

DFS MEASUREMENT REPORT

FCC 15.407 WLAN 802.11a/n/ac/ax

FCC ID: 2ABLK-GS4227E

APPLICANT: Calix Inc.

Application Type: CLASS II PERMISSIVE CHANGE

Product: GigaSpire, GigaSpire BLAST^{u6.1}

Model No.: GS4227E, GS4220E

Brand Name:  **Calix**

FCC Classification: Unlicensed National Information Infrastructure (NII)

FCC Rule Part(s): Part 15 Subpart E - 15.407 Section (h)(2)

KDB 905462 D02v02, KDB 905462 D04v01

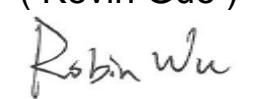
Type of Device: Master Device

Test Date: November 24 ~December 03, 2019

Reviewed By:


(Kevin Guo)

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
1911RSU033-U5	Rev. 01	Initial report	02-02-2020	Valid

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§2.1033 General Information

Applicant:	Calix Inc.
Applicant Address:	1035 N. McDowell Blvd Petaluma, CA94954 U.S.A
Manufacturer:	Calix Inc.
Manufacturer Address:	1035 N. McDowell Blvd Petaluma, CA94954 U.S.A
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
Test Device Serial No.:	N/A <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 registered (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 Innovation, Science and Economic Development Canada and 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:	GigaSpire, GigaSpire BLAST ^{U6.1}
Model No.:	GS4227E, GS4220E
Brand Name:	 Calix
Wi-Fi Specification:	802.11a/b/g/n/ac/ax

Note 1: There are the same hardware design, PCB layout between product names and models, except the data rate of the white RJ45 port. For this port, GS4227E supports 2.5Gbps, but GS4220E supports 1Gbps only.

Note 2: The difference addressed as above doesn't affect the RF test result, so we selected GS4227E (product name: GigaSpire) for all RF testing.

2.2. Product Specification Subjective to this Report

Frequency Range:	For 802.11a/n-HT20/ac-VHT20/ax-HE20: 5260~5320MHz, 5500~5720MHz For 802.11n-HT40/ac-VHT40/ax-HE40: 5270~5310MHz, 5510~5710MHz For 802.11ac-VHT80/ax-HE80: 5290MHz, 5530MHz, 5610MHz, 5690MHz For 802.11ac-VHT80+80/ax-HE80+80: 5210+5290MHz, 5530+5610MHz
Type of Modulation:	802.11a/n/ac: OFDM 802.11ax: OFDMA
Data Rate:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733Mbps 802.11ax: up to 2475Mbps
Power-on cycle:	Requires 43.9 seconds to complete its power-on cycle
Uniform Spreading (For DFS Frequency Band)	For the 5250-5350MHz, 5470-5725 MHz bands, the Master device provides, on aggregate, uniform loading of the spectrum across all devices by selecting an operating channel among the available channels using a random algorithm.

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

2.3. Description of Available Antennas

Antenna Type	Frequency Band (MHz)	Tx Paths	Directional Gain (dBi)	
			Non Beam-Forming Mode	Beam-Forming Mode
PCB Antenna	2412 ~ 2462	2	2.62	5.52
	5150 ~ 5250	4	1.89	6.90
	5250 ~ 5350	4	1.89	6.90
	5470 ~ 5725	4	2.03	7.44
	5725 ~ 5850	4	1.20	6.34

Note:

1. The EUT supports Beam Forming technology, and the Beam Forming mode support 802.11ac/ax, not include 802.11a/b/g. Its transmit signals are correlated, then

Directional gain = $10 \log [(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}]$ dBi [Note the "20"s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2. The EUT also support Non Beam-Forming technology, and Non Beam-Forming mode support 802.11a/b/g/n/ac/ax, its transmit signals are uncorrelated, then

Directional gain = $10 \log [(10^{G1/10} + 10^{G2/10} + \dots + 10^{GN/10}) / N_{ANT}]$ dBi

2.4. DFS Band Carrier Frequencies Operation

802.11a/n-HT20/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
42+58	5210+5290 MHz	106+122	5530+5610 MHz

2.5. Test Mode

Test Mode	Mode 1: Communication with Notebook
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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 a specified time duration (Channel Availability Check Time) to ensure that there is no radar system operating on the Channel, using DFS described under subsection a) above.
- (c) The Master Device initiates a U-NII network by transmitting control signals that will enable other U-NII devices to Associate with the Master Device.
- (d) During normal operation, the Master Device will monitor the Channel (In-Service Monitoring) to ensure that there is no radar system operating on the Channel, using DFS described under a).
- (e) If the Master Device has detected a Radar Waveform during In-Service Monitoring as described under d), the Operating Channel of the U-NII network is no longer an Available Channel. The Master Device will instruct all associated Client Device(s) to stop transmitting on this Channel within the Channel Move Time. The transmissions during the Channel Move Time will be limited to the Channel Closing Transmission Time.
- (f) Once the Master Device has detected a Radar Waveform it will not utilize the Channel for the duration of the Non-Occupancy Period.
- (g) If the Master Device delegates the In-Service Monitoring to a Client Device, then the combination will be tested to the requirements described under d) through f) above.

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

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

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

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

Table 3-3: DFS Response Requirements

3.3. DFS Detection Threshold Values

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

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP \geq 200 milliwatt	-64 dBm
EIRP $<$ 200 milliwatt and power spectral density $<$ 10 dBm/MHz	-62 dBm
EIRP $<$ 200 milliwatt that do not meet the power spectral density requirement	-64 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.

Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Note 3: 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 $\left\lceil \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\rceil$	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: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

Table 3-5: Parameters for Short Pulse Radar Waveforms

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

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

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

Long Pulse Radar Test Waveform

Radar Type	Pulse Width (usec)	Chirp Width (MHz)	PRI (usec)	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 (usec)	PRI (usec)	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. Conducted 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 conducted test setup was used for this testing. Figure 3-1 shows the typical test setup.

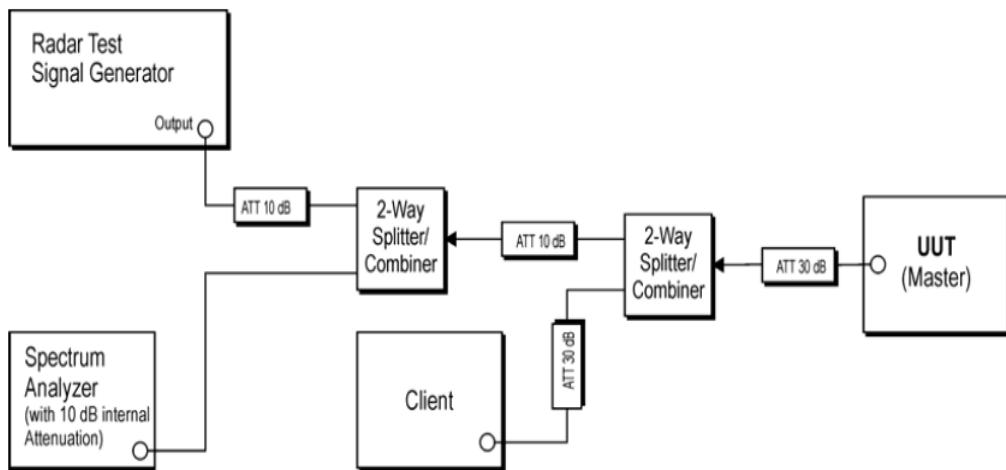


Figure 3-1: Conducted Test Setup where UUT is a Master and Radar Test Waveforms are injected into the Masters

4. TEST EQUIPMENT CALIBRATION DATE

Dynamic Frequency Selection (DFS) - SR4

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	KEYSIGHT	N9010B	MRTSUE06452	1 year	2020/07/11
ESG Vector Signal Generator	Agilent	E4438C	MRTSUE06026	1 year	2020/11/07
Vector Signal Generator	R&S	SMBV100A	MRTSUE06279	1 year	2020/04/15
Thermohygrometer	Testo	608-H1	MRTSUE06402	1 year	2020/08/08

Client Information

Instrument	Manufacturer	Type No.
Wireless Network Adapter	Intel	7260HMW

Software	Version	Manufacturer	Function
Pulse Building	N/A	Agilent	Radar Signal Generation Software
DFS Tool	V 6.9.2	Agilent	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.

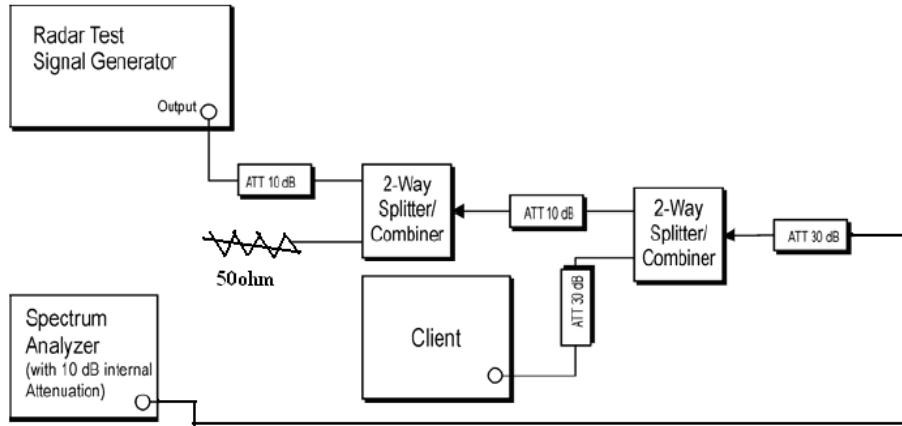


Figure 3-2: Conducted Test Setup

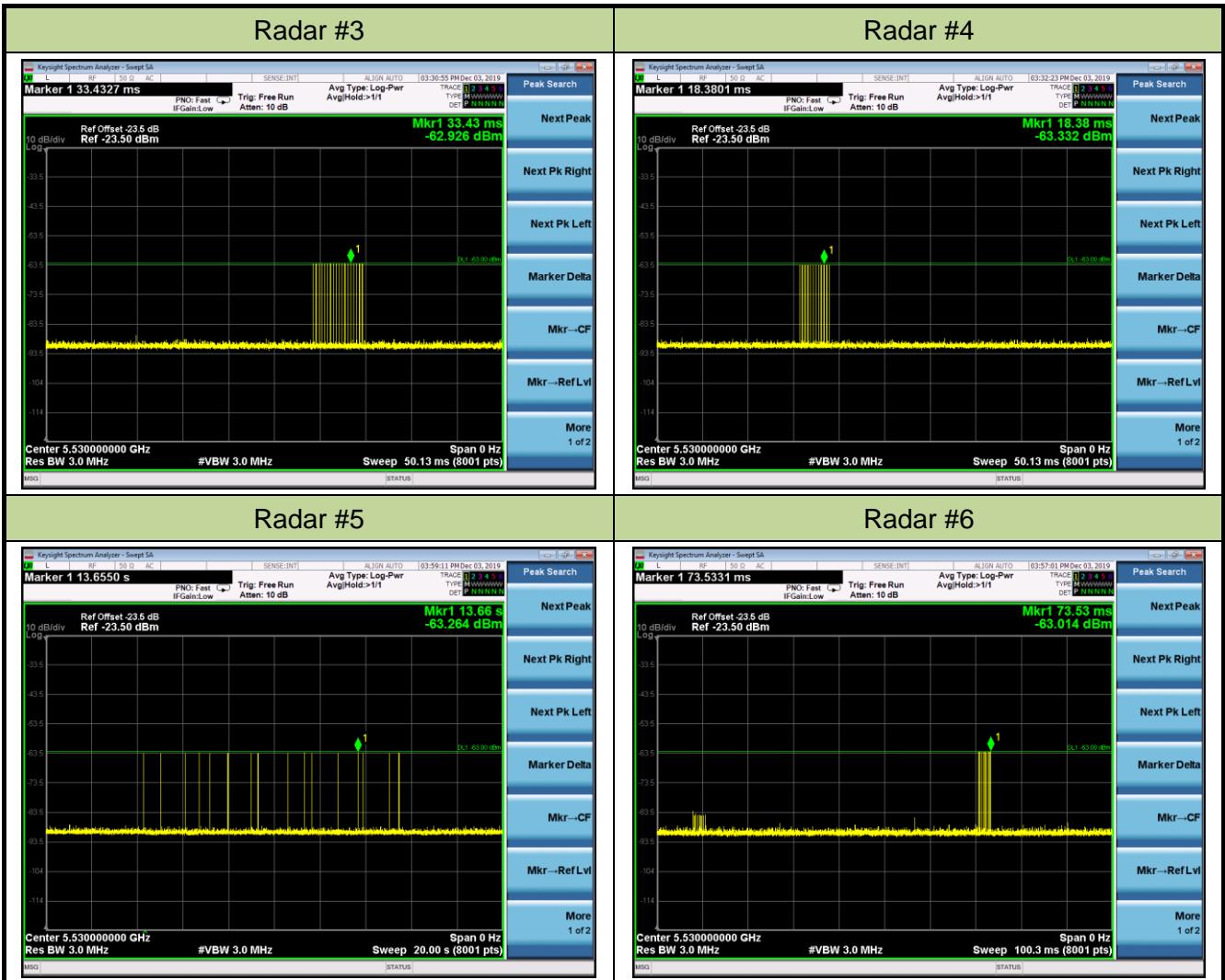
5.2.2. Calibration Procedure

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

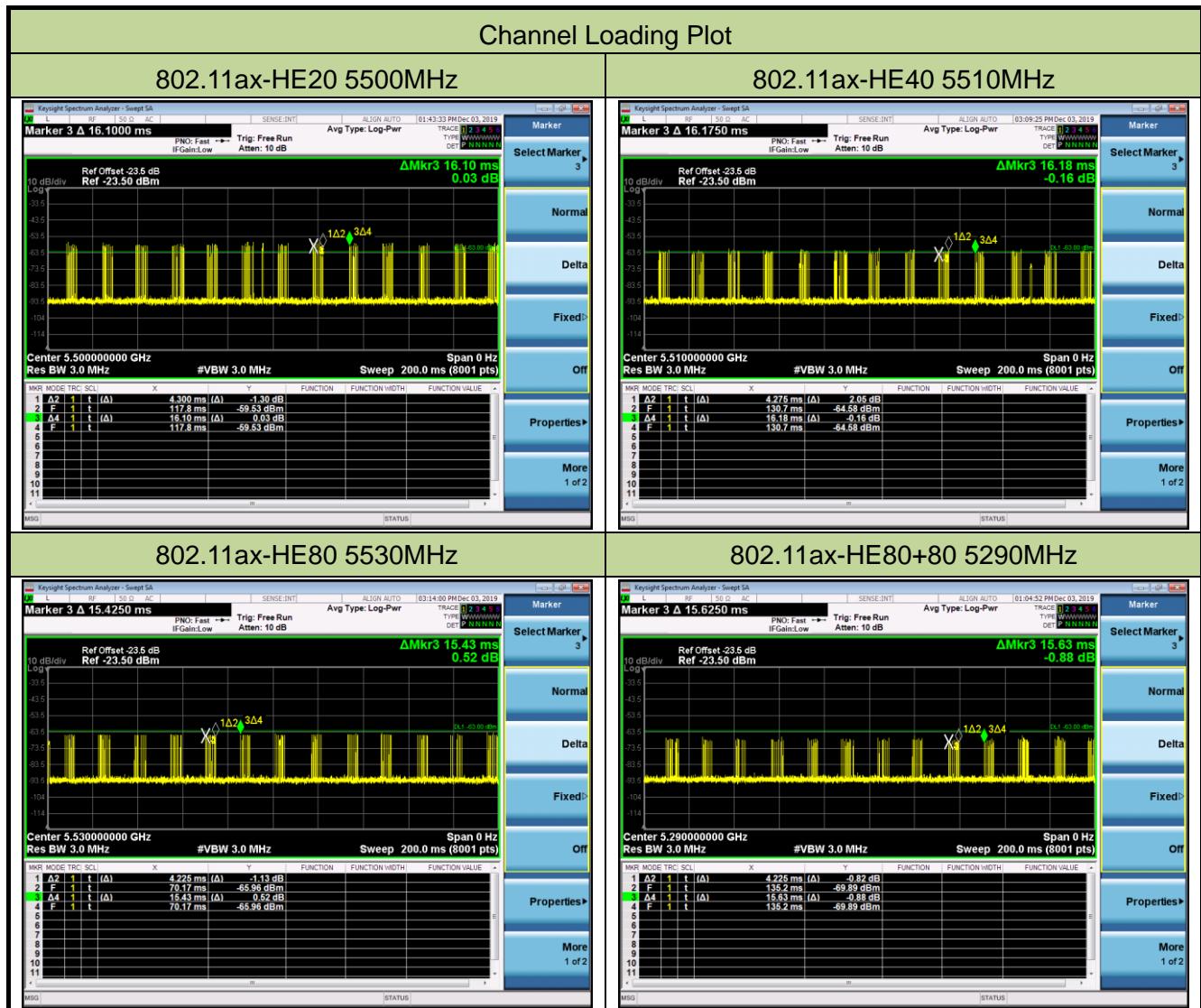
Product	GigaSpire	Temperature	25°C
Test Engineer	Amy Zhang	Relative Humidity	60%
Test Site	SR4	Test Date	2019/12/03
Test Item	Radar Waveform Calibration		

