

DFS MEASUREMENT REPORT

FCC 15.407 WLAN 802.11a/n/ac/ax

FCC ID: 2ABLK-BLASTU4X

APPLICANT: Calix Inc.

Application Type: CLASS II PERMISSIVE CHANGE

Product: GigaSpire BLAST u4, GigaSpire Mesh BLAST u4m


Model No.: GigaSpire BLAST u4, GigaSpire Mesh BLAST u4m

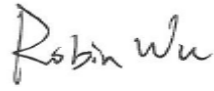
Brand Name: 

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

Test Date: July 16 ~August 22, 2020

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
2006RSU066-U6	Rev. 01	Initial report	09-17-2020	Valid

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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 Facility / Accreditations

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

- MRT facility is an FCC accredited testing laboratory (MRT Designation No. CN1166) on the FCC website.
- MRT facility is an ISED recognized testing laboratory (MRT Reg. No. CN0001) on the ISED website.
- 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 A2LA under the A2LA Program (Cert. No. 3628.01) and CNAS under the CNAS Program (Cert. No. L10551) in EMC, Safety, Radio, Telecommunications 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 BLAST u4, GigaSpire Mesh BLAST u4m
Model No.:	GigaSpire BLAST u4, GigaSpire Mesh BLAST u4m
Brand Name:	
Wi-Fi Specification:	802.11a/b/g/n/ac/ax/VHT
Operating Mode:	Master (AP, Repeater, Mesh)
Serial No.:	262007036403 (AP mode), 262007039753 (Repeater & Mesh mode)
Accessory	
Switching Mode Power Adapter:	MODEL: F24L9-120200SPAU INPUT: 100-240V~50/60Hz 0.6A OUTPUT: 12V=2A

Note: Between the models, there are the same schematics design, same PCB layout and the same RF parameters except the difference as below (Section 2.2), and GigaSpire BLAST u4 was selected for all RF test.

2.2. Models Difference

Model name	Difference
GigaSpire BLAST u4	2 LAN ports, 1 WAN port, 1 USB, 2.4G/5G Wi-Fi, external PSU
GigaSpire Mesh BLAST u4m	1 WAN port, 2.4G/5G Wi-Fi, external PSU

2.3. 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
Type of Modulation:	802.11a/n/ac: OFDM 802.11ax: OFDMA
Data Rate:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.6Mbps 802.11ax: up to 1201Mbps
Power-on cycle:	Requires 39.41 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.

2.4. Description of Available Antennas

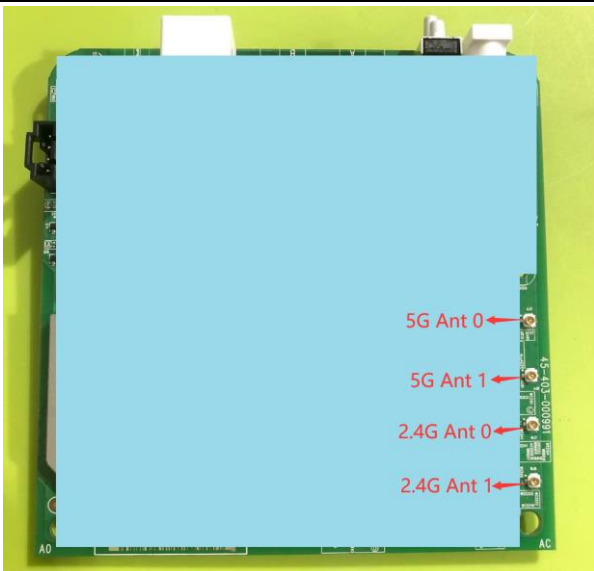
Model name	Manufacturer	Tx Port	Frequency Band (MHz)	Cable length (mm)
2.4G-2_PCB-LY70FC1	CHANGSHU HONGBO TELECOMMUNICATION TECHNOLOGY CO., LTD.	2.4G Ant 0	2412~2462	70
2.4G-1_PCB-LE160FC3		2.4G Ant 1	2412~2462	160
RFPCA252302IM5B301	WALSIN TECHNOLOGY CORPORATION	5G Ant 0	5150~5850	30
RFPCA252312IM5B301		5G Ant 1	5150~5850	125

Antenna Type	Frequency Band (MHz)	Tx Paths	Directional Gain (dBi)
			CDD & Beamforming
PCB Antenna	2412 ~ 2462	2	5.84
	5150 ~ 5350	2	5.81
	5470 ~ 5725	2	5.93
	5725 ~ 5850	2	5.95

Note 1: The EUT supports Cyclic Delay Diversity (CDD) and Beamforming technology, and the Beamforming mode support 802.11ac/ax, not include 802.11a/b/g. It transmits signals that 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.

Note 2: All the messages as above are provided by manufacturer.

2.5. Description of Antenna RF Port

Antenna RF Port				
Software Control Port	2.4GHz RF Port		5GHz RF Port	
	Ant 0	Ant 1	Ant 0	Ant 1
				

2.6. 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	--	--	--	--

2.7. Test Mode

Test Mode	Mode 1: Operating under AP mode Mode 2: Operating under Repeater Mode Mode 3: Operating under Mesh mode
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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 ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm

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

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

Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.

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

3.4. Parameters of DFS Test Signals

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

Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 3-6	$\text{Roundup} \left\{ \begin{array}{l} \left(\frac{1}{360} \right) \cdot \\ \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \end{array} \right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

Table 3-5: Parameters for Short Pulse Radar Waveforms

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

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

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

Long Pulse Radar Test Waveform

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

Table 3-7: Parameters for Long Pulse Radar Waveforms

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

Frequency Hopping Radar Test Waveform

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

Table 3-8: Parameters for Frequency Hopping Radar Waveforms

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

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

3.5. 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.

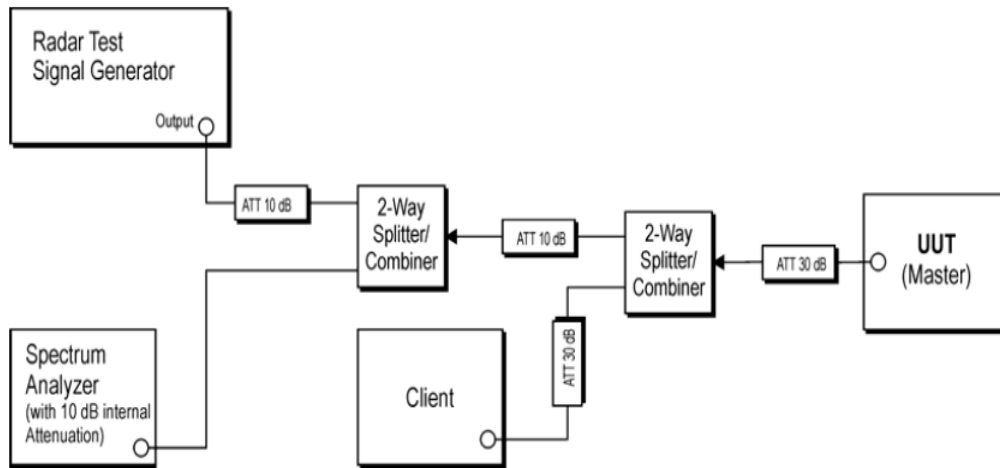


Figure 3-1: Conducted Test Setup where UUT is a Master and Radar Test Waveforms are injected into the Masters

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	MRTSUE06457	1 year	2021/07/02
ESG Vector Signal Generator	Agilent	E4438C	MRTSUE06026	1 year	2020/11/07
Vector Signal Generator	R&S	SMBV100A	MRTSUE06279	1 year	2021/04/14
Thermohygrometer	Testo	608-H1	MRTSUE06402	1 year	2021/07/26

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.

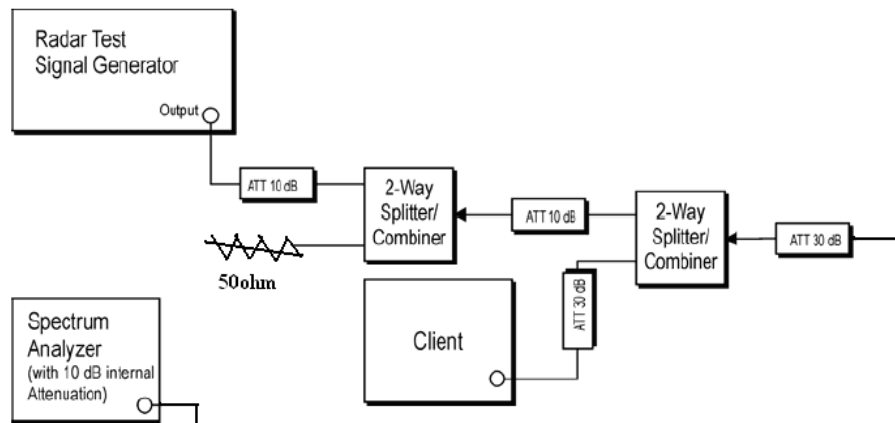


Figure 3-2: Conducted Test Setup

5.2.2. Calibration Procedure

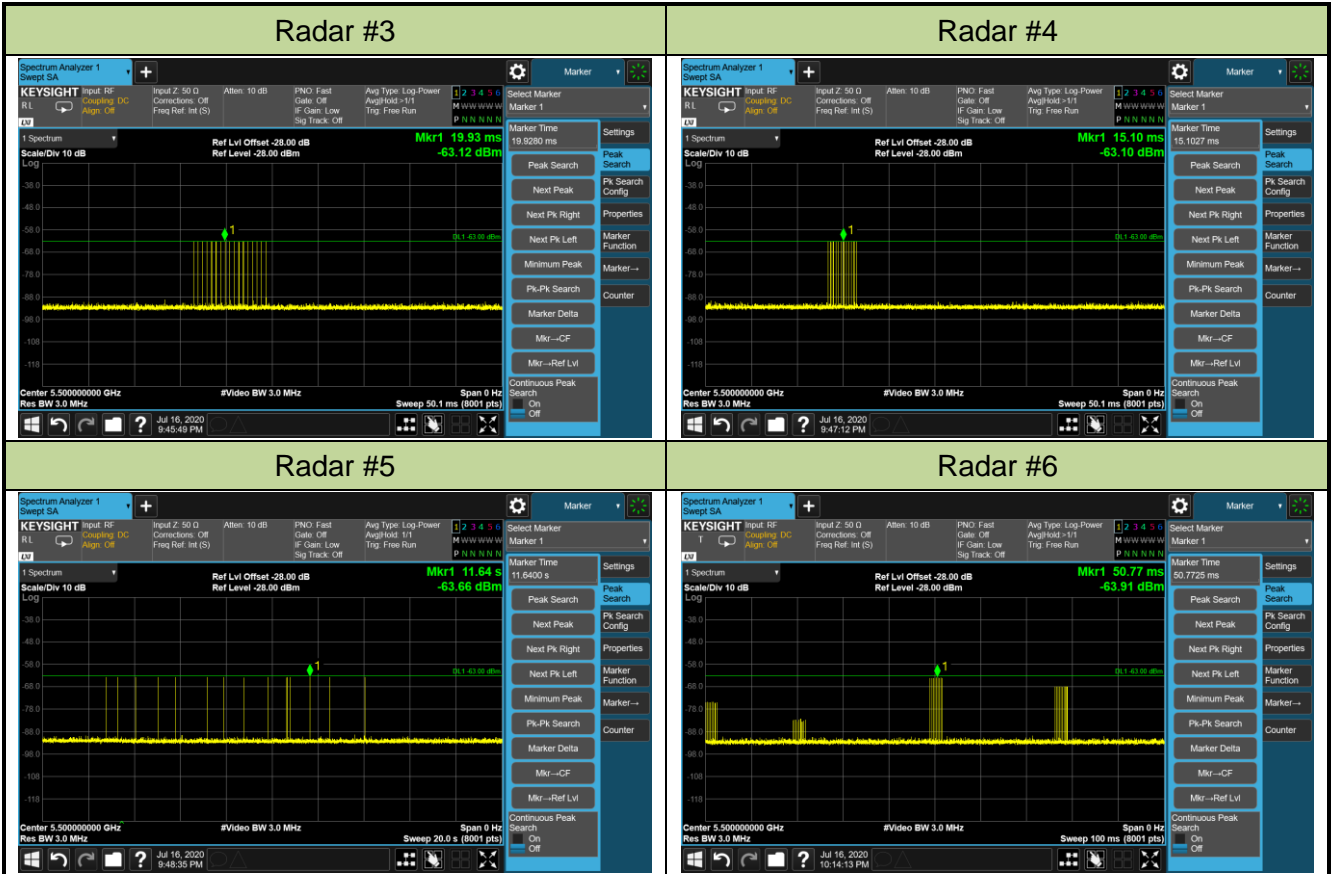
The Interference Radar Detection Threshold Level is $(-64\text{dBm}) + (0) [\text{dBi}] + 1 \text{ dB} = -63 \text{ dBm}$ that had been taken into account the output power range and antenna gain. The above equipment setup was used to calibrate the conducted Radar Waveform. A vector signal generator was 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 BLAST u4	Temperature	25°C
Test Engineer	Jake Lan	Relative Humidity	60%
Test Site	SR4	Test Date	2020/07/16
Test Item	Radar Waveform Calibration		

