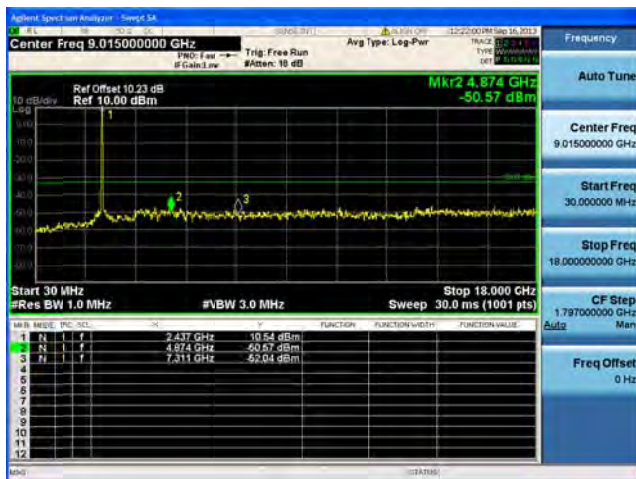
**Conducted Spurs Peak, 2437 MHz, Non HT-20, 6 to 54 Mbps****Antenna A**

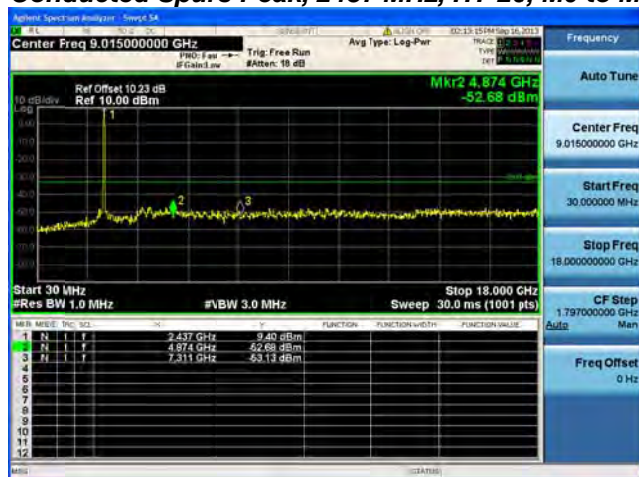
**Conducted Spurs Peak, 2437 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B**



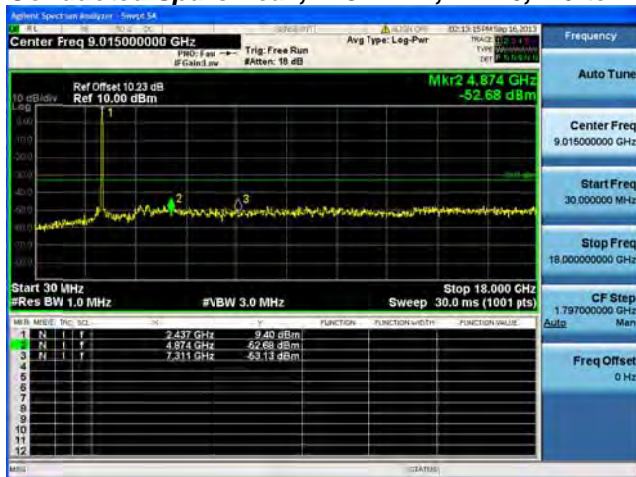
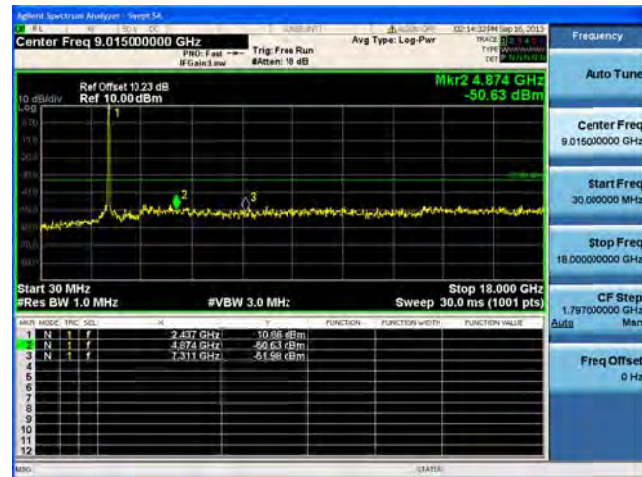
**Conducted Spurs Peak, 2437 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

**Conducted Spurs Peak, 2437 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B**

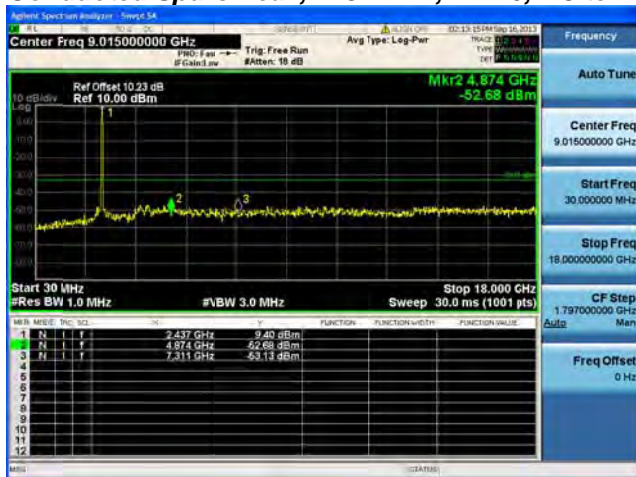
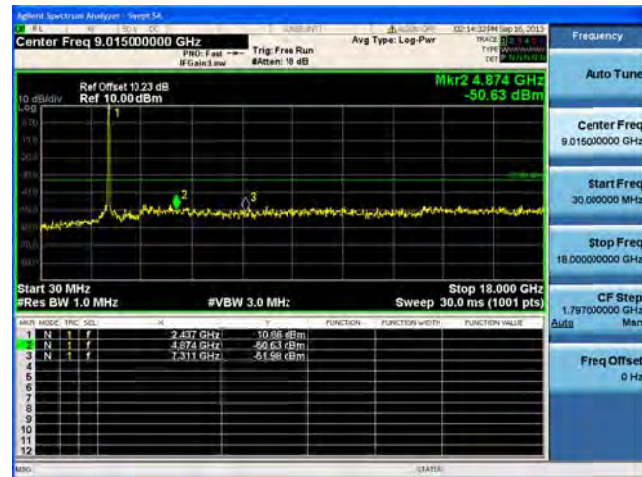
**Conducted Spurs Peak, 2437 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

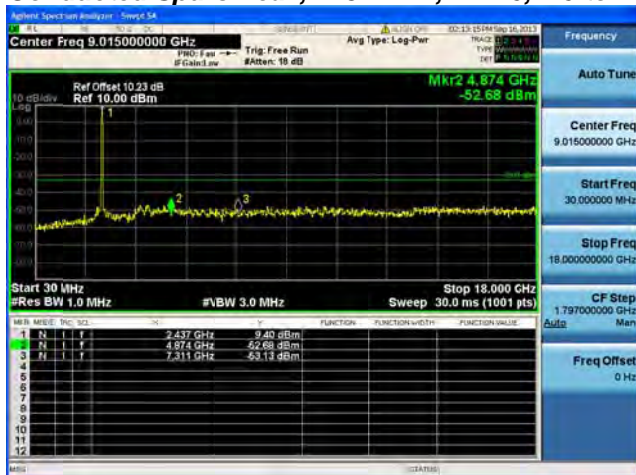
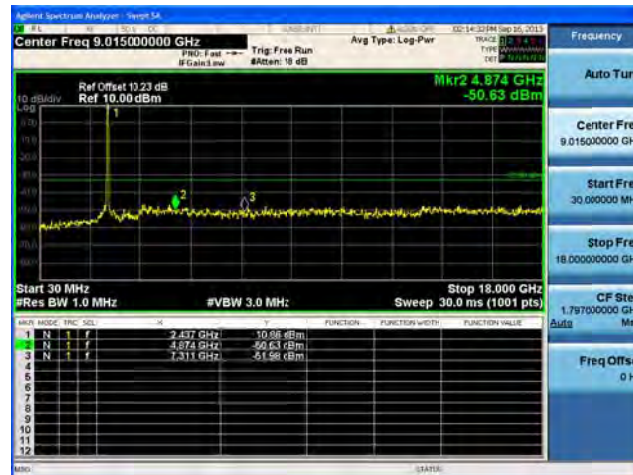
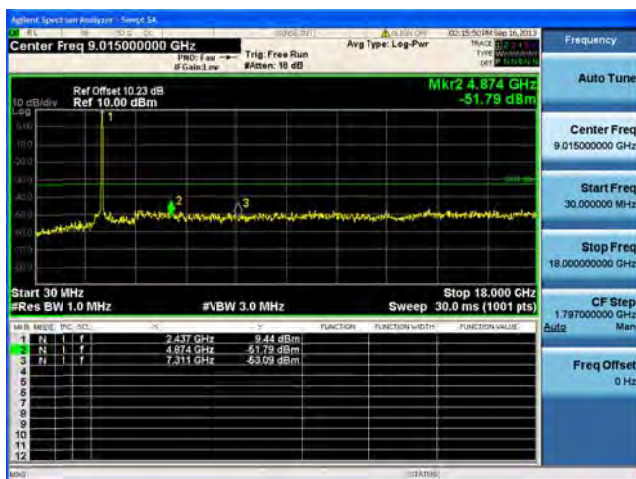
**Conducted Spurs Peak, 2437 MHz, HT-20, M0 to M7****Antenna A**

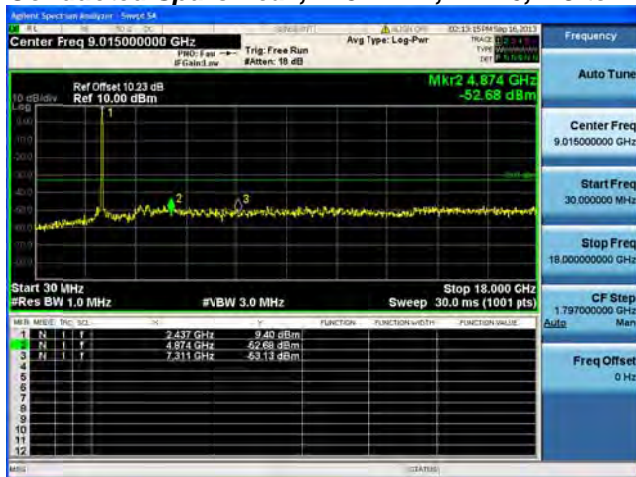
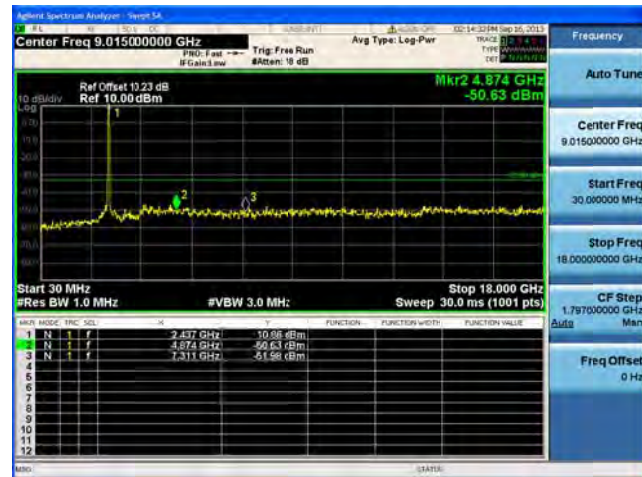
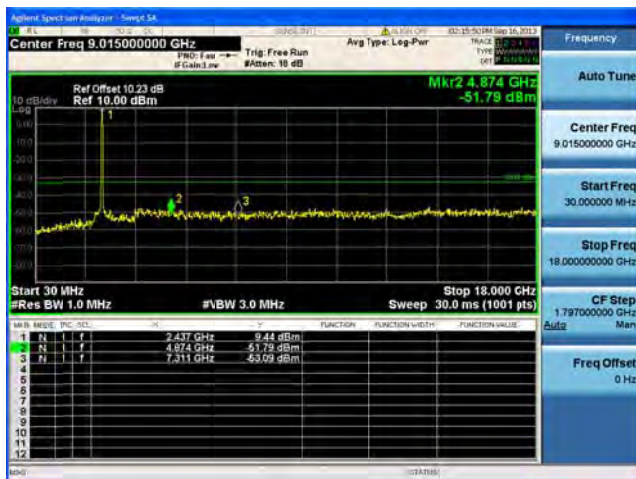


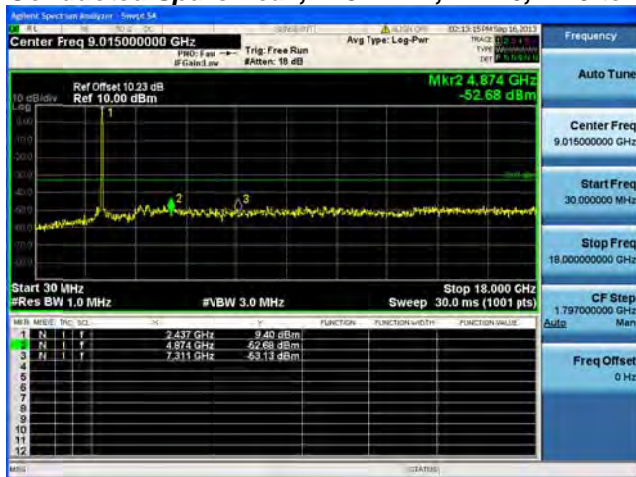
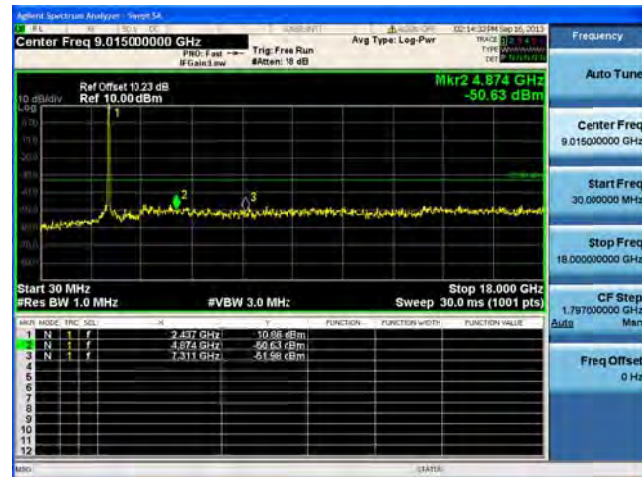
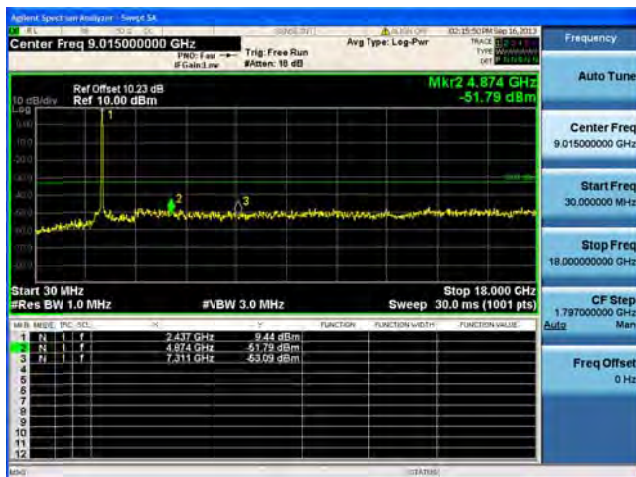
**Conducted Spurs Peak, 2437 MHz, HT-20, M0 to M7****Antenna A****Antenna B**



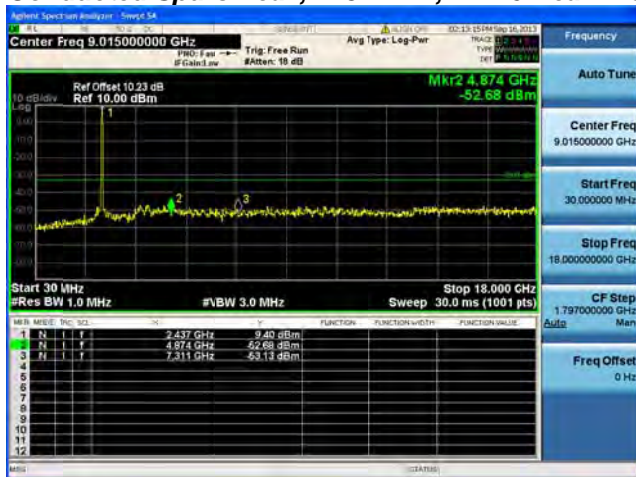
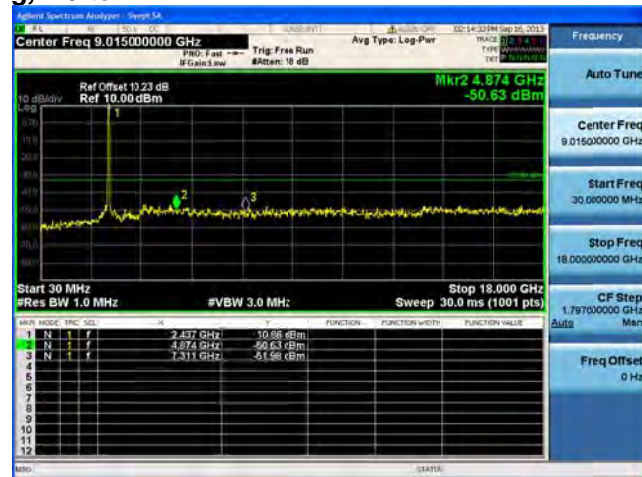
**Conducted Spurs Peak, 2437 MHz, HT-20, M8 to M15****Antenna A****Antenna B**

**Conducted Spurs Peak, 2437 MHz, HT-20, M0 to M7****Antenna A****Antenna B****Antenna C**

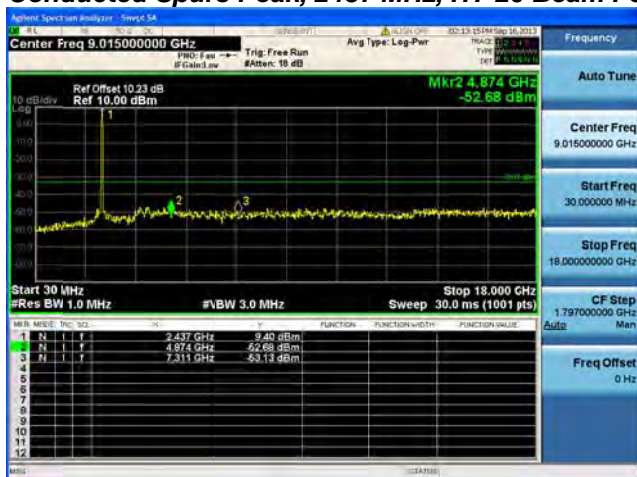
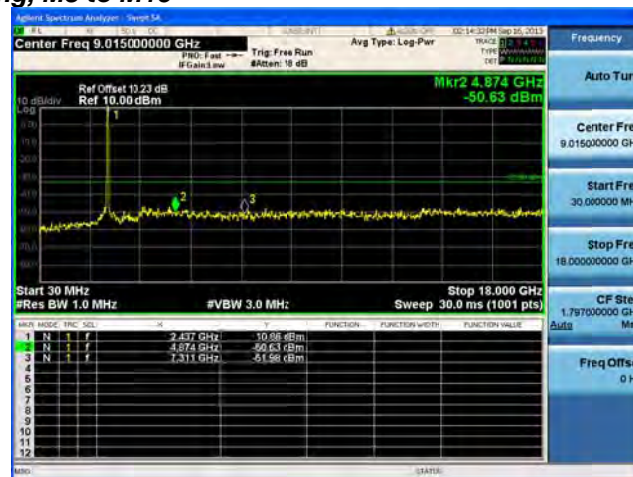
**Conducted Spurs Peak, 2437 MHz, HT-20, M8 to M15****Antenna A****Antenna B****Antenna C**

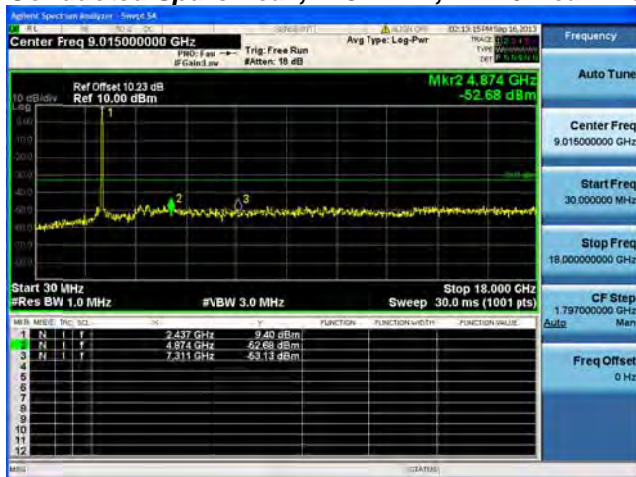
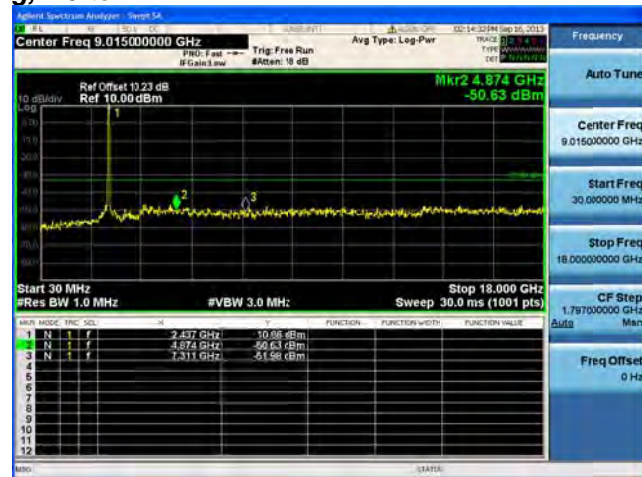
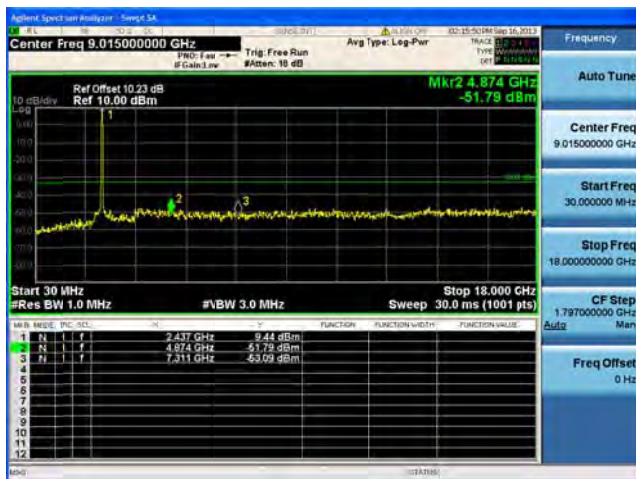
**Conducted Spurs Peak, 2437 MHz, HT-20, M16 to M23****Antenna A****Antenna B****Antenna C**

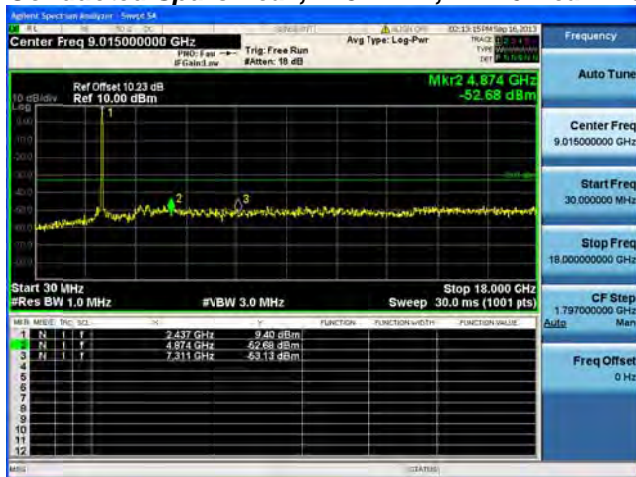
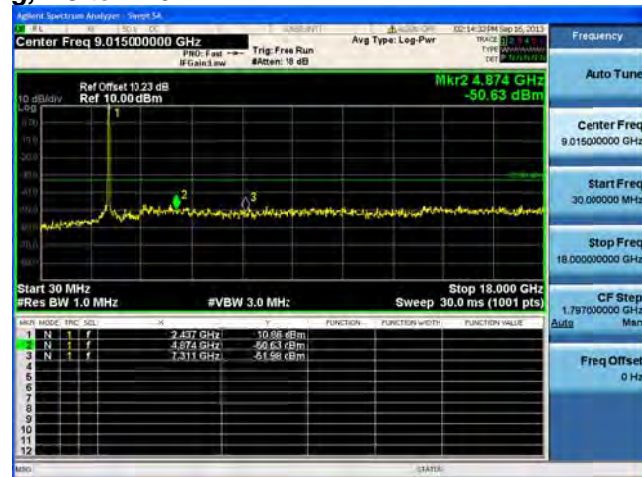
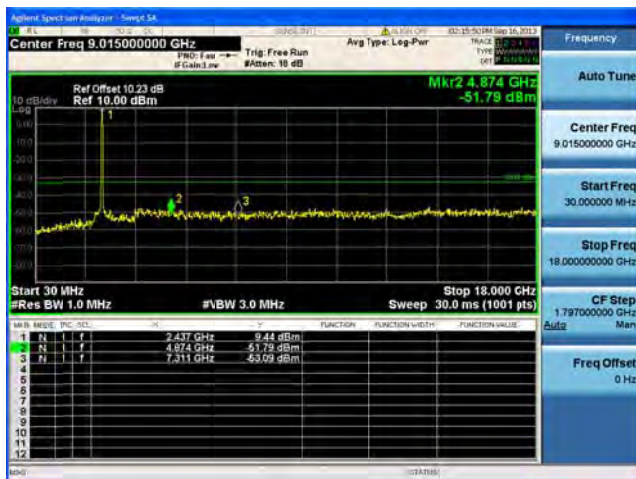


