Test Report

FCC ID: LDK102096

AIR-AP1810W-B-K9, AIR-OEAP1810-B-K9

IC: 2461B-102096

AIR-AP1810W-A-K9, AIR-OEAP1810-A-K9

Cisco Aironet 802.11ac Dual Band Access Points

5250-5350 MHz

Against the following Specifications:

CFR47 Part 15.407

Cisco Systems
170 West Tasman Drive
San Jose, CA 95134

	
Author: Jose Aguirre **Tested By**	**Approved By:** Jim Nicholson **Title:** Technical Leader, Engineering **Revision:** 1

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Section 1: Overview

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

Specifications:
CFR47 Part 15.407

Measurements were made in accordance with

- ANSI C63.10:2013
- KDB 789033 D02 General UNII Test Procedures New Rules v01r01
- KDB 662911 D01 Multiple Transmitter Output v02r01

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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*%

e) All AC testing was performed at one or more of the following supply voltages:
110V 60 Hz (+/-20%)

Units of Measurement

The units of measurements defined in the appendices are reported in specific terms, which are test dependent. Where radiated measurements are concerned these are defined at a particular distance. Basic voltage measurements are defined in units of [dBuV]

As an example, the basic calculation for all measurements is as follows:

Emission level [dBuV] = Indicated voltage level [dBuV] + Cable Loss [dB] + Other correction factors [dB]

The combinations of correction factors are dependent upon the exact test configurations [see test equipment lists for further details] and may include:-

Antenna Factors, Pre Amplifier Gain, LISN Loss, Pulse Limiter Loss and Filter Insertion Loss

Note: to convert the results from dBuV/m to uV/m use the following formula:-

Level in uV/m = Common Antilogarithm [(X dBuV/m)/20] = Y uV/m

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Measurement Uncertainty Values

voltage and power measurements	± 2 dB
conducted EIRP measurements	± 1.4 dB
radiated measurements	± 3.2 dB
frequency measurements	± 2.4 10-7
temperature measurements	± 0.54º
humidity measurements	± 2.3%
DC and low frequency measurements	± 2.5%

Where relevant measurement uncertainty levels have been estimated for tests performed on the apparatus. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Radiated emissions (expanded uncertainty, confidence interval 95%)

30 MHz - 300 MHz	+/- 3.8 dB
300 MHz - 1000 MHz	+/- 4.3 dB
1 GHz - 10 GHz	+/- 4.0 dB
10 GHz - 18GHz	+/- 8.2 dB
18GHz - 26.5GHz	+/- 4.1 dB
26.5GHz - 40GHz	+/- 3.9 dB

Conducted emissions (expanded uncertainty, confidence interval 95%)

30 MHz – 40GHz	+/- 0.38 dB

A product is considered to comply with a requirement if the nominal measured value is below the limit line. The product is considered to not be in compliance in case the nominal measured value is above the limit line.

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2.2 Date of testing

01-Jan-16 - 22-Feb-16

2.3 Report Issue Date

08-March-2016

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2.4 Testing facilities

This assessment was performed by:

Testing Laboratory

Cisco Systems, Inc.,
125 West Tasman Drive
San Jose, CA 95134, USA

Registration Numbers for Industry Canada

Cisco System Site	Address	Site Identifier
Building P, 10m Chamber	125 West Tasman Dr San Jose, CA 95134	Company #: 2461N-2
Building P, 5m Chamber	125 West Tasman Dr San Jose, CA 95134	Company #: 2461N-1
Building I, 5m Chamber	285 W. Tasman Drive San Jose, California 95134	Company #: 2461M-1

Test Engineers

Jose Aguirre

2.5 Equipment Assessed (EUT)

AIR-AP1810W-B-K9

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2.6 EUT Description

The Cisco Aironet 802.11ac Radio supports 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.

802.11n/ac - Non HT20, One Antenna, 6 to 54 Mbps
802.11n/ac - Non HT20, Two Antennas, 6 to 54 Mbps

802.11n/ac - HT/VHT20, One Antenna, M0 to M7
802.11n/ac - HT/VHT20, Two Antennas, M0 to M7
802.11n/ac - HT/VHT20, Two Antennas, M8 to M15

802.11n/ac - HT/VHT20 Beam Forming, Two Antennas, M0 to M7
802.11n/ac - HT/VHT20 Beam Forming, Two Antennas, M8 to M15

802.11n/ac - HT/VHT20 STBC, Two Antennas, M0 to M7

802.11n/ac - Non HT40 Duplicate, One Antenna, 6 to 54 Mbps
802.11n/ac - Non HT40 Duplicate, Two Antennas, 6 to 54 Mbps

802.11n/ac - HT/VHT40, One Antenna, M0 to M7
802.11n/ac - HT/VHT40, Two Antennas, M0 to M7
802.11n/ac - HT/VHT40, Two Antennas, M8 to M15

802.11n/ac - HT/VHT40 Beam Forming, Two Antennas, M0 to M7
802.11n/ac - HT/VHT40 Beam Forming, Two Antennas, M8 to M15

802.11n/ac - HT/VHT40 STBC, Two Antennas, M0 to M7

802.11n/ac - Non HT80 Duplicate, One Antenna, 6 to 54 Mbps
802.11n/ac - Non HT80 Duplicate, Two Antennas, 6 to 54 Mbps

802.11ac - VHT80, One Antenna, M0 to M7
802.11ac - VHT80, Two Antennas, M0 to M7
802.11ac - VHT80, Two Antennas, M8 to M15

802.11ac - VHT80 Beam Forming, Two Antennas, M0 to M7
802.11ac - VHT80 Beam Forming, Two Antennas, M8 to M15

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 GHz	BlueTooth	Omni	2
2.4 / 5 GHz	2x2 Internal	Omni	2 / 4

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Section 3: Result Summary

3.1 Results Summary Table

Conducted emissions

Basic Standard	Technical Requirements / Details	Result
FCC 15.407	**99% & 26 dB Bandwidth:** The 99% occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. There is no limit for 99% OBW. The 26 dB emission is the width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.	Pass
FCC 15.407	**Output Power:** For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	Pass
FCC 15.407	**Power Spectral Density:** The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	Pass
FCC 15.407	**Conducted Spurious Emissions / Band-Edge:** For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27dBm/MHz.	Pass
FCC 15.407 FCC 15.209 FCC 15.205	**Restricted band:** Unwanted emissions must comply with the general field strength set forth in FCC 15.209.	Pass

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Radiated Emissions (General requirements)

Basic Standard	Technical Requirements / Details	Result
FCC 15.407 FCC 15.209 FCC 15.205	**TX Spurious Emissions:** Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the filed strength limits table in this section.	Pass
FCC 15.207	**AC conducted Emissions:** Except when the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply, either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table in these sections. The more stringent limit applies at the frequency range boundaries.	Pass

***** MPE calculation is recorded in a separate report

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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.

4.1 Sample Details

Sample No.	Equipment Details	Manufacturer	Hardware Rev.	Firmware Rev.	Software Rev.	Serial Number
S01	AIR-AP1810W-B-K9	Cisco Systems	01	8.1.10.159	Linux v3.4.103	RFDP2AHY202
S02*	AIR-PWR-C	Meanwell	A0	NA	NA	EB46E93226

(*) S02 are support equipment Power supplies for EUT S01

4.2 System Details

System #	Description	Samples
1	AIR-AP1810W-B-K9	S01
2	AIR-PWR-C	S02

4.3 Mode of Operation Details

Mode#	Description	Comments
1	Continuous Transmitting	Continuous Transmitting ≥98% duty cycle

All measurements were made in accordance with

- ANSI C63.10:2013
- KDB 789033 D02 General UNII Test Procedures New Rules v01r01
- KDB 662911 D01 Multiple Transmitter Output v02r01

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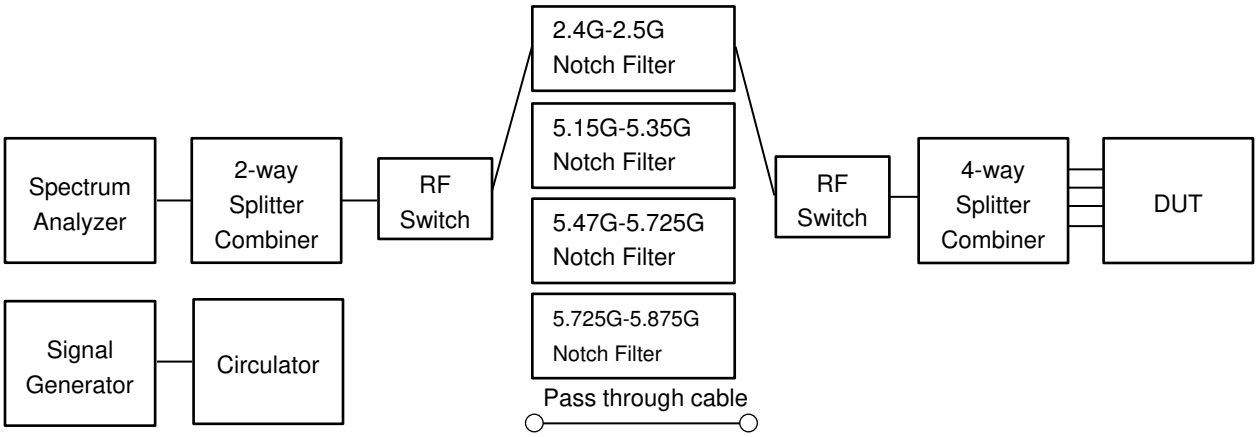
Appendix A: Emission Test Results

Testing Laboratory: Cisco Systems, Inc., 4125 Highlander Parkway, Richfield, OH, USA

Conducted Test Setup Diagram



Target Maximum Channel Power

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

	Maximum Channel Power (dBm)		
	Frequency (MHz)		
Operating Mode	5260	5280	5320
Non HT20, 6 to 54 Mbps	19	20	19
Non HT20 Beam Forming, 6 to 54 Mbps	19	20	19
HT/VHT20, M0 to M15, M0 to M9 1-0ss	19	19	19
HT/VHT20 Beam Forming, M0 to M15, M0 to M9 1-0ss	19	19	19
HT/VHT20 STBC, M0 to M7	19	19	19
	5270	5310	
Non HT40, 6 to 54 Mbps	20	17	
HT/VHT40, M0 to M15, M0 to M9 1-0ss	20	18	
HT/VHT40 Beam Forming, M0 to M15, M0 to M9 1-0ss	20	18	
HT/VHT40 STBC, M0 to M7	20	18	
	5290		
Non HT80, 6 to 54 Mbps	17		
VHT80, M0 to M15, M0 to M9 1-0ss	17		
VHT80 Beam Forming, M0 to M15, M0 to M9 1-0ss	17		
VHT80 STBC, M8 to M15	17		

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A.1 99% and 26dB Bandwidth

FCC 15.407 The 99% occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. There is no limit for 99% OBW.

The 26 dB emission is the width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.

Test Procedure

Ref. ANSI C63.10: 2013 Section 6.9.3

99% BW and EBW (-26dB)
Test Procedure
1. Set the radio in the continuous transmitting mode.
2. Allow the trace to stabilize.
3. Setting the x-dB bandwidth mode to -26dB and OBW power function to 99% within the measurement set up function.
4. Select the automatic OBW measurement function of an instrument to perform bandwidth measurement.
5. Capture graphs and record pertinent measurement data.

Ref. ANSI C63.10: 2013 Section 6.9.3

99% BW and EBW (-26dB)
Test parameters
Span = 1.5 x to 5.0 times OBW
RBW = approx. 1% to 5% of the OBW
VBW ≥ 3 x RBW
Detector = Peak or where practical sample shall be used
Trace = Max. Hold

System Number	Description	Samples	System under test	Support equipment
1	EUT	S01	☑	☐
	Support	S02	☐	☑

Tested By :	**Date of testing:**
Jose Aguirre	01-Jan-16 - 22-Feb-16
Test Result : PASS	

See Appendix C for list of test equipment

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Frequency (MHz)	Mode	Data Rate (Mbps)	26dB BW (MHz)	99% BW (MHz)
5260	Non HT20, 6 to 54 Mbps	6	21.2	17.3
	HT/VHT20, M0 to M15, M0 to M9 1-0ss	m0	21.8	18.2
5270	Non HT40, 6 to 54 Mbps	6	66.2	35.9
	HT/VHT40, M0 to M15, M0 to M9 1-0ss	m0	41.3	36.2
5290	Non HT80, 6 to 54 Mbps	6	82.8	75.6
	VHT80, M0 to M15, M0 to M9 1-0ss	m0x1	87.1	75.9
5280	Non HT20, 6 to 54 Mbps	6	21.4	17.3
	HT/VHT20, M0 to M15, M0 to M9 1-0ss	m0	21.1	18.2
5300	Non HT20, 6 to 54 Mbps	6	21.2	17.3
	HT/VHT20, M0 to M15, M0 to M9 1-0ss	m0	21.9	18.2
5310	Non HT40, 6 to 54 Mbps	6	39.9	35.5
	HT/VHT40, M0 to M15, M0 to M9 1-0ss	m0	40.8	36.0
5320	Non HT20, 6 to 54 Mbps	6	21.3	17.3
	HT/VHT20, M0 to M15, M0 to M9 1-0ss	m0	21.8	18.2

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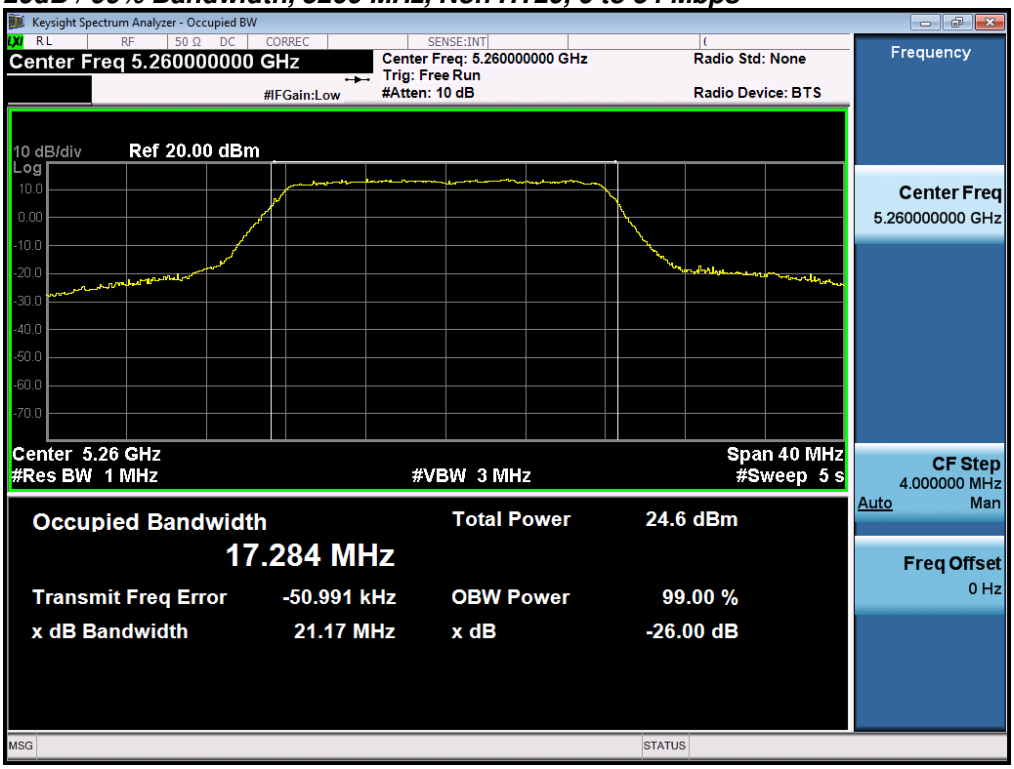
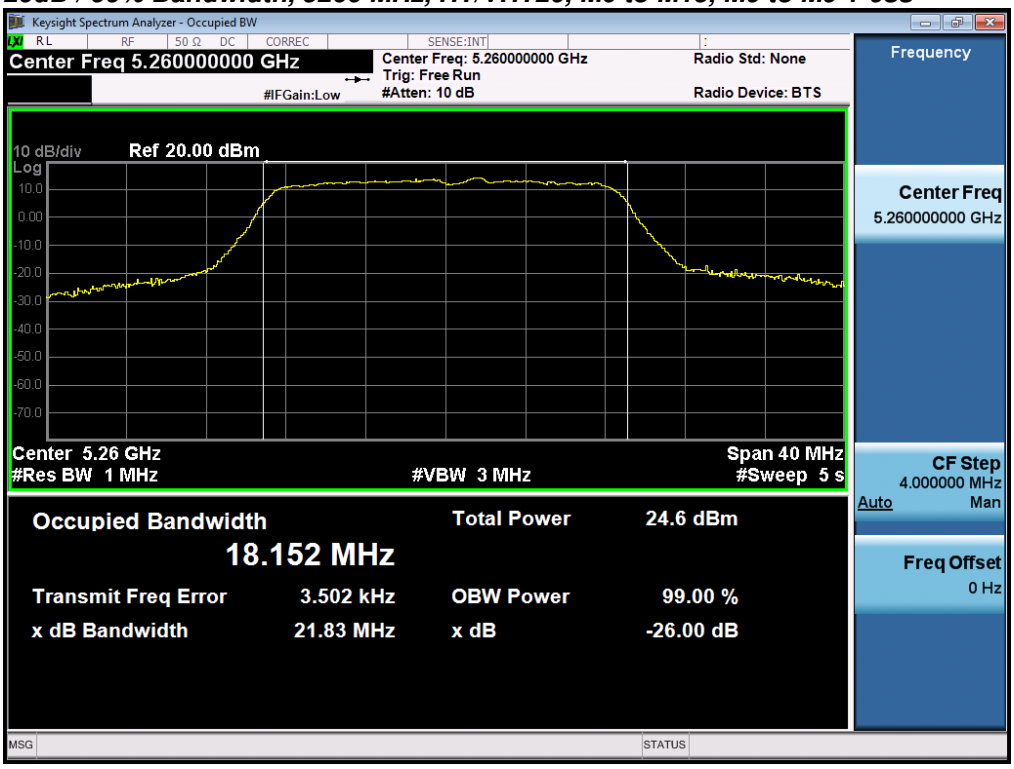
26dB / 99% Bandwidth, 5260 MHz, Non HT20, 6 to 54 Mbps