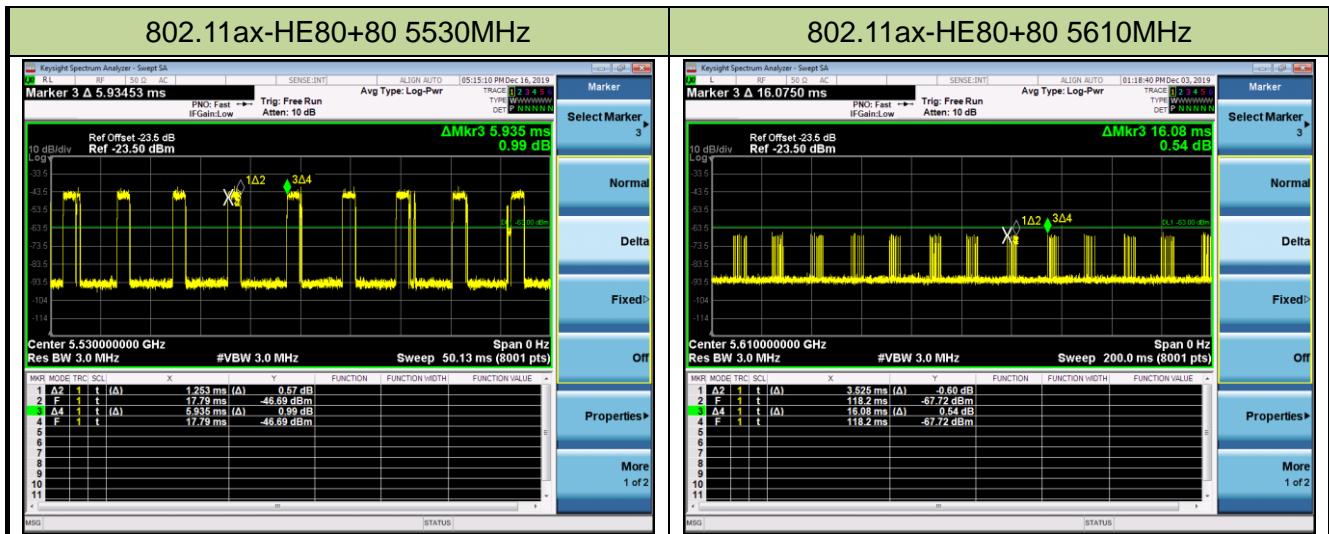




5.2.4. Channel Loading Test Result

Product	GigaSpire	Temperature	25°C
Test Engineer	Amy Zhang	Relative Humidity	62%
Test Site	SR4	Test Date	2019/12/03
Test Item	Channel Loading		





Test Mode	Test Frequency	Packet ratio	Requirement ratio	Test Result
802.11ax-HE20	5500 MHz	26.71%	≥ 17%	Pass
802.11ax-HE40	5510 MHz	26.42%	≥ 17%	Pass
802.11ax-HE80	5530 MHz	27.38%	≥ 17%	Pass
802.11ax-HE80+80	5290 MHz	27.03%	≥ 17%	Pass
802.11ax-HE80+80	5530 MHz	21.11%	≥ 17%	Pass
802.11ax-HE80+80	5610 MHz	21.92%	≥ 17%	Pass

Note: System testing was performed with the designated iperf test file. This file is used by IP and Frame based systems for loading the test channel during the In-service compliance testing of the U-NII device. Packet ratio = Time On / (Time On + Off Time).

5.3. NII Detection Bandwidth Measurement

5.3.1. Test Limit

Minimum 100% of the NII 99% transmission power bandwidth. During the U-NII Detection Bandwidth detection test, each frequency step the minimum percentage of detection is 90 percent.

Measurements are performed with no data traffic.

5.3.2. Test Procedure

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

7. The U-NII Detection Bandwidth is calculated as follows: U-NII Detection Bandwidth = FH – FL
8. The U-NII Detection Bandwidth must be at least 100% of the EUT transmitter 99% power, otherwise, the EUT does not comply with DFS requirements.

5.3.3. Test Result

Product	GigaSpire	Temperature	23 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2019/12/03
Test Item	Detection Bandwidth (802.11ax-HE20 mode - 5500MHz)		

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										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 18.94MHz. (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): $18.94\text{MHz} \times 100\% = 18.94\text{MHz}$.

Product	GigaSpire	Temperature	23 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2019/12/03
Test Item	Detection Bandwidth (802.11ax-HE40 mode - 5510MHz)		

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										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 37.74MHz. (See the 99% BW section of the RF report for further measurement details).

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

Note 3: NII Detection Bandwidth Min. Limit (MHz): $37.74\text{MHz} \times 100\% = 37.74\text{MHz}$.

Product	GigaSpire	Temperature	23 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2019/12/03
Test Item	Detection Bandwidth (802.11ax-HE80 mode - 5530MHz)		

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										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 76.96MHz. (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): $76.96\text{MHz} \times 100\% = 76.96\text{MHz}$.

Product	GigaSpire	Temperature	23 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2019/12/03
Test Item	Detection Bandwidth (802.11ax-HE80+80 mode – 5290MHz)		

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										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 77.58MHz. (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): $77.58\text{MHz} \times 100\% = 77.58\text{MHz}$.

Product	GigaSpire	Temperature	23 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2019/12/03
Test Item	Detection Bandwidth (802.11ax-HE80+80 mode - 5530MHz)		

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										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 77.71MHz. (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): $77.71\text{MHz} \times 100\% = 77.71\text{MHz}$.

Product	GigaSpire	Temperature	23 ~ 27°C
Test Engineer	Amy Zhang	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2019/12/03
Test Item	Detection Bandwidth (802.11ax-HE80+80 mode - 5610MHz)		

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										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 77.66 MHz. (See the 99% BW section of the RF report for further measurement details).

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

Note 3: NII Detection Bandwidth Min. Limit (MHz): $77.66\text{MHz} \times 100\% = 77.66\text{MHz}$.

5.4. Initial Channel Availability Check Time Measurement

5.4.1. Test Limit

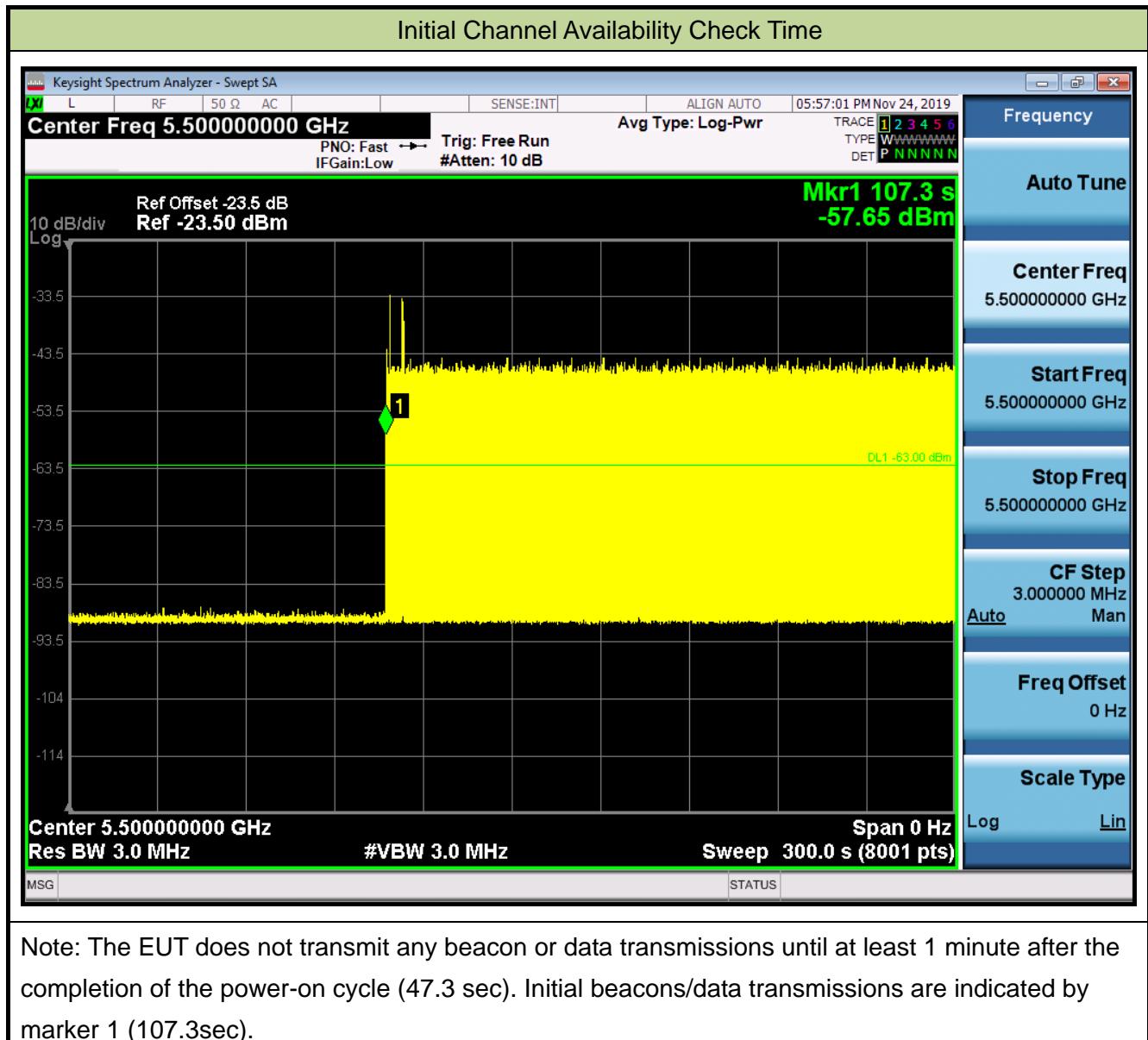
The EUT shall perform a Channel Availability Check to ensure that there is no radar operating on the channel. After power-up sequence, receive at least 1 minute on the intended operating frequency.

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	GigaSpire	Temperature	27°C
Test Engineer	Amy Zhang	Relative Humidity	65%
Test Site	SR4	Test Date	2019/11/24
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

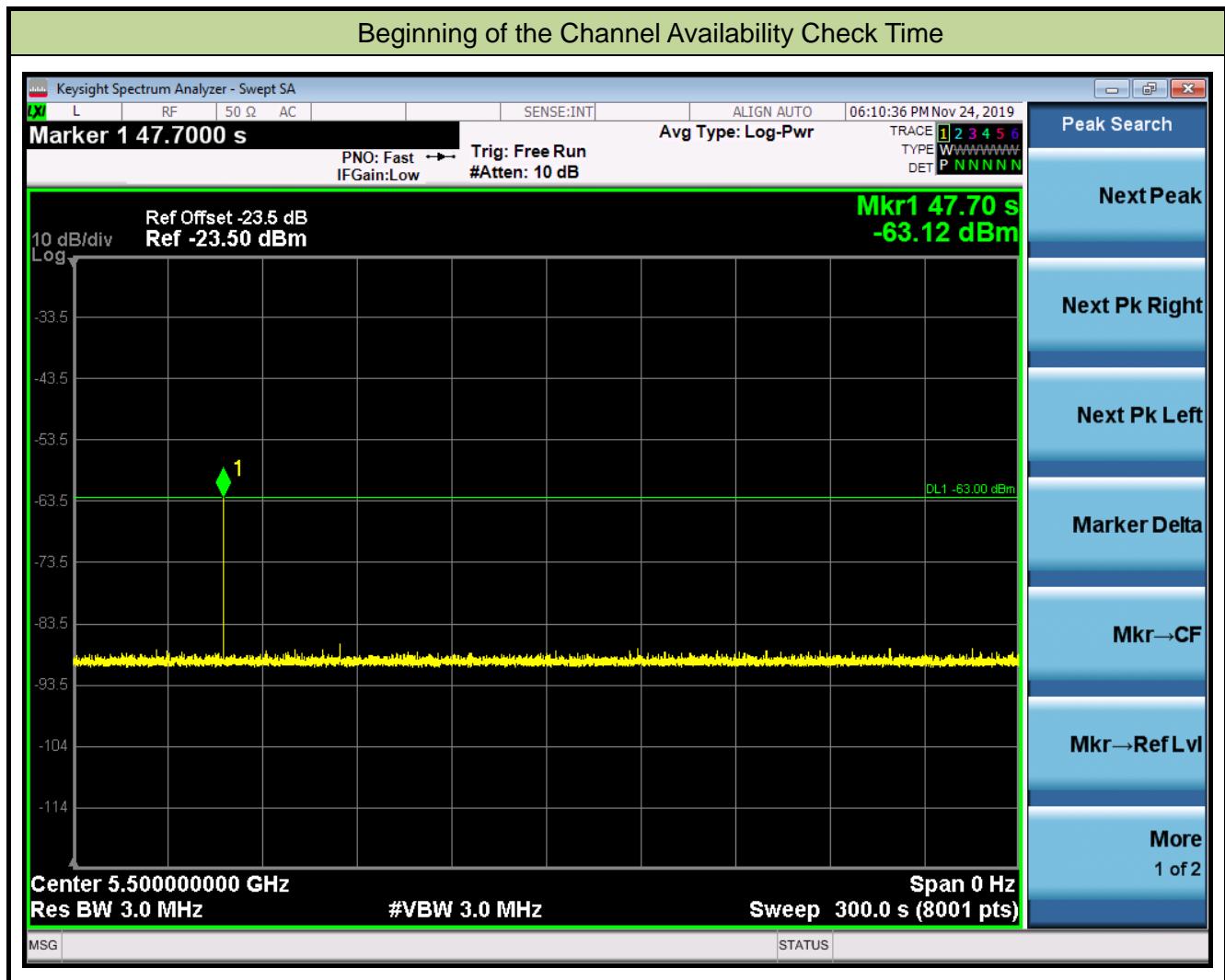
In beginning of the Channel Availability Check (CAC) Time, radar is detected on this channel, select another intended channel and perform a CAC on that channel.

