# Test Report

AIR-AP1832I-x-K9 (x=A,B,D,N,T,Z)

Cisco Aironet 802.11ac Dual Band Access Points

FCC ID: LDK102098 IC: 2461B-102098

# 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)



Cisco Systems 170 West Tasman Drive San Jose, CA 95134

ster Aguine

Author: Jose Aguirre Tested By: TEST ENGINEER

Approved By: Jim Nicholson Title: Technical Leader, Engineering Revision: 3

This report replaces any previously entered test report under EDCS – **11496961**. This test report has been electronically authorized and archived using the CISCO Engineering Document Control system.

Page No: 1 of 88

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

SECTION 1: OVERVIEW	3
SECTION 2: ASSESSMENT INFORMATION	4
2.1 General	4
2.2 DATE OF TESTING	6
2.3 Report Issue Date	6
2.4 TESTING FACILITIES	6
2.5 Equipment Assessed (EUT)	6
2.6 EUT DESCRIPTION	7
SECTION 3: RESULT SUMMARY	8
3.1 Results Summary Table	8
SECTION 4: SAMPLE DETAILS	
4.1 Sample Details	
4.2 System Details	
4.3 Mode of Operation Details	
APPENDIX A: EMISSION TEST RESULTS	
CONDUCTED TEST SETUP DIAGRAM	
TARGET MAXIMUM CHANNEL POWER	
A.1 6DB BANDWIDTH	
A.2 99% and 26dB Bandwidth	
A.3 MAXIMUM CONDUCTED OUTPUT POWER	
A.4 POWER SPECTRAL DENSITY	
A.5 CONDUCTED SPURIOUS EMISSIONS	
A.6 CONDUCTED BANDEDGE	
APPENDIX B: EMISSION TEST RESULTS	
RADIATED EMISSION SETUP DIAGRAM-BELOW 1G	
B.1 RADIATED SPURIOUS EMISSIONS	
B.2 RECEIVER SPURIOUS EMISSIONS	
B.3 RADIATED EMISSIONS 30MHZ TO 1GHZ	
B.4 AC CONDUCTED EMISSIONS	
APPENDIX C: LIST OF TEST EQUIPMENT USED TO PERFORM THE TEST	84
APPENDIX E: ABBREVIATION KEY AND DEFINITIONS	84

#### Section 1: Overview

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

Emission	
CFR47 Part 15.247	
RSS-247, Issue 2, February 2017	
RSS-Gen Issue 4: Nov 2014	

Measurements were made in accordance with

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

Page No: 3 of 88

This document is uncontrolled. Please refer to the electronic copy within EDCS for the most up to date version. Cisco Systems, Inc. Company Confidential

### **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%.

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

Page No: 4 of 88

Measurement Uncertainty Values

voltage and power measurements	±2dB
conducted EIRP measurements	± 1.4 dB
radiated measurements	± 3.2 dB
frequency measurements	± 2.4 10-7
temperature measurements	± 0.54°
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.

This report must not be reproduced except in full, without written approval of Cisco Systems.

Page No: 5 of 88



#### 2.2 Date of testing

05-May-16 - 14-Nov-16

#### 2.3 Report Issue Date

17-Nov-16

Cisco uses an electronic system to issue, store and control the revision of test reports. This system is called the Engineering Document Control System 11496961. 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	Company #: 2461N-2
	San Jose, CA 95134	
Building P, 5m Chamber	125 West Tasman Dr	Company #: 2461N-1
	San Jose, CA 95134	
Building I, 5m Chamber	285 W. Tasman Drive	Company #: 2461M-1
	San Jose, California 95134	

#### **Test Engineers**

Jose Aguirre

2.5 Equipment Assessed (EUT)

AIR-AP1832I-A-K9

Page No: 6 of 88

#### 2.6 EUT Description

The Cisco Aironet 802.11ac Dual Band Access Points support the following modes of operation. The modes are further defined in the radio Theory of Operation. The modes included in this report represent the worst case data for all modes. Data is recorded at the lowest supported data rate for each mode. This report covers operation on channel 1-11.

802.11n/ac - Mode, Tx Paths

802.11n/ac - Legacy CCK, One Antenna, 1 to 11 Mbps 802.11n/ac - Legacy CCK, Two Antennas, 1 to 11 Mbps 802.11n/ac - Legacy CCK, Three Antennas, 1 to 11 Mbps

802.11n/ac - Non HT20, One Antenna, 6 to 54 Mbps, 1ss 802.11n/ac - Non HT20, Two Antennas, 6 to 54 Mbps, 1ss 802.11n/ac - Non HT20, Three Antennas, 6 to 54 Mbps, 1ss

802.11n/ac - Non HT20 Beam Forming, Two Antennas, 6 to 54 Mbps, 1ss 802.11n/ac - Non HT20 Beam Forming, Three 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, Three Antennas, M0 to M7, 1ss 802.11n/ac - HT/VHT20, Three 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 Beam Forming, Three Antennas, M0 to M7, 1ss 802.11n/ac - HT/VHT20 Beam Forming, Three Antennas, M8 to M15, 2ss

802.11n/ac - HT/VHT20 STBC, Two Antennas, M0 to M7, 2ss 802.11n/ac - HT/VHT20 STBC, Three Antennas, M0 to M7, 2ss

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

Frequency	Part Number	Antenna Type	Antenna Gain (dBi)
2.4 / 5 GHz	3x3 Internal	Omni	3/5

Page No: 7 of 88

### 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)	<b>6dB Bandwidth:</b> 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	<b>99% &amp; 26 dB Bandwidth:</b> 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)	<ul> <li>Output Power:</li> <li>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.</li> <li>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.</li> </ul>	Pass
FCC 15.247 RSS-247 LP0002:3.10.1(6.2.2)	<b>Power Spectral Density:</b> 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	<b>Conducted Spurious Emissions / Band-Edge:</b> 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	<b>Restricted band:</b> 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

Page No: 8 of 88

Basic Standard	Technical Requirements / Details	
FCC 15.209 RSS-Gen LP0002:3.10.1(5)/2.8	<b>TX Spurious Emissions:</b> 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 <i>spe</i> cified in FCC 15.209 (a) and RSS-Gen 8.9.	Pass
RSS-Gen LP0002:3.10.1(5)2.8	<ul> <li>RX Spurious Emissions:</li> <li>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.</li> <li>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.</li> </ul>	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

սիսին

Radiated Emissions (General requirements)

\* MPE calculation is recorded in a separate report

Page No: 9 of 88

#### **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-AP1832I-A-K9	Cisco Systems	P2	8.4.1.10	AP1G4 Sept22	RFDP2BHY033
S02*	AIR-PWRADPT-RGD1	Meanwell	A0	NA	NA	EB3F71752

(\*) S02 is support equipment Power supply for EUT S01

#### 4.2 System Details

System #	Description	Samples
1	AIR-AP1832I-A-K9	S01
2	AIR-PWRADPT-RGD1	S02

#### 4.3 Mode of Operation Details

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

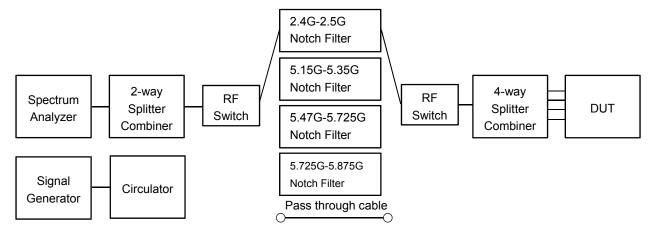
Measurements were made in accordance with

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

Page No: 10 of 88

# 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 24					
Legacy CCK, 1 to 11 Mbps	26	26	26			
Non HT20, 6 to 54 Mbps	22	25	25			
Non HT20 Beam Forming, 6 to 54 Mbps	25	30	30			
HT/VHT20, M0 to M15	21	25	25			
HT/VHT20 Beam Forming, M0 to M15	24	30	30			
HT/VHT20 STBC, M0 to M7	21	25	25			

Page No: 11 of 88

# 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
	EUT	S01	$\checkmark$	
1	Support	S02		$\mathbf{\nabla}$

j:
-Jun-16
i-,

**Test Result : PASS** 

See Appendix C for list of test equipment

Page No: 12 of 88

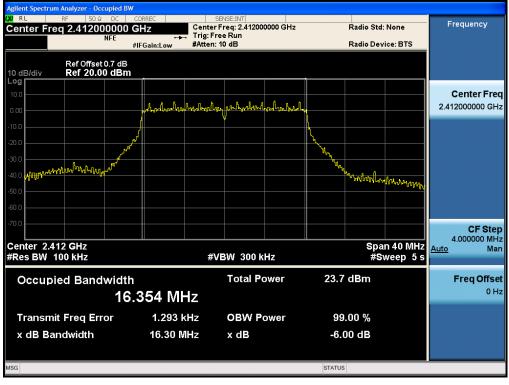
Frequency (MHz)	Mode	Data Rate (Mbps)	6dB BW (MHz)	Limit (kHz)	Margin (MHz)
	CCK, 1 to 11 Mbps	11	7.6	>500	7.1
2412	Non HT20, 6 to 54 Mbps	6	16.3	>500	15.8
	HT/VHT20, M0 to M15	m0	16.9	>500	16.4
	CCK, 1 to 11 Mbps	11	8.1	>500	7.6
2437	Non HT20, 6 to 54 Mbps	6	16.3	>500	15.8
	HT/VHT20, M0 to M15	m0	17.3	>500	16.8
	CCK, 1 to 11 Mbps		8.1	>500	7.6
2462	Non HT20, 6 to 54 Mbps	6	16.3	>500	15.8
	HT/VHT20, M0 to M15	m0	16.9	>500	16.4

Page No: 13 of 88

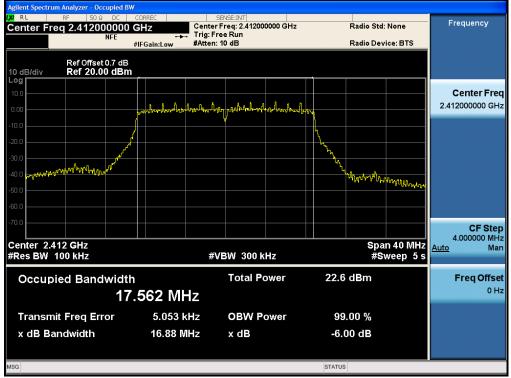


## 6dB Bandwidth, 2412 MHz, CCK, 1 to 11 Mbps

#### 6dB Bandwidth, 2412 MHz, Non HT20, 6 to 54 Mbps



Page No: 14 of 88

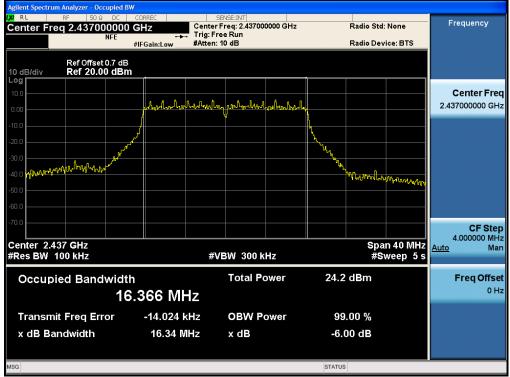


# 6dB Bandwidth, 2412 MHz, HT/VHT20, M0 to M15

#### 6dB Bandwidth, 2437 MHz, CCK, 1 to 11 Mbps

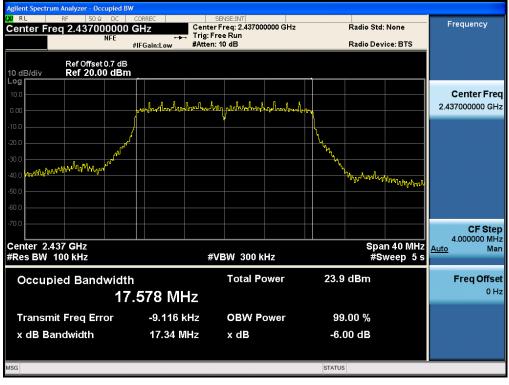


Page No: 15 of 88



# 6dB Bandwidth, 2437 MHz, Non HT20, 6 to 54 Mbps

#### 6dB Bandwidth, 2437 MHz, HT/VHT20, M0 to M15

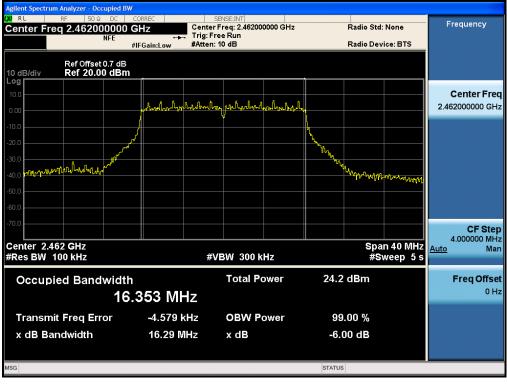


Page No: 16 of 88

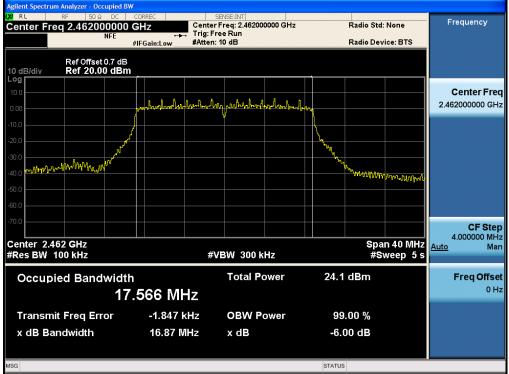


# 6dB Bandwidth, 2462 MHz, CCK, 1 to 11 Mbps

#### 6dB Bandwidth, 2462 MHz, Non HT20, 6 to 54 Mbps



Page No: 17 of 88



# 6dB Bandwidth, 2462 MHz, HT/VHT20, M0 to M15

Page No: 18 of 88

# 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

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
	EUT	S01	$\checkmark$	
1	Support	S02		$\checkmark$

Tested By :	Date of testing:
Jose Aguirre	05-May-16 - 06-Jun-16
Test Result : PASS	

See Appendix C for list of test equipment

Page No: 19 of 88

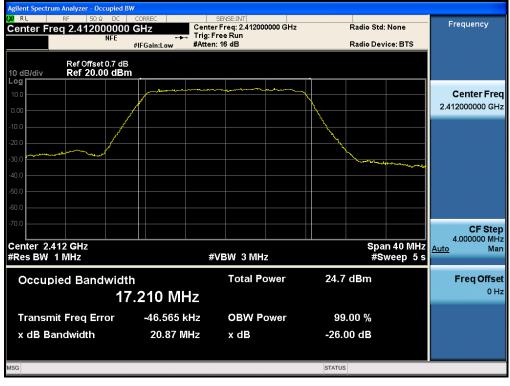
Frequency (MHz)	Mode	Data Rate (Mbps)	26dB BW (MHz)	99% BW (MHz)
	CCK, 1 to 11 Mbps	11	16.8	12.765
2412	Non HT20, 6 to 54 Mbps	6	20.9	17.210
	HT/VHT20, M0 to M15	m0	21.5	18.113
	CCK, 1 to 11 Mbps	11	16.9	12.744
2437	Non HT20, 6 to 54 Mbps	6	21.1	17.266
	HT/VHT20, M0 to M15	m0	21.7	18.155
	CCK, 1 to 11 Mbps		16.8	12.712
2462	Non HT20, 6 to 54 Mbps	6	21.3	17.204
	HT/VHT20, M0 to M15	m0	21.6	18.103

