



Test Report

AIR-CAP3702y-A-K9 AIR-SAP3702y-A-K9

Cisco Aironet 802.11ac Dual Band Access Points

**FCC ID: LDK102087
IC: 2461B-102087**

Also covers:

AIR-CAP3702y-D-K9, AIR-SAP3702y-D-K9

AIR-CAP3702y-N-K9, AIR-SAP3702y-N-K9

AIR-CAP3702y-T-K9, AIR-SAP3702y-T-K9

AIR-CAP3702y-Z-K9, AIR-SAP3702y-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



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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

18-February-2013 – 08-March-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

James Nicholson

2.5 Equipment Assessed (EUT)

AIR-SAP3702E-A-K9 Cisco Aironet 802.11ac Dual Band Access Point



2.6 EUT Description

The 3700 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.

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, Four 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
 Non HT-20 Beam Forming, Four 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, Four Antennas, M0 to M23

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

HT-20 Beam Forming, Two Antennas, M0 to M15
 HT-20 Beam Forming, Three Antennas, M0 to M23
 HT-20 Beam Forming, Four 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)
2.4 / 5 GHz	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	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-SAP3702E-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
Legacy CCK, 1 to 11 Mbps	21	21	21
Non HT-20, 6 to 54 Mbps	21	21	21
Non HT-20 Beam Forming, 6 to 54 Mbps	20	21	19
HT-20, M0 to M23	21	21	20
HT-20 STBC, M0 to M7	21	21	20
HT-20 Beam Forming, M0 to M23	20	21	20



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.

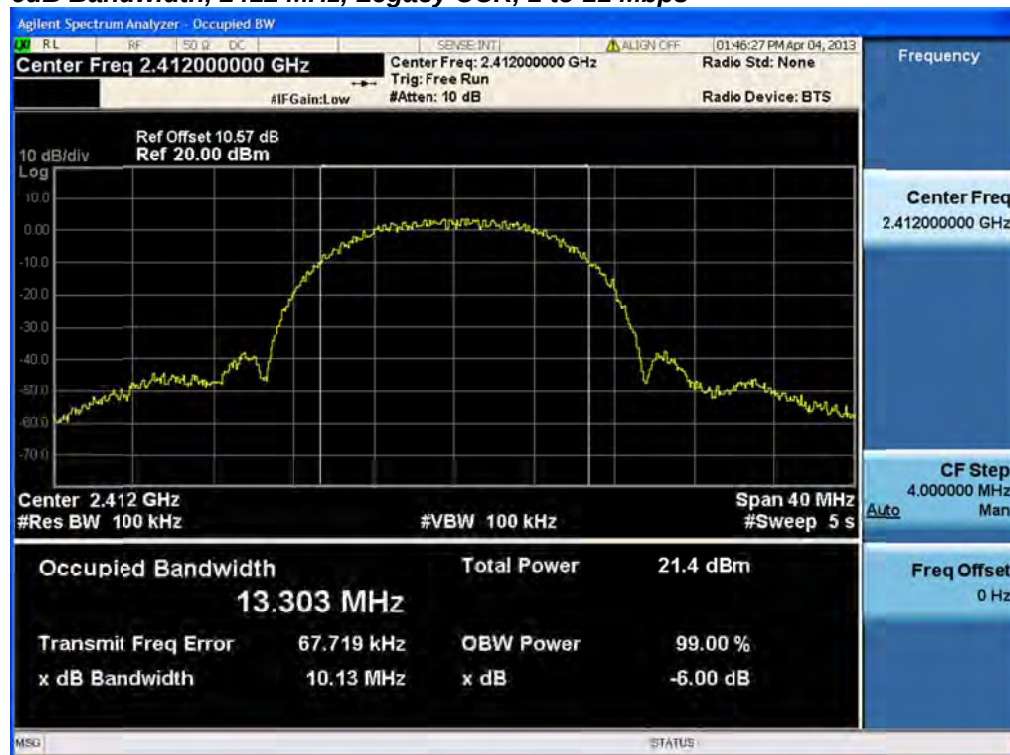
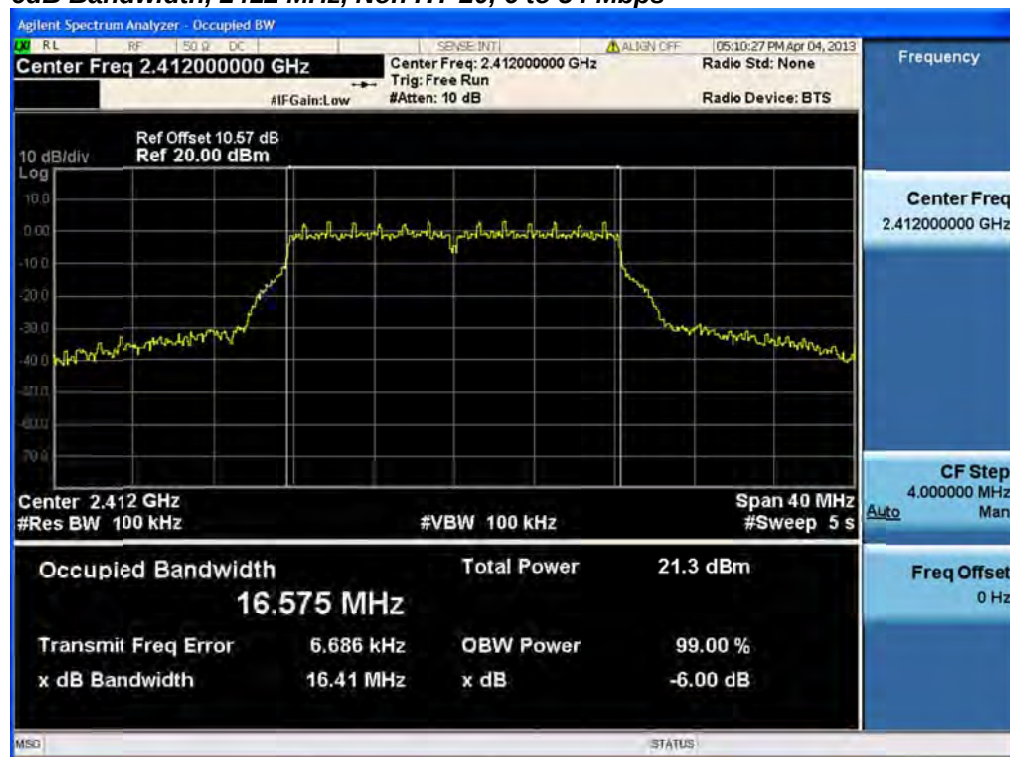
Connect the antenna port(s) to the spectrum analyzer input. Using the spectrum analyzer Channel Bandwidth mode, configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).

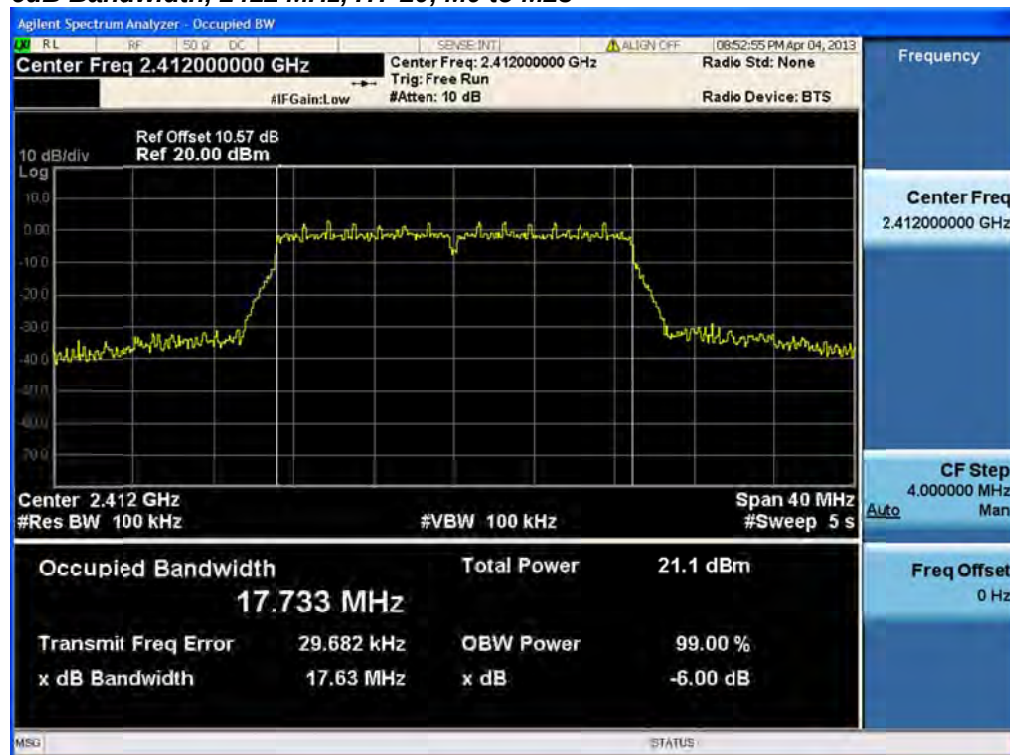
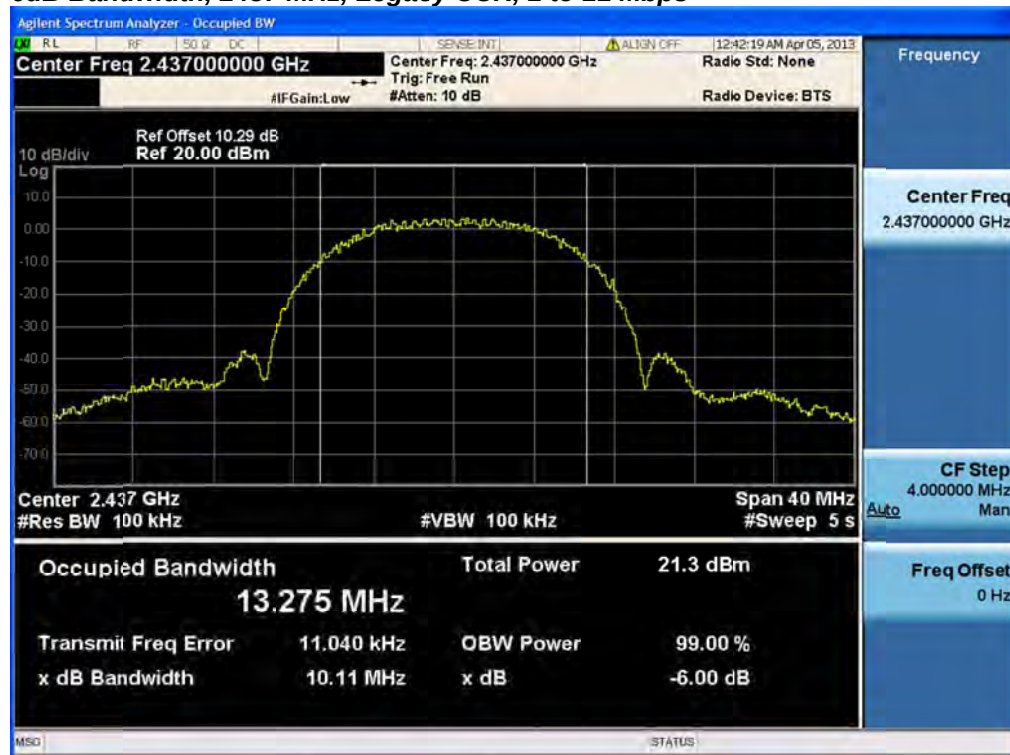
Center Frequency:	Frequency from table below
Span:	2 x Nominal Bandwidth (e.g. 40MHz for a 20MHz channel)
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	5 s
Resolution Bandwidth:	100 kHz
Video Bandwidth:	100 kHz
X dB Bandwidth:	6 dB
Detector:	Peak
Trace:	Single

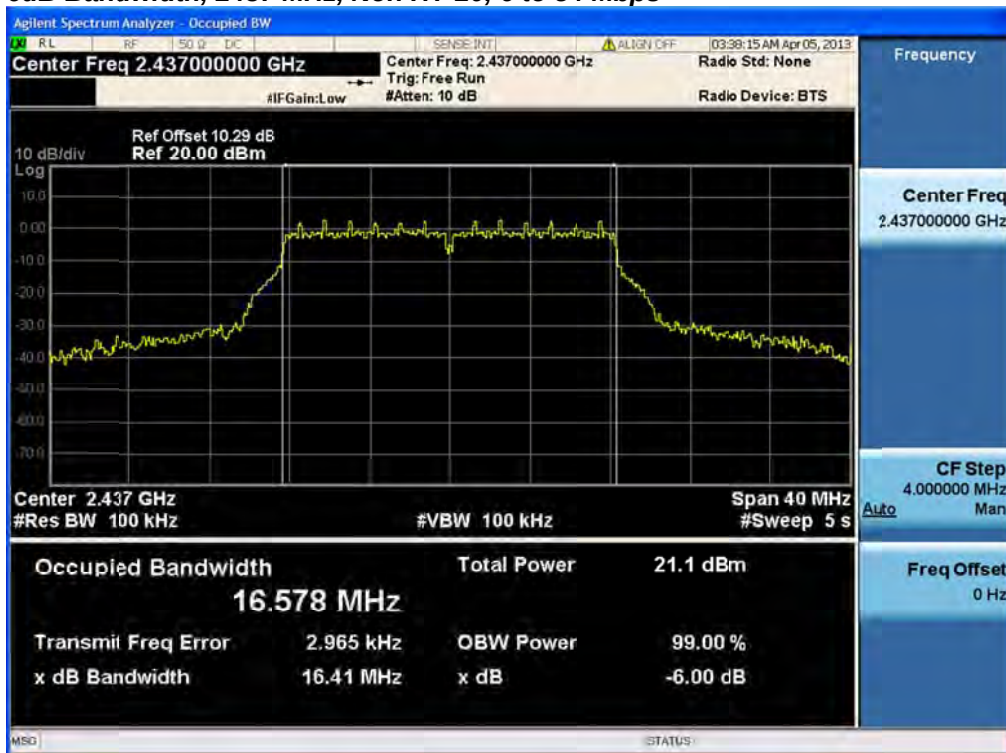
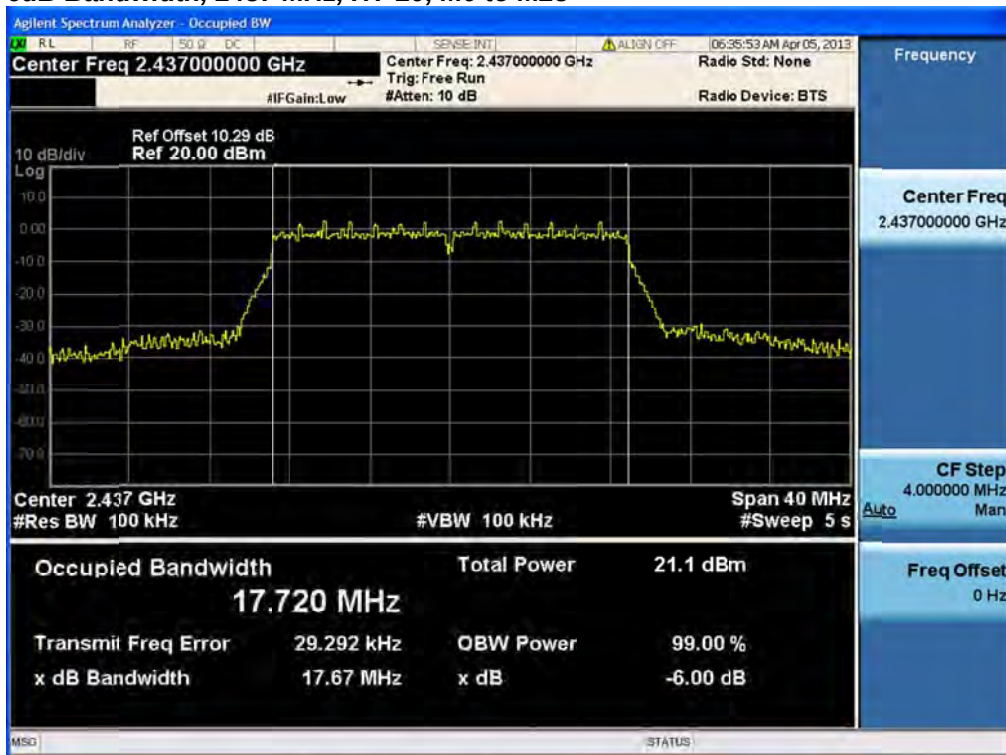
Place the radio in continuous transmit mode. View the transmitter waveform on the spectrum analyzer, and record the pertinent measurements:

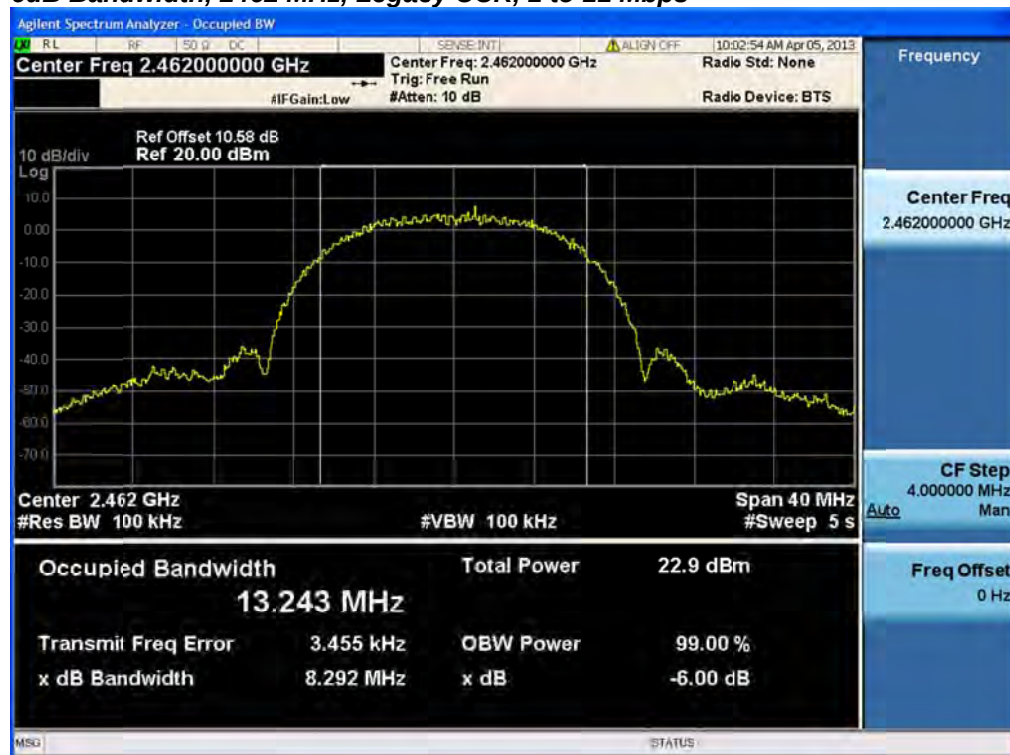
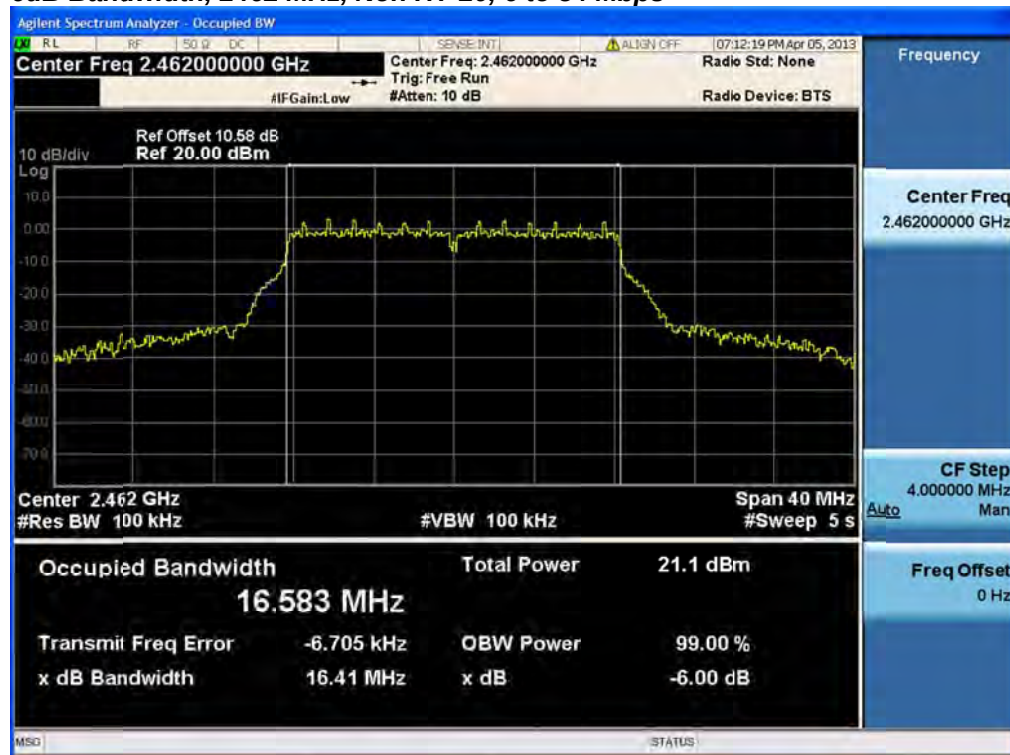


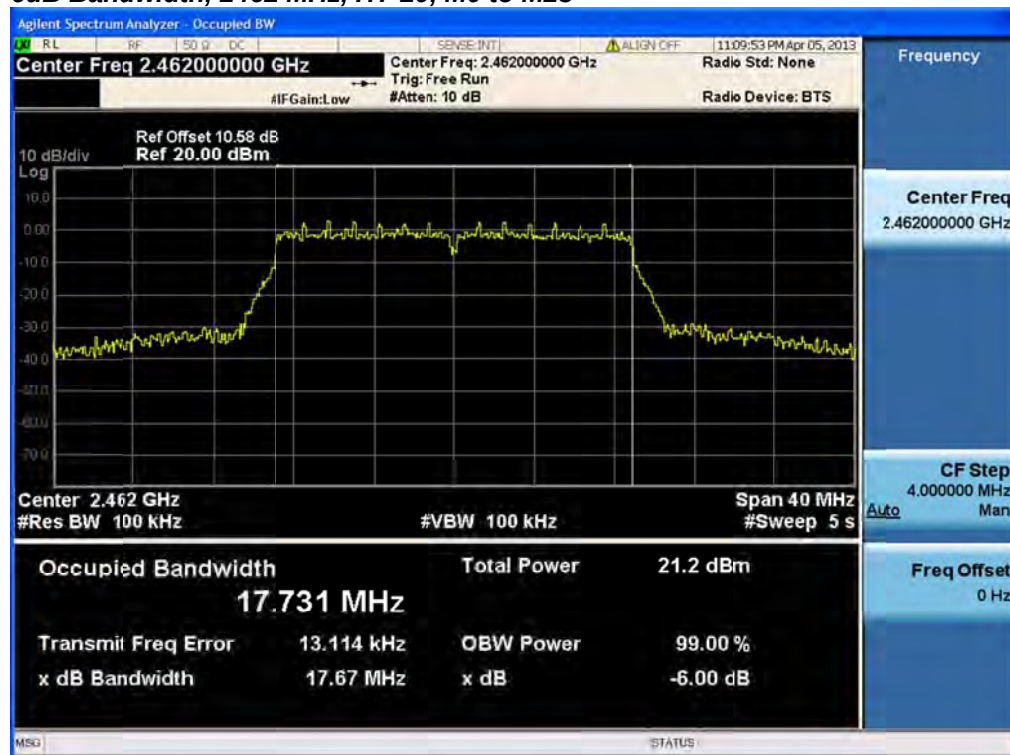
Frequency (MHz)	Mode	Data Rate (Mbps)	6dB BW (MHz)	Limit (kHz)	Margin (MHz)
2412	Legacy CCK, 1 to 11 Mbps	11	<u>10.13</u>	>500	12.8
	Non HT-20, 6 to 54 Mbps	6	<u>16.41</u>	>500	16.1
	HT-20, M0 to M23	m0	<u>17.63</u>	>500	17.2
2437	Legacy CCK, 1 to 11 Mbps	11	<u>10.11</u>	>500	12.8
	Non HT-20, 6 to 54 Mbps	6	<u>16.41</u>	>500	16.1
	HT-20, M0 to M23	m0	<u>17.67</u>	>500	17.2
2462	Legacy CCK, 1 to 11 Mbps	11	<u>8.29</u>	>500	12.7
	Non HT-20, 6 to 54 Mbps	6	<u>16.41</u>	>500	16.1
	HT-20, M0 to M23	m0	<u>17.67</u>	>500	17.2

6dB Bandwidth, 2412 MHz, Legacy 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, Legacy 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, Legacy 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

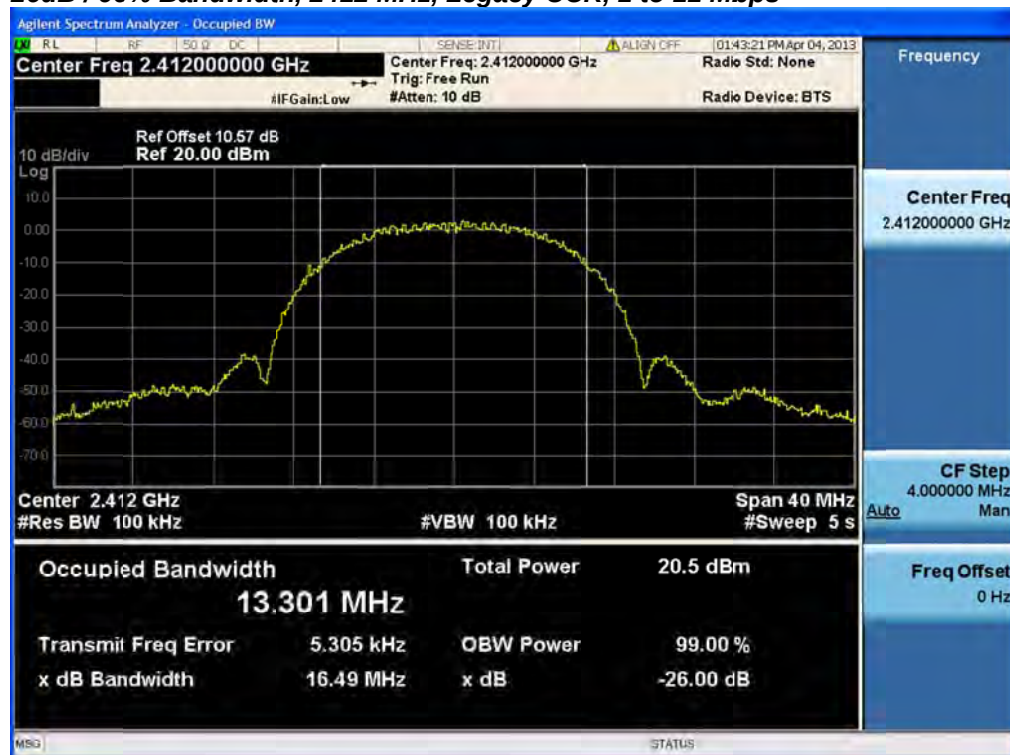
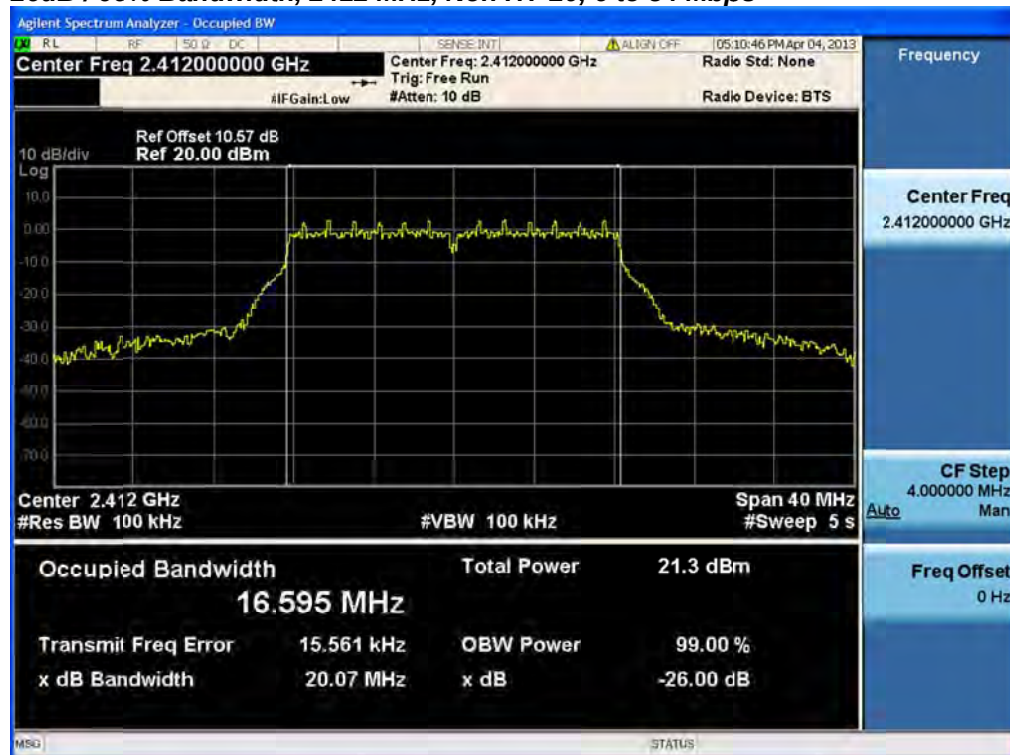
Connect the antenna port(s) to the spectrum analyzer input. Using the spectrum analyzer Channel Bandwidth mode, configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).

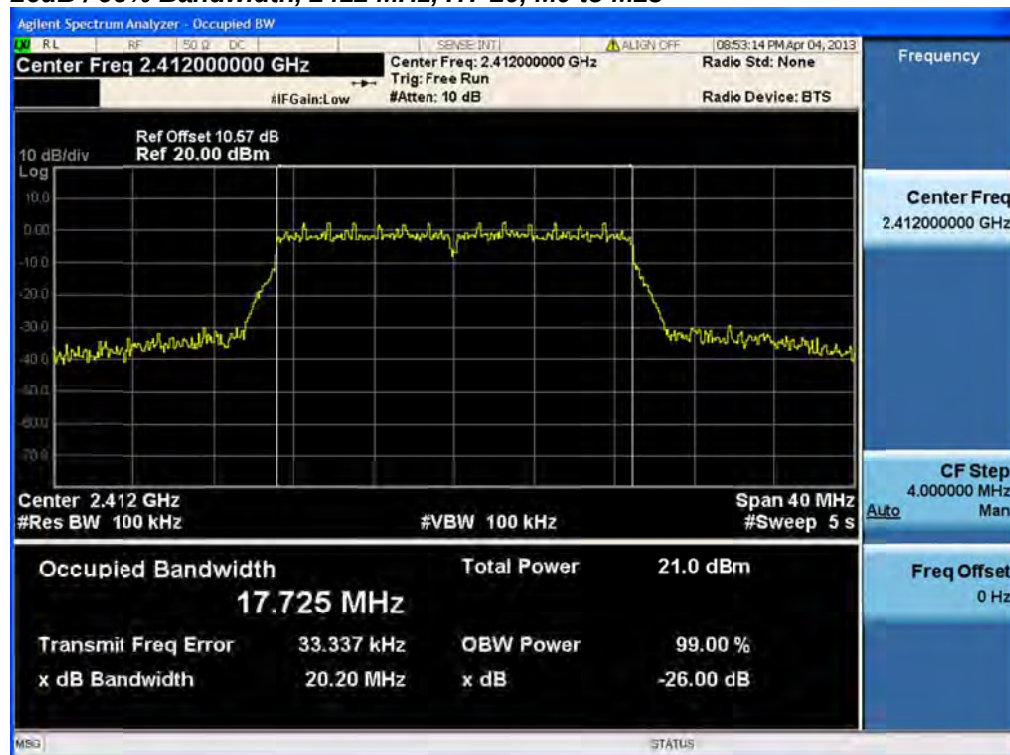
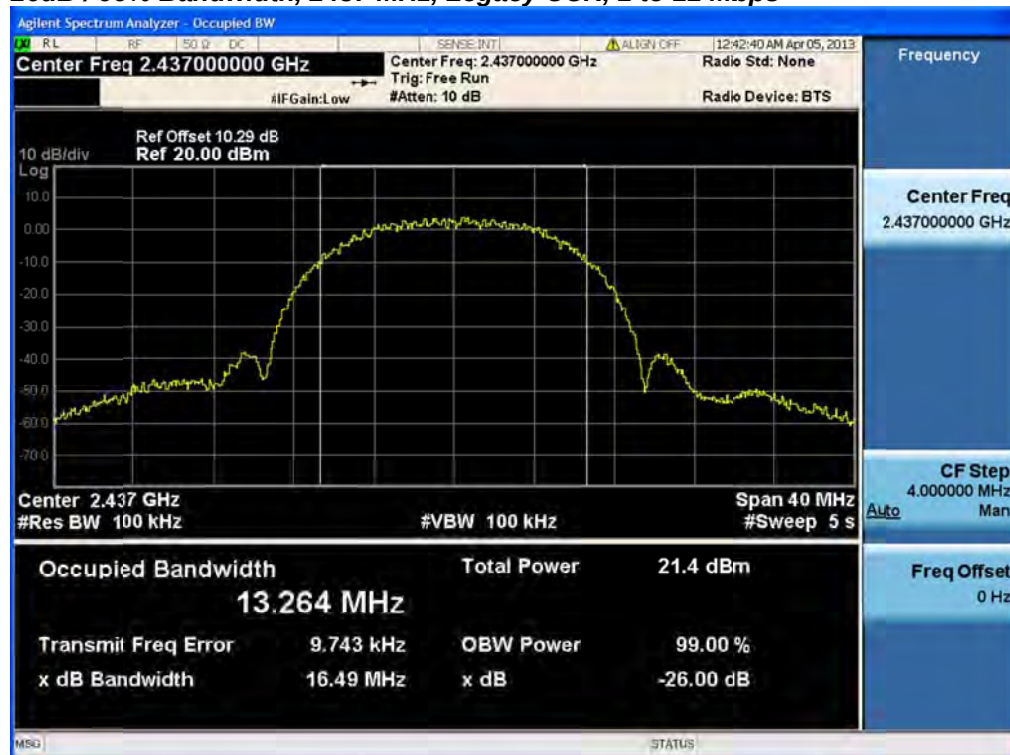
Center Frequency:	Frequency from table below
Span:	2 x Nominal Bandwidth (e.g. 40MHz for a 20MHz channel)
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	5 s
Resolution Bandwidth:	1%-3% of 26 dB Bandwidth
Video Bandwidth:	≥Resolution Bandwidth
X dB Bandwidth:	26 dB
Detector:	Peak
Trace:	Single

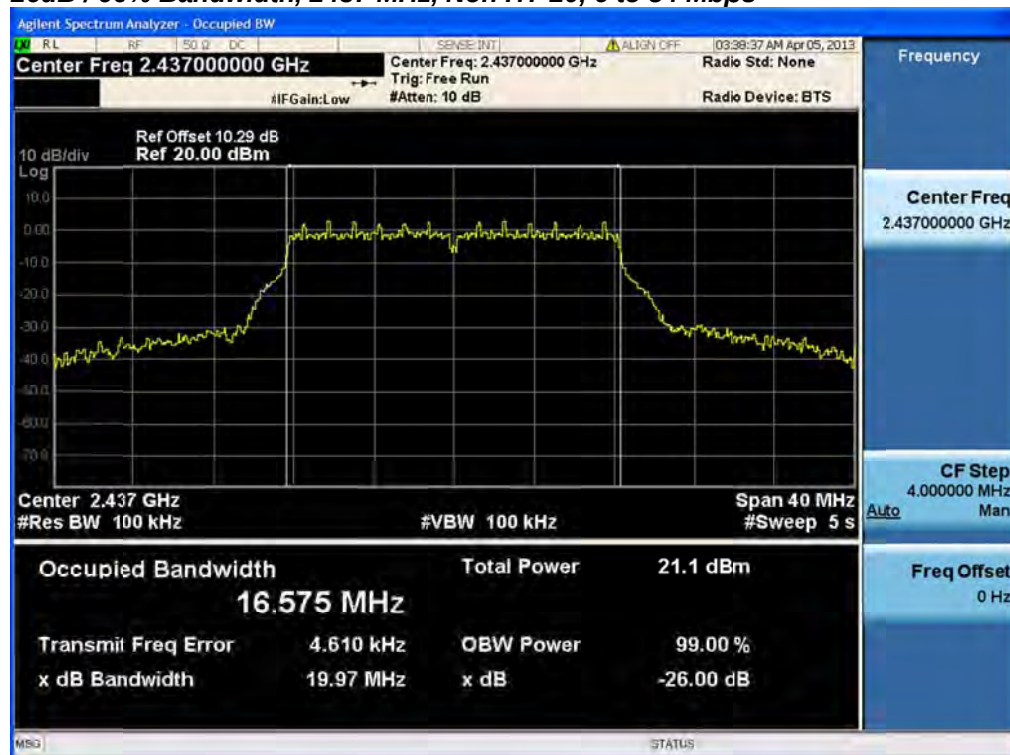
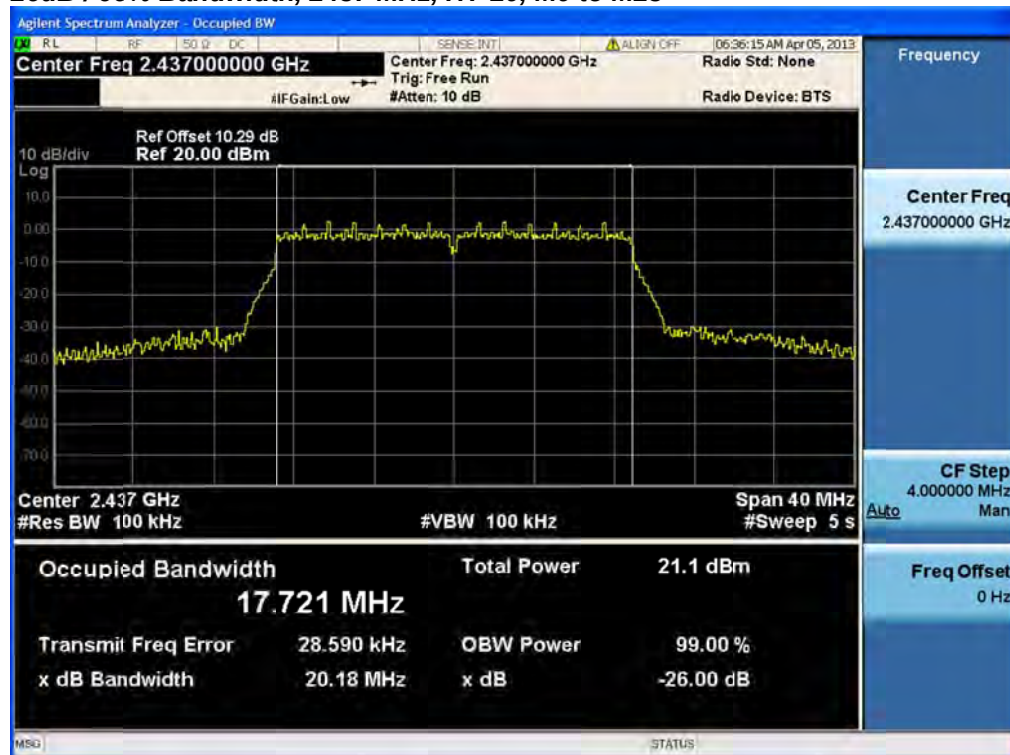
Place the radio in continuous transmit mode. View the transmitter waveform on the spectrum analyzer, and record the pertinent measurements:



Frequency (MHz)	Mode	Data Rate (Mbps)	99% BW (MHz)	26dB BW (MHz)
2412	Legacy CCK, 1 to 11 Mbps	11	<u>13.3</u>	<u>16.2</u>
	Non HT-20, 6 to 54 Mbps	6	<u>16.6</u>	<u>19.9</u>
	HT-20, M0 to M23	m0	<u>17.7</u>	20.2
2437	Legacy CCK, 1 to 11 Mbps	11	<u>13.3</u>	16.5
	Non HT-20, 6 to 54 Mbps	6	<u>16.6</u>	20
	HT-20, M0 to M23	m0	<u>17.7</u>	20.2
2462	Legacy CCK, 1 to 11 Mbps	11	<u>13.3</u>	16.4
	Non HT-20, 6 to 54 Mbps	6	<u>16.6</u>	<u>19.9</u>
	HT-20, M0 to M23	m0	<u>17.7</u>	20.2

26dB / 99% Bandwidth, 2412 MHz, Legacy 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, Legacy 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, Legacy CCK, 1 to 11 Mbps**26dB / 99% Bandwidth, 2462 MHz, Non HT-20, 6 to 54 Mbps**

Agilent Spectrum Analyzer - Occupied BW

Center Freq 2.46200000 GHz

Center Freq: 2.462000000 GHz
Trig: Free Run
#IFGain: Low
#Atten: 10 dB

Radio Std: None
Radio Device: BTS

Frequency

Center Freq
2.462000000 GHz

CF Step
4.000000 MHz
Man

Auto

Freq Offset
0 Hz

10 dB/div
Log
Ref Offset 10.58 dB
Ref 20.00 dBm

Center 2.462 GHz
#Res BW 100 kHz
#VBW 100 kHz
Span 40 MHz
#Sweep 5 s

Occupied Bandwidth
17.735 MHz

Total Power
21.2 dBm

Transmit Freq Error
12.505 kHz

OBW Power
99.00 %

x dB Bandwidth
20.15 MHz

x dB
-26.00 dB



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.