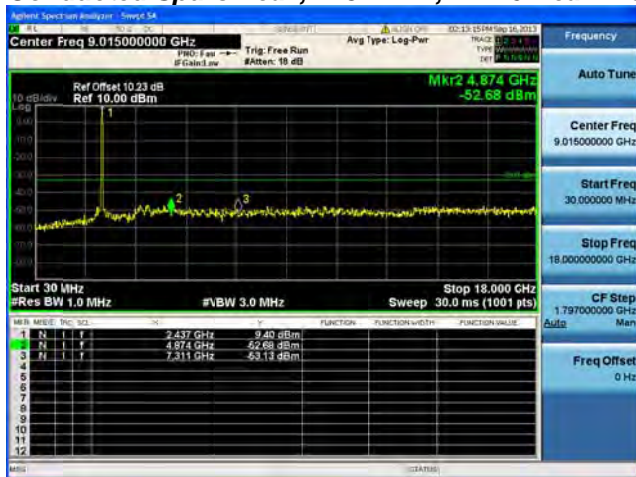
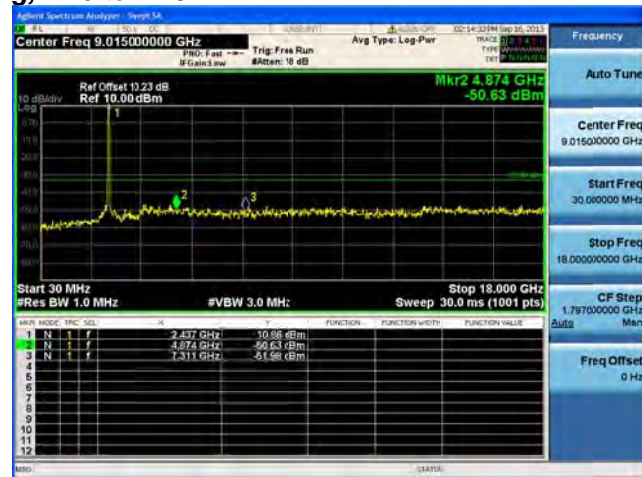
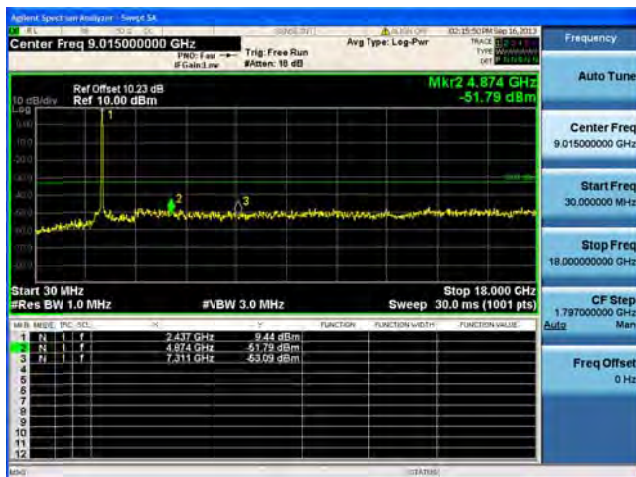
**Conducted Spurs Peak, 2437 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**



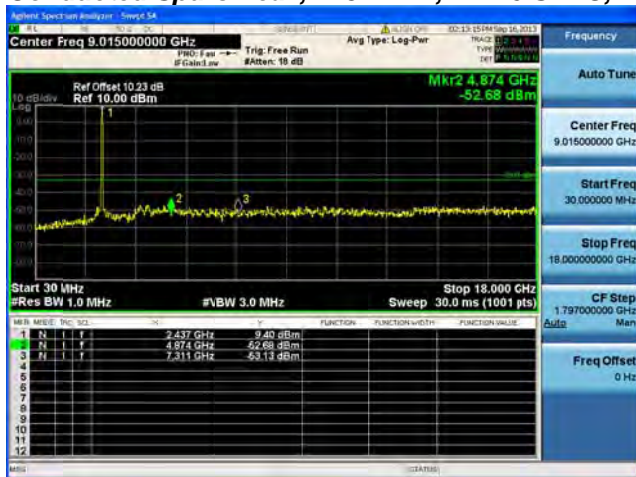
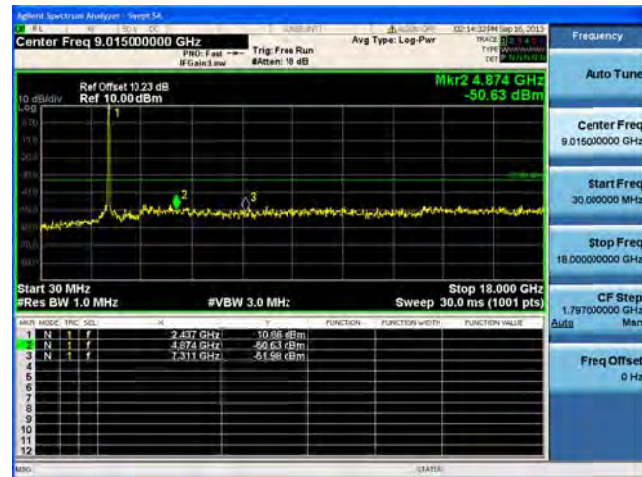
**Conducted Spurs Peak, 2437 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B**

**Conducted Spurs Peak, 2437 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B****Antenna C**

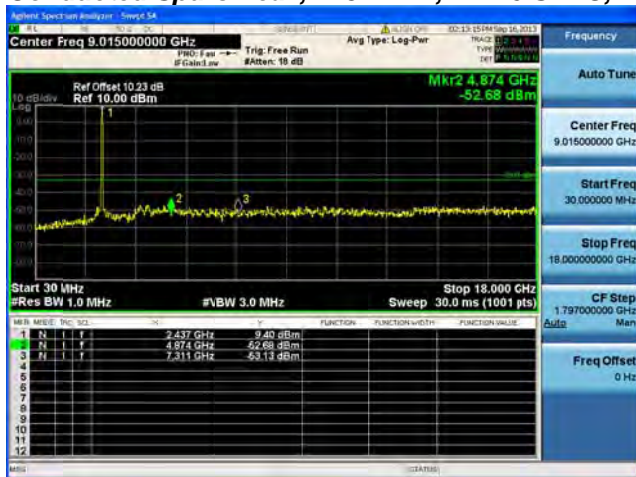
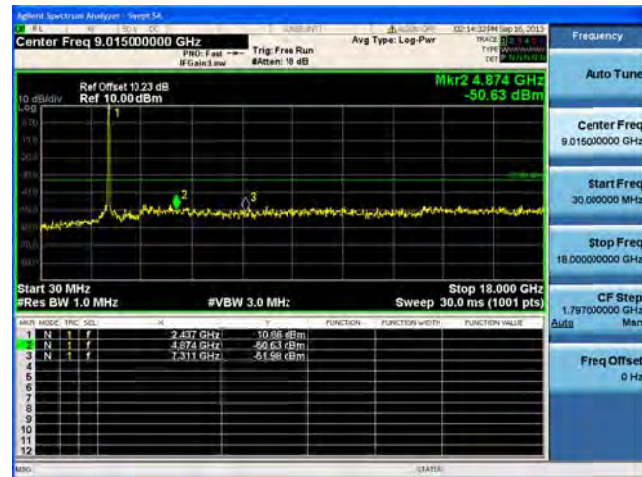
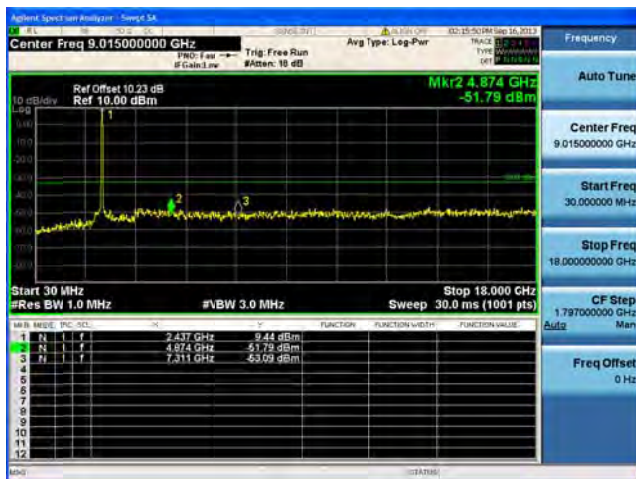
**Conducted Spurs Peak, 2437 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B****Antenna C**

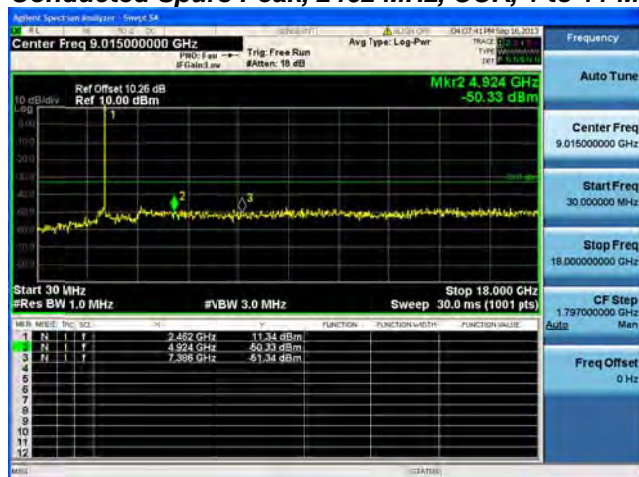
**Conducted Spurs Peak, 2437 MHz, HT-20 Beam Forming, M16 to M23****Antenna A****Antenna B****Antenna C**

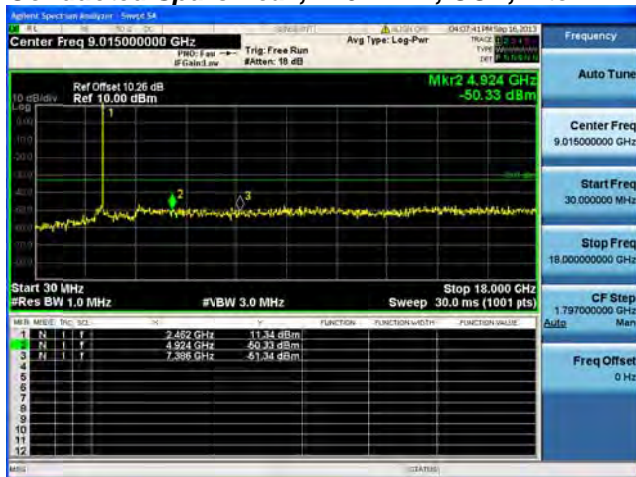
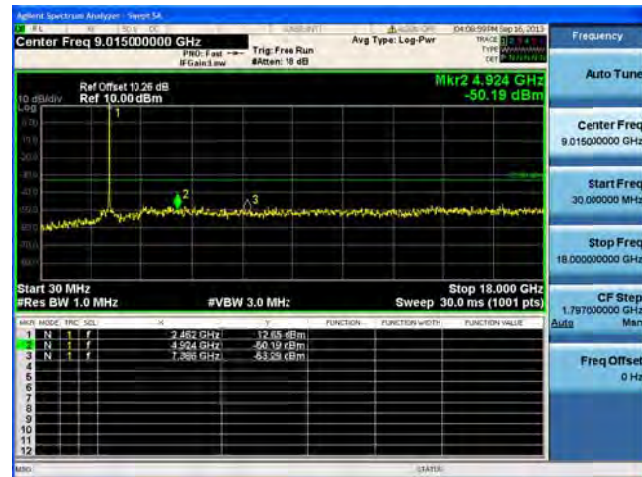


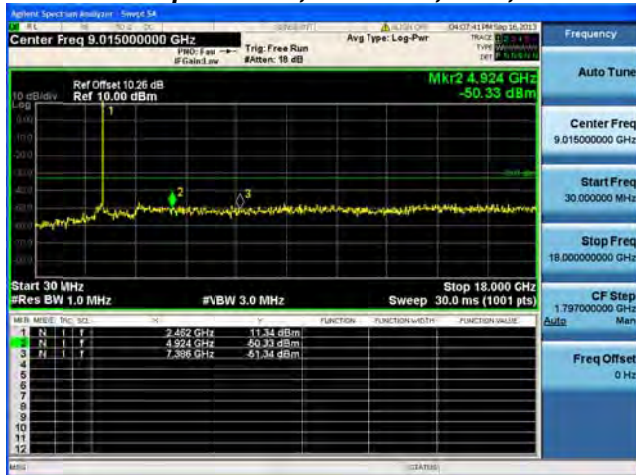
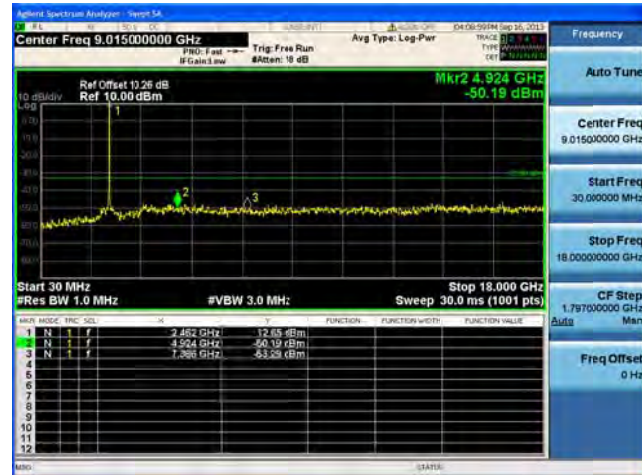
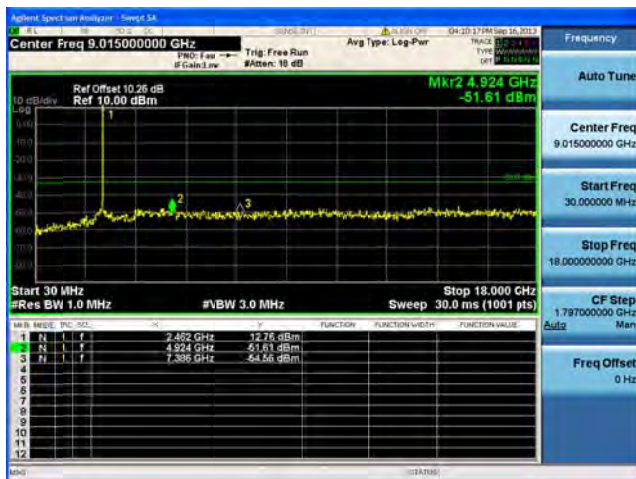
**Conducted Spurs Peak, 2437 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B**

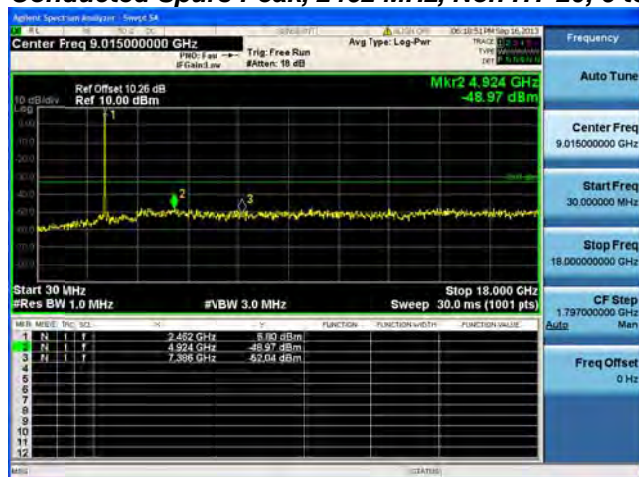


**Conducted Spurs Peak, 2437 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B****Antenna C**

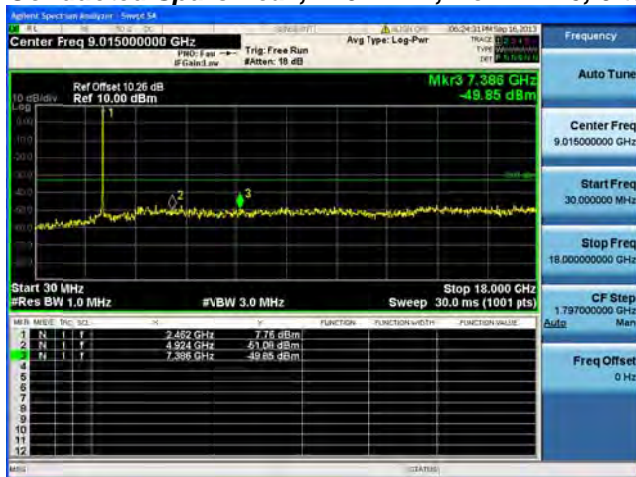
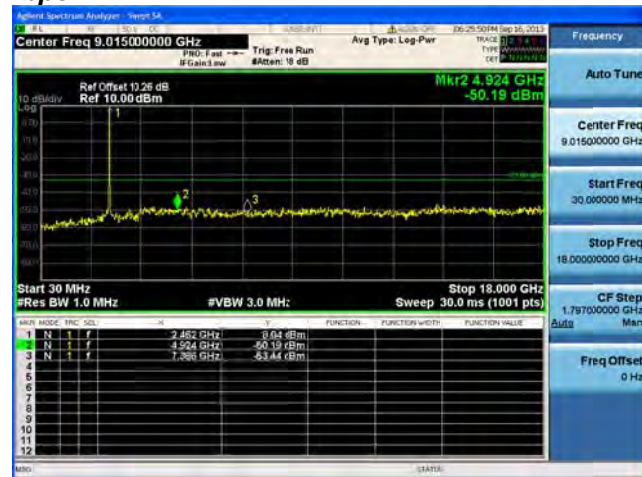
**Conducted Spurs Peak, 2462 MHz, CCK, 1 to 11 Mbps****Antenna A**

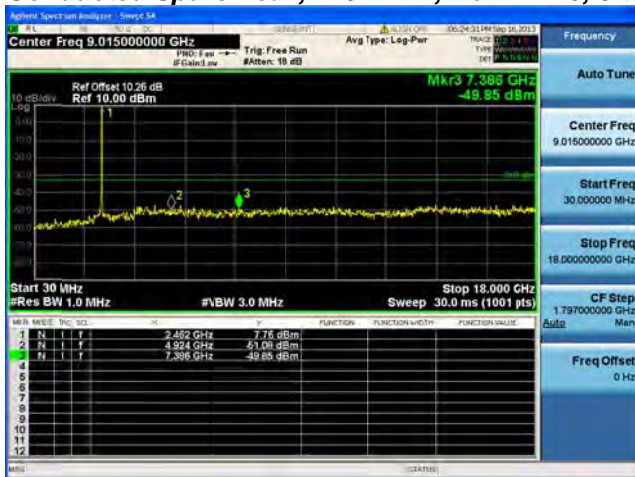
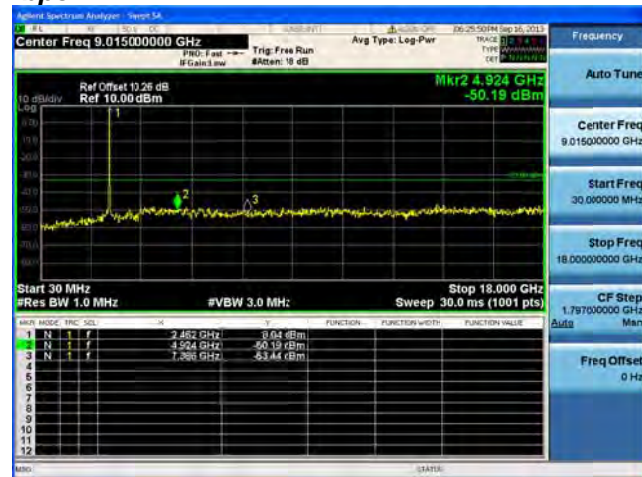
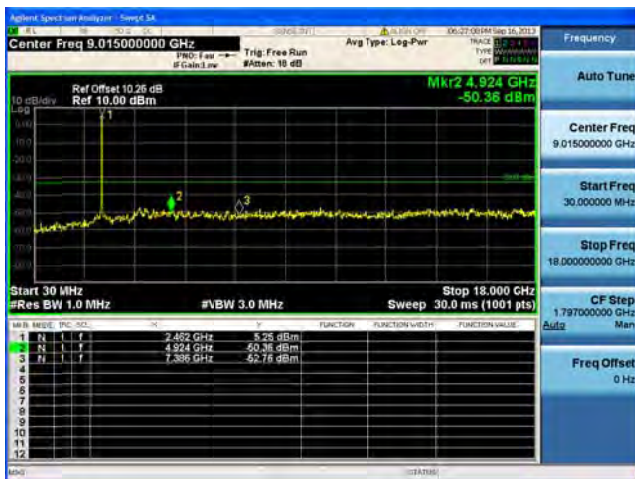
**Conducted Spurs Peak, 2462 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B**

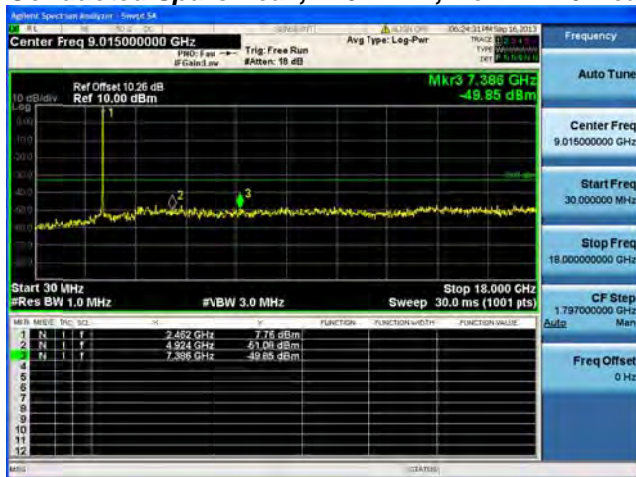
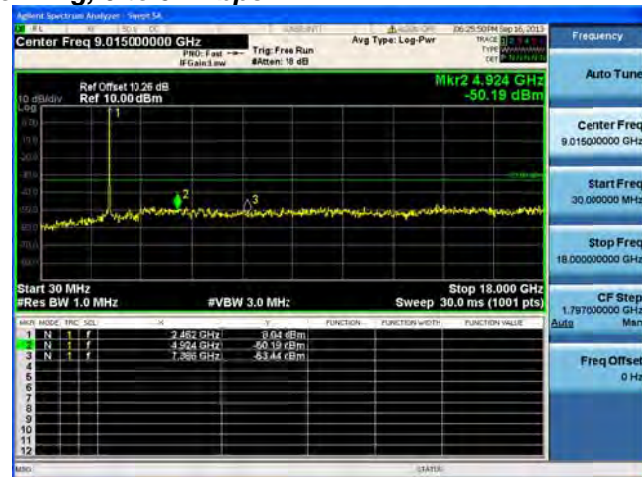
**Conducted Spurs Peak, 2462 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B****Antenna C**

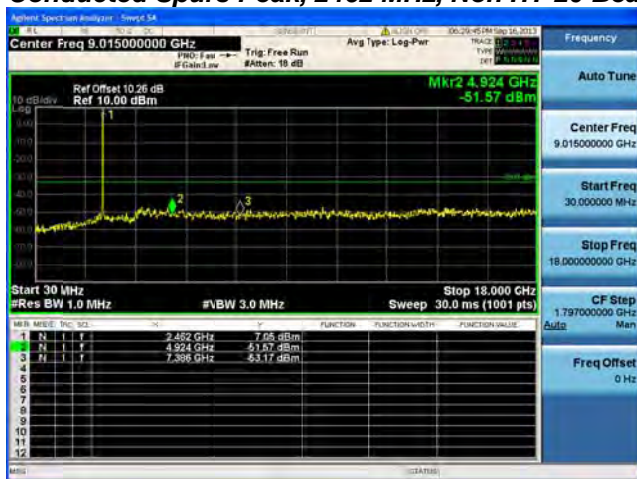
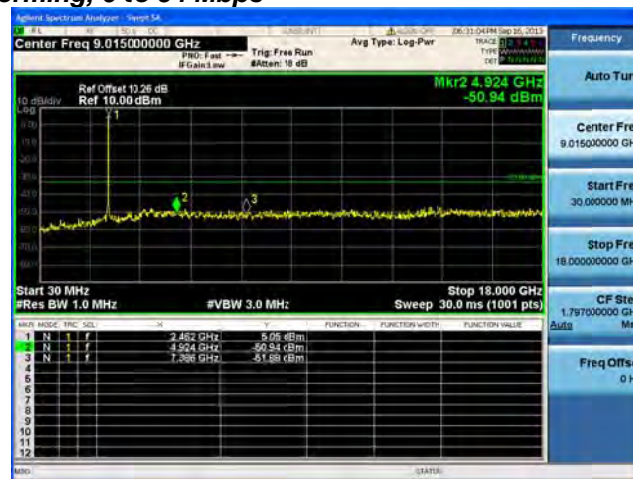
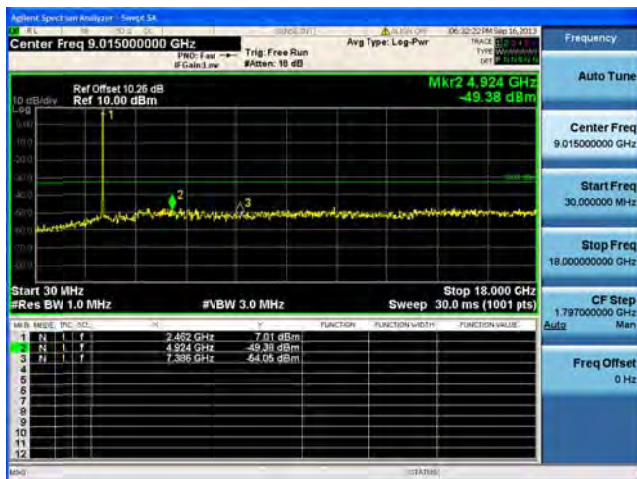
**Conducted Spurs Peak, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A**



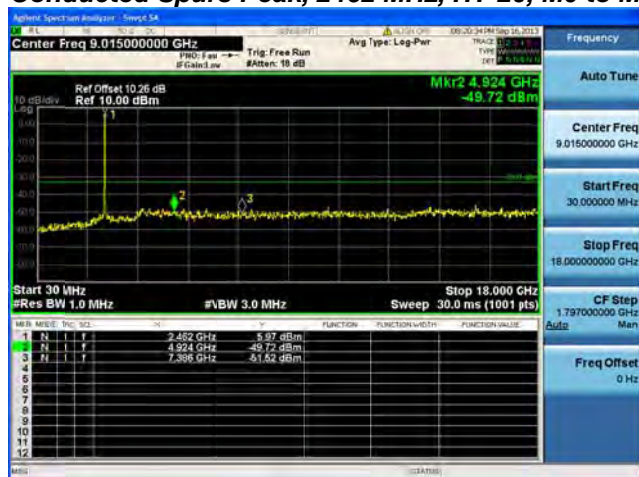
**Conducted Spurs Peak, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B**

**Conducted Spurs Peak, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

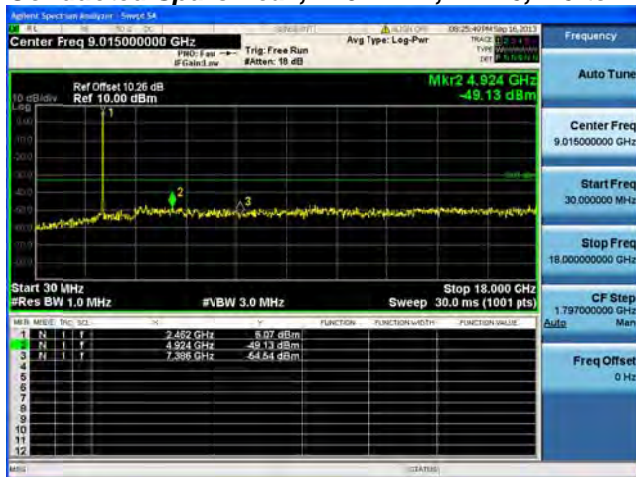
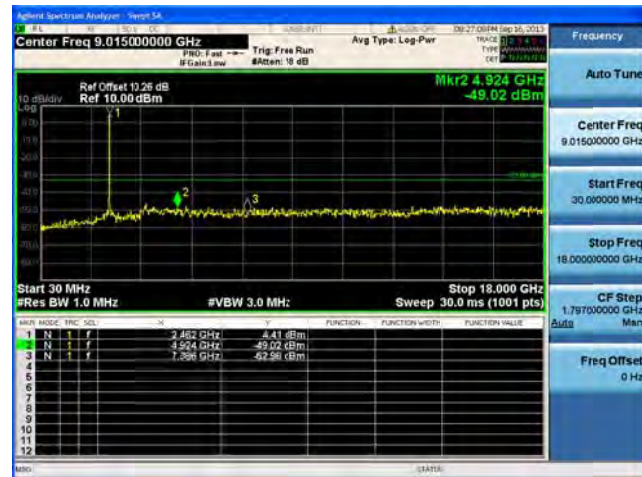
**Conducted Spurs Peak, 2462 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B**