Page No: 20 of 88



# 26dB / 99% Bandwidth, 2412 MHz, CCK, 1 to 11 Mbps

### 26dB / 99% Bandwidth, 2412 MHz, Non HT20, 6 to 54 Mbps

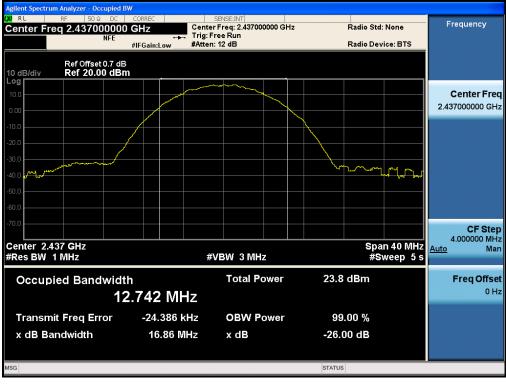


Page No: 21 of 88



# 26dB / 99% Bandwidth, 2412 MHz, HT/VHT20, M0 to M15

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

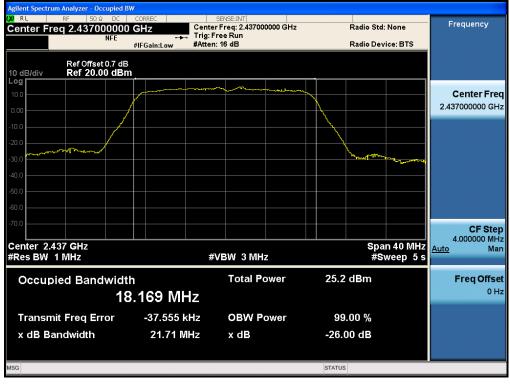


Page No: 22 of 88



### 26dB / 99% Bandwidth, 2437 MHz, Non HT20, 6 to 54 Mbps

#### 26dB / 99% Bandwidth, 2437 MHz, HT/VHT20, M0 to M15

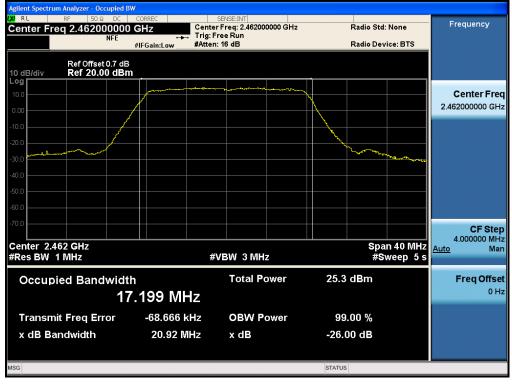


Page No: 23 of 88



# 26dB / 99% Bandwidth, 2462 MHz, CCK, 1 to 11 Mbps

### 26dB / 99% Bandwidth, 2462 MHz, Non HT20, 6 to 54 Mbps



Page No: 24 of 88

	Analyzer - Occupied E							
	RF 50 Ω DC		SENSE:INT	62000000 GHz		Radio Sto	l: None	Frequency
	NFE	+ #IFGain:Low	Trig: Free Run #Atten: 16 dB			Radio De	vice: BTS	
	D-608							
10 dB/div	Ref Offset 0.7 dB Ref 20.00 dBr							
Log					$\overline{}$			Contor From
10.0		/						Center Freq 2.462000000 GHz
0.00								2.402000000 0112
-10.0	/							
-20.0	man					George and a		
-30.0							and the second second	
-40.0								
-50.0								
-60.0								
-70.0								CF Step
Center 2.46	2 CH7					Sna	an 40 MHz	4 000000 MHz
#Res BW 1			#VBW 3	MHz		#S	weep 5 s	<u>Auto</u> Man
Occupie	ed Bandwidt	h	Tota	al Power	25.3	dBm		Freq Offset
Occupit		 8.092 MI						0 Hz
Transmit	t Freq Error	-21.394	kHz OBV	V Power	99	0.00 %		
x dB Bar	ndwidth	21.56 N	/IHz xdE	3	-26.	00 dB		
MSG					STATU	3		

# 26dB / 99% Bandwidth, 2462 MHz, HT/VHT20, M0 to M15

Page No: 25 of 88



Page No: 26 of 88

# **Duty Cycle**

EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%)

# 20MHz Channel plan

	5.01673		CORREC		ENSE:INT		e: Log-Pwr	12:30:55 PM Feb TRACE	82.1523	Marker	
		NFE	PNO: Fast • IFGain:Low	Trig: Fr Atten:				DET P	N N N N	Select Marke	
	tef 30.00 (	1Bm					Δ		7 ms 7 dB		
	n an	******	hallfer - handfred	lan tanak		John da	a sharan ta ta shara sa	3∆2 ? 	antes-	Norr	
										De	
										Fixe	
SBW 8 M			#VE	W 50 MH			<u> </u>	.061 ms (100			
MODE TRC 5	t (Δ)	×	5.092 ms (A 215.5 µs	-0.1	dB	CTION FUN	ICTION WIDTH	FUNCTION VALU			
Δ2 1			5.017 ms (Δ							Propertie	
										<b>M</b> 1	

Page No: 27 of 88

# 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 3 dBi. 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

ANOTO 505.10. 2019 Section 11.5.2 Method AV GOA-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

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
	EUT	S01	$\checkmark$	
1	Support	S02		$\checkmark$

Tested By :	Date of testing:
Jose Aguirre	05-May-16 - 06-Jun-16
	05-Way-10 - 00-501-10

### Test Result : PASS

See Appendix C for list of test equipment

Page No: 28 of 88

Note: Limit is modified to ensure complying with both conducted power limit of 30dBm and eirp limit of 36 dBm. For antenna gains <6dBi, a product could comply with the 36dBm eirp limit, and still exceed the 30 dBm conducted limit. As a result, for gains <6dBi, we calculate the limit as 36dBm –(6dBi – Actual gain).

<b></b>	conducted limit. As a result, for gains <6dBi, we calculate the limit as 36dBm –(6dBi – Actual gain).								
Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Tx 2 Max Power (dBm)	Tx 3 Max Power (dBm)	Total Tx Channel Power (dBm) EIRP	Limit (dBm) EIRP	Margin (dB)
	CCK, 1 to 11 Mbps	1	3	17.8			20.8	33.0	12.2
	CCK, 1 to 11 Mbps	2	3	17.8	17.6		23.7	33.0	9.3
	CCK, 1 to 11 Mbps	3	3	17.8	17.6	18.1	25.6	33.0	7.4
	Non HT20, 6 to 54 Mbps	1	3	16.3			19.3	33.0	13.7
	Non HT20, 6 to 54 Mbps	2	3	14.3	14.0		20.2	33.0	12.8
	Non HT20, 6 to 54 Mbps	3	3	14.3	14.0	14.5	22.0	33.0	11.0
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	13.3	13.0		22.2	36.0	13.8
	Non HT20 Beam Forming, 6 to 54 Mbps	3	8	11.3	10.9	11.6	24.0	36.0	12.0
	HT/VHT20, M0 to M7	1	3	15.1			18.1	33.0	14.9
2412	HT/VHT20, M0 to M7	2	3	14.1	13.7		19.9	33.0	13.1
2	HT/VHT20, M8 to M15	3	3	13.0	12.8	13.4	20.8	33.0	12.2
	HT/VHT20, M0 to M7	2	3	14.1	13.7		19.9	33.0	13.1
	HT/VHT20, M8 to M15	3	3	13.0	12.8	13.4	20.8	33.0	12.2
	HT/VHT20 Beam Forming, M0 to M7	2	6	12.0	11.7		20.9	36.0	15.1
	HT/VHT20 Beam Forming, M8 to M15	3	8	11.1	10.7	11.3	23.8	36.0	12.2
	HT/VHT20 Beam Forming, M0 to M7	2	3	14.1	13.7		19.9	33.0	13.1
	HT/VHT20 Beam Forming, M8 to M15	3	5	12.0	11.7	12.3	21.8	35.0	13.2
	HT/VHT20 STBC, M0 to M7	2	3	14.1	13.7		19.9	33.0	13.1
	HT/VHT20 STBC, M0 to M7	3	3	13.0	12.8	13.4	20.8	33.0	12.2
	CCK, 1 to 11 Mbps	1	3	17.2			20.2	33.0	12.8
	CCK, 1 to 11 Mbps	2	3	17.2	18.5		23.9	33.0	9.1
	CCK, 1 to 11 Mbps	3	3	17.2	18.5	19.0	26.1	33.0	6.9
	Non HT20, 6 to 54 Mbps	1	3	16.7			19.7	33.0	13.3
	Non HT20, 6 to 54 Mbps	2	3	16.7	17.8		23.3	33.0	9.7
	Non HT20, 6 to 54 Mbps	3	3	16.7	17.8	18.4	25.5	33.0	7.5
2437	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	16.7	17.8		26.3	36.0	9.7
24	Non HT20 Beam Forming, 6 to 54 Mbps	3	8	16.7	17.8	18.4	30.5	36.0	5.5
	HT/VHT20, M0 to M7	1	3	16.5			19.5	33.0	13.5
	HT/VHT20, M0 to M7	2	3	16.5	17.5		23.0	33.0	10.0
	HT/VHT20, M8 to M15	2	3	16.5	17.5		23.0	33.0	10.0
	HT/VHT20, M0 to M7	3	3	16.5	17.5	18.1	25.2	33.0	7.8
	HT/VHT20, M8 to M15	3	3	16.5	17.5	18.1	25.2	33.0	7.8
	HT/VHT20 Beam Forming, M0 to M7	2	6	16.5	17.5		26.0	36.0	10.0

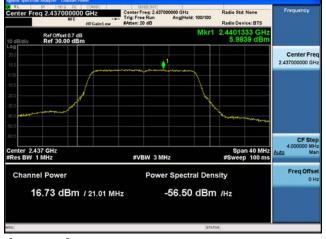
Page No: 29 of 88

# -uluulu -cisco

	HT/VHT20 Beam Forming, M8 to M15	2	3	16.5	17.5		23.0	33.0	10.0
	HT/VHT20 Beam Forming, M0 to M7	3	8	16.5	17.5	18.1	30.2	36.0	5.8
	HT/VHT20 Beam Forming, M8 to M15	3	5	16.5	17.5	18.1	27.2	35.0	7.8
	HT/VHT20 STBC, M0 to M7	2	3	16.5	17.5		23.0	33.0	10.0
	HT/VHT20 STBC, M0 to M7	3	3	16.5	17.5	18.1	25.2	33.0	7.8
	CCK, 1 to 11 Mbps	1	3	17.3			20.3	33.0	12.7
	CCK, 1 to 11 Mbps	2	3	17.3	18.2		23.8	33.0	9.2
	CCK, 1 to 11 Mbps	3	3	17.3	18.2	18.7	25.9	33.0	7.1
	Non HT20, 6 to 54 Mbps	1	3	16.8			19.8	33.0	13.2
	Non HT20, 6 to 54 Mbps	2	3	15.7	16.7		22.2	33.0	10.8
	Non HT20, 6 to 54 Mbps	3	3	15.7	16.7	17.2	24.3	33.0	8.7
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	14.8	15.6		24.2	36.0	11.8
	Non HT20 Beam Forming, 6 to 54 Mbps	3	8	13.7	14.5	15.2	27.3	36.0	8.7
2	HT/VHT20, M0 to M7	1	3	16.6			19.6	33.0	13.4
2462	HT/VHT20, M0 to M7	2	3	15.5	16.5		22.0	33.0	11.0
<sup>CN</sup>	HT/VHT20, M8 to M15	3	3	14.5	15.4	15.9	23.1	33.0	9.9
	HT/VHT20, M0 to M7	2	3	15.5	16.5		22.0	33.0	11.0
	HT/VHT20, M8 to M15	3	3	14.5	15.4	15.9	23.1	33.0	9.9
	HT/VHT20 Beam Forming, M0 to M7	2	6	14.5	15.4		24.0	36.0	12.0
	HT/VHT20 Beam Forming, M8 to M15	3	8	12.5	13.3	13.9	26.0	36.0	10.0
	HT/VHT20 Beam Forming, M0 to M7	2	3	15.5	16.5		22.0	33.0	11.0
	HT/VHT20 Beam Forming, M8 to M15	3	5	14.5	15.4	15.9	25.1	35.0	9.9
	HT/VHT20 STBC, M0 to M7	2	3	15.5	16.5		22.0	33.0	11.0
	HT/VHT20 STBC, M0 to M7	3	3	14.5	15.4	15.9	23.1	33.0	9.9

Page No: 30 of 88

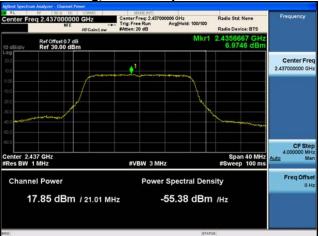
# Maximum Transmit Output Power, 2437 MHz, Non HT20 Beam Forming, 6 to 54 Mbps







Antenna C



Antenna B

Page No: 31 of 88

# 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 003.10.2013	
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.	
<b>Ref</b> 558074 D01 DTS Meas Guidance v03r05 section 10.2 Peak PSD	

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

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
	EUT	S01	$\mathbf{V}$	
1	Support	S02		$\checkmark$

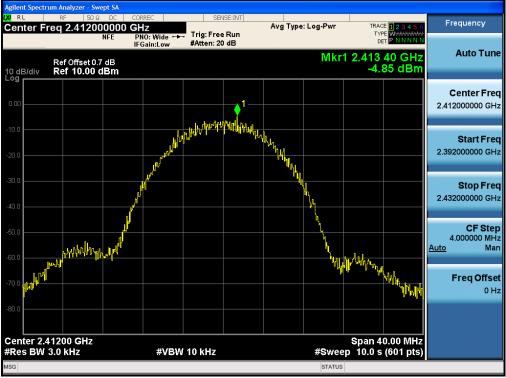
Tested By :	Date of testing:
Jose Aguirre	05-May-16 - 06-Jun-16
Test Result : PASS	

See Appendix C for list of test equipment

Page No: 32 of 88

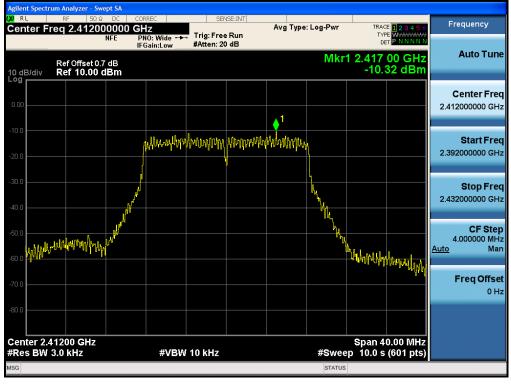
Frequency (MHz)	Mode	Data Rate (Mbps)	PSD / Antenna (dBm/3kHz)	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
	CCK, 1 to 11 Mbps	11	-4.9	-0.1	8.0	8.1
2412	Non HT20, 6 to 54 Mbps	6	-10.3	-5.5	8.0	13.5
	HT/VHT20, M0 to M15	m0	-12.7	-7.9	8.0	15.9
	CCK, 1 to 11 Mbps	11	-5.5	-0.7	8.0	8.7
2437	Non HT20, 6 to 54 Mbps	6	-10.7	-5.9	8.0	13.9
	HT/VHT20, M0 to M15	m0	-11.0	-6.2	8.0	14.2
	CCK, 1 to 11 Mbps	11	0.9	5.7	8.0	2.3
2462	Non HT20, 6 to 54 Mbps	6	-10.7	-5.9	8.0	13.9
	HT/VHT20, M0 to M15	m0	-11.2	-6.4	8.0	14.4