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	GigaSpire	Temperature	27°C
Test Engineer	Amy Zhang	Relative Humidity	65%
Test Site	SR4	Test Date	2019/11/24
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

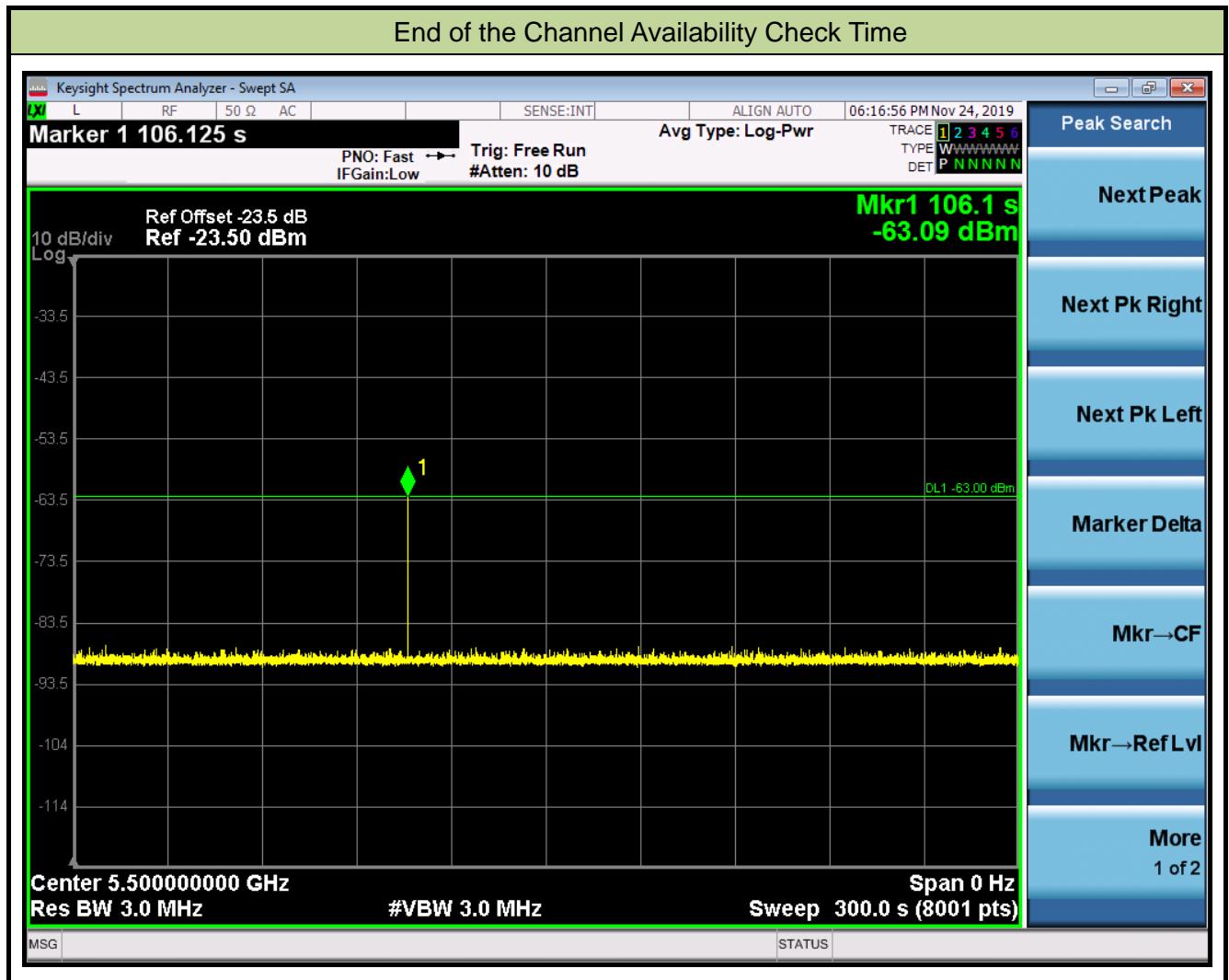
In the end of Channel Availability Check (CAC) Time, radar is detected on this channel, select another intended channel and perform a CAC on that channel.

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	GigaSpire	Temperature	27°C
Test Engineer	Amy Zhang	Relative Humidity	65%
Test Site	SR4	Test Date	2019/11/24
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

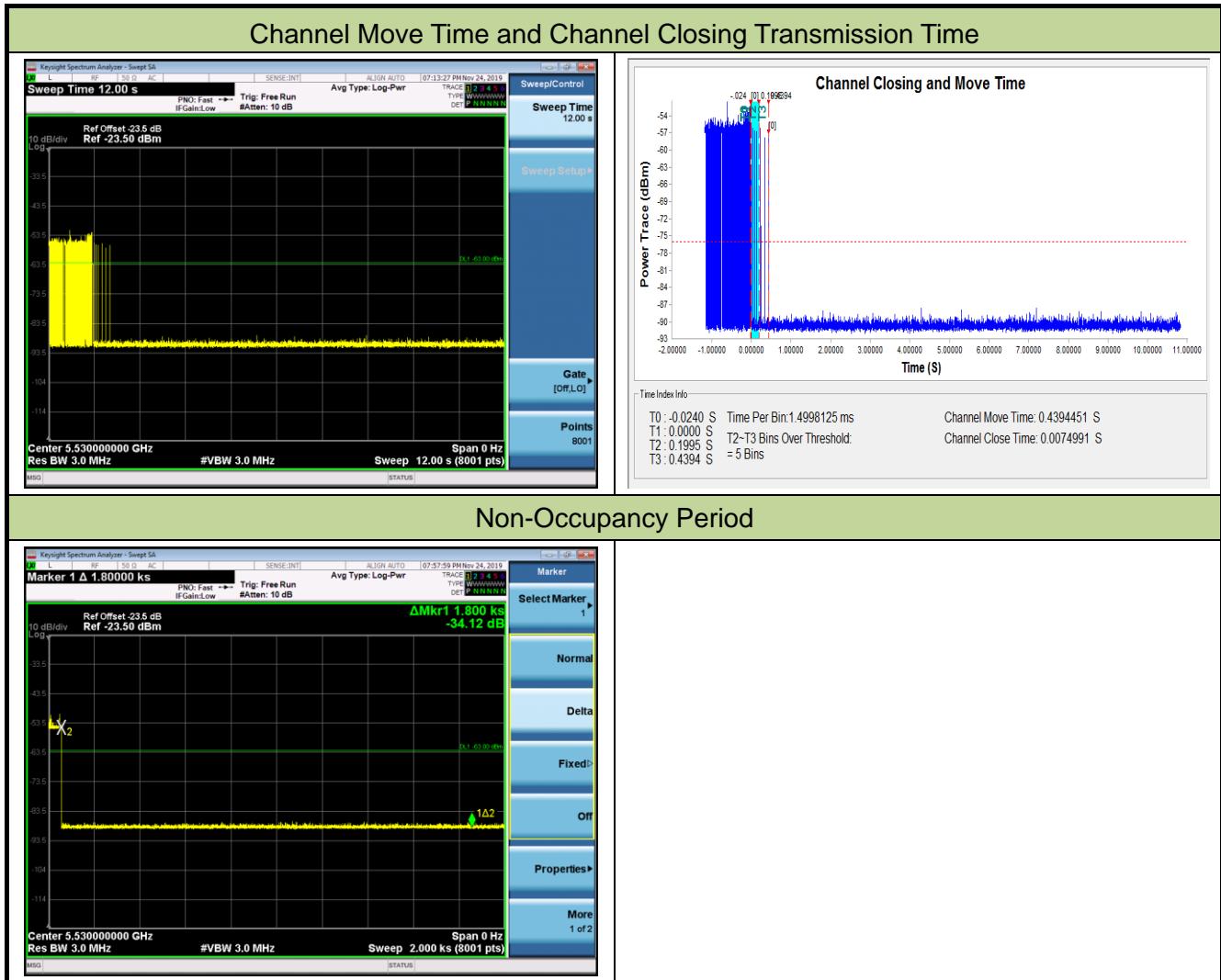
The EUT has In-Service Monitoring function to continuously monitor the radar signals. If the radar is detected, must leave the channel (Shutdown). The Channel Move Time to cease all transmissions on the current channel upon detection of a Radar Waveform above the DFS Detection Threshold within 10 sec. 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: $Dwell (1.5ms) = S (12 sec) / B (8000)$; 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

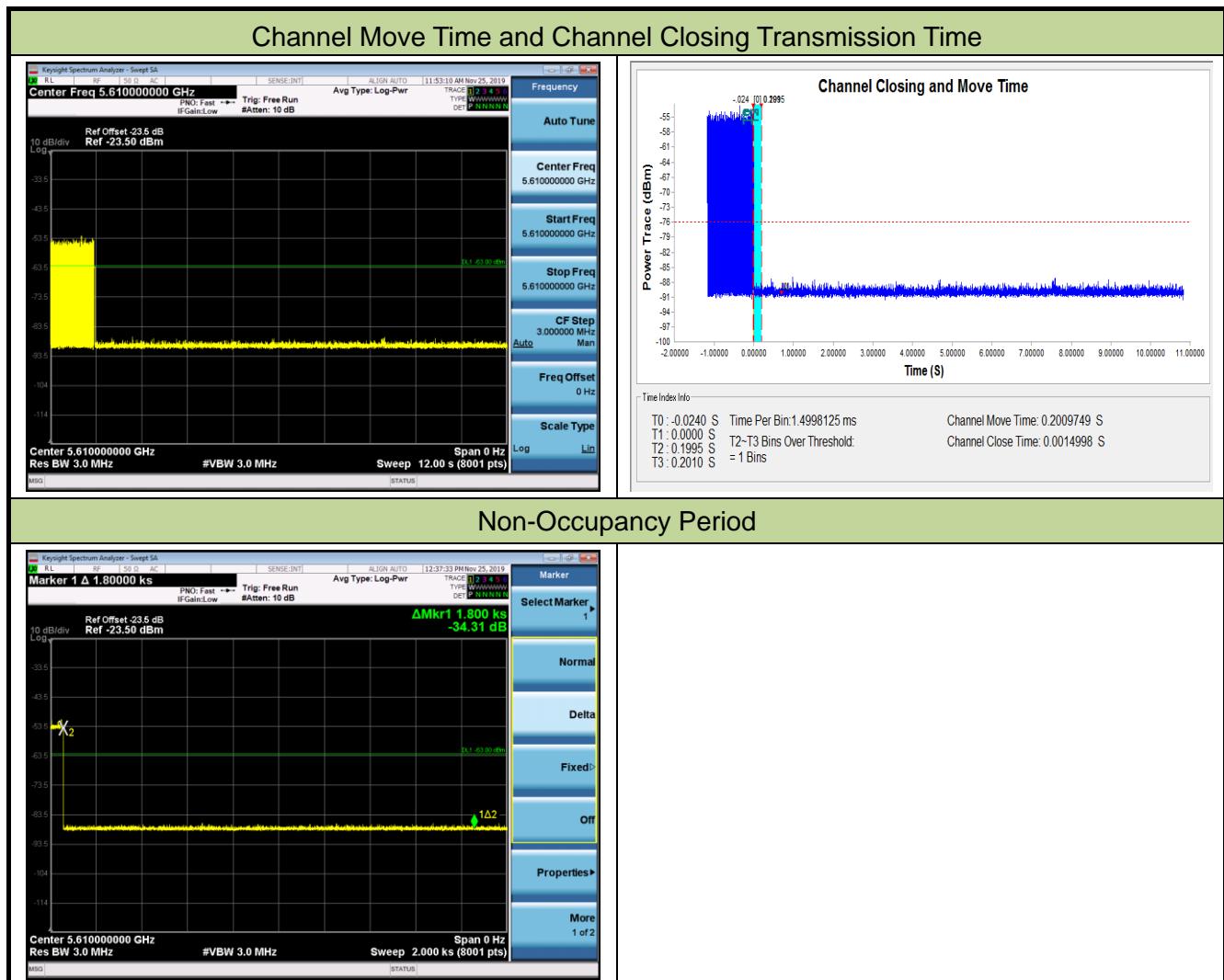
Product	GigaSpire	Temperature	27°C
Test Engineer	Amy Zhang	Relative Humidity	65%
Test Site	SR4	Test Date	2019/11/24
Test Item	Channel Move Time and Channel Closing Transmission Time (802.11ax-HE80+80 mode - 5530MHz)		



Parameter	Test Result	Limit
Channel Move Time (s)	0.439s	<10s
Channel Closing Transmission Time (ms) (Note)	7.5ms	< 60ms
Non-Occupancy Period (min)	≥ 30min	≥ 30 min

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

Product	GigaSpire	Temperature	27°C
Test Engineer	Amy Zhang	Relative Humidity	65%
Test Site	SR4	Test Date	2019/11/25
Test Item	Channel Move Time and Channel Closing Transmission Time (802.11ax-HE80+80 mode - 5610MHz)		



Parameter	Test Result	Limit
Channel Move Time (s)	0.201s	<10s
Channel Closing Transmission Time (ms) (Note)	1.5ms	< 60ms
Non-Occupancy Period (min)	≥ 30min	≥ 30 min

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

5.8. Statistical Performance Check Measurement

5.8.1. Test Limit

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

Radar Type	Minimum Number of Trails	Detection Probability
0	30	Pd > 60%
1	30(15 of test A and 15 of test B)	Pd > 60%
2	30	Pd > 60%
3	30	Pd > 60%
4	30	Pd > 60%
Aggregate (Radar Types 1-4)	120	Pd > 80%
5	30	Pd > 80%
6	30	Pd > 70%

Note: The percentage of successful detection is calculated by:

(Total Waveform Detections / Total Waveform Trails) * 100 = Probability of Detection Radar

Waveform In addition an aggregate minimum percentage of successful detection across all Short Pulse Radar Types 1-4 is required and is calculated as follows: (Pd1 + Pd2 + Pd3 + Pd4) / 4.

