Dynamic Frequency Selection (DFS) Test Report

ISR-AP1101AC-I-B WiFi module inside of C1109-4PLTE2PWB router

FCC ID: LDKC11011757
IC: 2461N-11011757

5250-5350, 5470-5725 MHz

Against the following Specifications:
CFR47 Part 15.407
RSS-247

ACCREDITED

Cisco Systems
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This report replaces any previously entered test report under EDCS – 15463834. This test report has been electronically authorized and archived using the CISCO Engineering Document Control system. Test Report Template EDCS# 1537616.

Section 1: Overview

Samples were assessed against the tests detailed in section 3 under the requirements of the following specifications:

Specifications:
CFR47 Part 15.407 RSS-247

Measurements were made in accordance with

1. KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02

Section 2: Assessment Information

2.1 General

This report contains an assessment of an apparatus against Radio Standards based upon tests carried out on the samples submitted. The testing was performed by and for the use of Cisco systems Inc:

With regard to this assessment, the following points should be noted:

a) The results contained in this report relate only to the items tested and were obtained in the period between the date of the initial assessment and the date of issue of the report. Manufactured products will not necessarily give identical results due to production and measurement tolerances.
b) The apparatus was set up and exercised using the configuration and modes of operation defined in this report only.
c) Where relevant, the apparatus was only assessed using the susceptibility criteria defined in this report and the Test Assessment Plan (TAP).
d) All testing was performed under the following environmental conditions:

Temperature	15°C to 35°C (54°F to 95°F)
Atmospheric Pressure	860mbar to 1060mbar (25.4" to 31.3")
Humidity	10% to 75*%

All AC testing was performed at one or more of the following supply voltages:
110V 60 Hz (+/-20%)

Units of Measurement

The units of measurements defined in the appendices are reported in specific terms, which are test dependent. Where radiated measurements are concerned these are defined at a particular distance. Basic voltage measurements are defined in units of [dBuV]

As an example, the basic calculation for all measurements is as follows:

Emission level [dBuV] = Indicated voltage level [dBuV] + Cable Loss [dB] + Other correction factors [dB]

The combinations of correction factors are dependent upon the exact test configurations [see test equipment lists for further details] and may include:-

Antenna Factors, Pre Amplifier Gain, LISN Loss, Pulse Limiter Loss and Filter Insertion Loss..

Note: to convert the results from dBuV/m to uV/m use the following formula:-

Level in uV/m = Common Antilogarithm [(X dBuV/m)/20] = Y uV/m

Measurement Uncertainty Values

voltage and power measurements	± 2 dB
conducted EIRP measurements	± 1.4 dB
radiated measurements	± 3.2 dB
frequency measurements	± 2.4 10-7
temperature measurements	± 0.54º.
humidity measurements	± 2.3%
DC and low frequency measurements	± 2.5%.

Where relevant measurement uncertainty levels have been estimated for tests performed on the apparatus. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Radiated emissions (expanded uncertainty, confidence interval 95%)

30 MHz - 300 MHz	+/- 3.8 dB
300 MHz - 1000 MHz	+/- 4.3 dB
1 GHz - 10 GHz	+/- 4.0 dB
10 GHz - 18GHz	+/- 8.2 dB
18GHz - 26.5GHz	+/- 4.1 dB
26.5GHz - 40GHz	+/- 3.9 dB

Conducted emissions (expanded uncertainty, confidence interval 95%)

30 MHz – 40GHz	+/- 0.38 dB

A product is considered to comply with a requirement if the nominal measured value is below the limit line.
The product is considered to not be in compliance in case the nominal measured value is above the limit line.

2.2 Date of testing (initial sample receipt date to last date of testing)

20-Aug-2018 through 18-Sept - 2018

2.3 Report Issue Date

Cisco uses an electronic system to issue, store and control the revision of test reports. This system is called the Engineering Document Control System (EDCS). The actual report issue date is embedded into the original file on EDCS. Any copies of this report, either electronic or paper, that are not on EDCS must be considered uncontrolled

2.4 Testing facilities

This assessment was performed by:

Testing Laboratory

Cisco Systems, Inc.
125 West Tasman Drive (Building P)
San Jose, CA 95134
USA

Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134
USA

Test Engineers

Farida Rahmanzai

2.5 Equipment Assessed (EUT)

C1109-4PLTE2PWB with ISR-AP1101AC-I-B

2.6 EUT Description

The C1109 is a next generation Enterprise/MSP/M2M low end router with Wave 2 802.11ac WLAN, LTE pluggable architecture and Ethernet LAN/WAN.

The modes included in this report represent the worst case data for all modes.

The following antennas are supported by this product series.
The data included in this report represent the worst case data for all antennas.

Frequency	Part Number	Antenna Type	Antenna Gain (dBi)
2.4GHz / 5GHz	07-1147-01	Dipole	2.14 / 4
2.4GHz / 5GHz	07-100497-01	Ceiling Mount Omni Directional	2.14 / 4
2.4GHz / 5GHz	07-100496-01	Roof Mount	2.14 / 4

Section 3: Result Summary

Antenna Conducted Test

Basic Standard	Technical Requirement / Details	Result
RSS-247 15.407	Dynamic Frequency Selection (DFS) Detection Threshold	Pass
	U-NII Detection Bandwidth	Pass
	Performance Requirements Check • Initial Channel Availability Check Time • Radar Pulse at the Beginning of the Channel Availability Check Time • Radar Pulse at the End of the Channel Availability Check Time	Pass
	In-Service Monitoring • Channel Move Time • Channel Closing Time	Pass
	Non-Occupancy Period	Pass
	Statistical Performance Check	Pass

Section 4: Sample Details

Note: Each sample was evaluated to ensure that its condition was suitable to be used as a test sample prior to the commencement of testing. Please also refer to the “Justification for worst Case test Configuration” section of this report for further details on the selection of EUT samples.

4.1 Sample Details

Sample No.	Equipment Details	Manufacturer	Hardware Rev.	Firmware Rev.	Software Rev.	Serial Number
S01	C1109-4PLTE2PWB with ISR-AP1101AC-I-B WiFi adpater	Cisco Systems	P2	ce271f0c3bd6087f274af2d1d72e15b7	8.5.1.10	FGL2216906F
S02	Delta Electronics AC/DC Adapter	Delta	NA	NA	NA	DTH1749D08Z
S03	AIR-CAP3702E-A-K9	Cisco Systems	NA	NA	NA	FOC171065N2
S04	Laptop PC (traffic server)	HP	NA	NA	Windows 10Pro	CNU431C1BZ

4.2 System Details

System #	Description	Samples
1	C1109-4PLTE2PWB with ISR-AP1101AC-I-B WiFi adpater	S01
	Support Power Supply	S02
	Support Client Equipment	S03
	Laptop PC (traffic server)	S04

4.3 Mode of Operation Details

Mode#	Description	Comments
1	UUT continuously transmitting	Continuous Transmitting ~19% traffic load for statistics tests (iperf).
2	UUT associated with client, on channel, no traffic	No traffic for detection bandwidth and timing plot tests. (D0 tests)
3	Powered UUT off & on	Boot up for CAC tests.

Appendix A: Dynamic Frequency Selection (DFS)

From 15.407:

(h) Transmit Power Control (TPC) and Dynamic Frequency Selection (DFS).

(1) Transmit power control (TPC). U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

(2) Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems. Operators shall only use equipment with a DFS mechanism that is turned on when operating in these bands. The device must sense for radar signals at 100 percent of its emission bandwidth. The minimum DFS detection threshold for devices with a maximum e.i.r.p. of 200 mW to 1 W is −64 dBm. For devices that operate with less than 200 mW e.i.r.p. and a power spectral density of less than 10 dBm in a 1 MHz band, the minimum detection threshold is −62 dBm. The detection threshold is the received power averaged over 1 microsecond referenced to a 0 dBi antenna. For the initial channel setting, the manufacturers shall be permitted to provide for either random channel selection or manual channel selection.

(i) Operational Modes. The DFS requirement applies to the following operational modes:

(A) The requirement for channel availability check time applies in the master operational mode.

(B) The requirement for channel move time applies in both the master and slave operational modes.

(ii) Channel Availability Check Time. A U-NII device shall check if there is a radar system already operating on the channel before it can initiate a transmission on a channel and when it has to move to a new channel. The U-NII device may start using the channel if no radar signal with a power level greater than the interference threshold values listed in paragraph (h)(2) of this section, is detected within 60 seconds.

(iii) Channel Move Time. After a radar's presence is detected, all transmissions shall cease on the operating channel within 10 seconds. Transmissions during this period shall consist of normal traffic for a maximum of 200 ms after detection of the radar signal. In addition, intermittent management and control signals can be sent during the remaining time to facilitate vacating the operating channel.

(iv) Non-occupancy Period. A channel that has been flagged as containing a radar system, either by a channel availability check or in-service monitoring, is subject to a non-occupancy period of at least 30 minutes. The non-occupancy period starts at the time when the radar system is detected.

(i) *Device Security.* All U-NII devices must contain security features to protect against modification of software by unauthorized parties.

(1) Manufacturers must implement security features in any digitally modulated devices capable of operating in any of the U-NII bands, so that third parties are not able to reprogram the device to operate outside the parameters for which the device was certified. The software must prevent the user from operating the transmitter with operating frequencies, output power, modulation types or other radio frequency parameters outside those that were approved for the device. Manufacturers may use means including, but not limited to the use of a private network that allows only authenticated users to download software, electronic signatures in software or coding in hardware that is decoded by software to verify that new software can be legally loaded into a device to meet these requirements and must describe the methods in their application for equipment authorization.

(2) Manufacturers must take steps to ensure that DFS functionality cannot be disabled by the operator of the U-NII device.

A.1.0 UNII Device Description

1. The device operates in the following bands:
   a. 5150-5250 MHz
   b. 5250-5350 MHz
   c. 5470-5725 MHz
   d. 5725-5850 MHz

2. The maximum EIRP of the 5GHz equipment is 25.02 dBm, and the minimum possible EIRP is 17.68 dBm.

   Below are the available 50 ohm antenna assemblies and their corresponding gains. 0dBi gain was used to set the -63 dBm threshold level (-64dBm +1 dB) during calibration of the test setup.

