Test Report

C1101-4PLTEPW
with ISR-AP1101AC-x
(x=A,B,D,N,T,Z)

Cisco 802.11ac Dual Band Access Point

FCC ID: LDKC11011757
IC: 2461N-11011757

2400-2483.5 MHz

Against the following Specifications:

CFR47 Part 15.247
RSS-247
RSS-Gen
AS/NZS 4268
LP0002
G.S.R 45 (E)

ACCREDITED

Cisco Systems
170 West Tasman Drive
San Jose, CA 95134

Author: Chris Blair **Tested By:** Chris Blair, Dennis Thai	**Approved By:** Gerard Thorpe **Title:** Manager, Engineering **Revision:** see Doc Central

This report replaces any previously entered test report under EDCS – 12057781.
This test report has been electronically authorized and archived using the CISCO Engineering Document Control system.

This test report has been electronically authorized and archived using the CISCO Engineering Document Control system.

Section 1: Overview

The samples were assessed against the tests under the requirements of the following specifications:

Emission
CFR47 Part 15.247 RSS247 Issue 2: Feb 2017 RSS-Gen Issue 4: Nov 2014

Applicable measurement guidance:

- ANSI C63.10:2013
- FCC KDB 662911 D01 v02r01
- KDB 558074 D01 Meas Guidance v03r05

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%)

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

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	+/- 5.2 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.

2.2 Date of testing

02-Jan-18 – 17-Apr-18

2.3 Report Issue Date

25-Apr-18

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.,
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

Chris Blair, Marie Higa

2.5 Equipment Assessed (EUT)

C1101-4PLTEPW with embedded WiFi modem: ISR-AP1101AC-x.

2.6 EUT Description

C1101-4PLTEPW with ISR-AP1101AC-x is Enterprise/MSP/M2M next generation low end router with the unified platform GE WAN, next generation Wave 2 802.11a/g/n/ac WLAN, and next generation LTE WWAN on Polaris IOS XE. It supports the following 2.4G modes:

802.11b - Legacy CCK, One Antenna, 1 to 11 Mbps
802.11b - Legacy CCK, Two Antennas, 1 to 11 Mbps

802.11g - Non HT20, One Antenna, 6 to 54 Mbps, 1ss
802.11g - Non HT20, Two Antennas, 6 to 54 Mbps, 1ss

802.11g - Non HT20 Beam Forming, Two Antennas, 6 to 54 Mbps, 1ss

802.11n/ac - HT/VHT20, One Antenna, M0 to M7, 1ss
802.11n/ac - HT/VHT20, Two Antennas, M0 to M7, 1ss
802.11n/ac - HT/VHT20, Two Antennas, M8 to M15, 2ss

802.11n/ac - HT/VHT20 Beam Forming, Two Antennas, M0 to M7, 1ss
802.11n/ac - HT/VHT20 Beam Forming, Two Antennas, M8 to M15, 2ss

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

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.
Data is recorded at the lowest supported data rate for each mode.
This report covers operation on channel 1-11.

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)
2.4G/5G	ANTS2M1-CCF34-EH	Internal PIFA	2.14/4

Section 3: Result Summary

3.1 Results Summary Table

Conducted emissions

Basic Standard	Technical Requirements / Details	Result
FCC 15.247 RSS-247 LP0002:3.10.1(6.2.1)	**6dB Bandwidth:** Systems using digital modulation techniques may operate in the 2400-2483.5MHz band. The minimum 6dB bandwidth shall be at least 500 kHz.	Pass
FCC 15.247 RSS-247	**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 15.247 RSS-247 LP0002:3.10.1(2.3)	**Output Power:** **15.247** 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. **RSS-247** For DTSs employing digital modulation techniques operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. Except as provided in Section 5.4(5), the e.i.r.p. shall not exceed 4 W.	Pass
FCC 15.247 RSS-247 LP0002:3.10.1(6.2.2)	**Power Spectral Density:** For digitally modulated systems, the 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.	Pass
FCC 15.247 RSS-247 LP0002:3.10.1(5)/2.8	**Conducted Spurious Emissions / Band-Edge:** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required	Pass
FCC 15.247 RSS-247 FCC 15.205 RSS-Gen	**Restricted band:** Unwanted emissions falling within the restricted bands, as defined in FCC 15.205 (a) and RSS-Gen 8.10 must also comply with the radiated emission limits specified in FCC 15.209 (a) and RSS-Gen 8.9.	Pass

Radiated Emissions (General requirements)

Basic Standard	Technical Requirements / Details	Result
FCC 15.209 RSS-Gen LP0002:3.10.1(5)/2.8	**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. Unwanted emissions falling within the restricted bands, as defined in FCC 15.205 (a) and RSS-Gen 8.10 must also comply with the radiated emission limits specified in FCC 15.209 (a) and RSS-Gen 8.9.	Pass
RSS-Gen LP0002:3.10.1(5)2.8	**RX Spurious Emissions:** **RSS-Gen 8.9** Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in Table 4 and Table 5 below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission. **RSS-Gen 8.10** Unwanted emissions that fall into restricted bands of Table 6 shall comply with the limits specified in RSS-Gen; and (c) Unwanted emissions that do not fall within the restricted frequency bands of Table 6 shall comply either with the limits specified in the applicable RSS or with those specified in this RSS-Gen.	Pass
FCC 15.207 RSS-Gen LP0002:2.3	**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

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	C1101-4PLTEPW with ISR-AP1101AC-x wifi adapter	Cisco Systems	P1B (WiFi adapter = P2)	e1c63a0b b171f78c5 800c1478 007abc1	8.4.1.10	FOC2131026Q
S02*	ADP-66CR B	Delta	01	NA	NA	DAB2110G3CH
S03	C1101-4PLTEPW with ISR-AP1101AC-x wifi adapter	Cisco Systems	P2B (WiFi adapter = P2)	e1c63a0b b171f78c5 800c1478 007abc1	8.4.1.10	FOC2147556Z
S04	P-LTE-VZ pluggable LTE/GPS module	Cisco Systems	P2	NA	NA	FOC215217QC
S05	ADP-66CR B	Delta	01	NA	NA	DAB2122G378
S06	C1101-4PLTEPW with ISR-AP1101AC-x wifi adapter	Cisco Systems	P2	2.0	c1100-universalk9_ias.BLD_POLARIS_DEV_LATEST_20171209_001819.SSA.bin	FGL220490Y0
S07	ADP-66CR B	Delta Electronics Inc.	01	n/a	n/a	DAB2122G3CZ
S08	P-LTE-EA	Cisco Systems	P2	n/a	n/a	FOC215217LF
S09	Power Splitter ZB8PD-2-S+	Cisco Systems	n/a	n/a	n/a	n/a
S10	Laptop81C3	Lenova Yoga	n/a	n/a	n/a	MP1C6AA7

Traffic Generators

Sample No.	CIS No	Model Number	Manufacturer	Description.
S11	CIS055442	XM2	Ixia	IP Performance Monitor
S12	CIS047262	CMW500	Rohde & Schwarz	Wideband Radio Communication Tester

4.2 System Details

System #	Description	Samples
1	Conducted tests	S01, S02
2	RSE	S03, S04, S05
3	AC CE	S06, S07, S08, S09, S10, S11, S12

4.3 Mode of Operation Details

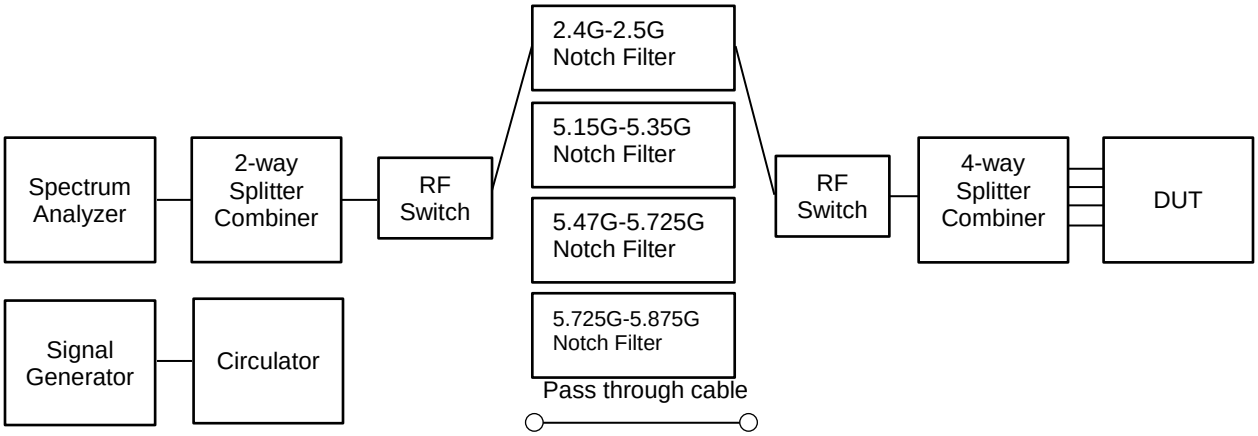
Mode#	Description	Comments
1	Continuous Transmitting	Continuous Transmitting, max duty cycle, dfstool menu
2	Continuous Receiving	For Rx RSE, dfstool menu
3	Idle	WiFi adapter on for CE on AC lines (IOS)

Applicable measurement guidance

- ANSI C63.10:2013
- FCC KDB 662911 D01 v02r01
- KDB 558074 D01 Meas Guidance v03r05

Appendix A: Emission Test Results

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 EIRP)		
	Frequency (MHz)		
Operating Mode	**2412**	**2437**	**2462**
Legacy CCK, 1 to 11 Mbps	**22**	**23**	**23**
Non HT20, 6 to 54 Mbps	**21**	**23**	**20**
Non HT20 Beam Forming, 6 to 54 Mbps	**23**	**26**	**22**
HT/VHT20, M0 to M15	**21**	**23**	**19**
HT/VHT20 Beam Forming, M0 to M15	**23**	**26**	**21**
HT/VHT20 STBC, M0 to M7	**21**	**23**	**19**

A.1 6dB Bandwidth

15.247 / RSS-247 / LP0002:3.10.1(6.2.1) Systems using digital modulation techniques may operate in the 2400-2483.5MHz band. The minimum 6dB bandwidth shall be at least 500 kHz.

Test Procedure

Ref. KDB 558074 D01 DTS Meas Guidance v03r05
ANSI C63.10: 2013

6 BW 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 -6dB 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. KDB 558074 D01 DTS Meas Guidance v03r05
ANSI C63.10: 2013 section 11.8.2 Option 2

6 BW Test parameters
X dB BW = 6dB (using the OBW function of the spectrum analyzer) Span = Large enough to capture the entire EBW RBW = 100 KHz VBW ≥ 3 x RBW Sweep = Auto couple Detector = Peak or where practical sample shall be used Trace = Max. Hold

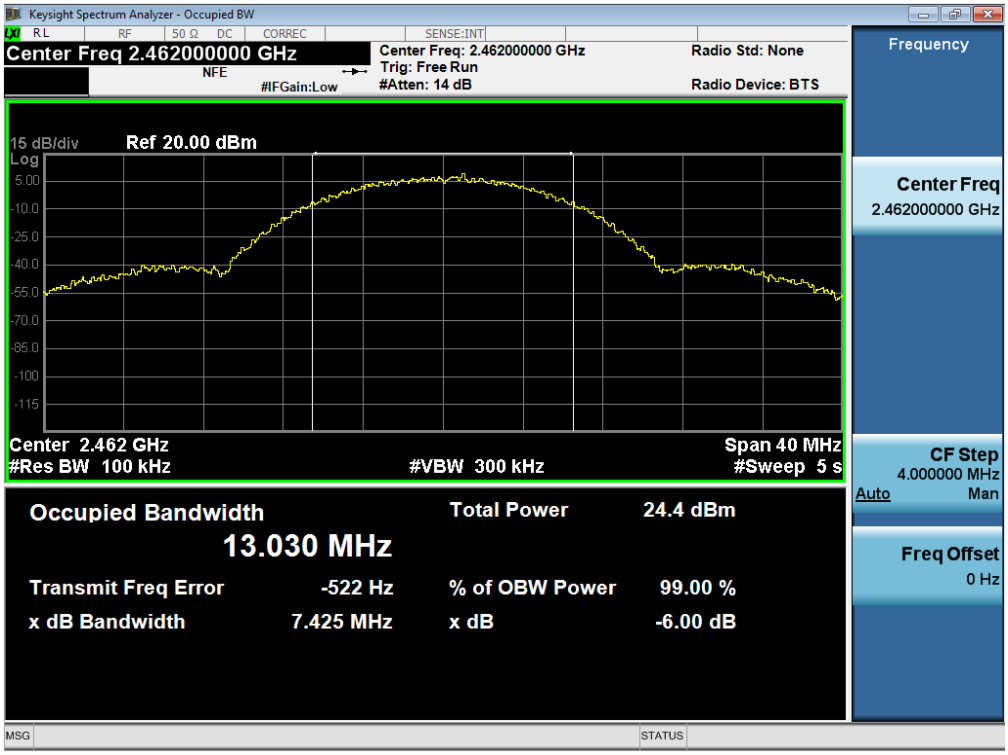
System Number	Description	Samples	System under test	Support equipment
1	EUT	S01	☑	☐
	Support	S02	☐	☑

Tested By :	**Date of testing:**
Chris Blair	02-Jan-18 - 05-Jan-18
Test Result : PASS	

See Appendix C for list of test equipment

Frequency (MHz)	Mode	Data Rate (Mbps)	6dB BW (MHz)	Limit (kHz)	Margin (MHz)
2412	CCK, 1 to 11 Mbps	11	8.1	>500	7.6
	Non HT20, 6 to 54 Mbps	6	16.4	>500	15.9
	HT/VHT20, M0 to M15	m0	17.6	>500	17.1
2437	CCK, 1 to 11 Mbps	11	7.6	>500	7.1
	Non HT20, 6 to 54 Mbps	6	16.4	>500	15.9
	HT/VHT20, M0 to M15	m0	17.3	>500	16.8
2462	**CCK, 1 to 11 Mbps**	**11**	**7.4**	**>500**	**6.9**
	Non HT20, 6 to 54 Mbps	6	16.4	>500	15.9
	HT/VHT20, M0 to M15	m0	17.6	>500	17.1

6dB Bandwidth, 2462 MHz, CCK, 1 to 11 Mbps



A.2 99% and 26dB 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.