5.8.2. Test Procedure

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

5.8.3. Test Result

Product	GigaSpire	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)		
Test Mode	AP mode		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.0	1.0	638	83	1
2	5490.0	1.0	578	92	1
3	5490.0	1.0	678	78	1
4	5490.0	1.0	858	62	1
5	5490.0	1.0	758	70	1
6	5490.0	1.0	718	74	1
7	5490.0	1.0	598	89	1
8	5490.0	1.0	558	95	1
9	5490.0	1.0	938	57	1
10	5490.0	1.0	838	63	1
11	5500.0	1.0	618	86	1
12	5500.0	1.0	738	72	1
13	5500.0	1.0	918	58	1
14	5500.0	1.0	658	81	1
15	5500.0	1.0	538	98	1
16	5500.0	1.0	2042	26	1
17	5500.0	1.0	2211	24	1
18	5500.0	1.0	773	69	1
19	5500.0	1.0	2997	18	1
20	5500.0	1.0	2250	24	1
21	5510.0	1.0	619	86	1
22	5510.0	1.0	1881	29	1
23	5510.0	1.0	2397	22	1
24	5510.0	1.0	1057	50	1
25	5510.0	1.0	1954	27	1
26	5510.0	1.0	1369	39	1
27	5510.0	1.0	823	65	1

28	5510.0	1.0	1192	45	1
29	5510.0	1.0	540	98	1
30	5510.0	1.0	2268	24	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.0	4.9	189	24	1
2	5490.0	4.8	192	25	1
3	5490.0	1.2	155	24	1
4	5490.0	4.2	219	26	1
5	5490.0	5.0	223	29	1
6	5490.0	4.8	192	27	1
7	5490.0	4.5	178	26	1
8	5490.0	2.9	162	28	1
9	5490.0	2.1	173	27	1
10	5490.0	2.9	178	25	1
11	5500.0	4.9	175	24	1
12	5500.0	2.9	162	25	1
13	5500.0	2.8	157	23	1
14	5500.0	2.6	216	24	1
15	5500.0	4.5	200	27	1
16	5500.0	2.2	200	24	1
17	5500.0	1.3	168	28	1
18	5500.0	1.5	206	26	1
19	5500.0	4.2	165	28	1
20	5500.0	2.2	175	25	1
21	5510.0	1.7	154	24	1
22	5510.0	4.8	156	26	1
23	5510.0	2.7	162	28	1
24	5510.0	3.4	152	27	1
25	5510.0	4.4	204	27	1
26	5510.0	1.0	175	26	1
27	5510.0	4.9	154	25	1
28	5510.0	2.4	173	23	1
29	5510.0	1.3	204	24	1
30	5510.0	3.0	220	24	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.0	7.0	317	16	1
2	5490.0	7.5	247	17	1
3	5490.0	9.9	426	17	1
4	5490.0	7.2	359	18	1
5	5490.0	6.5	470	17	1
6	5490.0	7.4	406	16	1
7	5490.0	7.5	352	17	1
8	5490.0	7.9	343	16	1
9	5490.0	8.9	479	17	1
10	5490.0	9.8	348	18	1
11	5500.0	8.2	356	17	1
12	5500.0	6.2	477	16	1
13	5500.0	6.2	485	16	1
14	5500.0	6.2	249	17	1
15	5500.0	9.1	380	17	1
16	5500.0	6.9	308	17	1
17	5500.0	8.6	281	17	1
18	5500.0	7.5	258	16	1
19	5500.0	6.7	376	18	1
20	5500.0	6.7	324	16	1
21	5510.0	6.5	259	16	1
22	5510.0	7.0	200	18	1
23	5510.0	8.9	332	18	1
24	5510.0	10.0	244	17	1
25	5510.0	9.4	304	16	1
26	5510.0	10.0	251	16	1
27	5510.0	7.6	318	17	1
28	5510.0	9.3	344	18	1
29	5510.0	9.6	480	18	1
30	5510.0	7.5	353	16	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.0	14.6	452	12	1
2	5490.0	14.0	344	15	1
3	5490.0	13.3	421	13	1
4	5490.0	18.3	477	13	1
5	5490.0	11.1	404	15	1
6	5490.0	19.5	211	13	1
7	5490.0	19.5	226	14	1
8	5490.0	11.7	345	15	1
9	5490.0	14.6	318	15	1
10	5490.0	13.2	248	14	1
11	5500.0	18.9	437	14	1
12	5500.0	14.5	320	16	1
13	5500.0	15.1	344	14	1
14	5500.0	19.8	312	12	1
15	5500.0	14.9	386	14	1
16	5500.0	14.2	420	12	1
17	5500.0	12.6	487	13	1
18	5500.0	18.1	395	13	1
19	5500.0	17.0	358	15	1
20	5500.0	16.1	392	14	1
21	5510.0	19.2	329	14	1
22	5510.0	18.0	473	14	1
23	5510.0	17.9	206	13	1
24	5510.0	16.0	479	13	1
25	5510.0	13.1	482	12	1
26	5510.0	12.8	396	14	1
27	5510.0	11.2	459	12	1
28	5510.0	11.2	406	13	1
29	5510.0	18.1	238	16	1
30	5510.0	13.5	404	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: $\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4} = (100\% + 100\% + 100\% + 100\%)/4 = 100\% (>80\%)$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5500.0	1	16	5496.4	1
2	5500.0	1	17	5495.6	1
3	5500.0	1	18	5492.8	1
4	5500.0	1	19	5494.0	1
5	5500.0	1	20	5493.2	1
6	5500.0	1	21	5502.0	1
7	5500.0	1	22	5506.8	1
8	5500.0	1	23	5506.8	1
9	5500.0	1	24	5505.6	1
10	5500.0	1	25	5507.2	1
11	5494.4	1	26	5506.0	1
12	5494.0	1	27	5505.6	1
13	5492.0	1	28	5504.4	1
14	5493.6	1	29	5503.6	1
15	5497.2	1	30	5508.0	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5490.0	1	16	5500.0	1
2	5490.0	1	17	5500.0	1
3	5490.0	1	18	5500.0	1
4	5490.0	1	19	5500.0	1
5	5490.0	1	20	5500.0	1
6	5490.0	1	21	5510.0	1
7	5490.0	1	22	5510.0	1
8	5490.0	1	23	5510.0	1
9	5490.0	1	24	5510.0	1
10	5490.0	1	25	5510.0	1
11	5500.0	1	26	5510.0	1
12	5500.0	1	27	5510.0	1
13	5500.0	1	28	5510.0	1
14	5500.0	1	29	5510.0	1
15	5500.0	1	30	5510.0	1
Detection Percentage (%)					100%

Product	GigaSpire	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)		
Test Mode	AP mode		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	1.0	918	58	1
2	5491.0	1.0	718	74	1
3	5491.0	1.0	698	76	1
4	5491.0	1.0	938	57	1
5	5500.0	1.0	678	78	1
6	5500.0	1.0	738	72	1
7	5500.0	1.0	818	65	1
8	5500.0	1.0	578	92	1
9	5509.0	1.0	638	83	1
10	5509.0	1.0	878	61	1
11	5509.0	1.0	758	70	1
12	5509.0	1.0	838	63	1
13	5510.0	1.0	538	98	1
14	5510.0	1.0	898	59	1
15	5510.0	1.0	798	67	1
16	5510.0	1.0	1088	49	1
17	5510.0	1.0	693	77	1
18	5510.0	1.0	2958	18	1
19	5511.0	1.0	2649	20	1
20	5511.0	1.0	1031	52	1
21	5511.0	1.0	2874	19	1
22	5511.0	1.0	2584	21	1
23	5520.0	1.0	2904	19	1
24	5520.0	1.0	773	69	1
25	5520.0	1.0	2037	26	1
26	5520.0	1.0	645	82	1
27	5529.0	1.0	700	76	1
28	5529.0	1.0	670	79	1

29	5529.0	1.0	3037	18	1
30	5529.0	1.0	2656	20	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	3.6	157	24	1
2	5491.0	3.5	168	25	1
3	5491.0	4.4	174	29	1
4	5491.0	5.0	173	29	1
5	5500.0	1.1	183	25	1
6	5500.0	1.0	200	24	1
7	5500.0	1.9	205	27	1
8	5500.0	3.5	154	27	1
9	5509.0	4.5	228	26	1
10	5509.0	2.6	209	28	1
11	5509.0	2.8	216	27	1
12	5509.0	4.7	202	26	1
13	5510.0	3.0	206	24	1
14	5510.0	4.7	174	27	1
15	5510.0	2.8	173	24	1
16	5510.0	1.8	222	24	1
17	5510.0	1.1	225	25	1
18	5510.0	4.7	181	24	1
19	5511.0	1.5	176	27	1
20	5511.0	2.9	150	25	1
21	5511.0	1.9	202	28	1
22	5511.0	2.0	158	28	1
23	5520.0	2.3	213	26	1
24	5520.0	3.1	218	25	1
25	5520.0	4.8	164	23	1
26	5520.0	2.8	216	27	1
27	5529.0	3.5	184	27	1
28	5529.0	3.3	198	25	1
29	5529.0	2.6	224	23	1
30	5529.0	4.3	174	26	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	7.1	400	17	1
2	5491.0	6.1	403	17	1
3	5491.0	7.9	381	17	1
4	5491.0	7.2	466	16	1
5	5500.0	6.0	203	17	1
6	5500.0	6.4	338	17	1
7	5500.0	6.3	365	17	1
8	5500.0	9.8	266	16	1
9	5509.0	9.6	274	16	1
10	5509.0	8.7	412	17	1
11	5509.0	8.5	273	18	1
12	5509.0	9.2	239	18	1
13	5510.0	6.4	239	18	1
14	5510.0	7.3	213	17	1
15	5510.0	6.4	377	17	1
16	5510.0	8.8	294	18	1
17	5510.0	9.3	306	17	1
18	5510.0	9.5	261	17	1
19	5511.0	9.5	478	18	1
20	5511.0	8.4	497	16	1
21	5511.0	8.4	334	16	1
22	5511.0	8.1	310	18	1
23	5520.0	6.7	250	17	1
24	5520.0	9.7	334	16	1
25	5520.0	9.9	241	17	1
26	5520.0	7.7	232	16	1
27	5529.0	6.3	286	17	1
28	5529.0	8.4	385	17	1
29	5529.0	8.0	252	17	1
30	5529.0	7.9	279	17	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	11.0	376	13	1
2	5491.0	12.3	212	14	1
3	5491.0	15.5	393	15	1
4	5491.0	17.0	494	14	1
5	5500.0	14.2	402	15	1
6	5500.0	13.5	448	14	1
7	5500.0	18.3	463	15	1
8	5500.0	17.2	439	16	1
9	5509.0	16.5	362	13	1
10	5509.0	15.7	272	13	1
11	5509.0	13.6	374	16	1
12	5509.0	13.4	286	15	1
13	5510.0	12.9	454	16	1
14	5510.0	12.0	328	15	1
15	5510.0	19.1	328	16	1
16	5510.0	15.6	397	13	1
17	5510.0	18.4	263	13	1
18	5510.0	13.5	364	14	1
19	5511.0	18.8	202	12	1
20	5511.0	19.3	379	15	1
21	5511.0	12.9	446	15	1
22	5511.0	12.1	251	14	1
23	5520.0	11.2	256	13	1
24	5520.0	16.5	318	15	1
25	5520.0	19.1	250	16	1
26	5520.0	19.9	461	14	1
27	5529.0	16.1	421	16	1
28	5529.0	18.6	207	13	1
29	5529.0	18.7	440	13	1
30	5529.0	15.0	412	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: $\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4} = (100\% + 100\% + 100\% + 100\%)/4 = 100\% (>80\%)$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5510.0	1	16	5498.6	1
2	5510.0	1	17	5498.6	1
3	5510.0	1	18	5494.6	1
4	5510.0	1	19	5493.0	1
5	5510.0	1	20	5497.4	1
6	5510.0	1	21	5527.0	1
7	5510.0	1	22	5526.6	1
8	5510.0	1	23	5524.2	1
9	5510.0	1	24	5526.6	1
10	5510.0	1	25	5521.4	1
11	5493.8	1	26	5522.2	1
12	5498.6	1	27	5522.6	1
13	5493.0	1	28	5525.8	1
14	5499.0	1	29	5525.4	1
15	5499.0	1	30	5525.0	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5491.0	1	16	5510.0	1
2	5491.0	1	17	5510.0	1
3	5491.0	1	18	5510.0	1
4	5491.0	1	19	5511.0	1
5	5500.0	1	20	5511.0	1
6	5500.0	1	21	5511.0	1
7	5500.0	1	22	5511.0	1
8	5500.0	1	23	5520.0	1
9	5509.0	1	24	5520.0	1
10	5509.0	1	25	5520.0	1
11	5509.0	1	26	5520.0	1
12	5509.0	1	27	5529.0	1
13	5510.0	1	28	5529.0	1
14	5510.0	1	29	5529.0	1
15	5510.0	1	30	5529.0	1
Detection Percentage (%)					100%

Product	GigaSpire	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)		
Test Mode	AP mode		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	1.0	758	70	1
2	5491.0	1.0	898	59	1
3	5500.0	1.0	878	61	1
4	5500.0	1.0	718	74	1
5	5509.0	1.0	858	62	1
6	5509.0	1.0	518	102	1
7	5510.0	1.0	778	68	1
8	5510.0	1.0	618	86	1
9	5511.0	1.0	838	63	1
10	5511.0	1.0	3066	18	1
11	5520.0	1.0	818	65	1
12	5520.0	1.0	678	78	1
13	5529.0	1.0	558	95	1
14	5529.0	1.0	658	81	1
15	5530.0	1.0	738	72	1
16	5530.0	1.0	2709	20	1
17	5531.0	1.0	1455	37	1
18	5531.0	1.0	2474	22	1
19	5540.0	1.0	3016	18	1
20	5540.0	1.0	2182	25	1
21	5549.0	1.0	1310	41	1
22	5549.0	1.0	1319	40	1
23	5550.0	1.0	1495	36	1
24	5550.0	1.0	2282	24	1
25	5551.0	1.0	2476	22	1
26	5551.0	1.0	1858	29	1
27	5560.0	1.0	1115	48	1
28	5560.0	1.0	2018	27	1