Frequency	Part Number	Antenna Type	Antenna Gain (dBi)
5GHz	07-1147-01	Dipole	4
5GHz	07-100497-01	Ceiling Mount Omni Directional	4
5GHz	07-100496-01	Roof Mount	4

3. System testing was performed with the designated MPEG test file that streams full motion video at 30 frames per second from the Master to the Client IP based system.

4. The Master requires 108.9 seconds to complete its power-on cycle.

5. Information regarding the parameters of the detected Radar Waveforms is not available to the end user.

6. For the 5250-5350 MHz and 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.

A.2.0 DFS Detection Thresholds

1. **Interference Threshold values, Master or Client incorporating In-Service Monitoring**

Table 3: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

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.	

2. **DFS Response Requirement Values**

Table 4: DFS Response Requirement Values

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.	

A.3.0 Radar Test Waveforms

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.

1. **Short Pulse Radar Test Waveforms**

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

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. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.

For example if in Short Pulse Radar Type 1 Test B a PRI of 3066 usec is selected, the number of pulses would be $\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{3066}\right)\right\} = \text{Roundup}\{17.2\} = 18.$

Table 5a - Pulse Repetition Intervals Values for Test A

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

The aggregate is the average of the percentage of successful detections of Short Pulse Radar Types 1-4. For example, the following table indicates how to compute the aggregate of percentage of successful detections.

Radar Type	Number of Trials	Number of Successful Detections	Minimum Percentage of Successful Detection
1	35	29	82.9%
2	30	18	60%
3	30	27	90%
4	50	44	88%
Aggregate (82.9% + 60% + 90% + 88%)/4 = 80.2%			

2. **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 Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

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

Each waveform is defined as follows:

1) The transmission period for the Long Pulse Radar test signal is 12 seconds.
2) There are a total of 8 to 20 Bursts in the 12 second period, with the number of Bursts being randomly chosen. This number is Burst_Count.
3) Each Burst consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each Burst within the 12 second sequence may have a different number of pulses.
4) The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a Burst will have the same pulse width. Pulses in different Bursts may have different pulse widths.
5) Each pulse has a linear FM chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a Burst will have the same chirp width. Pulses in different Bursts may have different chirp widths. The chirp is centered on the pulse. For example, with a radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.
6) If more than one pulse is present in a Burst, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a Burst, the time between the first and second pulses is chosen independently of the time between the second and third pulses.
7) The 12 second transmission period is divided into even intervals. The number of intervals is equal to Burst_Count. Each interval is of length (12,000,000 / Burst_Count) microseconds. Each interval contains one Burst. The start time for the Burst, relative to the beginning of the interval, is between 1 and [(12,000,000 / Burst_Count) – (Total Burst Length) + (One Random PRI Interval)] microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each Burst is chosen independently.

A representative example of a Long Pulse Radar Type waveform:
1) The total test waveform length is 12 seconds.
2) Eight (8) *Bursts* are randomly generated for the *Burst_Count*.
3) *Burst* 1 has 2 randomly generated pulses.
4) The pulse width (for both pulses) is randomly selected to be 75 microseconds.
5) The PRI is randomly selected to be at 1213 microseconds.
6) *Bursts* 2 through 8 are generated using steps 3 – 5.
7) Each *Burst* is contained in even intervals of 1,500,000 microseconds. The starting location for Pulse 1, *Burst* 1 is randomly generated (1 to 1,500,000 minus the total *Burst* 1 length + 1 random PRI interval) at the 325,001 microsecond step. *Bursts* 2 through 8 randomly fall in successive 1,500,000 microsecond intervals (i.e. *Burst* 2 falls in the 1,500,001 – 3,000,000 microsecond range).

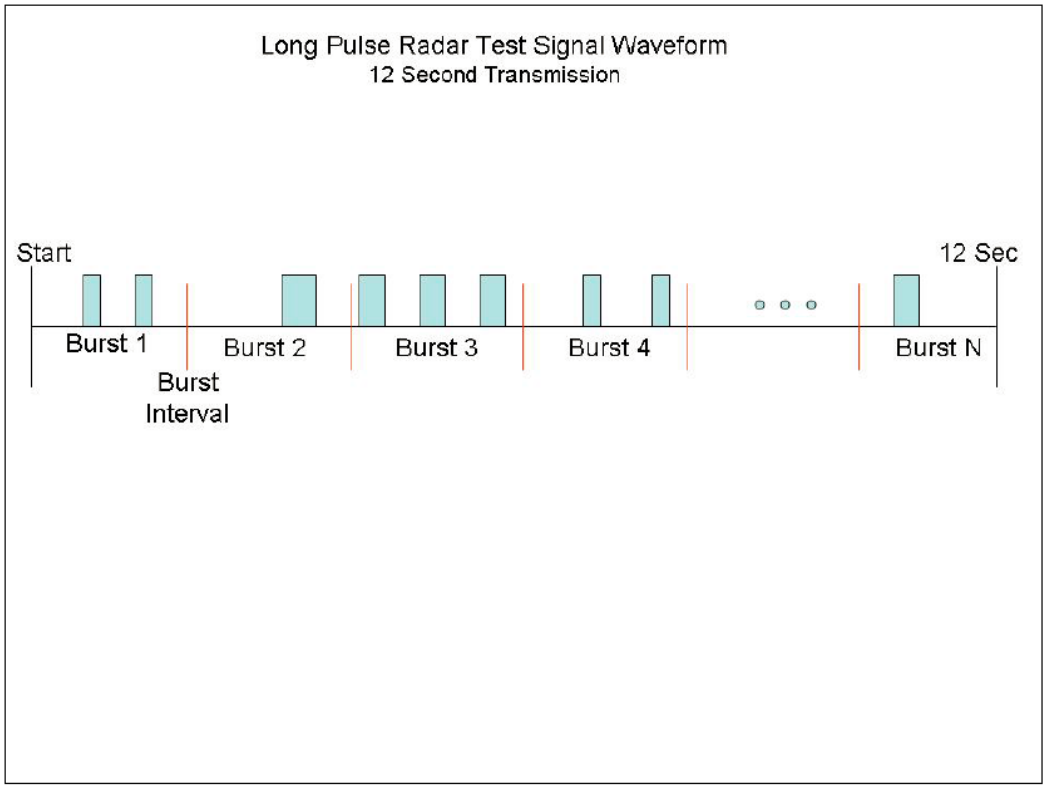


Figure 1: Graphical Representation of a Long Pulse Radar Type Waveform

3. **Frequency Hopping Radar Test Waveform**

Table 7 – 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 Trials
6	1	333	9	.333	300	70%	30

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[1] 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 – 5724 MHz. 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.

Appendix B: Dynamic Frequency Selection / Test Results

Standards Reference:

15.407 / RSS-247

Test Procedure
Ref. KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02

Test parameters
Span = 0 Hz
RBW ≥ 3 MHz
VBW ≥ 3 MHz
Detector = Peak
Trace = Single sweep

Tested By :
Farida Rahmanzai

Date of testing:
20-Aug-2018 through 18-Sept - 2018

Test Result : PASS

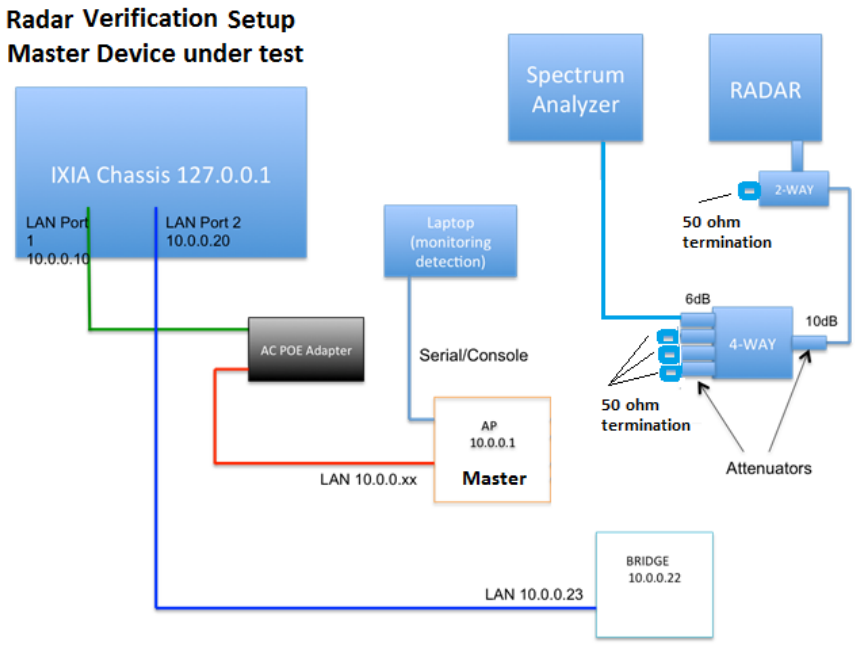
See Appendix C for list of test equipment

Waveform Verification

The following equipment setup was used to calibrate the conducted Radar Waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process there were no transmissions by either the Master or Client Device. The spectrum analyzer was switched to the zero span (Time Domain) mode at the frequency of the Radar Waveform generator. Peak detection was utilized. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz.

