DFS MEASUREMENT REPORT

FCC PART 15 Subpart E

FCC ID:	2AI9TOAW-AP132X
APPLICANT:	ALE USA INC.
Application Type:	Certification
Product:	OmniAccess Stellar
Model No.:	OAW-AP1321, OAW-AP1322
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:	September 30 ~ December 13, 2019

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.
The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
1912RSU023-U7	Rev. 01	Initial Report	02-24-2020	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.**

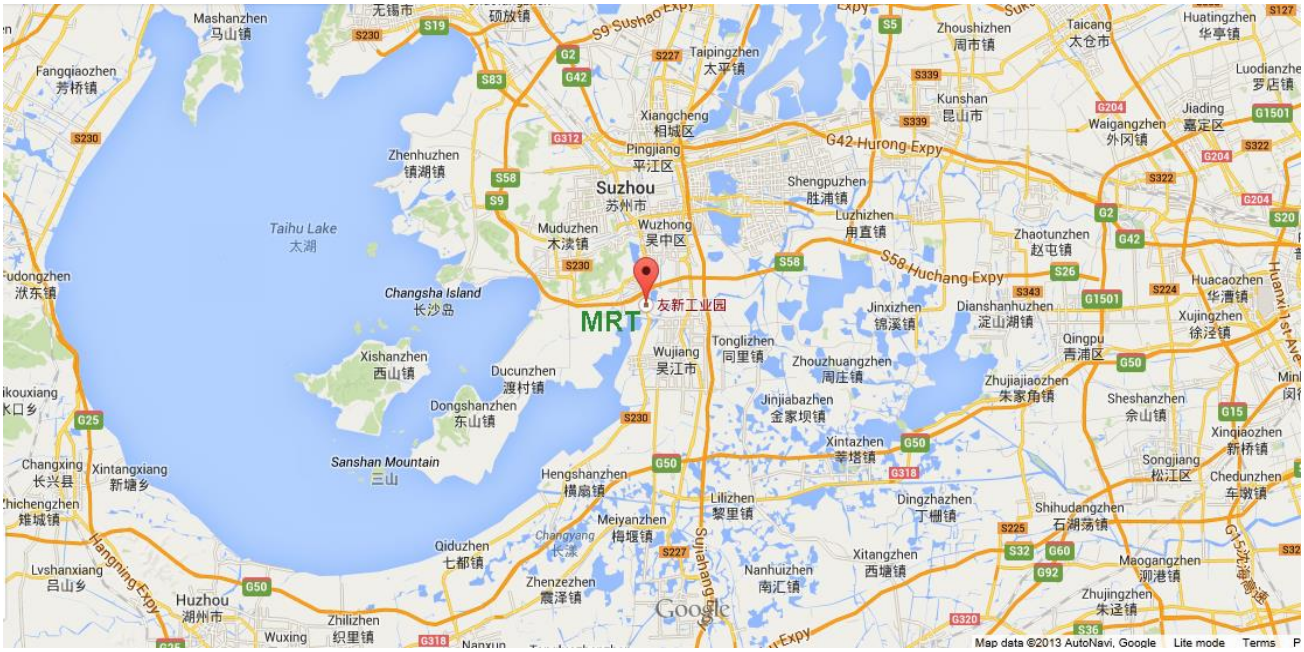
1. INTRODUCTION

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-AP1321, OAW-AP1322
Brand Name:	Alcatel·Lucent Enterprise
Wi-Fi Specification:	802.11a/b/g/n/ac/ax
Bluetooth Specification:	V5.1
Operating Temperature:	0 ~ 50 °C
Power Type:	POE input or AC adapter input
Operating Environment:	Indoor Use
Accessories	
Adapter 1#:	Configuration: ADP-30HR B Input Power: 100 - 240V ~ 50/60Hz, 1.0A Output Power: 48VDC/0.66A
Adapter 2#:	Configuration: PD-9001 25GR/AC Input Power: 100 - 240V ~ 50/60Hz, 1.5A Output Power: 55VDC/0.63A

Note: The difference between models is that EUT use different Wi-Fi antenna and appearance, other hardware and software are the same.

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 60.0 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

Configuration: OAW-AP1321

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	3.5	3.5	--	--	3.5	6.51
	5150 ~ 5850	4	20	3.2	3.6	3.7	3.5	3.7	9.52
			40						
			80						

Bluetooth Internal Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	3.2

Scan Internal Antenna		
Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)
Omni Antenna	2400 ~ 2483.5	3.5
	5150 ~ 5850	3.5

Configuration: OAW-AP1322

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)						
Dipole	2400 ~ 2483.5	2	20, 40	3.5	3.5	6.51
	5150 ~ 5850	4	20	6	6	12.02
			40			
			80			
Bluetooth Internal Antenna						
Antenna Type	Frequency Band (GHz)			Max Peak Gain (dBi)		
Omni Antenna	2400 ~ 2483.5			3.2		
Scan Internal Antenna						
Antenna Type	Frequency Band (GHz)			Max Peak Gain (dBi)		
Omni Antenna	2400 ~ 2483.5			3.5		
	5150 ~ 5850			3.5		

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

Note 2: The EUT also supports Beam Forming technology for 802.11n/ac/ax.

Note 3: The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are 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 $N_{ANT} \leq 4$;

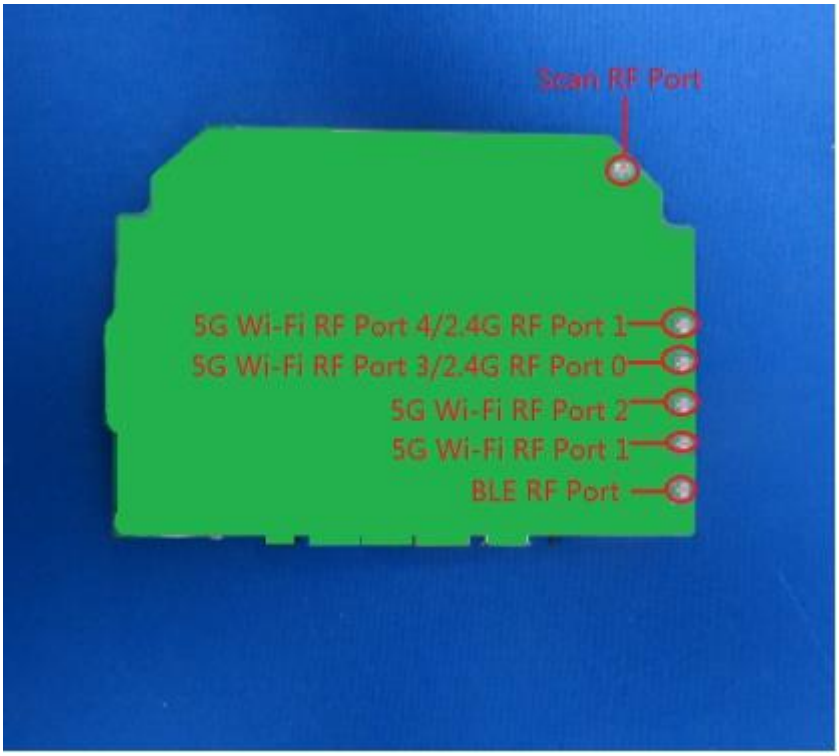
If antenna gains are not equal, Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Note 4: The EUT also supports Beam Forming mode, and the Beam Forming support 802.11n/ac/ax, not include 802.11a/b/g. The directional gain = $10*\log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/N_{ANT}]$dBi.

Note 5: Here is the same scan antenna, so this report has assessed the scan antenna with OAW-AP1321.

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 1	Ant 2	Ant 3	Ant 4	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.

