DFS MEASUREMENT REPORT

FCC 15.407 WLAN 802.11a/n/ac

FCC ID:	P27ME221
Applicant:	Sercomm Corporation
Application Type:	Class III Permissive Change
Product:	Dual Band WiFi Mesh
Model No.:	AME-4221SR
Brand Name:	Airtel
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:	January 29 ~ March 01, 2021

Reviewed By: oscar shi
Oscar Shi

Approved By: Robin Wu
Robin Wu

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 905462 D02v02. Test results reported herein relate only to the item(s) tested.
The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2101RSU064-U2	Rev. 01	Initial Report	04-13-2021	Valid

Note: Adding band U-NII-2A and U-NII-2C, requests a Class III Permissive Change for its application with FCC ID: P27ME221 granted on 10-26-2020 and 12-06-2020.

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Description Page

1. General Information

1.1. Applicant

Sercomm Corporation

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1.2. Manufacturer

Sercomm Corporation

8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C.

1.3. Testing Facility

☒	**Test Site – MRT Suzhou Laboratory**	
	Laboratory Location (Suzhou – Wuzhong)	
	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China	
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	Laboratory Accreditations	
	A2LA: 3628.01	CNAS: L10551
	FCC: CN1166	ISED: CN0001
	VCCI: R-20025, G-20034, C-20020, T-20020	
☐	**Test Site – MRT Shenzhen Laboratory**	
	Laboratory Location (Shenzhen)	
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	Laboratory Accreditations	
	A2LA: 3628.02	CNAS: L10551
	FCC: CN1284	ISED: CN0105
☐	**Test Site – MRT Taiwan Laboratory**	
	Laboratory Location (Taiwan)	
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	Laboratory Accreditations	
	TAF: L3261-190725	
	FCC: 291082, TW3261	ISED: TW3261

2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	Dual Band WiFi Mesh
Model No.	AME-4221SR
Brand Name	Airtel
Wi-Fi Specification	802.11a/b/g/n/ac
EUT Identification No.	20210127Sample#02 (Conducted)
Hardware Version	6.0
Software Version	AME4221SR_R1.9

2.2. Product Specification Subjective to this Report

Frequency Range	For 802.11a/n-HT20/ac-VHT20: 5260~5320MHz, 5500~5720MHz For 802.11n-HT40/ac-VHT40: 5270~5310MHz, 5510~5710MHz For 802.11ac-VHT80: 5290MHz, 5530MHz, 5610MHz, 5690MHz
Type of Modulation	802.11a/n/ac: OFDM
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.6Mbps
Power-on cycle	Requires 137.4 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. DFS Band Working Frequencies

802.11a/n-HT20/ac-VHT20

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

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

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

2.4. Description of Available Antennas

Antenna Type	Frequency Band (MHz)	T_X Paths	Max Antenna Gain (dBi)	Beamforming Directional Gain (dBi)	CDD Directional Gain (dBi)	
					For Power	For PSD
PIFA Antenna	2412 ~ 2462	2	3.30	6.31	3.30	6.31
	5250 ~ 5350	2	3.50	6.51	3.50	6.51
	5470~5725	2	3.40	6.41	3.40	6.41

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

Note 2: The CDD and beamforming mode signals are correlated.

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

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

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

- For power measurements on IEEE 802.11 devices,

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

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

Note 3: The antenna gain is declared by manufacturer.

2.5. Test Mode

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

2.6. Test Environment Condition

Ambient Temperature	15°C~35°C
Relative Humidity	20%RH ~75%RH

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	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{\text{PRI}_{\text{usec}}}\right)\right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note: 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.

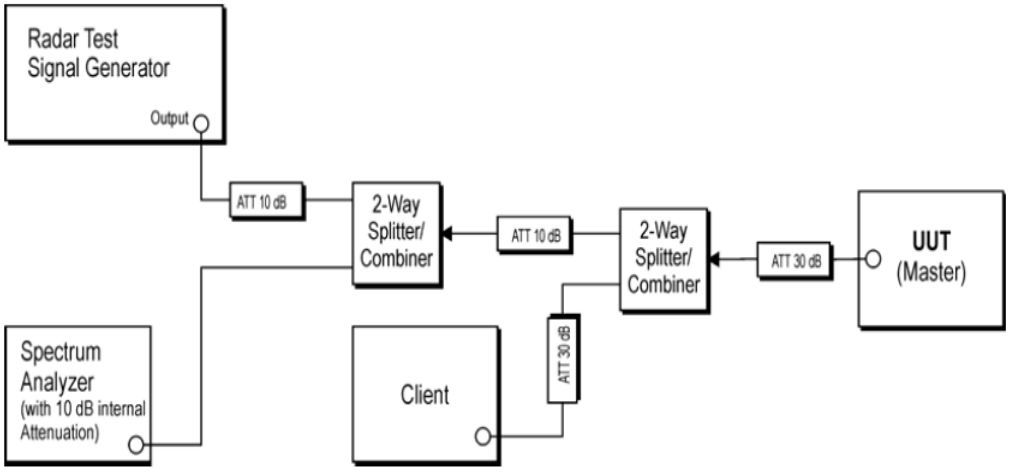


Figure 3-1: Conducted Test Setup where UUT is a Master and Radar Test Waveforms are injected into the Masters

4. TEST EQUIPMENT CALIBRATION DATE

Dynamic Frequency Selection (DFS) (SIP-TR2)

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	2021/10/22
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
R&S Pulse Sequencer DFS	V 2.0	R&S	DFS Test Software

