



# DFS MEASUREMENT REPORT

## FCC PART 15 Subpart E

**FCC ID:** 2ALJ3AP32X

**APPLICANT:** HAN Networks Co., Ltd

**Application Type:** Certification

**Product:** HAN Access Point

**Model No.:** AP321, AP321e

**Brand Name:** HAN NETWORKS; HANNETWORKS

**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 )

Approved By:

( Robin Wu )



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  |
|---------------|---------|----------------|------------|-------|
| 1909RSU036-U7 | Rev. 01 | Initial Report | 02-10-2020 | Valid |
|               |         |                |            |       |

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## General Information

|                                |                                                                                                                                 |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Applicant:</b>              | HAN Networks Co., Ltd.                                                                                                          |
| <b>Applicant Address:</b>      | 101-A16, 1 <sup>st</sup> Floor, Building 3, No.9 compound, Yongfeng Road, Haidian District, Beijing, P.R. China                 |
| <b>Manufacturer:</b>           | HAN Networks Co., Ltd.                                                                                                          |
| <b>Manufacturer Address:</b>   | 101-A16, 1 <sup>st</sup> Floor, Building 3, No.9 compound, Yongfeng Road, Haidian District, Beijing, P.R. China                 |
| <b>Test Site:</b>              | MRT Technology (Suzhou) Co., Ltd                                                                                                |
| <b>Test Site Address:</b>      | D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China                                              |
| <b>Test Device Serial No.:</b> | N/A <input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production <input type="checkbox"/> 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:            | HAN Access Point                                                                                       |
| Configuration:           | AP321, AP321e                                                                                          |
| Brand Name:              | HAN NETWORKS; HANNETWORKS                                                                              |
| 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<br>Input Power: 100 - 240V ~ 50/60Hz, 1.0A<br>Output Power: 48VDC/0.66A      |
| Adapter 2#:              | Configuration: PD-9001 25GR/AC<br>Input Power: 100 - 240V ~ 50/60Hz, 1.5A<br>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:                            | <p>For 802.11a/n-HT20/ac-VHT20/ax-HE20:<br/>5260~5320MHz, 5500~5720MHz</p> <p>For 802.11n-HT40/ac-VHT40/ax-HE40:<br/>5270~5310MHz, 5510~5710MHz</p> <p>For 802.11ac-VHT80/ax-HE80:<br/>5290MHz, 5530MHz, 5610 MHz, 5690 MHz</p> <p>For 802.11ac-VHT80 + 80/ax-HE80 + 80:<br/>5290MHz, 5530MHz, 5610 MHz</p> |
| Type of Modulation:                         | 802.11a/n/ac: OFDM; 802.11ax: OFDMA                                                                                                                                                                                                                                                                         |
| Data Rate:                                  | <p>802.11a: 6/9/12/18/24/36/48/54Mbps</p> <p>802.11n: up to 300Mbps</p> <p>802.11ac: up to 1733.3Mbps</p> <p>802.11ax: up to 2402Mbps</p>                                                                                                                                                                   |
| 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: AP321

| Antenna Type                                                 | Frequency Band (GHz) | T <sub>x</sub> 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: AP321e

| Antenna Type                                                 | Frequency Band (GHz) | T <sub>x</sub> 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  $N_{ANT} \leq 4$ ;

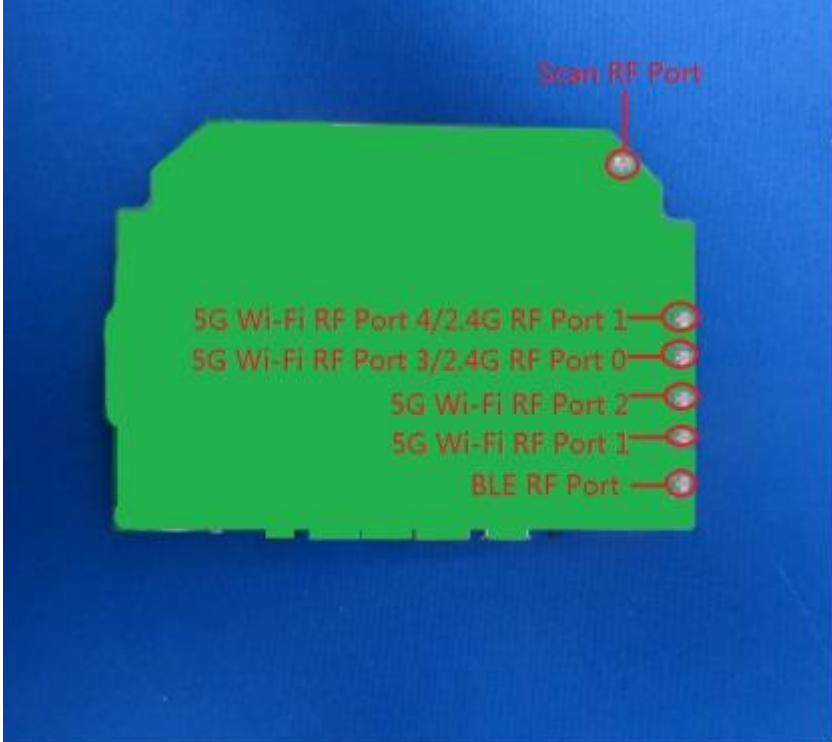
If antenna gains are not equal, Directional gain may be calculated by using the formulas applicable to equal gain antennas with  $G_{ANT}$  set equal to the gain of the antenna having the highest gain.

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 =  $10 \cdot \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}]$  dBi.

Note 5: Here is the same scan antenna, so this report has assessed the scan antenna with AP321.