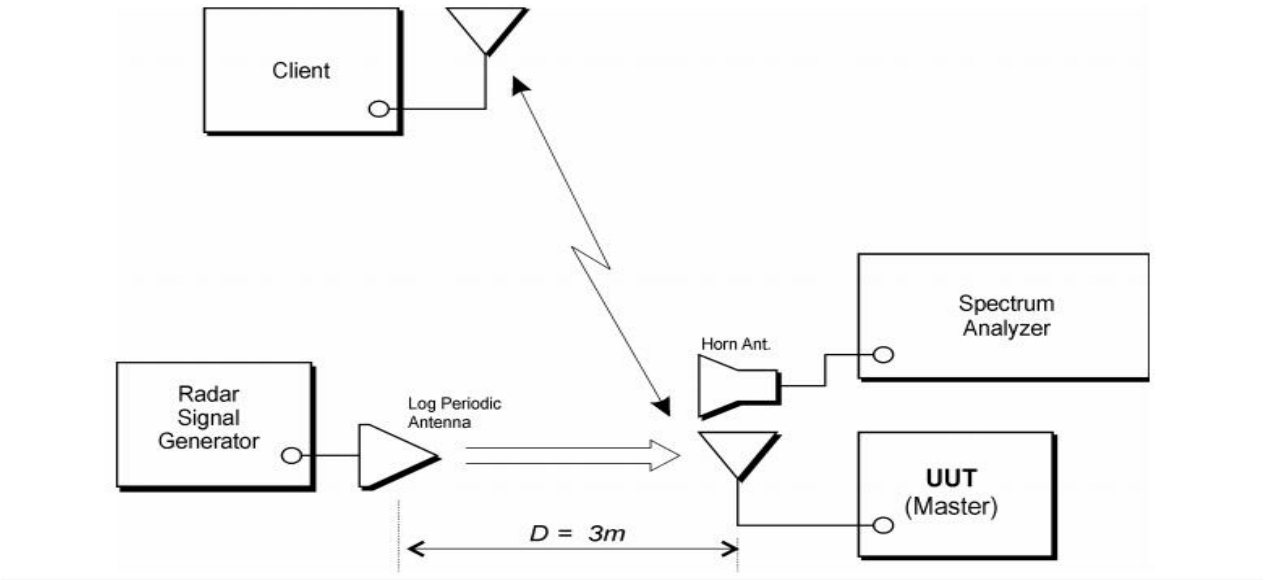


Figure 3-1: Radiated Test Setup where UUT is a Master and Radar Test Waveforms are injected into the Masters

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-AP1321

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.

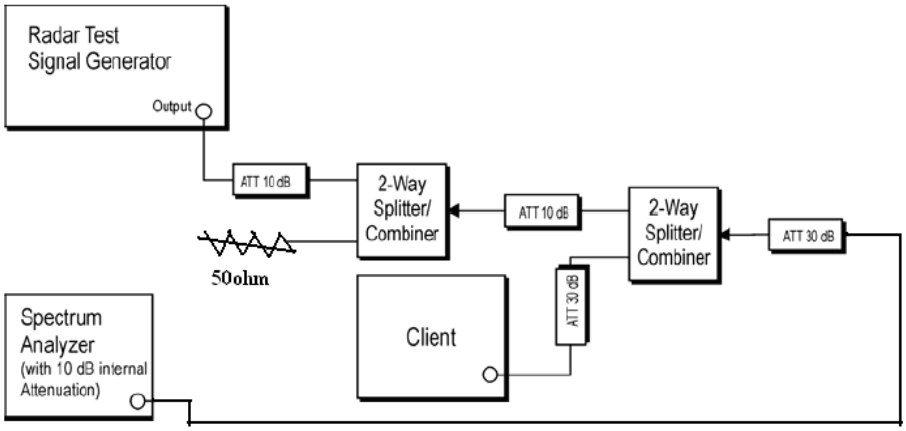


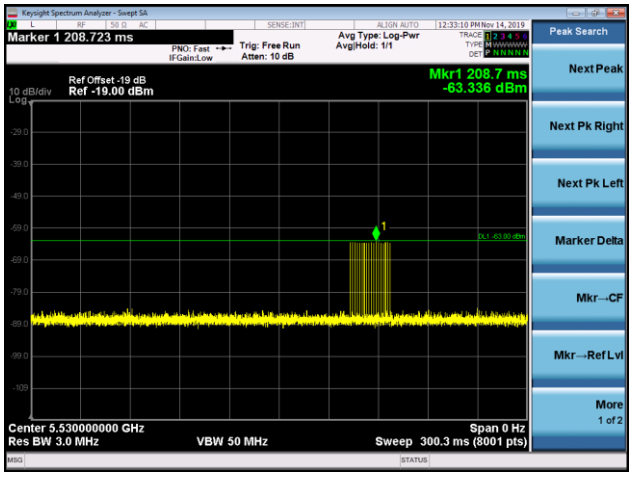
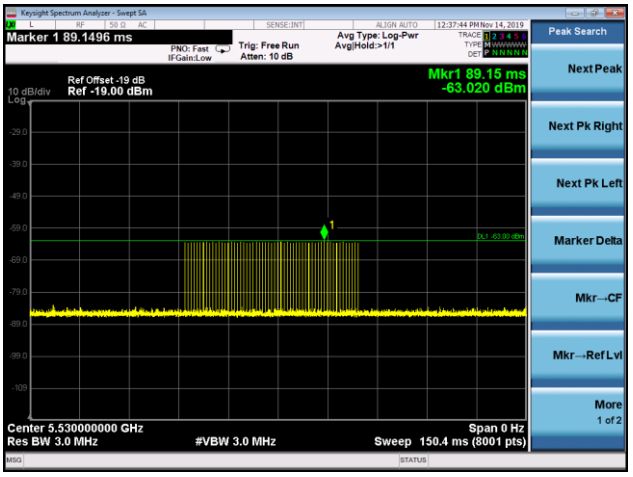
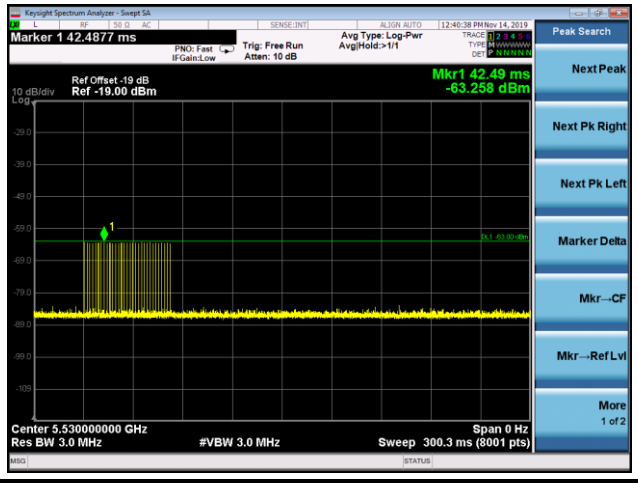
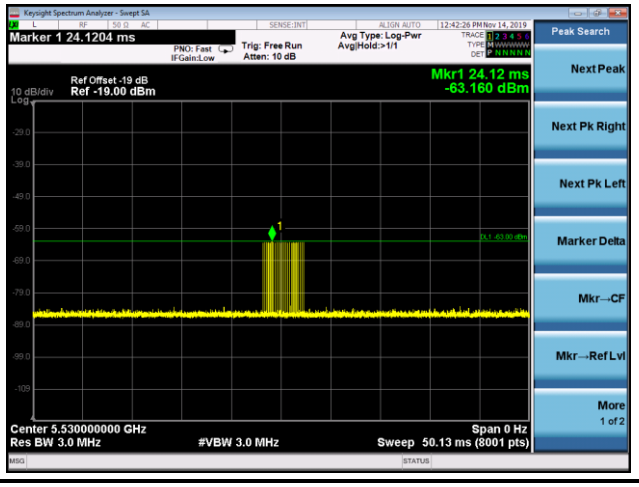
Figure 3-2: Conducted Test Setup