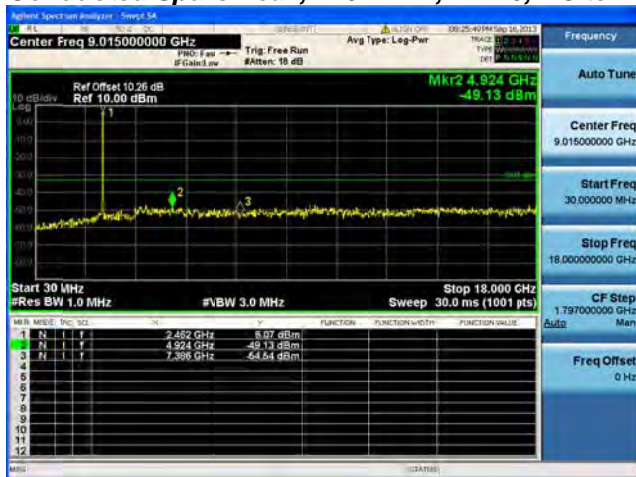
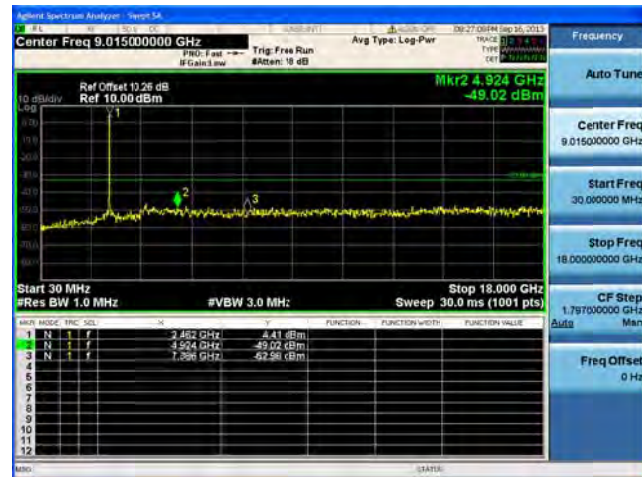
**Conducted Spurs Peak, 2462 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

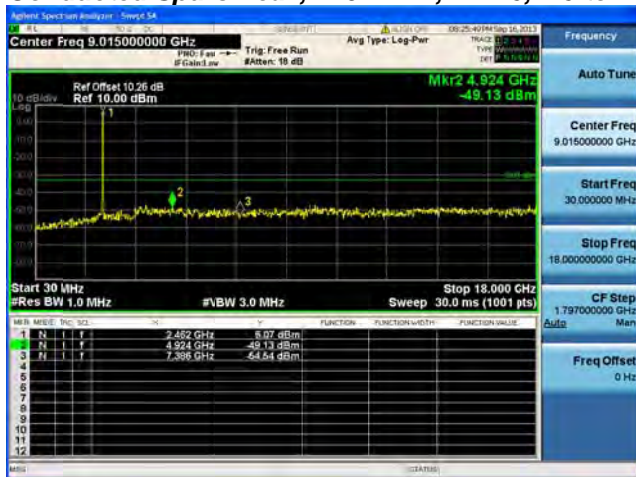
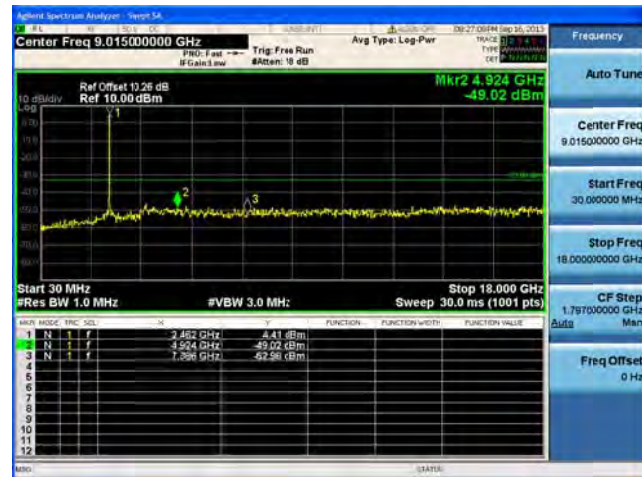
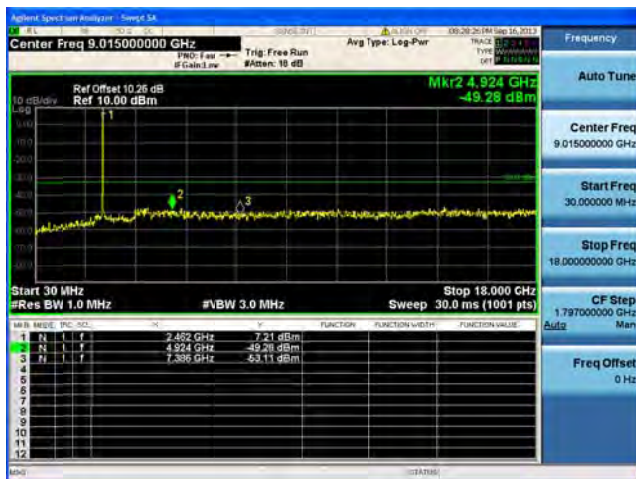


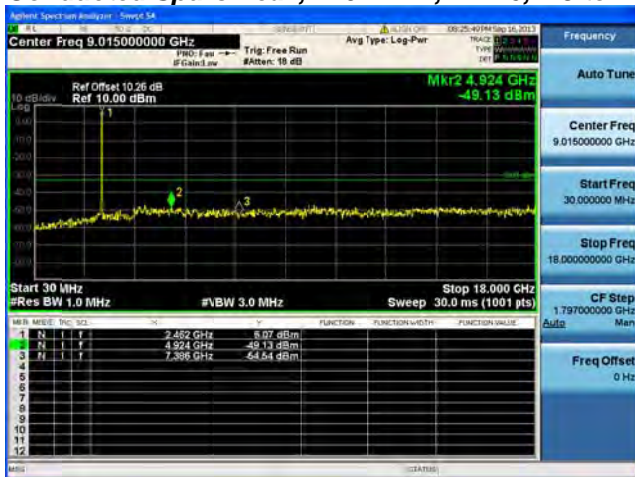
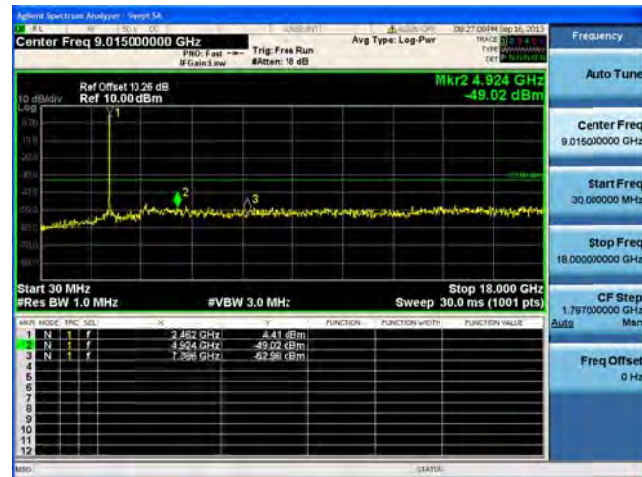
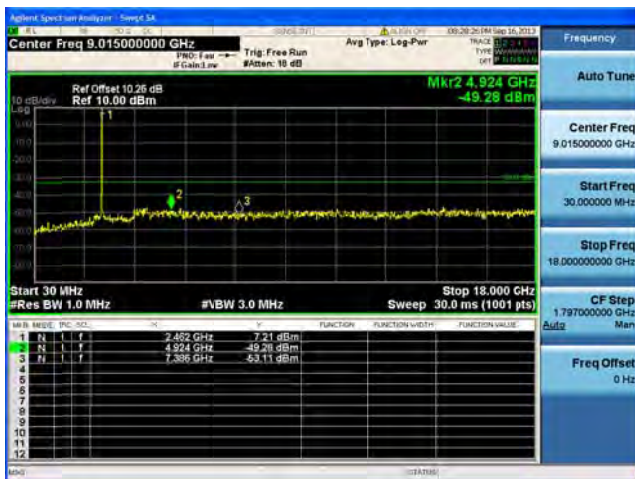
**Conducted Spurs Peak, 2462 MHz, HT-20, M0 to M7****Antenna A**



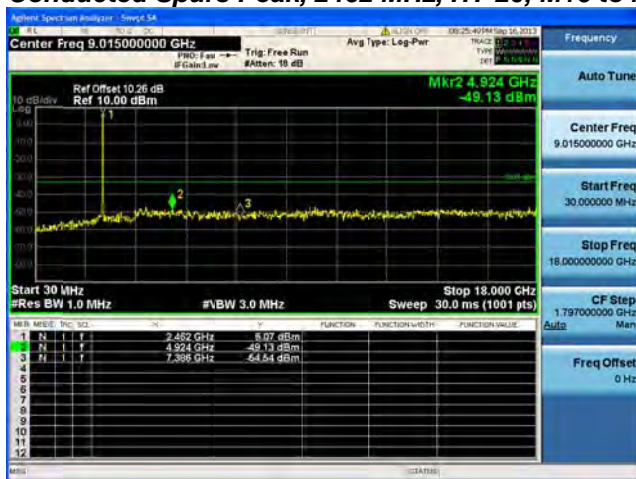
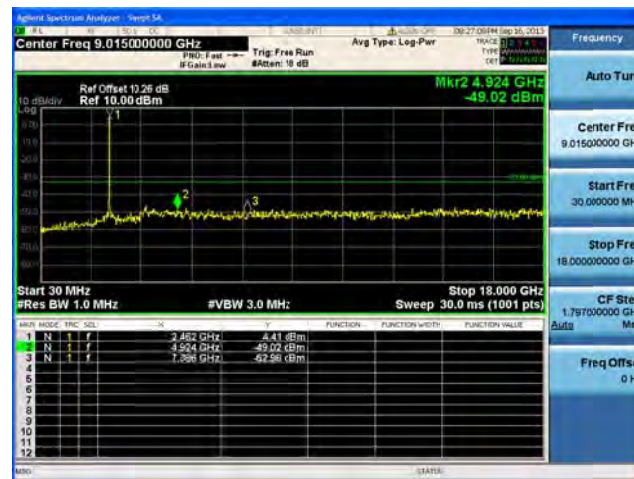
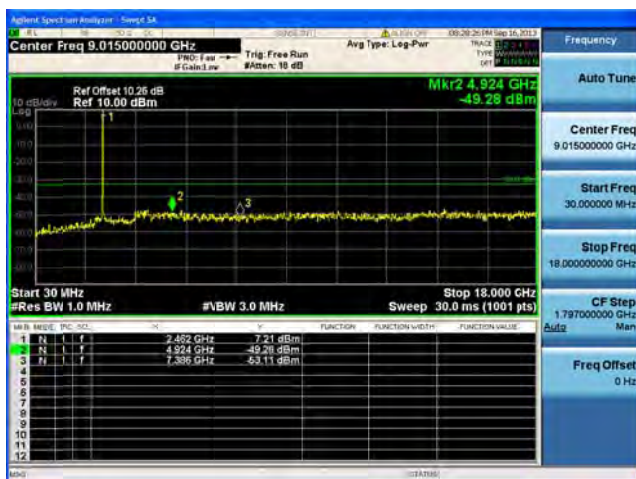
**Conducted Spurs Peak, 2462 MHz, HT-20, M0 to M7****Antenna A****Antenna B**

**Conducted Spurs Peak, 2462 MHz, HT-20, M8 to M15****Antenna A****Antenna B**

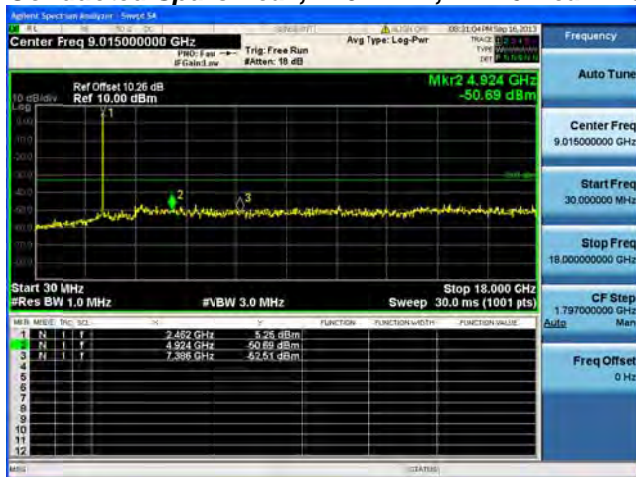
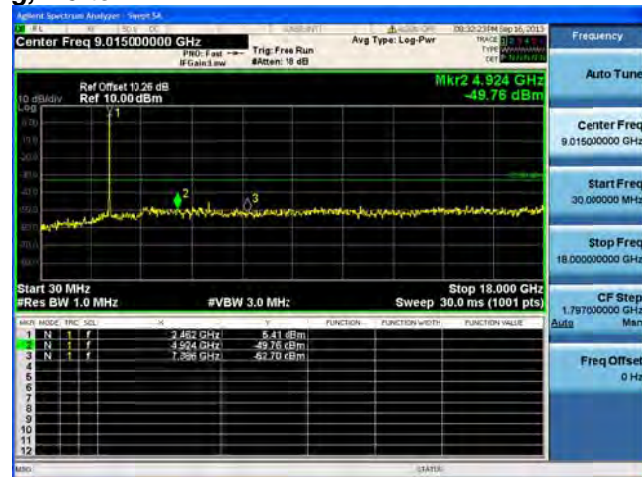
**Conducted Spurs Peak, 2462 MHz, HT-20, M0 to M7****Antenna A****Antenna B****Antenna C**

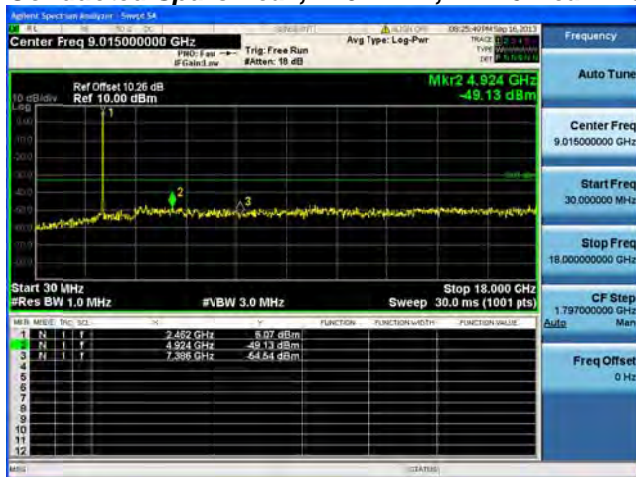
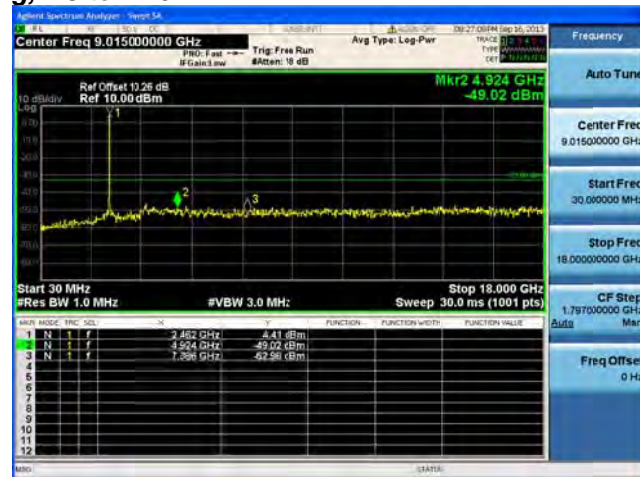
**Conducted Spurs Peak, 2462 MHz, HT-20, M8 to M15****Antenna A****Antenna B****Antenna C**

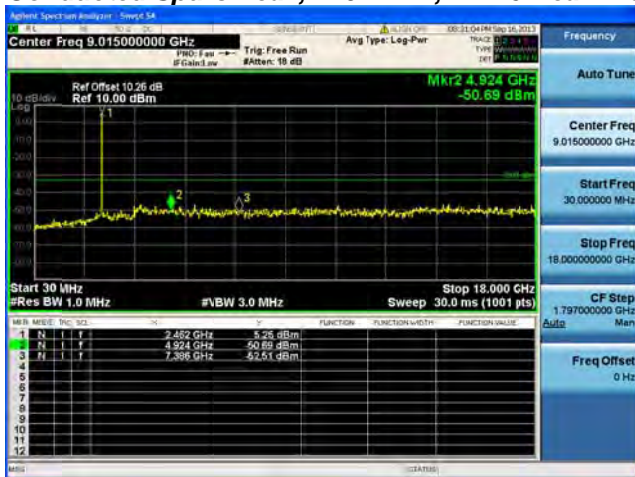
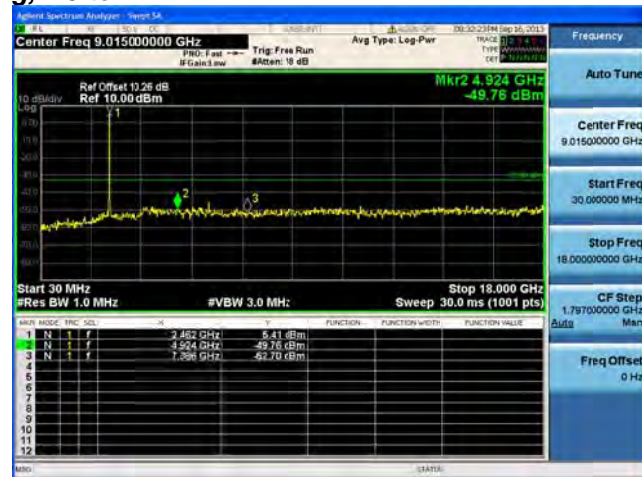
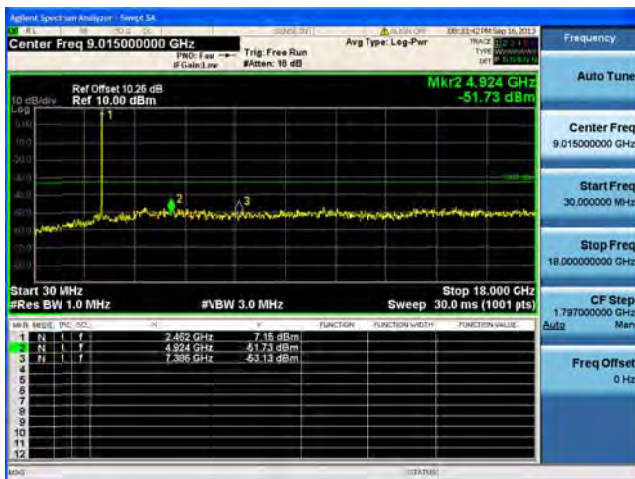


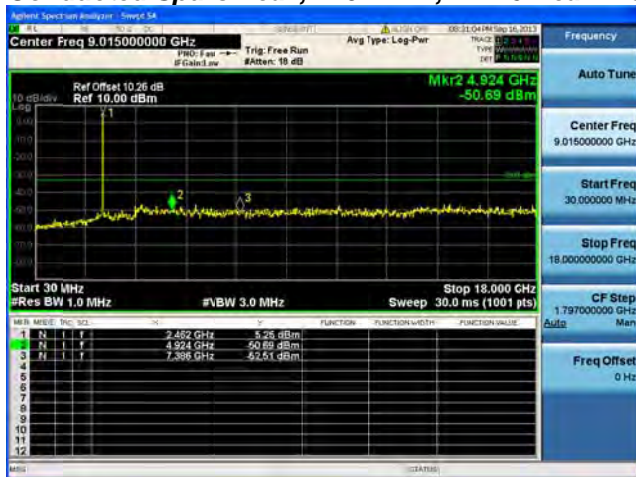
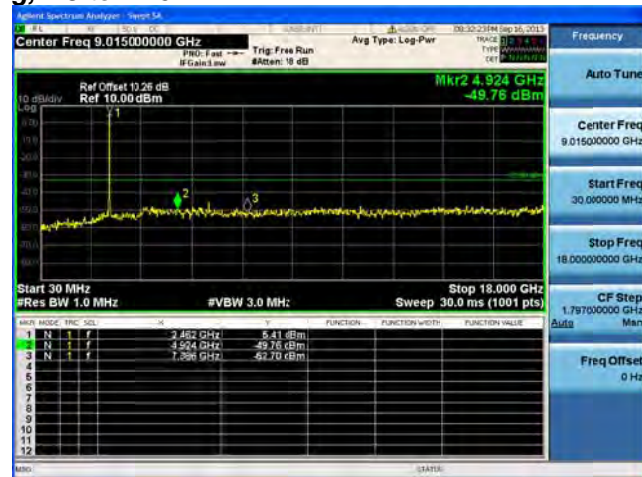
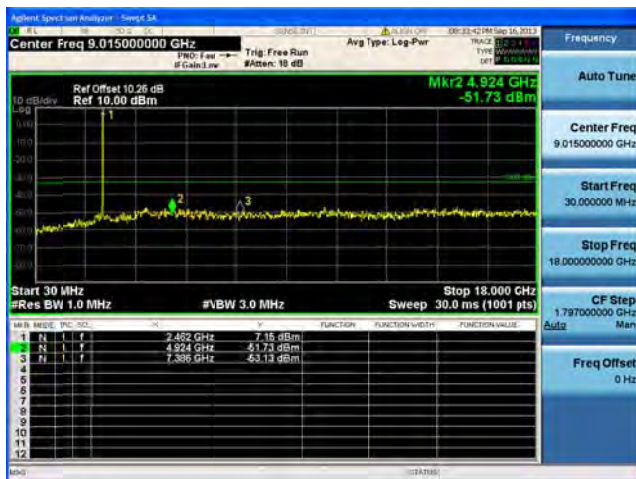
**Conducted Spurs Peak, 2462 MHz, HT-20, M16 to M23****Antenna A****Antenna B****Antenna C**



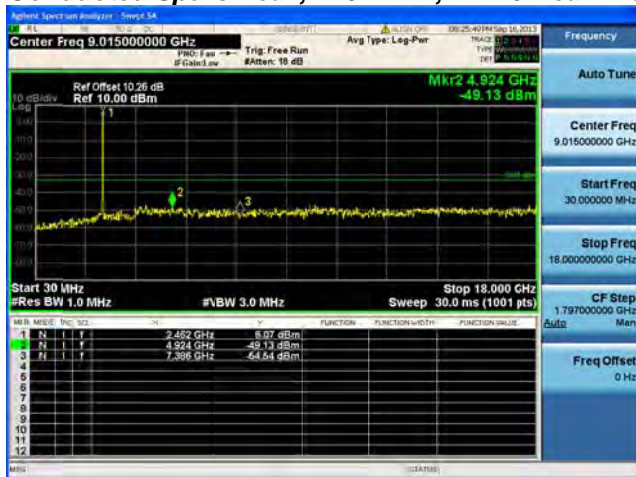
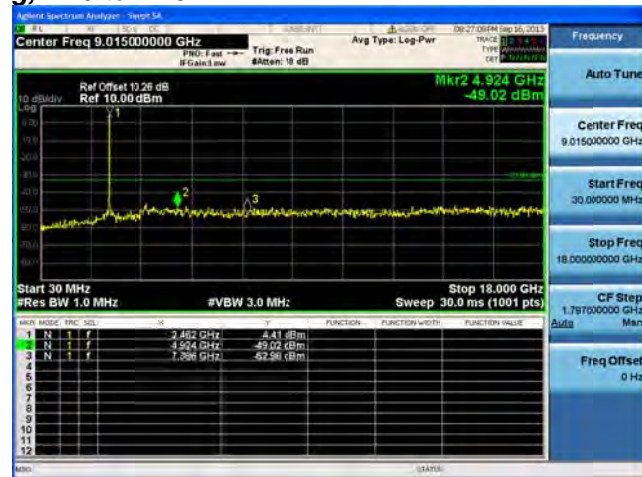
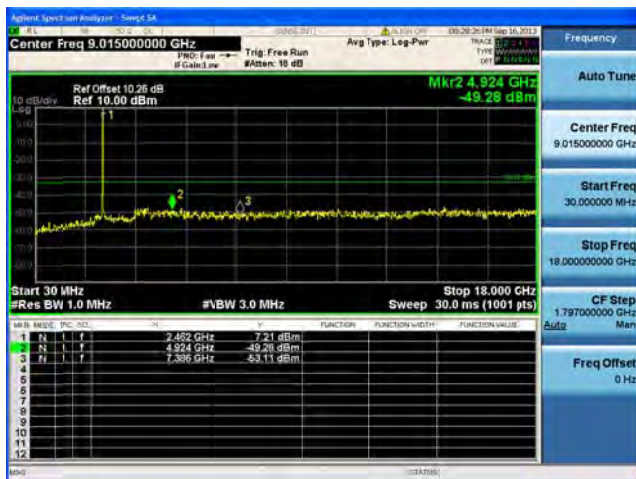
**Conducted Spurs Peak, 2462 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**

**Conducted Spurs Peak, 2462 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B**

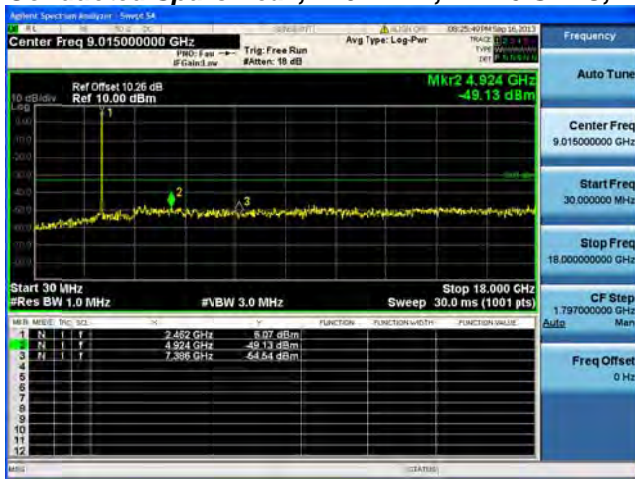
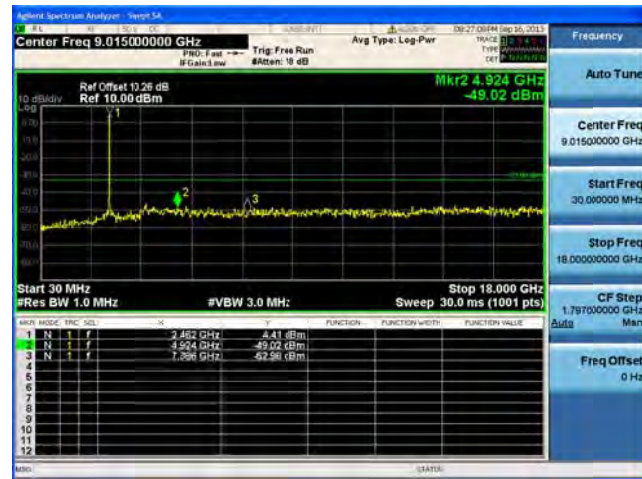
**Conducted Spurs Peak, 2462 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B****Antenna C**

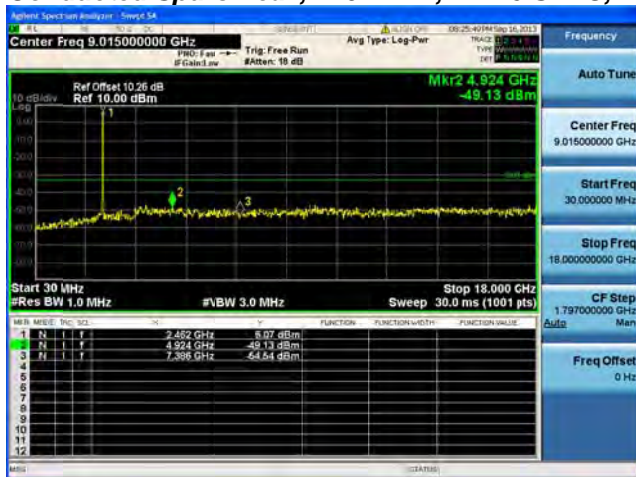
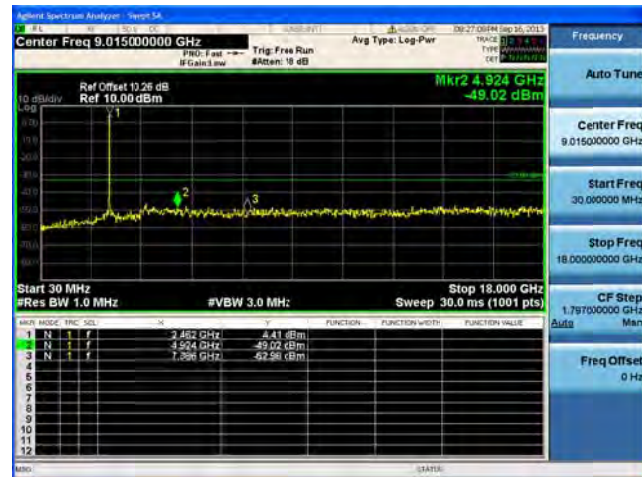
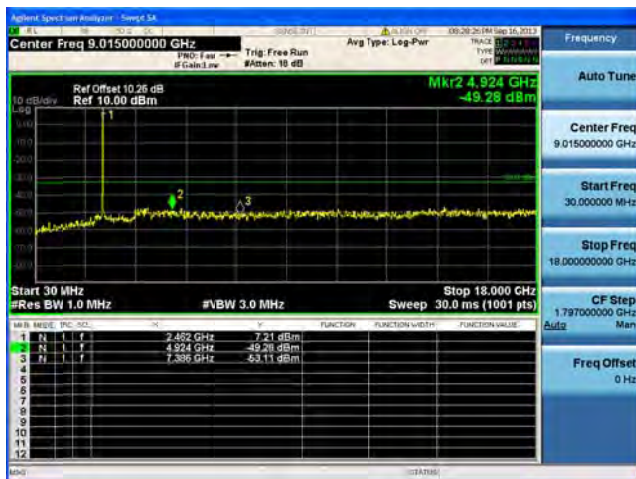
**Conducted Spurs Peak, 2462 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Peak, 2462 MHz, HT-20 Beam Forming, M16 to M23****Antenna A****Antenna B****Antenna C**



**Conducted Spurs Peak, 2462 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B**

**Conducted Spurs Peak, 2462 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B****Antenna C**



## Conducted Bandedge

15.205 / RSS-210 2.7: Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Use the procedures in 718828 D01 DTS Meas Guidance v01 to substitute conducted measurements in place of radiated measurements.

