DFS MEASUREMENT REPORT

FCC PART 15 Subpart E

FCC ID:	2AI9TOAW-AP136X
APPLICANT:	ALE USA INC.
Application Type:	Certification
Product:	OmniAccess Stellar
Model No.:	OAW-AP1361, OAW-AP1361D, OAW-AP1362
Brand Name:	Alcatel·Lucent Enterprise
FCC Classification:	Unlicensed National Information Infrastructure (NII)
FCC Rule Part(s):	Part15 Subpart E (Section 15.407(h)(2))
Test Procedure(s):	KDB 905462 D02v02, KDB 905462 D04v01
Type of Device:	Master Device
Test Date:	November 05, 2019 ~ March 01, 2020

Reviewed By: Sunny Sun
(Sunny Sun)

Approved By: Robin Wu
(Robin Wu)

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 905462 D02v02. Test results reported herein relate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date	Note
1912RSU073-U7	Rev. 01	Initial Report	03-18-2020	Valid

CONTENTS

General Information

Applicant:	ALE USA INC.
Applicant Address:	26801 WEST AGOURA ROAD, CALABASAS, CA 91301, USA
Manufacturer:	ALE USA INC.
Manufacturer Address:	26801 WEST AGOURA ROAD, CALABASAS, CA 91301, USA
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- **MRT facility is a FCC accredited (MRT Designation No. CN1166) test facility with the site description report on file and has met all the requirements specified in ANSI C63.4-2014.**
- **MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.**
- **MRT facility is a VCCI registered (R-20025, G-20034, C-20020, T-20020) test laboratory with the site description on file at VCCI Council.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications, Radio and SAR testing.**

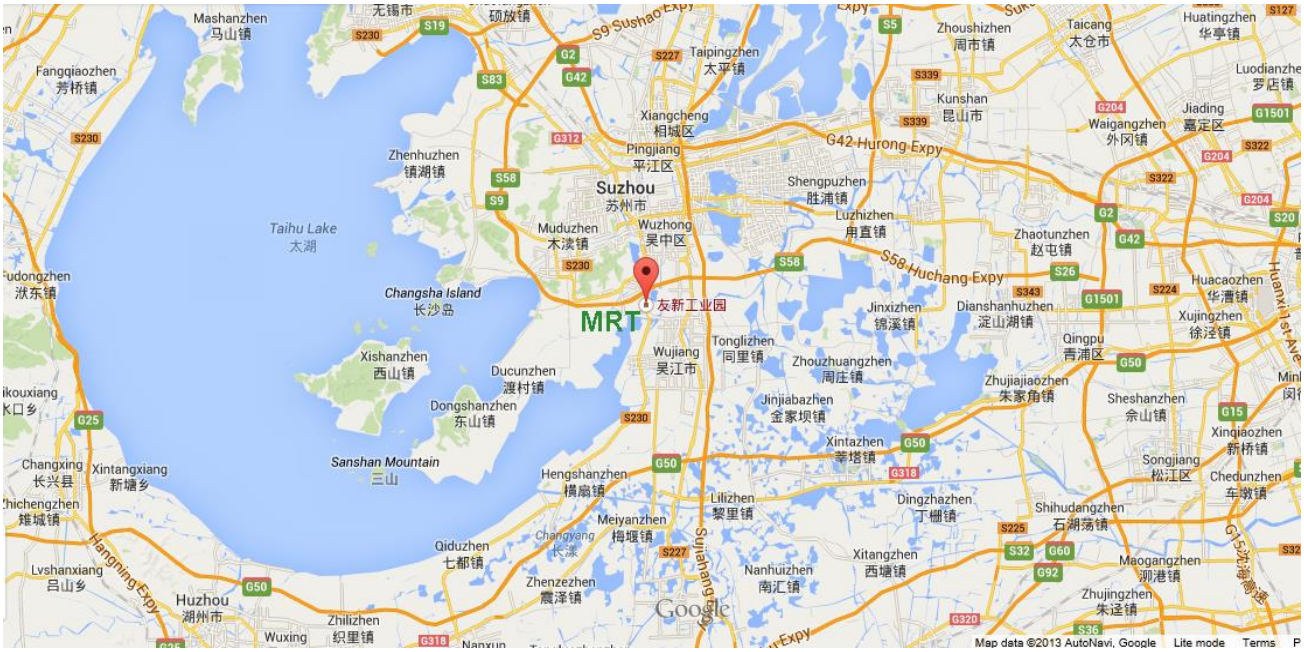
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The measurement facility compliant with the test site requirements specified in ANSI C63.4-2014.



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name:	OmniAccess Stellar
Configuration:	OAW-AP1361, OAW-AP1361D, OAW-AP1362
Brand Name:	Alcatel·Lucent Enterprise
Wi-Fi Specification:	802.11a/b/g/n/ac/ax
Bluetooth Specification:	V5.1
Operating Temperature:	-40 ~ 65 °C
Power Type:	PoE input
Operating Environment:	Outdoor Use
Accessories	
Adapter	Model No.: PD-9501GC/AC Input Power: 100 - 240V ~ 50/60Hz, 1.5A Output Power: 55VDC/1.1A

Note 1: The difference between models is that EUT use different antennas and appearances, other hardware and software are the same.

Note 2: The adapters not market with AP.

2.2. Product Specification Subjective to this Report

Frequency Range:	For 802.11a/n-HT20/ac-VHT20/ax-HE20: 5260~5320MHz, 5500~5720MHz For 802.11n-HT40/ac-VHT40/ax-HE40: 5270~5310MHz, 5510~5710MHz For 802.11ac-VHT80/ax-HE80: 5290MHz, 5530MHz, 5610 MHz, 5690 MHz For 802.11ac-VHT80 + 80/ax-HE80 + 80: 5290MHz, 5530MHz, 5610 MHz
Type of Modulation:	802.11a/n/ac: OFDM; 802.11ax: OFDMA
Data Rate:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 1733.3Mbps 802.11ax: up to 2402Mbps
Power-on cycle:	Requires 80.9 seconds to complete its power-on cycle
Uniform Spreading (For DFS Frequency Band):	For the 5250-5350MHz, 5470-5725 MHz bands, the Master device provides, on aggregate, uniform loading of the spectrum across all devices by selecting an operating channel among the available channels using a random algorithm.

Note: For other features of this EUT, test report will be issued separately.

2.3. Description of Available Antennas

Model No.: OAW-AP1361

Antenna Type	Frequency Band (GHz)	T_X Paths	Bandwidth (MHz)	Max Peak Gain (dBi)				Directional Gain (dBi)	
				Ant 0	Ant 1	Ant 2	Ant 3	CDD	Beamforming
Wi-Fi Internal Antenna List (2.4GHz 2*2 MIMO, 5GHz 4*4 MIMO)									
Omni Antenna	2400 ~ 2483.5	2	20, 40	4.72	4.85	--	--	4.85	7.86
	5150 ~ 5850	4	20, 40, 80	6.48	6.31	6.26	6.12	6.48	12.50
	5150 ~ 5250 30° elevation angle	4	20, 40, 80	-5.46	-4.22	-2.90	-3.84	--	

Bluetooth Internal Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	4.64

Scan Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	4.58
	5150 ~ 5850	6.00
	5150 ~ 5250 30° elevation angle	-5.83

Model No.: OAW-AP1361D

Antenna Type	Frequency Band (GHz)	T_X Paths	Bandwidth (MHz)	Max Peak Gain (dBi)				Directional Gain (dBi)	
				Ant 0	Ant 1	Ant 2	Ant 3	CDD	Beamforming
Wi-Fi Internal Antenna List (2.4GHz 2*2 MIMO, 5GHz 4*4 MIMO)									
Directional Antenna	2400 ~ 2483.5	2	20, 40	7.5	7.0	--	--	7.5	10.51
	5150 ~ 5850	4	20, 40, 80	7.4	7.0	6.9	7.2	7.4	13.42
	5150 ~ 5250 30° elevation angle	4	20, 40, 80	3.99	4.13	3.90	4.31	--	

Bluetooth Internal Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	3.30

Scan Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	7.20
	5150 ~ 5850	9.40
	5150 ~ 5250 30° elevation angle	4.02

Model No.: OAW-AP1362

Antenna Type	Frequency Band (GHz)	T_X Paths	Bandwidth (MHz)	Max Peak Gain (dBi)	Directional Gain (dBi)	
					CDD	Beamforming
Wi-Fi Internal Antenna List (2.4GHz 2*2 MIMO, 5GHz 4*4 MIMO)						
Omni Antenna	2400 ~ 2483.5	2	20, 40	5	5	8.01
	5150 ~ 5850	4	20, 40, 80	7	5	11.02
	5150 ~ 5250 30° elevation angle	4	20, 40, 80	-0.3	--	

Bluetooth Internal Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	4.06

Scan Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	4.58
	5150 ~ 5850	6.00
	5150 ~ 5250 30° elevation angle	4.02

Note 1: The EUT supports Cyclic Delay Diversity (CDD) technology for 802.11a/b/g/n/ac/ax and Beam Forming technology for 802.11n/ac/ax.

Note 2: When the EUT supports Cyclic Delay Diversity (CDD) and it is correlated.

If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,

Array Gain = 10 log (N_{ANT}/ N_{SS}) dB = 3.01;

- For power measurements on IEEE 802.11 devices,

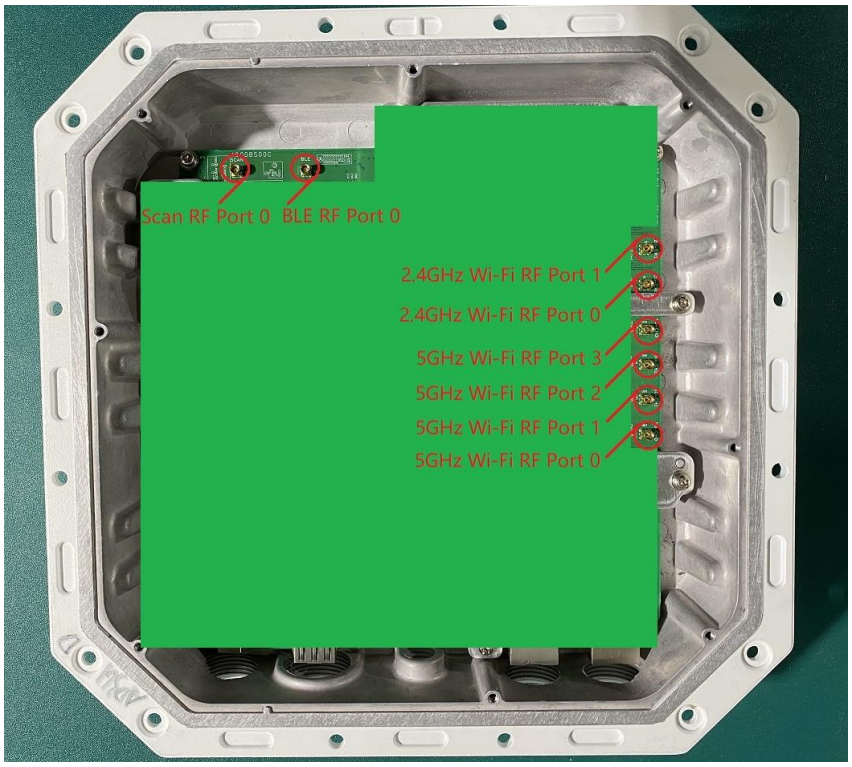
Array Gain = 0 dB for $N_{ANT} \leq 4$;

If antenna gains are not equal, Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Note 3: The EUT also supports Beam Forming mode, Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi, Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain

2.4. Description of Antenna RF Port

Antenna RF Port								
--	2.4GHz RF Port		5GHz RF Port				Scan RF Port	BLE RF Port
Software Control Port	Ant 0	Ant 1	Ant 0	Ant 1	Ant 2	Ant 3	Ant 0	Ant 0



2.5. DFS Band Carrier Frequencies Operation

802.11a/n/ac-VHT20/ax-HE20

Channel	Frequency	Channel	Frequency	Channel	Frequency
52	5260 MHz	56	5280 MHz	60	5300 MHz
64	5320 MHz	100	5500 MHz	104	5520 MHz
108	5540 MHz	112	5560 MHz	116	5580 MHz
120	5600 MHz	124	5620 MHz	128	5640 MHz
132	5660 MHz	136	5680 MHz	140	5700 MHz
144	5720 MHz	--	--	--	--

802.11n-HT40/ac-VHT40/ax-HE40

Channel	Frequency	Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz	102	5510 MHz
110	5550 MHz	118	5590 MHz	126	5630 MHz
134	5670 MHz	142	5710 MHz	--	--

802.11ac-VHT80/ax-HE80

Channel	Frequency	Channel	Frequency	Channel	Frequency
58	5290 MHz	106	5530 MHz	122	5610 MHz
138	5690 MHz	--	--	--	--

802.11ac-VHT80 + 80/ax-HE80 + 80

Channel	Frequency	Channel	Frequency	Channel	Frequency
58	5290 MHz	106	5530 MHz	122	5610 MHz

2.6. Test Mode

Test Mode	Mode 1: Make the EUT communicate with client device at DFS channel

3. DFS DETECTION THRESHOLDS AND RADAR TEST WAVEFORMS

3.1. Applicability

The following table from FCC KDB 905462 D02 NII DFS Compliance Procedures New Rules v02 lists the applicable requirements for the DFS testing.