The signal generator amplitude was set so that the power level measured at the spectrum analyzer was

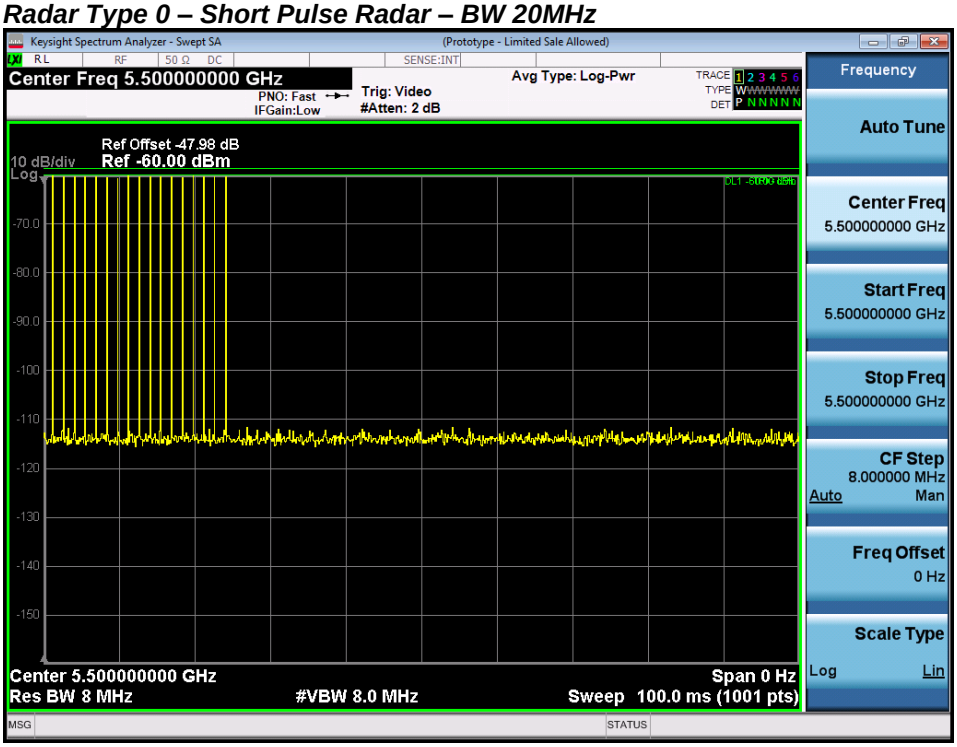
-60dBm.



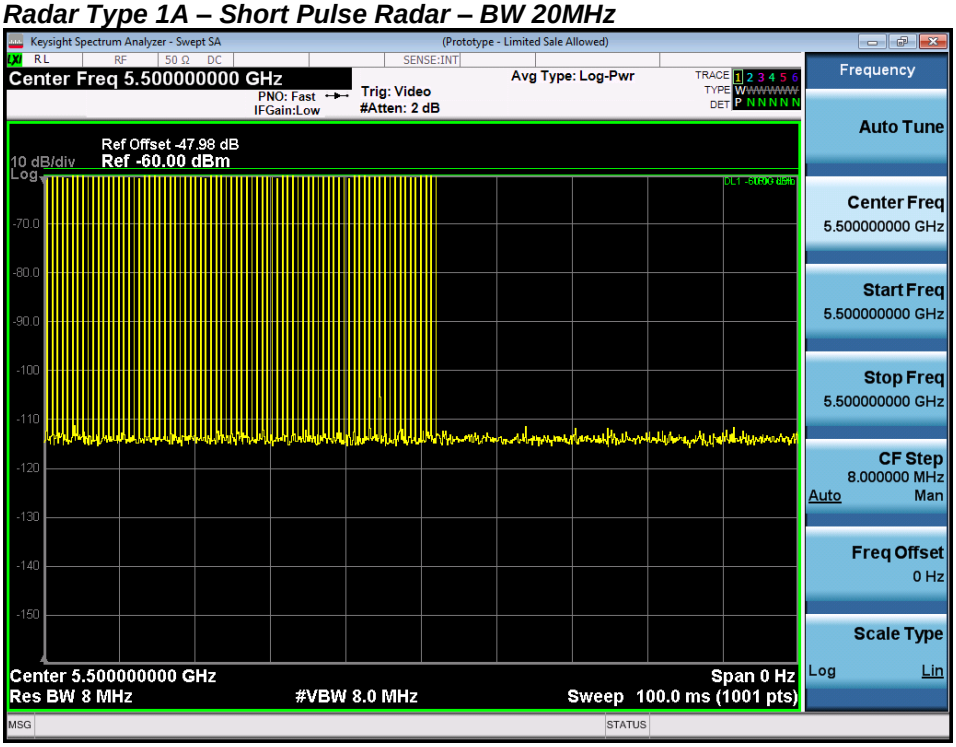
Conducted Calibration Setup

Following are the verification plots for each of the required radar waveforms.

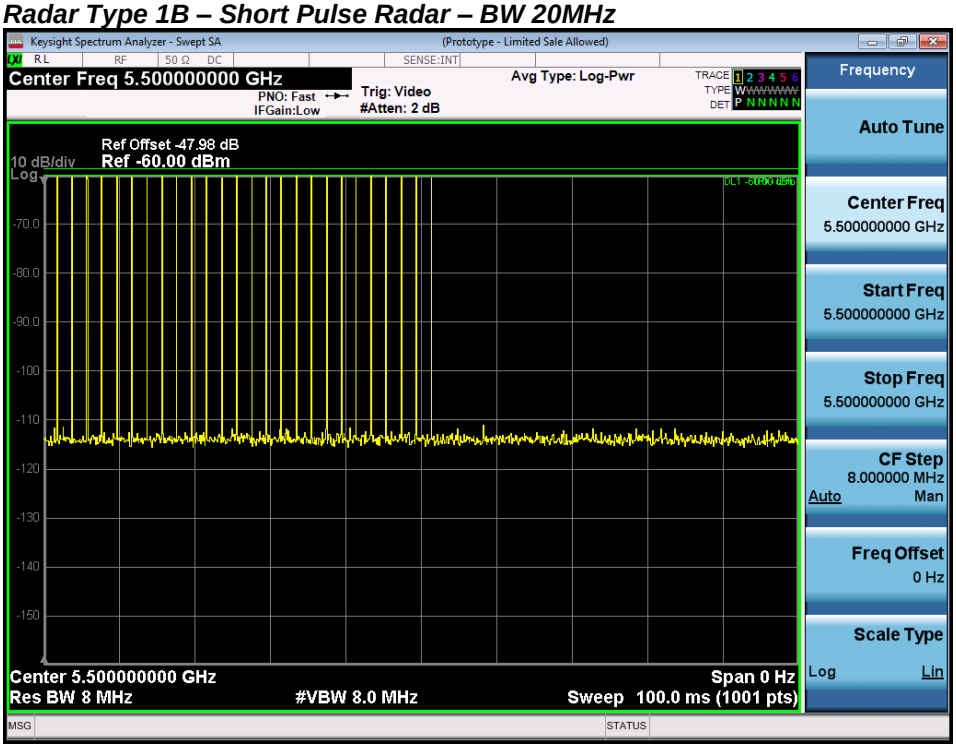
Radar Type 0 – Short Pulse Radar – BW 20MHz



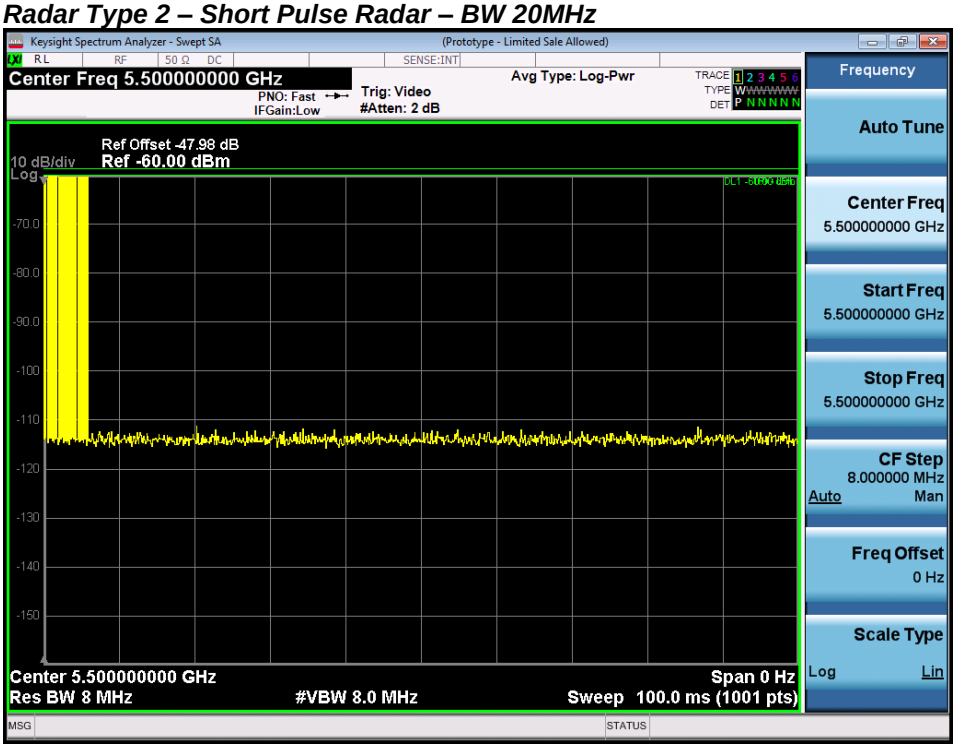
Radar Type 1A – Short Pulse Radar – BW 20MHz