## 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<br>See Note 1.                                                                                 |
| Channel Closing Transmission Time | 200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period.<br>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<br>(See Notes 1, 2, and 3) |
|---------------------------------------------------------------------------------|----------------------------------|
| EIRP $\geq$ 200 milliwatt                                                       | -64 dBm                          |
| EIRP < 200 milliwatt and<br>power spectral density < 10 dBm/MHz                 | -62 dBm                          |
| EIRP < 200 milliwatt that do not meet the power<br>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 $\left\{ \left( \frac{1}{360} \right) \cdot \left( \frac{19 \cdot 10^6}{PRI_{\mu sec}} \right) \right\}$ | 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<br>Number | Pulse Repetition Frequency<br>(Pulses Per Second) | Pulse Repetition Interval<br>(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                       |

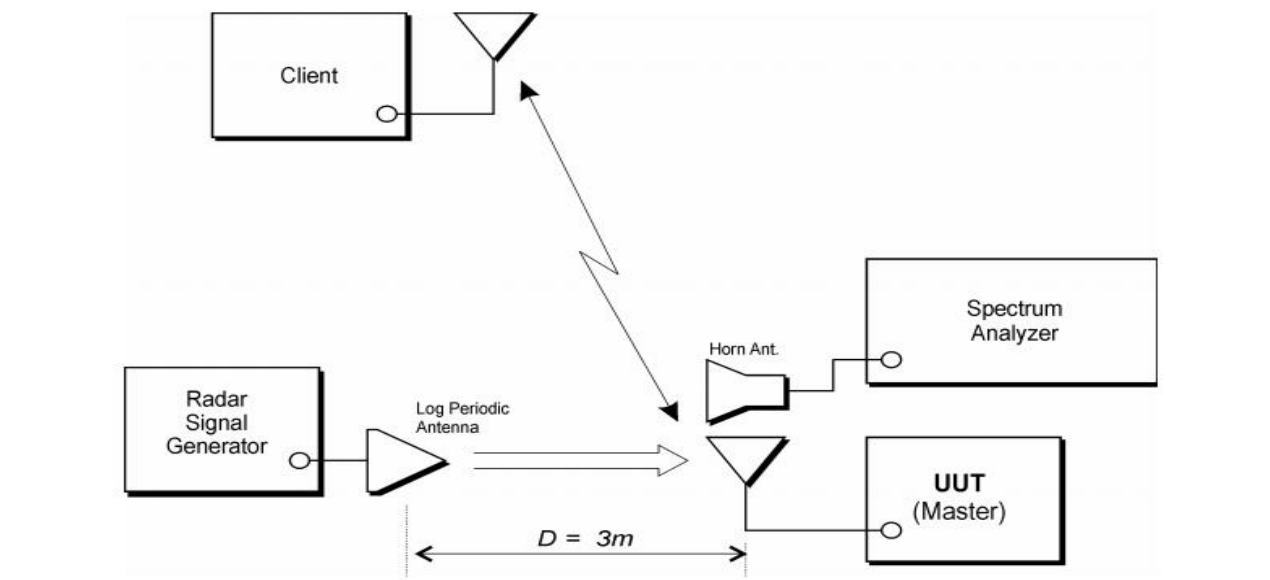
**Table 3-8: Parameters for Frequency Hopping Radar Waveforms**

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             | HAN Networks Co., Ltd | AP321    |

| 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

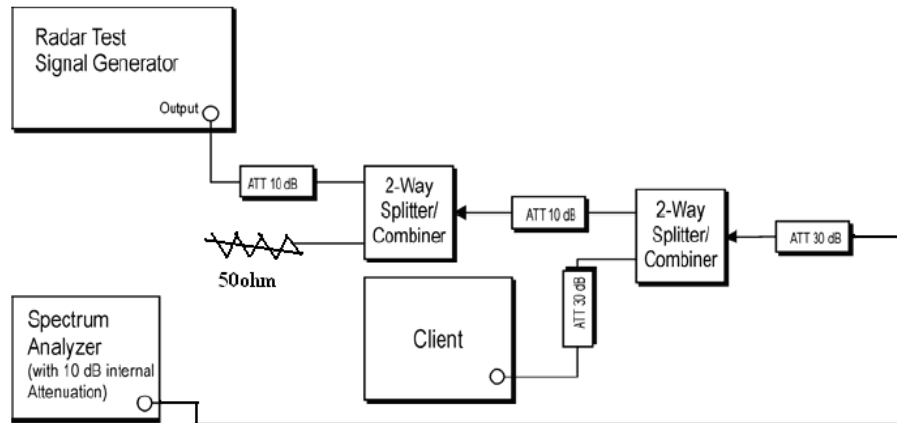
### 5.1. Summary

| 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**

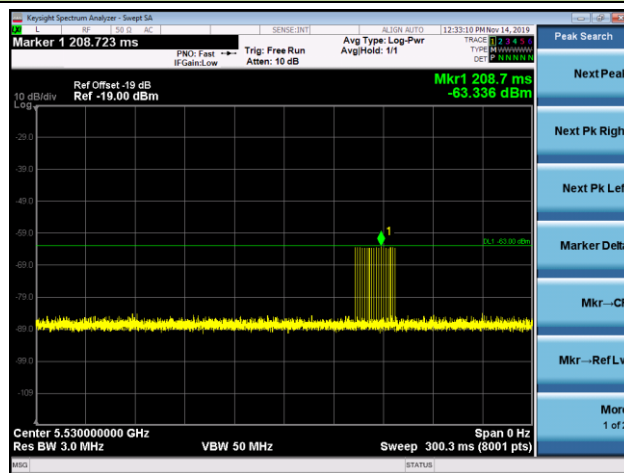
### 5.2.2. Calibration Procedure

The Interference Radar Detection Threshold Level is  $(-64\text{dBm}) + (0) [\text{dBi}] + 1 \text{ dB} = -63 \text{ dBm}$  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  $(-64\text{dBm}) + (0) [\text{dBi}] + 1 \text{ dB} = -63\text{dBm}$ . Capture the spectrum analyzer plots on short pulse radar types, long pulse radar type and hopping radar waveform.