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client with Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 3-1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

Table 3-2: Applicability of DFS Requirements during normal operation

3.2. DFS Devices Requirements

Per FCC KDB 905462 D02 NII DFS Compliance Procedures New Rules v02 the following are the requirements for Master Devices:

(a) The Master Device will use DFS in order to detect Radar Waveforms with received signal strength above the DFS Detection Threshold in the 5250 ~ 5350 MHz and 5470 ~ 5725 MHz bands. DFS is not required in the 5150 ~ 5250 MHz or 5725 ~ 5825 MHz bands.

(b) Before initiating a network on a Channel, the Master Device will perform a Channel Availability Check for specified time duration (Channel Availability Check Time) to ensure that there is no radar system operating on the Channel, using DFS described under subsection a) above.

(c) The Master Device initiates a U-NII network by transmitting control signals that will enable other U-NII devices to Associate with the Master Device.

(d) During normal operation, the Master Device will monitor the Channel (In-Service Monitoring) to ensure that there is no radar system operating on the Channel, using DFS described under a).

(e) If the Master Device has detected a Radar Waveform during In-Service Monitoring as described under d), the Operating Channel of the U-NII network is no longer an Available Channel. The Master Device will instruct all associated Client Device(s) to stop transmitting on this Channel within the Channel Move Time. The transmissions during the Channel Move Time will be limited to the Channel Closing Transmission Time.

(f) Once the Master Device has detected a Radar Waveform it will not utilize the Channel for the duration of the Non-Occupancy Period.

(g) If the Master Device delegates the In-Service Monitoring to a Client Device, then the combination will be tested to the requirements described under d) through f) above.

Channel Move Time and Channel Closing Transmission Time requirements are listed in the following table.

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 100% of the U-NII 99% transmission power bandwidth. See Note 3.

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. 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 a Channel move (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 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

Table 3-3: DFS Response Requirements

3.3. DFS Detection Threshold Values

The DFS detection thresholds are defined for Master devices and Client Devices with In-service monitoring. These detection thresholds are listed in the following table.

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-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. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

Table 3-4: Detection Thresholds for Master Devices and Client Devices with Radar Detection

3.4. Parameters of DFS Test Signals

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.

Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 3-6	Roundup$\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{PRI_{usec}}\right)\right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
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
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

Table 3-5: Parameters for Short Pulse Radar Waveforms

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms.

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

Table 3-6: Pulse Repetition Intervals Values for Test A

Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50 - 100	5 - 20	1000 - 2000	1 - 3	8 - 20	80%	30

Table 3-7: Parameters for Long Pulse Radar Waveforms

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse Radar Type waveforms. If more than 30 waveforms are used for the Long Pulse Radar Type waveforms, then each additional waveform must also be unique and not repeated from the previous waveforms.

Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses Per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

Table 3-8: Parameters for Frequency Hopping Radar Waveforms

For the Frequency Hopping Radar Type, the same Burst parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected from the hopping sequence defined by the following algorithm:

The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250 – 5724MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

3.5. Test Setup

The FCC KDB 905462 D02 NII DFS Compliance Procedures New Rules v02 describes a radiated test setup and a conducted test setup. The Radiated test setup was used for this testing. Figure 3-1 shows the typical test setup.

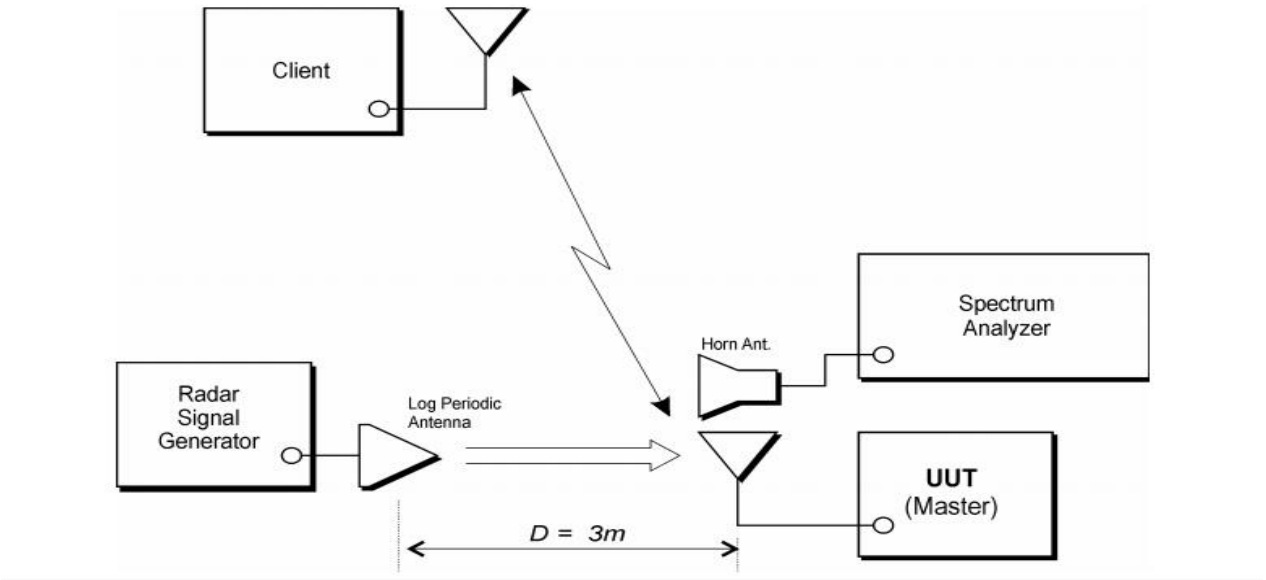


Figure 3-1: Radiated Test Setup where UUT is a Master and Radar Test Waveforms are injected into the Masters

4. TEST EQUIPMENT CALIBRATION DATE

Dynamic Frequency Selection (DFS) – SR4

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2020/04/15
Vector Signal Generator	Agilent	E4438C	MRTSUE06026	1 year	2020/11/07
Thermohygrometer	Testo	608-H1	MRTSUE06222	1 year	2020/11/10

Client Information

Instrument	Manufacturer	Type No.
Wireless Network Adapter	Intel	7260HMW
Access Point	ALE USA INC.	OAW-AP1361

Software	Version	Manufacturer	Function
Pulse Building	N/A	Agilent	Radar Signal Generation Software
DFS Tool	V 6.9.2	Agilent	DFS Test Software
R&S Pulse Sequencer DFS	V 1.4	R&S	DFS Test Software

5. TEST RESULT

5.1. Summary

Parameter	Limit	Test Result	Reference
NII Detection Bandwidth Measurement	Refer Table 3-3	Pass	Section 5.4
Initial Channel Availability Check Time	Refer Table 3-3	Pass	Section 5.5
Radar Burst at the Beginning of the Channel Availability Check Time	Refer Table 3-3	Pass	Section 5.6
Radar Burst at the End of the Channel Availability Check Time	Refer Table 3-3	Pass	Section 5.7
In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time	Refer Table 3-3	Pass	Section 5.8
Non-Occupancy Period	Refer Table 3-3	Pass	Section 5.8
Statistical Performance Check	Refer Table 3-3	Pass	Section 5.9

5.2. Radar Waveform Calibration

5.2.1. Calibration Setup

The conducted test setup was used for this calibration testing. Figure 3-2 shows the typical test setup.

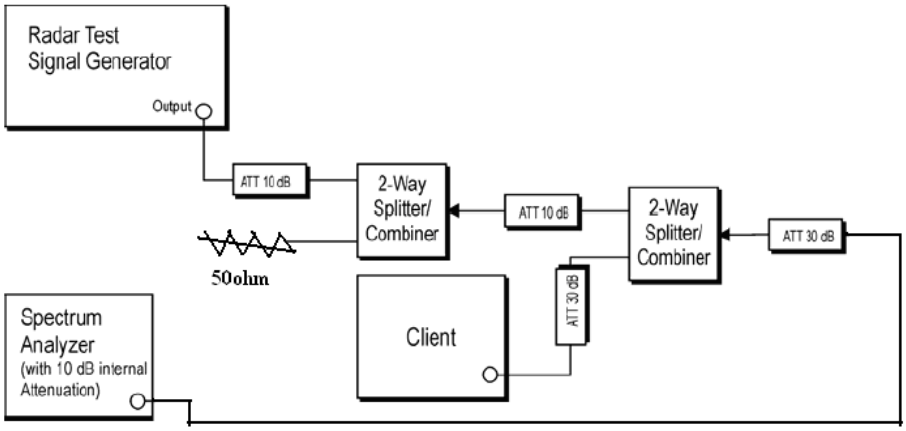


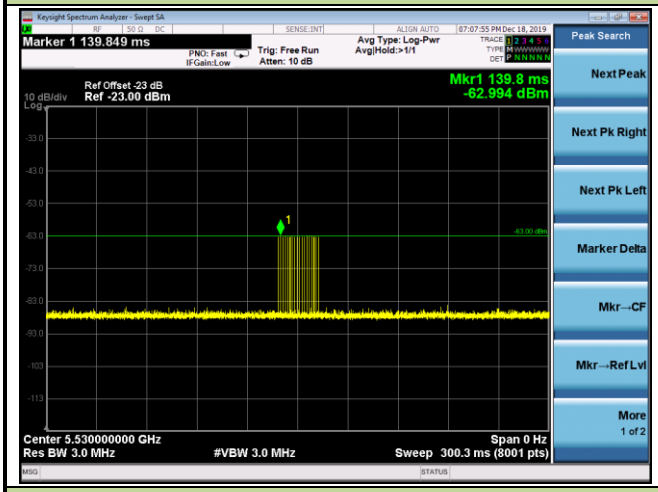
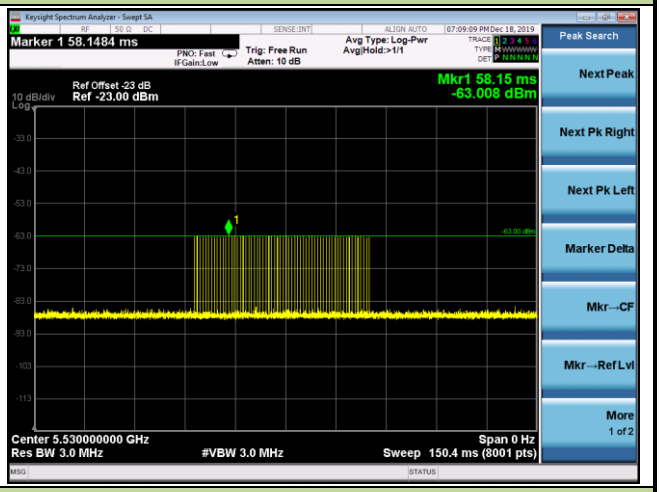
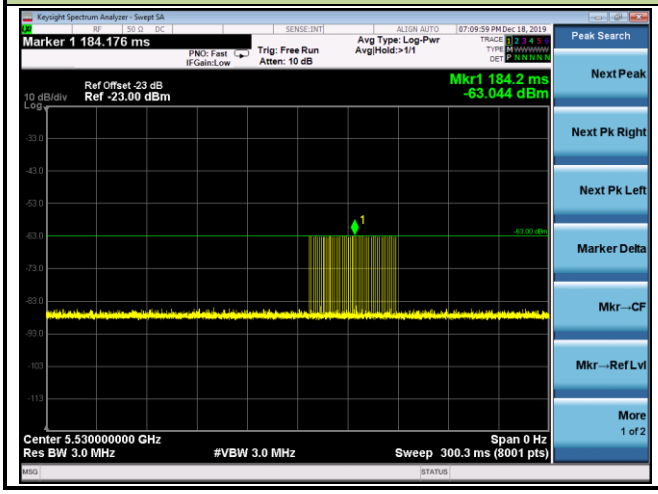
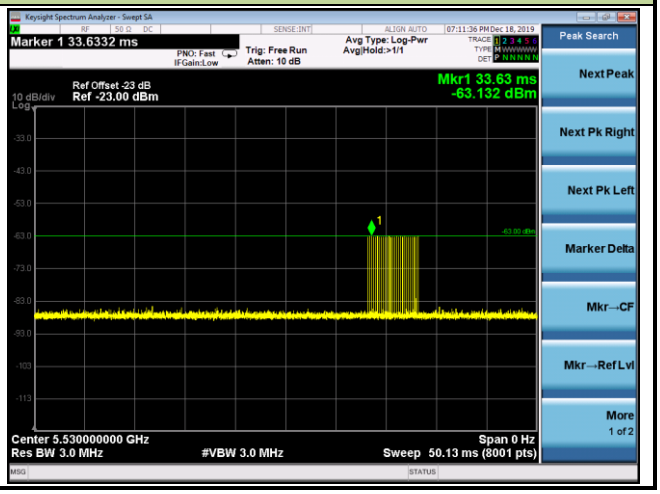
Figure 3-2: Conducted Test Setup