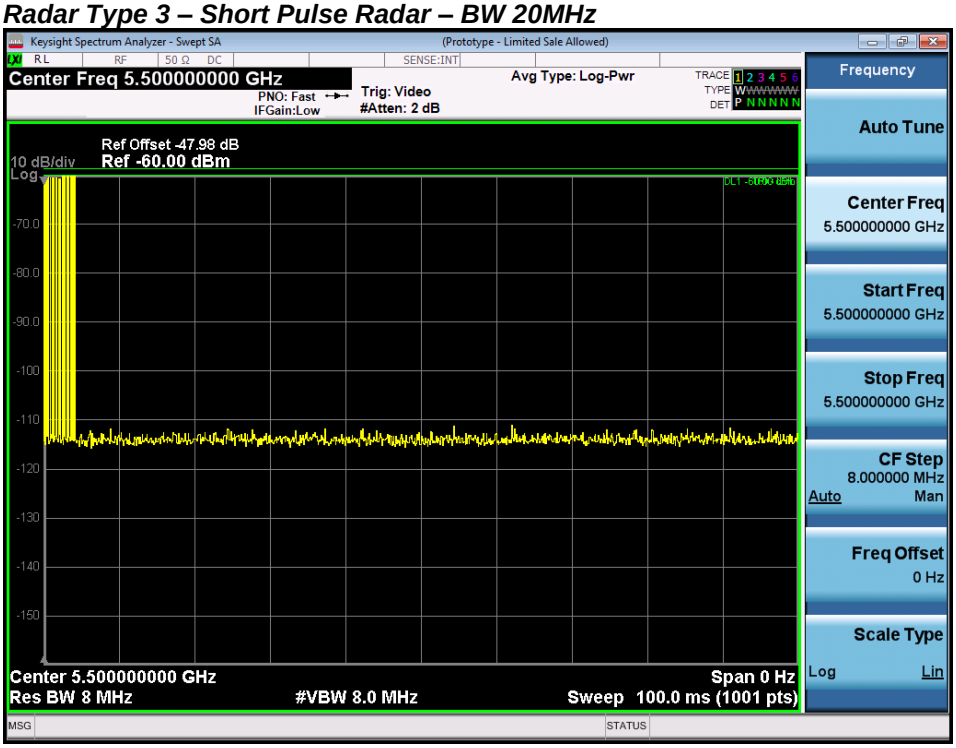
Radar Type 1B – Short Pulse Radar – BW 20MHz



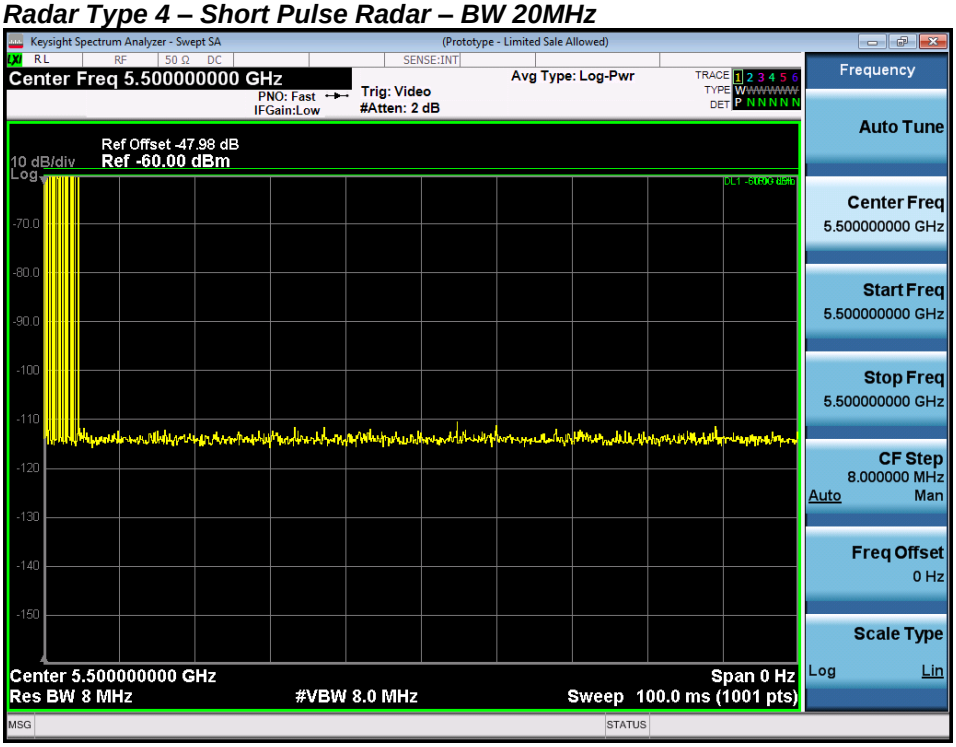
Radar Type 2 – Short Pulse Radar – BW 20MHz



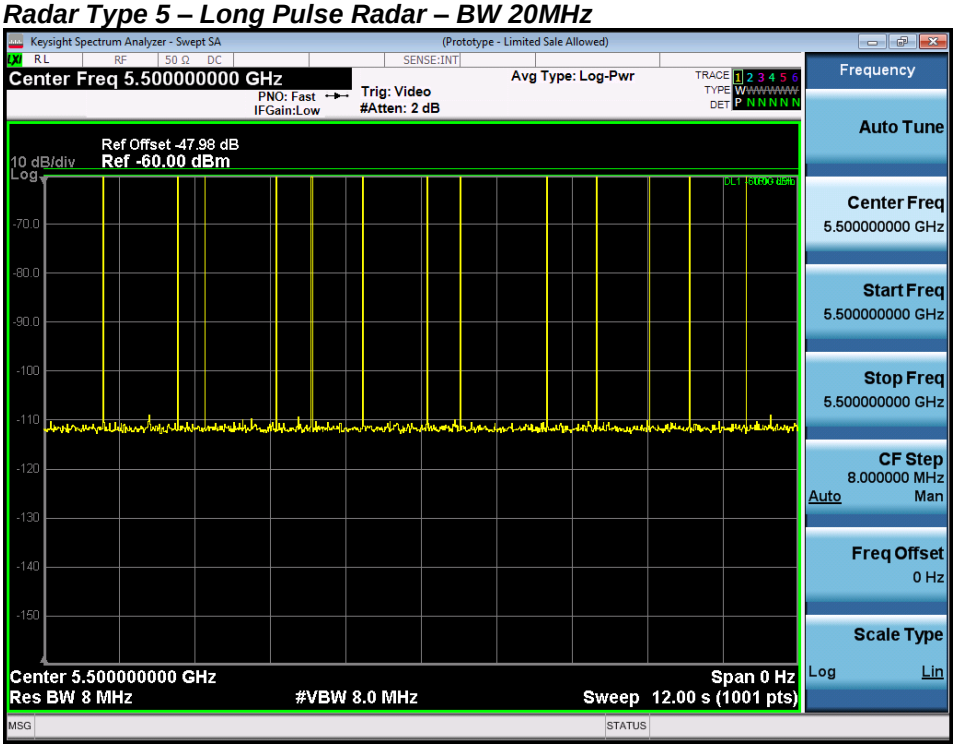
Radar Type 3 – Short Pulse Radar – BW 20MHz



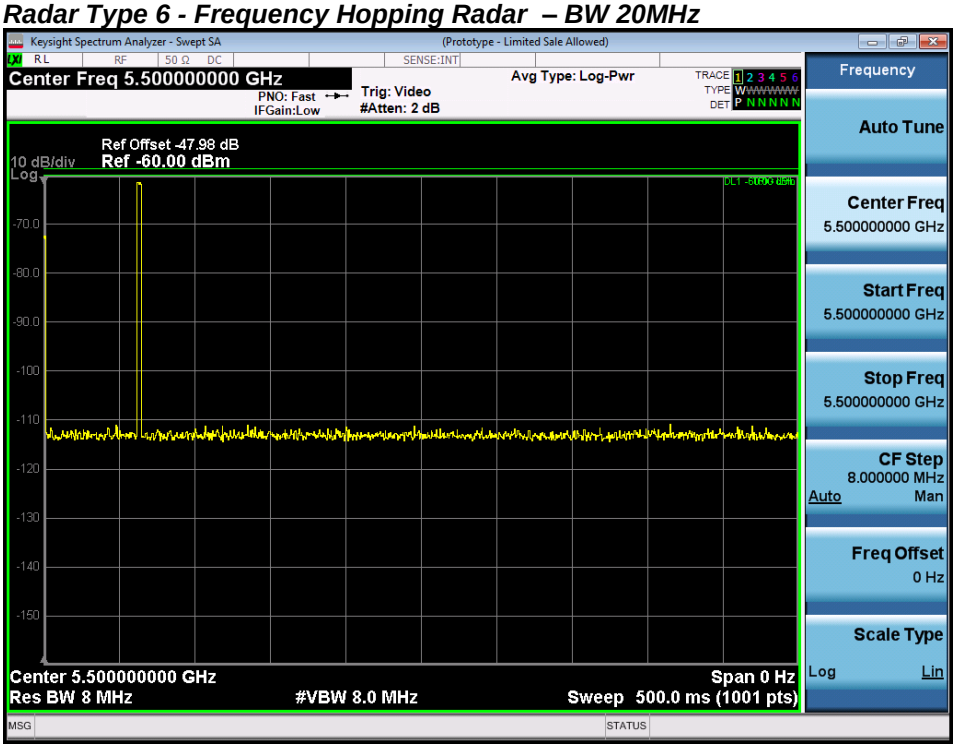
Radar Type 4 – Short Pulse Radar – BW 20MHz



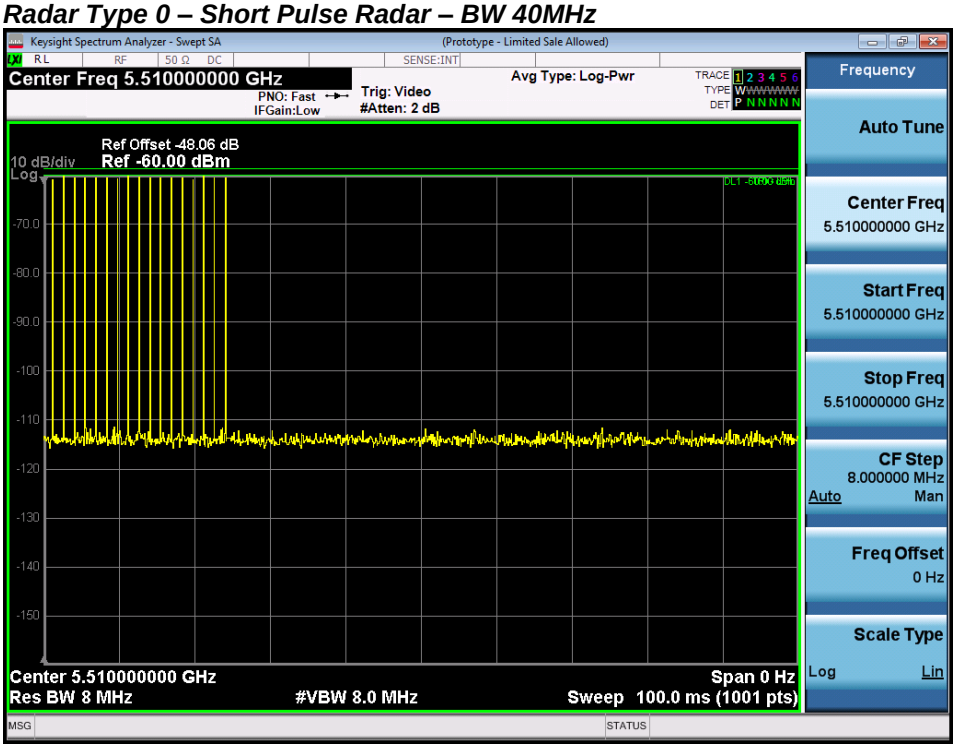
Radar Type 5 – Long Pulse Radar – BW 20MHz