Page No: 33 of 88

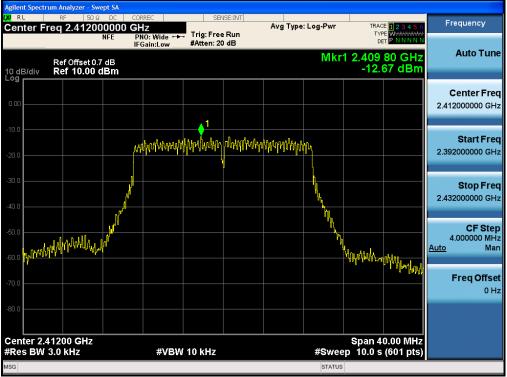


## Power Spectral Density, 2412 MHz, CCK, 1 to 11 Mbps

### Power Spectral Density, 2412 MHz, Non HT20, 6 to 54 Mbps

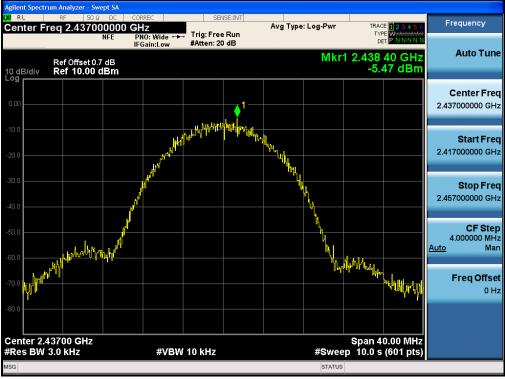


Page No: 34 of 88

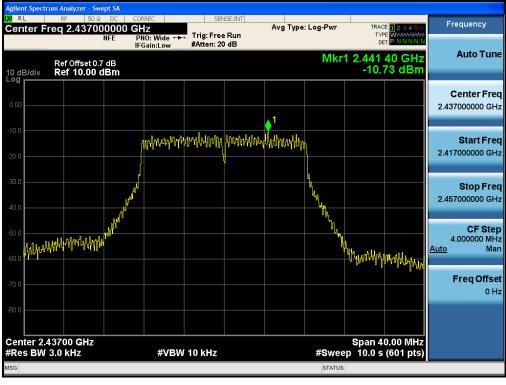


### Power Spectral Density, 2412 MHz, HT/VHT20, M0 to M15





Page No: 35 of 88

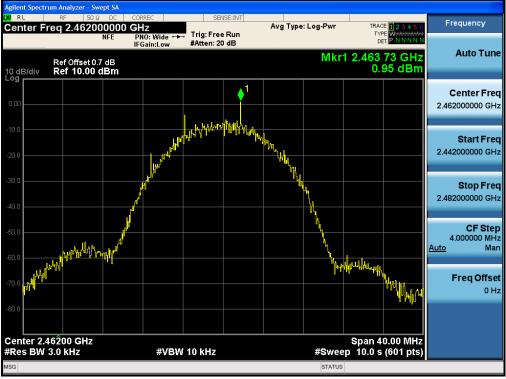


#### Power Spectral Density, 2437 MHz, Non HT20, 6 to 54 Mbps

### Power Spectral Density, 2437 MHz, HT/VHT20, M0 to M15

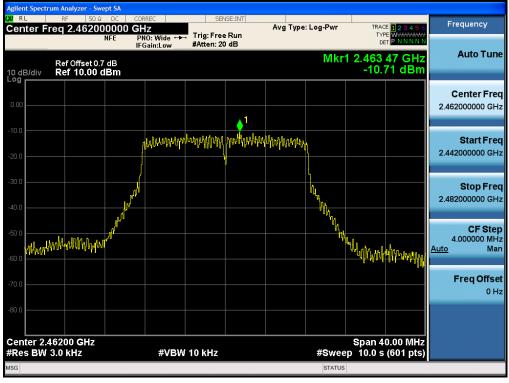


Page No: 36 of 88



### Power Spectral Density, 2462 MHz, CCK, 1 to 11 Mbps

### Power Spectral Density, 2462 MHz, Non HT20, 6 to 54 Mbps



Page No: 37 of 88



### Power Spectral Density, 2462 MHz, HT/VHT20, M0 to M15

Page No: 38 of 88

# **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

 $E[dB\mu V/m] = EIRP[dBm] - 20 \log(d[meters]) + 104.77$ , 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  $\ge$  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	$\checkmark$	
ļ	Support	S02		$\checkmark$

Test Result : PASS

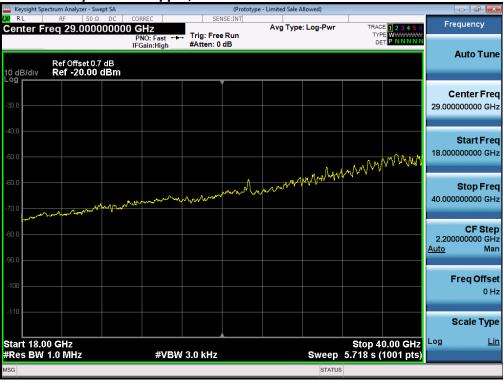
See Appendix C for list of test equipment

Page No: 39 of 88



### Conducted Spurs Average Upper, All Antennas

Conducted Spurs Peak Upper, All Antennas



Page No: 40 of 88

Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Tx 2 Spur Power (dBm)	Tx 3 Spur Power (dBm)	Total Conducted Spur (dBm)	Limit (dBm)	Margin (dB)
	CCK, 1 to 11 Mbps	1	3	-75.0			-72.0	-41.25	30.8
	CCK, 1 to 11 Mbps	2	3	-75.0	-75.0		-69.0	-41.25	27.7
	CCK, 1 to 11 Mbps	3	3	-75.0	-75.0	-72.9	-66.4	-41.25	25.2
	Non HT20, 6 to 54 Mbps	1	3	-77.7			-74.7	-41.25	33.5
	Non HT20, 6 to 54 Mbps	2	3	-70.4	-70.3		-64.3	-41.25	23.1
	Non HT20, 6 to 54 Mbps	3	3	-70.5	-78.3	-78.5	-66.3	-41.25	25.0
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-70.5	-78.3		-63.8	-41.25	22.6
	Non HT20 Beam Forming, 6 to 54 Mbps	3	8	-78.6	-78.0	-78.8	-65.7	-41.25	24.4
	HT/VHT20, M0 to M7	1	3	-70.6			-67.6	-41.25	26.4
2412	HT/VHT20, M0 to M7	2	3	-77.8	-78.2		-72.0	-41.25	30.7
2	HT/VHT20, M8 to M15	2	3	-77.8	-78.2		-72.0	-41.25	30.7
	HT/VHT20, M0 to M7	3	3	-78.2	-78.3	-70.0	-65.9	-41.25	24.6
	HT/VHT20, M8 to M15	3	3	-78.2	-78.3	-70.0	-65.9	-41.25	24.6
	HT/VHT20 Beam Forming, M0 to M7	2	6	-78.2	-78.3		-69.2	-41.25	28.0
	HT/VHT20 Beam Forming, M8 to M15	2	3	-77.8	-78.2		-72.0	-41.25	30.7
	HT/VHT20 Beam Forming, M0 to M7	3	8	-78.8	-61.6	-70.5	-53.0	-41.25	11.8
	HT/VHT20 Beam Forming, M8 to M15	3	5	-74.1	-70.4	-78.5	-63.4	-41.25	22.2
	HT/VHT20 STBC, M0 to M7	2	3	-77.8	-78.2		-72.0	-41.25	30.7
	HT/VHT20 STBC, M0 to M7	3	3	-78.2	-78.3	-70.0	-65.9	-41.25	24.6
	CCK, 1 to 11 Mbps	1	3	-75.0			-72.0	-41.25	30.8
	CCK, 1 to 11 Mbps	2	3	-75.0	-74.5		-68.7	-41.25	27.5
	CCK, 1 to 11 Mbps	3	3	-75.0	-74.5	-70.7	-65.2	-41.25	23.9
	Non HT20, 6 to 54 Mbps	1	3	-76.6			-73.6	-41.25	32.4
	Non HT20, 6 to 54 Mbps	2	3	-76.6	-70.5		-66.5	-41.25	25.3
	Non HT20, 6 to 54 Mbps	3	3	-76.6	-70.5	-70.4	-63.9	-41.25	22.7
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-76.6	-70.5		-63.5	-41.25	22.3
37	Non HT20 Beam Forming, 6 to 54 Mbps	3	8	-76.6	-70.5	-70.4	-58.9	-41.25	17.7
2437	HT/VHT20, M0 to M7	1	3	-77.1			-74.1	-41.25	32.9
	HT/VHT20, M0 to M7	2	3	-77.1	-76.3		-70.7	-41.25	29.4
	HT/VHT20, M8 to M15	2	3	-77.1	-76.3		-70.7	-41.25	29.4
	HT/VHT20, M0 to M7	3	3	-77.1	-76.3	-76.4	-68.8	-41.25	27.6
	HT/VHT20, M8 to M15	3	3	-77.1	-76.3	-76.4	-68.8	-41.25	27.6
	HT/VHT20 Beam Forming, M0 to M7	2	6	-77.1	-76.3		-67.7	-41.25	26.4
	HT/VHT20 Beam Forming, M8 to M15	2	3	-77.1	-76.3		-70.7	-41.25	29.4
	HT/VHT20 Beam Forming, M0 to M7	3	8	-77.1	-76.3	-76.4	-63.8	-41.25	22.6