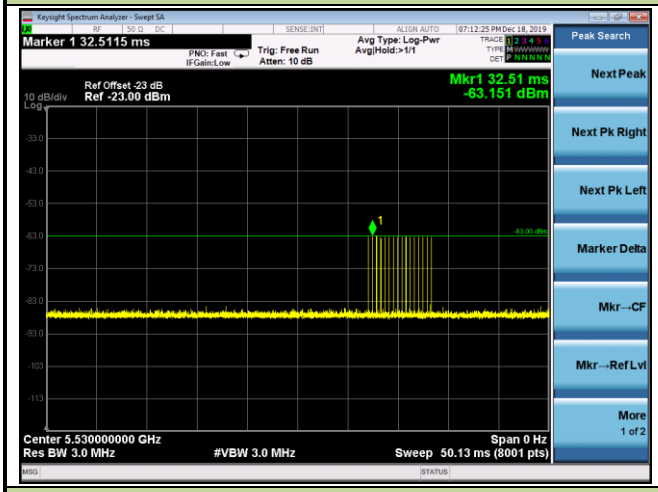
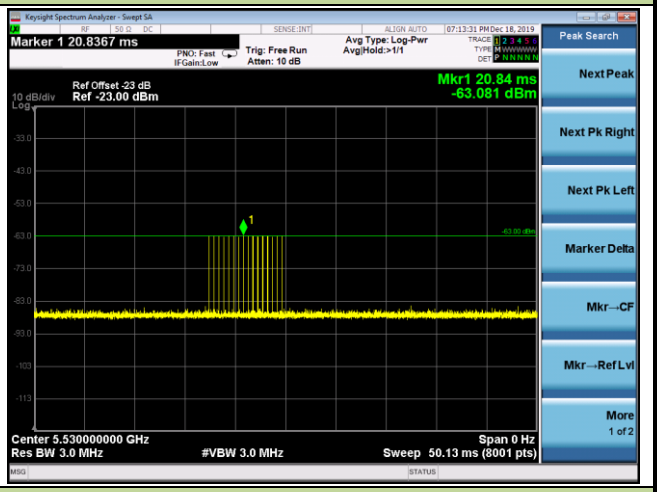
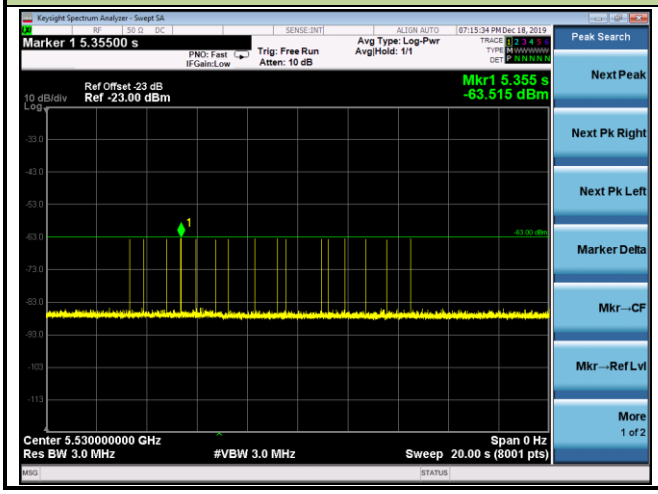
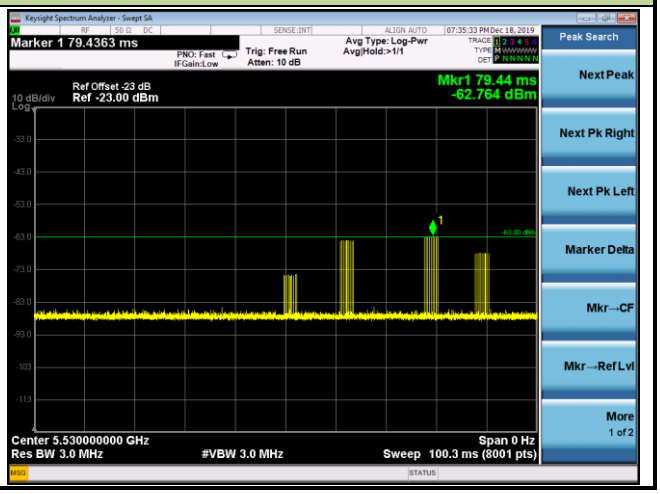
5.2.2. Calibration Procedure

The Interference Radar Detection Threshold Level is (-64dBm) + (0) [dBi] + 1 dB= -63 dBm that had been taken into account the output power range and antenna gain. The above equipment setup was used to calibrate the conducted Radar Waveform. A vector signal generator was utilized to establish the test signal level for each radar type. During this process there were replace 50ohm terminal form Master and Client device and no transmissions by either the Master or Client Device. The spectrum analyzer was switched to the zero span (Time Domain) at the frequency of the Radar Waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to at least 3MHz. The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was (-64dBm) + (0) [dBi] + 1 dB= -63dBm. Capture the spectrum analyzer plots on short pulse radar types, long pulse radar type and hopping radar waveform.

5.2.3. Cablibration Result

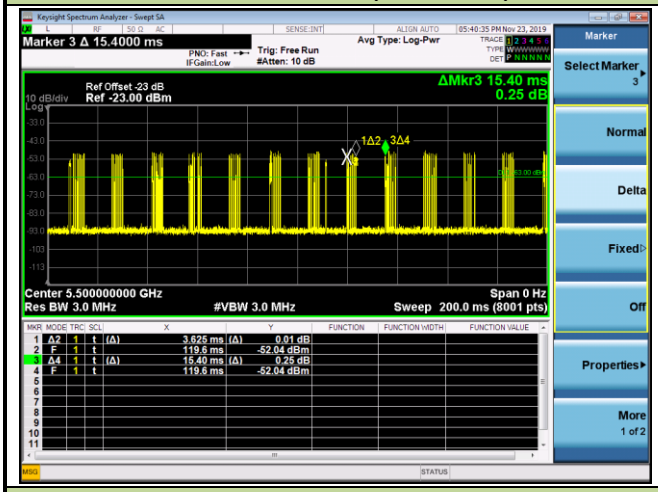
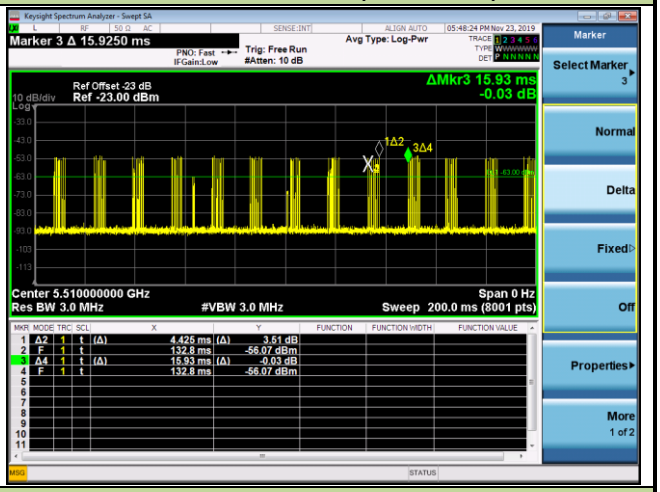
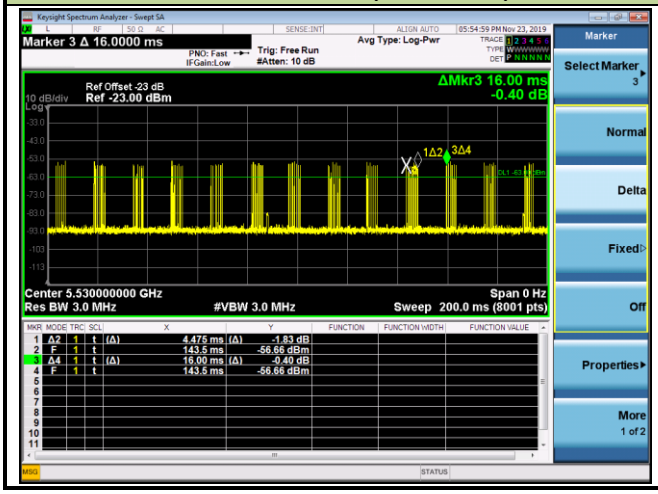
Product	OmniAccess Stellar	Temperature	27°C
Test Engineer	Amy Zhang	Relative Humidity	65%
Test Site	SR5	Test Date	2019/12/18
Test Item	Radar Waveform Calibration		

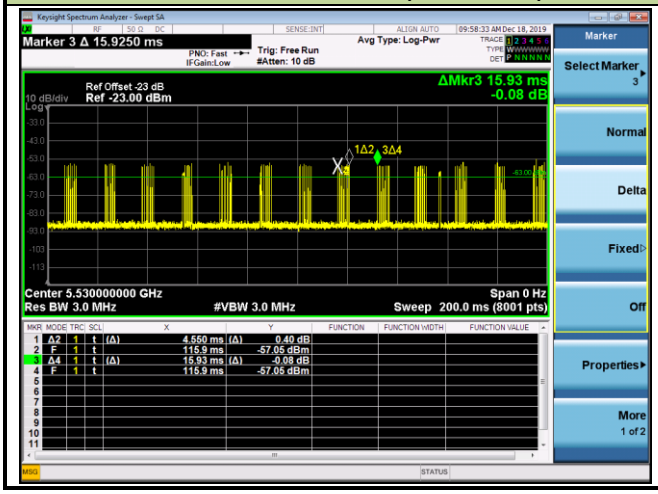
Radar #0	Radar #1 (Test A) PRI = 778us and the number of pulses = 68
	
Radar #1 (Test B) PRI = 1.148ms and the number of pulses = 46	Radar #2
	

Radar #3	Radar #4
	
Radar #5	**Radar #6**
	

5.2.4. Channel Loading Test Result

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Amy Zhang	Relative Humidity	46 ~ 55%
Test Site	SR4	Test Date	2019/11/23 ~ 2019/12/18
Model No.	OAW-AP1361D	Test Item	Channel Loading

802.11ax-HE20 (5500MHz)	802.11ax-HE40 (5510MHz)
	
802.11ax-HE80 (5530MHz)	**802.11ax-HE80 + 80 (5290MHz)**
	

802.11ax-HE80 + 80 (5530MHz)	802.11ax-HE80 + 80 (5610MHz)
	

Test Mode	Test Frequency	Packet ratio	Requirement ratio	Test Result
802.11ax-HE20	5500 MHz	23.54%	≥ 17%	Pass
802.11ax-HE40	5510 MHz	27.78%	≥ 17%	Pass
802.11ax-HE80	5530 MHz	27.98%	≥ 17%	Pass
802.11ax-HE80 + 80	5290 MHz	29.82%	≥ 17%	Pass
802.11ax-HE80 + 80	5530 MHz	28.56%	≥ 17%	Pass
802.11ax-HE80 + 80	5610 MHz	25.94%	≥ 17%	Pass
Note: System testing was performed with the designated iperf test file. This file is used by IP and Frame based systems for loading the test channel during the In-service compliance testing of the U-NII device. Packet ratio = Time On / (Time On + Off Time).				

5.3. NII Detection Bandwidth Measurement

5.3.1. Test Limit

Minimum 100% of the NII 99% transmission power bandwidth. During the U-NII Detection Bandwidth detection test, each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

5.3.2. Test Procedure

1. Adjust the equipment to produce a single Burst of any one of the Short Pulse Radar Types 0-4 in Table 3-5 at the center frequency of the EUT Operating Channel at the specified DFS Detection Threshold level.
2. The generating equipment is configured as shown in the Conducted Test Setup above section 3.5.
3. The EUT is set up as a stand-alone device (no associated Client or Master, as appropriate) and no traffic. Frame based systems will be set to a talk/listen ratio reflecting the worst case (maximum) that is user configurable during this test.
4. Generate a single radar Burst and note the response of the EUT. Repeat for a minimum of 10 trials. The EUT must detect the Radar Waveform using the specified U-NII Detection Bandwidth criterion shown in Table 3-5. In cases where the channel bandwidth may exceed past the DFS band edge on specific channels (i.e., 802.11ac or wideband frame based systems) select a channel that has the entire emission bandwidth within the DFS band. If this is not possible, test the detection BW to the DFS band edge.
5. Starting at the center frequency of the UUT operating Channel, increase the radar frequency in 5 MHz steps, repeating the above test sequence, until the detection rate falls below the U-NII Detection Bandwidth criterion specified in Table 3-3. Repeat this measurement in 1MHz steps at frequencies 5 MHz below where the detection rate begins to fall. Record the highest frequency (denote as FH) at which detection is greater than or equal to the U-NII Detection Bandwidth criterion. Recording the detection rate at frequencies above FH is not required to demonstrate compliance.
6. Starting at the center frequency of the EUT operating Channel, decrease the radar frequency in 1 MHz steps, repeating the above item 4 test sequence, until the detection rate falls below the U-NII Detection Bandwidth criterion. Record the lowest frequency (denote as FL) at which detection is greater than or equal to the U-NII Detection Bandwidth criterion. Recording the detection rate at frequencies below FL is not required to demonstrate compliance.

7. The U-NII Detection Bandwidth is calculated as follows: U-NII Detection Bandwidth = FH – FL

8. The U-NII Detection Bandwidth must be at least 100% of the EUT transmitter 99% power, otherwise, the EUT does not comply with DFS requirements.

5.3.3. Test Result

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Amy Zhang	Relative Humidity	46 ~ 60%
Test Site	SR4	Test Date	2019/11/25 ~ 2019/12/24
Model No.	OAW-AP1361D	Test Item	Detection Bandwidth (802.11ax-HE20 mode - 5500MHz)

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										
	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5489	0	0	0	0	0	0	0	0	0	0	0%
5490 FL	1	1	1	1	1	1	1	1	1	1	100%
5491	1	1	1	1	1	1	1	1	1	1	100%
5492	1	1	1	1	1	1	1	1	1	1	100%
5493	1	1	1	1	1	1	1	1	1	1	100%
5494	1	1	1	1	1	1	1	1	1	1	100%
5495	1	1	1	1	1	1	1	1	1	1	100%
5500	1	1	1	1	1	1	1	1	1	1	100%
5505	1	1	1	1	1	1	1	1	1	1	100%
5506	1	1	1	1	1	1	1	1	1	1	100%
5507	1	1	1	1	1	1	1	1	1	1	100%
5508	1	1	1	1	1	1	1	1	1	1	100%
5509	1	1	1	1	1	1	1	1	1	1	100%
5510 FH	1	1	1	1	1	1	1	1	1	1	100%
5511	0	0	0	0	0	0	0	0	0	0	0%

Note 1: All NII channels for this device have identical Channel bandwidths. Therefore, all DFS testing was done at 5500MHz. The 99% channel bandwidth is 18.93MHz. (See the 99% BW section of the RF report for further measurement details).