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 Peak Power (dBm)	Tx 2 Peak Power (dBm)	Tx 3 Peak Power (dBm)	Tx 4 Peak Power (dBm)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
2412	Legacy CCK, 1 to 11 Mbps	1	6	<u>13.2</u>				13.20	30	16.80
	Legacy CCK, 1 to 11 Mbps	2	6	<u>14.3</u>	<u>15.7</u>	<u>14.8</u>		19.74	30	10.26
	Legacy CCK, 1 to 11 Mbps	4	6	<u>14.3</u>	<u>15.7</u>	<u>14.8</u>	<u>15.6</u>	21.16	30	8.84
	Non HT-20, 6 to 54 Mbps	1	6	<u>14.7</u>				14.70	30	15.30
	Non HT-20, 6 to 54 Mbps	2	6	<u>14.7</u>	<u>15.5</u>			18.13	30	11.87
	Non HT-20, 6 to 54 Mbps	3	6	<u>14.7</u>	<u>15.5</u>	<u>14.8</u>		19.79	30	10.21
	Non HT-20, 6 to 54 Mbps	4	6	<u>14.7</u>	<u>15.5</u>	<u>14.8</u>	<u>15.4</u>	21.13	30	8.87
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	<u>14.7</u>	<u>15.5</u>			18.13	27	8.87
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	<u>13.6</u>	<u>14.2</u>	<u>13.8</u>		18.65	25.2	6.55
	Non HT-20 Beam Forming, 6 to 54 Mbps	4	12	<u>13.6</u>	<u>14.2</u>	<u>13.8</u>	<u>14.3</u>	20.00	24	4.00
	HT-20, M0 to M7	1	6	<u>14.1</u>				14.10	30	15.90
	HT-20, M0 to M7	2	6	<u>14.1</u>	<u>15.4</u>			17.81	30	12.19
	HT-20, M8 to M15	2	6	<u>14.1</u>	<u>15.4</u>			17.81	30	12.19
	HT-20, M0 to M7	3	6	<u>14.1</u>	<u>15.4</u>	<u>14.6</u>		19.50	30	10.50
	HT-20, M8 to M15	3	6	<u>14.1</u>	<u>15.4</u>	<u>14.6</u>		19.50	30	10.50
	HT-20, M16 to M23	3	6	<u>14.1</u>	<u>15.4</u>	<u>14.6</u>		19.50	30	10.50
	HT-20, M0 to M7	4	6	<u>14.1</u>	<u>15.4</u>	<u>14.6</u>	<u>15.1</u>	20.85	30	9.15
	HT-20, M8 to M15	4	6	<u>14.1</u>	<u>15.4</u>	<u>14.6</u>	<u>15.1</u>	20.85	30	9.15
	HT-20, M16 to M23	4	6	<u>14.1</u>	<u>15.4</u>	<u>14.6</u>	<u>15.1</u>	20.85	30	9.15
	HT-20 Beam Forming, M0 to M7	2	9	<u>14.1</u>	<u>15.4</u>			17.81	27	9.19
	HT-20 Beam Forming, M8 to M15	2	6	<u>14.1</u>	<u>15.4</u>			17.81	30	12.19
	HT-20 Beam Forming, M0 to M7	3	11	<u>13.1</u>	<u>14.1</u>	<u>13.6</u>		18.39	25.2	6.81
	HT-20 Beam Forming, M8 to M15	3	8	<u>14.1</u>	<u>15.4</u>	<u>14.6</u>		19.50	28.2	8.70
	HT-20 Beam Forming, M16 to M23	3	6	<u>14.1</u>	<u>15.4</u>	<u>14.6</u>		19.50	30	10.50
	HT-20 Beam Forming, M0 to M7	4	12	<u>12.1</u>	<u>13.1</u>	<u>12.2</u>	<u>13.0</u>	18.64	24	5.36
	HT-20 Beam Forming, M8 to M15	4	9	<u>13.1</u>	<u>14.1</u>	<u>13.6</u>	<u>14.2</u>	19.79	27	7.21
	HT-20 Beam Forming, M16 to M23	4	7	<u>13.1</u>	<u>14.1</u>	<u>13.6</u>	<u>14.2</u>	19.79	28.8	9.01
	HT-20 STBC, M0 to M7	2	6	<u>14.1</u>	<u>15.4</u>			17.81	30	12.19
	HT-20 STBC, M0 to M7	3	6	<u>14.1</u>	<u>15.4</u>	<u>14.6</u>		19.50	30	10.50
	HT-20 STBC, M0 to M7	4	6	<u>14.1</u>	<u>15.4</u>	<u>14.6</u>	<u>15.1</u>	20.85	30	9.15

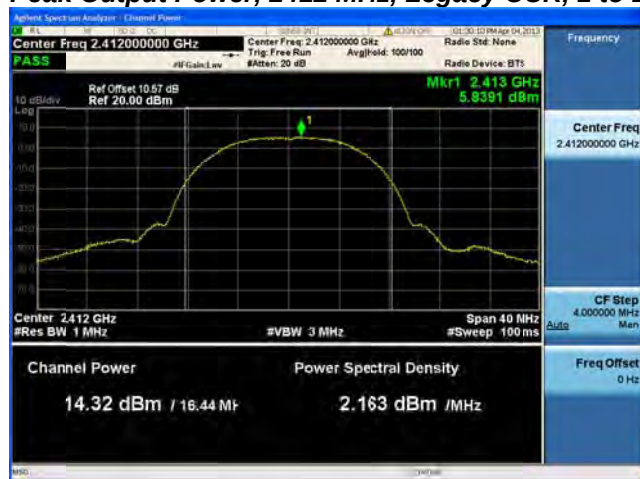


2437	Legacy CCK, 1 to 11 Mbps	1	6	<u>14.2</u>				14.20	30	15.80
	Legacy CCK, 1 to 11 Mbps	2	6	<u>14.2</u>	<u>15.5</u>			17.91	30	12.09
	Legacy CCK, 1 to 11 Mbps	3	6	<u>14.2</u>	<u>15.5</u>	<u>14.8</u>		19.64	30	10.36
	Legacy CCK, 1 to 11 Mbps	4	6	<u>14.2</u>	<u>15.5</u>	<u>14.8</u>	<u>15.6</u>	21.08	30	8.92
	Non HT-20, 6 to 54 Mbps	1	6	<u>14.4</u>				14.40	30	15.60
	Non HT-20, 6 to 54 Mbps	2	6	<u>14.4</u>	<u>15.6</u>			18.05	30	11.95
	Non HT-20, 6 to 54 Mbps	3	6	<u>14.4</u>	<u>15.6</u>	<u>14.6</u>		19.67	30	10.33
	Non HT-20, 6 to 54 Mbps	4	6	<u>14.4</u>	<u>15.6</u>	<u>14.6</u>	<u>15.5</u>	21.08	30	8.92
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	<u>14.4</u>	<u>15.6</u>			18.05	27	8.95
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	<u>14.4</u>	<u>15.6</u>	<u>14.6</u>		19.67	25.2	5.53
	Non HT-20 Beam Forming, 6 to 54 Mbps	4	12	<u>14.4</u>	<u>15.6</u>	<u>14.6</u>	<u>15.5</u>	21.08	24	2.92
	HT-20, M0 to M7	1	6	<u>14.2</u>				14.20	30	15.80
	HT-20, M0 to M7	2	6	<u>14.2</u>	<u>15.4</u>			17.85	30	12.15
	HT-20, M8 to M15	2	6	<u>14.2</u>	<u>15.4</u>			17.85	30	12.15
	HT-20, M0 to M7	3	6	<u>14.2</u>	<u>15.4</u>	<u>14.7</u>		19.57	30	10.43
	HT-20, M8 to M15	3	6	<u>14.2</u>	<u>15.4</u>	<u>14.7</u>		19.57	30	10.43
	HT-20, M16 to M23	3	6	<u>14.2</u>	<u>15.4</u>	<u>14.7</u>		19.57	30	10.43
	HT-20, M0 to M7	4	6	<u>14.2</u>	<u>15.4</u>	<u>14.7</u>	<u>15.2</u>	20.92	30	9.08
	HT-20, M8 to M15	4	6	<u>14.2</u>	<u>15.4</u>	<u>14.7</u>	<u>15.2</u>	20.92	30	9.08
	HT-20, M16 to M23	4	6	<u>14.2</u>	<u>15.4</u>	<u>14.7</u>	<u>15.2</u>	20.92	30	9.08
	HT-20 Beam Forming, M0 to M7	2	9	<u>14.2</u>	<u>15.4</u>			17.85	27	9.15
	HT-20 Beam Forming, M8 to M15	2	6	<u>14.2</u>	<u>15.4</u>			17.85	30	12.15
	HT-20 Beam Forming, M0 to M7	3	11	<u>14.2</u>	<u>15.4</u>	<u>14.7</u>		19.57	25.2	5.63
	HT-20 Beam Forming, M8 to M15	3	8	<u>14.2</u>	<u>15.4</u>	<u>14.7</u>		19.57	28.2	8.63
	HT-20 Beam Forming, M16 to M23	3	6	<u>14.2</u>	<u>15.4</u>	<u>14.7</u>		19.57	30	10.43
	HT-20 Beam Forming, M0 to M7	4	12	<u>14.2</u>	<u>15.4</u>	<u>14.7</u>	<u>15.2</u>	20.92	24	3.08
	HT-20 Beam Forming, M8 to M15	4	9	<u>14.2</u>	<u>15.4</u>	<u>14.7</u>	<u>15.2</u>	20.92	27	6.08
	HT-20 Beam Forming, M16 to M23	4	7	<u>14.2</u>	<u>15.4</u>	<u>14.7</u>	<u>15.2</u>	20.92	28.8	7.88
	HT-20 STBC, M0 to M7	2	6	<u>14.2</u>	<u>15.4</u>			17.85	30	12.15
	HT-20 STBC, M0 to M7	3	6	<u>14.2</u>	<u>15.4</u>	<u>14.7</u>		19.57	30	10.43
	HT-20 STBC, M0 to M7	4	6	<u>14.2</u>	<u>15.4</u>	<u>14.7</u>	<u>15.2</u>	20.92	30	9.08



2462	Legacy CCK, 1 to 11 Mbps	1	6	<u>13.6</u>				13.60	30	16.40
	Legacy CCK, 1 to 11 Mbps	2	6	<u>14.6</u>	<u>15.6</u>			18.14	30	11.86
	Legacy CCK, 1 to 11 Mbps	3	6	<u>14.6</u>	<u>15.6</u>	<u>15.0</u>		19.86	30	10.14
	Legacy CCK, 1 to 11 Mbps	4	6	<u>14.6</u>	<u>15.6</u>	<u>15.0</u>	<u>15.3</u>	21.16	30	8.84
	Non HT-20, 6 to 54 Mbps	1	6	<u>14.5</u>				14.50	30	15.50
	Non HT-20, 6 to 54 Mbps	2	6	<u>14.5</u>	<u>15.5</u>			18.04	30	11.96
	Non HT-20, 6 to 54 Mbps	3	6	<u>14.5</u>	<u>15.5</u>	<u>14.9</u>		19.76	30	10.24
	Non HT-20, 6 to 54 Mbps	4	6	<u>14.5</u>	<u>15.5</u>	<u>14.9</u>	<u>15.2</u>	21.06	30	8.94
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	<u>14.5</u>	<u>15.5</u>			18.04	27	8.96
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	<u>13.5</u>	<u>14.1</u>	<u>14.0</u>		18.65	25.2	6.55
	Non HT-20 Beam Forming, 6 to 54 Mbps	4	12	<u>12.5</u>	<u>13.1</u>	<u>12.6</u>	<u>12.9</u>	18.80	24	5.20
	HT-20, M0 to M7	1	6	<u>14.3</u>				14.30	30	15.70
	HT-20, M0 to M7	2	6	<u>14.3</u>	<u>15.3</u>			17.84	30	12.16
	HT-20, M8 to M15	2	6	<u>14.3</u>	<u>15.3</u>			17.84	30	12.16
	HT-20, M0 to M7	3	6	<u>14.3</u>	<u>15.3</u>	<u>14.7</u>		19.56	30	10.44
	HT-20, M8 to M15	3	6	<u>14.3</u>	<u>15.3</u>	<u>14.7</u>		19.56	30	10.44
	HT-20, M16 to M23	3	6	<u>14.3</u>	<u>15.3</u>	<u>14.7</u>		19.56	30	10.44
	HT-20, M0 to M7	4	6	<u>13.3</u>	<u>13.9</u>	<u>13.5</u>	<u>14.0</u>	19.70	30	10.30
	HT-20, M8 to M15	4	6	<u>13.3</u>	<u>13.9</u>	<u>13.5</u>	<u>14.0</u>	19.70	30	10.30
	HT-20, M16 to M23	4	6	<u>13.3</u>	<u>13.9</u>	<u>13.5</u>	<u>14.0</u>	19.70	30	10.30
	HT-20 Beam Forming, M0 to M7	2	9	<u>13.3</u>	<u>13.9</u>			16.62	27	10.38
	HT-20 Beam Forming, M8 to M15	2	6	<u>14.3</u>	<u>15.3</u>			17.84	30	12.16
	HT-20 Beam Forming, M0 to M7	3	11	<u>12.4</u>	<u>12.9</u>	<u>12.4</u>		17.34	25.2	7.86
	HT-20 Beam Forming, M8 to M15	3	8	<u>13.3</u>	<u>13.9</u>	<u>13.5</u>		18.35	28.2	9.85
	HT-20 Beam Forming, M16 to M23	3	6	<u>14.3</u>	<u>15.3</u>	<u>14.7</u>		19.56	30	10.44
	HT-20 Beam Forming, M0 to M7	4	12	<u>12.4</u>	<u>12.9</u>	<u>12.4</u>	<u>12.7</u>	18.63	24	5.37
	HT-20 Beam Forming, M8 to M15	4	9	<u>12.4</u>	<u>12.9</u>	<u>12.4</u>	<u>12.7</u>	18.63	27	8.37
	HT-20 Beam Forming, M16 to M23	4	7	<u>12.4</u>	<u>12.9</u>	<u>12.4</u>	<u>12.7</u>	18.63	28.8	10.17
	HT-20 STBC, M0 to M7	2	6	<u>14.3</u>	<u>15.3</u>			17.84	30	12.16
	HT-20 STBC, M0 to M7	3	6	<u>14.3</u>	<u>15.3</u>	<u>14.7</u>		19.56	30	10.44
	HT-20 STBC, M0 to M7	4	6	<u>13.3</u>	<u>13.9</u>	<u>13.5</u>	<u>14.0</u>	19.70	30	10.30

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

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

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

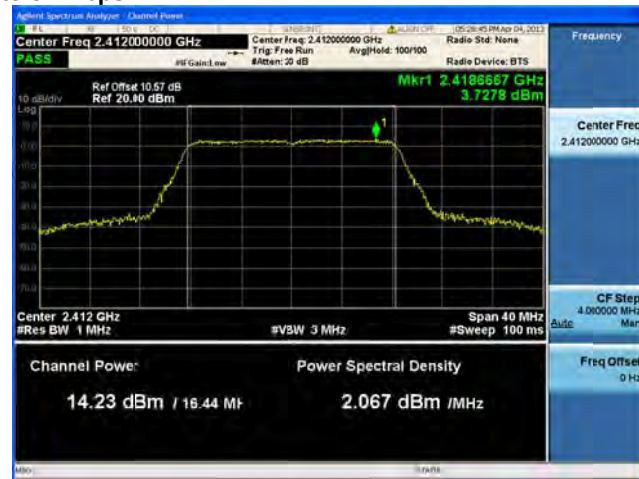
Peak Output Power, 2412 MHz, Non HT-20, 6 to 54 Mbps**Antenna A**

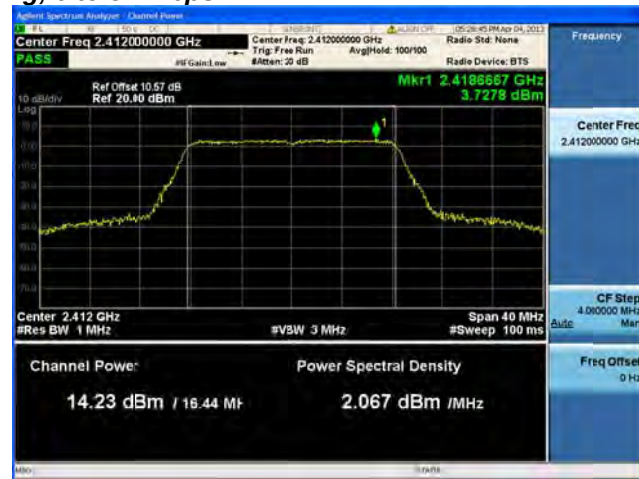
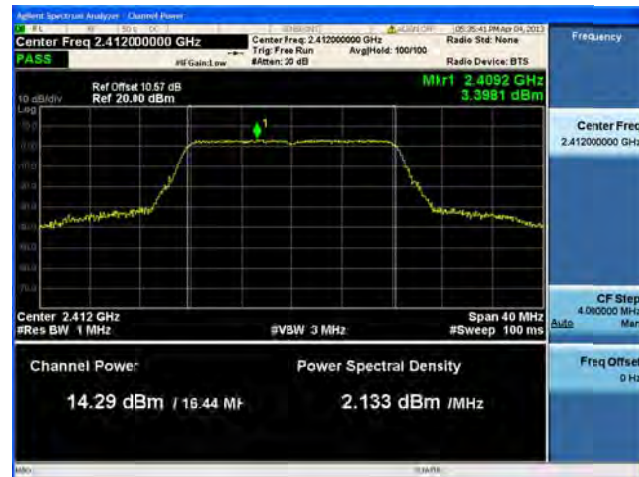
Peak Output Power, 2412 MHz, Non HT-20, 6 to 54 Mbps**Antenna A****Antenna B**

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, 6 to 54 Mbps**Antenna A****Antenna B****Antenna C****Antenna D**

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, Non HT-20 Beam Forming, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C****Antenna D**

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**

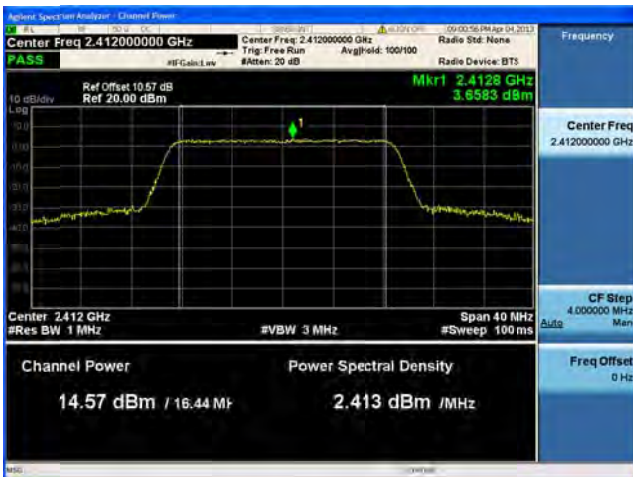
Peak Output Power, 2412 MHz, HT-20, M8 to M15**Antenna A****Antenna B**

**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, M0 to M7**Antenna A****Antenna B****Antenna C****Antenna D**

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

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

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**

Rohde & Schwarz Spectrum Analyzer - Channel Power
 1 2.4132867 GHz 0.000000 MHz
 Center Freq 2.412000000 GHz Center Freq 2.412000000 GHz
 Trig: Free Run AvgHold: 100/100 Radio Sts: None
 #F Grid: Low #Pattern: 20 dB Radio Device: BT3
PASS
 Ref Offset 10.57 dB
 Ref 20.00 dBm
 to dBmV
 100.0
 90.0
 80.0
 70.0
 60.0
 50.0
 40.0
 30.0
 20.0
 10.0
 0.0
 -10.0
 -20.0
 -30.0
 -40.0
 -50.0
 -60.0
 -70.0
 -80.0
 -90.0
 -100.0
 -110.0
 -120.0
 -130.0
 -140.0
 -150.0
 -160.0
 -170.0
 -180.0
 -190.0
 -200.0
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Active Spectrum Analyzer - Channel 0001

Center Freq 2.41200000 GHz

Ref Offset 10.57 dB

Radio Std: None

Radio Device: BTS

Channel Power: 13.08 dBm / 16.44 MHz

Power Spectral Density: 0.9225 dBm / MHz

Frequency

Center Freq 2.41200000 GHz

CF Step 4.000000 MHz

Ref Offset 10.57 dB

Ref 20.00 dBm

Span 40 MHz

Sweep 100 ms

10 dB/div

Agilent Spectrum Analyzer - Channel Power

Center Freq 2.412000000 GHz

PASS

Ref Offset 10.57 dB

Ref 20.00 dBm

Center Freq: 2.412000000 GHz

Radio Std: None

Trig: Free Run

AvgHold: 100/100

Radio Device: BT3

#F Chain: Low

#BW 3 MHz

Span 40 MHz

#Res BW 1 MHz

#Sweep 100 ms

Channel Power

12.25 dBm / 16.44 MHz

Power Spectral Density

0.08914 dBm / MHz

Frequency

Center Freq 2.412000000 GHz

CF Step 4.000000 MHz

Freq Offset 0 Hz

[illegible]

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Cisco Systems, Inc. Company Confidential

Software: Spectrum Analyzer - Channel Power

Center Freq 2.412000000 GHz

Center Freq: 2.412000000 GHz

Trig: Free Run

AvgHold: 100/100

Radio Sts: None

Radio Device: BT3

PASS

Ref Offset 10.57 dB

Ref 20.00 dBm

Mkr1 2.4110857 GHz

2.8777 dBm

Center 2.412 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 40 MHz

#Sweep 100 ms

Channel Power

Power Spectral Density

13.14 dBm / 16.44 MHz

0.9801 dBm / MHz

Frequency

Center Freq 2.412000000 GHz

CF Step 4.000000 MHz

Freq Offset 0 Hz

Agilent Spectrum Analyzer - Channel View

Center Freq 2.412000000 GHz

Ref Offset 10.57 dB

Ref 20.40 dBm

Center Freq: 2.412000000 GHz

Trig: Free Run

Avg/Hold: 100/100

Radio Std: None

Radio Device: BTS

Mkr1 2.4109667 GHz

3.3659 dBm

10 dB/div

Center 2.412 GHz

#Res BW 1 MHz

#VSW 3 MHz

Span 40 MHz

#Sweep 100 ms

Channel Power: 14.06 dBm / 16.44 MHz

Power Spectral Density: 1.903 dBm / MHz

Active Spectrum Analyzer - Channel 1

Center Freq 2.41200000 GHz

PASS

Ref Offset 10.57 dB

Ref 20.00 dBm

Center Freq: 2.412000000 GHz

Trig: Free Run

Avg: Hold: 100/100

Radio Stn: None

Radio Device: BT5

Frequency

Center Freq 2.412000000 GHz

CF Step 4.000000 MHz

Freq Offset 0 Hz

Channel Power

Power Spectral Density

13.61 dBm / 16.44 MHz

1.451 dBm / MHz

Channel Power Analyzer - Channel Power

Center Freq 2.412000000 GHz

Center Freq: 2.412000000 GHz

Trig: Freq Run

Avg/Hold: 100/H00

Radio Std: None

Ref Offset: 10.57 dB

Ref: 20.00 dBm

MR1 2.412 GHz

3.3853 dBm

Channel Power: 14.18 dBm / 16.44 MHz

Power Spectral Density

2.020 dBm /MHz

Span 40 MHz

#Res BW 1 MHz

#VSW 3 MHz

#Sweep 100 ms

Frequency

Center Freq 2.412000000 GHz

CF Step 4.000000 MHz

Freq Offset 0 Hz

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Software: Spectrum Analyzer - Channel Power

Center Freq 2.412000000 GHz

Center Freq: 2.412000000 GHz
 Trig: Free Run
 #atten: 20 dB

Radio Stn: None
 Radio Device: BT3

PASS

Ref Offset 10.57 dB
 Ref 20.00 dBm

Mkr1 2.4110857 GHz
 2.8777 dBm

Center 2.412 GHz
 #Res BW 1 MHz

#VBW 3 MHz
 Span 40 MHz
 #Sweep 100 ms

Channel Power

Power Spectral Density

13.14 dBm / 16.44 MHz

0.9801 dBm / MHz

Frequency

Center Freq
 2.412000000 GHz

CF Step
 4.000000 MHz

Freq Offset
 0 Hz

Agilent Spectrum Analyzer - Channel 01

Center Freq 2.412000000 GHz

Center Freq: 2.412000000 GHz

Radio Std: None

Radio Device: BTS

Mkr1 2.4109667 GHz

3.3659 dBm

Center Freq 2.412000000 GHz

CF Step 4.000000 MHz

Audio

Frequency

Center Freq 2.412000000 GHz

CF Step 4.000000 MHz

Audio

Freq Offset 0 Hz

Channel Power: 14.06 dBm / 16.44 MHz

Power Spectral Density 1.903 dBm / MHz

Agilent Spectrum Analyzer - Channel Power

Center Freq 2.412000000 GHz

Span 40 MHz

Res BW 1 MHz

Sweep 100 ms

Channel Power

13.61 dBm / 16.44 MHz

Power Spectral Density

1.451 dBm / MHz

Frequency

Center Freq 2.412000000 GHz

CF Step 4.000000 MHz

Freq Offset 0 Hz

Ref Offset 10.57 dB

Ref 20.00 dBm

Mkr1 2.4156957 GHz

2.8637 dBm

10 dB/div

0.0

10.0

20.0

30.0

40.0

50.0

60.0

70.0

80.0

90.0

100.0

110.0

120.0

130.0

140.0

150.0

160.0

170.0

180.0

190.0

200.0

210.0

220.0

230.0

240.0

250.0

260.0

270.0

280.0

290.0

300.0

310.0

320.0

330.0

340.0

350.0

360.0

370.0

380.0

390.0

400.0

410.0

420.0

430.0

440.0

450.0

460.0

470.0

480.0

490.0

500.0

510.0

520.0

530.0

540.0

550.0

560.0

570.0

580.0

590.0

600.0

610.0

620.0

630.0

640.0

650.0

660.0

670.0

680.0

690.0

700.0

710.0

720.0

730.0

740.0

750.0

760.0

770.0

780.0

790.0

800.0

810.0

820.0

830.0

840.0

850.0

860.0

870.0

880.0

890.0

900.0

910.0

920.0

930.0

940.0

950.0

960.0

970.0

980.0

990.0

1000.0

1010.0

1020.0

1030.0

1040.0

1050.0

1060.0

1070.0

1080.0

1090.0

1100.0

1110.0

1120.0

1130.0

1140.0

1150.0

1160.0

1170.0

1180.0

1190.0

1200.0

1210.0

1220.0

1230.0

1240.0

1250.0

1260.0

1270.0

1280.0

1290.0

1300.0

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1490.0

1500.0

1510.0

1520.0

1530.0

1540.0

1550.0

1560.0

1570.0

1580.0

1590.0

1600.0

1610.0

1620.0

1630.0

1640.0

1650.0

1660.0

1670.0

1680.0

1690.0

1700.0

1710.0

1720.0

1730.0

1740.0

1750.0

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1780.0

1790.0

1800.0

1810.0

1820.0

1830.0

1840.0

1850.0

1860.0

1870.0

1880.0

1890.0

1900.0

1910.0

1920.0

1930.0

1940.0

1950.0

1960.0

1970.0

1980.0

1990.0

2000.0

2010.0

2020.0

2030.0

2040.0

2050.0

2060.0

2070.0

2080.0

2090.0

2100.0

2110.0

2120.0

2130.0

2140.0

2150.0

2160.0

2170.0

2180.0

2190.0

2200.0

2210.0

2220.0

2230.0

2240.0

2250.0

2260.0

2270.0

2280.0

2290.0

2300.0

2310.0

2320.0

2330.0

2340.0

2350.0

2360.0

2370.0

2380.0

2390.0

2400.0

2410.0

2420.0

2430.0

2440.0

2450.0

2460.0

2470.0

2480.0

2490.0

2500.0

2510.0

2520.0

2530.0

2540.0

2550.0

2560.0

2570.0

2580.0

2590.0

2600.0

2610.0

2620.0

2630.0

2640.0

2650.0

2660.0

2670.0

2680.0

2690.0

2700.0

2710.0

2720.0

2730.0

2740.0

2750.0

2760.0

2770.0

2780.0

2790.0

2800.0

2810.0

2820.0

2830.0

2840.0

2850.0

2860.0

2870.0

2880.0

2890.0

2900.0

2910.0

2920.0

2930.0

2940.0

2950.0

2960.0

2970.0

2980.0

2990.0

3000.0

3010.0

3020.0

3030.0

3040.0

3050.0

3060.0

3070.0

3080.0

3090.0

3100.0

3110.0

3120.0

3130.0

3140.0

3150.0

3160.0

3170.0

3180.0

3190.0

3200.0

3210.0

Channel Power: 14.18 dBm / 16.44 MHz

Power Spectral Density: 2.020 dBm / MHz

Center Freq 2.41200000 GHz

Ref Offset 10.57 dB

Ref 20.80 dBm

Center Freq 2.41200000 GHz

CF Step 4.000000 MHz

Frequency Offset 0 Hz

14.18 dBm / 16.44 MHz

2.020 dBm / MHz

Center Freq 2.41200000 GHz

Ref Offset 10.57 dB

Ref 20.80 dBm

Center Freq 2.41200000 GHz

CF Step 4.000000 MHz

Frequency Offset 0 Hz

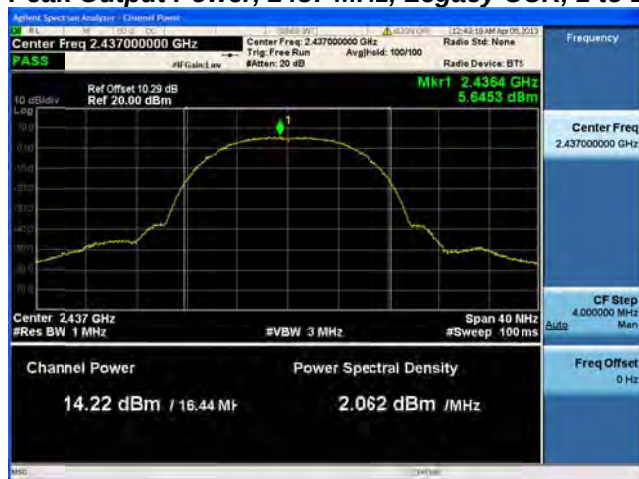
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Peak Output Power, 2412 MHz, HT-20 STBC, M0 to M7**Antenna A****Antenna B**

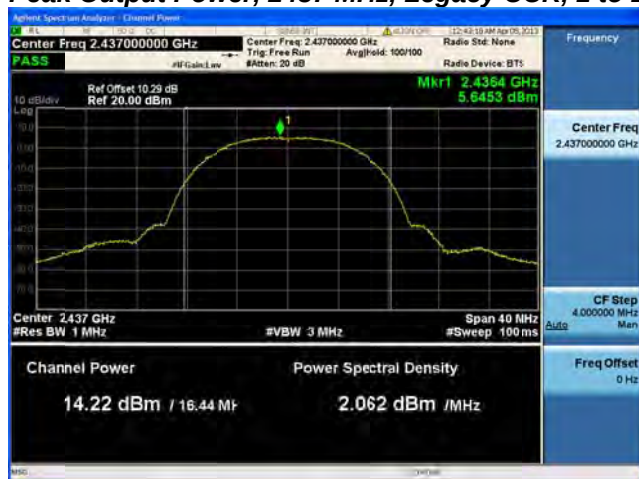
**Peak Output Power, 2412 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B****Antenna C**

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

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

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

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

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

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, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C****Antenna D**

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, Non HT-20 Beam Forming, 6 to 54 Mbps**Antenna A****Antenna B****Antenna C****Antenna D**

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, M0 to M7**Antenna A****Antenna B****Antenna C****Antenna D**

Active Spectrum Analyzer - Channel Power

Center Freq 2.437000000 GHz

PASS

Ref Offset 10.29 dB

Ref 20.00 dBm

Center Freq: 2.437000000 GHz

Trig: Free Run

AvgHold: 100/100

Radio Std: None

Radio Device: BT5

Frequency

Center Freq: 2.437000000 GHz

CF Step: 4.000000 MHz

Span 40 MHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 100 ms

Channel Power

Power Spectral Density

14.22 dBm / 16.44 MHz

2.058 dBm / MHz

Freq Offset: 0 Hz

Client Spectrum Analyzer - Channel Power
 #1 2.43700000 GHz
 Center Freq: 2.437000000 GHz
 Trig: Free Run
 Avg/Hold: 100/100
 Radio Std: None
 Radio Device: B75
 #1 Gain: 1.00
 #1 Att: 22.0 dB
 Ref Off: 10.29 dB
 Ref: 20.00 dBm
 Mkr1: 2.4412667 GHz
 4.5230 dBm
 Center Freq: 2.43700000 GHz
 CF Step: 4.000000 MHz
 Span: 40 MHz
 #Res BW: 1 MHz
 #VBW: 3 MHz
 #Sweep: 100 ms
 Channel Power: 15.41 dBm / 16.44 MHz
 Power Spectral Density: 3.247 dBm / MHz
 Freq Offset: 0 Hz

Active Spectrum Analyzer - Channel Power

Center Freq 2.437000000 GHz

Ref Offset 10.29 dB
Ref 20.00 dBm

Channel Power
14.70 dBm / 16.44 MHz

Power Spectral Density
2.537 dBm / MHz

Center Freq: 2.437000000 GHz
Radio Std: None
Trig: Free Run
Avg: Hold: 100/100
#Att: 20 dB
Radio Device: BT1

Center Freq: 2.438 GHz
4.1984 dBm

Center Freq: 2.437000000 GHz

CF Step: 4.000000 MHz

Span: 40 MHz
#VBW: 3 MHz
#Sweep: 100 ms

Ref: 20.00 dBm

Log

146.40

140.00

130.00

120.00

110.00

100.00

90.00

80.00

70.00

60.00

50.00

40.00

30.00

20.00

10.00

0.00

-10.00

-20.00

-30.00

-40.00

-50.00

-60.00

-70.00

-80.00

-90.00

-100.00

-110.00

-120.00

-130.00

-140.00

-150.00

-160.00

-170.00

-180.00

-190.00

-200.00

-210.00

-220.00

-230.00

-240.00

-250.00

-260.00

-270.00

-280.00

-290.00

-300.00

-310.00

-320.00

-330.00

-340.00

-350.00

-360.00

-370.00

-380.00

-390.00

-400.00

-410.00

-420.00

-430.00

-440.00

-450.00

-460.00

-470.00

-480.00

-490.00

-500.00

-510.00

-520.00

-530.00

-540.00

-550.00

-560.00

-570.00

-580.00

-590.00

-600.00

-610.00

-620.00

-630.00

-640.00

-650.00

-660.00

-670.00

-680.00

-690.00

-700.00

-710.00

-720.00

-730.00

-740.00

-750.00

-760.00

-770.00

-780.00

-790.00

-800.00

-810.00

-820.00

-830.00

-840.00

-850.00

-860.00

-870.00

-880.00

-890.00

-900.00

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-920.00

-930.00

-940.00

-950.00

-960.00

-970.00

-980.00

-990.00

-1000.00

-1010.00

-1020.00

-1030.00

-1040.00

-1050.00

-1060.00

-1070.00

-1080.00

-1090.00

-1100.00

-1110.00

-1120.00

-1130.00

-1140.00

-1150.00

-1160.00

-1170.00

-1180.00

-1190.00

-1200.00

-1210.00

-1220.00

-1230.00

-1240.00

-1250.00

-1260.00

-1270.00

-1280.00

-1290.00

-1300.00

-1310.00

-1320.00

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-1370.00

-1380.00

-1390.00

-1400.00

-1410.00

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-1440.00

-1450.00

-1460.00

-1470.00

-1480.00

-1490.00

-1500.00

-1510.00

-1520.00

-1530.00

-1540.00

-1550.00

-1560.00

-1570.00

-1580.00

-1590.00

-1600.00

-1610.00

-1620.00

-1630.00

-1640.00

-1650.00

-1660.00

-1670.00

-1680.00

-1690.00

-1700.00

-1710.00

-1720.00

-1730.00

-1740.00

-1750.00

-1760.00

-1770.00

-1780.00

-1790.00

-1800.00

-1810.00

-1820.00

-1830.00

-1840.00

-1850.00

-1860.00

-1870.00

-1880.00

-1890.00

-1900.00

-1910.00

-1920.00

-1930.00

-1940.00

-1950.00

-1960.00

-1970.00

-1980.00

-1990.00

-2000.00

-2010.00

-2020.00

-2030.00

-2040.00

-2050.00

-2060.00

-2070.00

-2080.00

-2090.00

-2100.00

-2110.00

-2120.00

-2130.00

-2140.00

-2150.00

-2160.00

-2170.00

-2180.00

-2190.00

-2200.00

-2210.00

-2220.00

-2230.00

-2240.00

-2250.00

-2260.00

-2270.00

-2280.00

-2290.00

-2300.00

-2310.00

-2320.00

-2330.00

-2340.00

-2350.00

-2360.00

-2370.00

-2380.00

-2390.00

-2400.00

-2410.00

-2420.00

-2430.00

-2440.00

-2450.00

-2460.00

-2470.00

-2480.00

-2490.00

-2500.00

-2510.00

-2520.00

-2530.00

-2540.00

-2550.00

-2560.00

-2570.00

-2580.00

-2590.00

-2600.00

-2610.00

-2620.00

-2630.00

-2640.00

-2650.00

-2660.00

-2670.00

-2680.00

-2690.00

-2700.00

-2710.00

-2720.00

Advanced Spectrum Analyser - Channel Power

Center Freq 2.437000000 GHz

PASS

Ref Offset 10.29 dB
Ref 20.80 dBm

Center Freq: 2.437000000 GHz
Trig: Free Run
Avg/Hold: 100/100
Radio Std: None
Radio Device: BTS

Frequency

Center Freq
2.437000000 GHz

CF Step
4.000000 MHz

Auto

Freq Offset
0 MHz

Channel Power: 15.23 dBm / 16.44 MHz

Power Spectral Density 3.066 dBm / MHz

Span 40 MHz
#Res BW 1 MHz
#Sweep 100 ms

Marker 1 2.437 GHz 15.23 dBm

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

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**

Active Spectrum Analyzer - Element Power

Center Freq 2.437000000 GHz

Center Freq: 2.437000000 GHz

Trig: Free Run

AvgHold: 100/100

Radio Sts: None

Radio Device: BT5

PASS

Ref Offset 10.29 dB

Ref 20.00 dBm

Mkr1 2.4357333 GHz

3.6005 dBm

10 dB/div

1.00

0.00

-10.00

-20.00

-30.00

-40.00

-50.00

Center 2437 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 40 MHz

#Sweep 100 ms

Channel Power

Power Spectral Density

14.22 dBm / 16.44 Mf

2.058 dBm / MHz

Frequency

Center Freq

2.437000000 GHz

CF Step

4.000000 MHz

Auto

Man

Freq Offset

0 Hz

Center Freq 2.437000000 GHz
 Ref Offset 10.29 dB
 Ref 20.40 dBm
 #Res BW 1 MHz
 #VBW 3 MHz
 Span 40 MHz
 #Sweep 100 ms
 Channel Power: 15.41 dBm / 16.44 MHz
 Power Spectral Density: 3.247 dBm / MHz

Vector Signal Analyzer - Channel Power

Center Freq 2.437000000 GHz

PASS

Ref Offset 10.25 dB

Ref 20.00 dBm

Center Freq: 2.437000000 GHz

Trig: Free Run

Avg: Hold: 100/100

Radio Device: BT

Frequency

Center Freq 2.437000000 GHz

CF Step 4.000000 MHz

Span 40 MHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 100 ms

Channel Power

Power Spectral Density

14.70 dBm / 16.44 MHz

2.537 dBm / MHz

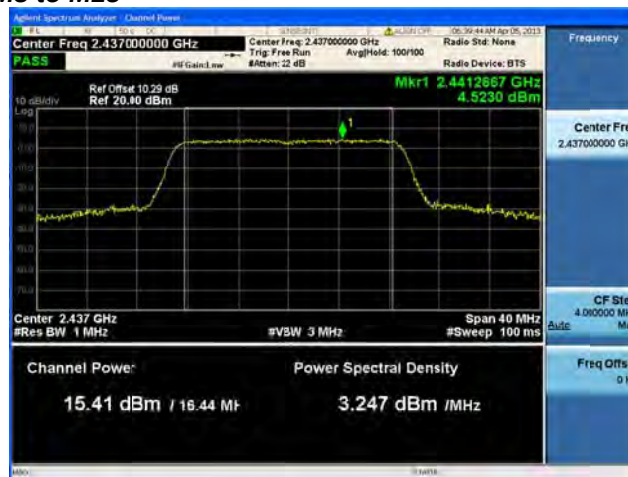
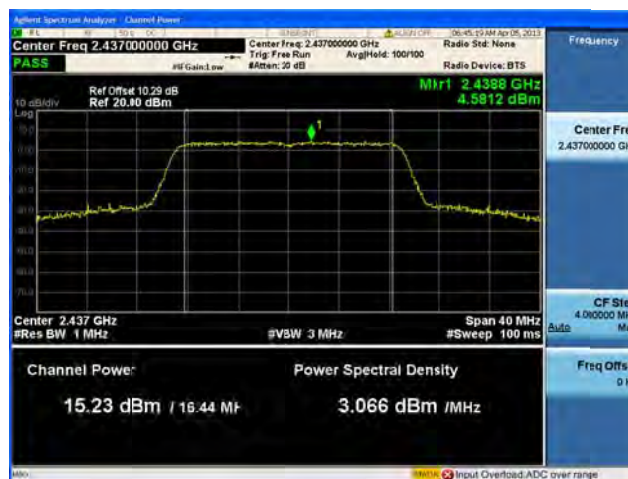
Freq Offset 0 Hz

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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 Beam Forming, M0 to M7**Antenna A****Antenna B****Antenna C****Antenna D**

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

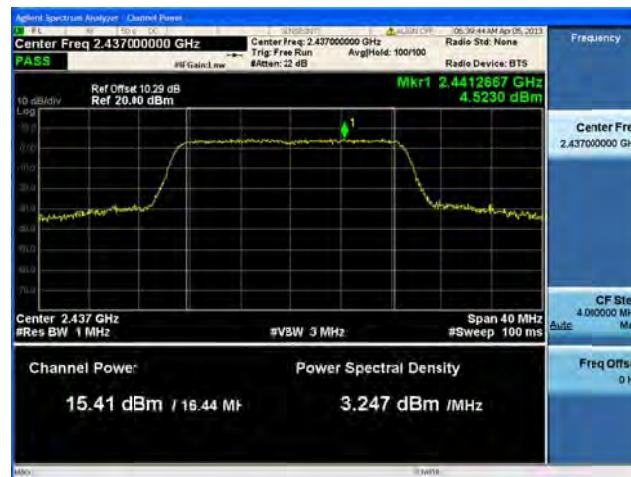
**Peak Output Power, 2437 MHz, HT-20 Beam Forming, M16 to M23****Antenna A****Antenna B****Antenna C****Antenna D**

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

The screenshot displays a software-defined radio (SDR) interface with the following components:

- Top Bar:**
 - Left: Software Spectrum Analyzer - Element 1
 - Center: 0.375 GHz
 - Right: 06:36:55 AM Apr 09, 2013
- Control Panel (Top):**
 - Center Freq: 2.437000000 GHz
 - Center Freq: 2.437000000 GHz
 - Trig: Free Run
 - AvgHold: 100/100
 - Radio Sts: None
 - Radio Device: BT1
- Status Bar (Top):**
 - PASS
 - #F Gain: Low
 - #atten: 20 dB
- Frequency Section (Right):**
 - Frequency
 - Center Freq: 2.437000000 GHz
- Spectrum Plot (Center):**
 - Y-axis: 10 dBdiv
 - Grid: 10 dB, 20 dB, 30 dB, 40 dB, 50 dB, 60 dB, 70 dB, 80 dB, 90 dB, 100 dB
 - Plot: A yellow line representing the spectrum, showing a flat baseline at approximately -40 dBm, a sharp rise to a plateau at approximately 0 dBm, and a sharp fall back to the baseline. A green cursor labeled '1' is positioned on the plateau.
 - Ref Offset 10.29 dB
 - Ref 20.00 dBm
 - Mkr1 2.4357333 GHz
 - 3.6005 dBm
- Measurement Parameters (Bottom):**
 - Center 2437 GHz
 - #Res BW 1 MHz
 - #VBW 3 MHz
 - Span 40 MHz
 - #Sweep 100 ms
- Power Section (Bottom):**
 - Channel Power: 14.22 dBm / 16.44 MFr
 - Power Spectral Density: 2.058 dBm / MHz
- CF Step Section (Bottom Right):**
 - CF Step: 4.000000 MHz
 - Auto
 - Man
- Freq Offset Section (Bottom Right):**
 - Freq Offset: 0 Hz
- Footer:**
 - MSO
 - CH1

Advent Spectrum Analyzer - Channel View

Center Freq 2.437000000 GHz

Ref Offt 10.29 dB

Ref 20.40 dBm

10 dB/div

Center Freq 2.437000000 GHz

Trig Free Run

Avg/Hold: 100/100

Radio Std: None

Radio Device: BTS

Span 40 MHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 100 ms

Channel Power:

15.41 dBm / 16.44 MHz

Power Spectral Density

3.247 dBm /MHz

Marker 1 2.4412667 GHz

4.5230 dBm

Frequency

Center Freq 2.437000000 GHz

CF Step 4.000000 MHz

Marker 1 2.4412667 GHz

4.5230 dBm

Frequency Offset 0 Hz

Vector Signal Analyzer - Channel Power

Center Freq 2.437000000 GHz

PASS

Ref Offset 10.25 dB

Ref 20.00 dBm

Center Freq: 2.437000000 GHz

Trig: Free Run

Avg: Hold: 100/100

RBW: 1 MHz

Span: 40 MHz

Sweep: 100 ms

Channel Power

Power Spectral Density

14.70 dBm / 16.44 MHz

2.537 dBm / MHz

Mkr1 2.438 GHz

4.1984 dBm

Frequency

Center Freq 2.437000000 GHz

CF Step 4.000000 MHz

Auto

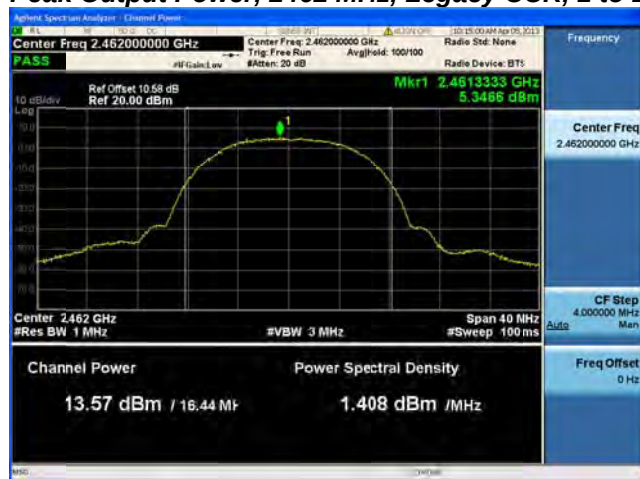
Man

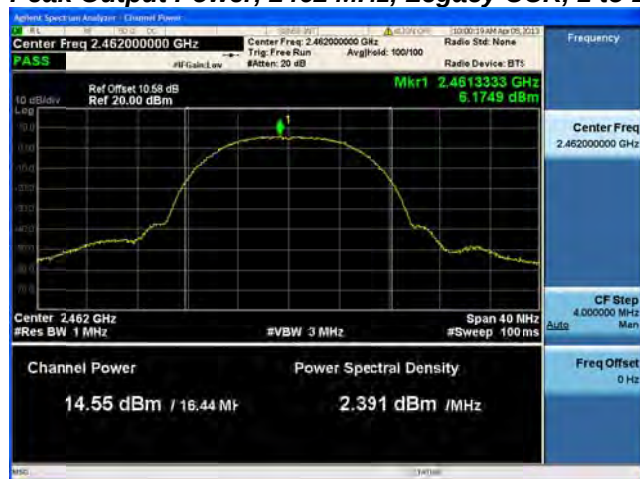
Freq Offset 0 Hz

Channel Power: 15.23 dBm / 16.44 MHz
Power Spectral Density: 3.066 dBm / 1MHz

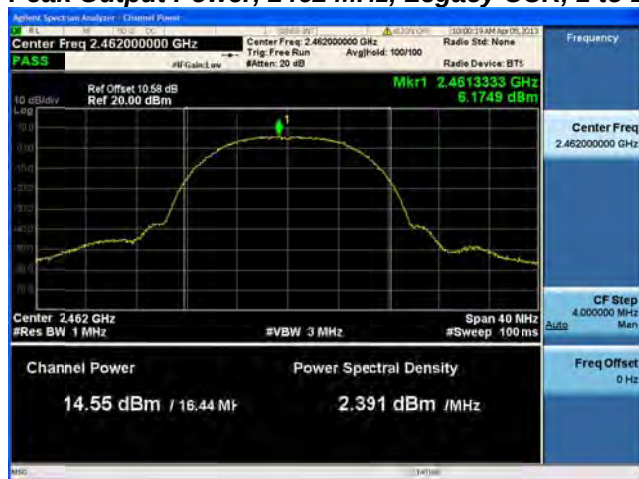
Center Freq: 2.437000000 GHz
 Span: 40 MHz
 Res BW: 1 MHz
 VBW: 3 MHz
 Sweep: 100 ms

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

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

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

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

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, 6 to 54 Mbps**Antenna A****Antenna B****Antenna C****Antenna D**

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**

Software: Spectrum Analyzer - Channel Power
 Center Freq 2.462000000 GHz
 Center Freq: 2.462000000 GHz
 Trig: Free Run
 AvgHold: 100/100
 Radio Std: None
 Radio Device: BT1
 #F Chain: Low
 #Btem: 20 dB
 Ref Offset 10.58 dB
 Ref 20.00 dBm
 Mkr1 2.455867 GHz
 1.7817 dBm
 10 dB/div
 100
 0
 -10
 -20
 -30
 -40
 -50
 -60
 -70
 -80
 -90
 -100
 Center 2.462 GHz
 #Res BW 1 MHz
 #VBW 3 MHz
 Span 40 MHz
 #Sweep 100 ms
 Channel Power
 12.52 dBm / 16.44 MHz
 Power Spectral Density
 0.3591 dBm / MHz
 Frequency
 Center Freq
 2.46200000 GHz
 CF Step
 4.000000 MHz
 Mar
 Freq Offset
 0 Hz
 Auto

Center Freq 2.46200000 GHz
 #Res BW 1 MHz
 #VBW 3 MHz
 Span 40 MHz
 #Sweep 100 ms

Channel Power: 13.06 dBm / 16.44 MHz
 Power Spectral Density: 0.8985 dBm / MHz

Center Freq 2.46200000 GHz
 CF Step 4.000000 MHz
 Freq Offset 0 Hz

Active Spectrum Analyzer - Channel Power

Center Freq 2.462000000 GHz

PASS

Ref Offset 10.58 dB

Ref 20.00 dBm

Center Freq: 2.462000000 GHz

Trig: Free Run

AvgHold: 100/100

Radio Std: None

Radio Device: BT5

Mkr1 2.4635333 GHz

1.8452 dBm

Log

10 dBm

0 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

-80 dBm

-90 dBm

-100 dBm

Center 2.462 GHz

#Res BW 1 MHz

#VBW 3 MHz

Span 40 MHz

#Sweep 100 ms

Channel Power

Power Spectral Density

12.56 dBm / 16.44 MHz

0.4035 dBm / MHz

Frequency

Center Freq

2.462000000 GHz

CF Step

4.000000 MHz

Auto

Freq Offset

0 Hz

Agilent Spectrum Analyzer - Channel Power

Center Freq 2.46200000 GHz

Center Freq: 2.462000000 GHz

Trig: Free Run

Avg/Hold: 100/H00

Radio Std: None

PSM Gain: 3.000

Attenu: 20 dB

Radio Device: BT5

Frequency

Ref Offst 10.58 dB

Ref 20.0 dBm

Wkr1 2.458 GHz

1.9455 dBm

Center Freq 2.46200000 GHz

CF Step 4.000000 MHz

Span 40 MHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 100 ms

Channel Power: 12.90 dBm / 16.44 MHz

Power Spectral Density 0.7424 dBm / MHz

Freq Offset 0 Hz

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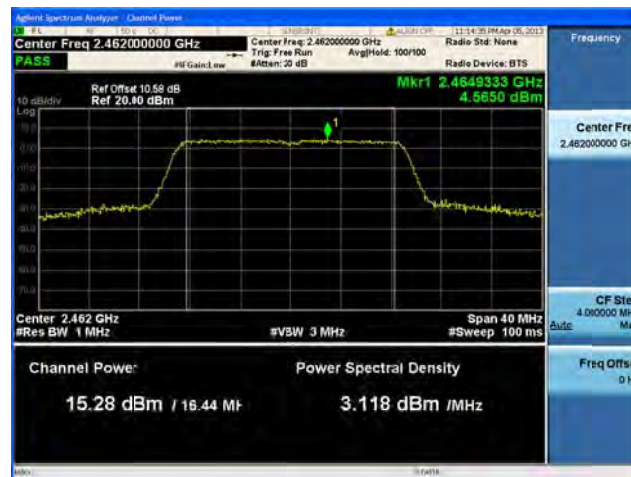
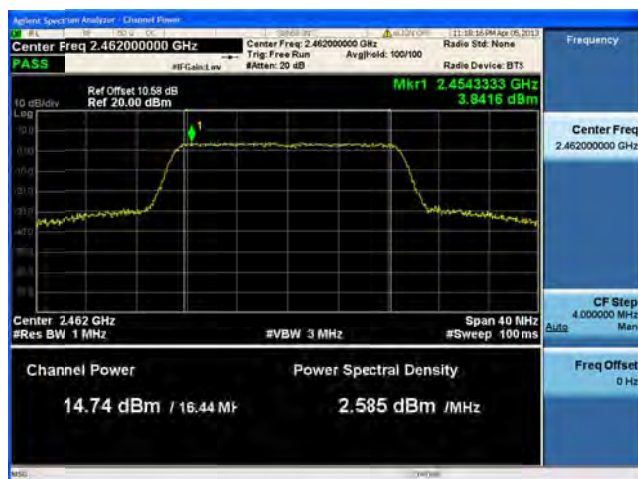
Peak Output Power, 2462 MHz, HT-20, M0 to M7**Antenna A**

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

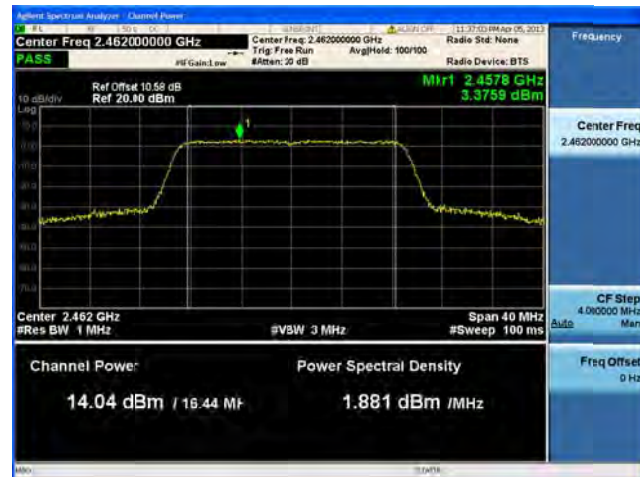
Peak Output Power, 2462 MHz, HT-20, M8 to M15**Antenna A****Antenna B**

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**

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

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

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

The screenshot displays the Rohde & Schwarz Spectrum Analyzer interface. The main plot shows a signal spectrum with a peak at 2.4659333 GHz. The y-axis represents power in dBm, and the x-axis represents frequency in GHz. The plot is titled "Center Freq 2.462000000 GHz". The signal is identified as "Mkr1 2.4659333 GHz 2.4752 dBm". The channel power is 13.32 dBm / 16.44 MHz, and the power spectral density is 1.156 dBm / MHz. The plot settings include a span of 40 MHz, a resolution bandwidth of 1 MHz, and a sweep time of 100 ms. The interface also shows various status indicators and settings, such as "PASS", "Ref Offset 10.58 dB", "Ref 20.00 dBm", and "Center Freq 2.462000000 GHz".