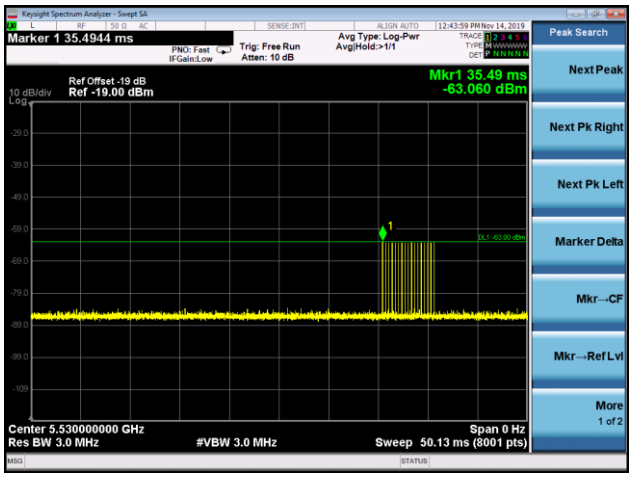
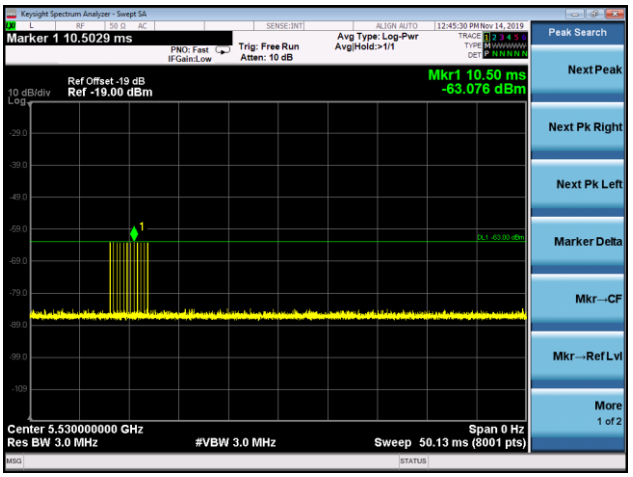
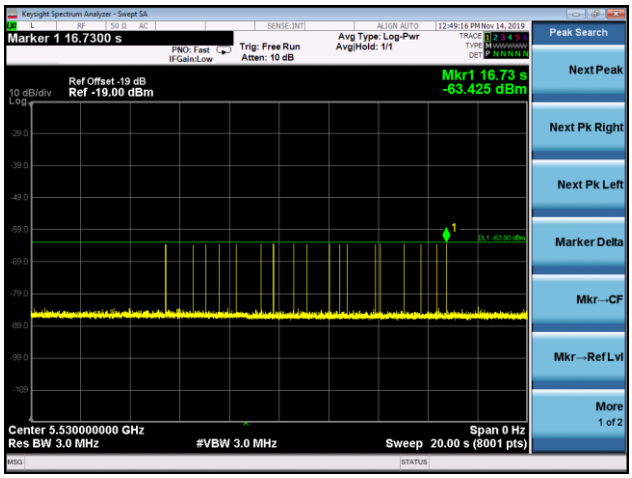
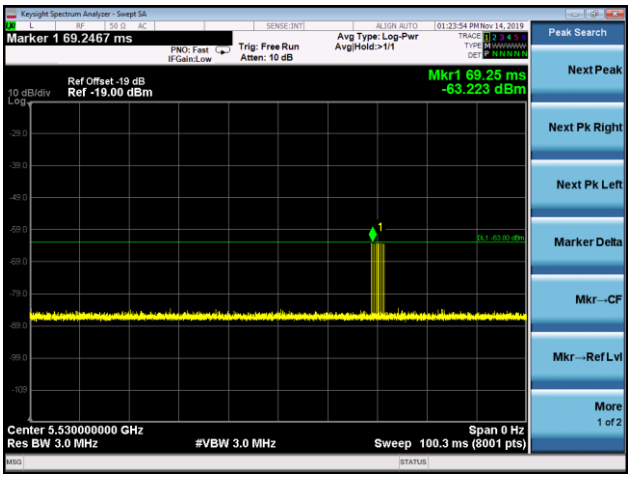
5.2.2. Calibration Procedure

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

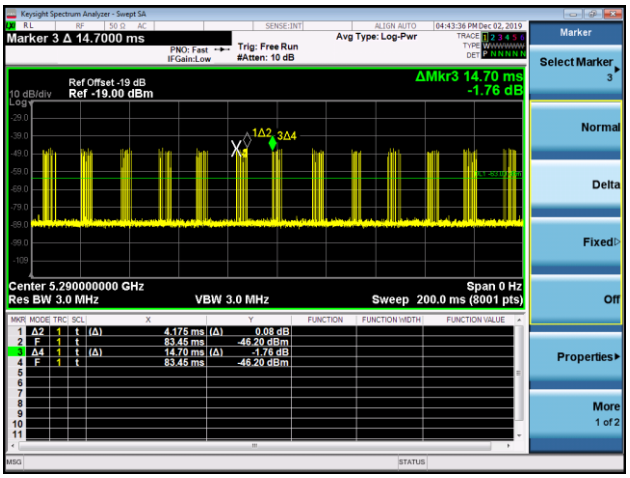
Product	OmniAccess Stellar	Temperature	27°C
Test Engineer	Amy Zhang	Relative Humidity	65%
Test Site	SR5	Test Date	2019/11/14
Test Item	Radar Waveform Calibration		

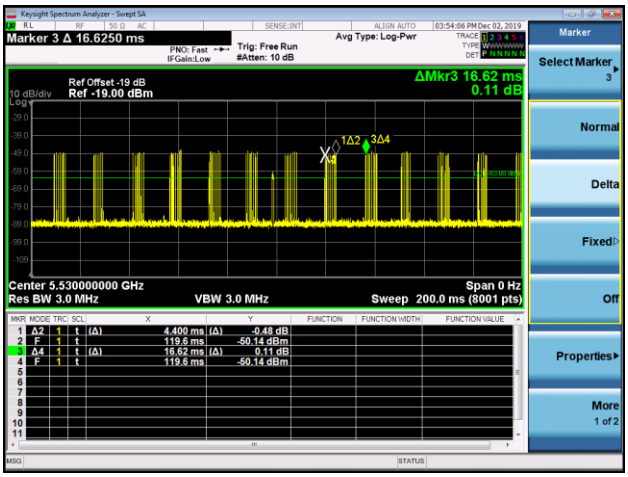
Radar #0	Radar #1 (Test A) PRI = 858us and the number of pulses = 62
	
Radar #1 (Test B) PRI = 1.553ms and the number of pulses = 34	Radar #2
	

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

5.2.4. Channel Loading Test Result

Product	OmniAccess Stellar	Temperature	27°C
Test Engineer	Amy Zhang	Relative Humidity	65%
Test Site	SR4	Test Date	2019/12/02
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	28.33%	≥ 17%	Pass
802.11ax-HE40	5510 MHz	29.31%	≥ 17%	Pass
802.11ax-HE80	5530 MHz	29.18%	≥ 17%	Pass
802.11ax-HE80 + 80	5290 MHz	28.40%	≥ 17%	Pass
802.11ax-HE80 + 80	5530 MHz	26.47%	≥ 17%	Pass
802.11ax-HE80 + 80	5610 MHz	28.14%	≥ 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 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2019/12/03
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 18.97MHz. (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): 18.97MHz x 100% = 18.97MHz.

Product	OmniAccess Stellar	Temperature	23 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2019/12/03
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 37.79MHz. (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): 37.79MHz x 100% = 37.79MHz.

Product	OmniAccess Stellar	Temperature	23 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2019/12/03
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 77.32MHz. (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): 77.32MHz x 100% = 77.32MHz.

Product	OmniAccess Stellar	Temperature	23 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2019/12/03
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 77.00MHz. (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): 77.00MHz x 100% = 77.00MHz.

Product	OmniAccess Stellar	Temperature	23 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2019/12/03
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 77.86MHz. (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): 77.86MHz x 100% = 77.86MHz.

Product	OmniAccess Stellar	Temperature	23 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2019/12/03
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 76.82MHz. (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): 76.82MHz x 100% = 76.82MHz.