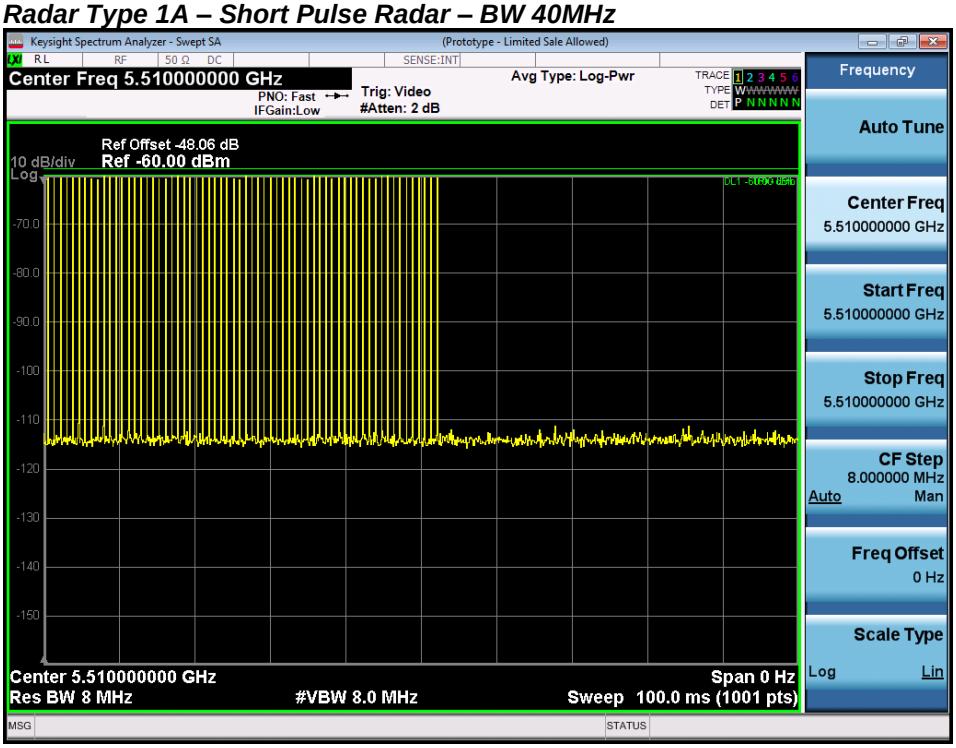
Radar Type 6 - Frequency Hopping Radar – BW 20MHz



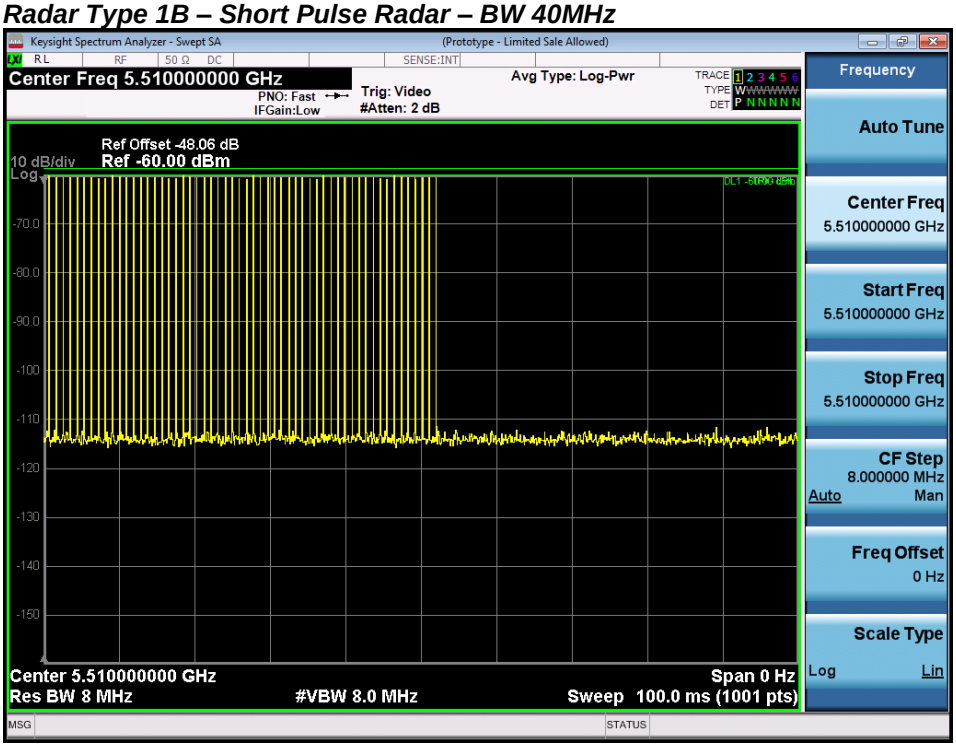
Radar Type 0 – Short Pulse Radar – BW 40MHz



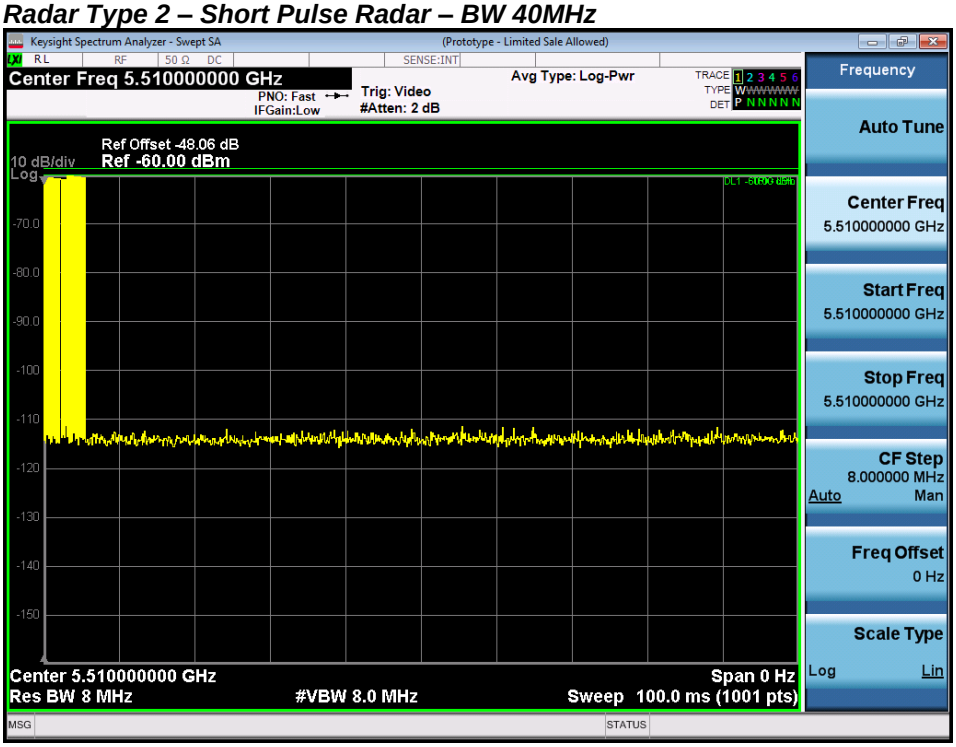
Radar Type 1A – Short Pulse Radar – BW 40MHz



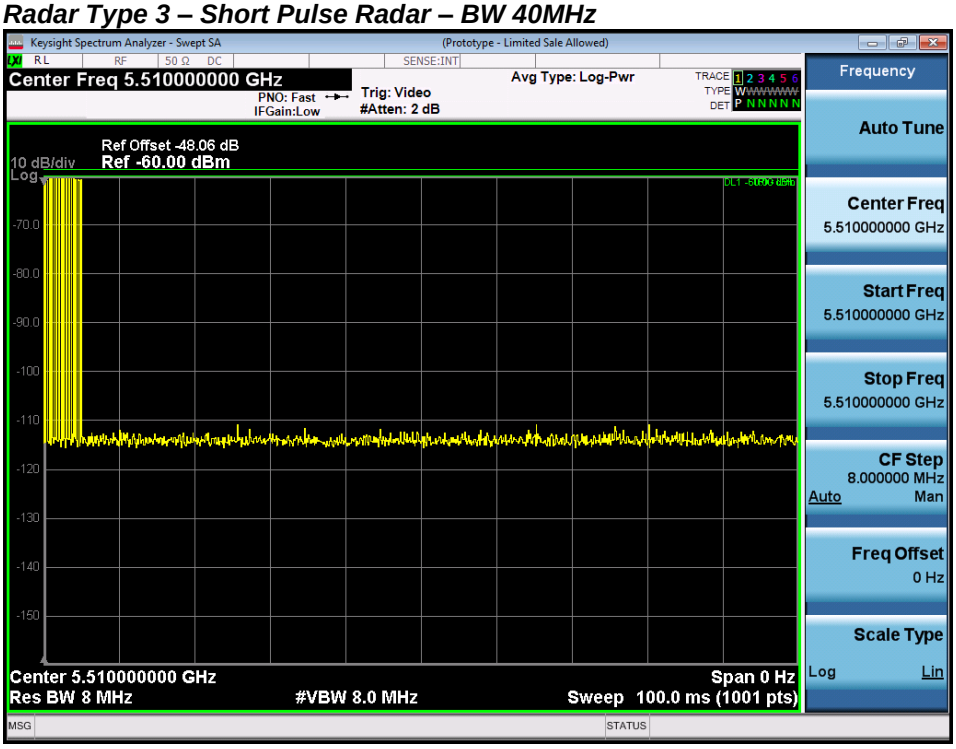
Radar Type 1B – Short Pulse Radar – BW 40MHz