Connect the antenna port(s) to the spectrum analyzer input. Place the radio in continuous transmit mode. Be sure to enter all losses between the transmitter output and the spectrum analyzer.

Reference Level:	10 dBm
Attenuation:	4 dB
Sweep Time:	Coupled
Resolution Bandwidth:	1MHz
Video Bandwidth:	1 MHz for peak, 100 Hz for average
Detector:	Peak

Save 2 plots:     1) Average Plot (Vertical and Horizontal), Limit= -41.25 dBm eirp (54dBuV/m @3m)  
                      2) Peak plot (Vertical and Horizontal), Limit = -21.25 dBm eirp (74dBuV/m @3m)

Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands.

The “measure-and-sum technique” is used for measuring in-band transmit power of a device. In the measure-and-sum approach, the conducted emission level is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in linear power units.

This report represents the worst case data for all supported operating modes and antennas.

Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Tx 2 Bandedge Level (dBm)	Tx 3 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
2412	CCK, 1 to 11 Mbps	1	6	-54.3			-48.3	-41.25	7.1
	CCK, 1 to 11 Mbps	2	6	-54.3	-54.6		-45.4	-41.25	4.2
	CCK, 1 to 11 Mbps	3	6	-54.3	-54.6	-56.5	-44.3	-41.25	3.0
	Non HT-20, 6 to 54 Mbps	1	6	-51.0			-45.0	-41.25	3.8
	Non HT-20, 6 to 54 Mbps	2	6	-51.0	-50.2		-41.6	-41.25	0.3
	Non HT-20, 6 to 54 Mbps	3	6	-54.3	-54.0	-55.8	-43.9	-41.25	2.6
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	-54.3	-54.0		-42.1	-41.25	0.9
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	-57.2	-57.4	-58.3	-42.0	-41.25	0.8
	HT-20, M0 to M7	1	6	-59.4			-53.4	-41.25	12.2
	HT-20, M0 to M7	2	6	-59.4	-57.8		-49.5	-41.25	8.3
	HT-20, M8 to M15	2	6	-59.4	-57.8		-49.5	-41.25	8.3
	HT-20, M0 to M7	3	6	-59.4	-57.8	-61.7	-48.6	-41.25	7.3
	HT-20, M8 to M15	3	6	-59.4	-57.8	-61.7	-48.6	-41.25	7.3
	HT-20, M16 to M23	3	6	-59.4	-57.8	-61.7	-48.6	-41.25	7.3
	HT-20 Beam Forming, M0 to M7	2	9	-59.4	-57.8		-46.5	-41.25	5.3
	HT-20 Beam Forming, M8 to M15	2	6	-59.4	-57.8		-49.5	-41.25	8.3
	HT-20 Beam Forming, M0 to M7	3	11	-59.4	-57.8	-61.7	-43.8	-41.25	2.5
	HT-20 Beam Forming, M8 to M15	3	8	-59.4	-57.8	-61.7	-46.8	-41.25	5.5
	HT-20 Beam Forming, M16 to M23	3	6	-59.4	-57.8	-61.7	-48.6	-41.25	7.3
	HT-20 STBC, M0 to M7	2	6	-59.4	-57.8		-49.5	-41.25	8.3
	HT-20 STBC, M0 to M7	3	6	-59.4	-57.8	-61.7	-48.6	-41.25	7.3
2462	CCK, 1 to 11 Mbps	1	6	-57.1			-51.1	-41.25	9.9
	CCK, 1 to 11 Mbps	2	6	-57.1	-54.0		-46.3	-41.25	5.0
	CCK, 1 to 11 Mbps	3	6	-57.1	-54.0	-56.8	-45.0	-41.25	3.7
	Non HT-20, 6 to 54 Mbps	1	6	-48.3			-42.3	-41.25	1.1
	Non HT-20, 6 to 54 Mbps	2	6	-56.6	-52.5		-45.1	-41.25	3.8
	Non HT-20, 6 to 54 Mbps	3	6	-56.6	-52.5	-57.1	-44.1	-41.25	2.9
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	-56.6	-52.5		-42.1	-41.25	0.8
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	-59.8	-57.9	-59.6	-43.4	-41.25	2.2
	HT-20, M0 to M7	1	6	-50.3			-44.3	-41.25	3.1
	HT-20, M0 to M7	2	6	-54.6	-52.6		-44.5	-41.25	3.2
	HT-20, M8 to M15	2	6	-54.6	-52.6		-44.5	-41.25	3.2
	HT-20, M0 to M7	3	6	-54.6	-52.6	-55.4	-43.3	-41.25	2.0



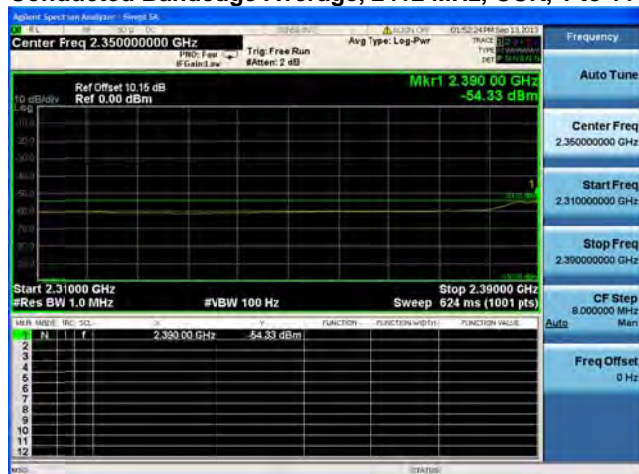
HT-20, M8 to M15	3	6	-54.6	-52.6	-55.4	-43.3	-41.25	2.0
HT-20, M16 to M23	3	6	-54.6	-52.6	-55.4	-43.3	-41.25	2.0
HT-20 Beam Forming, M0 to M7	2	9	-54.6	-52.6		-41.5	-41.25	0.2
HT-20 Beam Forming, M8 to M15	2	6	-54.6	-52.6		-44.5	-41.25	3.2
HT-20 Beam Forming, M0 to M7	3	11	-58.2	-56.5	-58.5	-42.1	-41.25	0.8
HT-20 Beam Forming, M8 to M15	3	8	-54.6	-52.6	-55.4	-41.5	-41.25	0.2
HT-20 Beam Forming, M16 to M23	3	6	-54.6	-52.6	-55.4	-43.3	-41.25	2.0
HT-20 STBC, M0 to M7	2	6	-54.6	-52.6		-44.5	-41.25	3.2
HT-20 STBC, M0 to M7	3	6	-54.6	-52.6	-55.4	-43.3	-41.25	2.0

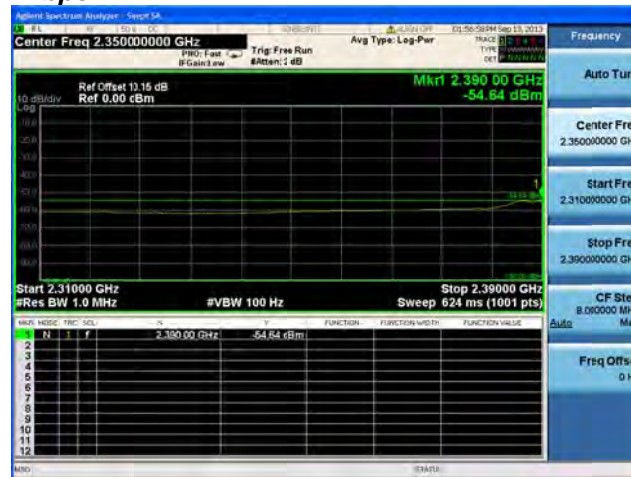


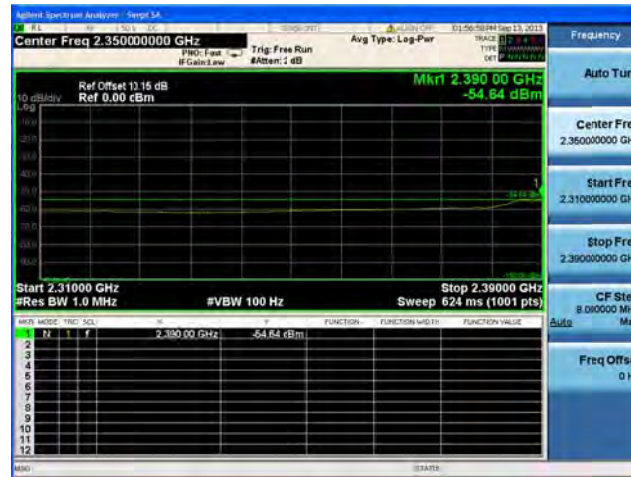
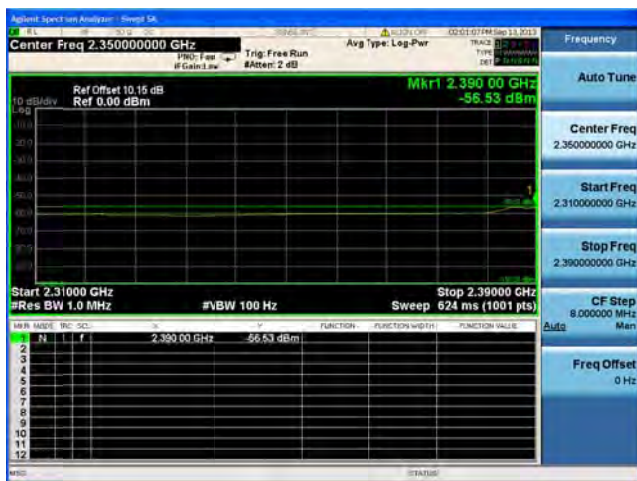
Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Tx 2 Bandedge Level (dBm)	Tx 3 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
2412	CCK, 1 to 11 Mbps	1	6	-44.2			-38.2	-21.25	17.0
	CCK, 1 to 11 Mbps	2	6	-44.2	-44.2		-35.2	-21.25	13.9
	CCK, 1 to 11 Mbps	3	6	-44.2	-44.2	-45.7	-33.9	-21.25	12.6
	Non HT-20, 6 to 54 Mbps	1	6	-34.9			-28.9	-21.25	7.7
	Non HT-20, 6 to 54 Mbps	2	6	-34.9	-30.7		-23.3	-21.25	2.1
	Non HT-20, 6 to 54 Mbps	3	6	-33.8	-32.9	-38.5	-23.7	-21.25	2.5
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	-33.8	-32.9		-21.3	-21.25	0.1
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	-37.2	-39.2	-40.3	-23.1	-21.25	1.9
	HT-20, M0 to M7	1	6	-39.6			-33.6	-21.25	12.4
	HT-20, M0 to M7	2	6	-44.6	-40.8		-33.3	-21.25	12.0
	HT-20, M8 to M15	2	6	-44.6	-40.8		-33.3	-21.25	12.0
	HT-20, M0 to M7	3	6	-44.6	-40.8	-32.7	-25.8	-21.25	4.6
	HT-20, M8 to M15	3	6	-44.6	-40.8	-32.7	-25.8	-21.25	4.6
	HT-20, M16 to M23	3	6	-44.6	-40.8	-32.7	-25.8	-21.25	4.6
	HT-20 Beam Forming, M0 to M7	2	9	-44.6	-40.8		-30.3	-21.25	9.0
	HT-20 Beam Forming, M8 to M15	2	6	-44.6	-40.8		-33.3	-21.25	12.0
	HT-20 Beam Forming, M0 to M7	3	11	-37.3	-39.0	-38.7	-22.7	-21.25	1.4
	HT-20 Beam Forming, M8 to M15	3	8	-44.6	-40.8	-32.7	-24.0	-21.25	2.8
	HT-20 Beam Forming, M16 to M23	3	6	-44.6	-40.8	-32.7	-25.8	-21.25	4.6
	HT-20 STBC, M0 to M7	2	6	-44.6	-40.8		-33.3	-21.25	12.0
	HT-20 STBC, M0 to M7	3	6	-44.6	-40.8	-32.7	-25.8	-21.25	4.6
2462	CCK, 1 to 11 Mbps	1	6	-45.6			-39.6	-21.25	18.4
	CCK, 1 to 11 Mbps	2	6	-45.6	-43.9		-35.7	-21.25	14.4
	CCK, 1 to 11 Mbps	3	6	-45.6	-43.9	-46.8	-34.5	-21.25	13.2
	Non HT-20, 6 to 54 Mbps	1	6	-34.6			-28.6	-21.25	7.4
	Non HT-20, 6 to 54 Mbps	2	6	-37.0	-33.4		-25.8	-21.25	4.6
	Non HT-20, 6 to 54 Mbps	3	6	-37.0	-33.4	-39.4	-25.1	-21.25	3.9
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	-37.0	-33.4		-22.8	-21.25	1.6
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	-40.4	-39.0	-39.5	-24.0	-21.25	2.8
	HT-20, M0 to M7	1	6	-30.4			-24.4	-21.25	3.2
	HT-20, M0 to M7	2	6	-35.1	-30.6		-23.3	-21.25	2.0
	HT-20, M8 to M15	2	6	-35.1	-30.6		-23.3	-21.25	2.0
	HT-20, M0 to M7	3	6	-35.1	-30.6	-34.5	-22.1	-21.25	0.9



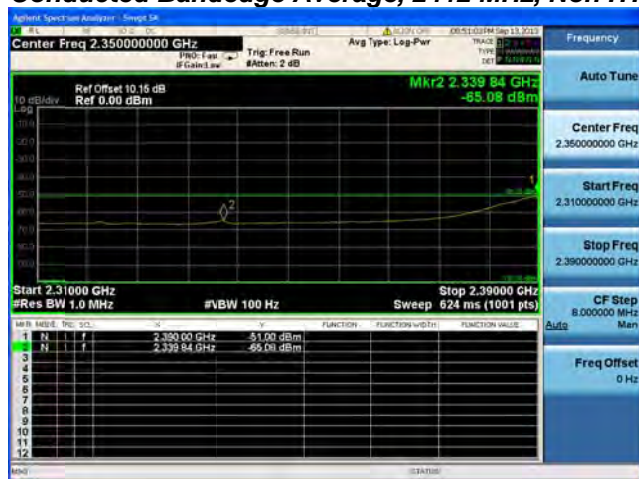
HT-20, M8 to M15	3	6	-35.1	-30.6	-34.5	-22.1	-21.25	0.9
HT-20, M16 to M23	3	6	-35.1	-30.6	-34.5	-22.1	-21.25	0.9
HT-20 Beam Forming, M0 to M7	2	9	-40.3	-36.2		-25.8	-21.25	4.5
HT-20 Beam Forming, M8 to M15	2	6	-35.1	-30.6		-23.3	-21.25	2.0
HT-20 Beam Forming, M0 to M7	3	11	-40.3	-36.2	-40.5	-22.9	-21.25	1.7
HT-20 Beam Forming, M8 to M15	3	8	-40.3	-36.2	-40.5	-25.9	-21.25	4.7
HT-20 Beam Forming, M16 to M23	3	6	-35.1	-30.6	-34.5	-22.1	-21.25	0.9
HT-20 STBC, M0 to M7	2	6	-35.1	-30.6		-23.3	-21.25	2.0
HT-20 STBC, M0 to M7	3	6	-35.1	-30.6	-34.5	-22.1	-21.25	0.9

**Conducted Bandedge Average, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A**

**Conducted Bandedge Average, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B**

**Conducted Bandedge Average, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B****Antenna C**



**Conducted Bandedge Average, 2412 MHz, Non HT-20, 6 to 54 Mbps**

Ref Offset 10.15 dB  
Ref 0.00 dBm

Mkr2 2.339 84 GHz  
-65.08 dBm

Start 2.310000 GHz  
Res BW 1.0 MHz  
F#BW 100 Hz  
Stop 2.390000 GHz  
Sweep 624 ms (1001 pts)

Mk1	Mk2	Mk3	Mk4	Mk5	Mk6	Mk7	Mk8	Mk9	Mk10	Mk11	Mk12
1	N	F									
2	N	F									
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											

FUNCTION FUNCTION ON/OFF FUNCTION VALUE

Center Freq 2.350000000 GHz

Ref Offset 10.15 dB  
Ref 0.00 cBm

Start 2.310000 GHz  
#Res BW 1.0 MHz

Stop 2.390000 GHz  
Sweep 624 ms (1001 pts)

Auto Tun

Center Freq 2.350000000 GHz

Start Freq 2.310000000 GHz

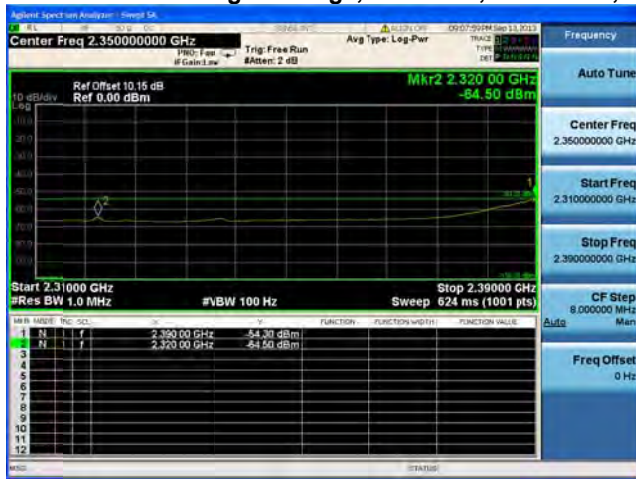
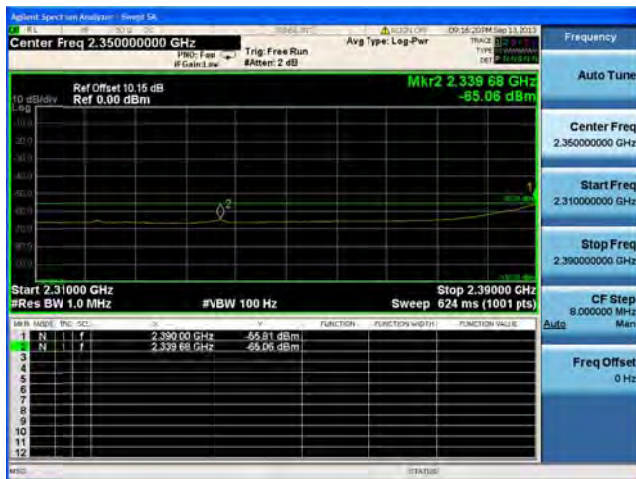
Stop Freq 2.390000000 GHz

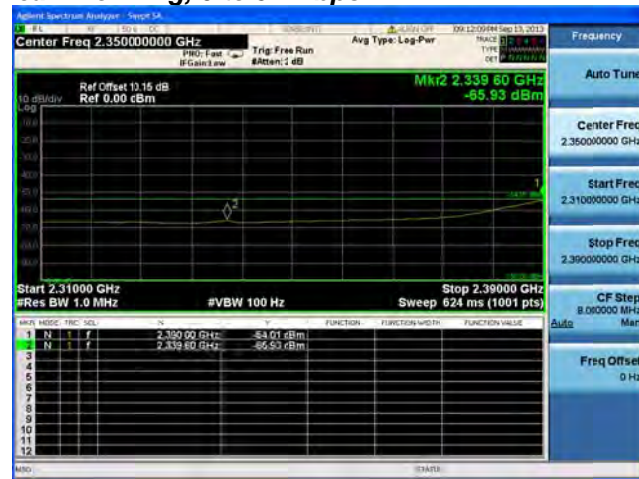
CF Stop 2.390000000 GHz

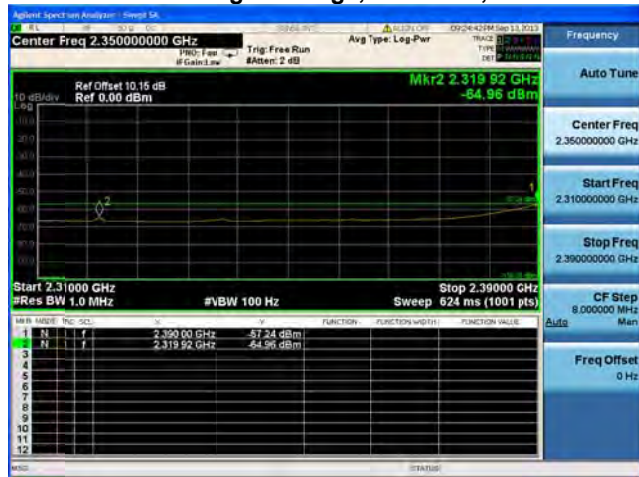
Auto

Freq Offset 0.00

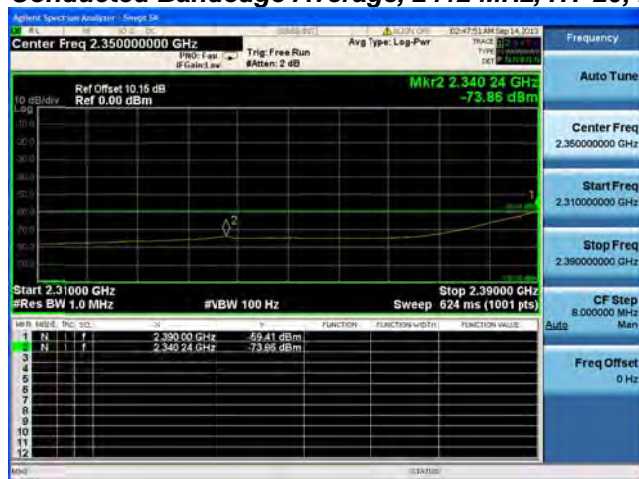
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**Conducted Bandedge Average, 2412 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

**Conducted Bandedge Average, 2412 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B**

**Conducted Bandedge Average, 2412 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

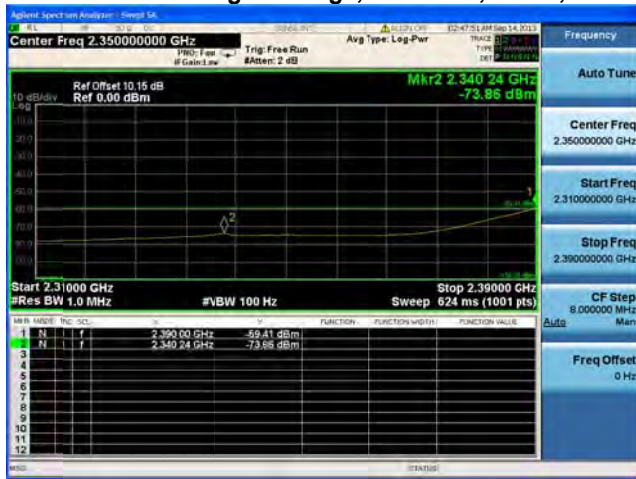


**Conducted Bandedge Average, 2412 MHz, HT-20, M0 to M7****Antenna A**

**Conducted Bandedge Average, 2412 MHz, HT-20, M0 to M7****Antenna A****Antenna B**



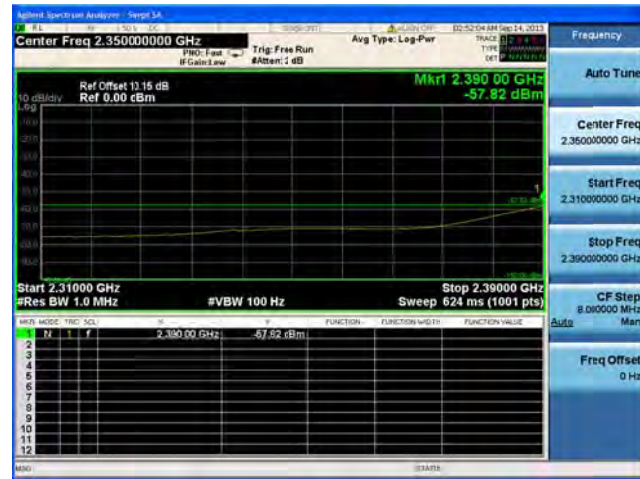
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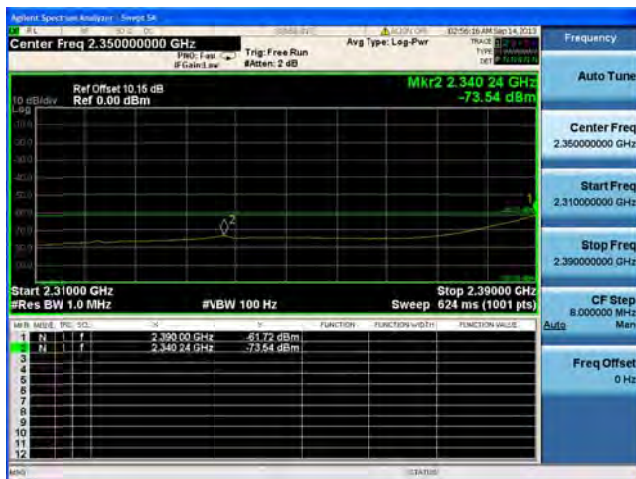