### 5.2.3. Cablibration Result

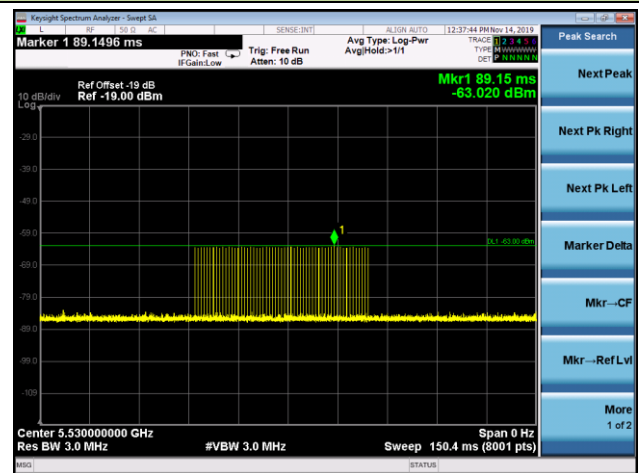
|               |                            |                   |            |
|---------------|----------------------------|-------------------|------------|
| Product       | HAN Access Point           | Temperature       | 27°C       |
| Test Engineer | Amy Zhang                  | Relative Humidity | 65%        |
| Test Site     | SR5                        | Test Date         | 2019/11/14 |
| Test Item     | Radar Waveform Calibration |                   |            |

Radar #0



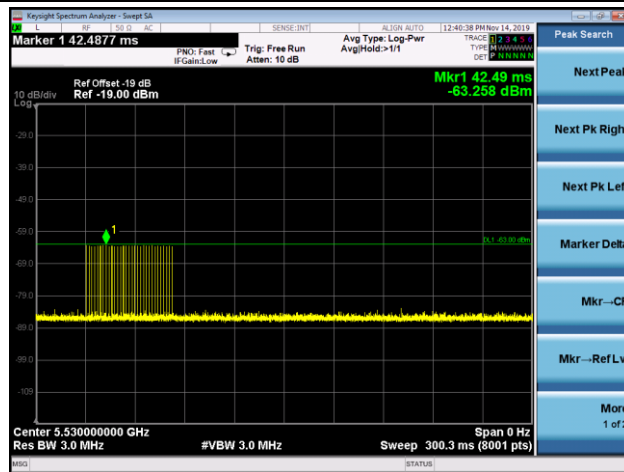
Radar #1 (Test A)

PRI = 858us and the number of pulses = 62

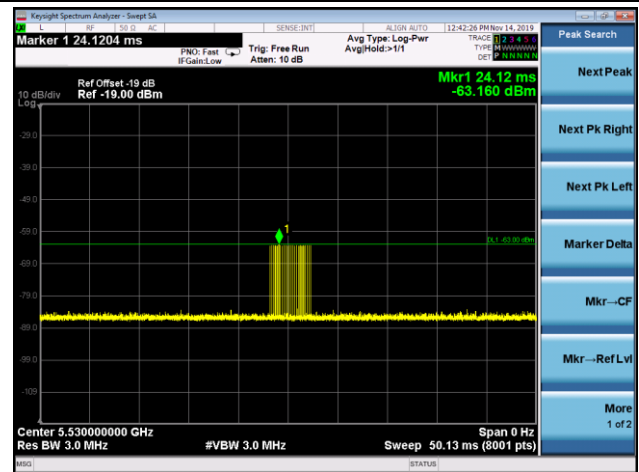


Radar #1 (Test B)

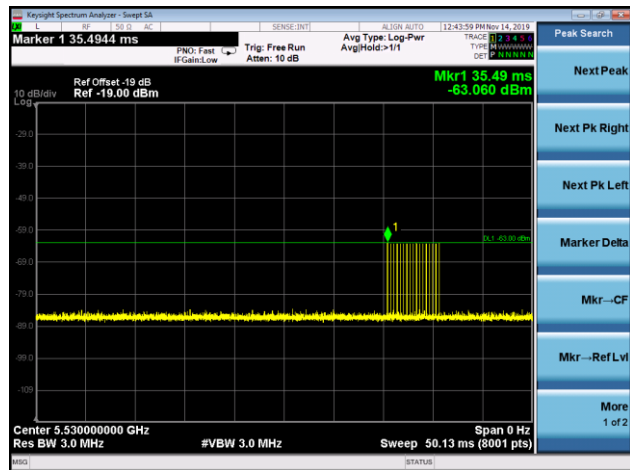
PRI = 1.553ms and the number of pulses = 34