Test Procedure

Ref. ANSI C63.10: 2013

26 BW & 99% BW 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 & OBW 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

26 BW & 99% BW Test parameters
X dB BW = -26dB (using the OBW function of the spectrum analyzer) OBW = 99% Span = 1.5 to 5 times the OBW RBW = 1% to 5% of the OBW VBW ≥ 3 x RBW Sweep = Auto couple Detector = Peak or where practical sample shall be used Trace = Max. Hold

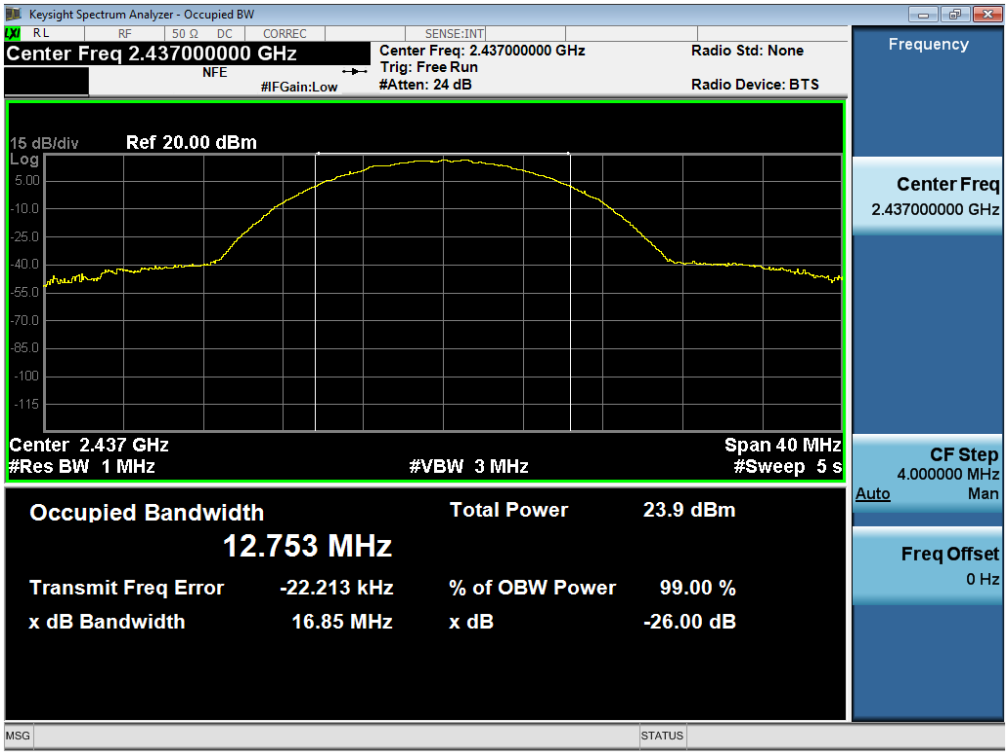
System Number	Description	Samples	System under test	Support equipment
1	EUT	S01	☑	☐
	Support	S02	☐	☑

Tested By : Chris Blair	**Date of testing:** 02-Jan-18 - 05-Jan-18
Test Result : PASS	

See Appendix C for list of test equipment

Frequency (MHz)	Mode	Data Rate (Mbps)	26dB BW (MHz)	99% BW (MHz)
2412	CCK, 1 to 11 Mbps	11	17.0	12.884
	Non HT20, 6 to 54 Mbps	6	20.7	17.255
	HT/VHT20, M0 to M15	m0	21.7	18.248
2437	**CCK, 1 to 11 Mbps**	**11**	**16.9**	**12.753**
	Non HT20, 6 to 54 Mbps	6	21.1	17.243
	HT/VHT20, M0 to M15	m0	21.6	18.191
2462	CCK, 1 to 11 Mbps	11	17.2	13.099
	Non HT20, 6 to 54 Mbps	6	20.9	17.353
	HT/VHT20, M0 to M15	m0	21.8	18.299

26dB / 99% Bandwidth, 2437 MHz, CCK, 1 to 11 Mbps



A.3 Maximum Conducted Output Power

15.247 / RSS-247 section 5.4 / LP0002:3.10.1(2.3) 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.

As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.

The maximum supported antenna gain is 3dBi. The peak correlated gain for each mode is listed in the table below.

Test Procedure

Ref. KDB 558074 D01 DTS Meas Guidance v03r05
ANSI C63.10: 2013

Maximum Conducted 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. 558074 D01 DTS Meas Guidance v03r05 section 9.2 Method AVGSA-1
ANSI C63.10: 2013 section 11.9.2 Method AVGSA-1

Maximum Conducted Output power
Test parameters
Span = >1.5 times the OBW RBW = 1MHz VBW ≥ 3 x RBW Sweep = Auto couple Detector = Peak 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 for Guidance)

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

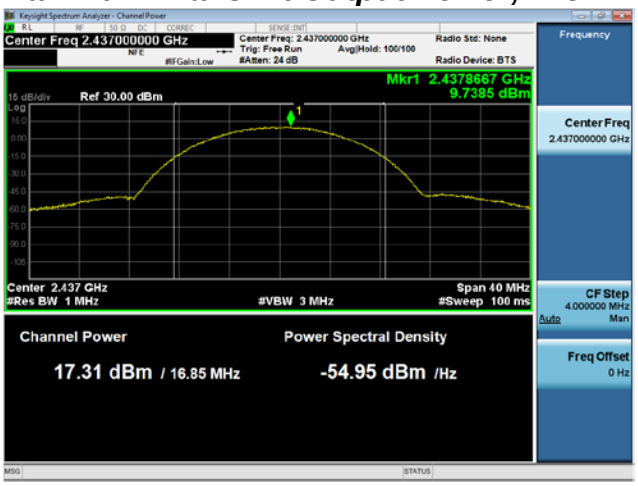
Tested By :	**Date of testing:**
Chris Blair	02-Jan-18 - 05-Jan-18
Test Result : PASS	

See Appendix C for list of test equipment
Note: Limit is modified to ensure complying with both conducted power limit of 30dBm and eirp limit of 36 dBm

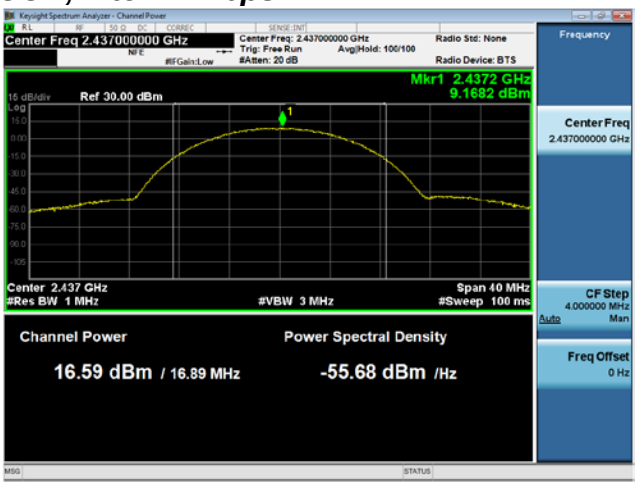
Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Tx 2 Max Power (dBm)	Total Tx Channel Power (dBm)	Limit (dBm) EIRP	Margin (dB)
2412	CCK, 1 to 11 Mbps	1	3	16.4		19.4	32.8	13.4
	CCK, 1 to 11 Mbps	2	3	16.4	15.7	22.1	32.8	10.7
	Non HT20, 6 to 54 Mbps	1	3	16.5		19.5	32.8	13.3
	Non HT20, 6 to 54 Mbps	2	3	15.5	15.2	21.4	32.8	11.4
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	14.5	14.1	23.3	35.8	12.5
	HT/VHT20, M0 to M7	1	3	15.5		18.5	32.8	14.3
	HT/VHT20, M0 to M7	2	3	15.5	15.1	21.3	32.8	11.5
	HT/VHT20, M8 to M15	2	3	15.5	15.1	21.3	32.8	11.5
	HT/VHT20 Beam Forming, M0 to M7	2	6	14.5	14.2	23.4	35.8	12.4
	HT/VHT20 Beam Forming, M8 to M15	2	3	15.5	15.1	21.3	32.8	11.5
	HT/VHT20 STBC, M0 to M7	2	3	15.5	15.1	21.3	32.8	11.5
2437	CCK, 1 to 11 Mbps	1	3	17.3		20.3	32.8	12.5
	CCK, 1 to 11 Mbps	**2**	**3**	**17.3**	**16.6**	**23.0**	**32.8**	**9.8**
	Non HT20, 6 to 54 Mbps	1	3	17.3		20.3	32.8	12.5
	Non HT20, 6 to 54 Mbps	2	3	17.3	16.6	23.0	32.8	9.8
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	17.3	16.6	26.0	35.8	9.8
	HT/VHT20, M0 to M7	1	3	17.4		20.4	32.8	12.4
	HT/VHT20, M0 to M7	2	3	17.4	16.6	23.0	32.8	9.8
	HT/VHT20, M8 to M15	2	3	17.4	16.6	23.0	32.8	9.8
	HT/VHT20 Beam Forming, M0 to M7	2	6	17.4	16.6	26.0	35.8	9.8
	HT/VHT20 Beam Forming, M8 to M15	2	3	17.4	16.6	23.0	32.8	9.8
	HT/VHT20 STBC, M0 to M7	2	3	17.4	16.6	23.0	32.8	9.8
2462	CCK, 1 to 11 Mbps	1	3	16.8		19.8	32.8	13.0
	CCK, 1 to 11 Mbps	2	3	16.8	16.5	22.7	32.8	10.1
	Non HT20, 6 to 54 Mbps	1	3	14.8		17.8	32.8	15.0
	Non HT20, 6 to 54 Mbps	2	3	14.0	13.8	19.9	32.8	12.9
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	13.0	12.8	21.9	35.8	13.9
	HT/VHT20, M0 to M7	1	3	14.1		17.1	32.8	15.7
	HT/VHT20, M0 to M7	2	3	13.0	12.7	18.9	32.8	13.9
	HT/VHT20, M8 to M15	2	3	13.0	12.7	18.9	32.8	13.9
	HT/VHT20 Beam Forming, M0 to M7	2	6	12.1	11.9	21.0	35.8	14.8

	HT/VHT20 Beam Forming, M8 to M15	2	3	13.0	12.7	18.9	32.8	13.9
	HT/VHT20 STBC, M0 to M7	2	3	13.0	12.7	18.9	32.8	13.9

Maximum Transmit Output Power, 2437 MHz, CCK, 1 to 11 Mbps



Antenna A



Antenna B

A.4 Power Spectral Density

15.247 / RSS-247 / LP0002:3.10.1(6.2.2) 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.

Test Procedure

Ref. KDB 558074 D01 DTS Meas Guidance v03r05
ANSI C63.10: 2013

Power Spectral Density Test Procedure
1. Set the radio in the continuous transmitting mode at full power 2.Configure Spectrum analyzer as per test parameters below and Peak search marker 3. Capture graphs and record pertinent measurement data.

Ref. 558074 D01 DTS Meas Guidance v03r05 section 10.2 Peak PSD
ANSI C63.10: 2013 section 11.10.2 Peak PSD

Power Spectral Density Test parameters
Span = >1.5 times the OBW RBW = 3 kHz ≤ RBW ≤ 100 kHz. VBW ≥ 3 x RBW Sweep = Auto couple Detector = Peak Trace = Trace Average 100

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. (See ANSI C63.10 section 14.3.2.3)

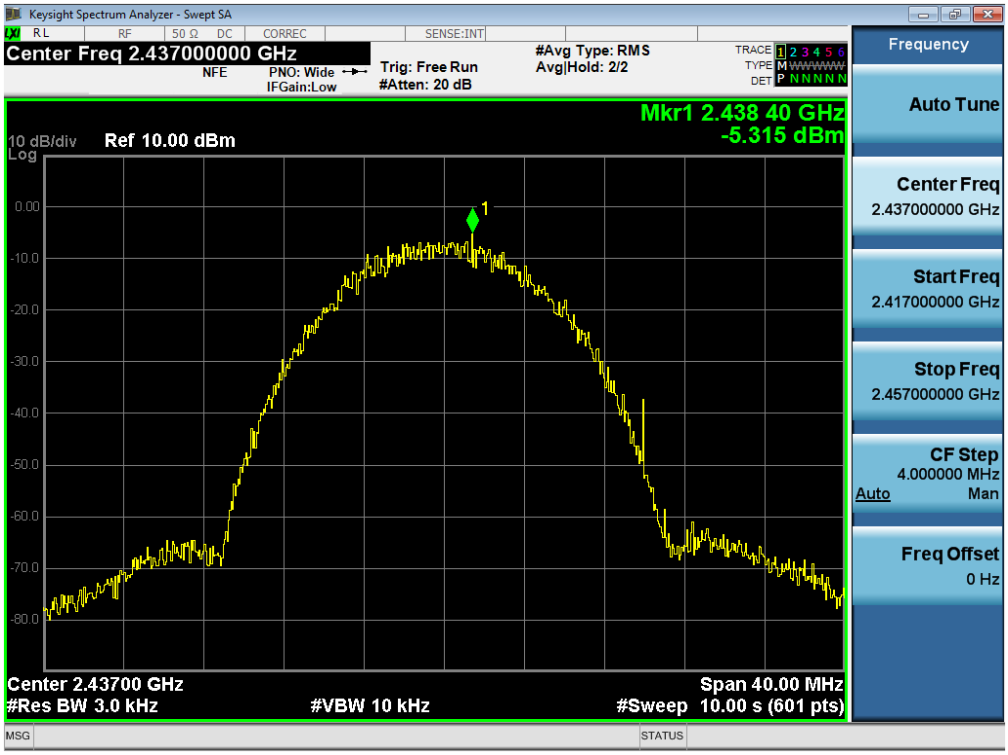
System Number	Description	Samples	System under test	Support equipment
1	EUT	S01	☑	☐
	Support	S02	☐	☑

Tested By : Chris Blair	**Date of testing:** 02-Jan-18 - 05-Jan-18
Test Result : PASS	

See Appendix C for list of test equipment

Frequency (MHz)	Mode	Data Rate (Mbps)	PSD / Antenna (dBm/3kHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
2412	CCK, 1 to 11 Mbps	11	-6.8	-3.8	7.8	11.6
	Non HT20, 6 to 54 Mbps	6	-11.5	-8.5	7.8	16.3
	HT/VHT20, M0 to M15	m0	-10.4	-7.4	7.8	15.2
2437	**CCK, 1 to 11 Mbps**	**11**	**-5.3**	**-2.3**	**7.8**	**10.1**
	Non HT20, 6 to 54 Mbps	6	-9.7	-6.7	7.8	14.5
	HT/VHT20, M0 to M15	m0	-10.5	-7.5	7.8	15.3
2462	CCK, 1 to 11 Mbps	11	-6.8	-3.8	7.8	11.6
	Non HT20, 6 to 54 Mbps	6	-12.9	-9.9	7.8	17.7
	HT/VHT20, M0 to M15	m0	-13.8	-10.8	7.8	18.6

Power Spectral Density, 2437 MHz, CCK, 1 to 11 Mbps



A.5 Conducted Spurious Emissions

15.205 / 15.209 / LP0002 - 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)).

RSS-Gen 8.9: Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in Table 4 and Table 5 below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission.

RSS-Gen 8.10 (**b**) Unwanted emissions that fall into restricted bands of Table 6 shall comply with the limits specified in RSS-Gen; and (**c**) Unwanted emissions that do not fall within the restricted frequency bands of Table 6 shall comply either with the limits specified in the applicable RSS or with those specified in this RSS-Gen.

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 558074 D01 DTS Meas Guidance v03r05
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 3. Configure Spectrum analyzer as per test parameters below (be sure to enter all losses between the transmitter output and the spectrum analyzer). 4. Use the peak marker function to determine the maximum spurs amplitude level. 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. (see ANSI C63.10 2013 section 14.3.2.2) 6. Capture graphs and record pertinent measurement data.

Ref. 558074 D01 DTS Meas Guidance v03r05 section 11.1b, 11.2-3, 12.2.4 & 12.2.5.3
ANSI C63.10: 2013 section 11.10.3 & 11.12.2.4 & 11.12.2.5.3

Conducted Spurious Emissions Test parameters
Span = 30 MHz-26 GHz RBW = 100 kHz. VBW ≥ 3 x RBW Sweep = Auto couple Detector = Peak Trace = Max Hold

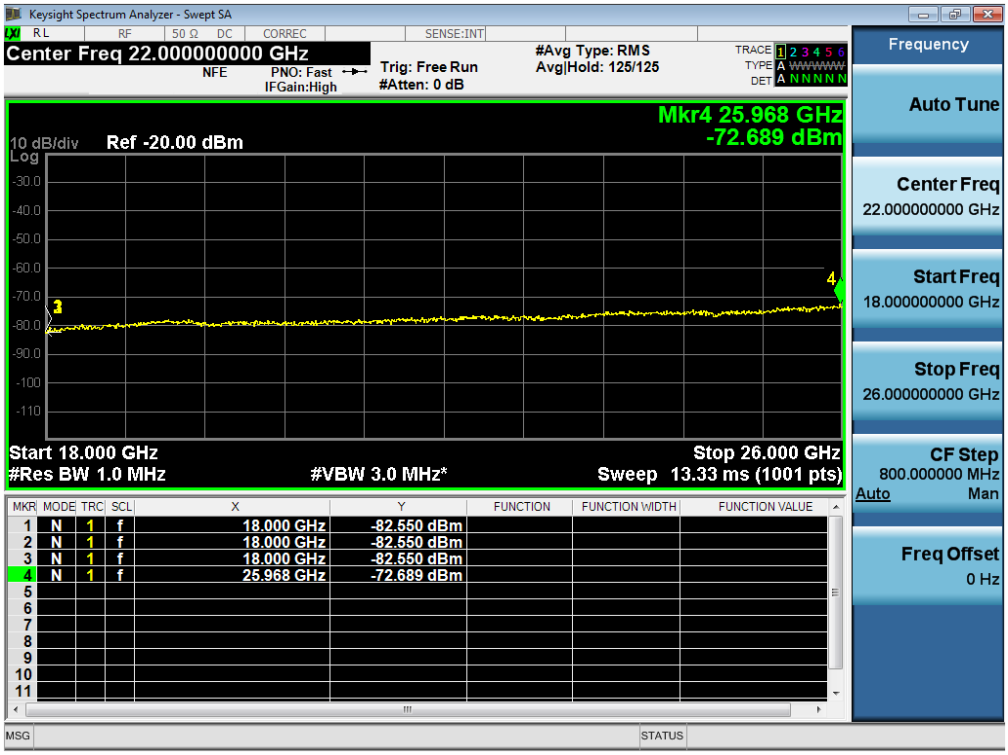
KDB: 558074 D01 DTS Meas Guidance v03r05 section 12.2.2 © add the max antenna gain + ground reflection factor (4.7 dB for frequencies between 30 MHz and 1000 MHz, and 0 dB for frequencies > 1000 MHz).