5. TEST RESULT

5.1. Summary

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

5.2. Radar Waveform Calibration

5.2.1. Calibration Setup

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

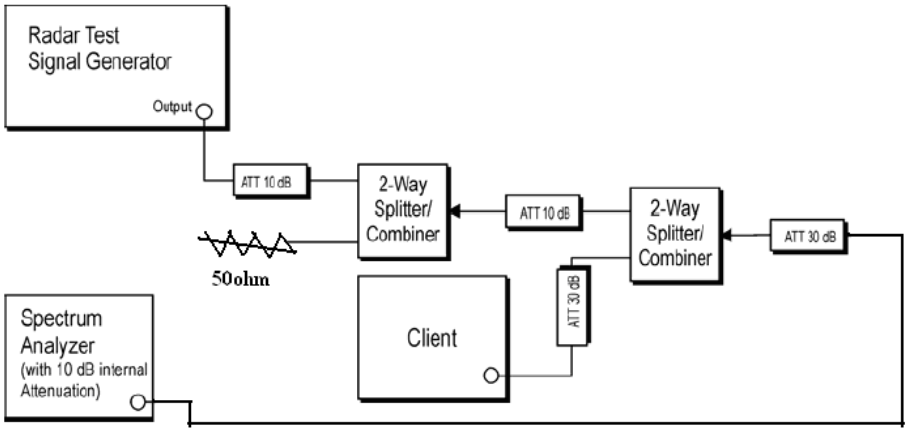


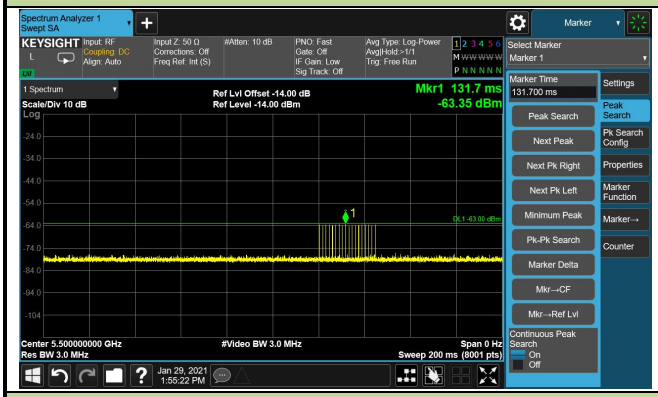
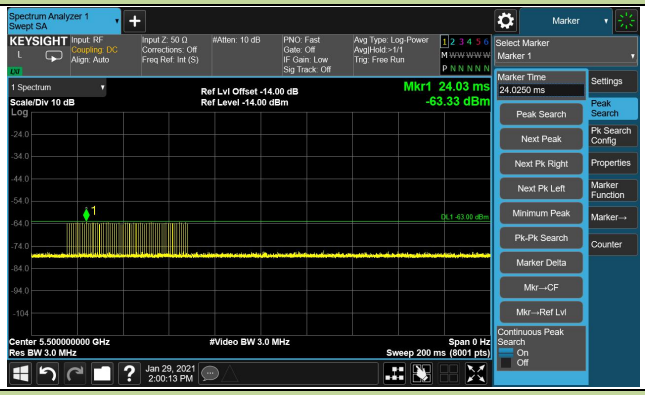
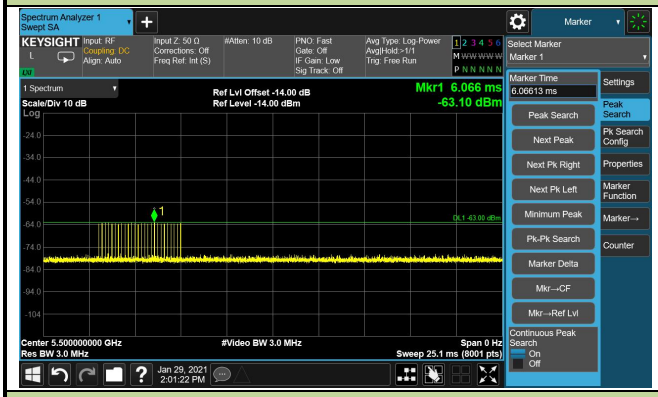
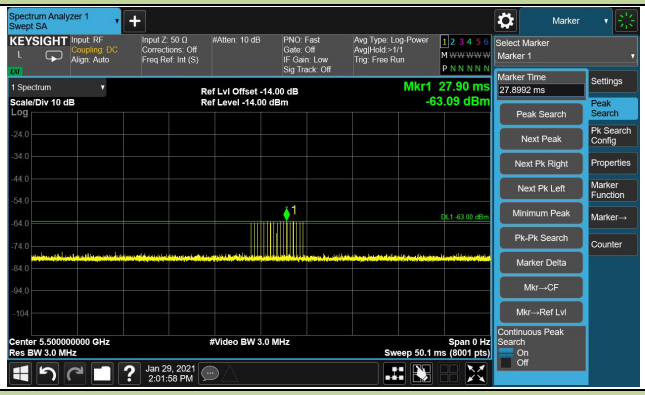
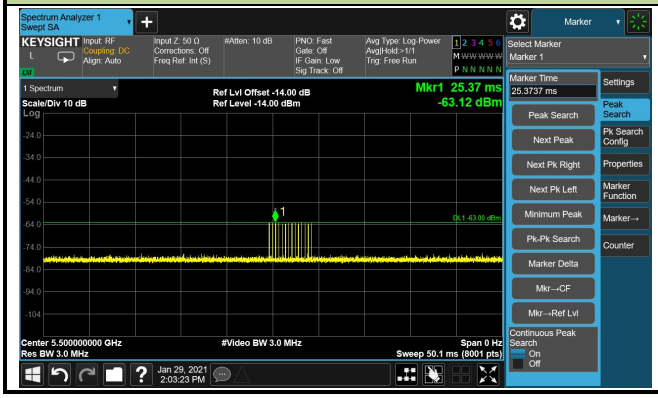
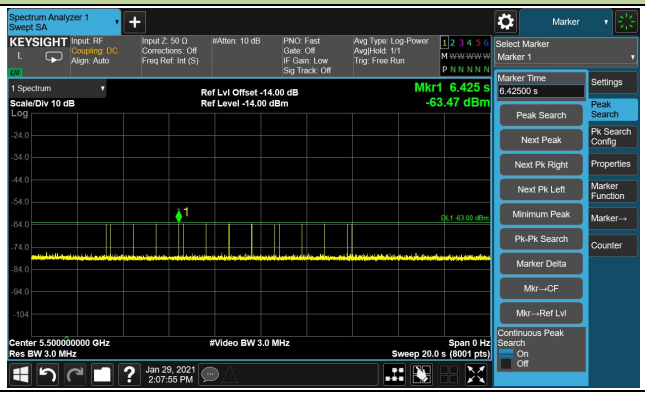
Figure 3-2: Conducted Test Setup

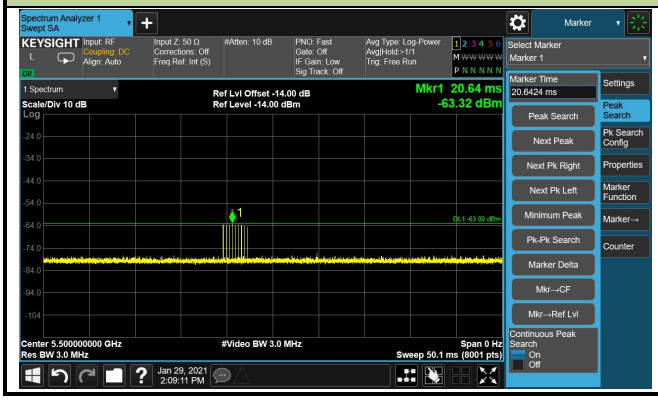
5.2.2. Calibration Procedure

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

5.2.3. Cablibration Result

Test Site	SIP-TR2	Test Engineer	Alisa Deng
Test Date	2021/01/29	Test Item	Radar Waveform Calibration

Radar Waveform Calibration	
Radar #0	Radar #1
	
Radar #2	Radar #3
	
Radar #4	Radar #5
	

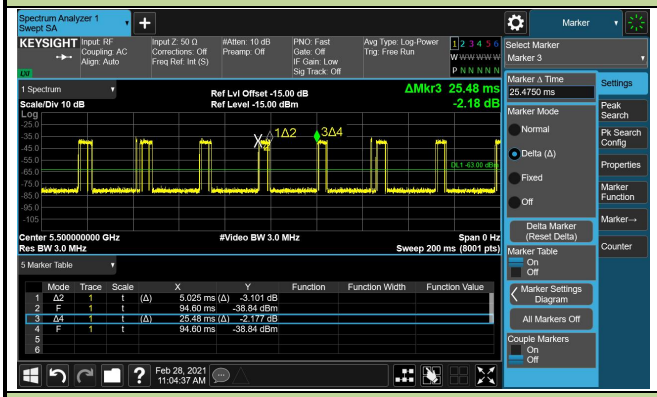
Radar #6	
 Spectrum Analyzer 1 Swept SA KEYSIGHT Input: RF Coupling: DC Align: Auto Input Z: 50 Ω Corrections: Off Freq Ref: Int (S) #Atten: 10 dB PNO: Fast Gate: Off IF Gain: Low Sig Track: Off Avg Type: Log-Power Avg|Hold:>1/1 Trig: Free Run Marker Select Marker Marker 1 1 Spectrum Scale/Div 10 dB Ref Lvl Offset -14.00 dB Ref Level -14.00 dBm Mkr1 20.64 ms -63.32 dBm Log Marker Time 20.6424 ms Peak Search Next Peak Next Pk Right Next Pk Left Minimum Peak Pk-Pk Search Marker Delta Mkr→CF Mkr→Ref Lvl Continuous Peak Search On Off Settings Peak Search Pk Search Config Properties Marker Function Marker→ Counter Center 5.500000000 GHz Res BW 3.0 MHz #Video BW 3.0 MHz Span 0 Hz Sweep 50.1 ms (8001 pts) Jan 29, 2021 2:09:11 PM	

5.2.4. Channel Loading Test Result

Test Site	SIP-TR2	Test Engineer	Alisa Deng
Test Date	2021/02/28	Test Item	Channel Loading

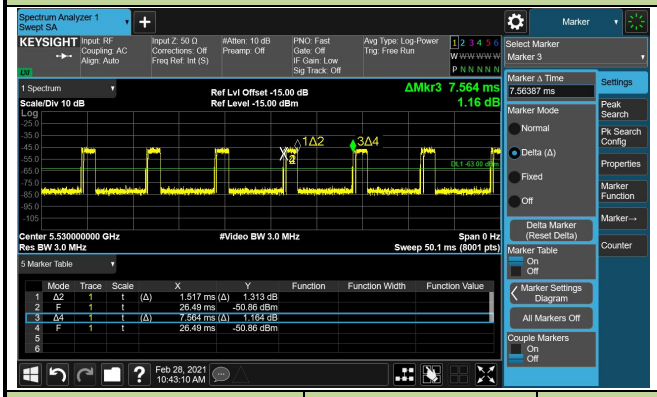
Channel Loading Plot

802.11ac-VHT20 5500MHz



802.11ac-VHT40 5510MHz

802.11ac-VHT80 5530MHz



Test Mode	Test Frequency	Packet ratio	Requirement ratio	Test Result
802.11ac-VHT20	5500 MHz	19.72%	≥ 17%	Pass
802.11ac-VHT40	5510 MHz	17.05%	≥ 17%	Pass
802.11ac-VHT80	5530 MHz	20.06%	≥ 17%	Pass

Note: System testing was performed with the iperf software 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

Test Site	SIP-TR2	Test Engineer	Alisa Deng
Test Date	2021/02/28	Test Item	Detection Bandwidth (802.11ac-VHT20 mode - 5500MHz)

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										
	1	2	3	4	5	6	7	8	9	10	Detection Rate
5487	0	0	0	0	0	0	0	0	0	0	0%
5488 F_L	1	1	1	1	1	1	1	1	1	1	100%
5489	1	1	1	1	1	1	1	1	1	1	100%
5490	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%
5511 F_H	1	1	1	1	1	1	1	1	1	1	100%
5512	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 17.57MHz. (See the 99% BW section of the RF report for further measurement details).

Note 2: Detection Bandwidth = F_H- F_L = 5511MHz – 5488MHz = 23MHz.

Note 3: NII Detection Bandwidth Min. Limit (MHz): 17.57MHz x 100% = 17.57MHz.

Test Site	SIP-TR2	Test Engineer	Alisa Deng
Test Date	2021/02/28	Test Item	Detection Bandwidth (802.11ac-VHT40 mode - 5510MHz)

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										
	1	2	3	4	5	6	7	8	9	10	Detection Rate
5485	0	0	0	0	0	0	0	0	0	0	0%
5486 F_L	1	1	1	1	1	1	1	1	1	1	100%
5487	1	1	1	1	1	1	1	1	1	1	100%
5488	1	1	1	1	1	1	1	1	1	1	100%
5489	1	1	1	1	1	1	1	1	1	1	100%
5490	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%
5531	1	1	1	1	1	1	1	1	1	1	100%
5532	1	1	1	1	1	1	1	1	1	1	100%
5533	1	1	1	1	1	1	1	1	1	1	100%
5534 F_H	1	1	1	1	1	1	1	1	1	1	100%
5535	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 36.01MHz. (See the 99% BW section of the RF report for further measurement details).