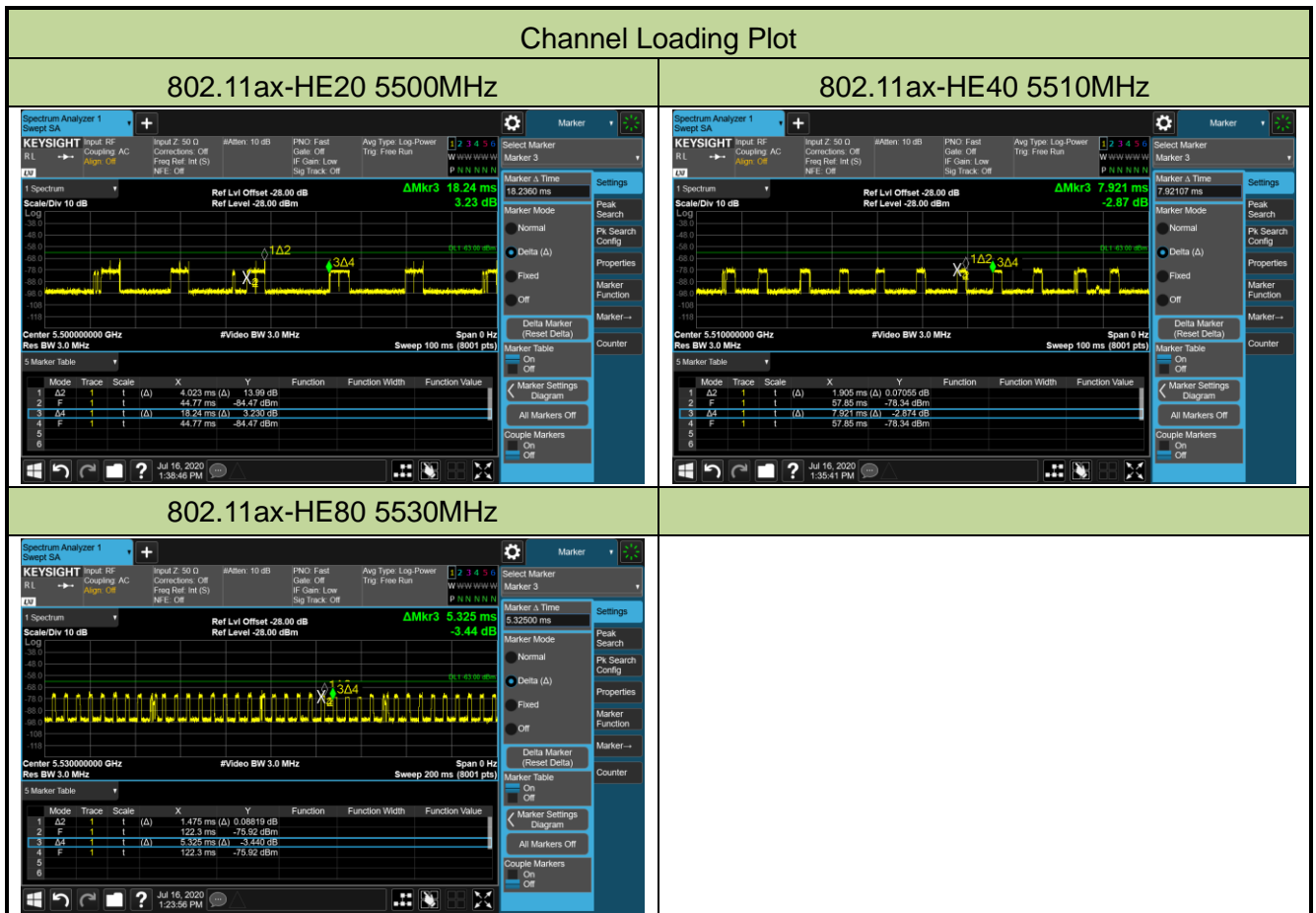
Radar Waveform Calibration

<h4>Radar #0</h4> <p>Marker Time: 85.699 ms Mkr1 85.69 ms -63.42 dBm</p>	<h4>Radar #1 (Test A)</h4> <p>PRI = 858us and the number of pulses = 62</p> <p>Marker Time: 197.275 ms Mkr1 197.3 ms -63.50 dBm</p>
<h4>Radar #1 (Test B)</h4> <p>PRI = 2.828ms and the number of pulses = 19</p> <p>Marker Time: 225.500 ms Mkr1 225.5 ms -63.53 dBm</p>	<h4>Radar #2</h4> <p>Marker Time: 27.5859 ms Mkr1 27.59 ms -63.25 dBm</p>



5.2.4. Channel Loading Test Result

Product	GigaSpire BLAST u4	Temperature	25°C
Test Engineer	Jake Lan	Relative Humidity	62%
Test Site	SR4	Test Date	2020/07/16
Test Item	Channel Loading		



Test Mode	Test Frequency	Packet ratio	Requirement ratio	Test Result
802.11ax-HE20	5500 MHz	22.06%	≥ 17%	Pass
802.11ax-HE40	5510 MHz	24.05%	≥ 17%	Pass
802.11ax-HE80	5530 MHz	27.70%	≥ 17%	Pass

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

5.3. NII Detection Bandwidth Measurement

5.3.1. Test Limit

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

Measurements are performed with no data traffic.

5.3.2. Test Procedure

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

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

5.3.3. Test Result

Product	GigaSpire BLAST u4	Temperature	23 ~ 27°C
Test Engineer	Jake Lan	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2020/07/22
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	
5490	0	0	0	0	0	0	0	0	0	0	0%
5490.4 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%
5509.6 FH	1	1	1	1	1	1	1	1	1	1	100%
5510	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 18.96MHz. (See the 99% BW section of the RF report for further measurement details).

Note 2: Detection Bandwidth = FH - FL = 5509.6MHz – 5490.4MHz = 19.2MHz.

Note 3: NII Detection Bandwidth Min. Limit (MHz): 18.96MHz x 100% = 18.96MHz.

Product	GigaSpire BLAST u4	Temperature	23 ~ 27°C
Test Engineer	Jake Lan	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2020/07/22
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 37.70MHz. (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): $37.70\text{MHz} \times 100\% = 37.70\text{MHz}$.

Product	GigaSpire BLAST u4	Temperature	23 ~ 27°C
Test Engineer	Jake Lan	Relative Humidity	52 ~ 65%
Test Site	SR4	Test Date	2020/07/22
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 77.22MHz. (See the 99% BW section of the RF report for further measurement details).

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

Note 3: NII Detection Bandwidth Min. Limit (MHz): 77.22MHz x 100% = 77.22MHz.

5.4. Initial Channel Availability Check Time Measurement

5.4.1. Test Limit

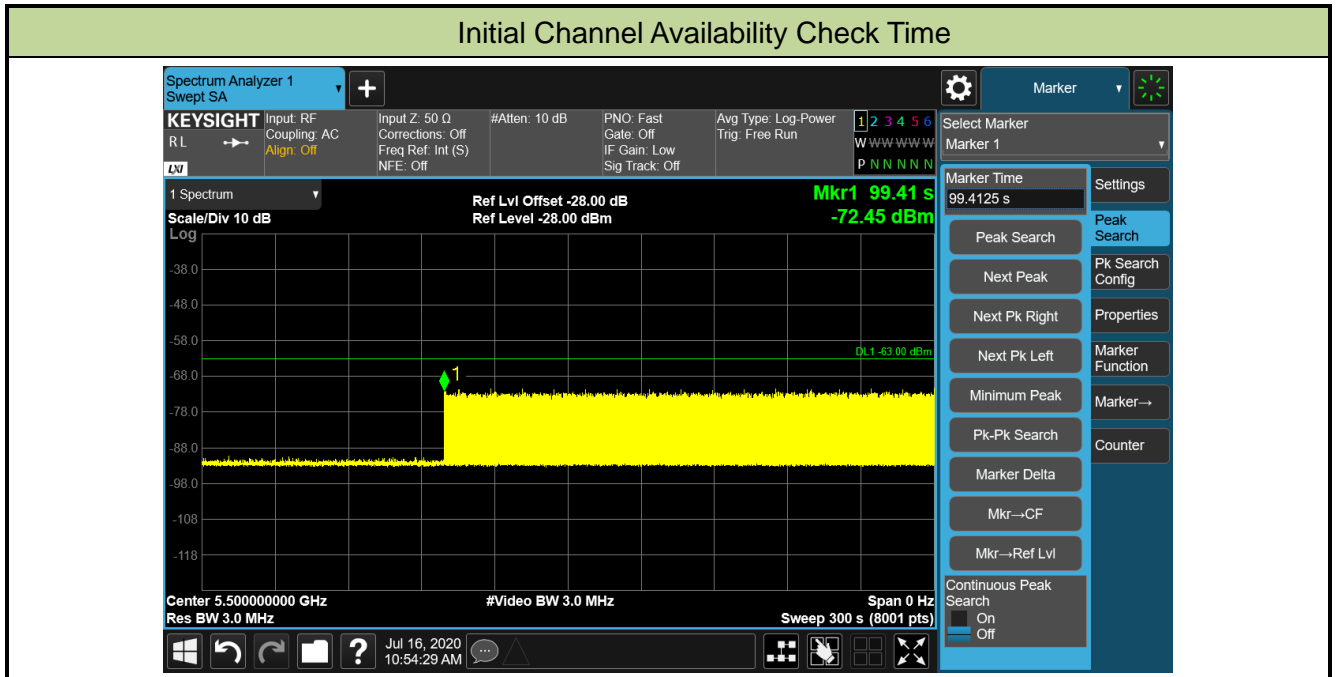
The EUT shall perform a Channel Availability Check to ensure that there is no radar operating on the channel. After power-up sequence, receive at least 1 minute on the intended operating frequency.

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 BLAST u4	Temperature	27°C
Test Engineer	Jake Lan	Relative Humidity	65%
Test Site	SR4	Test Date	2020/07/16
Test Item	Initial Channel Availability Check Time (802.11ax-HE20 mode - 5500MHz)		



Note: The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (39.41 sec). Initial beacons/data transmissions are indicated by marker 1 (99.41sec).