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

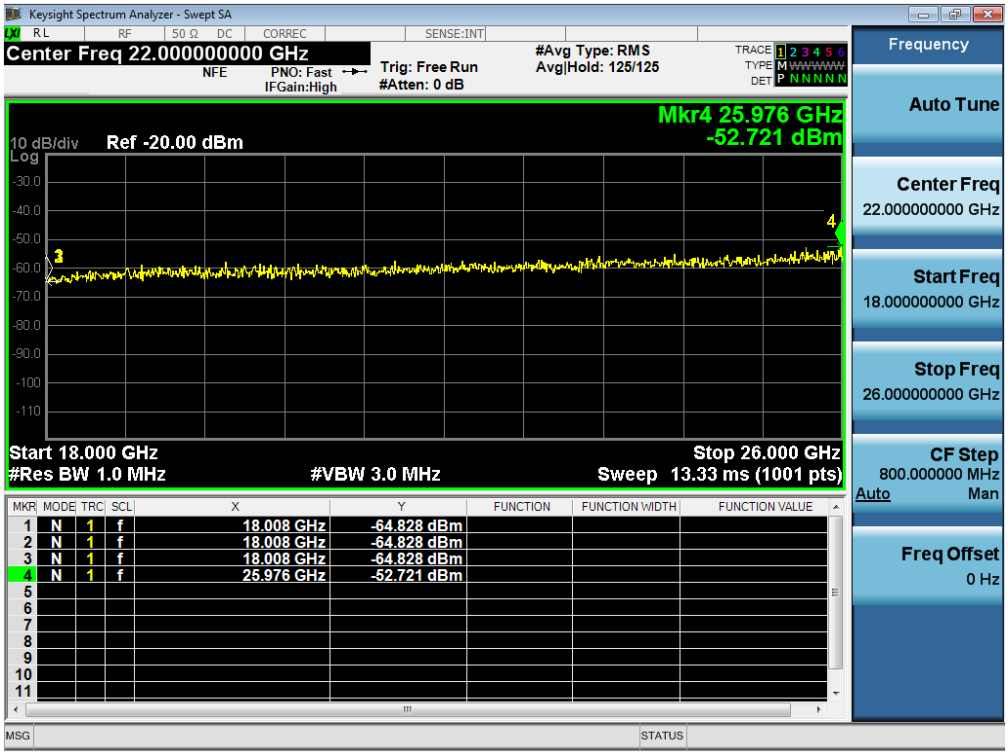
Tested By : Chris Blair	**Date of testing:** 02-Jan-18 - 05-Jan-18
Test Result : PASS	

See Appendix C for list of test equipment

Conducted Spurs Average Upper, All Antennas



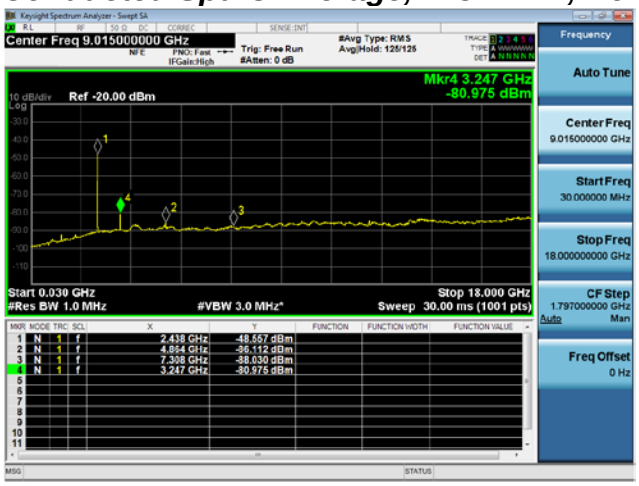
Conducted Spurs Peak Upper, All Antennas



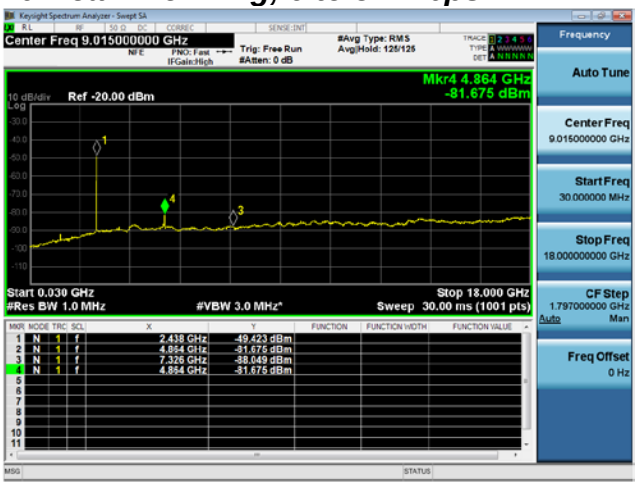
Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Tx 2 Spur Power (dBm)	Total Conducted Spur (dBm)	Limit (dBm)	Margin (dB)
2412	CCK, 1 to 11 Mbps	1	3	-82.8		-79.8	-41.45	38.4
	CCK, 1 to 11 Mbps	2	3	-82.8	-80.7	-75.6	-41.45	34.2
	Non HT20, 6 to 54 Mbps	1	3	-79.4		-76.4	-41.45	35.0
	Non HT20, 6 to 54 Mbps	2	3	-79.1	-80.9	-73.9	-41.45	32.4
	Non HT20 Beam Forming, 6 to 54 Mbps	**2**	**6**	**-80.3**	**-82.9**	**-72.4**	**-41.45**	**30.9**
	HT/VHT20, M0 to M7	1	3	-79.3		-76.3	-41.45	34.9
	HT/VHT20, M0 to M7	2	3	-79.3	-81.5	-74.3	-41.45	32.8
	HT/VHT20, M8 to M15	2	3	-79.3	-81.5	-74.3	-41.45	32.8
	HT/VHT20 Beam Forming, M0 to M7	2	6	-80.5	-82.6	-72.4	-41.45	31.0
	HT/VHT20 Beam Forming, M8 to M15	2	3	-79.3	-81.5	-74.3	-41.45	32.8
	HT/VHT20 STBC, M0 to M7	2	3	-79.3	-81.5	-74.3	-41.45	32.8
2437	CCK, 1 to 11 Mbps	1	3	-82.7		-79.7	-41.45	38.3
	CCK, 1 to 11 Mbps	2	3	-82.7	-82.6	-76.6	-41.45	35.2
	Non HT20, 6 to 54 Mbps	1	3	-81.0		-78.0	-41.45	36.6
	Non HT20, 6 to 54 Mbps	2	3	-81.0	-81.7	-75.3	-41.45	33.9
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-81.0	-81.7	-72.3	-41.45	30.9
	HT/VHT20, M0 to M7	1	3	-81.0		-78.0	-41.45	36.6

	HT/VHT20, M0 to M7	2	3	-81.0	-81.8	-75.4	-41.45	33.9
	HT/VHT20, M8 to M15	2	3	-81.0	-81.8	-75.4	-41.45	33.9
	HT/VHT20 Beam Forming, M0 to M7	2	6	-81.0	-81.8	-72.4	-41.45	30.9
	HT/VHT20 Beam Forming, M8 to M15	2	3	-81.0	-81.8	-75.4	-41.45	33.9
	HT/VHT20 STBC, M0 to M7	2	3	-81.0	-81.8	-75.4	-41.45	33.9
2462	CCK, 1 to 11 Mbps	1	3	-82.1		-79.1	-41.45	37.7
	CCK, 1 to 11 Mbps	2	3	-82.1	-79.8	-74.8	-41.45	33.3
	Non HT20, 6 to 54 Mbps	1	3	-82.8		-79.8	-41.45	38.4
	Non HT20, 6 to 54 Mbps	2	3	-83.0	-83.0	-77.0	-41.45	35.5
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-82.5	-82.4	-73.4	-41.45	32.0
	HT/VHT20, M0 to M7	1	3	-82.5		-79.5	-41.45	38.1
	HT/VHT20, M0 to M7	2	3	-82.6	-82.7	-76.6	-41.45	35.2
	HT/VHT20, M8 to M15	2	3	-82.6	-82.7	-76.6	-41.45	35.2
	HT/VHT20 Beam Forming, M0 to M7	2	6	-82.3	-82.6	-73.4	-41.45	32.0
	HT/VHT20 Beam Forming, M8 to M15	2	3	-82.6	-82.7	-76.6	-41.45	35.2
	HT/VHT20 STBC, M0 to M7	2	3	-82.6	-82.7	-76.6	-41.45	35.2

Conducted Spurs Average, 2437 MHz, Non HT20 Beam Forming, 6 to 54 Mbps



Antenna A

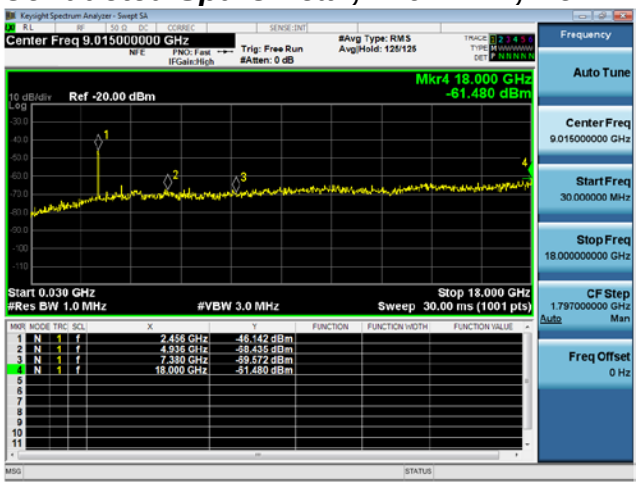


Antenna B

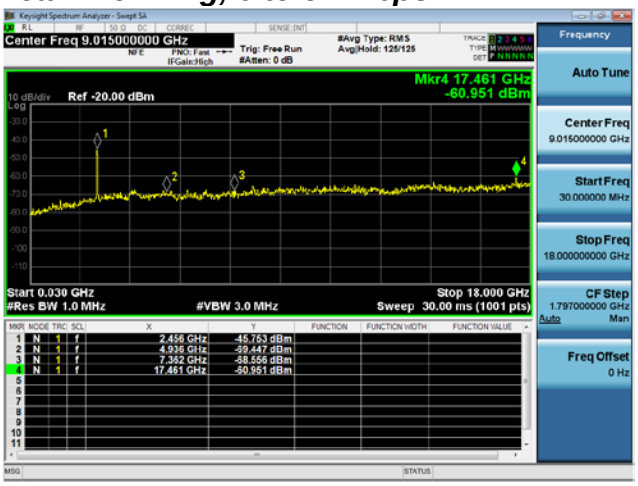
Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Tx 2 Spur Power (dBm)	Total Conducted Spur (dBm)	Limit (dBm)	MargIn (dB)
2412	CCK, 1 to 11 Mbps	1	3	-62.1		-59.1	-21.45	37.7
	CCK, 1 to 11 Mbps	2	3	-62.1	-63.6	-56.8	-21.45	35.3
	Non HT20, 6 to 54 Mbps	1	3	-63.5		-60.5	-21.45	39.1
	Non HT20, 6 to 54 Mbps	2	3	-62.8	-60.9	-55.7	-21.45	34.3
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-63.3	-62.1	-53.6	-21.45	32.2
	HT/VHT20, M0 to M7	1	3	-62.4		-59.4	-21.45	38.0
	HT/VHT20, M0 to M7	2	3	-62.4	-63.1	-56.7	-21.45	35.3
	HT/VHT20, M8 to M15	2	3	-62.4	-63.1	-56.7	-21.45	35.3
	HT/VHT20 Beam Forming, M0 to M7	2	6	-63.3	-62.9	-54.1	-21.45	32.6
	HT/VHT20 Beam Forming, M8 to M15	2	3	-62.4	-63.1	-56.7	-21.45	35.3
	HT/VHT20 STBC, M0 to M7	2	3	-62.4	-63.1	-56.7	-21.45	35.3
2437	CCK, 1 to 11 Mbps	1	3	-63.2		-60.2	-21.45	38.8
	CCK, 1 to 11 Mbps	2	3	-63.2	-62.4	-56.8	-21.45	35.3
	Non HT20, 6 to 54 Mbps	1	3	-62.9		-59.9	-21.45	38.5
	Non HT20, 6 to 54 Mbps	2	3	-62.9	-63.1	-57.0	-21.45	35.5
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-62.9	-63.1	-54.0	-21.45	32.5
	HT/VHT20, M0 to M7	1	3	-63.0		-60.0	-21.45	38.6

	HT/VHT20, M0 to M7	2	3	-63.0	-62.8	-56.9	-21.45	35.4
	HT/VHT20, M8 to M15	2	3	-63.0	-62.8	-56.9	-21.45	35.4
	HT/VHT20 Beam Forming, M0 to M7	2	6	-63.0	-62.8	-53.9	-21.45	32.4
	HT/VHT20 Beam Forming, M8 to M15	2	3	-63.0	-62.8	-56.9	-21.45	35.4
	HT/VHT20 STBC, M0 to M7	2	3	-63.0	-62.8	-56.9	-21.45	35.4
2462	CCK, 1 to 11 Mbps	1	3	-62.6		-59.6	-21.45	38.2
	CCK, 1 to 11 Mbps	2	3	-62.6	-63.3	-56.9	-21.45	35.5
	Non HT20, 6 to 54 Mbps	1	3	-62.7		-59.7	-21.45	38.3
	Non HT20, 6 to 54 Mbps	2	3	-62.3	-63.1	-56.7	-21.45	35.2
	Non HT20 Beam Forming, 6 to 54 Mbps	**2**	**6**	**-61.5**	**-61.0**	**-52.2**	**-21.45**	**30.8**
	HT/VHT20, M0 to M7	1	3	-62.8		-59.8	-21.45	38.4
	HT/VHT20, M0 to M7	2	3	-61.9	-63.6	-56.7	-21.45	35.2
	HT/VHT20, M8 to M15	2	3	-61.9	-63.6	-56.7	-21.45	35.2
	HT/VHT20 Beam Forming, M0 to M7	2	6	-62.9	-61.8	-53.3	-21.45	31.9
	HT/VHT20 Beam Forming, M8 to M15	2	3	-61.9	-63.6	-56.7	-21.45	35.2
	HT/VHT20 STBC, M0 to M7	2	3	-61.9	-63.6	-56.7	-21.45	35.2

Conducted Spurs Peak, 2462 MHz, Non HT20 Beam Forming, 6 to 54 Mbps



Antenna A



Antenna B

A.6 Conducted Bandedge

15.205 / 15.247 / RSS-Gen / RSS-247 / LP0002:3.10.1(5) & 2.8 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.

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), and RSS-Gen 8.10 must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)) and RSS-Gen 8.9..

Test Procedure

Ref. KDB 558074 D01 DTS Meas Guidance v03r05
ANSI C63.10: 2013

Conducted Band edge 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 558074 D01 DTS Meas Guidance v03r05 to substitute conducted measurements in place of radiated measurements. 3. Configure Spectrum analyzer as per test parameters below 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.