26dB / 99% Bandwidth, 5260 MHz, HT/VHT20, M0 to M15, M0 to M9 1-0ss



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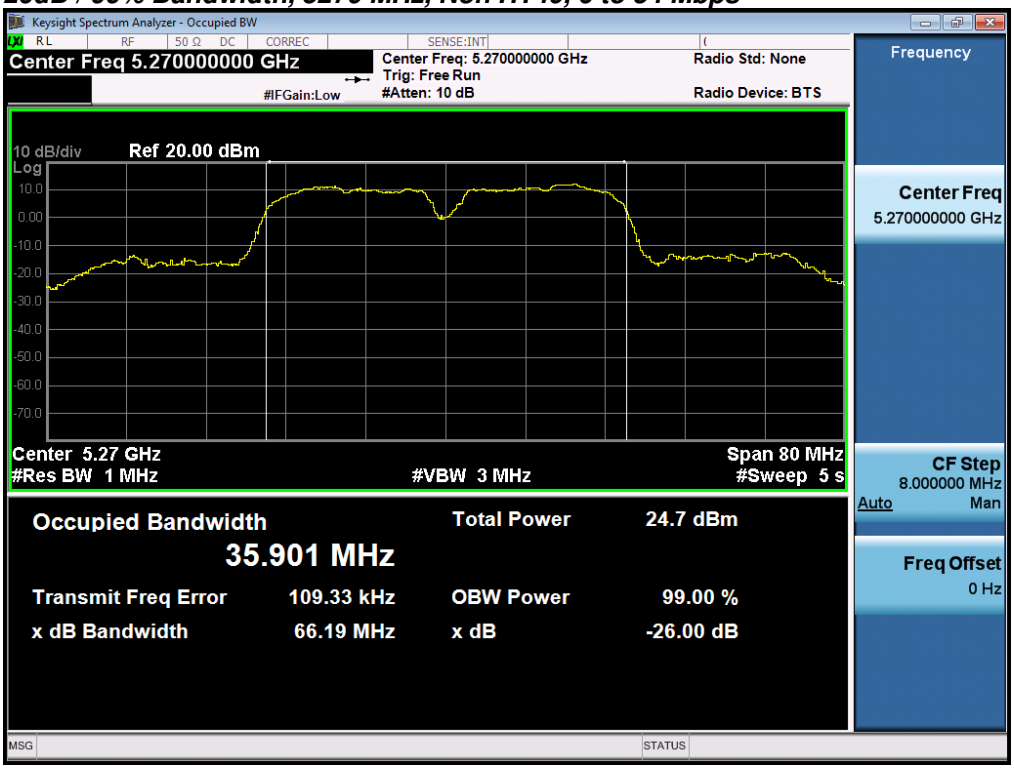
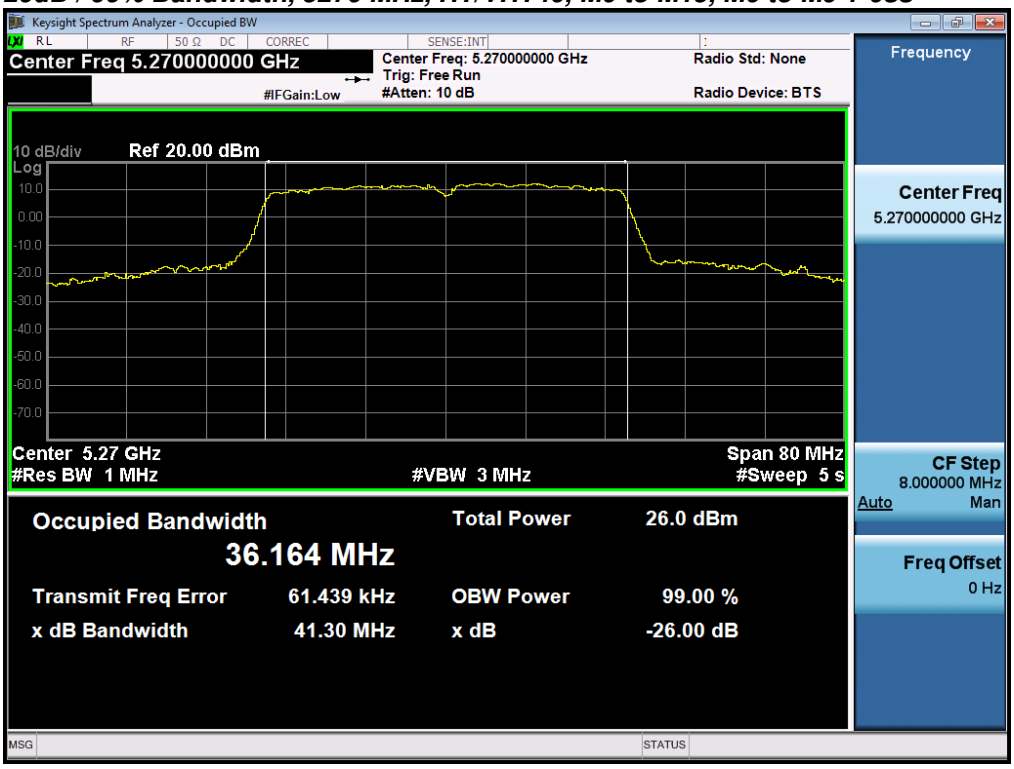
26dB / 99% Bandwidth, 5270 MHz, Non HT40, 6 to 54 Mbps



26dB / 99% Bandwidth, 5270 MHz, HT/VHT40, M0 to M15, M0 to M9 1-0ss



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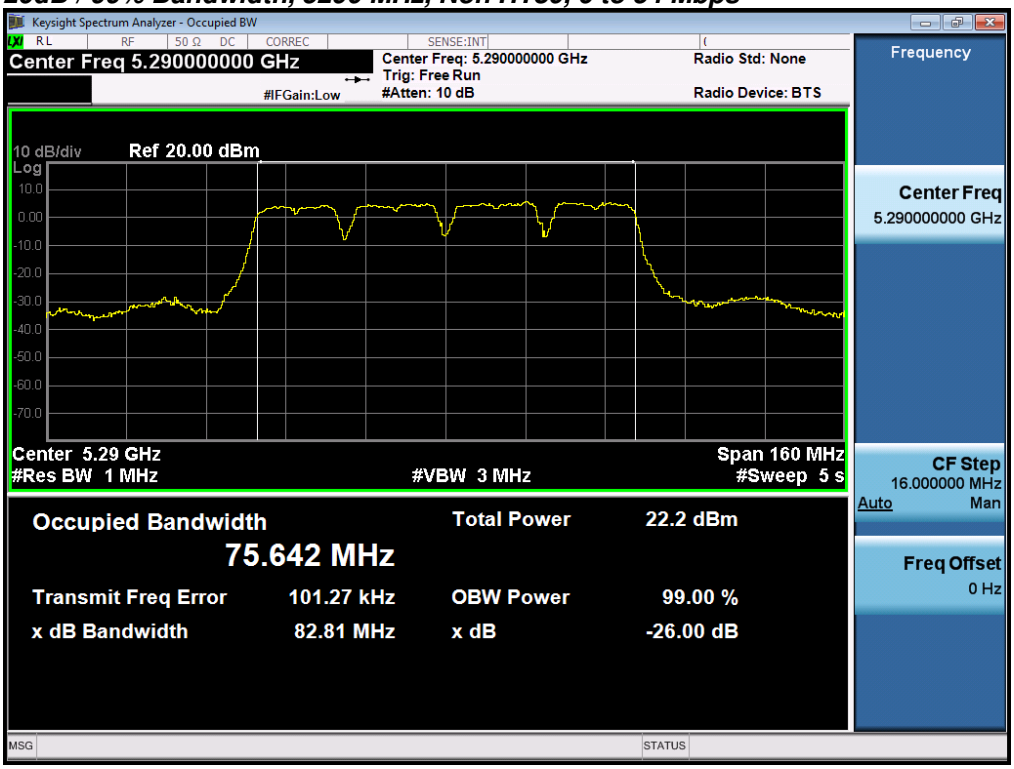
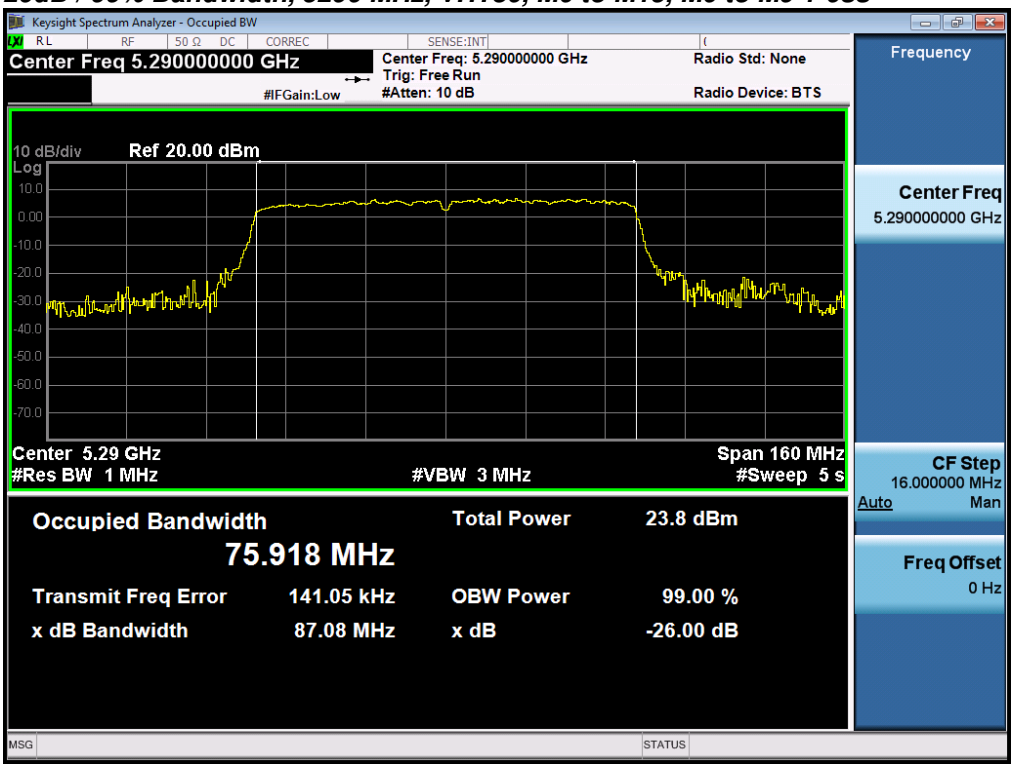
26dB / 99% Bandwidth, 5290 MHz, Non HT80, 6 to 54 Mbps



26dB / 99% Bandwidth, 5290 MHz, VHT80, M0 to M15, M0 to M9 1-0ss



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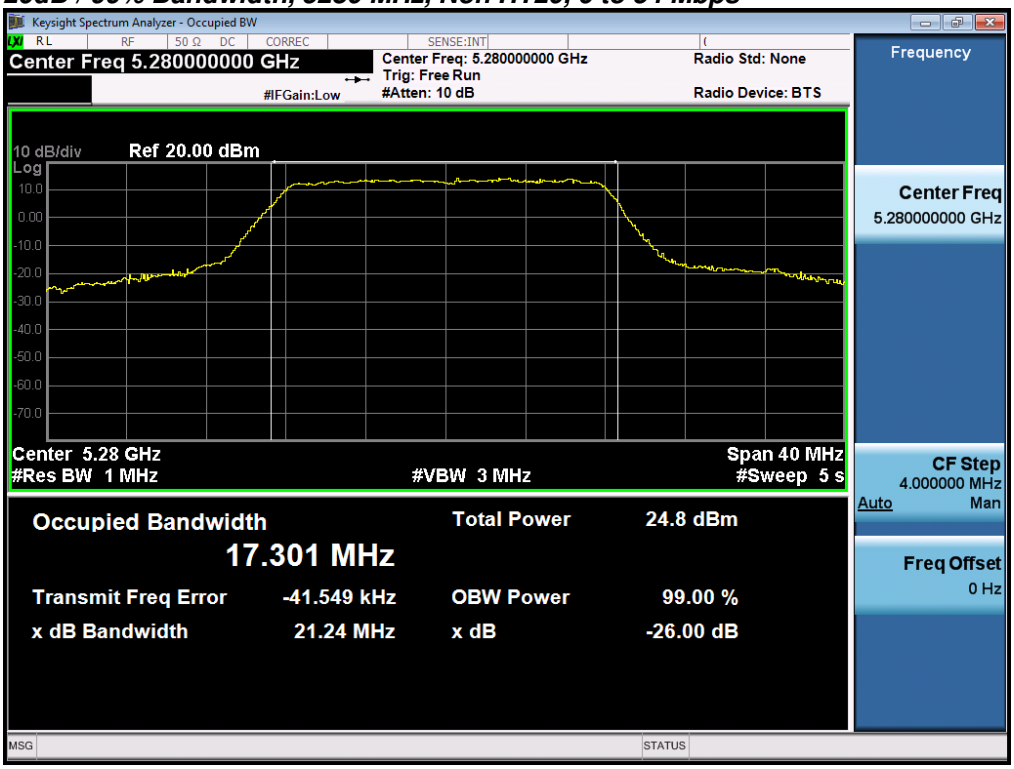
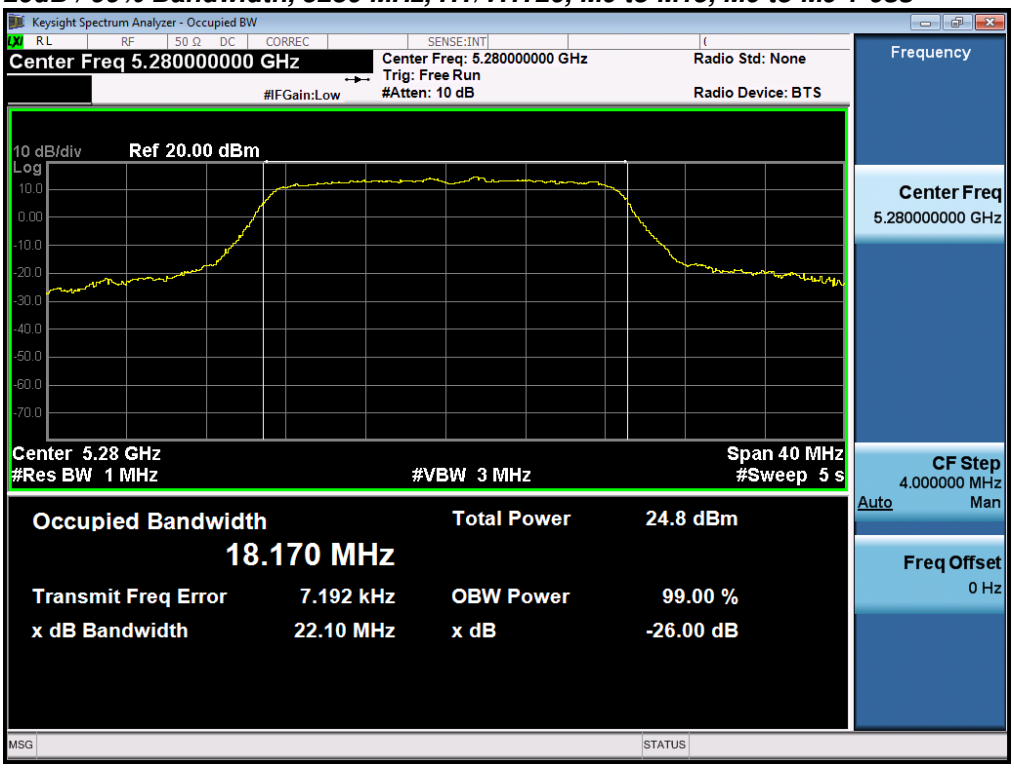
26dB / 99% Bandwidth, 5280 MHz, Non HT20, 6 to 54 Mbps



26dB / 99% Bandwidth, 5280 MHz, HT/VHT20, M0 to M15, M0 to M9 1-0ss



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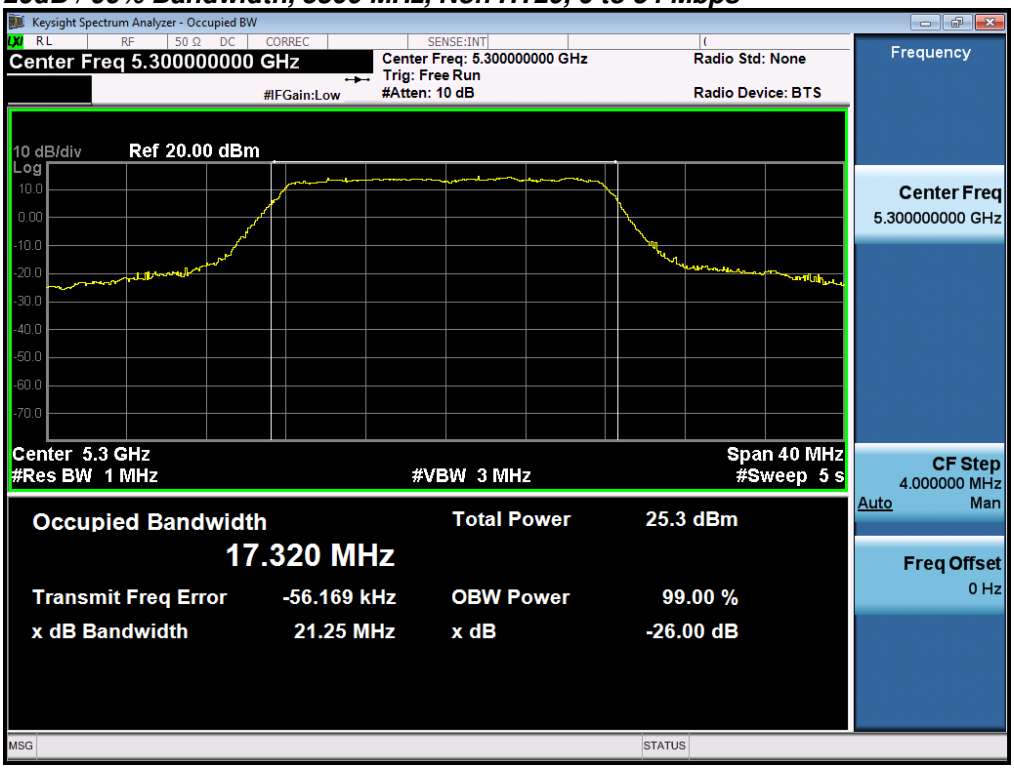
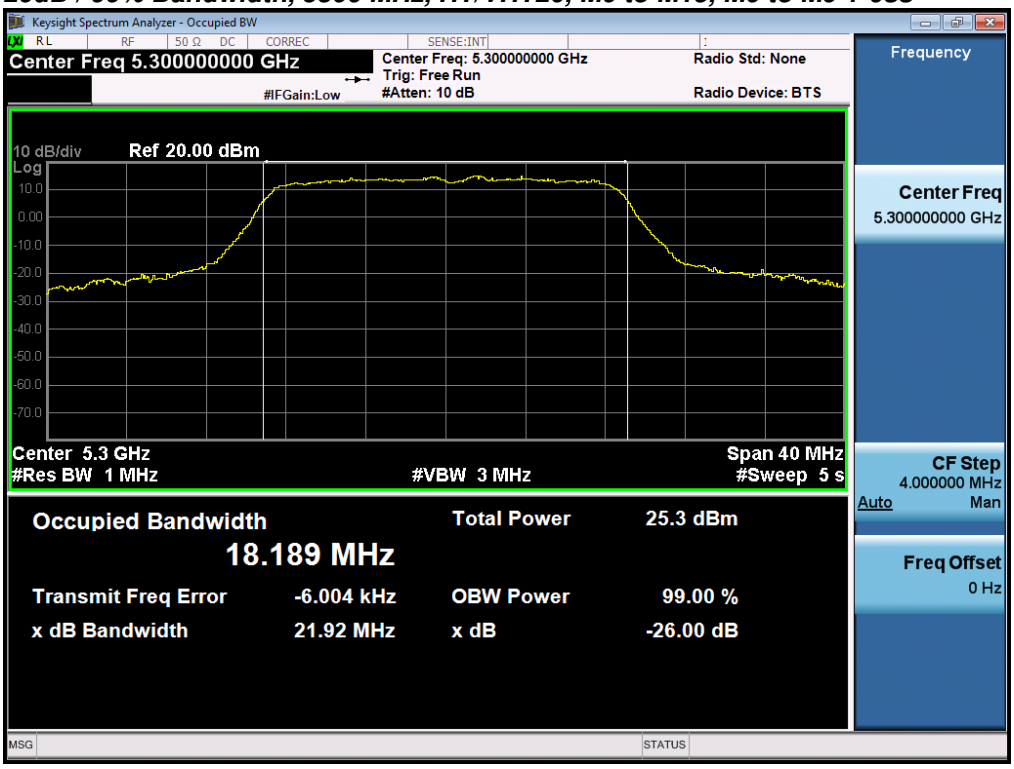
26dB / 99% Bandwidth, 5300 MHz, Non HT20, 6 to 54 Mbps