5.4. Initial Channel Availability Check Time Measurement

5.4.1. Test Limit

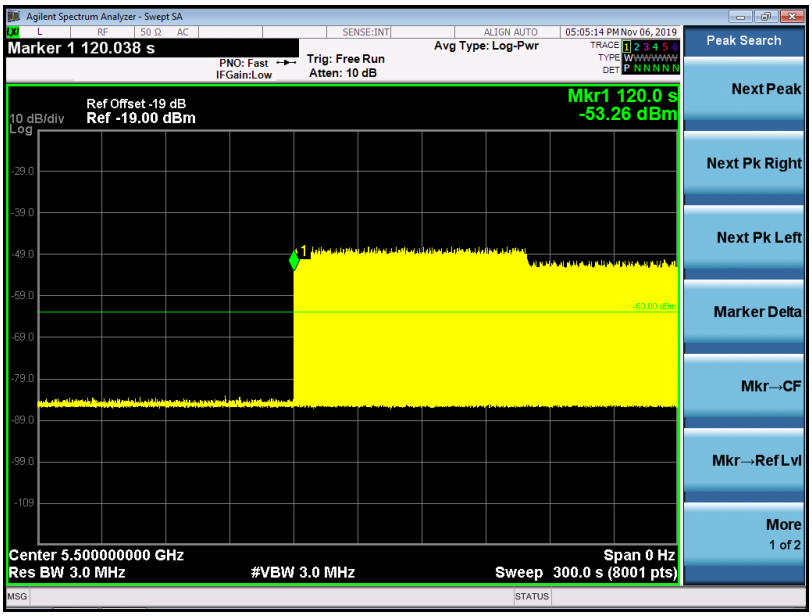
The EUT shall perform a Channel Availability Check to ensure that there is no radar operating on the channel. After power-up sequence, receive at least 1 minute on the intended operating frequency.

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	27°C
Test Engineer	Amy Zhang	Relative Humidity	65%
Test Site	SR5	Test Date	2019/11/06
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 (60.0 sec). Initial beacons/data transmissions are indicated by marker 1 (120.0 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

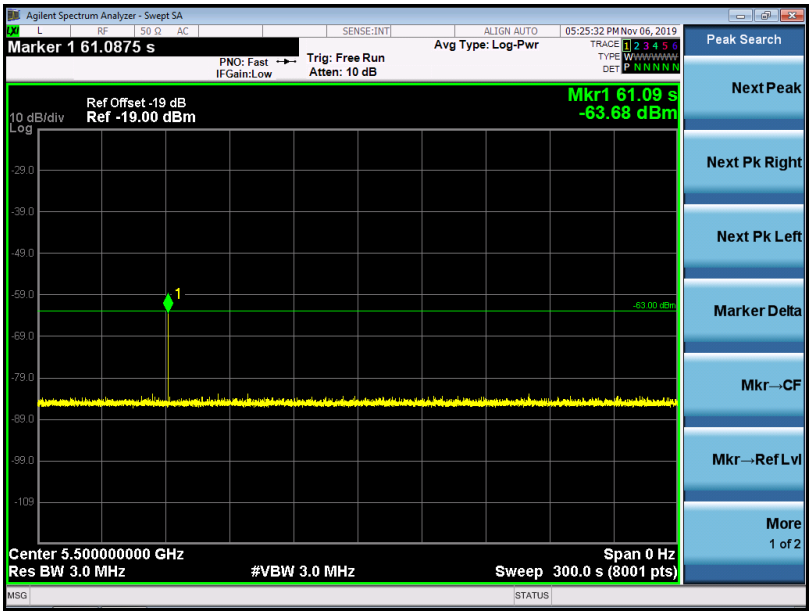
1. The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB occurs at the beginning 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	27°C
Test Engineer	Amy Zhang	Relative Humidity	65%
Test Site	SR4	Test Date	2019/11/06
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

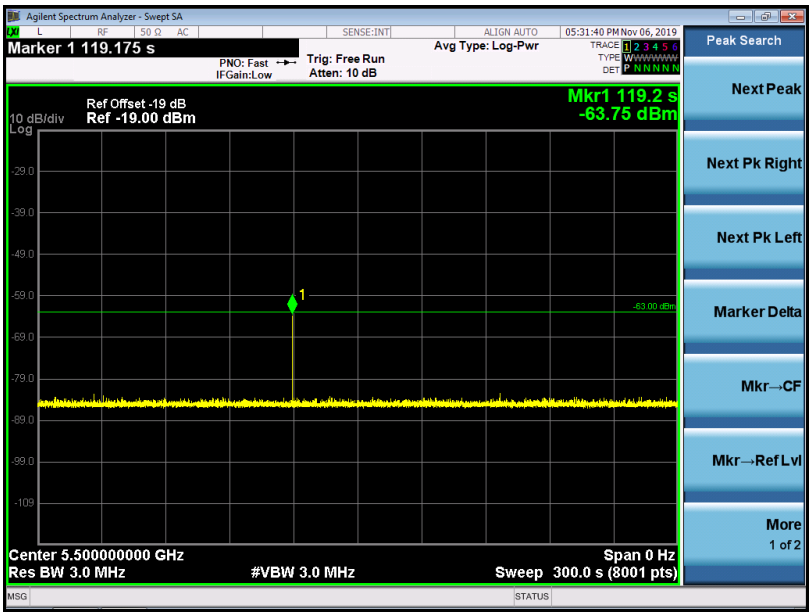
1. The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB occurs at the beginning 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	27°C
Test Engineer	Amy Zhang	Relative Humidity	65%
Test Site	SR5	Test Date	2019/11/06
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.

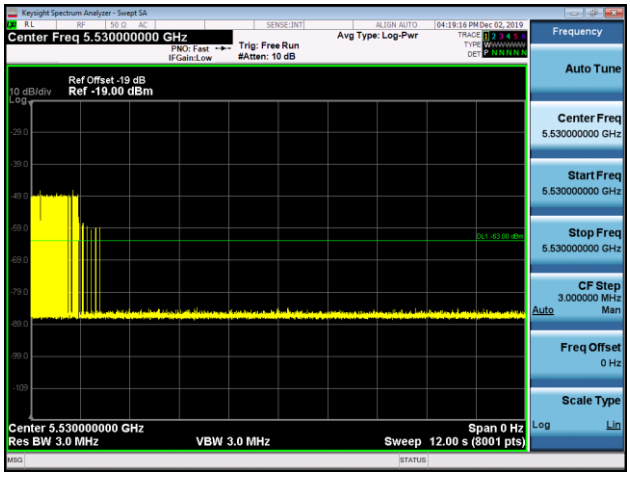
5.7.2. Test Procedure Used

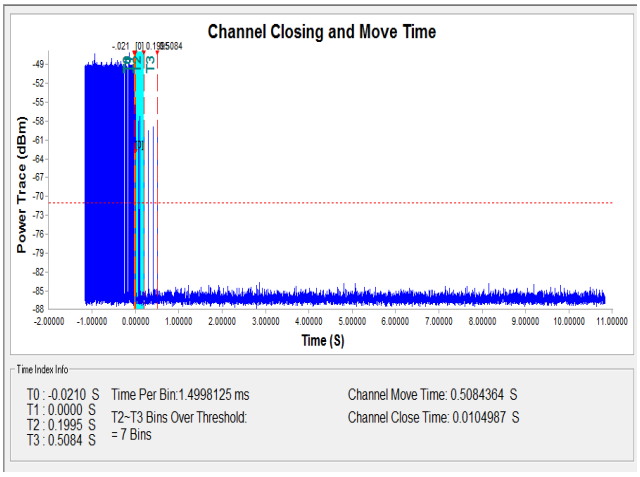
1. The test should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0.
2. When the radar burst with a level equal to the DFS Detection Threshold + 1dB is generated on the Operating Channel of the U-NII device. A U-NII device operating as a Master Device will 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	27°C
Test Engineer	Amy Zhang	Relative Humidity	65%
Test Site	SR4	Test Date	2019/12/02
Test Item	Channel Move Time and Channel Closing Transmission Time (802.11ax-HE80 + 80 mode - 5530MHz)		