[illegible]

Vector Signal Analyzer - Channel Power

Center Freq 2.462000000 GHz
 #F Calc: 1.00
 #F Calc: 1.00

Center Freq: 2.462000000 GHz
 Trig: Free Run
 Avg: 100/100
 #Att: 20 dB

Radio Std: None
 Radio Device: BT5

Frequency

Center Freq
 2.462000000 GHz

CF Step
 4.000000 MHz
 Mar

Freq Offset
 0 Hz

Ref Offset 10.58 dB
 Ref 20.00 dBm

Mkr1 2.4544 GHz
 2.6193 dBm

10 dBmV
 Log

Center 2.462 GHz
 #Res BW 1 MHz

#VBW 3 MHz

Span 40 MHz
 #Sweep 100 ms

Channel Power

Power Spectral Density

13.51 dBm / 16.44 MHz

1.347 dBm / MHz

Channel Power
 Center Freq 2.462000000 GHz
 Ref Offset 10.58 dB
 Ref 20.40 dBm
 Span 40 MHz
 Sweep 100 ms
 Res BW 1 MHz
 VSW 3 MHz
 Auto
 CF Step 4.000000 MHz
 Fsq Offset 0 Hz

Power Spectral Density
 14.04 dBm / 18.44 MHz
 1.881 dBm / MHz

M1 2.4578 GHz
 3.3759 dBm

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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



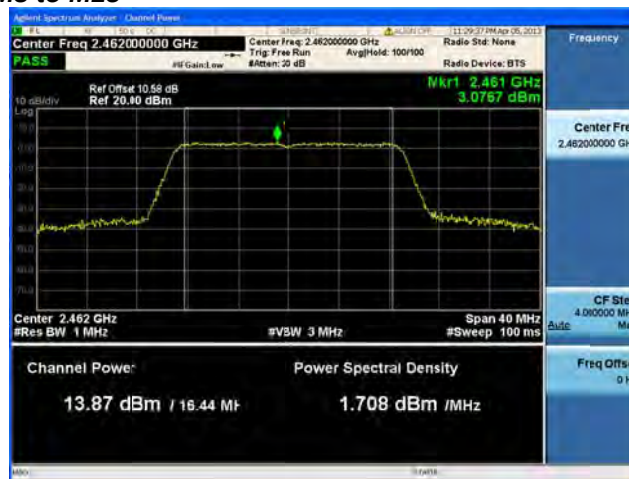
Antenna A



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 Beam Forming, M0 to M7**Antenna A****Antenna B****Antenna C****Antenna D**

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

The screenshot displays a Spectrum Analyzer interface with the following details:

- Top Bar:**
 - Left: "Ref Offset 10.58 dB", "Ref 20.00 dBm".
 - Center: "Center Freq: 2.462000000 GHz", "Trig: Free Run", "#atten: 20 dB".
 - Right: "Radio Sts: None", "Radio Device: BT5".
- Left Panel:**
 - Top: "PASS" in green.
 - Middle: A graph showing a signal trace (yellow line) with a peak at 2.4547333 GHz and a level of 1.7508 dBm. The y-axis is labeled "to dBmV" and ranges from -100 to 0.
 - Bottom: "Center 2.462 GHz", "#Res BW 1 MHz", "#VBW 3 MHz", "#Sweep 100 ms".
- Right Panel:**
 - Top: "Frequency" label.
 - Middle: "Center Freq 2.462000000 GHz".
 - Bottom: "CF Step 4.000000 MHz", "Auto" button, "Man" button.
- Bottom Section:**
 - Left: "Channel Power 12.37 dBm / 16.44 MHz".
 - Right: "Power Spectral Density 0.2056 dBm / MHz".
- Far Right Panel:**
 - Top: "Freq Offset 0 Hz".

Agilent Spectrum Analyzer - Channel 1

Center Freq 2.46200000 GHz

Ref Offset 10.58 dB

Ref 20.40 dBm

Mkr1 2.4584667 GHz

2.1463 dBm

Channel Power: 12.92 dBm / 16.44 MHz

Power Spectral Density: 0.7561 dBm / MHz

Frequency: 2.46200000 GHz

Active Spectrum Analyzer - Channel Power

Center Freq 2.462000000 GHz

PASS

Ref Offset 10.58 dB

Ref 20.00 dBm

Center Freq: 2.462000000 GHz

Trig: Free Run

Avg: Hold: 100/100

Radio Std: None

Radio Device: BTS

Frequency

Center Freq 2.462000000 GHz

CF Step 4.000000 MHz

Span 40 MHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 100 ms

Channel Power 12.42 dBm / 16.44 MHz

Power Spectral Density 0.2583 dBm / MHz

Freq Offset 0 Hz

Channel Power

Center Freq 2.462000000 GHz

Ref Offst 10.58 dB

Ref 20.90 dBm

Mkr1 2.455133 GHz

1.6329 dBm

Channel Power

Power Spectral Density

12.68 dBm / 16.44 MHz

0.5211 dBm / MHz

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

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

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



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.

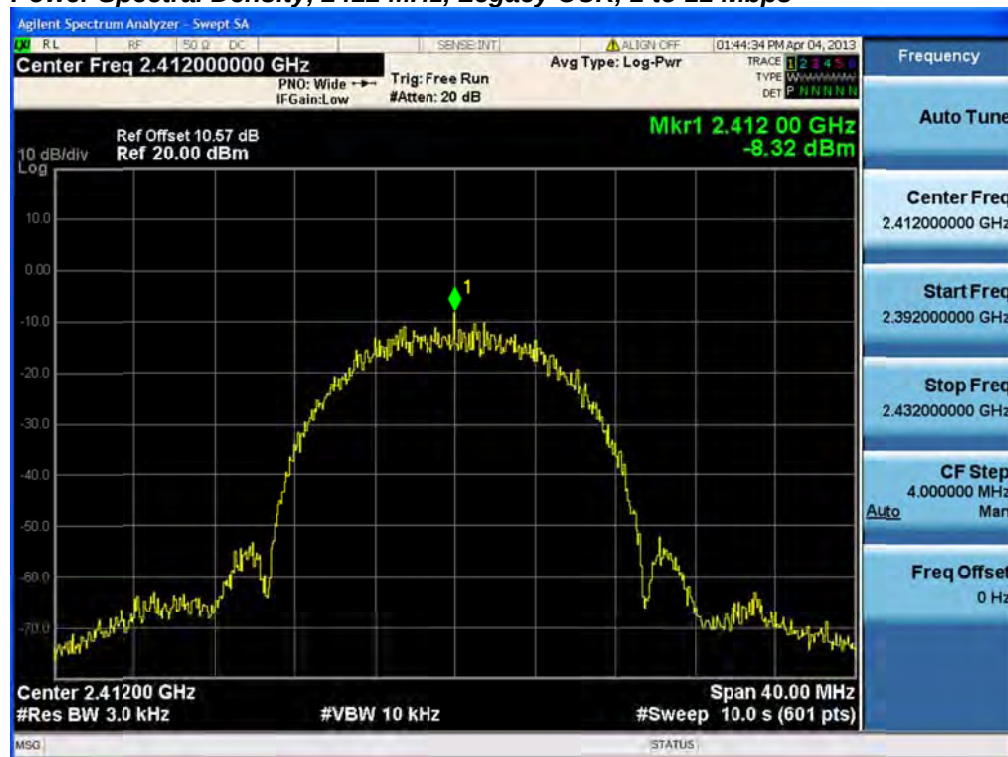
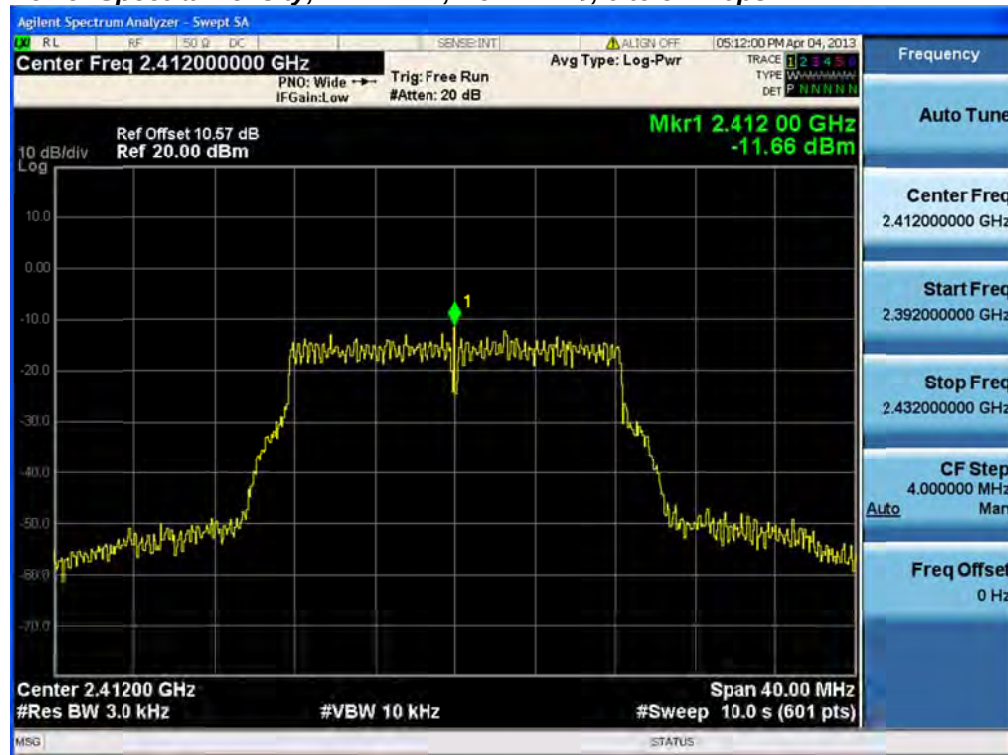
Center Frequency:	Frequency from table below
Span:	20 MHz
Ref Level Offset:	Correct for attenuator and cable loss.
Reference Level:	20 dBm
Attenuation:	20 dB
Sweep Time:	10s
Resolution Bandwidth:	3 kHz
Video Bandwidth:	10 kHz
Detector:	Peak
Trace:	Single
Marker:	Peak Search

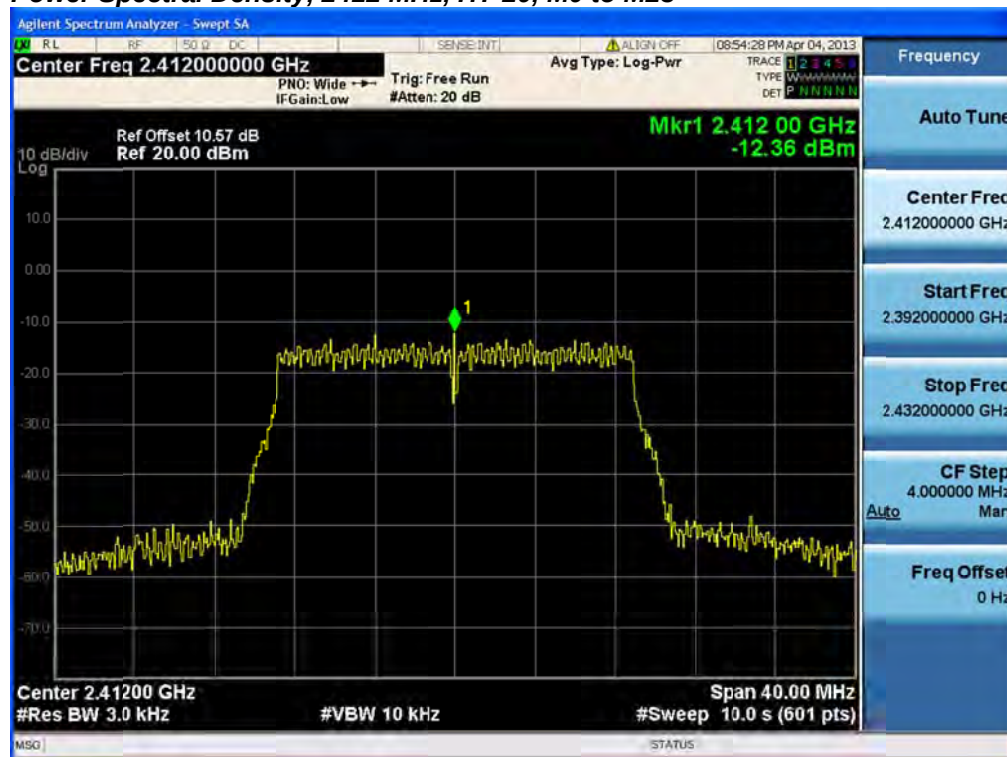
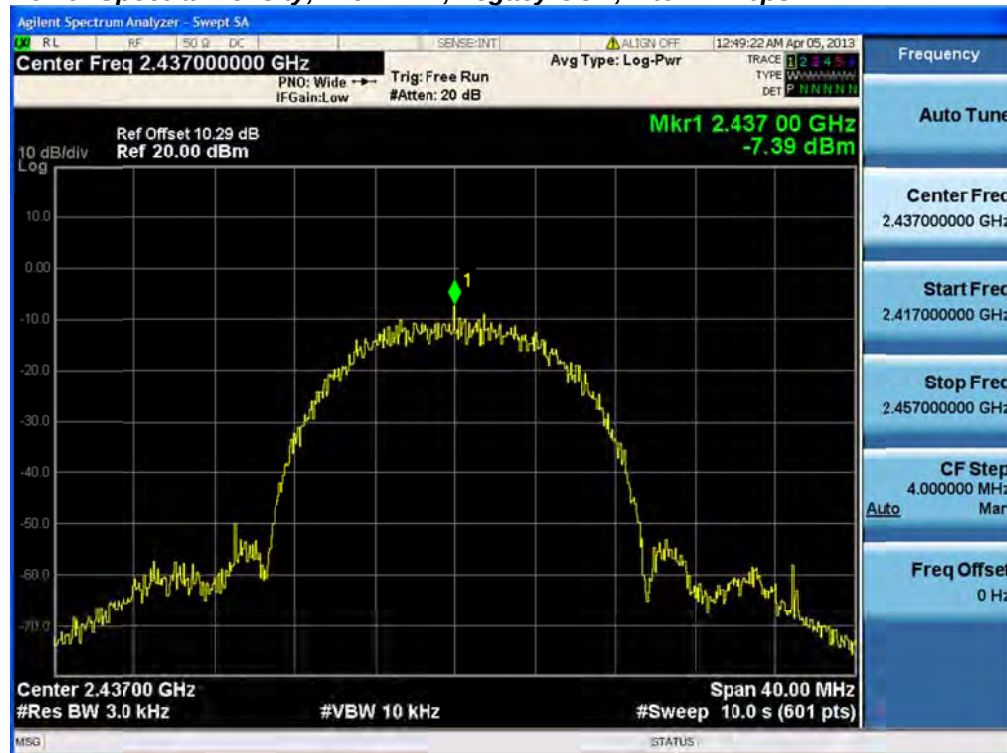
Record the Marker value.

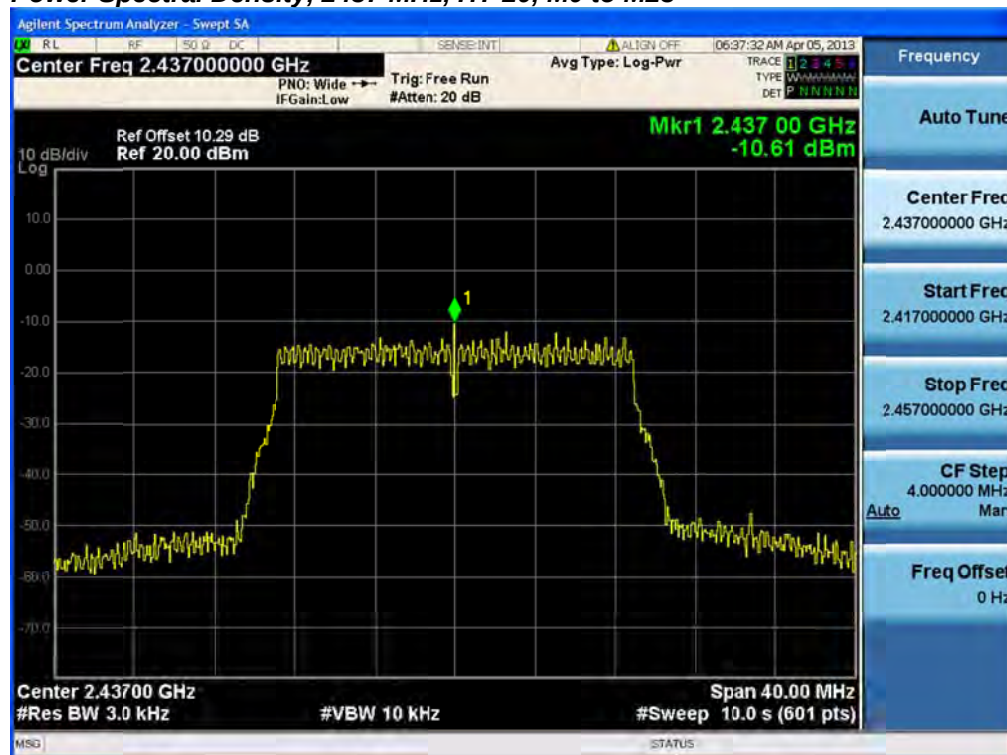
The “Measure and add $10 \log(N)$ dB technique”, where N is the number of outputs, is used for measuring in-band Power Spectral Density. With this technique, spectrum measurements are performed at each output of the device, and the quantity $10 \log(4)$ (or 6dB) is added to the worst case spectrum value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



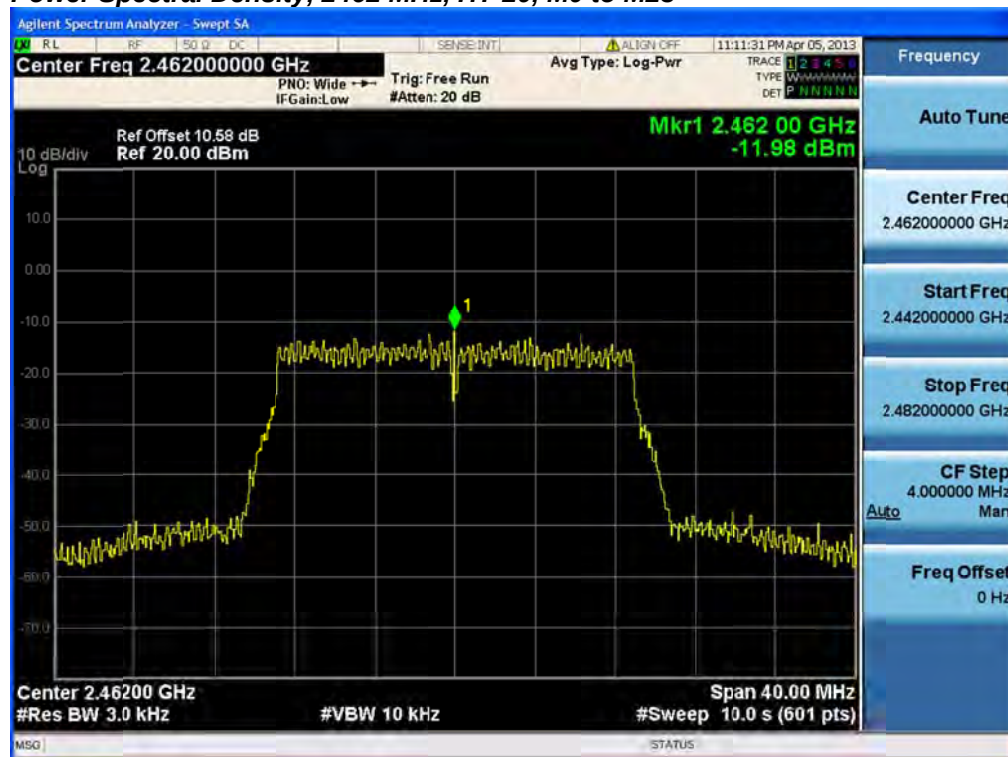
Frequency (MHz)	Mode	Data Rate (Mbps)	PSD / Antenna (dBm/3kHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
2412	Legacy CCK, 1 to 11 Mbps	11	<u>-8.3</u>	-2.28	8.00	10.28
	Non HT-20, 6 to 54 Mbps	6	<u>-11.7</u>	-5.68	8.00	13.68
	HT-20, M0 to M23	m0	<u>-12.4</u>	-6.38	8.00	14.38
2437	Legacy CCK, 1 to 11 Mbps	11	<u>-7.4</u>	-1.38	8.00	9.38
	Non HT-20, 6 to 54 Mbps	6	<u>-12.9</u>	-6.88	8.00	14.88
	HT-20, M0 to M23	m0	<u>-10.6</u>	-4.58	8.00	12.58
2462	Legacy CCK, 1 to 11 Mbps	11	<u>-8.9</u>	-2.88	8.00	10.88
	Non HT-20, 6 to 54 Mbps	6	<u>-11.9</u>	-5.88	8.00	13.88
	HT-20, M0 to M23	m0	<u>-12</u>	-5.98	8.00	13.98

Power Spectral Density, 2412 MHz, Legacy 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, Legacy 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, Legacy 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).

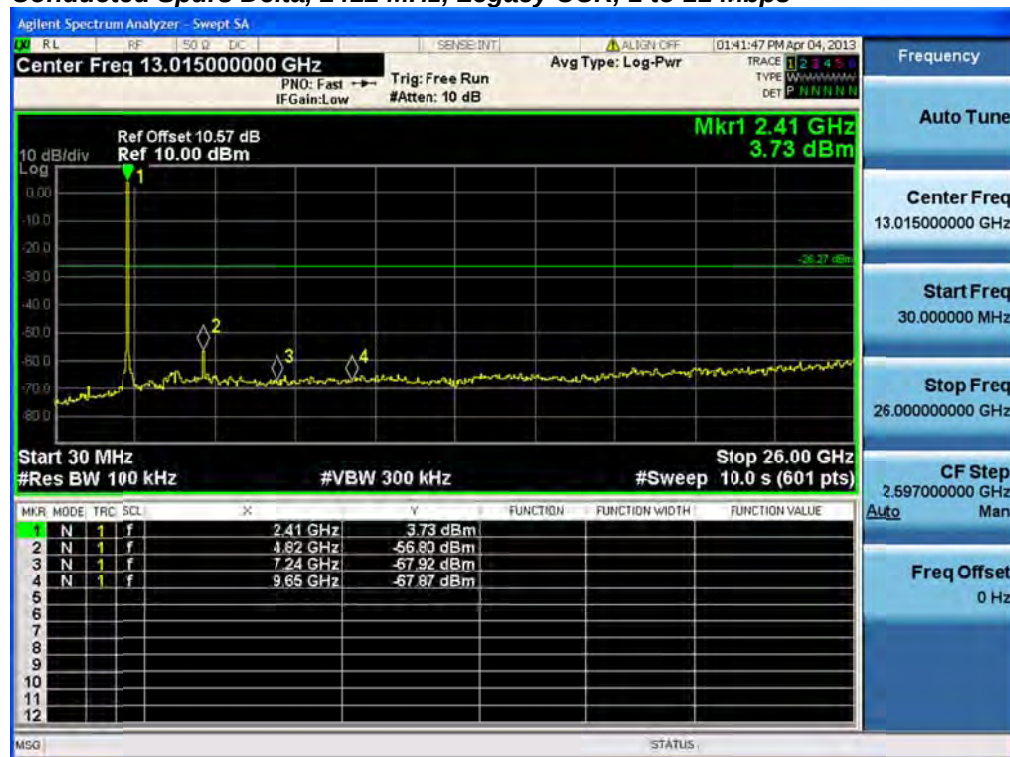
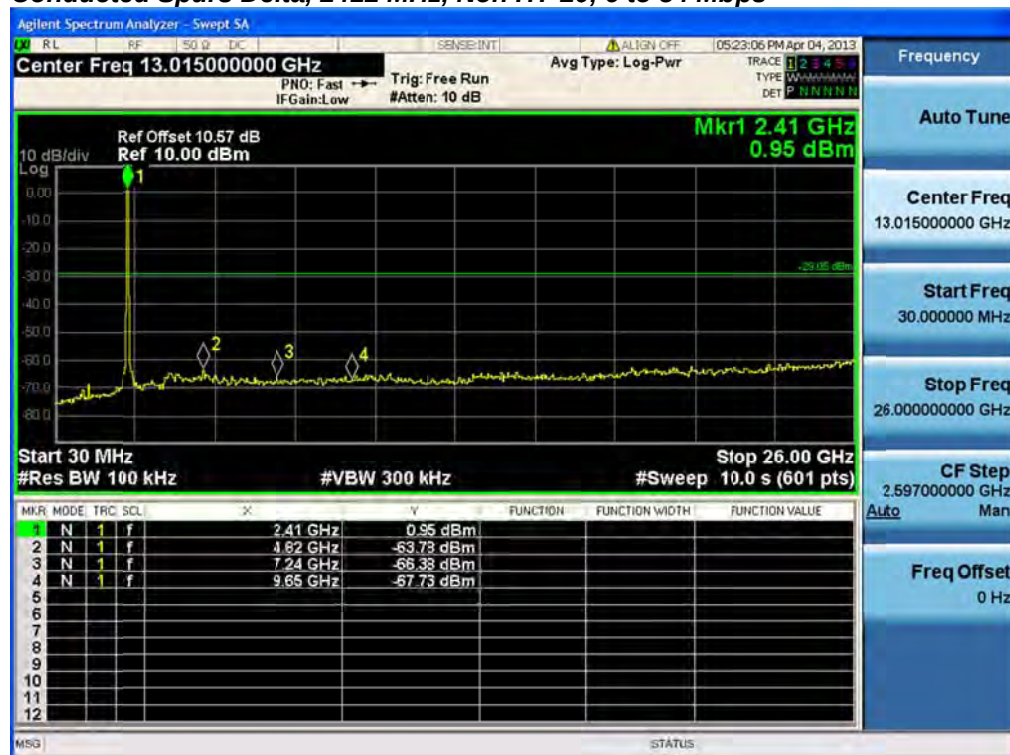
Span:	30 MHz-26 GHz
Reference Level:	20 dBm
Attenuation:	10 dB
Sweep Time:	5s
Resolution Bandwidth:	100 kHz
Video Bandwidth:	300 kHz
Detector:	Peak
Trace:	Single
Marker:	Peak

Record the marker waveform peak to spur difference

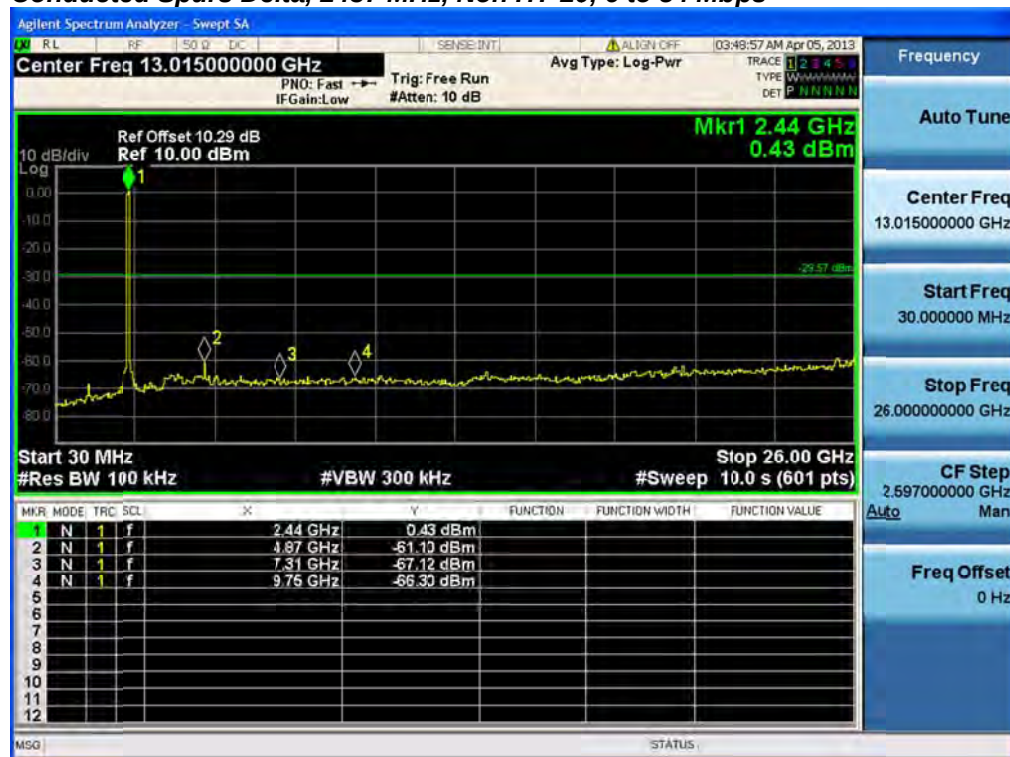
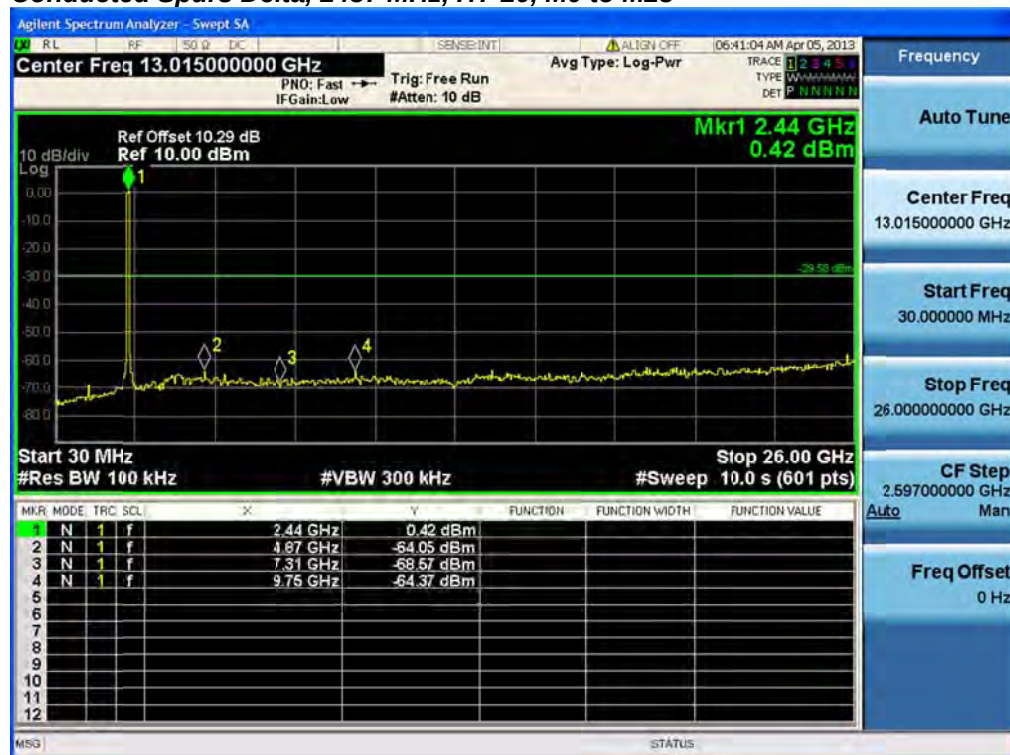
Out-of-band and spurious emissions tests are performed on each output individually without summing or adding $10 \log(N)$ since the measurements are made relative to the in-band emissions on the individual outputs. The worst case output is recorded.



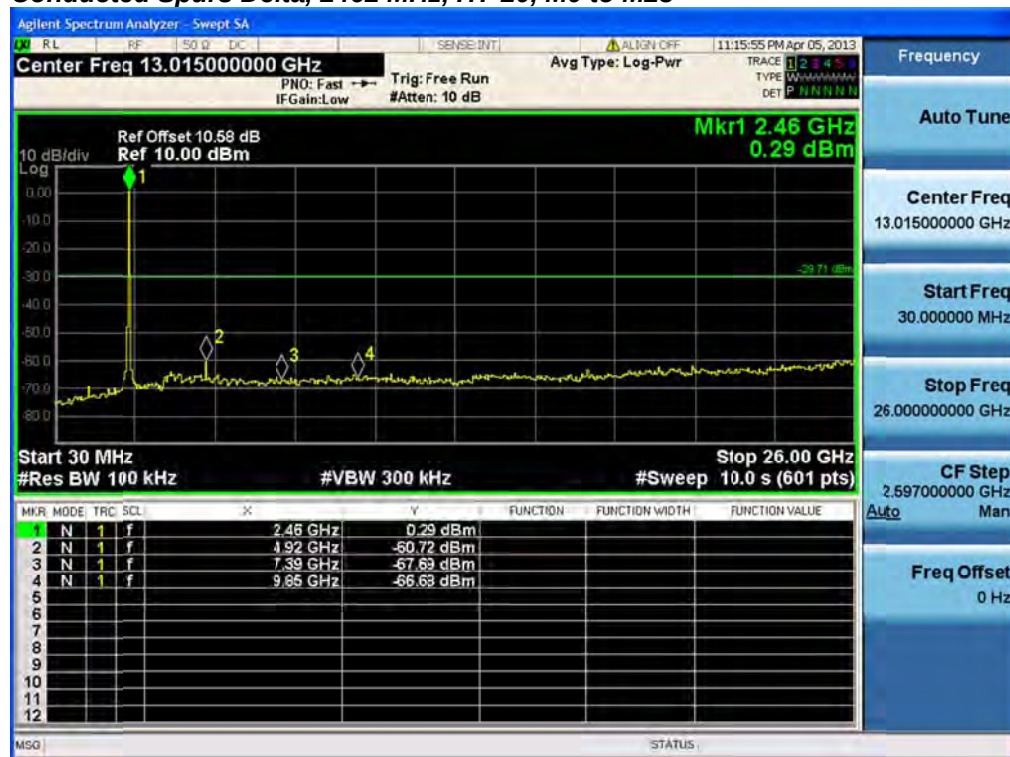
Frequency (MHz)	Mode	Data Rate (Mbps)	Conducted Spur Delta (dB)	Limit (dB c)	Margin (dB)
2412	Legacy CCK, 1 to 11 Mbps	11	<u>60.5</u>	30	30.5
	Non HT-20, 6 to 54 Mbps	6	<u>64.7</u>	30	34.7
	HT-20, M0 to M23	m0	<u>64.7</u>	30	34.7
2437	Legacy CCK, 1 to 11 Mbps	11	<u>66.8</u>	30	36.8
	Non HT-20, 6 to 54 Mbps	6	<u>61.5</u>	30	31.5
	HT-20, M0 to M23	m0	<u>64.5</u>	30	34.5
2462	Legacy CCK, 1 to 11 Mbps	11	<u>66.1</u>	30	36.1
	Non HT-20, 6 to 54 Mbps	6	<u>60</u>	30	30
	HT-20, M0 to M23	m0	<u>61</u>	30	31

Conducted Spurs Delta, 2412 MHz, Legacy CCK, 1 to 11 Mbps**Conducted Spurs Delta, 2412 MHz, Non HT-20, 6 to 54 Mbps**

Conducted Spurs Delta, 2412 MHz, HT-20, M0 to M23**Conducted Spurs Delta, 2437 MHz, Legacy CCK, 1 to 11 Mbps**

Conducted Spurs Delta, 2437 MHz, Non HT-20, 6 to 54 Mbps**Conducted Spurs Delta, 2437 MHz, HT-20, M0 to M23**

Conducted Spurs Delta, 2462 MHz, Legacy CCK, 1 to 11 Mbps**Conducted Spurs Delta, 2462 MHz, Non HT-20, 6 to 54 Mbps**

Conducted Spurs Delta, 2462 MHz, HT-20, M0 to M23



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.

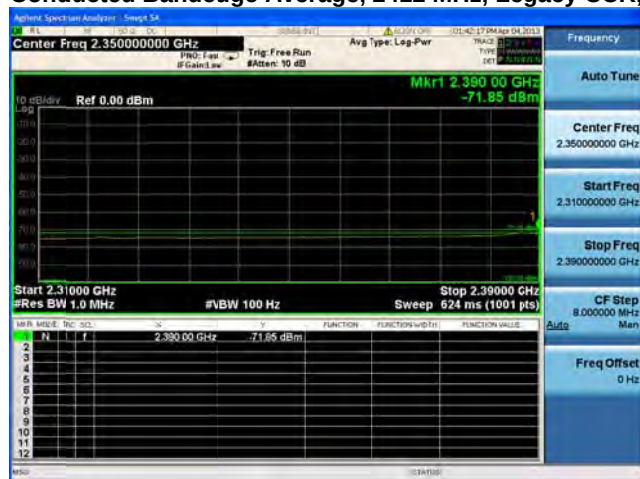


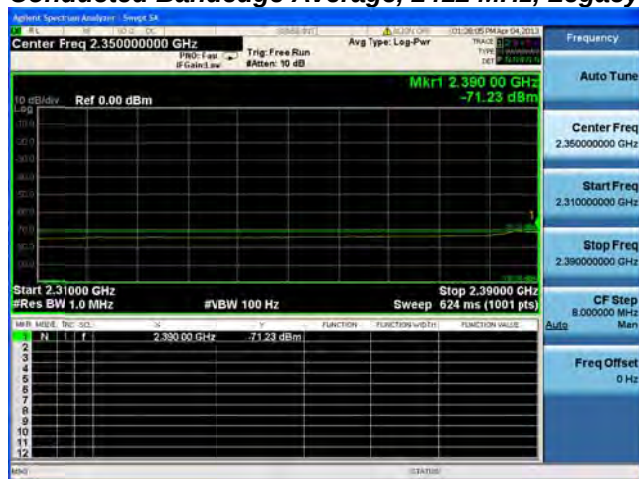
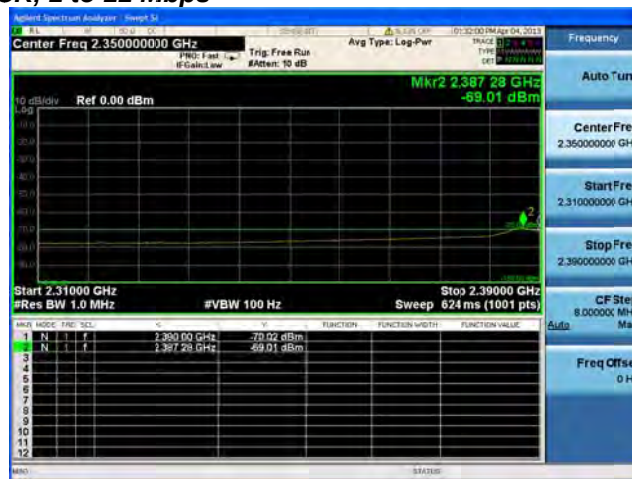
Average Bandedge Data

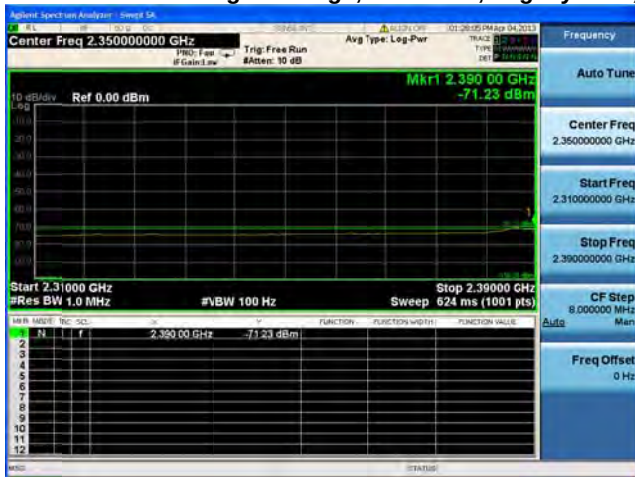
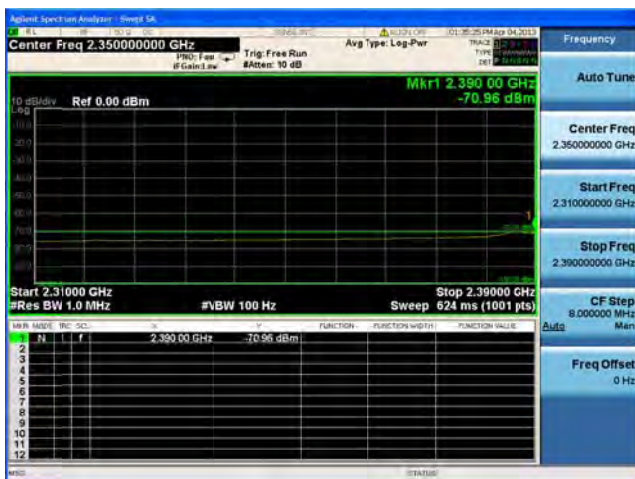
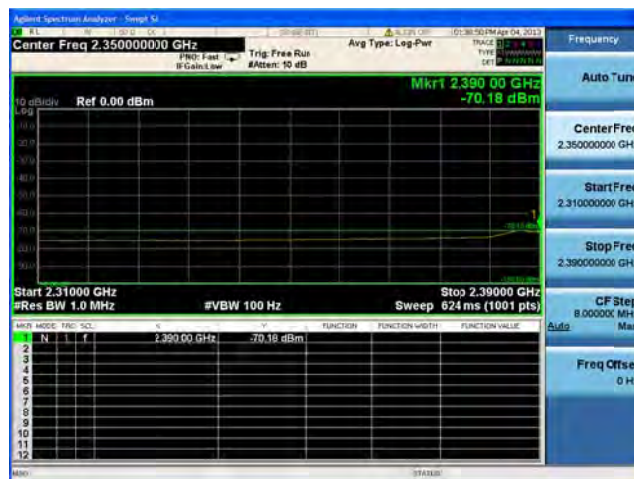
Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Tx 2 Bandedge Level (dBm)	Tx 3 Bandedge Level (dBm)	Tx 4 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
2412	Legacy CCK, 1 to 11 Mbps	1	6	-71.80				-65.80	-41.25	24.55
	Legacy CCK, 1 to 11 Mbps	2	6	-71.20	-69.00	-71.00		-60.95	-41.25	19.70
	Legacy CCK, 1 to 11 Mbps	4	6	-71.20	-69.00	-71.00	-70.20	-58.24	-41.25	16.99
	Non HT-20, 6 to 54 Mbps	1	6	-57.60				-51.60	-41.25	10.35
	Non HT-20, 6 to 54 Mbps	2	6	-57.60	-54.40			-46.70	-41.25	5.45
	Non HT-20, 6 to 54 Mbps	3	6	-57.60	-54.40	-57.10		-45.36	-41.25	4.11
	Non HT-20, 6 to 54 Mbps	4	6	-57.60	-54.40	-57.10	-54.40	-43.61	-41.25	2.36
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	-57.60	-54.40			-43.70	-41.25	2.45
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	-61.70	-59.00	-60.70		-44.75	-41.25	3.50
	Non HT-20 Beam Forming, 6 to 54 Mbps	4	12	-61.70	-59.00	-60.70	-58.70	-41.84	-41.25	0.59
	HT-20, M0 to M7	1	6	-58.10				-52.10	-41.25	10.85
	HT-20, M0 to M7	2	6	-58.10	-52.40			-45.36	-41.25	4.11
	HT-20, M8 to M15	2	6	-58.10	-52.40			-45.36	-41.25	4.11
	HT-20, M0 to M7	3	6	-58.10	-52.40	-54.30		-43.58	-41.25	2.33
	HT-20, M8 to M15	3	6	-58.10	-52.40	-54.30		-43.58	-40.25	3.33
	HT-20, M16 to M23	3	6	-58.10	-52.40	-54.30		-43.58	-41.25	2.33
	HT-20, M0 to M7	4	6	-58.10	-52.40	-54.30	-52.50	-41.79	-41.25	0.54
	HT-20, M8 to M15	4	6	-58.10	-52.40	-54.30	-52.50	-41.79	-41.25	0.54
	HT-20, M16 to M23	4	6	-58.10	-52.40	-54.30	-52.50	-41.79	-41.25	0.54
	HT-20 Beam Forming, M0 to M7	2	9	-58.10	-52.40			-42.36	-41.25	1.11
	HT-20 Beam Forming, M8 to M15	2	6	-58.10	-52.40			-45.36	-41.25	4.11
	HT-20 Beam Forming, M0 to M7	3	11	-61.70	-57.80	-57.70		-43.14	-41.25	1.89
	HT-20 Beam Forming, M8 to M15	3	8	-58.10	-52.40	-54.30		-41.78	-41.25	0.53
	HT-20 Beam Forming, M16 to M23	3	6	-58.10	-52.40	-54.30		-43.58	-41.25	2.33
	HT-20 Beam Forming, M0 to M7	4	12	-64.40	-61.10	-61.40	-61.70	-43.95	-41.25	2.70
	HT-20 Beam Forming, M8 to M15	4	9	-61.70	-57.80	-57.70	-56.40	-42.99	-41.25	1.74
	HT-20 Beam Forming, M16 to M23	4	7	-61.70	-57.80	-57.70	-56.40	-44.79	-41.25	3.54
	HT-20 STBC, M0 to M7	2	6	-58.10	-52.40			-45.36	-41.25	4.11
	HT-20 STBC, M0 to M7	3	6	-58.10	-52.40	-54.30		-43.58	-41.25	2.33