26dB / 99% Bandwidth, 5300 MHz, HT/VHT20, M0 to M15, M0 to M9 1-0ss



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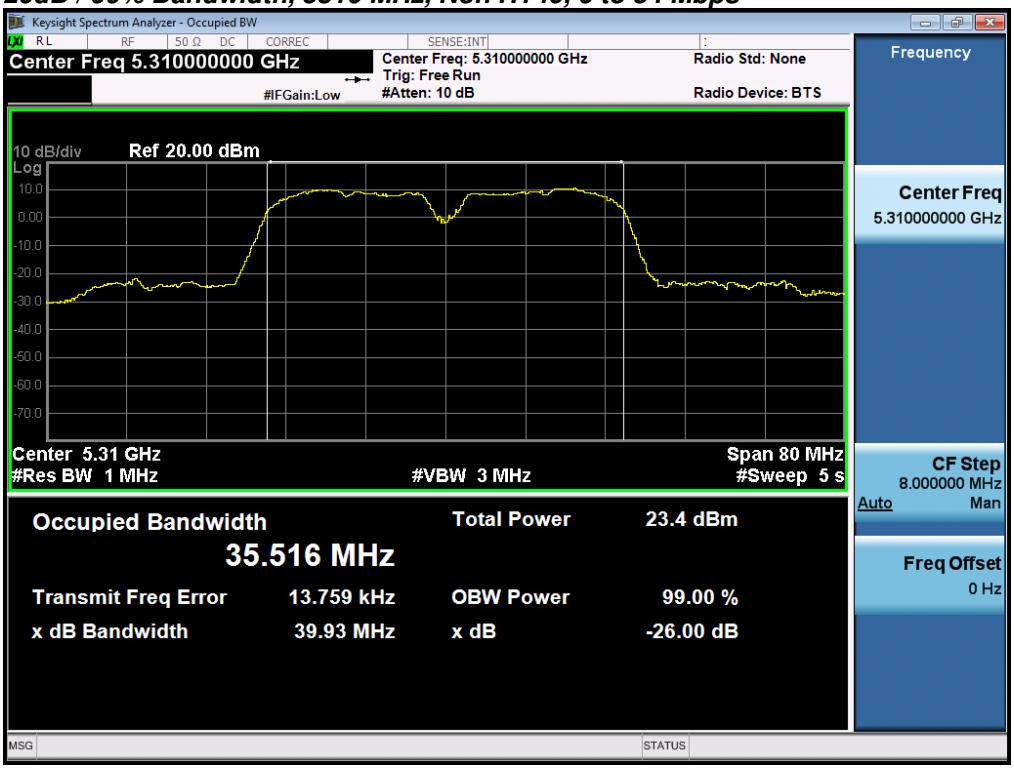
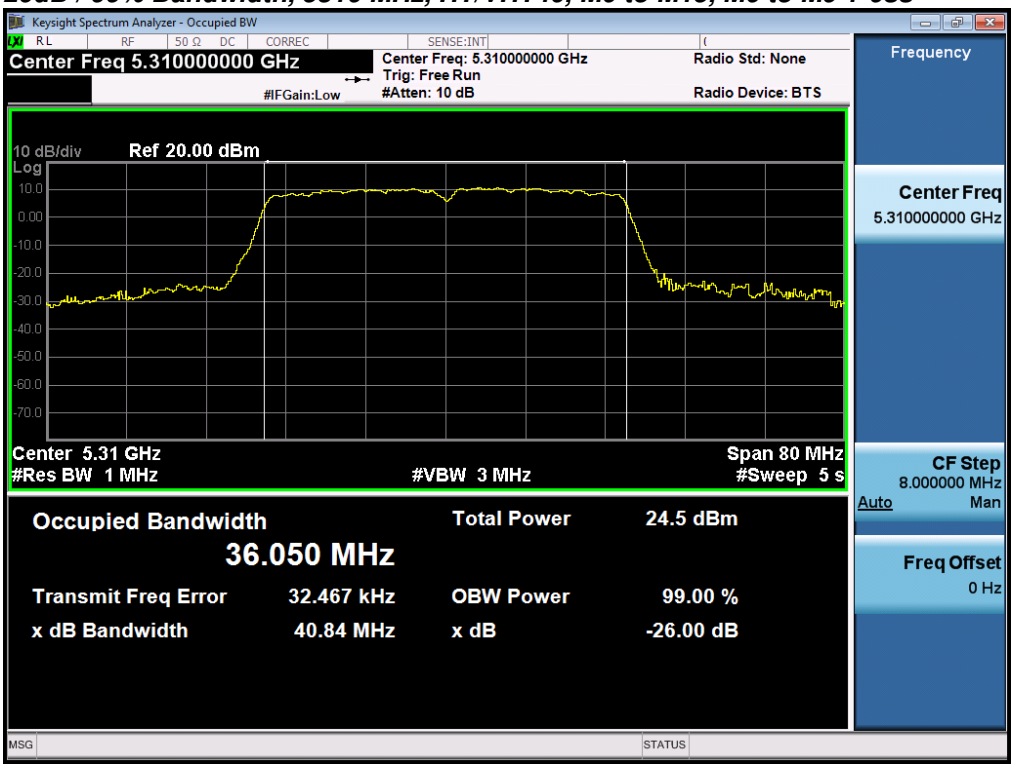
26dB / 99% Bandwidth, 5310 MHz, Non HT40, 6 to 54 Mbps



26dB / 99% Bandwidth, 5310 MHz, HT/VHT40, M0 to M15, M0 to M9 1-0ss



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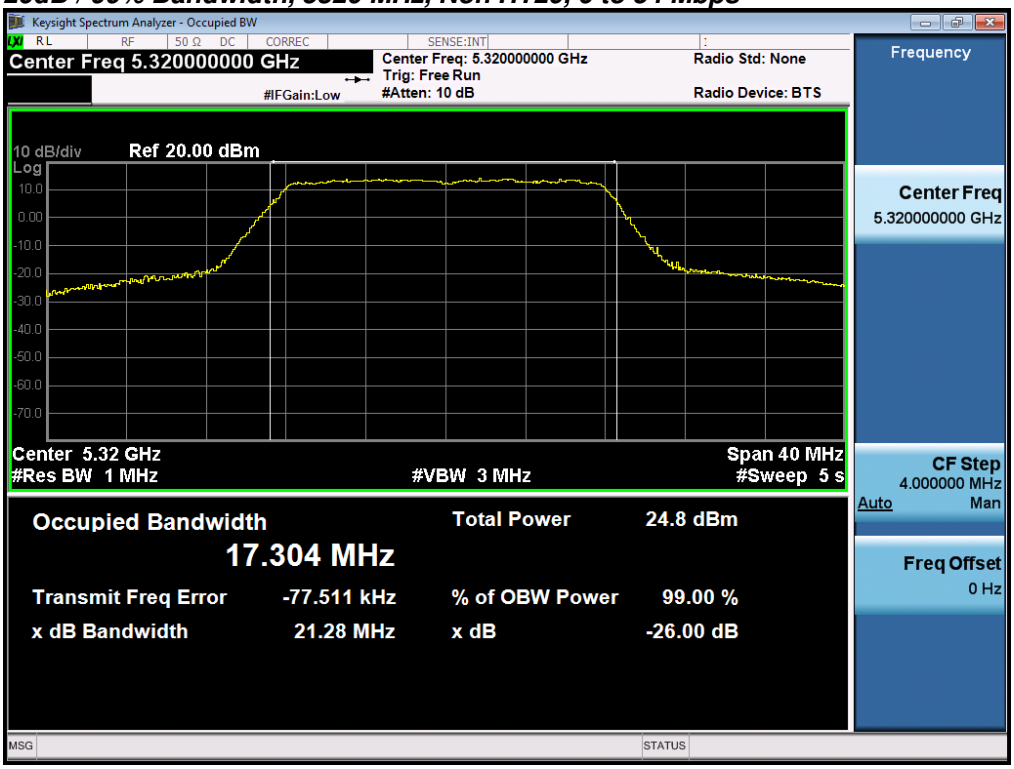
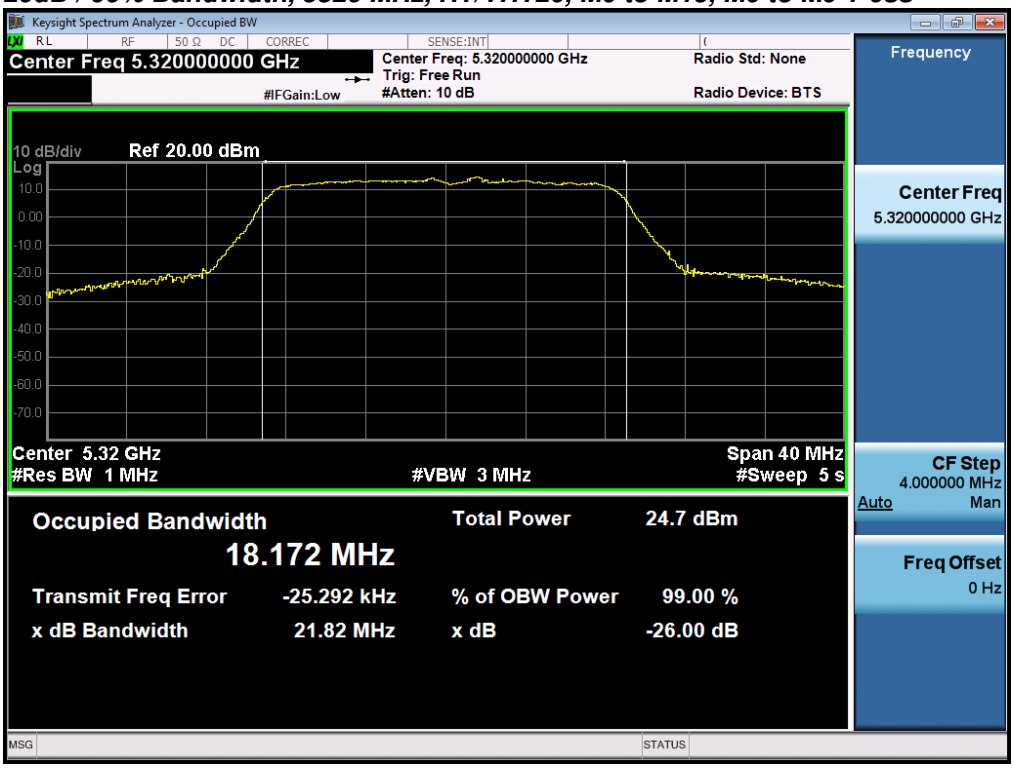
26dB / 99% Bandwidth, 5320 MHz, Non HT20, 6 to 54 Mbps



26dB / 99% Bandwidth, 5320 MHz, HT/VHT20, M0 to M15, M0 to M9 1-0ss



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A.2 Maximum Conducted Output Power/ Power Spectral Density

15.407 (2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

15.407 (5) The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

Test Procedure

Ref. KDB 789033 D02 General UNII Test Procedures New Rules v01r01
ANSI C63.10: 2013

Output Power Test Procedure
1. Set the radio in the continuous transmitting mode at full power 2. Compute power by integrating the spectrum across the EBW (or alternatively entire 99% OBW) of the signal using the instrument's band power measurement function. The integration shall be performed using the spectrum analyzer band-power measurement function with band limits set equal to the EBW or the OBW band edges. 3. Capture graphs and record pertinent measurement data.

Ref. KDB 789033 D02 General UNII Test Procedures New Rules v01r01
ANSI C63.10: 2013 section 12.3.2.2 Method SA-1

Output Power Test parameters
Span = >1.5 times the OBW RBW = 1MHz VBW ≥ 3 x RBW Sweep = Auto couple Detector = sample Trace = Trace Average 100

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. (See ANSI C63.10 section 14.3.2.2)

System Number	Description	Samples	System under test	Support equipment
1	EUT	S01	☑	☐
	Support	S02	☐	☑

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Tested By :	**Date of testing:**
Jose Aguirre	01-Jan-16 - 22-Feb-16
Test Result : PASS	

See Appendix C for list of test equipment

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Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Tx 2 Max Power (dBm)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
5260	Non HT20, 6 to 54 Mbps	1	4	16.3		16.3	23.4	7.1
	Non HT20, 6 to 54 Mbps	2	4	16.3	16.1	19.2	23.4	4.2
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	16.3	16.1	19.2	22.4	3.2
	HT/VHT20, M0 to M7	1	4	16.1		16.1	23.6	7.5
	HT/VHT20, M0 to M7	2	4	16.1	15.8	19.0	23.6	4.6
	HT/VHT20, M8 to M15	2	4	16.1	15.8	19.0	23.6	4.6
	HT/VHT20 Beam Forming, M0 to M7	2	7	16.1	15.8	19.0	22.6	3.6
	HT/VHT20 Beam Forming, M8 to M15	2	4	16.1	15.8	19.0	23.6	4.6
	HT/VHT20 STBC, M0 to M7	2	4	16.1	15.8	19.0	23.6	4.6
5270	Non HT40, 6 to 54 Mbps	1	4	16.7		16.7	24.0	7.3
	Non HT40, 6 to 54 Mbps	2	4	16.7	16.6	19.7	24.0	4.3
	HT/VHT40, M0 to M7	1	4	17.2		17.2	24.0	6.8
	HT/VHT40, M0 to M7	2	4	17.2	17.1	20.2	24.0	3.8
	HT/VHT40, M8 to M15	2	4	17.2	17.1	20.2	24.0	3.8
	HT/VHT40 Beam Forming, M0 to M7	2	7	17.2	17.1	20.2	23.0	2.8
	HT/VHT40 Beam Forming, M8 to M15	2	4	17.2	17.1	20.2	24.0	3.8
	HT/VHT40 STBC, M0 to M7	2	4	17.2	17.1	20.2	24.0	3.8
5290	Non HT80, 6 to 54 Mbps	1	4	14.0		14.0	24.0	10.0
	Non HT80, 6 to 54 Mbps	2	4	14.0	13.9	17.0	24.0	7.0
	VHT80, M0 to M7	1	4	14.5		14.5	24.0	9.5
	VHT80, M0 to M7	2	4	13.5	13.5	16.5	24.0	7.5
	VHT80, M8 to M15	2	4	13.5	13.5	16.5	24.0	7.5
	VHT80 Beam Forming, M0 to M7	2	4	13.5	13.5	16.5	24.0	7.5
	VHT80 Beam Forming, M8 to M15	2	4	13.5	13.5	16.5	24.0	7.5
	VHT80 STBC, M8 to M15	2	4	13.5	13.5	16.5	24.0	7.5
5280	Non HT20, 6 to 54 Mbps	1	4	16.6		16.6	23.4	6.8
	Non HT20, 6 to 54 Mbps	2	4	16.6	16.4	19.5	23.4	3.9
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	16.6	16.4	19.5	22.4	2.9
	HT/VHT20, M0 to M7	1	4	16.3		16.3	23.6	7.3
	HT/VHT20, M0 to M7	2	4	16.3	16.1	19.2	23.6	4.4
	HT/VHT20, M8 to M15	2	4	16.3	16.1	19.2	23.6	4.4

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	HT/VHT20 Beam Forming, M0 to M7	2	7	16.3	16.1	19.2	22.6	3.4
	HT/VHT20 Beam Forming, M8 to M15	2	4	16.3	16.1	19.2	23.6	4.4
	HT/VHT20 STBC, M0 to M7	2	4	16.3	16.1	19.2	23.6	4.4
5300	Non HT20, 6 to 54 Mbps	1	4	17.0		17.0	23.4	6.4
	Non HT20, 6 to 54 Mbps	2	4	17.0	16.9	20.0	23.4	3.4
	Non HT20 Beam Forming, 6 to 54 Mbps	**2**	**7**	**17.0**	**16.9**	**20.0**	**22.4**	**2.4**
	HT/VHT20, M0 to M7	1	4	16.8		16.8	23.6	6.8
	HT/VHT20, M0 to M7	2	4	16.8	16.7	19.8	23.6	3.8
	HT/VHT20, M8 to M15	2	4	16.8	16.7	19.8	23.6	3.8
	HT/VHT20 Beam Forming, M0 to M7	2	7	16.8	16.7	19.8	22.6	2.8
	HT/VHT20 Beam Forming, M8 to M15	2	4	16.8	16.7	19.8	23.6	3.8
	HT/VHT20 STBC, M0 to M7	2	4	16.8	16.7	19.8	23.6	3.8
5310	Non HT40, 6 to 54 Mbps	1	4	15.3		15.3	24.0	8.7
	Non HT40, 6 to 54 Mbps	2	4	14.3	14.2	17.3	24.0	6.7
	HT/VHT40, M0 to M7	1	4	15.8		15.8	24.0	8.2
	HT/VHT40, M0 to M7	2	4	14.8	14.7	17.8	24.0	6.2
	HT/VHT40, M8 to M15	2	4	14.8	14.7	17.8	24.0	6.2
	HT/VHT40 Beam Forming, M0 to M7	2	7	13.7	13.6	16.7	23.0	6.3
	HT/VHT40 Beam Forming, M8 to M15	2	4	14.8	14.7	17.8	24.0	6.2
	HT/VHT40 STBC, M0 to M7	2	4	14.8	14.7	17.8	24.0	6.2
5320	Non HT20, 6 to 54 Mbps	1	4	16.4		16.4	23.4	7.0
	Non HT20, 6 to 54 Mbps	2	4	16.4	16.6	19.5	23.4	3.9
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	16.4	16.6	19.5	22.4	2.9
	HT/VHT20, M0 to M7	1	4	16.0		16.0	23.6	7.6
	HT/VHT20, M0 to M7	2	4	16.0	16.2	19.1	23.6	4.5
	HT/VHT20, M8 to M15	2	4	16.0	16.2	19.1	23.6	4.5
	HT/VHT20 Beam Forming, M0 to M7	2	7	16.0	16.2	19.1	22.6	3.5
	HT/VHT20 Beam Forming, M8 to M15	2	4	16.0	16.2	19.1	23.6	4.5
	HT/VHT20 STBC, M0 to M7	2	4	16.0	16.2	19.1	23.6	4.5