Antenna A

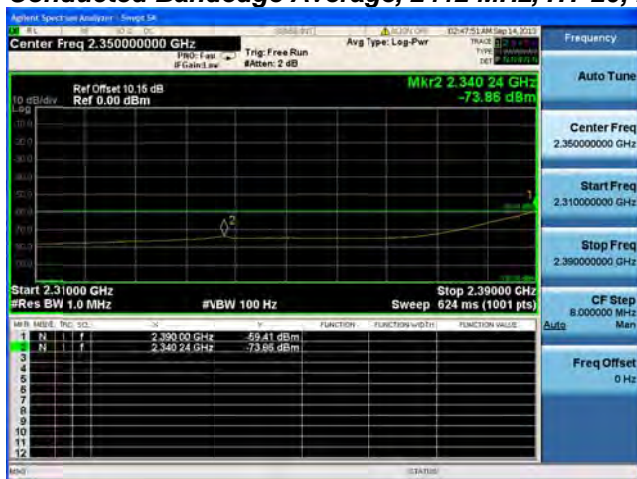
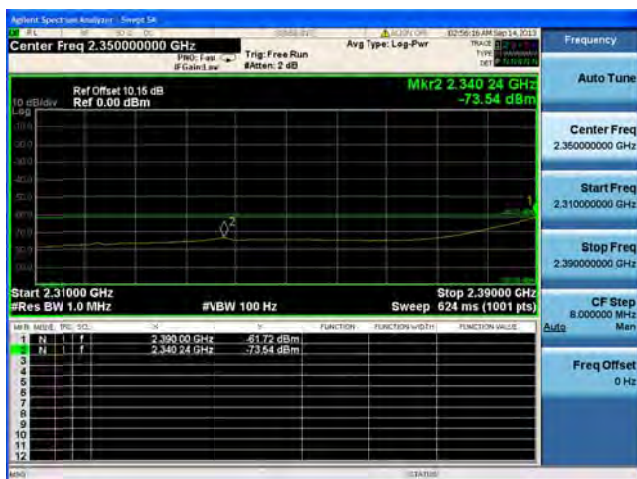


Antenna B

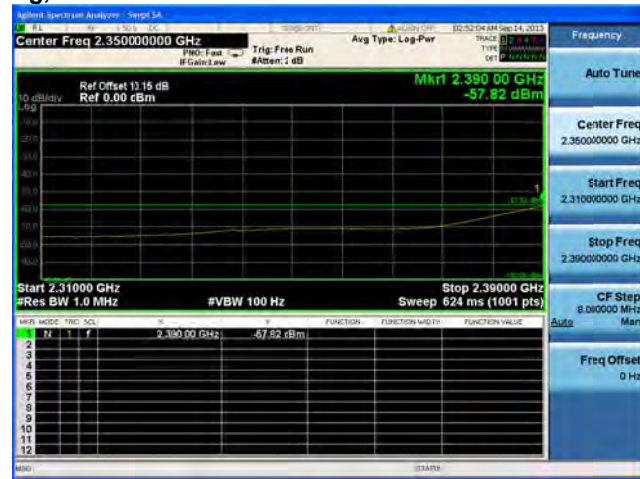
**Conducted Bandedge Average, 2412 MHz, HT-20, M0 to M7****Antenna A****Antenna B****Antenna C**

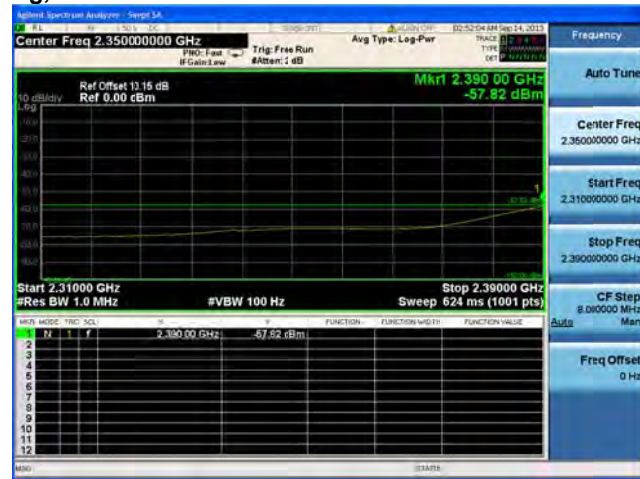
**Conducted Bandedge Average, 2412 MHz, HT-20, M8 to M15****Antenna A****Antenna B****Antenna C**



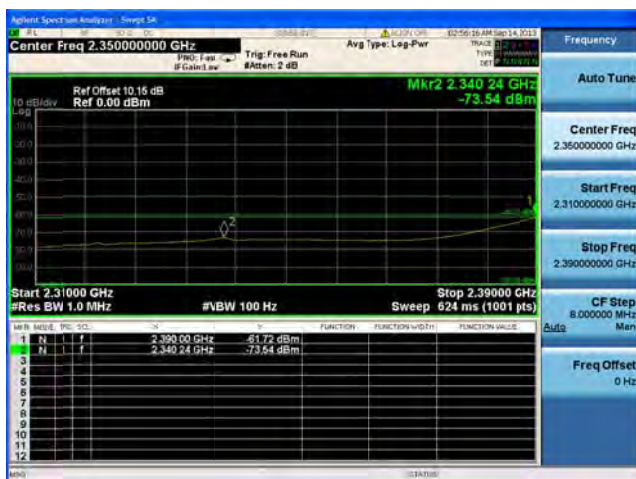
**Conducted Bandedge Average, 2412 MHz, HT-20, M16 to M23****Antenna A****Antenna B****Antenna C**

**Conducted Bandedge Average, 2412 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**

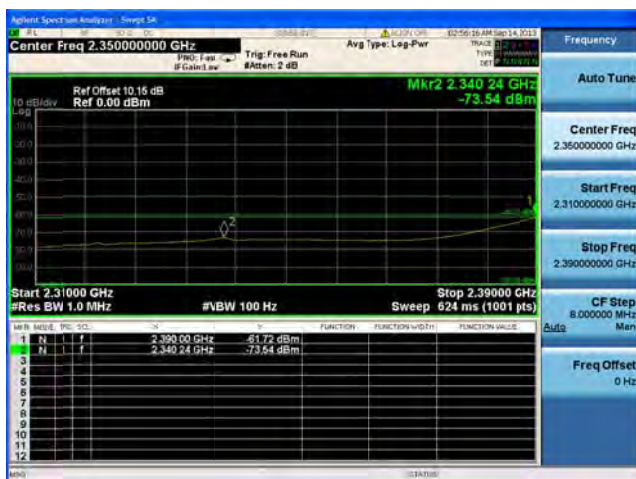
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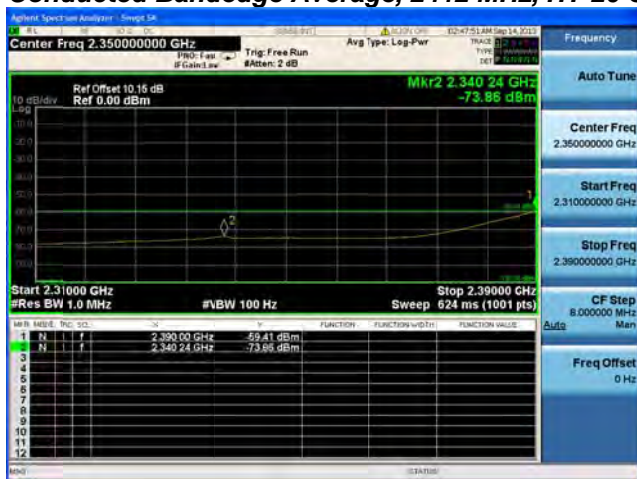
**Conducted Bandedge Average, 2412 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B****Antenna C**



**Conducted Bandedge Average, 2412 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B****Antenna C**



**Conducted Bandedge Average, 2412 MHz, HT-20 Beam Forming, M16 to M23****Antenna A****Antenna B****Antenna C**

**Conducted Bandedge Average, 2412 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B**



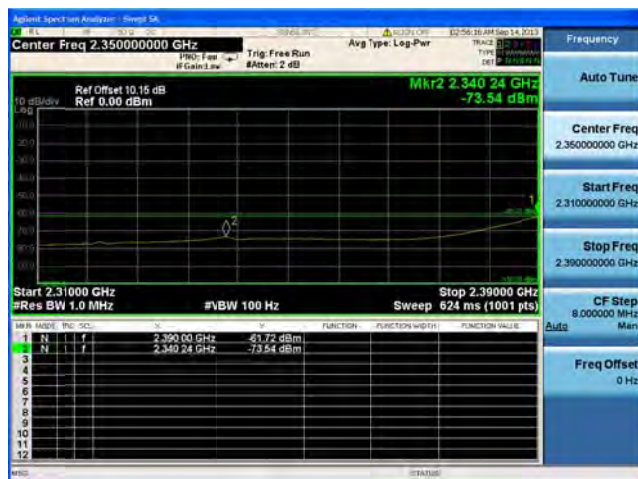
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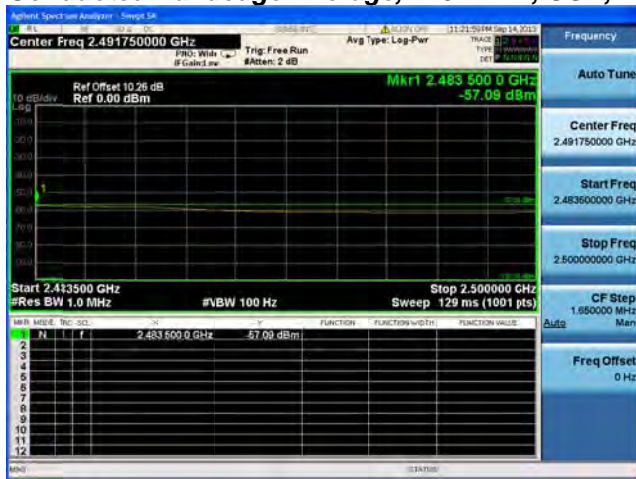
Antenna A

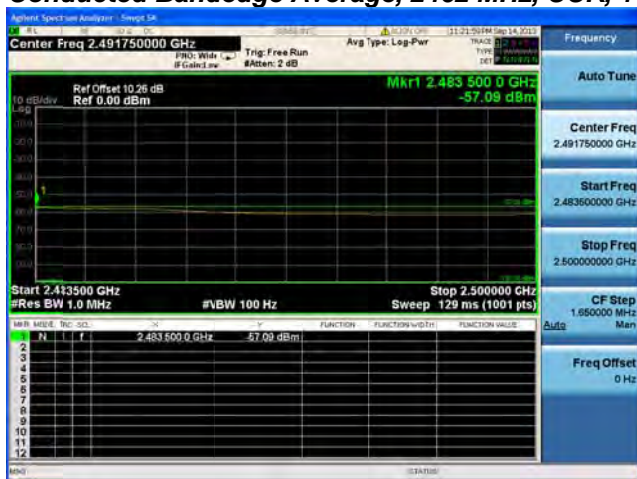
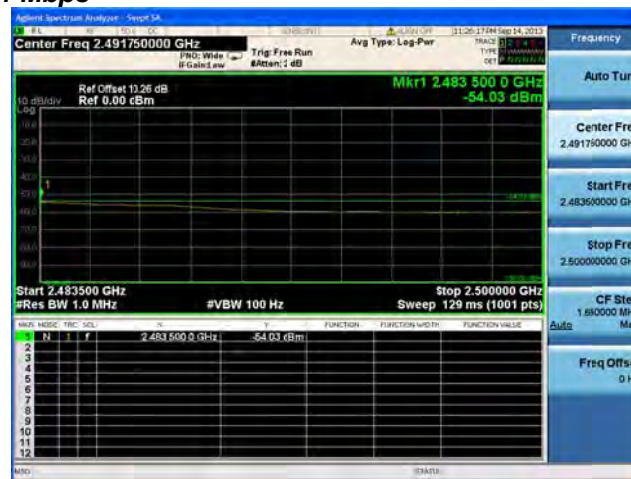


Antenna B

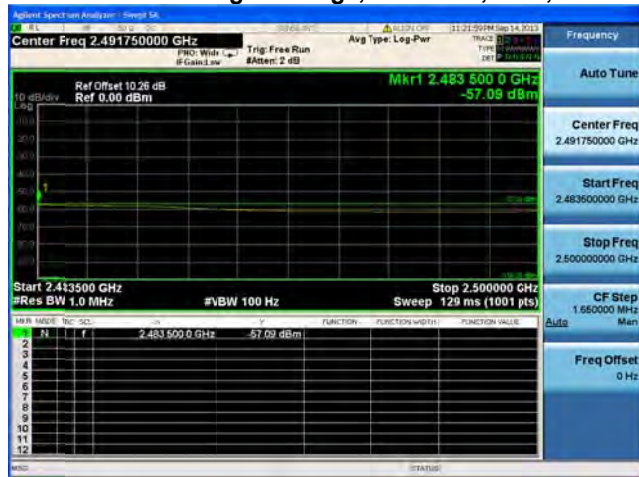
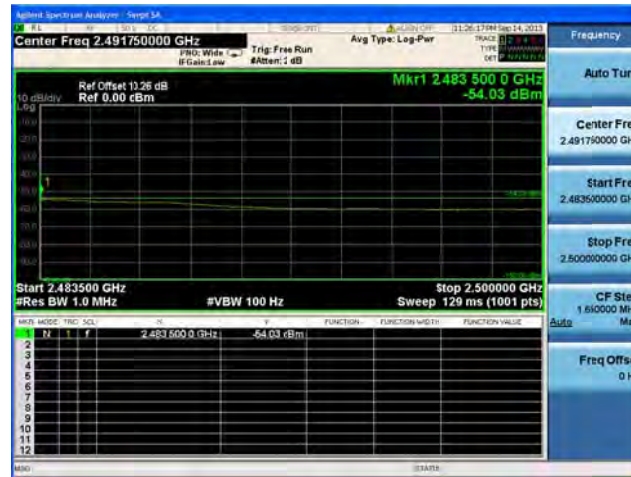


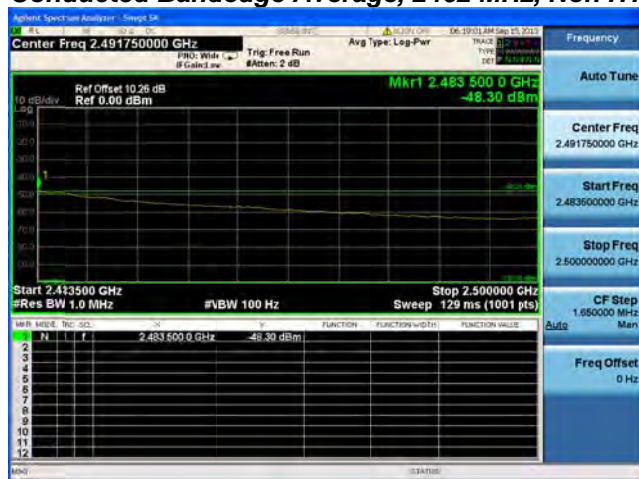
Antenna C

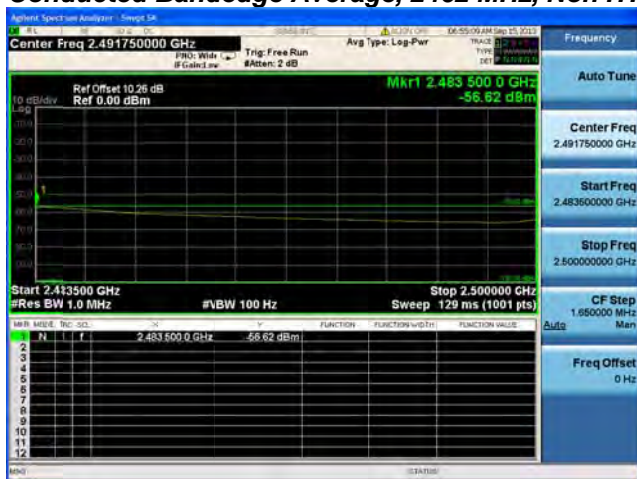
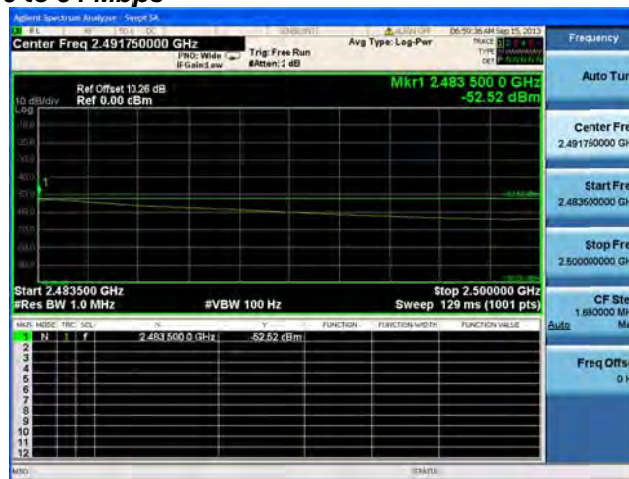
**Conducted Bandedge Average, 2462 MHz, CCK, 1 to 11 Mbps****Antenna A**

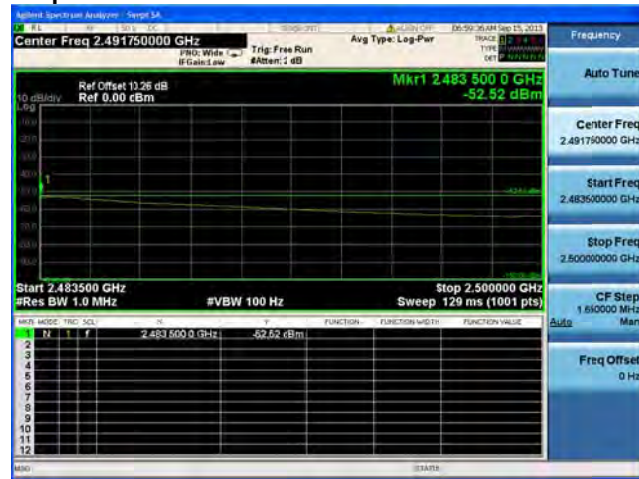
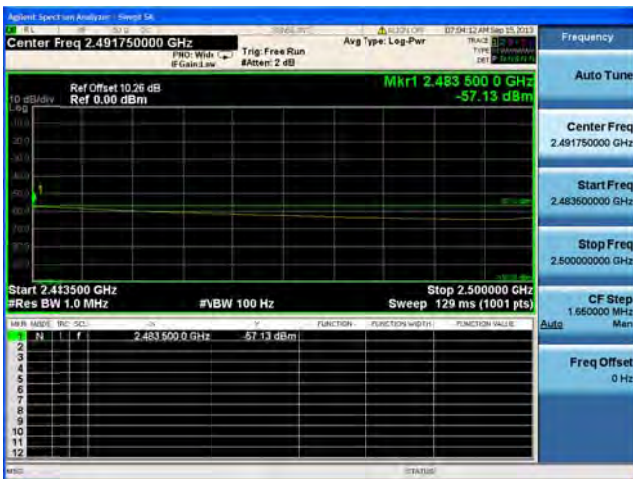
**Conducted Bandedge Average, 2462 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B**

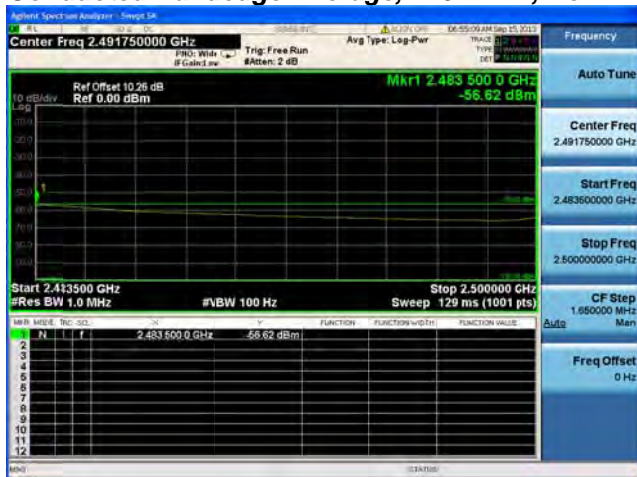
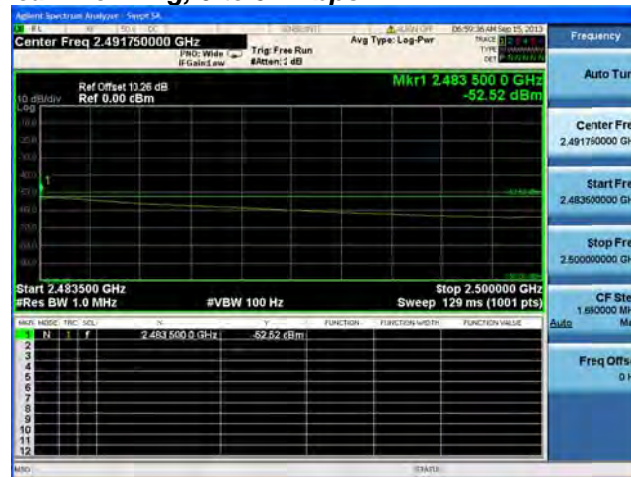


**Conducted Bandedge Average, 2462 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B****Antenna C**

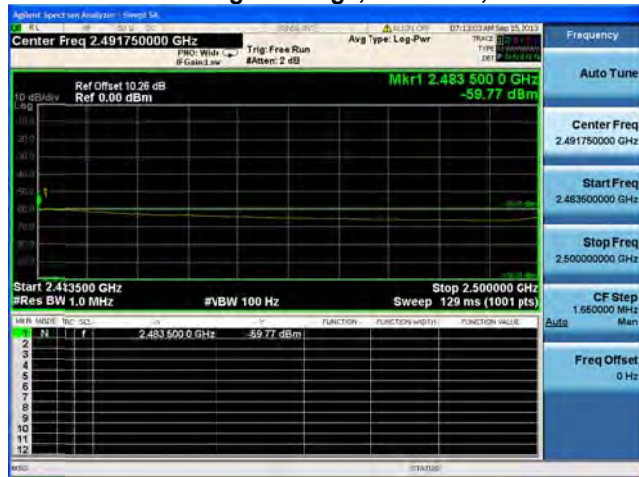
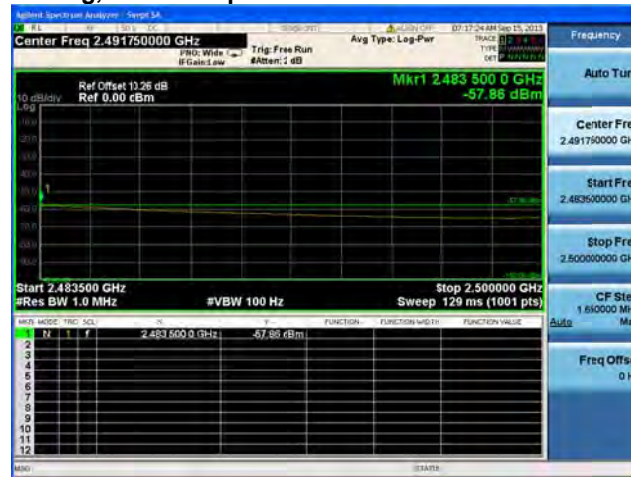
**Conducted Bandedge Average, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A**

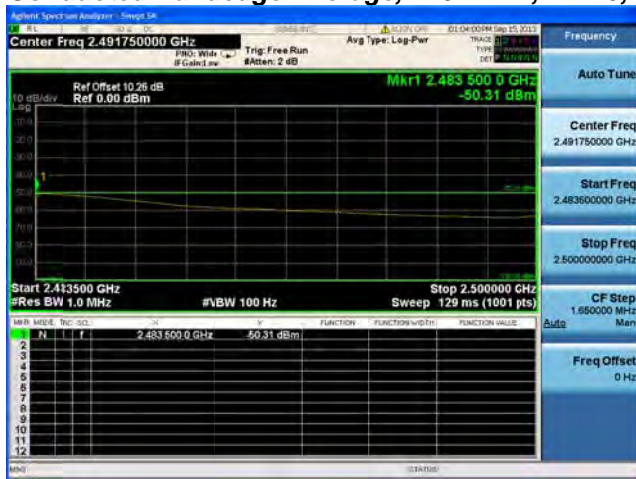
**Conducted Bandedge Average, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B**

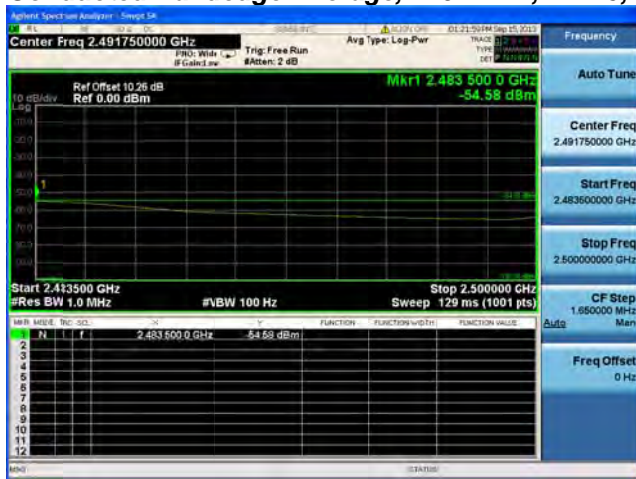
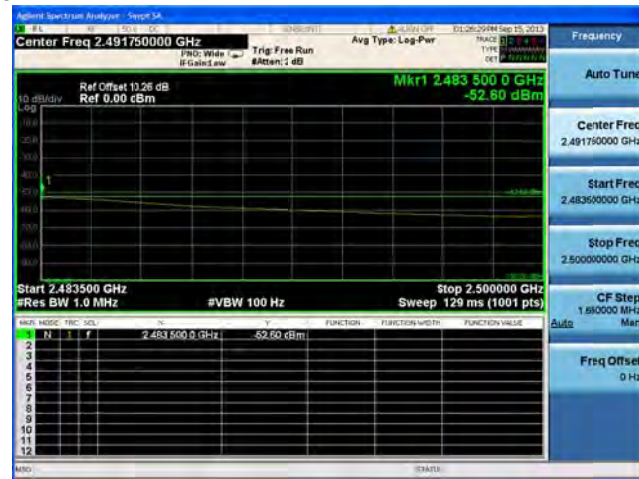
**Conducted Bandedge Average, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

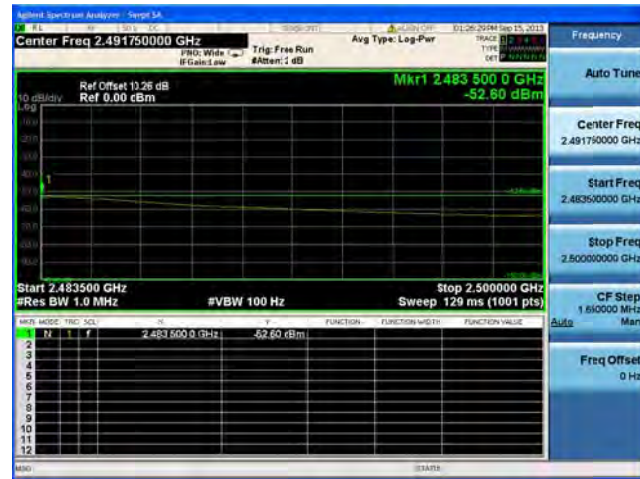
**Conducted Bandedge Average, 2462 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B**