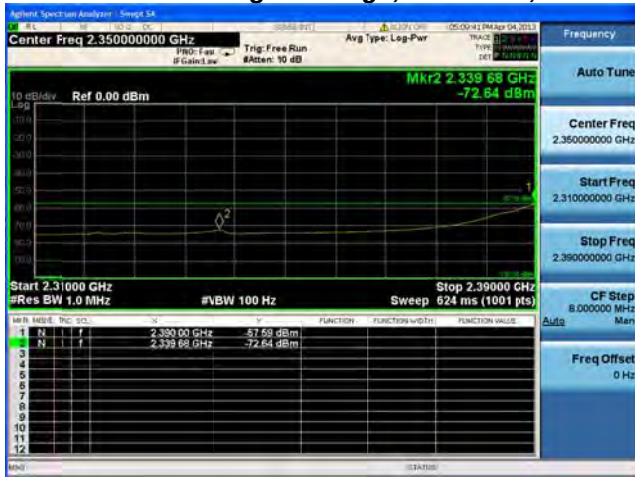


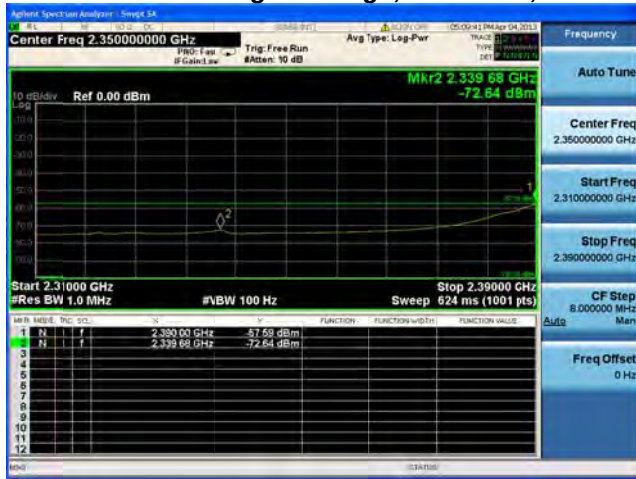
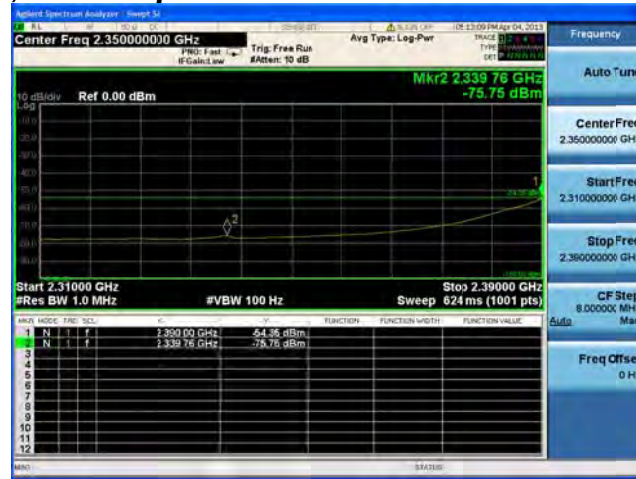
	HT-20 STBC, M0 to M7	4	6	<u>-58.10</u>	<u>-52.40</u>	<u>-54.30</u>	<u>-52.50</u>	-41.79	-41.25	0.54
2462	Legacy CCK, 1 to 11 Mbps	1	6	<u>-72.60</u>				-66.60	-41.25	25.35
	Legacy CCK, 1 to 11 Mbps	2	6	<u>-71.80</u>	<u>-70.10</u>			-61.86	-41.25	20.61
	Legacy CCK, 1 to 11 Mbps	3	6	<u>-71.80</u>	<u>-70.10</u>	<u>-71.20</u>		-60.20	-41.25	18.95
	Legacy CCK, 1 to 11 Mbps	4	6	<u>-71.80</u>	<u>-70.10</u>	<u>-71.20</u>	<u>-71.10</u>	-58.99	-41.25	17.74
	Non HT-20, 6 to 54 Mbps	1	6	<u>-58.20</u>				-52.20	-41.25	10.95
	Non HT-20, 6 to 54 Mbps	2	6	<u>-58.20</u>	<u>-53.50</u>			-46.23	-41.25	4.98
	Non HT-20, 6 to 54 Mbps	3	6	<u>-58.20</u>	<u>-53.50</u>	<u>-56.20</u>		-44.77	-41.25	3.52
	Non HT-20, 6 to 54 Mbps	4	6	<u>-58.20</u>	<u>-53.50</u>	<u>-56.20</u>	<u>-52.50</u>	-42.54	-41.25	1.29
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	<u>-58.20</u>	<u>-53.50</u>			-43.23	-41.25	1.98
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	<u>-62.20</u>	<u>-58.90</u>	<u>-59.60</u>		-44.45	-41.25	3.20
	Non HT-20 Beam Forming, 6 to 54 Mbps	4	12	<u>-66.10</u>	<u>-63.40</u>	<u>-64.50</u>	<u>-62.70</u>	-45.97	-41.25	4.72
	HT-20, M0 to M7	1	6	<u>-55.80</u>				-49.80	-41.25	8.55
	HT-20, M0 to M7	2	6	<u>-55.80</u>	<u>-50.90</u>			-43.68	-41.25	2.43
	HT-20, M8 to M15	2	6	<u>-55.80</u>	<u>-50.90</u>			-43.68	-41.25	2.43
	HT-20, M0 to M7	3	6	<u>-55.80</u>	<u>-50.90</u>	<u>-53.20</u>		-42.08	-41.25	0.83
	HT-20, M8 to M15	3	6	<u>-55.80</u>	<u>-50.90</u>	<u>-53.20</u>		-42.08	-41.25	0.83
	HT-20, M16 to M23	3	6	<u>-55.80</u>	<u>-50.90</u>	<u>-53.20</u>		-42.08	-41.25	0.83
	HT-20, M0 to M7	4	6	<u>-60.10</u>	<u>-57.20</u>	<u>-57.70</u>	<u>-54.20</u>	-44.77	-41.25	3.52
	HT-20, M8 to M15	4	6	<u>-60.10</u>	<u>-57.20</u>	<u>-57.70</u>	<u>-54.20</u>	-44.77	-41.25	3.52
	HT-20, M16 to M23	4	6	<u>-60.10</u>	<u>-57.20</u>	<u>-57.70</u>	<u>-54.20</u>	-44.77	-41.25	3.52
	HT-20 Beam Forming, M0 to M7	2	9	<u>-60.10</u>	<u>-57.20</u>			-46.40	-41.25	5.15
	HT-20 Beam Forming, M8 to M15	2	6	<u>-55.80</u>	<u>-50.90</u>			-43.68	-41.25	2.43
	HT-20 Beam Forming, M0 to M7	3	11	<u>-64.10</u>	<u>-61.50</u>	<u>-62.10</u>		-46.86	-41.25	5.61
	HT-20 Beam Forming, M8 to M15	3	8	<u>-60.10</u>	<u>-57.20</u>	<u>-57.70</u>		-45.59	-41.25	4.34
	HT-20 Beam Forming, M16 to M23	3	6	<u>-55.80</u>	<u>-50.90</u>	<u>-53.20</u>		-42.08	-41.25	0.83
	HT-20 Beam Forming, M0 to M7	4	12	<u>-64.10</u>	<u>-61.50</u>	<u>-62.10</u>	<u>-59.40</u>	-43.43	-41.25	2.18
	HT-20 Beam Forming, M8 to M15	4	9	<u>-64.10</u>	<u>-61.50</u>	<u>-62.10</u>	<u>-59.40</u>	-46.43	-41.25	5.18
	HT-20 Beam Forming, M16 to M23	4	7	<u>-64.10</u>	<u>-61.50</u>	<u>-62.10</u>	<u>-59.40</u>	-48.23	-41.25	6.98
	HT-20 STBC, M0 to M7	2	6	<u>-55.80</u>	<u>-50.90</u>			-43.68	-41.25	2.43
	HT-20 STBC, M0 to M7	3	6	<u>-55.80</u>	<u>-50.90</u>	<u>-53.20</u>		-42.08	-41.25	0.83
	HT-20 STBC, M0 to M7	4	6	<u>-60.10</u>	<u>-57.20</u>	<u>-57.70</u>	<u>-54.20</u>	-44.77	-41.25	3.52

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

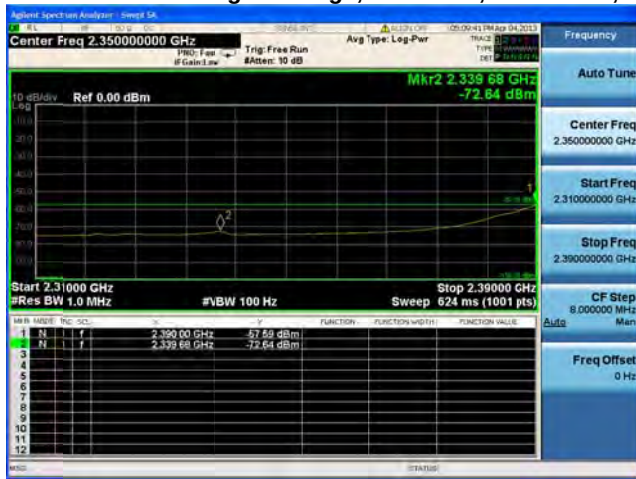
Conducted Bandedge Average, 2412 MHz, Legacy CCK, 1 to 11 Mbps**Antenna A****Antenna B**

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

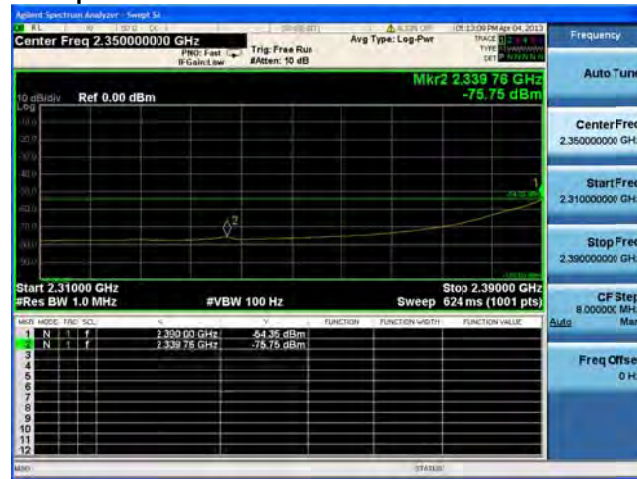
**Conducted Bandedge Average, 2412 MHz, Non HT-20, 6 to 54 Mbps****Antenna A**

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

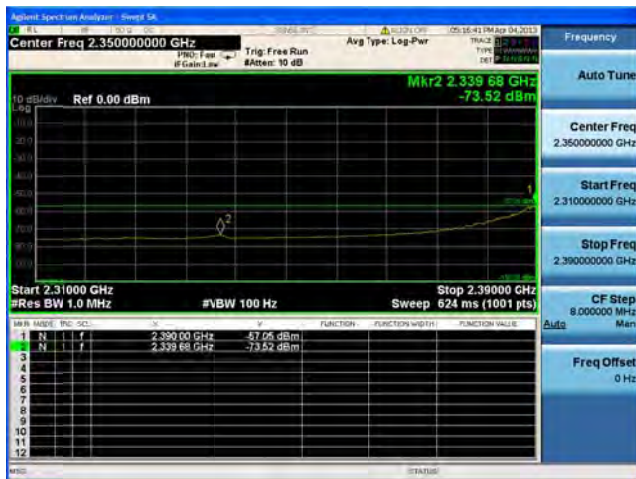
Conducted Bandedge Average, 2412 MHz, Non HT-20, 6 to 54 Mbps



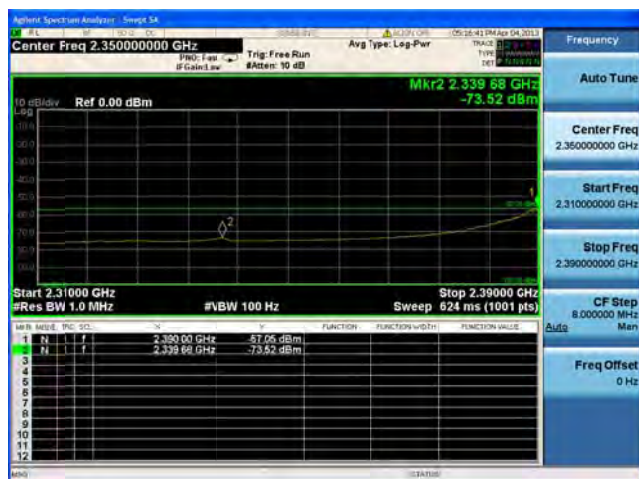
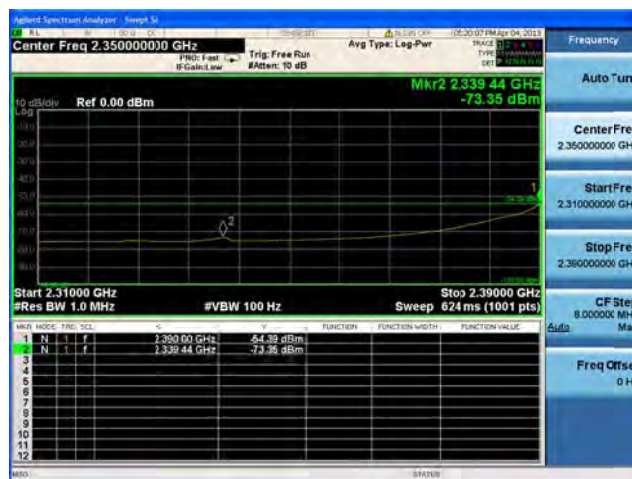
Antenna A

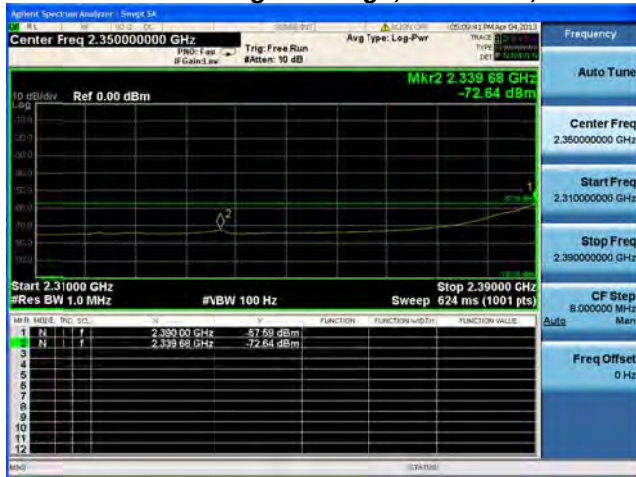
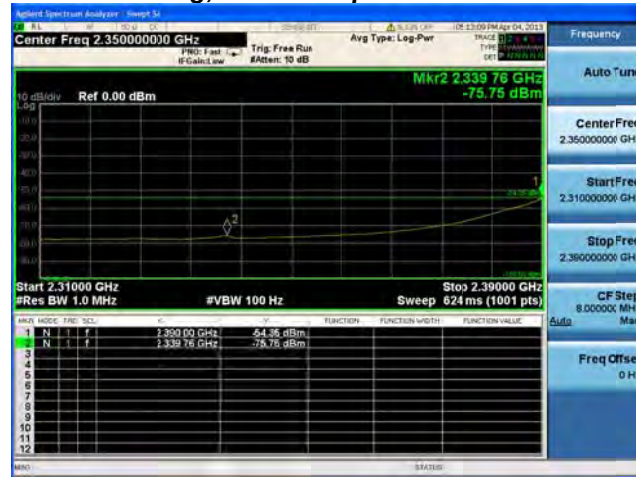


Antenna B

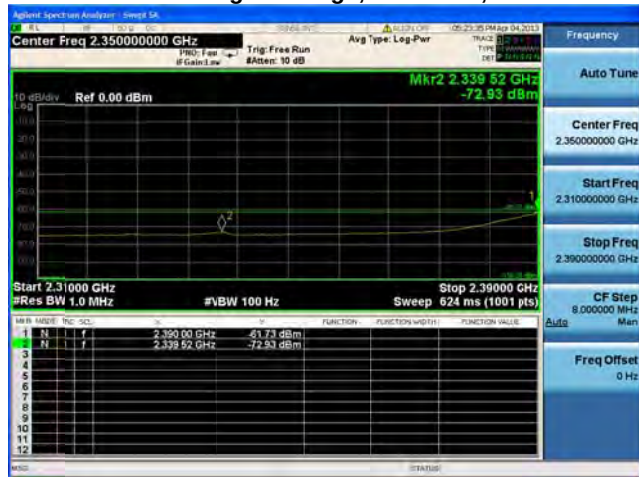


Antenna C

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

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

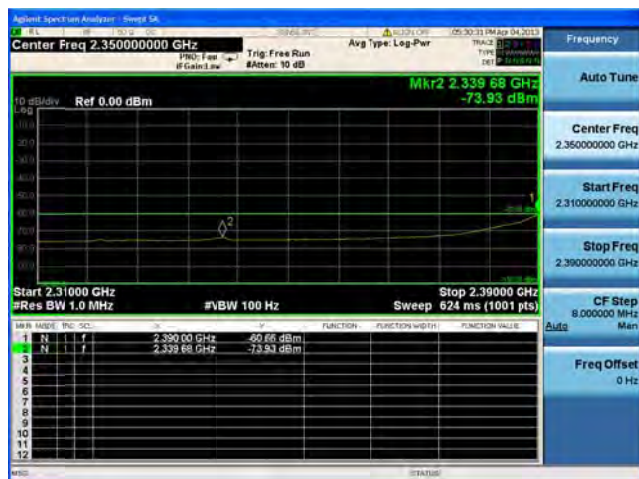
Conducted Bandedge Average, 2412 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps



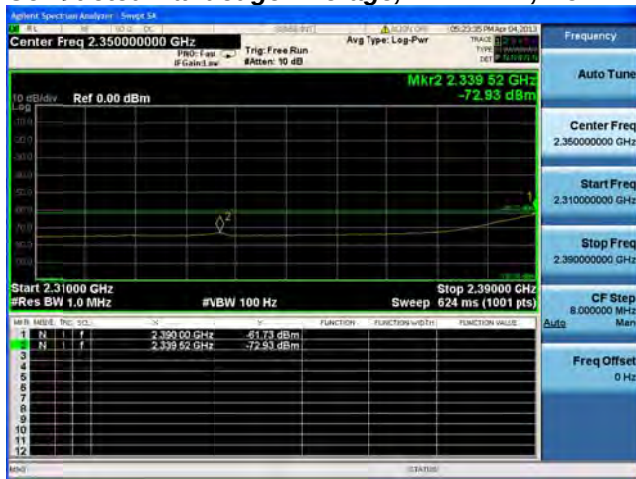
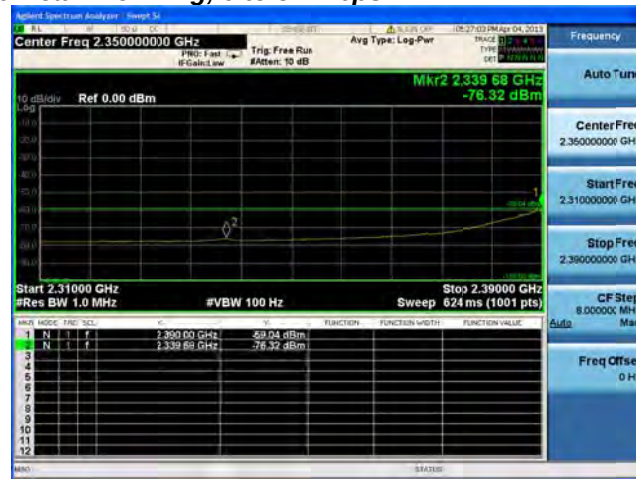
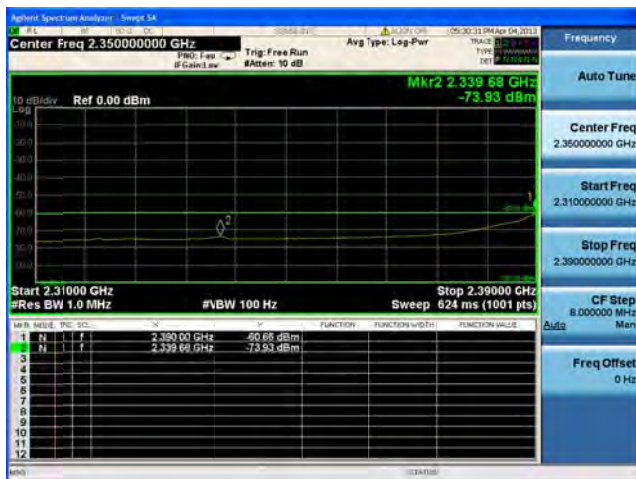
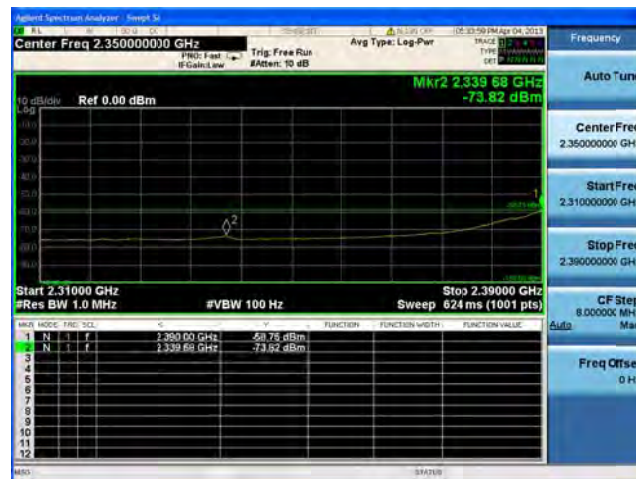
Antenna A

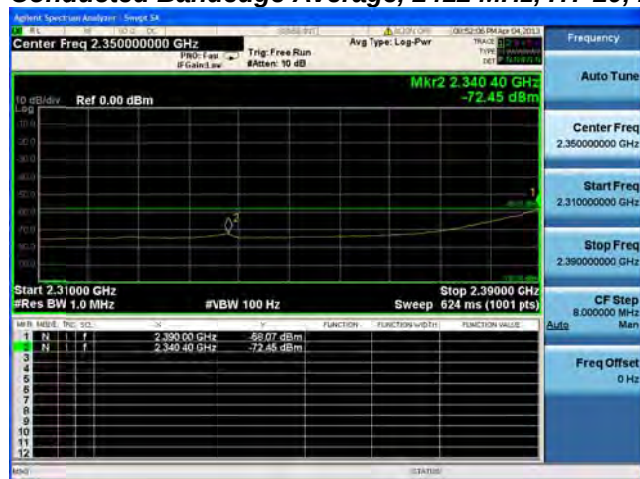


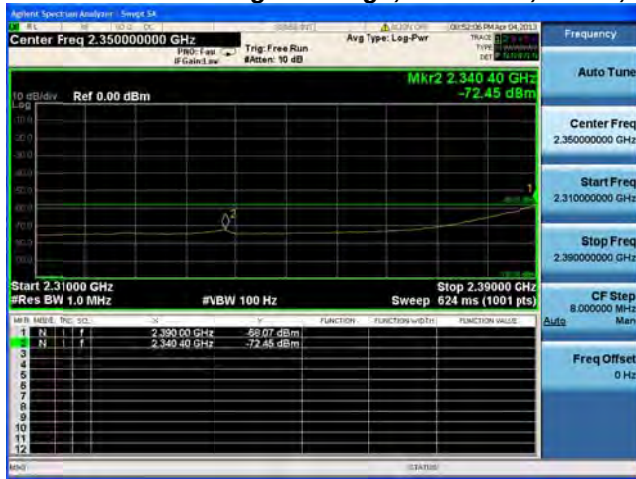
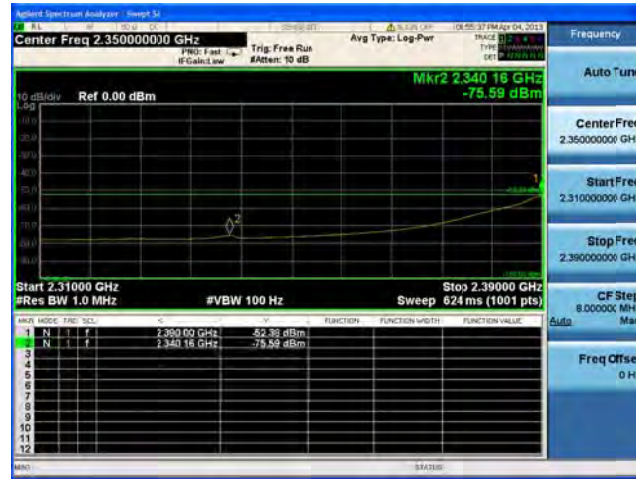
Antenna B



Antenna C

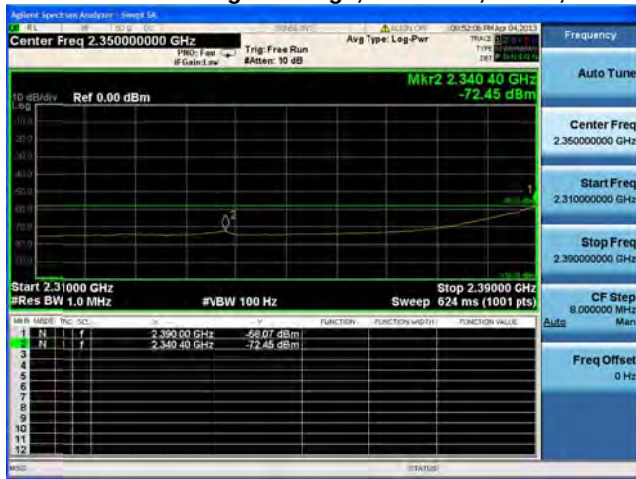
Conducted Bandedge Average, 2412 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps**Antenna A****Antenna B****Antenna C****Antenna D**

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

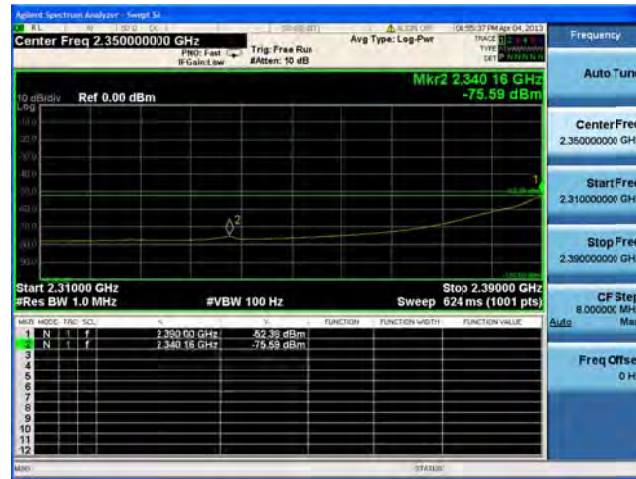
**Conducted Bandedge Average, 2412 MHz, HT-20, M0 to M7****Antenna A****Antenna B**



Conducted Bandedge Average, 2412 MHz, HT-20, M8 to M15

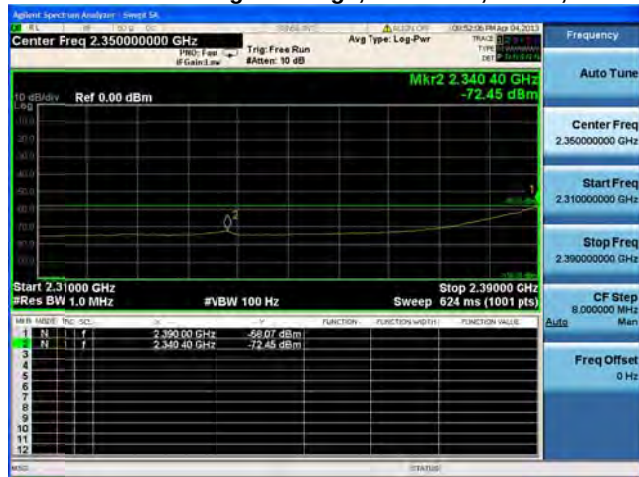


Antenna A

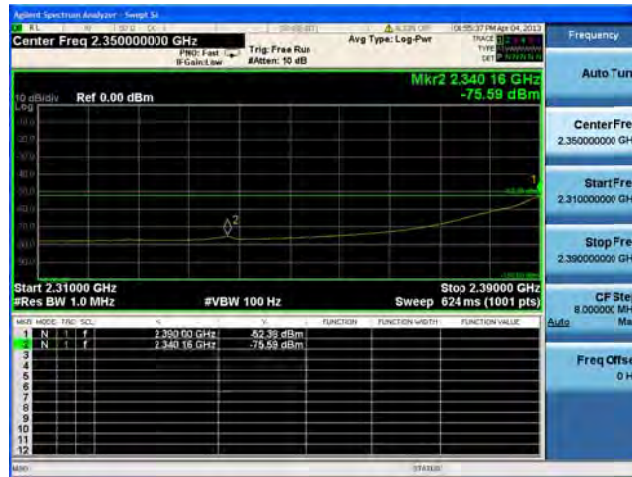


Antenna B

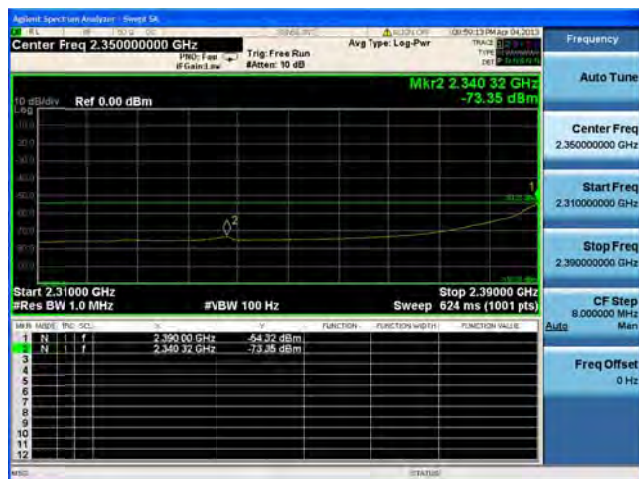
Conducted Bandedge Average, 2412 MHz, HT-20, M0 to M7



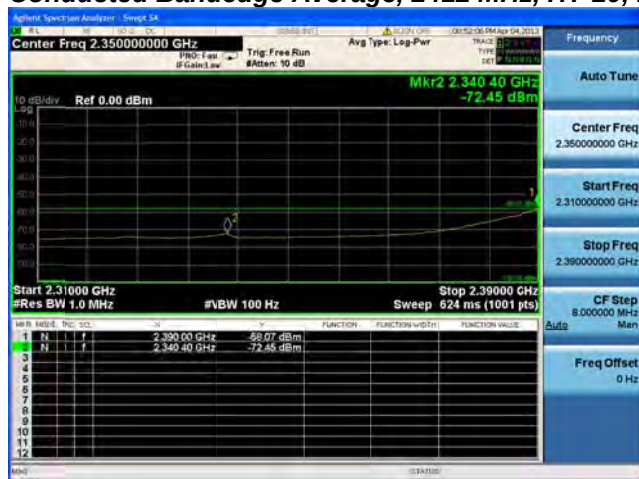
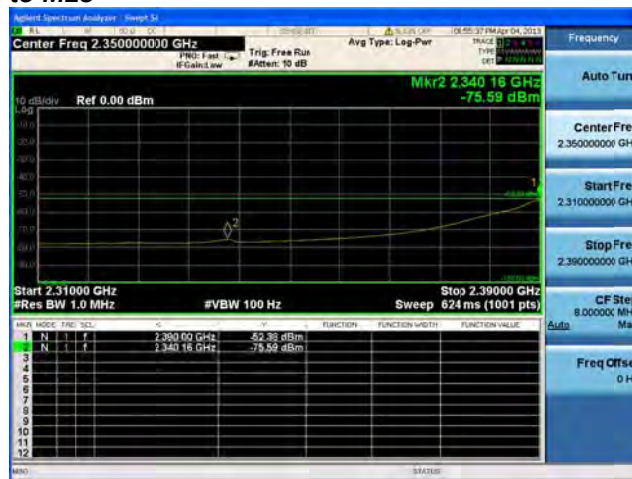
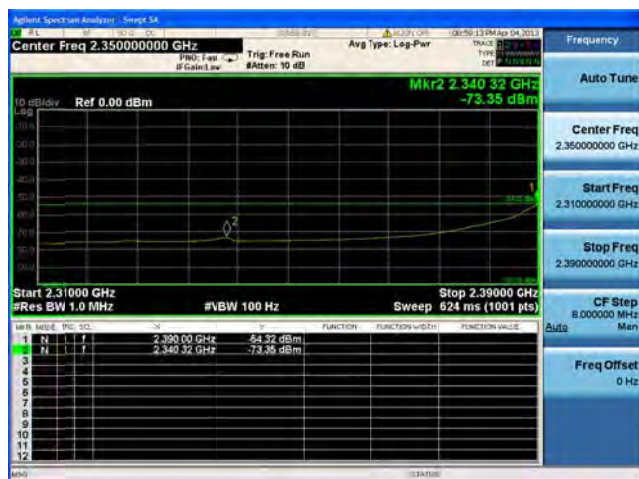
Antenna A

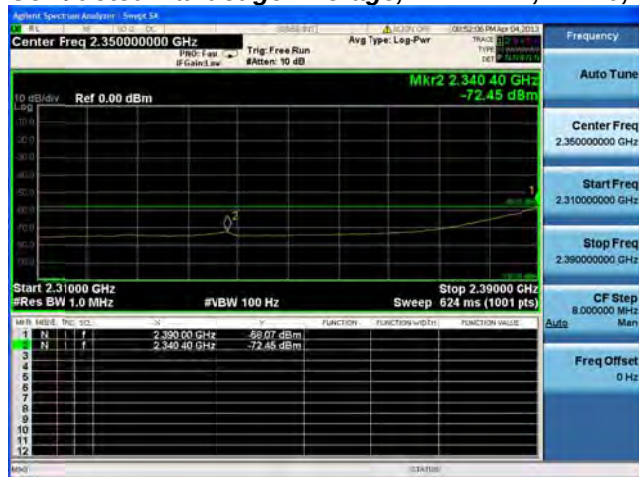
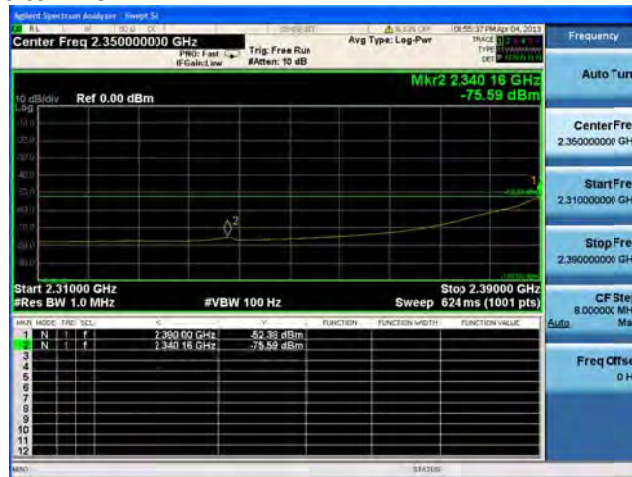
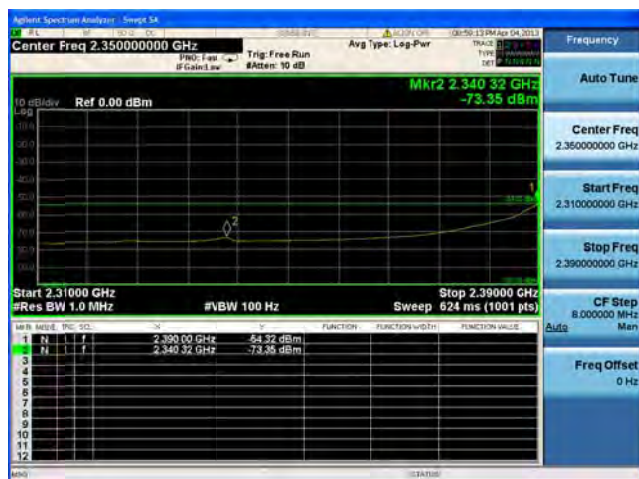


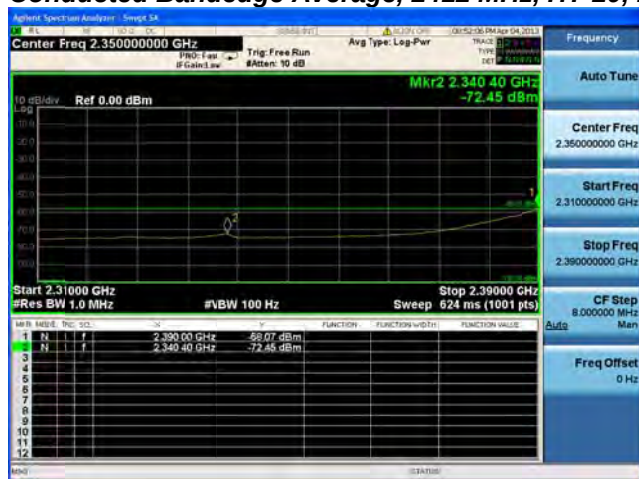
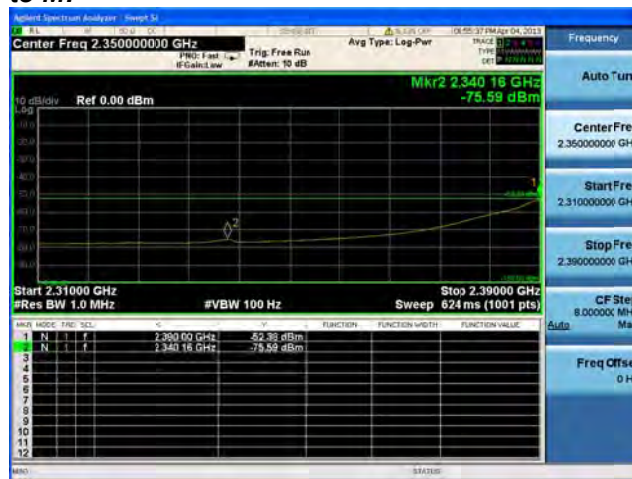
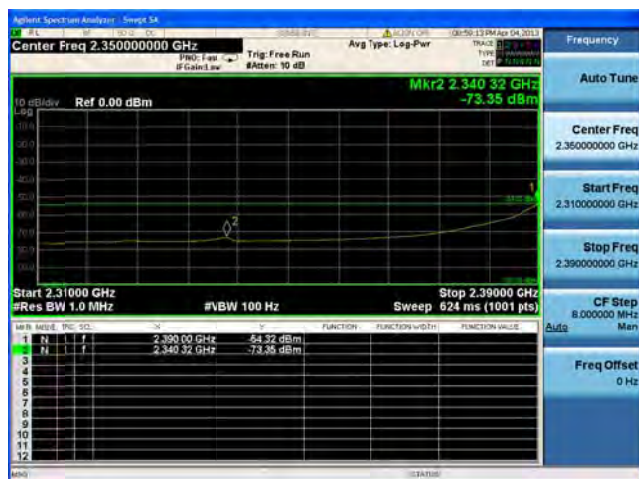
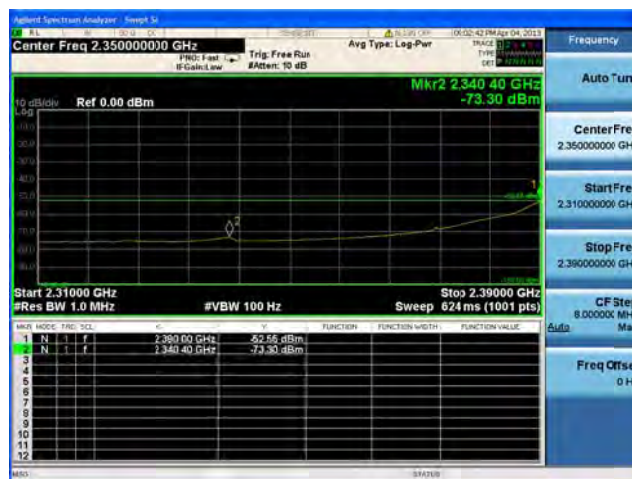
Antenna B

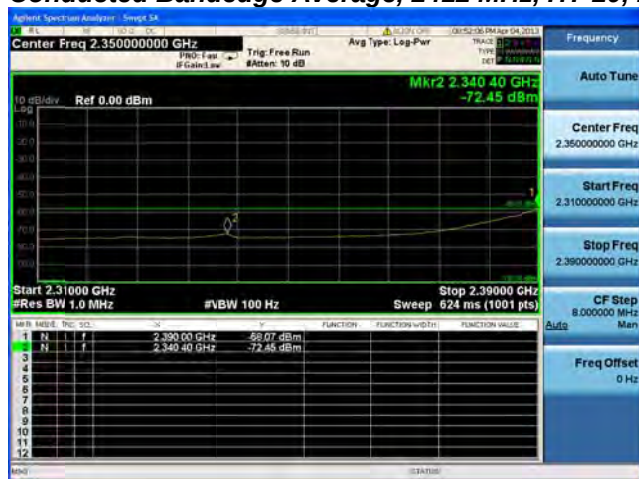
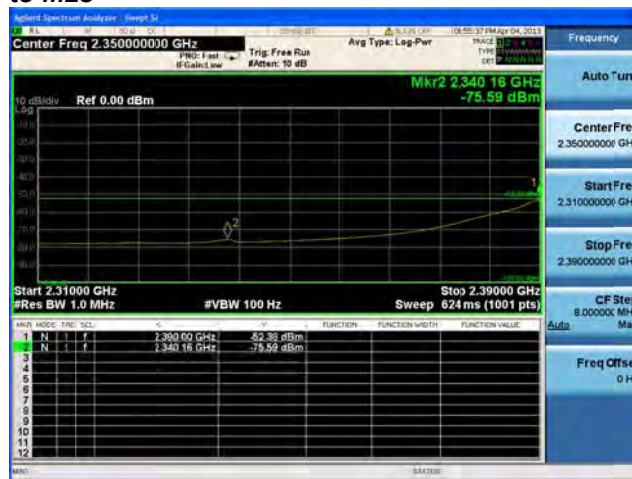
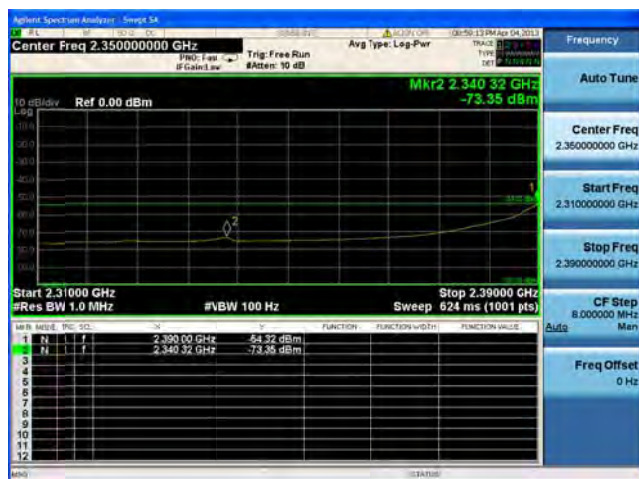
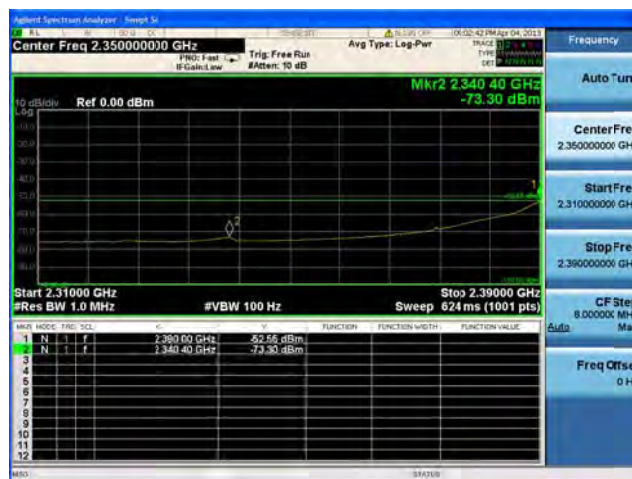


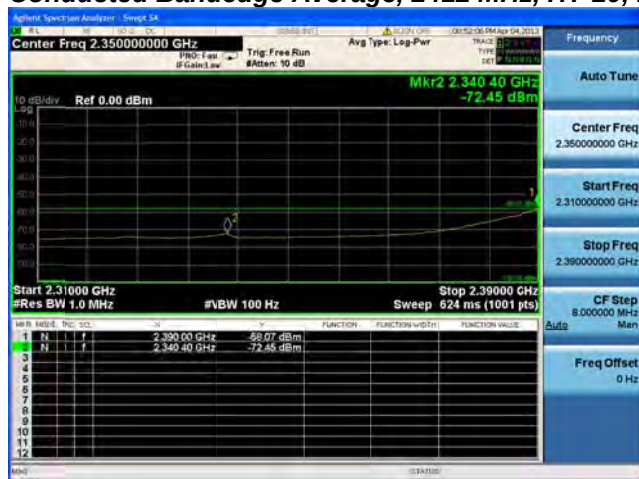
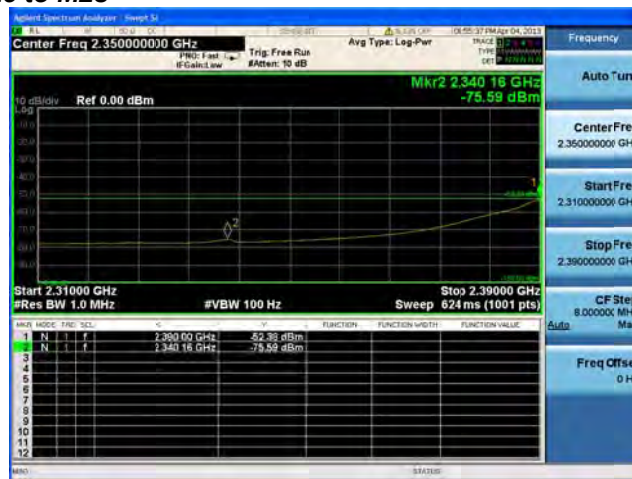
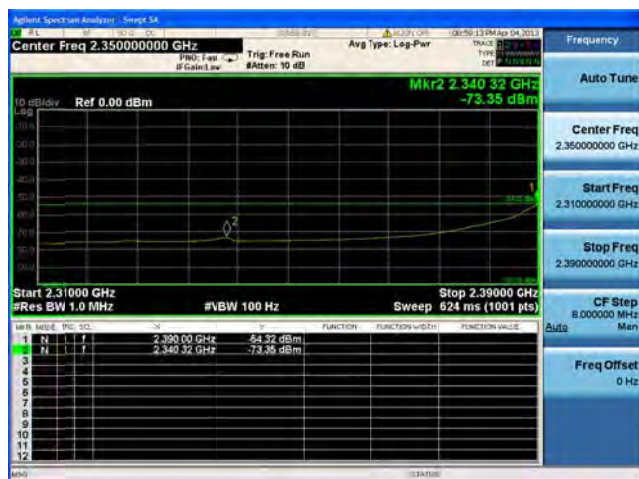
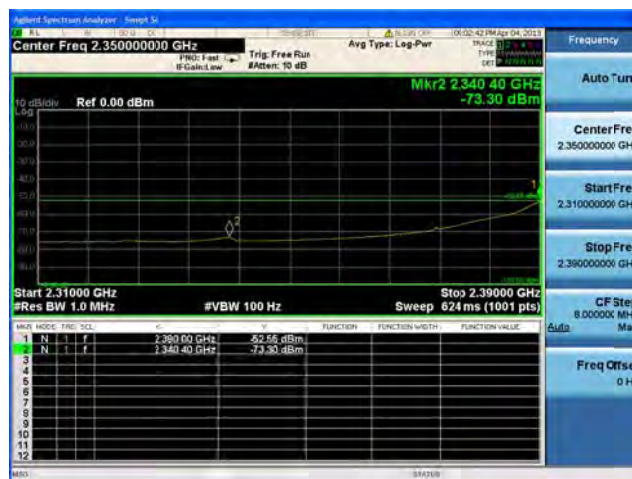
Antenna C