Note 2: Detection Bandwidth = F_H - F_L = 5534MHz – 5486MHz = 48MHz.

Note 3: NII Detection Bandwidth Min. Limit (MHz):36.01MHz x 100% = 36.01MHz.

Test Site	SIP-TR2	Test Engineer	Alisa Deng
Test Date	2021/02/28	Test Item	Detection Bandwidth (802.11ac-VHT80 mode - 5530MHz)

Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										
	1	2	3	4	5	6	7	8	9	10	Detection Rate
5480	0	0	0	0	0	0	0	0	0	0	0%
5481F_L	1	1	1	1	1	1	1	1	1	1	100%
5482	1	1	1	1	1	1	1	1	1	1	100%
5483	1	1	1	1	1	1	1	1	1	1	100%
5484	1	1	1	1	1	1	1	1	1	1	100%
5485	1	1	1	1	1	1	1	1	1	1	100%
5490	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%
5570	1	1	1	1	1	1	1	1	1	1	100%
5575	1	1	1	1	1	1	1	1	1	1	100%
5576	1	1	1	1	1	1	1	1	1	1	100%
5577	1	1	1	1	1	1	1	1	1	1	100%
5578	1	1	1	1	1	1	1	1	1	1	100%
5579 F_H	1	1	1	1	1	1	1	1	1	1	100%
5580	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 75.30MHz. (See the 99% BW section of the RF report for further measurement details).
Note 2: Detection Bandwidth = F_H - F_L = 5579MHz – 5481MHz = 98MHz.
Note 3: NII Detection Bandwidth Min. Limit (MHz): 75.30MHz x 100% = 75.30MHz.

5.4. Initial Channel Availability Check Time Measurement

5.4.1. Test Limit

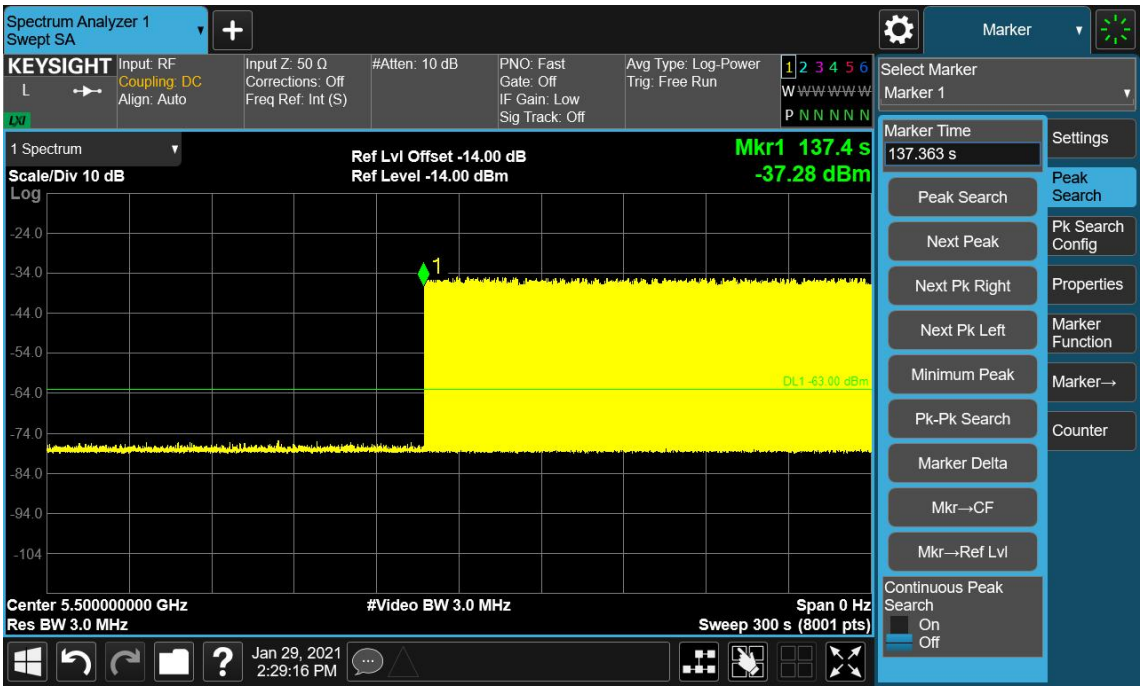
The EUT shall perform a Channel Availability Check to ensure that there is no radar operating on the channel. After power-up sequence, receive at least 1 minute on the intended operating frequency.

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 minutes 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

Test Site	SIP-TR2	Test Engineer	Alisa Deng
Test Date	2021/01/29	Test Item	Initial Channel Availability Check Time (802.11ac-VHT20 mode - 5500MHz)

Initial Channel Availability Check Time

Note: The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (77.4 sec). Initial beacons/data transmissions are indicated by marker 1 (137.4 sec).

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

5.5.1. Test Limit

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

5.5.2. Test Procedure

1. The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB occurs at the beginning of the Channel Availability Check Time.
2. The EUT is in completion power-up cycle (from T0 to T1). T1 denotes the instant when the EUT has completed its power-up sequence. The Channel Availability Check Time commences at instant T1 and will end no sooner than T1 + 60 seconds. A single Burst of one of Short Pulse Radar Types 0-4 at DFS Detection Threshold + 1 dB will commence within a 6 second window starting at T1.
3. Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions will continue for 2.5 minutes after the radar Burst has been generated. Verify that during the 2.5 minutes measurement window no EUT transmissions occurred.

5.5.3. Test Result

Test Site	SIP-TR2	Test Engineer	Alisa Deng
Test Date	2021/01/29	Test Item	Beginning of the Channel Availability Check Time (802.11ac-VHT20 mode - 5500MHz)

Beginning of the Channel Availability Check Time

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

5.6.1. Test Limit

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

5.6.2. Test Procedure

1. The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB occurs at the beginning of the Channel Availability Check Time.
2. The EUT is powered on at T0. T1 denotes the instant when the EUT has completed its power-up sequence. The Channel Availability Check Time commences at instant T1 and will end no sooner thanT1 + 60 seconds. A single Burst of one of Short Pulse Radar Types 0-4 at DFS Detection Threshold + 1 dB will commence within a 6 second window starting at T1+ 54 seconds.
3. Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions will continue for 2.5 minutes after the radar Burst has been generated. Verify that during the 2.5 minutes measurement window no EUT transmissions occurred.

5.6.3. Test Result

Test Site	SIP-TR2	Test Engineer	Alisa Deng
Test Date	2021/01/29	Test Item	End of the Channel Availability Check Time (802.11ac-VHT20 mode - 5500MHz)

End of the Channel Availability Check Time

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

5.7.1. Test Limit

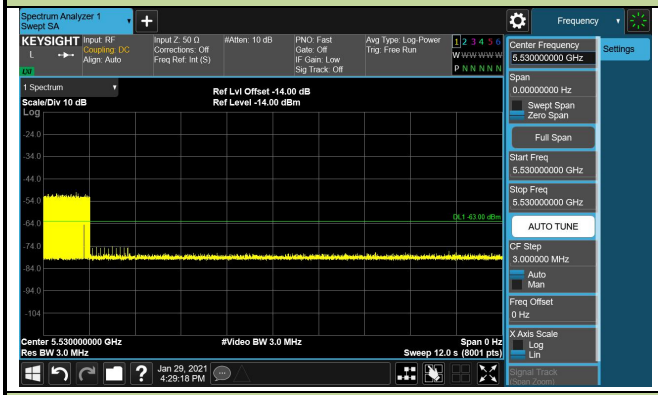
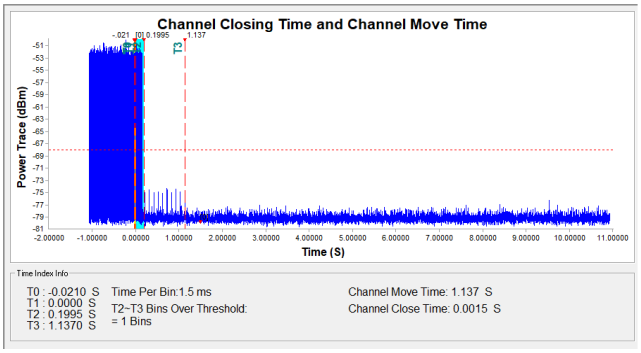
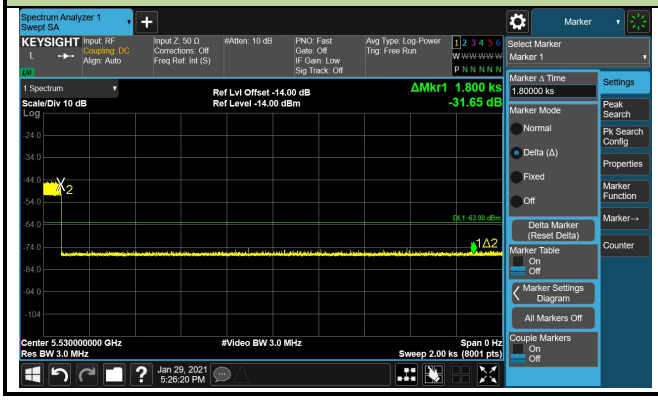
The EUT has In-Service Monitoring function to continuously monitor the radar signals. If the radar is detected, must leave the channel (Shutdown). The Channel Move Time to cease all transmissions on the current channel upon detection of a Radar Waveform above the DFS Detection Threshold within 10 sec.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

