Dynamic Frequency Selection (DFS) Test Report

For

SPK_SHARE with

2.4 GHz /5.0 GHz Wi-Fi Radio 802.11a/ac/b/g/n + Bluetooth v2.1 + BTLE v4.0

FCC ID: LDKSPKSH1576
ISED ID: 2461L-SPKSH1576

Against the following Specifications:
47 CFR 15.407
RSS-247 Issue 2

5250-5350 MHz, 5470-5725 MHz

Cisco Systems

170 West Tasman Drive
San Jose, CA 95134

Author: Danh Le **Tested By:** Danh Le	**Approved By:** Diana Canafoglia **Title:** Compliance Manager **Revision:** See EDCS

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

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Section 1: Overview

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

Specifications:
CFR47 Part 15.407
RSS-247

RSS-247 section A9.3a allows the use of applicable FCC KDBs
Measurements were made in accordance with

- KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02

Section 2: Assessment Information

2.1 General

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

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

a) The results contained in this report relate only to the items tested and were obtained in the period between the date of the initial assessment and the date of issue of the report. Manufactured products will not necessarily give identical results due to production and measurement tolerances.

b) The apparatus was set up and exercised using the configuration and modes of operation defined in this report only.

c) Where relevant, the apparatus was only assessed using the susceptibility criteria defined in this report and the Test Assessment Plan (TAP).

d) All testing was performed under the following environmental conditions:

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

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

Units of Measurement

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

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

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

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

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

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

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

Measurement Uncertainty Values

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

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

Radiated emissions (expanded uncertainty, confidence interval 95%)

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

Conducted emissions (expanded uncertainty, confidence interval 95%)

30 MHz – 40GHz	+/- 0.38 dB

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

2.2 Test Conditions

Temperature	28 °C
Humidity	39%
Pressure	56 PA

2.3 Date of Testing

18-Dec-2017 to 20-Dec-2017

2.4 Report Issue Date

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

2.5 Testing facilities

This assessment was performed by:

Testing Laboratory

Cisco Systems, Inc.
125 West Tasman Drive (Building P)
San Jose, CA 95134
USA

Headquarters

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

Registration Numbers for Industry Canada

Cisco System Site	Address	Site Identifier
Building P, 10m Chamber	125 West Tasman Dr San Jose, CA 95134	Company #: 2461N-2
Building P, 5m Chamber	125 West Tasman Dr San Jose, CA 95134	Company #: 2461N-1
Building I, 5m Chamber	285 W. Tasman Drive San Jose, California 95134	Company #: 2461M-1
Building 7, 5m Chamber	425 E. Tasman Drive San Jose, California 95134 United States	Company #: 2461N-3

Test Engineer(s)

Danh Le

2.6 Equipment Assessed (EUT)

SPK_SHARE Dongle

2.7 EUT Description

Cisco SPK-SHARE dongle is the next generation cloud collaboration platform that unifies messaging, meeting and calling and content-sharing. Cisco SPK-Share provides HDMI support for connection to a display and USB Type-C interface to receive 5V power. Cisco SPK-Share offers both wired and wireless solution with Ethernet via USB 2.0 external adapter and 802.11a/b/g/n/ac, Bluetooth classic and Bluetooth LE radios.

Below are brief summary of the SPK-SHARE hardware specifications:
Wired Protocol support

- USB C main interface (Power, Ethernet via USB2)
- External POE Ethernet adapter (Ethernet Injector accessory connected via USB type C)
  - Ethernet: 10/100/1000BASE-T Ethernet network (IEEE 802.3i/802.3u/802.3ab/802.3az)
- External18W power supply (Direct connected via USB)

Wireless Protocols support

- Wi-Fi: IEEE 802.11a, 802.11b, 802.11g, 802.11n, 802.11ac
- Bluetooth: IEEE 802.15 Basic Rate v2.1+ EDR, Low Energy v4.0

2.4GHz FHSS Radio Supported Modes:

- 802.15 BlueTooth ver 2.1+EDR (1Mbps – 3Mbps, Single stream)

2.4GHz BTLE Radio Supported Modes:

- 802.15 BlueTooth ver 4.0 (1Mbps, Single stream)

- **2.4GHz WLAN Radio Supported Modes:**
- 802.11b (1Mbps – 11Mbps)
- 802.11g (6Mbps - 54Mbps)
- 802.11n (HT20, M0 – M15)
- 802.11n (HT40, M0 – M15)

5GHz WLAN Radio Supported Modes:

- 802.11a (6Mbps – 54Mbps,)
- 802.11n (HT20, M0 – M15)
- 802.11n (HT40, M0 – M15)
- 802.11ac (VHT20, M0 – M8)
- 802.11ac (VHT40, M0 – M9)
- 802.11ac (VHT80, M0 – M9)

Model Differences

SPK-SHARE
SPK-SHARE-K9

Both have identical components, PCB layout, electronics circuitries and enclosure. The only difference is the encryption software being offered for SPK_SHARE-K9

Section 3: Result Summary

Dynamic Frequency Selection (DFS) Test Results Summary		
Basic Standard	**Technical Requirements / Details**	**Result**
FCC 15.407 (h) (2) (i) (b) (iii) / **RSS 247** Section 6.3 (2) (iv)	Channel Closing Transmission Time	**Pass**
FCC 15.407 (h) (2) (i) (b) (iii) / **RSS 247** Section 6.3 (2) (iii)	Channel Move Time	**Pass**
FCC 15.407 (h) (2) (i) (b) (iv) / **RSS 247** Section 6.3 (2) (v)	Non-occupancy period	**Pass**

Section 4: Sample Details

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

4.1 Sample Details

Sample Number	Equipment Description	Manufacturer / Model#	Hardware Rev.	Firmware Rev.	Serial Number
S01	Wireless dongle (conducted sample)	Cisco / SPK-SHARE	P3	novum1.1.0 PreAlpha1 2017-10-03	FCH2135DG58
S02	Switching Power Supply	Cisco / AQ18A-59CFA	Production	----------	PH1212400BC

4.2 System Details

System #	Description	Samples
1	RF Conducted Radio Test Sample and Power Supply	S01 & S02

4.3 Mode of Operation Details

Mode#	Description	Comments
1, 2, 3	802.11a, n40, ac80 Test Mode	The radio shall be set in a normal operating mode and establish communication link with an AP router with traffic on.

Measurements were made in accordance with

- 905462 D02 UNII DFS Compliance Procedures New Rules v01r02

4.4 Test Mode, Modulation and Data Rate Description

Setting#	Wi-Fi Mode	Modulation	Data Rate
1	802.11a	BPSK	6 Mbps
2	802.11n (HT40)	BPSK	13.5 Mbps (MCS0)
3	802.11ac (VHT80)	BPSK	29.3 Mbps (MCS0)

4.5 Antenna Information

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

Frequency (MHz)	Part Number	Antenna Type	Antenna Gain Peak (dBi)
5250 – 5350	CI8847-11-000-R-FA	PIFA	4.26
5470 – 5725	CI8847-11-000-R-FA	PIFA	3.77

Appendix A Dynamic Frequency Selection (DFS)

in the 5250 MHz – 5350 MHz and 5470 MHz – 5725 MHz bands.

A.1 DFS Overview

A UNII network will employ a DFS function to detect signal from radar systems and to avoid co-channel operation with these systems. This applies to the 5250 MHz – 5350 MHz and/or 5470 MHz – 5725 MHz bands.

Within the context of the operation of the DFS function, a U-NII device will operate in either Master Mode or Client Mode. U-NII devices operating in the Client Mode can only operate in a network controlled by a U-NII device operating in Master Mode.