Page No: 41 of 88

HT/VHT20 Beam Forming, M8 to M15	3	5	-77.1	-76.3	-76.4	-66.8	-41.25	25.6
HT/VHT20 STBC, M0 to M7	2	3	-77.1	-76.3		-70.7	-41.25	29.4
HT/VHT20 STBC, M0 to M7	3	3	-77.1	-76.3	-76.4	-68.8	-41.25	27.6
CCK, 1 to 11 Mbps	1	3	-74.8			-71.8	-41.25	30.6
CCK, 1 to 11 Mbps	2	3	-74.8	-76.9		-69.7	-41.25	28.5
CCK, 1 to 11 Mbps	3	3	-74.8	-76.9	-76.4	-68.2	-41.25	26.9
Non HT20, 6 to 54 Mbps	1	3	-77.5			-74.5	-41.25	33.3
Non HT20, 6 to 54 Mbps	2	3	-77.5	-77.2		-71.3	-41.25	30.1
Non HT20, 6 to 54 Mbps	3	3	-77.5	-77.2	-70.4	-65.9	-41.25	24.7
Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-77.5	-77.2		-68.3	-41.25	27.1
Non HT20 Beam Forming, 6 to 54 Mbps	3	8	-77.5	-77.2	-70.4	-60.9	-41.25	19.7
HT/VHT20, M0 to M7	1	3	-76.9			-73.9	-41.25	32.7
HT/VHT20, M0 to M7	2	3	-76.9	-76.9		-70.9	-41.25	29.6
HT/VHT20, M8 to M15	2	3	-76.9	-76.9		-70.9	-41.25	29.6
HT/VHT20, M0 to M7	3	3	-76.9	-76.9	-77.0	-69.2	-41.25	27.9
HT/VHT20, M8 to M15	3	3	-76.9	-76.9	-77.0	-69.2	-41.25	27.9
HT/VHT20 Beam Forming, M0 to M7	2	6	-76.9	-76.9		-67.9	-41.25	26.6
HT/VHT20 Beam Forming, M8 to M15	2	3	-76.9	-76.9		-70.9	-41.25	29.6
HT/VHT20 Beam Forming, M0 to M7	3	8	-76.9	-76.9	-77.0	-64.2	-41.25	22.9
HT/VHT20 Beam Forming, M8 to M15	3	5	-76.9	-76.9	-77.0	-67.2	-41.25	25.9
HT/VHT20 STBC, M0 to M7	2	3	-76.9	-76.9		-70.9	-41.25	29.6
HT/VHT20 STBC, M0 to M7	3	3	-76.9	-76.9	-77.0	-69.2	-41.25	27.9
	HT/VHT20 STBC, M0 to M7 HT/VHT20 STBC, M0 to M7 CCK, 1 to 11 Mbps CCK, 1 to 11 Mbps CCK, 1 to 11 Mbps CCK, 1 to 11 Mbps Non HT20, 6 to 54 Mbps Non HT20, 6 to 54 Mbps Non HT20, 6 to 54 Mbps Non HT20 Beam Forming, 6 to 54 Mbps Non HT20 Beam Forming, 6 to 54 Mbps Non HT20 Beam Forming, 6 to 54 Mbps HT/VHT20, M0 to M7 HT/VHT20, M0 to M7 HT/VHT20, M0 to M7 HT/VHT20, M8 to M15 HT/VHT20, M8 to M15 HT/VHT20 Beam Forming, M0 to M7 HT/VHT20 Beam Forming, M8 to M15 HT/VHT20 STBC, M0 to M7	HT/VHT20 STBC, M0 to M7       2         HT/VHT20 STBC, M0 to M7       3         CCK, 1 to 11 Mbps       1         CCK, 1 to 11 Mbps       2         CCK, 1 to 11 Mbps       3         Non HT20, 6 to 54 Mbps       1         Non HT20, 6 to 54 Mbps       2         Non HT20, 6 to 54 Mbps       2         Non HT20, 6 to 54 Mbps       2         Non HT20, 6 to 54 Mbps       3         Non HT20 Beam Forming, 6 to 54 Mbps       2         Non HT20 Beam Forming, 6 to 54 Mbps       3         HT/VHT20, M0 to M7       1         HT/VHT20, M0 to M7       1         HT/VHT20, M0 to M7       2         HT/VHT20, M8 to M15       3         HT/VHT20, M8 to M15       3         HT/VHT20 Beam Forming, M0 to M7       2         HT/VHT20 Beam Forming, M0 to M7       3         HT/VHT20 Beam Forming, M8 to M15       3         HT/VHT20 Beam Forming, M8 to M15       3         HT/VHT20 Beam Forming, M0 to M7       3         HT/VHT20 Beam Forming, M8 to M15       3         HT/VHT20 STBC, M0 to M7       3         HT/VHT20 STBC, M0 to M7       3	HT/VHT20 STBC, M0 to M7       2       3         HT/VHT20 STBC, M0 to M7       3       3         CCK, 1 to 11 Mbps       1       3         CCK, 1 to 11 Mbps       2       3         CCK, 1 to 11 Mbps       2       3         CCK, 1 to 11 Mbps       2       3         Non HT20, 6 to 54 Mbps       1       3         Non HT20, 6 to 54 Mbps       2       3         Non HT20, 6 to 54 Mbps       2       3         Non HT20 Beam Forming, 6 to 54 Mbps       2       6         Non HT20 Beam Forming, 6 to 54 Mbps       3       8         HT/VHT20, M0 to M7       1       3         HT/VHT20, M0 to M7       2       3         HT/VHT20, M0 to M7       3       3         HT/VHT20, M0 to M7       3       3         HT/VHT20, M0 to M7       3       3         HT/VHT20, M8 to M15       2       3         HT/VHT20 Beam Forming, M0 to M7       2       6         HT/VHT20 Beam Forming, M0 to M7       3       8         HT/VHT20 Beam Forming, M8 to M15       2       3         HT/VHT20 Beam Forming, M0 to M7       3       8         HT/VHT20 Beam Forming, M8 to M15       3       5	HT/VHT20 STBC, M0 to M7       2       3       -77.1         HT/VHT20 STBC, M0 to M7       3       3       -77.1         CCK, 1 to 11 Mbps       1       3       -74.8         CCK, 1 to 11 Mbps       2       3       -74.8         CCK, 1 to 11 Mbps       2       3       -74.8         CCK, 1 to 11 Mbps       3       3       -74.8         CCK, 1 to 11 Mbps       3       3       -74.8         CCK, 1 to 11 Mbps       2       3       -74.8         CCK, 1 to 11 Mbps       3       3       -74.8         CCK, 1 to 11 Mbps       3       3       -74.8         Non HT20, 6 to 54 Mbps       1       3       -77.5         Non HT20 for 54 Mbps       2       3       -77.5         Non HT20 Beam Forming, 6 to 54 Mbps       2       6       -77.5         Non HT20 Beam Forming, 6 to 54 Mbps       3       8       -77.5         Non HT20 M0 to M7       1       3       -76.9         HT/VHT20, M0 to M7       2       3       -76.9         HT/VHT20, M8 to M15       3       3       -76.9         HT/VHT20, M8 to M15       3       3       -76.9         HT/VHT20 Beam Forming, M0 to	HT/VHT20 STBC, M0 to M7       2       3       -77.1       -76.3         HT/VHT20 STBC, M0 to M7       3       3       -77.1       -76.3         CCK, 1 to 11 Mbps       1       3       -74.8       -76.9         CCK, 1 to 11 Mbps       2       3       -74.8       -76.9         CCK, 1 to 11 Mbps       3       3       -74.8       -76.9         CCK, 1 to 11 Mbps       3       3       -74.8       -76.9         Non HT20, 6 to 54 Mbps       1       3       -77.5       -77.2         Non HT20, 6 to 54 Mbps       2       3       -77.5       -77.2         Non HT20, 6 to 54 Mbps       3       3       -77.5       -77.2         Non HT20 Beam Forming, 6 to 54 Mbps       3       8       -77.5       -77.2         Non HT20 Beam Forming, 6 to 54 Mbps       3       8       -77.5       -77.2         Non HT20 Beam Forming, 6 to 54 Mbps       3       8       -77.5       -77.2         Non HT20 M0 to M7       1       3       -76.9       -76.9         HT/VHT20, M0 to M7       1       3       -76.9       -76.9         HT/VHT20, M8 to M15       3       3       -76.9       -76.9         HT/VHT20 Be	HT/VHT20 STBC, M0 to M7       2       3       -77.1       -76.3         HT/VHT20 STBC, M0 to M7       3       3       -77.1       -76.3       -76.4         CCK, 1 to 11 Mbps       1       3       -74.8       -76.9         CCK, 1 to 11 Mbps       2       3       -74.8       -76.9         CCK, 1 to 11 Mbps       2       3       -74.8       -76.9         CCK, 1 to 11 Mbps       3       3       -74.8       -76.9         CCK, 1 to 11 Mbps       3       3       -74.8       -76.9         CCK, 1 to 11 Mbps       3       3       -74.8       -76.9         CCK, 1 to 11 Mbps       1       3       -77.5       -76.9         CCK, 1 to 11 Mbps       3       3       -77.5       -77.2         Non HT20, 6 to 54 Mbps       1       3       -77.5       -77.2         Non HT20 Beam Forming, 6 to 54 Mbps       3       8       -77.5       -77.2         Non HT20 Beam Forming, 6 to 54 Mbps       3       8       -77.5       -77.2         Non HT20, M0 to M7       1       3       -76.9       -76.9         HT/VHT20, M0 to M7       2       3       -76.9       -77.0         HT/VHT20, M8 to M15	HT/VHT20 STBC, M0 to M7       2       3       -77.1       -76.3       -70.7         HT/VHT20 STBC, M0 to M7       3       3       -77.1       -76.3       -76.4       -68.8         CCK, 1 to 11 Mbps       1       3       -74.8       -71.8       -71.8         CCK, 1 to 11 Mbps       2       3       -74.8       -76.9       -69.7         CCK, 1 to 11 Mbps       3       3       -74.8       -76.9       -69.7         CCK, 1 to 11 Mbps       3       3       -74.8       -76.9       -69.7         CCK, 1 to 11 Mbps       3       3       -74.8       -76.4       -68.2         Non HT20, 6 to 54 Mbps       1       3       -77.5       -77.2       -74.5         Non HT20, 6 to 54 Mbps       2       3       -77.5       -77.2       -71.3         Non HT20 Beam Forming, 6 to 54 Mbps       3       8       -77.5       -77.2       -70.4       -66.9         Non HT20 Beam Forming, 6 to 54 Mbps       3       8       -77.5       -77.2       -70.4       -60.9         HT/VHT20, M0 to M7       1       3       -76.9       -77.0       -68.3         Non HT20 Beam Forming, 6 to 54 Mbps       3       8       -77.5 <td< td=""><td>HT/VHT20 STBC, M0 to M7       2       3       -77.1       -76.3       -70.7       -41.25         HT/VHT20 STBC, M0 to M7       3       3       -77.1       -76.3       -76.4       -68.8       -41.25         CCK, 1 to 11 Mbps       1       3       -74.8       -71.8       -41.25         CCK, 1 to 11 Mbps       2       3       -74.8       -76.9       -69.7       -41.25         CCK, 1 to 11 Mbps       3       -74.8       -76.9       -69.7       -41.25         CCK, 1 to 11 Mbps       3       -77.5       -76.4       -68.2       -41.25         Non HT20, 6 to 54 Mbps       1       3       -77.5       -77.2       -71.3       -41.25         Non HT20, 6 to 54 Mbps       2       3       -77.5       -77.2       -71.3       -41.25         Non HT20 6 to 54 Mbps       3       3       -77.5       -77.2       -71.3       -41.25         Non HT20 6 to 54 Mbps       3       3       -77.5       -77.2       -70.4       -65.9       -41.25         Non HT20 Beam Forming, 6 to 54 Mbps       3       8       -77.5       -77.2       -70.4       -60.9       -41.25         Non HT20 M0 to M7       1       3       -76.9</td></td<>	HT/VHT20 STBC, M0 to M7       2       3       -77.1       -76.3       -70.7       -41.25         HT/VHT20 STBC, M0 to M7       3       3       -77.1       -76.3       -76.4       -68.8       -41.25         CCK, 1 to 11 Mbps       1       3       -74.8       -71.8       -41.25         CCK, 1 to 11 Mbps       2       3       -74.8       -76.9       -69.7       -41.25         CCK, 1 to 11 Mbps       3       -74.8       -76.9       -69.7       -41.25         CCK, 1 to 11 Mbps       3       -77.5       -76.4       -68.2       -41.25         Non HT20, 6 to 54 Mbps       1       3       -77.5       -77.2       -71.3       -41.25         Non HT20, 6 to 54 Mbps       2       3       -77.5       -77.2       -71.3       -41.25         Non HT20 6 to 54 Mbps       3       3       -77.5       -77.2       -71.3       -41.25         Non HT20 6 to 54 Mbps       3       3       -77.5       -77.2       -70.4       -65.9       -41.25         Non HT20 Beam Forming, 6 to 54 Mbps       3       8       -77.5       -77.2       -70.4       -60.9       -41.25         Non HT20 M0 to M7       1       3       -76.9

Page No: 42 of 88

## Conducted Spurs Average, 2412 MHz, HT/VHT20 Beam Forming, M0 to M7



Center Freq 9	.015000000 NFE	COMPEC OGHZ PNO: Fast IFGain:High		Av	Type: Log-Pwr	TRACE DELET	Frequency
Ref ( 0 dBidiv Ref	offset 0.7 dB -20.00 dBm	a danchigo			h	Auto Tuni	
40.0							Center Fre 9.015000000 GH
60 0 70 0 en 0	1 Lann	hun		~~~		È	Start Fre 30.000000 MH
90.0 100 110							Stop Fre 18.00000000 GH
Start 30 MHz Res BW 1.0 M	lHz	#V	BW 1.0 kHz		Sweep	Stop 18.000 GH 14.0 s (1001 pts	1.797000000 GH
MCR         MODE         THC         SOL           1         N         1         f           2         N         1         f           3         N         1         f           4         N         1         f           5         N         1         f           6         1         1         f           7         2         1         f           9         1         1         f	×	2 412 GHz 4 824 GHz 7 236 GHz 911 MHz 7.533 GHz	-65.96 dBm -78.20 dBm -76.25 dBm -61.62 dBm -70.53 dBm	FUNCTION	PUNCTION WIDTH	FUNCTION VALUE	Auto Ma Freq Offse 0 H