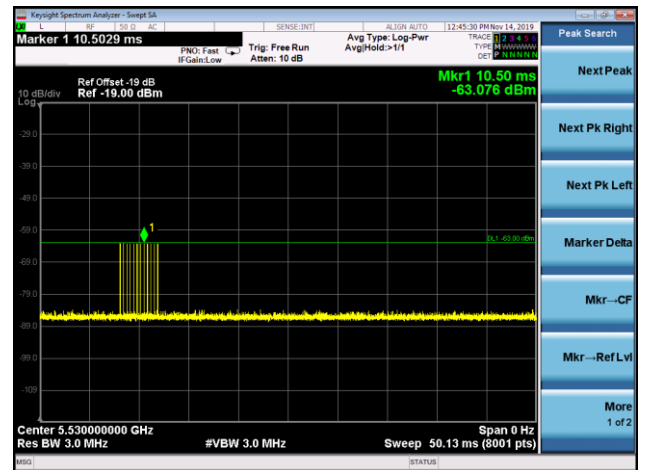
Radar #2



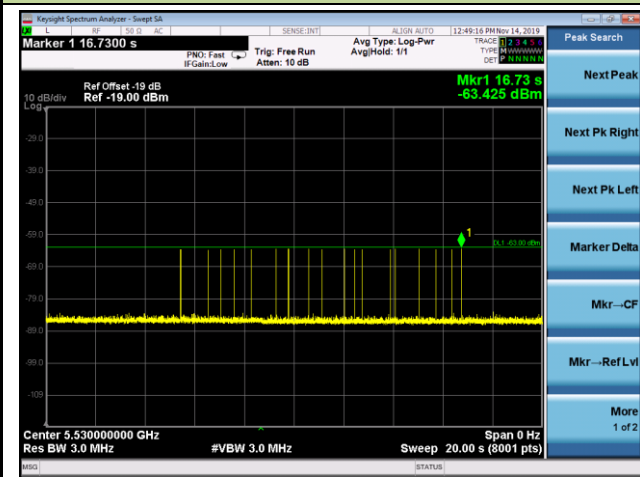
Radars #3



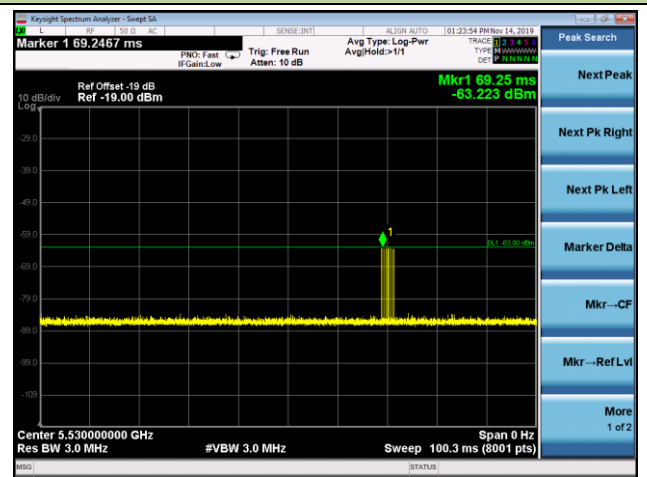
Radars #4



Radars #5

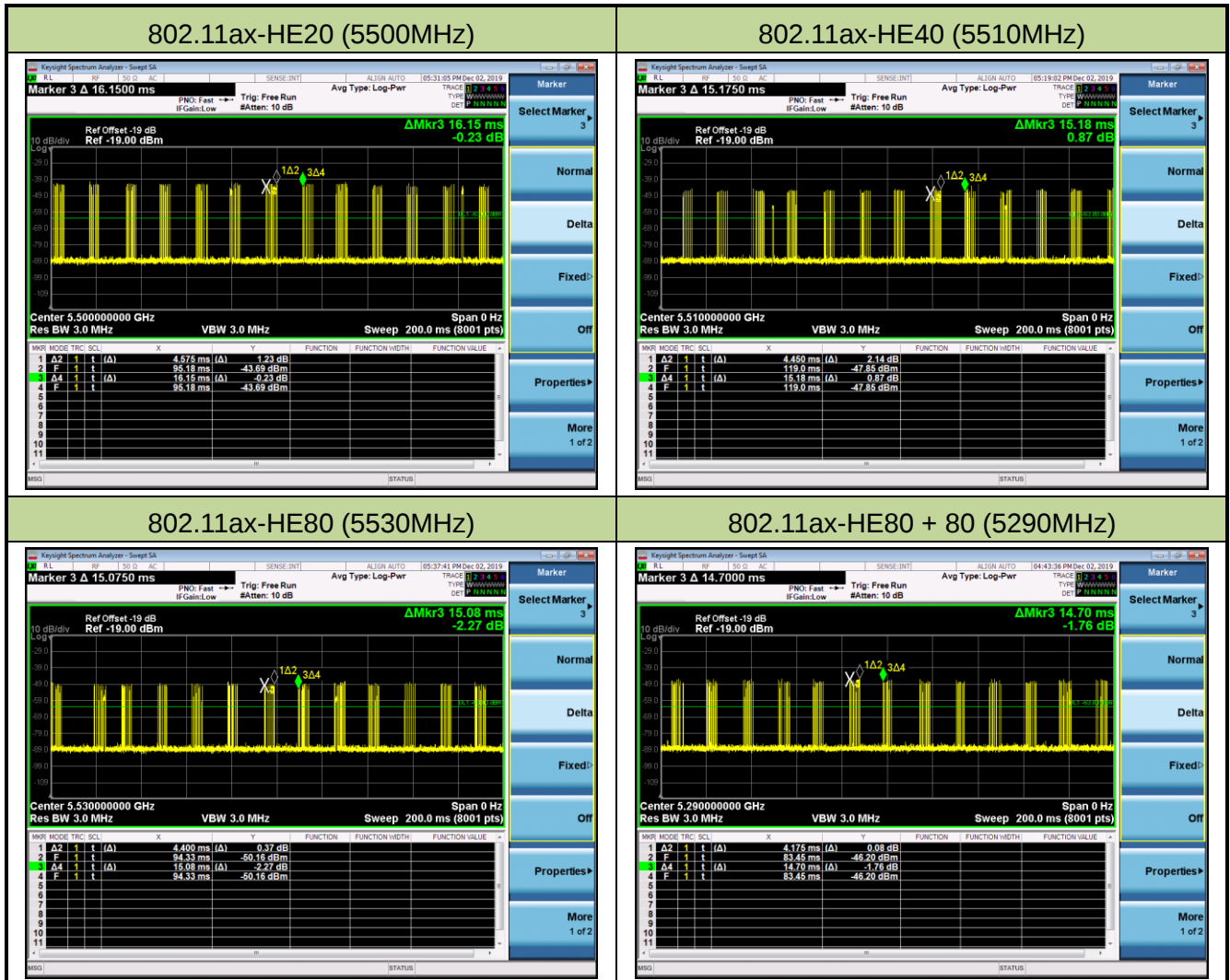


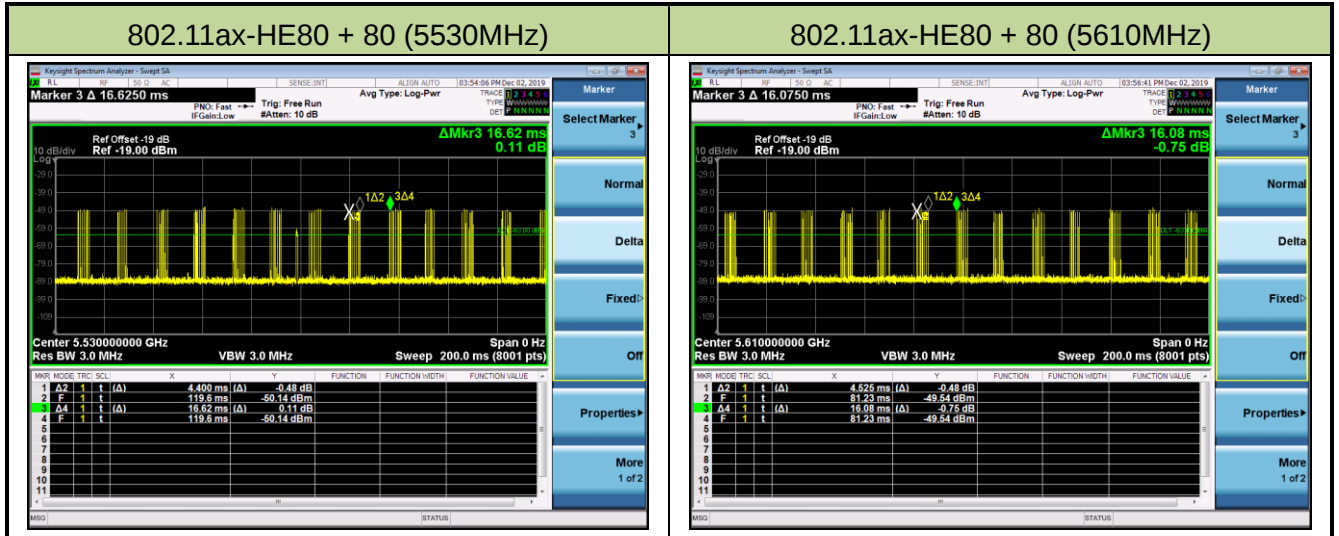
Radars #6



### 5.2.4. Channel Loading Test Result

|               |                  |                   |            |
|---------------|------------------|-------------------|------------|
| Product       | HAN Access Point | Temperature       | 27°C       |
| Test Engineer | Amy Zhang        | Relative Humidity | 65%        |
| Test Site     | SR4              | Test Date         | 2019/12/02 |
| Test Item     | Channel Loading  |                   |            |





| 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:  $\text{U-NII Detection Bandwidth} = \text{FH} - \text{FL}$
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       | HAN Access Point                                   | 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<br>(MHz) | DFS Detection Trials (1=Detection, 0= No Detection) |   |   |   |   |   |   |   |   |    | Detection Rate (%) |
|--------------------------|-----------------------------------------------------|---|---|---|---|---|---|---|---|----|--------------------|
|                          | 1                                                   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |                    |
| 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       | HAN Access Point                                   | 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<br>(MHz) | DFS Detection Trials (1=Detection, 0= No Detection) |   |   |   |   |   |   |   |   |    | Detection Rate (%) |
|--------------------------|-----------------------------------------------------|---|---|---|---|---|---|---|---|----|--------------------|
|                          | 1                                                   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |                    |
| 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       | HAN Access Point                                   | 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<br>(MHz) | DFS Detection Trials (1=Detection, 0= No Detection) |   |   |   |   |   |   |   |   |    | Detection Rate (%) |