A.2 DFS Technical Requirements

FCC 15.407: U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

U-NII devices operating in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems.

A.2.1 DFS Detection Thresholds

Table1: **Interference Threshold for Master Devices and Client devices With Radar Detection**

Maximum Transmit Power	**Value (see note)**
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna **Note 2**: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. **Note 3**: EIRP is based on the highest antenna gain.	

A.2.2 DFS Response Requirements

Table2: **DFS Response Requirement Values**

Parameter	**Value**
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 80% of the 99% power bandwidth See Note 3.

Note 1: The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:

- For the Short pulse radar Test Signals this instant is the end of the *Burst*.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar *Burst* generated.
- For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.

Note 2: The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate *Channel* changes (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the *U-NII Detection Bandwidth* detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90%. Measurements are performed with no data traffic.

A.3 Radar Test Waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Table3: **Short Pulse Radar Test Waveforms**

Radar Type	Pulse Width (µsec)	PRI (µsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	See Note1	See Note1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in table 5a		60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note1: short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time and channel close time tests.					

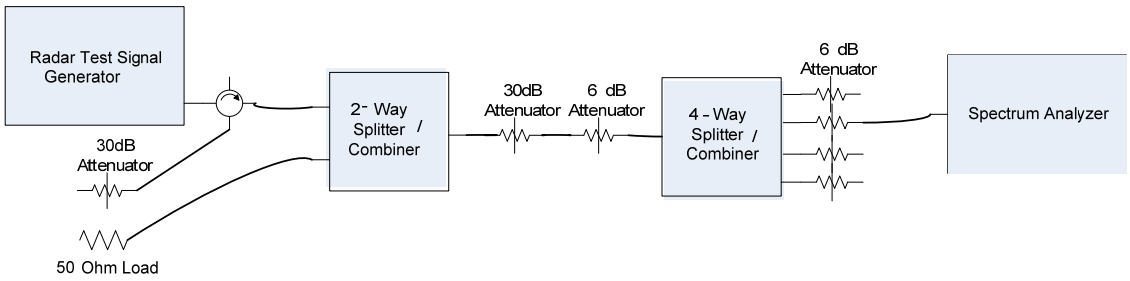
A.4 Radar Waveform Calibration

A.4.1 Block Diagram

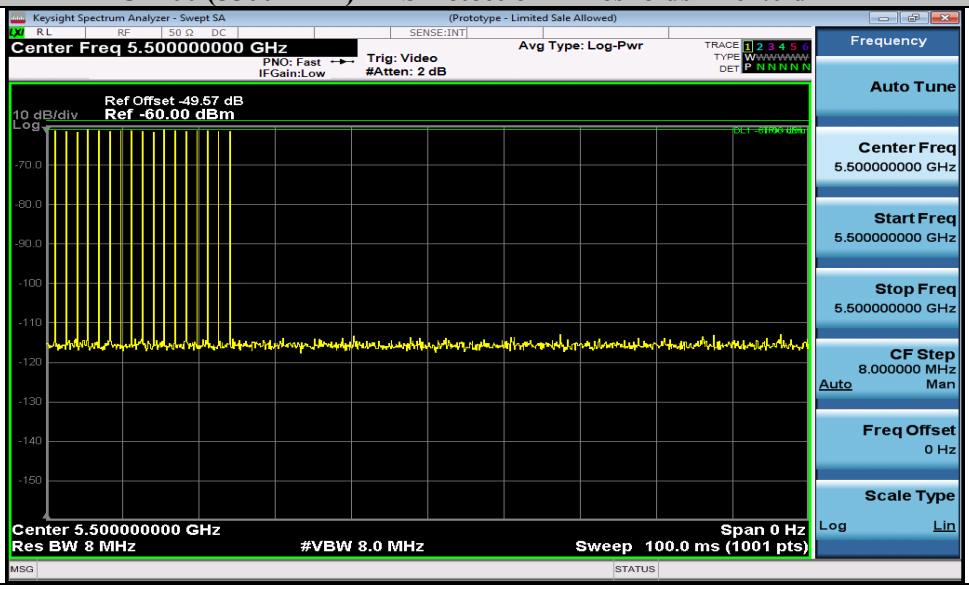
The following equipment setup was used to calibrate the conducted Radar Waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process there were no transmissions by either the Master or Client Device. The spectrum analyzer was switched to the zero span (Time Domain) mode at the frequency of the Radar Waveform generator. Peak detection was utilized. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to largest bandwidth available.

The signal generator amplitude was calibrated so that the power level measured approximately at -61.0 dBm.

Conducted Calibration Test Setup Block Diagram



A.4.2 Calibration plots

Calibration *for Type 0 radar*
Mode: 802.11a / Band: UNII-2C
Ch100 (5500 MHz) DFS Detection Thresholds = -61.0 dBm

The DFS detection thresholds level of -61 dBm at the input of the receiver is assuming a 0 dBi of antenna gain during calibration of the test setup. Throughout the test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in the measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