Antenna B

Antenna A

enter Freq 9.015	0000000 GHz NFE PNO: Fa IFGain:Hi	st Trig: Free Run		g Type: Log-Pwr	TRACE	Frequency
Ref Offset	0.7 dB 00 dBm			Mkr	5 16.149 GHz -70.45 dBm	Auto Tune
	T					Center Free 9.015000000 GH
	~~~ <sup>2</sup> ~~	<sup>3</sup>	~~~~	~~~~	5	Start Free 30.000000 MH
50.0						Stop Free 18.000000000 GH
Start 30 MHz Res BW 1.0 MHz	#	VBW 1.0 kHz			top 18.000 GHz 14.0 s (1001 pts)	CF Step 1.797000000 GH
N         1         F           1         N         1         F           2         N         1         F           3         N         1         F           4         N         1         F           5         N         1         F           6         7         7         7	× 2.412 GH 4.824 GH 7.236 GH 929 MH 16.149 GH	2 -78 21 dBm 2 -76.79 dBm 2 -63.14 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Auto Ma Freq Offse 0 H
/ 8 9 10 11 12						

Antenna C

Page No: 43 of 88

Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Tx 2 Spur Power (dBm)	Tx 3 Spur Power (dBm)	Total Conducted Spur (dBm)	Limit (dBm)	Margin (dB)
	CCK, 1 to 11 Mbps	1	3	-62.3			-59.3	-21.25	38.1
	CCK, 1 to 11 Mbps	2	3	-62.3	-61.3		-55.8	-21.25	34.5
	CCK, 1 to 11 Mbps	3	3	-62.3	-61.3	-61.9	-54.0	-21.25	32.8
	Non HT20, 6 to 54 Mbps	1	3	-60.9			-57.9	-21.25	36.7
	Non HT20, 6 to 54 Mbps	2	3	-53.6	-53.2		-47.4	-21.25	26.1
	Non HT20, 6 to 54 Mbps	3	3	-53.8	-53.8	-62.9	-47.5	-21.25	26.3
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-53.8	-53.8		-44.8	-21.25	23.5
	Non HT20 Beam Forming, 6 to 54 Mbps	3	8	-62.2	-53.6	-58.6	-44.0	-21.25	22.7
N	HT/VHT20, M0 to M7	1	3	-60.2			-57.2	-21.25	36.0
2412	HT/VHT20, M0 to M7	2	3	-54.0	-53.6		-47.8	-21.25	26.5
	HT/VHT20, M8 to M15	2	3	-54.0	-53.6		-47.8	-21.25	26.5
[	HT/VHT20, M0 to M7	3	3	-60.4	-60.6	-61.0	-52.9	-21.25	31.6
	HT/VHT20, M8 to M15	3	3	-60.4	-60.6	-61.0	-52.9	-21.25	31.6
	HT/VHT20 Beam Forming, M0 to M7	2	6	-60.4	-60.6		-51.5	-21.25	30.2
	HT/VHT20 Beam Forming, M8 to M15	2	3	-54.0	-53.6		-47.8	-21.25	26.5
	HT/VHT20 Beam Forming, M0 to M7	3	8	-53.8	-53.6	-52.7	-40.6	-21.25	19.3
	HT/VHT20 Beam Forming, M8 to M15	3	5	-62.9	-53.9	-61.1	-47.7	-21.25	26.5
	HT/VHT20 STBC, M0 to M7	2	3	-54.0	-53.6		-47.8	-21.25	26.5
	HT/VHT20 STBC, M0 to M7	3	3	-60.4	-60.6	-61.0	-52.9	-21.25	31.6
	CCK, 1 to 11 Mbps	1	3	-62.4			-59.4	-21.25	38.2
	CCK, 1 to 11 Mbps	2	3	-62.4	-63.9		-57.1	-21.25	35.8
	CCK, 1 to 11 Mbps	3	3	-62.4	-63.9	-60.7	-54.4	-21.25	33.1
	Non HT20, 6 to 54 Mbps	1	3	-63.1			-60.1	-21.25	38.9
	Non HT20, 6 to 54 Mbps	2	3	-63.1	-62.1		-56.6	-21.25	35.3
	Non HT20, 6 to 54 Mbps	3	3	-63.1	-62.1	-62.1	-54.6	-21.25	33.4
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-63.1	-62.1		-53.6	-21.25	32.3
37	Non HT20 Beam Forming, 6 to 54 Mbps	3	8	-63.1	-62.1	-62.1	-49.6	-21.25	28.4
2437	HT/VHT20, M0 to M7	1	3	-62.5			-59.5	-21.25	38.3
	HT/VHT20, M0 to M7	2	3	-62.5	-61.1		-55.7	-21.25	34.5
	HT/VHT20, M8 to M15	2	3	-62.5	-61.1		-55.7	-21.25	34.5
	HT/VHT20, M0 to M7	3	3	-62.5	-61.1	-61.9	-54.0	-21.25	32.8
	HT/VHT20, M8 to M15	3	3	-62.5	-61.1	-61.9	-54.0	-21.25	32.8
	HT/VHT20 Beam Forming, M0 to M7	2	6	-62.5	-61.1		-52.7	-21.25	31.5
	HT/VHT20 Beam Forming, M8 to M15	2	3	-62.5	-61.1		-55.7	-21.25	34.5
	HT/VHT20 Beam Forming, M0 to M7	3	8	-62.5	-61.1	-61.9	-49.0	-21.25	27.8

Page No: 44 of 88

	HT/VHT20 Beam Forming, M8 to M15	3	5	-62.5	-61.1	-61.9	-52.0	-21.25	30.8
	HT/VHT20 STBC, M0 to M7	2	3	-62.5	-61.1		-55.7	-21.25	34.5
	HT/VHT20 STBC, M0 to M7	3	3	-62.5	-61.1	-61.9	-54.0	-21.25	32.8
	CCK, 1 to 11 Mbps	1	3	-62.6			-59.6	-21.25	38.4
	CCK, 1 to 11 Mbps	2	3	-62.6	-62.7		-56.6	-21.25	35.4
	CCK, 1 to 11 Mbps	3	3	-62.6	-62.7	-63.4	-55.1	-21.25	33.9
	Non HT20, 6 to 54 Mbps	1	3	-62.1			-59.1	-21.25	37.9
	Non HT20, 6 to 54 Mbps	2	3	-62.1	-62.0		-56.0	-21.25	34.8
	Non HT20, 6 to 54 Mbps	3	3	-62.1	-62.0	-62.4	-54.4	-21.25	33.1
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-62.1	-62.0		-53.0	-21.25	31.8
	Non HT20 Beam Forming, 6 to 54 Mbps	3	8	-62.1	-62.0	-62.4	-49.4	-21.25	28.1
	HT/VHT20, M0 to M7	1	3	-63.6			-60.6	-21.25	39.4
2462	HT/VHT20, M0 to M7	2	3	-63.6	-61.9		-56.7	-21.25	35.4
~	HT/VHT20, M8 to M15	2	3	-63.6	-61.9		-56.7	-21.25	35.4
	HT/VHT20, M0 to M7	3	3	-63.6	-61.9	-60.9	-54.2	-21.25	33.0
	HT/VHT20, M8 to M15	3	3	-63.6	-61.9	-60.9	-54.2	-21.25	33.0
	HT/VHT20 Beam Forming, M0 to M7	2	6	-63.6	-61.9		-53.7	-21.25	32.4
	HT/VHT20 Beam Forming, M8 to M15	2	3	-63.6	-61.9		-56.7	-21.25	35.4
	HT/VHT20 Beam Forming, M0 to M7	3	8	-63.6	-61.9	-60.9	-49.2	-21.25	28.0
	HT/VHT20 Beam Forming, M8 to M15	3	5	-63.6	-61.9	-60.9	-52.2	-21.25	31.0
	HT/VHT20 STBC, M0 to M7	2	3	-63.6	-61.9		-56.7	-21.25	35.4
	HT/VHT20 STBC, M0 to M7	3	3	-63.6	-61.9	-60.9	-54.2	-21.25	33.0

Page No: 45 of 88

## Conducted Spurs Peak, 2412 MHz, HT/VHT20 Beam Forming, M0 to M7



Center Freq 9.0150	PN0: Fast	Trig: Free Run #Atten: 0 dB	Avg Type: Log-Pwr	TRACE DI A S	Frequency
Ref Offset 0. 10 dBidiv Ref -20.00	Auto Tune				
-40.0 -40.0		.3		<b>♦</b> <sup>4</sup>	Center Free 9.015000000 GH
and internation	the contraction		tan fi dan da da da ang ng kalan	ad and a sea of the sea	Start Free 30.000000 MH
90.0 -100 -110					Stop Free 18.000000000 GH
Start 30 MHz #Res BW 1.0 MHz #R MODE THE SE	#VB\ *	N 3.0 MHz	Sweep 3	Stop 18.000 GHz 0.0 ms (1001 pts)	CF Step 1.797000000 GH Auto Mar
1 N 1 f 2 N 1 f 3 N 1 f 4 N 1 f 5 6	2.412 GHz 4.824 GHz 7.236 GHz 14.855 GHz	-57 49 dBm -62 70 dBm -62 82 dBm -63 60 dBm			Freq Offse 0 H
8 9 10 11					

Antenna B

### Antenna A

Frequency	TYPE CONTRACT		pe: Log-Pwr	Avg		Trig: Free #Atten: 0	VO: Fast		9.01500	Freq	enter
Auto Tu	Ref 075et 0.7 dB Mkr4 17.748 GHz 0 dBidly Ref -20.00 dBm -52.72 dBm -52.72 dBm										
Center Fr 9.015000000 G	4										10 — 10 —
Start Fr 30.000000 Mi	saragar shiziya	wices and	the ange of the first	Cyrin 1. 1417	un pe	2 <sup>3</sup>	nt-spelartyp		Alman	Jarra	
Stop Fre 18.00000000 G											10 00 10
CF Ste 1.797000000 G	18.000 GHz is (1001 pts)	Stop 30.0 n	Sweep			/ 3.0 MHz	#VB		MHz	0 MHz W 1.0	
Auto M Freq Offs 01	ICTION VALUE	FU	UNCTION WIDTH	UNCTION	im im	66.36 dE -62.68 dE -62.92 dE -52.72 dE	2 GHz 4 GHz 6 GHz 8 GHz	4.82			ZZZZ
		10	STATU								2

Antenna C

Page No: 46 of 88

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

System Number	Description	Samples	System under test	Support equipment
	EUT	S01	V	
1	Support	S02		$\checkmark$

Tested By :	Date of testing:
Jose Aguirre	05-May-16 - 06-Jun-16
Test Result : PASS	

See Appendix C for list of test equipment

Page No: 47 of 88

# **Restricted Band**

Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Tx 2 Bandedge Level (dBm)	Tx 3 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
	CCK, 1 to 11 Mbps	1	3	-57.0			-54.0	-41.25	12.8
	CCK, 1 to 11 Mbps	2	3	-57.0	-56.0		-50.5	-41.25	9.2
	CCK, 1 to 11 Mbps	3	3	-57.0	-56.0	-56.6	-48.7	-41.25	7.5
	Non HT20, 6 to 54 Mbps	1	3	-45.0			-42.0	-41.25	0.8
	Non HT20, 6 to 54 Mbps	2	3	-50.1	-49.9		-44.0	-41.25	2.7
	Non HT20, 6 to 54 Mbps	3	3	-50.1	-49.9	-48.5	-41.7	-41.25	0.4
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-52.4	-52.0		-43.2	-41.25	1.9
	Non HT20 Beam Forming, 6 to 54 Mbps	3	8	-56.2	-55.8	-55.5	-43.1	-41.25	1.8
N	HT/VHT20, M0 to M7	1	3	-45.4			-42.4	-41.25	1.2
2412	HT/VHT20, M0 to M7	2	3	-47.6	-47.3		-41.4	-41.25	0.2
	HT/VHT20, M8 to M15	3	3	-50.3	-49.6	-48.7	-41.7	-41.25	0.5
	HT/VHT20, M0 to M7	2	3	-47.6	-47.3		-41.4	-41.25	0.2
	HT/VHT20, M8 to M15	3	3	-50.3	-49.6	-48.7	-41.7	-41.25	0.5
	HT/VHT20 Beam Forming, M0 to M7	2	6	-52.4	-51.9		-43.1	-41.25	1.9
	HT/VHT20 Beam Forming, M8 to M15	3	8	-54.4	-54.0	-53.8	-41.3	-41.25	0.0
	HT/VHT20 Beam Forming, M0 to M7	2	3	-47.6	-47.3		-41.4	-41.25	0.2
	HT/VHT20 Beam Forming, M8 to M15	3	5	-52.4	-51.9	-51.4	-42.1	-41.25	0.9
	HT/VHT20 STBC, M0 to M7	2	3	-47.6	-47.3		-41.4	-41.25	0.2
	HT/VHT20 STBC, M0 to M7	3	3	-50.3	-49.6	-48.7	-41.7	-41.25	0.5
	CCK, 1 to 11 Mbps	1	3	-58.2			-55.2	-41.25	14.0
	CCK, 1 to 11 Mbps	2	3	-58.2	-57.3		-51.7	-41.25	10.5
	CCK, 1 to 11 Mbps	3	3	-58.2	-57.3	-57.3	-49.8	-41.25	8.6
	Non HT20, 6 to 54 Mbps	1	3	-44.4			-41.4	-41.25	0.2
	Non HT20, 6 to 54 Mbps	2	3	-48.1	-50.1		-43.0	-41.25	1.7
	Non HT20, 6 to 54 Mbps	3	3	-48.1	-50.1	-49.8	-41.5	-41.25	0.2
62	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-51.1	-52.9		-42.9	-41.25	1.6
2462	Non HT20 Beam Forming, 6 to 54 Mbps	3	8	-53.1	-55.7	-54.4	-41.5	-41.25	0.3
	HT/VHT20, M0 to M7	1	3	-45.2			-42.2	-41.25	1.0
	HT/VHT20, M0 to M7	2	3	-48.0	-49.5		-42.7	-41.25	1.4
	HT/VHT20, M8 to M15	3	3	-50.2	-52.1	-51.2	-43.3	-41.25	2.1
	HT/VHT20, M0 to M7	2	3	-48.0	-49.5		-42.7	-41.25	1.4
	HT/VHT20, M8 to M15	3	3	-50.2	-52.1	-51.2	-43.3	-41.25	2.1
	HT/VHT20 Beam Forming, M0 to M7	2	6	-50.2	-52.1		-42.0	-41.25	0.8

Page No: 48 of 88

HT/VHT20 Beam Forming, M8 to M15	3	8	-54.8	-56.9	-56.4	-43.2	-41.25	1.9
HT/VHT20 Beam Forming, M0 to M7	2	3	-48.0	-49.5		-42.7	-41.25	1.4
HT/VHT20 Beam Forming, M8 to M15	3	5	-50.2	-52.1	-51.2	-41.3	-41.25	0.1
HT/VHT20 STBC, M0 to M7	2	3	-48.0	-49.5		-42.7	-41.25	1.4
HT/VHT20 STBC, M0 to M7	3	3	-50.2	-52.1	-51.2	-43.3	-41.25	2.1

Page No: 49 of 88

### Conducted Bandedge Average, 2412 MHz, HT/VHT20 Beam Forming, M0 to M7, M0 to M9 1ss



enter Freq 2.0654	NFE PNO: F	ast 🗭 Trig: Free Run aw #Atten: 14 dB	#Avg Type: Voltage	TRACE DE A	Frequency
Ref Offset 0	1.7 dB 1Bm		Mk	r1 2.390 0 GHz -53.98 dBm	Auto Tune
					Center Free 2.065400000 GH
0.0 0.0 0.0					Start Fre 1.718800000 GH
00 00 00					Stop Fre 2.412000000 GH
tart 1.7188 GHz Res BW 1.0 MHz		#VBW 100 Hz	Sweep	Stop 2.4120 GHz 5.41 s (1001 pts)	CF Ste 69.320000 MH
KR MODE TRC SOL	× 2,390.0 GH	y 453,98 dBm	FUNCTION FUNCTION WOTH	FUNCTION VALUE	Auto Mar
23456					Freq Offse 0 H
7					
2			STATUS		

Antenna B

Antenna A

RL Center F		5400000 C	PNO: Fast	Trig: Free Run #Atten: 14 dB	#As	g Type: Voltage	TRACE DET	Frequency
0 dBldiv	Ref Offse Ref 0.0	t0.7 dB 0 dBm				Mk	r1 2.390 0 GHz -53.83 dBm	Auto Tun
10.0 20.0								Center Fre 2.065400000 GH
40.0 50.0 60.0							<sup>1</sup>	Start Fre 1.718800000 GH
70.0 00.0 00.0								Stop Fre 2.412000000 GH
start 1.71 Res BW	88 GHz 1.0 MHz		#VB	W 100 Hz		Sweep	Stop 2.4120 GHz 5.41 s (1001 pts)	CF Ste 69.320000 MH
AR MODE T		× 2.39	00 GHz	√-53.83 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Auto Mi
3456								Freq Offs 0 F
7 8 9 10 11								
12						STATUS		

Antenna C

Page No: 50 of 88

## Conducted Bandedge Average, 2462 MHz, HT/VHT20 Beam Forming, M8 to M15, M0 to M9 2ss





Antenna A



enter Freq 2.		PNO: Fast C	Trig: Free Ru	#Av	g Type: Voltage	TRACE DE LA S	Frequency
0 dB/div Ref	offset 0.7 dB 10.00 dBm	#Gain:Low	satten: 20 db		Mkr1	2.483 500 GHz -51.21 dBm	Auto Tun
09 100 100 100							Center Fre 2.864500000 GH
							Start Fre 2.452000000 GH
00							Stop Fre 3.267000000 GH
tart 2.4620 GH Res BW 1.0 M		#VB	W 100 Hz		Sweep		CF Ste 80.500000 Mi Auto Mi
RR MODE TRC SCL	2.483	1600 GHz	-51.21 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Freq Offse