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Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 PSD (dBm/MHz)	Tx 2 PSD (dBm/MHz)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Margin (dB)
5260	Non HT20, 6 to 54 Mbps	1	4	5.7		5.7	11.0	5.3
	Non HT20, 6 to 54 Mbps	2	7	5.7	5.5	8.6	10.0	1.4
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	5.7	5.5	8.6	10.0	1.4
	HT/VHT20, M0 to M7	1	4	5.3		5.3	11.0	5.7
	HT/VHT20, M0 to M7	2	7	5.3	4.7	8.0	10.0	2.0
	HT/VHT20, M8 to M15	2	4	5.3	4.7	8.0	11.0	3.0
	HT/VHT20 Beam Forming, M0 to M7	2	7	5.3	4.7	8.0	10.0	2.0
	HT/VHT20 Beam Forming, M8 to M15	2	4	5.3	4.7	8.0	11.0	3.0
	HT/VHT20 STBC, M0 to M7	2	4	5.3	4.7	8.0	11.0	3.0
5270	Non HT40, 6 to 54 Mbps	1	4	4.1		4.1	11.0	6.9
	Non HT40, 6 to 54 Mbps	2	7	4.1	4.1	7.1	10.0	2.9
	HT/VHT40, M0 to M7	1	4	3.7		3.7	11.0	7.3
	HT/VHT40, M0 to M7	2	7	3.7	3.4	6.6	10.0	3.4
	HT/VHT40, M8 to M15	2	4	3.7	3.4	6.6	11.0	4.4
	HT/VHT40 Beam Forming, M0 to M7	2	7	3.7	3.4	6.6	10.0	3.4
	HT/VHT40 Beam Forming, M8 to M15	2	4	3.7	3.4	6.6	11.0	4.4
	HT/VHT40 STBC, M0 to M7	2	4	3.7	3.4	6.6	11.0	4.4
5290	Non HT80, 6 to 54 Mbps	1	4	-1.9		-1.9	11.0	12.9
	Non HT80, 6 to 54 Mbps	2	7	-1.9	-2.3	0.9	10.0	9.1
	VHT80, M0 to M7	1	4	-2.1		-2.1	11.0	13.1
	VHT80, M0 to M7	2	4	-3.0	-3.1	0.0	11.0	11.0
	VHT80, M8 to M15	2	4	-3.0	-3.1	0.0	11.0	11.0
	VHT80 Beam Forming, M0 to M7	2	4	-3.0	-3.1	0.0	11.0	11.0
	VHT80 Beam Forming, M8 to M15	2	4	-3.0	-3.1	0.0	11.0	11.0
	VHT80 STBC, M8 to M15	2	4	-3.0	-3.1	0.0	11.0	11.0
5280	Non HT20, 6 to 54 Mbps	1	4	5.9		5.9	11.0	5.1
	Non HT20, 6 to 54 Mbps	2	7	5.9	5.6	8.8	10.0	1.2
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	5.9	5.6	8.8	10.0	1.2
	HT/VHT20, M0 to M7	1	4	5.5		5.5	11.0	5.5
	HT/VHT20, M0 to M7	2	7	5.5	5.3	8.4	10.0	1.6
	HT/VHT20, M8 to M15	2	4	5.5	5.3	8.4	11.0	2.6

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	HT/VHT20 Beam Forming, M0 to M7	2	7	5.5	5.3	8.4	10.0	1.6
	HT/VHT20 Beam Forming, M8 to M15	2	4	5.5	5.3	8.4	11.0	2.6
	HT/VHT20 STBC, M0 to M7	2	4	5.5	5.3	8.4	11.0	2.6
5300	Non HT20, 6 to 54 Mbps	1	4	6.5		6.5	11.0	4.5
	Non HT20, 6 to 54 Mbps	**2**	**7**	**6.5**	**6.5**	**9.5**	**10.0**	**0.5**
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	6.5	6.5	9.5	10.0	0.5
	HT/VHT20, M0 to M7	1	4	5.7		5.7	11.0	5.3
	HT/VHT20, M0 to M7	2	7	5.7	6.2	9.0	10.0	1.0
	HT/VHT20, M8 to M15	2	4	5.7	6.2	9.0	11.0	2.0
	HT/VHT20 Beam Forming, M0 to M7	2	7	5.7	6.2	9.0	10.0	1.0
	HT/VHT20 Beam Forming, M8 to M15	2	4	5.7	6.2	9.0	11.0	2.0
	HT/VHT20 STBC, M0 to M7	2	4	5.7	6.2	9.0	11.0	2.0
5310	Non HT40, 6 to 54 Mbps	1	4	2.4		2.4	11.0	8.6
	Non HT40, 6 to 54 Mbps	2	7	1.8	1.9	4.9	10.0	5.1
	HT/VHT40, M0 to M7	1	4	2.1		2.1	11.0	8.9
	HT/VHT40, M0 to M7	2	7	0.9	1.3	4.1	10.0	5.9
	HT/VHT40, M8 to M15	2	4	0.9	1.3	4.1	11.0	6.9
	HT/VHT40 Beam Forming, M0 to M7	2	7	-0.1	-0.2	2.9	10.0	7.1
	HT/VHT40 Beam Forming, M8 to M15	2	4	0.9	1.3	4.1	11.0	6.9
	HT/VHT40 STBC, M0 to M7	2	4	0.9	1.3	4.1	11.0	6.9
5320	Non HT20, 6 to 54 Mbps	1	4	5.7		5.7	11.0	5.3
	Non HT20, 6 to 54 Mbps	2	7	5.7	5.7	8.7	10.0	1.3
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	5.7	5.7	8.7	10.0	1.3
	HT/VHT20, M0 to M7	1	4	5.1		5.1	11.0	5.9
	HT/VHT20, M0 to M7	2	7	5.1	5.3	8.2	10.0	1.8
	HT/VHT20, M8 to M15	2	4	5.1	5.3	8.2	11.0	2.8
	HT/VHT20 Beam Forming, M0 to M7	2	7	5.1	5.3	8.2	10.0	1.8
	HT/VHT20 Beam Forming, M8 to M15	2	4	5.1	5.3	8.2	11.0	2.8
	HT/VHT20 STBC, M0 to M7	2	4	5.1	5.3	8.2	11.0	2.8

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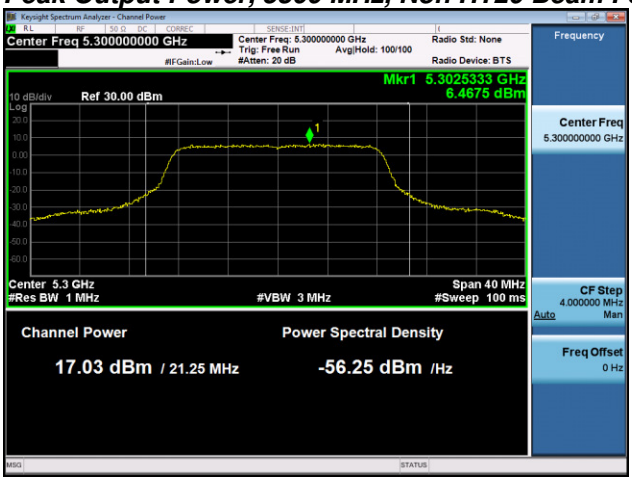
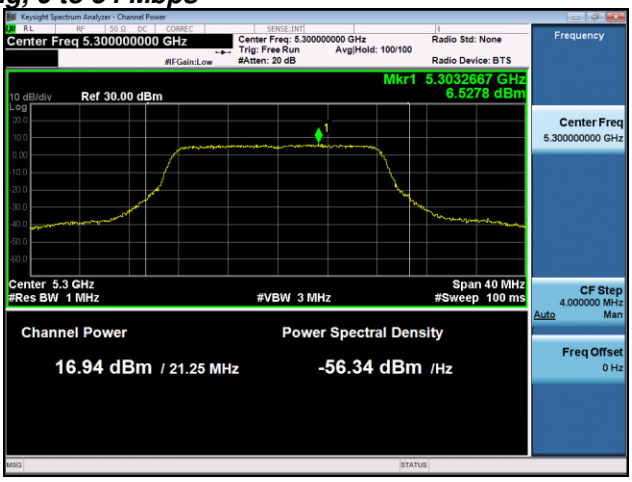
Peak Output Power, 5300 MHz, Non HT20 Beam Forming, 6 to 54 Mbps



Antenna A



Antenna B

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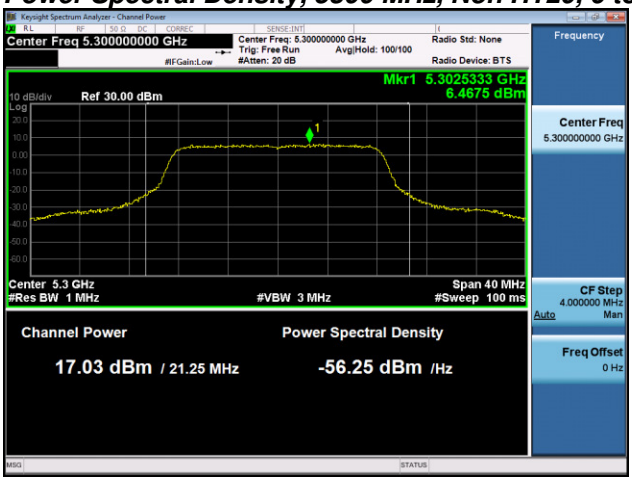
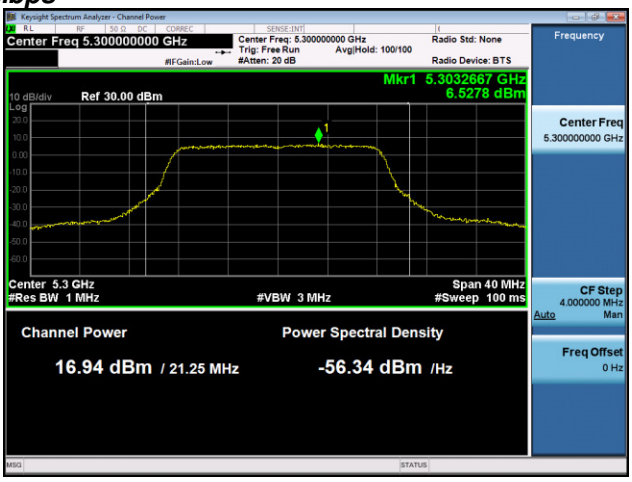
Power Spectral Density, 5300 MHz, Non HT20, 6 to 54 Mbps



Antenna A



Antenna B

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A.3 Conducted Spurious Emissions

15.407 (b) *Undesirable emission limits.* Except as shown in paragraph (b) (7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

> **(2)** For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
>
> **(6)** Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.
>
> (**7)** The provisions of §15.205 apply to intentional radiators operating under this section.

Use formula below to substitute conducted measurements in place of radiated measurements

E[dBµV/m] = EIRP[dBm] - 20 log(d[meters]) + 104.77, where E = field strength and d = 3 meter

1) Average Plot, Limit= -41.25 dBm eirp
2) Peak plot, Limit = -21.25 dBm eirp

Test Procedure

Ref. KDB 789033 D02 General UNII Test Procedures New Rules v01r01
ANSI C63.10: 2013

Conducted Spurious Emissions Test Procedure
1. Connect the antenna port(s) to the spectrum analyzer input. 2. Place the radio in continuous transmit mode. Use the procedures in KDB 789033 D02 General UNII Test Procedures New Rules v01 to substitute conducted measurements in place of radiated measurements. 3. Configure Spectrum analyzer as per test parameters below (be sure to enter all losses between the transmitter output and the spectrum analyzer). 4. Record the marker waveform peak to spur difference. Also measure any emissions in the restricted bands. 5. 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. The worst case output is recorded. 6. Capture graphs and record pertinent measurement data.

Ref. KDB 789033 D02 General UNII Test Procedures New Rules v01r01
ANSI C63.10: 2013 section 12.7.7.3 (average) & 12.7.6 (peak)

Conducted Spurious Emissions Test parameters
Span = 30MHz to 18GHz / 18GHz to 40GHz RBW = 1 MHz VBW ≥ 3 x RBW for Peak, 1kHz for Average Sweep = Auto couple Detector = Peak Trace = Max Hold.

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System Number	Description	Samples	System under test	Support equipment
1	EUT	S01	☑	☐
	Support	S02	☐	☑

Tested By :	**Date of testing:**
Jose Aguirre	01-Jan-16 - 22-Feb-16
Test Result : PASS	

See Appendix C for list of test equipment

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Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Tx 2 Spur Power (dBm)	Total Conducted Spur (dBm)	Limit (dBm)	Margin (dB)
5260	Non HT20, 6 to 54 Mbps	1	4	-58.2		-54.2	-41.25	13.0
	Non HT20, 6 to 54 Mbps	2	4	-58.2	-58.2	-51.2	-41.25	9.9
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	-58.2	-58.2	-48.2	-41.25	6.9
	HT/VHT20, M0 to M7	1	4	-58.1		-54.1	-41.25	12.9
	HT/VHT20, M0 to M7	2	4	-58.1	-58.2	-51.1	-41.25	9.9
	HT/VHT20, M8 to M15	2	4	-58.1	-58.2	-51.1	-41.25	9.9
	HT/VHT20 Beam Forming, M0 to M7	2	7	-58.1	-58.2	-48.1	-41.25	6.9
	HT/VHT20 Beam Forming, M8 to M15	2	4	-58.1	-58.2	-51.1	-41.25	9.9
	HT/VHT20 STBC, M0 to M7	2	4	-58.1	-58.2	-51.1	-41.25	9.9
5270	Non HT40, 6 to 54 Mbps	1	4	-58.3		-54.3	-41.25	13.1
	Non HT40, 6 to 54 Mbps	2	4	-58.3	-58.3	-51.3	-41.25	10.0
	HT/VHT40, M0 to M7	1	4	-58.3		-54.3	-41.25	13.1
	HT/VHT40, M0 to M7	2	4	-58.3	-58.2	-51.2	-41.25	10.0
	HT/VHT40, M8 to M15	2	4	-58.3	-58.2	-51.2	-41.25	10.0
	HT/VHT40 Beam Forming, M0 to M7	2	7	-58.3	-58.2	-48.2	-41.25	7.0
	HT/VHT40 Beam Forming, M8 to M15	2	4	-58.3	-58.2	-51.2	-41.25	10.0
	HT/VHT40 STBC, M0 to M7	2	4	-58.3	-58.2	-51.2	-41.25	10.0
5290	Non HT80, 6 to 54 Mbps	1	4	-58.3		-54.3	-41.25	13.1
	Non HT80, 6 to 54 Mbps	2	4	-58.3	-58.2	-51.2	-41.25	10.0
	VHT80, M0 to M7	1	4	-58.2		-54.2	-41.25	13.0
	VHT80, M0 to M7	2	4	-58.3	-58.2	-51.2	-41.25	10.0
	VHT80, M8 to M15	2	4	-58.3	-58.2	-51.2	-41.25	10.0
	VHT80 Beam Forming, M0 to M7	2	4	-58.3	-58.2	-51.2	-41.25	10.0
	VHT80 Beam Forming, M8 to M15	2	4	-58.3	-58.2	-51.2	-41.25	10.0
	VHT80 STBC, M8 to M15	2	4	-58.3	-58.2	-51.2	-41.25	10.0
5280	Non HT20, 6 to 54 Mbps	1	4	-58.3		-54.3	-41.25	13.1
	Non HT20, 6 to 54 Mbps	2	4	-58.3	-58.2	-51.2	-41.25	10.0
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	-58.3	-58.2	-48.2	-41.25	7.0
	HT/VHT20, M0 to M7	1	4	-58.3		-54.3	-41.25	13.1
	HT/VHT20, M0 to M7	2	4	-58.3	-58.2	-51.2	-41.25	10.0
	HT/VHT20, M8 to M15	2	4	-58.3	-58.2	-51.2	-41.25	10.0

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	HT/VHT20 Beam Forming, M0 to M7	2	7	-58.3	-58.2	-48.2	-41.25	7.0
	HT/VHT20 Beam Forming, M8 to M15	2	4	-58.3	-58.2	-51.2	-41.25	10.0
	HT/VHT20 STBC, M0 to M7	2	4	-58.3	-58.2	-51.2	-41.25	10.0
5300	Non HT20, 6 to 54 Mbps	1	4	-58.0		-54.0	-41.25	12.8
	Non HT20, 6 to 54 Mbps	2	4	-58.0	-57.9	-50.9	-41.25	9.7
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	-58.0	-57.9	-47.9	-41.25	6.7
	HT/VHT20, M0 to M7	1	4	-57.9		-53.9	-41.25	12.7
	HT/VHT20, M0 to M7	2	4	-57.9	-58.0	-50.9	-41.25	9.7
	HT/VHT20, M8 to M15	2	4	-57.9	-58.0	-50.9	-41.25	9.7
	HT/VHT20 Beam Forming, M0 to M7	2	7	-57.9	-58.0	-47.9	-41.25	6.7
	HT/VHT20 Beam Forming, M8 to M15	2	4	-57.9	-58.0	-50.9	-41.25	9.7
	HT/VHT20 STBC, M0 to M7	2	4	-57.9	-58.0	-50.9	-41.25	9.7
5310	Non HT40, 6 to 54 Mbps	1	4	-58.1		-54.1	-41.25	12.9
	Non HT40, 6 to 54 Mbps	2	4	-58.0	-57.9	-50.9	-41.25	9.7
	HT/VHT40, M0 to M7	1	4	-57.9		-53.9	-41.25	12.7
	HT/VHT40, M0 to M7	2	4	-57.9	-58.0	-50.9	-41.25	9.7
	HT/VHT40, M8 to M15	2	4	-57.9	-58.0	-50.9	-41.25	9.7
	HT/VHT40 Beam Forming, M0 to M7	2	7	-57.9	-58.0	-47.9	-41.25	6.7
	HT/VHT40 Beam Forming, M8 to M15	2	4	-57.9	-58.0	-50.9	-41.25	9.7
	HT/VHT40 STBC, M0 to M7	2	4	-57.9	-58.0	-50.9	-41.25	9.7
5320	Non HT20, 6 to 54 Mbps	1	4	-56.5		-52.5	-41.25	11.3
	Non HT20, 6 to 54 Mbps	2	4	-56.5	-56.6	-49.5	-41.25	8.3
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	-56.5	-56.6	-46.5	-41.25	5.3
	HT/VHT20, M0 to M7	1	4	-56.5		-52.5	-41.25	11.3
	HT/VHT20, M0 to M7	2	4	-56.5	-54.8	-48.6	-41.25	7.3
	HT/VHT20, M8 to M15	2	4	-56.5	-54.8	-48.6	-41.25	7.3
	HT/VHT20 Beam Forming, M0 to M7	**2**	**7**	**-56.5**	**-54.8**	**-45.6**	**-41.25**	**4.3**
	HT/VHT20 Beam Forming, M8 to M15	2	4	-56.5	-54.8	-48.6	-41.25	7.3
	HT/VHT20 STBC, M0 to M7	2	4	-56.5	-54.8	-48.6	-41.25	7.3