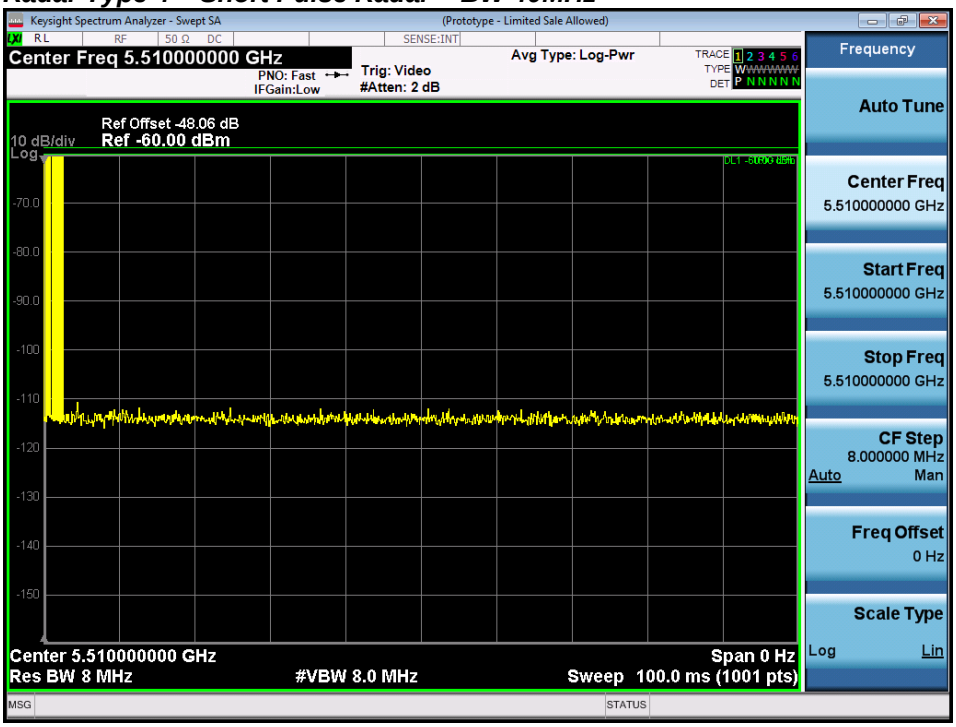
Radar Type 2 – Short Pulse Radar – BW 40MHz



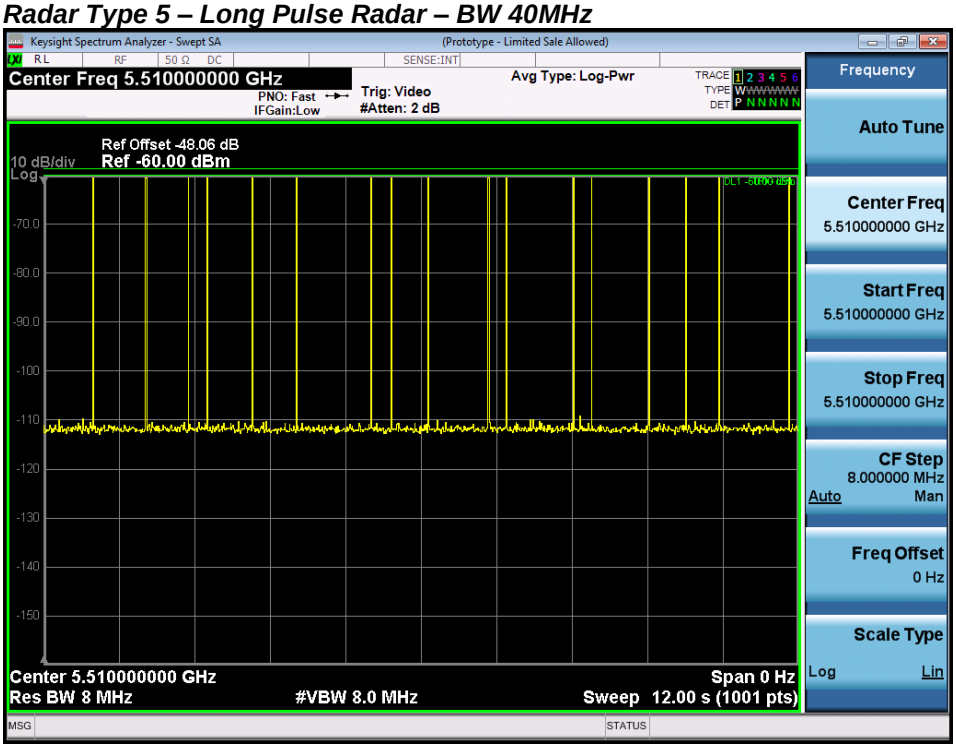
Radar Type 3 – Short Pulse Radar – BW 40MHz



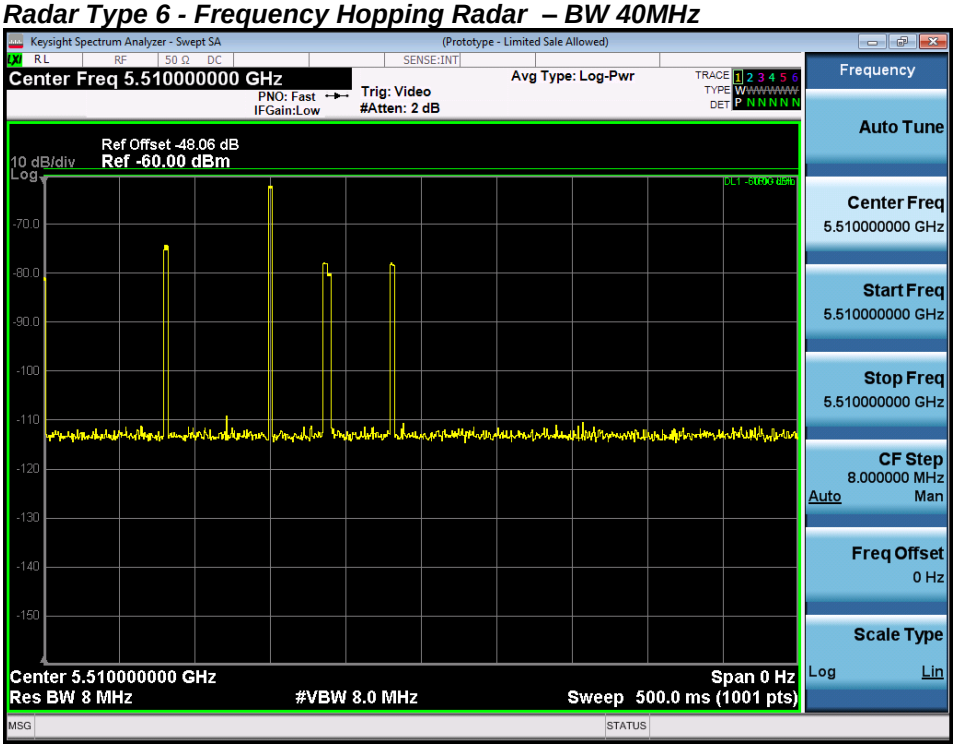
Radar Type 4 – Short Pulse Radar – BW 40MHz



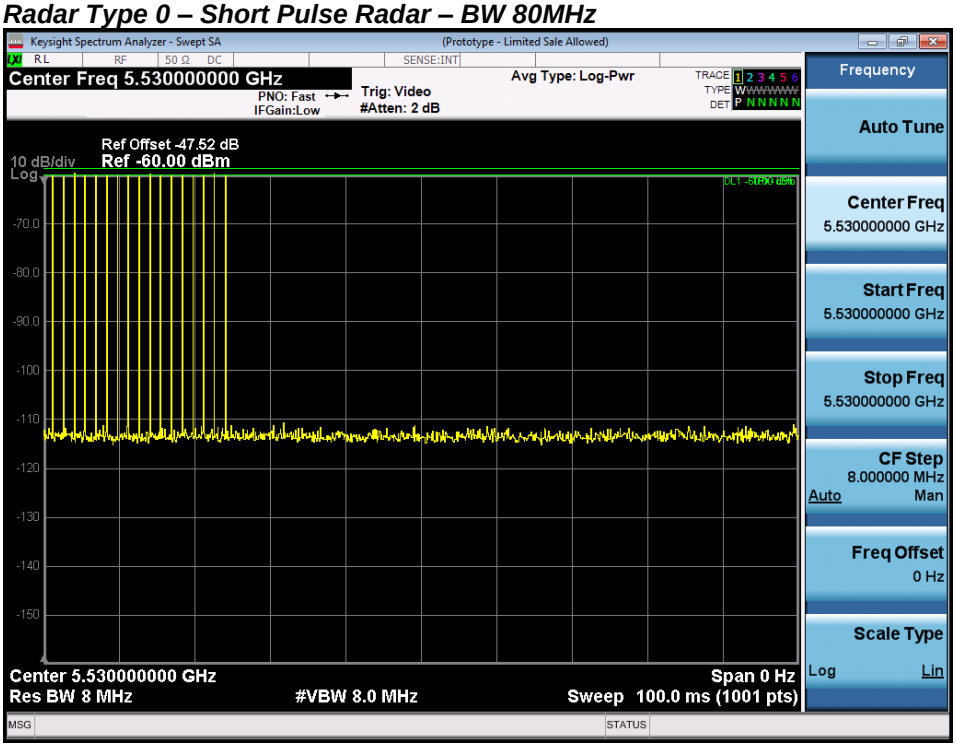
Radar Type 5 – Long Pulse Radar – BW 40MHz