Conducted Bandedge Test parameters non-restricted Band KDB 558074 D01 v03r05 section 11.1b, 11.2-3, also see ANSI C63.10: 2013 section 11.10.3	**Conducted Bandedge** Test parameters restricted Band KDB 558074 D01 v03r05 section 12.2.4 & 12.2.5.3 also see ANSI C63.10: 2013 section 11.12.4 & 11.12.5.3
RBW = 100 kHz VBW ≥ 3 x RBW Sweep = Auto couple Detector = Peak Trace = Max Hold.	RBW = 1 MHz VBW ≥ 3 x RBW for Peak, 100Hz for Average Sweep = Auto couple Detector = Peak Trace = Max Hold.

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

Tested By : Chris Blair	**Date of testing:** 02-Jan-18 - 05-Jan-18
Test Result : PASS	

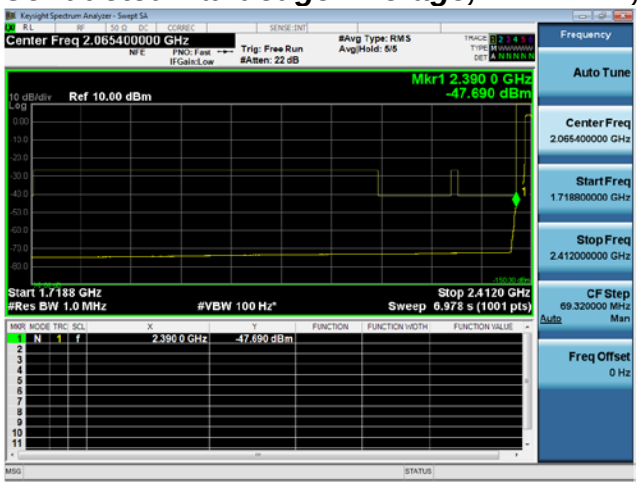
See Appendix C for list of test equipment

Restricted Band

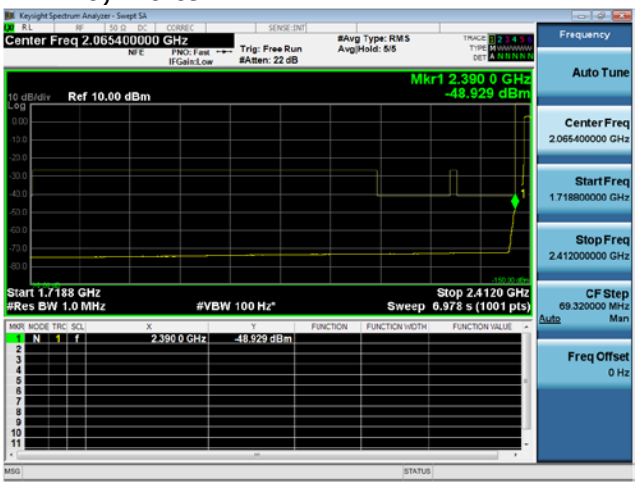
Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Tx 2 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
2412	CCK, 1 to 11 Mbps	1	3	-66.2		-63.2	-41.45	21.8
	CCK, 1 to 11 Mbps	2	3	-66.2	-65.0	-59.5	-41.45	18.1
	Non HT20, 6 to 54 Mbps	1	3	-45.5		-42.5	-41.45	1.1
	Non HT20, 6 to 54 Mbps	2	3	-48.9	-49.5	-43.2	-41.45	1.7
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-53.3	-53.8	-44.5	-41.45	3.1
	HT/VHT20, M0 to M7	1	3	-47.7		-44.7	-41.45	3.3
	HT/VHT20, M0 to M7	2	3	-47.7	-48.9	-42.2	-41.45	0.8
	HT/VHT20, M8 to M15	2	3	-47.7	-48.9	-42.2	-41.45	0.8
	HT/VHT20 Beam Forming, M0 to M7	2	6	-52.8	-53.7	-44.2	-41.45	2.8
	HT/VHT20 Beam Forming, M8 to M15	2	3	-47.7	-48.9	-42.2	-41.45	0.8
	HT/VHT20 STBC, M0 to M7	2	3	-47.7	-48.9	-42.2	-41.45	0.8
2462	CCK, 1 to 11 Mbps	1	3	-60.5		-57.5	-41.45	16.1
	CCK, 1 to 11 Mbps	2	3	-60.5	-60.6	-54.5	-41.45	13.1
	Non HT20, 6 to 54 Mbps	1	3	-44.8		-41.8	-41.45	0.3
	Non HT20, 6 to 54 Mbps	2	3	-47.4	-50.2	-42.6	-41.45	1.1
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-50.6	-53.3	-42.7	-41.45	1.3

	HT/VHT20, M0 to M7	**1**	**3**	**-44.5**		**-41.5**	**-41.45**	**0.1**
	HT/VHT20, M0 to M7	2	3	-48.1	-51.1	-43.3	-41.45	1.9
	HT/VHT20, M8 to M15	2	3	-48.1	-51.1	-43.3	-41.45	1.9
	HT/VHT20 Beam Forming, M0 to M7	2	6	-51.0	-53.3	-43.0	-41.45	1.5
	HT/VHT20 Beam Forming, M8 to M15	2	3	-48.1	-51.1	-43.3	-41.45	1.9
	HT/VHT20 STBC, M0 to M7	2	3	-48.1	-51.1	-43.3	-41.45	1.9

Conducted Bandedge Average, 2412 MHz, HT/VHT20, M0 to M7

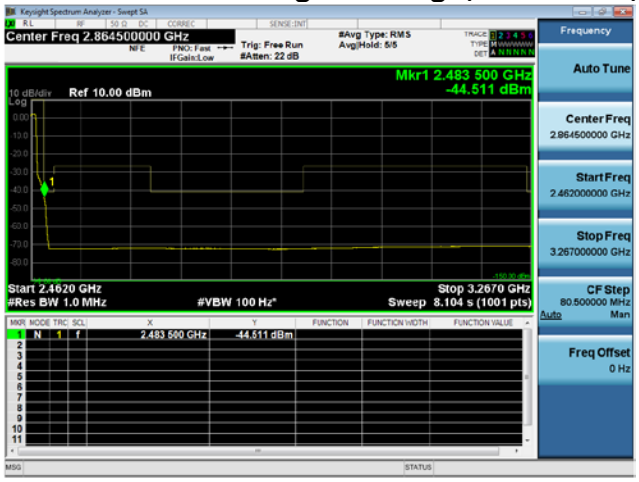


Antenna A



Antenna B

Conducted Bandedge Average, 2462 MHz, HT/VHT20, M0 to M7

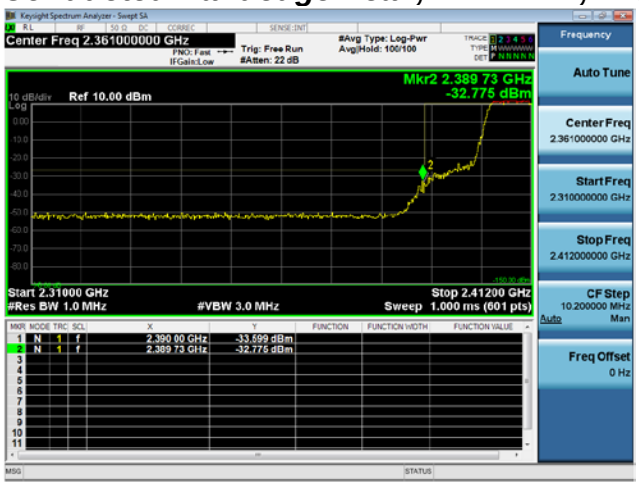


Antenna A

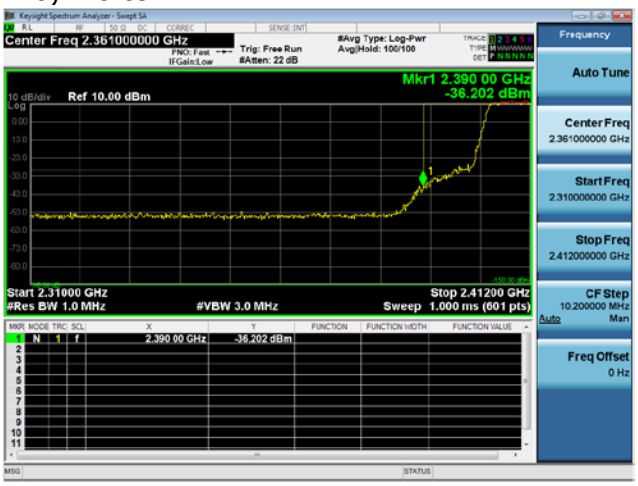
Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Tx 2 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
2412	CCK, 1 to 11 Mbps	1	3	-52.1		-49.1	-21.45	27.7
	CCK, 1 to 11 Mbps	2	3	-52.1	-51.2	-45.6	-21.45	24.2
	Non HT20, 6 to 54 Mbps	1	3	-31.6		-28.6	-21.45	7.2
	Non HT20, 6 to 54 Mbps	2	3	-36.9	-35.8	-30.3	-21.45	8.9
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-39.8	-43.9	-32.4	-21.45	10.9
	HT/VHT20, M0 to M7	1	3	-32.8		-29.8	-21.45	8.4
	HT/VHT20, M0 to M7	**2**	**3**	**-32.8**	**-36.2**	**-28.2**	**-21.45**	**6.7**
	HT/VHT20, M8 to M15	2	3	-32.8	-36.2	-28.2	-21.45	6.7
	HT/VHT20 Beam Forming, M0 to M7	2	6	-39.3	-40.7	-30.9	-21.45	9.5
	HT/VHT20 Beam Forming, M8 to M15	2	3	-32.8	-36.2	-28.2	-21.45	6.7
	HT/VHT20 STBC, M0 to M7	2	3	-32.8	-36.2	-28.2	-21.45	6.7
2462	CCK, 1 to 11 Mbps	1	3	-48.9		-45.9	-21.45	24.5
	CCK, 1 to 11 Mbps	2	3	-48.9	-49.7	-43.3	-21.45	21.8
	Non HT20, 6 to 54 Mbps	1	3	-33.5		-30.5	-21.45	9.1
	Non HT20, 6 to 54 Mbps	2	3	-36.9	-40.2	-32.2	-21.45	10.8
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-36.6	-42.1	-29.5	-21.45	8.1
	HT/VHT20, M0 to M7	1	3	-34.2		-31.2	-21.45	9.8

	HT/VHT20, M0 to M7	2	3	-36.8	-39.6	-32.0	-21.45	10.5
	HT/VHT20, M8 to M15	2	3	-36.8	-39.6	-32.0	-21.45	10.5
	HT/VHT20 Beam Forming, M0 to M7	2	6	-38.6	-41.9	-30.9	-21.45	9.5
	HT/VHT20 Beam Forming, M8 to M15	2	3	-36.8	-39.6	-32.0	-21.45	10.5
	HT/VHT20 STBC, M0 to M7	2	3	-36.8	-39.6	-32.0	-21.45	10.5

Conducted Bandedge Peak, 2412 MHz, HT/VHT20, M0 to M7



Antenna A



Antenna B

Conducted Bandedge Peak, 2462 MHz, Non HT20 Beam Forming, 6 to 54 Mbps

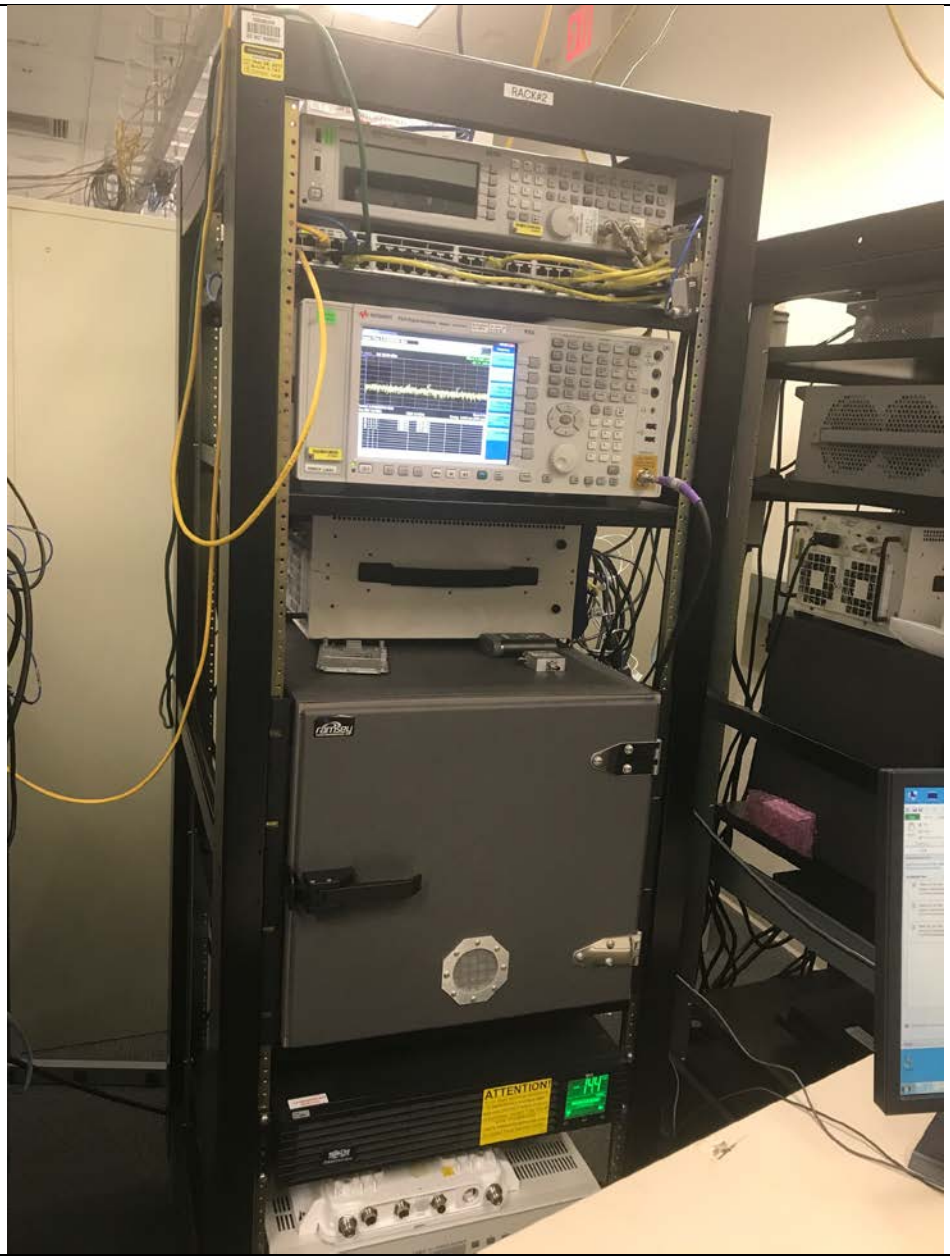
Antenna A

Antenna B

Non-Restricted Band

Frequency (MHz)	Mode	Data Rate (Mbps)	Conducted Bandedge Delta (dB)	Limit (dBc)	Margin (dB)
2412	CCK, 1 to 11 Mbps	11	58.6	>30	28.6
	Non HT20, 6 to 54 Mbps	**6**	**36.1**	**>30**	**6.1**
	HT/VHT20, M0 to M15	m0	39.5	>30	9.5

Conducted Bandedge Delta, 2412 MHz, Non HT20, 6 to 54 Mbps



Title: Physical Test Arrangement Photograph

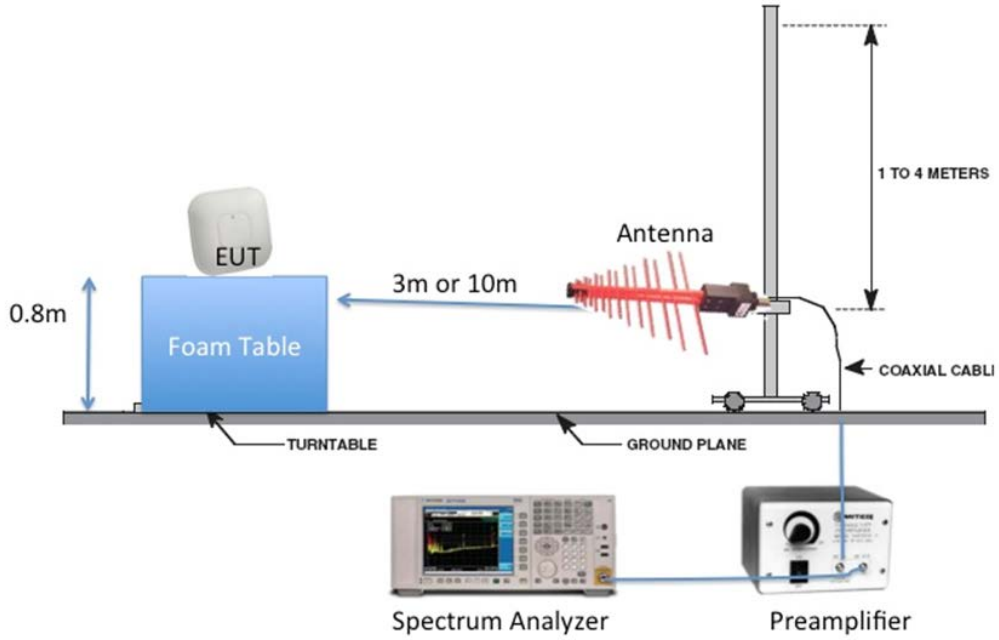
This is a dual band 2.4GHz / 5GHz device. All ports in this test set up photo are connected as all testing is automated. Section 2.6 of this test report given an overview of the different Tx antenna combinations used by this device.