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Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Tx 2 Spur Power (dBm)	Total Conducted Spur (dBm)	Limit (dBm)	Margin (dB)
5260	Non HT20, 6 to 54 Mbps	1	4	-45.0		-41.0	-21.25	19.8
	Non HT20, 6 to 54 Mbps	2	4	-45.0	-44.6	-37.8	-21.25	16.5
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	-45.0	-44.6	-34.8	-21.25	13.5
	HT/VHT20, M0 to M7	1	4	-45.4		-41.4	-21.25	20.2
	HT/VHT20, M0 to M7	2	4	-45.4	-44.6	-38.0	-21.25	16.7
	HT/VHT20, M8 to M15	2	4	-45.4	-44.6	-38.0	-21.25	16.7
	HT/VHT20 Beam Forming, M0 to M7	2	7	-45.4	-44.6	-35.0	-21.25	13.7
	HT/VHT20 Beam Forming, M8 to M15	2	4	-45.4	-44.6	-38.0	-21.25	16.7
	HT/VHT20 STBC, M0 to M7	2	4	-45.4	-44.6	-38.0	-21.25	16.7
5270	Non HT40, 6 to 54 Mbps	1	4	-45.7		-41.7	-21.25	20.5
	Non HT40, 6 to 54 Mbps	2	4	-45.7	-45.1	-38.4	-21.25	17.1
	HT/VHT40, M0 to M7	1	4	-45.2		-41.2	-21.25	20.0
	HT/VHT40, M0 to M7	2	4	-45.2	-44.5	-37.8	-21.25	16.6
	HT/VHT40, M8 to M15	2	4	-45.2	-44.5	-37.8	-21.25	16.6
	HT/VHT40 Beam Forming, M0 to M7	2	7	-45.2	-44.5	-34.8	-21.25	13.6
	HT/VHT40 Beam Forming, M8 to M15	2	4	-45.2	-44.5	-37.8	-21.25	16.6
	HT/VHT40 STBC, M0 to M7	2	4	-45.2	-44.5	-37.8	-21.25	16.6
5290	Non HT80, 6 to 54 Mbps	1	4	-44.6		-40.6	-21.25	19.4
	Non HT80, 6 to 54 Mbps	2	4	-44.6	-45.1	-37.8	-21.25	16.6
	VHT80, M0 to M7	1	4	-45.5		-41.5	-21.25	20.3
	VHT80, M0 to M7	2	4	-44.6	-44.7	-37.6	-21.25	16.4
	VHT80, M8 to M15	2	4	-44.6	-44.7	-37.6	-21.25	16.4
	VHT80 Beam Forming, M0 to M7	2	4	-44.6	-44.7	-37.6	-21.25	16.4
	VHT80 Beam Forming, M8 to M15	2	4	-44.6	-44.7	-37.6	-21.25	16.4
	VHT80 STBC, M8 to M15	2	4	-44.6	-44.7	-37.6	-21.25	16.4
5280	Non HT20, 6 to 54 Mbps	1	4	-45.6		-41.6	-21.25	20.4
	Non HT20, 6 to 54 Mbps	2	4	-45.6	-45.7	-38.6	-21.25	17.4
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	-45.6	-45.7	-35.6	-21.25	14.4
	HT/VHT20, M0 to M7	1	4	-45.0		-41.0	-21.25	19.8
	HT/VHT20, M0 to M7	2	4	-45.0	-44.7	-37.8	-21.25	16.6
	HT/VHT20, M8 to M15	2	4	-45.0	-44.7	-37.8	-21.25	16.6

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	HT/VHT20 Beam Forming, M0 to M7	2	7	-45.0	-44.7	-34.8	-21.25	13.6
	HT/VHT20 Beam Forming, M8 to M15	2	4	-45.0	-44.7	-37.8	-21.25	16.6
	HT/VHT20 STBC, M0 to M7	2	4	-45.0	-44.7	-37.8	-21.25	16.6
5300	Non HT20, 6 to 54 Mbps	1	4	-44.7		-40.7	-21.25	19.5
	Non HT20, 6 to 54 Mbps	2	4	-44.7	-44.9	-37.8	-21.25	16.5
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	-44.7	-44.9	-34.8	-21.25	13.5
	HT/VHT20, M0 to M7	1	4	-44.6		-40.6	-21.25	19.4
	HT/VHT20, M0 to M7	2	4	-44.6	-44.8	-37.7	-21.25	16.4
	HT/VHT20, M8 to M15	2	4	-44.6	-44.8	-37.7	-21.25	16.4
	HT/VHT20 Beam Forming, M0 to M7	**2**	**7**	**-44.6**	**-44.8**	**-34.7**	**-21.25**	**13.4**
	HT/VHT20 Beam Forming, M8 to M15	2	4	-44.6	-44.8	-37.7	-21.25	16.4
	HT/VHT20 STBC, M0 to M7	2	4	-44.6	-44.8	-37.7	-21.25	16.4
5310	Non HT40, 6 to 54 Mbps	1	4	-44.7		-40.7	-21.25	19.5
	Non HT40, 6 to 54 Mbps	2	4	-45.3	-45.1	-38.2	-21.25	16.9
	HT/VHT40, M0 to M7	1	4	-45.0		-41.0	-21.25	19.8
	HT/VHT40, M0 to M7	2	4	-44.2	-45.5	-37.8	-21.25	16.5
	HT/VHT40, M8 to M15	2	4	-44.2	-45.5	-37.8	-21.25	16.5
	HT/VHT40 Beam Forming, M0 to M7	2	7	-45.5	-44.7	-35.1	-21.25	13.8
	HT/VHT40 Beam Forming, M8 to M15	2	4	-44.2	-45.5	-37.8	-21.25	16.5
	HT/VHT40 STBC, M0 to M7	2	4	-44.2	-45.5	-37.8	-21.25	16.5
5320	Non HT20, 6 to 54 Mbps	1	4	-49.4		-45.4	-21.25	24.2
	Non HT20, 6 to 54 Mbps	2	4	-49.4	-46.3	-40.6	-21.25	19.3
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	-49.4	-46.3	-37.6	-21.25	16.3
	HT/VHT20, M0 to M7	1	4	-48.5		-44.5	-21.25	23.3
	HT/VHT20, M0 to M7	2	4	-48.5	-44.4	-39.0	-21.25	17.7
	HT/VHT20, M8 to M15	2	4	-48.5	-44.4	-39.0	-21.25	17.7
	HT/VHT20 Beam Forming, M0 to M7	2	7	-48.5	-44.4	-36.0	-21.25	14.7
	HT/VHT20 Beam Forming, M8 to M15	2	4	-48.5	-44.4	-39.0	-21.25	17.7
	HT/VHT20 STBC, M0 to M7	2	4	-48.5	-44.4	-39.0	-21.25	17.7

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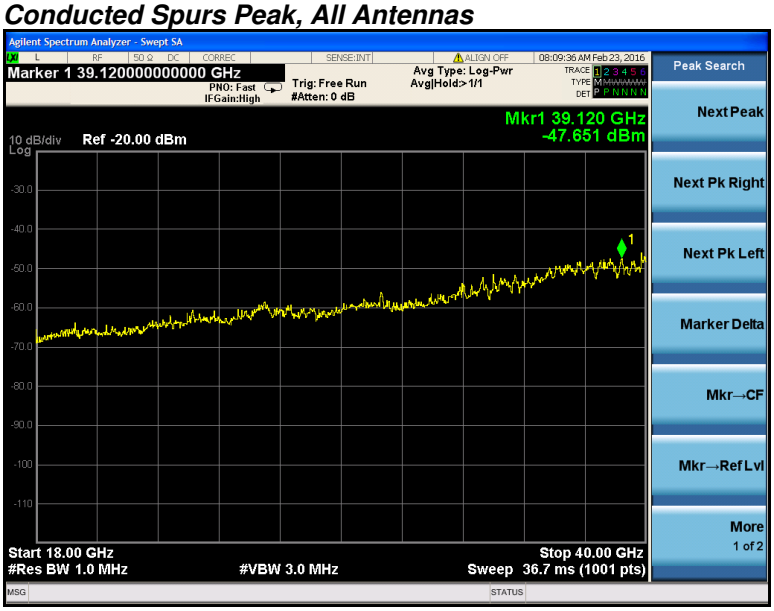
Conducted Spurs Average, All Antennas

Conducted Spurs Peak, All Antennas



no emissions seen above 18GHz. The plots above are representative of all modes tested.

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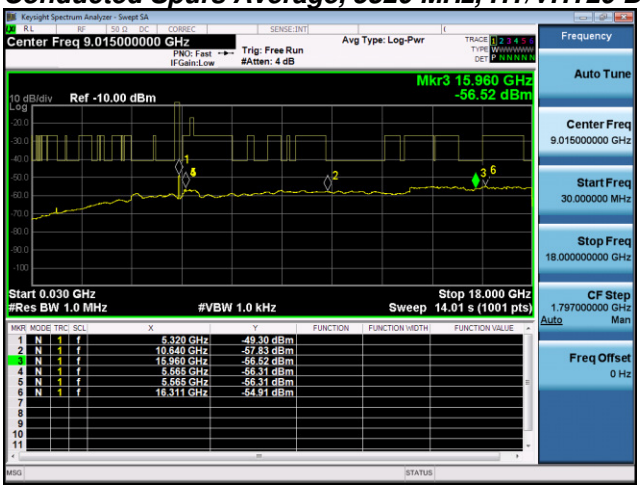
Conducted Spurs Average, 5320 MHz, HT/VHT20 Beam Forming, M0 to M7



Antenna A

Antenna B

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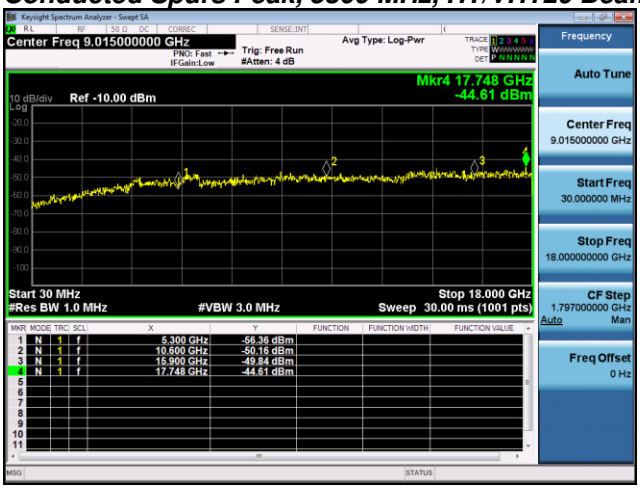
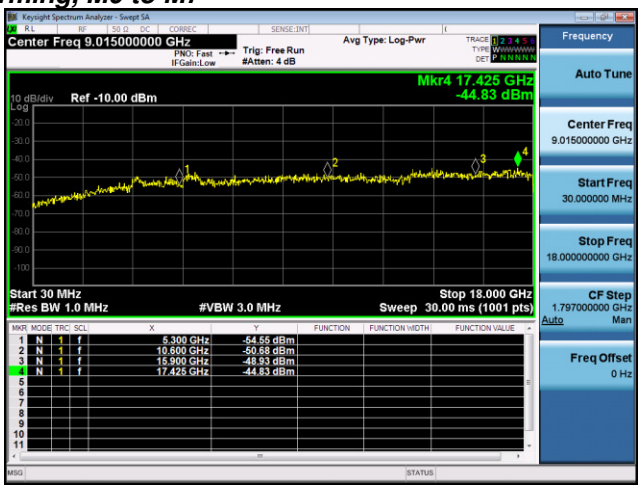
Conducted Spurs Peak, 5300 MHz, HT/VHT20 Beam Forming, M0 to M7



Antenna A



Antenna B

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A.4 Conducted Bandedge

15.407 (b) *Undesirable emission limits.* Except as shown in paragraph (b) (7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

> **(2)** For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
> **(6)** Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in 15.209.
> **(7)** The provisions of §15.205 apply to intentional radiators operating under this section.
> **(8)** When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

Test Procedure

Ref. KDB 789033 D02 General UNII Test Procedures New Rules v01r01
ANSI C63.10: 2013

Conducted Bandedge
Test Procedure
1. Connect the antenna port(s) to the spectrum analyzer input. 2. Place the radio in continuous transmit mode. Use the procedures in ANSI C63.10: 2013 to substitute conducted measurements in place of radiated measurements. 3. Configure Spectrum analyzer as per test parameters below (be sure to enter all losses between the transmitter output and the spectrum analyzer). 4. 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. 5. 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. The worst case output is recorded. 6. 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 7. Capture graphs and record pertinent measurement data.

Ref. ANSI C63.10: 2013 section 12.7.6 (peak) & 12.7.7.3 (average, Method VB-A (Alternative))

Conducted Bandedge
Test parameters restricted Band
RBW = 1 MHz VBW ≥ 3 x RBW for Peak, 100Hz for Average Sweep = Auto couple Detector = Peak Trace = Max Hold.

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System Number	Description	Samples	System under test	Support equipment
1	EUT	S01	☑	☐
	Support	S02	☐	☑

Tested By :	**Date of testing:**
Jose Aguirre	01-Jan-16 - 22-Feb-16
Test Result : PASS	

See Appendix C for list of test equipment

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Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Tx 2 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
5290	Non HT80, 6 to 54 Mbps	1	4	-47.2		-43.2	-41.25	2.0
	Non HT80, 6 to 54 Mbps	**2**	**4**	**-47.2**	**-51.0**	**-41.7**	**-41.25**	**0.4**
	VHT80, M0 to M7	1	4	-45.6		-41.6	-41.25	0.4
	VHT80, M0 to M7	2	4	-48.3	-52.1	-42.8	-41.25	1.5
	VHT80, M8 to M15	2	4	-48.3	-52.1	-42.8	-41.25	1.5
	VHT80 Beam Forming, M0 to M7	2	4	-48.3	-52.1	-42.8	-41.25	1.5
	VHT80 Beam Forming, M8 to M15	2	4	-48.3	-52.1	-42.8	-41.25	1.5
	VHT80 STBC, M8 to M15	2	4	-48.3	-52.1	-42.8	-41.25	1.5
5280	Non HT20, 6 to 54 Mbps	1	4	-52.5		-48.5	-41.25	7.3
	Non HT20, 6 to 54 Mbps	2	4	-52.5	-55.3	-46.7	-41.25	5.4
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	-52.5	-55.3	-43.7	-41.25	2.4
	HT/VHT20, M0 to M7	1	4	-52.3		-48.3	-41.25	7.1
	HT/VHT20, M0 to M7	2	4	-52.3	-55.1	-46.5	-41.25	5.2
	HT/VHT20, M8 to M15	2	4	-52.3	-55.1	-46.5	-41.25	5.2
	HT/VHT20 Beam Forming, M0 to M7	2	7	-52.3	-55.1	-43.5	-41.25	2.2
	HT/VHT20 Beam Forming, M8 to M15	2	4	-52.3	-55.1	-46.5	-41.25	5.2
	HT/VHT20 STBC, M0 to M7	2	4	-52.3	-55.1	-46.5	-41.25	5.2
5310	Non HT40, 6 to 54 Mbps	1	4	-46.4		-42.4	-41.25	1.2
	Non HT40, 6 to 54 Mbps	2	4	-49.7	-53.5	-44.2	-41.25	2.9
	HT/VHT40, M0 to M7	1	4	-46.2		-42.2	-41.25	1.0
	HT/VHT40, M0 to M7	2	4	-49.1	-52.3	-43.4	-41.25	2.2
	HT/VHT40, M8 to M15	2	4	-49.1	-52.3	-43.4	-41.25	2.2
	HT/VHT40 Beam Forming, M0 to M7	2	7	-51.9	-54.3	-42.9	-41.25	1.7
	HT/VHT40 Beam Forming, M8 to M15	2	4	-49.1	-52.3	-43.4	-41.25	2.2
	HT/VHT40 STBC, M0 to M7	2	4	-49.1	-52.3	-43.4	-41.25	2.2
5320	Non HT20, 6 to 54 Mbps	1	4	-52.1		-48.1	-41.25	6.9
	Non HT20, 6 to 54 Mbps	2	4	-52.1	-54.4	-46.1	-41.25	4.8
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	-52.1	-54.4	-43.1	-41.25	1.8
	HT/VHT20, M0 to M7	1	4	-52.8		-48.8	-41.25	7.6
	HT/VHT20, M0 to M7	2	4	-52.8	-54.4	-46.5	-41.25	5.3
	HT/VHT20, M8 to M15	2	4	-52.8	-54.4	-46.5	-41.25	5.3

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	HT/VHT20 Beam Forming, M0 to M7	2	7	-52.8	-54.4	-43.5	-41.25	2.3
	HT/VHT20 Beam Forming, M8 to M15	2	4	-52.8	-54.4	-46.5	-41.25	5.3
	HT/VHT20 STBC, M0 to M7	2	4	-52.8	-54.4	-46.5	-41.25	5.3

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Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Tx 2 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
5290	Non HT80, 6 to 54 Mbps	1	4	-34.0		-30.0	-21.25	8.8
	Non HT80, 6 to 54 Mbps	2	4	-34.0	-39.8	-29.0	-21.25	7.7
	VHT80, M0 to M7	1	4	-32.1		-28.1	-21.25	6.9
	VHT80, M0 to M7	2	4	-33.5	-35.8	-27.5	-21.25	6.2
	VHT80, M8 to M15	2	4	-33.5	-35.8	-27.5	-21.25	6.2
	VHT80 Beam Forming, M0 to M7	2	4	-33.5	-35.8	-27.5	-21.25	6.2
	VHT80 Beam Forming, M8 to M15	2	4	-33.5	-35.8	-27.5	-21.25	6.2
	VHT80 STBC, M8 to M15	2	4	-33.5	-35.8	-27.5	-21.25	6.2
5280	Non HT20, 6 to 54 Mbps	1	4	-36.9		-32.9	-21.25	11.7
	Non HT20, 6 to 54 Mbps	2	4	-36.9	-44.5	-32.2	-21.25	11.0
	Non HT20 Beam Forming, 6 to 54 Mbps	2	7	-36.9	-44.5	-29.2	-21.25	8.0
	HT/VHT20, M0 to M7	1	4	-41.4		-37.4	-21.25	16.2
	HT/VHT20, M0 to M7	2	4	-41.4	-46.4	-36.2	-21.25	15.0
	HT/VHT20, M8 to M15	2	4	-41.4	-46.4	-36.2	-21.25	15.0
	HT/VHT20 Beam Forming, M0 to M7	2	7	-41.4	-46.4	-33.2	-21.25	12.0
	HT/VHT20 Beam Forming, M8 to M15	2	4	-41.4	-46.4	-36.2	-21.25	15.0
	HT/VHT20 STBC, M0 to M7	2	4	-41.4	-46.4	-36.2	-21.25	15.0
5310	Non HT40, 6 to 54 Mbps	1	4	-28.7		-24.7	-21.25	3.5
	Non HT40, 6 to 54 Mbps	2	4	-32.6	-39.1	-27.7	-21.25	6.5
	HT/VHT40, M0 to M7	1	4	-33.3		-29.3	-21.25	8.1
	HT/VHT40, M0 to M7	2	4	-30.0	-40.2	-25.6	-21.25	4.4
	HT/VHT40, M8 to M15	2	4	-30.0	-40.2	-25.6	-21.25	4.4
	HT/VHT40 Beam Forming, M0 to M7	2	7	-36.1	-37.9	-26.9	-21.25	5.6
	HT/VHT40 Beam Forming, M8 to M15	2	4	-30.0	-40.2	-25.6	-21.25	4.4
	HT/VHT40 STBC, M0 to M7	2	4	-30.0	-40.2	-25.6	-21.25	4.4
5320	Non HT20, 6 to 54 Mbps	1	4	-32.1		-28.1	-21.25	6.9
	Non HT20, 6 to 54 Mbps	2	4	-32.1	-37.1	-26.9	-21.25	5.7
	Non HT20 Beam Forming, 6 to 54 Mbps	**2**	**7**	**-32.1**	**-37.1**	**-23.9**	**-21.25**	**2.7**
	HT/VHT20, M0 to M7	1	4	-33.9		-29.9	-21.25	8.7
	HT/VHT20, M0 to M7	2	4	-33.9	-39.1	-28.8	-21.25	7.5
	HT/VHT20, M8 to M15	2	4	-33.9	-39.1	-28.8	-21.25	7.5

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	HT/VHT20 Beam Forming, M0 to M7	2	7	-33.9	-39.1	-25.8	-21.25	4.5
	HT/VHT20 Beam Forming, M8 to M15	2	4	-33.9	-39.1	-28.8	-21.25	7.5
	HT/VHT20 STBC, M0 to M7	2	4	-33.9	-39.1	-28.8	-21.25	7.5