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

5.5.1. Test Limit

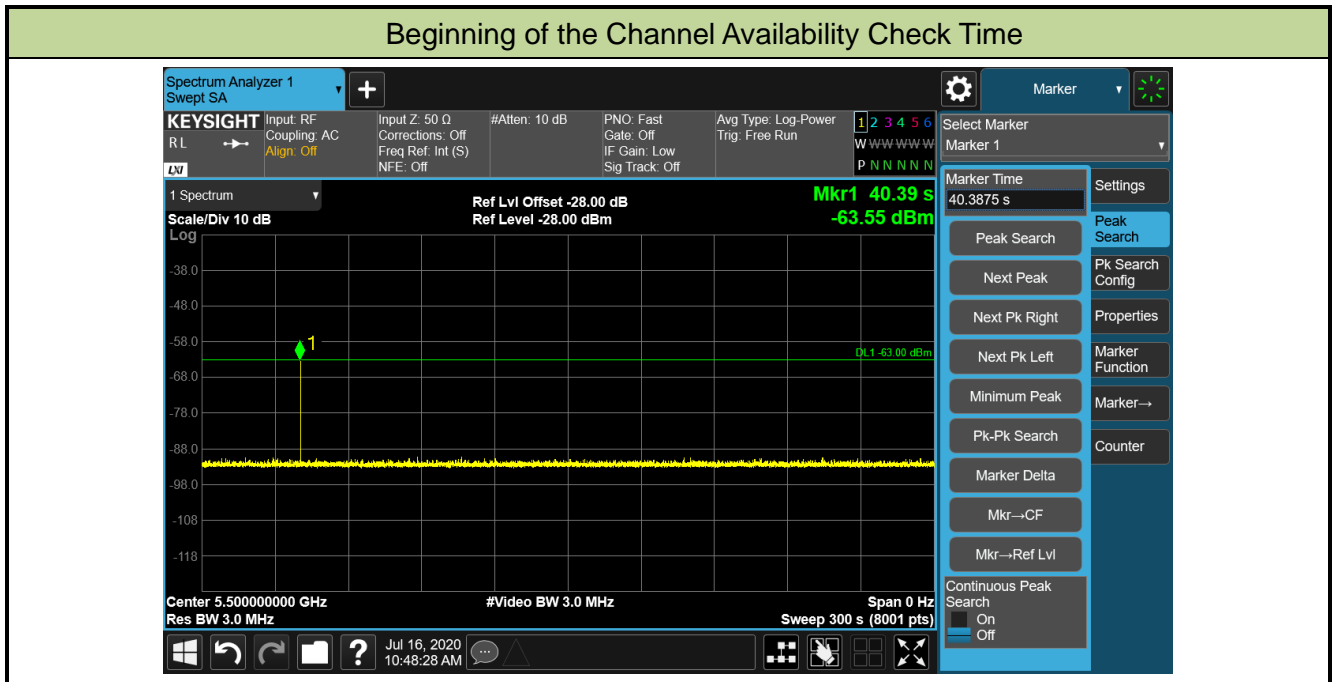
In beginning of the Channel Availability Check (CAC) Time, radar is detected on this channel, select another intended channel and perform a CAC on that channel.

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 BLAST u4	Temperature	27°C
Test Engineer	Jake Lan	Relative Humidity	65%
Test Site	SR4	Test Date	2020/07/16
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

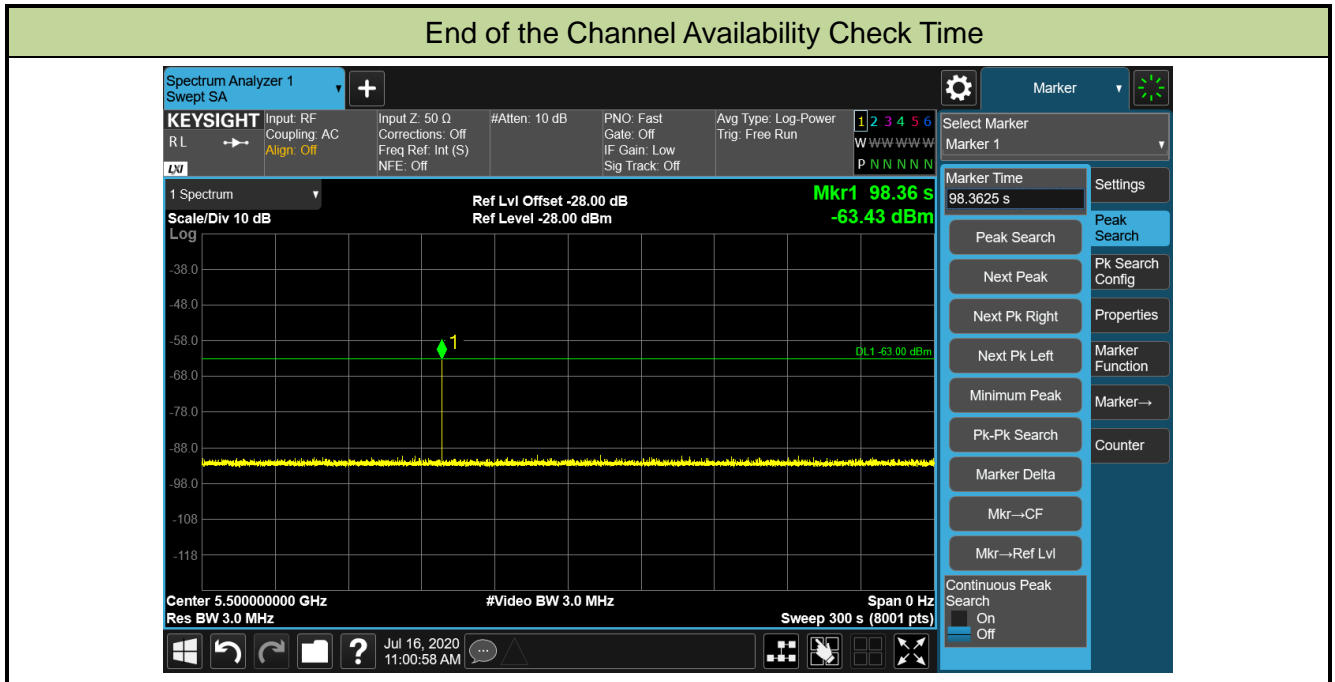
In the end of Channel Availability Check (CAC) Time, radar is detected on this channel, select another intended channel and perform a CAC on that channel.

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 BLAST u4	Temperature	27°C
Test Engineer	Jake Lan	Relative Humidity	65%
Test Site	SR4	Test Date	2020/07/16
Test Item	End of the Channel Availability Check Time (802.11ax-HE20 mode - 5500MHz)		



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

5.7.1. Test Limit

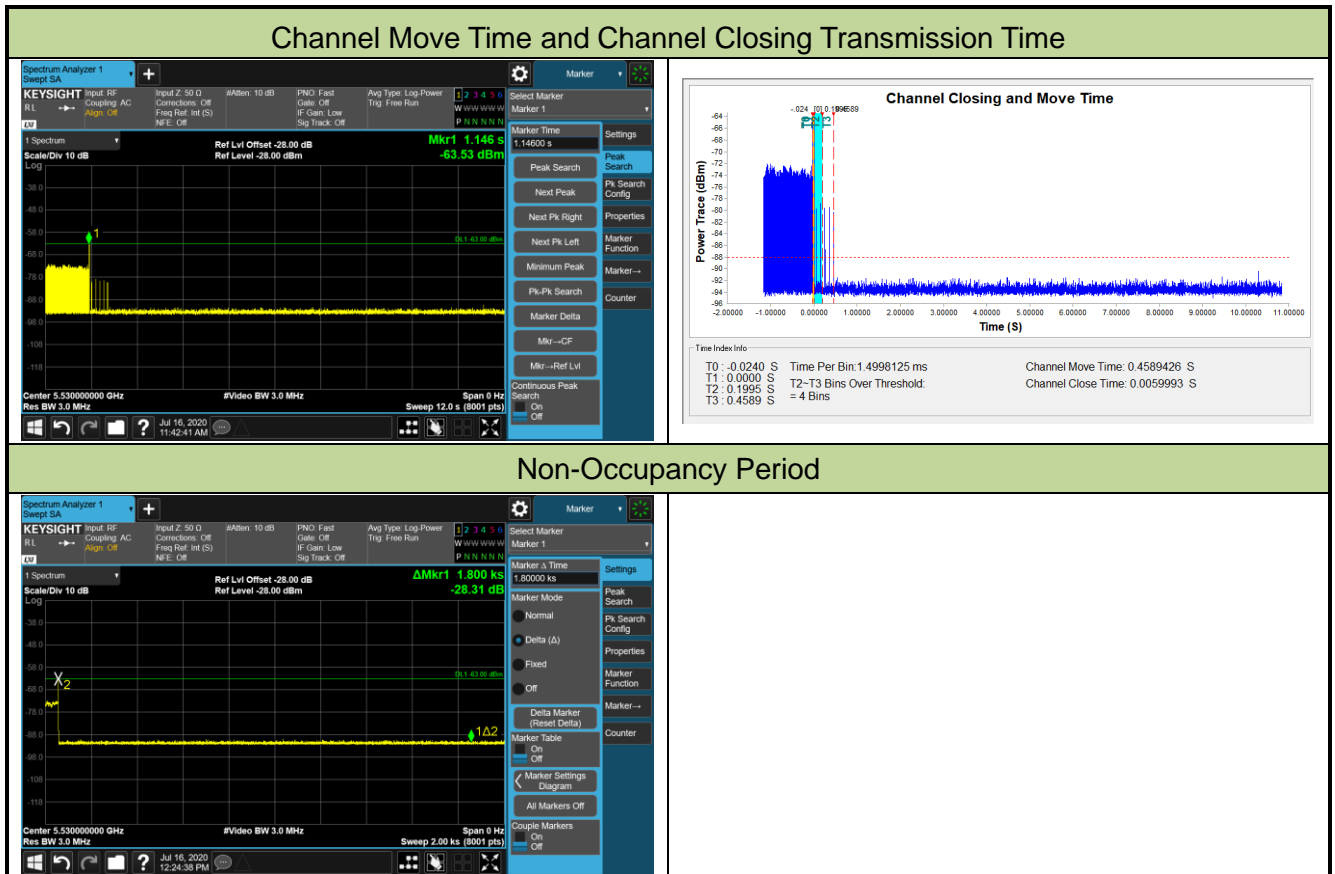
The EUT has In-Service Monitoring function to continuously monitor the radar signals. If the radar is detected, must leave the channel (Shutdown). The Channel Move Time to cease all transmissions on the current channel upon detection of a Radar Waveform above the DFS Detection Threshold within 10 sec.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

5.7.2. Test Procedure Used

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

5.7.3. Test Result

Product	GigaSpire BLAST u4	Temperature	27°C
Test Engineer	Jake Lan	Relative Humidity	65%
Test Site	SR4	Test Date	2020/07/16
Test Item	Channel Move Time and Channel Closing Transmission Time (802.11ax-HE80 mode - 5530MHz)		



Parameter	Test Result	Limit
Channel Move Time (s)	0.459s	<10s
Channel Closing Transmission Time (ms) (Note)	6.0ms	< 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:

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

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

5.8.2. Test Procedure

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 BLAST u4	Temperature	23 ~ 27°C
Test Engineer	Jake Lan	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2020/07/22
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	5490.4	1.0	718	74	1
2	5491.1	1.0	578	92	1
3	5491.8	1.0	538	98	1
4	5492.5	1.0	678	78	1
5	5493.2	1.0	778	68	1
6	5494.0	1.0	698	76	1
7	5494.7	1.0	3066	18	1
8	5495.4	1.0	758	70	1
9	5496.1	1.0	798	67	1
10	5496.8	1.0	658	81	1
11	5497.5	1.0	838	63	1
12	5498.2	1.0	878	61	1
13	5498.9	1.0	638	83	1
14	5499.6	1.0	858	62	1
15	5500.0	1.0	918	58	1
16	5500.7	1.0	585	91	1
17	5501.3	1.0	2795	19	1
18	5502.0	1.0	990	54	1
19	5502.6	1.0	633	84	1
20	5503.3	1.0	1183	45	1
21	5504.0	1.0	1901	28	1
22	5504.6	1.0	1483	36	1
23	5505.3	1.0	581	91	1
24	5505.9	1.0	2545	21	1
25	5506.6	1.0	2216	24	1
26	5507.3	1.0	1720	31	1
27	5507.9	1.0	1857	29	1