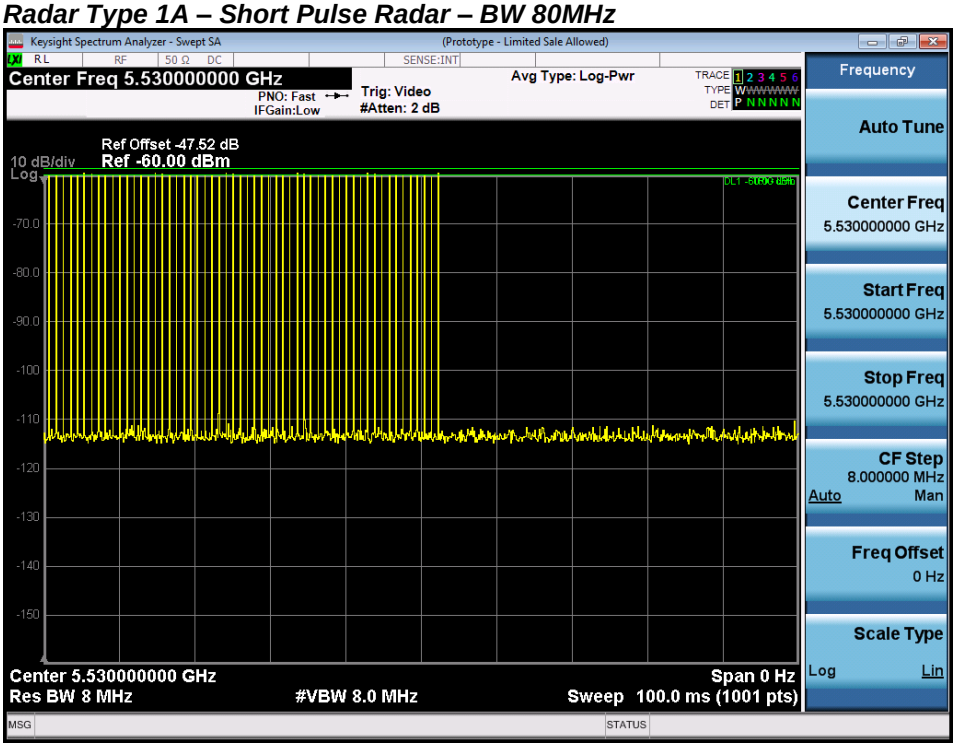
Radar Type 6 - Frequency Hopping Radar – BW 40MHz



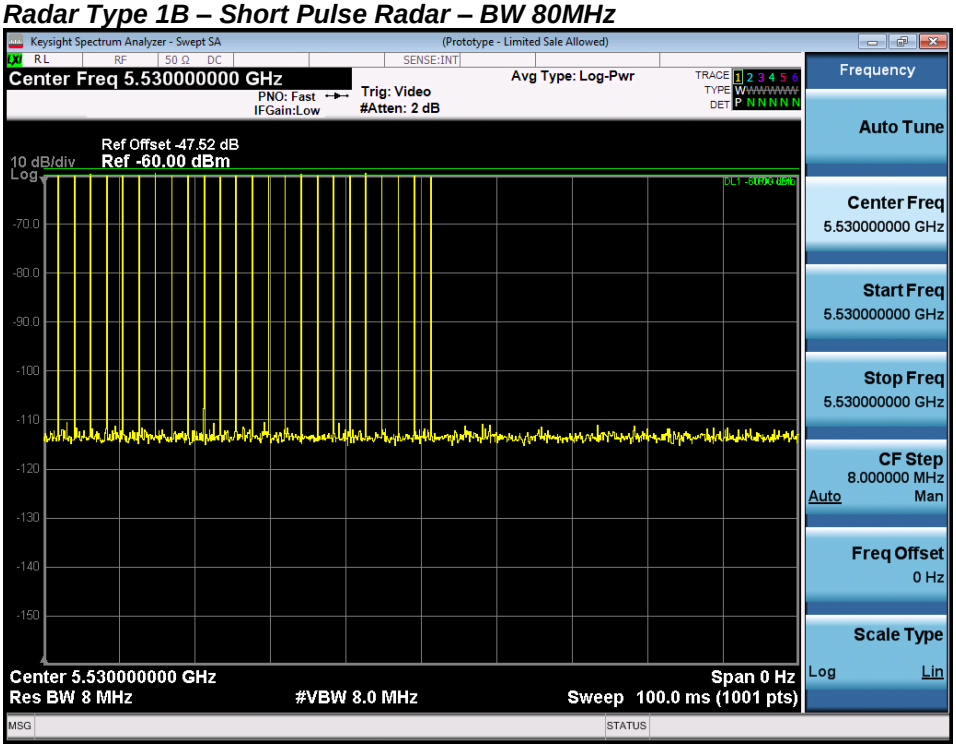
Radar Type 0 – Short Pulse Radar – BW 80MHz



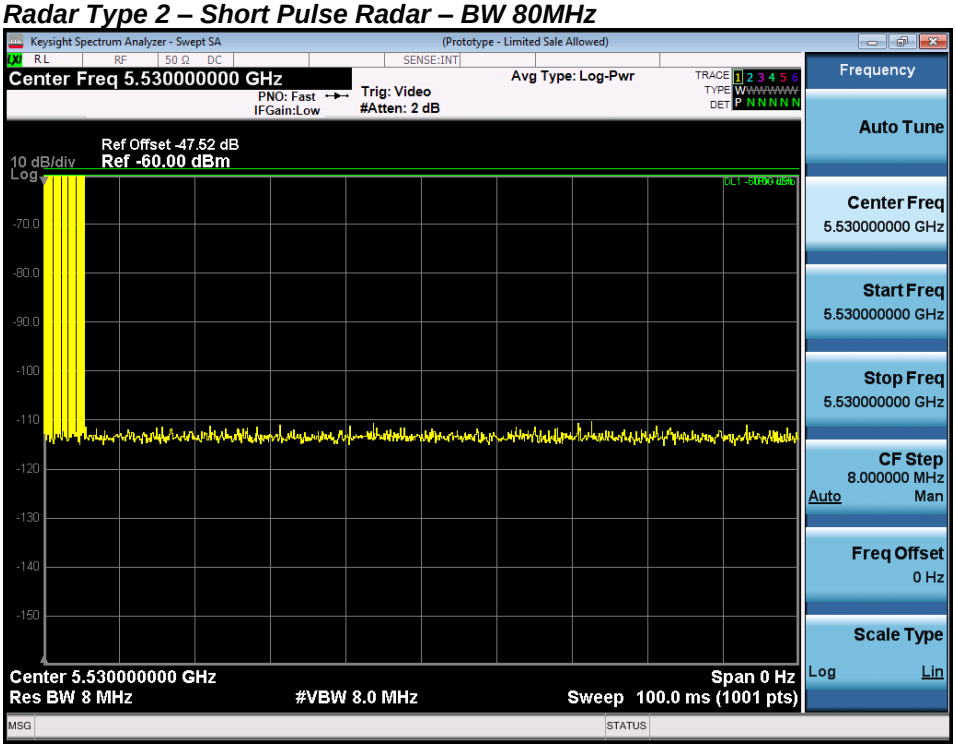
Radar Type 1A – Short Pulse Radar – BW 80MHz



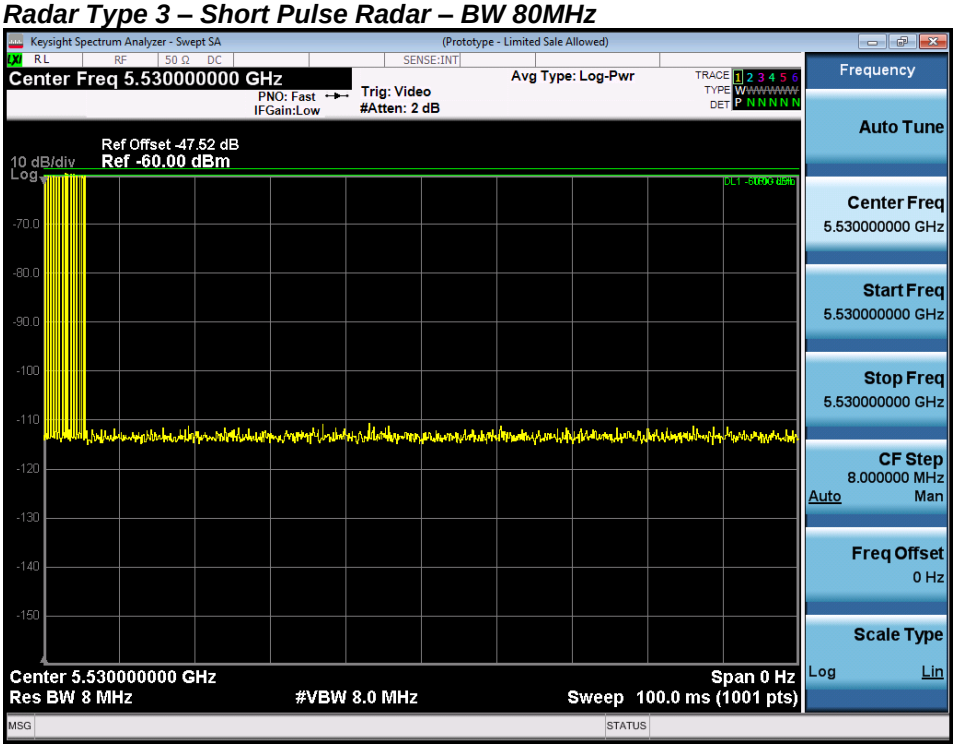
Radar Type 1B – Short Pulse Radar – BW 80MHz