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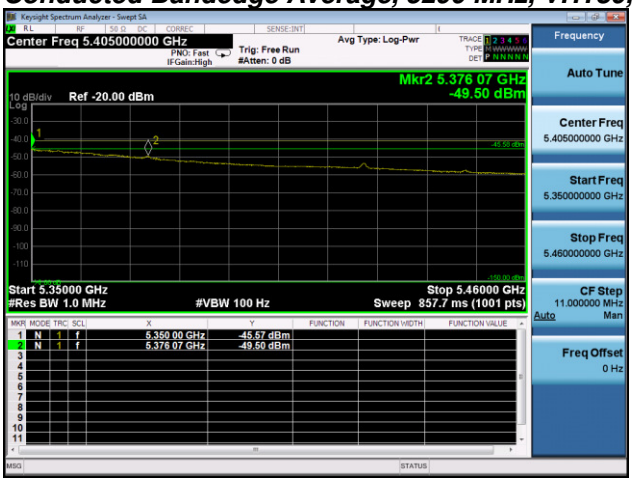
Conducted Bandedge Average, 5290 MHz, VHT80, M0 to M7



Antenna A

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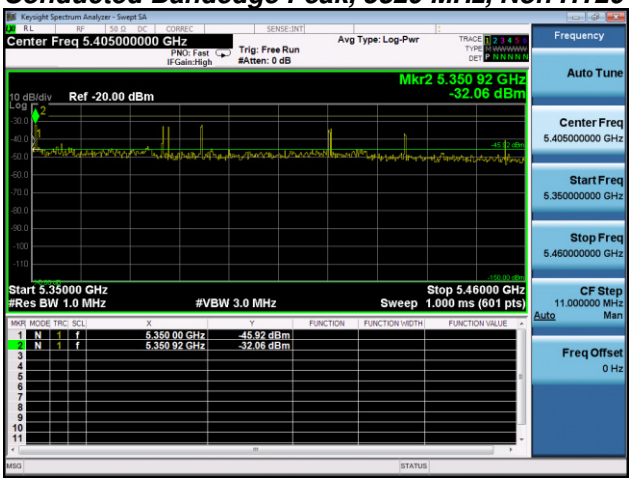
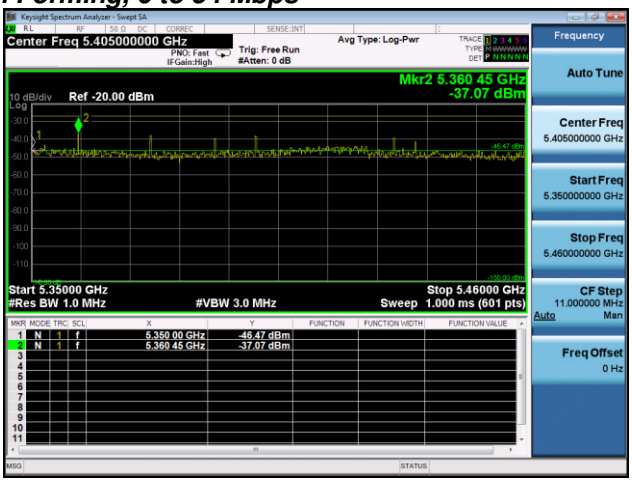
Conducted Bandedge Peak, 5320 MHz, Non HT20 Beam Forming, 6 to 54 Mbps



Antenna A



Antenna B

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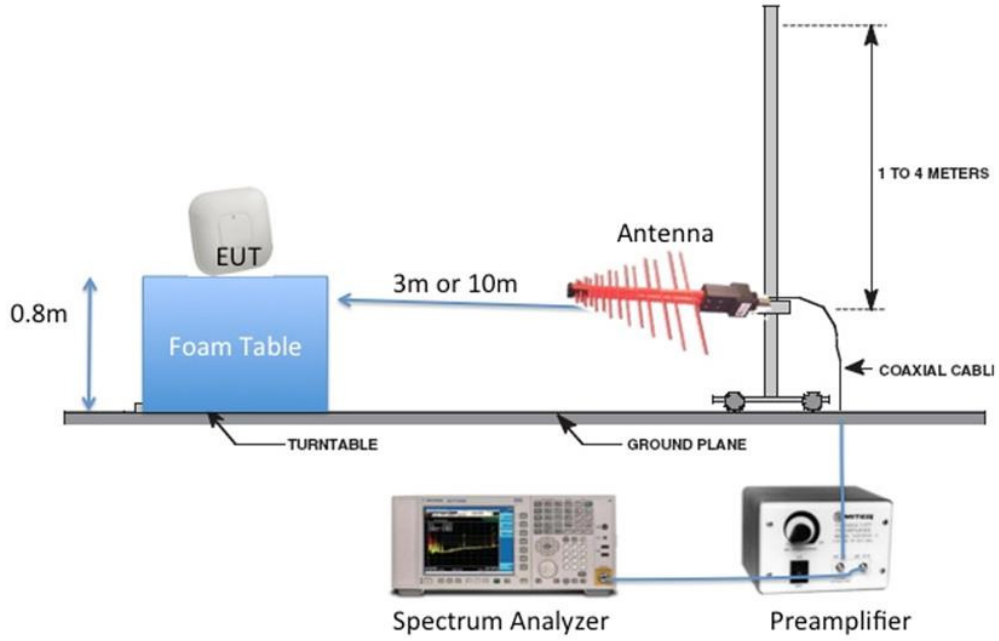
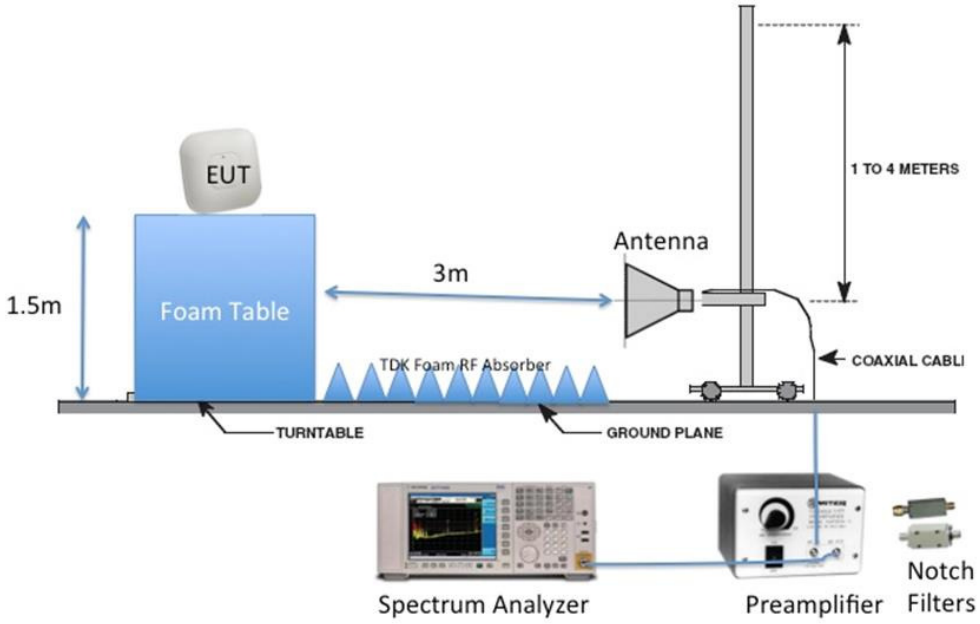
Appendix B: Emission Test Results

Testing Laboratory: Cisco Systems, Inc., 125 West Tasman Drive, San Jose, CA 95134, USA

Radiated Emission Setup Diagram-Below 1G



Radiated Emission Setup Diagram-Above 1G



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B.1 Radiated Spurious Emissions

15.407 (b) *Undesirable emission limits.* Except as shown in paragraph (b) (7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

15.205 / **15.209**

(7) The provisions of 15.205 apply to intentional radiators operating under this section.

(6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in 15.209.

Ref. ANSI C63.10: 2013 section 12.7.6 (peak) & 12.7.7.3 (average)

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/18GHz-26G/26GHz-40GHz
Reference Level:	80 dBuV
Attenuation:	10 dB
Sweep Time:	Coupled
Resolution Bandwidth:	1MHz
Video Bandwidth:	3 MHz for peak, 1 KHz 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.

System Number	Description	Samples	System under test	Support equipment
1	EUT	S01	☑	☐
	Support	S02	☐	☑

Tested By :	Date of testing:
Jose Aguirre	01-Jan-16 - 22-Feb-16
Test Result : PASS	

See Appendix C for list of test equipment

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B.1.A Transmitter Radiated Spurious Emissions-Average

Frequency (MHz)	Mode	Data Rate (Mbps)	Spurious Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (MHz)
5260	Non HT/VHT20, 6 to 54 Mbps	6	50.6	54.0	3.4
5270	HT/VHT40, M0 to M7, M0 to M9 1ss	m0	50.3	54.0	3.7
5280	Non HT/VHT20, 6 to 54 Mbps	m0x1	49.6	54.0	4.4
5290	HT/VHT80, M0 to M7, M0 to M9 1ss	6	50.3	54.0	3.7
5310	HT/VHT40, M0 to M7, M0 to M9 1ss	m0	53.0	54.0	1.0
5320	Non HT/VHT20, 6 to 54 Mbps	6	50.5	54.0	3.5

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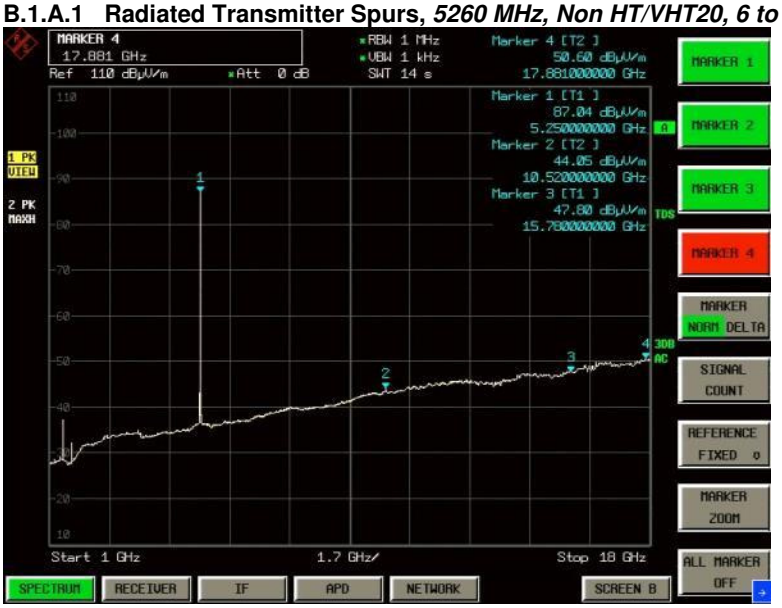
B.1.A.1 Radiated Transmitter Spurs, *5260 MHz, Non HT/VHT20, 6 to 54 Mbps*, Average (1-18GHz)



B.1.A.2 Radiated Transmitter Spurs, *5270 MHz*, HT/VHT40, M0 to M7, M0 to M9 1ss Average (1-18GHz)

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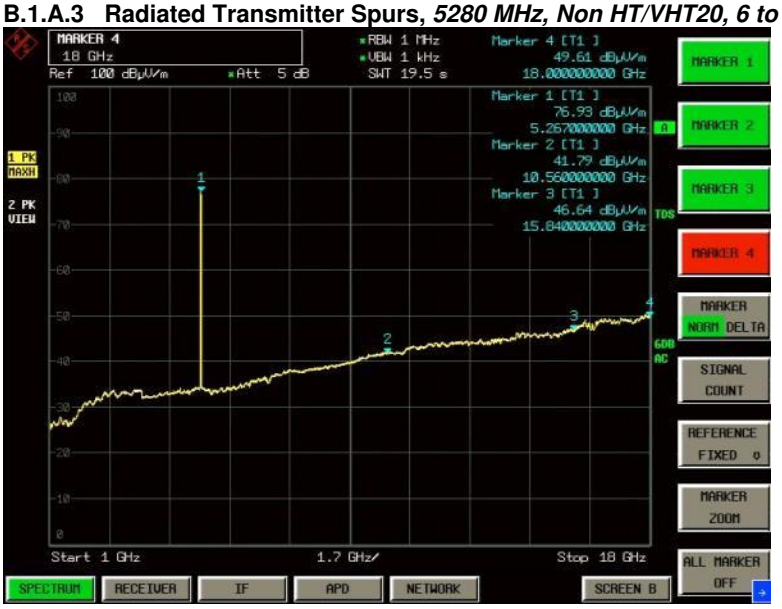
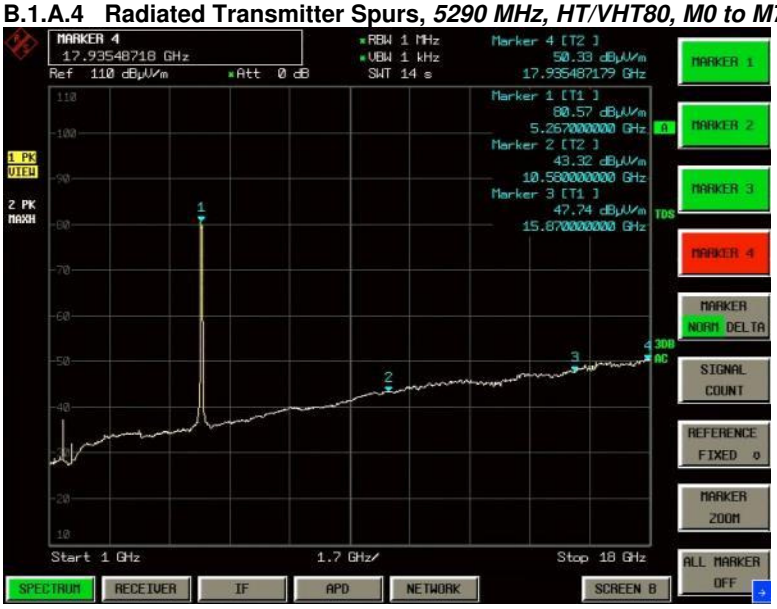
B.1.A.3 Radiated Transmitter Spurs, *5280 MHz, Non HT/VHT20, 6 to 54 Mbps*, Average (1-18GHz)



B.1.A.4 Radiated Transmitter Spurs, *5290 MHz, HT/VHT80, M0 to M7, M0 to M9 1ss*, Average (1-18GHz)



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B.1.A.5 Radiated Transmitter Spurs, *5310 MHz,* HT/VHT40, M0 to M7, M0 to M9 1ss, Average (1-18GHz)

B.1.A.6 Radiated Transmitter Spurs, *5320 MHz, Non HT/VHT20, 6 to 54 Mbps*, Average (1-18GHz)

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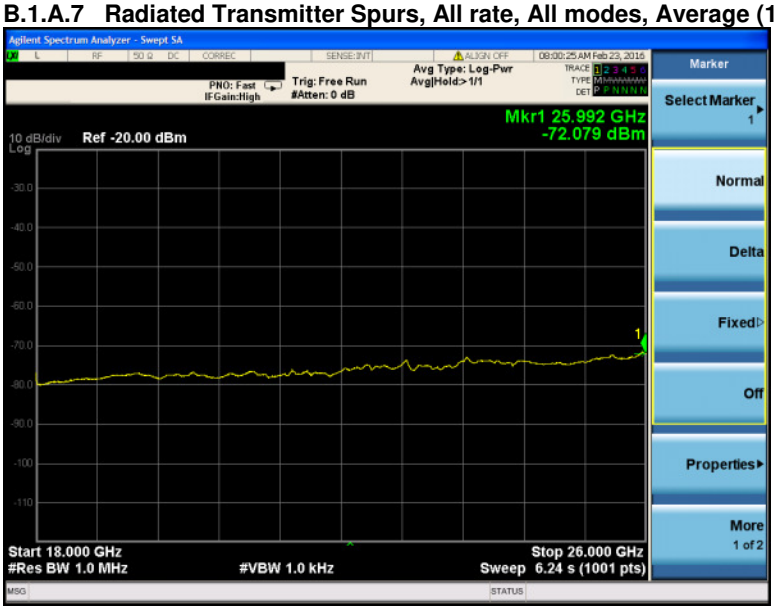
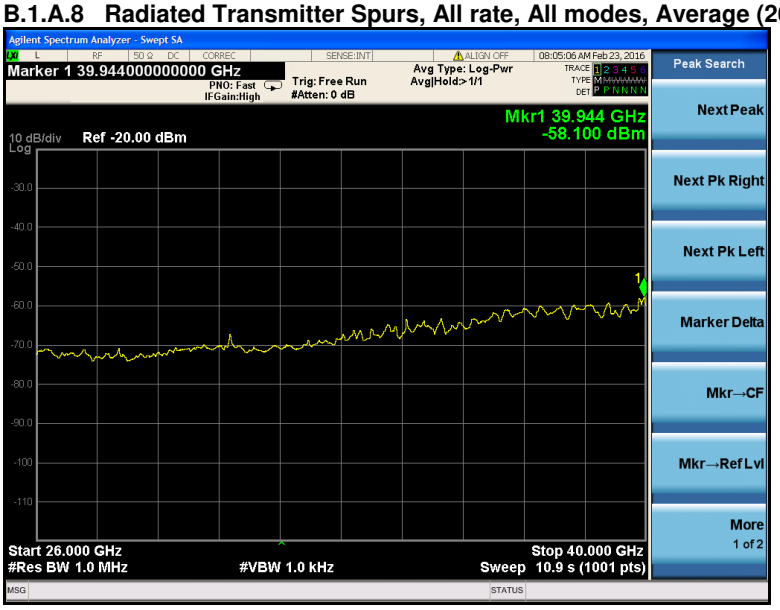
B.1.A.7 Radiated Transmitter Spurs, All rate, All modes, Average (18-26.5GHz)



B.1.A.8 Radiated Transmitter Spurs, All rate, All modes, Average (26.5- 40GHz)



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B.1.P Transmitter Radiated Spurious Emissions-Peak worst case

Frequency (MHz)	Mode	Data Rate (Mbps)	Spurious Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (MHz)
5260	Non HT/VHT20, 6 to 54 Mbps	6	61.6	74.0	12.4
5270	HT/VHT40, M0 to M7, M0 to M9 1ss	m0	65.8	74.0	8.2
5280	Non HT/VHT20, 6 to 54 Mbps	6	62.6	74.0	11.4
5290	HT/VHT80, M0 to M7, M0 to M9 1ss	m0x1	61.6	74.0	12.4
5310	HT/VHT40, M0 to M7, M0 to M9 1ss	m0	61.8	74.0	12.2
5320	Non HT/VHT20, 6 to 54 Mbps	6	61.7	74.0	12.3