Note 2: Detection Bandwidth = FH - FL = 5510MHz - 5490MHz = 20MHz.

Note 3: NII Detection Bandwidth Min. Limit (MHz): 18.93MHz x 100% = 18.93MHz.

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Amy Zhang	Relative Humidity	46 ~ 60%
Test Site	SR4	Test Date	2019/11/25 ~ 2019/12/24
Model No.	OAW-AP1361D	Test Item	Detection Bandwidth (802.11ax-HE40 mode - 5510MHz)

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										
	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5490	0	0	0	0	0	0	0	0	0	0	0%
5491 FL	1	1	1	1	1	1	1	1	1	1	100%
5492	1	1	1	1	1	1	1	1	1	1	100%
5493	1	1	1	1	1	1	1	1	1	1	100%
5494	1	1	1	1	1	1	1	1	1	1	100%
5495	1	1	1	1	1	1	1	1	1	1	100%
5500	1	1	1	1	1	1	1	1	1	1	100%
5505	1	1	1	1	1	1	1	1	1	1	100%
5510	1	1	1	1	1	1	1	1	1	1	100%
5515	1	1	1	1	1	1	1	1	1	1	100%
5520	1	1	1	1	1	1	1	1	1	1	100%
5525	1	1	1	1	1	1	1	1	1	1	100%
5526	1	1	1	1	1	1	1	1	1	1	100%
5527	1	1	1	1	1	1	1	1	1	1	100%
5528	1	1	1	1	1	1	1	1	1	1	100%
5529 FH	1	1	1	1	1	1	1	1	1	1	100%
5530	0	0	0	0	0	0	0	0	0	0	0%

Note 1: All NII channels for this device have identical Channel bandwidths. Therefore, all DFS testing was done at 5510MHz. The 99% channel bandwidth is 37.74MHz. (See the 99% BW section of the RF report for further measurement details).

Note 2: Detection Bandwidth = FH - FL = 5529MHz - 5491MHz = 38MHz.

Note 3: NII Detection Bandwidth Min. Limit (MHz): 37.74MHz x 100% = 37.74MHz.

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Amy Zhang	Relative Humidity	46 ~ 60%
Test Site	SR4	Test Date	2019/11/25 ~ 2019/12/24
Model No.	OAW-AP1361D	Test Item	Detection Bandwidth (802.11ax-HE80 mode - 5530MHz)

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										
	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5490	0	0	0	0	0	0	0	0	0	0	0%
5491 FL	1	1	1	1	1	1	1	1	1	1	100%
5492	1	1	1	1	1	1	1	1	1	1	100%
5493	1	1	1	1	1	1	1	1	1	1	100%
5494	1	1	1	1	1	1	1	1	1	1	100%
5495	1	1	1	1	1	1	1	1	1	1	100%
5500	1	1	1	1	1	1	1	1	1	1	100%
5505	1	1	1	1	1	1	1	1	1	1	100%
5510	1	1	1	1	1	1	1	1	1	1	100%
5515	1	1	1	1	1	1	1	1	1	1	100%
5520	1	1	1	1	1	1	1	1	1	1	100%
5525	1	1	1	1	1	1	1	1	1	1	100%
5530	1	1	1	1	1	1	1	1	1	1	100%
5535	1	1	1	1	1	1	1	1	1	1	100%
5540	1	1	1	1	1	1	1	1	1	1	100%
5545	1	1	1	1	1	1	1	1	1	1	100%
5550	1	1	1	1	1	1	1	1	1	1	100%
5555	1	1	1	1	1	1	1	1	1	1	100%
5560	1	1	1	1	1	1	1	1	1	1	100%
5565	1	1	1	1	1	1	1	1	1	1	100%
5566	1	1	1	1	1	1	1	1	1	1	100%
5567	1	1	1	1	1	1	1	1	1	1	100%
5568	1	1	1	1	1	1	1	1	1	1	100%
5569 FH	1	1	1	1	1	1	1	1	1	1	100%
5570	0	0	0	0	0	0	0	0	0	0	0%

Note 1: All NII channels for this device have identical Channel bandwidths. Therefore, all DFS testing was done at 5530MHz. The 99% channel bandwidth is 77.12MHz. (See the 99% BW section of the RF report for further measurement details).

Note 2: Detection Bandwidth = FH - FL = 5569MHz - 5491MHz = 78MHz.

Note 3: NII Detection Bandwidth Min. Limit (MHz): 77.12MHz x 100% = 77.12MHz.

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Amy Zhang	Relative Humidity	46 ~ 60%
Test Site	SR4	Test Date	2019/11/25 ~ 2019/12/24
Model No.	OAW-AP1361D	Test Item	Detection Bandwidth (802.11ax-HE80 + 80 mode - 5290MHz)

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										
	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5250 FL	1	1	1	1	1	1	1	1	1	1	100%
5251	1	1	1	1	1	1	1	1	1	1	100%
5252	1	1	1	1	1	1	1	1	1	1	100%
5253	1	1	1	1	1	1	1	1	1	1	100%
5254	1	1	1	1	1	1	1	1	1	1	100%
5255	1	1	1	1	1	1	1	1	1	1	100%
5260	1	1	1	1	1	1	1	1	1	1	100%
5265	1	1	1	1	1	1	1	1	1	1	100%
5270	1	1	1	1	1	1	1	1	1	1	100%
5275	1	1	1	1	1	1	1	1	1	1	100%
5280	1	1	1	1	1	1	1	1	1	1	100%
5285	1	1	1	1	1	1	1	1	1	1	100%
5290	1	1	1	1	1	1	1	1	1	1	100%
5295	1	1	1	1	1	1	1	1	1	1	100%
5300	1	1	1	1	1	1	1	1	1	1	100%
5305	1	1	1	1	1	1	1	1	1	1	100%
5310	1	1	1	1	1	1	1	1	1	1	100%
5315	1	1	1	1	1	1	1	1	1	1	100%
5320	1	1	1	1	1	1	1	1	1	1	100%
5325	1	1	1	1	1	1	1	1	1	1	100%
5326	1	1	1	1	1	1	1	1	1	1	100%
5327	1	1	1	1	1	1	1	1	1	1	100%
5328	1	1	1	1	1	1	1	1	1	1	100%
5329 FH	1	1	1	1	1	1	1	1	1	1	100%
5330	0	0	0	0	0	0	0	0	0	0	0%

Note 1: All NII channels for this device have identical Channel bandwidths. Therefore, all DFS testing was done at 5290MHz. The 99% channel bandwidth is 78.30MHz. (See the 99% BW section of the RF report for further measurement details).

Note 2: Detection Bandwidth = FH - FL = 5329MHz - 5250MHz = 79MHz.

Note 3: NII Detection Bandwidth Min. Limit (MHz): 78.30MHz x 100% = 78.30MHz.

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Amy Zhang	Relative Humidity	46 ~ 60%
Test Site	SR4	Test Date	2019/11/25 ~ 2019/12/24
Model No.	OAW-AP1361D	Test Item	Detection Bandwidth (802.11ax-HE80 + 80 mode - 5530MHz)

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										
	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5490	0	0	0	0	0	0	0	0	0	0	0%
5491 FL	1	1	1	1	1	1	1	1	1	1	100%
5492	1	1	1	1	1	1	1	1	1	1	100%
5493	1	1	1	1	1	1	1	1	1	1	100%
5494	1	1	1	1	1	1	1	1	1	1	100%
5495	1	1	1	1	1	1	1	1	1	1	100%
5500	1	1	1	1	1	1	1	1	1	1	100%
5505	1	1	1	1	1	1	1	1	1	1	100%
5510	1	1	1	1	1	1	1	1	1	1	100%
5515	1	1	1	1	1	1	1	1	1	1	100%
5520	1	1	1	1	1	1	1	1	1	1	100%
5525	1	1	1	1	1	1	1	1	1	1	100%
5530	1	1	1	1	1	1	1	1	1	1	100%
5535	1	1	1	1	1	1	1	1	1	1	100%
5540	1	1	1	1	1	1	1	1	1	1	100%
5545	1	1	1	1	1	1	1	1	1	1	100%
5550	1	1	1	1	1	1	1	1	1	1	100%
5555	1	1	1	1	1	1	1	1	1	1	100%
5560	1	1	1	1	1	1	1	1	1	1	100%
5565	1	1	1	1	1	1	1	1	1	1	100%
5566	1	1	1	1	1	1	1	1	1	1	100%
5567	1	1	1	1	1	1	1	1	1	1	100%
5568	1	1	1	1	1	1	1	1	1	1	100%
5569	1	1	1	1	1	1	1	1	1	1	100%
5570 FH	1	1	1	1	1	1	1	1	1	1	100%

Note 1: All NII channels for this device have identical Channel bandwidths. Therefore, all DFS testing was done at 5530MHz. The 99% channel bandwidth is 77.78MHz. (See the 99% BW section of the RF report for further measurement details).

Note 2: Detection Bandwidth = FH - FL = 5570MHz - 5491MHz = 79MHz.

Note 3: NII Detection Bandwidth Min. Limit (MHz): 77.78MHz x 100% = 77.78MHz.

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Amy Zhang	Relative Humidity	46 ~ 60%
Test Site	SR4	Test Date	2019/11/25 ~ 2019/12/24
Model No.	OAW-AP1361D	Test Item	Detection Bandwidth (802.11ax-HE80+80 mode - 5610MHz)

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										
	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5570 FL	1	1	1	1	1	1	1	1	1	1	100%
5571	1	1	1	1	1	1	1	1	1	1	100%
5572	1	1	1	1	1	1	1	1	1	1	100%
5573	1	1	1	1	1	1	1	1	1	1	100%
5574	1	1	1	1	1	1	1	1	1	1	100%
5575	1	1	1	1	1	1	1	1	1	1	100%
5580	1	1	1	1	1	1	1	1	1	1	100%
5585	1	1	1	1	1	1	1	1	1	1	100%
5590	1	1	1	1	1	1	1	1	1	1	100%
5595	1	1	1	1	1	1	1	1	1	1	100%
5600	1	1	1	1	1	1	1	1	1	1	100%
5605	1	1	1	1	1	1	1	1	1	1	100%
5610	1	1	1	1	1	1	1	1	1	1	100%
5615	1	1	1	1	1	1	1	1	1	1	100%
5620	1	1	1	1	1	1	1	1	1	1	100%
5625	1	1	1	1	1	1	1	1	1	1	100%
5630	1	1	1	1	1	1	1	1	1	1	100%
5635	1	1	1	1	1	1	1	1	1	1	100%
5640	1	1	1	1	1	1	1	1	1	1	100%
5645	1	1	1	1	1	1	1	1	1	1	100%
5646	1	1	1	1	1	1	1	1	1	1	100%
5647	1	1	1	1	1	1	1	1	1	1	100%
5648	1	1	1	1	1	1	1	1	1	1	100%
5649 FH	1	1	1	1	1	1	1	1	1	1	100%
5650	0	0	0	0	0	0	0	0	0	0	0%

Note 1: All NII channels for this device have identical Channel bandwidths. Therefore, all DFS testing was done at 5610MHz. The 99% channel bandwidth is 77.71MHz. (See the 99% BW section of the RF report for further measurement details).

Note 2: Detection Bandwidth = FH - FL = 5649 - 5570 = 79MHz.

Note 3: NII Detection Bandwidth Min. Limit (MHz): 77.71MHz x 100% = 77.71MHz.

5.4. Initial Channel Availability Check Time Measurement

5.4.1. Test Limit

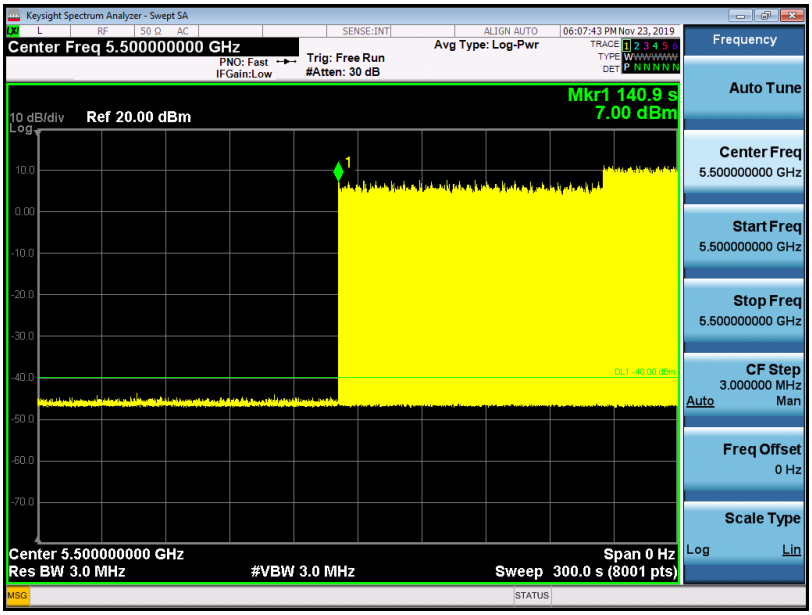
The EUT shall perform a Channel Availability Check to ensure that there is no radar operating on the channel. After power-up sequence, receive at least 1 minute on the intended operating frequency.