28	5508.6	1.0	949	56	1
29	5509.2	1.0	1664	32	1
30	5509.6	1.0	2915	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	5490.4	3.7	203	26	1
2	5491.1	2.5	167	27	1
3	5491.8	1.0	198	24	1
4	5492.5	3.7	155	25	1
5	5493.2	4.9	229	28	1
6	5494.0	1.1	215	27	1
7	5494.7	3.6	156	27	1
8	5495.4	4.7	173	26	1
9	5496.1	4.6	227	25	1
10	5496.8	3.7	200	24	1
11	5497.5	3.8	201	24	1
12	5498.2	2.8	153	25	1
13	5498.9	2.7	185	25	1
14	5499.6	1.0	230	25	1
15	5500.0	1.0	186	29	1
16	5500.7	1.8	199	24	1
17	5501.3	2.1	158	24	1
18	5502.0	2.1	171	26	1
19	5502.6	1.0	224	23	1
20	5503.3	3.0	228	28	1
21	5504.0	2.8	185	29	1
22	5504.6	1.4	220	24	1
23	5505.3	5.0	162	26	1
24	5505.9	2.1	200	24	1
25	5506.6	1.8	220	25	1
26	5507.3	5.0	222	25	1
27	5507.9	2.4	228	29	1
28	5508.6	3.3	203	23	1
29	5509.2	1.8	172	24	1
30	5509.6	4.6	166	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	5490.4	6.6	456	16	1
2	5491.1	7.6	264	17	1
3	5491.8	6.5	448	16	1
4	5492.5	6.7	314	17	1
5	5493.2	8.2	413	16	1
6	5494.0	7.0	354	17	1
7	5494.7	7.8	249	17	1
8	5495.4	7.2	250	17	1
9	5496.1	8.7	275	18	1
10	5496.8	9.7	381	17	1
11	5497.5	8.5	440	16	1
12	5498.2	8.1	439	17	1
13	5498.9	8.7	303	17	1
14	5499.6	9.0	352	18	1
15	5500.0	6.5	390	17	1
16	5500.7	6.9	445	17	1
17	5501.3	7.3	222	17	1
18	5502.0	7.8	399	18	1
19	5502.6	6.8	256	18	1
20	5503.3	8.1	412	17	1
21	5504.0	9.8	225	16	1
22	5504.6	7.5	239	16	1
23	5505.3	7.8	387	17	1
24	5505.9	9.1	441	18	1
25	5506.6	9.9	332	18	1
26	5507.3	8.8	422	16	1
27	5507.9	8.6	273	18	1
28	5508.6	7.2	273	17	1
29	5509.2	8.1	337	18	1
30	5509.6	7.4	284	17	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.4	18.1	256	14	1
2	5491.1	11.6	370	15	1
3	5491.8	13.7	215	16	1
4	5492.5	11.7	358	15	1
5	5493.2	16.5	325	14	1
6	5494.0	17.3	344	15	1
7	5494.7	18.1	478	14	1
8	5495.4	15.0	474	15	1
9	5496.1	19.4	244	14	1
10	5496.8	16.7	340	13	1
11	5497.5	17.1	322	16	1
12	5498.2	13.4	396	15	1
13	5498.9	14.6	473	14	1
14	5499.6	16.5	211	16	1
15	5500.0	15.8	427	16	1
16	5500.7	11.1	499	15	1
17	5501.3	19.2	495	14	1
18	5502.0	15.7	407	14	1
19	5502.6	16.0	330	14	1
20	5503.3	15.1	292	14	1
21	5504.0	15.7	260	13	1
22	5504.6	19.6	245	15	1
23	5505.3	13.7	325	16	1
24	5505.9	14.3	302	14	1
25	5506.6	18.8	448	14	1
26	5507.3	15.4	323	13	1
27	5507.9	12.7	298	14	1
28	5508.6	12.3	300	14	1
29	5509.2	14.9	439	15	1
30	5509.6	14.0	352	13	1
Detection Percentage (%)					100%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test

waveforms is as follows: $\frac{P_d1 + P_d2 + P_d3 + P_d4}{4} = (100\% + 100\% + 100\% + 100\%) / 4 = 100\% (>80\%)$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5500.0	1	16	5494.4	1
2	5500.0	1	17	5498.0	1
3	5500.0	1	18	5492.4	1
4	5500.0	1	19	5494.0	1
5	5500.0	1	20	5497.2	1
6	5500.0	1	21	5505.2	1
7	5500.0	1	22	5505.2	1
8	5500.0	1	23	5506.8	1
9	5500.0	1	24	5502.0	1
10	5500.0	1	25	5504.4	1
11	5497.6	1	26	5505.2	1
12	5492.8	1	27	5506.0	1
13	5497.2	1	28	5503.2	1
14	5494.8	1	29	5507.6	1
15	5498.0	1	30	5506.4	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5490.4	1	16	5500.7	1
2	5491.1	1	17	5501.3	1
3	5491.8	1	18	5502.0	1
4	5492.5	1	19	5502.6	1
5	5493.2	1	20	5503.3	1
6	5494.0	1	21	5504.0	1
7	5494.7	1	22	5504.6	1
8	5495.4	1	23	5505.3	1
9	5496.1	1	24	5505.9	1
10	5496.8	1	25	5506.6	1
11	5497.5	1	26	5507.3	1
12	5498.2	1	27	5507.9	1
13	5498.9	1	28	5508.6	1
14	5499.6	1	29	5509.2	1
15	5500.0	1	30	5509.6	1
Detection Percentage (%)					100%



Product	GigaSpire BLAST u4	Temperature	23 ~ 27°C
Test Engineer	Jake Lan	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2020/07/22
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	778	68	1
2	5492.3	1.0	3066	18	1
3	5493.5	1.0	818	65	1
4	5494.8	1.0	698	76	1
5	5496.1	1.0	538	98	1
6	5497.3	1.0	598	89	1
7	5498.6	1.0	578	92	1
8	5499.9	1.0	678	78	1
9	5501.1	1.0	838	63	1
10	5502.4	1.0	758	70	1
11	5503.7	1.0	638	83	1
12	5504.9	1.0	798	67	1
13	5506.2	1.0	878	61	1
14	5507.5	1.0	618	86	1
15	5508.8	1.0	918	58	1
16	5510.0	1.0	860	62	1
17	5511.3	1.0	2331	23	1
18	5512.6	1.0	903	59	1
19	5513.9	1.0	1737	31	1
20	5515.2	1.0	2155	25	1
21	5516.6	1.0	572	93	1
22	5517.9	1.0	1993	27	1
23	5519.2	1.0	1055	50	1
24	5520.5	1.0	1088	49	1
25	5521.8	1.0	1871	29	1
26	5523.0	1.0	1417	38	1
27	5524.3	1.0	2174	25	1
28	5525.6	1.0	1827	29	1

29	5527.0	1.0	1266	42	1
30	5529.0	1.0	2708	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	3.0	166	24	1
2	5492.3	3.0	212	25	1
3	5493.5	4.1	170	24	1
4	5494.8	4.2	193	24	1
5	5496.1	4.1	180	24	1
6	5497.3	4.9	181	27	1
7	5498.6	4.7	169	29	1
8	5499.9	2.9	210	24	1
9	5501.1	3.4	230	24	1
10	5502.4	4.6	179	26	1
11	5503.7	4.2	189	28	1
12	5504.9	3.3	183	27	1
13	5506.2	2.1	202	25	1
14	5507.5	2.0	206	24	1
15	5508.8	2.1	193	25	1
16	5510.0	1.1	218	25	1
17	5511.3	2.1	176	27	1
18	5512.6	2.6	211	24	1
19	5513.9	1.5	168	26	1
20	5515.2	1.9	160	24	1
21	5516.6	1.6	215	29	1
22	5517.9	2.8	210	26	1
23	5519.2	2.7	224	24	1
24	5520.5	1.7	189	25	1
25	5521.8	2.0	210	24	1
26	5523.0	1.0	173	25	1
27	5524.3	3.4	201	28	1
28	5525.6	2.7	228	25	1
29	5527.0	1.9	182	28	1
30	5529.0	1.6	183	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	9.2	394	16	1
2	5492.3	9.6	260	17	1
3	5493.5	8.4	447	18	1
4	5494.8	8.5	467	16	1
5	5496.1	7.3	396	17	1
6	5497.3	6.2	487	18	1
7	5498.6	6.3	271	16	1
8	5499.9	9.3	357	17	1
9	5501.1	9.0	411	16	1
10	5502.4	8.7	242	16	1
11	5503.7	8.7	223	17	1
12	5504.9	8.8	366	16	1
13	5506.2	7.4	253	17	1
14	5507.5	9.9	495	16	1
15	5508.8	8.7	362	16	1
16	5510.0	8.2	333	17	1
17	5511.3	7.2	487	16	1
18	5512.6	8.3	244	18	1
19	5513.9	7.8	229	18	1
20	5515.2	6.3	259	17	1
21	5516.6	8.2	500	16	1
22	5517.9	7.0	362	18	1
23	5519.2	6.5	258	18	1
24	5520.5	8.2	320	16	1
25	5521.8	9.9	422	17	1
26	5523.0	8.3	322	17	1
27	5524.3	10.0	445	17	1
28	5525.6	8.3	437	18	1
29	5527.0	8.9	300	18	1
30	5529.0	9.0	331	18	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	11.4	297	15	1
2	5492.3	14.2	316	16	1
3	5493.5	13.7	297	13	1
4	5494.8	18.2	275	13	1
5	5496.1	19.6	465	13	1
6	5497.3	12.7	396	13	1
7	5498.6	13.3	463	16	1
8	5499.9	19.9	374	14	1
9	5501.1	13.8	244	14	1
10	5502.4	13.1	366	12	1
11	5503.7	18.9	308	15	1
12	5504.9	15.6	425	14	1
13	5506.2	16.2	201	13	1
14	5507.5	12.4	295	13	1
15	5508.8	13.8	276	13	1
16	5510.0	14.6	282	13	1
17	5511.3	12.7	463	15	1
18	5512.6	17.0	378	16	1
19	5513.9	17.1	322	14	1
20	5515.2	19.1	300	12	1
21	5516.6	12.2	339	13	1
22	5517.9	17.1	266	13	1
23	5519.2	16.0	491	16	1
24	5520.5	18.3	328	15	1
25	5521.8	14.5	283	13	1
26	5523.0	12.2	354	14	1
27	5524.3	19.0	370	16	1
28	5525.6	18.5	247	14	1
29	5527.0	19.0	319	12	1
30	5529.0	15.5	327	13	1
Detection Percentage (%)					100%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test

waveforms is as follows:
$$\frac{P_d1 + P_d2 + P_d3 + P_d4}{4} = (100\% + 100\% + 100\% + 100\%) / 4 = 100\% (>80\%)$$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5510.0	1	16	5494.2	1
2	5510.0	1	17	5495.0	1
3	5510.0	1	18	5498.6	1
4	5510.0	1	19	5493.8	1
5	5510.0	1	20	5497.4	1
6	5510.0	1	21	5522.2	1
7	5510.0	1	22	5524.2	1
8	5510.0	1	23	5523.4	1
9	5510.0	1	24	5523.8	1
10	5510.0	1	25	5525.0	1
11	5497.4	1	26	5526.2	1
12	5498.2	1	27	5525.4	1
13	5498.6	1	28	5524.6	1
14	5497.8	1	29	5523.8	1
15	5497.8	1	30	5525.8	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5491.0	1	16	5510.0	1
2	5492.3	1	17	5511.3	1
3	5493.5	1	18	5512.6	1
4	5494.8	1	19	5513.9	1
5	5496.1	1	20	5515.2	1
6	5497.3	1	21	5516.6	1
7	5498.6	1	22	5517.9	1
8	5499.9	1	23	5519.2	1
9	5501.1	1	24	5520.5	1
10	5502.4	1	25	5521.8	1
11	5503.7	1	26	5523.0	1
12	5504.9	1	27	5524.3	1
13	5506.2	1	28	5525.6	1
14	5507.5	1	29	5527.0	1
15	5508.8	1	30	5529.0	1
Detection Percentage (%)					100%