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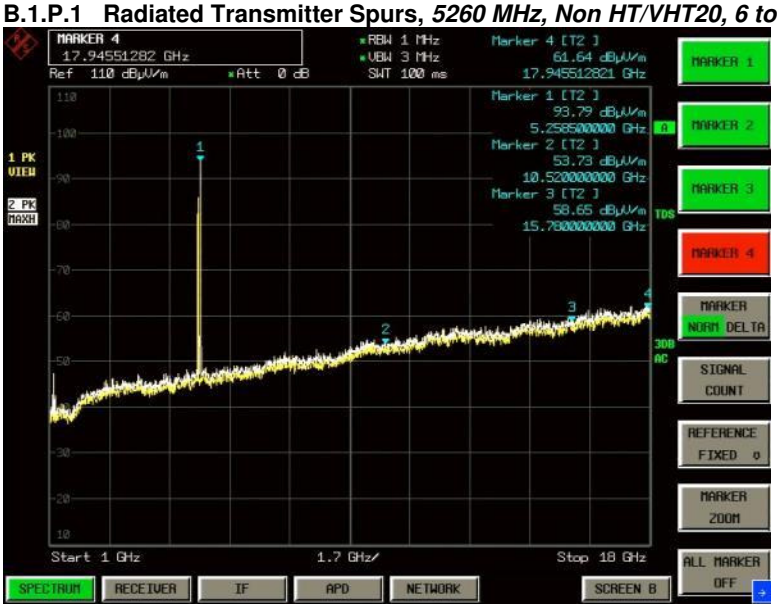
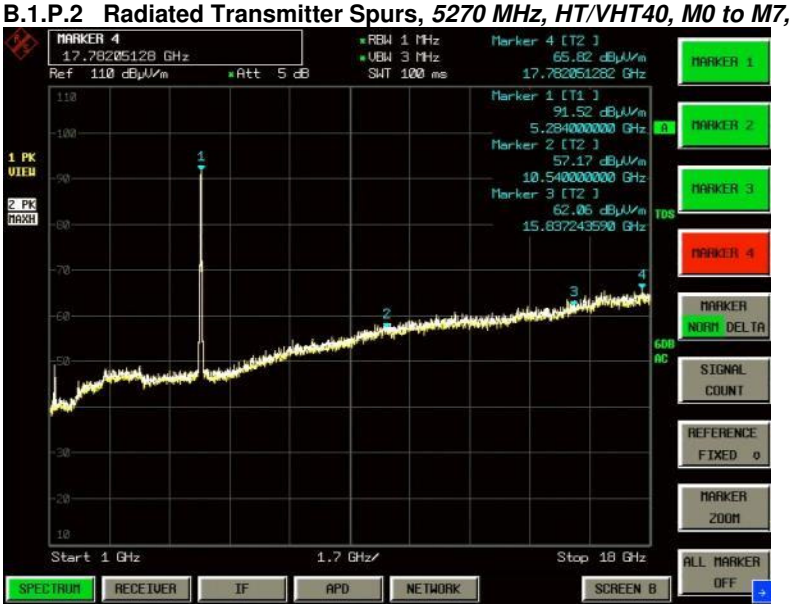
B.1.P.1 Radiated Transmitter Spurs, *5260 MHz, Non HT/VHT20, 6 to 54 Mbps*, (1-18GHz)



B.1.P.2 Radiated Transmitter Spurs, *5270 MHz, HT/VHT40, M0 to M7, M0 to M9 1ss*, Peak (1-18GHz)



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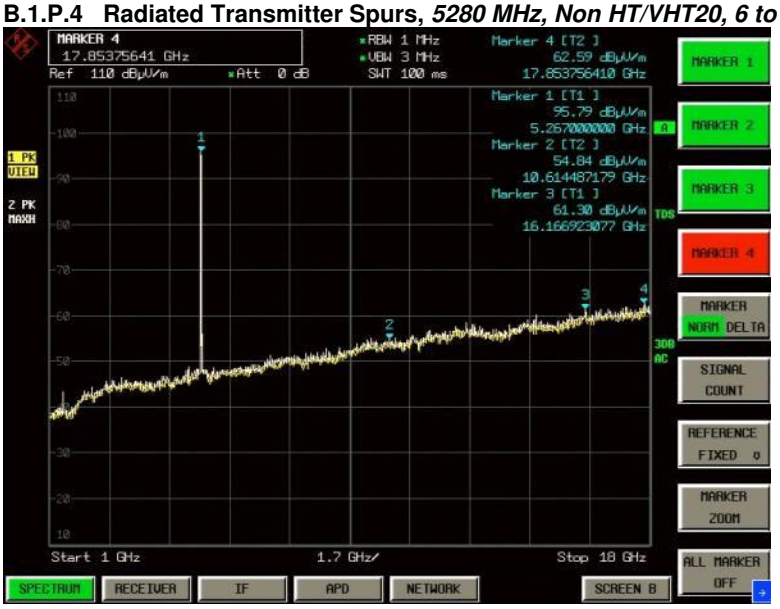
B.1.P.4 Radiated Transmitter Spurs, *5280 MHz, Non HT/VHT20, 6 to 54 Mbps*, Peak (1-18GHz)



B.1.P.3 Radiated Transmitter Spurs, *5290 MHz, VHT80, M0 to M9, M0 to M9 1.1*, Peak (1-18GHz)

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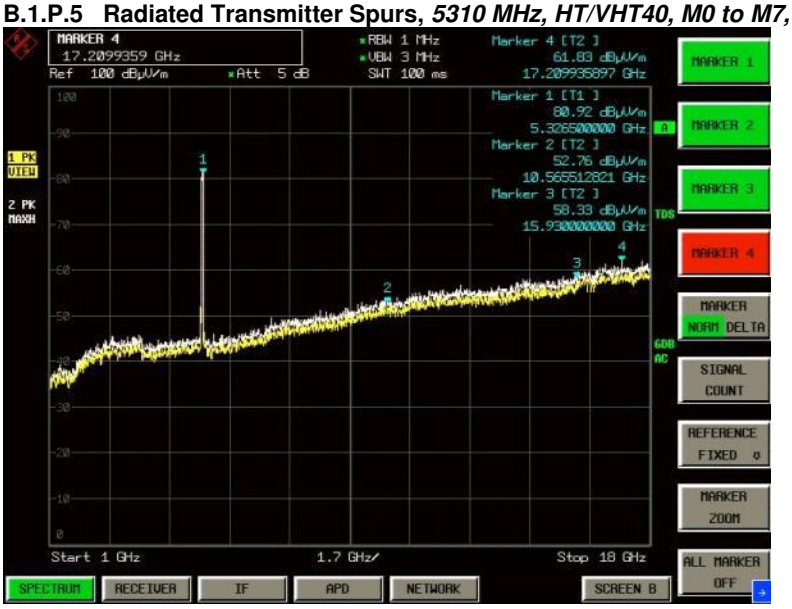
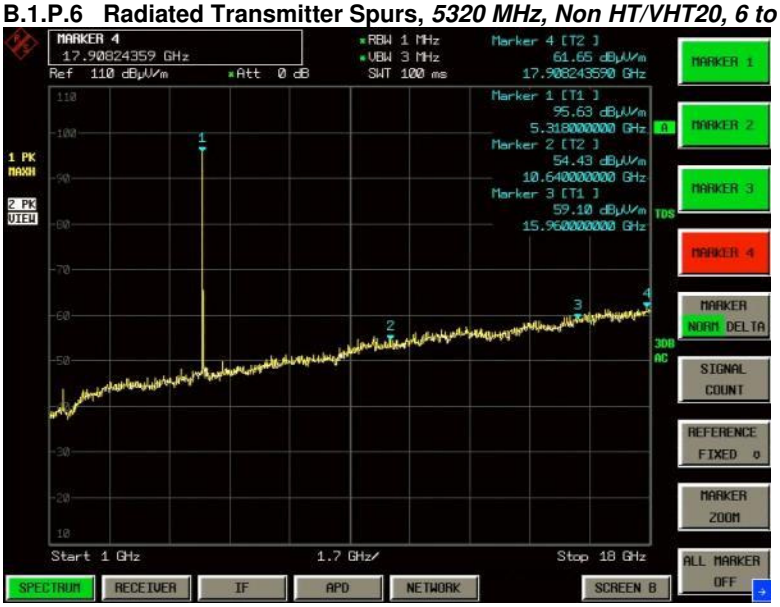
B.1.P.5 Radiated Transmitter Spurs, *5310 MHz, HT/VHT40, M0 to M7, M0 to M9 1ss*, Peak (1-18GHz)



B.1.P.6 Radiated Transmitter Spurs, *5320 MHz, Non HT/VHT20, 6 to 54 Mbps*, Peak (1-18GHz)



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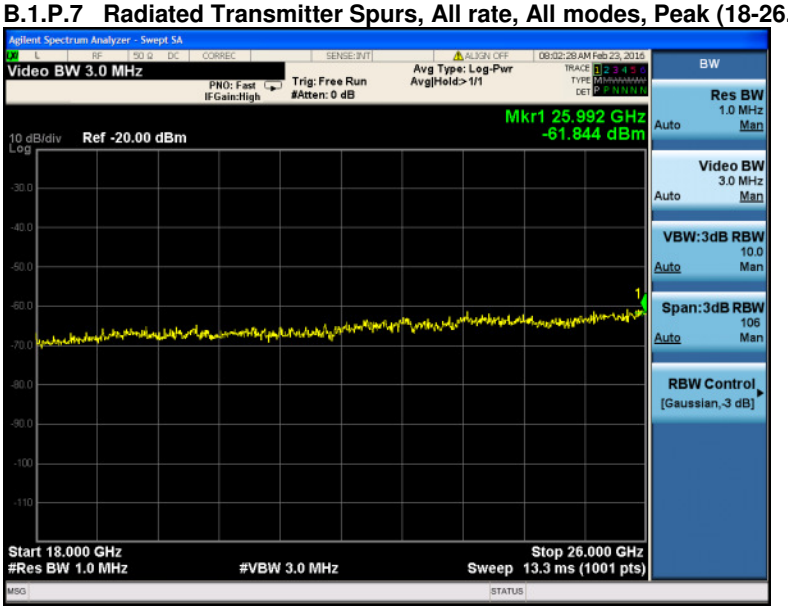
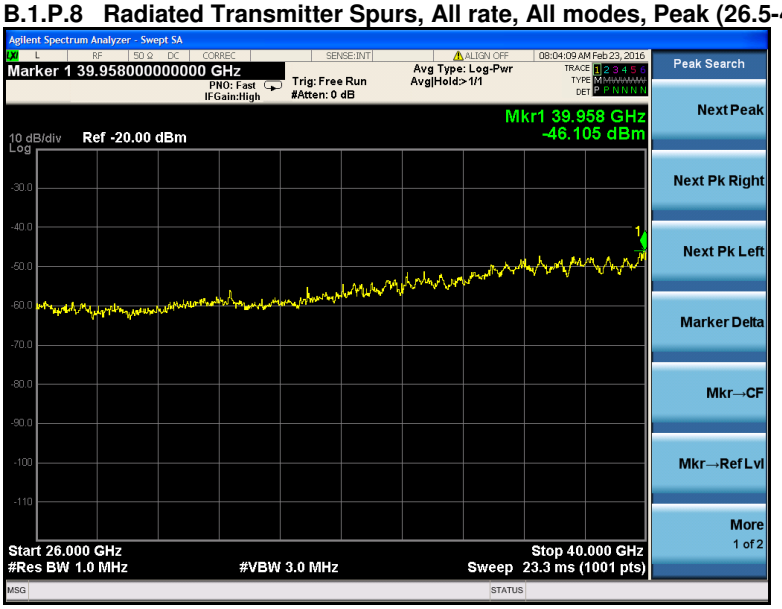
B.1.P.7 Radiated Transmitter Spurs, All rate, All modes, Peak (18-26.5GHz)



B.1.P.8 Radiated Transmitter Spurs, All rate, All modes, Peak (26.5-40GHz)



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B.2 Radiated Emissions 30MHz to 1GHz

FCC 15.209 / **15.205** / **15.407** 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)).

Ref. ANSI C63.10: 2013 section 6.5

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:	30MHz – 1GHz
Reference Level:	80 dBuV
Attenuation:	10 dB
Sweep Time:	Coupled
Resolution Bandwidth:	100kHz
Video Bandwidth:	300kHz
Detector:	Peak for Pre-scan, Quasi-Peak Compliance shall be determined using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

Terminate the access Point RF ports with 50 ohm loads.

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

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

System Number	Description	Samples	System under test	Support equipment
1	EUT	S01	☑	☐
	Support	S02	☐	☑

Tested By :	Date of testing:
Jose Aguirre	01-Jan-16 - 22-Feb-16
Test Result : PASS	

See Appendix C for list of test equipment

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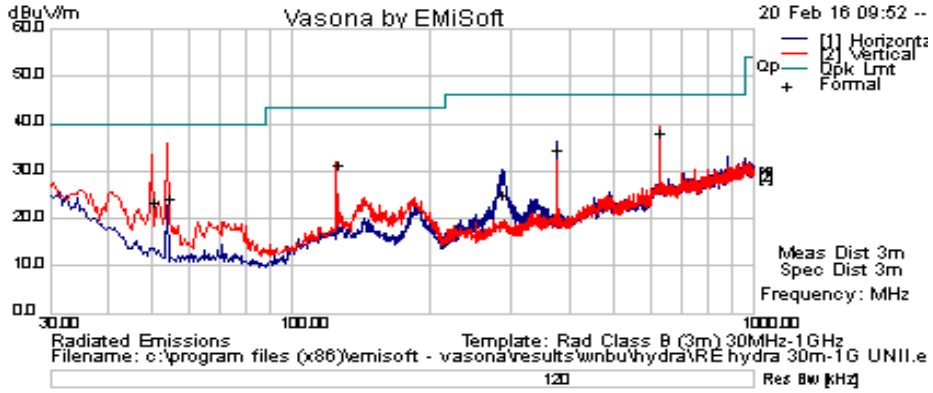
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results

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
53.993	16.3	0.7	7.4	24.4	Quasi Peak.	V	300	45	40	-15.6	Pass
625.002	16.3	2.4	19.5	38.2	Quasi Peak.	V	115	48	46	-7.8	Pass
285.11	10.2	1.6	13.4	25.2	Quasi Peak.	H	133	112	46	-20.8	Pass
375.001	17.7	1.8	15.3	34.8	Quasi Peak.	H	110	245	46	-11.2	Pass
125.001	16.4	1.1	13.9	31.4	Quasi Peak.	V	108	333	43.5	-12.1	Pass
50.003	14.9	0.7	8	23.6	Quasi Peak.	V	102	75	40	-16.4	Pass

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B.3 AC Conducted Emissions

FCC 15.207 Except when the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply, either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table in these sections. The more stringent limit applies at the frequency range boundaries.

Measurement Procedure
Accordance with ANSI C63.10:2013 section 6.2

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:	150 KHz – 30 MHz
Attenuation:	10 dB
Sweep Time:	Coupled
Resolution Bandwidth:	9 KHz
Video Bandwidth:	30 KHz
Detector:	Quasi-Peak / Average

System Number	Description	Samples	System under test	Support equipment
1	EUT	S01	☑	☐
	Support	S02	☐	☑

Tested By :	**Date of testing:**
Jose Aguirre	01-Jan-16 - 22-Feb-16
Test Result : PASS	

See Appendix C for list of test equipment

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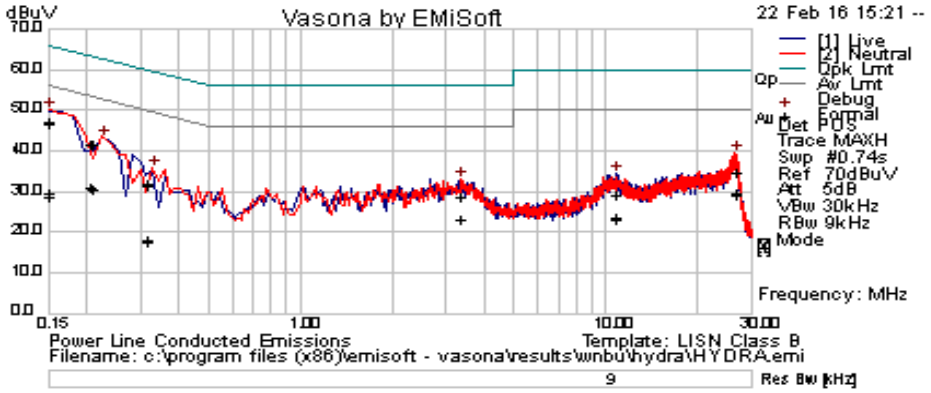
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



Test Results

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail
3.328074	8.87	19.94	0.05	28.87	Quasi Peak	Live	56	-27.13	Pass
0.206625	20.9	20.8	0.05	41.76	Quasi Peak	Live	63.34	-21.58	Pass
0.150119	25.75	21.16	0.08	46.98	Quasi Peak	Live	65.99	-19.01	Pass
26.520726	14.4	20.44	0.28	35.11	Quasi Peak	Live	60	-24.89	Pass
10.79433	9.38	20.09	0.08	29.55	Quasi Peak	Live	60	-30.45	Pass
0.312792	11.36	20.34	0.04	31.74	Quasi Peak	Live	59.9	-28.15	Pass
0.209523	20.96	20.79	0.05	41.8	Quasi Peak	Neutral	63.22	-21.42	Pass
0.150339	26.11	21.16	0.08	47.35	Quasi Peak	Neutral	65.98	-18.63	Pass
26.513274	14.07	20.44	0.28	34.78	Quasi Peak	Neutral	60	-25.22	Pass
0.313386	11.62	20.34	0.04	32	Quasi Peak	Neutral	59.88	-27.88	Pass
3.355524	8.79	19.94	0.05	28.78	Quasi Peak	Neutral	56	-27.22	Pass
10.791576	9.2	20.09	0.08	29.37	Quasi Peak	Neutral	60	-30.63	Pass
3.328074	3.5	19.94	0.05	23.5	Average	Live	46	-22.5	Pass
0.206625	10.25	20.8	0.05	31.1	Average	Live	53.34	-22.24	Pass
0.150119	7.65	21.16	0.08	28.88	Average	Live	55.99	-27.11	Pass
26.520726	9.1	20.44	0.28	29.81	Average	Live	50	-20.19	Pass
10.79433	3.56	20.09	0.08	23.73	Average	Live	50	-26.27	Pass
0.312792	-2.8	20.34	0.04	17.59	Average	Live	49.9	-32.31	Pass
0.209523	9.94	20.79	0.05	30.78	Average	Neutral	53.22	-22.45	Pass
0.150339	8.39	21.16	0.08	29.62	Average	Neutral	55.98	-26.36	Pass
26.513274	8.64	20.44	0.28	29.36	Average	Neutral	50	-20.64	Pass
0.313386	-2.14	20.34	0.04	18.24	Average	Neutral	49.88	-31.64	Pass
3.355524	3.46	19.94	0.05	23.45	Average	Neutral	46	-22.55	Pass
10.791576	3.16	20.09	0.08	23.33	Average	Neutral	50	-26.67	Pass

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Photographs of setup

Title: Conducted Test Setup

This is a dual band 2.4GHz / 5GHz device. All ports in this test set up photo are connected as all testing is automated. Section 2.6 of this test report given an overview of the different Tx antenna combinations used by this device.