5.4.2. Test Procedure

1. The U-NII devices will be powered on and be instructed to operate on the appropriate U-NII Channel that must incorporate DFS functions. At the same time the EUT is powered on, the spectrum analyzer will be set to zero span mode with a 3 MHz RBW and 3 MHz VBW on the Channel occupied by the radar (Chr) with a 2.5 minute sweep time. The spectrum analyzer's sweep will be started at the same time power is applied to the U-NII device.
2. The EUT should not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle.
3. Confirm that the EUT initiates transmission on the channel. Measurement system showing its nominal noise floor is marker1.

5.4.3. Test Result

Product	OmniAccess Stellar	Temperature	25°C
Test Engineer	Amy Zhang	Relative Humidity	54%
Test Site	SR5	Test Date	2019/11/23
Model No.	OAW-AP1361D		
Test Item	Initial Channel Availability Check Time (802.11ax-HE20 mode - 5500MHz)		

Initial Channel Availability Check Time

Note: The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (80.9 sec). Initial beacons/data transmissions are indicated by marker 1 (140.9 sec).

5.5. Radar Burst at the Beginning of the Channel Availability Check Time Measurement

5.5.1. Test Limit

In beginning of the Channel Availability Check (CAC) Time, radar is detected on this channel, select another intended channel and perform a CAC on that channel.

5.5.2. Test Procedure

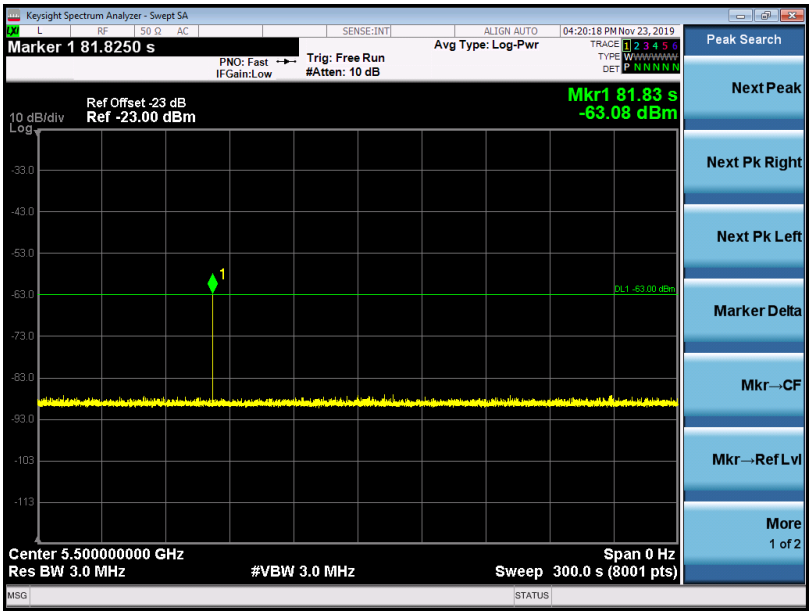
1. The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB occurs at the beginning of the Channel Availability Check Time.

2. The EUT is in completion power-up cycle (from T0 to T1). T1 denotes the instant when the EUT has completed its power-up sequence. The Channel Availability Check Time commences at instant T1 and will end no sooner than T1 + 60 seconds. A single Burst of one of Short Pulse Radar Types 0-4 at DFS Detection Threshold + 1 dB will commence within a 6 second window starting at T1.

3. Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions will continue for 2.5 minutes after the radar Burst has been generated. Verify that during the 2.5 minutes measurement window no EUT transmissions occurred.

5.5.3. Test Result

Product	OmniAccess Stellar	Temperature	25°C
Test Engineer	Amy Zhang	Relative Humidity	54%
Test Site	SR4	Test Date	2019/11/23
Model No.	OAW-AP1361D		
Test Item	Beginning of the Channel Availability Check Time (802.11ax-HE20 mode - 5500MHz)		

Beginning of the Channel Availability Check Time


5.6. Radar Burst at the End of the Channel Availability Check Time Measurement

5.6.1. Test Limit

In the end of Channel Availability Check (CAC) Time, radar is detected on this channel, select another intended channel and perform a CAC on that channel.

5.6.2. Test Procedure

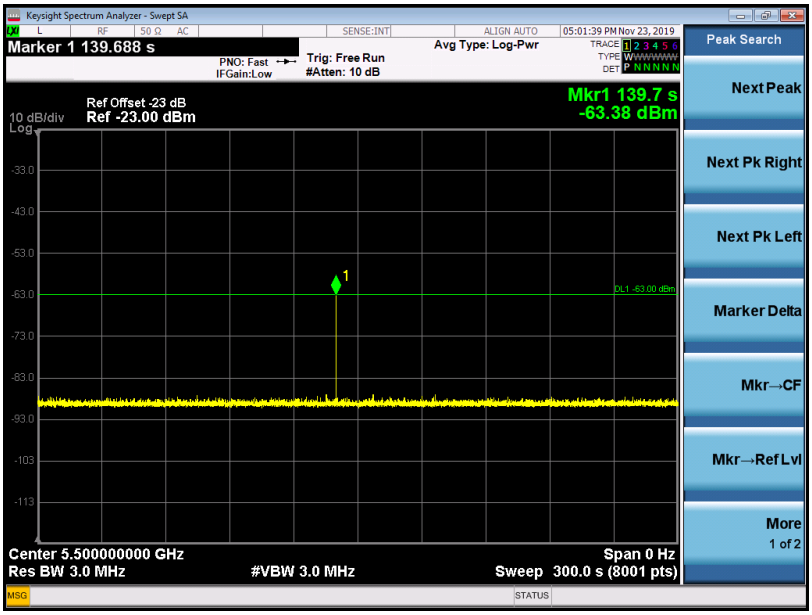
1. The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB occurs at the beginning of the Channel Availability Check Time.

2. The EUT is powered on at T0. T1 denotes the instant when the EUT has completed its power-up sequence. The Channel Availability Check Time commences at instant T1 and will end no sooner thanT1 + 60 seconds. A single Burst of one of Short Pulse Radar Types 0-4 at DFS Detection Threshold + 1 dB will commence within a 6 second window starting at T1+ 54 seconds.

3. Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions will continue for 2.5 minutes after the radar Burst has been generated. Verify that during the 2.5 minutes measurement window no EUT transmissions occurred.

5.6.3. Test Result

Product	OmniAccess Stellar	Temperature	25°C
Test Engineer	Amy Zhang	Relative Humidity	54%
Test Site	SR5	Test Date	2019/11/23
Model No.	OAW-AP1361D		
Test Item	End of the Channel Availability Check Time (802.11ax-HE20 mode - 5500MHz)		

End of the Channel Availability Check Time


5.7. In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period Measurement

5.7.1. Test Limit

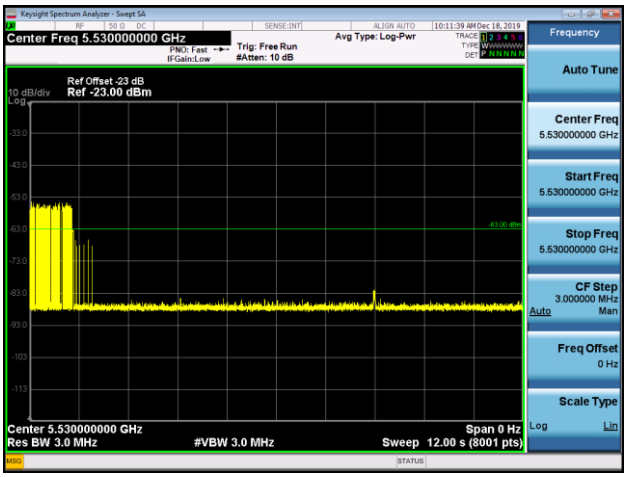
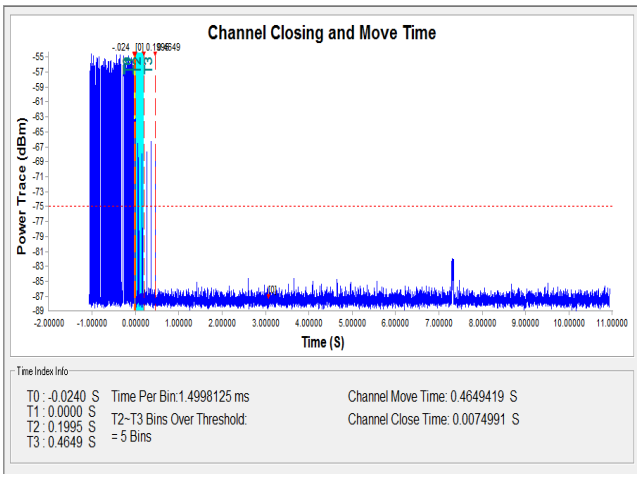
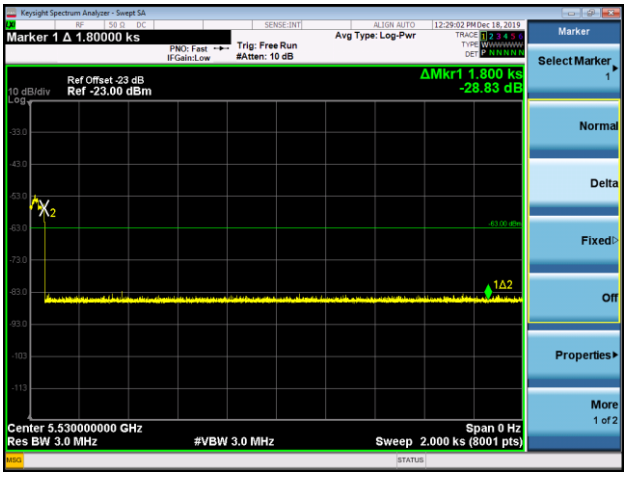
The EUT has In-Service Monitoring function to continuously monitor the radar signals. If the radar is detected, must leave the channel (Shutdown). The Channel Move Time to cease all transmissions on the current channel upon detection of a Radar Waveform above the DFS Detection Threshold within 10 sec. The total duration of Channel Closing Transmission Time is 260ms, consisting of data signals and the aggregate of control signals, by a U-NII device during the Channel Move Time. The Non-Occupancy Period time is 30 minute during which a Channel will not be utilized after a Radar Waveform is detected on that Channel.

5.7.2. Test Procedure Used

1. The test should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0.
2. When the radar burst with a level equal to the DFS Detection Threshold + 1dB is generated on the Operating Channel of the U-NII device. A U-NII device operating as a Master Device will associate with the Client Device at Channel. Stream the MPEG test file from the Master Device to the Client Device on the selected Channel for the entire period of the test. At time T0 the Radar Waveform generator sends a Burst of pulses for each of the radar types at Detection Threshold + 1dB.
3. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel. Measure and record the transmissions from the EUT during the observation time (Channel Move Time).
4. Measurement of the aggregate duration of the Channel Closing Transmission Time method. With the spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: Dwell (1.5ms) = S (12 sec) / B (8000); where Dwell is the dwell time per spectrum analyzer sampling bin, S is the sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission Time is calculated by: C = N X Dwell; where C is the Closing Time, N is the number of spectrum analyzer sampling bins showing a U-NII transmission and Dwell is the dwell time per bin.
5. Measure the EUT for more than 30 minutes following the channel close/move time to verify that the EUT does not resume any transmissions on this Channel.

5.7.3. Test Result

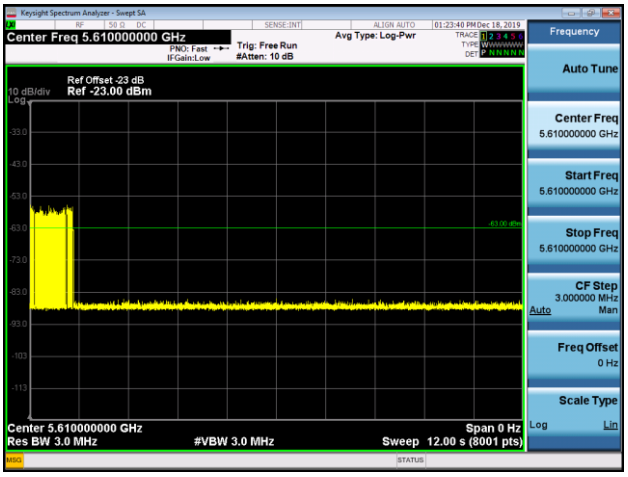
Product	OmniAccess Stellar	Temperature	25°C
Test Engineer	Amy Zhang	Relative Humidity	52%
Test Site	SR4	Test Date	2019/12/18
Model No.	OAW-AP1361D		
Test Item	Channel Move Time and Channel Closing Transmission Time (802.11ax-HE80 + 80 mode - 5530MHz)		

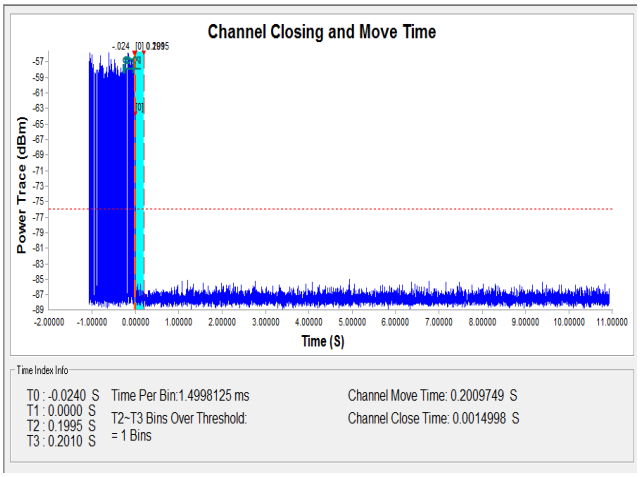
Channel Move Time and Channel Closing Transmission Time	
	
Non-Occupancy Period	
	

Parameter	Test Result	Limit
Channel Move Time (s)	0.465s	<10s
Channel Closing Transmission Time (ms) (Note)	7.5ms	< 60ms
Non-Occupancy Period (min)	≥ 30min	≥ 30 min
Note: 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 a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 seconds period. The aggregate duration of control signals will not count quiet periods in between transmissions.		