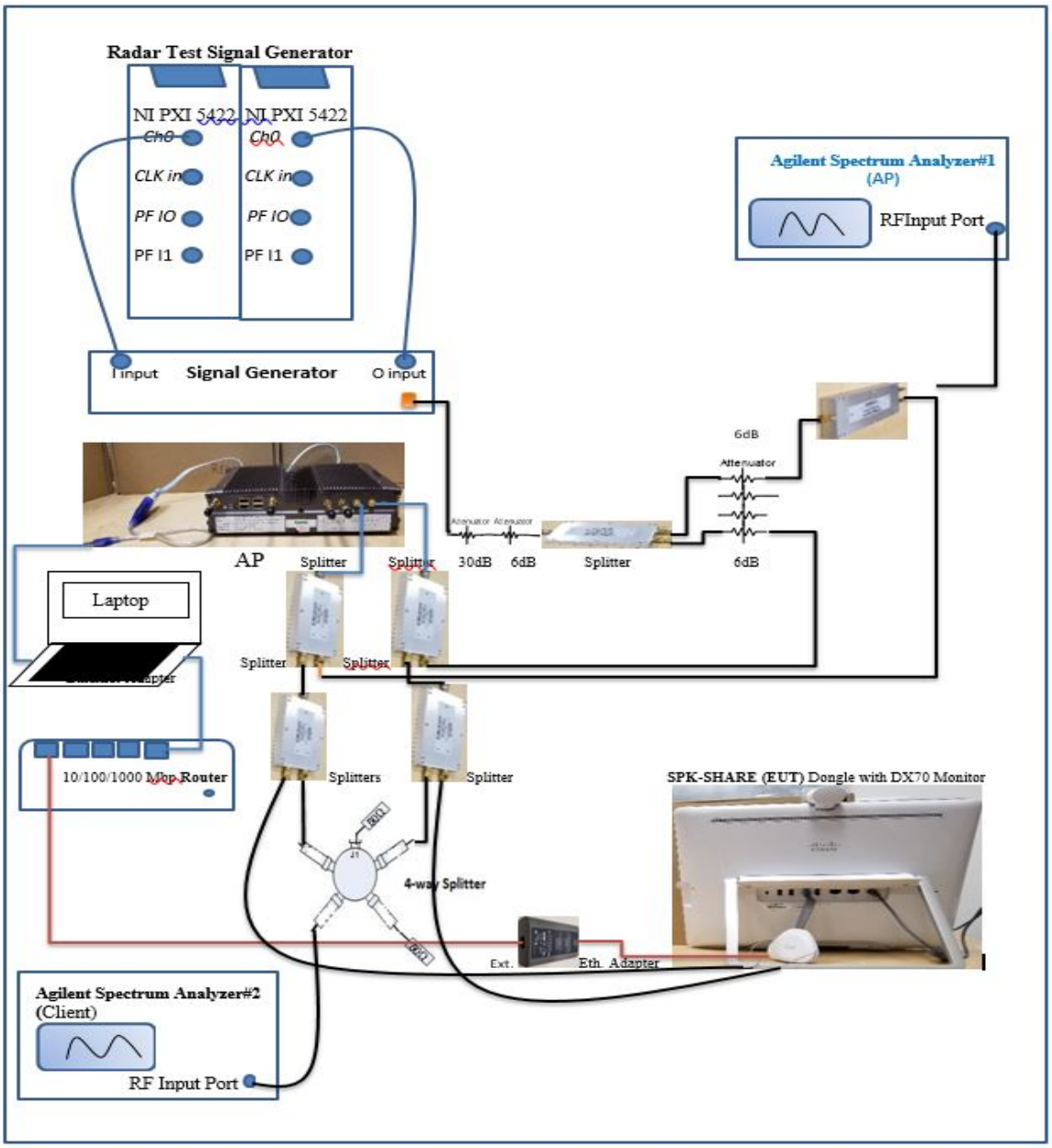
A.5 Test Procedures

Ref. KDB 905462 D02 UNII DFS Compliance Procedures New Rules v01r02, section 7.8.3

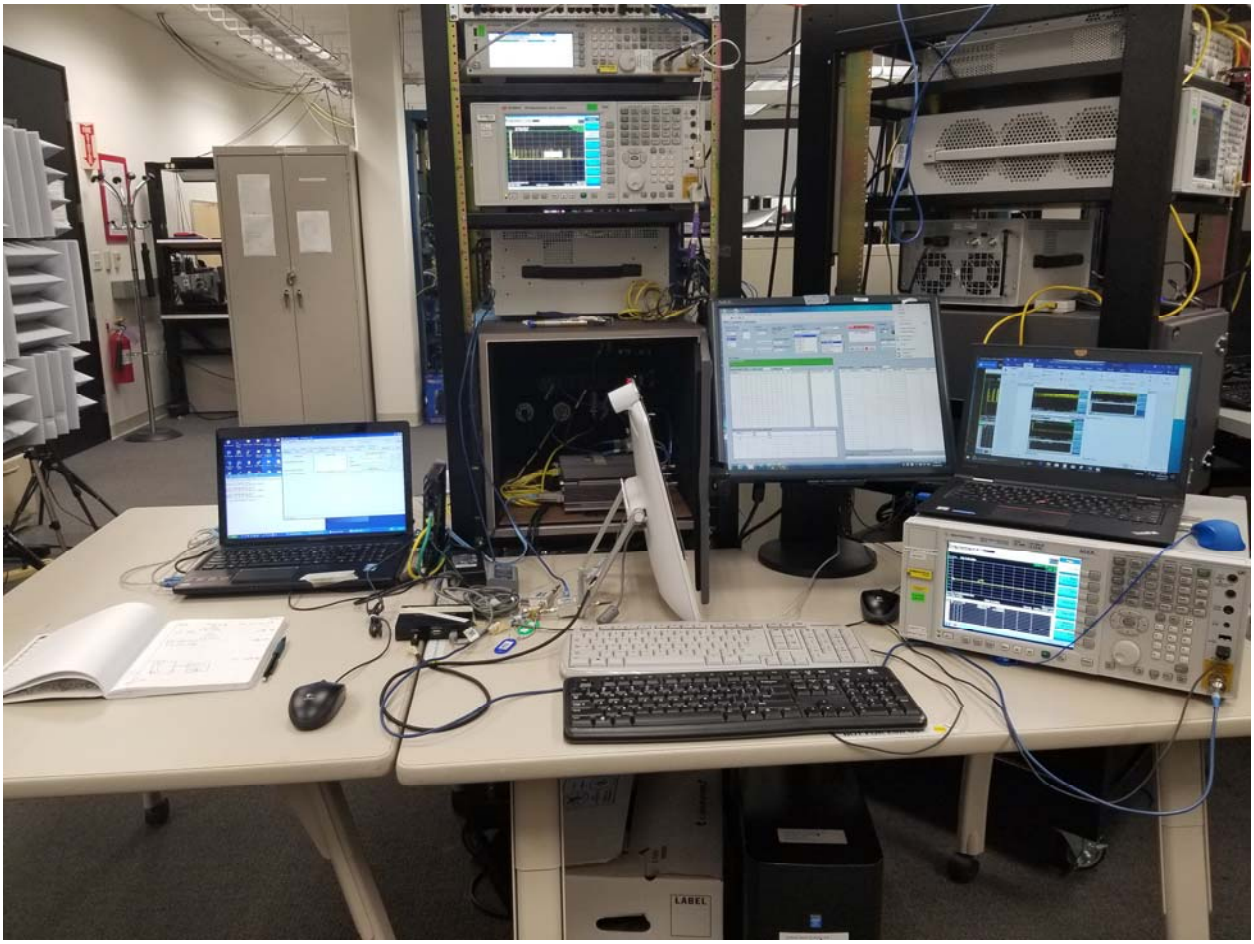
1. A spectrum analyzer is used as a monitor to verify that the UUT has vacated the Channel within the (Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the detection and Channel move.
2. Following is the test setup used to generate the Radar Waveforms, and for all DFS tests described herein.

3. System test setup was configured with two IP-Phones registered to the Call Manager and using the Access Point router for Wi-Fi connection to establish call connection.

Conducted Setup Block Diagram: Radar Test Waveforms are injected into the Master



Conducted Setup Photo: Radar Test Waveforms are injected into the Master



DFS Setup

The test setup is constructed of the following equipment:

See Appendix C for complete detail of Test Equipment used and section 3.3 of this test report for support Equipment used for DFS Test setup.

4. **UNII Detection Bandwidth**: DFS testing was done at 5290 MHz and 5530 MHz in 802.11ac VHT80. The 99% channel bandwidth for 80MHz signals is 76.0 MHz (See the 99% BW section of the RF report for further measurement details).

   The generating equipment is configured as shown in the Conducted Test Setup above. A single *Burst* of the desired radar profile is produced at 5290 MHz for UNII-2A band and 5530MHz for UNII-2C band at a -61dBm level. The UUT is set up as a client device associated with the master with traffic during phone call established.

5. One frequency will be chosen from the *Operating Channels* of the UUT within the 5250-5350 MHz or 5470-5725 MHz bands. For 802.11 devices, the test frequency must contain control signals. This can be verified by disabling channel loading and monitoring the spectrum analyzer. If no control signals are detected, another frequency must be selected within the emission bandwidth where control signals are detected.

6. In case the UUT is a U-NII device operating as a *Client Device* (with or without DFS), a U-NII device operating as a *Master Device* will be used to allow the UUT (Client device) to *Associate* with the *Master Device*. In case the UUT is a *Master Device*, a U-NII device operating as a *Client Device* will be used and it is assumed that the Client will *associate* with the UUT (Master). In both cases for conducted tests, the *Radar Waveform* generator will be connected to the *Master Device*. For radiated tests, the emissions of the *Radar Waveform* generator will be directed towards the *Master Device*. If the *Master Device* has antenna gain, the main beam of the antenna will be directed toward the radar emitter. Vertical polarization is used for testing.

7. Stream the channel loading test file from the *Master Device* to the *Client Device* on the test *Channel* for the entire period of the test.