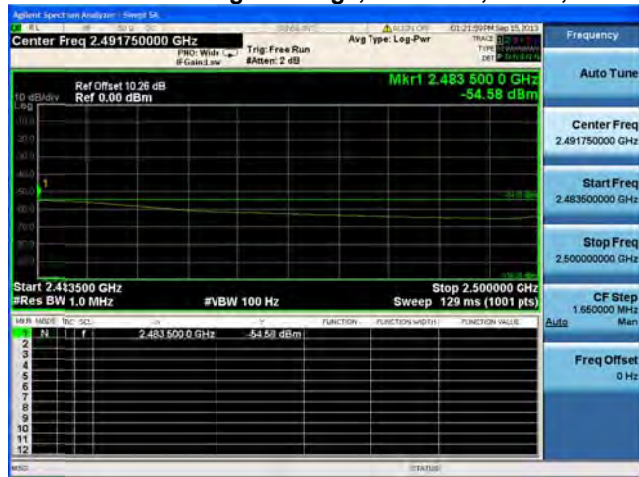
**Conducted Bandedge Average, 2462 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

**Conducted Bandedge Average, 2462 MHz, HT-20, M0 to M7****Antenna A**

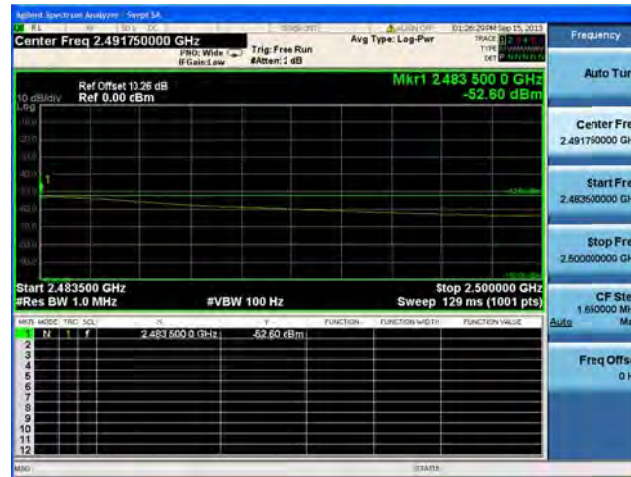
**Conducted Bandedge Average, 2462 MHz, HT-20, M0 to M7****Antenna A****Antenna B**

**Conducted Bandedge Average, 2462 MHz, HT-20, M8 to M15****Antenna A****Antenna B**

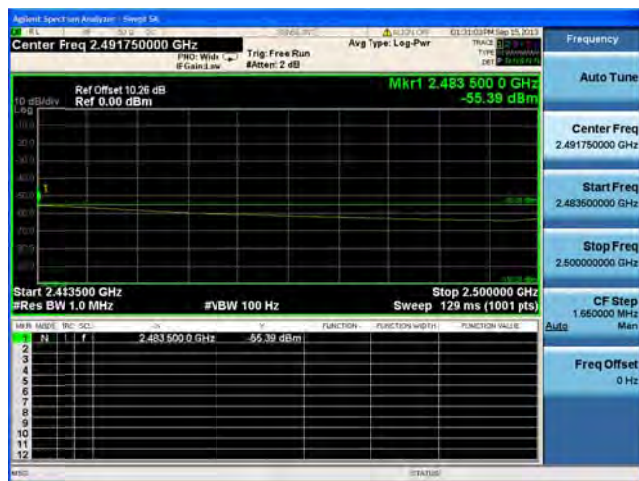
## Conducted Bandedge Average, 2462 MHz, HT-20, M0 to M7



Antenna A

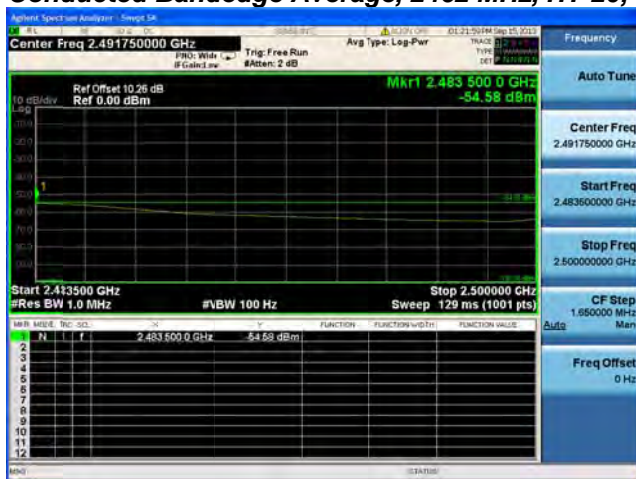
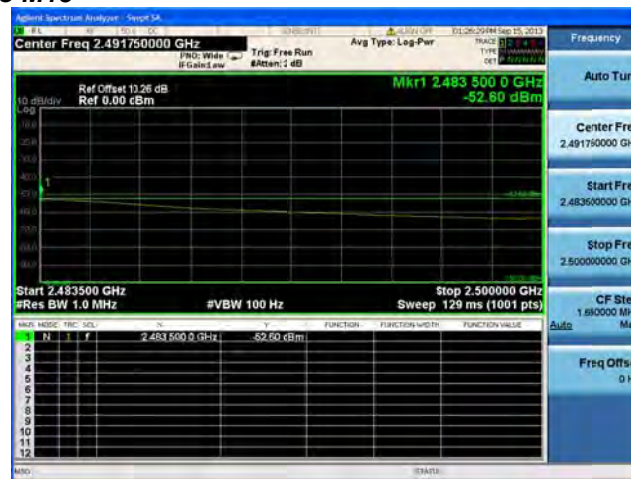
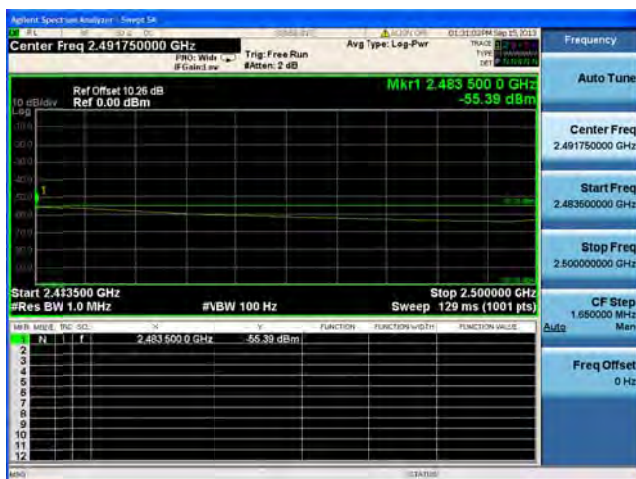


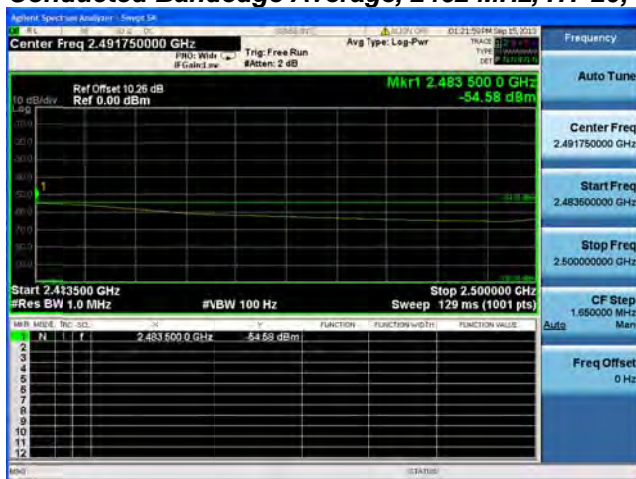
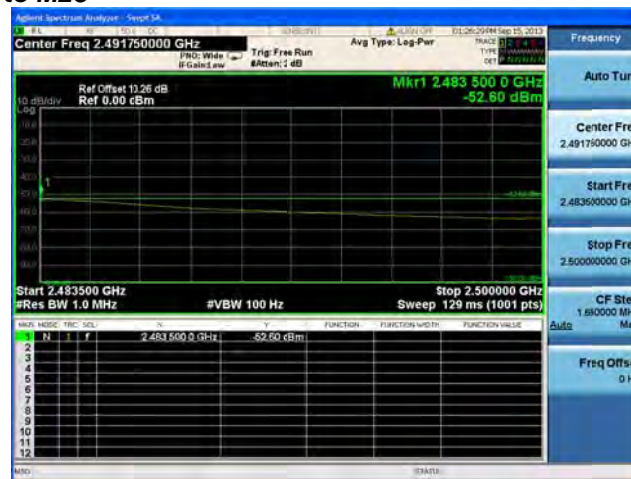
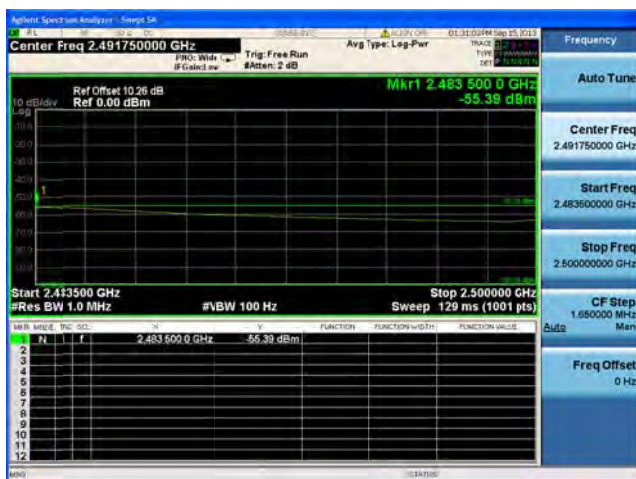
Antenna B

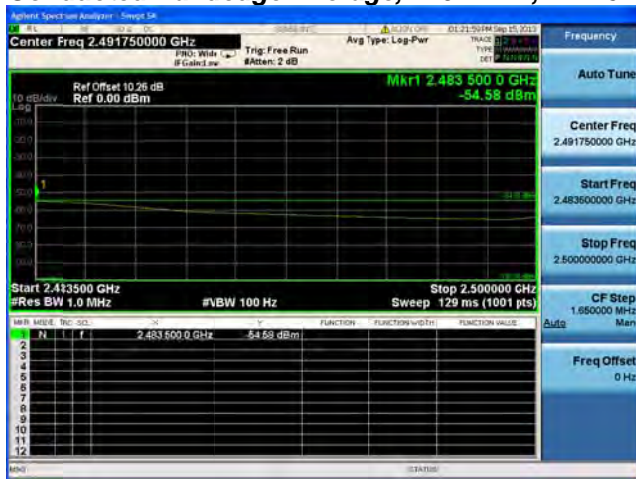
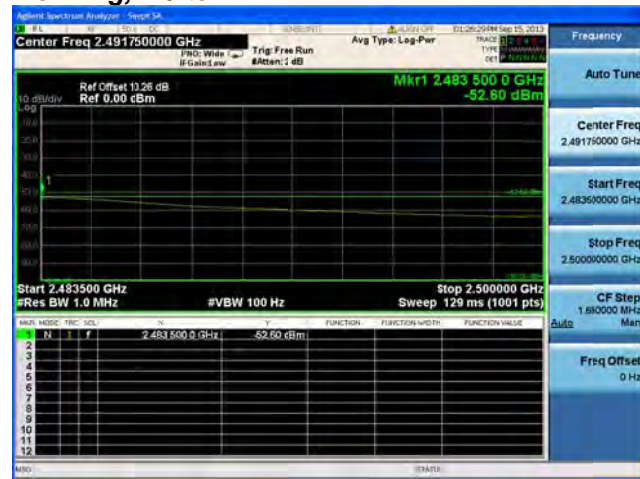


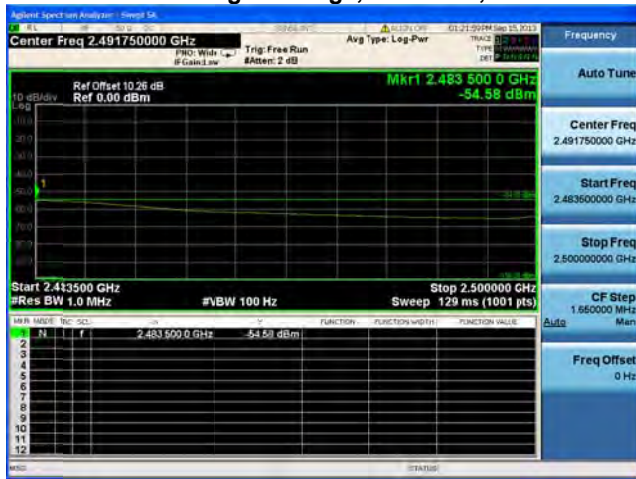
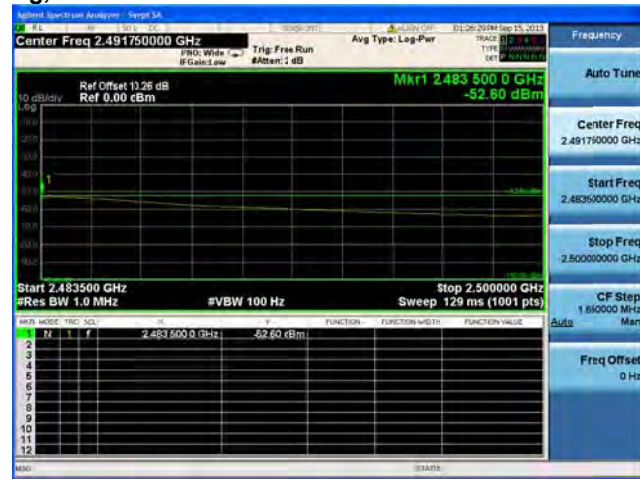
Antenna C



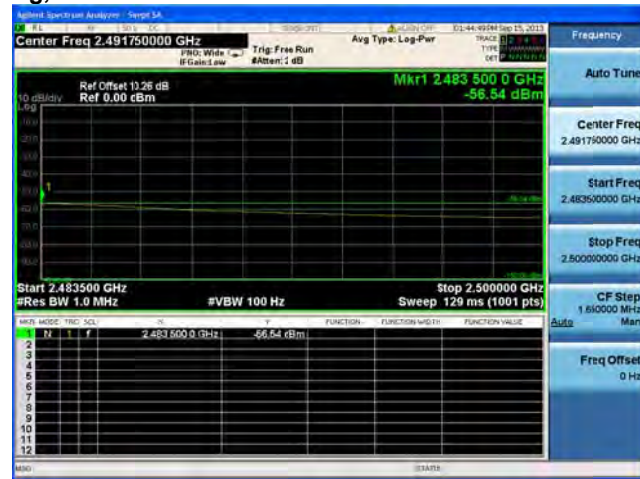
**Conducted Bandedge Average, 2462 MHz, HT-20, M8 to M15****Antenna A****Antenna B****Antenna C**

**Conducted Bandedge Average, 2462 MHz, HT-20, M16 to M23****Antenna A****Antenna B****Antenna C**

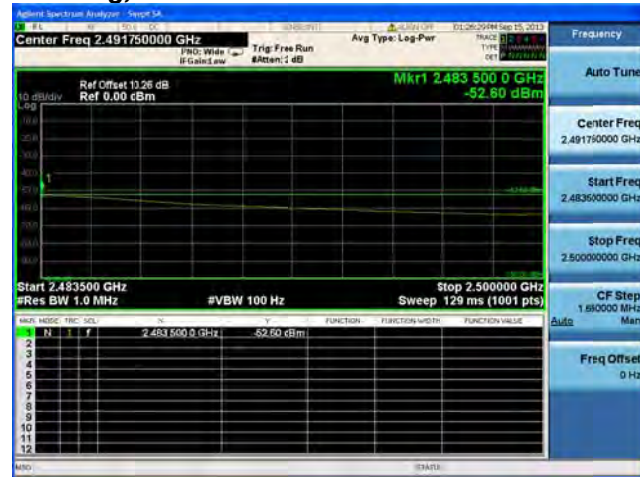
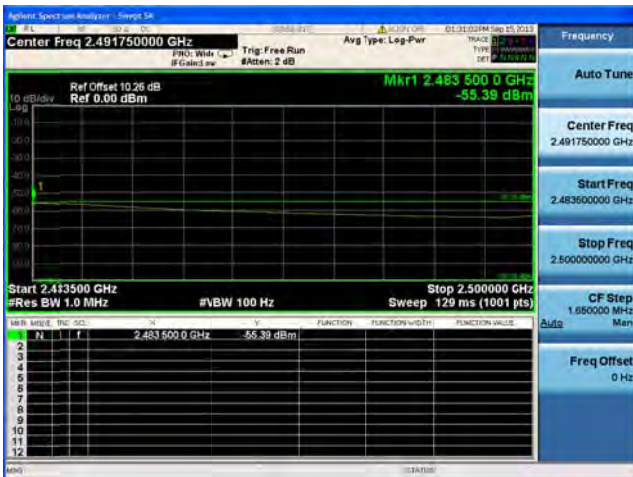
**Conducted Bandedge Average, 2462 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**

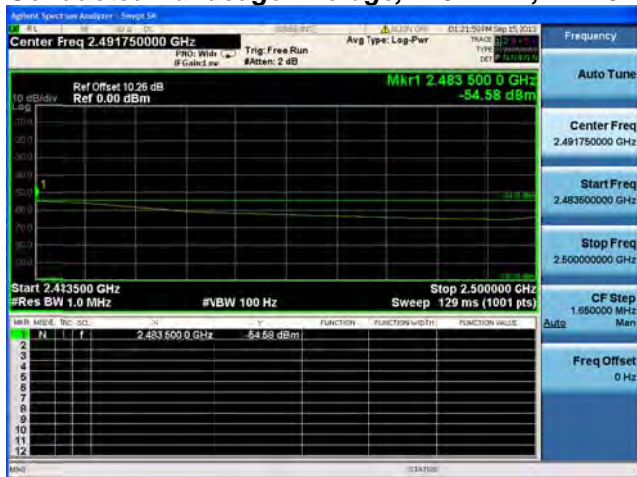
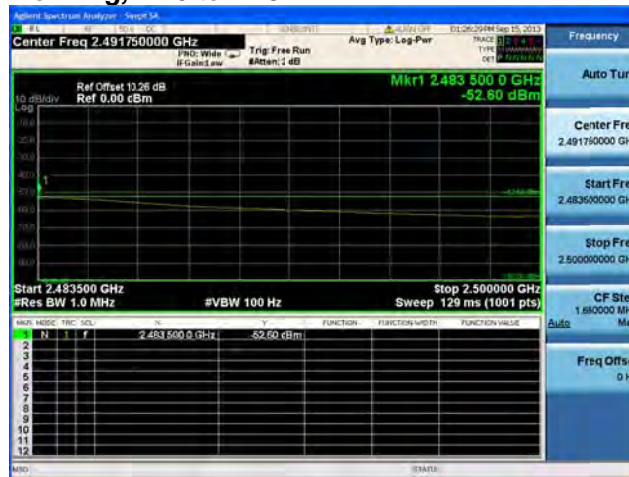
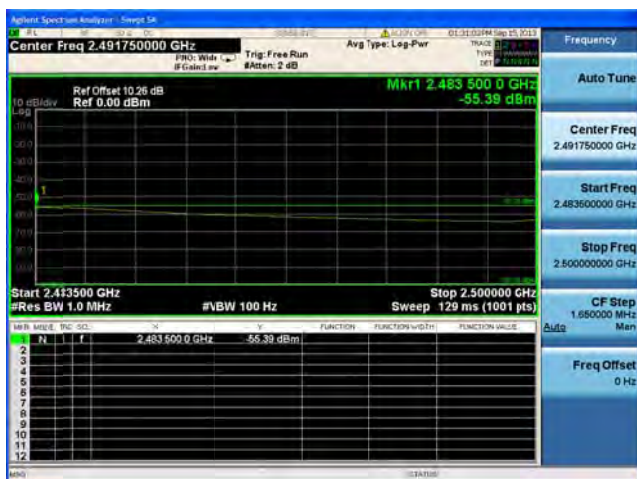
**Conducted Bandedge Average, 2462 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B**

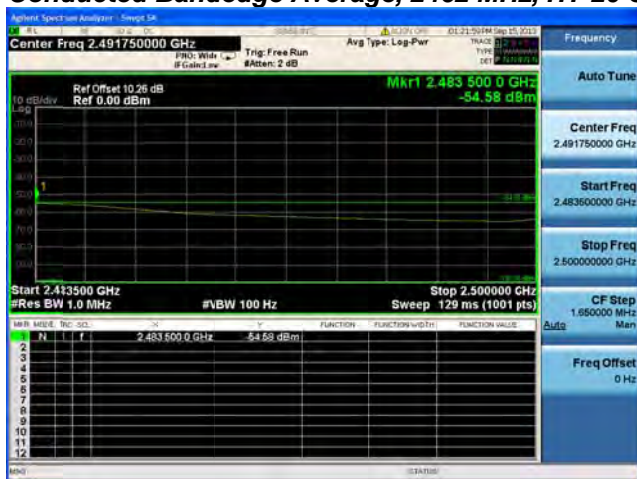
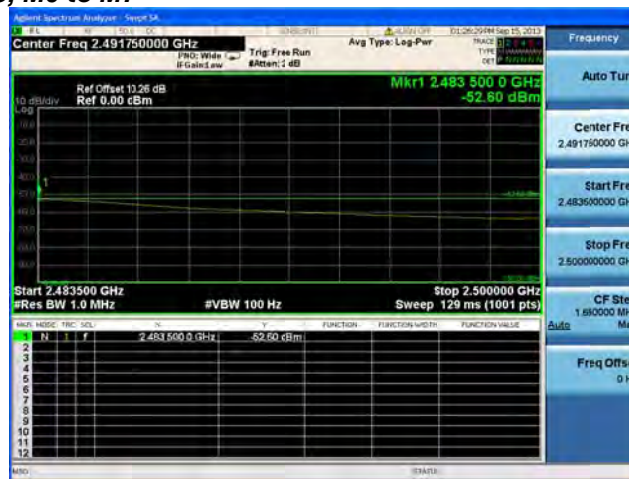


**Conducted Bandedge Average, 2462 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B****Antenna C**



**Conducted Bandedge Average, 2462 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B****Antenna C**

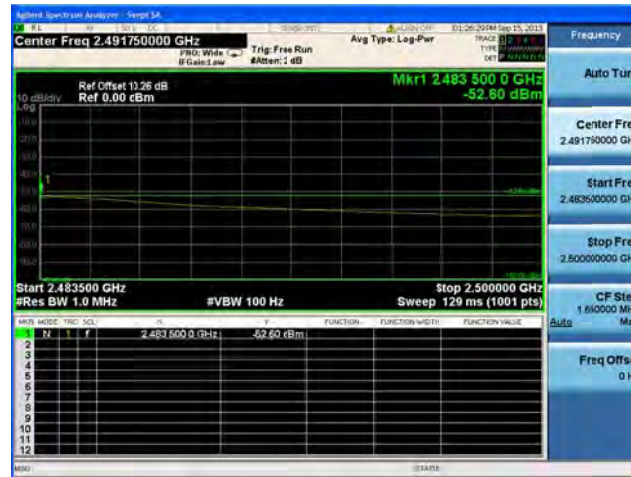
**Conducted Bandedge Average, 2462 MHz, HT-20 Beam Forming, M16 to M23****Antenna A****Antenna B****Antenna C**

**Conducted Bandedge Average, 2462 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B**

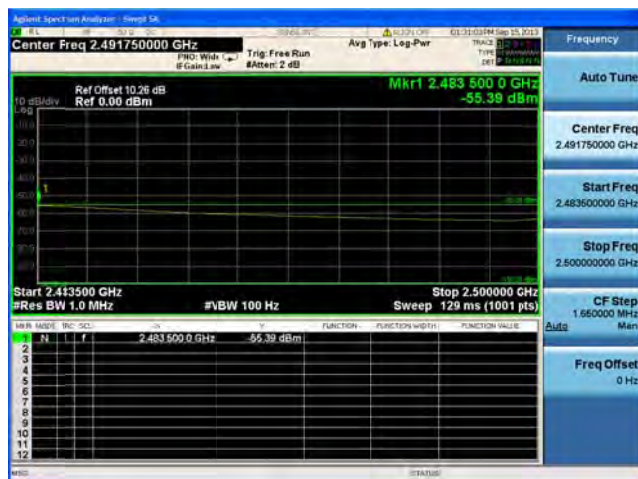
## Conducted Bandedge Average, 2462 MHz, HT-20 STBC, M0 to M7



Antenna A



Antenna B

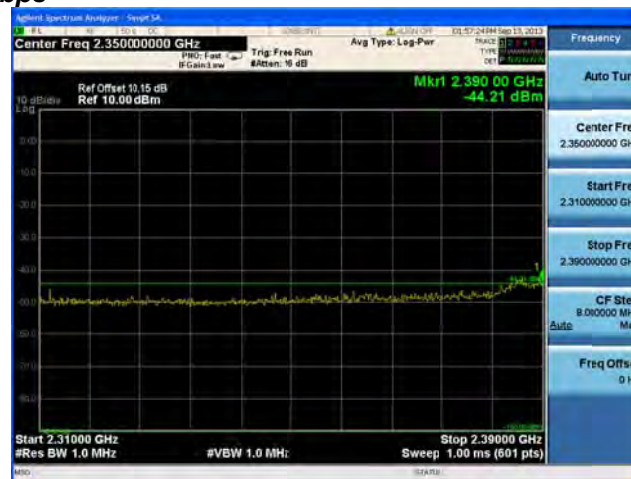


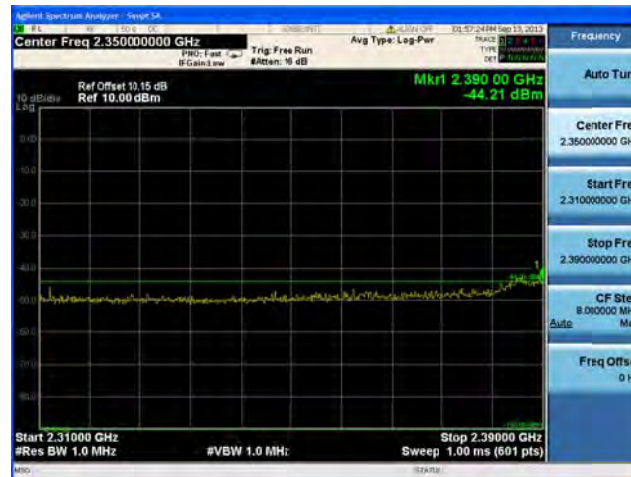
Antenna C



**Conducted Bandedge Peak, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A**



**Conducted Bandedge Peak, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B**

**Conducted Bandedge Peak, 2412 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B****Antenna C**

**Conducted Bandedge Peak, 2412 MHz, Non HT-20, 6 to 54 Mbps****Antenna A**

**Conducted Bandedge Peak, 2412 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B**

**Conducted Bandedge Peak, 2412 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**



**Conducted Bandedge Peak, 2412 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B**

**Conducted Bandedge Peak, 2412 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

**Conducted Bandedge Peak, 2412 MHz, HT-20, M0 to M7****Antenna A**

**Conducted Bandedge Peak, 2412 MHz, HT-20, M0 to M7****Antenna A****Antenna B**

**Conducted Bandedge Peak, 2412 MHz, HT-20, M8 to M15****Antenna A****Antenna B**



**Conducted Bandedge Peak, 2412 MHz, HT-20, M0 to M7****Antenna A****Antenna B****Antenna C**

**Conducted Bandedge Peak, 2412 MHz, HT-20, M8 to M15****Antenna A****Antenna B****Antenna C**

**Conducted Bandedge Peak, 2412 MHz, HT-20, M16 to M23****Antenna A****Antenna B****Antenna C**

**Conducted Bandedge Peak, 2412 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**



**Conducted Bandedge Peak, 2412 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B**



**Conducted Bandedge Peak, 2412 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B****Antenna C**

**Conducted Bandedge Peak, 2412 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B****Antenna C**

**Conducted Bandedge Peak, 2412 MHz, HT-20 Beam Forming, M16 to M23****Antenna A****Antenna B****Antenna C**

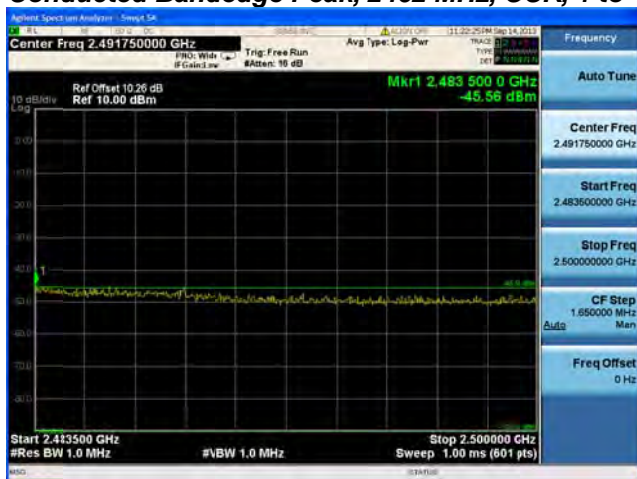
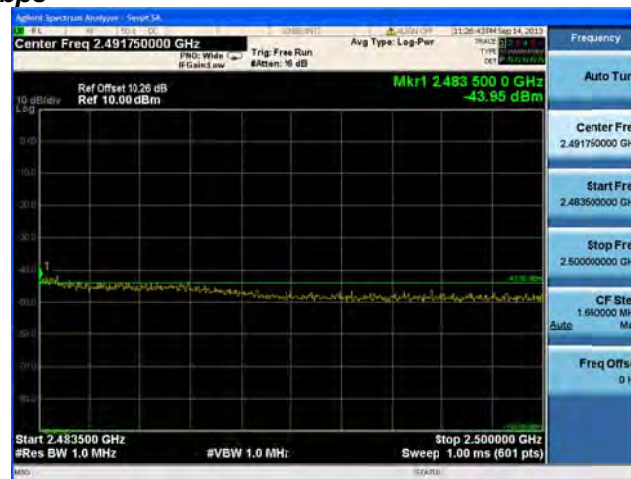
**Conducted Bandedge Peak, 2412 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B**