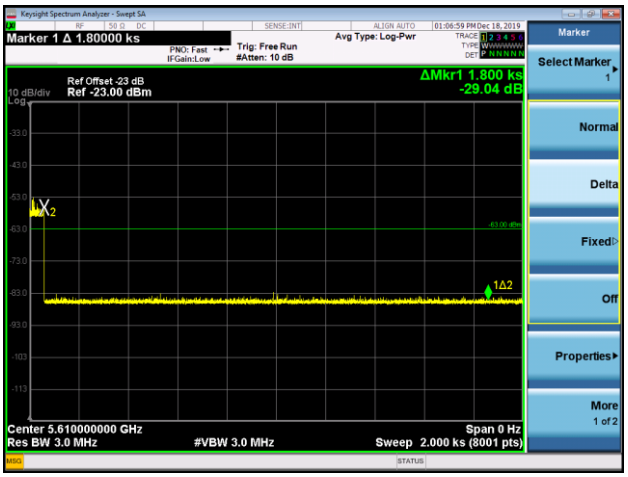
Product	OmniAccess Stellar	Temperature	25°C
Test Engineer	Amy Zhang	Relative Humidity	52%
Test Site	SR4	Test Date	2019/12/18
Model No.	OAW-AP1361D		
Test Item	Channel Move Time and Channel Closing Transmission Time (802.11ax-HE80 + 80 mode - 5610MHz)		

Channel Move Time and Channel Closing Transmission Time





Non-Occupancy Period



Parameter	Test Result	Limit
Channel Move Time (s)	0.201s	<10s
Channel Closing Transmission Time (ms) (Note)	1.5ms	< 60ms
Non-Occupancy Period (min)	≥ 30min	≥ 30 min
Note: 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 a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 seconds period. The aggregate duration of control signals will not count quiet periods in between transmissions.		

5.8. Statistical Performance Check Measurement

5.8.1. Test Limit

The minimum percentage of successful detection requirements found in below table when a radar burst with a level equal to the DFS Detection Threshold + 1dB is generated on the Operating Channel of the U-NII device (In- Service Monitoring).

Radar Type	Minimum Number of Trails	Detection Probability
0	30	Pd > 60%
1	30(15 of test A and 15 of test B)	Pd > 60%
2	30	Pd > 60%
3	30	Pd > 60%
4	30	Pd > 60%
Aggregate (Radar Types 1-4)	120	Pd > 80%
5	30	Pd > 80%
6	30	Pd > 70%
Note: The percentage of successful detection is calculated by: (Total Waveform Detections / Total Waveform Trails) * 100 = Probability of Detection Radar Waveform In addition an aggregate minimum percentage of successful detection across all Short Pulse Radar Types 1-4 is required and is calculated as follows: (Pd1 + Pd2 + Pd3 + Pd4) / 4.		

5.8.2. Test Procedure

1. Stream the MPEG test file from the Master Device to the Client Device on the test Channel for the entire period of the test.
2. At time T0 the Radar Waveform generator sends the individual waveform for each of the Radar Types 1-6, at levels equal to the DFS Detection Threshold + 1dB, on the Operating Channel.
3. Observe the transmissions of the EUT at the end of the Burst on the Operating Channel for duration greater than 10 seconds for Short Pulse Radar Types 0 to ensure detection occurs.
4. Observe the transmissions of the EUT at the end of the Burst on the Operating Channel for duration greater than 22 seconds for Long Pulse Radar Type 5 to ensure detection occurs.
5. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trial runs.
6. The Minimum number of trails, minimum percentage of successful detection and the average minimum percentage of successful detection are found in below table.

5.8.3. Test Result

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Amy Zhang	Relative Humidity	50 ~ 56%
Test Site	SR4	Test Date	2019/12/12 ~ 2019/12/22
Model No.	OAW-AP1361D		
Test Item	Radar Statistical Performance Check (802.11ax-HE20 mode - 5500MHz)		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490	1	578	92	1
2	5490	1	538	99	1
3	5490	1	558	95	1
4	5490	1	858	62	1
5	5490	1	678	78	1
6	5490	1	3066	18	1
7	5490	1	898	59	1
8	5490	1	758	70	1
9	5490	1	618	86	1
10	5490	1	738	72	1
11	5500.	1	798	67	1
12	5500.	1	698	76	1
13	5500.	1	838	63	1
14	5500.	1	518	102	1
15	5500.	1	658	81	1
16	5500.	1	1858	29	1
17	5500.	1	601	88	1
18	5500.	1	2207	24	1
19	5500.	1	1626	33	1
20	5500.	1	2492	22	1
21	5510	1	889	60	1
22	5510	1	796	67	1
23	5510	1	2237	24	1
24	5510	1	1546	35	1
25	5510	1	1856	29	1
26	5510	1	2701	20	1
27	5510	1	1756	31	1

28	5510	1	2089	26	1
29	5510	1	1068	50	1
30	5510	1	730	73	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490	2.4	221	29	1
2	5490	4.8	154	24	1
3	5490	2.4	222	26	1
4	5490	2.1	154	23	1
5	5490	3.2	215	26	1
6	5490	1.5	188	28	1
7	5490	1.0	194	24	1
8	5490	2.8	185	29	1
9	5490	3.6	181	28	1
10	5490	4.7	168	23	1
11	5500.	2.3	164	25	1
12	5500.	3.1	200	23	1
13	5500.	4.9	214	25	1
14	5500.	3.0	209	25	1
15	5500.	1.2	177	27	1
16	5500.	4.8	224	25	1
17	5500.	3.7	174	27	1
18	5500.	4.9	187	26	1
19	5500.	2.7	158	26	1
20	5500.	4.3	217	27	1
21	5510	2.4	155	26	1
22	5510	3.5	216	25	1
23	5510	1.1	226	27	1
24	5510	1.3	178	28	1
25	5510	2.6	225	25	1
26	5510	3.8	151	23	1
27	5510	1.9	181	23	1
28	5510	1.7	205	23	1
29	5510	4.1	186	28	1
30	5510	2.0	196	25	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490	6.4	320	17	1
2	5490	7.2	359	16	1
3	5490	8.9	376	17	1
4	5490	7.5	286	17	1
5	5490	7.1	463	17	1
6	5490	8.0	498	18	1
7	5490	7.2	440	17	1
8	5490	8.4	361	17	1
9	5490	8.0	450	17	1
10	5490	9.4	416	17	1
11	5500.	9.6	444	18	1
12	5500.	9.6	457	17	1
13	5500.	7.6	313	16	1
14	5500.	8.7	313	16	1
15	5500.	8.5	405	18	1
16	5500.	6.7	386	16	1
17	5500.	6.9	299	16	1
18	5500.	7.0	479	17	1
19	5500.	8.3	498	18	1
20	5500.	6.9	381	17	1
21	5510	7.3	462	18	1
22	5510	9.6	438	16	1
23	5510	8.1	446	16	1
24	5510	9.3	267	16	1
25	5510	7.3	360	18	1
26	5510	6.8	304	16	1
27	5510	9.3	338	16	1
28	5510	10.0	404	17	1
29	5510	8.4	464	16	1
30	5510	9.3	422	17	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490	14.1	278	12	1
2	5490	13.6	424	14	1
3	5490	13.1	408	16	1
4	5490	15.2	491	15	1
5	5490	18.3	330	14	1
6	5490	13.1	341	15	1
7	5490	13.7	367	12	1
8	5490	17.1	464	12	1
9	5490	15.8	258	14	1
10	5490	11.5	415	13	1
11	5500.	17.4	262	14	1
12	5500.	18.7	404	15	1
13	5500.	20.0	366	14	1
14	5500.	12.1	392	16	1
15	5500.	16.3	396	13	1
16	5500.	17.4	292	14	1
17	5500.	15.5	306	12	1
18	5500.	18.1	488	14	1
19	5500.	17.2	440	12	1
20	5500.	11.3	465	12	1
21	5510	15.8	439	13	1
22	5510	19.9	346	16	1
23	5510	13.9	480	12	1
24	5510	13.0	463	13	1
25	5510	15.3	400	14	1
26	5510	13.6	252	12	1
27	5510	15.3	263	15	1
28	5510	19.6	493	15	1
29	5510	16.1	388	16	1
30	5510	11.0	494	15	1
Detection Percentage (%)					100%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test waveforms is as follows: $\frac{P_d1+P_d2+P_d3+P_d4}{4}$ = (100%+100%+100%+100%)/4 = 100% (>80%)

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5500.0	1	16	5497.2	1
2	5500.0	1	17	5496.8	1
3	5500.0	1	18	5495.6	1
4	5500.0	1	19	5498.0	1
5	5500.0	1	20	5498.0	1
6	5500.0	1	21	5503.6	1
7	5500.0	1	22	5506.8	1
8	5500.0	1	23	5507.2	1
9	5500.0	1	24	5505.2	1
10	5500.0	1	25	5504.4	1
11	5494.8	1	26	5502.0	1
12	5496.0	1	27	5508.0	1
13	5496.4	1	28	5504.4	1
14	5494.8	1	29	5505.2	1
15	5496.8	1	30	5502.0	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5490	1	16	5500	1
2	5490	1	17	5500	1
3	5490	1	18	5500	1
4	5490	1	19	5500	1
5	5490	1	20	5500	1
6	5490	1	21	5510	1
7	5490	1	22	5510	1
8	5490	1	23	5510	1
9	5490	1	24	5510	1
10	5490	1	25	5510	1
11	5500	1	26	5510	1
12	5500	1	27	5510	1
13	5500	1	28	5510	1
14	5500	1	29	5510	1
15	5500	1	30	5510	1
Detection Percentage (%)					100%

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Amy Zhang	Relative Humidity	50 ~ 56%
Test Site	SR4	Test Date	2019/12/12 ~ 2019/12/22
Model No.	OAW-AP1361D		
Test Item	Radar Statistical Performance Check (802.11ax-HE40 mode - 5510MHz)		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491	1	918	58	1
2	5491	1	618	86	1
3	5491	1	778	68	1
4	5491	1	658	81	1
5	5500	1	638	83	1
6	5500	1	898	59	1
7	5500	1	698	76	1
8	5500	1	798	67	1
9	5509	1	878	61	1
10	5509	1	718	74	1
11	5509	1	838	63	1
12	5509	1	3066	18	1
13	5510	1	938	57	1
14	5510	1	678	78	1
15	5510	1	538	99	1
16	5510	1	1795	30	1
17	5510	1	1462	37	1
18	5510	1	2885	19	1
19	5511	1	2903	19	1
20	5511	1	1003	53	1
21	5511	1	2041	26	1
22	5511	1	2380	23	1
23	5520	1	1269	42	1
24	5520	1	554	96	1
25	5520	1	1743	31	1
26	5520	1	905	59	1
27	5529	1	1292	41	1
28	5529	1	3056	18	1

29	5529	1	1820	29	1
30	5529	1	2973	18	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491	1.6	222	28	1
2	5491	1.8	221	24	1
3	5491	3.2	220	24	1
4	5491	4.2	176	28	1
5	5500	1.8	176	26	1
6	5500	4.5	165	23	1
7	5500	3.2	220	29	1
8	5500	3.0	228	23	1
9	5509	3.6	204	24	1
10	5509	4.3	175	28	1
11	5509	2.5	188	27	1
12	5509	4.9	197	24	1
13	5510	3.4	167	23	1
14	5510	4.2	191	25	1
15	5510	4.0	191	29	1
16	5510	2.4	196	25	1
17	5510	3.4	198	27	1
18	5510	1.3	208	25	1
19	5511	3.1	176	28	1
20	5511	3.4	157	27	1
21	5511	3.2	216	26	1
22	5511	1.4	167	28	1
23	5520	3.5	228	28	1
24	5520	4.3	218	29	1
25	5520	1.2	227	29	1
26	5520	2.2	173	26	1
27	5529	2.4	178	27	1
28	5529	2.1	201	29	1
29	5529	3.0	213	26	1
30	5529	2.6	160	24	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491	9.6	417	18	1
2	5491	7.1	334	17	1
3	5491	6.6	270	17	1
4	5491	8.0	354	17	1
5	5500	6.0	491	17	1
6	5500	8.7	479	16	1
7	5500	9.9	266	16	1
8	5500	7.1	401	18	1
9	5509	9.7	322	16	1
10	5509	10.0	273	16	1
11	5509	6.1	252	18	1
12	5509	7.1	448	18	1
13	5510	7.9	467	17	1
14	5510	6.8	403	18	1
15	5510	6.9	393	16	1
16	5510	7.5	408	17	1
17	5510	6.0	350	16	1
18	5510	7.5	459	18	1
19	5511	6.6	338	18	1
20	5511	6.2	335	18	1
21	5511	9.9	291	18	1
22	5511	7.3	335	18	1
23	5520	8.6	366	17	1
24	5520	8.8	303	17	1
25	5520	8.1	307	16	1
26	5520	9.4	339	18	1
27	5529	9.4	262	16	1
28	5529	8.0	489	17	1
29	5529	6.7	461	16	1
30	5529	7.7	445	18	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491	13.2	256	14	1
2	5491	17.7	429	15	1
3	5491	13.0	404	16	1
4	5491	14.7	335	13	1
5	5500	11.1	498	14	1
6	5500	18.2	324	14	1
7	5500	11.9	285	15	1
8	5500	14.7	325	13	1
9	5509	11.4	366	12	1
10	5509	18.9	356	15	1
11	5509	17.4	337	15	1
12	5509	18.9	384	14	1
13	5510	11.9	487	14	1
14	5510	14.5	376	13	1
15	5510	16.1	315	13	1
16	5510	19.9	338	13	1
17	5510	11.1	426	14	1
18	5510	13.8	483	13	1
19	5511	18.7	381	16	1
20	5511	13.1	277	13	1
21	5511	18.5	328	12	1
22	5511	19.4	331	12	1
23	5520	16.7	416	15	1
24	5520	13.4	464	12	1
25	5520	14.5	436	13	1
26	5520	12.2	443	13	1
27	5529	15.2	473	15	1
28	5529	15.4	500	12	1
29	5529	18.9	406	14	1
30	5529	18.0	254	16	1
Detection Percentage (%)					100%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test waveforms is as follows: $\frac{P_d1+P_d2+P_d3+P_d4}{4}$ = (100%+100%+100%+100%)/4 = 100% (>80%)