5.7.2. Test Procedure Used

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

5.7.3. Test Result

Test Site	SIP-TR2	Test Engineer	Alisa Deng
Test Date	2021/01/29	Test Item	Channel Move Time and Channel Closing Transmission Time (802.11ac-VHT80 mode - 5530MHz)

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

Parameter	Test Result	Limit
Channel Move Time (s)	1.137s	<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

Test Site	SIP-TR2	Test Engineer	Alisa Deng
Test Date	2021/03/01	Test Item	Radar Statistical Performance Check (802.11ac-VHT20 mode - 5500MHz)

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5507.0	1.0	778	68	1
2	5496.0	1.0	738	72	1
3	5503.0	1.0	578	92	1
4	5506.0	1.0	538	99	1
5	5505.0	1.0	838	63	1
6	5500.0	1.0	658	81	1
7	5505.0	1.0	618	86	1
8	5498.0	1.0	3066	18	1
9	5504.0	1.0	598	89	1
10	5501.0	1.0	818	65	1
11	5489.0	1.0	678	78	1
12	5491.0	1.0	878	61	1
13	5494.0	1.0	718	74	1
14	5493.0	1.0	518	102	1
15	5496.0	1.0	638	83	1
16	5503.0	1.0	820	65	1
17	5506.0	1.0	2796	19	1
18	5501.0	1.0	987	54	1
19	5507.0	1.0	1349	40	1
20	5495.0	1.0	2203	24	1
21	5503.0	1.0	1773	30	1
22	5501.0	1.0	1062	50	1
23	5504.0	1.0	1218	44	1
24	5504.0	1.0	2742	20	1
25	5503.0	1.0	1129	47	1
26	5511.0	1.0	1400	38	1
27	5500.0	1.0	531	100	1
28	5496.0	1.0	1106	48	1
29	5504.0	1.0	2402	22	1

30	5497.0	1.0	2778	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	5501.0	2.6	220	25	1
2	5505.0	1.5	228	23	1
3	5508.0	3.2	180	26	1
4	5488.0	2.4	175	25	1
5	5490.0	3.9	210	27	0
6	5506.0	4.7	151	29	1
7	5509.0	1.5	170	23	1
8	5488.0	4.2	209	28	0
9	5500.0	4.1	195	28	1
10	5490.0	3.7	202	27	1
11	5493.0	2.5	152	25	1
12	5510.0	2.1	207	24	1
13	5490.0	1.3	167	23	1
14	5508.0	2.8	196	26	1
15	5504.0	3.4	183	27	1
16	5503.0	2.4	187	25	1
17	5499.0	1.7	153	24	1
18	5496.0	1.5	224	23	1
19	5506.0	2.2	225	25	1
20	5503.0	1.8	161	24	1
21	5497.0	1.5	191	23	1
22	5489.0	2.9	223	26	1
23	5503.0	3.1	218	26	1
24	5499.0	2.8	206	26	1
25	5493.0	2.8	199	26	1
26	5489.0	2.7	203	25	1
27	5510.0	1.0	198	23	1
28	5494.0	4.7	174	29	1
29	5493.0	4.4	221	28	1
30	5494.0	2.0	166	24	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	5496.0	7.6	296	17	1
2	5504.0	6.5	333	16	1
3	5499.0	8.2	331	17	1
4	5499.0	7.4	212	17	1
5	5491.0	8.9	247	18	1
6	5505.0	9.7	450	18	1
7	5508.0	6.5	227	16	1
8	5493.0	9.2	338	18	1
9	5505.0	9.1	245	18	1
10	5488.0	8.7	325	18	1
11	5508.0	7.5	203	17	1
12	5489.0	7.1	218	16	1
13	5509.0	6.3	201	16	1
14	5497.0	7.8	423	17	1
15	5510.0	8.4	500	17	1
16	5507.0	7.4	311	17	1
17	5499.0	6.7	381	16	1
18	5490.0	6.5	485	16	1
19	5509.0	7.2	417	16	1
20	5495.0	6.8	371	16	1
21	5491.0	6.5	264	16	1
22	5497.0	7.9	347	17	1
23	5494.0	8.1	483	17	1
24	5491.0	7.8	419	17	1
25	5508.0	7.8	489	17	1
26	5500.0	7.7	283	17	1
27	5510.0	6.0	254	16	1
28	5492.0	9.7	473	18	1
29	5493.0	9.4	380	18	1
30	5511.0	7.0	445	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	5511.0	19.5	315	16	1
2	5501.0	14.7	492	14	1
3	5497.0	13.2	279	13	1
4	5508.0	16.1	385	14	1
5	5501.0	12.4	475	12	0
6	5493.0	18.1	244	15	1
7	5503.0	16.2	310	14	1
8	5497.0	13.5	360	13	1
9	5491.0	19.1	470	16	1
10	5508.0	11.4	392	12	1
11	5500.0	12.1	269	12	1
12	5490.0	11.4	299	12	1
13	5505.0	17.9	254	15	1
14	5505.0	19.9	468	16	1
15	5494.0	13.7	210	13	1
16	5496.0	20.0	245	16	1
17	5489.0	16.5	370	15	1
18	5496.0	17.8	327	15	1
19	5496.0	13.9	441	13	1
20	5507.0	16.3	294	14	1
21	5507.0	13.3	422	13	0
22	5503.0	17.5	377	15	1
23	5511.0	17.4	231	15	1
24	5491.0	18.2	474	15	1
25	5494.0	16.1	242	14	1
26	5506.0	11.6	495	12	1
27	5507.0	18.8	396	16	1
28	5495.0	15.8	325	14	1
29	5495.0	12.1	239	12	1
30	5500.0	11.6	375	12	1
Detection Percentage (%)					93.3%

Note: In addition an average minimum percentage of successful detection across all four Short pulse radar test waveforms is as follows: $\frac{P_d1+P_d2+P_d3+P_d4}{4}$ = (100%+93.3%+100%+93.3%)/4 = 96.7% (>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	5495.0	1
2	5500.0	1	17	5494.2	1
3	5500.0	1	18	5493.8	1
4	5500.0	1	19	5494.6	1
5	5500.0	1	20	5494.2	1
6	5500.0	1	21	5506.6	1
7	5500.0	1	22	5504.2	1
8	5500.0	1	23	5503.8	1
9	5500.0	1	24	5504.2	1
10	5500.0	1	25	5504.2	1
11	5495.4	1	26	5504.6	1
12	5494.6	1	27	5507.0	1
13	5493.4	1	28	5501.4	1
14	5495.8	1	29	5501.8	1
15	5496.6	1	30	5505.4	1
Detection Percentage (%)					100%

Type 5 Radar Waveform_1

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	6026...	70.6	11	2	1346.0	1219.0	-
1	8268...	56.1	11	1	1447.0	-	-
2	1285...	77.6	11	2	1754.0	1249.0	-
3	3516...	67.3	11	2	1862.0	1227.0	-
4	5738...	85.5	11	3	1566.0	1885.0	1141.0
5	7961...	95.8	11	3	1727.0	1620.0	1717.0
6	1012...	56.4	11	1	1077.0	-	-
7	3234...	89.1	11	3	1982.0	1337.0	1813.0
8	5465...	88.7	11	3	1265.0	1267.0	1737.0
9	7693...	83.9	11	3	1454.0	1351.0	1603.0
10	73596.0	69.3	11	2	1563.0	1047.0	-
11	2971...	63.5	11	1	1787.0	-	-
12	5204...	54.0	11	1	1890.0	-	-

Type 5 Radar Waveform_2

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	1074. . .	73. 1	6	2	1179. 0	1714. 0	–
1	66638. 0	80. 1	6	2	1157. 0	1572. 0	–
2	3892. . .	68. 3	6	2	1879. 0	1356. 0	–
3	7128. . .	59. 6	6	1	1233. 0	–	–
4	1035. . .	56. 4	6	1	1666. 0	–	–
5	26906. 0	65. 0	6	1	1767. 0	–	–
6	3500. . .	60. 1	6	1	1041. 0	–	–
7	6729. . .	56. 1	6	1	1498. 0	–	–
8	9948. . .	73. 9	6	2	1110. 0	1914. 0	–