|--------------------------|-----------------------------------------------------|---|---|---|---|---|---|---|---|----|--------------------|
|                          | 1                                                   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |                    |
| 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       | HAN Access Point                                        | 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<br>(MHz) | DFS Detection Trials (1=Detection, 0= No Detection) |   |   |   |   |   |   |   |   |    | Detection Rate (%) |
|--------------------------|-----------------------------------------------------|---|---|---|---|---|---|---|---|----|--------------------|
|                          | 1                                                   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |                    |
| 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       | HAN Access Point                                        | 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<br>(MHz) | DFS Detection Trials (1=Detection, 0= No Detection) |   |   |   |   |   |   |   |   |    | Detection Rate (%) |
|--------------------------|-----------------------------------------------------|---|---|---|---|---|---|---|---|----|--------------------|
|                          | 1                                                   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |                    |
| 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       | HAN Access Point                                      | 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<br>(MHz) | DFS Detection Trials (1=Detection, 0= No Detection) |   |   |   |   |   |   |   |   |    | Detection Rate (%) |
|--------------------------|-----------------------------------------------------|---|---|---|---|---|---|---|---|----|--------------------|
|                          | 1                                                   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |                    |
| 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**

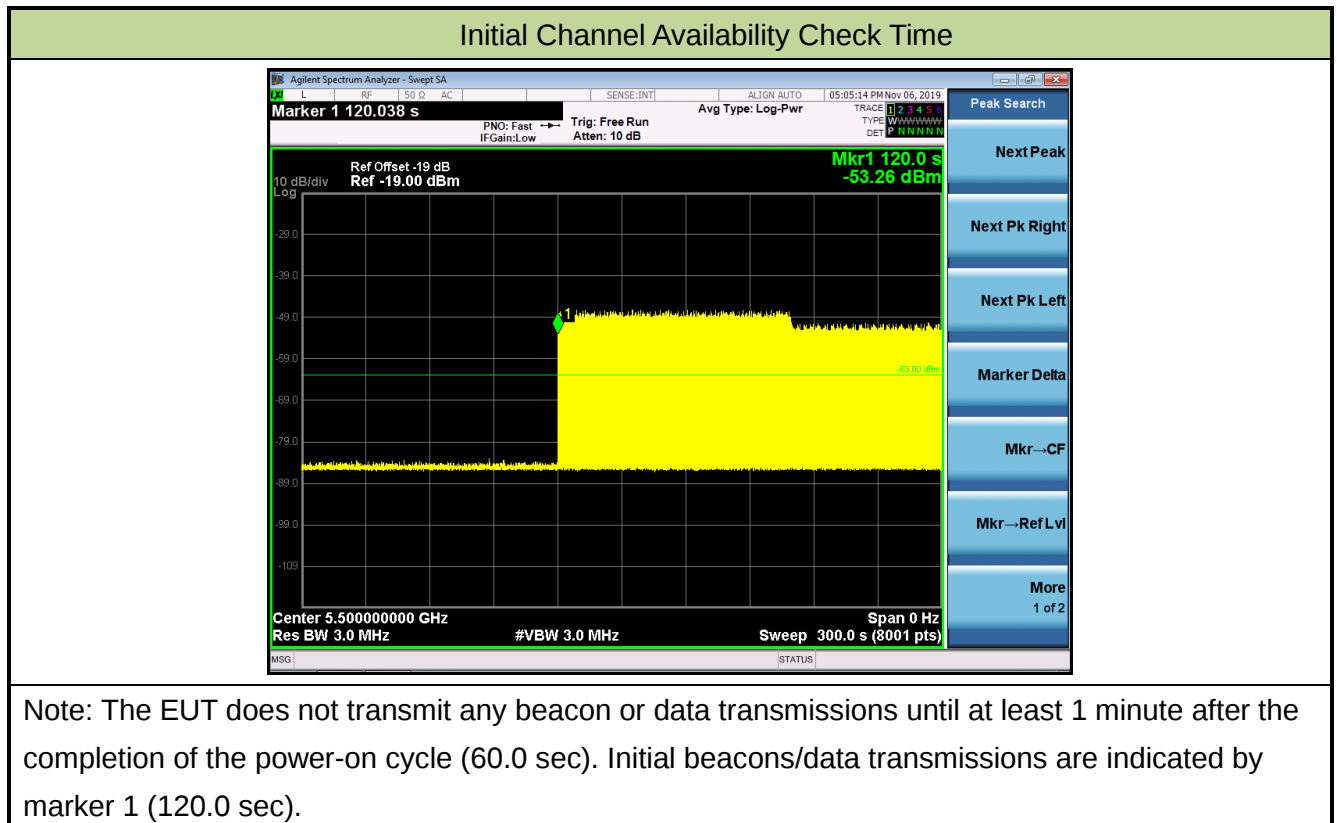
The EUT shall perform a Channel Availability Check to ensure that there is no radar operating on the channel. After power-up sequence, receive at least 1 minute on the intended operating frequency.