Product	GigaSpire BLAST u4	Temperature	23 ~ 27°C
Test Engineer	Jake Lan	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2020/07/22
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	538	98	1
2	5493.7	1.0	558	95	1
3	5496.4	1.0	658	81	1
4	5499.1	1.0	638	83	1
5	5501.8	1.0	578	92	1
6	5504.5	1.0	778	68	1
7	5507.0	1.0	598	89	1
8	5509.7	1.0	678	78	1
9	5512.4	1.0	518	102	1
10	5515.1	1.0	698	76	1
11	5517.8	1.0	858	62	1
12	5520.5	1.0	838	63	1
13	5523.1	1.0	3066	18	1
14	5525.8	1.0	758	70	1
15	5530.0	1.0	738	72	1
16	5532.7	1.0	935	57	1
17	5535.4	1.0	2872	19	1
18	5538.0	1.0	1286	41	1
19	5540.7	1.0	1886	28	1
20	5543.4	1.0	1154	46	1
21	5546.1	1.0	1138	47	1
22	5548.8	1.0	1160	46	1
23	5551.5	1.0	1060	50	1
24	5554.2	1.0	2433	22	1
25	5556.9	1.0	1188	45	1
26	5559.6	1.0	1681	32	1
27	5562.3	1.0	1338	40	1
28	5565.0	1.0	2239	24	1

29	5567.7	1.0	1116	48	1
30	5569.0	1.0	3018	18	1
Detection Percentage (%)					100%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	1.5	202	29	1
2	5493.7	3.0	189	25	1
3	5496.4	1.5	211	25	1
4	5499.1	4.8	193	28	1
5	5501.8	1.5	179	24	1
6	5504.5	3.1	219	27	1
7	5507.0	3.2	206	28	1
8	5509.7	4.6	163	27	1
9	5512.4	1.0	165	28	1
10	5515.1	1.3	181	28	1
11	5517.8	2.7	168	27	1
12	5520.5	3.8	215	29	1
13	5523.1	2.0	154	28	1
14	5525.8	3.6	195	26	1
15	5530.0	1.6	197	29	1
16	5532.7	3.0	174	28	1
17	5535.4	3.1	168	25	1
18	5538.0	4.3	185	23	1
19	5540.7	3.9	171	27	1
20	5543.4	2.3	217	26	1
21	5546.1	4.0	227	26	1
22	5548.8	4.3	164	29	1
23	5551.5	4.8	205	28	1
24	5554.2	3.1	206	27	1
25	5556.9	1.6	205	28	1
26	5559.6	2.0	230	29	1
27	5562.3	4.4	175	26	1
28	5565.0	4.6	170	24	1
29	5567.7	2.0	183	24	1
30	5569.0	4.1	153	27	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	9.2	279	18	1
2	5493.7	9.6	314	16	1
3	5496.4	9.7	324	16	1
4	5499.1	8.3	383	17	1
5	5501.8	8.7	430	16	1
6	5504.5	7.4	421	18	1
7	5507.0	9.0	440	18	1
8	5509.7	7.9	439	18	1
9	5512.4	8.9	497	18	1
10	5515.1	9.1	327	16	1
11	5517.8	9.1	488	16	1
12	5520.5	7.6	372	16	1
13	5523.1	9.4	360	16	1
14	5525.8	10.0	385	18	1
15	5530.0	8.7	320	17	1
16	5532.7	7.8	349	16	1
17	5535.4	7.3	222	16	1
18	5538.0	9.3	483	16	1
19	5540.7	7.7	484	17	1
20	5543.4	7.0	463	18	1
21	5546.1	7.1	420	17	1
22	5548.8	8.9	492	17	1
23	5551.5	8.5	286	17	1
24	5554.2	6.8	344	17	1
25	5556.9	9.1	323	17	1
26	5559.6	8.5	357	17	1
27	5562.3	8.4	354	18	1
28	5565.0	7.3	494	16	1
29	5567.7	7.7	427	17	1
30	5569.0	9.4	472	18	1
Detection Percentage (%)					100%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5491.0	14.0	304	16	1
2	5493.7	12.4	400	15	1
3	5496.4	14.0	494	14	1
4	5499.1	12.1	327	13	1
5	5501.8	19.6	328	14	1
6	5504.5	18.9	289	14	1
7	5507.0	12.0	464	15	1
8	5509.7	17.3	449	15	1
9	5512.4	13.3	431	15	1
10	5515.1	15.4	249	13	1
11	5517.8	16.4	468	15	1
12	5520.5	17.1	445	12	1
13	5523.1	16.2	443	14	1
14	5525.8	13.1	315	12	1
15	5530.0	16.9	279	14	1
16	5532.7	11.1	251	12	1
17	5535.4	11.9	278	14	1
18	5538.0	15.4	375	15	1
19	5540.7	19.4	490	12	1
20	5543.4	13.1	483	14	1
21	5546.1	18.3	206	14	1
22	5548.8	17.7	337	14	1
23	5551.5	16.7	294	15	1
24	5554.2	12.7	384	14	1
25	5556.9	14.8	234	12	1
26	5559.6	18.1	441	16	1
27	5562.3	18.0	381	13	1
28	5565.0	17.1	311	12	1
29	5567.7	11.9	331	12	1
30	5569.0	14.4	328	15	1
Detection Percentage (%)					100%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test

waveforms is as follows:
$$\frac{P_d1 + P_d2 + P_d3 + P_d4}{4} = (100\% + 100\% + 100\% + 100\%) / 4 = 100\% (>80\%)$$

Radar Type 5 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5530.0	1	16	5497.8	1
2	5530.0	1	17	5495.8	1
3	5530.0	1	18	5498.2	1
4	5530.0	1	19	5493.0	1
5	5530.0	1	20	5495.8	1
6	5530.0	1	21	5564.6	1
7	5530.0	1	22	5566.6	1
8	5530.0	1	23	5561.0	1
9	5530.0	1	24	5561.0	1
10	5530.0	1	25	5562.2	1
11	5493.4	1	26	5566.2	1
12	5495.4	1	27	5567.0	1
13	5494.2	1	28	5562.6	1
14	5498.2	1	29	5566.2	1
15	5497.4	1	30	5565.4	1
Detection Percentage (%)					100%

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5491.0	1	16	5532.7	1
2	5493.7	1	17	5535.4	1
3	5496.4	1	18	5538.0	1
4	5499.1	1	19	5540.7	1
5	5501.8	1	20	5543.4	1
6	5504.5	1	21	5546.1	1
7	5507.0	1	22	5548.8	1
8	5509.7	1	23	5551.5	1
9	5512.4	1	24	5554.2	1
10	5515.1	1	25	5556.9	1
11	5517.8	1	26	5559.6	1
12	5520.5	1	27	5562.3	1
13	5523.1	1	28	5565.0	1
14	5525.8	1	29	5567.7	1
15	5530.0	1	30	5569.0	1
Detection Percentage (%)					100%

Product	GigaSpire BLAST u4	Temperature	23 ~ 27°C
Test Engineer	Jake Lan	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2020/08/21
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	5490.4	1.0	798	67	1
2	5491.1	1.0	778	68	1
3	5491.7	1.0	938	57	0
4	5492.4	1.0	578	92	1
5	5493.0	1.0	918	58	1
6	5493.7	1.0	538	98	1
7	5494.4	1.0	838	63	1
8	5495.0	1.0	598	89	1
9	5495.7	1.0	718	74	1
10	5496.3	1.0	738	72	0
11	5497.0	1.0	898	59	1
12	5497.6	1.0	678	78	1
13	5498.3	1.0	878	61	1
14	5499.0	1.0	758	70	1
15	5500.0	1.0	638	83	1
16	5500.7	1.0	1512	35	1
17	5501.3	1.0	2643	20	1
18	5502.0	1.0	1396	38	1
19	5502.6	1.0	2671	20	1
20	5503.3	1.0	549	96	1
21	5504.0	1.0	2039	26	1
22	5504.6	1.0	1792	30	1
23	5505.3	1.0	3057	18	1
24	5505.9	1.0	2690	20	1
25	5506.6	1.0	943	56	1
26	5507.2	1.0	1534	35	1
27	5507.9	1.0	545	97	1
28	5508.6	1.0	2273	24	1

29	5509.2	1.0	523	101	1
30	5509.6	1.0	843	63	1
Detection Percentage (%)					93.3%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.4	3.2	199	24	1
2	5491.1	2.5	166	25	1
3	5491.7	3.4	151	26	1
4	5492.4	3.7	188	25	1
5	5493.0	1.2	158	25	1
6	5493.7	3.4	160	28	0
7	5494.4	2.0	198	27	1
8	5495.0	1.8	194	26	1
9	5495.7	1.1	226	26	1
10	5496.3	4.9	209	27	0
11	5497.0	4.5	155	26	0
12	5497.6	2.4	228	29	1
13	5498.3	4.6	154	27	0
14	5499.0	1.5	187	25	1
15	5500.0	1.6	208	29	1
16	5500.7	3.6	218	24	1
17	5501.3	3.8	156	28	1
18	5502.0	1.3	154	27	1
19	5502.6	2.4	157	26	1
20	5503.3	2.0	184	25	1
21	5504.0	1.6	163	27	1
22	5504.6	4.9	195	26	1
23	5505.3	4.2	226	29	1
24	5505.9	1.0	190	26	1
25	5506.6	2.0	221	26	1
26	5507.2	3.3	229	27	1
27	5507.9	4.1	215	27	1
28	5508.6	5.0	191	23	1
29	5509.2	2.8	187	24	1
30	5509.6	4.3	182	28	1
Detection Percentage (%)					86.7%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.4	6.2	320	17	1
2	5491.1	9.1	461	16	0
3	5491.7	8.6	314	17	1
4	5492.4	6.8	379	16	1
5	5493.0	8.0	224	17	1
6	5493.7	10.0	369	17	1
7	5494.4	10.0	251	17	0
8	5495.0	8.0	372	17	1
9	5495.7	8.4	245	18	1
10	5496.3	9.4	459	18	1
11	5497.0	9.0	446	17	1
12	5497.6	7.4	293	17	1
13	5498.3	10.0	299	17	1
14	5499.0	9.2	380	16	1
15	5500.0	6.1	318	17	1
16	5500.7	8.2	464	16	0
17	5501.3	7.5	261	17	1
18	5502.0	9.9	305	17	1
19	5502.6	9.3	380	17	1
20	5503.3	7.3	241	16	1
21	5504.0	8.7	322	17	0
22	5504.6	7.6	246	17	1
23	5505.3	7.9	500	17	1
24	5505.9	9.3	423	17	1
25	5506.6	7.7	286	16	1
26	5507.2	7.1	268	17	1
27	5507.9	6.2	425	16	1
28	5508.6	6.9	202	17	1
29	5509.2	8.0	218	18	1
30	5509.6	6.5	385	16	1
Detection Percentage (%)					86.7%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.4	12.9	411	13	0
2	5491.1	17.9	261	13	1
3	5491.7	18.9	247	14	1
4	5492.4	13.5	474	16	0
5	5493.0	12.5	473	13	1
6	5493.7	18.5	471	14	1
7	5494.4	11.2	320	13	1
8	5495.0	11.7	435	13	0
9	5495.7	16.9	481	16	1
10	5496.3	13.3	483	14	1
11	5497.0	18.1	426	13	1
12	5497.6	14.1	360	16	1
13	5498.3	18.3	326	14	1
14	5499.0	15.1	365	16	1
15	5500.0	18.1	246	15	0
16	5500.7	14.9	446	15	1
17	5501.3	17.9	276	14	1
18	5502.0	17.7	220	14	1
19	5502.6	17.9	321	14	0
20	5503.3	11.0	326	14	1
21	5504.0	14.1	275	14	1
22	5504.6	18.8	277	15	1
23	5505.3	12.6	353	13	0
24	5505.9	13.7	468	15	1
25	5506.6	15.1	295	15	0
26	5507.2	19.3	234	14	1
27	5507.9	12.8	262	16	1
28	5508.6	19.2	376	15	1
29	5509.2	20.0	466	12	0
30	5509.6	13.0	223	16	1
Detection Percentage (%)					73.3%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test

waveforms is as follows: $\frac{P_d1 + P_d2 + P_d3 + P_d4}{4} = (93.3\% + 86.7\% + 86.7\% + 73.3\%) / 4 = 85\% (>80\%)$