Type 5 Radar Waveform_3

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	7896. . .	76. 8	13	2	1292. 0	1326. 0	–
1	1856. . .	72. 2	13	2	1512. 0	1061. 0	–
2	3787. . .	73. 1	13	2	1867. 0	1360. 0	–
3	5721. . .	71. 3	13	2	1508. 0	1613. 0	–
4	7672. . .	50. 2	13	1	1136. 0	–	–
5	1613. . .	95. 5	13	3	1840. 0	1895. 0	1205. 0
6	3542. . .	92. 4	13	3	1948. 0	1422. 0	1436. 0
7	5495. . .	63. 0	13	1	1248. 0	–	–
8	7391. . .	92. 9	13	3	1871. 0	1886. 0	1960. 0
9	1376. . .	86. 6	13	3	1464. 0	1974. 0	1301. 0
10	3320. . .	66. 5	13	1	1105. 0	–	–
11	5242. . .	81. 0	13	2	1728. 0	1824. 0	–
12	7182. . .	69. 1	13	2	1101. 0	1517. 0	–
13	1143. . .	50. 6	13	1	1413. 0	–	–
14	3081. . .	51. 9	13	1	1215. 0	–	–

Type 5 Radar Waveform_4

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	6274. . .	66. 2	10	1	1296. 0	–	–
1	8682. . .	67. 4	10	2	1568. 0	1408. 0	–
2	1132. . .	64. 2	10	1	1355. 0	–	–
3	3553. . .	58. 0	10	1	1445. 0	–	–
4	5977. . .	56. 0	10	1	1128. 0	–	–
5	8368. . .	93. 5	10	3	1092. 0	1795. 0	1951. 0
6	83202. 0	78. 7	10	2	1942. 0	1532. 0	–
7	3245. . .	84. 3	10	3	1530. 0	1043. 0	1876. 0
8	5666. . .	77. 6	10	2	1367. 0	1933. 0	–
9	8086. . .	76. 5	10	2	1936. 0	1050. 0	–
10	53528. 0	53. 4	10	1	1671. 0	–	–
11	2948. . .	89. 6	10	3	1149. 0	1410. 0	1793. 0

Type 5 Radar Waveform_5

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	3787.0	75.9	16	2	1648.0	1193.0	-
1	5479.0	92.8	16	3	1244.0	1474.0	1786.0
2	16683.0	68.5	16	2	1492.0	1766.0	-
3	1876.0	50.7	16	1	1096.0	-	-
4	3582.0	57.3	16	1	1773.0	-	-
5	5266.0	94.6	16	3	1453.0	1923.0	1544.0
6	6961.0	96.7	16	3	1580.0	1846.0	1979.0
7	1662.0	79.4	16	2	1308.0	1156.0	-
8	3374.0	55.3	16	1	1329.0	-	-
9	5066.0	94.2	16	3	1188.0	1271.0	1185.0
10	6788.0	64.1	16	1	1697.0	-	-
11	1450.0	95.6	16	3	1258.0	1231.0	1211.0
12	3163.0	61.0	16	1	1457.0	-	-
13	4847.0	96.7	16	3	1423.0	1583.0	1940.0
14	6565.0	75.6	16	2	1997.0	1066.0	-
15	1238.0	91.1	16	3	1139.0	1777.0	1762.0
16	2945.0	82.8	16	2	1415.0	1909.0	-

Type 5 Radar Waveform_6

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	4150.0	97.0	19	3	1303.0	1761.0	1330.0
1	5686.0	73.1	19	2	1375.0	1332.0	-
2	92527.0	54.0	19	1	1190.0	-	-
3	2447.0	79.4	19	2	1570.0	1340.0	-
4	3978.0	66.4	19	1	1959.0	-	-
5	5489.0	93.4	19	3	1515.0	1073.0	1222.0
6	73221.0	89.0	19	3	1775.0	1716.0	1751.0
7	2262.0	50.7	19	1	1988.0	-	-
8	3792.0	52.0	19	1	1496.0	-	-
9	5320.0	50.1	19	1	1575.0	-	-
10	54737.0	80.5	19	2	1035.0	1596.0	-
11	2067.0	98.1	19	3	1768.0	1086.0	1458.0
12	3582.0	87.9	19	3	1857.0	1658.0	1805.0
13	5108.0	95.6	19	3	1543.0	1431.0	1525.0
14	35853.0	94.9	19	3	1401.0	1850.0	1026.0
15	1879.0	96.8	19	3	1256.0	1427.0	1679.0
16	3414.0	55.8	19	1	1901.0	-	-
17	4946.0	66.5	19	1	1274.0	-	-
18	17169.0	70.3	19	2	1140.0	1083.0	-

Type 5 Radar Waveform_7

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	3589.0	74.3	7	2	1626.0	1196.0	-
1	6811.0	85.8	7	3	1482.0	1246.0	1170.0
2	1005.0	59.2	7	1	1255.0	-	-
3	1325.0	86.5	7	3	1046.0	1721.0	1735.0
4	3191.0	72.4	7	2	1521.0	1591.0	-
5	6418.0	71.2	7	2	1331.0	1675.0	-
6	9628.0	96.6	7	3	1874.0	1520.0	1929.0
7	1287.0	72.0	7	2	1640.0	1027.0	-
8	2796.0	53.3	7	1	1911.0	-	-

Type 5 Radar Waveform_8

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	3003.0	68.7	17	2	1434.0	1667.0	-
1	4606.0	97.1	17	3	1601.0	1037.0	1384.0
2	6233.0	59.4	17	1	1852.0	-	-
3	1195.0	67.8	17	2	1597.0	1554.0	-
4	2803.0	87.7	17	3	1148.0	1142.0	1143.0
5	4426.0	51.4	17	1	1229.0	-	-
6	6019.0	80.7	17	2	1864.0	1741.0	-
7	99939.0	53.4	17	1	1803.0	-	-
8	2604.0	99.5	17	3	1497.0	1057.0	1241.0
9	4228.0	60.1	17	1	1115.0	-	-
10	5837.0	59.5	17	1	1760.0	-	-
11	79731.0	99.4	17	3	1920.0	1004.0	1748.0
12	2408.0	79.6	17	2	1889.0	1113.0	-
13	4008.0	100.0	17	3	1192.0	1602.0	1817.0
14	5641.0	55.2	17	1	1452.0	-	-
15	60004.0	94.4	17	3	1204.0	1656.0	1262.0
16	2215.0	66.2	17	1	1535.0	-	-
17	3820.0	81.4	17	2	1122.0	1818.0	-

Type 5 Radar Waveform_9

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	5435.0	67.5	17	2	1078.0	1189.0	-
1	40147.0	98.7	17	3	1898.0	1441.0	1839.0
2	2012.0	69.2	17	2	1785.0	1144.0	-
3	3612.0	98.8	17	3	1630.0	1608.0	1542.0
4	5243.0	55.1	17	1	1505.0	-	-
5	20455.0	80.2	17	2	1033.0	1891.0	-
6	1816.0	55.3	17	1	1983.0	-	-
7	3422.0	66.8	17	2	1878.0	1339.0	-
8	5023.0	97.0	17	3	1203.0	1414.0	1665.0
9	625.0	87.8	17	3	1537.0	1147.0	1488.0
10	1611.0	86.7	17	3	1485.0	1937.0	1425.0
11	3224.0	81.6	17	2	1387.0	1842.0	-
12	4848.0	58.1	17	1	1160.0	-	-
13	6451.0	69.8	17	2	1103.0	1213.0	-
14	1417.0	71.3	17	2	1283.0	1564.0	-
15	3017.0	85.7	17	3	1247.0	1912.0	1905.0
16	4634.0	82.1	17	2	1404.0	1899.0	-
17	6257.0	54.9	17	1	1769.0	-	-

Type 5 Radar Waveform_10

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	1370.0	90.8	15	3	1239.0	1242.0	1484.0
1	3188.0	62.6	15	1	1906.0	-	-
2	5002.0	60.4	15	1	1945.0	-	-
3	6790.0	86.5	15	3	1550.0	1661.0	1695.0
4	1152.0	64.9	15	1	1183.0	-	-
5	2953.0	91.5	15	3	1598.0	1561.0	1788.0
6	4757.0	97.3	15	3	1770.0	1870.0	1707.0
7	6572.0	95.8	15	3	1309.0	1641.0	1402.0
8	92765.0	56.9	15	1	1755.0	-	-
9	2734.0	70.9	15	2	1887.0	1998.0	-
10	4541.0	94.8	15	3	1259.0	1841.0	1232.0
11	6347.0	85.9	15	3	1420.0	1798.0	1354.0
12	70425.0	53.9	15	1	1621.0	-	-
13	2508.0	92.1	15	3	1220.0	1882.0	1782.0
14	4334.0	56.2	15	1	1624.0	-	-
15	6128.0	89.9	15	3	1064.0	1396.0	1757.0

Type 5 Radar Waveform_11

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	59095.0	79.1	11	2	1191.0	1808.0	-
1	2823...	73.4	11	2	1670.0	1111.0	-
2	5048...	84.1	11	3	1373.0	1137.0	1432.0
3	7285...	69.9	11	2	1600.0	1335.0	-
4	31575.0	91.9	11	3	1493.0	1272.0	1200.0
5	2547...	79.2	11	2	1291.0	1704.0	-
6	4786...	62.5	11	1	1612.0	-	-
7	7009...	70.8	11	2	1677.0	1465.0	-
8	4127.0	54.5	11	1	1763.0	-	-
9	2268...	93.0	11	3	1927.0	1772.0	1006.0
10	4500...	66.8	11	2	2000.0	1696.0	-
11	6731...	67.9	11	2	1844.0	1676.0	-
12	8985...	52.0	11	1	1131.0	-	-