6 7 8 9 10							
2							

Antenna C

Page No: 51 of 88

Frequency (MHz)	Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Tx 2 Bandedge Level (dBm)	Tx 3 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
	CCK, 1 to 11 Mbps	1	3	-40.0			-37.0	-21.25	15.8
	CCK, 1 to 11 Mbps	2	3	-40.0	-33.5		-29.6	-21.25	8.4
	CCK, 1 to 11 Mbps	3	3	-40.0	-33.5	-47.3	-29.5	-21.25	8.2
	Non HT20, 6 to 54 Mbps	1	3	-32.0			-29.0	-21.25	7.8
	Non HT20, 6 to 54 Mbps	2	3	-33.4	-33.4		-27.4	-21.25	6.1
	Non HT20, 6 to 54 Mbps	3	3	-36.7	-34.0	-36.4	-27.8	-21.25	6.5
	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-36.7	-34.0		-26.1	-21.25	4.9
	Non HT20 Beam Forming, 6 to 54 Mbps	3	8	-40.1	-38.3	-40.5	-26.8	-21.25	5.5
N	HT/VHT20, M0 to M7	1	3	-32.7			-29.7	-21.25	8.5
2412	HT/VHT20, M0 to M7	2	3	-34.1	-34.3		-28.2	-21.25	6.9
	HT/VHT20, M8 to M15	2	3	-34.1	-34.3		-28.2	-21.25	6.9
	HT/VHT20, M0 to M7	3	3	-36.3	-39.0	-36.9	-29.5	-21.25	8.2
	HT/VHT20, M8 to M15	3	3	-36.3	-39.0	-36.9	-29.5	-21.25	8.2
	HT/VHT20 Beam Forming, M0 to M7	2	6	-36.3	-39.0		-28.4	-21.25	7.2
	HT/VHT20 Beam Forming, M8 to M15	2	3	-34.1	-34.3		-28.2	-21.25	6.9
	HT/VHT20 Beam Forming, M0 to M7	3	8	-40.9	-39.3	-43.1	-28.1	-21.25	6.8
	HT/VHT20 Beam Forming, M8 to M15	3	5	-38.0	-40.2	-37.8	-28.8	-21.25	7.5
	HT/VHT20 STBC, M0 to M7	2	3	-34.1	-34.3		-28.2	-21.25	6.9
	HT/VHT20 STBC, M0 to M7	3	3	-36.3	-39.0	-36.9	-29.5	-21.25	8.2
	CCK, 1 to 11 Mbps	1	3	-39.2			-36.2	-21.25	15.0
	CCK, 1 to 11 Mbps	2	3	-39.2	-32.1		-28.3	-21.25	7.1
	CCK, 1 to 11 Mbps	3	3	-39.2	-32.1	-45.5	-28.2	-21.25	6.9
	Non HT20, 6 to 54 Mbps	1	3	-33.5			-30.5	-21.25	9.3
	Non HT20, 6 to 54 Mbps	2	3	-37.4	-32.7		-28.4	-21.25	7.2
	Non HT20, 6 to 54 Mbps	3	3	-37.4	-32.7	-38.9	-27.7	-21.25	6.5
32	Non HT20 Beam Forming, 6 to 54 Mbps	2	6	-40.9	-32.4		-25.8	-21.25	4.6
2462	Non HT20 Beam Forming, 6 to 54 Mbps	3	8	-39.4	-36.6	-43.8	-26.3	-21.25	5.0
	HT/VHT20, M0 to M7, M0 to M9 1ss	1	3	-33.2	0.1.0		-30.2	-21.25	9.0
	HT/VHT20, M0 to M7, M0 to M9 1ss	2	3	-37.8	-31.9	14.0	-27.9	-21.25	6.7
	HT/VHT20, M0 to M7, M0 to M9 1ss	3	3	-40.1	-32.5	-41.2	-28.3	-21.25	7.1
	HT/VHT20, M8 to M15, M0 to M9 2ss	2	3	-37.8	-31.9	14.0	-27.9	-21.25	6.7
	HT/VHT20, M8 to M15, M0 to M9 2ss	3	3	-40.1	-32.5	-41.2	-28.3	-21.25	7.1
	HT/VHT20 Beam Forming, M0 to M7, M0 to M9 1ss	2	6	-40.1	-32.5		-25.8	-21.25	4.6

Page No: 52 of 88

HT/VHT20 Beam Forming, M0 to M7, M0 to M9 1ss	3	8	-45.7	-36.4	-46.0	-27.5	-21.25	6.3
HT/VHT20 Beam Forming, M0 to M7	3	8	-62.9	-61.5	-63.3	-49.7	-21.25	28.5
HT/VHT20 Beam Forming, M8 to M15	3	5	-62.9	-61.5	-63.3	-52.7	-21.25	31.5
HT/VHT20 STBC, M0 to M7	2	3	-62.9	-61.5		-56.1	-21.25	34.9
HT/VHT20 STBC, M0 to M7	3	3	-62.9	-61.5	-63.3	-54.7	-21.25	33.5

Page No: 53 of 88

## Conducted Bandedge Peak, 2412 MHz, Non HT20 Beam Forming, 6 to 54 Mbps



Center Freq 2.36100000	GH7	Avg Type: ree Run 12 dB			Frequency
Ref Offset 0.7 dB	P Galitzow Shirten		Mkr2 2.388 -34	8 37 GHz .03 dBm	Auto Tuni
200			\$ <sup>2</sup> 1		Center Fre 2.361000000 GH
40.0 50.0 60.0 60.0	anar Palita, Ang	henehoore	1. Ind		Start Fre 2.310000000 GH
-70.0 					Stop Fre 2.412000000 GF
			Stop 2.	41200 GHz	
Start 2.31000 GHz #Res BW 1.0 MHz	#VBW 3.0 MH	lz	Sweep 1.00 m	s (601 pts)	10.200000 MH
#Res BW 1.0 MHz MRR MODE TRC SCL X 1 N 1 F 2.3	90.00 GHz -37.12	FUNCTION FUN	Sweep 1.00 m	s (601 pts)	CF Ste 10.200000 MH uto Ma
#Res BW 1.0 MHz MRR MODE TRC SCL X 1 N 1 F 2.3	Y	FUNCTION FUN	Sweep 1.00 m	s (601 pts)	10.200000 MH
#Res BW 1.0 MHz           W/R MODE TRC SCL         X           1         N         1         f         2.3           3         4         5         5	90.00 GHz -37.12	FUNCTION FUN	Sweep 1.00 m	s (601 pts)	10.200000 Mi

Antenna A

Antenna B



Center Freq 2.4	SO Q DC COMMEC 81000000 GHz PNO: Wide C IF Gain1ew	Trig: Free Run #Atten: 18 dB	Avg Type: Log-Pwr	THACE DO A S	Frequency
Ref Off	set 0.7 dB 00 dBm		Mkr2	2.491 51 GHz -42.44 dBm	Auto Tune
-10.0 -20.0 -20.0			1		Center Free 2.481000000 GH
40.0 50.0 42.0			1 concurrinternetalication	and an	Start Fre 2.462000000 GH
-70.0					Stop Fre 2.500000000 GH
Start 2.46200 GH #Res BW 1.0 MH:		W 3.0 MHz	Sweep	Stop 2.50000 GHz 1.00 ms (601 pts)	CF Ste 3.800000 MH
1 N 1 F 2 N 1 F 3 4	2.483.50 GHz 2.491.51 GHz	40.95 dBm 42.44 dBm	HEILON PONETON WOTH	PORCHON VALUE	Freq Offse
6 7 8 9 10					
12					

Antenna A

Center F	req 2.4810	00000 GHz PNO: Wide C IFGain:Low	Trig: Free Run #Atten: 18 dB	Avg Type: Log-Pwr	TYPE DET	Frequency
t0 dB/div	Ref Offset 0 Ref 0.00 d	7 dB Bm		Mkr2	2.483 53 GHz -32.44 dBm	Auto Tune
-10.0				2		Center Fred 2.481000000 GH:
40.0 50.0 60.0		1	พางเป็นไปไปได้	ALAN MURAND	li di Milaiza	Start Free 2.462000000 GH
70.0 00.0 00.0						Stop Free 2.500000000 GH
Res BW	5200 GHz 1.0 MHz NC SCL	#VB 2.483 50 GHz	W 3.0 MHz 7 FU -38.89 dBm		top 2.50000 GHz 1.00 ms (601 pts) FUNCTION VALUE	CF Step 3.800000 MHz Auto Mar
N 3 4 5 6 7 8 9		2,483 50 GHz 2,483 53 GHz	-32.44 dBm			Freq Offse 0 Hz
9 10 11 12				STATUS		

Antenna B

Page No: 54 of 88

# **Non-Restristred Band**

Frequency (MHz)	Mode	Data Rate (Mbps)	Conducted Bandedge Delta (dB)	Limit (dBc)	Margin (dB)
	CCK, 1 to 11 Mbps	11	49.7	>30	19.7
2412	Non HT20, 6 to 54 Mbps	6	37.9	>30	7.9
	HT/VHT20, M0 to M15	m0	39.0	>30	9.0

Page No: 55 of 88

Agilent Spectru (X) R L	<mark>m Analyzer - Sw</mark> RF 50 ହ		RREC	SENS	E:INT					-
Center Fre	eq 2.4060		<b>-Iz</b> NO: Wide 🗔	Trig: Free		Avg Typ	e: Log-Pwr	TY	CE 1 2 3 4 5 6 PE MWWWW	Frequency
		IF	Gain:Low	#Atten: 20	dB		A 14		52 MHz	Auto Tune
10 dB/div	Ref Offset 0. Ref 10.00							- 4	9.67 dB	
0.00				- And Anna a	-	N'y <sup>ndynt</sup> w <sup>a</sup> h	∽ <sup>™⊅‡</sup> 3∆2 √,	Mulmon Maria		Center Freq
-10.0				And the second					March March	2.406000000 GHz
-30.0		<mark>2</mark>	1 h/	pro la companya de la					- Ad	01
-40.0	- hornor	window	www							Start Freq 2.390000000 GHz
-50.0	And a start of the									
-70.0										Stop Freq
-80.0										2.422000000 GHz
Start 2.390									-150.00 dBm 2200 GHz	CF Step
#Res BW 1			#VBV	V 300 kHz					1001 pts)	3.200000 MHz Auto Man
MKR MODE TRO	f	× 2.400 00		Y -41.71 dBi		TION FL	INCTION WIDTH	FUNCTIO	IN VALUE	Man
2 Ν 1 3 Δ2 1 4	f f (Δ)	2.397 48 15.55	<u>8 GHZ</u> 2 MHz (Δ)	-38.64 dBı 49.67 d						Freq Offset
5 6										0 Hz
7 8										
9										
11 12										
MSG							STATUS	5		

### Conducted Bandedge Delta, 2412 MHz, CCK, 1 to 11 Mbps

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

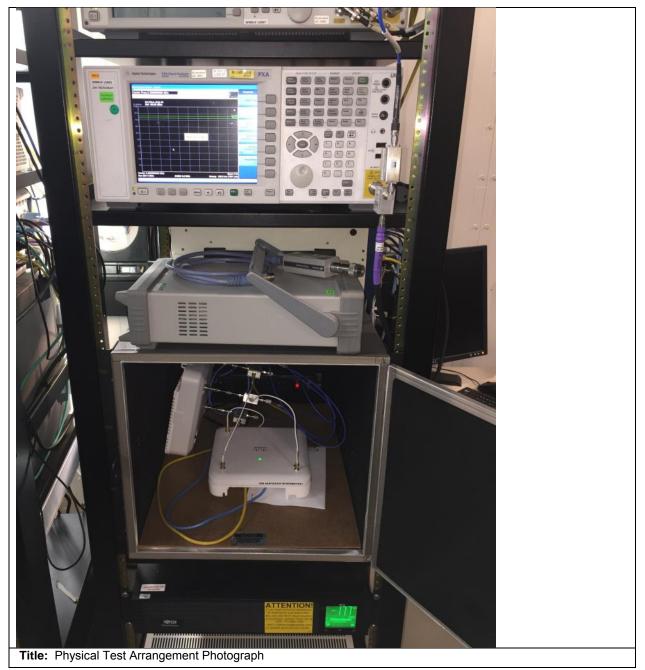


Page No: 56 of 88

LXI RL	rum Analyzer - Sw RF 50 Ω req 2.40601	DC COR	z		E:INT	Avg Type	e: Log-Pwr		E 123456 E M <del>WWWW</del>	Frequency
10 dB/div	Ref Offset 0. Ref 10.00 ⊧	IFG 7 dB	IO: Wide 🕞 Sain:Low	#Atten: 20			ΔMk	r3 18.1	44 MHz 8.99 dB	Auto Tune
Log 0.00 -10.0 -20.0			,	Marillanaura	, , , , , , , , , , , , , , , , , , ,	mann	<mark>∧,∩∽,∿~,, 3∆</mark>	2 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	where and here	Center Freq 2.406000000 GHz
-30.0 -40.0 -50.0	iland worker	2 Jamannagay	A war							Start Freq 2.390000000 GHz
-60.0 -70.0 -80.0										<b>Stop Fred</b> 2.422000000 GHz
Start 2.39 #Res BW	100 kHz	×	#VBW	300 kHz	FUNC				-150.00 dBm 2200 GHz 1001 pts)	CF Step 3.200000 MHz Auto Mar
1 N 1 2 N 1	f f $f$ $(\Delta)$	2.400 000		-41.19 dBr -34.25 dBr 38.99 d	n n			FUNCTIO		Freq Offset 0 Hz
7 8 9 10 11 12										
MSG							STATUS			

### Conducted Bandedge Delta, 2412 MHz, HT/VHT20, M0 to M15

Page No: 57 of 88



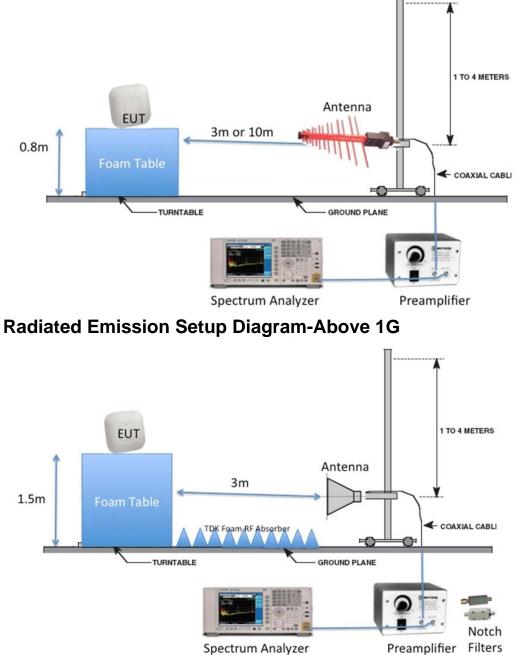
This is a dual band 2.4GHz / 5GHz device. All ports in this test set up photo are connected as all testing is automated. Section 2.6 of this test report given an overview of the different Tx antenna combinations used by this device.

Page No: 58 of 88

### **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**



Spectrum Analyzer

Page No: 59 of 88

# **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
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, Limit= 54dBuV/m @3m 2) Peak plot, 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
4	EUT	S01	$\checkmark$	
1	Support	S02		$\checkmark$

Tested By :	Date of testing:
Jose Aguirre	05-May-16 - 06-Jun-16
Test Result : PASS	

See Appendix C for list of test equipment

Page No: 60 of 88

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

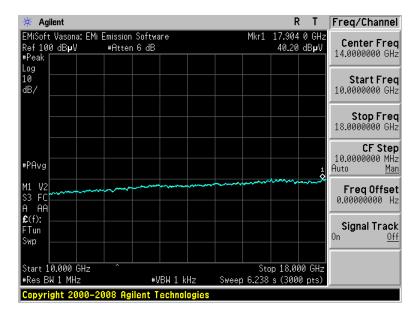
Frequency (MHz)	Mode	Data Rate (Mbps)	Spurious Emission Level (dBuV/m)	Limit (dBuV/m)	Margin dB
2412	CCK, 1 to 11 Mbps	1	40.2	54	13.8
2437	CCK, 1 to 11 Mbps	1	40.3	54	13.7
2462	CCK, 1 to 11 Mbps	1	39.8	54	14.2

Page No: 61 of 88

🔆 Agilent			F	2 T	Peak Search
EMiSoft Vasona: E Ref 100 dBµV #Peak	Mi Emission Software #Atten 6 dB			58 GHz dB <b>µ</b> V	Next Peak
.og LØ					Next Pk Right
3B/					
www.www.	2 Munumanna		\$ \$	4 •	Next Pk Left
PAvg					Min Search
Start 1.000 GHz			Stop 10.0		
Res BW 1 MHz Marker Trace	#VBW 1 Type	LKHZ Swee XAxis	ep 7.018 s (300 Amplit		Pk-Pk Search
1 (1) 2 (1)	Freq Freq	2.412 GHz 3.665 GHz	34.02 d 37.09 d	BµV BµV	Mkr → Cl
3 (1) 4 (1)	Freq Freq	7.234 GHz 9.658 GHz	34.45 d 38.72 d		
					More 1 of 2

## Average Radiated Transmitter Spurs, 2412 MHz, 6 to 54 Mbps

Copyright 200 Hglient



Page No: 62 of 88

🔆 Agilent				R	Т	Trace
EMiSoft Vasona: EMi Ref 100 dBµV PPeak	Emission Softw #Atten 6 dB		Mkr	4 9.73 37.57	9 GHz dB <b>µ</b> V	<b>Trace</b> <u>1</u> 2 3
.og .0 IB/						Clear Write
www.umay th	2	······	3 		4	Max Hold
PAvg						Min Hold
itart 1.000 GHz Res BW 1 MHz Marker Trace	type	VBW 1 kHz S X Axis	weep 7.018 s	10.000 (3000 Amplitud	pts)	Viev
$ \begin{array}{cccc} 1 & (1) \\ 2 & (1) \\ 3 & (1) \\ 4 & (1) \end{array} $	Freq Freq Freq Freq	2.437 GHz 3.668 GHz 7.311 GHz 9.739 GHz	3:	3.98 dBµ 5.10 dBµ 4.94 dBµ 7.57 dBµ	10 10	Blani
						More 1 of 2

### Average Radiated Transmitter Spurs, 2437 MHz, 6 to 54 Mbps

Copyright 2000–2008 Agilent Technologies

Agilent R T Peak Search EMISOft Vasona: EMI Emission Software Ref 100 dBµV +Atten 6 dB \*Peak Log 10 dB/ Mkr1 16.423 5 GHz 40.29 dBµV Next Peak Next Pk Right Next Pk Left Min Search #PAvg 4 M1 V2 S3 FC A AA £(f): Pk-Pk Search FTun Mkr→CF òwр More 1 of 2 Start 10.000 GHz #Res BW 1 MHz Stop 18.000 GHz Sweep 6.238 s (3000 pts) #VBW 1 kHz Copyright 2000-20 Technolo R Aailei

Page No: 63 of 88

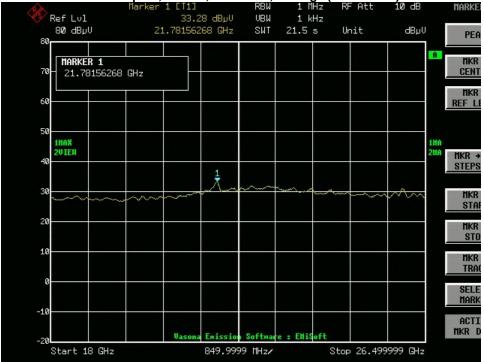
🔆 Agilent	t					R	Т	Mar	ker
EMiSoft Va Ref 100 dl #Peak □		Emission Soft #Atten 6 d			Mk	(r3 7.3) 35.15	63 GHz dB <b>µ</b> V	Select	Marker
-og 10 dB/									Norma
	~~~~ <sup>1</sup>	2 *******	······································	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	3 		4 ~\$		Delta
*PAvg									l <b>ta Pai</b> i king Ref
Start 1.00 •Res BW 1	MHz		₩VBW 1 kHz		Sto ep 7.018		l pts)	Span Span	oan Pail Cente
Marker 1 2 3 4	Trace (1) (1) (1) (1) (1)	Type Freq Freq Freq Freq	X A) 2.462 3.664 7.363 9.685	2 GHz 4 GHz 3 GHz		Amplitu 30.54 dE 37.34 dE 35.15 dE 36.93 dE	8µ0 8µ0 8µ0		Of
									More 1 of 2