Title: Physical Test Arrangement Photograph

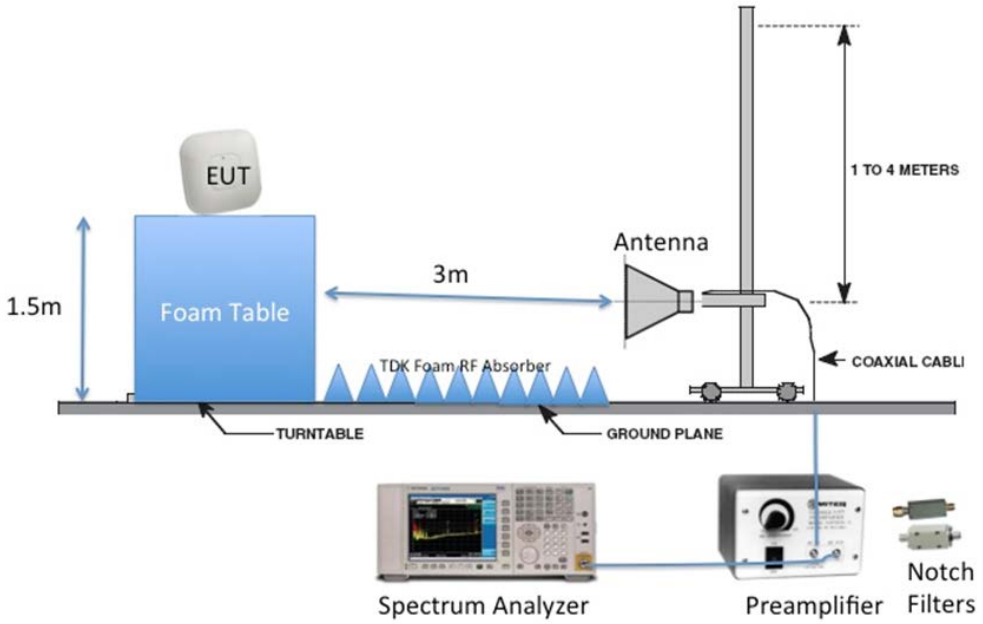
This is a dual band 2.4GHz / 5GHz device. All ports in this test set up photo are connected as all testing is automated. Section 2.6 of this test report given an overview of the different Tx antenna combinations used by this device.

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



B.1 Radiated Spurious Emissions

15.205 / RSS-Gen / LP0002:3.10.1(5)/2.8 Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) and RSS-Gen 8.10, must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)) and RSS-Gen 8.9.

Ref. ANSI C63.10: 2013 section 4.1.4.2.2, 4.1.4.2.3, 6.6.4 & 11.12.2

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:	1GHz – 18 GHz/18GHz-26G
Reference Level:	80 dBuV
Sweep Time:	Coupled
Resolution Bandwidth:	1MHz
Video Bandwidth:	3 MHz
Detector:	Peak, Average
Trace:	Max Hold, Average

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
2	EUT	S03	☑	☐
	Support	S04, S05	☐	☑

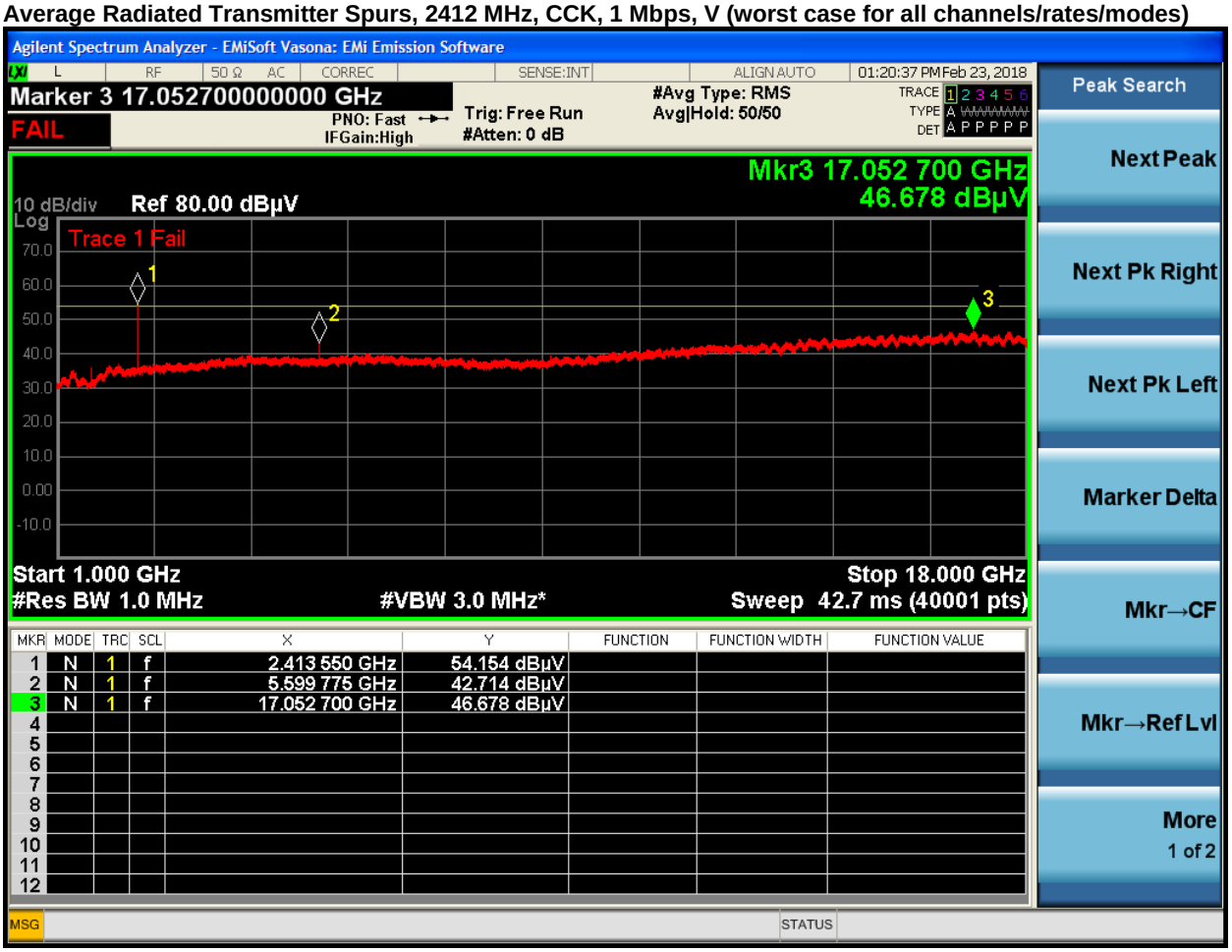
Tested By : Chris Blair	**Date of testing:** 14-Feb-18 to 15-Feb-18 & 21-Feb-18 to 23-Feb-18 & 13-Mar-18 to 16-Mar-18.
Test Result : PASS	

See Appendix C for list of test equipment

B.1.A Transmitter Radiated Spurious Emissions-Average Worst Case

Frequency (MHz)	Mode	Data Rate	Spurious Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (MHz)
2412	CCK	1Mbps	46.678	54	7.322

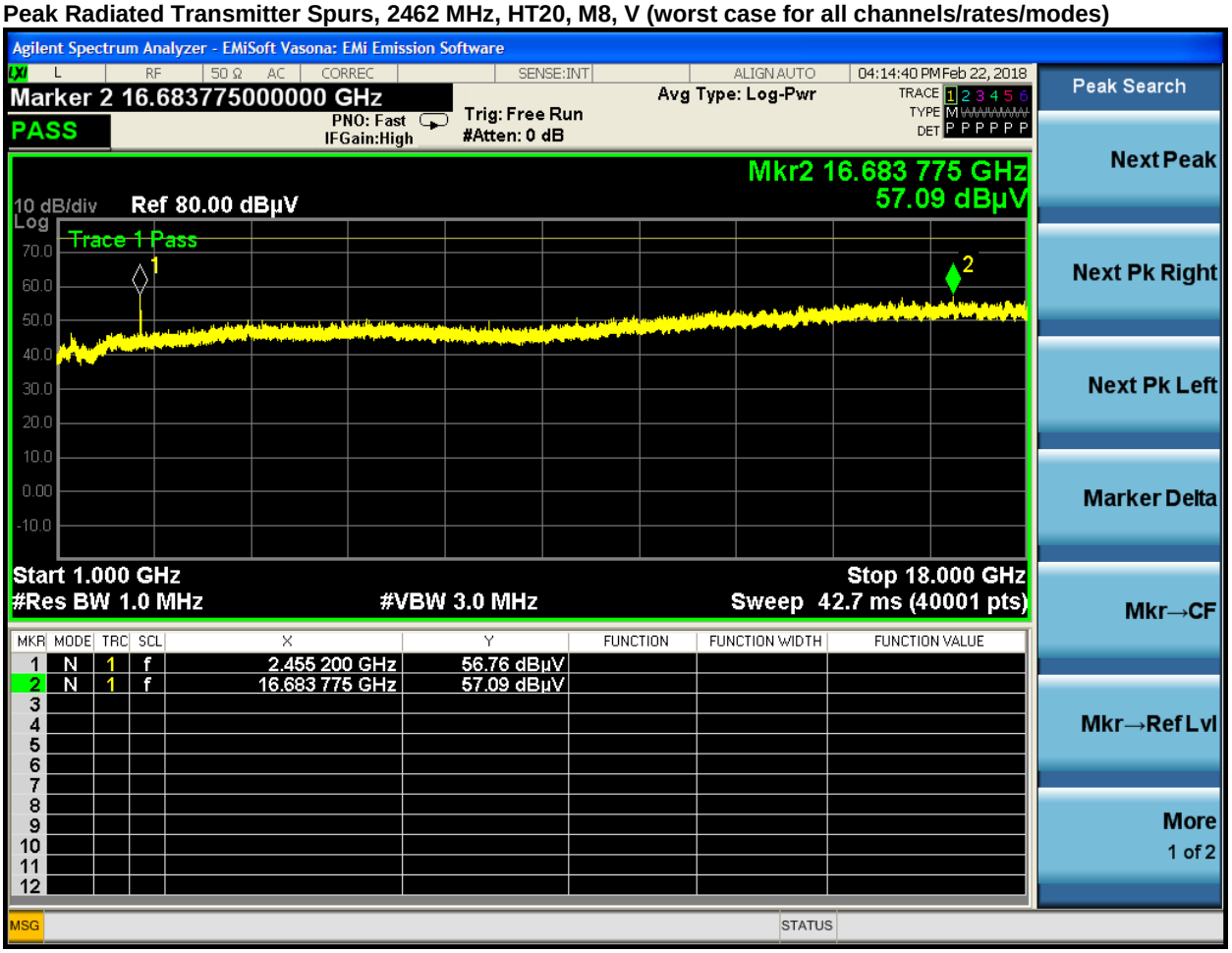
Average Radiated Transmitter Spurs, 2412 MHz, CCK, 1 Mbps, V (worst case for all channels/rates/modes)



B.1.P Transmitter Radiated Spurious Emissions-Peak Worst Case

Frequency (MHz)	Mode	Data Rate	Spurious Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (MHz)
2462	HT20	M8	**57.09**	74	16.91

Peak Radiated Transmitter Spurs, 2462 MHz, HT20, M8, V (worst case for all channels/rates/modes)



B.2 Receiver Spurious Emissions

RSS-Gen Receivers are required to comply with the limits of spurious emissions as set out in this section. Receiver emission measurements are to be performed as per the normative test method referenced in Section 3.

Radiated emissions which fall in the restricted bands, as defined in RSS-Gen section 8.10, must also comply with the radiated emission limits specified in RSS-Gen section 8.9.

For emissions at frequencies below 1 GHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. At frequencies above 1 GHz, measurements shall be performed using a linear average detector with a minimum resolution bandwidth of 1 MHz.

Ref. RSS-Gen section 8.9 & 8.10
ANSI C63.10: 2013 section 4.1.4.2.2, 4.1.4.2.3, 6.6.4 & 11.12.2

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:	1GHz – 18 GHz/18GHz-26G
Reference Level:	80 dBuV
Sweep Time:	Coupled
Resolution Bandwidth:	1MHz
Video Bandwidth:	3MHz
Detector:	Peak, Average
Trace:	Max Hold, Average

Radiated emission measurements shall be performed with the receiver antenna connected to the receiver antenna terminals.