29	5569.0	1.0	1355	39	1
30	5569.0	1.0	2529	21	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	2.8	171	23	1
2	5491.0	2.0	217	25	1
3	5500.0	4.4	155	28	1
4	5500.0	4.0	227	28	1
5	5509.0	1.7	164	27	1
6	5509.0	4.1	170	27	1
7	5510.0	3.4	150	28	1
8	5510.0	2.8	208	23	1
9	5511.0	3.7	155	24	1
10	5511.0	4.7	201	25	1
11	5520.0	1.3	220	26	1
12	5520.0	2.9	163	26	1
13	5529.0	3.8	193	27	1
14	5529.0	4.9	183	27	1
15	5530.0	1.2	173	28	1
16	5530.0	4.2	220	24	1
17	5531.0	3.4	210	27	1
18	5531.0	2.0	193	25	1
19	5540.0	3.8	211	27	1
20	5540.0	3.9	206	25	1
21	5549.0	2.7	204	25	1
22	5549.0	3.7	167	26	1
23	5550.0	1.8	177	27	1
24	5550.0	2.4	152	24	1
25	5551.0	1.0	202	26	1
26	5551.0	4.1	188	28	1
27	5560.0	3.0	152	24	1
28	5560.0	3.3	152	27	1
29	5569.0	1.4	201	28	1
30	5569.0	2.6	156	28	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	8.5	299	17	1
2	5491.0	8.0	337	17	1
3	5500.0	9.3	454	17	1
4	5500.0	8.1	308	17	1
5	5509.0	9.9	276	18	1
6	5509.0	9.0	358	17	1
7	5510.0	6.9	381	17	1
8	5510.0	6.4	247	18	1
9	5511.0	6.3	342	17	1
10	5511.0	9.2	493	16	1
11	5520.0	6.2	289	16	1
12	5520.0	10.0	235	17	1
13	5529.0	7.4	236	17	1
14	5529.0	6.1	273	17	1
15	5530.0	7.1	230	16	1
16	5530.0	6.3	449	18	1
17	5531.0	10.0	375	16	1
18	5531.0	7.5	306	17	1
19	5540.0	6.7	372	17	1
20	5540.0	6.2	420	18	1
21	5549.0	8.8	274	17	1
22	5549.0	6.3	455	17	1
23	5550.0	9.5	283	17	1
24	5550.0	6.0	257	17	1
25	5551.0	6.5	246	17	1
26	5551.0	6.5	476	17	1
27	5560.0	8.8	482	18	1
28	5560.0	8.1	309	17	1
29	5569.0	9.6	220	16	1
30	5569.0	7.7	234	17	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	17.4	488	14	1
2	5491.0	14.0	297	15	1
3	5500.0	17.6	208	13	1
4	5500.0	12.7	237	14	1
5	5509.0	12.6	333	16	1
6	5509.0	13.9	349	14	1
7	5510.0	18.0	382	15	1
8	5510.0	18.1	257	14	1
9	5511.0	19.8	268	12	1
10	5511.0	15.0	455	13	1
11	5520.0	17.7	393	15	1
12	5520.0	11.4	350	15	1
13	5529.0	13.0	221	13	1
14	5529.0	15.1	424	13	1
15	5530.0	13.4	291	14	1
16	5530.0	12.3	404	13	1
17	5531.0	14.2	302	15	1
18	5531.0	14.0	428	13	1
19	5540.0	12.3	488	14	1
20	5540.0	19.6	420	12	1
21	5549.0	12.3	321	14	1
22	5549.0	19.9	411	16	1
23	5550.0	16.7	388	15	1
24	5550.0	16.7	463	15	1
25	5551.0	17.6	273	12	1
26	5551.0	15.4	277	12	1
27	5560.0	18.9	386	15	1
28	5560.0	19.0	450	15	1
29	5569.0	14.1	252	14	1
30	5569.0	13.5	359	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: $\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4} = (100\% + 100\% + 100\% + 100\%)/4 = 100\% (>80\%)$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5530.0	1	16	5493.4	1
2	5530.0	1	17	5493.0	1
3	5530.0	1	18	5497.4	1
4	5530.0	1	19	5493.4	1
5	5530.0	1	20	5495.4	1
6	5530.0	1	21	5563.4	1
7	5530.0	1	22	5563.4	1
8	5530.0	1	23	5564.2	1
9	5530.0	1	24	5566.6	1
10	5530.0	1	25	5567.0	1
11	5495.4	1	26	5562.2	1
12	5493.4	1	27	5562.6	1
13	5494.6	1	28	5564.6	1
14	5497.8	1	29	5562.2	1
15	5496.2	1	30	5561.0	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5491.0	1	16	5530.0	1
2	5491.0	1	17	5531.0	1
3	5500.0	1	18	5531.0	1
4	5500.0	1	19	5540.0	1
5	5509.0	1	20	5540.0	1
6	5509.0	1	21	5549.0	1
7	5510.0	1	22	5549.0	1
8	5510.0	1	23	5550.0	1
9	5511.0	1	24	5550.0	1
10	5511.0	1	25	5551.0	1
11	5520.0	1	26	5551.0	1
12	5520.0	1	27	5560.0	1
13	5529.0	1	28	5560.0	1
14	5529.0	1	29	5569.0	1
15	5530.0	1	30	5569.0	1
Detection Percentage (%)					100%

Product	GigaSpire	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)		
Test Mode	AP mode		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5250.0	1.0	658	81	1
2	5250.0	1.0	618	86	1
3	5260.0	1.0	778	68	1
4	5260.0	1.0	698	76	1
5	5269.0	1.0	538	98	1
6	5269.0	1.0	678	78	1
7	5270.0	1.0	738	72	1
8	5270.0	1.0	598	89	1
9	5271.0	1.0	578	92	1
10	5271.0	1.0	818	65	1
11	5280.0	1.0	558	95	1
12	5280.0	1.0	838	63	1
13	5289.0	1.0	898	59	1
14	5289.0	1.0	718	74	1
15	5290.0	1.0	518	102	1
16	5290.0	1.0	2011	27	1
17	5291.0	1.0	2974	18	1
18	5291.0	1.0	2586	21	1
19	5300.0	1.0	1662	32	1
20	5300.0	1.0	881	60	1
21	5309.0	1.0	1926	28	1
22	5309.0	1.0	1864	29	1
23	5310.0	1.0	2177	25	1
24	5310.0	1.0	2195	25	1
25	5311.0	1.0	1217	44	1
26	5311.0	1.0	1716	31	1
27	5320.0	1.0	2119	25	1
28	5320.0	1.0	2443	22	1

29	5329.0	1.0	1476	36	1
30	5329.0	1.0	653	81	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5250.0	2.9	197	27	1
2	5250.0	2.1	209	26	1
3	5260.0	1.0	177	24	1
4	5260.0	4.6	215	23	1
5	5269.0	4.7	154	29	1
6	5269.0	1.0	180	28	1
7	5270.0	4.2	176	25	1
8	5270.0	1.9	214	28	1
9	5271.0	3.1	179	29	1
10	5271.0	4.0	205	29	1
11	5280.0	3.2	157	25	1
12	5280.0	2.6	162	25	1
13	5289.0	2.1	156	24	1
14	5289.0	5.0	181	28	1
15	5290.0	3.7	219	28	1
16	5290.0	3.1	193	23	1
17	5291.0	1.5	195	26	1
18	5291.0	1.0	183	27	1
19	5300.0	4.0	182	27	1
20	5300.0	3.6	187	26	1
21	5309.0	1.6	214	27	1
22	5309.0	3.4	191	27	1
23	5310.0	4.0	202	25	1
24	5310.0	4.9	220	24	1
25	5311.0	4.4	201	24	1
26	5311.0	1.3	173	24	1
27	5320.0	3.5	225	28	1
28	5320.0	1.7	186	25	1
29	5329.0	2.3	192	26	1
30	5329.0	2.4	179	28	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5250.0	8.4	270	16	1
2	5250.0	8.0	413	16	1
3	5260.0	7.7	277	17	1
4	5260.0	8.0	215	17	1
5	5269.0	7.4	494	16	1
6	5269.0	6.2	200	18	1
7	5270.0	8.4	489	17	1
8	5270.0	7.4	422	17	1
9	5271.0	8.9	347	18	1
10	5271.0	7.8	281	17	1
11	5280.0	7.2	400	17	1
12	5280.0	6.1	254	17	1
13	5289.0	8.3	279	16	1
14	5289.0	6.7	369	16	1
15	5290.0	9.1	351	16	1
16	5290.0	7.2	387	17	1
17	5291.0	10.0	212	18	1
18	5291.0	6.8	472	18	1
19	5300.0	7.1	220	18	1
20	5300.0	9.3	349	17	1
21	5309.0	7.0	448	16	1
22	5309.0	7.5	430	17	1
23	5310.0	7.1	356	18	1
24	5310.0	7.6	349	16	1
25	5311.0	6.9	226	18	1
26	5311.0	7.9	320	18	1
27	5320.0	8.0	332	16	1
28	5320.0	9.7	332	17	1
29	5329.0	9.1	296	17	1
30	5329.0	9.9	378	17	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5250.0	13.5	441	13	1
2	5250.0	16.5	336	13	1
3	5260.0	11.6	335	14	1
4	5260.0	13.6	208	16	1
5	5269.0	13.0	295	14	1
6	5269.0	17.5	327	15	1
7	5270.0	18.4	399	16	1
8	5270.0	20.0	255	12	1
9	5271.0	13.8	357	13	1
10	5271.0	16.6	488	14	1
11	5280.0	17.9	331	14	1
12	5280.0	20.0	276	16	1
13	5289.0	18.3	442	12	1
14	5289.0	17.7	223	12	1
15	5290.0	13.2	357	14	1
16	5290.0	18.7	357	13	1
17	5291.0	13.4	428	14	1
18	5291.0	19.1	382	12	1
19	5300.0	11.3	307	15	1
20	5300.0	12.3	253	14	1
21	5309.0	15.6	312	13	1
22	5309.0	11.9	246	15	1
23	5310.0	16.0	375	13	1
24	5310.0	19.2	283	15	1
25	5311.0	14.7	258	14	1
26	5311.0	18.7	262	15	1
27	5320.0	14.7	323	13	1
28	5320.0	12.7	376	13	1
29	5329.0	16.7	403	15	1
30	5329.0	18.4	293	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: $\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4} = (100\% + 100\% + 100\% + 100\%)/4 = 100\% (>80\%)$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5290.0	1	16	5254.0	1
2	5290.0	1	17	5257.6	1
3	5290.0	1	18	5253.6	1
4	5290.0	1	19	5254.0	1
5	5290.0	1	20	5254.8	1
6	5290.0	1	21	5321.4	1
7	5290.0	1	22	5326.2	1
8	5290.0	1	23	5325.8	1
9	5290.0	1	24	5322.6	1
10	5290.0	1	25	5326.2	1
11	5253.2	1	26	5325.0	1
12	5256.4	1	27	5321.8	1
13	5253.6	1	28	5325.8	1
14	5255.6	1	29	5325.8	1
15	5258.0	1	30	5324.2	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5250.0	1	16	5290.0	1
2	5250.0	1	17	5291.0	1
3	5260.0	1	18	5291.0	1
4	5260.0	1	19	5300.0	1
5	5269.0	1	20	5300.0	1
6	5269.0	1	21	5309.0	1
7	5270.0	1	22	5309.0	1
8	5270.0	1	23	5310.0	1
9	5271.0	1	24	5310.0	1
10	5271.0	1	25	5311.0	1
11	5280.0	1	26	5311.0	1
12	5280.0	1	27	5320.0	1
13	5289.0	1	28	5320.0	1
14	5289.0	1	29	5329.0	1
15	5290.0	1	30	5329.0	1
Detection Percentage (%)					100%

Product	GigaSpire	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)		
Test Mode	AP mode		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	1.0	658	81	1
2	5491.0	1.0	758	70	1
3	5500.0	1.0	838	63	1
4	5500.0	1.0	938	57	1
5	5509.0	1.0	878	61	1
6	5509.0	1.0	818	65	1
7	5510.0	1.0	518	102	1
8	5510.0	1.0	678	78	1
9	5511.0	1.0	618	86	1
10	5511.0	1.0	718	74	1
11	5520.0	1.0	578	92	1
12	5520.0	1.0	698	76	1
13	5529.0	1.0	778	68	1
14	5529.0	1.0	738	72	1
15	5530.0	1.0	638	83	1
16	5530.0	1.0	2481	22	1
17	5531.0	1.0	1965	27	1
18	5531.0	1.0	1915	28	1
19	5540.0	1.0	2599	21	1
20	5540.0	1.0	1179	45	1
21	5549.0	1.0	848	63	1
22	5549.0	1.0	1134	47	1
23	5550.0	1.0	615	86	1
24	5550.0	1.0	2766	20	1
25	5551.0	1.0	1832	29	1
26	5551.0	1.0	2316	23	1
27	5560.0	1.0	2856	19	1
28	5560.0	1.0	2270	24	1

29	5570.0	1.0	1154	46	1
30	5570.0	1.0	1543	35	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	1.5	210	25	1
2	5491.0	4.8	204	27	1
3	5500.0	3.8	226	25	1
4	5500.0	4.7	183	25	1
5	5509.0	4.7	192	26	1
6	5509.0	3.2	226	28	1
7	5510.0	4.7	214	29	1
8	5510.0	3.3	213	28	1
9	5511.0	4.2	171	26	1
10	5511.0	2.2	166	26	1
11	5520.0	4.5	184	28	1
12	5520.0	4.0	197	24	1
13	5529.0	4.8	228	23	1
14	5529.0	2.8	219	27	1
15	5530.0	2.3	189	27	1
16	5530.0	4.5	208	27	1
17	5531.0	3.5	195	25	1
18	5531.0	1.5	199	27	1
19	5540.0	4.8	159	28	1
20	5540.0	4.7	169	26	1
21	5549.0	4.9	160	28	1
22	5549.0	3.9	193	28	1
23	5550.0	3.6	206	25	1
24	5550.0	3.5	210	24	1
25	5551.0	1.4	207	26	1
26	5551.0	3.5	224	26	1
27	5560.0	3.8	191	25	1
28	5560.0	1.8	196	23	1
29	5570.0	2.1	185	26	1
30	5570.0	2.1	219	24	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	7.7	324	17	1
2	5491.0	7.9	293	18	1
3	5500.0	9.1	209	18	1
4	5500.0	6.5	460	17	1
5	5509.0	10.0	299	16	1
6	5509.0	9.1	452	18	1
7	5510.0	7.8	434	16	1
8	5510.0	6.0	400	17	1
9	5511.0	8.2	372	18	1
10	5511.0	8.8	433	17	1
11	5520.0	6.7	296	17	1
12	5520.0	7.6	272	17	1
13	5529.0	7.1	304	17	1
14	5529.0	9.9	268	18	1
15	5530.0	6.1	247	16	1
16	5530.0	9.1	335	18	1
17	5531.0	7.5	426	18	1
18	5531.0	6.2	430	18	1
19	5540.0	7.9	234	16	1
20	5540.0	6.6	487	18	1
21	5549.0	7.8	400	16	1
22	5549.0	6.0	370	18	1
23	5550.0	9.2	492	18	1
24	5550.0	9.1	457	17	1
25	5551.0	7.7	225	17	1
26	5551.0	8.6	346	17	1
27	5560.0	8.1	367	18	1
28	5560.0	7.2	417	17	1
29	5570.0	10.0	393	16	1
30	5570.0	6.5	203	17	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	13.7	221	14	1
2	5491.0	11.3	386	16	1
3	5500.0	14.6	437	14	1
4	5500.0	15.0	231	13	1
5	5509.0	19.7	473	15	1
6	5509.0	12.6	419	14	1
7	5510.0	11.3	313	12	1
8	5510.0	11.6	410	15	1
9	5511.0	11.1	297	14	1
10	5511.0	16.0	295	12	1
11	5520.0	12.5	354	15	1
12	5520.0	13.9	420	15	1
13	5529.0	12.5	445	13	1
14	5529.0	13.4	289	13	1
15	5530.0	16.7	427	13	1
16	5530.0	16.4	357	16	1
17	5531.0	11.7	371	13	1
18	5531.0	14.7	415	13	1
19	5540.0	17.9	374	15	1
20	5540.0	11.1	258	13	1
21	5549.0	12.8	200	15	1
22	5549.0	16.8	319	14	1
23	5550.0	13.0	269	13	1
24	5550.0	19.1	465	13	1
25	5551.0	14.0	483	16	1
26	5551.0	14.8	349	16	1
27	5560.0	11.8	298	15	1
28	5560.0	16.7	332	15	1
29	5570.0	14.0	486	14	1
30	5570.0	15.9	422	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: $\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4} = (100\% + 100\% + 100\% + 100\%)/4 = 100\% (>80\%)$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5530.0	1	16	5496.2	1
2	5530.0	1	17	5495.0	1
3	5530.0	1	18	5495.0	1
4	5530.0	1	19	5497.0	1
5	5530.0	1	20	5497.8	1
6	5530.0	1	21	5564.8	1
7	5530.0	1	22	5565.6	1
8	5530.0	1	23	5566.8	1
9	5530.0	1	24	5567.2	1
10	5530.0	1	25	5564.4	1
11	5497.8	1	26	5562.4	1
12	5498.2	1	27	5562.8	1
13	5494.2	1	28	5564.8	1
14	5493.8	1	29	5562.4	1
15	5498.2	1	30	5566.0	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5491.0	1	16	5530.0	1
2	5491.0	1	17	5531.0	1
3	5500.0	1	18	5531.0	1
4	5500.0	1	19	5540.0	1
5	5509.0	1	20	5540.0	1
6	5509.0	1	21	5549.0	1
7	5510.0	1	22	5549.0	1
8	5510.0	1	23	5550.0	1
9	5511.0	1	24	5550.0	1
10	5511.0	1	25	5551.0	1
11	5520.0	1	26	5551.0	1
12	5520.0	1	27	5560.0	1
13	5529.0	1	28	5560.0	1
14	5529.0	1	29	5570.0	1
15	5530.0	1	30	5570.0	1
Detection Percentage (%)					100%