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5510.0	1	16	5497.0	1
2	5510.0	1	17	5493.0	1
3	5510.0	1	18	5495.0	1
4	5510.0	1	19	5496.6	1
5	5510.0	1	20	5497.4	1
6	5510.0	1	21	5523.4	1
7	5510.0	1	22	5523.4	1
8	5510.0	1	23	5523.0	1
9	5510.0	1	24	5525.0	1
10	5510.0	1	25	5526.2	1
11	5499.0	1	26	5524.6	1
12	5495.8	1	27	5526.6	1
13	5493.0	1	28	5525.8	1
14	5499.0	1	29	5524.6	1
15	5494.2	1	30	5526.2	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5491	1	16	5510	1
2	5491	1	17	5510	1
3	5491	1	18	5510	1
4	5491	1	19	5511	1
5	5500	1	20	5511	1
6	5500	1	21	5511	1
7	5500	1	22	5511	1
8	5500	1	23	5520	1
9	5509	1	24	5520	1
10	5509	1	25	5520	1
11	5509	1	26	5520	1
12	5509	1	27	5529	1
13	5510	1	28	5529	1
14	5510	1	29	5529	1
15	5510	1	30	5529	1
Detection Percentage (%)					100%

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Amy Zhang	Relative Humidity	50 ~ 56%
Test Site	SR4	Test Date	2019/12/12 ~ 2019/12/22
Model No.	OAW-AP1361D		
Test Item	Radar Statistical Performance Check (802.11ax-HE80 mode – 5530MHz)		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491	1	618	86	1
2	5491	1	698	76	1
3	5500	1	838	63	1
4	5500	1	678	78	1
5	5509	1	718	74	1
6	5509	1	3066	18	1
7	5510	1	878	61	1
8	5510	1	938	57	1
9	5511	1	858	62	1
10	5511	1	598	89	1
11	5520	1	738	72	1
12	5520	1	538	99	1
13	5529	1	758	70	1
14	5529	1	558	95	1
15	5530	1	518	102	1
16	5530	1	1999	27	1
17	5531	1	754	70	1
18	5531	1	2612	21	1
19	5540	1	1089	49	1
20	5540	1	1903	28	1
21	5549	1	2062	26	1
22	5549	1	1935	28	1
23	5550	1	1176	45	1
24	5550	1	1781	30	1
25	5551	1	740	72	1
26	5551	1	2581	21	1
27	5560	1	840	63	1
28	5560	1	1873	29	1

29	5569	1	2586	21	1
30	5569	1	1153	46	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491	3.2	151	26	1
2	5491	1.8	193	24	1
3	5500	3.4	213	25	1
4	5500	2.3	197	25	1
5	5509	2.7	169	29	1
6	5509	2.8	223	26	1
7	5510	3.2	207	23	1
8	5510	2.1	176	23	1
9	5511	3.2	153	28	1
10	5511	2.0	202	27	1
11	5520	3.0	220	24	1
12	5520	4.9	210	23	1
13	5529	2.2	227	24	1
14	5529	4.1	216	29	1
15	5530	1.1	182	29	1
16	5530	2.8	211	25	1
17	5531	1.3	222	26	1
18	5531	2.2	167	25	1
19	5540	3.8	199	26	1
20	5540	4.4	163	24	1
21	5549	4.9	180	26	1
22	5549	4.2	219	29	1
23	5550	2.6	230	27	1
24	5550	4.7	155	29	1
25	5551	2.6	202	26	1
26	5551	4.9	230	25	1
27	5560	1.5	181	26	1
28	5560	2.8	201	26	1
29	5569	2.9	185	29	1
30	5569	1.8	185	24	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491	6.4	309	16	1
2	5491	9.2	382	18	1
3	5500	8.1	257	17	1
4	5500	7.7	392	16	1
5	5509	9.9	493	18	1
6	5509	6.7	303	18	1
7	5510	8.4	301	17	1
8	5510	6.7	403	18	1
9	5511	7.5	485	16	1
10	5511	8.8	307	18	1
11	5520	6.4	334	16	1
12	5520	8.8	307	16	1
13	5529	7.7	470	18	1
14	5529	7.7	312	16	1
15	5530	8.2	382	18	1
16	5530	8.1	416	18	1
17	5531	7.0	257	16	1
18	5531	6.4	340	18	1
19	5540	8.0	486	17	1
20	5540	7.6	447	18	1
21	5549	7.6	303	17	1
22	5549	6.7	429	18	1
23	5550	6.0	361	17	1
24	5550	9.3	403	16	1
25	5551	6.7	486	18	1
26	5551	6.8	433	16	1
27	5560	8.2	376	16	1
28	5560	9.2	344	17	1
29	5569	6.7	309	18	1
30	5569	8.3	329	16	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491	13.0	491	16	1
2	5491	15.7	391	14	1
3	5500	14.3	315	15	1
4	5500	19.8	408	14	1
5	5509	16.3	284	14	1
6	5509	18.5	289	16	1
7	5510	12.3	349	15	1
8	5510	15.5	451	14	1
9	5511	12.1	455	13	1
10	5511	18.2	459	16	1
11	5520	16.7	421	14	1
12	5520	15.7	466	15	1
13	5529	18.7	448	15	1
14	5529	13.1	363	12	1
15	5530	15.2	436	13	1
16	5530	14.8	376	14	1
17	5531	20.0	340	15	1
18	5531	14.1	323	15	1
19	5540	16.2	254	13	1
20	5540	11.0	443	13	1
21	5549	17.7	341	15	1
22	5549	14.8	280	16	1
23	5550	18.4	496	13	1
24	5550	14.7	328	12	1
25	5551	19.5	465	15	1
26	5551	11.7	481	16	1
27	5560	14.6	315	12	1
28	5560	15.3	305	16	1
29	5569	17.9	464	12	1
30	5569	11.2	430	13	1
Detection Percentage (%)					100%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test waveforms is as follows: $\frac{P_d1+P_d2+P_d3+P_d4}{4}$ = (100%+100%+100%+100%)/4 = 100% (>80%)

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5530.0	1	16	5497.8	1
2	5530.0	1	17	5497.4	1
3	5530.0	1	18	5493.4	1
4	5530.0	1	19	5496.6	1
5	5530.0	1	20	5497.8	1
6	5530.0	1	21	5563.4	1
7	5530.0	1	22	5565.8	1
8	5530.0	1	23	5562.6	1
9	5530.0	1	24	5566.2	1
10	5530.0	1	25	5561.8	1
11	5495.0	1	26	5562.6	1
12	5497.0	1	27	5565.4	1
13	5496.2	1	28	5566.2	1
14	5493.0	1	29	5565.0	1
15	5497.8	1	30	5564.2	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5491	1	16	5530	1
2	5491	1	17	5531	1
3	5500	1	18	5531	1
4	5500	1	19	5540	1
5	5509	1	20	5540	1
6	5509	1	21	5549	1
7	5510	1	22	5549	1
8	5510	1	23	5550	1
9	5511	1	24	5550	1
10	5511	1	25	5551	1
11	5520	1	26	5551	1
12	5520	1	27	5560	1
13	5529	1	28	5560	1
14	5529	1	29	5569	1
15	5530	1	30	5569	1
Detection Percentage (%)					100%

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Amy Zhang	Relative Humidity	50 ~ 56%
Test Site	SR4	Test Date	2019/12/12 ~ 2019/12/22
Model No.	OAW-AP1361D		
Test Item	Radar Statistical Performance Check (802.11ax-HE80 + 80 mode - 5290MHz)		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5250	1	818	65	1
2	5250	1	798	67	1
3	5260	1	898	59	1
4	5260	1	598	89	1
5	5269	1	938	57	1
6	5269	1	858	62	1
7	5270	1	558	95	1
8	5270	1	638	83	1
9	5271	1	758	70	1
10	5271	1	538	99	1
11	5280	1	518	102	1
12	5280	1	578	92	1
13	5289	1	918	58	1
14	5289	1	778	68	1
15	5290	1	658	81	1
16	5290	1	2377	23	1
17	5291	1	1674	32	1
18	5291	1	2899	19	1
19	5300	1	2145	25	1
20	5300	1	2834	19	1
21	5309	1	1220	44	1
22	5309	1	1235	43	1
23	5310	1	2221	24	1
24	5310	1	797	67	1
25	5311	1	990	54	1
26	5311	1	3052	18	1
27	5320	1	2547	21	1
28	5320	1	1311	41	1

29	5329	1	1132	47	1
30	5329	1	1607	33	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5250	1.0	192	26	1
2	5250	4.8	198	27	1
3	5260	4.6	151	29	1
4	5260	4.3	205	23	1
5	5269	1.9	203	25	1
6	5269	1.8	213	23	1
7	5270	2.6	151	23	1
8	5270	1.5	178	23	1
9	5271	2.9	166	26	1
10	5271	2.7	173	26	1
11	5280	3.5	189	23	1
12	5280	4.6	204	29	1
13	5289	2.9	222	25	1
14	5289	3.4	220	25	1
15	5290	1.8	223	23	1
16	5290	3.9	206	23	1
17	5291	4.4	167	27	1
18	5291	2.0	152	24	1
19	5300	1.4	179	28	1
20	5300	3.3	182	23	1
21	5309	3.1	158	29	1
22	5309	1.9	168	29	1
23	5310	1.0	208	24	1
24	5310	4.9	218	27	1
25	5311	3.1	206	23	1
26	5311	2.3	187	25	1
27	5320	4.9	150	29	1
28	5320	4.3	209	25	1
29	5329	1.9	154	26	1
30	5329	3.7	227	24	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5250	7.5	280	16	1
2	5250	6.8	382	18	1
3	5260	7.5	359	18	1
4	5260	9.0	315	17	1
5	5269	9.3	457	18	1
6	5269	10.0	363	16	1
7	5270	8.1	260	17	1
8	5270	7.1	326	16	1
9	5271	6.9	287	18	1
10	5271	7.1	279	16	1
11	5280	9.0	281	17	1
12	5280	9.1	344	16	1
13	5289	7.8	405	18	1
14	5289	7.9	425	17	1
15	5290	8.2	466	18	1
16	5290	6.6	358	18	1
17	5291	6.4	492	17	1
18	5291	6.0	496	18	1
19	5300	7.5	342	16	1
20	5300	6.1	359	18	1
21	5309	7.5	491	18	1
22	5309	7.6	299	18	1
23	5310	9.3	327	16	1
24	5310	9.6	338	16	1
25	5311	6.4	255	17	1
26	5311	7.9	308	17	1
27	5320	8.8	381	18	1
28	5320	6.2	389	16	1
29	5329	6.1	278	17	1
30	5329	6.9	283	16	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5250	17.1	329	14	1
2	5250	18.2	355	16	1
3	5260	13.5	468	13	1
4	5260	14.1	455	14	1
5	5269	15.6	344	14	1
6	5269	13.9	252	14	1
7	5270	14.8	368	12	1
8	5270	18.9	329	14	1
9	5271	14.7	308	16	1
10	5271	15.4	257	14	1
11	5280	13.9	472	13	1
12	5280	19.2	344	15	1
13	5289	14.1	393	13	1
14	5289	14.5	352	16	1
15	5290	19.8	398	16	1
16	5290	18.7	311	15	1
17	5291	19.6	363	13	1
18	5291	15.6	340	16	1
19	5300	14.9	484	14	1
20	5300	15.5	331	12	1
21	5309	11.3	479	14	1
22	5309	14.2	499	13	1
23	5310	11.6	393	15	1
24	5310	19.8	379	14	1
25	5311	13.3	340	15	1
26	5311	11.9	323	14	1
27	5320	16.5	397	14	1
28	5320	17.1	265	15	1
29	5329	16.8	460	12	1
30	5329	19.6	329	14	1
Detection Percentage (%)					100%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test waveforms is as follows: $\frac{P_d1+P_d2+P_d3+P_d4}{4}$ = (100%+100%+100%+100%)/4 = 100% (>80%)