Type 5 Radar Waveform_12

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	2357...	89.8	9	3	1924.0	1576.0	1792.0
1	4999...	78.1	9	2	1539.0	1729.0	-
2	7622...	93.9	9	3	1863.0	1744.0	1804.0
3	1027...	67.9	9	2	1223.0	1947.0	-
4	2040...	50.3	9	1	1398.0	-	-
5	4684...	53.6	9	1	1084.0	-	-
6	7325...	53.5	9	1	1341.0	-	-
7	9945...	70.9	9	2	1946.0	1825.0	-
8	1713...	81.0	9	2	1138.0	1212.0	-
9	4342...	83.8	9	3	1747.0	1830.0	1582.0
10	6991...	77.8	9	2	1578.0	1010.0	-

Type 5 Radar Waveform_13

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	1178...	51.4	6	1	1702.0	-	-
1	1698...	59.4	6	1	1478.0	-	-
2	4921...	73.2	6	2	1953.0	1438.0	-
3	8144...	84.5	6	3	1134.0	1074.0	1604.0
4	1137...	72.0	6	2	1389.0	1802.0	-
5	1300...	61.1	6	1	1372.0	-	-
6	4517...	83.8	6	3	1855.0	1865.0	1503.0
7	7742...	94.6	6	3	1290.0	1853.0	1383.0
8	1097...	75.4	6	2	1955.0	1430.0	-

Type 5 Radar Waveform_14

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	62396.0	68.3	12	2	1076.0	1234.0	–
1	2851...	90.8	12	3	1538.0	1403.0	1042.0
2	5078...	98.0	12	3	1712.0	1040.0	1764.0
3	7333...	51.6	12	1	1030.0	–	–
4	34936.0	62.1	12	1	1055.0	–	–
5	2585...	63.0	12	1	1063.0	–	–
6	4819...	61.5	12	1	1540.0	–	–
7	7052...	50.1	12	1	1790.0	–	–
8	7362.0	89.6	12	3	1778.0	1611.0	1281.0
9	2305...	81.9	12	2	1715.0	1199.0	–
10	4538...	72.0	12	2	1627.0	1053.0	–
11	6771...	74.6	12	2	1251.0	1261.0	–
12	8999...	79.4	12	2	1861.0	1177.0	–

Type 5 Radar Waveform_15

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	1756...	93.8	14	3	1093.0	1319.0	1394.0
1	3691...	67.2	14	2	1552.0	1470.0	–
2	5616...	92.9	14	3	1029.0	1701.0	1480.0
3	7575...	50.8	14	1	1102.0	–	–
4	1519...	67.9	14	2	1957.0	1848.0	–
5	3462...	53.6	14	1	1072.0	–	–
6	5373...	88.4	14	3	1467.0	1734.0	1691.0
7	7331...	52.6	14	1	1657.0	–	–
8	1282...	68.9	14	2	1120.0	1958.0	–
9	3208...	98.1	14	3	1964.0	1449.0	1424.0
10	5137...	89.6	14	3	1888.0	1221.0	1590.0
11	7093...	56.2	14	1	1637.0	–	–
12	1044...	68.4	14	2	1934.0	1226.0	–
13	2977...	82.5	14	2	1487.0	1428.0	–
14	4919...	55.9	14	1	1500.0	–	–

Type 5 Radar Waveform_16

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	8564...	78.1	10	2	1382.0	1207.0	–
1	1007...	98.9	10	3	1984.0	1254.0	1298.0
2	3420...	93.4	10	3	1275.0	1629.0	1843.0
3	5851...	59.1	10	1	1832.0	–	–
4	8259...	72.2	10	2	1860.0	1594.0	–
5	70976.0	92.6	10	3	1446.0	1736.0	1393.0
6	3124...	83.8	10	3	1494.0	1722.0	1107.0
7	5541...	99.0	10	3	1024.0	1080.0	1829.0
8	7966...	80.1	10	2	1451.0	1400.0	–
9	41225.0	92.3	10	3	1589.0	1659.0	1638.0
10	2835...	55.8	10	1	1381.0	–	–
11	5238...	87.3	10	3	1528.0	1668.0	1823.0

Type 5 Radar Waveform_17							
Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	9198. . .	92. 2	8	3	1236. 0	1079. 0	1534. 0
1	13852. 0	53. 4	8	1	1049. 0	–	–
2	3041. . .	81. 4	8	2	1153. 0	1900. 0	–
3	5939. . .	99. 2	8	3	1169. 0	1483. 0	1448. 0
4	8857. . .	61. 8	8	1	1634. 0	–	–
5	1177. . .	53. 2	8	1	1001. 0	–	–
6	2685. . .	72. 0	8	2	1009. 0	1456. 0	–
7	5592. . .	65. 7	8	1	1834. 0	–	–
8	8499. . .	56. 0	8	1	1711. 0	–	–
9	1138. . .	91. 6	8	3	1771. 0	1181. 0	1094. 0

Type 5 Radar Waveform_18							
Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	2586. . .	71. 2	7	2	1130. 0	1350. 0	–
1	5803. . .	93. 3	7	3	1811. 0	1359. 0	1639. 0
2	9035. . .	80. 2	7	2	1838. 0	1548. 0	–
3	1227. . .	56. 2	7	1	1944. 0	–	–
4	2187. . .	72. 7	7	2	1287. 0	1995. 0	–
5	5407. . .	99. 4	7	3	1392. 0	1280. 0	1952. 0
6	8634. . .	92. 7	7	3	1184. 0	1257. 0	1533. 0
7	1187. . .	58. 3	7	1	1745. 0	–	–
8	1789. . .	95. 4	7	3	1653. 0	1070. 0	1252. 0

Type 5 Radar Waveform_19							
Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	4094. . .	93. 7	9	3	1892. 0	1880. 0	1463. 0
1	6736. . .	80. 6	9	2	1981. 0	1781. 0	–
2	9396. . .	55. 5	9	1	1016. 0	–	–
3	1139. . .	72. 0	9	2	1087. 0	1180. 0	–
4	3771. . .	90. 8	9	3	1921. 0	1197. 0	1807. 0
5	6411. . .	88. 6	9	3	1395. 0	1217. 0	1268. 0
6	9068. . .	62. 8	9	1	1295. 0	–	–
7	81494. 0	52. 4	9	1	1978. 0	–	–
8	3449. . .	86. 9	9	3	1439. 0	1008. 0	1549. 0
9	6100. . .	59. 9	9	1	1391. 0	–	–
10	8731. . .	68. 2	9	2	1429. 0	1379. 0	–

Type 5 Radar Waveform_20

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	53875.0	62.7	8	1	1819.0	–	–
1	3446...	58.6	8	1	1178.0	–	–
2	6350...	62.1	8	1	1845.0	–	–
3	9255...	66.3	8	1	1987.0	–	–
4	18035.0	96.3	8	3	1739.0	1930.0	1159.0
5	3078...	99.3	8	3	1872.0	1284.0	1780.0
6	5980...	87.6	8	3	1421.0	1472.0	1358.0
7	8882...	99.0	8	3	1738.0	1059.0	1270.0
8	1179...	77.8	8	2	1681.0	1313.0	–
9	2729...	53.0	8	1	1516.0	–	–

Type 5 Radar Waveform_21

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	6249...	96.4	6	3	1524.0	1007.0	1856.0
1	9476...	66.8	6	2	1925.0	1980.0	–
2	1270...	100.0	6	3	1333.0	1390.0	1081.0
3	2629...	86.5	6	3	1152.0	1866.0	1556.0
4	5857...	77.7	6	2	1651.0	1723.0	–
5	9097...	50.1	6	1	1225.0	–	–
6	1230...	79.0	6	2	1943.0	1316.0	–
7	2236...	66.0	6	1	1822.0	–	–
8	5461...	69.8	6	2	1224.0	1713.0	–

Type 5 Radar Waveform_22

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	5573...	84.4	12	3	1099.0	1397.0	1166.0
1	7660...	56.2	12	1	1826.0	–	–
2	1179...	71.7	12	2	1567.0	1654.0	–
3	3247...	96.9	12	3	1586.0	1195.0	1125.0
4	5334...	62.1	12	1	1117.0	–	–
5	7403...	56.7	12	1	1917.0	–	–
6	92257.0	86.6	12	3	1828.0	1753.0	1305.0
7	2994...	81.4	12	2	1622.0	1750.0	–
8	5064...	90.6	12	3	1264.0	1005.0	1245.0
9	7148...	60.6	12	1	1913.0	–	–
10	66909.0	99.0	12	3	1044.0	1121.0	1288.0
11	2747...	50.7	12	1	1095.0	–	–
12	4800...	85.1	12	3	1976.0	1114.0	1996.0
13	6899...	55.7	12	1	1112.0	–	–

Type 5 Radar Waveform_23

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	41313.0	87.9	13	3	1831.0	1523.0	1990.0
1	2487...	78.9	13	2	1365.0	1089.0	–
2	4564...	62.5	13	1	1709.0	–	–
3	6628...	81.2	13	2	1343.0	1672.0	–
4	15946.0	63.8	13	1	1068.0	–	–
5	2233...	59.9	13	1	1731.0	–	–
6	4302...	73.4	13	2	1649.0	1276.0	–
7	6381...	61.7	13	1	1963.0	–	–
8	8430...	93.8	13	3	1560.0	1919.0	1018.0
9	1974...	80.6	13	2	1720.0	1519.0	–
10	4039...	92.4	13	3	1323.0	1973.0	1378.0
11	6106...	97.4	13	3	1685.0	1809.0	1135.0
12	8206...	63.8	13	1	1293.0	–	–
13	1722...	55.6	13	1	1954.0	–	–