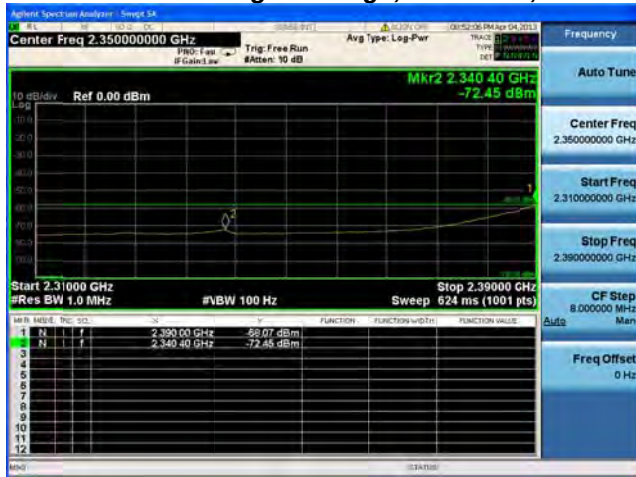
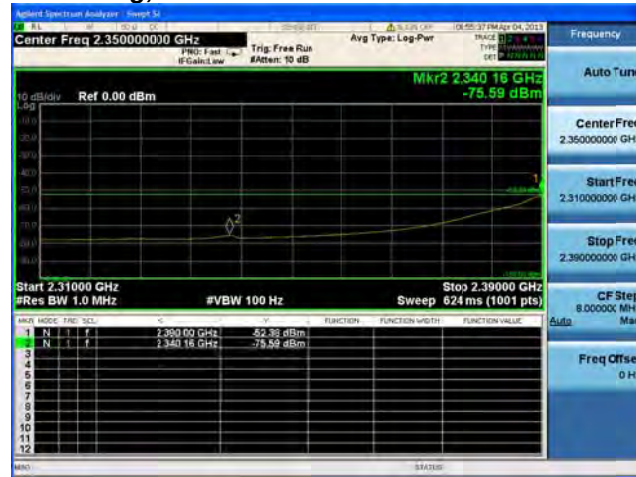
Conducted Bandedge Average, 2412 MHz, HT-20, M8 to M15**Antenna A****Antenna B****Antenna C**

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

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

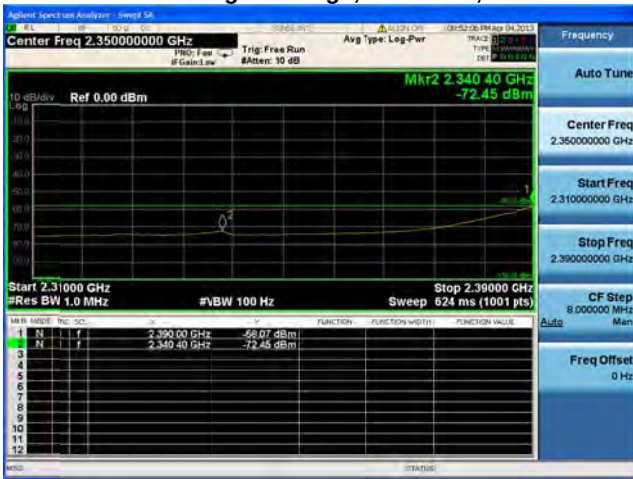
Conducted Bandedge Average, 2412 MHz, HT-20, M8 to M15**Antenna A****Antenna B****Antenna C****Antenna D**

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

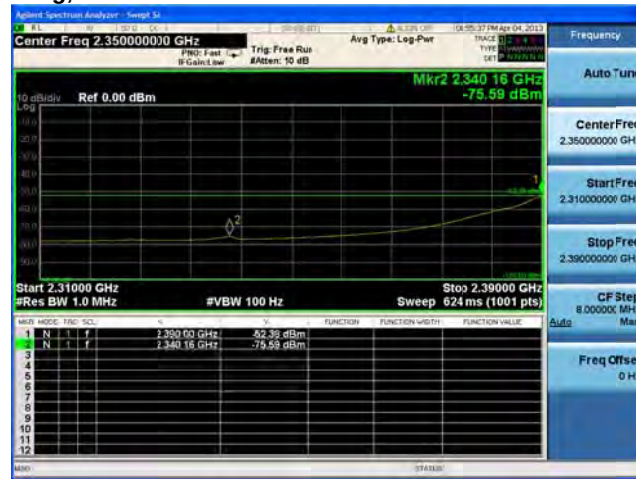
**Conducted Bandedge Average, 2412 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**



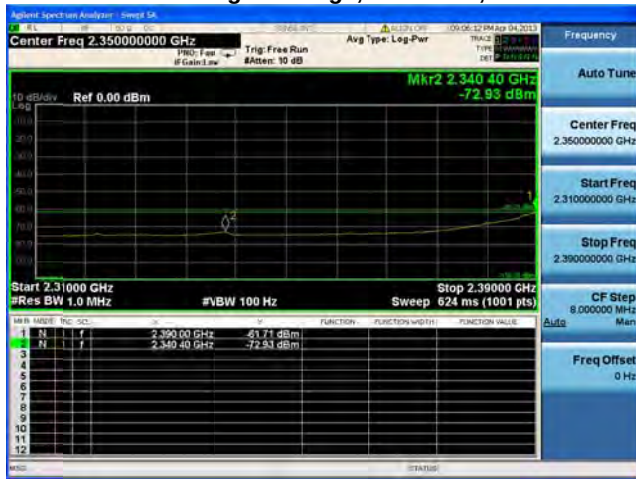
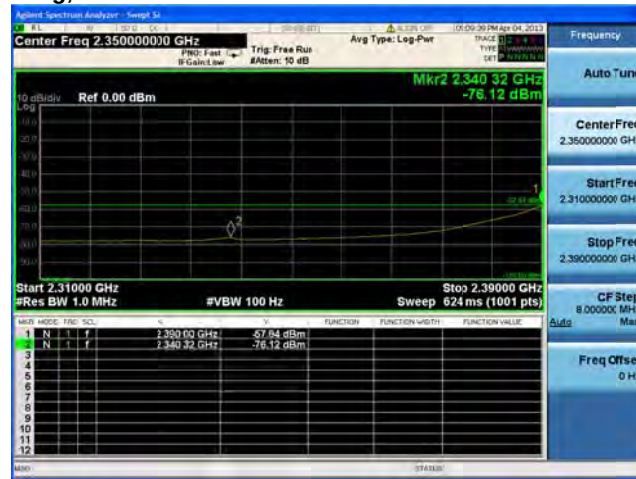
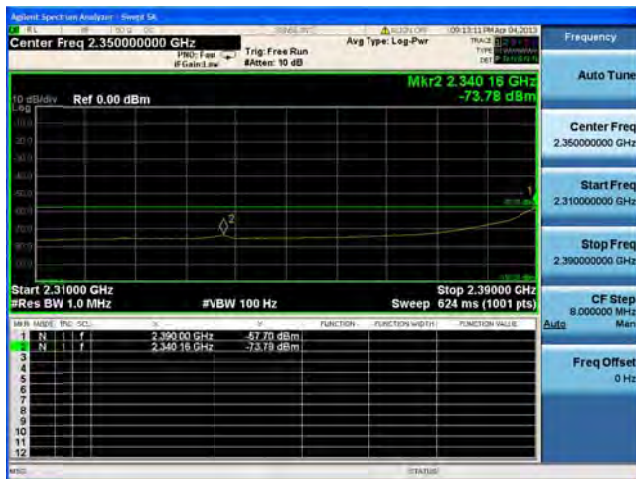
Conducted Bandedge Average, 2412 MHz, HT-20 Beam Forming, M8 to M15

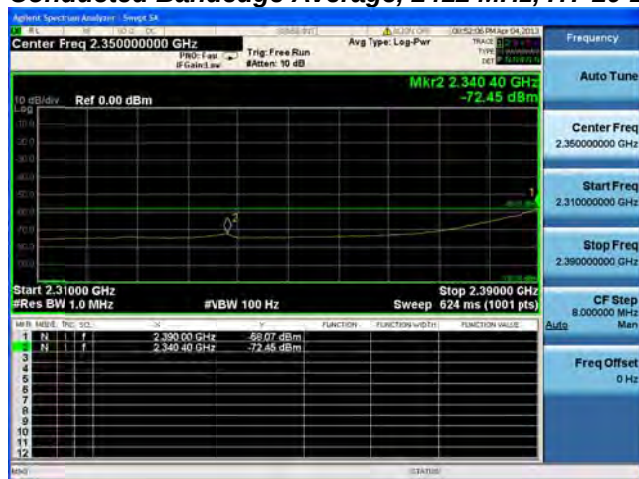
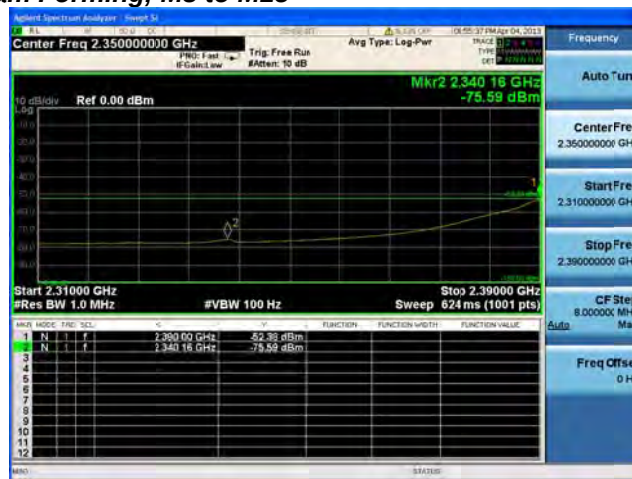
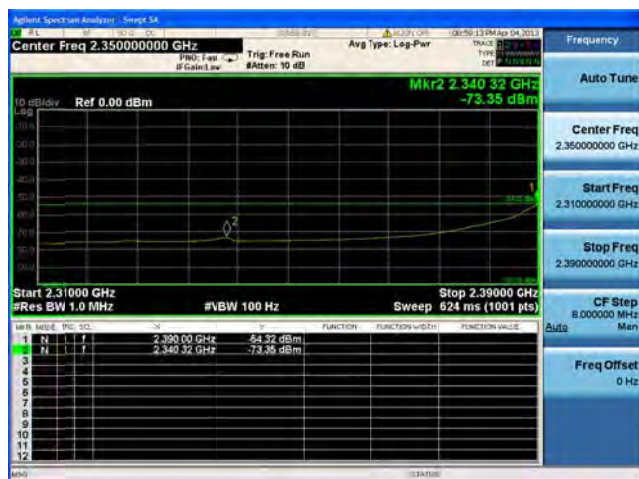


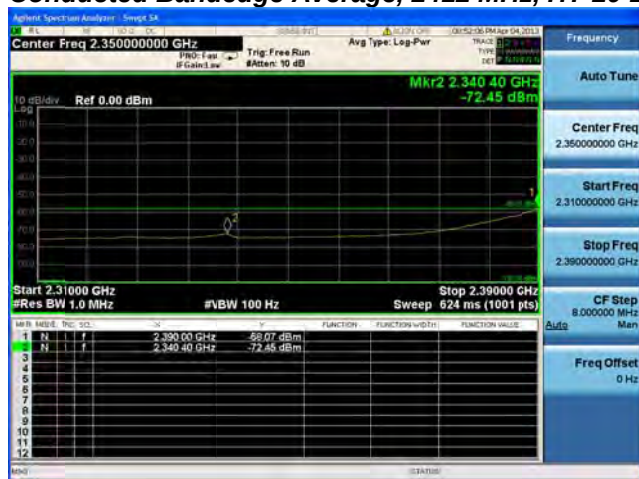
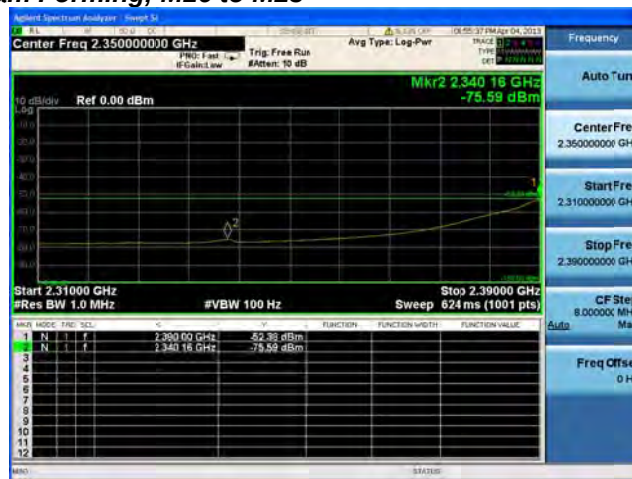
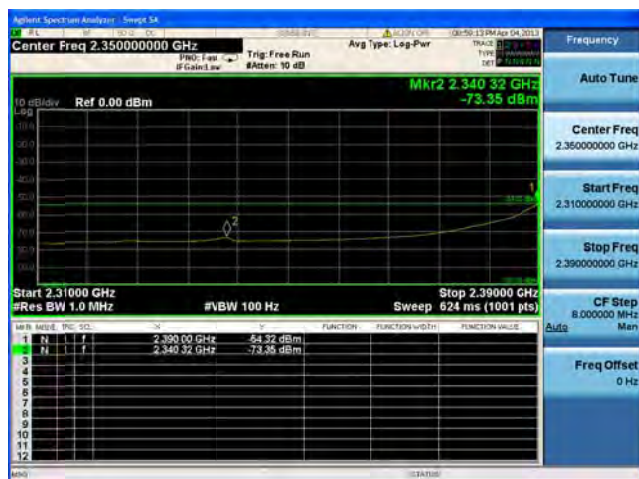
Antenna A

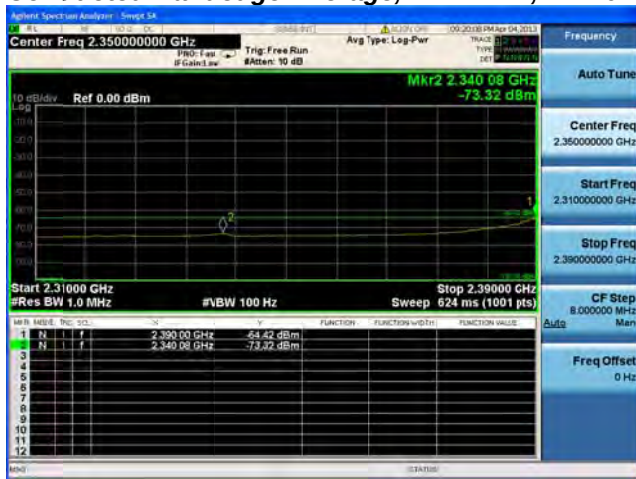
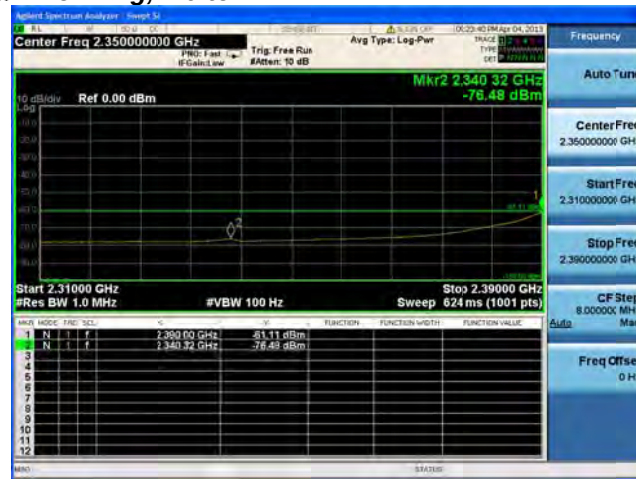
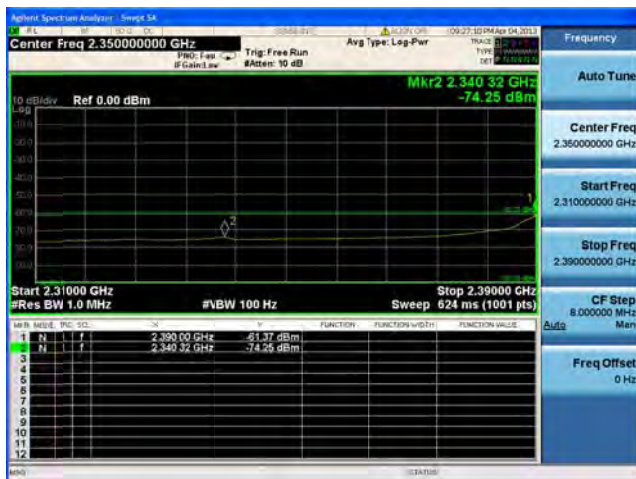
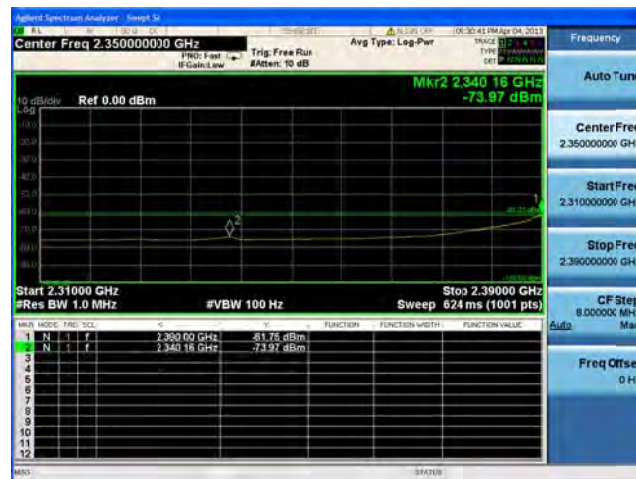


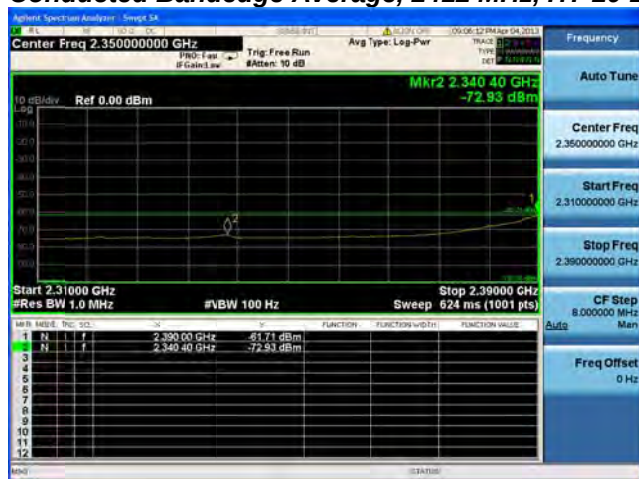
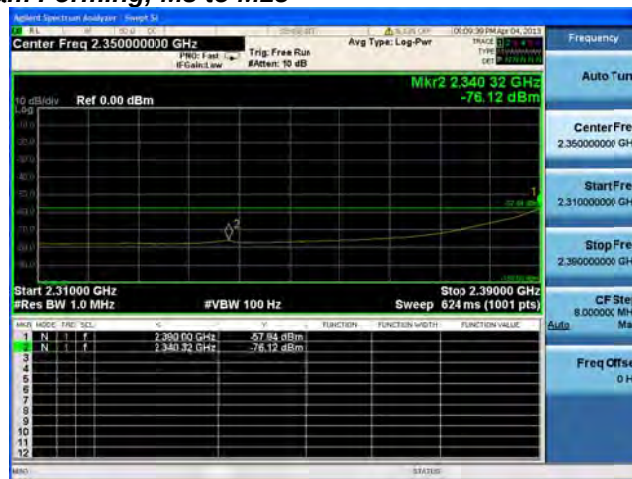
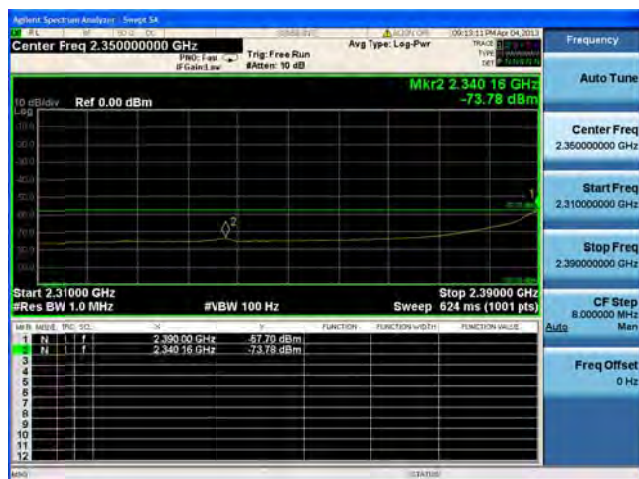
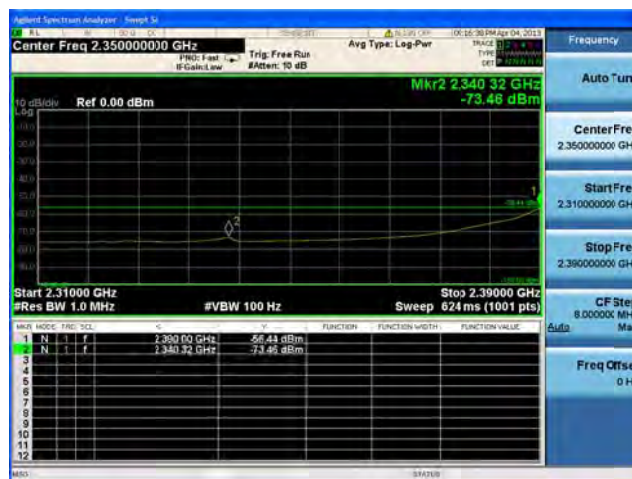
Antenna B

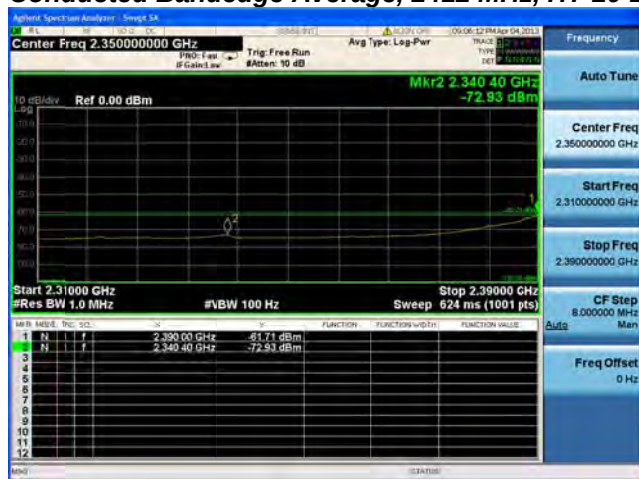
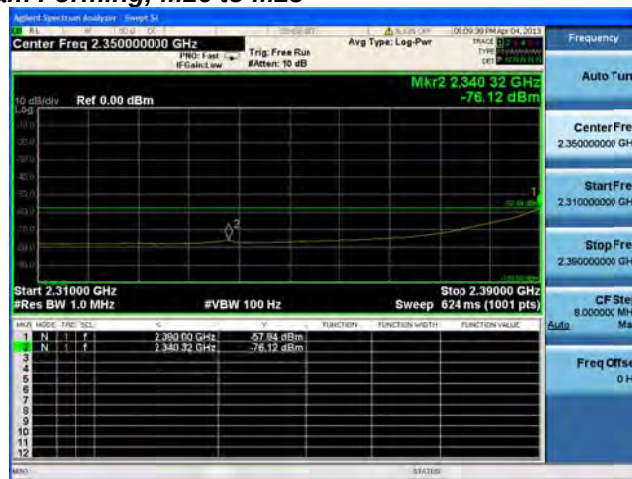
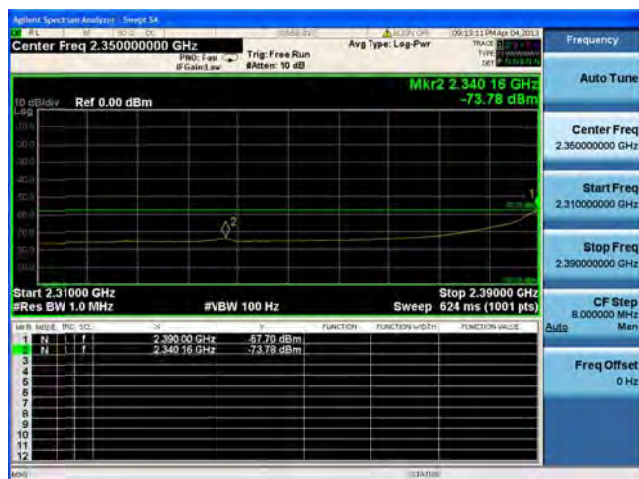
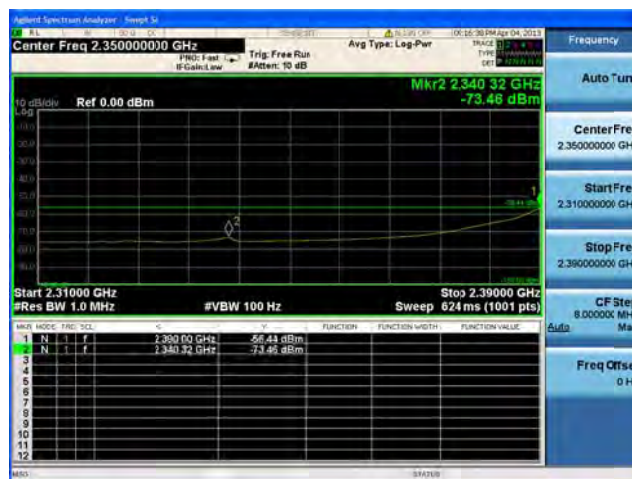
Conducted Bandedge Average, 2412 MHz, HT-20 Beam Forming, M0 to M7**Antenna A****Antenna B****Antenna C**

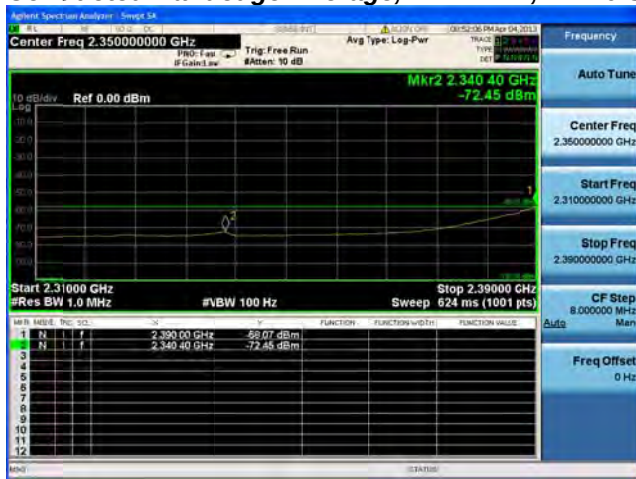
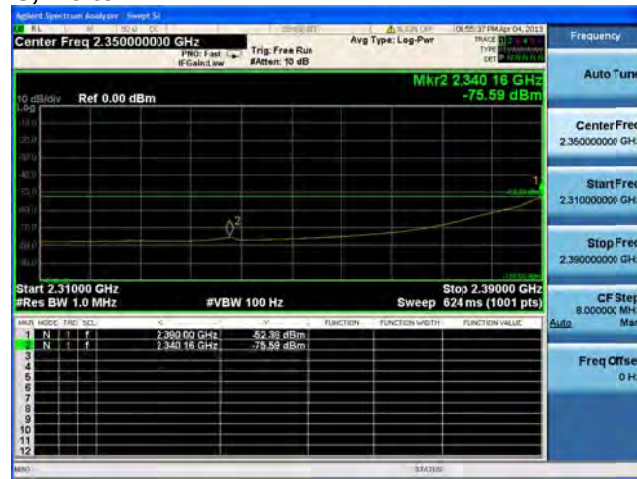
Conducted Bandedge Average, 2412 MHz, HT-20 Beam Forming, M8 to M15**Antenna A****Antenna B****Antenna C**

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 Beam Forming, M0 to M7**Antenna A****Antenna B****Antenna C****Antenna D**

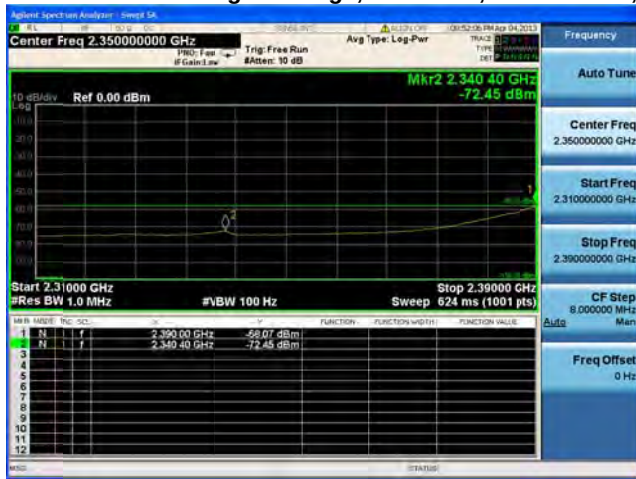
Conducted Bandedge Average, 2412 MHz, HT-20 Beam Forming, M8 to M15**Antenna A****Antenna B****Antenna C****Antenna D**

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

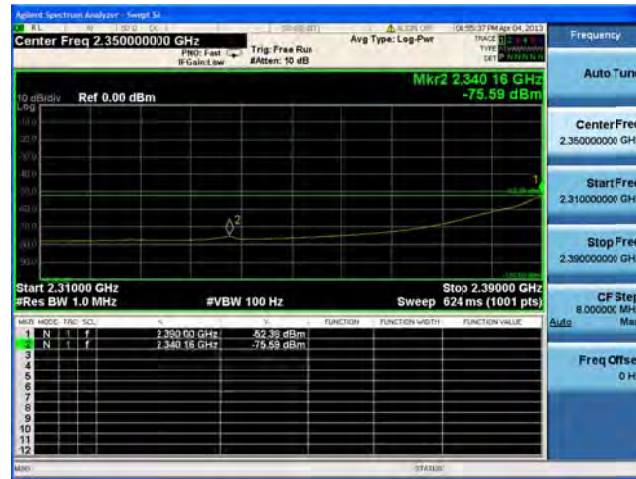
**Conducted Bandedge Average, 2412 MHz, HT-20 STBC, M0 to M7****Antenna A****Antenna B**



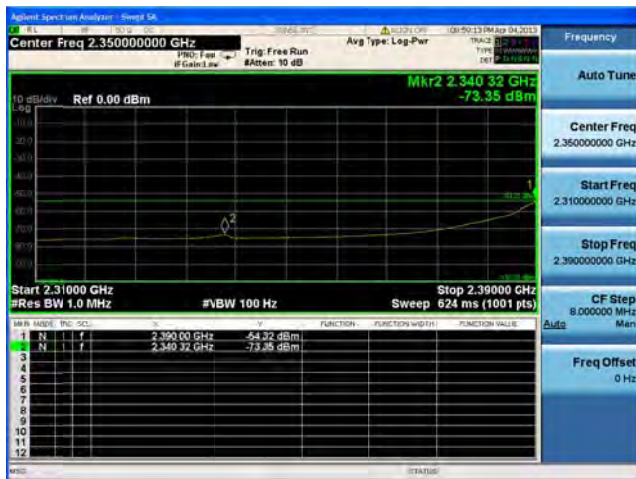
Conducted Bandedge Average, 2412 MHz, HT-20 STBC, M0 to M7



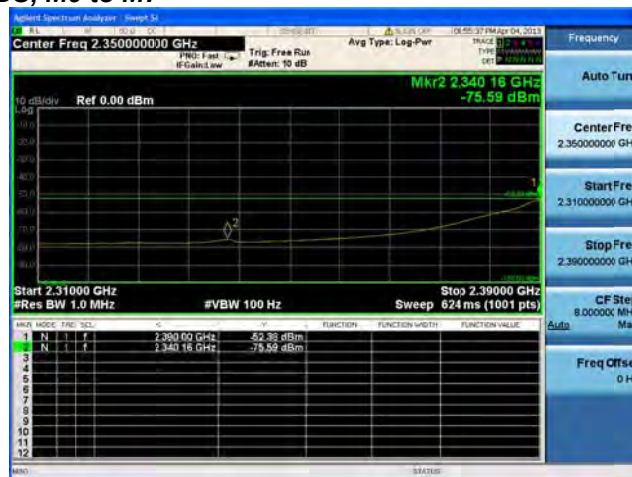
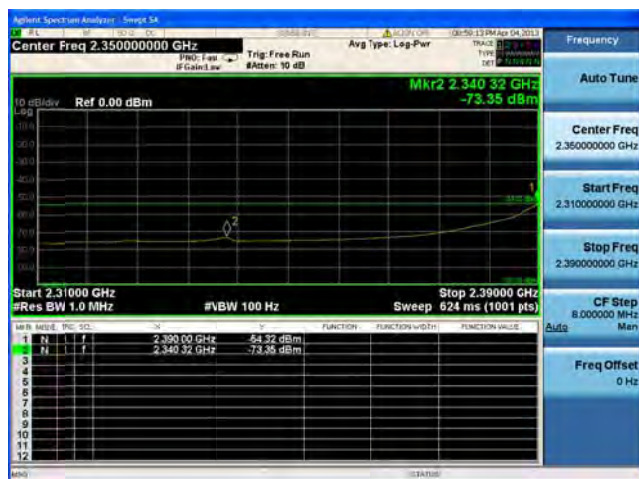
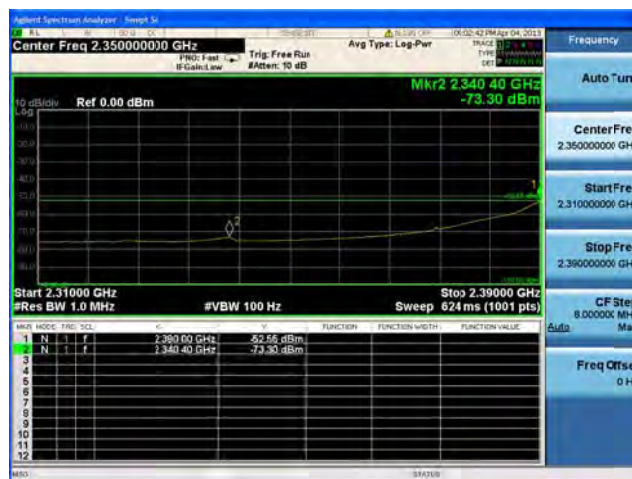
Antenna A

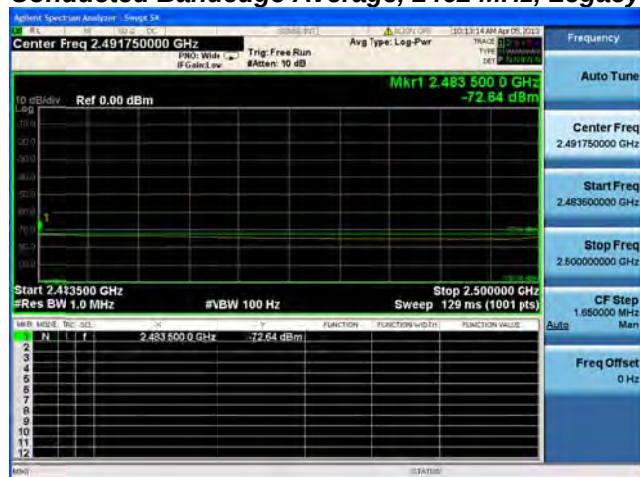


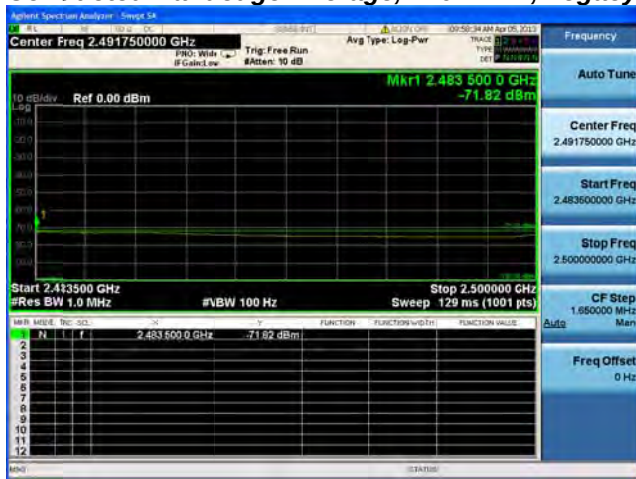
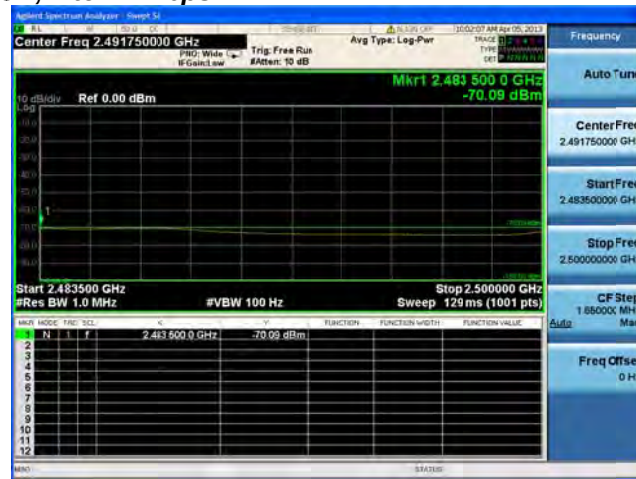
Antenna B

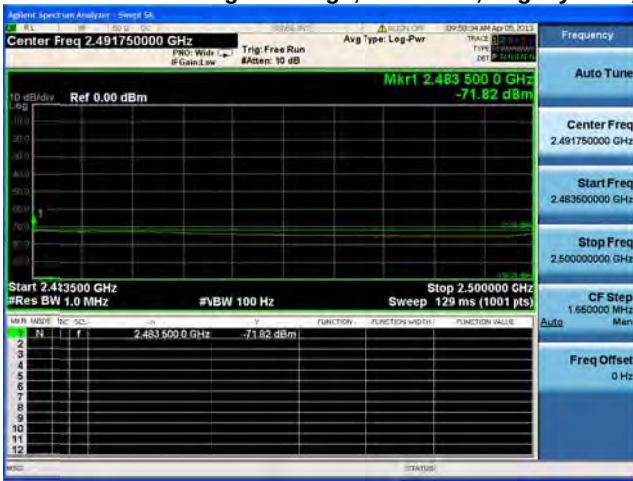
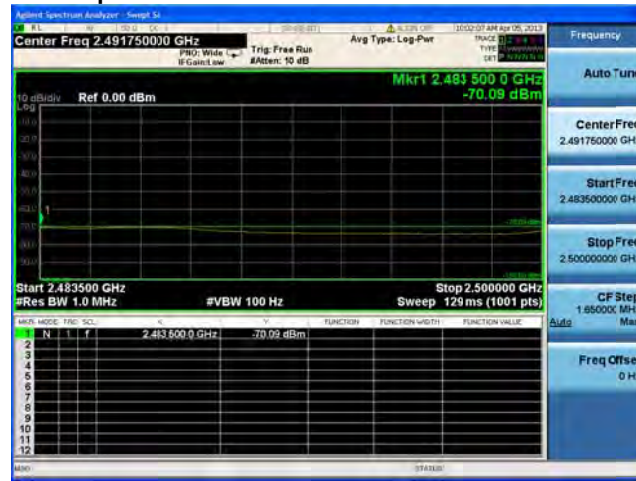
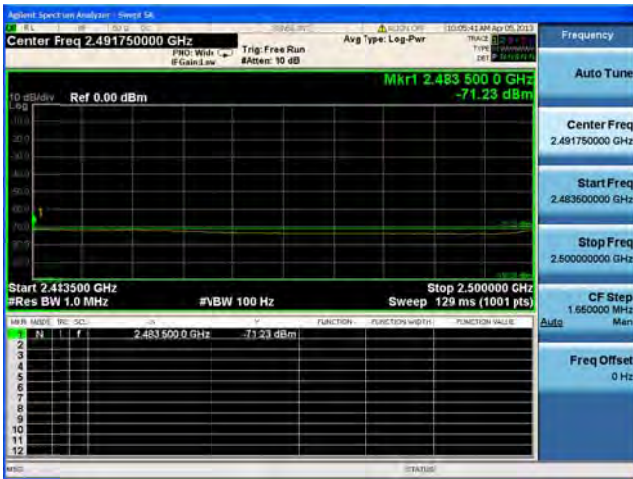


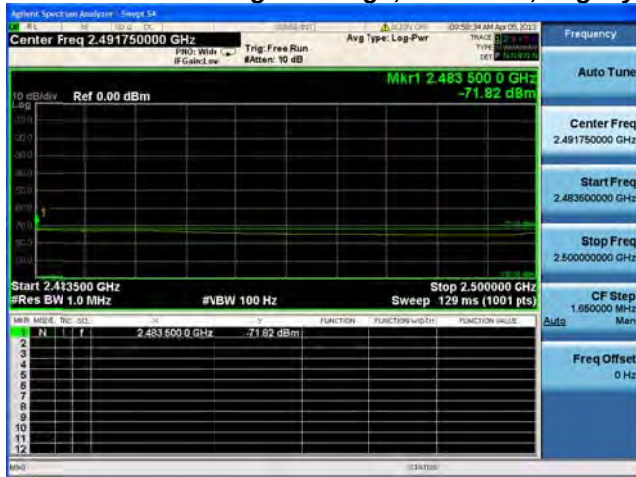
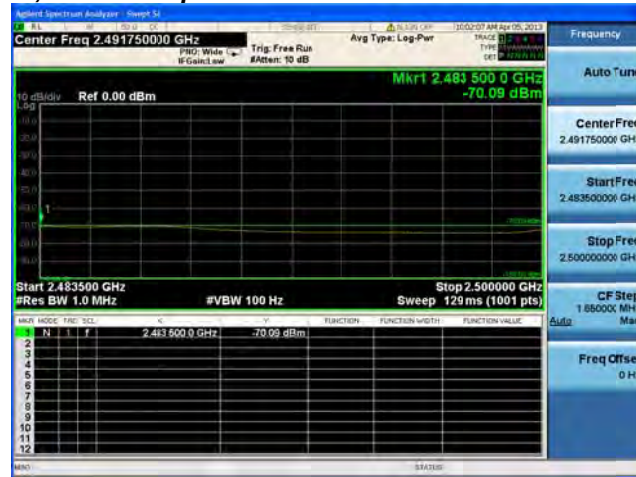
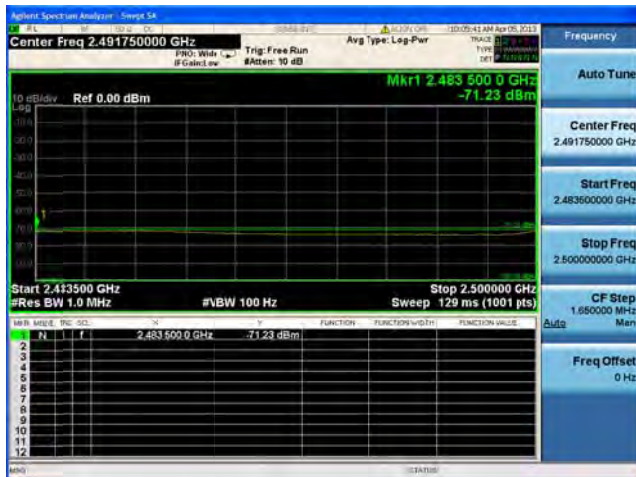
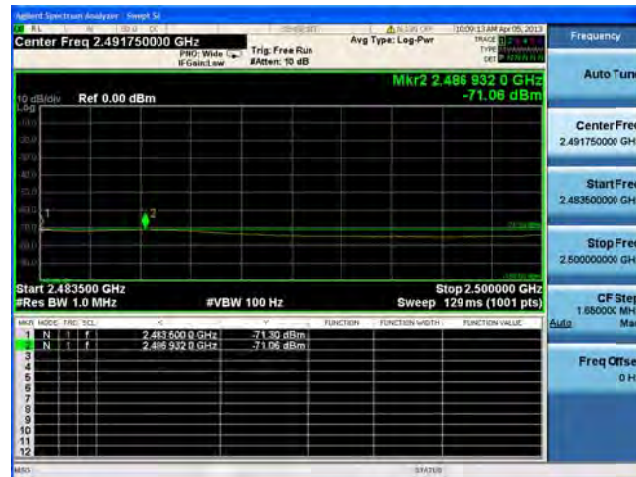
Antenna C

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

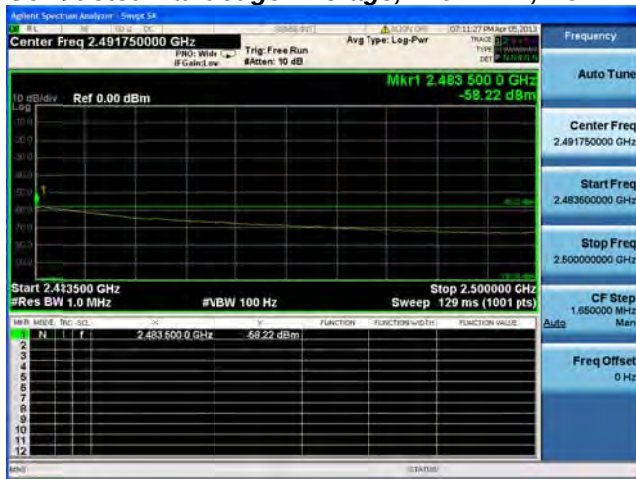
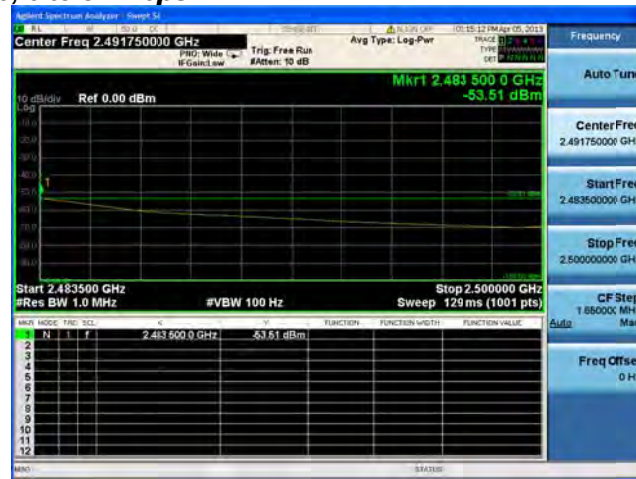
Conducted Bandedge Average, 2462 MHz, Legacy CCK, 1 to 11 Mbps**Antenna A**

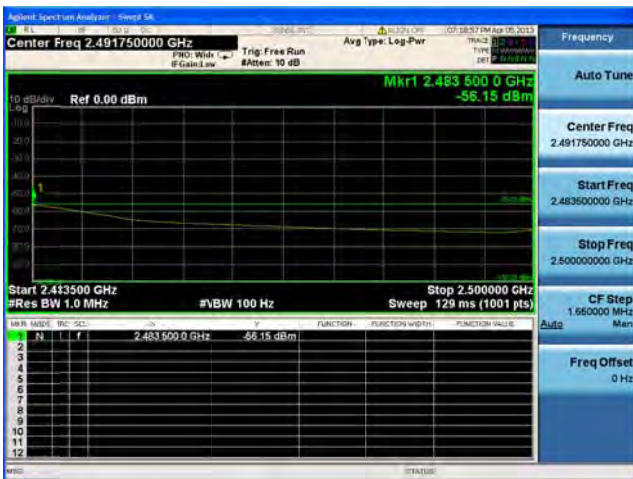
**Conducted Bandedge Average, 2462 MHz, Legacy CCK, 1 to 11 Mbps****Antenna A****Antenna B**