### **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       | HAN Access Point                                                       | 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) |                   |            |



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

### **5.5.1. Test Limit**

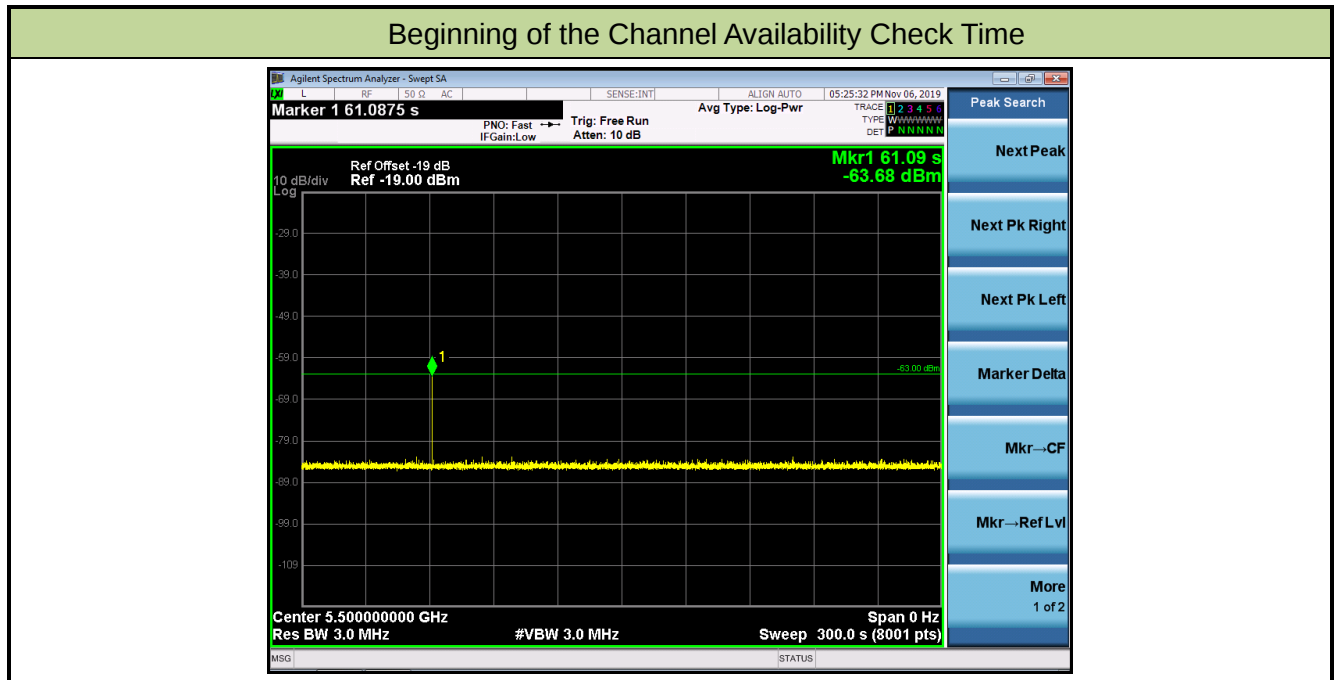
In beginning of the Channel Availability Check (CAC) Time, radar is detected on this channel, select another intended channel and perform a CAC on that channel.

### **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       | HAN Access Point                                                                | 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) |                   |            |



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

### **5.6.1. Test Limit**

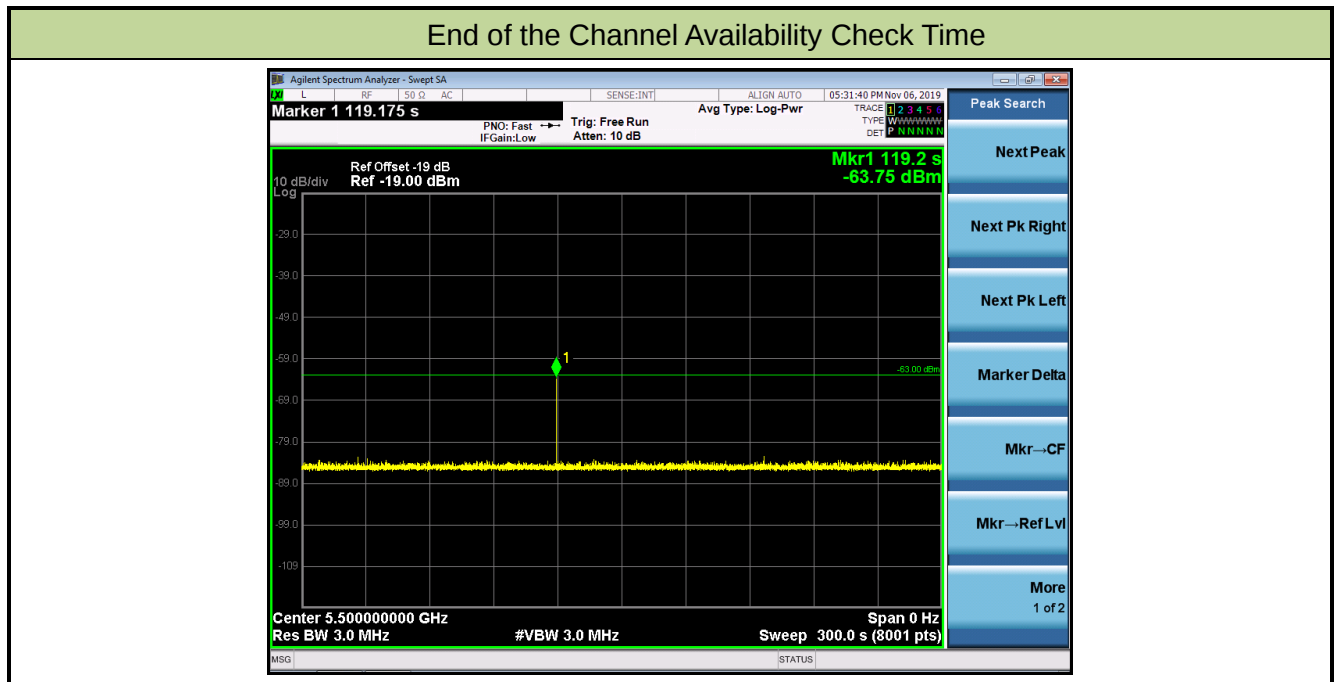
In the end of Channel Availability Check (CAC) Time, radar is detected on this channel, select another intended channel and perform a CAC on that channel.