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

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

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

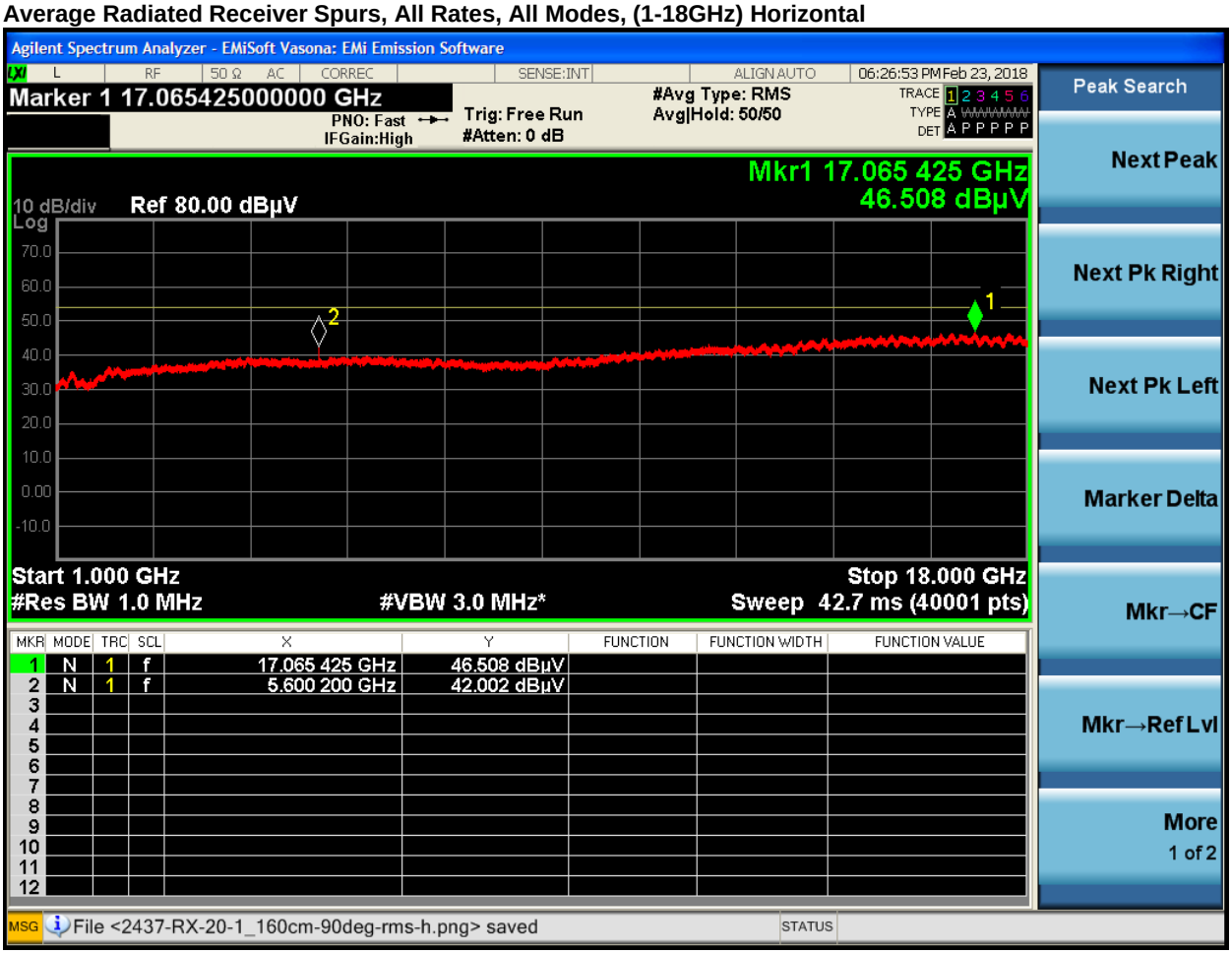
System Number	Description	Samples	System under test	Support equipment
2	EUT	S03	☑	☐
	Support	S04, S05	☐	☑

Tested By : Chris Blair	**Date of testing:** 14-Feb-18 to 15-Feb-18 & 21-Feb-18 to 23-Feb-18 & 13-Mar-18 to 16-Mar-18.
Test Result : PASS	

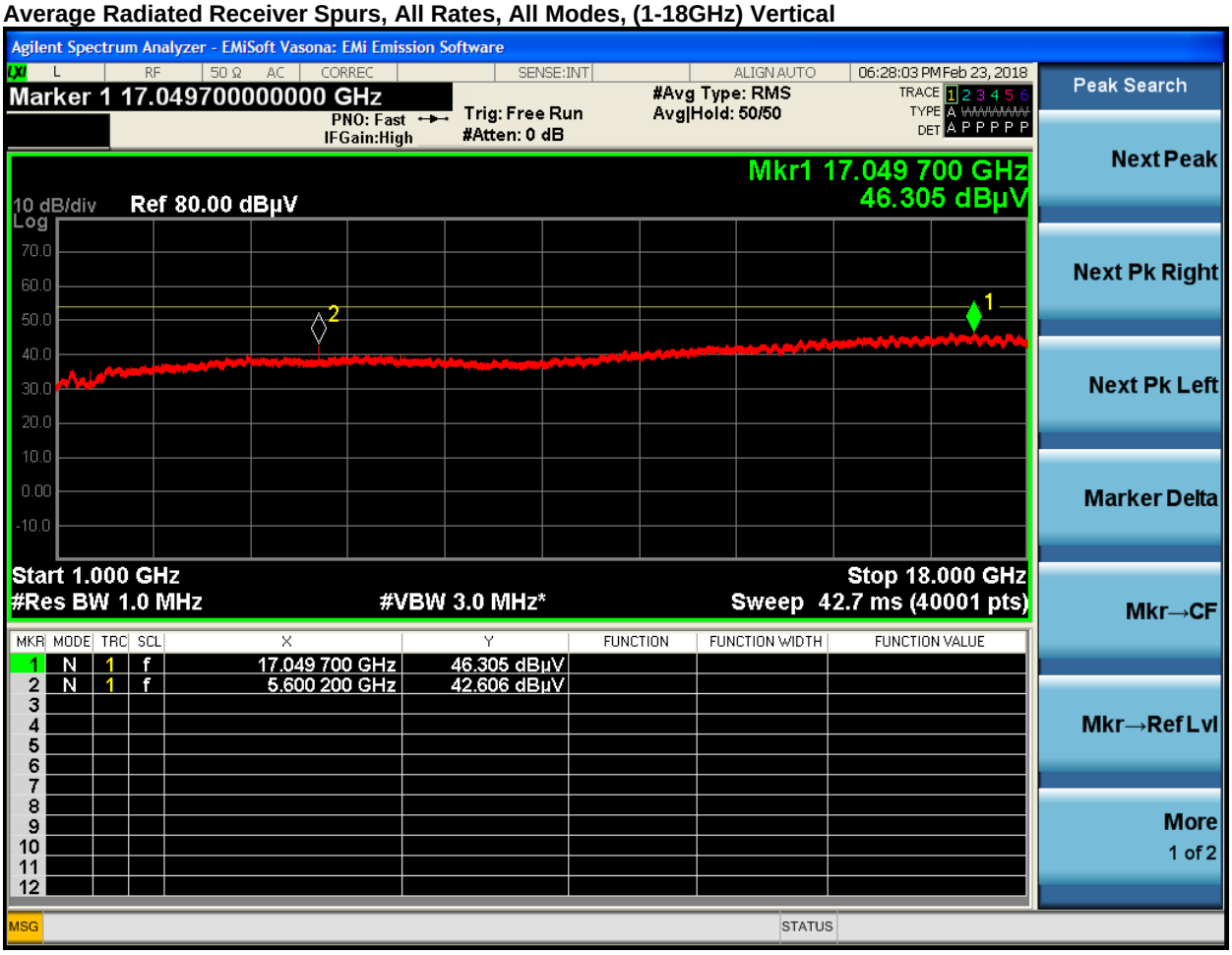
See Appendix C for list of test equipment

B.2.A Receiver Radiated Spurious Emissions (Average Measurements)

Average Radiated Receiver Spurs, All Rates, All Modes, (1-18GHz) Horizontal

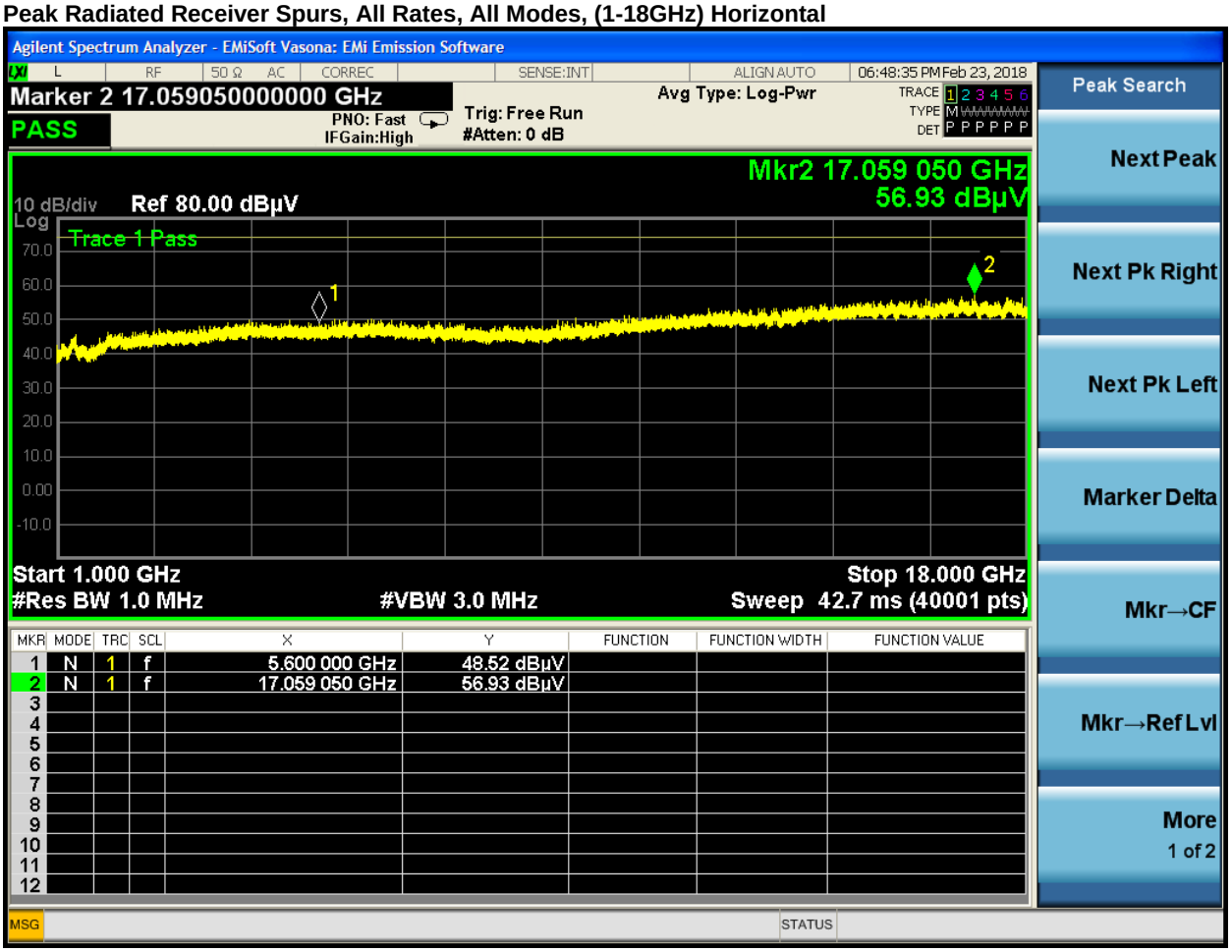


Average Radiated Receiver Spurs, All Rates, All Modes, (1-18GHz) Vertical

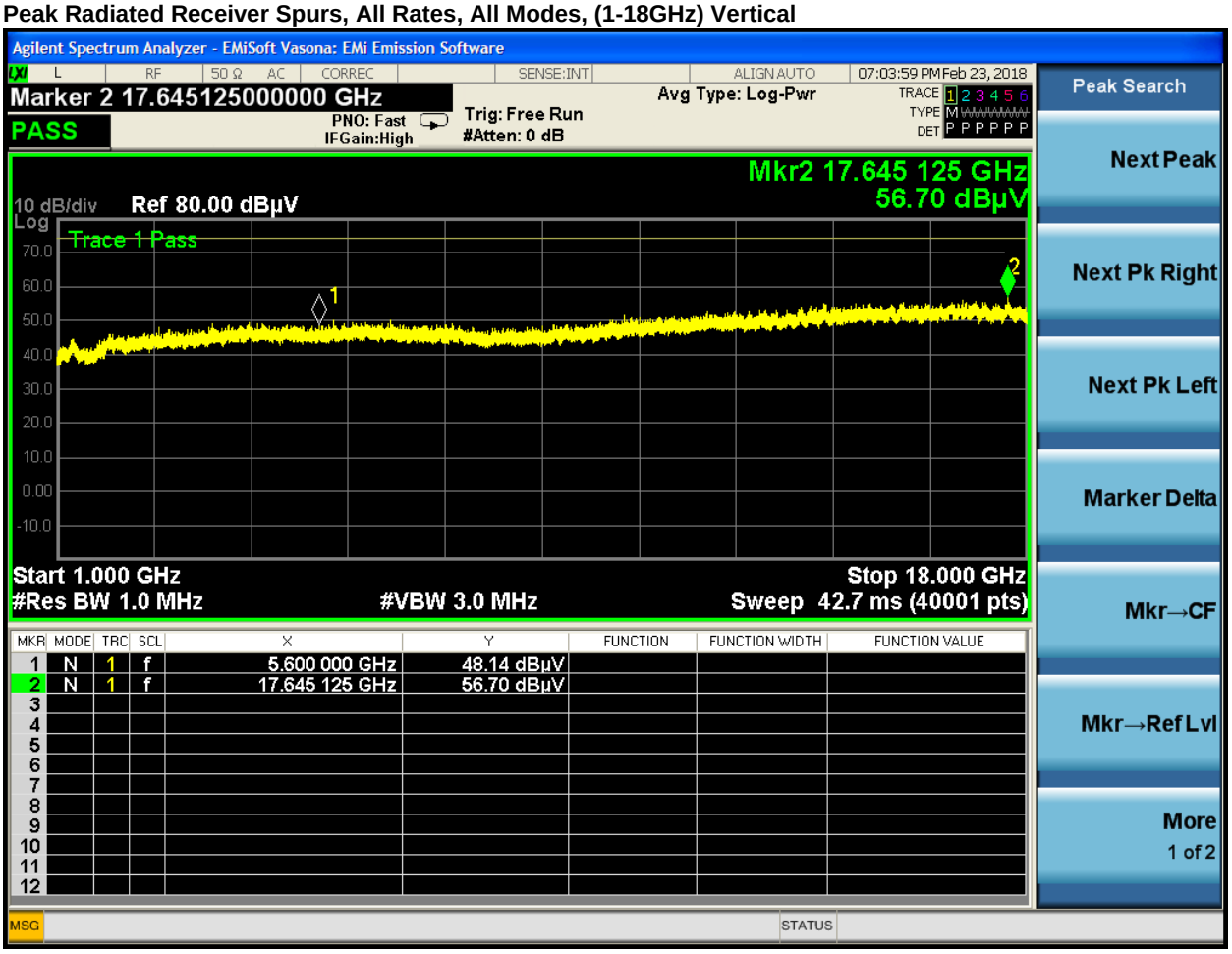


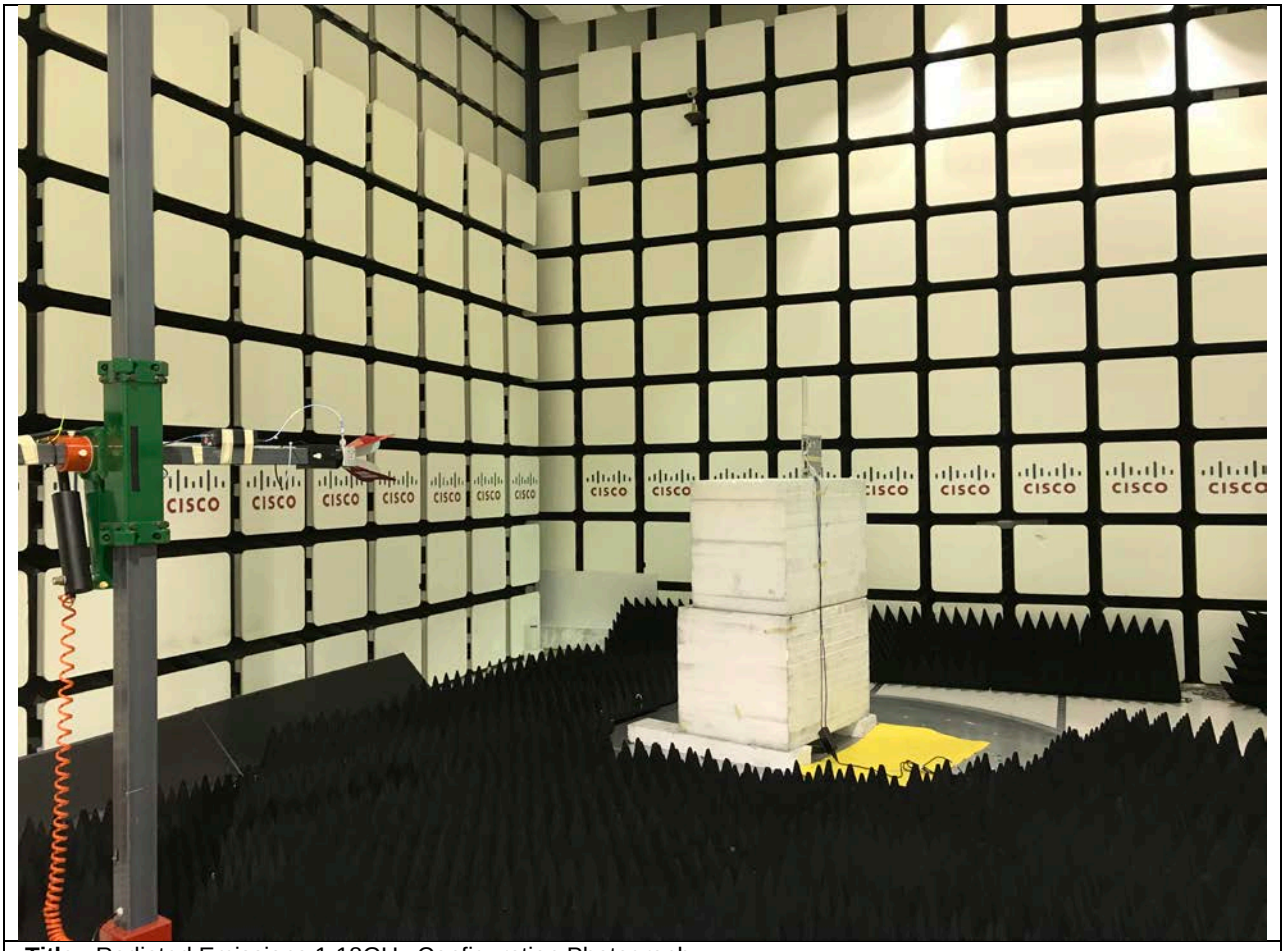
B.2.P Receiver Radiated Spurious Emissions (Peak Measurements)