Product	GigaSpire	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)		
Test Mode	AP mode		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5570.0	1.0	898	59	1
2	5570.0	1.0	938	57	1
3	5580.0	1.0	758	70	1
4	5580.0	1.0	818	65	1
5	5589.0	1.0	558	95	1
6	5589.0	1.0	678	78	1
7	5590.0	1.0	658	81	1
8	5590.0	1.0	638	83	1
9	5591.0	1.0	738	72	1
10	5591.0	1.0	578	92	1
11	5600.0	1.0	598	89	1
12	5600.0	1.0	798	67	1
13	5609.0	1.0	918	58	1
14	5609.0	1.0	618	86	1
15	5610.0	1.0	778	68	1
16	5610.0	1.0	2863	19	1
17	5611.0	1.0	1782	30	1
18	5611.0	1.0	1990	27	1
19	5620.0	1.0	994	54	1
20	5620.0	1.0	1767	30	1
21	5629.0	1.0	2243	24	1
22	5629.0	1.0	664	80	1
23	5630.0	1.0	2868	19	1
24	5630.0	1.0	2545	21	1
25	5631.0	1.0	2581	21	1
26	5631.0	1.0	2421	22	1
27	5640.0	1.0	2604	21	1
28	5640.0	1.0	2637	20	1

29	5649.0	1.0	2781	19	1
30	5649.0	1.0	946	56	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5570.0	2.4	223	23	1
2	5570.0	1.4	166	29	1
3	5580.0	4.7	212	25	1
4	5580.0	1.4	201	25	1
5	5589.0	2.5	153	28	1
6	5589.0	1.1	198	27	1
7	5590.0	2.7	177	25	1
8	5590.0	4.3	169	27	1
9	5591.0	1.5	198	26	1
10	5591.0	4.9	187	28	1
11	5600.0	1.3	181	24	1
12	5600.0	4.7	203	28	1
13	5609.0	4.0	155	27	1
14	5609.0	3.0	157	27	1
15	5610.0	4.2	162	27	1
16	5610.0	4.2	157	27	1
17	5611.0	4.0	155	25	1
18	5611.0	4.3	220	26	1
19	5620.0	4.8	172	25	1
20	5620.0	3.1	219	28	1
21	5629.0	3.4	161	25	1
22	5629.0	2.6	176	25	1
23	5630.0	2.7	190	28	1
24	5630.0	1.5	157	28	1
25	5631.0	3.2	183	23	1
26	5631.0	3.0	227	29	1
27	5640.0	1.4	169	29	1
28	5640.0	2.2	195	26	1
29	5649.0	2.3	198	25	1
30	5649.0	3.2	214	28	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5570.0	6.7	483	17	1
2	5570.0	7.4	308	18	1
3	5580.0	9.9	377	17	1
4	5580.0	6.3	298	16	1
5	5589.0	6.5	331	16	1
6	5589.0	6.4	332	17	1
7	5590.0	7.8	261	18	1
8	5590.0	8.9	260	17	1
9	5591.0	8.3	469	17	1
10	5591.0	8.3	309	16	1
11	5600.0	7.2	375	16	1
12	5600.0	8.4	370	17	1
13	5609.0	8.3	462	18	1
14	5609.0	6.3	262	17	1
15	5610.0	8.8	359	16	1
16	5610.0	8.2	367	16	1
17	5611.0	9.3	257	16	1
18	5611.0	8.3	321	17	1
19	5620.0	6.1	338	17	1
20	5620.0	9.8	462	17	1
21	5629.0	8.7	296	17	1
22	5629.0	8.9	413	18	1
23	5630.0	6.4	234	16	1
24	5630.0	7.8	391	18	1
25	5631.0	9.0	490	17	1
26	5631.0	8.4	207	17	1
27	5640.0	8.7	411	17	1
28	5640.0	7.5	301	16	1
29	5649.0	6.5	258	17	1
30	5649.0	7.7	330	18	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5570.0	16.2	476	14	1
2	5570.0	11.1	213	14	1
3	5580.0	16.3	400	15	1
4	5580.0	11.3	417	15	1
5	5589.0	14.3	271	16	1
6	5589.0	15.6	479	14	1
7	5590.0	14.1	488	13	1
8	5590.0	11.3	471	13	1
9	5591.0	18.3	368	15	1
10	5591.0	16.0	363	12	1
11	5600.0	13.4	230	16	1
12	5600.0	13.2	441	13	1
13	5609.0	14.4	312	14	1
14	5609.0	14.2	331	14	1
15	5610.0	16.1	375	15	1
16	5610.0	17.0	300	14	1
17	5611.0	15.0	408	15	1
18	5611.0	11.8	453	13	1
19	5620.0	19.7	366	15	1
20	5620.0	13.0	448	15	1
21	5629.0	13.9	341	15	1
22	5629.0	17.5	357	13	1
23	5630.0	12.6	221	13	1
24	5630.0	11.9	231	15	1
25	5631.0	19.4	420	15	1
26	5631.0	12.9	375	14	1
27	5640.0	14.2	461	13	1
28	5640.0	16.8	278	13	1
29	5649.0	15.4	288	14	1
30	5649.0	15.7	256	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: $\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4} = (100\% + 100\% + 100\% + 100\%)/4 = 100\% (>80\%)$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5610.0	1	16	5574.0	1
2	5610.0	1	17	5577.6	1
3	5610.0	1	18	5573.2	1
4	5610.0	1	19	5575.2	1
5	5610.0	1	20	5575.2	1
6	5610.0	1	21	5641.4	1
7	5610.0	1	22	5645.8	1
8	5610.0	1	23	5645.4	1
9	5610.0	1	24	5641.0	1
10	5610.0	1	25	5645.8	1
11	5578.0	1	26	5646.6	1
12	5573.2	1	27	5644.2	1
13	5576.0	1	28	5646.2	1
14	5574.4	1	29	5643.4	1
15	5577.2	1	30	5641.4	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5570.0	1	16	5610.0	1
2	5570.0	1	17	5611.0	1
3	5580.0	1	18	5611.0	1
4	5580.0	1	19	5620.0	1
5	5589.0	1	20	5620.0	1
6	5589.0	1	21	5629.0	1
7	5590.0	1	22	5629.0	1
8	5590.0	1	23	5630.0	1
9	5591.0	1	24	5630.0	1
10	5591.0	1	25	5631.0	1
11	5600.0	1	26	5631.0	1
12	5600.0	1	27	5640.0	1
13	5609.0	1	28	5640.0	1
14	5609.0	1	29	5649.0	1
15	5610.0	1	30	5649.0	1
Detection Percentage (%)					100%

Product	GigaSpire	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)		
Test Mode	Repeater mode		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.0	1.0	818	65	1
2	5490.0	1.0	918	58	1
3	5490.0	1.0	798	67	1
4	5490.0	1.0	558	95	1
5	5490.0	1.0	578	92	1
6	5490.0	1.0	758	70	1
7	5490.0	1.0	518	102	1
8	5490.0	1.0	638	83	1
9	5490.0	1.0	718	74	1
10	5490.0	1.0	658	81	1
11	5500.0	1.0	878	61	1
12	5500.0	1.0	738	72	1
13	5500.0	1.0	598	89	1
14	5500.0	1.0	618	86	1
15	5500.0	1.0	538	98	1
16	5500.0	1.0	2725	20	1
17	5500.0	1.0	752	71	1
18	5500.0	1.0	1641	33	1
19	5500.0	1.0	651	81	1
20	5500.0	1.0	1030	52	1
21	5510.0	1.0	1765	30	1
22	5510.0	1.0	1919	28	1
23	5510.0	1.0	2623	21	1
24	5510.0	1.0	1194	45	1
25	5510.0	1.0	2581	21	1
26	5510.0	1.0	2146	25	1
27	5510.0	1.0	2144	25	1
28	5510.0	1.0	2942	18	1

29	5510.0	1.0	2756	20	1
30	5510.0	1.0	999	53	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.0	4.9	196	29	1
2	5490.0	3.4	161	25	1
3	5490.0	2.7	194	27	1
4	5490.0	4.4	208	23	1
5	5490.0	5.0	196	23	1
6	5490.0	2.2	215	29	1
7	5490.0	2.5	176	27	1
8	5490.0	4.3	166	26	1
9	5490.0	1.6	221	25	1
10	5490.0	4.6	195	29	1
11	5500.0	3.7	196	26	1
12	5500.0	3.0	228	26	1
13	5500.0	1.4	218	26	1
14	5500.0	1.8	190	24	1
15	5500.0	2.9	172	28	1
16	5500.0	1.9	190	29	1
17	5500.0	1.2	197	27	1
18	5500.0	2.5	189	25	1
19	5500.0	3.9	167	29	1
20	5500.0	4.0	230	26	1
21	5510.0	1.0	227	28	1
22	5510.0	4.6	192	28	1
23	5510.0	2.4	177	25	1
24	5510.0	2.8	164	27	1
25	5510.0	2.0	191	28	1
26	5510.0	4.1	192	24	1
27	5510.0	4.4	186	24	1
28	5510.0	4.9	195	25	1
29	5510.0	3.0	172	25	1
30	5510.0	3.9	228	24	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.0	9.3	220	17	1
2	5490.0	8.7	270	16	1
3	5490.0	8.9	386	16	1
4	5490.0	9.4	442	17	1
5	5490.0	8.4	289	18	1
6	5490.0	9.0	473	18	1
7	5490.0	6.9	461	16	1
8	5490.0	8.2	345	16	1
9	5490.0	10.0	309	18	1
10	5490.0	9.9	269	16	1
11	5500.0	9.1	467	17	1
12	5500.0	9.1	420	17	1
13	5500.0	7.6	400	18	1
14	5500.0	6.8	491	18	1
15	5500.0	9.3	248	18	1
16	5500.0	9.5	360	18	1
17	5500.0	7.3	223	17	1
18	5500.0	10.0	308	16	1
19	5500.0	6.8	317	17	1
20	5500.0	9.7	254	16	1
21	5510.0	6.9	335	18	1
22	5510.0	6.1	266	17	1
23	5510.0	7.2	234	16	1
24	5510.0	7.2	285	17	1
25	5510.0	7.3	274	17	1
26	5510.0	9.8	208	16	1
27	5510.0	8.9	371	18	1
28	5510.0	7.0	461	17	1
29	5510.0	9.4	268	16	1
30	5510.0	9.5	346	18	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.0	11.9	318	13	1
2	5490.0	19.0	275	14	1
3	5490.0	13.0	267	13	1
4	5490.0	19.2	441	13	1
5	5490.0	19.6	297	14	1
6	5490.0	18.0	330	15	1
7	5490.0	16.4	318	15	1
8	5490.0	17.7	394	13	1
9	5490.0	14.5	353	13	1
10	5490.0	17.9	425	14	1
11	5500.0	16.7	378	16	1
12	5500.0	15.9	417	16	1
13	5500.0	16.5	396	16	1
14	5500.0	17.6	379	15	1
15	5500.0	14.9	369	15	1
16	5500.0	16.3	297	13	1
17	5500.0	14.7	306	15	1
18	5500.0	14.7	492	16	1
19	5500.0	13.9	470	13	1
20	5500.0	17.4	469	15	1
21	5510.0	17.4	404	15	1
22	5510.0	12.8	348	13	1
23	5510.0	18.9	469	14	1
24	5510.0	12.3	342	15	1
25	5510.0	14.1	321	14	1
26	5510.0	12.2	485	15	1
27	5510.0	16.8	232	15	1
28	5510.0	14.6	392	12	1
29	5510.0	14.3	346	13	1
30	5510.0	19.2	224	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: $\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4} = (100\% + 100\% + 100\% + 100\%)/4 = 100\% (>80\%)$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5500.0	1	16	5494.4	1
2	5500.0	1	17	5493.6	1
3	5500.0	1	18	5496.4	1
4	5500.0	1	19	5496.4	1
5	5500.0	1	20	5492.4	1
6	5500.0	1	21	5504.0	1
7	5500.0	1	22	5508.0	1
8	5500.0	1	23	5503.2	1
9	5500.0	1	24	5507.2	1
10	5500.0	1	25	5507.2	1
11	5493.2	1	26	5507.6	1
12	5496.0	1	27	5504.8	1
13	5493.2	1	28	5507.6	1
14	5493.6	1	29	5503.6	1
15	5492.0	1	30	5507.6	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5490.0	1	16	5500.0	1
2	5490.0	1	17	5500.0	1
3	5490.0	1	18	5500.0	1
4	5490.0	1	19	5500.0	1
5	5490.0	1	20	5500.0	1
6	5490.0	1	21	5510.0	1
7	5490.0	1	22	5510.0	1
8	5490.0	1	23	5510.0	1
9	5490.0	1	24	5510.0	1
10	5490.0	1	25	5510.0	1
11	5500.0	1	26	5510.0	1
12	5500.0	1	27	5510.0	1
13	5500.0	1	28	5510.0	1
14	5500.0	1	29	5510.0	1
15	5500.0	1	30	5510.0	1
Detection Percentage (%)					100%

Product	GigaSpire	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)		
Test Mode	Repeater mode		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	1.0	878	61	1
2	5491.0	1.0	658	81	1
3	5491.0	1.0	918	58	1
4	5491.0	1.0	678	78	1
5	5500.0	1.0	798	67	1
6	5500.0	1.0	598	89	1
7	5500.0	1.0	698	76	1
8	5500.0	1.0	938	57	1
9	5509.0	1.0	718	74	1
10	5509.0	1.0	558	95	1
11	5509.0	1.0	738	72	1
12	5509.0	1.0	818	65	1
13	5510.0	1.0	758	70	1
14	5510.0	1.0	538	98	1
15	5510.0	1.0	898	59	1
16	5510.0	1.0	1876	29	1
17	5510.0	1.0	2523	21	1
18	5510.0	1.0	3028	18	1
19	5511.0	1.0	2144	25	1
20	5511.0	1.0	1108	48	1
21	5511.0	1.0	1697	32	1
22	5511.0	1.0	2450	22	1
23	5520.0	1.0	2387	23	1
24	5520.0	1.0	2803	19	1
25	5520.0	1.0	1484	36	1
26	5520.0	1.0	2460	22	1
27	5529.0	1.0	1382	39	1
28	5529.0	1.0	1328	40	1