Channel Move Time and Channel Closing Transmission Time



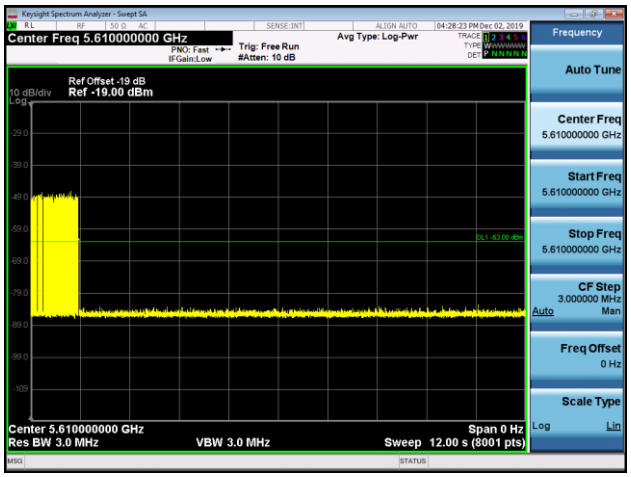


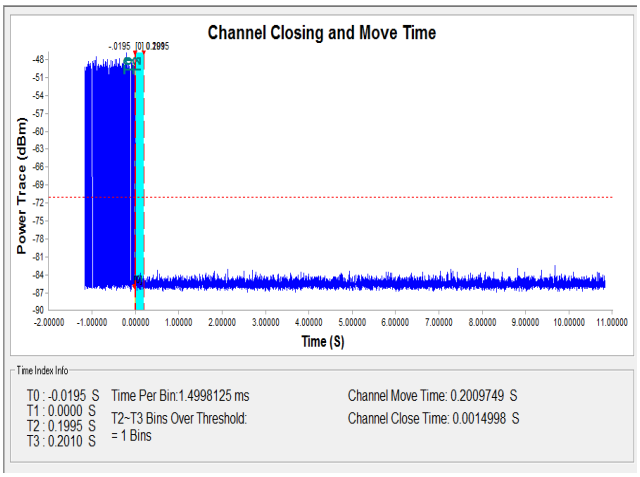
Non-Occupancy Period

Parameter	Test Result	Limit
Channel Move Time (s)	0.508s	<10s
Channel Closing Transmission Time (ms) (Note)	10.5ms	< 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	27°C
Test Engineer	Amy Zhang	Relative Humidity	65%
Test Site	SR4	Test Date	2019/12/02
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 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2019/12/03
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	818	65	1
2	5490	1	3066	18	1
3	5490	1	678	78	1
4	5490	1	878	61	1
5	5490	1	658	81	1
6	5490	1	538	99	1
7	5490	1	778	68	1
8	5490	1	898	59	1
9	5490	1	758	70	1
10	5490	1	838	63	1
11	5500.	1	578	92	1
12	5500.	1	558	95	1
13	5500.	1	698	76	1
14	5500.	1	618	86	1
15	5500.	1	518	102	1
16	5500.	1	2557	21	1
17	5500.	1	2473	22	1
18	5500.	1	2289	24	1
19	5500.	1	1521	35	1
20	5500.	1	2791	19	1
21	5510	1	2868	19	1
22	5510	1	872	61	1
23	5510	1	2683	20	1
24	5510	1	1558	34	1
25	5510	1	1594	34	1
26	5510	1	2632	21	1
27	5510	1	2191	25	1
28	5510	1	2333	23	1

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
29	5510	1	2940	18	1
30	5510	1	2346	23	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	2.3	157	29	1
2	5490	2.0	212	24	1
3	5490	2.7	221	28	1
4	5490	4.1	159	25	1
5	5490	4.5	203	26	1
6	5490	3.5	216	24	1
7	5490	2.5	223	28	1
8	5490	1.9	220	26	1
9	5490	4.6	220	28	1
10	5490	4.7	198	26	1
11	5500.	4.5	205	27	1
12	5500.	4.2	157	27	1
13	5500.	3.3	158	29	1
14	5500.	3.7	209	28	1
15	5500.	1.0	173	24	1
16	5500.	3.9	178	26	1
17	5500.	1.8	150	27	1
18	5500.	4.6	195	28	1
19	5500.	1.0	168	25	1
20	5500.	3.5	168	29	1
21	5510	4.7	218	29	1
22	5510	1.7	200	25	1
23	5510	1.8	201	29	1
24	5510	2.4	163	26	1
25	5510	1.2	221	23	1
26	5510	1.5	156	29	1
27	5510	2.6	212	23	1
28	5510	4.2	194	23	1
29	5510	2.2	188	24	1
30	5510	1.0	152	23	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	9.9	297	16	1
2	5490	7.5	492	18	1
3	5490	10.0	371	17	1
4	5490	8.5	457	17	1
5	5490	6.3	369	16	1
6	5490	8.9	390	16	1
7	5490	6.1	255	18	1
8	5490	6.1	262	16	1
9	5490	6.9	293	17	1
10	5490	6.1	420	16	1
11	5500.	7.9	430	17	1
12	5500.	6.9	444	18	1
13	5500.	7.7	409	18	1
14	5500.	6.4	422	17	1
15	5500.	7.8	252	17	1
16	5500.	7.4	426	18	1
17	5500.	9.6	337	16	1
18	5500.	10.0	379	16	1
19	5500.	9.9	346	17	1
20	5500.	9.4	296	17	1
21	5510	9.0	350	18	1
22	5510	10.0	330	16	1
23	5510	9.9	401	16	1
24	5510	7.8	459	18	1
25	5510	8.1	317	16	1
26	5510	8.2	498	18	1
27	5510	8.9	256	17	1
28	5510	6.9	361	18	1
29	5510	9.7	403	17	1
30	5510	7.9	485	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	14.6	255	12	1
2	5490	15.5	429	14	1
3	5490	16.8	306	16	1
4	5490	16.1	348	15	1
5	5490	19.9	347	13	1
6	5490	16.3	405	12	1
7	5490	18.9	256	16	1
8	5490	19.4	483	13	1
9	5490	14.6	367	14	1
10	5490	17.5	459	13	1
11	5500.	18.2	347	12	1
12	5500.	17.1	295	16	1
13	5500.	19.8	496	16	1
14	5500.	12.0	291	13	1
15	5500.	12.0	358	12	1
16	5500.	15.6	354	13	1
17	5500.	19.5	425	15	1
18	5500.	17.1	262	15	1
19	5500.	14.0	491	13	1
20	5500.	11.3	437	15	1
21	5510	11.4	250	14	1
22	5510	11.4	265	12	1
23	5510	14.6	385	12	1
24	5510	13.2	325	13	1
25	5510	15.4	424	13	1
26	5510	15.4	365	14	1
27	5510	18.3	360	15	1
28	5510	20.0	389	15	1
29	5510	19.1	431	12	1
30	5510	15.4	367	12	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	5494.4	1
2	5500.0	1	17	5495.2	1
3	5500.0	1	18	5495.6	1
4	5500.0	1	19	5494.4	1
5	5500.0	1	20	5496.0	1
6	5500.0	1	21	5503.6	1
7	5500.0	1	22	5504.0	1
8	5500.0	1	23	5503.6	1
9	5500.0	1	24	5506.8	1
10	5500.0	1	25	5507.6	1
11	5494.8	1	26	5504.0	1
12	5498.0	1	27	5504.4	1
13	5497.6	1	28	5505.6	1
14	5492.0	1	29	5505.6	1
15	5493.6	1	30	5506.4	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	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 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2019/12/03
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	858	62	1
2	5491	1	818	65	1
3	5491	1	838	63	1
4	5491	1	678	78	1
5	5500	1	938	57	1
6	5500	1	538	99	1
7	5500	1	3066	18	1
8	5500	1	638	83	1
9	5509	1	878	61	1
10	5509	1	658	81	1
11	5509	1	918	58	1
12	5509	1	558	95	1
13	5510	1	738	72	1
14	5510	1	798	67	1
15	5510	1	618	86	1
16	5510	1	2337	23	1
17	5510	1	547	97	1
18	5510	1	1641	33	1
19	5511	1	1579	34	1
20	5511	1	2433	22	1
21	5511	1	1751	31	1
22	5511	1	3041	18	1
23	5520	1	2044	26	1
24	5520	1	2853	19	1
25	5520	1	968	55	1
26	5520	1	1791	30	1
27	5529	1	1468	36	1
28	5529	1	712	75	1
29	5529	1	2258	24	1