8. At time T0 the *Radar Waveform* generator sends a *Burst* of pulses for one of the Short Pulse Radar Types 1-4 in **Table 3** at levels defined in **Table 1**, on the *Operating Channel*. An additional 1 dB is added to the radar test signal to ensure it is at or above the *DFS Detection Threshold*, accounting for equipment variations/errors.

9. Observe the transmissions of the UUT at the end of the radar *Burst* on the *Operating Channel* for duration greater than 10 seconds. Measure and record the transmissions from the UUT during the observation time (*Channel Move Time).* Measure and record the *Channel Move Time* and *Channel Closing Transmission Time* if radar detection occurs. **Figure 1** illustrates *Channel Closing Transmission Time.*

10. When operating as a *Master Device*, monitor the UUT for more than 30 minutes following instant T2 to verify that the UUT does not resume any transmissions on this *Channel*. Perform this test once and record the measurement result.

11. In case the UUT is a U-NII device operating as a *Client Device* with *In-Service Monitoring*, perform steps a) to f).

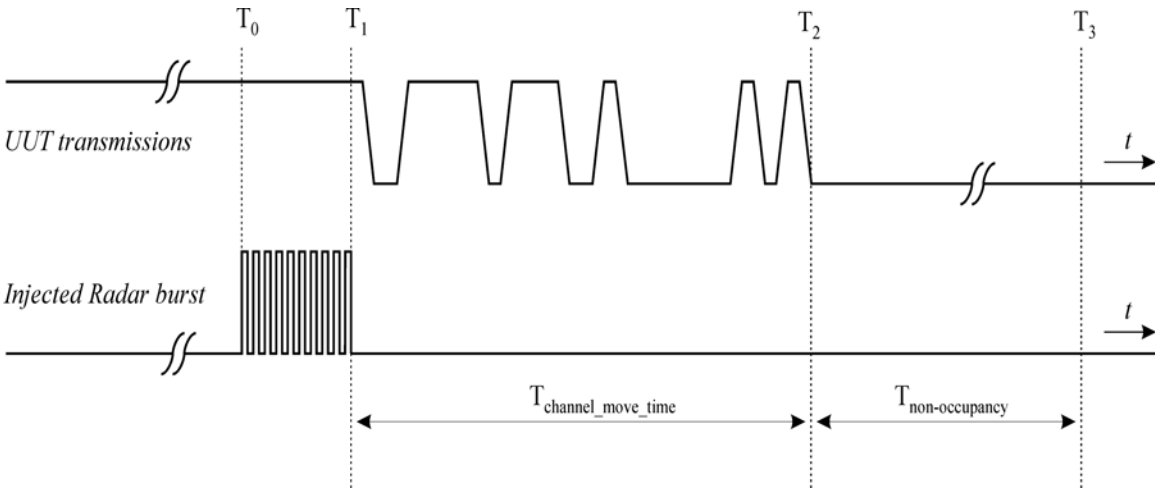
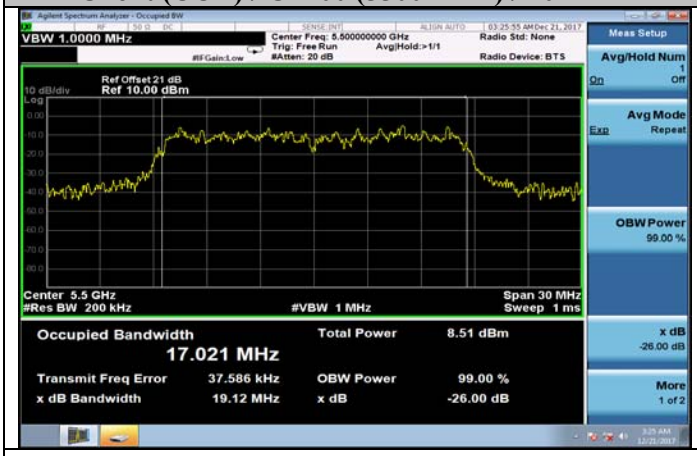
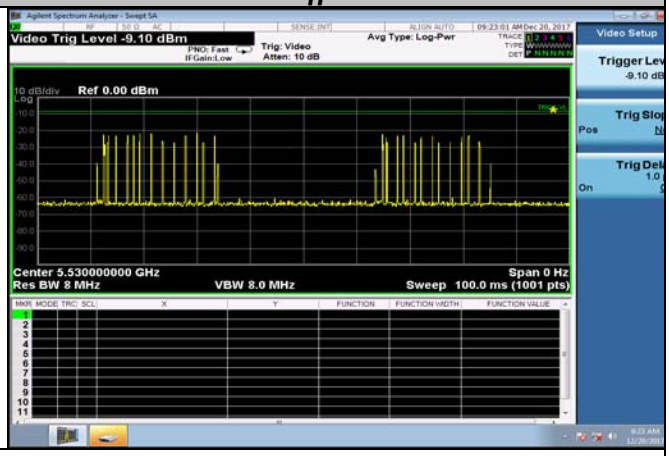
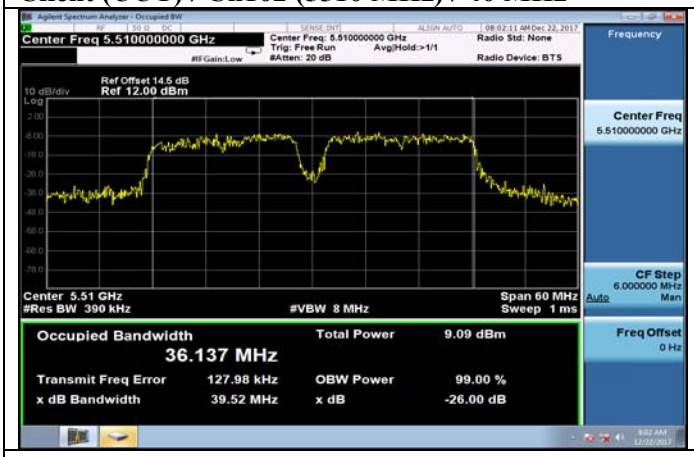
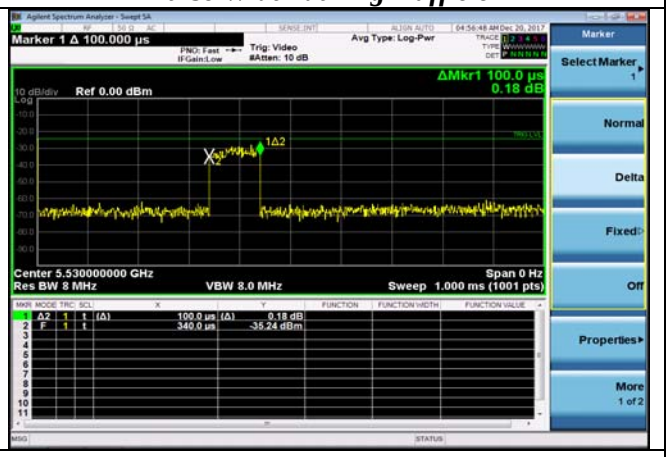
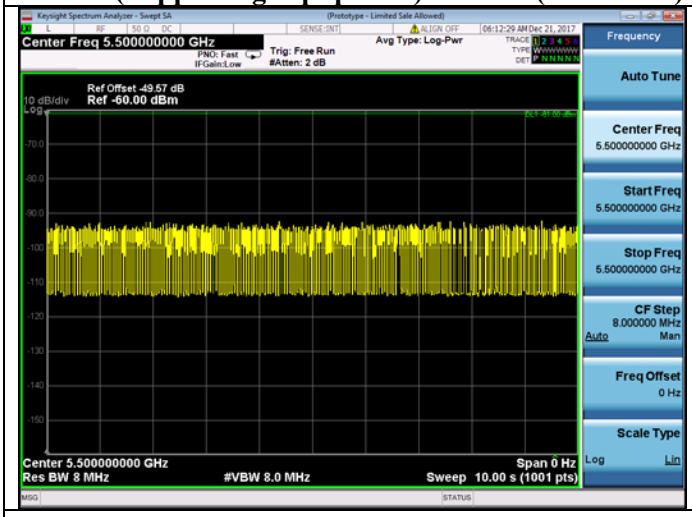
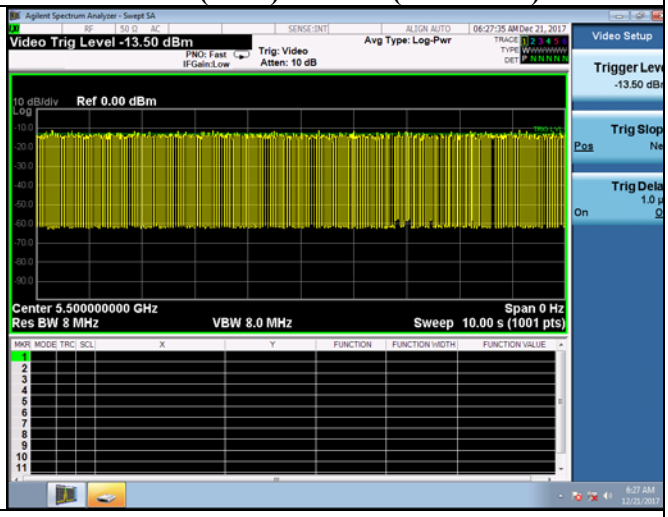
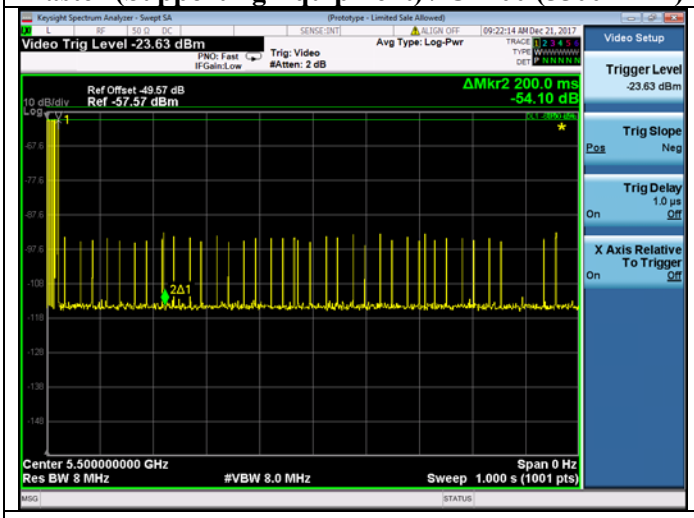
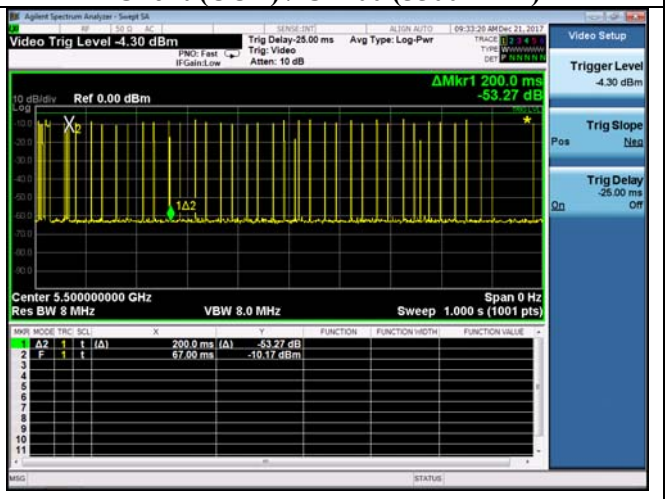
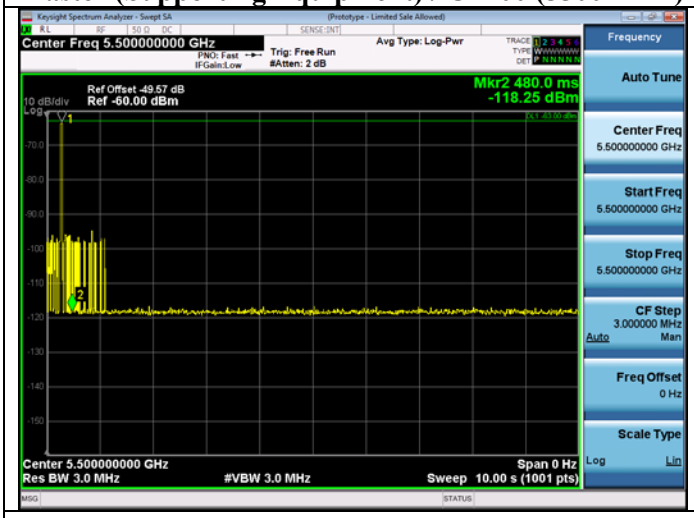
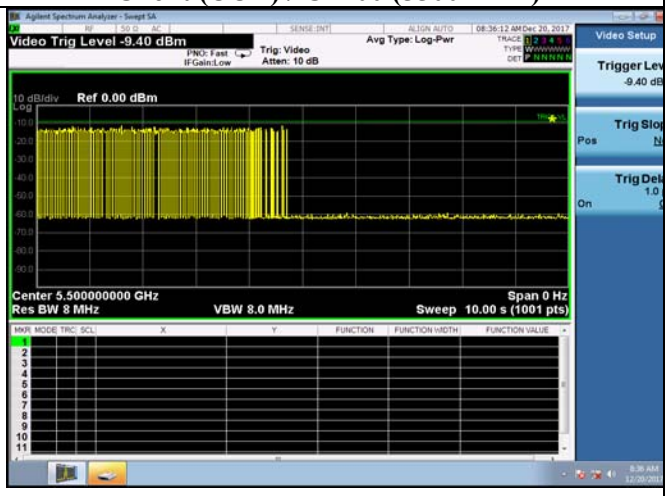
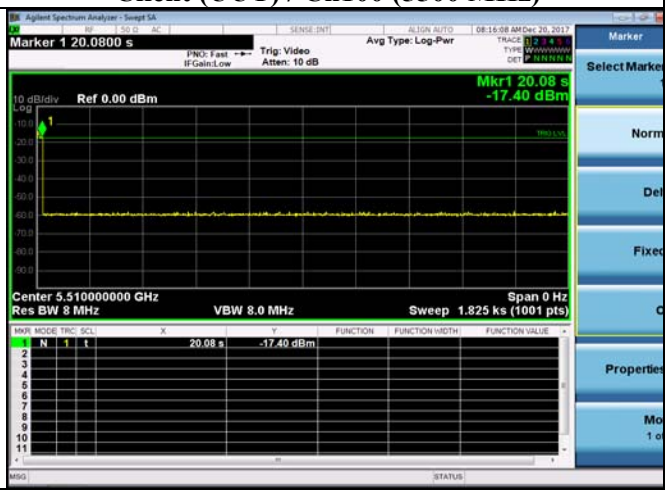