Average Radiated Transmitter Spurs, 2462 MHz, 6 to 54 Mbps

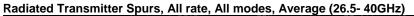
Copyright 2000–2008 Agilent Technologies

Agilent R T Peak Search 28 EMISoft Vasona: EMI Emission Software Ref 100 dBµV +Atten 6 dB +Peak Log 10 dB/ Mkr1 17.026 3 GHz 39.83 dBµV Next Peak Next Pk Right Next Pk Left Min Search #PAvg 1 M1 V2 S3 FC A AA £(f): Pk-Pk Search FTun Mkr→CF òwр More Start 10.000 GHz #Res BW 1 MHz Stop 18.000 GHz Sweep 6.238 s (3000 pts) 1 of 2 ₩VBW 1 kHz 8 Agile Copyright 2000-2008 Technol

Page No: 64 of 88



### Radiated Transmitter Spurs, All rate, All modes, Average (18-26.5GHz)





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

Page No: 65 of 88

## **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 dB
2412	CCK, 1 to 11 Mbps	1	50.4	74	23.6
2437	CCK, 1 to 11 Mbps	1	50.8	74	23.2
2462	CCK, 1 to 11 Mbps	1	50.0	74	24.0

Page No: 66 of 88



սիսիս

		RT	Peak Search
Emission Software #Atten 6 dB	M	1kr4 9.646 GHz 50.41 dBµV	Next Peak
			Next Pk Right
Anna ann an Anna an An			Next Pk Left
			Min Search
	· · · · · · · · · · · · · · · · · · ·		Pk-Pk Search
Freq 4.82 Freq 7.23	4 GHz 6 GHz	44.62 dBµV 43.79 dBµV 43.87 dBµV 50.41 dBµV	Mkr → CF
			<b>More</b> 1 of 2
	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	#Atten 6 dB	Emission Software Mkr4 9.646 GHz #Atten 6 dB 50.41 dBµV 2 3 4 4 6 4 4 6 4 6 4 7 6 4 6 4 7 6 4 6 6 4 7 6 4 6 6 4 7 6 4 6 6 4 7 6 4 6 6 4 7 6 4 6 6 4 7 6 4 6 6 6 4 7 6 4 6 6 6 6

Peak Search 🔆 Agilent R T Mkr1 16.708 9 GHz 48.85 dBµV EMISoft Vasona: EMI Emission Software Ref 100 dBµV #Atten 6 dB #Peak Next Peak Log 10 dB/ Next Pk Right Next Pk Left 1 \$ Min Search #PAvg M1 M2 S3 FC A AA £(f): FTun Sun Pk-Pk Search Mkr → CF бwр More Start 10.000 GHz #Res BW 1 MHz Stop 18.000 GHz Sweep 16.19 ms (3000 pts) 1 of 2 #VBW 3 MHz 0–2008 Agilent Technolo Convri

Page No: 67 of 88

### Peak Radiated Transmitter Spurs, 2437 MHz, 6 to 54 Mbps

🔆 Agilent			RT	Marker
Ref 100 dB <b>µ</b> V #Peak	Mi Emission Softwa #Atten 6 dB	re	Mkr3 7.317 GHz 44.26 dB <b>µ</b> V	Select Marker 1 2 <u>3</u> 4
Log 10 dB/				Norma
ANT ANT ANT AND	1 ************************************	<i>بۇرىدە ئەرىمەر يەرىمەر يەرە</i>	3 <u>Sund</u> er state st	Delta
				Delta Pair
#PAvg				(Tracking Ref) Ref 🛛 🛓
Start 1.000 GHz #Res BW 1 MHz	*V	3WI3 MHz Sweep	Stop 10.000 GHz 15.19 ms (3000 pts)	<b>Span Pair</b> Span Center
Marker Trac 1 (1)	e Type Freg	X Axis 2.437 GHz	Amplitude 42.31 dBµV	
2 (1) 3 (1) 4 (1)	Freq Freq Freq	3.668 GHz 7.317 GHz 9.745 GHz	43.26 dBµV 44.26 dBµV 47.71 dBµV	Off
				More 1 of 2

Agilent R T Peak Search EMISOft Vasona: EMI Emission Software Ref 100 dBµV +Atten 6 dB \*Peak Log 10 dB/ Mkr1 16.716 9 GHz 50.48 dBµV Next Peak Next Pk Right Next Pk Left 1 \$ Min Search #PAvg M1 V2 S3 FC A AA £(f): FTun Swp Pk-Pk Search Mkr→CF More 1 of 2 Start 10.000 GHz #Res BW 1 MHz Stop 18.000 GHz Sweep 16.19 ms (3000 pts) ₩VBW 3 MHz Copyright 2000-20 R Aailei nt Tech

Page No: 68 of 88

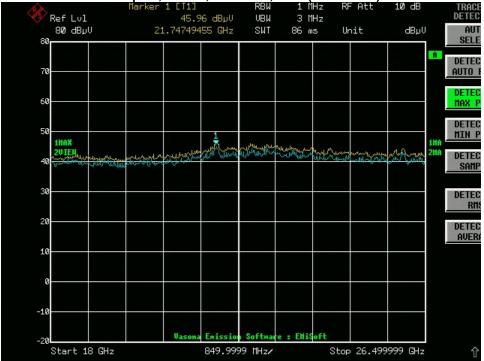
#### Peak Radiated Transmitter Spurs, 2462 MHz, 6 to 54 Mbps

սիսիս

🔆 Agilent						F	? T	Trace
EMiSoft Vas Ref 100 dB #Peak [		Emission Soft #Atten 6 d			Mk		85 GHz dB <b>µ</b> V	<b>Trace</b> 1 <u>2</u> 3
Log 10 dB/								Clear Write
n vierta		2 Japana and parameter	ميەجىرار يەسوقارىيدلەرىي	nutives and the	3	ana latan	4 And the second	Max Hold
#PAvg								Min Hold
Start 1.000 #Res BW 1 Marker		Туре	#VBW 3 MHz X Axis		Sto 15.04 m			View
1 2 3 4	(1) (1) (1) (1)	Freq Freq Freq Freq	2.462 G 3.664 G 7.386 G 9.685 G	iHz iHz		39.70 dl 44.09 dl 44.13 dl 47.62 dl	ΒμV ΒμV ΒμV	Blank
								More 1 of 2

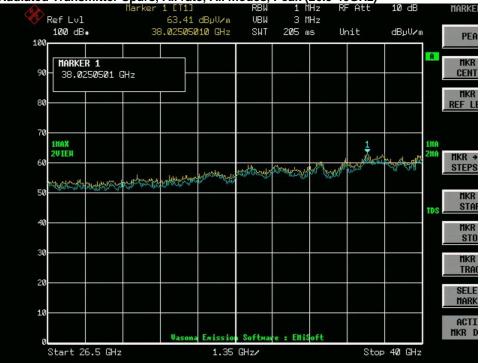
Freq/Channel Agilent RT EMISoft Vasona: EMI Emission Software Ref 100 dBµV +Atten 6 dB +Peak Log 10 dB/ Mkr1 16.431 5 GHz 50.02 dBµV Center Freq 14.0000000 GHz Start Freq 10.0000000 GHz Stop Freq 18.0000000 GHz **CF Step** 10.0000000 MHz Auto <u>Man</u> ō #PAvg M1 V2 S3 FC A AA £(f): FTun Sun FreqOffset 0.00000000 Hz Signal Track 0n <u>0ff</u> ŝwр Stop 18.000 GHz Sweep 16.19 ms (3000 pts) Start 10.000 GHz ₩VBW 3 MHz #Res BW 1 MHz Copyright 2000-20 R Aailei nt Tech

Page No: 69 of 88



#### Radiated Transmitter Spurs, All rate, All modes, Peak (18-26.5GHz)

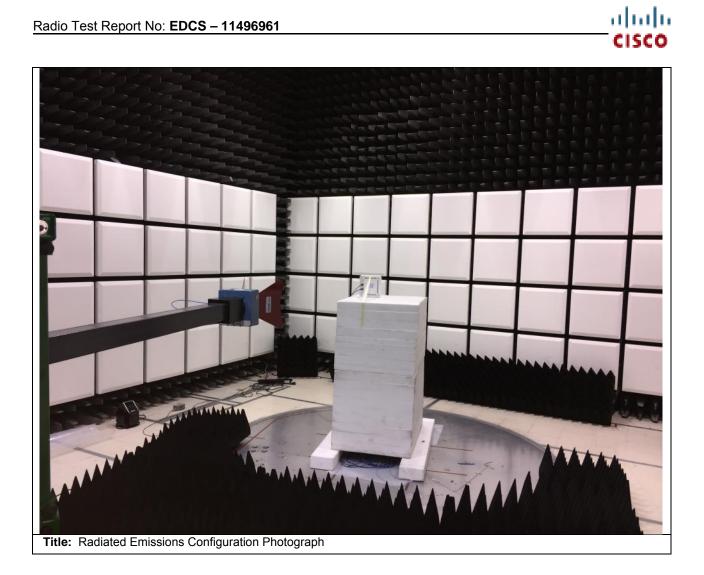
Radiated Transmitter Spurs, All rate, All modes, Peak (26.5-40GHz)



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

## **Radiated Test Setup**

Page No: 70 of 88



# **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.

1GHz – 18 GHz
80 dBuV
10 dB
Coupled
1MHz
3MHz for Peak, 1 kHz for average
Peak

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
1	EUT	S01	$\mathbf{V}$	
	Support	S02		$\checkmark$

Tested By :	Date of testing:
Jose Aguirre	05-May-16 - 06-Jun-16
Turk Dury H. DAGO	

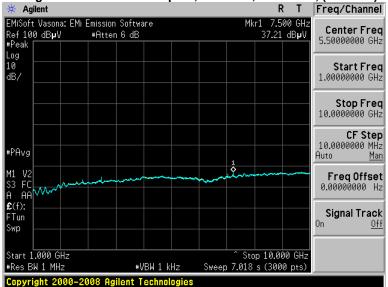
Test Result : PASS

See Appendix C for list of test equipment

Page No: 72 of 88

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

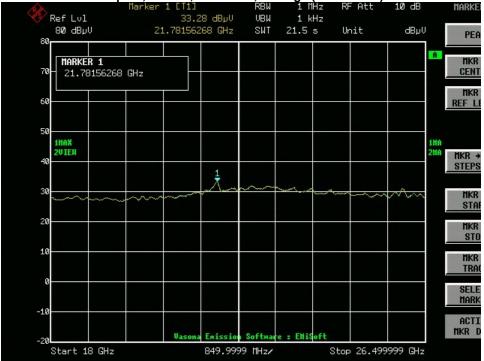
սիսիս



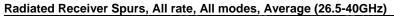
Average Radiated Receiver Spurs, All Rates, All Modes, (1-18GHz) Horizontal

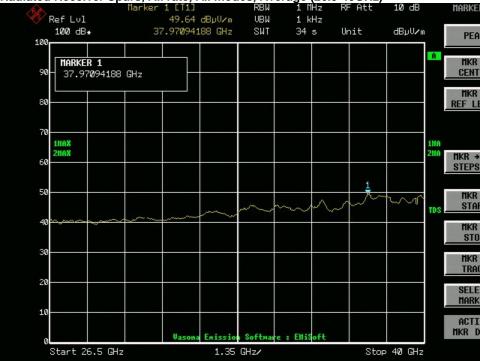
🔆 Agilent			RT	Peak Search
EMiSoft Vasona: EMi Emission Ref 100 dB <b>µ</b> V #Atter #Peak		Mkr1 (	16.412 8 GH 40.54 dBµ\	
Log 10 dB/				Next Pk Right
				Next Pk Left
#PAvg		1		Min Search
M1 V2 S3 FC		¥	~~~~~~	Pk-Pk Search
<b>£</b> (f): FTun Swp				Mkr → CF
Start 10.000 GHz #Res BW 1 MHz	*VBW 1 kHz	Stop Sweep 6.238 s	) 18.000 GH: 5 (3000 pts)	
File Operation Status, C:	VASONA.GIF file s	aved		

Page No: 73 of 88



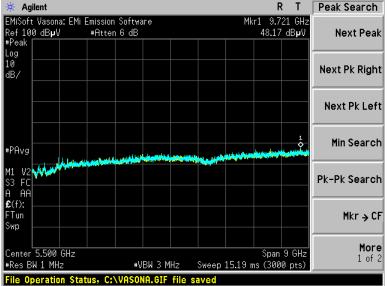
#### Radiated Receiver Spurs, All rate, All modes, Average (18-26.5GHz)





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

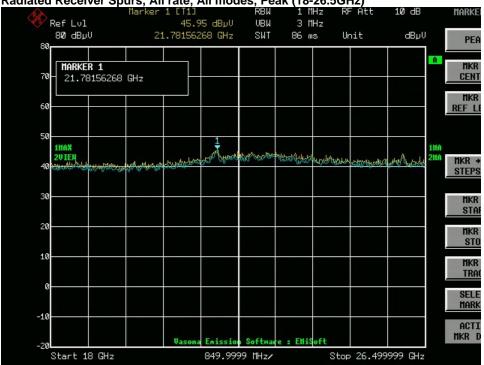
Page No: 74 of 88



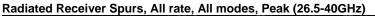
Peak Radiated Receiver Spurs, All Rates, All Modes, (1-18GHz) Horizontal

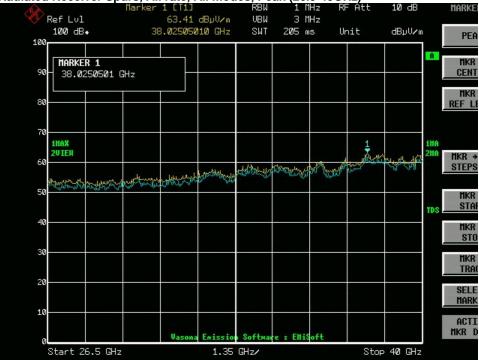
EMiSoft Vasona: EMi Emission Software Mkr1 16.188 7 GHz	
Ref 100 dB <b>µ</b> V	Next Peak
Log 10 dB/	Next Pk Right
	Next Pk Left
	Min Search
M1 V2	Pk-Pk Search
£(f): FTun Swp	Mkr → CF
Start 10.000 GHz Stop 18.000 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 16.19 ms (3000 pts) File Operation Status, C:\VASONA.61F file saved	More 1 of 2

Page No: 75 of 88



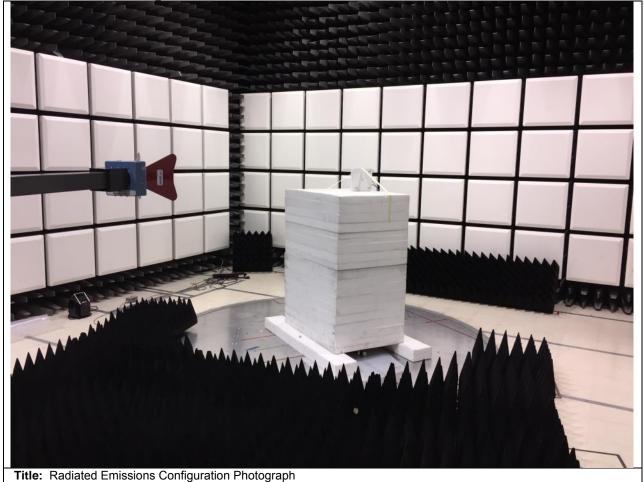
#### Radiated Receiver Spurs, All rate, All modes, Peak (18-26.5GHz)





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

Page No: 76 of 88



cisco

Page No: 77 of 88

## **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
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)

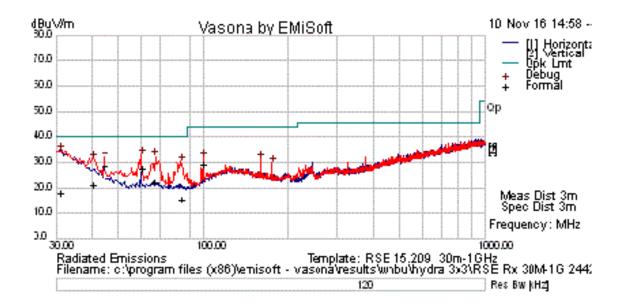
This report represents the worst case data for all supported operating modes and antennas.