### **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 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+ 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       | HAN Access Point                                                          | 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) |                   |            |



## **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.

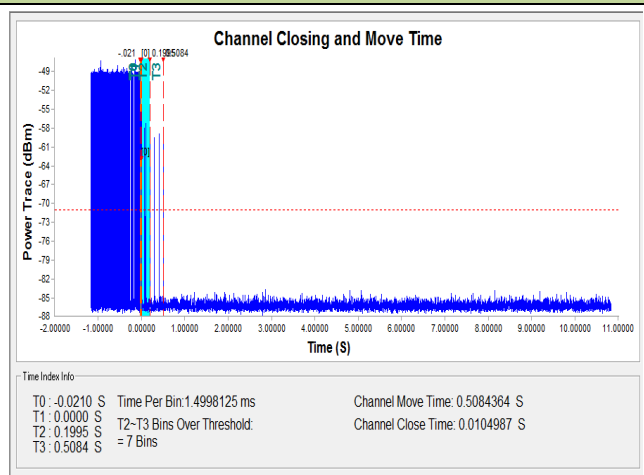
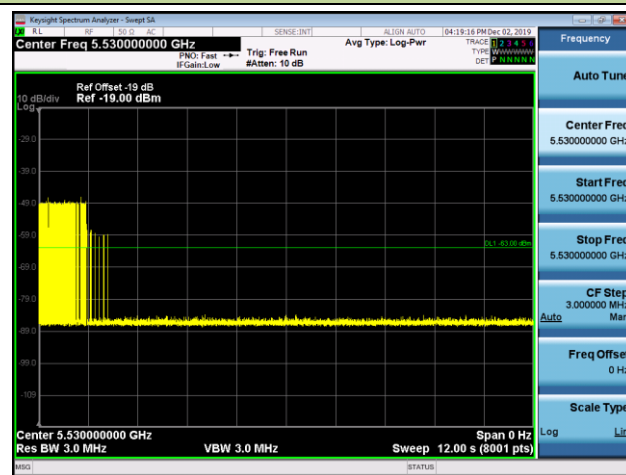
### **5.7.2. Test Procedure Used**

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:  $Dwell (1.5ms) = S (12 \text{ sec}) / B (8000)$ ; 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:  $C = N \times Dwell$ ; 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.

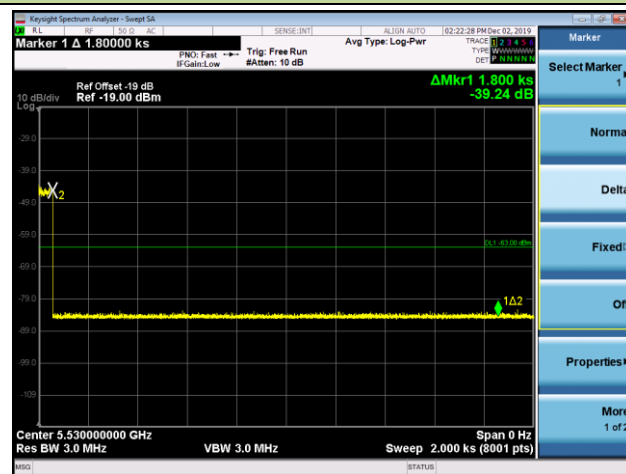
### 5.7.3. Test Result

|               |                                                                                                |                   |            |
|---------------|------------------------------------------------------------------------------------------------|-------------------|------------|
| Product       | HAN Access Point                                                                               | 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<br>(802.11ax-HE80 + 80 mode - 5530MHz) |                   |            |

#### Channel Move Time and Channel Closing Transmission Time



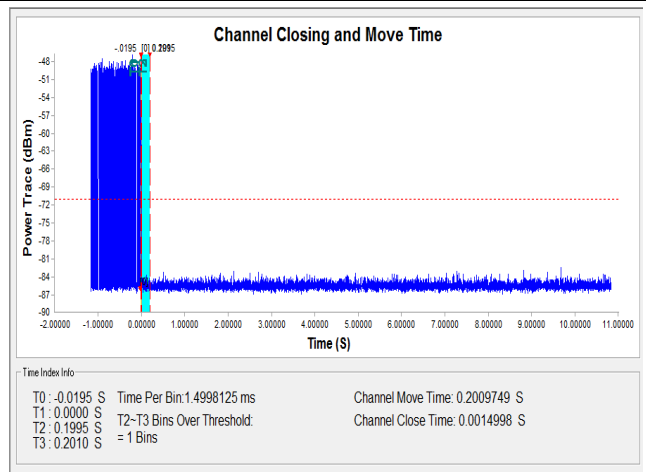
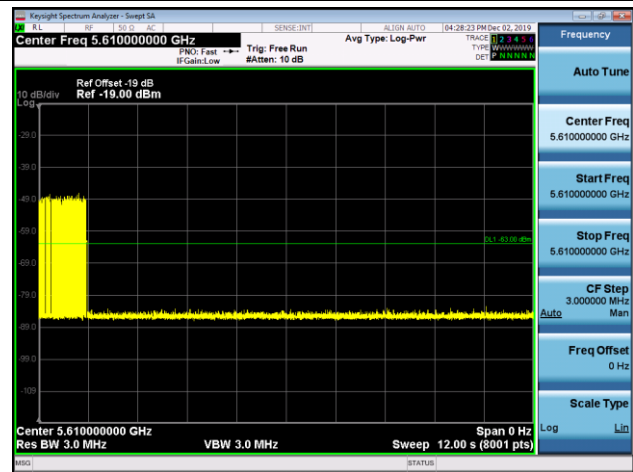
#### Non-Occupancy Period