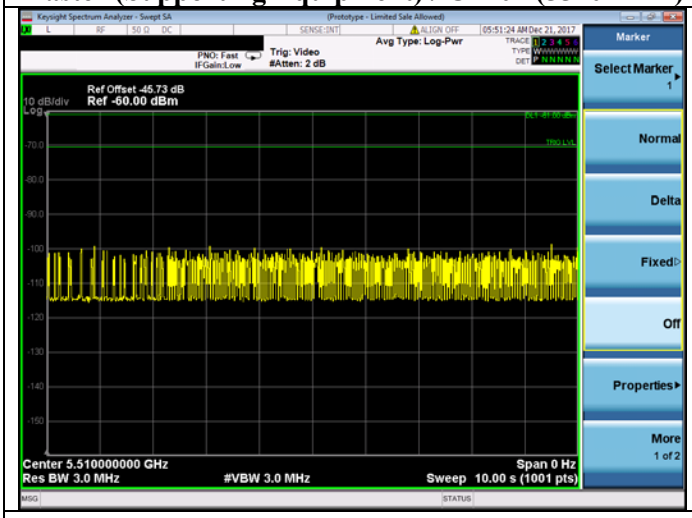
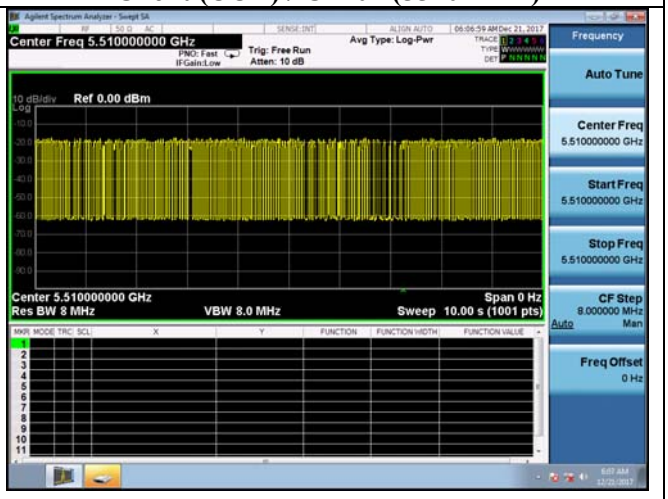
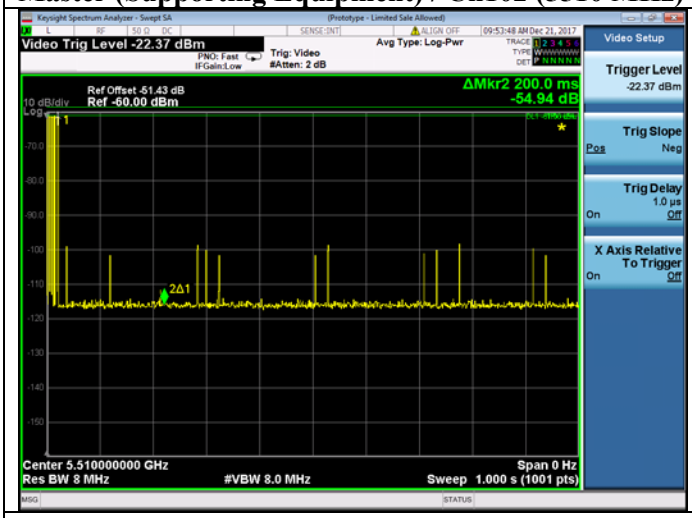
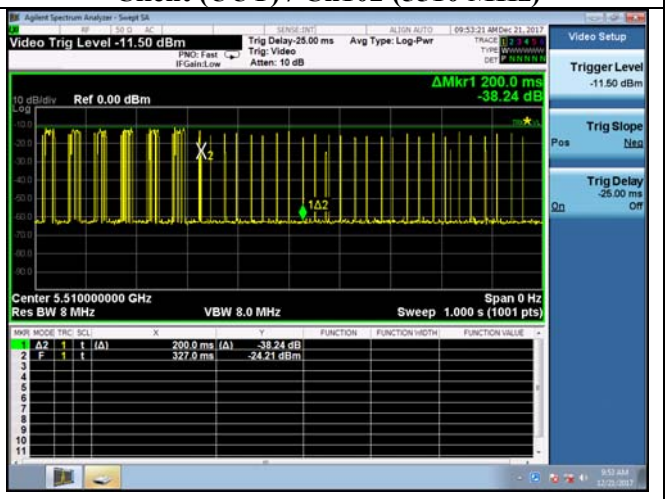
Figure 1: Example of Channel Closing Transmission Time & Channel Closing Time

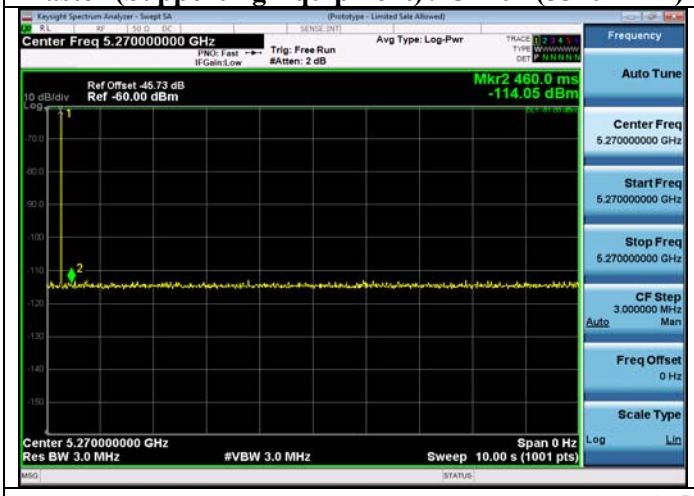
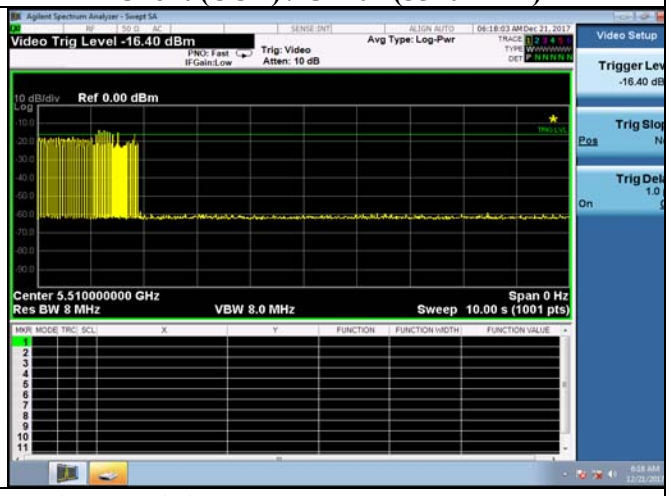
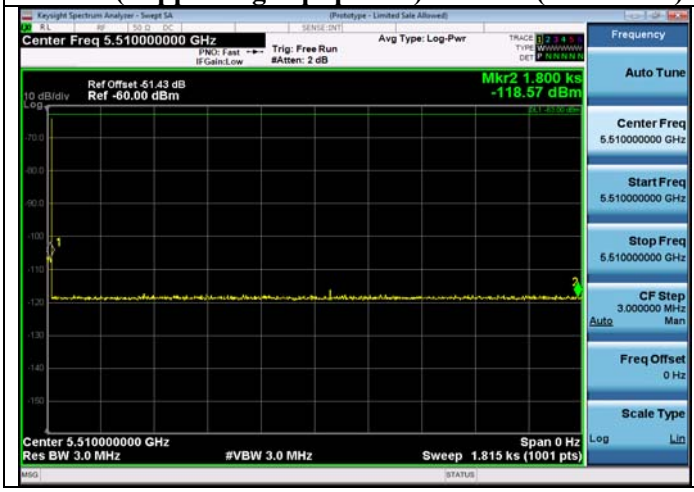
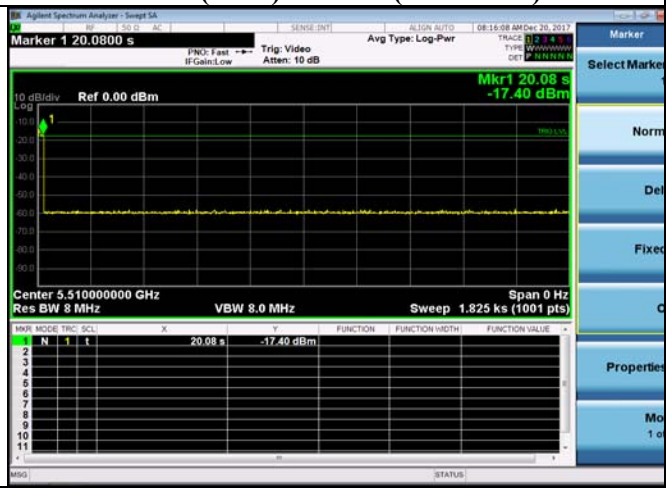
A.5 Graphical Test Results