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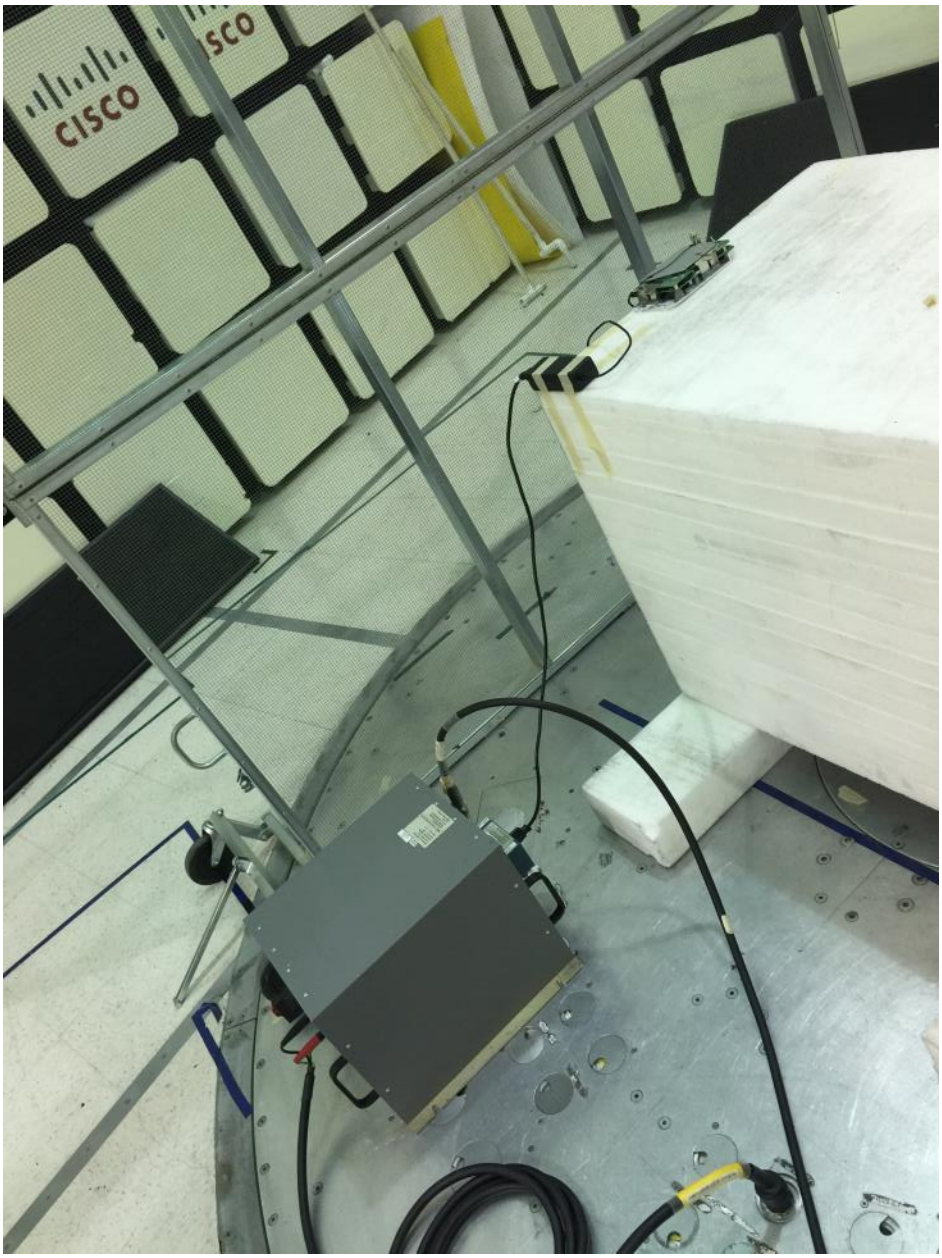
AIR-AP1810W-x-K9 AC Mains Conducted Emissions setup



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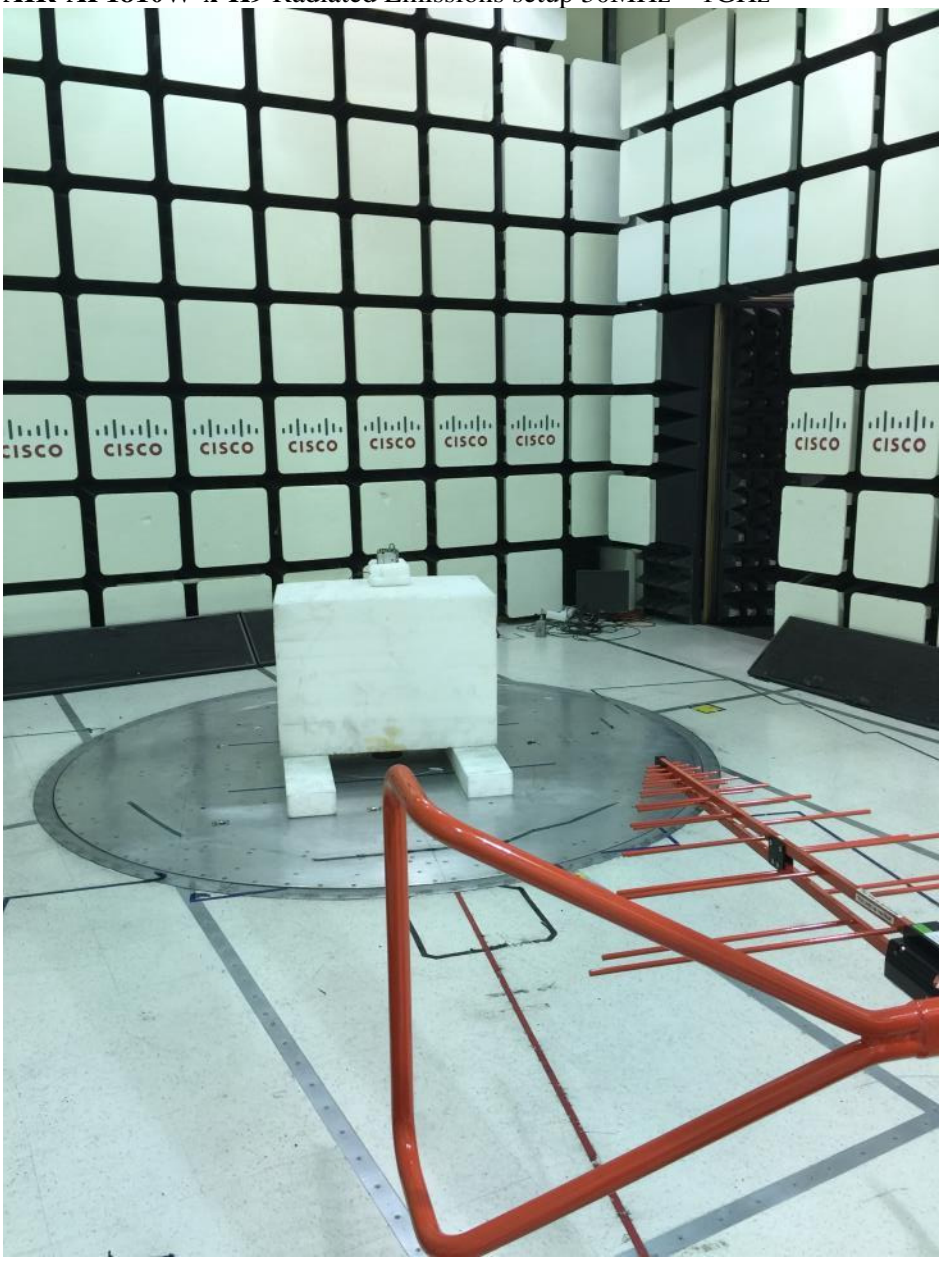
AIR-AP1810W-x-K9 Radiated Emissions setup 30MHz – 1GHz



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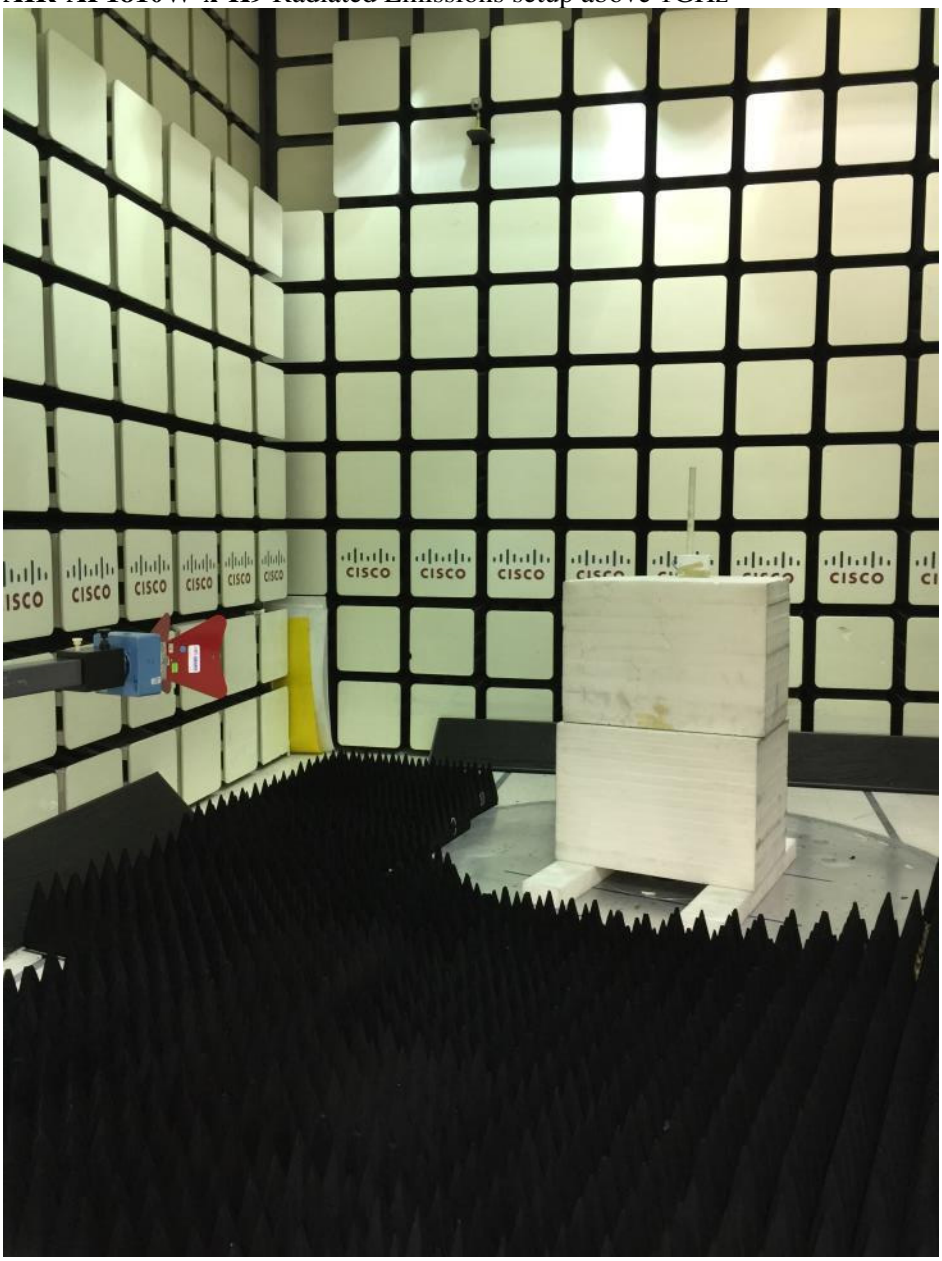
AIR-AP1810W-x-K9 Radiated Emissions setup above 1GHz



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Appendix C: List of Test Equipment Used to perform the test

Equip#	Manufacturer/ Model	Description	Last Cal	Next Due	Test Item
Test Equipment used for Radiated Emissions					
CIS005691	NSP1800-25-S1 Miteq	Broadband Preamplifier (1-18GHz)	25-Jun-15	25-Jun-16	B.1
CIS008448	NSA 5m Chamber Cisco	NSA 5m Chamber	9-Oct-15	9-Oct-16	B.1, B.2
CIS021117	UFB311A-0-2484-520520 Micro-Coax	RF Coaxial Cable, to 18GHz, 248.4 in	24-Aug-15	24-Aug-16	B.1, B.2
CIS034075	RSG 2000 Schaffner	Reference Spectrum Generator, 1-18GHz	Cal Not Required	Cal Not Required	B.1
CIS035284	3117 ETS-Lindgren	Double Ridged Waveguide Horn Antenna	30-Sep-15	30-Sep-16	B.1
CIS037236	50CB-015 JFW	GPIB Control Box	Cal Not Required	Cal Not Required	B.1
CIS040597	Above 1GHz Site Cal Cisco	Above 1GHz Cispr Site Verification	25-Sep-15	25-Sep-16	B.1
CIS041979	1840 Cisco	18-40GHz EMI Test Head/Verification Fixture	13-Jul-15	13-Jul-16	B.1
CIS042266	JB1 Sunol Sciences	Combination Antenna	21-Apr-15	21-Apr-16	B.2
CIS044940	ESU40 Rohde & Schwarz	EMI Test Receiver, 20Hz-40GHz	2-Nov-15	2-Nov-16	B.1, B.2
CIS054230	iBTHP-5-DB9 Newport	5 inch Temp/RH/Press Sensor w/20ft cable	10-Feb-16	10-Feb-17	B.1, B.2
CIS041979	1840 Cisco	18-40GHz EMI Test Head/Verification Fixture	13-Jul-15	13-Jul-16	B.1
CIS047299	N9030A Agilent Technologies	PXA Signal Analyzer	23-Oct-15	23-Oct-16	B.1
CIS037236	50CB-015 JFW	GPIB Control Box	Cal Not Required	Cal Not Required	B.1
CIS034075	RSG 2000 Schaffner	Reference Spectrum Generator, 1-18GHz	Cal Not Required	Cal Not Required	B.1
CIS049563	Sucoflex 106A Huber + Suhner	N Type Cable 18GHz	24-Aug-15	24-Aug-16	B.1, B.2

Test Equipment used for AC Mains Conducted Emissions					
Equip No	**Model Manufacturer**	**Description**	**Last Cal**	**Next Cal**	**Test Item**
CIS002464	FCC-801-M2-16 Fischer Custom Communications	CDN, 2-LINE, 16A	12-Mar-15	12-Mar-16	B.3
CIS049532	H785-150K-50-21378 TTE	High Pass Filter	8-May-15	8-May-16	B.3
CIS020913	FCC-LISN-PA-NEMA-5-15 Fischer Custom Communications	AC Adapter	8-May-15	8-May-16	B.3
CIS007704	FCC-LISN-50/250-50-2-01 Fischer Custom Communications	LISN	8-May-15	8-May-16	B.3
CIS008185	FCC-450B-2.4-N Fischer Custom Communications	Instrumentation Limiter	28-Jul-15	28-Jul-16	B.3
CIS051756	5-T-MB Bird	5W 50 Ohm BNC Termination 4GHz	6-Aug-15	6-Aug-16	B.3
CIS049563	Sucoflex 106A Huber + Suhner	N Type Cable 18GHz	24-Aug-15	24-Aug-16	B.3

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CIS021117	UFB311A-0-2484-520520 Micro-Coax	RF Coaxial Cable, to 18GHz, 248.4 in	24-Aug-15	24-Aug-16	B.4
CIS044940	ESU40 Rohde & Schwarz	EMI Test Receiver, 20Hz-40GHz	2-Nov-15	2-Nov-16	B.4
CIS054647	33-605 Stanley	10meter Measuring Tape	Cal not required	Cal not required	B.4
CIS018963	CNE V York	Comparison Noise Emitter, 30 - 1000MHz	Cal not required	Cal not required	B.4

Test Equipment used for RF Conducted Tests

Equip No	Model Manufacturer	Description	Last Cal	Next Cal	Test Item
CIS050721	N9030A Keysight	PXA Signal Analyzer	13-Apr-15	13-Apr-16	A1 thru A4
CIS054662	SF18-S1S1-36 MegaPhase	SMA 36" cable	24-Sep-15	24-Sep-16	A1 thru A4
CIS054663	F120-S1S1-48 MegaPhase	SMA 48" Cable	25-Sep-15	25-Sep-16	A1 thru A4
CIS054665	RA08-S1S1-24 MegaPhase	SMA 24" Cable	25-Sep-15	25-Sep-16	A1 thru A4
CIS054666	RA08-S1S1-18 MegaPhase	SMA 18" Cable	25-Sep-15	25-Sep-16	A1 thru A4
CIS054667	RA08-S1S1-18 MegaPhase	SMA 18" Cable	25-Sep-15	25-Sep-16	A1 thru A4
CIS054668	RA08-S1S1-18 MegaPhase	SMA 18" Cable	25-Sep-15	25-Sep-16	A1 thru A4
CIS054669	RA08-S1S1-18 MegaPhase	SMA 18" Cable	25-Sep-15	25-Sep-16	A1 thru A4
CIS054670	RA08-S1S1-12 MegaPhase	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A4
CIS054671	RA08-S1S1-12 MegaPhase	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A4
CIS054672	RA08-S1S1-12 MegaPhase	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A4
CIS054673	RA08-S1S1-12 MegaPhase	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A4
CIS054674	RA08-S1S1-12 MegaPhase	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A4
CIS054675	RA08-S1S1-12 MegaPhase	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A4
CIS054677	RA08-S1S1-12 MegaPhase	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A4
CIS054678	RA08-S1S1-12 MegaPhase	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A4
CIS054686	NI PXI-2796 National Instruments	Plug-in switch module	6-Oct-15	6-Oct-16	A1 thru A4
CIS055094	PXI-1042 National Instruments	Chassis	Cal Not Required	Cal Not Required	A1 thru A4
CIS055117	RFLT2WDC40G RF Lambda	2 Way 40GHz Splitter	11-Nov-15	11-Nov-16	A1 thru A4
CIS055166	RFLT4WDC40GK RF Lambda	4 Way Power Divider 40GHz	23-Nov-15	23-Nov-16	A1 thru A4
CIS054656	BRC50705-02 Micro-Tronics	Band Reject Filter	24-Sep-15	24-Sep-16	A1 thru A4
CIS054655	BRC50704-02 Micro-Tronics	Notch Filter, SB:5.470-5.725GHz, to 12GHz	24-Sep-15	24-Sep-16	A1 thru A4

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CIS054654	BRC50703-02 Micro-Tronics	Notch Filter, SB:5.150-5.350GHz, to 11GHz	24-Sep-15	24-Sep-16	A1 thru A4
CIS054653	BRM50702-02 Micro-Tronics	Notch Filter, SB:2.400-2.500GHz, to 18GHz	24-Sep-15	24-Sep-16	A1 thru A4
CIS054637	BWS30-W2/ Aeroflex	SMA 30dB Attenuator	02-June-15	02-June-16	A1 thru A4
CIS054636	BWS20-W2/ Aeroflex	20dB SMA Attenuator	02-June-15	02-June-16	A1 thru A4

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Appendix E: Abbreviation Key and Definitions

The following table defines abbreviations used within this test report.

Abbreviation	Description	Abbreviation	Description
EMC	Electro Magnetic Compatibility	°F	Degrees Fahrenheit
EMI	Electro Magnetic Interference	°C	Degrees Celsius
EUT	Equipment Under Test	Temp	Temperature
ITE	Information Technology Equipment	S/N	Serial Number
TAP	Test Assessment Schedule	Qty	Quantity
ESD	Electro Static Discharge	emf	Electromotive force
EFT	Electric Fast Transient	RMS	Root mean square
EDCS	Engineering Document Control System	Qp	Quasi Peak
Config	Configuration	Av	Average
CIS#	Cisco Number (unique identification number for Cisco test equipment)	Pk	Peak
Cal	Calibration	kHz	Kilohertz ($1x10^3$)
EN	European Norm	MHz	MegaHertz ($1x10^6$)
IEC	International Electro technical Commission	GHz	Gigahertz ($1x10^9$)
CISPR	International Special Committee on Radio Interference	H	Horizontal
CDN	Coupling/Decoupling Network	V	Vertical
LISN	Line Impedance Stabilization Network	dB	decibel
PE	Protective Earth	V	Volt
GND	Ground	kV	Kilovolt ($1x10^3$)
L1	Line 1	µV	Microvolt ($1x10^{-6}$)
L2	Line2	A	Amp
L3	Line 3	µA	Micro Amp ($1x10^{-6}$)
DC	Direct Current	mS	Milli Second ($1x10^{-3}$)
RAW	Uncorrected measurement value, as indicated by the measuring device	µS	Micro Second ($1x10^{-6}$)
RF	Radio Frequency	µS	Micro Second ($1x10^{-6}$)
SLCE	Signal Line Conducted Emissions	m	Meter
Meas dist	Measurement distance	Spec dist	Specification distance
N/A or NA	Not Applicable	SL	Signal Line (or Telecom Line)
P	Power Line	L	Live Line
N	Neutral Line	R	Return
S	Supply	AC	Alternating Current

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End

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