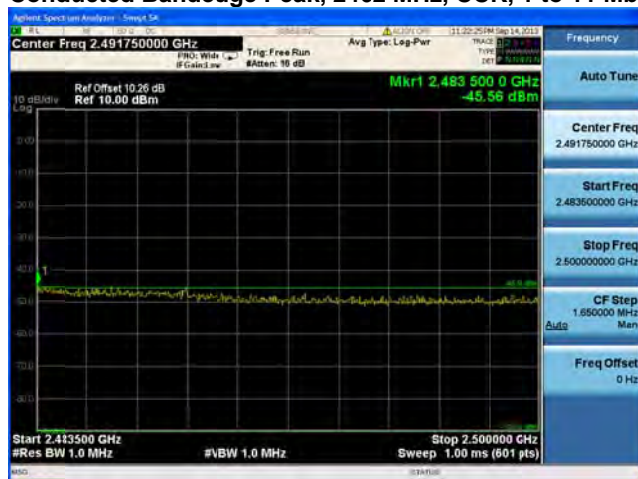
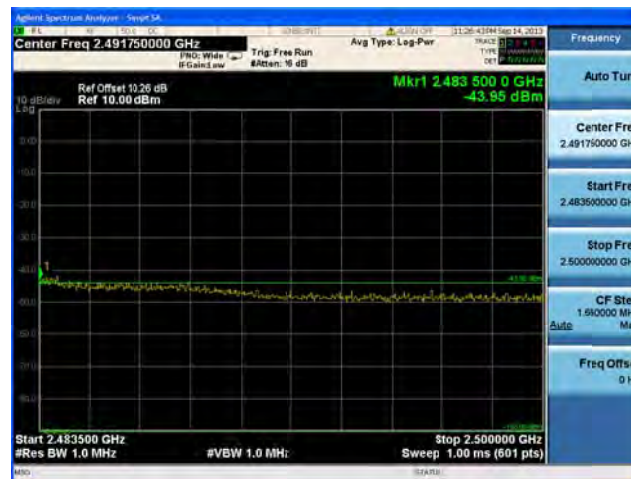


**Conducted Bandedge Peak, 2412 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B****Antenna C**

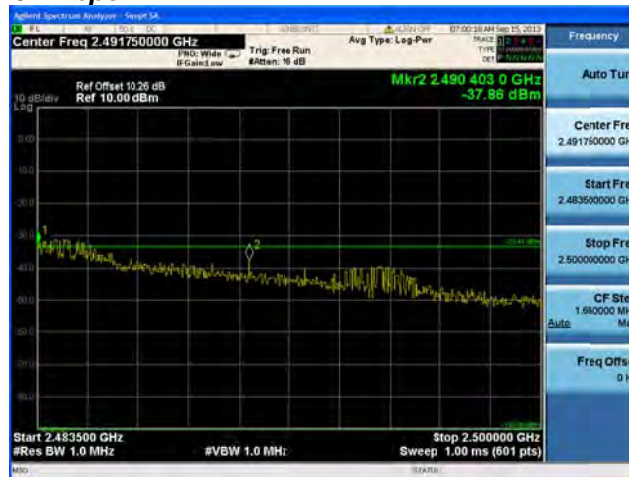


**Conducted Bandedge Peak, 2462 MHz, CCK, 1 to 11 Mbps****Antenna A**

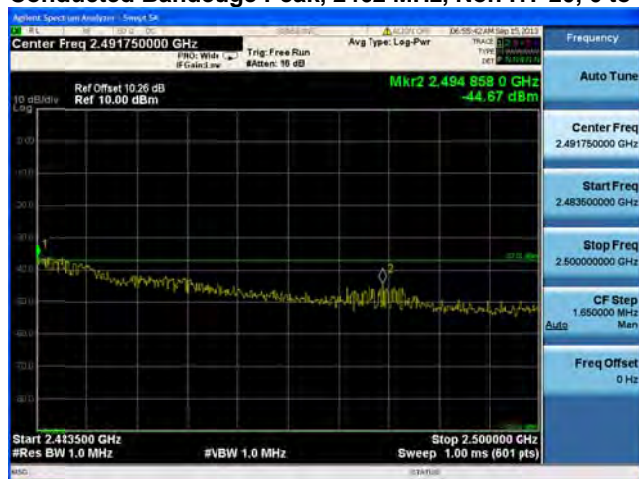
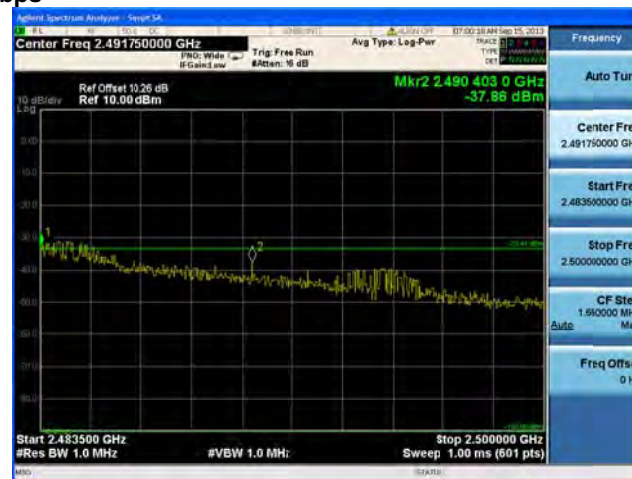
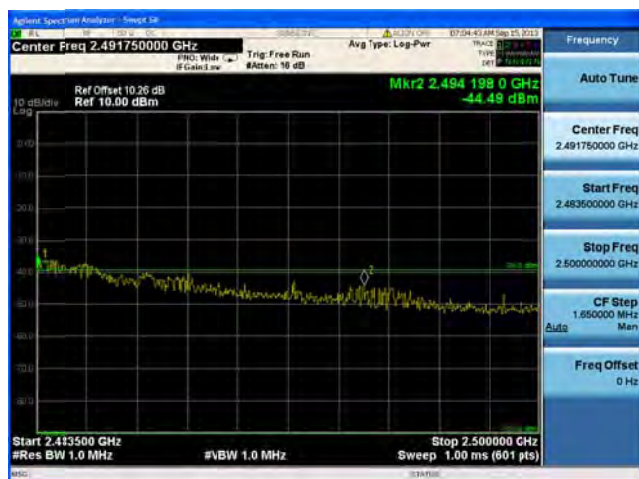
**Conducted Bandedge Peak, 2462 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B**

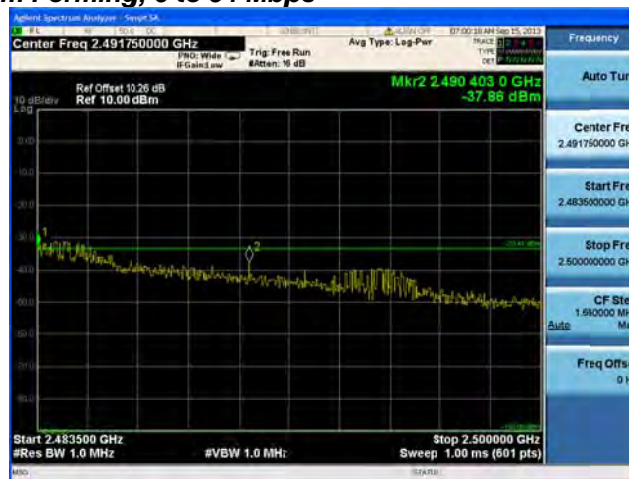
**Conducted Bandedge Peak, 2462 MHz, CCK, 1 to 11 Mbps****Antenna A****Antenna B****Antenna C**

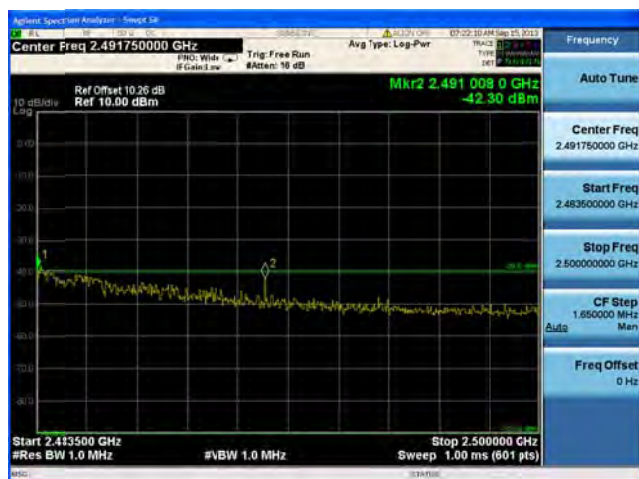
**Conducted Bandedge Peak, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A**

**Conducted Bandedge Peak, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B**

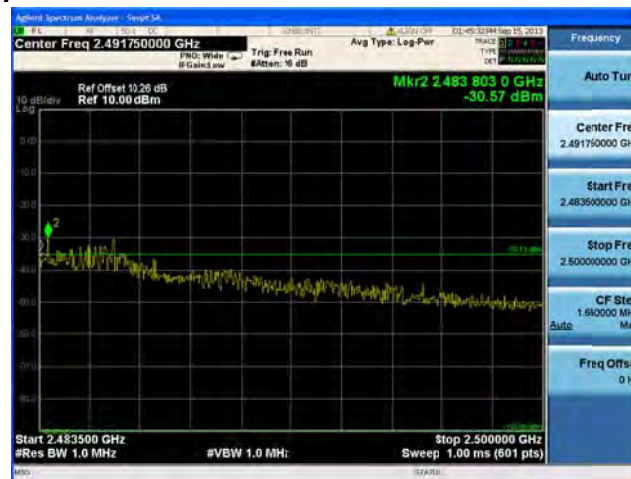


**Conducted Bandedge Peak, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

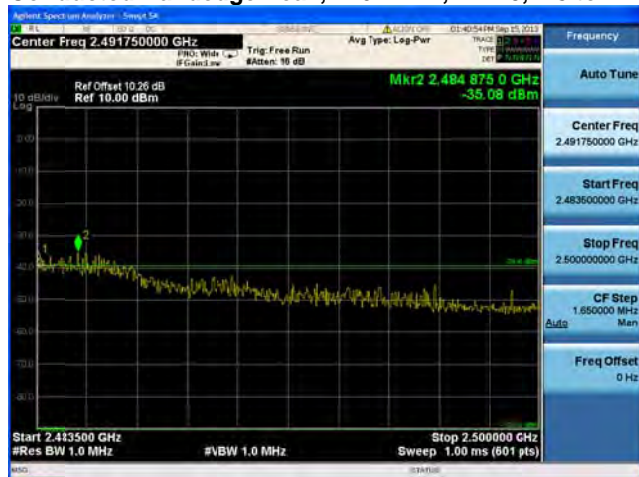
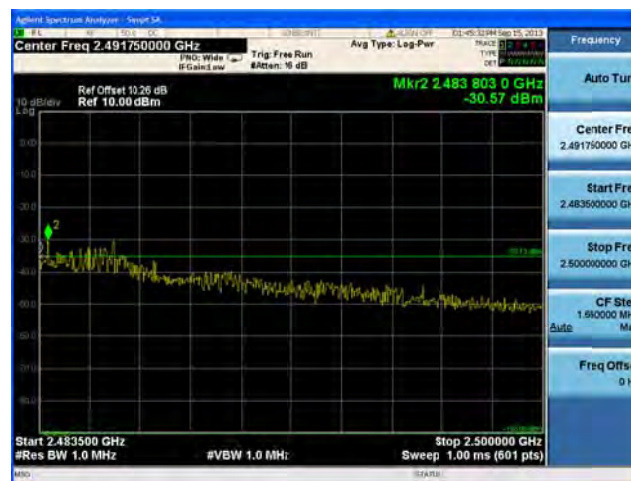
**Conducted Bandedge Peak, 2462 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B**

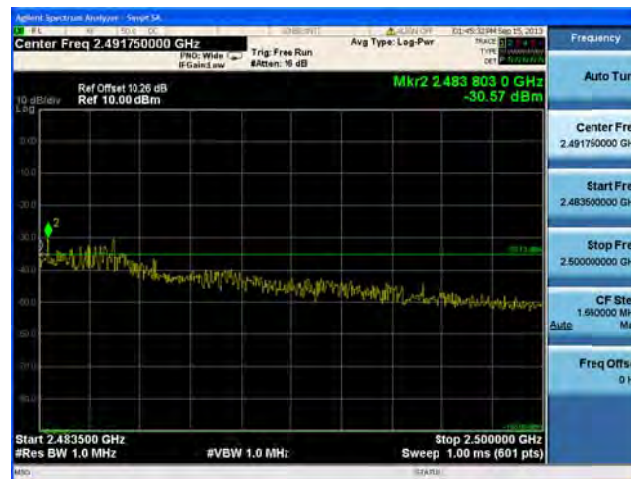
**Conducted Bandedge Peak, 2462 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

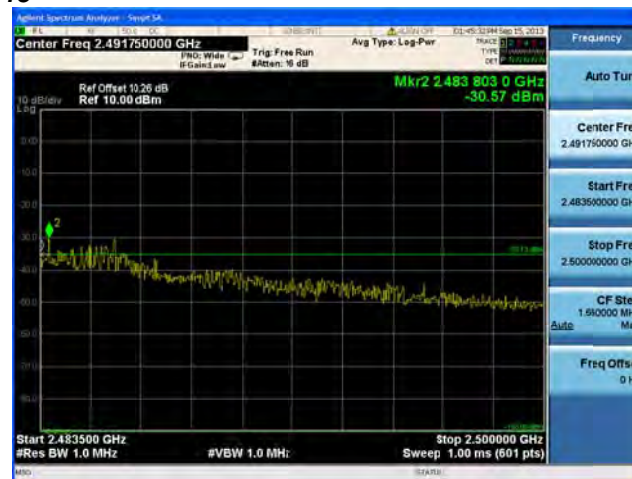
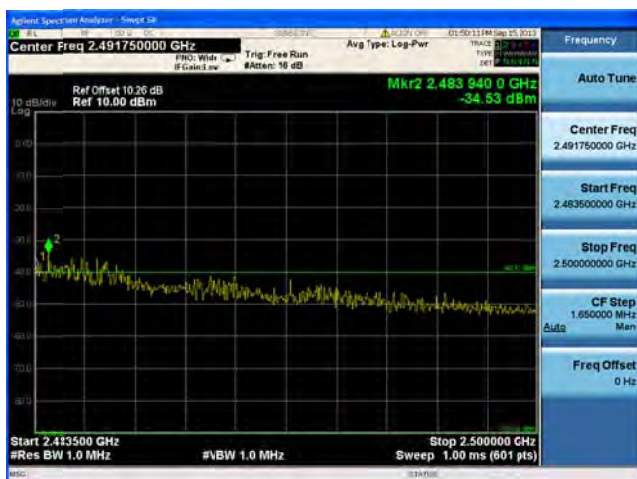
**Conducted Bandedge Peak, 2462 MHz, HT-20, M0 to M7****Antenna A**

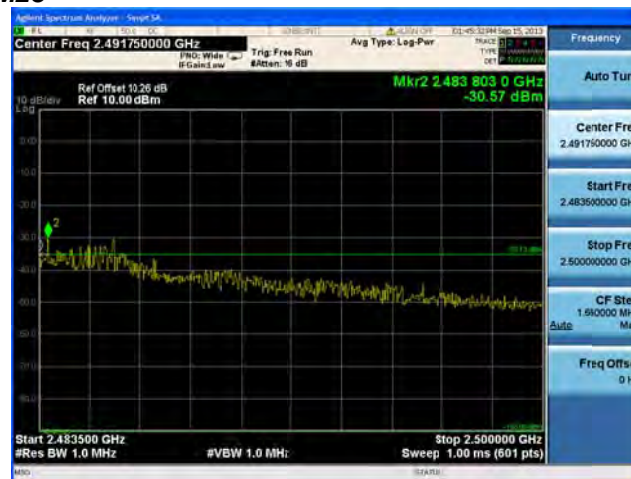
**Conducted Bandedge Peak, 2462 MHz, HT-20, M0 to M7****Antenna A****Antenna B**



**Conducted Bandedge Peak, 2462 MHz, HT-20, M8 to M15****Antenna A****Antenna B**

**Conducted Bandedge Peak, 2462 MHz, HT-20, M0 to M7****Antenna A****Antenna B****Antenna C**

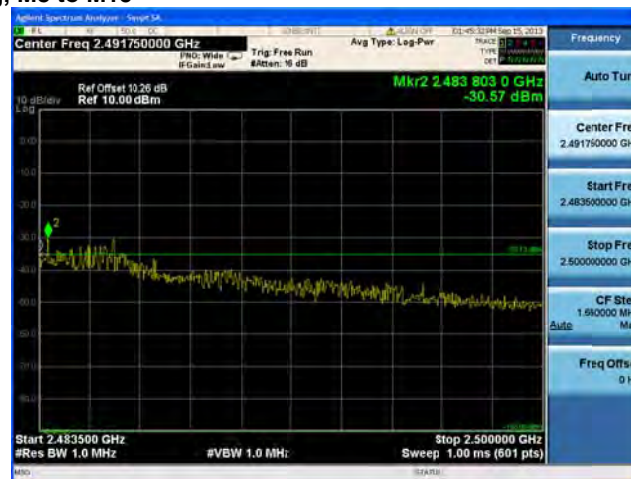
**Conducted Bandedge Peak, 2462 MHz, HT-20, M8 to M15****Antenna A****Antenna B****Antenna C**

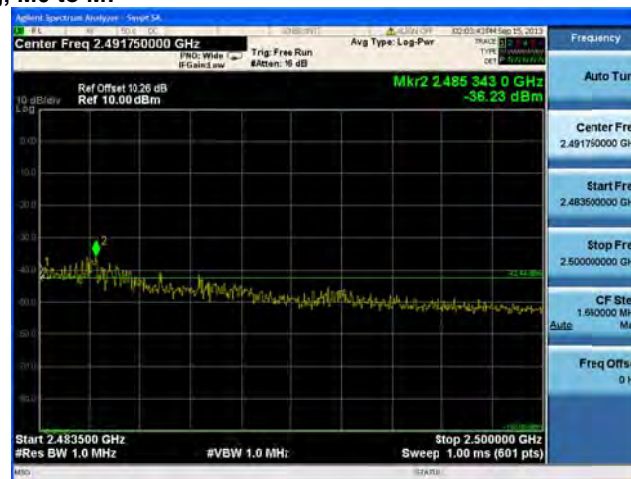
**Conducted Bandedge Peak, 2462 MHz, HT-20, M16 to M23****Antenna A****Antenna B****Antenna C**

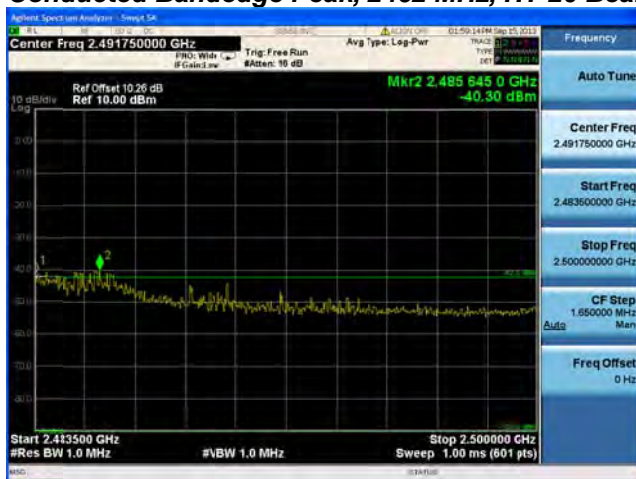


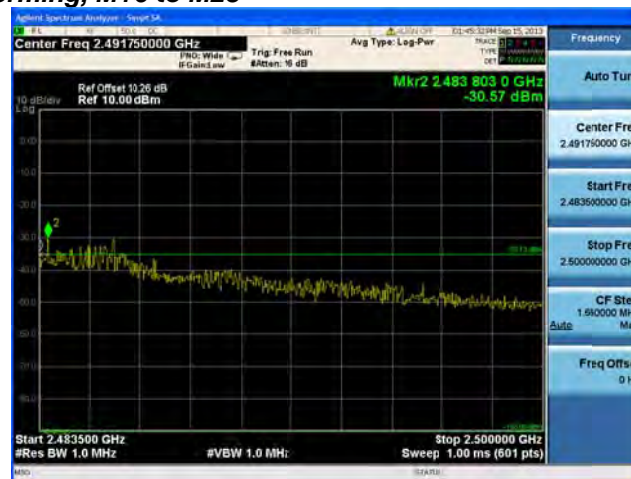
**Conducted Bandedge Peak, 2462 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**



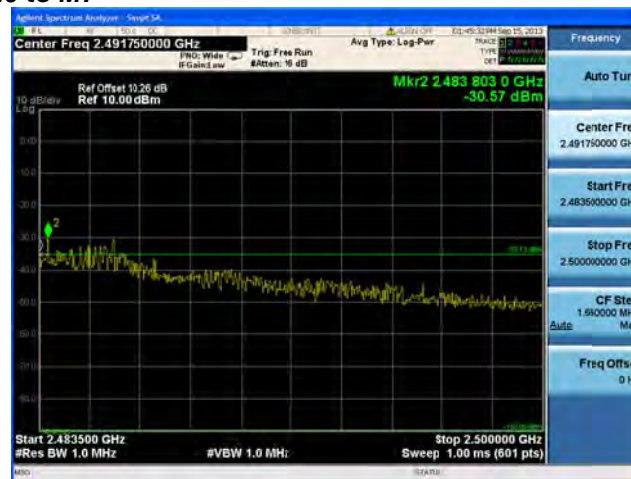
**Conducted Bandedge Peak, 2462 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B**

**Conducted Bandedge Peak, 2462 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B****Antenna C**

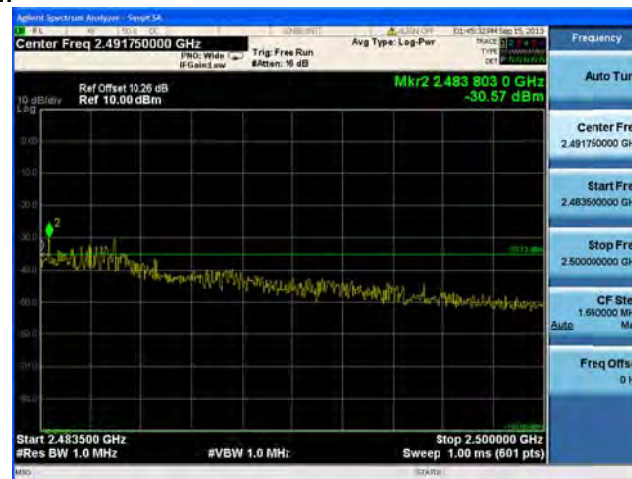
**Conducted Bandedge Peak, 2462 MHz, HT-20 Beam Forming, M8 to M15**

**Conducted Bandedge Peak, 2462 MHz, HT-20 Beam Forming, M16 to M23****Antenna A****Antenna B****Antenna C**



**Conducted Bandedge Peak, 2462 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B**



**Conducted Bandedge Peak, 2462 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B****Antenna C**



## **Appendix B: Emission Test Results**

**Testing Laboratory:** Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134, USA

### **Radiated Spurious Emissions**

15.205 / RSS-210 2.7: Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Using Vasona, configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer). Place the radio in continuous transmit mode.

Span:	1GHz – 18 GHz
Reference Level:	80 dBuV
Attenuation:	10 dB
Sweep Time:	Coupled
Resolution Bandwidth:	1MHz
Video Bandwidth:	1 MHz for peak, 10 Hz for average
Detector:	Peak

Terminate the access Point RF ports with 50 ohm loads.

Maximize Turntable (find worst case table angle), Maximize Antenna (find worst case height)

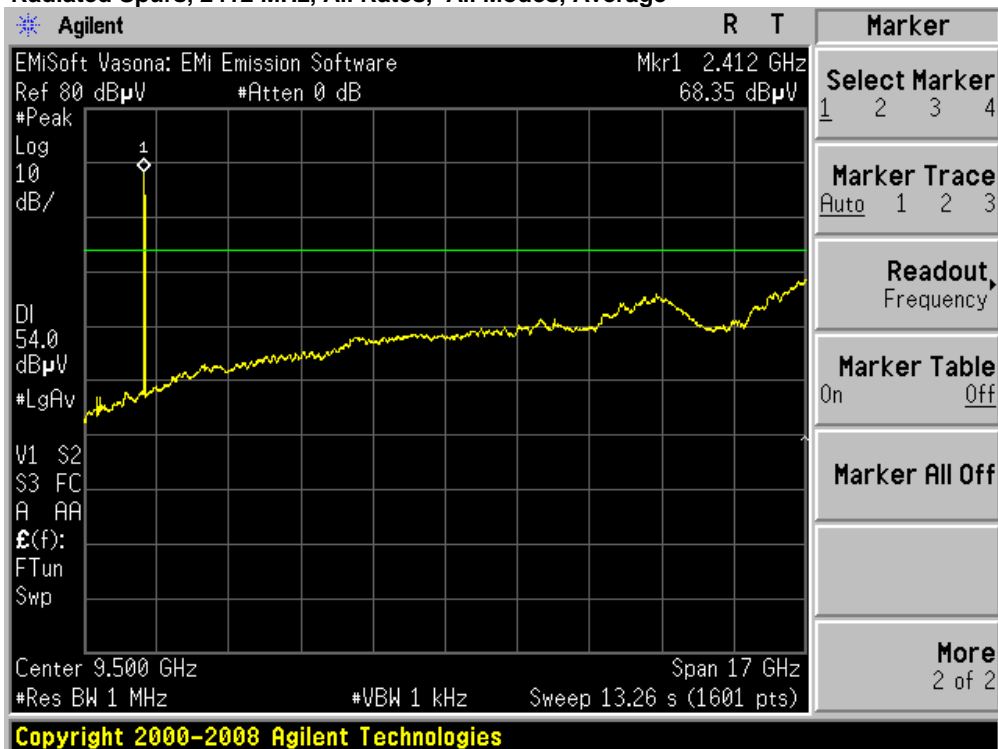
Save 2 plots:     1) Average Plot (Vertical and Horizontal), Limit= 54dBuV/m @3m  
                      2) Peak plot (Vertical and Horizontal), Limit = 74dBuV/m @3m

Place a marker at the end of the restricted band closest to the transmit frequency to show compliance.  
Also measure any emissions in the restricted bands.