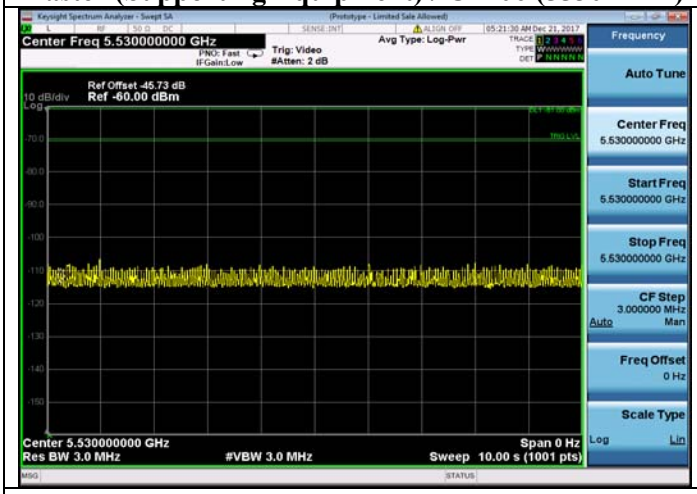
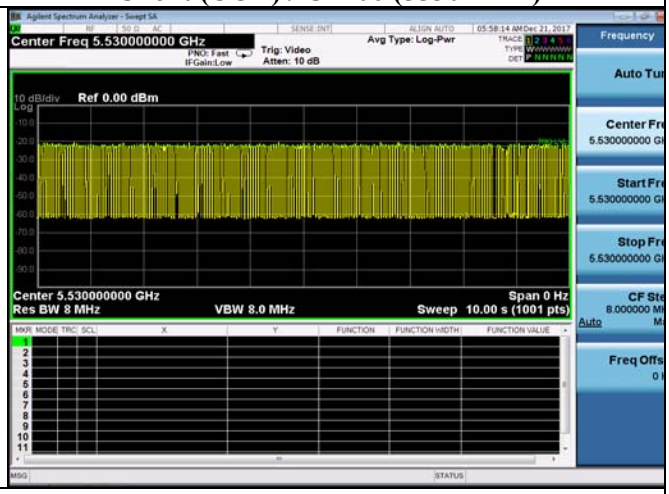
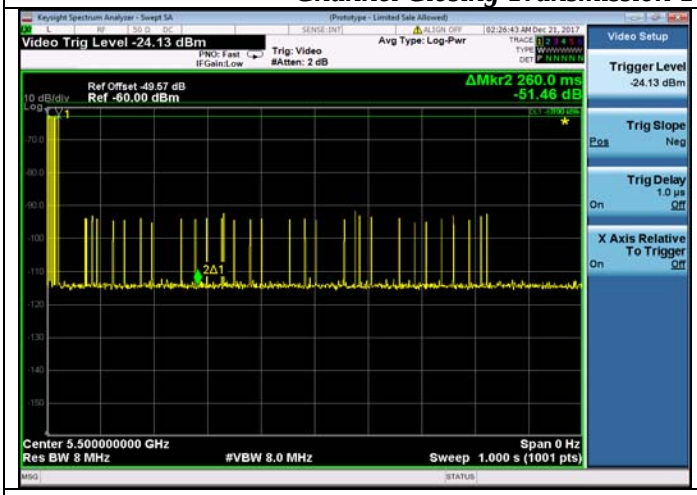
Mode: 802.11ac VHT80 / Band: UNII-2A	
99% Occupied Bandwidth Detection	
Client (UUT) / Ch100 (5500 MHz) / 20 MHz	***Traffic On***
	
Client (UUT) / Ch102 (5510 MHz) / 40 MHz	***Pulse Width duringTraffic on***
	
Client (UUT) / Ch106 (5530 MHz) / 80 MHz	
	

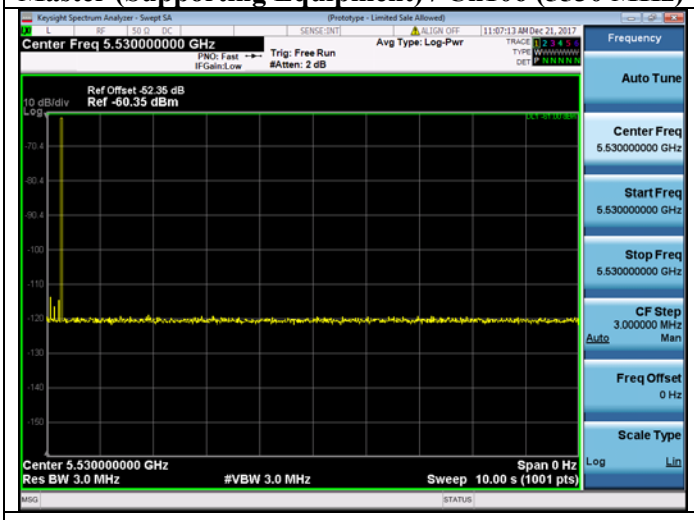
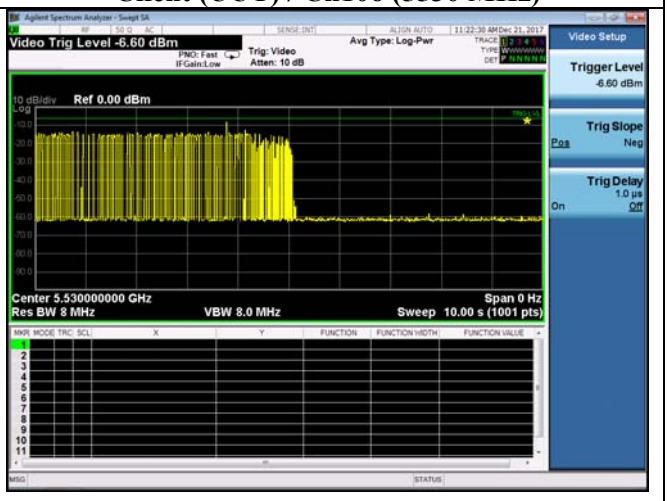
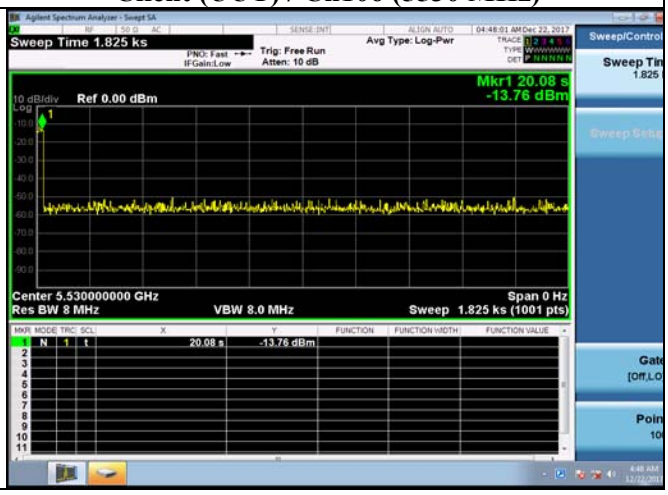
Mode: 802.11a / Band: UNII-2C	
BandWidth: 20 MHz	
Traffic On	
Master (Supporting Equipment) / Ch100 (5500 MHz)	**Client (UUT) / Ch100 (5500 MHz)**
	