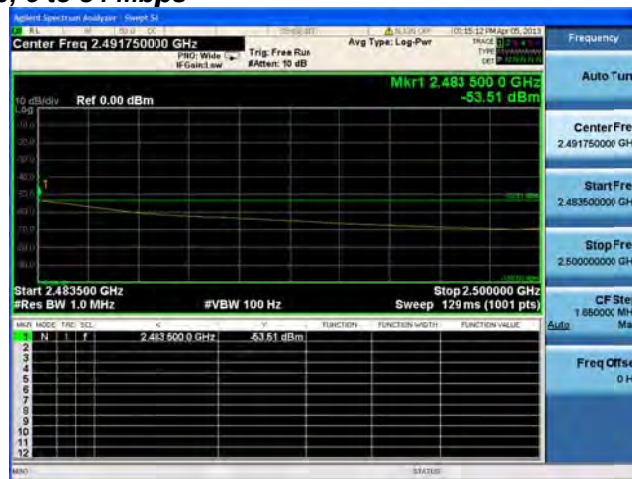
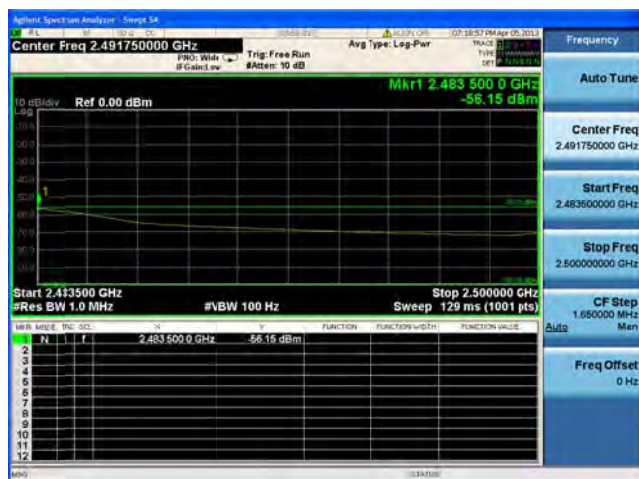
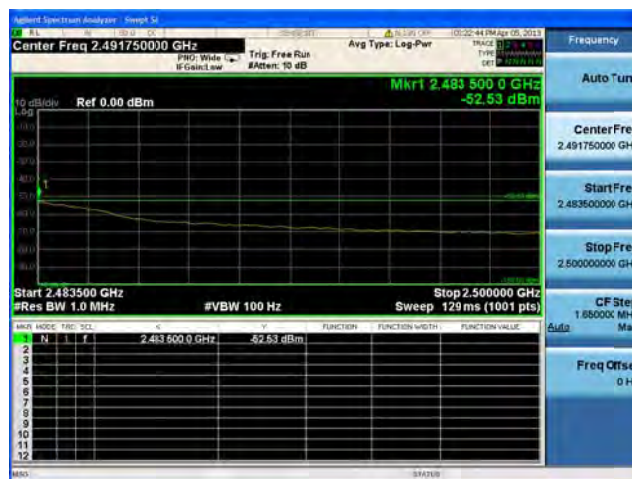
Conducted Bandedge Average, 2462 MHz, Legacy CCK, 1 to 11 Mbps**Antenna A****Antenna B****Antenna C**

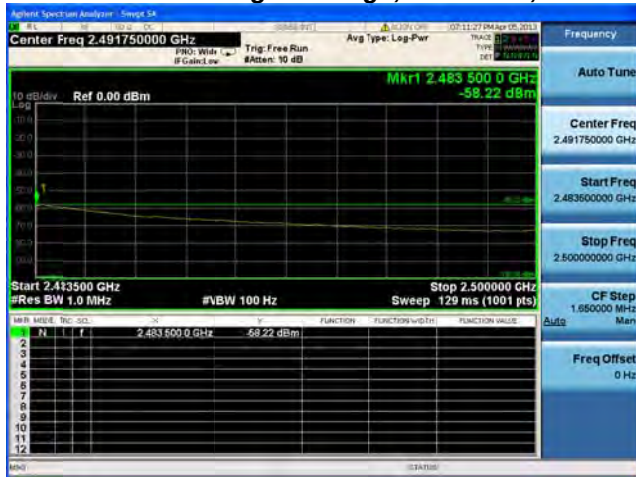
Conducted Bandedge Average, 2462 MHz, Legacy CCK, 1 to 11 Mbps**Antenna A****Antenna B****Antenna C****Antenna D**

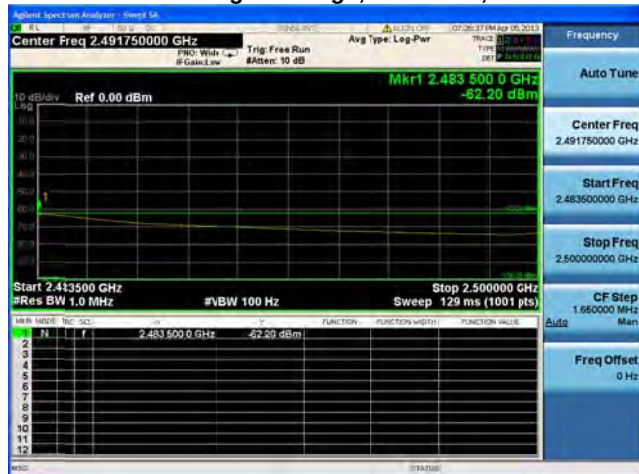
Conducted Bandedge Average, 2462 MHz, Non HT-20, 6 to 54 Mbps**Antenna A**

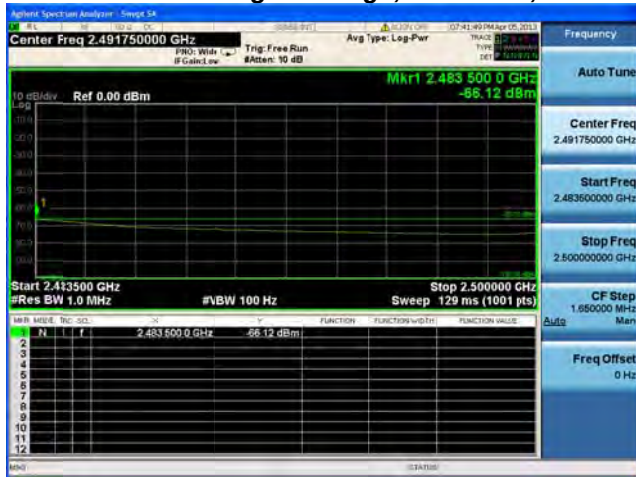
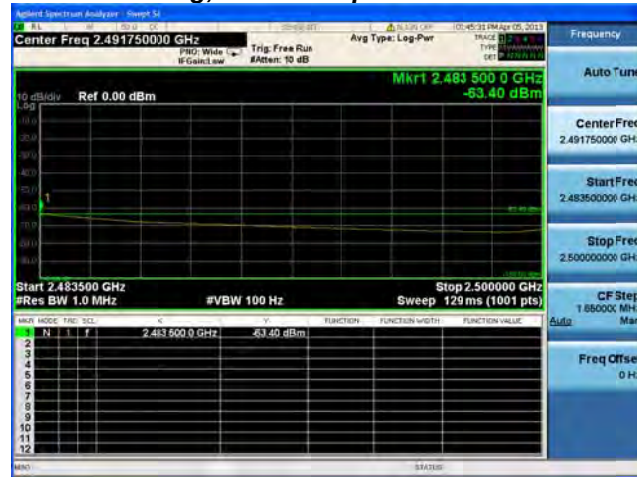
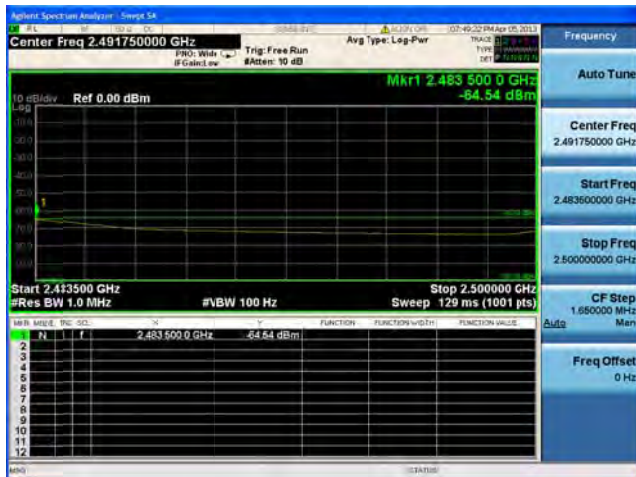
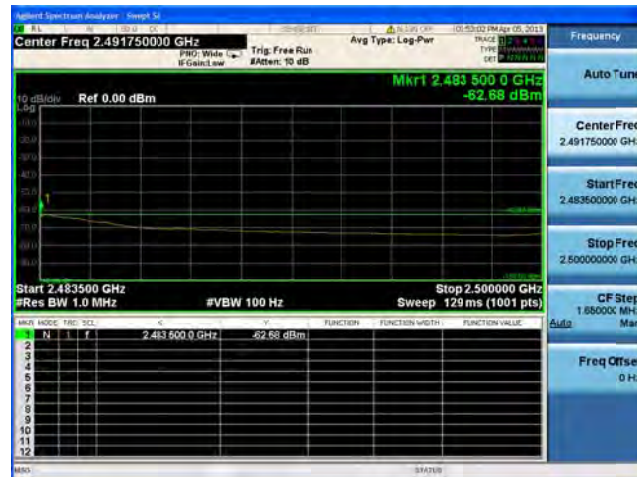
**Conducted Bandedge Average, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B**

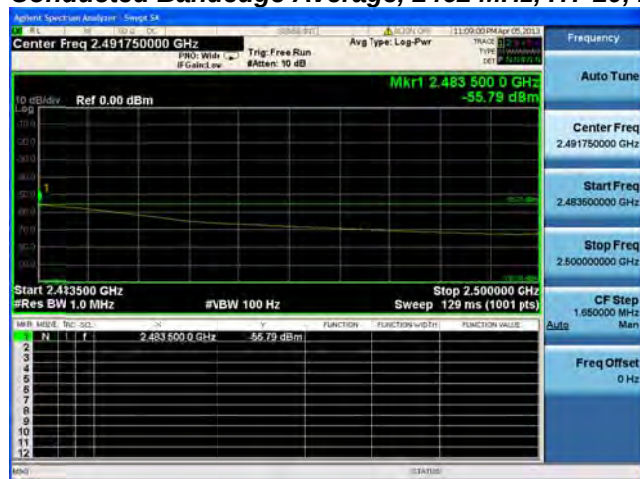
**Conducted Bandedge Average, 2462 MHz, Non HT-20, 6 to 54 Mbps****Antenna A****Antenna B****Antenna C**

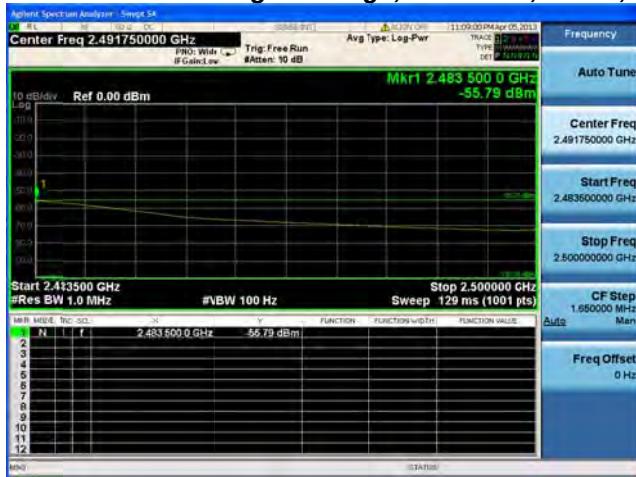
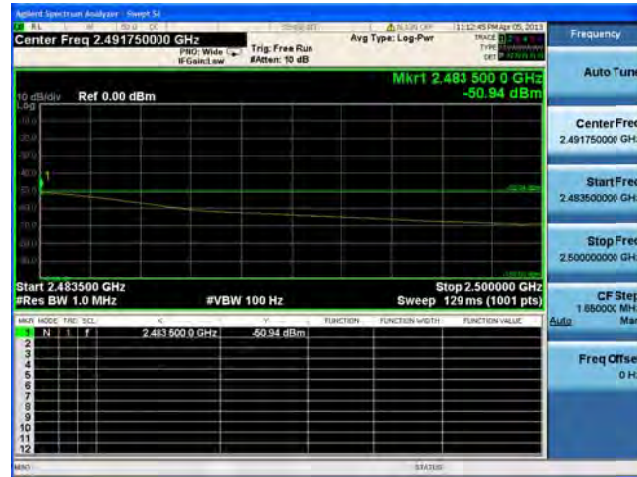
Conducted Bandedge Average, 2462 MHz, Non HT-20, 6 to 54 Mbps**Antenna A****Antenna B****Antenna C****Antenna D**

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

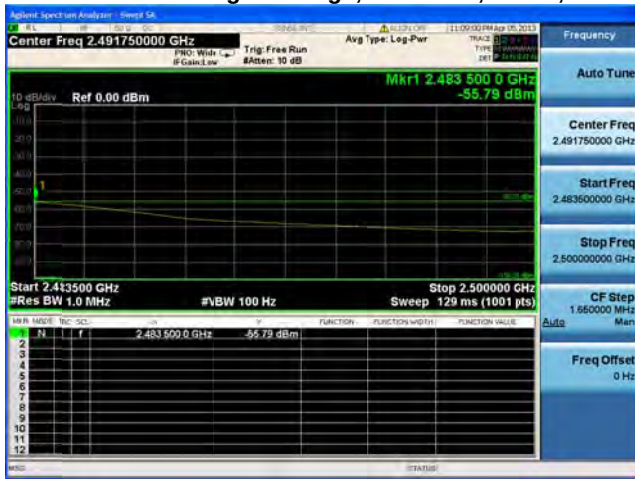
Conducted Bandedge Average, 2462 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps**Antenna A****Antenna B****Antenna C**

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

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

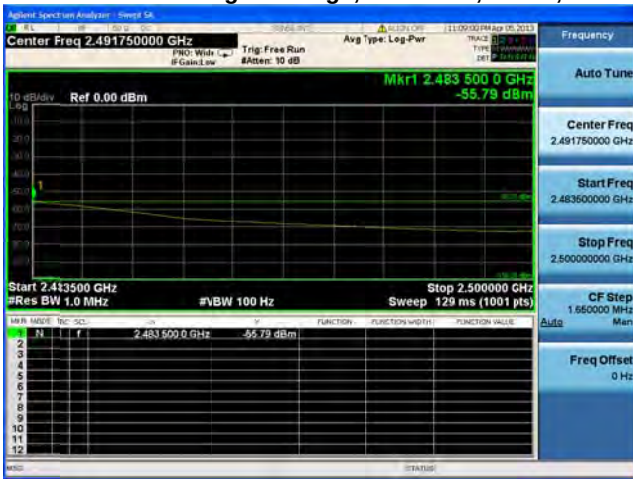


Antenna A



Antenna B

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



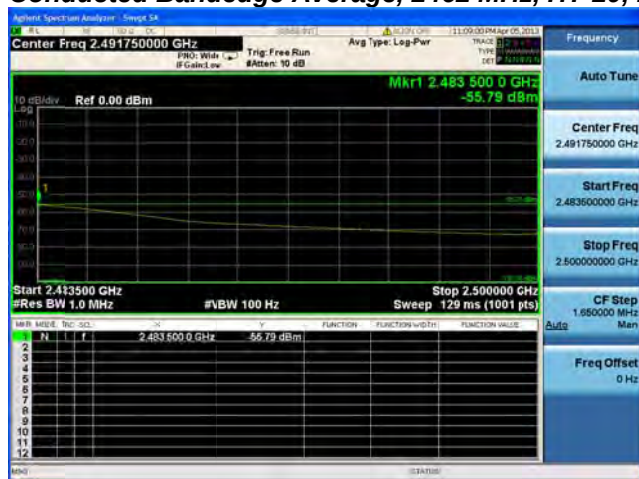
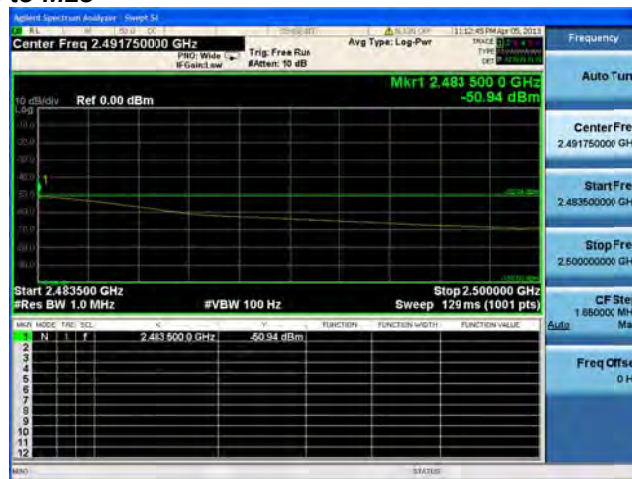
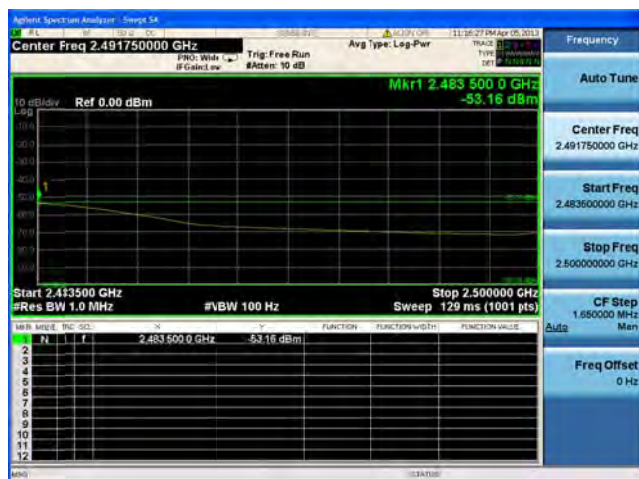
Antenna A

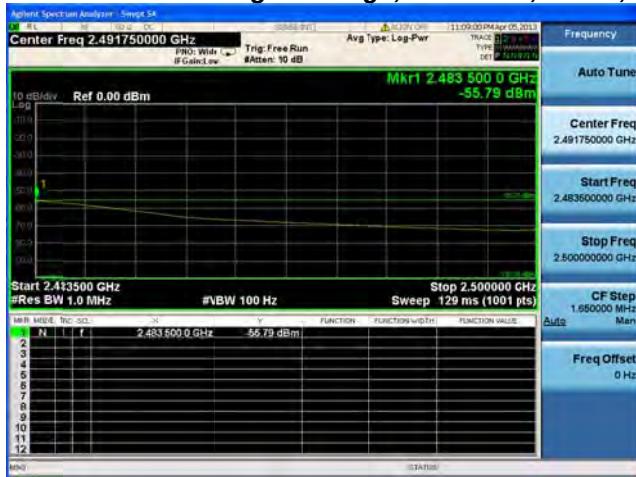
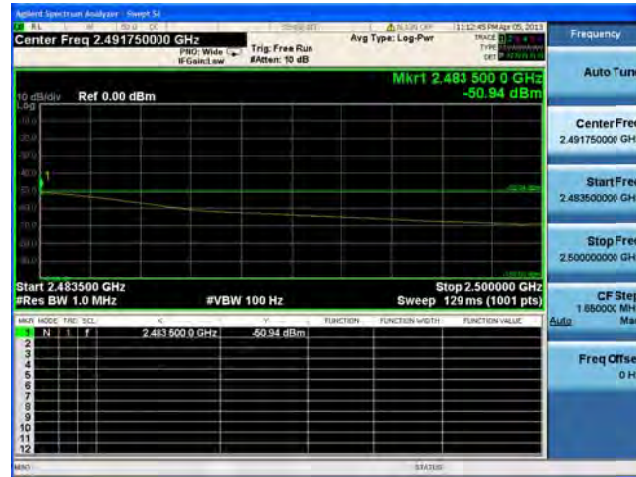
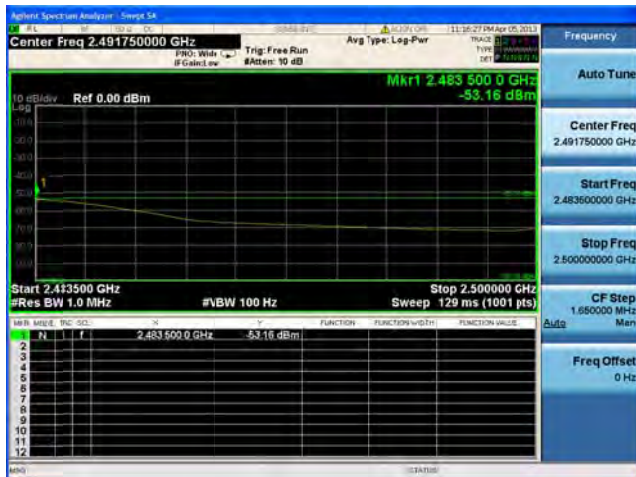


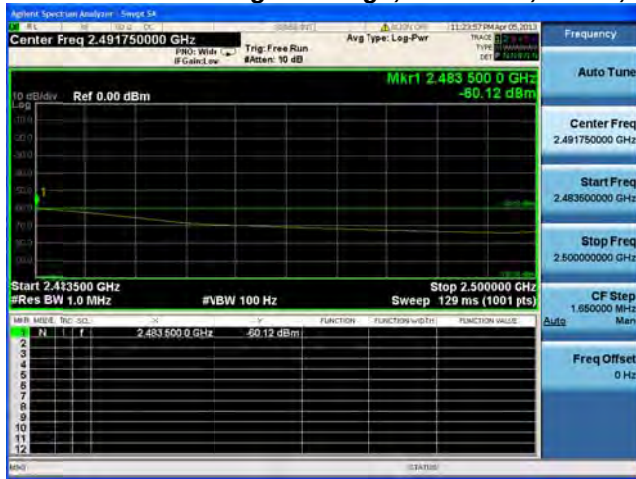
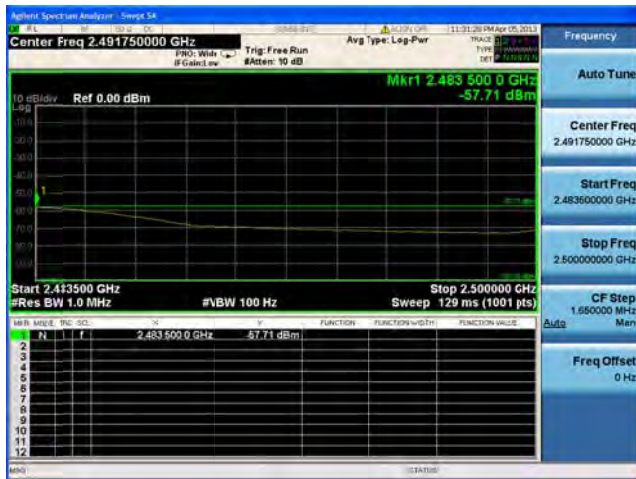
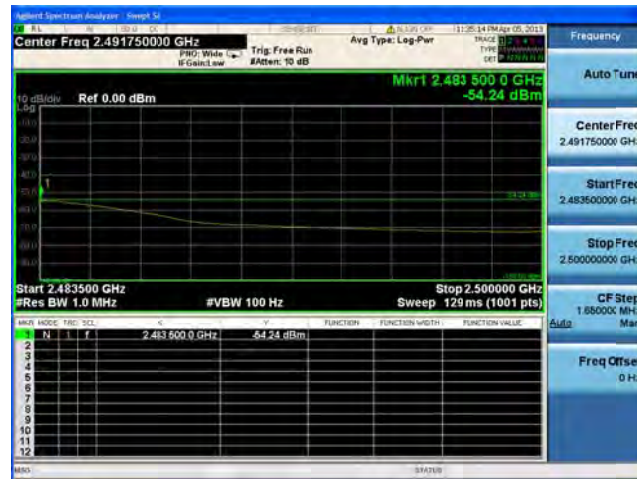
Antenna B

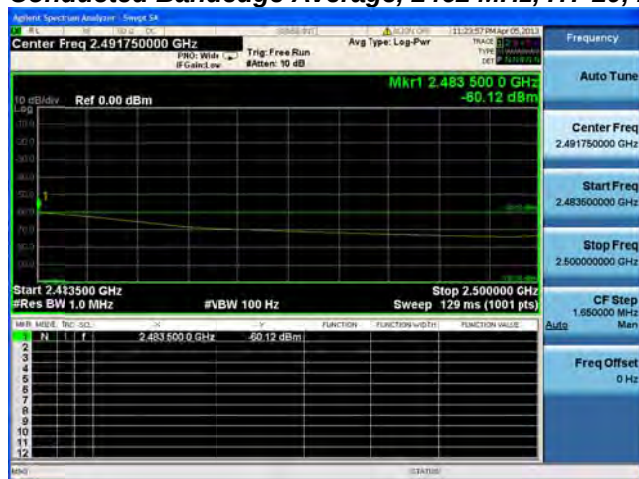
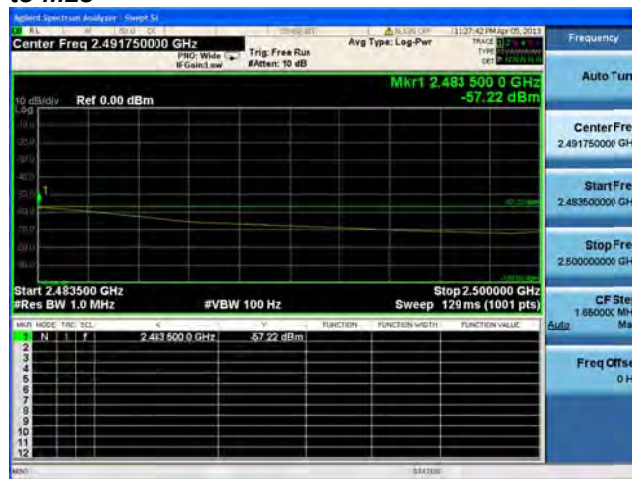
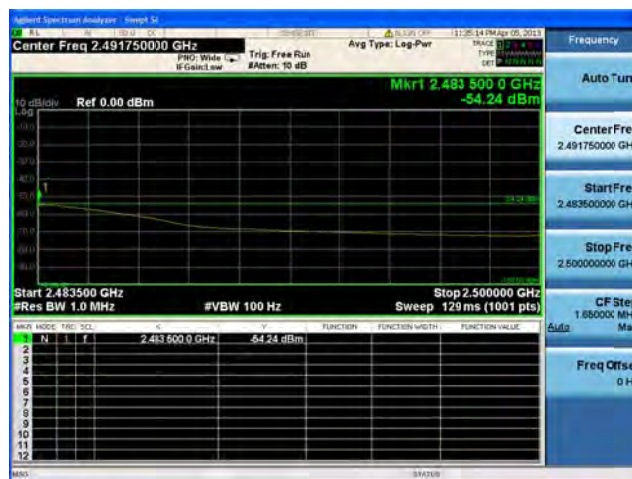


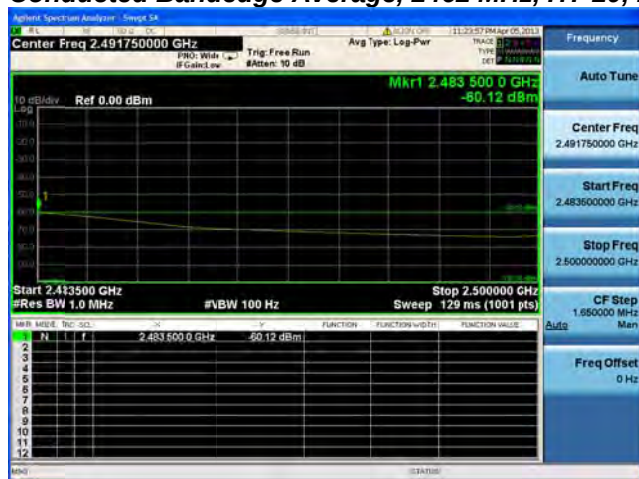
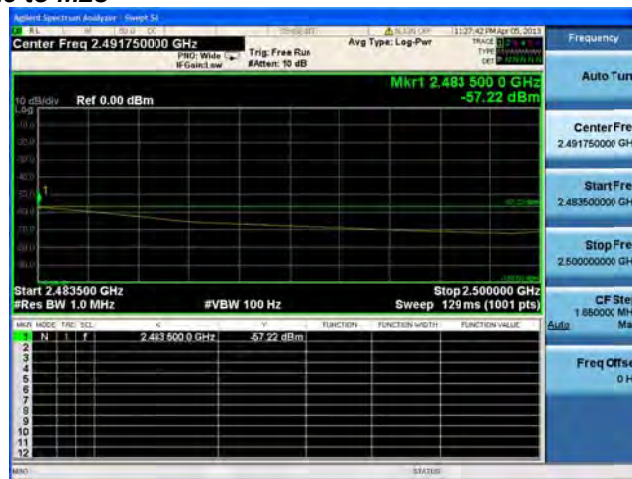
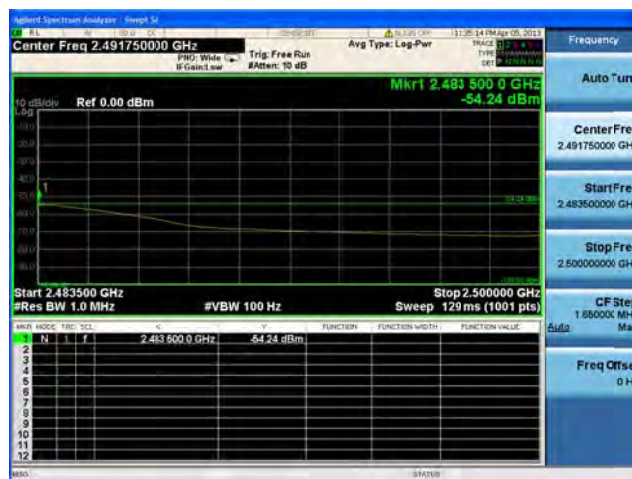
Antenna C

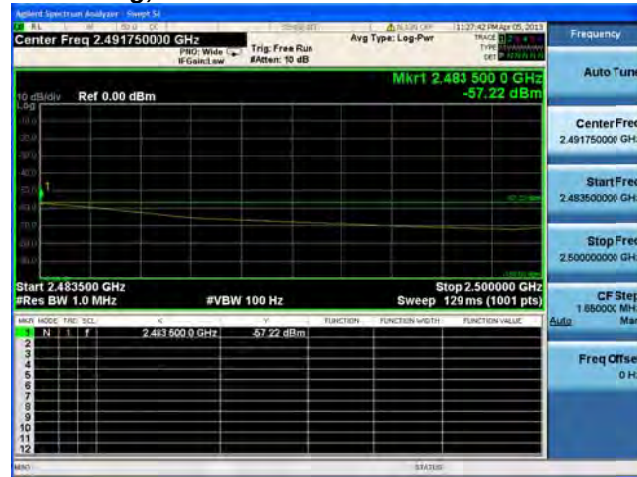
Conducted Bandedge Average, 2462 MHz, HT-20, M8 to M15**Antenna A****Antenna B****Antenna C**

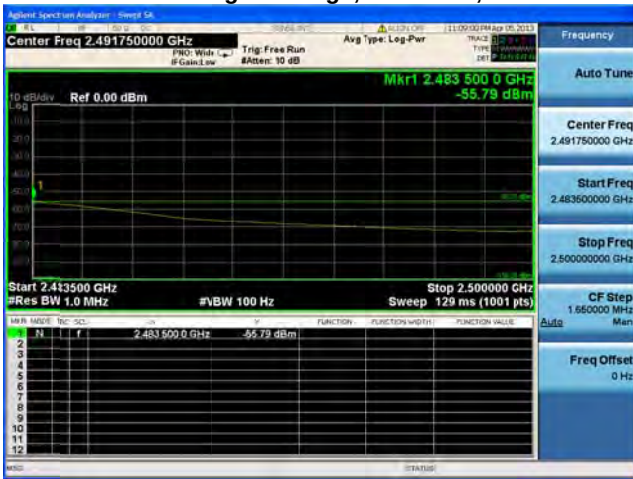
Conducted Bandedge Average, 2462 MHz, HT-20, M16 to M23**Antenna A****Antenna B****Antenna C**

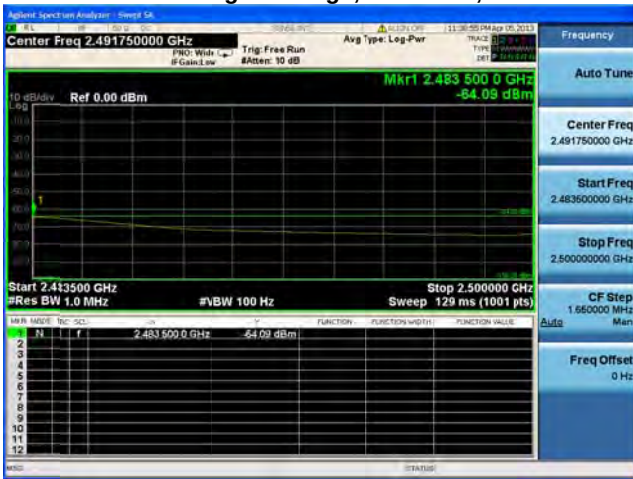
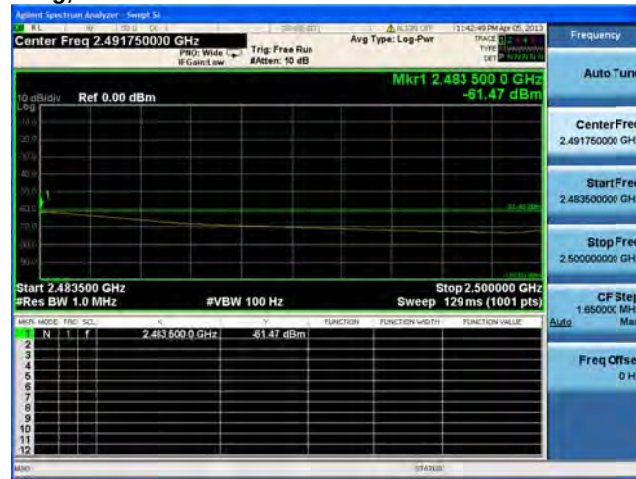
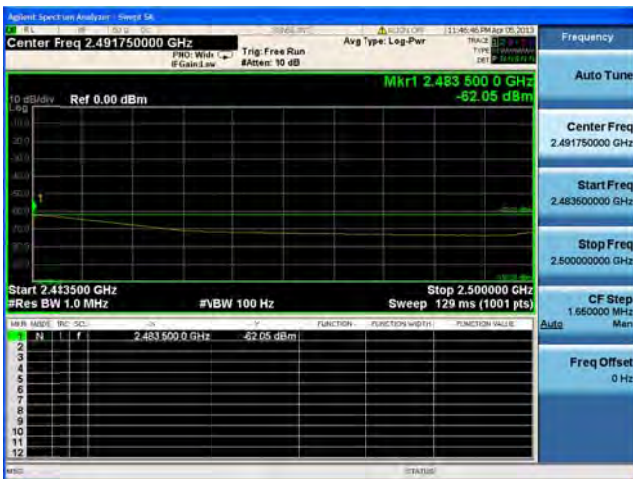
**Conducted Bandedge Average, 2462 MHz, HT-20, M0 to M7****Antenna A****Antenna B****Antenna C****Antenna D**

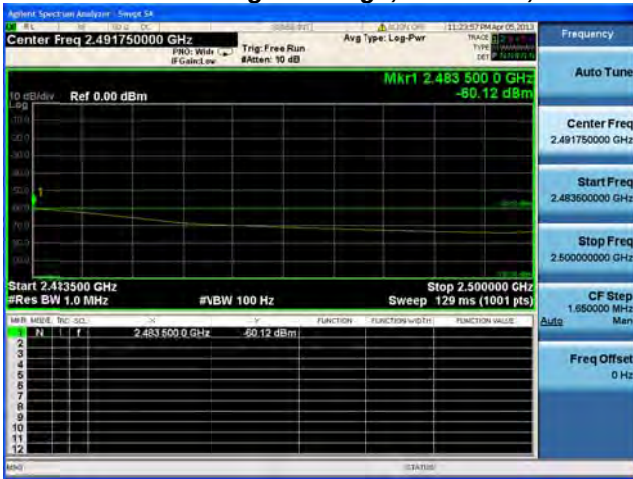
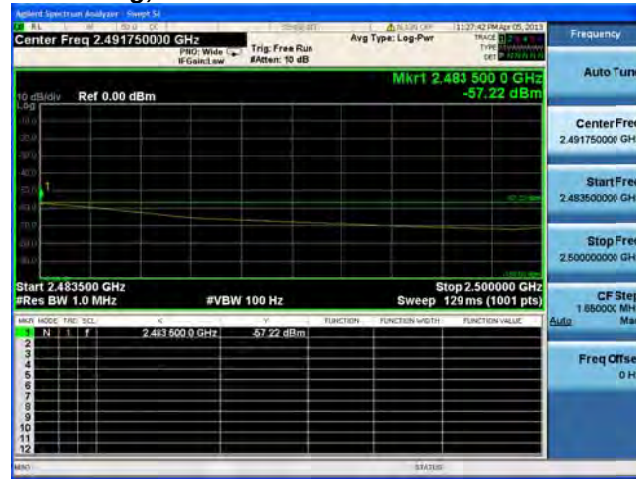
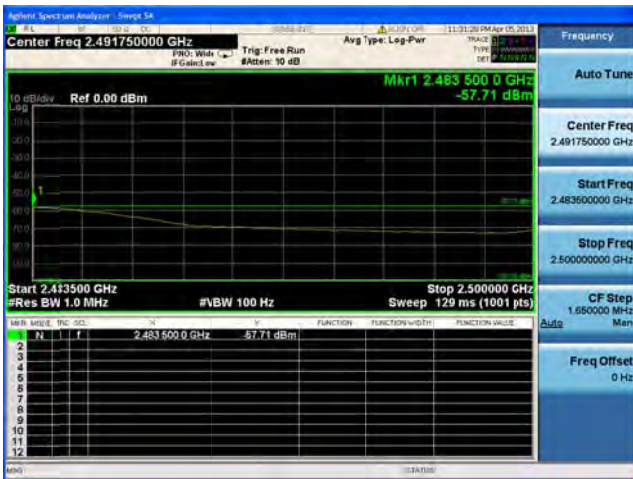
Conducted Bandedge Average, 2462 MHz, HT-20, M8 to M15**Antenna A****Antenna B****Antenna C****Antenna D**

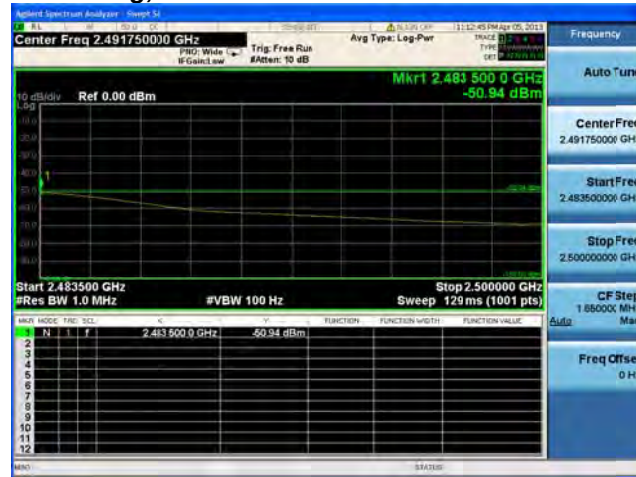
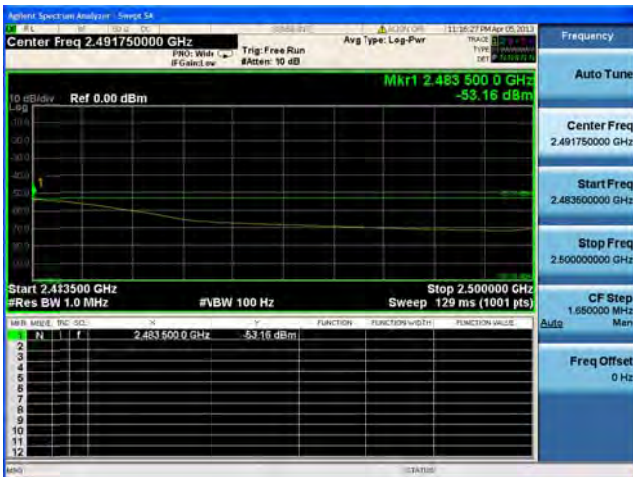
Conducted Bandedge Average, 2462 MHz, HT-20, M16 to M23**Antenna A****Antenna B****Antenna C****Antenna D**

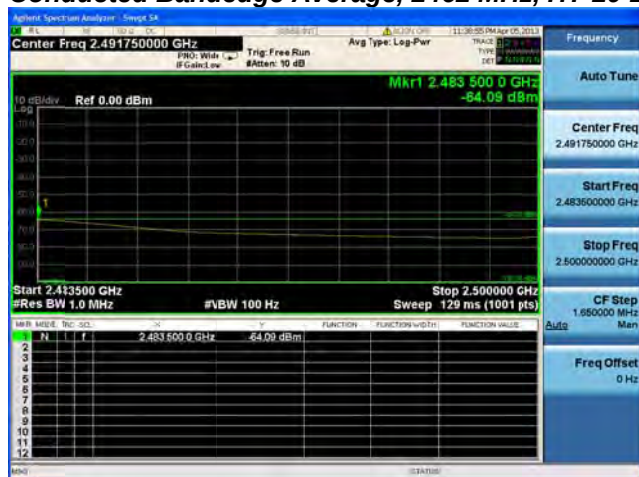
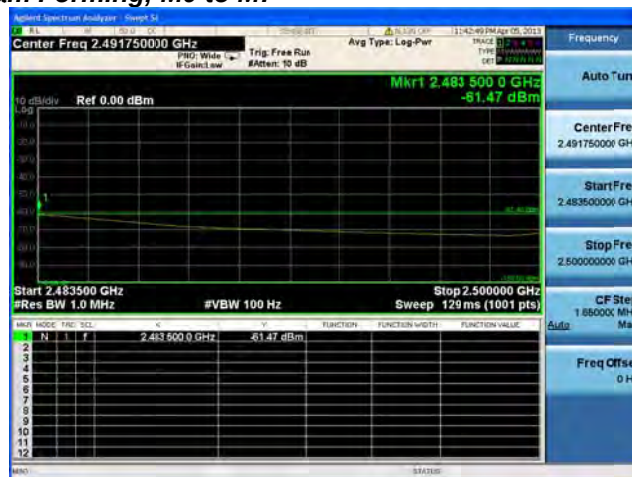
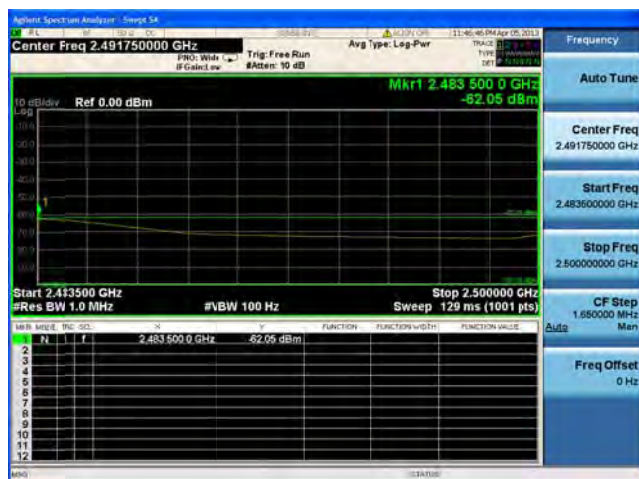
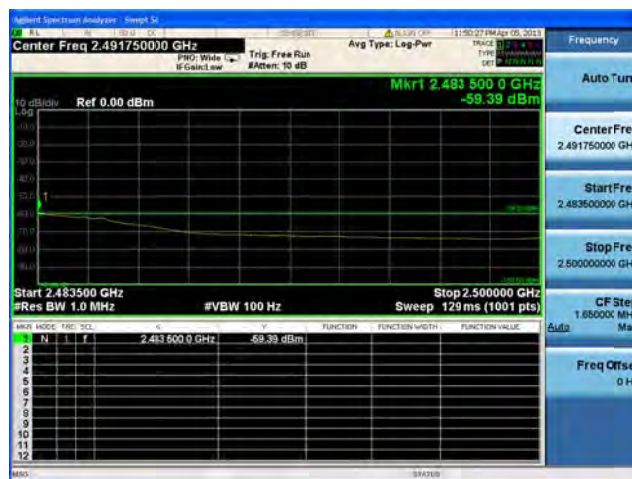
**Conducted Bandedge Average, 2462 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B**

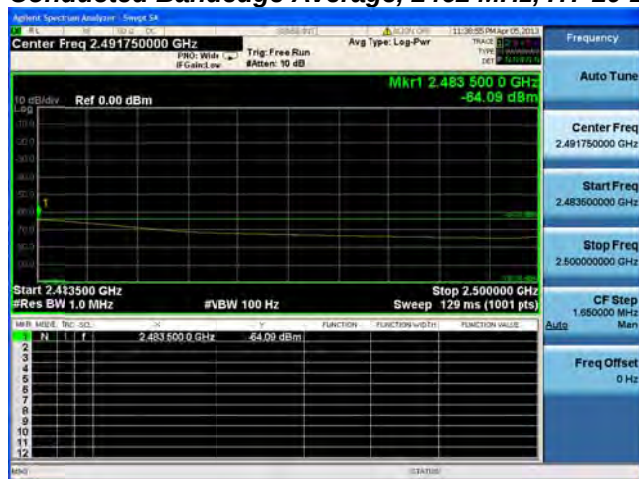
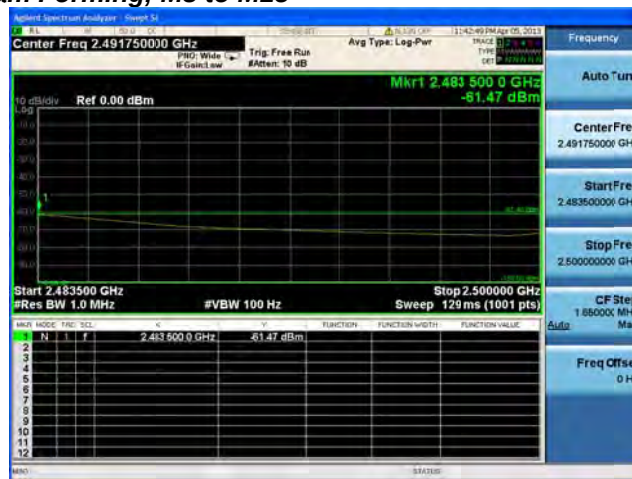
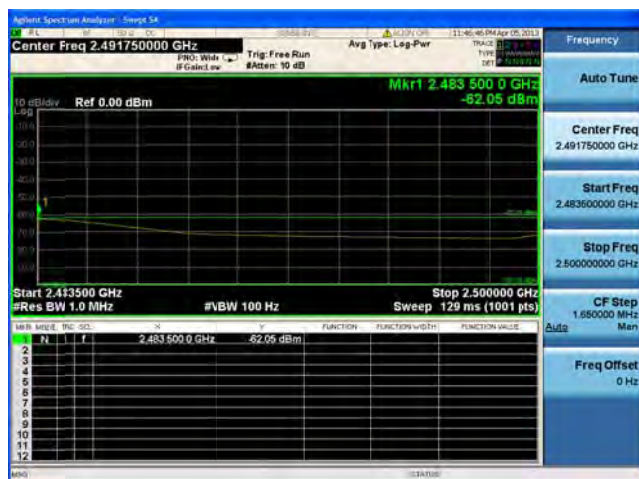
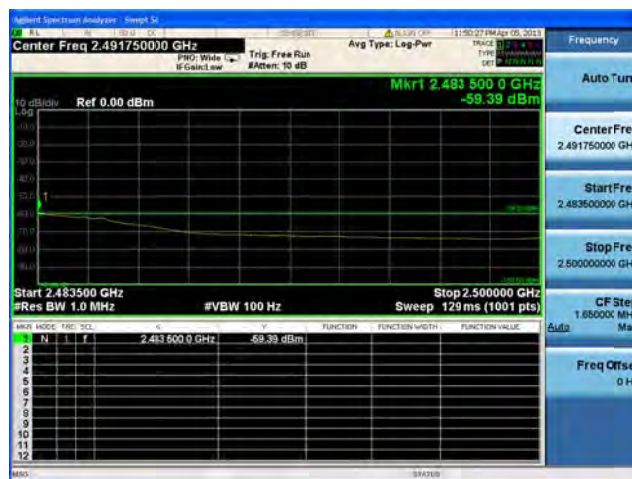
Conducted Bandedge Average, 2462 MHz, HT-20 Beam Forming, M8 to M15**Antenna A****Antenna B**

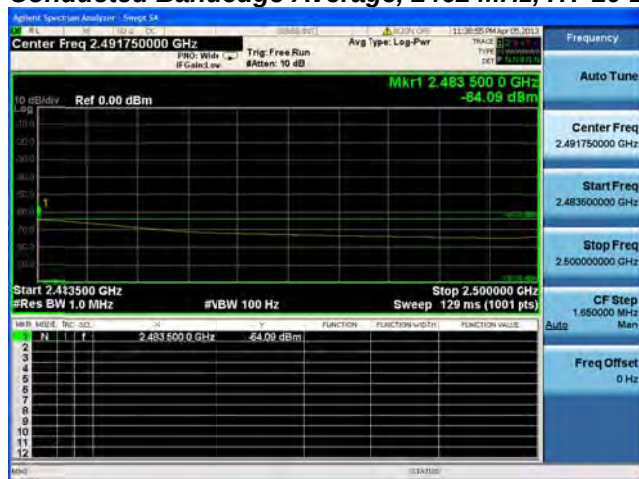
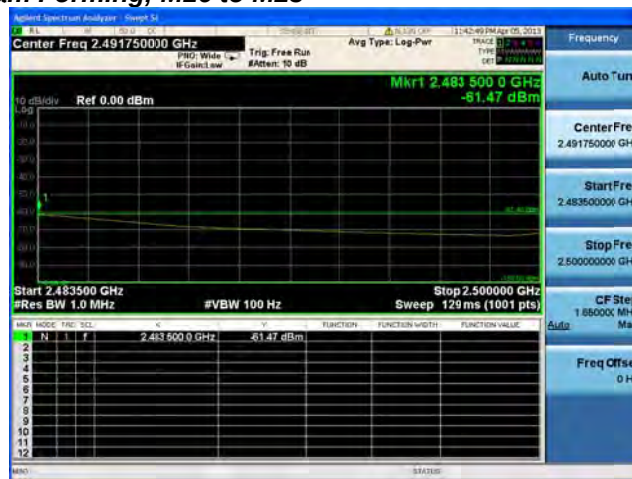
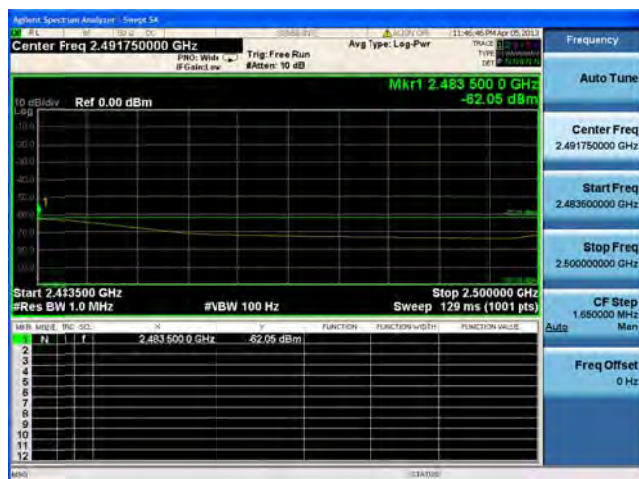
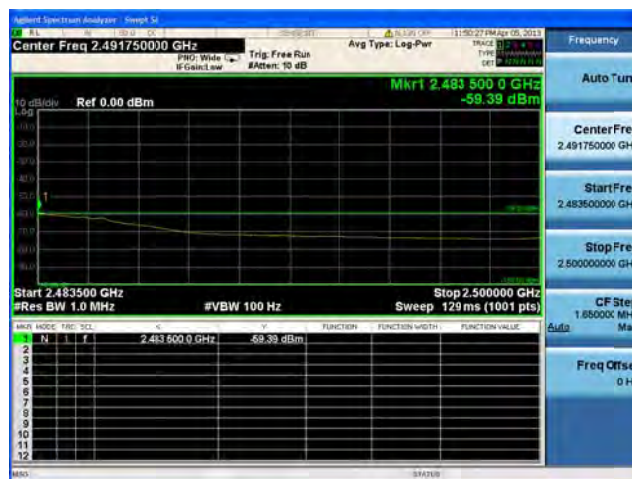
**Conducted Bandedge Average, 2462 MHz, HT-20 Beam Forming, M0 to M7****Antenna A****Antenna B****Antenna C**

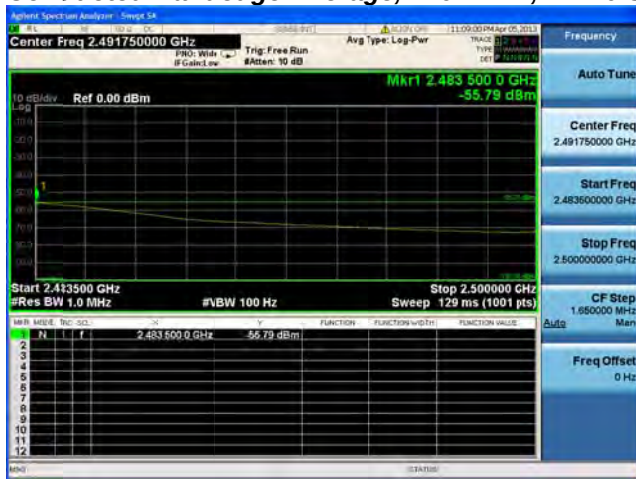
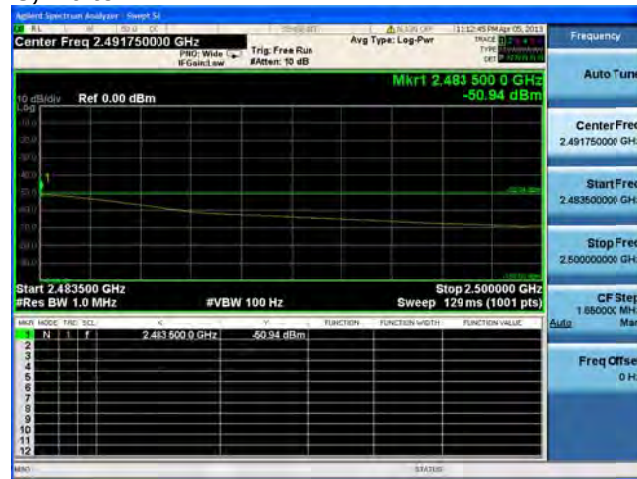
Conducted Bandedge Average, 2462 MHz, HT-20 Beam Forming, M8 to M15**Antenna A****Antenna B****Antenna C**

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 Beam Forming, M0 to M7**Antenna A****Antenna B****Antenna C****Antenna D**

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

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

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

The screenshot shows a software-defined radio (SDR) interface with the following components:

- Top Bar:**
 - Left: Software version (v1.0.0) and device name (SDR-001).
 - Center: Frequency readout (2.491750000 GHz) and power level (-55.79 dBm).
 - Right: Date and time (11/09/2023 14:00:00).
- Plot Area:**
 - Y-axis: Power level in dBm, ranging from -100 to 10.
 - X-axis: Frequency in GHz, ranging from 2.483 to 2.500.
 - Plot: A spectrum plot showing a signal at 2.491750000 GHz with a power level of -55.79 dBm.
- Controls and Readouts:**
 - Left: Frequency range (2.483 to 2.500 GHz) and power level (-55.79 dBm).
 - Right: Frequency range (2.483 to 2.500 GHz) and power level (-55.79 dBm).
 - Bottom: Frequency range (2.483 to 2.500 GHz) and power level (-55.79 dBm).