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	5498.4	1
2	5500.0	1	17	5496.8	1
3	5500.0	1	18	5496.4	0
4	5500.0	1	19	5497.2	1
5	5500.0	1	20	5492.8	1
6	5500.0	1	21	5503.2	1
7	5500.0	1	22	5505.6	1
8	5500.0	1	23	5504.8	1
9	5500.0	1	24	5504.0	1
10	5500.0	1	25	5501.6	1
11	5496.4	1	26	5503.6	1
12	5496.8	0	27	5503.6	1
13	5494.8	0	28	5502.0	1
14	5498.0	0	29	5507.2	1
15	5496.0	1	30	5504.0	1
Detection Percentage (%)					86.7%

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	5490.4	1	16	5500.7	1
2	5491.1	1	17	5501.3	1
3	5491.7	0	18	5502.0	1
4	5492.4	1	19	5502.6	1
5	5493.0	1	20	5503.3	1
6	5493.7	1	21	5504.0	1
7	5494.4	1	22	5504.6	1
8	5495.0	1	23	5505.3	1
9	5495.7	1	24	5505.9	1
10	5496.3	1	25	5506.6	1
11	5497.0	1	26	5507.2	1
12	5497.6	1	27	5507.9	1
13	5498.3	1	28	5508.6	1
14	5499.0	1	29	5509.2	1
15	5500.0	1	30	5509.6	1
Detection Percentage (%)					96.7%

Product	GigaSpire BLAST u4	Temperature	23 ~ 27°C
Test Engineer	Jake Lan	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2020/08/21
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	538	98	1
2	5492.3	1.0	838	63	1
3	5493.6	1.0	698	76	0
4	5495.0	1.0	638	83	1
5	5496.3	1.0	738	72	1
6	5497.6	1.0	598	89	1
7	5498.9	1.0	718	74	1
8	5500.0	1.0	658	81	1
9	5501.3	1.0	818	65	1
10	5502.6	1.0	578	92	1
11	5503.9	1.0	938	57	1
12	5505.2	1.0	878	61	1
13	5506.5	1.0	518	102	1
14	5507.8	1.0	778	68	1
15	5510.0	1.0	858	62	1
16	5511.3	1.0	1777	30	1
17	5512.6	1.0	1320	40	1
18	5514.0	1.0	1011	53	0
19	5515.3	1.0	2398	22	1
20	5516.6	1.0	985	54	1
21	5517.9	1.0	2997	18	1
22	5519.2	1.0	1073	50	1
23	5520.5	1.0	2332	23	1
24	5521.8	1.0	2409	22	1
25	5523.1	1.0	1535	35	1
26	5524.4	1.0	1389	38	1
27	5525.7	1.0	915	58	1
28	5527.0	1.0	2639	20	1

29	5528.3	1.0	2368	23	1
30	5529.0	1.0	2349	23	1
Detection Percentage (%)					93.3%

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	215	27	1
2	5492.3	1.6	211	28	1
3	5493.6	1.0	173	29	1
4	5495.0	2.3	199	28	1
5	5496.3	1.3	162	27	1
6	5497.6	2.3	197	29	1
7	5498.9	4.0	192	27	1
8	5500.0	2.5	165	27	1
9	5501.3	4.9	179	26	1
10	5502.6	2.5	221	28	1
11	5503.9	1.8	200	24	1
12	5505.2	4.5	194	27	1
13	5506.5	4.5	229	23	1
14	5507.8	3.2	152	26	1
15	5510.0	3.9	197	26	1
16	5511.3	2.7	212	23	0
17	5512.6	2.2	202	23	0
18	5514.0	1.7	162	25	0
19	5515.3	4.9	212	27	1
20	5516.6	4.7	220	25	1
21	5517.9	4.2	153	26	1
22	5519.2	1.6	169	28	1
23	5520.5	2.4	201	23	1
24	5521.8	1.9	161	26	1
25	5523.1	3.5	227	27	1
26	5524.4	2.9	174	26	1
27	5525.7	1.7	161	24	1
28	5527.0	2.4	150	25	1
29	5528.3	1.6	220	26	1
30	5529.0	3.7	170	28	1
Detection Percentage (%)					90%

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	7.4	461	18	1
2	5492.3	8.6	287	17	1
3	5493.6	7.3	354	17	0
4	5495.0	7.0	263	18	0
5	5496.3	7.5	480	17	1
6	5497.6	6.1	220	18	1
7	5498.9	9.5	344	17	1
8	5500.0	7.0	482	18	1
9	5501.3	6.6	397	16	1
10	5502.6	8.8	406	17	0
11	5503.9	9.3	332	17	1
12	5505.2	6.5	395	17	1
13	5506.5	6.6	230	18	1
14	5507.8	6.0	204	17	1
15	5510.0	8.3	204	18	1
16	5511.3	9.8	474	17	0
17	5512.6	7.7	287	17	1
18	5514.0	7.0	326	17	1
19	5515.3	7.3	295	17	1
20	5516.6	7.4	223	18	0
21	5517.9	8.4	473	16	0
22	5519.2	9.4	440	17	1
23	5520.5	8.1	446	17	1
24	5521.8	9.8	431	18	1
25	5523.1	7.0	484	17	0
26	5524.4	8.9	284	16	1
27	5525.7	8.9	449	18	1
28	5527.0	7.8	258	16	0
29	5528.3	6.7	315	18	1
30	5529.0	6.1	214	17	1
Detection Percentage (%)					73.3%

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	19.8	209	14	1
2	5492.3	11.9	392	14	1
3	5493.6	18.8	331	13	1
4	5495.0	19.0	228	12	1
5	5496.3	14.2	300	13	1
6	5497.6	16.5	404	13	1
7	5498.9	11.3	201	13	1
8	5500.0	18.2	350	14	1
9	5501.3	19.9	287	15	1
10	5502.6	18.2	306	14	1
11	5503.9	12.7	283	12	1
12	5505.2	16.2	236	16	1
13	5506.5	13.9	301	14	0
14	5507.8	13.8	402	12	1
15	5510.0	14.0	287	13	1
16	5511.3	14.8	474	14	1
17	5512.6	16.3	314	14	1
18	5514.0	18.2	271	14	1
19	5515.3	19.6	349	14	1
20	5516.6	14.1	239	16	0
21	5517.9	19.4	228	12	1
22	5519.2	18.2	214	14	0
23	5520.5	15.6	442	14	1
24	5521.8	14.0	454	14	0
25	5523.1	17.1	267	16	1
26	5524.4	16.4	474	14	0
27	5525.7	14.1	360	16	1
28	5527.0	19.4	334	14	1
29	5528.3	14.4	260	13	1
30	5529.0	11.1	325	15	1
Detection Percentage (%)					83.3%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test

waveforms is as follows:
$$\frac{P_d1+P_d2+P_d3+P_d4}{4} = (93.3\%+90\%+73.3\%+83.3\%)/4 = 85\% (>80\%)$$

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	5499.0	1
2	5510.0	1	17	5495.4	0
3	5510.0	1	18	5495.8	1
4	5510.0	1	19	5496.2	1
5	5510.0	1	20	5493.4	1
6	5510.0	1	21	5523.0	1
7	5510.0	1	22	5523.8	1
8	5510.0	1	23	5521.8	1
9	5510.0	1	24	5524.2	1
10	5510.0	1	25	5525.0	1
11	5493.0	0	26	5522.2	0
12	5493.8	1	27	5523.4	1
13	5498.6	1	28	5523.8	0
14	5494.2	1	29	5523.8	1
15	5498.2	1	30	5521.4	1
Detection Percentage (%)					86.7%

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	5511.3	1
2	5492.3	1	17	5512.6	1
3	5493.6	1	18	5514.0	0
4	5495.0	1	19	5515.3	1
5	5496.3	1	20	5516.6	1
6	5497.6	1	21	5517.9	1
7	5498.9	0	22	5519.2	1
8	5500.0	1	23	5520.5	1
9	5501.3	0	24	5521.8	1
10	5502.6	1	25	5523.1	1
11	5503.9	1	26	5524.4	1
12	5505.2	1	27	5525.7	1
13	5506.5	1	28	5527.0	1
14	5507.8	1	29	5528.3	1
15	5510.0	1	30	5529.0	1
Detection Percentage (%)					90%

Product	GigaSpire BLAST u4	Temperature	23 ~ 27°C
Test Engineer	Jake Lan	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2020/08/21
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	878	61	1
2	5493.7	1.0	678	78	1
3	5496.3	1.0	698	76	0
4	5499.0	1.0	618	86	1
5	5501.6	1.0	578	92	1
6	5504.3	1.0	818	65	1
7	5506.9	1.0	798	67	1
8	5509.6	1.0	838	63	1
9	5512.2	1.0	638	83	1
10	5514.9	1.0	518	102	1
11	5517.5	1.0	898	59	1
12	5520.2	1.0	738	72	1
13	5522.8	1.0	718	74	1
14	5525.5	1.0	758	70	1
15	5530.0	1.0	558	95	1
16	5532.7	1.0	1875	29	1
17	5535.4	1.0	1214	44	1
18	5538.1	1.0	971	55	1
19	5540.8	1.0	2267	24	1
20	5544.0	1.0	2360	23	1
21	5546.7	1.0	1102	48	1
22	5549.4	1.0	2443	22	1
23	5552.1	1.0	1141	47	1
24	5554.8	1.0	1357	39	1
25	5557.5	1.0	1148	46	1
26	5560.1	1.0	1653	32	1
27	5562.8	1.0	1388	38	1
28	5565.5	1.0	1717	31	1

29	5568.2	1.0	1883	28	1
30	5569.0	1.0	2493	22	1
Detection Percentage (%)					96.7%

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	162	24	1
2	5493.7	2.5	166	25	1
3	5496.3	5.0	185	29	0
4	5499.0	3.1	176	29	0
5	5501.6	1.3	186	29	1
6	5504.3	2.6	152	24	1
7	5506.9	4.2	160	25	1
8	5509.6	4.5	229	28	1
9	5512.2	3.1	224	24	1
10	5514.9	1.4	226	28	1
11	5517.5	4.5	190	26	1
12	5520.2	2.2	179	26	1
13	5522.8	1.0	195	25	1
14	5525.5	1.6	173	28	1
15	5530.0	4.0	211	29	1
16	5532.7	2.5	168	24	1
17	5535.4	3.0	180	25	1
18	5538.1	3.6	154	27	1
19	5540.8	2.6	168	24	1
20	5544.0	2.3	172	23	1
21	5546.7	1.8	184	28	1
22	5549.4	1.7	207	27	1
23	5552.1	1.4	192	26	1
24	5554.8	2.5	178	24	1
25	5557.5	3.4	155	26	1
26	5560.1	3.3	185	26	1
27	5562.8	1.3	176	24	1
28	5565.5	4.2	221	25	1
29	5568.2	3.2	182	24	1
30	5569.0	3.0	191	29	1
Detection Percentage (%)					93.3%

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	9.4	267	17	0
2	5493.7	6.6	432	17	1
3	5496.3	7.4	498	17	0
4	5499.0	8.8	478	18	1
5	5501.6	9.6	206	17	0
6	5504.3	7.6	449	17	1
7	5506.9	9.2	500	18	0
8	5509.6	7.8	276	16	1
9	5512.2	8.5	284	17	0
10	5514.9	9.0	299	16	1
11	5517.5	7.5	299	16	1
12	5520.2	7.2	410	17	1
13	5522.8	9.9	428	17	1
14	5525.5	9.4	288	17	0
15	5530.0	8.7	333	16	1
16	5532.7	9.4	324	17	0
17	5535.4	8.0	476	17	1
18	5538.1	7.1	414	17	1
19	5540.8	8.0	402	16	1
20	5544.0	7.7	455	18	1
21	5546.7	8.9	234	18	1
22	5549.4	7.3	270	17	1
23	5552.1	8.1	341	18	0
24	5554.8	8.2	254	18	1
25	5557.5	6.5	366	17	1
26	5560.1	9.9	294	17	1
27	5562.8	7.8	261	16	1
28	5565.5	7.2	449	16	1
29	5568.2	9.2	381	17	0
30	5569.0	8.3	308	16	1
Detection Percentage (%)					70%