29	5529.0	1.0	2236	24	1
30	5529.0	1.0	2371	23	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	3.3	212	24	1
2	5491.0	3.9	205	29	1
3	5491.0	2.7	169	27	1
4	5491.0	4.8	155	25	1
5	5500.0	1.0	223	28	1
6	5500.0	2.0	225	27	1
7	5500.0	3.8	153	28	1
8	5500.0	1.5	204	26	1
9	5509.0	4.5	188	25	1
10	5509.0	4.8	218	27	1
11	5509.0	1.7	186	24	1
12	5509.0	3.9	193	26	1
13	5510.0	2.2	154	24	1
14	5510.0	2.4	227	27	1
15	5510.0	3.3	152	25	1
16	5510.0	3.4	152	24	1
17	5510.0	4.8	222	27	1
18	5510.0	1.3	169	24	1
19	5511.0	4.2	227	27	1
20	5511.0	4.0	164	28	1
21	5511.0	2.0	205	27	1
22	5511.0	3.8	200	28	1
23	5520.0	4.8	161	24	1
24	5520.0	4.3	217	24	1
25	5520.0	2.7	175	26	1
26	5520.0	3.6	223	28	1
27	5529.0	2.1	175	28	1
28	5529.0	1.7	217	25	1
29	5529.0	1.7	194	29	1
30	5529.0	2.7	185	29	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	6.4	435	16	1
2	5491.0	7.0	477	18	1
3	5491.0	9.3	360	17	1
4	5491.0	7.0	438	18	1
5	5500.0	6.2	277	17	1
6	5500.0	7.0	254	18	1
7	5500.0	8.7	496	18	1
8	5500.0	7.0	465	18	1
9	5509.0	7.9	279	16	1
10	5509.0	9.5	434	17	1
11	5509.0	9.8	492	16	1
12	5509.0	6.6	429	17	1
13	5510.0	6.0	311	17	1
14	5510.0	9.8	384	17	1
15	5510.0	7.5	376	18	1
16	5510.0	7.4	243	18	1
17	5510.0	7.3	442	18	1
18	5510.0	6.3	290	17	1
19	5511.0	8.2	436	16	1
20	5511.0	6.9	382	17	1
21	5511.0	8.9	371	17	1
22	5511.0	9.1	414	17	1
23	5520.0	6.8	447	17	1
24	5520.0	6.4	215	17	1
25	5520.0	9.7	282	17	1
26	5520.0	6.9	329	18	1
27	5529.0	7.0	237	18	1
28	5529.0	6.3	265	18	1
29	5529.0	10.0	481	18	1
30	5529.0	10.0	287	16	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	12.5	223	15	1
2	5491.0	14.4	310	15	1
3	5491.0	14.1	472	13	1
4	5491.0	18.8	362	16	1
5	5500.0	18.1	307	15	1
6	5500.0	18.8	206	13	1
7	5500.0	11.0	435	15	1
8	5500.0	12.0	288	16	1
9	5509.0	15.3	273	13	1
10	5509.0	11.4	452	15	1
11	5509.0	18.1	256	13	1
12	5509.0	13.3	320	15	1
13	5510.0	13.5	342	13	1
14	5510.0	18.9	271	14	1
15	5510.0	11.2	366	13	1
16	5510.0	13.1	480	13	1
17	5510.0	16.3	294	15	1
18	5510.0	11.7	465	13	1
19	5511.0	13.3	427	12	1
20	5511.0	14.3	404	13	1
21	5511.0	12.2	461	16	1
22	5511.0	17.3	446	14	1
23	5520.0	12.1	350	15	1
24	5520.0	12.0	355	14	1
25	5520.0	18.3	293	14	1
26	5520.0	11.4	239	16	1
27	5529.0	17.1	429	13	1
28	5529.0	15.0	293	16	1
29	5529.0	18.9	318	14	1
30	5529.0	16.9	240	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: $\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4} = (100\% + 100\% + 100\% + 100\%)/4 = 100\% (>80\%)$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5510.0	1	16	5493.4	1
2	5510.0	1	17	5497.4	1
3	5510.0	1	18	5499.0	1
4	5510.0	1	19	5498.2	1
5	5510.0	1	20	5498.6	1
6	5510.0	1	21	5525.0	1
7	5510.0	1	22	5525.8	1
8	5510.0	1	23	5524.6	1
9	5510.0	1	24	5524.6	1
10	5510.0	1	25	5521.4	1
11	5493.4	1	26	5527.0	1
12	5494.2	1	27	5527.0	1
13	5496.2	1	28	5523.0	1
14	5493.0	1	29	5525.8	1
15	5497.4	1	30	5525.0	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5491.0	1	16	5510.0	1
2	5491.0	1	17	5510.0	1
3	5491.0	1	18	5510.0	1
4	5491.0	1	19	5511.0	1
5	5500.0	1	20	5511.0	1
6	5500.0	1	21	5511.0	1
7	5500.0	1	22	5511.0	1
8	5500.0	1	23	5520.0	1
9	5509.0	1	24	5520.0	1
10	5509.0	1	25	5520.0	1
11	5509.0	1	26	5520.0	1
12	5509.0	1	27	5529.0	1
13	5510.0	1	28	5529.0	1
14	5510.0	1	29	5529.0	1
15	5510.0	1	30	5529.0	1
Detection Percentage (%)					100%

Product	GigaSpire	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)		
Test Mode	Repeater mode		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	1.0	718	74	1
2	5491.0	1.0	758	70	1
3	5500.0	1.0	898	59	1
4	5500.0	1.0	878	61	1
5	5509.0	1.0	618	86	1
6	5509.0	1.0	638	83	1
7	5510.0	1.0	738	72	1
8	5510.0	1.0	3066	18	1
9	5511.0	1.0	818	65	1
10	5511.0	1.0	678	78	1
11	5520.0	1.0	938	57	1
12	5520.0	1.0	578	92	1
13	5529.0	1.0	558	95	1
14	5529.0	1.0	858	62	1
15	5530.0	1.0	658	81	1
16	5530.0	1.0	2742	20	1
17	5531.0	1.0	2565	21	1
18	5531.0	1.0	918	58	1
19	5540.0	1.0	1937	28	1
20	5540.0	1.0	955	56	1
21	5549.0	1.0	857	62	1
22	5549.0	1.0	1784	30	1
23	5550.0	1.0	2046	26	1
24	5550.0	1.0	703	75	1
25	5551.0	1.0	2786	19	1
26	5551.0	1.0	2763	20	1
27	5560.0	1.0	2092	26	1
28	5560.0	1.0	1755	31	1

29	5569.0	1.0	1645	33	1
30	5569.0	1.0	2635	20	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	2.5	216	26	1
2	5491.0	4.5	188	25	1
3	5500.0	1.6	202	27	1
4	5500.0	2.2	161	29	1
5	5509.0	4.8	176	28	1
6	5509.0	1.6	229	24	1
7	5510.0	3.8	151	28	1
8	5510.0	3.5	165	27	1
9	5511.0	3.9	226	29	1
10	5511.0	3.6	151	27	1
11	5520.0	2.9	201	25	1
12	5520.0	2.8	167	23	1
13	5529.0	2.6	165	24	1
14	5529.0	4.2	229	26	1
15	5530.0	1.1	186	27	1
16	5530.0	2.7	190	28	1
17	5531.0	2.6	170	25	1
18	5531.0	1.0	182	25	1
19	5540.0	1.0	186	28	1
20	5540.0	1.1	182	26	1
21	5549.0	1.7	211	29	1
22	5549.0	3.6	184	26	1
23	5550.0	2.3	150	27	1
24	5550.0	4.7	229	24	1
25	5551.0	4.9	188	26	1
26	5551.0	3.2	202	29	1
27	5560.0	3.2	175	24	1
28	5560.0	4.3	157	25	1
29	5569.0	3.4	214	27	1
30	5569.0	2.0	169	23	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	8.4	229	17	1
2	5491.0	6.5	419	16	1
3	5500.0	8.9	459	18	1
4	5500.0	7.2	482	17	1
5	5509.0	8.0	468	16	1
6	5509.0	6.8	488	18	1
7	5510.0	8.8	480	16	1
8	5510.0	9.9	238	17	1
9	5511.0	9.3	245	18	1
10	5511.0	8.1	485	16	1
11	5520.0	8.8	422	17	1
12	5520.0	6.5	448	17	1
13	5529.0	9.9	368	17	1
14	5529.0	6.8	453	17	1
15	5530.0	7.5	495	16	1
16	5530.0	9.9	479	16	1
17	5531.0	6.7	483	17	1
18	5531.0	7.7	254	18	1
19	5540.0	7.5	438	17	1
20	5540.0	10.0	401	16	1
21	5549.0	8.0	287	16	1
22	5549.0	10.0	222	16	1
23	5550.0	8.2	348	17	1
24	5550.0	8.0	282	18	1
25	5551.0	8.7	399	17	1
26	5551.0	6.4	433	17	1
27	5560.0	7.1	433	16	1
28	5560.0	6.5	235	16	1
29	5569.0	9.1	280	17	1
30	5569.0	7.6	330	17	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	13.1	436	15	1
2	5491.0	18.1	221	15	1
3	5500.0	16.5	451	14	1
4	5500.0	18.5	336	14	1
5	5509.0	14.0	211	15	1
6	5509.0	15.8	316	16	1
7	5510.0	15.5	425	13	1
8	5510.0	11.7	482	12	1
9	5511.0	16.1	287	15	1
10	5511.0	13.3	401	12	1
11	5520.0	14.1	355	16	1
12	5520.0	15.9	453	13	1
13	5529.0	16.7	357	14	1
14	5529.0	13.6	207	16	1
15	5530.0	13.7	364	14	1
16	5530.0	17.5	418	13	1
17	5531.0	11.1	251	14	1
18	5531.0	18.8	212	15	1
19	5540.0	19.2	411	15	1
20	5540.0	16.2	492	15	1
21	5549.0	16.3	480	12	1
22	5549.0	17.9	312	14	1
23	5550.0	13.4	467	16	1
24	5550.0	11.4	427	15	1
25	5551.0	17.3	476	12	1
26	5551.0	12.7	268	14	1
27	5560.0	14.4	277	13	1
28	5560.0	12.4	339	14	1
29	5569.0	14.9	486	14	1
30	5569.0	11.3	493	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: $\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4} = (100\% + 100\% + 100\% + 100\%)/4 = 100\% (>80\%)$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5530.0	1	16	5497.8	1
2	5530.0	1	17	5497.0	1
3	5530.0	1	18	5495.8	1
4	5530.0	1	19	5494.2	1
5	5530.0	1	20	5493.0	1
6	5530.0	1	21	5561.8	1
7	5530.0	1	22	5562.6	1
8	5530.0	1	23	5565.8	1
9	5530.0	1	24	5563.4	1
10	5530.0	1	25	5564.2	1
11	5499.0	1	26	5563.8	1
12	5493.0	1	27	5561.4	1
13	5495.0	1	28	5562.2	1
14	5495.4	1	29	5562.2	1
15	5495.8	1	30	5566.2	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5491.0	1	16	5530.0	1
2	5491.0	1	17	5531.0	1
3	5500.0	1	18	5531.0	1
4	5500.0	1	19	5540.0	1
5	5509.0	1	20	5540.0	1
6	5509.0	1	21	5549.0	1
7	5510.0	1	22	5549.0	1
8	5510.0	1	23	5550.0	1
9	5511.0	1	24	5550.0	1
10	5511.0	1	25	5551.0	1
11	5520.0	1	26	5551.0	1
12	5520.0	1	27	5560.0	1
13	5529.0	1	28	5560.0	1
14	5529.0	1	29	5569.0	1
15	5530.0	1	30	5569.0	1
Detection Percentage (%)					100%

Product	GigaSpire	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)		
Test Mode	Repeater mode		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5250.0	1.0	898	59	1
2	5250.0	1.0	538	98	1
3	5260.0	1.0	598	89	1
4	5260.0	1.0	878	61	1
5	5269.0	1.0	758	70	1
6	5269.0	1.0	818	65	1
7	5270.0	1.0	678	78	1
8	5270.0	1.0	838	63	1
9	5271.0	1.0	778	68	1
10	5271.0	1.0	578	92	1
11	5280.0	1.0	798	67	1
12	5280.0	1.0	858	62	1
13	5289.0	1.0	558	95	1
14	5289.0	1.0	698	76	1
15	5290.0	1.0	918	58	1
16	5290.0	1.0	2089	26	1
17	5291.0	1.0	2987	18	1
18	5291.0	1.0	1593	34	1
19	5300.0	1.0	1681	32	1
20	5300.0	1.0	2322	23	1
21	5309.0	1.0	1792	30	1
22	5309.0	1.0	2827	19	1
23	5310.0	1.0	1453	37	1
24	5310.0	1.0	2602	21	1
25	5311.0	1.0	939	57	1
26	5311.0	1.0	2128	25	1
27	5320.0	1.0	524	101	1
28	5320.0	1.0	2603	21	1

29	5329.0	1.0	1038	51	1
30	5329.0	1.0	753	70	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5250.0	3.7	191	29	1
2	5250.0	3.9	198	23	1
3	5260.0	3.2	229	26	1
4	5260.0	2.9	158	26	1
5	5269.0	2.0	151	24	1
6	5269.0	3.1	202	26	1
7	5270.0	3.3	153	26	1
8	5270.0	3.4	177	27	1
9	5271.0	4.6	199	24	1
10	5271.0	2.8	188	27	1
11	5280.0	3.2	177	27	1
12	5280.0	4.7	179	28	1
13	5289.0	3.9	178	27	1
14	5289.0	4.2	156	28	1
15	5290.0	4.4	213	27	1
16	5290.0	4.8	193	23	1
17	5291.0	3.0	228	23	1
18	5291.0	5.0	186	24	1
19	5300.0	3.7	205	28	1
20	5300.0	2.9	193	25	1
21	5309.0	3.1	178	23	1
22	5309.0	2.6	225	26	1
23	5310.0	4.9	211	29	1
24	5310.0	1.0	171	25	1
25	5311.0	2.6	156	24	1
26	5311.0	3.6	173	26	1
27	5320.0	2.2	150	25	1
28	5320.0	1.0	215	24	1
29	5329.0	1.8	219	29	1
30	5329.0	3.5	152	26	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5250.0	7.8	301	16	1
2	5250.0	9.3	323	17	1
3	5260.0	9.8	393	18	1
4	5260.0	7.5	226	17	1
5	5269.0	6.2	367	17	1
6	5269.0	6.1	488	17	1
7	5270.0	7.9	258	18	1
8	5270.0	9.2	223	17	1
9	5271.0	7.0	490	16	1
10	5271.0	7.6	478	17	1
11	5280.0	8.9	494	16	1
12	5280.0	6.7	288	17	1
13	5289.0	9.0	229	18	1
14	5289.0	6.6	305	18	1
15	5290.0	7.5	440	18	1
16	5290.0	8.3	339	18	1
17	5291.0	8.8	339	17	1
18	5291.0	9.0	280	18	1
19	5300.0	7.1	203	18	1
20	5300.0	8.7	326	17	1
21	5309.0	6.0	246	17	1
22	5309.0	8.1	237	17	1
23	5310.0	8.3	487	17	1
24	5310.0	9.1	385	17	1
25	5311.0	8.6	327	18	1
26	5311.0	8.5	435	18	1
27	5320.0	9.5	360	17	1
28	5320.0	7.9	408	17	1
29	5329.0	9.8	278	17	1
30	5329.0	6.8	458	17	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5250.0	13.5	202	13	1
2	5250.0	13.4	419	15	1
3	5260.0	13.5	385	15	1
4	5260.0	19.8	331	16	1
5	5269.0	19.6	364	13	1
6	5269.0	18.5	374	14	1
7	5270.0	14.4	307	14	1
8	5270.0	16.8	293	15	1
9	5271.0	11.8	270	15	1
10	5271.0	15.5	450	14	1
11	5280.0	15.3	442	16	1
12	5280.0	18.7	330	14	1
13	5289.0	14.0	271	16	1
14	5289.0	16.9	237	15	1
15	5290.0	11.8	319	14	1
16	5290.0	13.1	462	14	1
17	5291.0	16.1	443	14	1
18	5291.0	17.4	425	13	1
19	5300.0	13.8	284	12	1
20	5300.0	14.8	282	12	1
21	5309.0	16.7	248	15	1
22	5309.0	16.0	271	15	1
23	5310.0	15.6	445	14	1
24	5310.0	12.2	294	12	1
25	5311.0	17.1	400	15	1
26	5311.0	12.2	336	15	1
27	5320.0	14.4	244	15	1
28	5320.0	11.2	411	12	1
29	5329.0	11.6	416	13	1
30	5329.0	15.7	366	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: $\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4} = (100\% + 100\% + 100\% + 100\%)/4 = 100\% (>80\%)$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5290.0	1	16	5256.8	1
2	5290.0	1	17	5254.8	1
3	5290.0	1	18	5256.0	1
4	5290.0	1	19	5252.0	1
5	5290.0	1	20	5252.4	1
6	5290.0	1	21	5321.0	1
7	5290.0	1	22	5325.8	1
8	5290.0	1	23	5324.2	1
9	5290.0	1	24	5325.8	1
10	5290.0	1	25	5325.0	1
11	5254.8	1	26	5326.2	1
12	5252.4	1	27	5323.0	1
13	5256.0	1	28	5326.2	1
14	5255.2	1	29	5326.6	1
15	5257.2	1	30	5325.8	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5250.0	1	16	5290.0	1
2	5250.0	1	17	5291.0	1
3	5260.0	1	18	5291.0	1
4	5260.0	1	19	5300.0	1
5	5269.0	1	20	5300.0	1
6	5269.0	1	21	5309.0	1
7	5270.0	1	22	5309.0	1
8	5270.0	1	23	5310.0	1
9	5271.0	1	24	5310.0	1
10	5271.0	1	25	5311.0	1
11	5280.0	1	26	5311.0	1
12	5280.0	1	27	5320.0	1
13	5289.0	1	28	5320.0	1
14	5289.0	1	29	5329.0	1
15	5290.0	1	30	5329.0	1
Detection Percentage (%)					100%