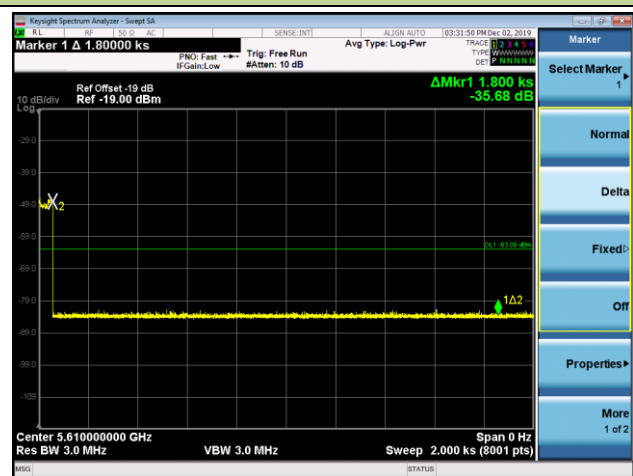
| Parameter                                                                                                                                                                                                                                                                                                                                                                                                       | Test Result | Limit    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------|
| Channel Move Time (s)                                                                                                                                                                                                                                                                                                                                                                                           | 0.508s      | <10s     |
| Channel Closing Transmission Time (ms)<br>(Note)                                                                                                                                                                                                                                                                                                                                                                | 10.5ms      | < 60ms   |
| Non-Occupancy Period (min)                                                                                                                                                                                                                                                                                                                                                                                      | ≥ 30min     | ≥ 30 min |
| <p>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.</p> |             |          |

|               |                                                                                                |                   |            |
|---------------|------------------------------------------------------------------------------------------------|-------------------|------------|
| Product       | HAN Access Point                                                                               | 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<br>(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)<br>(Note)                                                                                                                                                                                                                                                                                                                                                                | 1.5ms       | < 60ms   |
| Non-Occupancy Period (min)                                                                                                                                                                                                                                                                                                                                                                                      | ≥ 30min     | ≥ 30 min |
| <p>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.</p> |             |          |

## 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:  

$$(\text{Total Waveform Detections} / \text{Total Waveform Trails}) * 100 = \text{Probability of Detection Radar Waveform}$$
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

- Stream the MPEG test file from the Master Device to the Client Device on the test Channel for the entire period of the test.
- 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.
- 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.
- 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.
- The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trial runs.
- 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       | HAN Access Point                                                   | 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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | 1=Detection<br>0=No Detection | Trail # | Test Freq.<br>(MHz) | 1=Detection<br>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.<br>(MHz) | 1=Detection<br>0=No Detection | Trail # | Test Freq.<br>(MHz) | 1=Detection<br>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       | HAN Access Point                                                   | 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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>0=No Detection |
|--------------------------|---------------------|---------------------|----------|----------------|-------------------------------|
| 30                       | 5529                | 1                   | 2610     | 21             | 1                             |
| Detection Percentage (%) |                     |                     |          |                | 100%                          |

## Radar Type 2 - Radar Statistical Performance

| Trail #                  | Test Freq.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | 1=Detection<br>0=No Detection | Trail # | Test Freq.<br>(MHz) | 1=Detection<br>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.<br>(MHz) | 1=Detection<br>0=No Detection | Trail # | Test Freq.<br>(MHz) | 1=Detection<br>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       | HAN Access Point                                                   | 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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>0=No Detection |
|--------------------------|---------------------|---------------------|----------|----------------|-------------------------------|
| 30                       | 5569                | 1                   | 2070     | 26             | 1                             |
| Detection Percentage (%) |                     |                     |          |                | 100%                          |

## Radar Type 2 - Radar Statistical Performance

| Trail #                  | Test Freq.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | 1=Detection<br>0=No Detection | Trail # | Test Freq.<br>(MHz) | 1=Detection<br>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.<br>(MHz) | 1=Detection<br>0=No Detection | Trail # | Test Freq.<br>(MHz) | 1=Detection<br>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       | HAN Access Point                                                        | 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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>0=No Detection |
|--------------------------|---------------------|---------------------|----------|----------------|-------------------------------|
| 30                       | 5329                | 1                   | 2441     | 22             | 1                             |
| Detection Percentage (%) |                     |                     |          |                | 100%                          |

## Radar Type 2 - Radar Statistical Performance

| Trail #                  | Test Freq.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | 1=Detection<br>0=No Detection | Trail # | Test Freq.<br>(MHz) | 1=Detection<br>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.<br>(MHz) | 1=Detection<br>0=No Detection | Trail # | Test Freq.<br>(MHz) | 1=Detection<br>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       | HAN Access Point                                                        | 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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>0=No Detection |
|--------------------------|---------------------|---------------------|----------|----------------|-------------------------------|
| 30                       | 5570                | 1                   | 669      | 79             | 1                             |
| Detection Percentage (%) |                     |                     |          |                | 100%                          |

## Radar Type 2 - Radar Statistical Performance

| Trail #                  | Test Freq.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | 1=Detection<br>0=No Detection | Trail # | Test Freq.<br>(MHz) | 1=Detection<br>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.<br>(MHz) | 1=Detection<br>0=No Detection | Trail # | Test Freq.<br>(MHz) | 1=Detection<br>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       | HAN Access Point                                                        | 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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>0=No Detection |
|--------------------------|---------------------|---------------------|----------|----------------|-------------------------------|
| 30                       | 5649                | 1                   | 1352     | 39             | 1                             |
| Detection Percentage (%) |                     |                     |          |                | 100%                          |

## Radar Type 2 - Radar Statistical Performance

| Trail #                  | Test Freq.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | Pulse Width<br>(us) | PRI (us) | Pulses / Burst | 1=Detection<br>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.<br>(MHz) | 1=Detection<br>0=No Detection | Trail # | Test Freq.<br>(MHz) | 1=Detection<br>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.<br>(MHz) | 1=Detection<br>0=No Detection | Trail # | Test Freq.<br>(MHz) | 1=Detection<br>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.

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The End

## **Appendix A – Test Setup Photograph**

Refer to “1909RSU036-UT” file.

## **Appendix B – EUT Photograph**

Refer to “1909RSU036-UE” file.