Channel Closing Transmission Time with Radar Type 0 Detected	
Master (Supporting Equipment) / Ch100 (5500 MHz)	**Client (UUT) / Ch100 (5500 MHz)**
	
Result: Pass **Channel Closing TX time=** (# of bin) x (bin width) = 53 x 0.1 ms = **5.3 ms**	**Result: Pass** **Channel Closing TX time=** (# of bin) x (bin width) = 52 x 0.1 ms = **5.2 ms**

Mode: 802.11a / Band: UNII-2C	
BandWidth: 20 MHz	
Channel Move Time with Radar Type 0 Detected	
Master (Supporting Equipment) / Ch100 (5500 MHz)	**Client (UUT) / Ch100 (5500 MHz)**
	
Non-Occupancy Period (30 minutes minimum)	
Master (Supporting Equipment) / Ch100 (5500 MHz)	**Client (UUT) / Ch100 (5500 MHz)**
	

Mode: 802.11n40 / Band: UNII-2C	
BandWidth: 40 MHz	
Traffic on	
Master (Supporting Equipment) / Ch102 (5510 MHz)	**Client (UUT) / Ch102 (5510 MHz)**
	
Channel Closing Transmission Time with Radar Type 0 Detected	
Master (Supporting Equipment) / Ch102 (5510 MHz)	**Client (UUT) / Ch102 (5510 MHz)**
	
Result: Pass **Channel Closing TX time=** (# of bin) x (bin width) = 18 x 0.1 ms = **1.8 ms**	**Result: Pass** **Channel Closing TX time=** (# of bin) x (bin width) = 31 x 0.1 ms = **3.1 ms**

Mode: 802.11n40 / Band: UNII-2C	
BandWidth: 40 MHz	
Channel Move Time with Radar Type 0 Detected	
Master (Supporting Equipment) / Ch102 (5510 MHz)	**Client (UUT) / Ch102 (5510 MHz)**
	
Non-Occupancy Period (30 minutes minimum)	
Master (Supporting Equipment) / Ch102 (5510 MHz)	**Client (UUT) / Ch102 (5510 MHz)**
	

Mode: 802.11ac80 / Band: UNII-2C	
BandWidth: 80 MHz	
Traffic on	
Master (Supporting Equipment) / Ch106 (5530 MHz)	**Client (UUT) / Ch106 (5530 MHz)**
	
Channel Closing Transmission Time with Radar Type 0 Detected	
	
Result: Pass **Channel Closing TX time=** (# of bin) x (bin width) = 38 x 0.1 ms = **3.8 ms**	**Result: Pass** **Channel Closing TX time=** (# of bin) x (bin width) = 51 x 0.1 ms = **5.1 ms**

Mode: 802.11ac80 / Band: UNII-2C	
BandWidth: 80 MHz	
Channel Move Time with Radar Type 0 Detected	
Master (Supporting Equipment) / Ch106 (5530 MHz)	**Client (UUT) / Ch106 (5530 MHz)**
	
Non-Occupancy Period (30 minutes minimum) with **Radar Type 0 Detected**	
Master (Supporting Equipment) / Ch106 (5530 MHz)	**Client (UUT) / Ch106 (5530 MHz)**
	

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

Test Equipment List					
Equipment #	**Manufacturer**	**Model**	**Description**	**Last Cal**	**Next Cal Due Date**
CIS55096	National Instrument	PXI-1042	Radar Generator	Not Required	Not Required
CIS54447	IXIA	WBW 1604N	802.11a/ac/b/g/n line-card generator	Not Required	Not Required
CIS55109	Agilent	PXA N9030A	Signal Analyzer 3Hz-50GHz	29-Sep-17	29-Sep-18
CIS55980	Agilent	MXA N9020A	Spectrum Analyzer 10Hz-8.4GHz	12-Oct-17	12-Oct-18
CIS054407	Huber + Suhner	Sucoflex 106A	RF Coaxial Cable, to 18GHz	27-Apr-17	27-Apr-18
CIS054415	Huber + Suhner	Sucoflex 106A	RF Coaxial Cable, to 18GHz	27-Apr-17	27-Apr-18
CIS054410	Huber + Suhner	Sucoflex 106A	RF Coaxial Cable, to 18GHz	27-Apr-17	27-Apr-18
CIS047281	Huber + Suhner	Sucoflex 106A	RF Coaxial Cable, to 18GHz	16-Jun-17	16-Jun-18
CIS047285	Huber + Suhner	Sucoflex 106A	RF Coaxial Cable, to 18GHz	28-Jul-17	28-Jul-18
CIS054389	Huber + Suhner	Sucoflex 102	RF Coaxial Cable, to 18GHz	27-Apr-17	27-Apr-18
CIS054417	Huber + Suhner	Sucoflex 102E	RF Coaxial Cable, to 40GHz	27-Apr-17	27-Apr-18
CIS054657	Mini-Circuits	ZFSC-2-10+ 2-10 GHz	2-way Splitter	29-Sep-17	29-Sep-18
CIS049429	Mini-Circuits	ZFSC-2-10+ 2-10 GHz	2-way Splitter	19-Jan-17	19-Jan-18
CIS044069	Mini-Circuits	ZFSC-2-10+ 2-10 GHz	2-way Splitter	27-Jun-17	27-Jun-18
CIS041992	Mini-Circuits	ZFSC-2-10+ 2-10 GHz	2-way Splitter	26-Jun-17	26-Jun-18
CIS054609	Mini-Circuits	ZFSC-2-10+ 2-10 GHz	2-way Splitter	01-Sep-17	01-Sep-18
CIS041993	Mini-Circuits	ZFSC-2-10+ 2-9 GHz	2-way Splitter	17-Aug-17	17-Aug-18
CIS054696	Ditomi	D3C2060	4-way Splitter	16-Nov-17	16-Nov-18
CIS049497	JFW	50HF-020	20 dB attenuator	20-Apr-17	20-Apr-18
CIS049492	JFW	50HF-010	10 dB attenuator	20-Apr-17	20-Apr-18
CIS054051	Aeroflex	40AH2W-06	6 dB attenuator	21-Apr-17	21-Apr-18
CIS049485	JFW	50HF-006	6 dB attenuator	17-Mar-17	17-Mar-18
CIS041995	Mini-Circuits	BW-S6w2	6 dB attenuator	21-Apr-17	21-Apr-18

Appendix C: Test Procedures

Measurements were made in accordance with

- 905462 D02 U-NII DFS Compliance Procedures New Rules v02
- 905462 D03 U-NII Client Without Radar Detection Capability New Rules v01r01
- 905462 D04 Operational Modes Suggested for DFS Testing New Rules v01

Test procedures are summarized below:

FCC 5GHz Test Procedures	EDCS # - 1445052