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	13.9	245	15	0
2	5493.7	17.9	269	14	1
3	5496.3	16.0	324	12	0
4	5499.0	15.0	349	15	1
5	5501.6	18.5	228	12	1
6	5504.3	16.6	221	14	0
7	5506.9	17.2	360	16	0
8	5509.6	19.4	491	14	1
9	5512.2	12.1	286	15	1
10	5514.9	16.6	239	16	1
11	5517.5	13.8	229	14	0
12	5520.2	16.9	327	15	1
13	5522.8	17.1	372	14	1
14	5525.5	13.4	453	14	1
15	5530.0	17.2	367	14	1
16	5532.7	18.3	467	12	0
17	5535.4	12.1	433	15	1
18	5538.1	17.1	249	14	1
19	5540.8	13.1	489	12	1
20	5544.0	16.0	495	12	1
21	5546.7	16.5	277	14	1
22	5549.4	12.9	493	13	1
23	5552.1	17.2	321	12	1
24	5554.8	13.7	353	13	1
25	5557.5	18.5	364	12	1
26	5560.1	14.6	257	16	0
27	5562.8	17.8	410	14	1
28	5565.5	15.9	323	16	1
29	5568.2	16.0	302	14	1
30	5569.0	14.9	379	15	0
Detection Percentage (%)					73.3%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test

waveforms is as follows: $\frac{P_d1+P_d2+P_d3+P_d4}{4} = (96.7\%+93.3\%+70\%+73.3\%)/4 = 83.3\% (>80\%)$

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	5496.6	1
3	5530.0	1	18	5495.8	1
4	5530.0	1	19	5495.4	1
5	5530.0	1	20	5498.6	1
6	5530.0	1	21	5566.2	1
7	5530.0	1	22	5567.0	1
8	5530.0	1	23	5563.4	1
9	5530.0	1	24	5564.6	1
10	5530.0	0	25	5562.2	1
11	5497.4	1	26	5564.6	1
12	5498.6	0	27	5562.2	1
13	5493.8	1	28	5566.6	1
14	5497.8	0	29	5561.0	1
15	5493.0	1	30	5562.2	1
Detection Percentage (%)					90%

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	5532.7	1
2	5493.7	1	17	5535.4	1
3	5496.3	1	18	5538.1	1
4	5499.0	1	19	5540.8	1
5	5501.6	1	20	5544.0	1
6	5504.3	1	21	5546.7	1
7	5506.9	1	22	5549.4	1
8	5509.6	1	23	5552.1	1
9	5512.2	1	24	5554.8	1
10	5514.9	1	25	5557.5	1
11	5517.5	1	26	5560.1	1
12	5520.2	1	27	5562.8	1
13	5522.8	1	28	5565.5	1
14	5525.5	1	29	5568.2	1
15	5530.0	1	30	5569.0	1
Detection Percentage (%)					100%

Product	GigaSpire BLAST u4	Temperature	23 ~ 27°C
Test Engineer	Jake Lan	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2020/08/22
Test Item	Radar Statistical Performance Check (802.11ax-HE20 mode - 5500MHz)		
Test Mode	Mesh mode		

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.4	1.0	758	70	0
2	5491.1	1.0	658	81	1
3	5491.8	1.0	738	72	1
4	5492.5	1.0	878	61	1
5	5493.2	1.0	598	89	1
6	5494.0	1.0	678	78	1
7	5494.7	1.0	698	76	1
8	5495.4	1.0	818	65	1
9	5496.1	1.0	578	92	1
10	5496.8	1.0	898	59	1
11	5497.5	1.0	538	98	1
12	5498.2	1.0	558	95	1
13	5498.9	1.0	778	68	1
14	5499.6	1.0	918	58	1
15	5500.0	1.0	858	62	1
16	5500.7	1.0	2874	19	1
17	5501.3	1.0	969	55	1
18	5502.0	1.0	1397	38	1
19	5502.6	1.0	1617	33	1
20	5503.3	1.0	2611	21	1
21	5504.0	1.0	2613	21	1
22	5504.6	1.0	1081	49	1
23	5505.3	1.0	933	57	1
24	5505.9	1.0	1017	52	1
25	5506.6	1.0	1772	30	1
26	5507.3	1.0	2264	24	1
27	5507.9	1.0	554	96	1

28	5508.6	1.0	1993	27	1
29	5509.2	1.0	1998	27	1
30	5509.6	1.0	1595	34	1
Detection Percentage (%)					96.7%

Radar Type 2 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.4	3.3	206	25	1
2	5491.1	2.0	208	26	1
3	5491.8	1.9	209	28	1
4	5492.5	4.5	161	26	1
5	5493.2	4.7	212	27	1
6	5494.0	3.9	192	24	0
7	5494.7	1.3	211	25	1
8	5495.4	2.4	167	25	0
9	5496.1	2.0	168	27	1
10	5496.8	1.4	224	26	1
11	5497.5	1.0	173	27	1
12	5498.2	3.4	155	28	1
13	5498.9	3.2	192	24	1
14	5499.6	2.7	230	27	1
15	5500.0	2.0	165	26	1
16	5500.7	3.7	188	27	1
17	5501.3	3.0	206	24	1
18	5502.0	2.8	190	23	1
19	5502.6	1.3	153	27	1
20	5503.3	1.7	196	28	1
21	5504.0	1.9	162	24	1
22	5504.6	4.8	189	27	1
23	5505.3	2.4	162	26	0
24	5505.9	4.1	189	23	1
25	5506.6	1.4	154	29	1
26	5507.3	1.1	194	23	1
27	5507.9	1.9	203	26	1
28	5508.6	4.6	158	25	1
29	5509.2	1.8	205	23	1
30	5509.6	1.7	162	29	1
Detection Percentage (%)					90%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.4	8.1	434	17	1
2	5491.1	7.5	417	18	0
3	5491.8	7.4	200	17	1
4	5492.5	8.3	417	17	1
5	5493.2	9.0	301	18	1
6	5494.0	7.1	348	17	1
7	5494.7	8.1	401	18	1
8	5495.4	8.9	242	17	1
9	5496.1	8.2	334	16	1
10	5496.8	8.2	269	16	1
11	5497.5	8.1	212	17	1
12	5498.2	8.3	409	17	1
13	5498.9	9.1	341	17	0
14	5499.6	9.4	339	16	1
15	5500.0	6.5	416	17	1
16	5500.7	7.0	481	17	1
17	5501.3	8.2	447	18	1
18	5502.0	8.6	346	17	1
19	5502.6	7.5	220	17	1
20	5503.3	8.2	346	17	1
21	5504.0	7.9	203	18	1
22	5504.6	8.1	344	16	1
23	5505.3	6.1	460	18	1
24	5505.9	7.5	288	16	1
25	5506.6	10.0	500	17	1
26	5507.3	6.1	250	17	1
27	5507.9	7.9	266	17	1
28	5508.6	9.7	224	17	1
29	5509.2	9.2	453	18	1
30	5509.6	7.6	404	17	0
Detection Percentage (%)					90%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5490.4	12.2	347	14	0
2	5491.1	16.4	376	15	1
3	5491.8	18.3	399	14	1
4	5492.5	16.9	453	13	1
5	5493.2	12.7	468	16	1
6	5494.0	17.7	469	12	1
7	5494.7	14.1	200	15	0
8	5495.4	17.3	324	14	0
9	5496.1	15.6	222	13	1
10	5496.8	13.1	331	14	1
11	5497.5	12.9	250	15	1
12	5498.2	17.5	221	16	1
13	5498.9	16.1	365	13	1
14	5499.6	14.8	311	15	1
15	5500.0	15.8	331	12	1
16	5500.7	12.6	205	15	1
17	5501.3	11.5	201	13	1
18	5502.0	11.8	327	13	1
19	5502.6	17.8	448	13	0
20	5503.3	14.5	386	12	1
21	5504.0	12.1	238	14	1
22	5504.6	13.7	500	16	1
23	5505.3	16.0	220	12	1
24	5505.9	14.2	343	13	0
25	5506.6	14.7	236	13	1
26	5507.3	17.8	205	15	1
27	5507.9	13.2	291	16	1
28	5508.6	18.1	412	12	0
29	5509.2	15.8	208	13	1
30	5509.6	15.8	258	15	1
Detection Percentage (%)					80%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test

waveforms is as follows: $\frac{P_d1 + P_d2 + P_d3 + P_d4}{4} = (96.7\% + 90\% + 90\% + 80\%) / 4 = 89.2\% (>80\%)$

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	5496.5	1
2	5500.0	1	17	5498.1	1
3	5500.0	0	18	5492.9	1
4	5500.0	1	19	5493.7	1
5	5500.0	1	20	5497.3	1
6	5500.0	1	21	5507.6	1
7	5500.0	1	22	5502.0	1
8	5500.0	1	23	5502.4	1
9	5500.0	1	24	5502.4	1
10	5500.0	1	25	5506.0	1
11	5497.3	1	26	5502.0	1
12	5493.3	1	27	5502.0	1
13	5498.1	1	28	5504.8	1
14	5496.5	1	29	5504.4	1
15	5498.5	0	30	5502.8	1
Detection Percentage (%)					93.3%

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	5490.4	1	16	5500.7	1
2	5491.1	1	17	5501.3	1
3	5491.8	1	18	5502.0	1
4	5492.5	0	19	5502.6	1
5	5493.2	1	20	5503.3	1
6	5494.0	1	21	5504.0	1
7	5494.7	1	22	5504.6	1
8	5495.4	1	23	5505.3	1
9	5496.1	1	24	5505.9	1
10	5496.8	1	25	5506.6	1
11	5497.5	0	26	5507.3	1
12	5498.2	1	27	5507.9	1
13	5498.9	1	28	5508.6	1
14	5499.6	1	29	5509.2	1
15	5500.0	1	30	5509.6	1
Detection Percentage (%)					93.3%

Product	GigaSpire BLAST u4	Temperature	23 ~ 27°C
Test Engineer	Jake Lan	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2020/08/22
Test Item	Radar Statistical Performance Check (802.11ax-HE40 mode - 5510MHz)		
Test Mode	Mesh 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	538	98	1
2	5492.3	1.0	898	59	1
3	5493.5	1.0	778	68	1
4	5494.8	1.0	658	81	1
5	5496.1	1.0	598	89	1
6	5497.3	1.0	738	72	1
7	5498.6	1.0	758	70	1
8	5499.9	1.0	918	58	1
9	5501.1	1.0	678	78	1
10	5502.4	1.0	938	57	1
11	5503.7	1.0	818	65	1
12	5504.9	1.0	558	95	1
13	5506.2	1.0	638	83	1
14	5507.5	1.0	698	76	1
15	5508.8	1.0	3066	18	1
16	5510.0	1.0	1607	33	1
17	5511.3	1.0	2632	21	0
18	5512.6	1.0	2204	24	1
19	5513.9	1.0	600	88	1
20	5515.2	1.0	1172	45	1
21	5516.6	1.0	2952	18	1
22	5517.9	1.0	791	67	1
23	5519.2	1.0	3025	18	1
24	5520.5	1.0	2262	24	1
25	5521.8	1.0	2896	19	1
26	5523.0	1.0	1915	28	1
27	5524.3	1.0	1460	37	1
28	5525.6	1.0	2577	21	1

29	5527.0	1.0	1748	31	1
30	5529.0	1.0	1222	44	1
Detection Percentage (%)					96.7%