Autumn Spectral Analyzer - Image 5

Center Freq 2.491750030 GHz Avg Type: Log-Pwr

Mkr1 2.483500 GHz -50.94 dBm

Start 2.483500 GHz Stop 2.500000 GHz

Res BW 1.0 MHz VBW 100 Hz Sweep 129 ms (1001 pts)

Agilent Spectrum Analyzer - Sweep 54

Center Freq 2.491750000 GHz

PRO: Wide 1.0 MHz

Trig: Free Run

Avg Type: Log-Pwr

Trace 1: 2.491750000 GHz

11:35:27 PM Apr 05, 2013

Frequency

Auto Tune

Center Freq 2.491750000 GHz

Start Freq 2.483600000 GHz

Stop Freq 2.500000000 GHz

CF Step 1.6500000 MHz

Auto

Man

Freq Offset 0 Hz

10 dB/div Ref 0.00 dBm

Mkr1 2.483500 0 GHz

-53.18 dBm

Start 2.4f3500 GHz

#Res BW 1.0 MHz

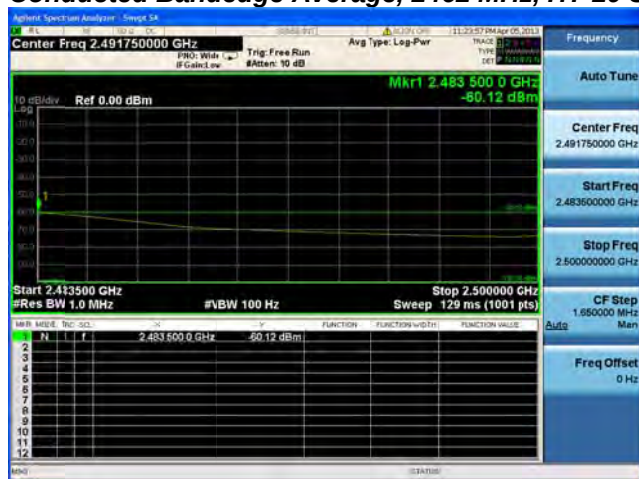
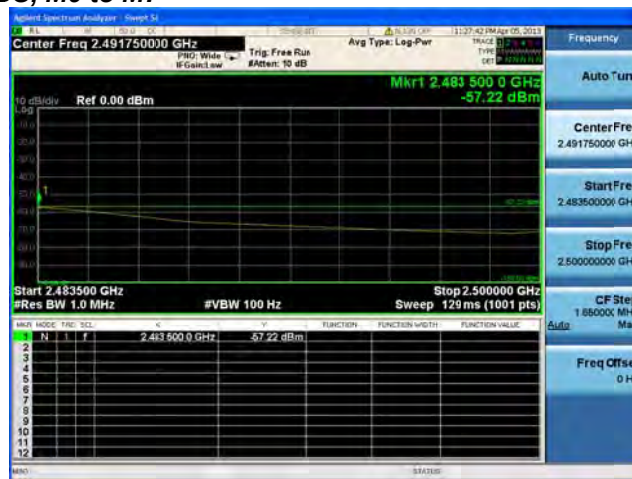
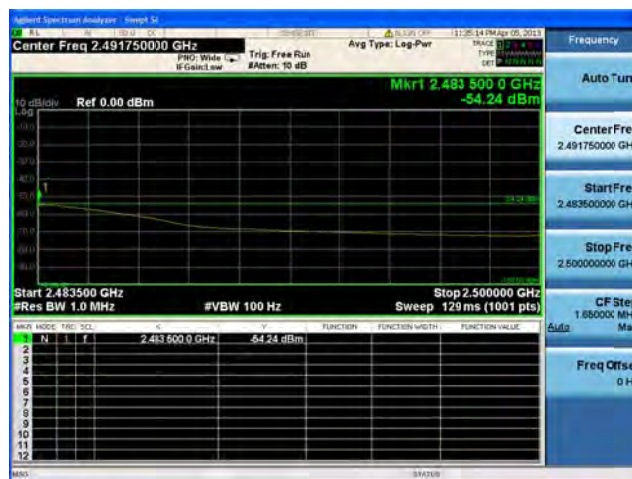
Stop 2.500000 GHz

Sweep 129 ms (1001 pts)

Table 1: Measurement Data

Meas Name	Ref	Unit	Function	Function Width	Function Value
N	2.483500 0 GHz	-53.18 dBm			
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

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



Peak Bandedge Data

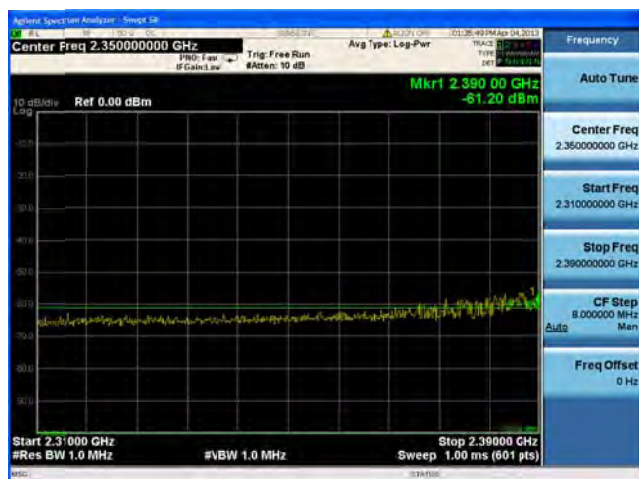
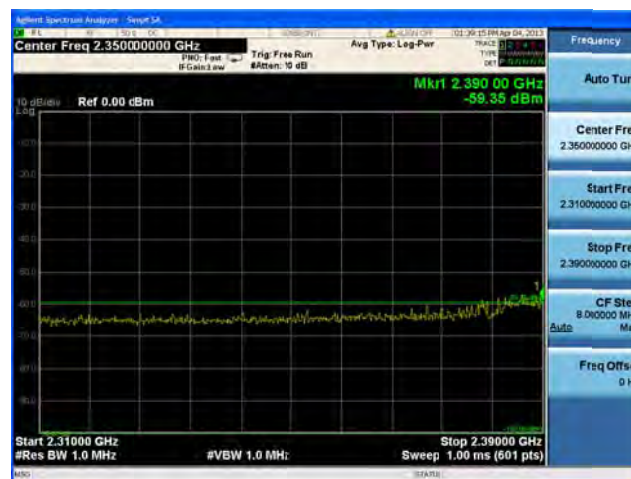
Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Tx 2 Bandedge Level (dBm)	Tx 3 Bandedge Level (dBm)	Tx 4 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
2412	Legacy CCK, 1 to 11 Mbps	1	6	<u>-60.90</u>				-54.90	-21.25	33.65
	Legacy CCK, 1 to 11 Mbps	2	6	<u>-60.60</u>	<u>-60.50</u>	<u>-61.20</u>		-51.54	-21.25	30.29
	Legacy CCK, 1 to 11 Mbps	4	6	<u>-60.60</u>	<u>-60.50</u>	<u>-61.20</u>	<u>-59.30</u>	-48.32	-21.25	27.07
	Non HT-20, 6 to 54 Mbps	1	6	<u>-40.60</u>				-34.60	-21.25	13.35
	Non HT-20, 6 to 54 Mbps	2	6	<u>-40.60</u>	<u>-37.90</u>			-30.03	-21.25	8.78
	Non HT-20, 6 to 54 Mbps	3	6	<u>-40.60</u>	<u>-37.90</u>	<u>-39.90</u>		-28.54	-21.25	7.29
	Non HT-20, 6 to 54 Mbps	4	6	<u>-40.60</u>	<u>-37.90</u>	<u>-39.90</u>	<u>-36.90</u>	-26.55	-21.25	5.30
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	<u>-40.60</u>	<u>-37.90</u>			-27.03	-21.25	5.78
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	<u>-42.30</u>	<u>-41.80</u>	<u>-44.30</u>		-27.10	-21.25	5.85
	Non HT-20 Beam Forming, 6 to 54 Mbps	4	12	<u>-42.30</u>	<u>-41.80</u>	<u>-44.30</u>	<u>-41.40</u>	-24.30	-21.25	3.05
	HT-20, M0 to M7	1	6	<u>-38.30</u>				-32.30	-21.25	11.05
	HT-20, M0 to M7	2	6	<u>-38.30</u>	<u>-36.20</u>			-28.11	-21.25	6.86
	HT-20, M8 to M15	2	6	<u>-38.30</u>	<u>-36.20</u>			-28.11	-21.25	6.86
	HT-20, M0 to M7	3	6	<u>-38.30</u>	<u>-36.20</u>	<u>-34.60</u>		-25.34	-21.25	4.09
	HT-20, M8 to M15	3	6	<u>-38.30</u>	<u>-36.20</u>	<u>-34.60</u>		-25.34	-20.25	5.09
	HT-20, M16 to M23	3	6	<u>-38.30</u>	<u>-36.20</u>	<u>-34.60</u>		-25.34	-21.25	4.09
	HT-20, M0 to M7	4	6	<u>-38.30</u>	<u>-36.20</u>	<u>-34.60</u>	<u>-30.80</u>	-22.05	-21.25	0.80
	HT-20, M8 to M15	4	6	<u>-38.30</u>	<u>-36.20</u>	<u>-34.60</u>	<u>-30.80</u>	-22.05	-21.25	0.80
	HT-20, M16 to M23	4	6	<u>-38.30</u>	<u>-36.20</u>	<u>-34.60</u>	<u>-30.80</u>	-22.05	-21.25	0.80
	HT-20 Beam Forming, M0 to M7	2	9	<u>-38.30</u>	<u>-36.20</u>			-25.11	-21.25	3.86
	HT-20 Beam Forming, M8 to M15	2	6	<u>-38.30</u>	<u>-36.20</u>			-28.11	-21.25	6.86
	HT-20 Beam Forming, M0 to M7	3	11	<u>-39.20</u>	<u>-36.20</u>	<u>-40.10</u>		-22.59	-21.25	1.34
	HT-20 Beam Forming, M8 to M15	3	8	<u>-38.30</u>	<u>-36.20</u>	<u>-34.60</u>		-23.54	-21.25	2.29
	HT-20 Beam Forming, M16 to M23	3	6	<u>-38.30</u>	<u>-36.20</u>	<u>-34.60</u>		-25.34	-21.25	4.09
	HT-20 Beam Forming, M0 to M7	4	12	<u>-42.50</u>	<u>-43.60</u>	<u>-44.50</u>	<u>-41.90</u>	-24.99	-21.25	3.74
	HT-20 Beam Forming, M8 to M15	4	9	<u>-39.20</u>	<u>-36.20</u>	<u>-40.10</u>	<u>-37.70</u>	-23.02	-21.25	1.77
	HT-20 Beam Forming, M16 to M23	4	7	<u>-39.20</u>	<u>-36.20</u>	<u>-40.10</u>	<u>-37.70</u>	-24.82	-21.25	3.57
	HT-20 STBC, M0 to M7	2	6	<u>-38.30</u>	<u>-36.20</u>			-28.11	-21.25	6.86
	HT-20 STBC, M0 to M7	3	6	<u>-38.30</u>	<u>-36.20</u>	<u>-34.60</u>		-25.34	-21.25	4.09



	HT-20 STBC, M0 to M7	4	6	<u>-38.30</u>	<u>-36.20</u>	<u>-34.60</u>	<u>-30.80</u>	-22.05	-21.25	0.80
2462	Legacy CCK, 1 to 11 Mbps	1	6	<u>-62.60</u>				-56.60	-21.25	35.35
	Legacy CCK, 1 to 11 Mbps	2	6	<u>-61.20</u>	<u>-59.90</u>			-51.49	-21.25	30.24
	Legacy CCK, 1 to 11 Mbps	3	6	<u>-61.20</u>	<u>-59.90</u>	<u>-55.40</u>		-47.31	-21.25	26.06
	Legacy CCK, 1 to 11 Mbps	4	6	<u>-61.20</u>	<u>-59.90</u>	<u>-55.40</u>	<u>-59.60</u>	-46.39	-21.25	25.14
	Non HT-20, 6 to 54 Mbps	1	6	<u>-36.20</u>				-30.20	-21.25	8.95
	Non HT-20, 6 to 54 Mbps	2	6	<u>-36.20</u>	<u>-33.00</u>			-25.30	-21.25	4.05
	Non HT-20, 6 to 54 Mbps	3	6	<u>-36.20</u>	<u>-33.00</u>	<u>-37.80</u>		-24.42	-21.25	3.17
	Non HT-20, 6 to 54 Mbps	4	6	<u>-36.20</u>	<u>-33.00</u>	<u>-37.80</u>	<u>-32.60</u>	-22.37	-21.25	1.12
	Non HT-20 Beam Forming, 6 to 54 Mbps	2	9	<u>-36.20</u>	<u>-33.00</u>			-22.30	-21.25	1.05
	Non HT-20 Beam Forming, 6 to 54 Mbps	3	11	<u>-44.80</u>	<u>-38.90</u>	<u>-42.40</u>		-25.79	-21.25	4.54
	Non HT-20 Beam Forming, 6 to 54 Mbps	4	12	<u>-48.60</u>	<u>-43.30</u>	<u>-46.50</u>	<u>-40.90</u>	-25.85	-21.25	4.60
	HT-20, M0 to M7	1	6	<u>-31.20</u>				-25.20	-21.25	3.95
	HT-20, M0 to M7	2	6	<u>-31.20</u>	<u>-31.10</u>			-22.14	-21.25	0.89
	HT-20, M8 to M15	2	6	<u>-31.20</u>	<u>-31.10</u>			-22.14	-21.25	0.89
	HT-20, M0 to M7	3	6	<u>-31.20</u>	<u>-31.10</u>	<u>-34.90</u>		-21.31	-21.25	0.06
	HT-20, M8 to M15	3	6	<u>-31.20</u>	<u>-31.10</u>	<u>-34.90</u>		-21.31	-21.25	0.06
	HT-20, M16 to M23	3	6	<u>-31.20</u>	<u>-31.10</u>	<u>-34.90</u>		-21.31	-21.25	0.06
	HT-20, M0 to M7	4	6	<u>-37.30</u>	<u>-34.90</u>	<u>-34.30</u>	<u>-31.70</u>	-22.08	-21.25	0.83
	HT-20, M8 to M15	4	6	<u>-37.30</u>	<u>-34.90</u>	<u>-34.30</u>	<u>-31.70</u>	-22.08	-21.25	0.83
	HT-20, M16 to M23	4	6	<u>-37.30</u>	<u>-34.90</u>	<u>-34.30</u>	<u>-31.70</u>	-22.08	-21.25	0.83
	HT-20 Beam Forming, M0 to M7	2	9	<u>-37.30</u>	<u>-34.90</u>			-23.93	-21.25	2.68
	HT-20 Beam Forming, M8 to M15	2	6	<u>-31.20</u>	<u>-31.10</u>			-22.14	-21.25	0.89
	HT-20 Beam Forming, M0 to M7	3	11	<u>-42.70</u>	<u>-38.00</u>	<u>-42.40</u>		-24.89	-21.25	3.64
	HT-20 Beam Forming, M8 to M15	3	8	<u>-37.30</u>	<u>-34.90</u>	<u>-34.30</u>		-22.75	-21.25	1.50
	HT-20 Beam Forming, M16 to M23	3	6	<u>-31.20</u>	<u>-31.10</u>	<u>-34.90</u>		-21.31	-21.25	0.06
	HT-20 Beam Forming, M0 to M7	4	12	<u>-42.70</u>	<u>-38.00</u>	<u>-42.40</u>	<u>-40.80</u>	-22.52	-21.25	1.27
	HT-20 Beam Forming, M8 to M15	4	9	<u>-42.70</u>	<u>-38.00</u>	<u>-42.40</u>	<u>-40.80</u>	-25.52	-21.25	4.27
	HT-20 Beam Forming, M16 to M23	4	7	<u>-42.70</u>	<u>-38.00</u>	<u>-42.40</u>	<u>-40.80</u>	-27.32	-21.25	6.07
	HT-20 STBC, M0 to M7	2	6	<u>-31.20</u>	<u>-31.10</u>			-22.14	-21.25	0.89
	HT-20 STBC, M0 to M7	3	6	<u>-31.20</u>	<u>-31.10</u>	<u>-34.90</u>		-21.31	-21.25	0.06
	HT-20 STBC, M0 to M7	4	6	<u>-37.30</u>	<u>-34.90</u>	<u>-34.30</u>	<u>-31.70</u>	-22.08	-21.25	0.83

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

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

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

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, 6 to 54 Mbps**Antenna A****Antenna B****Antenna C****Antenna D**

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, Non HT-20 Beam Forming, 6 to 54 Mbps**Antenna A****Antenna B****Antenna C****Antenna D**

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

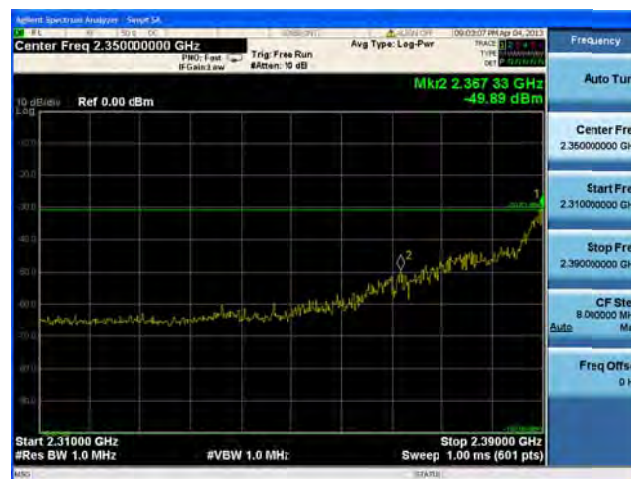
Conducted Bandedge Peak, 2412 MHz, HT-20, M0 to M7**Antenna A****Antenna B**

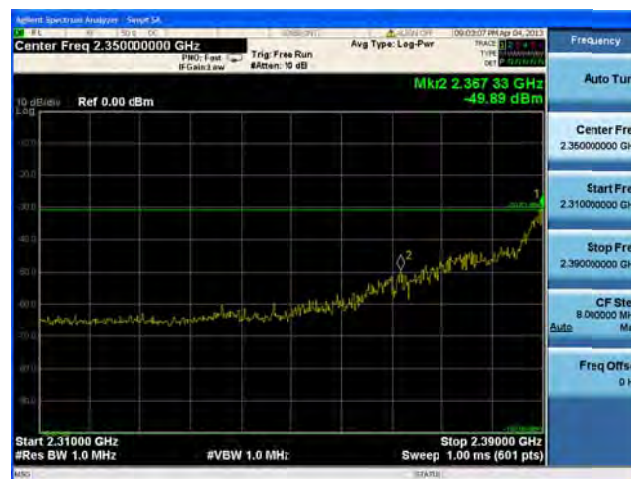
Conducted Bandedge Peak, 2412 MHz, HT-20, M8 to M15**Antenna A****Antenna B**

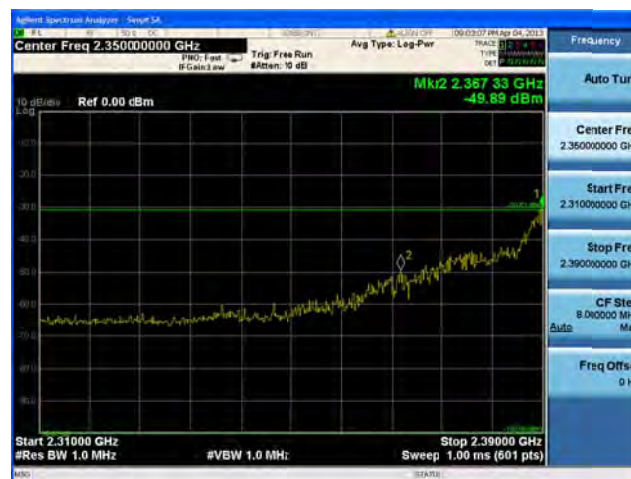
**Conducted Bandedge Peak, 2412 MHz, HT-20, M0 to M7****Antenna A****Antenna B****Antenna C**

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, M0 to M7**Antenna A****Antenna B****Antenna C****Antenna D**

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

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

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**

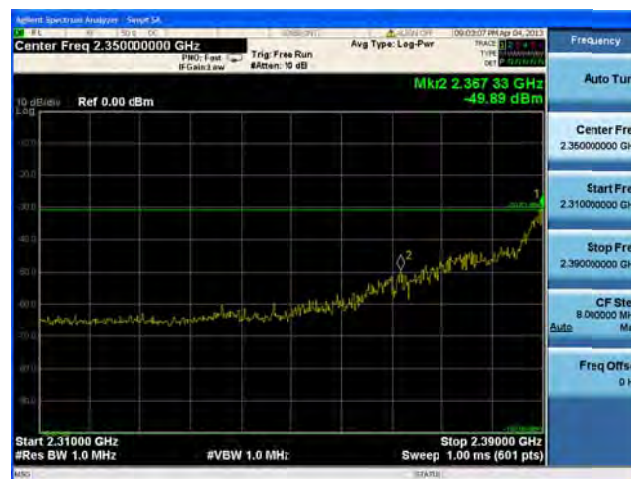
Conducted Bandedge Peak, 2412 MHz, HT-20 Beam Forming, M0 to M7**Antenna A****Antenna B****Antenna C****Antenna D**

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

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

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

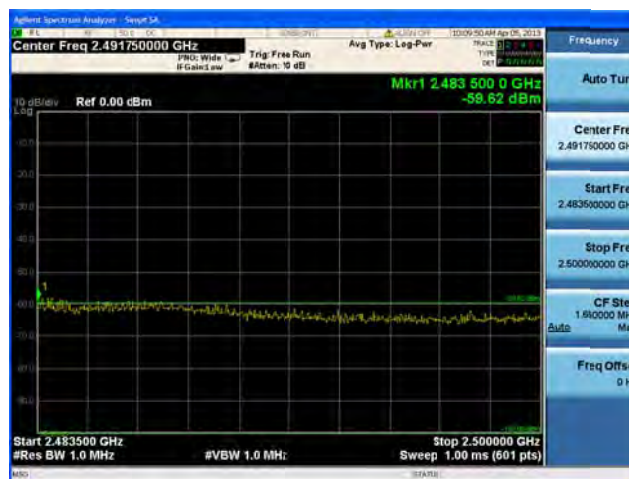
Conducted Bandedge Peak, 2412 MHz, HT-20 STBC, M0 to M7**Antenna A****Antenna B****Antenna C**

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

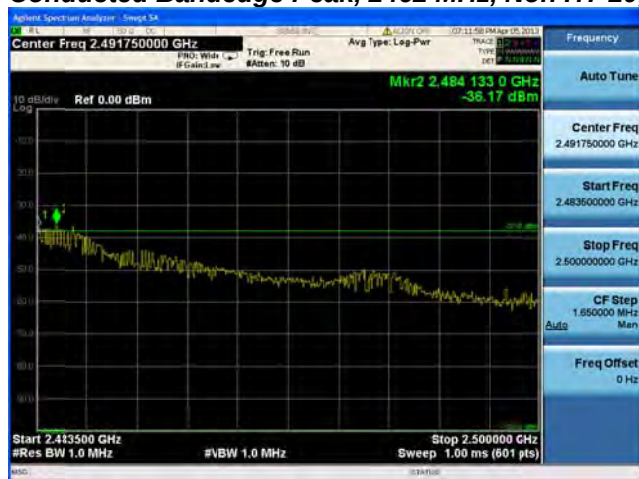
Conducted Bandedge Peak, 2462 MHz, Legacy CCK, 1 to 11 Mbps**Antenna A**

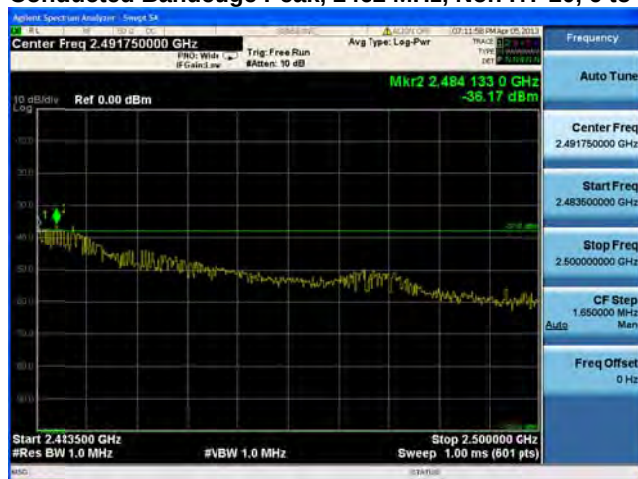
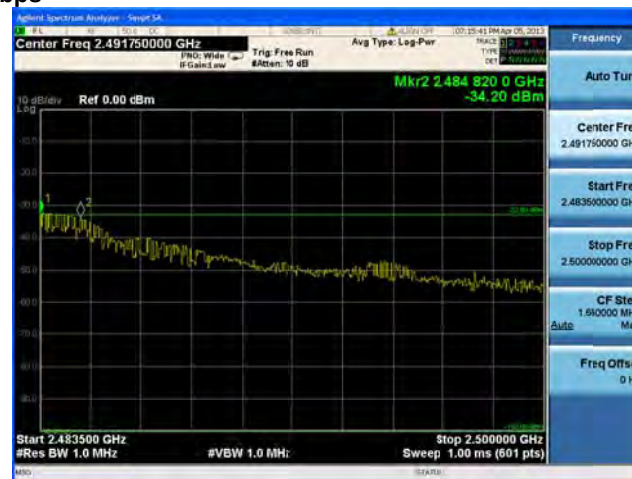
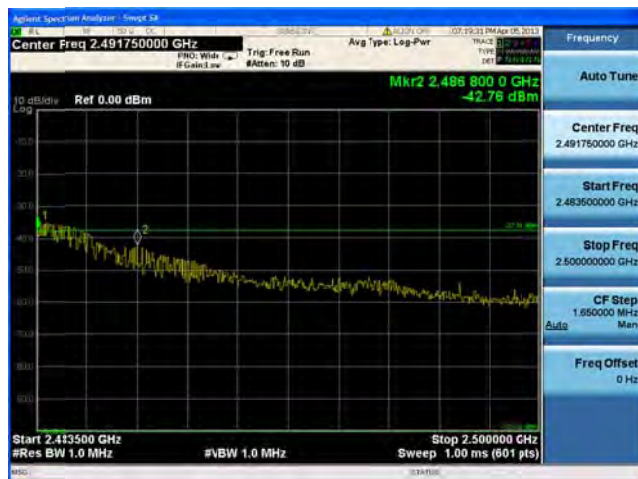
Conducted Bandedge Peak, 2462 MHz, Legacy CCK, 1 to 11 Mbps**Antenna A****Antenna B**

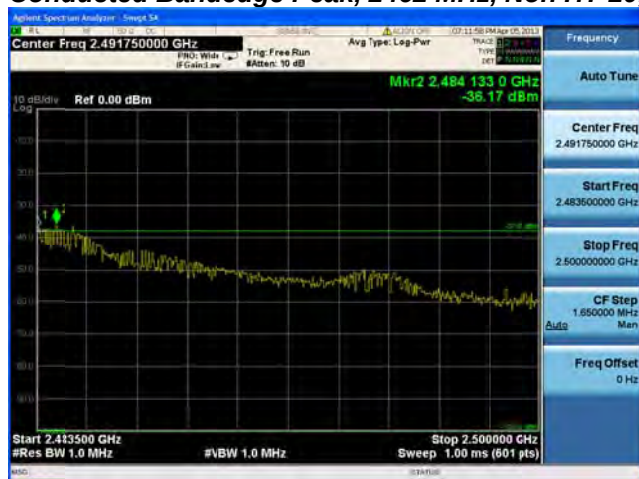
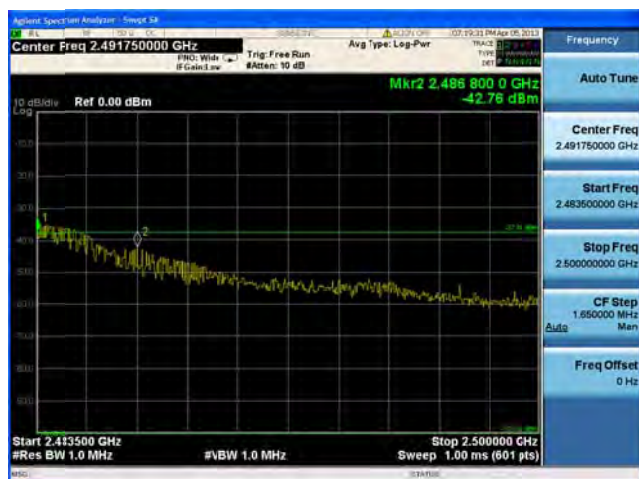
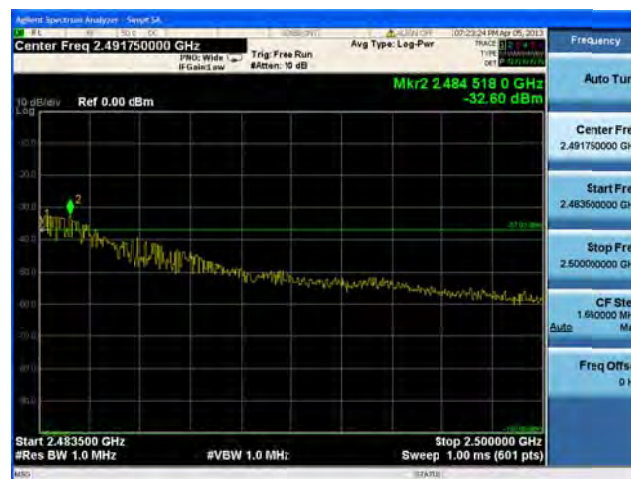
Conducted Bandedge Peak, 2462 MHz, Legacy CCK, 1 to 11 Mbps**Antenna A****Antenna B****Antenna C**

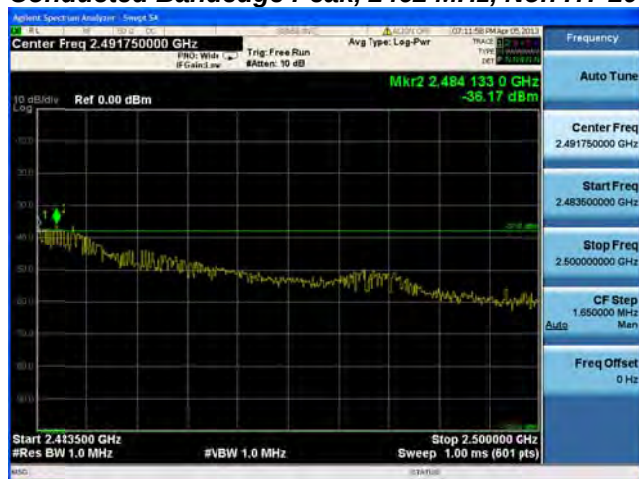
Conducted Bandedge Peak, 2462 MHz, Legacy CCK, 1 to 11 Mbps**Antenna A****Antenna B****Antenna C****Antenna D**

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

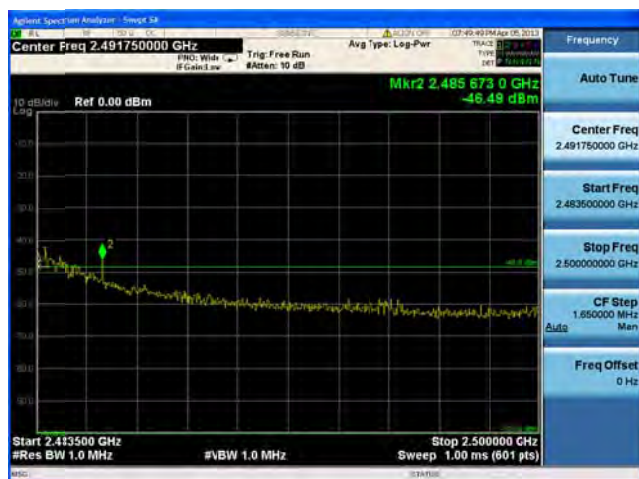
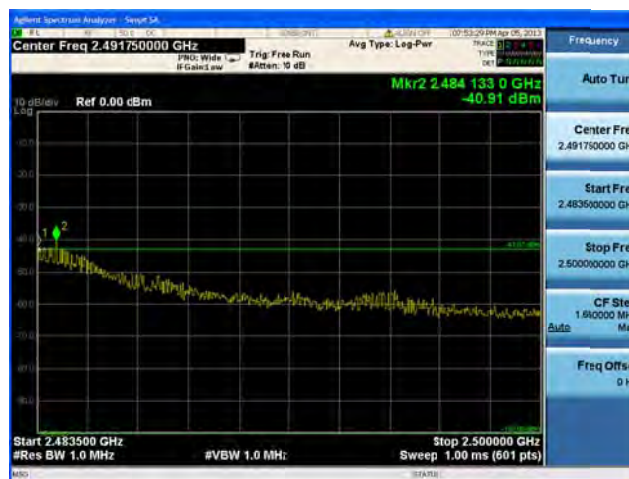
Conducted Bandedge Peak, 2462 MHz, Non HT-20, 6 to 54 Mbps**Antenna A****Antenna B**

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

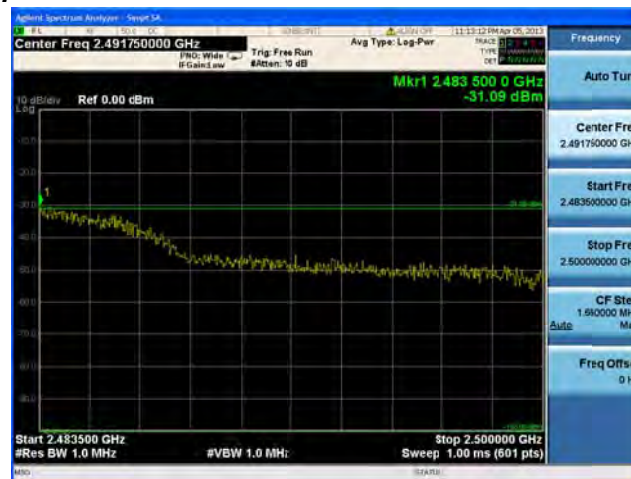
Conducted Bandedge Peak, 2462 MHz, Non HT-20, 6 to 54 Mbps**Antenna A****Antenna B****Antenna C****Antenna D**

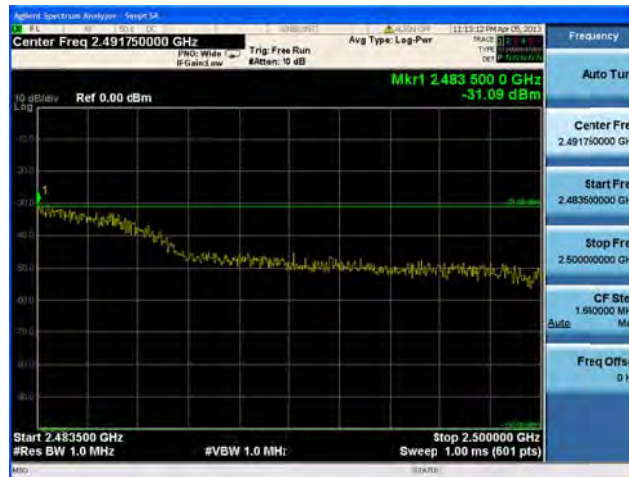
Conducted Bandedge Peak, 2462 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps**Antenna A****Antenna B**

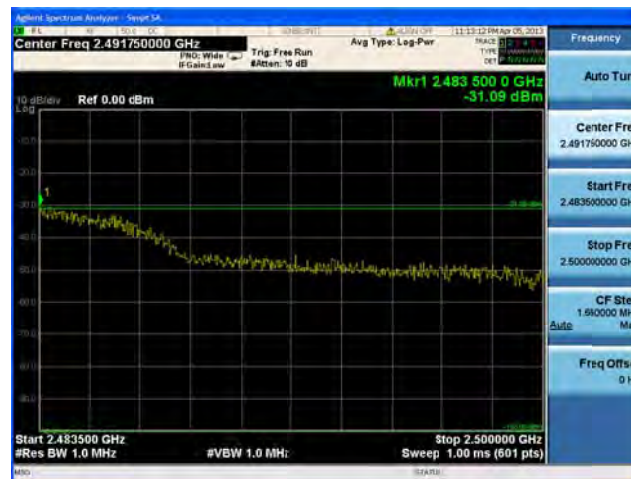
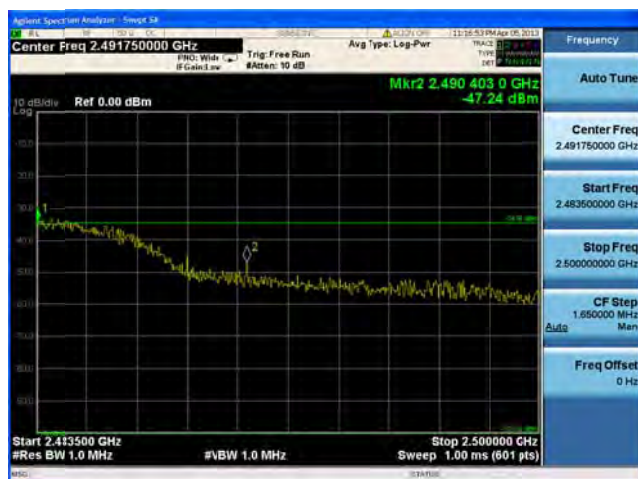
Conducted Bandedge Peak, 2462 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps**Antenna A****Antenna B****Antenna C**

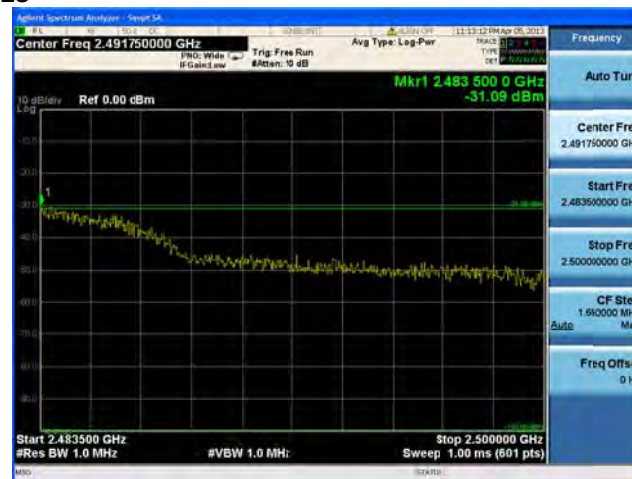
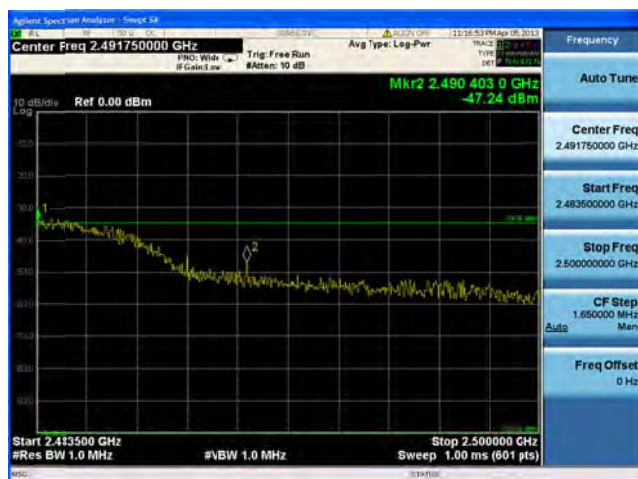
Conducted Bandedge Peak, 2462 MHz, Non HT-20 Beam Forming, 6 to 54 Mbps**Antenna A****Antenna B****Antenna C****Antenna D**

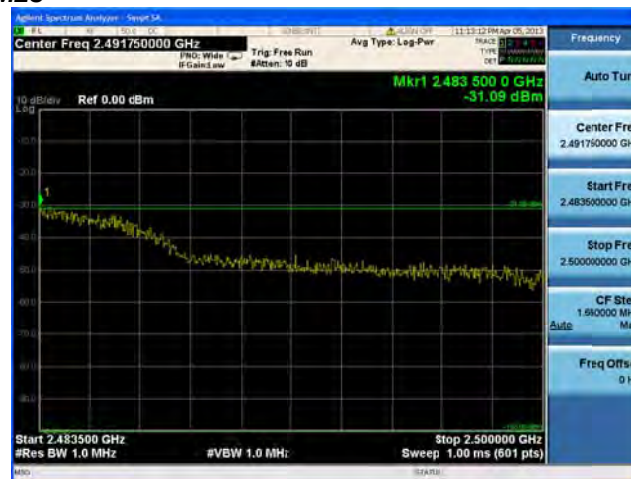
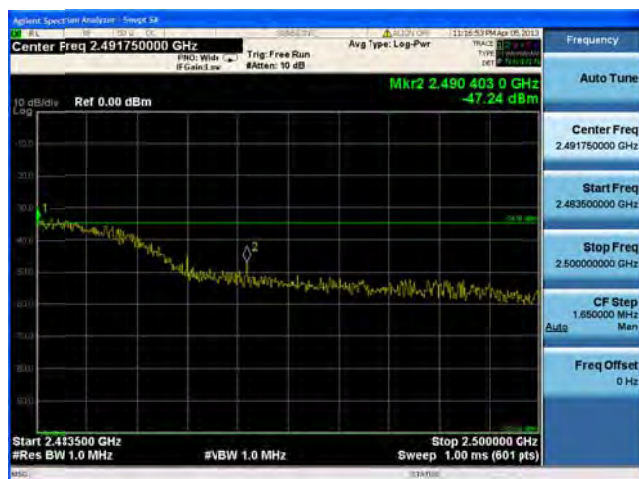
Conducted Bandedge Peak, 2462 MHz, HT-20, M0 to M7**Antenna A**