System Number	Description	Samples	System under test	Support equipment
	EUT	S01	V	
1	Support	S02		$\checkmark$

Tested By :	Date of testing:
Jose Aguirre	10-Nov-16
Test Result : PASS	

See Appendix C for list of test equipment

Page No: 78 of 88



սիսիս

#### **Test Results Table**

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
30.97	-2.9	0.5	20.7	18.2	Quasi Max	H	222	186	40	-21.8	Pass
60.003	19.6	0.7	7.4	27.7	Quasi Max	V	146	171	40	-12.3	Pass
66.358	14	0.7	8	22.6	Quasi Max	V	145	39	40	-17.4	Pass
44.236	17.2	0.6	10.8	28.6	Quasi Max	V	105	280	40	-11.4	Pass
40.185	6.9	0.5	13.9	21.3	Quasi Max	V	115	85	40	-18.7	Pass
83.35	7.2	0.8	7.5	15.4	Quasi Max	V	139	228	40	-24.6	Pass
100	18.4	0.8	10.2	29.4	Quasi Max	V	124	352	43.5	-14.1	Pass

Page No: 79 of 88



Page No: 80 of 88

## **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). Place the radio in continuous transmit mode.

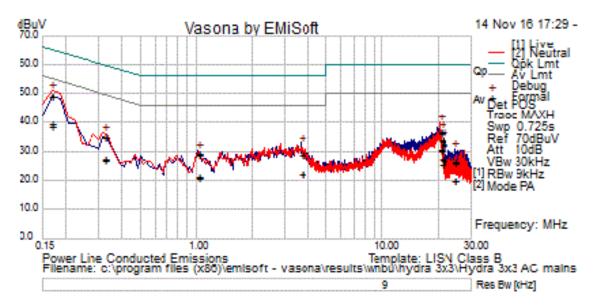
Span:	150 KHz – 30 MHz
Attenuation:	10 dB
Sweep Time:	Coupled
Resolution Bandwidth:	9 KHz
Video Bandwidth:	30 KHz
Detector:	Quasi-Peak / Average

System Number	Description	Samples	System under test	Support equipment
	EUT	S01	K	
1	Support	S02		$\checkmark$

Tested By :	Date of testing:	
Jose Aguirre	14-Nov-16	
Test Result : PASS		

See separate EMC test report for test data.

Page No: 81 of 88



#### **Test Results Table**

Frequency	Raw	Cable	Factors	Level	Measurement	Line	Limit	Margin	Pass
MHz	dBuV	Loss	dB	dBuV	Туре		dBuV	dB	/Fail
24.552	5.6	20.5	0.3	26.4	Quasi Peak	Live	60	-33.6	Pass
1.027	9	20	0	29	Quasi Peak	Live	56	-27	Pass
20.421	15.7	20.4	0.2	36.4	Quasi Peak	Live	60	-23.6	Pass
0.169	28	21.2	0.1	49.3	Quasi Peak	Live	65	-15.7	Pass
21.145	11.6	20.4	0.2	32.3	Quasi Peak	Live	60	-27.7	Pass
3.657	8.6	20.1	0.1	28.7	Quasi Peak	Live	56	-27.3	Pass
20.668	12.9	20.4	0.2	33.6	Quasi Peak	Live	60	-26.4	Pass
0.324	14.3	20.5	0.1	34.9	Quasi Peak	Live	59.6	-24.7	Pass
0.324	14.4	20.5	0.1	34.9	Quasi Peak	Neutral	59.6	-24.7	Pass
20.668	13.3	20.4	0.2	34	Quasi Peak	Neutral	60	-26	Pass
21.145	11.8	20.4	0.2	32.5	Quasi Peak	Neutral	60	-27.5	Pass
0.169	27.9	21.2	0.1	49.2	Quasi Peak	Neutral	65	-15.8	Pass
1.027	9.1	20	0	29.2	Quasi Peak	Neutral	56	-26.8	Pass
24.552	5.3	20.5	0.3	26.1	Quasi Peak	Neutral	60	-33.9	Pass
20.421	15.9	20.4	0.2	36.6	Quasi Peak	Neutral	60	-23.4	Pass
3.657	8.6	20.1	0.1	28.7	Quasi Peak	Neutral	56	-27.3	Pass
24.552	-0.5	20.5	0.3	20.3	Average	Live	50	-29.7	Pass
1.027	1.2	20	0	21.3	Average	Live	46	-24.7	Pass
20.421	9.9	20.4	0.2	30.6	Average	Live	50	-19.4	Pass
0.169	18	21.2	0.1	39.3	Average	Live	55	-15.7	Pass
21.145	6.3	20.4	0.2	26.9	Average	Live	50	-23.1	Pass
3.657	2.2	20.1	0.1	22.3	Average	Live	46	-23.7	Pass
20.668	5.1	20.4	0.2	25.8	Average	Live	50	-24.2	Pass
0.324	6.6	20.5	0.1	27.2	Average	Live	49.6	-22.4	Pass
0.324	6.8	20.5	0.1	27.3	Average	Neutral	49.6	-22.3	Pass
20.668	7	20.4	0.2	27.7	Average	Neutral	50	-22.3	Pass
21.145	6.4	20.4	0.2	27	Average	Neutral	50	-23	Pass
0.169	17.3	21.2	0.1	38.6	Average	Neutral	55	-16.5	Pass
1.027	1.6	20	0	21.6	Average	Neutral	46	-24.4	Pass
24.552	-0.6	20.5	0.3	20.2	Average	Neutral	50	-29.8	Pass
20.421	9.7	20.4	0.2	30.3	Average	Neutral	50	-19.7	Pass
3.657	2.2	20.1	0.1	22.4	Average	Neutral	46	-23.6	Pass

Page No: 82 of 88



Page No: 83 of 88

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

	Τε	est Equipment used for Radiated Emissic	ons		
Equip No	Model Manufacturer	Description	Last Cal	Next Cal	Test Item
CIS049413	iBTHP-5-DB9 Newport	5 inch Temp/RH/ Press Sensor	18-Dec-15	18-Dec-16	B.1, B.2, B.3
CIS040523	ESCI Rohde & Schwarz	EMI Test Receiver	30-Dec-15	30-Dec-16	B.3
CIS001937	NSA 5m Chamber Cisco	NSA 5m Chamber	12-Feb-16	12-Feb-17	B.3
CIS049535	Above 1GHz Site Cal Cisco	Above 1GHz CISPR Site Validation	13-Feb-16	13-Feb-17	B.1, B.2
CIS028072	1840 Cisco	18-40GHz EMI Test Head	22-Feb-16	22-Feb-17	B.1, B.2
CIS045588	JB1 Sunol Sciences	Combination Antenna, 30MHz-2GHz	9-Mar-16	9-Mar-17	B.3
CIS042000	E4440A Agilent	Spectrum Analyzer	6-Jul-16	6-Jul-17	B.1, B.2
CIS037581	3117 ETS-Lindgren	Horn Antenna	7-Oct-16	7-Oct-17	B.1, B.2
CIS045098	TH0118 Cisco	Mast Mount Preamplifier Array, 1-18GHz	31-Oct-16	31-Oct-17	B.1, B.2
CIS033602	CSY-NMNM-80-273001 Midwest Microwave	RF Coaxial Cable, to 18GHz	8-Nov-16	8-Nov-17	B.1, B.2, B.3
CIS030443	UFB311A-0-1560-520520 Micro-Coax	RF Coaxial Cable, to 18GHz	8-Nov-16	8-Nov-17	B.1, B.2, B.3
CIS008024	SF106A Huber + Suhner	3 meter Sucoflex cable	8-Nov-16	8-Nov-17	B.1, B.2, B.3
CIS024201	FSEK30 Rohde & Schwarz	Spectrum Analyzer 20Hz - 40GHz	23-Nov-16	23-Nov-17	B.1, B.2
CIS037235	50CB-015 JFW	GPIB Control Box	Cal not Required	Cal not Required	B.1, B.2
CIS035244	926-8ME Klein Tools	8 Meter Tape Measure	Cal not Required	Cal not Required	B.1, B.2, B.3

	Test Equipment used for AC Mains Conducted Emissions								
Equip#	Manufacturer/ Model	Description	Last Cal	Next Cal	Test Item				
8510	Fischer Custom Communications FCC-450B-2.4-N	Instrumentation Limiter	16-May-16	16-May-17	B.4				
23802	Fischer Custom Communications FCC-801-M2-50A	CDN, 2-LINE 50A	12-Jan-16	12-Jan-17	B.4				
45995	Fischer Custom Communications F-090527-1009-2	Lisn Adapter	17-Jun-16	17-Jun-17	B.4				
49468	Coleman RG223	BNC 25 ft Cable	9-Mar-16	9-Mar-17	B.4				
31918	Midwest Microwave TRM-2048-MC-BNC-10	50 Ohm, 5W Terminator, Type BNC	11-Nov-16	11-Nov-17	B.4				
49531	TTE H785-150K-50-21378	High Pass Filter	3-May-16	3-May-17	B.4				

Page No: 84 of 88

45994	Fischer Custom Communications F-090527-1009-1	Line Impedance Stabilization Network	17-Jun-16	17-Jun-17	B.4
18963	York CNE V	Comparison Noise Emitter, 30 - 1000MHz	Cal Not Required	Cal Not Required	B.4
45050	Rohde & Schwarz ESCI	EMI Test Receiver	11-Sep-16	11-Sep-17	B.4
51721	Teseq CDN ST08A	Coupling Decoupling Network	7-Jun-16	7-Jun-17	B.4
54231	Newport iBTHP-5-DB9	5 inch Temp/RH/Press Sensor w/20ft cable	10-Feb-16	10-Feb-17	B.4

Equip#	Manufacturer/ Model	Description	Last Cal	Next Cal	Test Item
CIS054666	RA08-S1S1-18	SMA 18" Cable	25-Sep-15	25-Sep-16	A1 thru A7
0.000 1000	MegaPhase				
CIS054667	RA08-S1S1-18	SMA 18" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase		•	•	
CIS054668	RA08-S1S1-18	SMA 18" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054669	RA08-S1S1-18	SMA 18" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054686	NI PXI-2796	Plug-in switch module	6-Oct-15	6-Oct-16	A1 thru A7
	National Instruments				
CIS055166	RFLT4WDC40GK	4 Way Power Divider 40GHz	23-Nov-15	23-Nov-16	A1 thru A7
	RF Lambda				
CIS054662	RFLT4WDC40GK	SMA 36" cable	24-Sep-15	24-Sep-16	A1 thru A7
	RF Lambda				
CIS054656	BRC50705-02	Band Reject Filter	24-Sep-15	24-Sep-16	A1 thru A7
	Micro-Tronics				
CIS054655	BRC50704-02	Notch Filter,	24-Sep-15	24-Sep-16	A1 thru A7
	Micro-Tronics	SB:5.470-5.725GHz, to 12GHz			
CIS054654	BRC50703-02	Notch Filter,	24-Sep-15	24-Sep-16	A1 thru A7
	Micro-Tronics	SB:5.150-5.350GHz, to 11GHz			
CIS054653	BRM50702-02	Notch Filter,	24-Sep-15	24-Sep-16	A1 thru A7
	Micro-Tronics	SB:2.400-2.500GHz, to 18GHz			
CIS054678	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054677	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054676	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054675	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054674	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054673	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7

Page No: 85 of 88

	MegaPhase				
CIS054672	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054671	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054670	RA08-S1S1-12	SMA 12" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054664	GC12-8181-16	SMA 16" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054663	F120-S1S1-48	SMA 48" Cable	25-Sep-15	25-Sep-16	A1 thru A7
	MegaPhase				
CIS054686	NI PXI-2796	Plug-in switch module	6-Oct-15	6-Oct-16	A1 thru A7
	National Instruments				
CIS042005	BWS30W2+	SMA 30dB Attenuator	16-Oct-15	16-Oct-16	A1 thru A7
	Mini-Circuits				
CIS041995	BW-S6W2	6dB Attenuator	16-Oct-15	16-Oct-16	A1 thru A7
	Mini-Circuits				
CIS054695	D3C2060	Circulator	20-Oct-15	20-Oct-16	A1 thru A7
	Ditom				
CIS055146	RA08-S1S1-12	12" SMA Cable	17-Nov-15	17-Nov-16	A1 thru A7
	Megaphase				
CIS050721	N9030A	PXA Signal Analyzer	30-Mar-16	30-Mar-17	A1 thru A7
	Keysight				
CIS054303	N5182B	MXG X-Series RF Vector Signal	6-Apr-16	6-Apr-17	A1 thru A7
	Keysight	Generator			
CIS055099	SMART2200RM2U Tripp-Lite	Power Supply			A1 thru A7
CIS055094	PXI-1042 National Instruments	Chassis	Cal Not Required A1 thru		A1 thru A7

### 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 <sup>3</sup> )	
EN	European Norm	MHz	MegaHertz (1x10 <sup>6</sup> )	
IEC	International Electro technical Commission	GHz	Gigahertz (1x10 <sup>9</sup> )	
CISPR	International Special Committee on Radio Interference	Н	Horizontal	
CDN	Coupling/Decoupling Network	V	Vertical	
LISN	Line Impedance Stabilization Network	dB	decibel	
PE	Protective Earth	V	Volt	
GND	Ground	kV	Kilovolt (1x10 <sup>3</sup> )	
L1	Line 1	μV	Microvolt (1x10 <sup>-6</sup> )	
L2	Line2	А	Amp	
L3	Line 3	μA	Micro Amp (1x10 <sup>-6</sup> )	
DC	Direct Current	mS	Milli Second (1x10 <sup>-3</sup> )	
RAW	Uncorrected measurement value, as indicated by the measuring device	μS	Micro Second (1x10 <sup>-6</sup> )	
RF	Radio Frequency	μS	Micro Second (1x10 <sup>-6</sup> )	
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)	
Р	Power Line	L	Live Line	
Ν	Neutral Line	R	Return	
S	Supply	AC	Alternating Current	

սիսիս

# End

Page No: 88 of 88