Type 5 Radar Waveform_24

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	4077...	85.6	12	3	1357.0	1632.0	1546.0
1	6323...	63.1	12	1	1992.0	–	–
2	8531...	88.4	12	3	1039.0	1907.0	1774.0
3	1576...	83.9	12	3	1116.0	1618.0	1126.0
4	3802...	86.5	12	3	1644.0	1019.0	1965.0
5	6043...	67.1	12	2	1377.0	1328.0	–
6	8268...	75.6	12	2	1896.0	1577.0	–
7	1305...	61.9	12	1	1263.0	–	–
8	3532...	91.0	12	3	1210.0	1435.0	1015.0
9	5774...	61.8	12	1	1733.0	–	–
10	8009...	50.0	12	1	1694.0	–	–
11	1030...	59.6	12	1	1518.0	–	–
12	3267...	59.6	12	1	1014.0	–	–

Type 5 Radar Waveform_25

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	5098...	67.8	12	2	1904.0	1052.0	–
1	7159...	97.0	12	3	1664.0	1011.0	1558.0
2	69878.0	88.4	12	3	1706.0	1017.0	1345.0
3	2771...	78.8	12	2	1218.0	1617.0	–
4	4852...	52.2	12	1	1209.0	–	–
5	6926...	61.2	12	1	1536.0	–	–
6	44525.0	61.0	12	1	1527.0	–	–
7	2520...	62.1	12	1	1573.0	–	–
8	4593...	57.6	12	1	1812.0	–	–
9	6673...	65.1	12	1	1171.0	–	–
10	18936.0	69.0	12	2	1344.0	1433.0	–
11	2265...	65.2	12	1	1198.0	–	–
12	4340...	56.0	12	1	1361.0	–	–
13	6390...	96.5	12	3	1961.0	1460.0	1371.0

Type 5 Radar Waveform_26

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	9133...	72.7	11	2	1023.0	1606.0	-
1	2162...	62.5	11	1	1966.0	-	-
2	4383...	91.2	11	3	1652.0	1462.0	1623.0
3	6635...	54.4	11	1	1362.0	-	-
4	8870...	64.7	11	1	1347.0	-	-
5	1881...	93.0	11	3	1491.0	1972.0	1636.0
6	4117...	81.0	11	2	1174.0	1650.0	-
7	6338...	95.9	11	3	1034.0	1499.0	1935.0
8	8576...	77.5	11	2	1501.0	1837.0	-
9	1610...	72.2	11	2	1854.0	1202.0	-
10	3846...	65.1	11	1	1939.0	-	-
11	6085...	64.3	11	1	1161.0	-	-
12	8306...	68.0	11	2	1167.0	1703.0	-

Type 5 Radar Waveform_27

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	2173...	80.2	5	2	1967.0	1366.0	-
1	5806...	75.9	5	2	1243.0	1312.0	-
2	9422...	87.9	5	3	1994.0	1529.0	1526.0
3	1308...	50.6	5	1	1021.0	-	-
4	1725...	81.1	5	2	1851.0	1903.0	-
5	5362...	54.1	5	1	1541.0	-	-
6	8996...	50.3	5	1	1490.0	-	-
7	1263...	55.6	5	1	1315.0	-	-

Type 5 Radar Waveform_28

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	53856.0	64.7	19	1	1318.0	-	-
1	2065...	55.4	19	1	1820.0	-	-
2	3593...	51.7	19	1	1710.0	-	-
3	5097...	90.2	19	3	1816.0	1479.0	1376.0
4	34878.0	86.1	19	3	1158.0	1338.0	1502.0
5	1877...	52.7	19	1	1827.0	-	-
6	3386...	93.6	19	3	1565.0	1647.0	1993.0
7	4922...	78.0	19	2	1300.0	1718.0	-
8	16120.0	98.0	19	3	1418.0	1835.0	1127.0
9	1685...	69.3	19	2	1969.0	1176.0	-
10	3211...	68.6	19	2	1815.0	1071.0	-
11	4741...	80.5	19	2	1109.0	1048.0	-
12	6259...	70.6	19	2	1201.0	1814.0	-
13	1501...	52.8	19	1	1585.0	-	-
14	3017...	99.5	19	3	1938.0	1002.0	1098.0
15	4537...	99.9	19	3	1858.0	1163.0	1277.0
16	6084...	57.3	19	1	1646.0	-	-
17	1307...	85.3	19	3	1765.0	1407.0	1364.0
18	2835...	66.7	19	2	1450.0	1388.0	-

Type 5 Radar Waveform_29

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	4354...	78.7	18	2	1794.0	1971.0	–
1	5887...	72.0	18	2	1619.0	1038.0	–
2	1122...	69.5	18	2	1168.0	1708.0	–
3	2654...	66.1	18	1	1363.0	–	–
4	4182...	63.7	18	1	1411.0	–	–
5	5687...	88.0	18	3	1032.0	1455.0	1444.0
6	93308.0	93.2	18	3	1579.0	1003.0	1655.0
7	2459...	80.9	18	2	1922.0	1133.0	–
8	3981...	86.2	18	3	1020.0	1028.0	1299.0
9	5507...	69.7	18	2	1719.0	1406.0	–
10	74874.0	64.4	18	1	1645.0	–	–
11	2267...	87.9	18	3	1660.0	1442.0	1123.0
12	3805...	61.1	18	1	1405.0	–	–
13	5333...	55.6	18	1	1531.0	–	–
14	55737.0	90.8	18	3	1801.0	1678.0	1743.0
15	2089...	57.9	18	1	1320.0	–	–
16	3615...	57.0	18	1	1776.0	–	–
17	5119...	89.4	18	3	1182.0	1609.0	1833.0
18	37238.0	64.3	18	1	1615.0	–	–

Type 5 Radar Waveform_30

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	3279...	78.7	9	2	1683.0	1931.0	–
1	5911...	90.2	9	3	1908.0	1317.0	1368.0
2	8544...	87.4	9	3	1571.0	1797.0	1466.0
3	31791.0	67.8	9	2	1970.0	1593.0	–
4	2954...	79.5	9	2	1989.0	1928.0	–
5	5602...	52.8	9	1	1595.0	–	–
6	8223...	96.5	9	3	1495.0	1273.0	1628.0
7	1086...	83.9	9	3	1477.0	1155.0	1514.0
8	2627...	97.5	9	3	1469.0	1240.0	1883.0
9	5269...	77.3	9	2	1725.0	1440.0	–
10	7910...	76.4	9	2	1013.0	1688.0	–

Radar Type 6 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Hopping Number	1=Detection 0=No Detection
1	5490.0	6.0	1
2	5506.0	9.0	1
3	5489.0	3.0	1
4	5508.0	7.0	1
5	5509.0	9.0	1
6	5510.0	4.0	1
7	5504.0	6.0	1
8	5504.0	9.0	1
9	5503.0	7.0	1
10	5503.0	4.0	1
11	5500.0	3.0	1
12	5501.0	6.0	1
13	5496.0	6.0	1
14	5505.0	3.0	1
15	5496.0	4.0	1
16	5501.0	5.0	1
17	5495.0	6.0	1
18	5507.0	3.0	1
19	5497.0	3.0	1
20	5504.0	6.0	1
21	5509.0	7.0	1
22	5490.0	6.0	1
23	5497.0	4.0	1
24	5507.0	7.0	1
25	5508.0	2.0	1
26	5500.0	5.0	1
27	5488.0	2.0	0
28	5505.0	3.0	1
29	5507.0	4.0	1
30	5499.0	4.0	1
Detection Percentage (%)			96.7%

Test Site	SIP-TR2	Test Engineer	Alisa Deng
Test Date	2021/03/01	Test Item	Radar Statistical Performance Check (802.11ac-VHT40 mode - 5510MHz)