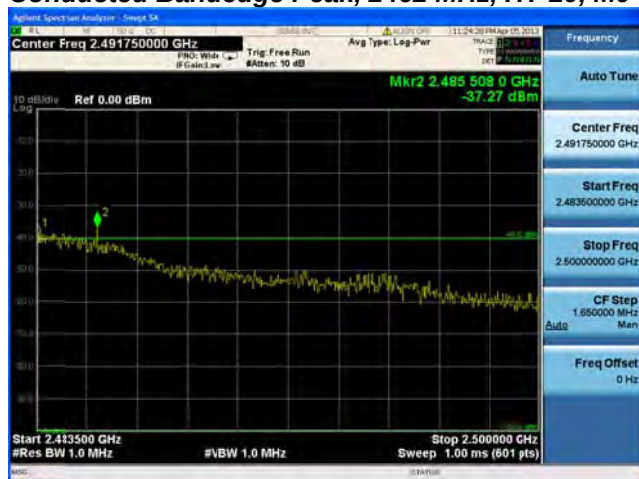
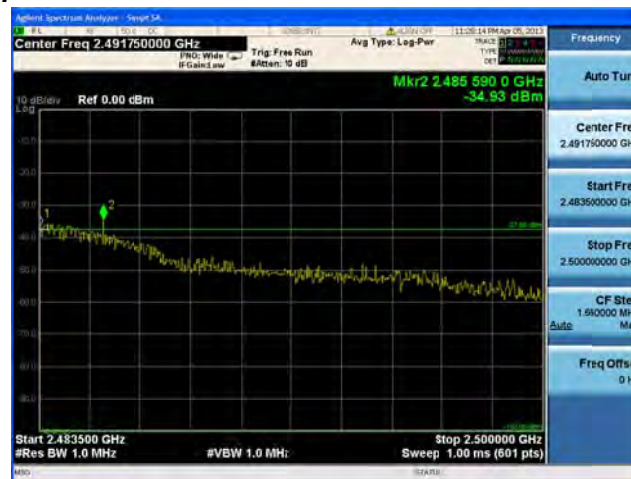
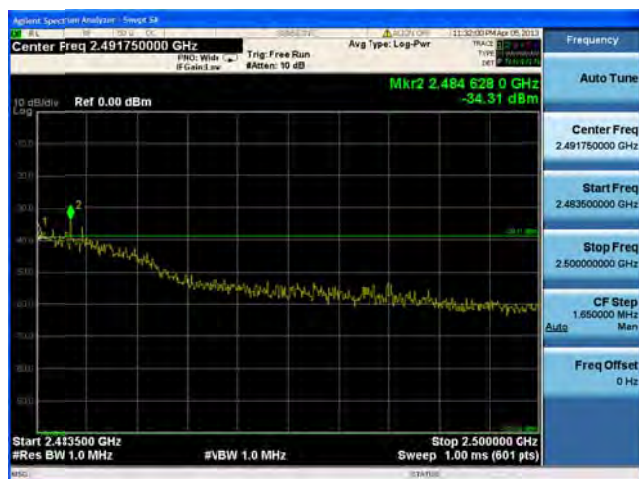
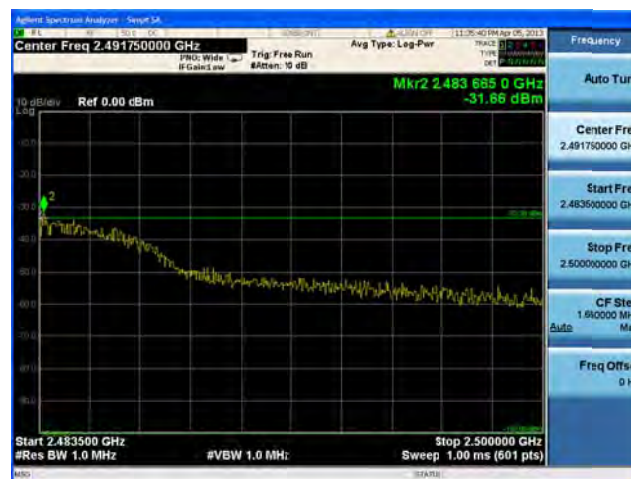
Conducted Bandedge Peak, 2462 MHz, HT-20, M0 to M7**Antenna A****Antenna B**

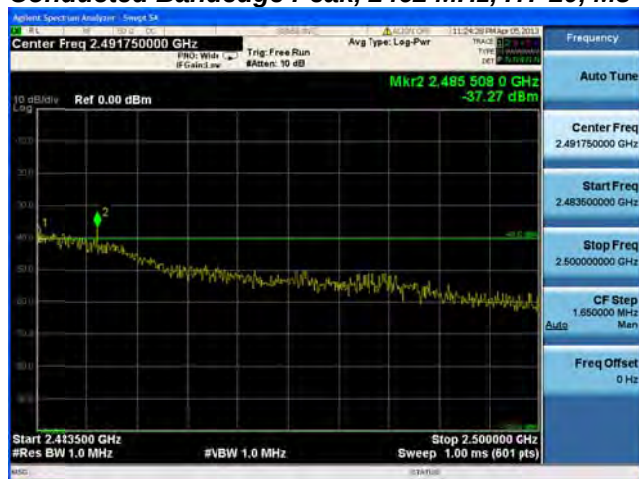
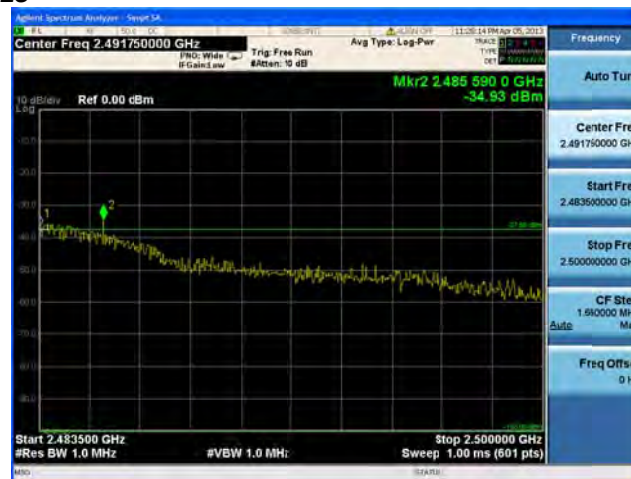
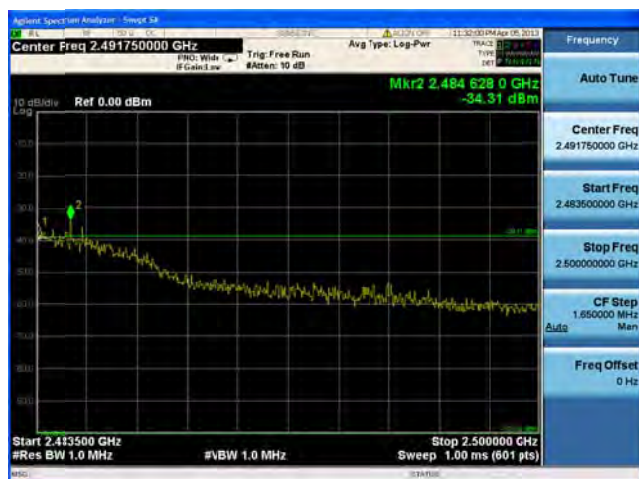
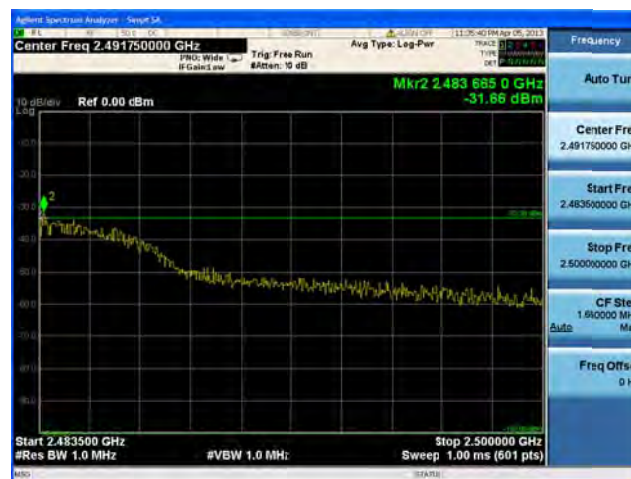
Conducted Bandedge Peak, 2462 MHz, HT-20, M8 to M15**Antenna A****Antenna B**

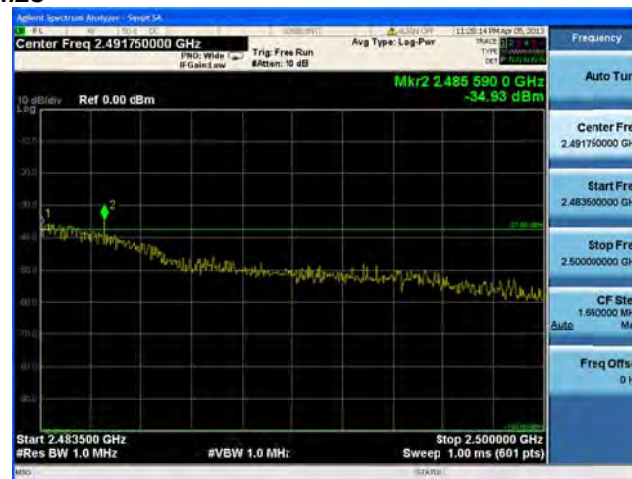
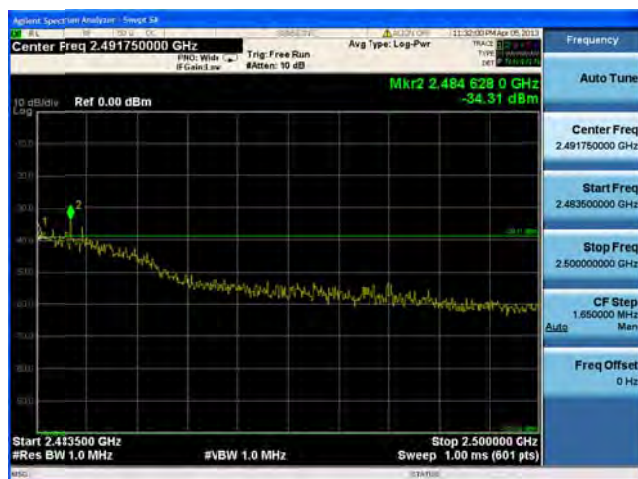
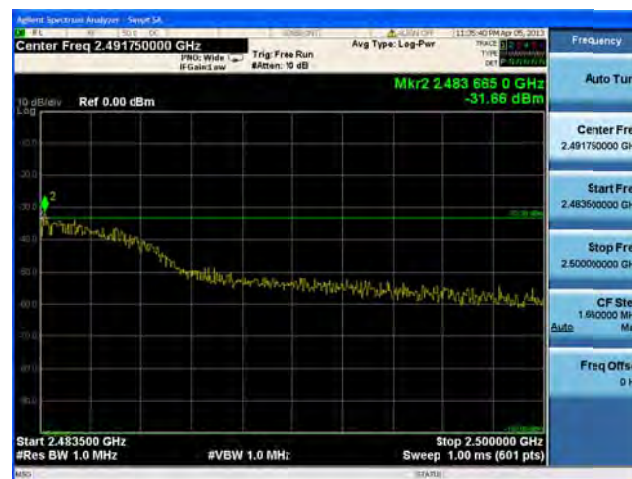
Conducted Bandedge Peak, 2462 MHz, HT-20, M0 to M7**Antenna A****Antenna B****Antenna C**

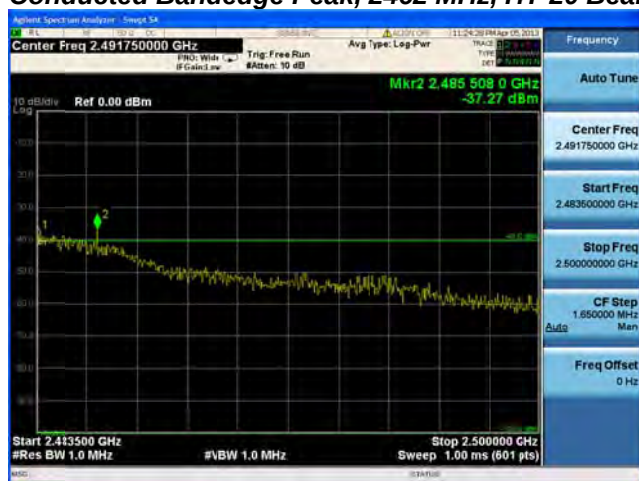
Conducted Bandedge Peak, 2462 MHz, HT-20, M8 to M15**Antenna A****Antenna B****Antenna C**

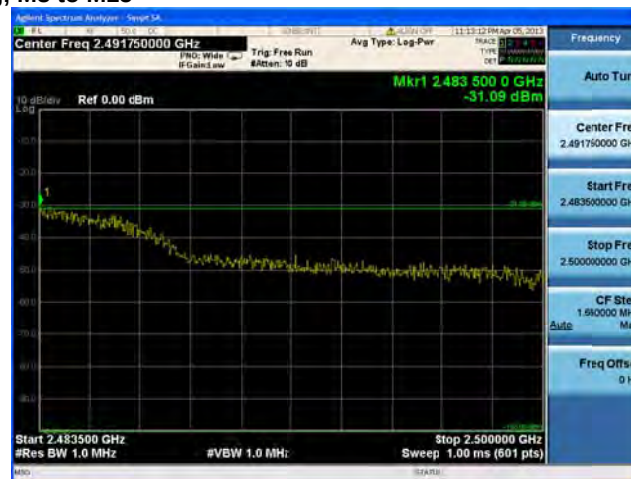
Conducted Bandedge Peak, 2462 MHz, HT-20, M16 to M23**Antenna A****Antenna B****Antenna C**

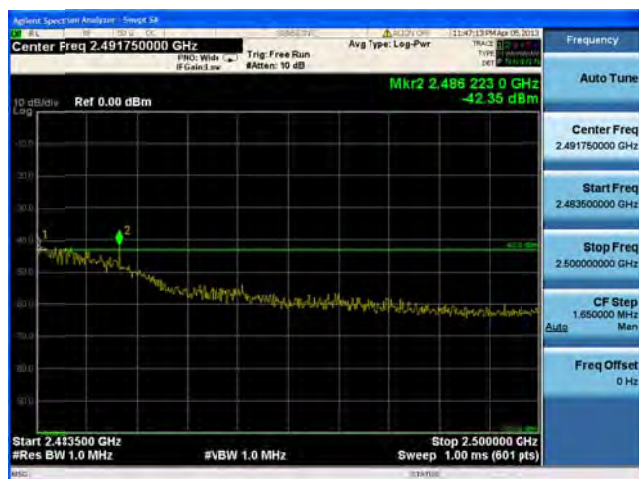
Conducted Bandedge Peak, 2462 MHz, HT-20, M0 to M7**Antenna A****Antenna B****Antenna C****Antenna D**

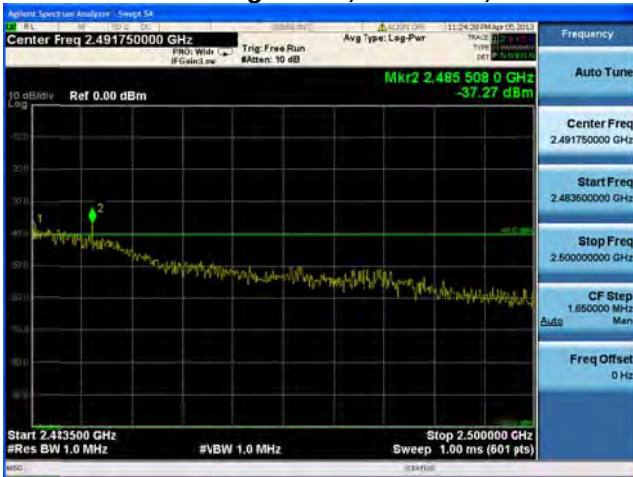
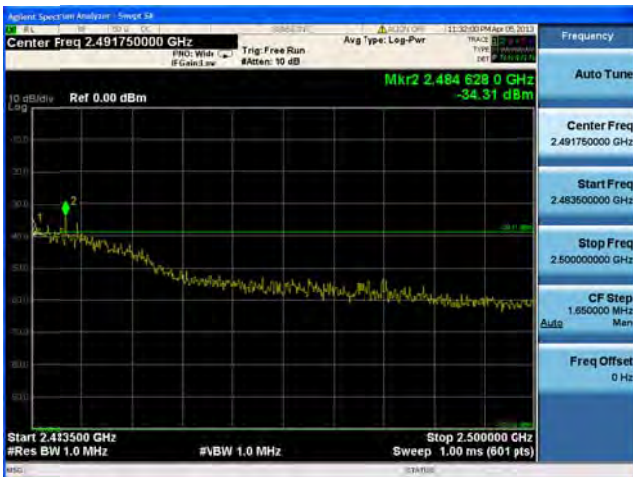
Conducted Bandedge Peak, 2462 MHz, HT-20, M8 to M15**Antenna A****Antenna B****Antenna C****Antenna D**

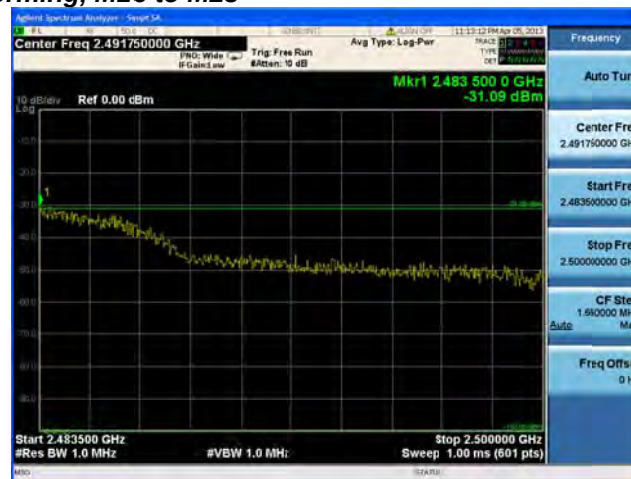
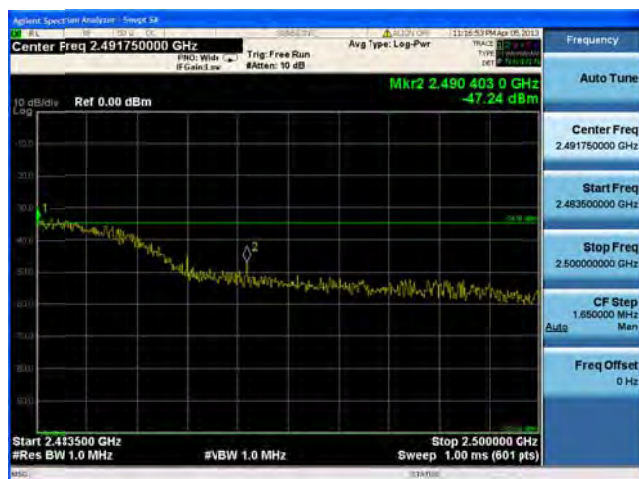
Conducted Bandedge Peak, 2462 MHz, HT-20, M16 to M23**Antenna A****Antenna B****Antenna C****Antenna D**

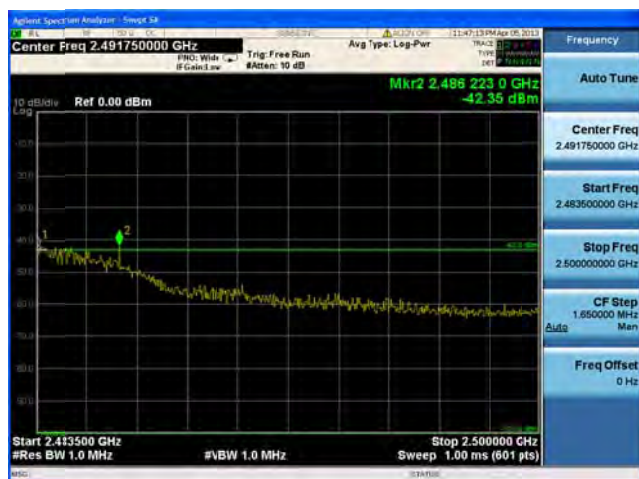
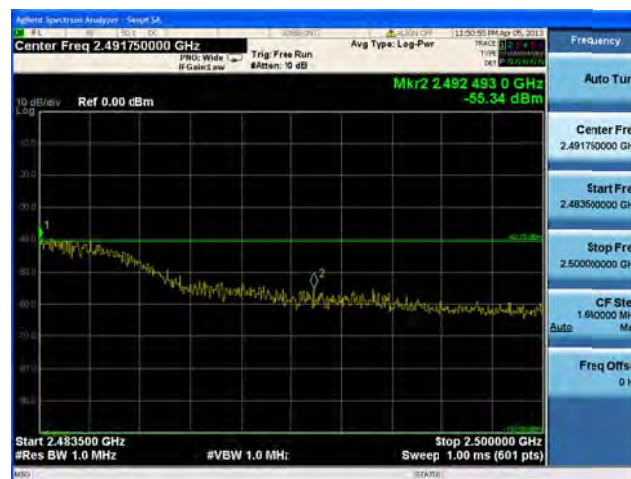
Conducted Bandedge Peak, 2462 MHz, HT-20 Beam Forming, M0 to M7**Antenna A****Antenna B**

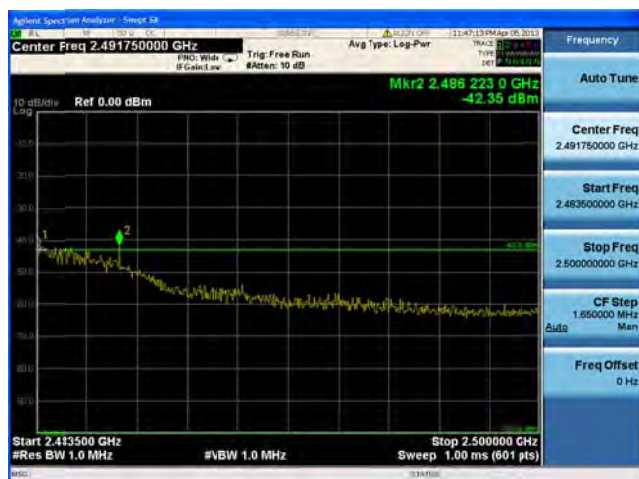
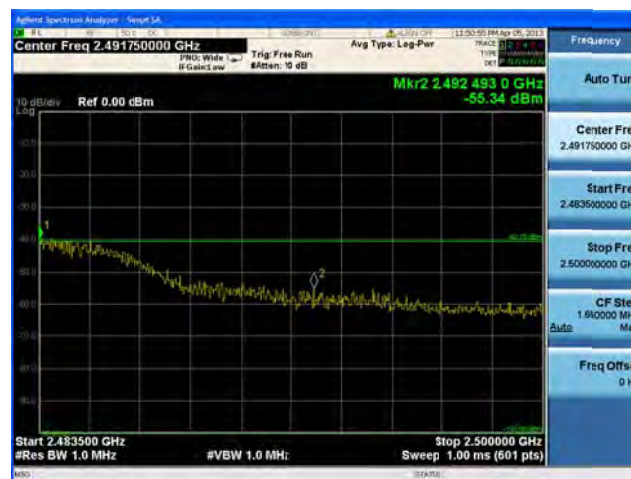
Conducted Bandedge Peak, 2462 MHz, HT-20 Beam Forming, M8 to M15**Antenna A****Antenna B**

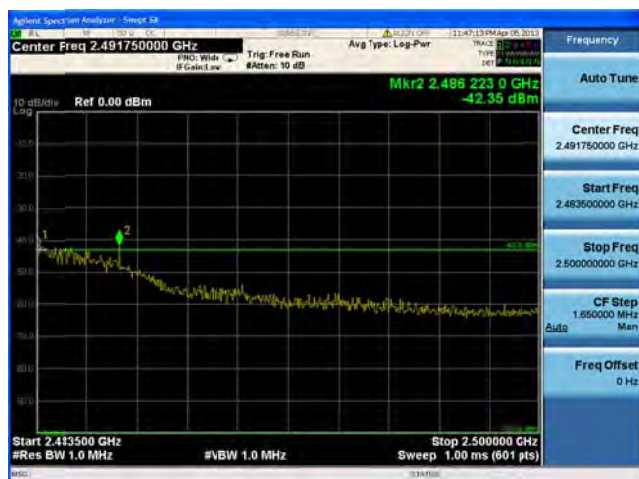
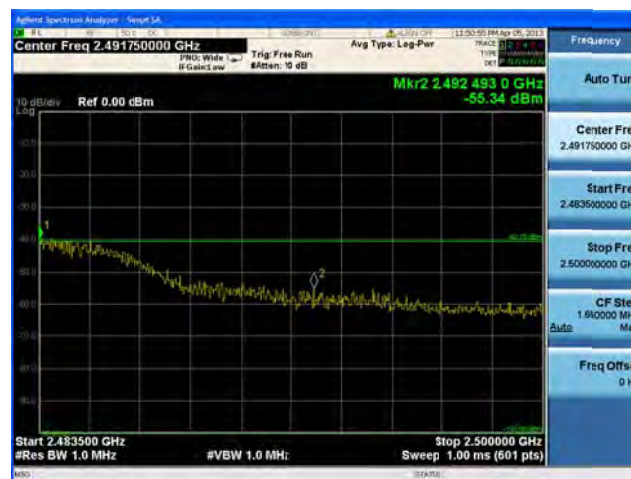
Conducted Bandedge Peak, 2462 MHz, HT-20 Beam Forming, M0 to M7**Antenna A****Antenna B****Antenna C**

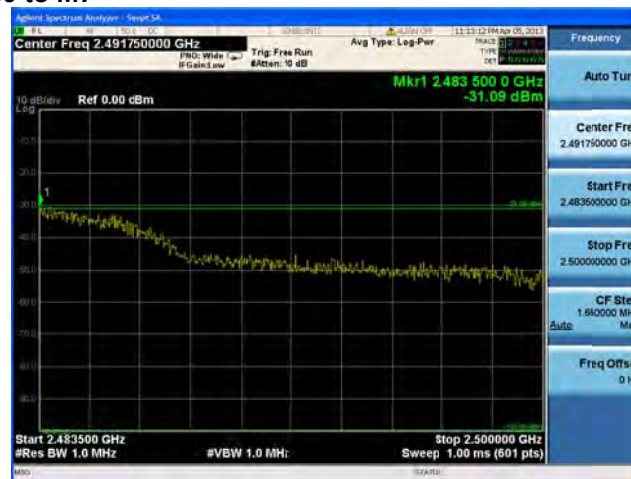
**Conducted Bandedge Peak, 2462 MHz, HT-20 Beam Forming, M8 to M15****Antenna A****Antenna B****Antenna C**

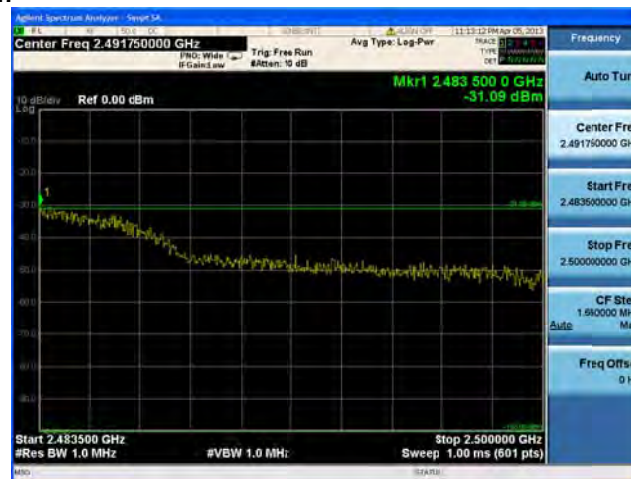
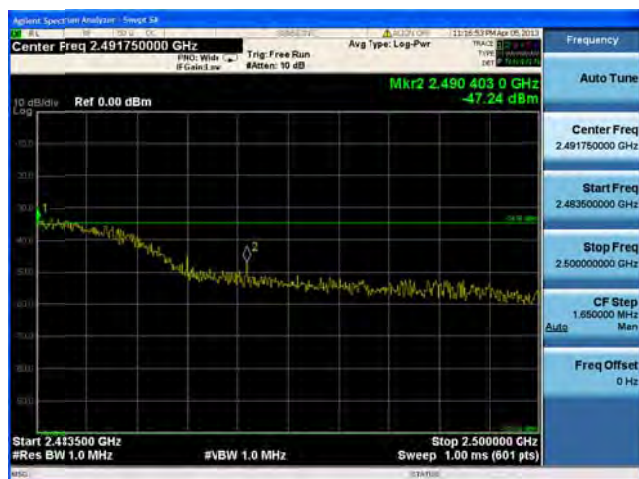
Conducted Bandedge Peak, 2462 MHz, HT-20 Beam Forming, M16 to M23**Antenna A****Antenna B****Antenna C**

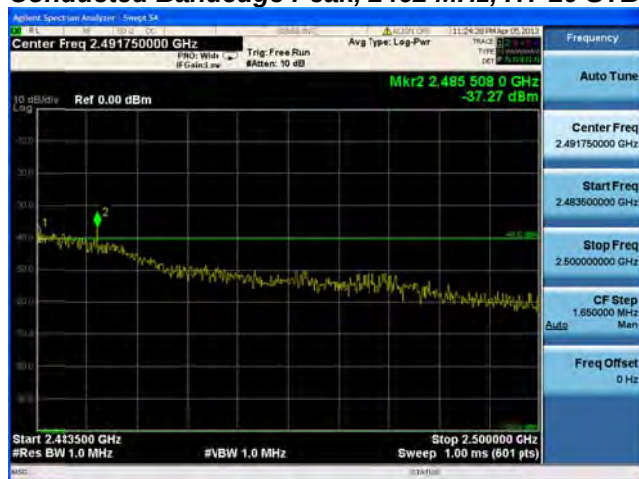
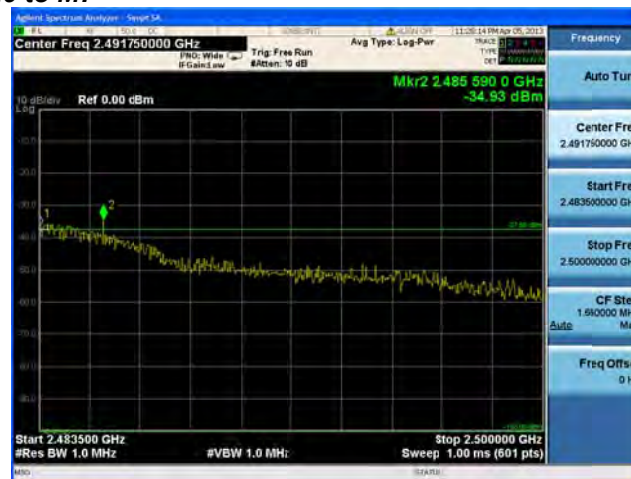
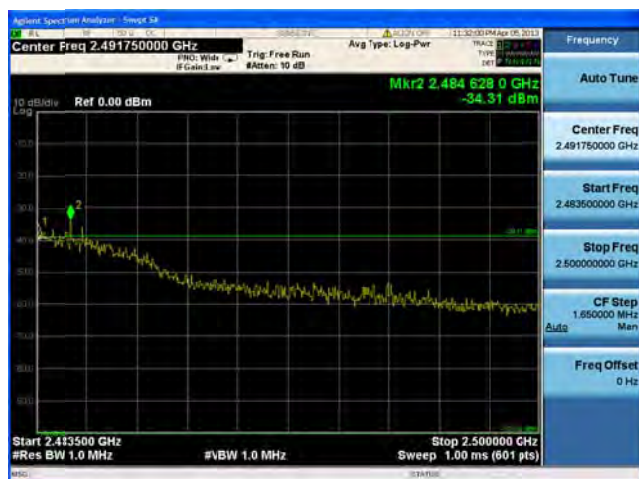
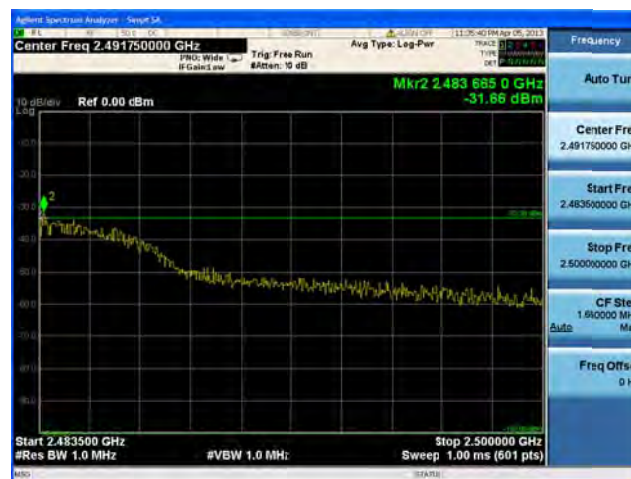
Conducted Bandedge Peak, 2462 MHz, HT-20 Beam Forming, M0 to M7**Antenna A****Antenna B****Antenna C****Antenna D**

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

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

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**

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



Conducted Test Setup Photo



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)	Margin (dB)
2412	Legacy CCK, 1 to 11 Mbps	1	44.07	<54	9.9
	Non HT-20, 6 to 54 Mbps	6	44.07	<54	9.9
	Non HT-20 Beam Forming, 6 to 54 Mbps	6	44.07	<54	9.9
	HT-20, M0 to M23	m0	44.07	<54	9.9
	HT-20 STBC, M0 to M7	m0	44.07	<54	9.9
	HT-20 Beam Forming, M0 to M23	m0	44.07	<54	9.9
2442	Legacy CCK, 1 to 11 Mbps	1	43.81	<54	10.19
	Non HT-20, 6 to 54 Mbps	6	43.81	<54	10.19
	Non HT-20 Beam Forming, 6 to 54 Mbps	6	43.81	<54	10.19
	HT-20, M0 to M23	m0	43.81	<54	10.19
	HT-20 STBC, M0 to M7	m0	43.81	<54	10.19
	HT-20 Beam Forming, M0 to M23	m0	43.81	<54	10.19
2462	Legacy CCK, 1 to 11 Mbps	1	43.68	<54	10.3
	Non HT-20, 6 to 54 Mbps	6	43.68	<54	10.3
	Non HT-20 Beam Forming, 6 to 54 Mbps	6	43.68	<54	10.3
	HT-20, M0 to M23	m0	43.68	<54	10.3
	HT-20 STBC, M0 to M7	m0	43.68	<54	10.3
	HT-20 Beam Forming, M0 to M23	m0	43.68	<54	10.3

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



Radiated Transmitter Spurs, 2442 MHz, All Rates, All Modes, Average





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



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



Radiated Transmitter Spurs, 2442 MHz, All Rates, All Modes, Peak



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

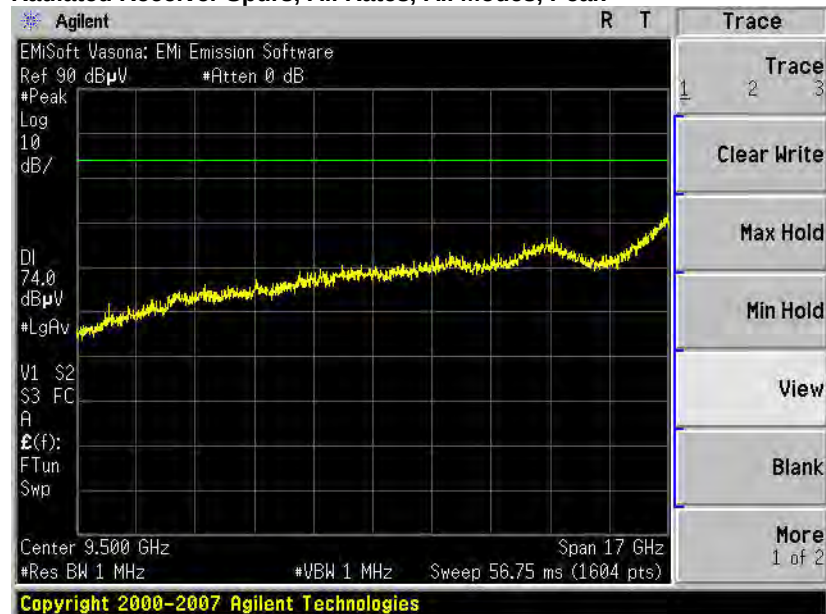


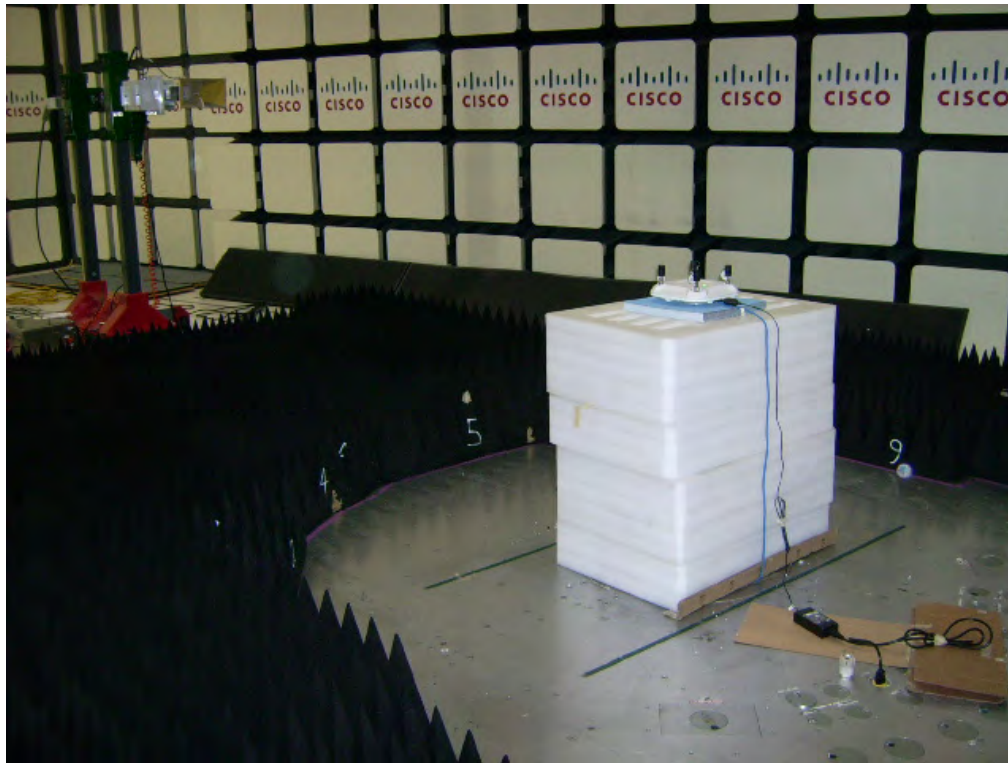
Receiver Radiated Spurious Emissions

Radiated Receiver Spurs, All Rates, All Modes, Average



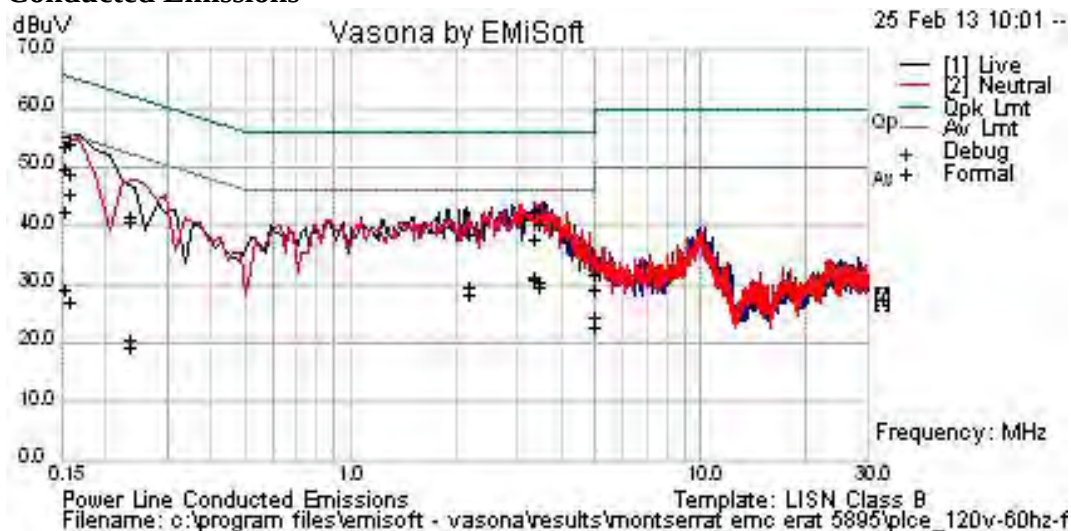
Radiated Receiver Spurs, All Rates, All Modes, Peak





Radiated Test Setup Photo

Conducted Emissions



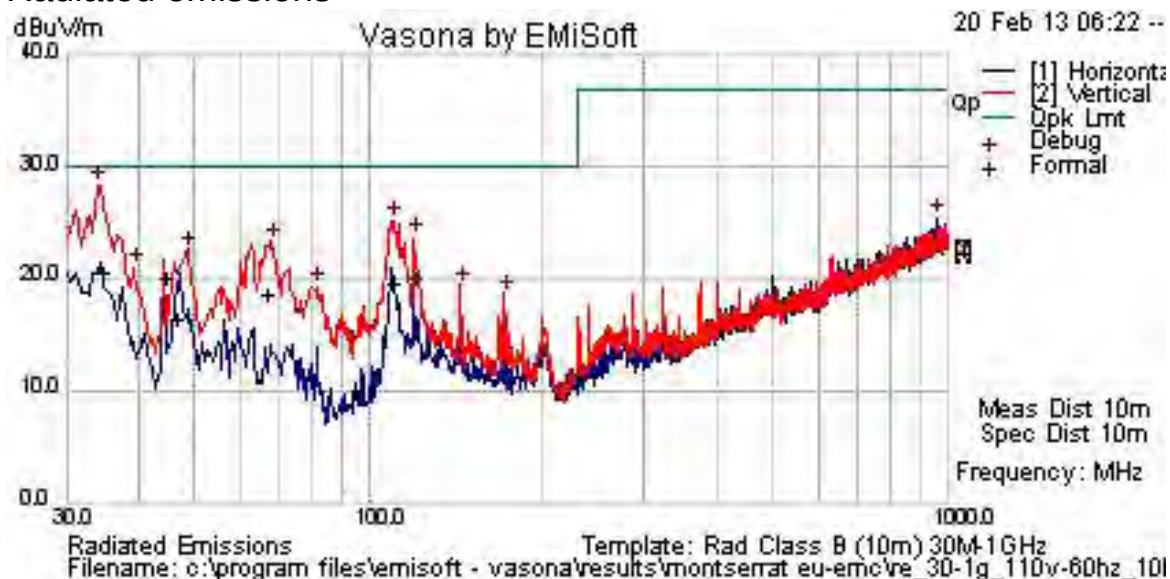
Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
0.15736	24	21.3	0.1	45.4	Av	N	55.6	-10.2	Pass	
0.15736	32.8	21.3	0.1	54.2	Qp	N	65.6	-11.4	Pass	
0.15288	32	21.4	0.1	53.5	Qp	N	65.8	-12.4	Pass	
3.424	22.7	20	0	42.8	Qp	N	56	-13.2	Pass	
0.15288	21	21.4	0.1	42.4	Av	L	55.8	-13.4	Pass	
3.351	22.5	20	0.1	42.6	Qp	N	56	-13.4	Pass	
3.351	11.1	20	0.1	31.2	Av	N	46	-14.8	Pass	
3.351	10.9	20	0.1	30.9	Av	L	46	-15.1	Pass	
3.424	20.3	20	0	40.3	Qp	L	56	-15.7	Pass	
3.424	10.2	20	0	30.3	Av	N	46	-15.7	Pass	
0.15288	28.1	21.4	0.1	49.6	Qp	L	65.8	-16.3	Pass	
3.424	9.4	20	0	29.5	Av	L	46	-16.5	Pass	
2.158	9.4	20	0	29.5	Av	N	46	-16.5	Pass	
0.15736	27.5	21.3	0.1	48.9	Qp	L	65.6	-16.7	Pass	
2.158	18.6	20	0	38.7	Qp	N	56	-17.3	Pass	
2.158	18.6	20	0	38.6	Qp	L	56	-17.4	Pass	
2.158	8.5	20	0	28.5	Av	L	46	-17.5	Pass	
3.351	17.6	20	0.1	37.6	Qp	L	56	-18.4	Pass	
0.23346	20.6	20.9	0	41.5	Qp	L	62.3	-20.8	Pass	
0.23346	19.8	20.9	0	40.7	Qp	N	62.3	-21.6	Pass	
4.916	4.3	20	0	24.4	Av	N	46	-21.6	Pass	
4.916	2.5	20	0	22.6	Av	L	46	-23.4	Pass	

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
4.916	11.8	20	0	31.9	Qp	N	56	-24.1	Pass	
0.15288	7.8	21.4	0.1	29.2	Av	N	55.8	-26.6	Pass	
4.916	9	20	0	29.1	Qp	L	56	-26.9	Pass	
0.15736	5.7	21.3	0.1	27.1	Av	L	55.6	-28.5	Pass	
0.23346	-0.1	20.9	0	20.8	Av	N	52.3	-31.6	Pass	
0.23346	-1.5	20.9	0	19.4	Av	L	52.3	-32.9	Pass	

**Title:** Power Line Conducted Emissions Test Setup

Radiated emissions



Test Results 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
34.65	30.1	0.6	-10.1	20.6	Qp	V	124	218	30	-9.4	Pass	
44.239	36.6	0.7	-17.2	20.2	Qp	V	198	221	30	-9.8	Pass	
120.013	32.5	1.2	-13.6	20.2	Qp	V	135	87	30	-9.8	Pass	
110.373	33.2	1.2	-14.7	19.7	Qp	V	131	175	30	-10.3	Pass	
66.612	37.4	1	-19.7	18.6	Qp	V	102	271	30	-11.4	Pass	
46.154	33.9	0.7	-18.3	16.3	Qp	V	254	195	30	-13.7	Pass	



Title: Radiated Emissions 10m Test Distance

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/cm²

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/cm²

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/cm²

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.

Frequency (MHz)	Power Density (mW/cm ²)	Peak Transmit Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)	Limit (cm)	Margin (cm)
2412	1	20.0	12	11.23	20	8.77
2437	1	21.1	12	12.71	20	7.29
2462	1	18.8	12	9.78	20	10.22

MPE Calculations

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 ²)	Limit (mW/cm ²)	Margin (mW/cm ²)
2412	20	20.0	12	0.32	1	0.68
2437	20	21.1	12	0.41	1	0.59
2462	20	18.8	12	0.24	1	0.76

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

Equip #	Manufacturer	Model	Description	Last Cal	Next Due
CIS004882	EMC Test Systems	3115	Double Ridged Guide Horn Antenna	04-Jun-12	04-Jun-13
CIS004927	Miteq	NSP1000-S1	Broadband Preamplifier	01-Feb-13	01-Feb-14
CIS007704	Fischer	FCC-LISN-50/250-50-2-01	LISN	11-May-12	11-May-13
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in	24-Aug-12	24-Aug-13
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in	24-Aug-12	24-Aug-13
CIS030652	Sunol Sciences	JB1	Combination Antenna, 30MHz-2GHz	04-Sep-12	04-Sep-13
CIS044940	Rohde & Schwarz	ESU40	EMI Test Receiver	08-May-12	08-May-13
CIS018313	HP	8447D	RF Preamplifier	08-Jan-13	08-Jan-14
CIS043116	Huber + Suhner	Sucoflex 104PE	N & SMA RF cable	14-Dec-12	14-Dec-13
CIS049381	Agilent	N9030A	Spectrum Analyzer	28-Aug-12	28-Aug-13