Peak Radiated Receiver Spurs, All Rates, All Modes, (1-18GHz) Horizontal

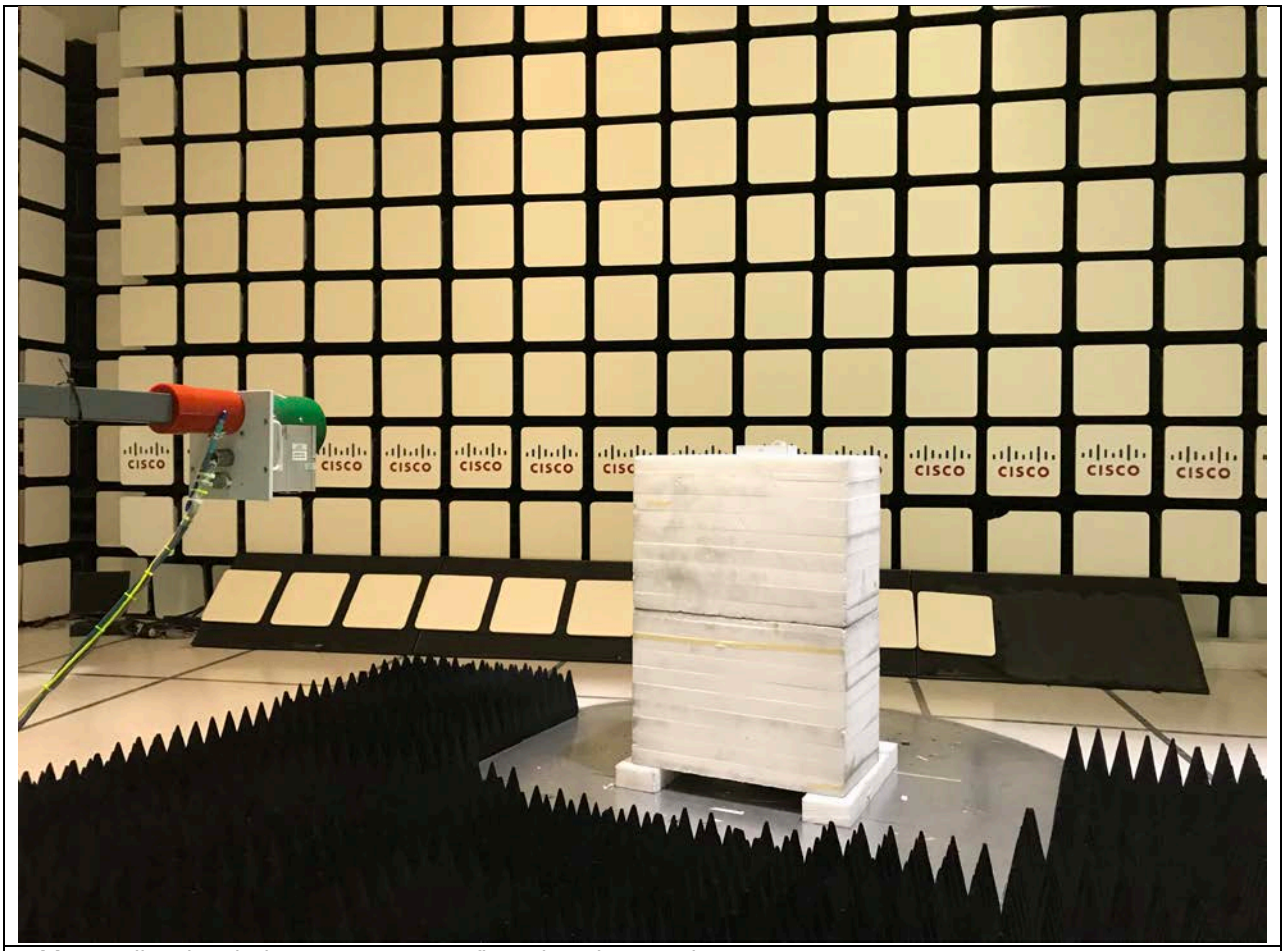


Peak Radiated Receiver Spurs, All Rates, All Modes, (1-18GHz) Vertical





Title: Radiated Emissions 1-18GHz Configuration Photograph



Title: Radiated Emissions 18-40GHz Configuration Photograph

B.3 Radiated Emissions 30MHz to 1GHz

15.205 / 15.209 / RSS-Gen / LP0002:3.10.1(5)/2.8 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)) and RSS-Gen section 8.9.

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
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.

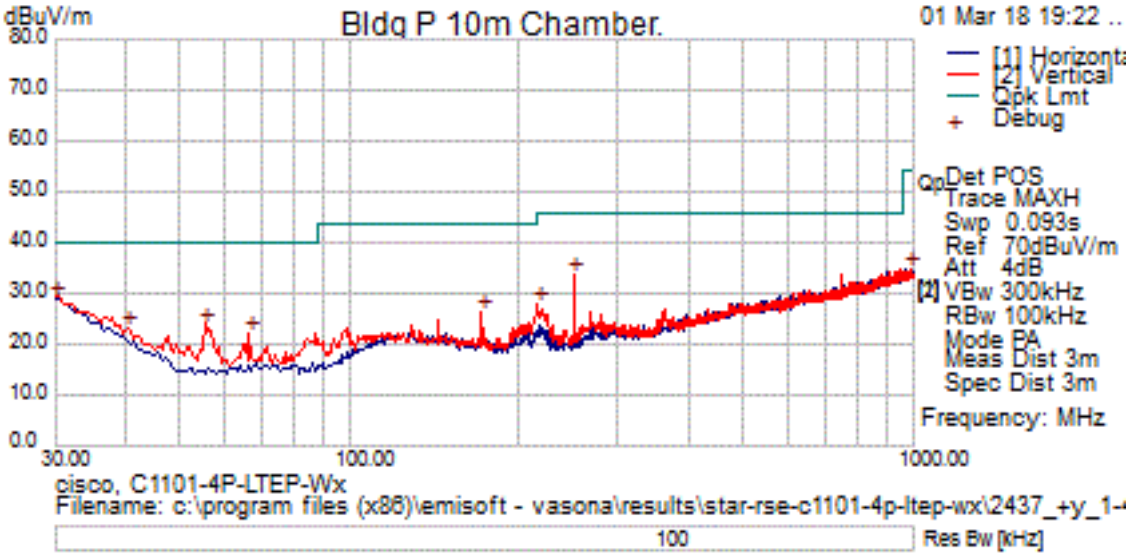
Maximize Turntable (find worst case table angle), Maximize Antenna (find worst case height)

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

System Number	Description	Samples	System under test	Support equipment
2	EUT	S03	☑	☐
	Support	S04, S05	☐	☑

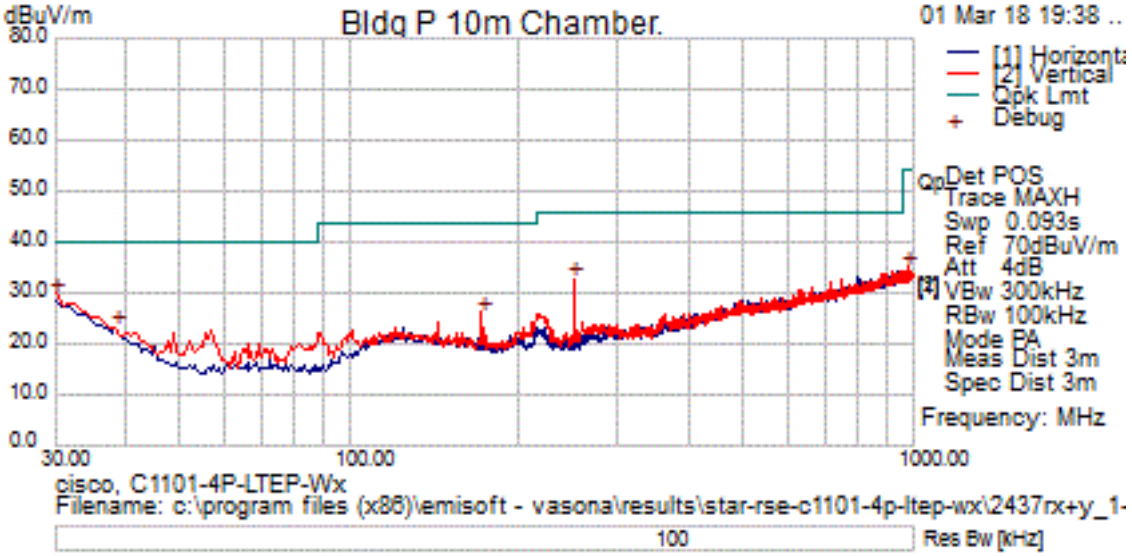
Tested By : Chris Blair	**Date of testing:** 01-Mar-18
Test Result : PASS	

See Appendix C for list of test equipment



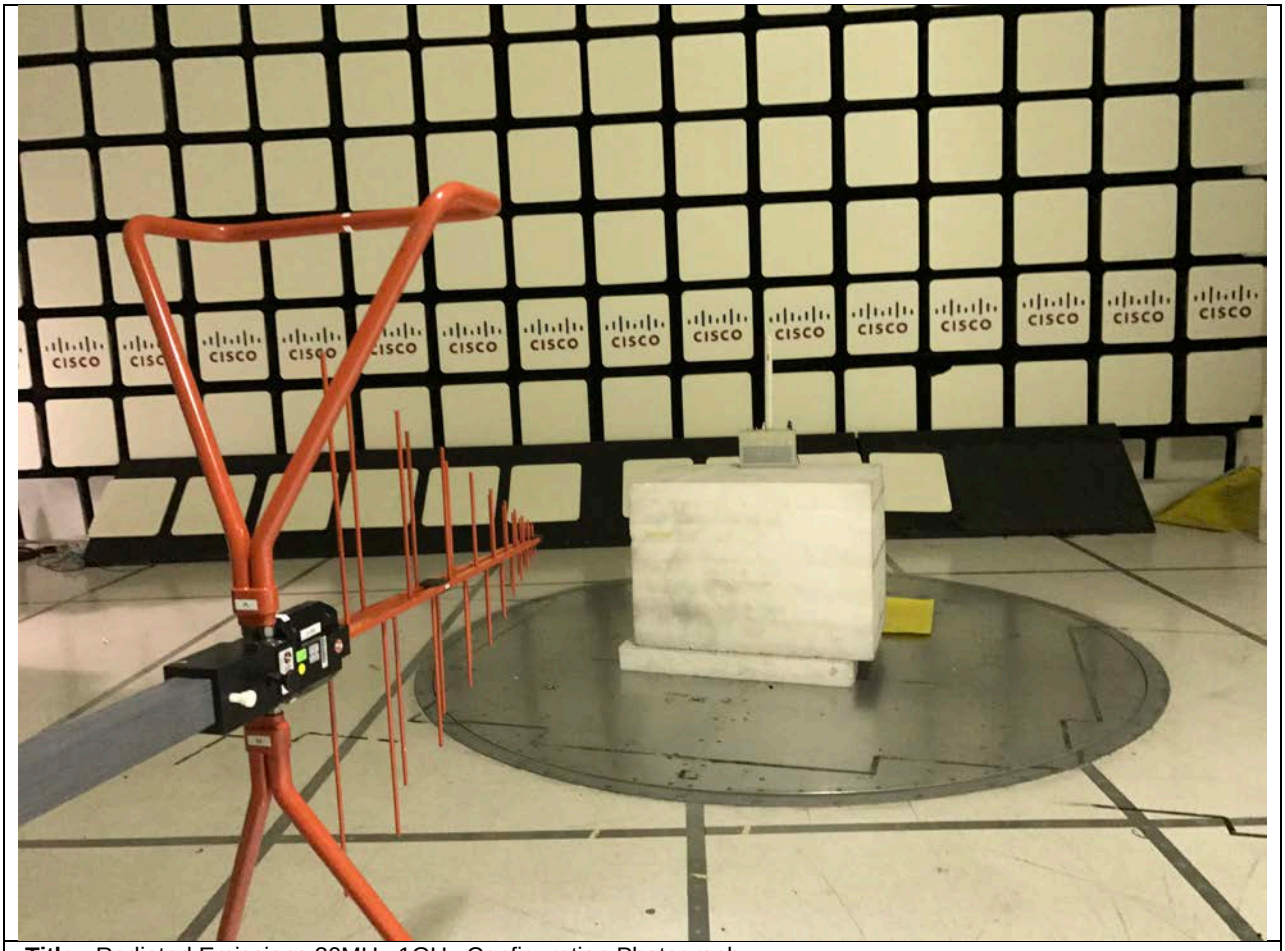
Test Results Table, Tx

Frequency (MHz)	Raw (dBuV)	Cable Loss	AF (dB)	Level (dBuV/m)	Measurement Type	Pol	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass/ Fail	Comments
30.000	7.1	.5	21.5	29.1	Peak [Scan]	V	200	360	40.0	-10.9	Pass	
250.069	20.7	1.3	11.6	33.6	Peak [Scan]	V	100	289	46.0	-12.4	Pass	
215.513	16.0	1.2	10.7	27.9	Peak [Scan]	V	100	43	43.5	-15.6	Pass	
55.463	15.9	.6	7.4	23.9	Peak [Scan]	V	150	226	40.0	-16.1	Pass	
40.306	8.9	.5	13.6	23.0	Peak [Scan]	V	100	165	40.0	-17.0	Pass	
171.863	13.4	1.1	11.8	26.3	Peak [Scan]	V	100	46	43.5	-17.2	Pass	
66.375	13.3	.7	8.1	22.1	Peak [Scan]	V	100	350	40.0	-17.9	Pass	
991.513	8.7	2.7	23.4	34.9	Peak [Scan]	V	150	244	54.0	-19.1	Pass	



Test Results Table, Rx

Frequency (MHz)	Raw (dBuV)	Cable Loss	AF (dB)	Level (dBuV/m)	Measurement Type	Pol	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass/ Fail	Comments
30.000	7.7	.5	21.5	29.7	Peak [Scan]	V	100	22	40.0	-10.3	Pass	
250.069	19.8	1.3	11.6	32.7	Peak [Scan]	V	100	300	46.0	-13.3	Pass	
38.488	7.8	.5	14.9	23.2	Peak [Scan]	H	400	336	40.0	-16.8	Pass	
171.863	13.1	1.1	11.8	26.0	Peak [Scan]	V	100	102	43.5	-17.5	Pass	
980.600	9.2	2.7	23.1	35.1	Peak [Scan]	V	400	229	54.0	-18.9	Pass	



Title: Radiated Emissions 30MHz-1GHz Configuration Photograph

B.4 AC Conducted Emissions

FCC 15.207 (a) & RSS-Gen 8.8 / LP0002:2.3 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).