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5290.0	1	16	5253.2	1
2	5290.0	1	17	5255.2	1
3	5290.0	1	18	5257.6	1
4	5290.0	1	19	5257.2	1
5	5290.0	1	20	5255.2	1
6	5290.0	1	21	5324.6	1
7	5290.0	1	22	5323.0	1
8	5290.0	1	23	5323.4	1
9	5290.0	1	24	5325.4	1
10	5290.0	1	25	5324.6	1
11	5255.2	1	26	5325.8	1
12	5256.8	1	27	5324.2	1
13	5254.8	1	28	5322.6	1
14	5254.8	1	29	5325.4	1
15	5257.2	1	30	5323.4	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5250	1	16	5290	1
2	5250	1	17	5291	1
3	5260	1	18	5291	1
4	5260	1	19	5300	1
5	5269	1	20	5300	1
6	5269	1	21	5309	1
7	5270	1	22	5309	1
8	5270	1	23	5310	1
9	5271	1	24	5310	1
10	5271	1	25	5311	1
11	5280	1	26	5311	1
12	5280	1	27	5320	1
13	5289	1	28	5320	1
14	5289	1	29	5329	1
15	5290	1	30	5329	1
Detection Percentage (%)					100%

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Amy Zhang	Relative Humidity	50 ~ 56%
Test Site	SR4	Test Date	2019/12/12 ~ 2019/12/22
Model No.	OAW-AP1361D		
Test Item	Radar Statistical Performance Check (802.11ax-HE80 + 80 mode - 5530MHz)		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491	1	658	81	1
2	5491	1	578	92	1
3	5500	1	558	95	1
4	5500	1	798	67	1
5	5509	1	678	78	1
6	5509	1	818	65	1
7	5510	1	718	74	1
8	5510	1	698	76	1
9	5511	1	898	59	1
10	5511	1	918	58	1
11	5520	1	778	68	1
12	5520	1	3066	18	1
13	5529	1	838	63	1
14	5529	1	638	83	1
15	5530	1	738	72	1
16	5530	1	2295	23	1
17	5531	1	1496	36	1
18	5531	1	2764	20	1
19	5540	1	1843	29	1
20	5540	1	2020	27	1
21	5549	1	1201	44	1
22	5549	1	2030	26	1
23	5550	1	1605	33	1
24	5550	1	616	86	1
25	5551	1	3050	18	1
26	5551	1	2174	25	1
27	5560	1	2401	22	1
28	5560	1	2117	25	1

29	5570	1	2039	26	1
30	5570	1	1967	27	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491	2.8	212	27	1
2	5491	4.0	164	28	1
3	5500	3.9	156	29	1
4	5500	4.4	162	26	1
5	5509	4.7	178	23	1
6	5509	4.8	188	26	1
7	5510	2.2	216	29	1
8	5510	3.8	206	24	1
9	5511	3.5	164	24	1
10	5511	1.0	213	28	1
11	5520	3.2	215	26	1
12	5520	1.9	212	27	1
13	5529	1.7	216	25	1
14	5529	3.8	215	23	1
15	5530	1.7	191	26	1
16	5530	5.0	190	24	1
17	5531	2.5	176	24	1
18	5531	3.1	191	25	1
19	5540	3.0	204	25	1
20	5540	2.9	174	28	1
21	5549	2.9	204	29	1
22	5549	1.1	204	26	1
23	5550	2.1	190	23	1
24	5550	1.1	214	27	1
25	5551	2.6	220	23	1
26	5551	2.6	157	25	1
27	5560	1.9	206	23	1
28	5560	4.1	194	24	1
29	5570	3.2	153	27	1
30	5570	2.9	186	24	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491	6.1	345	17	1
2	5491	6.8	495	17	1
3	5500	6.1	265	18	1
4	5500	8.5	428	16	1
5	5509	7.4	271	16	1
6	5509	7.6	477	18	1
7	5510	8.4	284	16	1
8	5510	6.4	475	17	1
9	5511	7.8	356	18	1
10	5511	8.6	327	18	1
11	5520	7.2	436	18	1
12	5520	8.1	358	16	1
13	5529	6.8	488	18	1
14	5529	7.8	272	18	1
15	5530	7.4	454	17	1
16	5530	7.9	368	16	1
17	5531	7.4	394	17	1
18	5531	7.7	343	16	1
19	5540	8.7	453	17	1
20	5540	7.8	429	18	1
21	5549	7.9	466	17	1
22	5549	8.7	486	16	1
23	5550	9.1	290	17	1
24	5550	9.9	340	16	1
25	5551	7.3	494	18	1
26	5551	6.5	494	18	1
27	5560	8.9	260	16	1
28	5560	7.1	286	16	1
29	5570	8.8	472	18	1
30	5570	9.6	298	17	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491	14.9	364	12	1
2	5491	18.8	303	13	1
3	5500	18.9	413	13	1
4	5500	16.0	473	16	1
5	5509	15.0	379	14	1
6	5509	16.5	476	12	1
7	5510	13.1	373	16	1
8	5510	12.7	385	16	1
9	5511	13.3	490	13	1
10	5511	16.7	334	12	1
11	5520	12.3	490	14	1
12	5520	14.7	424	15	1
13	5529	11.9	407	13	1
14	5529	15.8	297	15	1
15	5530	17.8	419	15	1
16	5530	16.5	451	12	1
17	5531	14.3	349	12	1
18	5531	17.0	269	16	1
19	5540	12.4	383	14	1
20	5540	16.6	495	15	1
21	5549	16.7	250	16	1
22	5549	12.9	471	16	1
23	5550	17.1	331	16	1
24	5550	12.6	470	12	1
25	5551	17.1	383	12	1
26	5551	13.0	382	14	1
27	5560	17.4	346	16	1
28	5560	19.7	411	12	1
29	5570	18.7	377	13	1
30	5570	15.9	410	16	1
Detection Percentage (%)					100%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test waveforms is as follows: $\frac{P_d1+P_d2+P_d3+P_d4}{4}$ = (100%+100%+100%+100%)/4 = 100% (>80%)

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5530.0	1	16	5493.8	1
2	5530.0	1	17	5496.2	1
3	5530.0	1	18	5493.0	1
4	5530.0	1	19	5493.4	1
5	5530.0	1	20	5493.8	1
6	5530.0	1	21	5565.6	1
7	5530.0	1	22	5566.8	1
8	5530.0	1	23	5565.2	1
9	5530.0	1	24	5565.6	1
10	5530.0	1	25	5567.6	1
11	5494.2	1	26	5563.2	1
12	5494.2	1	27	5562.0	1
13	5497.4	1	28	5562.8	1
14	5493.0	1	29	5562.4	1
15	5498.6	1	30	5567.6	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5491	1	16	5530	1
2	5491	1	17	5531	1
3	5500	1	18	5531	1
4	5500	1	19	5540	1
5	5509	1	20	5540	1
6	5509	1	21	5549	1
7	5510	1	22	5549	1
8	5510	1	23	5550	1
9	5511	1	24	5550	1
10	5511	1	25	5551	1
11	5520	1	26	5551	1
12	5520	1	27	5560	1
13	5529	1	28	5560	1
14	5529	1	29	5570	1
15	5530	1	30	5570	1
Detection Percentage (%)					100%

Product	OmniAccess Stellar	Temperature	23 ~ 25°C
Test Engineer	Amy Zhang	Relative Humidity	50 ~ 56%
Test Site	SR4	Test Date	2019/12/12 ~ 2019/12/22
Model No.	OAW-AP1361D		
Test Item	Radar Statistical Performance Check (802.11ax-HE80 + 80 mode - 5610MHz)		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5570	1	758	70	1
2	5570	1	598	89	1
3	5580	1	858	62	1
4	5580	1	518	102	1
5	5589	1	618	86	1
6	5589	1	538	99	1
7	5590	1	878	61	1
8	5590	1	698	76	1
9	5591	1	578	92	1
10	5591	1	718	74	1
11	5600	1	658	81	1
12	5600	1	778	68	1
13	5609	1	918	58	1
14	5609	1	838	63	1
15	5610	1	738	72	1
16	5610	1	2461	22	1
17	5611	1	1454	37	1
18	5611	1	2285	24	1
19	5620	1	2542	21	1
20	5620	1	3039	18	1
21	5629	1	2456	22	1
22	5629	1	2015	27	1
23	5630	1	2517	21	1
24	5630	1	1162	46	1
25	5631	1	1573	34	1
26	5631	1	728	73	1
27	5640	1	1852	29	1
28	5640	1	1481	36	1

29	5649	1	1896	28	1
30	5649	1	2512	22	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5570	3.1	209	27	1
2	5570	3.8	163	24	1
3	5580	1.8	210	25	1
4	5580	3.3	200	24	1
5	5589	5.0	159	29	1
6	5589	2.5	180	27	1
7	5590	4.7	213	26	1
8	5590	4.5	210	25	1
9	5591	1.9	173	26	1
10	5591	3.3	222	27	1
11	5600	3.6	173	27	1
12	5600	3.1	182	25	1
13	5609	3.4	175	28	1
14	5609	3.5	182	29	1
15	5610	3.5	186	27	1
16	5610	2.8	197	27	1
17	5611	4.8	191	25	1
18	5611	1.0	158	29	1
19	5620	1.0	184	23	1
20	5620	2.2	171	28	1
21	5629	4.0	203	29	1
22	5629	4.4	204	29	1
23	5630	1.0	223	23	1
24	5630	4.1	182	25	1
25	5631	4.8	199	23	1
26	5631	1.2	196	24	1
27	5640	3.4	219	28	1
28	5640	4.3	195	27	1
29	5649	1.4	215	25	1
30	5649	2.2	173	26	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5570	7.7	409	16	1
2	5570	7.0	303	17	1
3	5580	6.8	424	18	1
4	5580	7.4	380	17	1
5	5589	6.2	414	16	1
6	5589	6.3	481	17	1
7	5590	8.4	315	17	1
8	5590	8.4	451	16	1
9	5591	6.0	491	17	1
10	5591	6.9	434	16	1
11	5600	7.5	250	18	1
12	5600	9.6	327	16	1
13	5609	6.3	489	18	1
14	5609	9.0	466	18	1
15	5610	9.0	464	16	1
16	5610	9.5	429	18	1
17	5611	9.0	266	18	1
18	5611	6.7	368	18	1
19	5620	9.4	445	17	1
20	5620	8.5	413	16	1
21	5629	8.1	412	16	1
22	5629	7.3	433	17	1
23	5630	8.3	457	17	1
24	5630	8.2	398	18	1
25	5631	8.9	430	17	1
26	5631	8.0	377	16	1
27	5640	8.6	366	17	1
28	5640	8.3	396	17	1
29	5649	7.5	418	18	1
30	5649	6.5	495	17	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5570	17.4	416	15	1
2	5570	16.9	450	13	1
3	5580	12.1	453	16	1
4	5580	17.9	367	14	1
5	5589	15.0	289	16	1
6	5589	16.7	459	16	1
7	5590	19.2	447	16	1
8	5590	13.3	499	15	1
9	5591	14.5	286	12	1
10	5591	15.4	428	15	1
11	5600	16.6	455	16	1
12	5600	11.7	268	14	1
13	5609	11.7	472	13	1
14	5609	15.1	472	15	1
15	5610	19.2	370	12	1
16	5610	13.7	386	14	1
17	5611	11.8	495	13	1
18	5611	17.0	353	14	1
19	5620	19.2	390	14	1
20	5620	12.1	479	14	1
21	5629	11.4	327	14	1
22	5629	17.8	278	12	1
23	5630	19.4	326	14	1
24	5630	20.0	335	12	1
25	5631	16.5	423	16	1
26	5631	14.7	341	14	1
27	5640	12.7	371	16	1
28	5640	14.4	311	16	1
29	5649	13.1	296	12	1
30	5649	12.2	443	13	1
Detection Percentage (%)					100%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test waveforms is as follows: $\frac{P_d1+P_d2+P_d3+P_d4}{4}$ = (100%+100%+100%+100%)/4 = 100% (>80%)

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5610.0	1	16	5574.8	1
2	5610.0	1	17	5576.8	1
3	5610.0	1	18	5576.0	1
4	5610.0	1	19	5576.0	1
5	5610.0	1	20	5576.8	1
6	5610.0	1	21	5645.0	1
7	5610.0	1	22	5643.4	1
8	5610.0	1	23	5647.0	1
9	5610.0	1	24	5646.2	1
10	5610.0	1	25	5643.4	1
11	5576.0	1	26	5645.8	1
12	5574.8	1	27	5644.6	1
13	5578.0	1	28	5646.6	1
14	5575.2	1	29	5645.0	1
15	5572.8	1	30	5641.0	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5570	1	16	5610	1
2	5570	1	17	5611	1
3	5580	1	18	5611	1
4	5580	1	19	5620	1
5	5589	1	20	5620	1
6	5589	1	21	5629	1
7	5590	1	22	5629	1
8	5590	1	23	5630	1
9	5591	1	24	5630	1
10	5591	1	25	5631	1
11	5600	1	26	5631	1
12	5600	1	27	5640	1
13	5609	1	28	5640	1
14	5609	1	29	5649	1
15	5610	1	30	5649	1
Detection Percentage (%)					100%

6. CONCLUSION

The data collected relate only the item(s) tested and show that the unit is compliance with FCC Rules Rule.

The End

Appendix A - Test Setup Photograph

Refer to “1912RSU073-UT” file.

Appendix B - EUT Photograph

Refer to “1912RSU073-UE” file.