Product	GigaSpire	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)		
Test Mode	Repeater mode		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	1.0	718	74	1
2	5491.0	1.0	758	70	1
3	5500.0	1.0	898	59	1
4	5500.0	1.0	778	68	1
5	5509.0	1.0	838	63	1
6	5509.0	1.0	798	67	1
7	5510.0	1.0	618	86	1
8	5510.0	1.0	938	57	1
9	5511.0	1.0	698	76	1
10	5511.0	1.0	818	65	1
11	5520.0	1.0	918	58	1
12	5520.0	1.0	858	62	1
13	5529.0	1.0	738	72	1
14	5529.0	1.0	558	95	1
15	5530.0	1.0	678	78	1
16	5530.0	1.0	2654	20	1
17	5531.0	1.0	1510	35	1
18	5531.0	1.0	581	91	1
19	5540.0	1.0	2255	24	1
20	5540.0	1.0	2351	23	1
21	5549.0	1.0	2289	24	1
22	5549.0	1.0	2977	18	1
23	5550.0	1.0	2768	20	1
24	5550.0	1.0	2313	23	1
25	5551.0	1.0	2389	23	1
26	5551.0	1.0	1092	49	1
27	5560.0	1.0	1284	42	1
28	5560.0	1.0	1130	47	1

29	5570.0	1.0	1660	32	1
30	5570.0	1.0	669	79	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	1.4	167	25	1
2	5491.0	1.7	203	26	1
3	5500.0	1.4	157	24	1
4	5500.0	4.1	173	27	1
5	5509.0	3.3	159	25	1
6	5509.0	1.4	219	27	1
7	5510.0	1.1	193	28	1
8	5510.0	2.1	177	28	1
9	5511.0	1.0	218	28	1
10	5511.0	2.2	198	26	1
11	5520.0	4.5	226	25	1
12	5520.0	4.5	192	29	1
13	5529.0	2.4	165	24	1
14	5529.0	3.3	174	28	1
15	5530.0	2.0	216	28	1
16	5530.0	2.9	201	24	1
17	5531.0	2.7	182	27	1
18	5531.0	4.7	170	23	1
19	5540.0	4.1	211	26	1
20	5540.0	1.9	223	27	1
21	5549.0	3.9	161	26	1
22	5549.0	1.3	219	27	1
23	5550.0	2.6	186	23	1
24	5550.0	2.2	165	24	1
25	5551.0	2.6	170	24	1
26	5551.0	1.7	213	24	1
27	5560.0	1.1	174	29	1
28	5560.0	4.6	177	28	1
29	5570.0	2.5	188	25	1
30	5570.0	3.5	220	25	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	7.6	425	18	1
2	5491.0	8.9	321	17	1
3	5500.0	9.8	479	17	1
4	5500.0	7.9	448	18	1
5	5509.0	7.6	303	17	1
6	5509.0	8.8	216	17	1
7	5510.0	6.3	237	17	1
8	5510.0	8.8	287	17	1
9	5511.0	7.8	376	18	1
10	5511.0	7.0	207	18	1
11	5520.0	6.3	398	17	1
12	5520.0	6.5	402	17	1
13	5529.0	7.7	420	17	1
14	5529.0	8.0	469	16	1
15	5530.0	8.3	319	17	1
16	5530.0	8.5	455	17	1
17	5531.0	9.4	412	17	1
18	5531.0	9.6	441	17	1
19	5540.0	7.9	476	17	1
20	5540.0	9.0	394	17	1
21	5549.0	9.2	214	17	1
22	5549.0	6.9	308	17	1
23	5550.0	7.7	402	17	1
24	5550.0	9.9	261	17	1
25	5551.0	6.3	326	16	1
26	5551.0	6.0	496	17	1
27	5560.0	6.7	397	17	1
28	5560.0	7.3	343	16	1
29	5570.0	8.2	374	17	1
30	5570.0	6.2	365	17	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	13.2	290	13	1
2	5491.0	18.5	370	14	1
3	5500.0	13.5	341	14	1
4	5500.0	14.7	481	14	1
5	5509.0	18.1	362	14	1
6	5509.0	11.7	367	15	1
7	5510.0	14.3	245	16	1
8	5510.0	13.3	262	12	1
9	5511.0	13.7	266	16	1
10	5511.0	13.8	364	14	1
11	5520.0	17.7	239	12	1
12	5520.0	12.1	487	13	1
13	5529.0	13.7	343	14	1
14	5529.0	16.2	217	15	1
15	5530.0	14.0	401	13	1
16	5530.0	12.5	248	14	1
17	5531.0	18.8	408	15	1
18	5531.0	12.2	205	16	1
19	5540.0	11.3	473	15	1
20	5540.0	13.9	330	14	1
21	5549.0	15.7	216	13	1
22	5549.0	14.8	297	15	1
23	5550.0	11.5	243	15	1
24	5550.0	16.1	279	14	1
25	5551.0	12.1	283	16	1
26	5551.0	13.8	300	14	1
27	5560.0	12.8	316	16	1
28	5560.0	11.9	340	13	1
29	5570.0	15.8	486	15	1
30	5570.0	11.4	439	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: $\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4} = (100\% + 100\% + 100\% + 100\%)/4 = 100\% (>80\%)$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5530.0	1	16	5497.0	1
2	5530.0	1	17	5496.2	1
3	5530.0	1	18	5496.2	1
4	5530.0	1	19	5495.8	1
5	5530.0	1	20	5494.6	1
6	5530.0	1	21	5562.4	1
7	5530.0	1	22	5567.2	1
8	5530.0	1	23	5565.6	1
9	5530.0	1	24	5562.8	1
10	5530.0	1	25	5563.2	1
11	5495.0	1	26	5567.2	1
12	5498.6	1	27	5563.2	1
13	5498.2	1	28	5562.4	1
14	5496.6	1	29	5567.2	1
15	5498.6	1	30	5563.6	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5491.0	1	16	5530.0	1
2	5491.0	1	17	5531.0	1
3	5500.0	1	18	5531.0	1
4	5500.0	1	19	5540.0	1
5	5509.0	1	20	5540.0	1
6	5509.0	1	21	5549.0	1
7	5510.0	1	22	5549.0	1
8	5510.0	1	23	5550.0	1
9	5511.0	1	24	5550.0	1
10	5511.0	1	25	5551.0	1
11	5520.0	1	26	5551.0	1
12	5520.0	1	27	5560.0	1
13	5529.0	1	28	5560.0	1
14	5529.0	1	29	5570.0	1
15	5530.0	1	30	5570.0	1
Detection Percentage (%)					100%

Product	GigaSpire	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)		
Test Mode	Repeater mode		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5570.0	1.0	598	89	1
2	5570.0	1.0	938	57	1
3	5580.0	1.0	518	102	1
4	5580.0	1.0	798	67	1
5	5589.0	1.0	3066	18	1
6	5589.0	1.0	558	95	1
7	5590.0	1.0	638	83	1
8	5590.0	1.0	658	81	1
9	5591.0	1.0	878	61	1
10	5591.0	1.0	618	86	1
11	5600.0	1.0	578	92	1
12	5600.0	1.0	718	74	1
13	5609.0	1.0	678	78	1
14	5609.0	1.0	818	65	1
15	5610.0	1.0	758	70	1
16	5610.0	1.0	747	71	1
17	5611.0	1.0	2369	23	1
18	5611.0	1.0	2286	24	1
19	5620.0	1.0	2826	19	1
20	5620.0	1.0	1747	31	1
21	5629.0	1.0	2589	21	1
22	5629.0	1.0	1321	40	1
23	5630.0	1.0	1864	29	1
24	5630.0	1.0	587	90	1
25	5631.0	1.0	2357	23	1
26	5631.0	1.0	2364	23	1
27	5640.0	1.0	1055	50	1
28	5640.0	1.0	2976	18	1

29	5649.0	1.0	2193	25	1
30	5649.0	1.0	2795	19	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5570.0	1.3	211	24	1
2	5570.0	1.1	164	26	1
3	5580.0	4.5	182	24	1
4	5580.0	1.2	155	25	1
5	5589.0	1.0	182	25	1
6	5589.0	1.2	167	26	1
7	5590.0	3.4	212	27	1
8	5590.0	2.4	169	25	1
9	5591.0	1.4	159	28	1
10	5591.0	5.0	230	25	1
11	5600.0	3.5	163	24	1
12	5600.0	3.3	168	24	1
13	5609.0	4.4	211	26	1
14	5609.0	4.3	221	24	1
15	5610.0	1.4	162	26	1
16	5610.0	1.8	197	27	1
17	5611.0	2.2	185	27	1
18	5611.0	1.6	170	26	1
19	5620.0	5.0	229	27	1
20	5620.0	3.6	166	28	1
21	5629.0	1.0	217	28	1
22	5629.0	4.2	162	24	1
23	5630.0	3.3	224	25	1
24	5630.0	4.3	216	28	1
25	5631.0	4.2	167	27	1
26	5631.0	1.4	203	28	1
27	5640.0	2.9	182	28	1
28	5640.0	5.0	180	24	1
29	5649.0	4.6	166	24	1
30	5649.0	1.0	159	24	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5570.0	8.2	404	17	1
2	5570.0	9.5	459	16	1
3	5580.0	7.8	402	18	1
4	5580.0	8.0	367	16	1
5	5589.0	6.8	337	17	1
6	5589.0	8.3	373	17	1
7	5590.0	9.4	257	18	1
8	5590.0	9.2	470	17	1
9	5591.0	7.1	253	16	1
10	5591.0	6.9	459	16	1
11	5600.0	6.3	335	17	1
12	5600.0	9.5	305	17	1
13	5609.0	7.2	357	17	1
14	5609.0	8.5	448	16	1
15	5610.0	6.4	330	18	1
16	5610.0	9.4	352	18	1
17	5611.0	6.3	374	18	1
18	5611.0	6.5	498	18	1
19	5620.0	8.0	271	18	1
20	5620.0	8.6	366	17	1
21	5629.0	8.2	435	17	1
22	5629.0	6.3	411	17	1
23	5630.0	7.9	431	16	1
24	5630.0	7.6	441	17	1
25	5631.0	10.0	319	17	1
26	5631.0	7.0	374	17	1
27	5640.0	8.3	433	18	1
28	5640.0	9.9	323	18	1
29	5649.0	9.5	275	17	1
30	5649.0	10.0	237	17	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5570.0	17.9	265	13	1
2	5570.0	18.2	374	12	1
3	5580.0	15.8	325	14	1
4	5580.0	12.5	476	13	1
5	5589.0	11.1	310	15	1
6	5589.0	14.6	429	14	1
7	5590.0	19.6	282	16	1
8	5590.0	18.5	258	15	1
9	5591.0	11.8	223	13	1
10	5591.0	11.2	394	16	1
11	5600.0	15.4	471	13	1
12	5600.0	12.1	310	15	1
13	5609.0	18.7	285	13	1
14	5609.0	15.9	284	14	1
15	5610.0	16.7	453	12	1
16	5610.0	19.7	458	15	1
17	5611.0	11.5	434	15	1
18	5611.0	19.9	271	13	1
19	5620.0	13.0	224	12	1
20	5620.0	11.4	371	16	1
21	5629.0	16.9	252	14	1
22	5629.0	19.1	459	13	1
23	5630.0	14.3	344	16	1
24	5630.0	19.8	447	16	1
25	5631.0	19.5	460	14	1
26	5631.0	18.2	446	14	1
27	5640.0	12.6	480	14	1
28	5640.0	11.1	313	13	1
29	5649.0	16.4	301	13	1
30	5649.0	11.6	476	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: $\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4} = (100\% + 100\% + 100\% + 100\%)/4 = 100\% (>80\%)$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5610.0	1	16	5576.8	1
2	5610.0	1	17	5577.2	1
3	5610.0	1	18	5576.4	1
4	5610.0	1	19	5578.0	1
5	5610.0	1	20	5574.0	1
6	5610.0	1	21	5645.4	1
7	5610.0	1	22	5644.6	1
8	5610.0	1	23	5645.8	1
9	5610.0	1	24	5645.8	1
10	5610.0	1	25	5642.6	1
11	5572.0	1	26	5641.8	1
12	5578.0	1	27	5641.4	1
13	5577.2	1	28	5642.6	1
14	5574.8	1	29	5641.8	1
15	5576.0	1	30	5644.2	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5570.0	1	16	5610.0	1
2	5570.0	1	17	5611.0	1
3	5580.0	1	18	5611.0	1
4	5580.0	1	19	5620.0	1
5	5589.0	1	20	5620.0	1
6	5589.0	1	21	5629.0	1
7	5590.0	1	22	5629.0	1
8	5590.0	1	23	5630.0	1
9	5591.0	1	24	5630.0	1
10	5591.0	1	25	5631.0	1
11	5600.0	1	26	5631.0	1
12	5600.0	1	27	5640.0	1
13	5609.0	1	28	5640.0	1
14	5609.0	1	29	5649.0	1
15	5610.0	1	30	5649.0	1
Detection Percentage (%)					100%

6. CONCLUSION

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

The End

Appendix A - Test Setup Photograph

Refer to "1911RSU033-UT" file.

Appendix B - EUT Photograph

Refer to "1911RSU033-UE" file.