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	2.1	192	26	1
2	5492.3	4.4	224	28	1
3	5493.5	1.4	152	28	1
4	5494.8	3.9	228	27	1
5	5496.1	1.9	217	23	0
6	5497.3	2.5	196	27	1
7	5498.6	3.7	220	24	1
8	5499.9	1.3	171	24	1
9	5501.1	1.6	221	24	1
10	5502.4	1.3	176	27	1
11	5503.7	1.3	204	24	1
12	5504.9	3.9	155	27	1
13	5506.2	1.9	187	26	1
14	5507.5	3.1	169	28	1
15	5508.8	3.4	168	26	1
16	5510.0	3.9	219	27	1
17	5511.3	2.5	203	28	1
18	5512.6	4.1	186	28	1
19	5513.9	4.1	222	26	1
20	5515.2	4.7	227	24	1
21	5516.6	2.6	197	28	1
22	5517.9	2.6	220	28	1
23	5519.2	5.0	207	23	1
24	5520.5	5.0	186	27	1
25	5521.8	2.1	158	24	1
26	5523.0	4.3	157	28	1
27	5524.3	2.0	184	26	0
28	5525.6	4.3	167	28	1
29	5527.0	1.9	153	26	1
30	5529.0	1.3	187	27	1
Detection Percentage (%)					93.3%

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	6.7	477	17	1
2	5492.3	7.6	379	18	1
3	5493.5	7.9	405	16	0
4	5494.8	6.5	374	17	1
5	5496.1	9.2	219	17	1
6	5497.3	8.9	396	18	1
7	5498.6	6.9	225	18	1
8	5499.9	9.4	230	17	0
9	5501.1	6.1	366	18	1
10	5502.4	6.2	221	18	1
11	5503.7	8.4	292	17	1
12	5504.9	7.2	263	17	1
13	5506.2	7.6	222	18	0
14	5507.5	6.2	467	16	1
15	5508.8	7.8	440	17	0
16	5510.0	6.9	284	17	1
17	5511.3	8.9	398	17	1
18	5512.6	9.2	458	18	1
19	5513.9	9.0	471	17	1
20	5515.2	6.1	316	18	0
21	5516.6	6.1	237	16	0
22	5517.9	6.7	223	16	1
23	5519.2	8.7	337	17	1
24	5520.5	7.2	455	17	1
25	5521.8	9.1	466	17	1
26	5523.0	7.9	360	17	1
27	5524.3	9.4	291	17	1
28	5525.6	7.3	292	16	1
29	5527.0	6.6	211	16	1
30	5529.0	6.9	403	17	1
Detection Percentage (%)					80%

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	11.3	457	14	0
2	5492.3	12.4	210	14	1
3	5493.5	17.0	224	16	1
4	5494.8	12.1	238	15	1
5	5496.1	13.1	303	12	1
6	5497.3	19.3	389	16	1
7	5498.6	14.0	208	15	1
8	5499.9	18.1	215	13	0
9	5501.1	14.9	387	13	0
10	5502.4	19.1	472	12	1
11	5503.7	14.5	285	14	1
12	5504.9	12.2	408	14	1
13	5506.2	13.1	463	14	1
14	5507.5	19.2	463	16	1
15	5508.8	16.2	466	13	1
16	5510.0	12.0	335	16	1
17	5511.3	14.1	341	15	1
18	5512.6	19.7	314	16	0
19	5513.9	13.3	499	12	1
20	5515.2	14.7	361	16	1
21	5516.6	19.6	278	14	1
22	5517.9	13.8	232	13	1
23	5519.2	17.5	453	16	1
24	5520.5	12.3	357	14	0
25	5521.8	12.0	443	15	1
26	5523.0	14.2	438	15	1
27	5524.3	13.2	335	16	1
28	5525.6	14.3	398	15	1
29	5527.0	17.6	327	12	0
30	5529.0	15.8	364	15	1
Detection Percentage (%)					80%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test

waveforms is as follows: $\frac{P_d1+P_d2+P_d3+P_d4}{4} = (96.7\%+93.3\%+80\%+80\%)/4 = 87.5\% (>80\%)$

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	5499.0	1
2	5510.0	0	17	5496.6	1
3	5510.0	1	18	5494.6	0
4	5510.0	1	19	5499.0	1
5	5510.0	1	20	5498.6	1
6	5510.0	1	21	5521.4	1
7	5510.0	1	22	5523.4	1
8	5510.0	1	23	5524.6	1
9	5510.0	1	24	5525.8	1
10	5510.0	1	25	5525.0	1
11	5495.8	1	26	5527.0	1
12	5496.2	1	27	5525.8	1
13	5499.0	1	28	5527.0	1
14	5495.8	1	29	5525.8	0
15	5493.4	1	30	5525.8	1
Detection Percentage (%)					90%

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	5492.3	1	17	5511.3	1
3	5493.5	1	18	5512.6	1
4	5494.8	1	19	5513.9	1
5	5496.1	1	20	5515.2	1
6	5497.3	1	21	5516.6	1
7	5498.6	1	22	5517.9	1
8	5499.9	1	23	5519.2	1
9	5501.1	1	24	5520.5	0
10	5502.4	1	25	5521.8	1
11	5503.7	1	26	5523.0	1
12	5504.9	1	27	5524.3	1
13	5506.2	1	28	5525.6	1
14	5507.5	0	29	5527.0	1
15	5508.8	1	30	5529.0	1
Detection Percentage (%)					93.3%

Product	GigaSpire BLAST u4	Temperature	23 ~ 27°C
Test Engineer	Jake Lan	Relative Humidity	50 ~ 65%
Test Site	SR4	Test Date	2020/08/22
Test Item	Radar Statistical Performance Check (802.11ax-HE80 mode – 5530MHz)		
Test Mode	Mesh 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	0
2	5493.7	1.0	718	74	1
3	5496.4	1.0	938	57	1
4	5499.1	1.0	578	92	1
5	5501.8	1.0	598	89	1
6	5504.5	1.0	758	70	1
7	5507.0	1.0	698	76	1
8	5509.7	1.0	678	78	1
9	5512.4	1.0	778	68	1
10	5515.1	1.0	618	86	1
11	5517.8	1.0	898	59	0
12	5520.5	1.0	538	98	1
13	5523.1	1.0	3066	18	1
14	5525.8	1.0	658	81	1
15	5530.0	1.0	798	67	1
16	5532.7	1.0	591	90	1
17	5535.4	1.0	2660	20	1
18	5538.0	1.0	2973	18	1
19	5540.7	1.0	2516	21	1
20	5543.4	1.0	2995	18	1
21	5546.1	1.0	2149	25	1
22	5548.8	1.0	1781	30	1
23	5551.5	1.0	1708	31	1
24	5554.2	1.0	1912	28	0
25	5556.9	1.0	1115	48	1
26	5559.6	1.0	781	68	1
27	5562.3	1.0	566	94	1
28	5565.0	1.0	1523	35	1

29	5567.7	1.0	1714	31	1
30	5569.0	1.0	2350	23	1
Detection Percentage (%)					90%

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	2.6	171	24	1
2	5493.7	2.3	155	27	1
3	5496.4	2.1	167	26	1
4	5499.1	1.8	165	29	1
5	5501.8	3.6	161	25	1
6	5504.5	3.1	151	27	1
7	5507.0	2.3	219	23	1
8	5509.7	3.9	200	26	1
9	5512.4	3.9	158	28	0
10	5515.1	4.1	190	28	1
11	5517.8	1.1	193	25	1
12	5520.5	2.6	154	23	1
13	5523.1	3.1	215	23	1
14	5525.8	5.0	194	25	1
15	5530.0	3.1	199	25	1
16	5532.7	3.4	196	25	1
17	5535.4	1.5	165	25	1
18	5538.0	4.7	173	28	1
19	5540.7	2.4	229	26	1
20	5543.4	4.2	156	26	1
21	5546.1	4.1	193	28	1
22	5548.8	1.6	181	26	1
23	5551.5	1.6	229	28	1
24	5554.2	4.2	163	25	1
25	5556.9	2.2	179	29	1
26	5559.6	1.8	180	27	1
27	5562.3	2.5	186	25	1
28	5565.0	4.0	180	29	1
29	5567.7	2.8	201	26	1
30	5569.0	3.1	227	25	1
Detection Percentage (%)					96.7%

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	9.3	283	16	1
2	5493.7	8.8	249	18	0
3	5496.4	9.2	337	16	1
4	5499.1	7.7	207	17	1
5	5501.8	7.1	268	16	1
6	5504.5	7.9	488	17	1
7	5507.0	6.4	379	16	1
8	5509.7	6.3	407	16	0
9	5512.4	6.9	403	17	1
10	5515.1	9.7	334	18	1
11	5517.8	7.3	469	18	0
12	5520.5	6.8	289	16	1
13	5523.1	9.7	414	17	1
14	5525.8	8.4	293	17	0
15	5530.0	8.2	331	17	1
16	5532.7	7.9	437	16	1
17	5535.4	6.0	387	17	1
18	5538.0	6.5	331	17	1
19	5540.7	8.2	416	18	1
20	5543.4	7.6	214	17	0
21	5546.1	9.0	374	18	1
22	5548.8	9.6	289	17	1
23	5551.5	7.0	318	17	1
24	5554.2	6.2	232	18	1
25	5556.9	6.0	386	18	1
26	5559.6	9.8	431	17	1
27	5562.3	8.1	333	17	0
28	5565.0	9.4	316	16	1
29	5567.7	6.3	484	18	1
30	5569.0	6.8	221	16	0
Detection Percentage (%)					76.7%

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	14.3	204	13	1
2	5493.7	16.9	320	13	0
3	5496.4	13.0	217	13	1
4	5499.1	11.1	270	14	1
5	5501.8	18.7	295	16	1
6	5504.5	16.1	371	14	1
7	5507.0	13.2	291	14	1
8	5509.7	13.7	349	13	0
9	5512.4	14.6	499	14	1
10	5515.1	14.4	220	16	1
11	5517.8	12.1	377	15	1
12	5520.5	12.9	234	12	0
13	5523.1	15.2	349	12	1
14	5525.8	17.8	261	13	1
15	5530.0	15.3	354	13	1
16	5532.7	15.3	290	14	1
17	5535.4	13.7	431	13	1
18	5538.0	19.1	444	13	1
19	5540.7	17.9	352	14	0
20	5543.4	19.9	419	15	1
21	5546.1	16.6	486	16	1
22	5548.8	16.5	413	14	1
23	5551.5	13.3	477	14	1
24	5554.2	18.5	423	15	1
25	5556.9	14.9	205	14	0
26	5559.6	16.2	253	14	1
27	5562.3	19.6	343	16	1
28	5565.0	18.2	234	16	1
29	5567.7	11.7	203	14	0
30	5569.0	17.5	350	14	1
Detection Percentage (%)					80%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test

waveforms is as follows: $\frac{P_d1+P_d2+P_d3+P_d4}{4} = (90\%+96.7\%+76.7\%+80\%)/4 = 85.9\% (>80\%)$

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	0	16	5497.8	1
2	5530.0	1	17	5493.0	1
3	5530.0	1	18	5493.8	1
4	5530.0	1	19	5498.2	1
5	5530.0	1	20	5494.2	1
6	5530.0	1	21	5564.6	1
7	5530.0	1	22	5562.2	1
8	5530.0	1	23	5561.4	1
9	5530.0	1	24	5566.2	1
10	5530.0	1	25	5562.6	1
11	5496.2	1	26	5566.6	1
12	5495.8	1	27	5563.4	1
13	5496.6	1	28	5562.2	1
14	5498.2	1	29	5565.0	1
15	5496.6	0	30	5563.8	1
Detection Percentage (%)					93.3%

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	5532.7	1
2	5493.7	1	17	5535.4	1
3	5496.4	1	18	5538.0	1
4	5499.1	1	19	5540.7	1
5	5501.8	1	20	5543.4	1
6	5504.5	1	21	5546.1	1
7	5507.0	1	22	5548.8	1
8	5509.7	1	23	5551.5	1
9	5512.4	1	24	5554.2	1
10	5515.1	1	25	5556.9	1
11	5517.8	1	26	5559.6	1
12	5520.5	1	27	5562.3	1
13	5523.1	1	28	5565.0	1
14	5525.8	1	29	5567.7	1
15	5530.0	1	30	5569.0	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 "2006RSU066-UT" file.

Appendix B - EUT Photograph

Refer to "2006RSU066-UE" file.