Radar Type 1 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5509.0	1.0	878	61	1
2	5492.0	1.0	778	68	1
3	5502.0	1.0	598	89	1
4	5499.0	1.0	738	72	1
5	5486.0	1.0	538	99	1
6	5500.0	1.0	678	78	1
7	5513.0	1.0	698	76	1
8	5509.0	1.0	518	102	1
9	5487.0	1.0	578	92	1
10	5516.0	1.0	818	65	1
11	5492.0	1.0	658	81	1
12	5490.0	1.0	558	95	1
13	5511.0	1.0	758	70	1
14	5500.0	1.0	938	57	1
15	5526.0	1.0	3066	18	1
16	5515.0	1.0	2145	25	1
17	5509.0	1.0	942	57	1
18	5515.0	1.0	602	88	1
19	5490.0	1.0	2424	22	1
20	5503.0	1.0	1992	27	1
21	5519.0	1.0	1382	39	1
22	5503.0	1.0	2729	20	1
23	5525.0	1.0	2507	22	1
24	5493.0	1.0	2872	19	1
25	5521.0	1.0	1811	30	1
26	5531.0	1.0	2073	26	1
27	5499.0	1.0	1087	49	1
28	5486.0	1.0	1787	30	1
29	5502.0	1.0	2995	18	1
30	5522.0	1.0	2282	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	5507.0	4.6	199	29	1
2	5524.0	4.4	164	28	1
3	5489.0	4.4	154	28	1
4	5520.0	1.5	202	23	1
5	5513.0	2.0	222	24	1
6	5508.0	1.1	207	23	1
7	5522.0	3.4	186	27	1
8	5510.0	2.1	200	24	1
9	5513.0	3.6	210	27	1
10	5523.0	2.2	165	25	1
11	5506.0	3.6	190	27	1
12	5494.0	3.0	195	26	1
13	5501.0	2.6	157	25	1
14	5504.0	4.8	226	29	1
15	5523.0	4.6	155	29	1
16	5514.0	4.0	194	28	1
17	5516.0	4.1	160	28	1
18	5514.0	3.0	172	26	1
19	5491.0	2.1	227	24	1
20	5509.0	4.3	169	28	1
21	5500.0	5.0	173	29	1
22	5520.0	1.9	180	24	1
23	5493.0	2.5	197	25	1
24	5506.0	1.3	205	23	1
25	5518.0	2.4	184	25	1
26	5496.0	4.2	214	28	1
27	5518.0	1.5	229	24	1
28	5524.0	2.1	215	25	1
29	5526.0	3.3	206	27	1
30	5487.0	2.8	201	26	1
Detection Percentage (%)					100%

Radar Type 3 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5506.0	9.6	278	18	1
2	5492.0	9.4	477	18	1
3	5525.0	9.4	383	18	1
4	5494.0	6.5	341	16	1
5	5507.0	7.0	320	16	1
6	5511.0	6.1	353	16	1
7	5506.0	8.7	447	18	1
8	5499.0	7.1	315	16	1
9	5527.0	8.6	322	17	1
10	5496.0	7.2	257	16	1
11	5502.0	8.6	439	17	1
12	5505.0	8.0	451	17	1
13	5488.0	7.6	379	17	1
14	5516.0	9.8	488	18	1
15	5501.0	9.6	378	18	1
16	5488.0	9.0	393	18	1
17	5534.0	9.1	342	18	0
18	5509.0	8.0	449	17	1
19	5507.0	7.1	409	16	1
20	5523.0	9.3	317	18	1
21	5529.0	10.0	433	18	1
22	5525.0	6.9	364	16	1
23	5504.0	7.5	434	17	1
24	5505.0	6.3	373	16	1
25	5506.0	7.4	415	17	1
26	5512.0	9.2	318	18	1
27	5531.0	6.5	218	16	1
28	5500.0	7.1	213	16	1
29	5487.0	8.3	489	17	1
30	5523.0	7.8	240	17	1
Detection Percentage (%)					96.7%

Radar Type 4 - Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5532.0	19.0	278	16	1
2	5527.0	18.5	477	16	1
3	5510.0	18.7	383	16	1
4	5489.0	12.2	341	12	1
5	5489.0	13.3	320	13	1
6	5501.0	11.3	353	12	1
7	5503.0	17.1	447	15	1
8	5524.0	13.5	315	13	1
9	5514.0	16.9	322	15	1
10	5511.0	13.8	257	13	1
11	5521.0	16.9	439	15	1
12	5514.0	15.4	451	14	1
13	5508.0	14.5	379	13	1
14	5491.0	19.5	488	16	1
15	5500.0	19.1	378	16	1
16	5520.0	17.7	393	15	1
17	5500.0	18.0	342	15	1
18	5516.0	15.6	449	14	1
19	5523.0	13.4	409	13	1
20	5510.0	18.4	317	16	1
21	5534.0	20.0	433	16	0
22	5486.0	13.1	364	13	1
23	5509.0	14.3	434	13	1
24	5524.0	11.8	373	12	1
25	5520.0	14.3	415	13	1
26	5520.0	18.1	318	15	1
27	5521.0	12.3	218	12	1
28	5511.0	13.6	213	13	1
29	5490.0	16.2	489	14	1
30	5506.0	15.1	240	14	1
Detection Percentage (%)					96.7%

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%+96.7%+96.7%)/4 = 98.3% (>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	5510.0	1	16	5498.4	1
2	5510.0	1	17	5498.8	1
3	5510.0	1	18	5497.2	1
4	5510.0	1	19	5495.6	1
5	5510.0	1	20	5498.8	1
6	5510.0	1	21	5520.4	1
7	5510.0	1	22	5524.8	1
8	5510.0	1	23	5524.0	1
9	5510.0	1	24	5525.6	1
10	5510.0	1	25	5524.0	1
11	5498.0	1	26	5521.2	1
12	5496.8	1	27	5525.2	1
13	5496.4	1	28	5524.4	1
14	5500.0	1	29	5522.4	1
15	5499.6	1	30	5523.2	1
Detection Percentage (%)					100%

Type 5 Radar Waveform_1

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	82955.0	94.5	19	3	1100.0	1497.0	1559.0
1	2351...	91.5	19	3	1451.0	1252.0	1483.0
2	3866...	92.6	19	3	1597.0	1933.0	1592.0
3	5414...	56.6	19	1	1803.0	–	–
4	64521.0	62.9	19	1	1135.0	–	–
5	2171...	52.0	19	1	1819.0	–	–
6	3681...	84.1	19	3	1749.0	1667.0	1454.0
7	5232...	64.0	19	1	1120.0	–	–
8	45528.0	82.5	19	2	1661.0	1664.0	–
9	1986...	65.5	19	1	1089.0	–	–
10	3501...	82.5	19	2	1549.0	1935.0	–
11	5029...	74.4	19	2	1415.0	1529.0	–
12	26777.0	69.7	19	2	1434.0	1472.0	–
13	1788...	97.1	19	3	1979.0	1233.0	1102.0
14	3303...	95.1	19	3	1780.0	1949.0	1851.0
15	4821...	87.1	19	3	1629.0	1943.0	2000.0
16	7980.0	88.6	19	3	1337.0	1356.0	1490.0
17	1604...	75.4	19	2	1167.0	1704.0	–
18	3137...	63.6	19	1	1293.0	–	–

Type 5 Radar Waveform_2

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	4905...	90.8	18	3	1279.0	1286.0	1521.0
1	6514...	99.6	18	3	1078.0	1510.0	1247.0
2	1498...	61.7	18	1	1807.0	–	–
3	3105...	68.3	18	2	1595.0	1461.0	–
4	4724...	54.7	18	1	1717.0	–	–
5	6320...	68.2	18	2	1773.0	1687.0	–
6	1294...	89.2	18	3	1970.0	1125.0	1232.0
7	2913...	57.2	18	1	1528.0	–	–
8	4526...	64.4	18	1	1503.0	–	–
9	6127...	78.6	18	2	1495.0	1406.0	–
10	1099...	72.8	18	2	1645.0	1205.0	–
11	2710...	74.4	18	2	1035.0	1443.0	–
12	4320...	73.4	18	2	1059.0	1669.0	–
13	5912...	96.5	18	3	1607.0	1785.0	1305.0
14	90183.0	79.7	18	2	1174.0	1175.0	–
15	2514...	51.6	18	1	1847.0	–	–
16	4110...	98.5	18	3	1642.0	1389.0	1496.0
17	5742...	60.5	18	1	1520.0	–	–

Type 5 Radar Waveform_3

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	66542.0	82.2	18	2	1204.0	1901.0	–
1	2194...	58.8	18	1	1725.0	–	–
2	3704...	85.9	18	3	1108.0	1975.0	1621.0
3	5240...	69.7	18	2	1641.0	1165.0	–
4	47690.0	92.2	18	3	1423.0	1566.0	1132.0
5	2007...	64.8	18	1	1465.0	–	–
6	3529...	73.0	18	2	1377.0	1215.0	–
7	5059...	57.9	18	1	1919.0	–	–
8	28916.0	83.6	18	3	1209.0	1889.0	1636.0
9	1819...	59.4	18	1	1334.0	–	–
10	3347...	52.6	18	1	1385.0	–	–
11	4853...	84.7	18	3	1272.0	1094.0	1895.0
12	10225.0	69.3	18	2	1275.0	1290.0	–
13	1622...	87.0	18	3	1309.0	1539.0	1872.0
14	3144...	96.1	18	3	1131.0	1551.0	1727.0
15	4684...	64.4	18	1	1860.0	–	–
16	6184...	97.2	18	3	1028.0	1882.0	1640.0
17	1435...	84.6	18	3	1433.0	1291.0	1586.0
18	2963...	82.8	18	2	1396.0	1531.0	–

Type 5 Radar Waveform_4

Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
0	9498...	73.2	7	2	1891.0	1103.0	–
1	1271...	87.9	7	3	1475.0	1320.0	1181.0
2	2645...	88.5	7	3	1212.0	1511.0	1638.0
3	5874...	73.7	7	2	1755.0	1162.0	–
4	9091...	94.9	7	3	1388.0	1126.0	1884.0
5	1232...	69.6	7	2	1468.0	1953.0	–
6	2248...	85.4	7	3	1317.0	1565.0	1355.0
7	5483...	59.7	7	1	1295.0	–	–
8	8695...	91.1	7	3	1292.0	1268.0	1660.0