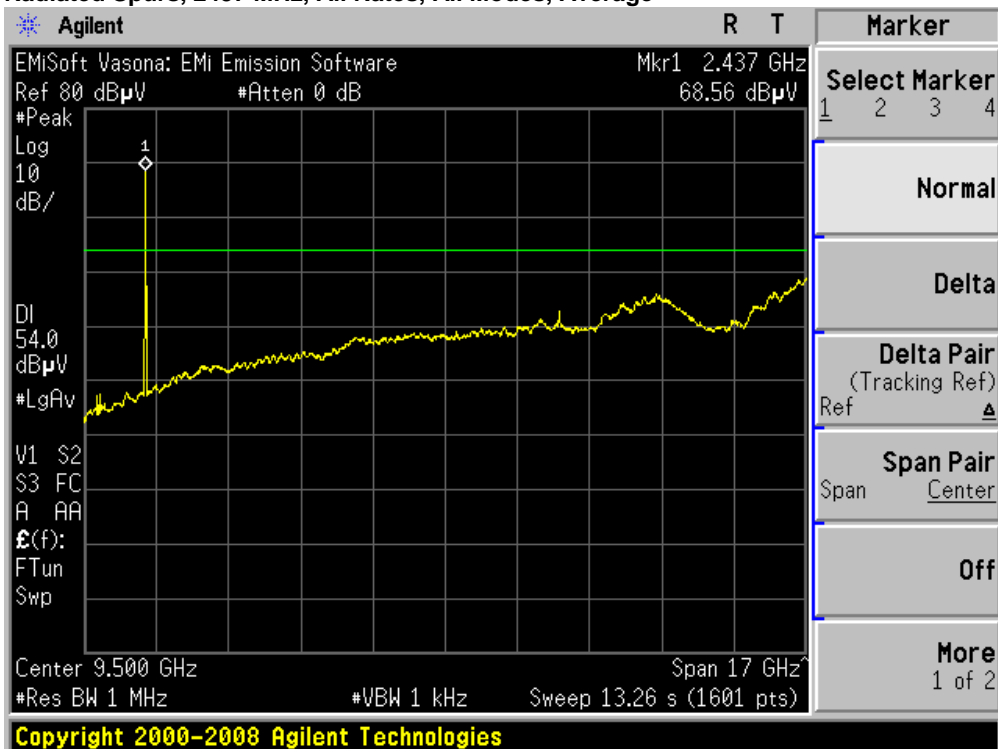
This report represents the worst case data for all supported operating modes and antennas.  
There are no measurable emissions above 18 GHz.

Frequency (MHz)	Mode	Data Rate (Mbps)	Spurious Emission Level (dBuV/m)	Limit (dBuV/m)
2412	Legacy CCK, 1 to 11 Mbps	1	<54	54
	Non HT-20, 6 to 54 Mbps	6	<54	54
	Non HT-20 Beam Forming, 6 to 54 Mbps	6	<54	54
	HT-20, M0 to M23	m0	<54	54
	HT-20 STBC, M0 to M7	m0	<54	54
	HT-20 Beam Forming, M0 to M23	m0	<54	54
2437	Legacy CCK, 1 to 11 Mbps	1	<54	54
	Non HT-20, 6 to 54 Mbps	6	<54	54
	Non HT-20 Beam Forming, 6 to 54 Mbps	6	<54	54
	HT-20, M0 to M23	m0	<54	54
	HT-20 STBC, M0 to M7	m0	<54	54
	HT-20 Beam Forming, M0 to M23	m0	<54	54
2462	Legacy CCK, 1 to 11 Mbps	1	<54	54
	Non HT-20, 6 to 54 Mbps	6	<54	54
	Non HT-20 Beam Forming, 6 to 54 Mbps	6	<54	54
	HT-20, M0 to M23	m0	<54	54
	HT-20 STBC, M0 to M7	m0	<54	54
	HT-20 Beam Forming, M0 to M23	m0	<54	54

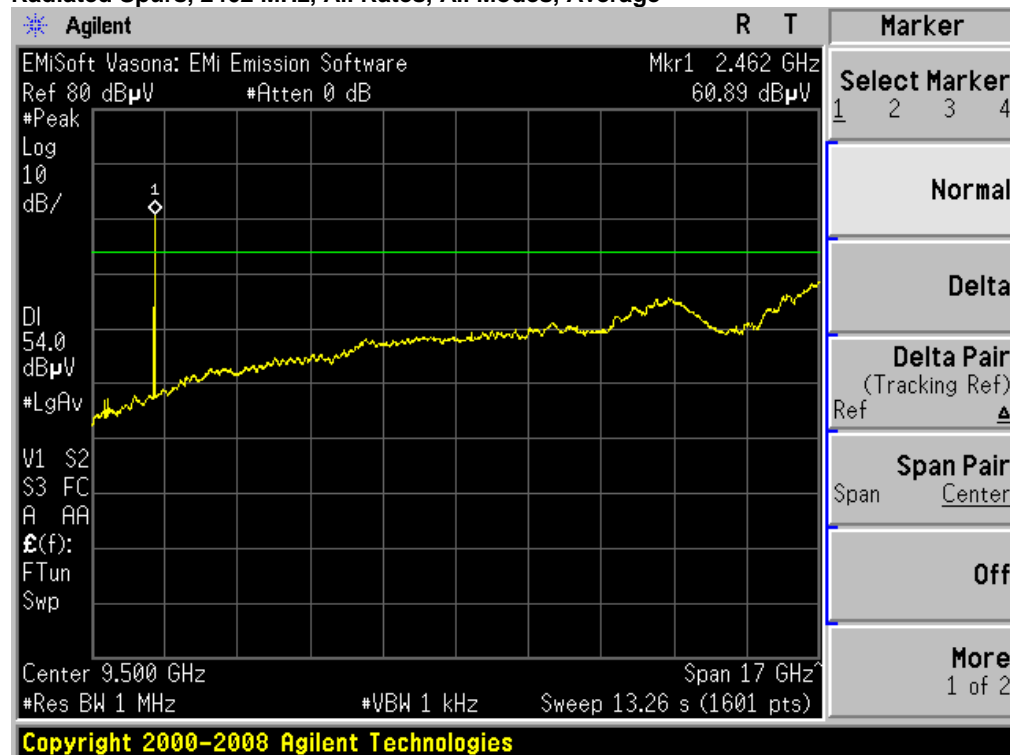
## Radiated Spurs, 2412 MHz, All Rates, All Modes, Average



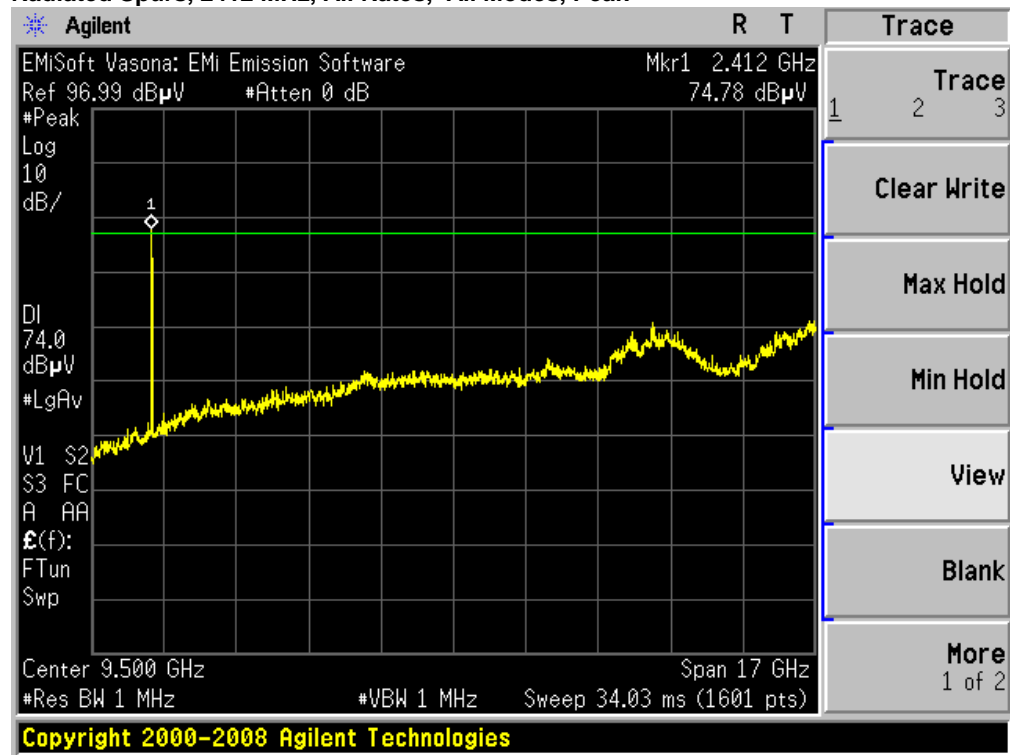
## Radiated Spurs, 2437 MHz, All Rates, All Modes, Average



## Radiated Spurs, 2462 MHz, All Rates, All Modes, Average

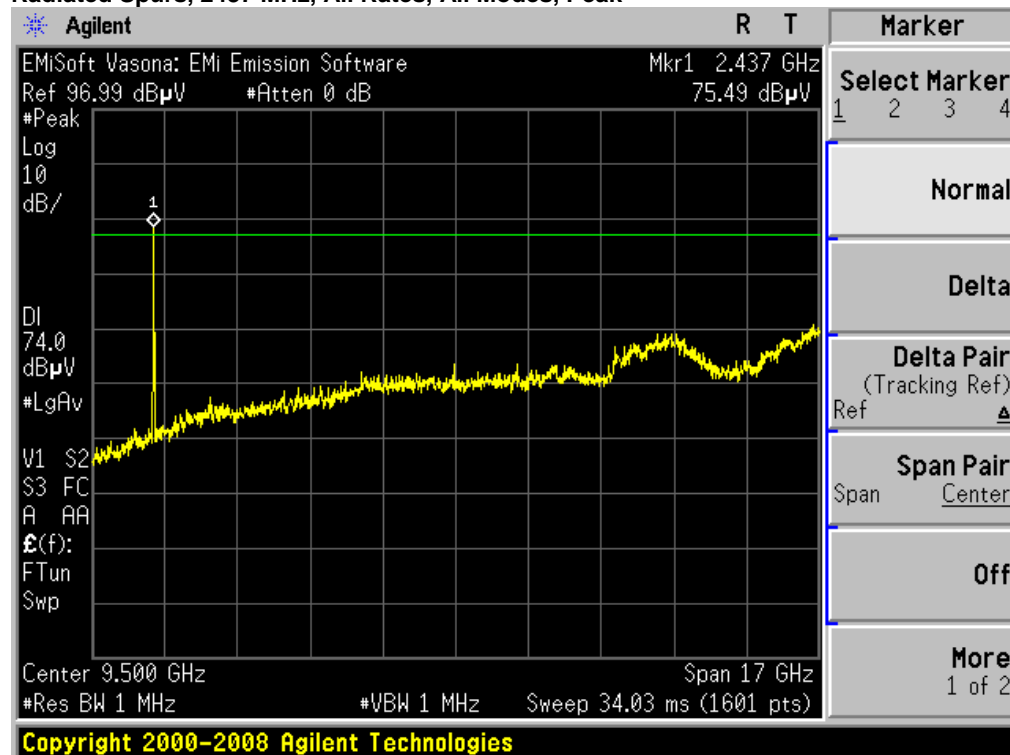


## Radiated Spurs, 2412 MHz, All Rates, All Modes, Peak

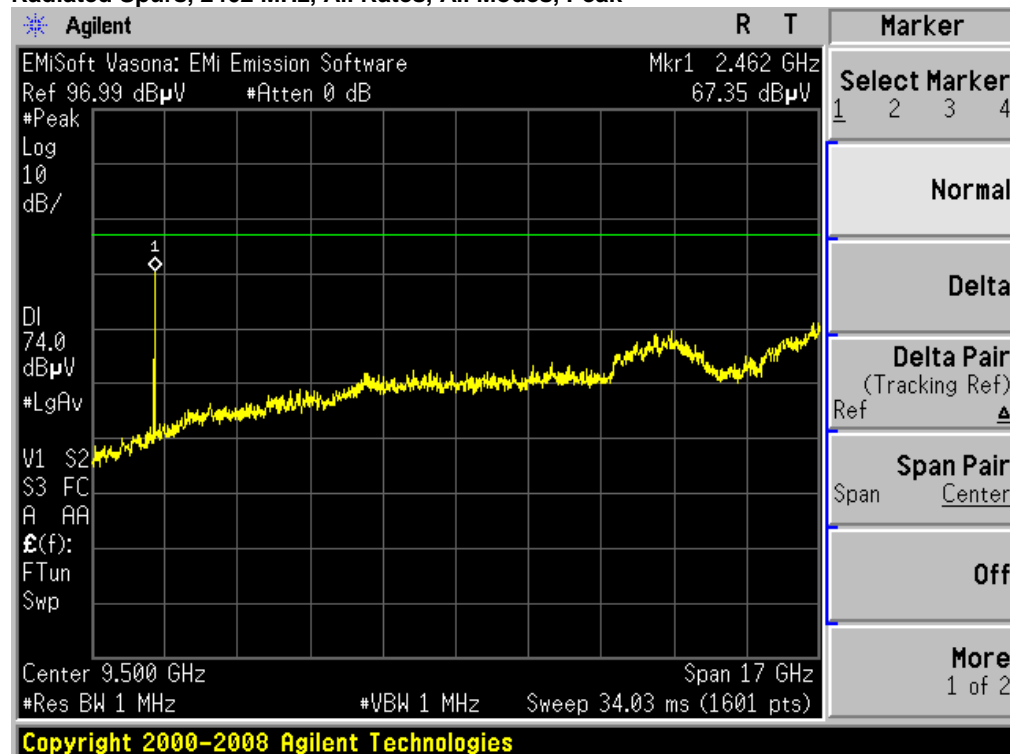




## Radiated Spurs, 2437 MHz, All Rates, All Modes, Peak



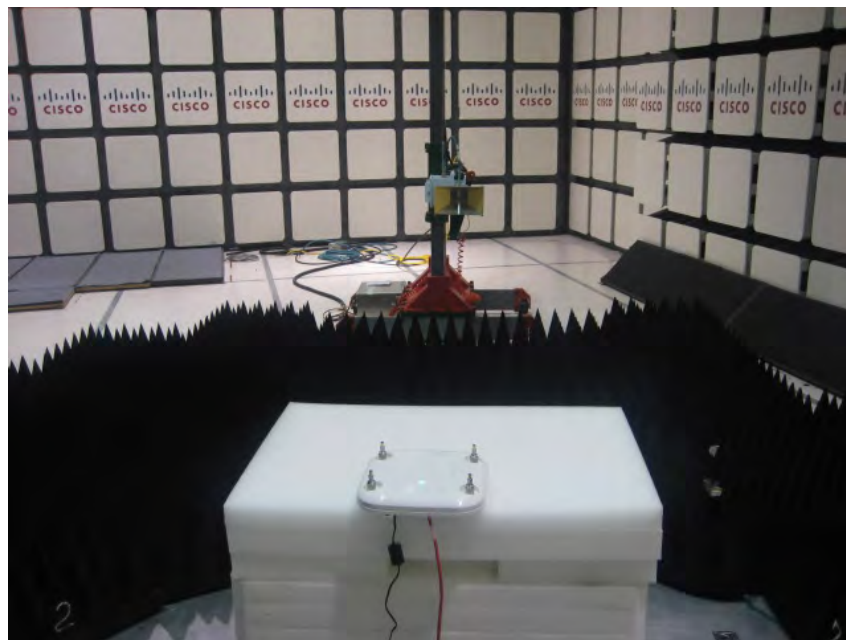
## Radiated Spurs, 2462 MHz, All Rates, All Modes, Peak



**Radiated Receiver Spurs, All Rates, All Modes, Average****Radiated Receiver Spurs, All Rates, All Modes, Peak**

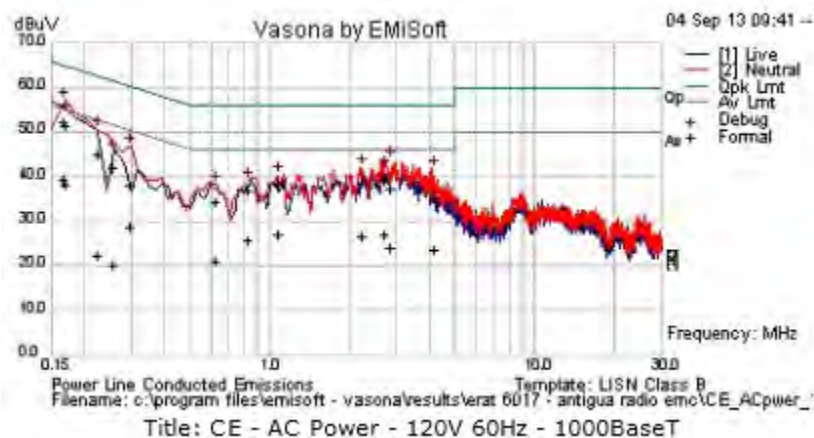


**Test Setup for Conducted Measurements**



**Test Setup for Radiated Measurements**

## Conducted Emissions



Test Result Table

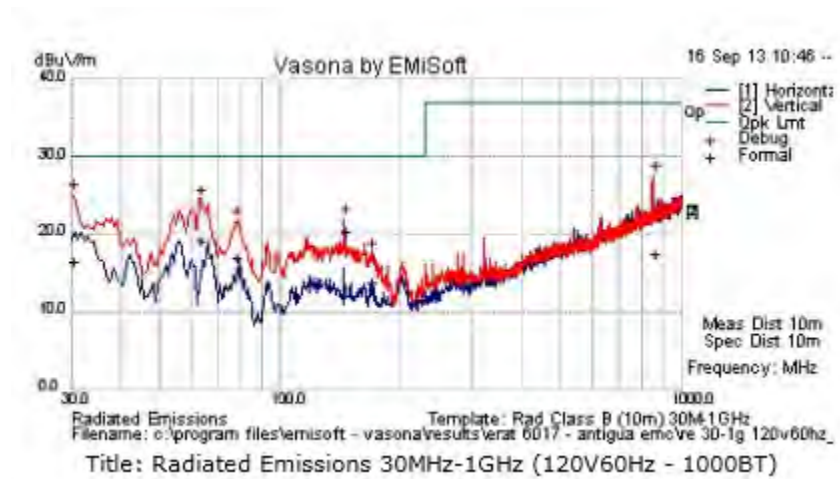
Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
0.168	29.9	21.2	0.2	51.3	Qp	L	65.1	-13.7	Pass	
0.256	21.3	20.7	0.1	42.1	Qp	L	61.6	-19.5	Pass	
0.222	23.9	20.9	0.1	44.9	Qp	L	62.7	-17.9	Pass	
2.695	19	20	0	39	Qp	L	56	-17	Pass	
0.826	16.7	20	0	36.7	Qp	L	56	-19.3	Pass	
0.618	14.2	20	0	34.3	Qp	L	56	-21.7	Pass	
0.293	17.7	20.6	0	38.3	Qp	N	60.4	-22.1	Pass	
1.07	18.4	20	0	38.4	Qp	N	56	-17.6	Pass	
2.834	17.2	20	0	37.2	Qp	N	56	-18.8	Pass	
0.166	30.8	21.3	0.2	52.3	Qp	N	65.2	-12.9	Pass	
2.221	18.6	20	0	38.7	Qp	N	56	-17.3	Pass	
4.111	15.3	20	0	35.4	Qp	N	56	-20.6	Pass	
0.168	17	21.2	0.2	38.4	Av	L	55.1	-16.7	Pass	
0.256	-0.4	20.7	0.1	20.4	Av	L	51.6	-31.2	Pass	
0.222	1.4	20.9	0.1	22.4	Av	L	52.7	-30.3	Pass	
2.695	7	20	0	27.1	Av	L	46	-18.9	Pass	
0.826	5.5	20	0	25.6	Av	L	46	-20.4	Pass	
0.618	0.9	20	0	21	Av	L	46	-25	Pass	
0.293	8	20.6	0	28.6	Av	N	50.4	-21.8	Pass	
1.07	7	20	0	27	Av	N	46	-19	Pass	
2.834	4	20	0	24	Av	N	46	-22	Pass	
0.166	18.2	21.3	0.2	39.6	Av	N	55.2	-15.5	Pass	
2.221	6.5	20	0	26.5	Av	N	46	-19.5	Pass	
4.111	3.5	20	0	23.6	Av	N	46	-22.4	Pass	



**Test Setup for Conducted Measurements**



## Radiated emissions



Test Result Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
30.449	22.5	0.7	-6.8	16.3	Qp	V	149	290	30	-13.7	Pass	
63.207	38.4	1	-20.2	19.2	Qp	V	197	87	30	-10.8	Pass	
144.011	34	1.4	-14.9	20.5	Qp	V	119	255	30	-9.5	Pass	
77.91	35.5	1.1	-19.8	16.8	Qp	V	119	19	30	-13.2	Pass	
853.084	20.6	3.3	-6.4	17.5	Qp	V	274	6	37	-19.5	Pass	
168.944	27.9	1.5	-15.7	13.7	Qp	V	115	34	30	-16.3	Pass	



## Maximum Permissible Exposure (MPE) Calculations

15.247: U-NII devices are subject to the radio frequency radiation exposure requirements specified in Sec. 1.1307(b), Sec. 2.1091 and Sec. 2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a "general population/uncontrolled" environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

Given

$$E = \sqrt{(30 \cdot P \cdot G)/d} \quad \text{and} \quad S = E^2/3770$$

where

E=Field Strength in Volts/meter

P=Power in Watts

G=Numeric Antenna Gain

d=Distance in meters

S=Power Density in mW/cm<sup>2</sup>

Combine equations and rearrange the terms to express the distance as a function of the remaining variables:

$$d = \sqrt{((30 \cdot P \cdot G)/(3770 \cdot S))}$$

Changing to units of power in mW and distance in cm, using:

$$P(\text{mW}) = P(\text{W})/1000 \quad d(\text{cm}) = 100 \cdot d(\text{m})$$

yields

$$d = 100 \cdot \sqrt{((30 \cdot (P/1000) \cdot G)/(3770 \cdot S))}$$

$$d = 0.282 \cdot \sqrt{(P \cdot G/S)}$$

where

d=Distance in cm

P=Power in mW

G=Numerica Antenna Gain

S=Power Density in mW/cm<sup>2</sup>

Substituting the logarithmic form of power and gain using:

$$P(\text{mW}) = 10^{(P(\text{dBm})/10)} \quad G(\text{numeric}) = 10^{(G(\text{dBi})/10)}$$

yields

$$d = 0.282 \cdot 10^{((P+G)/20)} / \sqrt{S} \quad \text{Equation (1)}$$

and

$$S = ((0.282 \cdot 10^{((P+G)/20)})/d)^2 \quad \text{Equation (2)}$$

where

d=MPE distance in cm

P=Power in dBm

G=Antenna Gain in dBi

S=Power Density in mW/cm<sup>2</sup>



Equation (1) and the measured peak power are used to calculate the MPE distance. Note that for mobile or fixed location transmitters such as an access point, the minimum separation distance is 20 cm even if the calculations indicate that the MPE distance may be less.

$S=1\text{mW/cm}^2$  maximum. The highest supported antenna gain is 6 dBi (9dBi with beamforming). Using the peak power levels recorded in the test report along with Equation 1 above, the MPE distances are calculated as follows.

#### MPE Calculations:

Frequency (MHz)	Power Density (mW/cm <sup>2</sup> )	Peak Transmit Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)	Limit (cm)	Margin (cm)
2412	1	21.4	6	<b>6.61</b>	20	13.39
2462	1	21.4	6	<b>6.61</b>	20	13.39

To maintain compliance, installations will assure a separation distance of at least 20cm.

Using Equation 2, the MPE levels (s) at 20 cm are calculated as follows:

Frequency (MHz)	MPE Distance (cm)	Peak Transmit Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Margin (mW/cm <sup>2</sup> )
2412	20	21.4	6	<b>0.11</b>	1	0.89
2462	20	21.4	6	<b>0.11</b>	1	0.89



## Appendix C: Test Equipment/Software Used to perform the test

Equip No	Manufacturer	Model	Description	Cal Due Date
30562	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in	6/26/2014
46702	Stanley	33-605	10 Meter Tape Measure	11/1/2013
32806	Sunol Sciences	JB1	Combination Antenna	1/24/2014
27234	York	CNE V	Comparison Noise Emitter	
41929	Newport	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable	12/12/2013
25651	Micro-Coax	UFB311A-1-3150-504504	Rf Coaxial Cable 315.0 in to 18GHz	2/13/2014
8320	Times Microwave Systems	RG-214	3 ft RG-214 Cable	11/19/2013
47410	Agilent	N9038A	EMI Receiver	1/15/2014
21116	Micro-Coax	UFB311A-0-3540-520520	RF Coaxial Cable, to 18GHz, 354 in	2/20/2014
18313	HP	8447D	RF Preamplifier	1/8/2014
8195	TTE	H613-150K-50-21378	Hi Pass Filter - 150KHz cutoff	1/4/2014
8496	Fischer Custom Communications	FCC-450B-2.4-N	Instrumentation Limiter	5/20/2014
47300	Agilent Technologies	N9038A	MXE EMI Receiver 20Hz to 26.5 Ghz	11/13/2013
49560	Bird	5-T-MB	5W 50 Ohm BNC Termination 4GHz	8/9/2014
27234	York	CNE V	Comparison Noise Emitter	
45990	Fischer Custom Communications	F-090527-1009-1	Line Impedance Stabilization Network	6/21/2014
45991	Fischer Custom Communications	F-090527-1009-2	Lisn Adapter	6/21/2014
21606	Coleman	RG-223	4ft BNC cable	10/31/2013
41928	Newport	iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable	4/12/2014
5687	Fluke	73 III	Digital Multimeter	9/11/2013
35248	Stanley	33-696	5 Meter Tape Measure	7/9/2014
39110	Coleman	RG-223	25 ft BNC cable	11/29/2013
30526	Midwest Microwave	TRM-2048-MC-BNC-10	50 Ohm Terminator, BNC w/chain	3/11/2014
44038	Fischer Custom Communications	F-071115-1057-1	Balanced Telecom Impedance Stabilization Network	5/29/2014
4003	Fischer Custom Communications	FCC-801-M2-32A	CDN, 2-LINE, 32A	3/14/2014