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
30	5529	1	2610	21	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	1.8	179	24	1
2	5491	1.5	210	23	1
3	5491	2.4	169	29	1
4	5491	4.9	152	29	1
5	5500	3.1	199	27	1
6	5500	2.2	190	28	1
7	5500	1.1	212	26	1
8	5500	4.2	151	24	1
9	5509	3.8	160	27	1
10	5509	3.1	227	29	1
11	5509	2.7	221	23	1
12	5509	2.3	159	26	1
13	5510	2.5	167	28	1
14	5510	1.1	195	25	1
15	5510	4.9	224	28	1
16	5510	1.3	223	28	1
17	5510	2.8	204	24	1
18	5510	3.3	160	28	1
19	5511	2.1	225	26	1
20	5511	3.6	179	28	1
21	5511	4.4	206	24	1
22	5511	3.0	185	26	1
23	5520	2.9	198	26	1
24	5520	1.3	207	26	1
25	5520	4.8	188	26	1
26	5520	1.4	203	25	1
27	5529	4.4	152	24	1
28	5529	4.0	225	28	1
29	5529	1.8	209	24	1
30	5529	1.9	201	23	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	9.4	476	18	1
2	5491	8.0	439	18	1
3	5491	8.1	490	18	1
4	5491	9.6	498	18	1
5	5500	7.7	455	18	1
6	5500	6.0	339	17	1
7	5500	8.0	388	16	1
8	5500	8.6	363	16	1
9	5509	6.5	311	18	1
10	5509	7.4	364	17	1
11	5509	7.6	319	17	1
12	5509	7.4	353	17	1
13	5510	9.9	411	17	1
14	5510	8.5	421	17	1
15	5510	8.6	373	18	1
16	5510	8.6	354	18	1
17	5510	6.4	268	17	1
18	5510	8.8	271	16	1
19	5511	9.6	360	18	1
20	5511	7.9	350	16	1
21	5511	8.0	337	16	1
22	5511	10.0	444	16	1
23	5520	7.3	277	17	1
24	5520	9.0	295	18	1
25	5520	8.8	319	17	1
26	5520	6.1	339	16	1
27	5529	6.2	289	16	1
28	5529	9.8	420	18	1
29	5529	9.1	342	16	1
30	5529	6.9	433	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	19.0	450	15	1
2	5491	16.4	457	15	1
3	5491	19.6	360	15	1
4	5491	17.8	491	13	1
5	5500	14.3	380	16	1
6	5500	13.2	394	12	1
7	5500	13.8	459	15	1
8	5500	17.4	427	12	1
9	5509	18.3	296	14	1
10	5509	14.0	471	13	1
11	5509	13.1	329	13	1
12	5509	13.7	403	12	1
13	5510	13.5	457	13	1
14	5510	14.4	462	16	1
15	5510	13.5	317	12	1
16	5510	13.9	392	16	1
17	5510	18.7	487	12	1
18	5510	13.1	354	14	1
19	5511	12.4	492	15	1
20	5511	13.6	433	16	1
21	5511	18.2	390	15	1
22	5511	17.7	399	14	1
23	5520	13.1	426	13	1
24	5520	19.2	375	14	1
25	5520	13.6	324	15	1
26	5520	17.0	471	13	1
27	5529	16.9	421	13	1
28	5529	15.0	271	16	1
29	5529	14.9	402	12	1
30	5529	13.5	407	12	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	5493.0	1
2	5510.0	1	17	5493.8	1
3	5510.0	1	18	5495.0	1
4	5510.0	1	19	5495.8	1
5	5510.0	1	20	5497.8	1
6	5510.0	1	21	5525.8	1
7	5510.0	1	22	5522.6	1
8	5510.0	1	23	5527.0	1
9	5510.0	1	24	5521.4	1
10	5510.0	1	25	5522.2	1
11	5495.8	1	26	5521.4	1
12	5494.2	1	27	5523.8	1
13	5493.0	1	28	5525.0	1
14	5497.8	1	29	5523.4	1
15	5497.8	1	30	5524.2	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 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2019/12/03
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	798	67	1
2	5491	1	538	99	1
3	5500	1	878	61	1
4	5500	1	858	62	1
5	5509	1	838	63	1
6	5509	1	558	95	1
7	5510	1	578	92	1
8	5510	1	658	81	1
9	5511	1	818	65	1
10	5511	1	3066	18	1
11	5520	1	738	72	1
12	5520	1	678	78	1
13	5529	1	898	59	1
14	5529	1	718	74	1
15	5530	1	518	102	1
16	5530	1	2421	22	1
17	5531	1	1838	29	1
18	5531	1	2652	20	1
19	5540	1	1471	36	1
20	5540	1	1418	38	1
21	5549	1	823	65	1
22	5549	1	1984	27	1
23	5550	1	2853	19	1
24	5550	1	721	74	1
25	5551	1	2132	25	1
26	5551	1	1161	46	1
27	5560	1	565	94	1
28	5560	1	1355	39	1
29	5569	1	1945	28	1

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
30	5569	1	2070	26	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	3.9	221	26	1
2	5491	4.2	172	23	1
3	5500	3.0	184	27	1
4	5500	2.1	194	29	1
5	5509	4.3	198	23	1
6	5509	3.4	201	26	1
7	5510	2.9	150	23	1
8	5510	3.8	210	27	1
9	5511	4.0	196	27	1
10	5511	4.2	160	26	1
11	5520	4.9	201	27	1
12	5520	1.9	221	28	1
13	5529	4.6	170	29	1
14	5529	2.9	210	25	1
15	5530	3.1	159	26	1
16	5530	1.6	160	27	1
17	5531	3.0	196	25	1
18	5531	4.0	226	26	1
19	5540	1.4	151	26	1
20	5540	5.0	172	23	1
21	5549	3.0	154	23	1
22	5549	4.7	163	25	1
23	5550	2.7	200	29	1
24	5550	5.0	187	28	1
25	5551	2.9	183	29	1
26	5551	1.5	157	27	1
27	5560	3.0	205	27	1
28	5560	3.3	166	28	1
29	5569	3.4	201	24	1
30	5569	2.2	207	23	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	8.5	419	17	1
2	5491	7.1	443	18	1
3	5500	7.2	471	17	1
4	5500	8.3	344	17	1
5	5509	7.6	363	17	1
6	5509	6.7	413	17	1
7	5510	7.8	416	16	1
8	5510	9.0	396	17	1
9	5511	8.8	310	18	1
10	5511	7.5	427	16	1
11	5520	7.7	474	18	1
12	5520	7.7	263	17	1
13	5529	8.6	485	18	1
14	5529	7.9	383	18	1
15	5530	8.4	499	17	1
16	5530	7.9	373	16	1
17	5531	6.1	342	17	1
18	5531	6.6	389	17	1
19	5540	8.5	368	18	1
20	5540	6.3	342	16	1
21	5549	6.6	289	17	1
22	5549	7.2	425	16	1
23	5550	6.1	361	17	1
24	5550	9.7	255	17	1
25	5551	6.5	466	16	1
26	5551	8.4	481	18	1
27	5560	8.5	336	16	1
28	5560	9.0	399	16	1
29	5569	9.8	311	17	1
30	5569	8.0	471	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	11.7	383	15	1
2	5491	13.7	256	14	1
3	5500	14.4	371	16	1
4	5500	12.2	295	16	1
5	5509	18.9	445	16	1
6	5509	16.4	318	16	1
7	5510	17.4	278	15	1
8	5510	19.3	483	12	1
9	5511	13.3	448	12	1
10	5511	18.8	424	16	1
11	5520	19.7	462	16	1
12	5520	18.6	448	13	1
13	5529	15.3	382	16	1
14	5529	17.1	489	15	1
15	5530	18.4	344	12	1
16	5530	12.3	371	12	1
17	5531	15.8	487	15	1
18	5531	19.2	440	14	1
19	5540	16.6	442	13	1
20	5540	14.9	364	13	1
21	5549	18.4	431	12	1
22	5549	13.8	455	12	1
23	5550	16.8	344	13	1
24	5550	12.6	307	16	1
25	5551	14.8	454	16	1
26	5551	17.9	401	13	1
27	5560	15.8	379	12	1
28	5560	18.6	499	12	1
29	5569	13.2	415	12	1
30	5569	15.1	375	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	5499.0	1
2	5530.0	1	17	5497.0	1
3	5530.0	1	18	5494.2	1
4	5530.0	1	19	5495.0	1
5	5530.0	1	20	5495.4	1
6	5530.0	1	21	5561.8	1
7	5530.0	1	22	5564.2	1
8	5530.0	1	23	5566.6	1
9	5530.0	1	24	5563.4	1
10	5530.0	1	25	5565.4	1
11	5495.8	1	26	5561.0	1
12	5497.0	1	27	5561.0	1
13	5493.4	1	28	5563.4	1
14	5495.0	1	29	5565.4	1
15	5494.6	1	30	5561.8	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 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2019/12/03
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	938	57	1
2	5250	1	858	62	1
3	5260	1	738	72	1
4	5260	1	538	98	1
5	5269	1	818	65	1
6	5269	1	838	63	1
7	5270	1	758	70	1
8	5270	1	678	78	1
9	5271	1	638	83	1
10	5271	1	898	59	1
11	5280	1	618	86	1
12	5280	1	518	102	1
13	5289	1	718	74	1
14	5289	1	698	76	1
15	5290	1	598	89	1
16	5290	1	2843	19	1
17	5291	1	2916	19	1
18	5291	1	1314	41	1
19	5300	1	2142	25	1
20	5300	1	1451	37	1
21	5309	1	2043	26	1
22	5309	1	577	92	1
23	5310	1	2766	20	1
24	5310	1	1775	30	1
25	5311	1	2297	23	1
26	5311	1	697	76	1
27	5320	1	1862	29	1
28	5320	1	2808	19	1
29	5329	1	2568	21	1