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

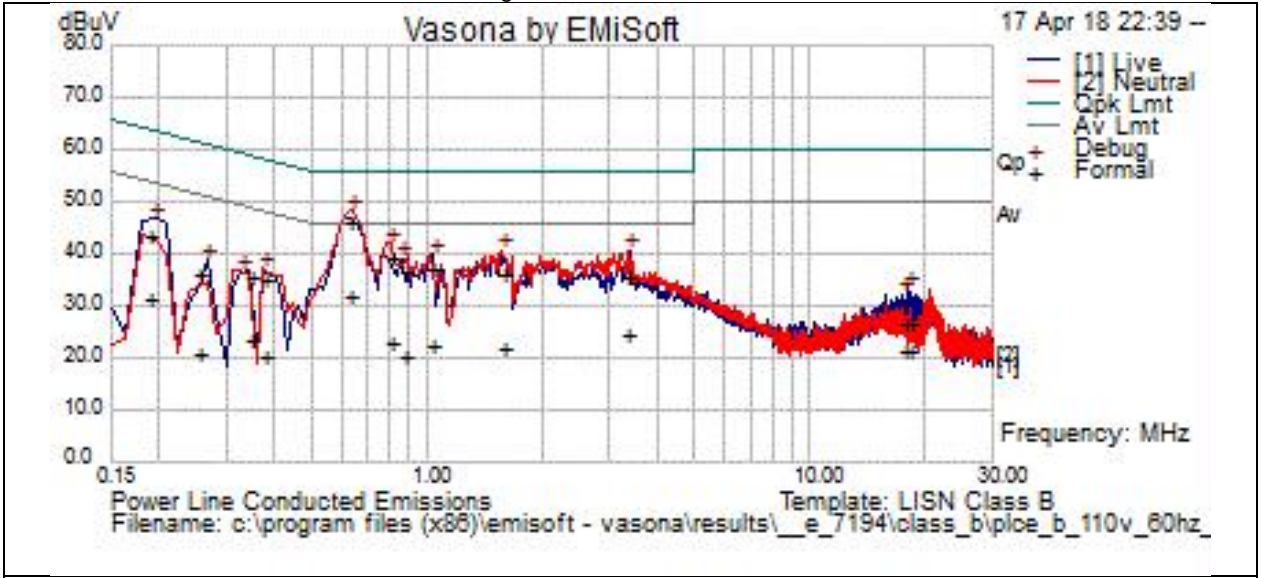
System Number	Description	Samples	System under test	Support equipment
3	EUT	S06, S07, S08	☑	☐
	Support	S09, S10, S11, S12	☐	☑

Tested By : Marie Higa	**Date of testing:** 17-Apr-2018
Test Result : PASS	

See Appendix C for list of test equipment

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



Title: Conducted Emissions - AC Power

Test Results Table

Frequency (MHz)	Raw (dBuV)	Cable Loss	Factors (dB)	Level (dBuV/m)	Measurement Type	Line	Limit (dBuV/m)	Margin (dB)	Pass/ Fail	Comments
1.04	17	19.9	0	37	Qp	L	56	-19	Pass	
0.87839	16.5	19.9	0	36.5	Qp	L	56	-19.5	Pass	
1.575	16.3	19.9	0	36.3	Qp	N	56	-19.7	Pass	
0.190203	22.9	20.8	0.1	43.8	Qp	L	64	-20.2	Pass	
3.356	15.6	20	0.1	35.7	Qp	N	56	-20.3	Pass	
3.356	4.5	20	0.1	24.5	Av	N	46	-21.5	Pass	
0.190203	10.4	20.8	0.1	31.2	Av	L	54	-22.8	Pass	
0.379198	15.2	20.1	0	35.4	Qp	N	58.3	-22.9	Pass	
0.801426	3	19.9	0	23	Av	N	46	-23	Pass	
0.347604	15.6	20.2	0	35.8	Qp	N	59	-23.2	Pass	
1.04	2.3	19.9	0	22.3	Av	L	46	-23.7	Pass	
1.575	2.2	19.9	0	22.1	Av	N	46	-23.9	Pass	
0.253034	15.7	20.5	0	36.3	Qp	L	61.7	-25.4	Pass	
0.347604	3.4	20.2	0	23.6	Av	N	49	-25.4	Pass	
0.87839	0.2	19.9	0	20.2	Av	L	46	-25.8	Pass	
0.379198	0	20.1	0	20.2	Av	N	48.3	-28.1	Pass	
18.11	0.7	20.4	0.2	21.3	Av	L	50	-28.7	Pass	

Frequency (MHz)	Raw (dBuV)	Cable Loss	Factors (dB)	Level (dBuV/m)	Measurement Type	Line	Limit (dBuV/m)	Margin (dB)	Pass/ Fail	Comments
17.536	0.6	20.4	0.2	21.2	Av	L	50	-28.8	Pass	
0.253034	0.5	20.5	0	21	Av	L	51.7	-30.6	Pass	
17.536	6.3	20.4	0.2	26.9	Qp	L	60	-33.1	Pass	
18.11	6	20.4	0.2	26.7	Qp	L	60	-33.3	Pass	

Title: Conducted Emissions Configuration Photograph

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

Test Equipment used for Radiated Emissions					
Equip#	**Manufacturer/ Model**	**Description**	**Last Cal**	**Next Cal**	**Test Item**
CIS008447	NSA 10m Chamber Cisco	NSA 10m Chamber	17-Oct-17	17-Oct-18	B.3
CIS047410	Keysight N9038A	MXE EMI Receiver	31 Mar 2017	31 Mar 2018	B.3
CIS054013	JB1 Sunol Sciences	Combination Antenna, 30MHz-2GHz	15 Jun 2017	15 Jun 2018	B.3
CIS055936	H+S Sucoflex 106PA	RF Type N Antenna Cable 18 GHz 8.5m	19 Oct 2017	19 Oct 2018	B.3
CIS020975	UFB311A-0-1344-520520 Micro-Coax	RF Coaxial Cable, to 18GHz, 134.4 in	19-Feb-18	19-Feb-19	B.3
CIS056154	H+S Sucoflex 104PEA	Sucoflex N Type blue 7ft cable	18 Jan 2018	18 Jan 2019	B.3
CIS041929	iBTHP-5-DB9 Newport	5 inch Temp/RH/Press Sensor w/20ft cable	28-Dec-17	28-Dec-18	B.3
CIS056037	Stanley 33-428	26' tape measure	NA	NA	B.3
CIS033041	Fluke 175	True RMS DMM	01 Jun 2017	01 Jun 2018	B.3
CIS027233	York CNE V	Comparison Noise Emitter	NA	NA	B.3
CIS051688	Dynawave 5400-9810-6251	SMA 50 Ohm Termination 18GHz	29 Jun 2017	29 Jun 2018	B.3
CIS051690	Dynawave 5400-9810-6251	SMA 50 Ohm Termination 18GHz	02 Feb 2018	02 Feb 2019	B.3
CIS032544	ETS Lindgren 3117	Double Ridged Horn Antenna	12 Jul 2017	12 Jul 2018	B.1, B.2
CIS047286	H+S Sucoflex 102E	40GHz Cable K Connector	08 Sep 2017	08 Sep 2018	B.1, B.2
CIS056054	Miteq TTA1800-30-HG	SMA 18GHz Pre Amplifier	09 Feb 2018	09 Feb 2019	B.1, B.2
CIS054393	H+S Sucoflex 102	RF Cable 2.4mm - N Type 18GHz	27 Apr 2017	27 Apr 2018	B.1, B.2
CIS055936	H+S Sucoflex 106PA	RF Type N Antenna Cable 18 GHz 8.5m	19 Oct 2017	19 Oct 2018	B.1, B.2
CIS020975	Micro-coax UFB311A-0-1344-520520	Coaxial Cable-18Ghz	19 Feb 2018	19 Feb 2019	B.1, B.2
CIS056154	H+S Sucoflex 104PEA	Sucoflex N Type blue 7ft cable	18 Jan 2018	18 Jan 2019	B.1, B.2
CIS047410	Keysight N9038A	MXE EMI Receiver	31 Mar 2017	31 Mar 2018	B.1, B.2
CIS043124	Above 1GHz Site Cal Cisco	Above 1GHz Cispr Site Verification	15 Jan 2018	15 Jan 2019	B.1, B.2
CIS08447	Cisco NSA 10m Chamber	NSA 10m Chamber	17 Oct 2017	17 Oct 2018	B.1, B.2
CIS041929	iBTHP-5-DB9 Newport	5 inch Temp/RH/Press Sensor w/20ft cable	28-Dec-17	28-Dec-18	B.1, B.2
CIS054647	Stanley 33-605	10m tape measure	NA	NA	B.1, B.2
CIS037570	Keysight 8710-1765	PRESET TORQUE WRENCH, 8lb-in	10 May 2017	10 May 2018	B.1, B.2

CIS037019	Fluke 175	True RMS Multimeter	19 Oct 2017	19 Oct 2018	B.1, B.2
CIS04883	Emco 3115	Horn antenna	NA	NA	B.1, B.2
CIS08171	Keysight 8491B Opt 010	Attenuator	26 Apr 2017	26 Apr 2018	B.1, B.2
CIS034075	RSG 2000 Schaffner	Reference Spectrum Generator, 1-18GHz	NA	NA	B.1, B.2
CIS040597	Above 1GHz Site Cal Cisco	Above 1GHz Cispr Site Verification	26 Sep 2017	26 Sep 2018	B.1, B.2
CIS08448	Cisco NSA Cal	NSA Chamber	06 Oct 2017	06 Oct 2018	B.1, B.2
CIS047300	Keysight N9038A	EMI Receiver	28 Mar 2017	28 Mar 2018	B.1, B.2
CIS049563	H+S Sucoflex 106A	Coaxial Cable, 8m	21 Aug 2017	21 Aug 2018	B.1, B.2
CIS021117	Micro-coax UFB311A-0-2484-520520	Coaxial Cable-18Ghz	16 Aug 2017	16 Aug 2018	B.1, B.2
CIS056158	H+S Sucoflex 104PEA	Sucoflex N Type blue 7ft cable	18 Jan 2018	18 Jan 2019	B.1, B.2
CIS054230	Newport iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable	09 Feb 2018	09 Feb 2019	B.1, B.2
CIS045166	Stanley 33-428	26' tape measure	NA	NA	B.1, B.2
CIS020490	Keysight 8710-1765	PRESET TORQUE WRENCH, 8lb-in	09 Feb 2018	09 Feb 2019	B.1, B.2
CIS051688	Dynawave 5400-9810-6251	SMA 50 Ohm Termination 18GHz	29 Jun 2017	29 Jun 2018	B.1, B.2
CIS051690	Dynawave 5400-9810-6251	SMA 50 Ohm Termination 18GHz	02 Feb 2018	02 Feb 2019	B.1, B.2
CIS033041	Fluke 175	True RMS DMM	01 Jun 2017	01 Jun 2018	B.1, B.2
CIS043124	Above 1GHz Site Cal Cisco	Above 1GHz Cispr Site Verification	15 Jan 2018	15 Jan 2019	B.1, B.2
CIS08447	Cisco NSA 10m Chamber	NSA 10m Chamber	17 Oct 2017	17 Oct 2018	B.1, B.2
CIS041929	iBTHP-5-DB9 Newport	5 inch Temp/RH/Press Sensor w/20ft cable	28-Dec-17	28-Dec-18	B.1, B.2
45167	Stanley 33-428	26' Tape Measure	NA	NA	B.1, B.2
56327	Pasternack PE5019-1	Torque Wrench	28 Feb 2018	28 Feb 2019	B.1, B.2
CIS037019	Fluke 175	True RMS Multimeter	19 Oct 2017	19 Oct 2018	B.1, B.2
CIS051688	Dynawave 5400-9810-6251	SMA 50 Ohm Termination 18GHz	29 Jun 2017	29 Jun 2018	B.1, B.2
CIS051690	Dynawave 5400-9810-6251	SMA 50 Ohm Termination 18GHz	02 Feb 2018	02 Feb 2019	B.1, B.2
38392	Keysignt E8257D	PSG Analog Signal Generator	01 Aug 2017	01 Aug 2018	B.1, B.2
47299	Keysight N9030A-544	PXA Signal Analyzer	12 Oct 2018	12 Oct 2018	B.1, B.2
CIS041979	1840 Cisco	18-40GHz EMI Test Head/ Verification Fixture	30 Aug 2017	30 Aug 2018	B.1, B.2

Test Equipment used for AC Mains Conducted Emissions					
Equip#	**Manufacturer/ Model**	**Description**	**Last Cal**	**Next Cal**	**Test Item**
CIS008496	Fischer Custom Communications FCC-450B-2.4-N	Instrumentation Limiter	16-MAY-17	16-MAY-18	B.4
CIS018963	York CNE V	Comparison Noise Emitter, 30 - 1000MHz	Cal Not Required	N/A	B.4
CIS035235	Lufkin HY1035CME	5 Meter Tape Measure	Cal Not Required	N/A	B.4
CIS037229	Coleman RG-223	25ft BNC cable	13-APR-18	13-APR-19	B.4
CIS037239	Rohde & Schwarz ESCI	ESCI EMI Test Receiver	02-MAY-17	02-MAY-18	B.4
CIS044023	Fischer Custom Communications FCC-801-M2-32A	Power Line Coupling Decoupling Network	09-NOV-17	09-NOV-18	B.4
CIS045990	Fischer Custom Communications F-090527-1009-1	Line Impedance Stabilization Network	15-JUN-17	15-JUN-18	B.4
CIS045991	Fischer Custom Communications F-090527-1009-2	Lisn Adapter	15-JUN-17	15-JUN-18	B.4
CIS049479	Coleman RG223	BNC 2ft Cable	05-MAR-18	05-MAR-19	B.4
CIS049531	TTE H785-150K-50-21378	High Pass Filter	03-MAY-17	03-MAY-18	B.4
CIS049558	Bird 5-T-MB	5W 50 Ohm BNC Termination 4GHz	10-AUG-17	10-AUG-18	B.4
CIS054231	Newport iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable	09-FEB-18	09-FEB-19	B.4

Test Equipment used for RF Conducted Tests.					
Equip#	**Manufacturer/ Model**	**Description**	**Last Cal**	**Next Cal**	**Test Item**
CIS055094	PXI-1042 National Instruments	Chassis	Cal Not Required		A1 thru A6
CIS055562	MEGAPHASE F120-S1S1-48	SMA cable	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS055565	MEGAPHASE F120-S1S1-36	SMA cable	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS054623	MEGAPHASE RA08-S1S1-18	SMA cable	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS054624	MEGAPHASE RA08-S1S1-18	SMA cable	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS054620	MEGAPHASE RA08-S1S1-12	SMA cable	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS054610	MEGAPHASE RA08-S1S1-12	SMA cable	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS055112	Microtronics BRM50702-02	Band Reject Filter	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS054621	MEGAPHASE RA08-S1S1-18	SMA cable	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS054619	MEGAPHASE RA08-S1S1-12	SMA cable	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS055353	Microtronics BRC50703-02	Band Reject Filter	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS054618	MEGAPHASE RA08-S1S1-12	SMA cable	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS054617	MEGAPHASE RA08-S1S1-12	SMA cable	27 Jul 2017	27 Jul 2018	A1 thru A6

CIS054691	Microtronics BRC50704-02	Band Reject Filter	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS054616	MEGAPHASE RA08-S1S1-12	SMA cable	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS054614	MEGAPHASE RA08-S1S1-12	SMA cable	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS054693	Microtronics BRC50705-02	Band Reject Filter	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS054615	MEGAPHASE RA08-S1S1-12	SMA cable	27 Jul 2017	27 Jul 2018	A1 thru A6
CIS055368	Pulsar PS4-09-452/4S	4 Way Divider	12 Apr 2017	12 Apr 2018	A1 thru A6
CIS054686	NI PXI-2796 National Instruments	Multiplexer, 40 GHz 50 Ohm	NA	NA	A1 thru A6
CIS053615	N9030A-550 Keysight	PXA Signal Analyzer	04 Apr 2017	04 Apr 2018	A1 thru A6
CIS056329	Pasternack PE5019-1	Torque wrench	01 Mar 2017	01 Mar 2018	A1 thru A6

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

End