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
30	5329	1	2441	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	5250	2.5	161	23	1
2	5250	2.0	186	27	1
3	5260	4.2	197	27	1
4	5260	4.5	159	24	1
5	5269	2.9	208	26	1
6	5269	3.0	203	26	1
7	5270	4.0	163	25	1
8	5270	1.1	209	29	1
9	5271	1.9	154	29	1
10	5271	3.4	196	28	1
11	5280	2.6	163	28	1
12	5280	2.3	188	27	1
13	5289	4.9	210	24	1
14	5289	4.2	154	25	1
15	5290	3.8	228	26	1
16	5290	1.3	159	27	1
17	5291	4.1	213	25	1
18	5291	5.0	226	27	1
19	5300	3.1	228	25	1
20	5300	5.0	177	27	1
21	5309	3.0	166	29	1
22	5309	1.4	155	28	1
23	5310	1.9	154	25	1
24	5310	2.4	176	24	1
25	5311	3.1	192	25	1
26	5311	2.2	190	29	1
27	5320	1.7	156	25	1
28	5320	4.6	216	27	1
29	5329	2.7	171	27	1
30	5329	2.0	201	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	5250	8.1	282	17	1
2	5250	8.3	499	17	1
3	5260	10.0	421	18	1
4	5260	9.2	342	16	1
5	5269	9.4	333	16	1
6	5269	6.8	370	17	1
7	5270	6.9	232	16	1
8	5270	7.5	255	17	1
9	5271	9.7	232	17	1
10	5271	6.2	491	18	1
11	5280	7.5	318	17	1
12	5280	8.3	487	18	1
13	5289	8.7	453	18	1
14	5289	6.2	421	16	1
15	5290	6.2	446	17	1
16	5290	9.7	225	17	1
17	5291	6.9	230	16	1
18	5291	7.7	364	18	1
19	5300	8.8	253	18	1
20	5300	8.2	351	16	1
21	5309	8.3	304	17	1
22	5309	7.0	306	17	1
23	5310	9.1	372	17	1
24	5310	9.6	465	17	1
25	5311	9.8	335	17	1
26	5311	8.8	229	16	1
27	5320	9.6	467	16	1
28	5320	7.9	335	18	1
29	5329	7.5	238	18	1
30	5329	6.2	233	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	5250	13.3	460	13	1
2	5250	19.3	391	16	1
3	5260	19.1	347	14	1
4	5260	18.2	492	13	1
5	5269	14.2	309	16	1
6	5269	14.4	493	14	1
7	5270	19.0	367	13	1
8	5270	11.7	408	12	1
9	5271	13.9	295	15	1
10	5271	18.6	290	15	1
11	5280	11.2	266	15	1
12	5280	12.9	290	13	1
13	5289	14.8	265	15	1
14	5289	19.6	203	15	1
15	5290	11.3	211	13	1
16	5290	19.6	347	12	1
17	5291	15.6	298	14	1
18	5291	11.4	348	14	1
19	5300	12.0	385	16	1
20	5300	12.1	210	15	1
21	5309	16.3	336	16	1
22	5309	15.9	204	13	1
23	5310	11.9	202	16	1
24	5310	16.6	339	16	1
25	5311	13.1	418	13	1
26	5311	14.8	261	13	1
27	5320	14.3	387	12	1
28	5320	15.9	280	13	1
29	5329	18.5	385	15	1
30	5329	14.3	274	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	5290.0	1	16	5256.8	1
2	5290.0	1	17	5255.6	1
3	5290.0	1	18	5258.0	1
4	5290.0	1	19	5257.2	1
5	5290.0	1	20	5252.0	1
6	5290.0	1	21	5323.4	1
7	5290.0	1	22	5325.8	1
8	5290.0	1	23	5322.6	1
9	5290.0	1	24	5323.8	1
10	5290.0	1	25	5325.0	1
11	5257.2	1	26	5323.4	1
12	5253.2	1	27	5323.0	1
13	5254.8	1	28	5322.6	1
14	5257.2	1	29	5323.4	1
15	5254.0	1	30	5324.2	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	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 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2019/12/03
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	818	65	1
2	5491	1	598	89	1
3	5500	1	878	61	1
4	5500	1	618	86	1
5	5509	1	658	81	1
6	5509	1	838	63	1
7	5510	1	798	67	1
8	5510	1	718	74	1
9	5511	1	538	98	1
10	5511	1	558	95	1
11	5520	1	858	62	1
12	5520	1	898	59	1
13	5529	1	938	57	1
14	5529	1	678	78	1
15	5530	1	518	102	1
16	5530	1	1580	34	1
17	5531	1	676	78	1
18	5531	1	2979	18	1
19	5540	1	1694	32	1
20	5540	1	2810	19	1
21	5549	1	2010	27	1
22	5549	1	1838	29	1
23	5550	1	1867	29	1
24	5550	1	2577	21	1
25	5551	1	1750	31	1
26	5551	1	2766	20	1
27	5560	1	1489	36	1
28	5560	1	794	67	1
29	5570	1	2037	26	1

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
30	5570	1	669	79	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	2.7	196	27	1
2	5491	4.0	186	27	1
3	5500	2.6	213	27	1
4	5500	3.0	155	26	1
5	5509	5.0	180	26	1
6	5509	4.6	208	28	1
7	5510	1.7	194	29	1
8	5510	4.1	210	29	1
9	5511	2.7	165	25	1
10	5511	3.8	222	28	1
11	5520	2.9	185	24	1
12	5520	2.7	218	28	1
13	5529	2.8	215	27	1
14	5529	2.1	230	26	1
15	5530	3.4	207	25	1
16	5530	1.7	205	27	1
17	5531	4.9	189	28	1
18	5531	1.0	174	28	1
19	5540	4.8	229	28	1
20	5540	1.6	166	28	1
21	5549	2.2	192	25	1
22	5549	2.9	161	23	1
23	5550	3.2	224	26	1
24	5550	4.1	162	27	1
25	5551	4.9	173	25	1
26	5551	3.5	226	27	1
27	5560	3.9	223	24	1
28	5560	1.9	179	26	1
29	5570	4.1	222	27	1
30	5570	1.3	182	28	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	8.7	369	16	1
2	5491	9.8	361	16	1
3	5500	8.8	351	18	1
4	5500	9.6	450	17	1
5	5509	9.9	364	17	1
6	5509	9.3	412	17	1
7	5510	8.3	320	18	1
8	5510	8.3	255	18	1
9	5511	6.4	276	17	1
10	5511	9.8	310	18	1
11	5520	6.3	234	17	1
12	5520	6.6	273	17	1
13	5529	8.6	278	18	1
14	5529	9.9	471	16	1
15	5530	6.4	291	17	1
16	5530	7.1	257	18	1
17	5531	7.6	251	17	1
18	5531	6.0	380	17	1
19	5540	8.4	425	16	1
20	5540	6.2	396	16	1
21	5549	8.1	394	18	1
22	5549	6.1	328	17	1
23	5550	6.4	459	16	1
24	5550	7.1	221	16	1
25	5551	7.1	252	16	1
26	5551	7.3	269	17	1
27	5560	8.1	342	17	1
28	5560	6.9	413	17	1
29	5570	9.9	392	18	1
30	5570	7.2	430	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	15.5	401	12	1
2	5491	12.2	365	14	1
3	5500	19.8	500	15	1
4	5500	17.3	465	16	1
5	5509	18.6	408	15	1
6	5509	16.4	259	12	1
7	5510	13.1	256	15	1
8	5510	12.5	259	12	1
9	5511	14.4	280	13	1
10	5511	13.7	223	14	1
11	5520	18.9	265	13	1
12	5520	14.8	354	12	1
13	5529	11.4	365	13	1
14	5529	13.6	376	15	1
15	5530	17.9	250	14	1
16	5530	14.9	300	14	1
17	5531	11.9	224	15	1
18	5531	14.6	298	13	1
19	5540	16.6	350	14	1
20	5540	11.7	205	15	1
21	5549	13.4	243	12	1
22	5549	13.1	296	13	1
23	5550	16.3	202	14	1
24	5550	11.1	208	13	1
25	5551	17.7	267	16	1
26	5551	18.7	313	15	1
27	5560	18.5	370	13	1
28	5560	12.9	326	15	1
29	5570	19.4	345	14	1
30	5570	15.9	465	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	5495.0	1
2	5530.0	1	17	5497.4	1
3	5530.0	1	18	5495.0	1
4	5530.0	1	19	5493.0	1
5	5530.0	1	20	5496.2	1
6	5530.0	1	21	5562.8	1
7	5530.0	1	22	5566.0	1
8	5530.0	1	23	5566.8	1
9	5530.0	1	24	5563.6	1
10	5530.0	1	25	5566.8	1
11	5499.0	1	26	5562.8	1
12	5497.4	1	27	5567.2	1
13	5498.6	1	28	5566.0	1
14	5495.4	1	29	5566.8	1
15	5496.2	1	30	5564.4	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	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 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2019/12/03
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	558	95	1
2	5570	1	3066	18	1
3	5580	1	798	67	1
4	5580	1	938	57	1
5	5589	1	698	76	1
6	5589	1	758	70	1
7	5590	1	738	72	1
8	5590	1	578	92	1
9	5591	1	718	74	1
10	5591	1	818	65	1
11	5600	1	618	86	1
12	5600	1	838	63	1
13	5609	1	778	68	1
14	5609	1	658	81	1
15	5610	1	598	89	1
16	5610	1	2377	23	1
17	5611	1	2722	20	1
18	5611	1	2311	23	1
19	5620	1	1923	28	1
20	5620	1	1368	39	1
21	5629	1	1228	43	1
22	5629	1	1747	31	1
23	5630	1	1446	37	1
24	5630	1	2785	19	1
25	5631	1	1376	39	1
26	5631	1	1574	34	1
27	5640	1	1992	27	1
28	5640	1	2653	20	1
29	5649	1	1226	43	1

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
30	5649	1	1352	39	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	2.5	226	24	1
2	5570	1.4	155	24	1
3	5580	4.4	184	28	1
4	5580	1.6	171	23	1
5	5589	5.0	183	29	1
6	5589	2.9	182	25	1
7	5590	3.3	209	27	1
8	5590	2.5	180	25	1
9	5591	3.2	217	26	1
10	5591	1.3	212	25	1
11	5600	1.5	152	27	1
12	5600	1.9	198	26	1
13	5609	4.6	156	28	1
14	5609	2.3	150	24	1
15	5610	2.7	216	27	1
16	5610	2.4	226	29	1
17	5611	3.9	195	27	1
18	5611	1.3	181	27	1
19	5620	3.6	221	23	1
20	5620	3.0	217	24	1
21	5629	4.7	213	28	1
22	5629	4.0	216	28	1
23	5630	3.9	187	26	1
24	5630	2.0	166	29	1
25	5631	1.3	212	26	1
26	5631	1.9	179	24	1
27	5640	1.0	194	27	1
28	5640	1.2	228	25	1
29	5649	4.6	190	24	1
30	5649	2.0	229	27	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	6.5	254	18	1
2	5570	7.3	335	17	1
3	5580	9.8	474	18	1
4	5580	9.8	440	16	1
5	5589	6.3	431	16	1
6	5589	9.9	333	17	1
7	5590	7.5	251	17	1
8	5590	7.3	220	17	1
9	5591	7.9	493	16	1
10	5591	9.0	355	16	1
11	5600	7.9	395	18	1
12	5600	7.4	202	18	1
13	5609	7.9	465	17	1
14	5609	7.8	294	17	1
15	5610	8.5	322	17	1
16	5610	7.7	444	18	1
17	5611	7.8	290	17	1
18	5611	9.1	281	16	1
19	5620	7.8	272	16	1
20	5620	9.4	350	17	1
21	5629	7.4	257	18	1
22	5629	9.4	346	16	1
23	5630	8.1	230	18	1
24	5630	8.8	358	17	1
25	5631	9.2	265	17	1
26	5631	6.9	348	17	1
27	5640	8.7	445	18	1
28	5640	8.6	440	17	1
29	5649	6.4	380	17	1
30	5649	8.8	212	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	5570	18.2	382	13	1
2	5570	19.7	391	14	1
3	5580	16.2	362	13	1
4	5580	13.9	288	16	1
5	5589	11.8	469	13	1
6	5589	19.8	362	13	1
7	5590	14.5	401	12	1
8	5590	16.7	254	14	1
9	5591	14.3	203	13	1
10	5591	16.9	319	13	1
11	5600	16.5	410	14	1
12	5600	16.4	482	14	1
13	5609	14.1	234	14	1
14	5609	17.9	288	12	1
15	5610	17.8	447	14	1
16	5610	13.2	276	15	1
17	5611	16.1	375	14	1
18	5611	13.6	309	15	1
19	5620	12.8	424	14	1
20	5620	18.9	465	16	1
21	5629	12.8	391	14	1
22	5629	16.2	237	14	1
23	5630	12.2	372	15	1
24	5630	17.0	216	13	1
25	5631	18.0	333	13	1
26	5631	17.1	415	16	1
27	5640	13.4	407	14	1
28	5640	11.0	484	13	1
29	5649	15.3	212	12	1
30	5649	13.4	340	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	5610.0	1	16	5574.0	1
2	5610.0	1	17	5575.6	1
3	5610.0	1	18	5577.2	1
4	5610.0	1	19	5573.2	1
5	5610.0	1	20	5577.6	1
6	5610.0	1	21	5641.0	1
7	5610.0	1	22	5645.4	1
8	5610.0	1	23	5643.0	1
9	5610.0	1	24	5642.2	1
10	5610.0	1	25	5643.0	1
11	5572.4	1	26	5641.8	1
12	5576.4	1	27	5642.2	1
13	5576.8	1	28	5643.4	1
14	5578.0	1	29	5644.2	1
15	5575.2	1	30	5647.0	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 “1912RSU023-UT” file.

Appendix B – EUT Photograph

Refer to “1912RSU023-UE” file.