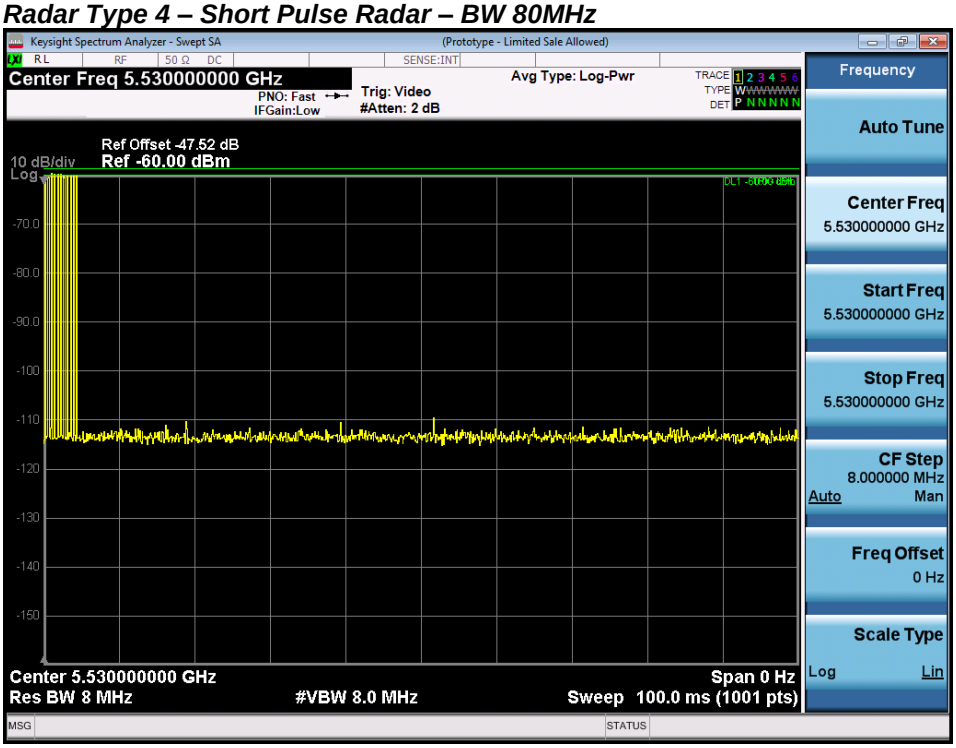
Radar Type 2 – Short Pulse Radar – BW 80MHz



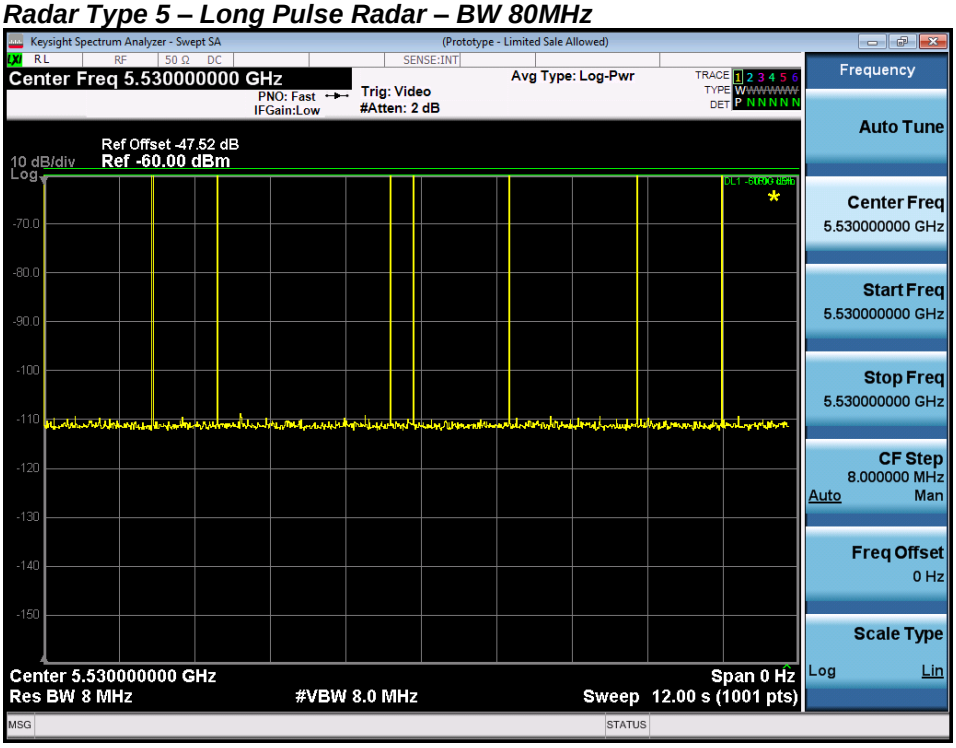
Radar Type 3 – Short Pulse Radar – BW 80MHz



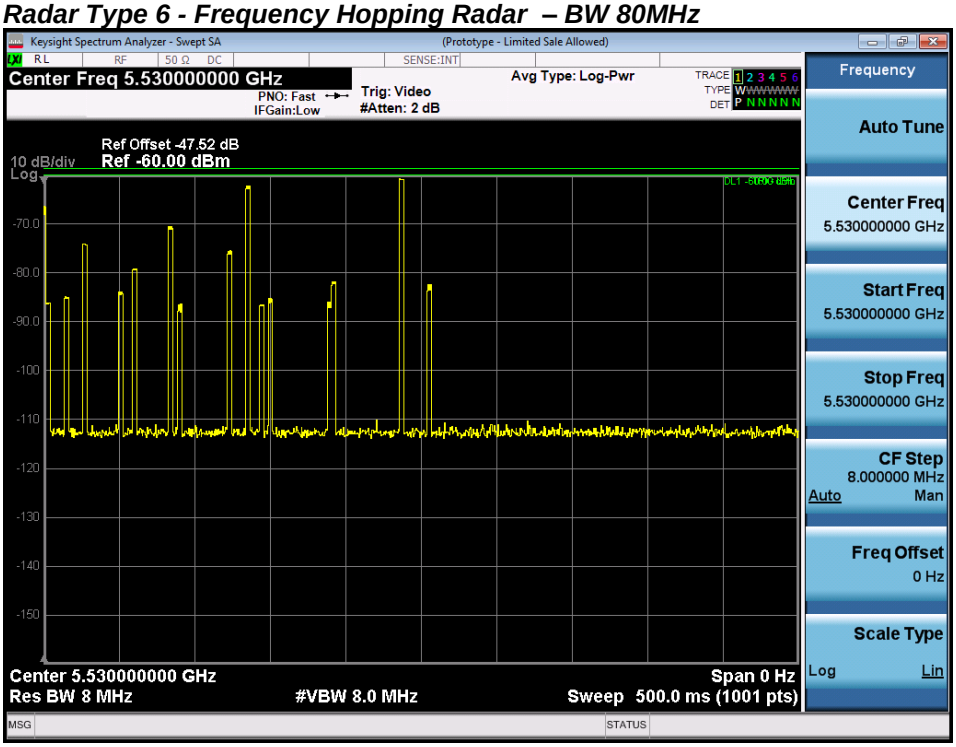
Radar Type 4 – Short Pulse Radar – BW 80MHz



Radar Type 5 – Long Pulse Radar – BW 80MHz

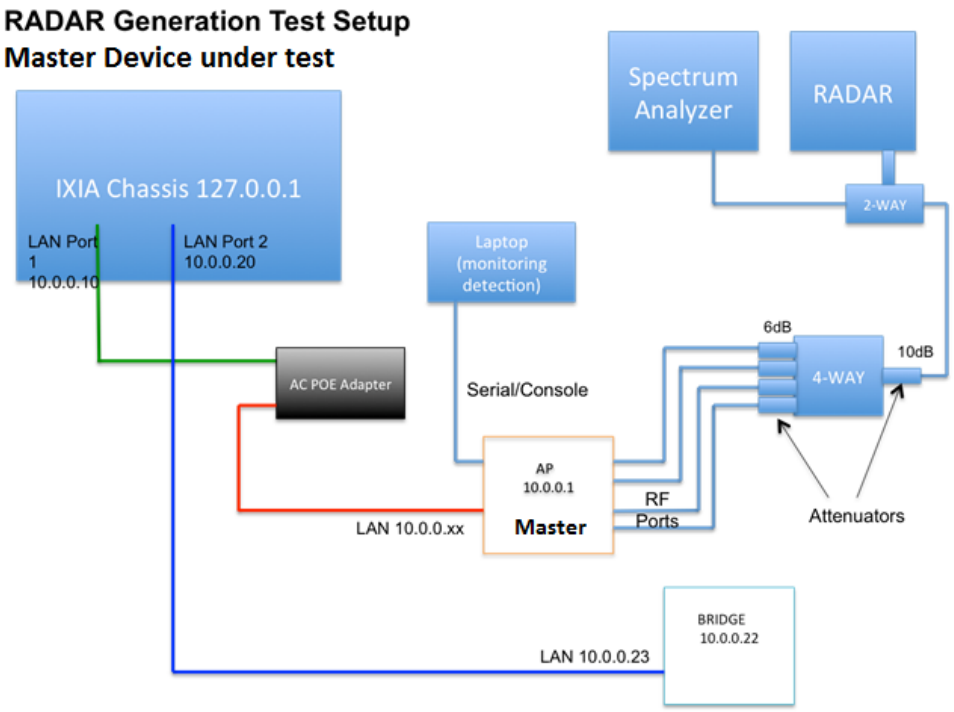


Radar Type 6 - Frequency Hopping Radar – BW 80MHz



Test Procedure/Results

1. A spectrum analyzer is used as a monitor to verify that the UUT has vacated the Channel within the (Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the detection and Channel move. It is also used to monitor UUT transmissions during the Channel Availability Check Time.
2. Following is the test setup used to generate the Radar Waveforms, and for all DFS tests described herein.



Conducted Setup: Radar Test Waveforms are injected into the Master

The waveform parameters from within the bounds of the signal type are selected randomly using uniform distribution.

UNII Detection Bandwidth

Procedure from KDB 905462, Section 7.8.1 U-NII Detection Bandwidth:

Set up the generating equipment as shown in **Figure 8**, or equivalent. Set up the DFS timing monitoring equipment as shown in **Figure 13** or **Figure 14**. Set up the overall system for either radiated or conducted coupling to the UUT.

Adjust the equipment to produce a single *Burst* of any one of the Short Pulse Radar Types 0 – 4 in **Table 5** at the center frequency of the UUT *Operating Channel* at the specified *DFS Detection Threshold* level found in **Table 3**.

Set the UUT up as a standalone 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.

Generate a single radar *Burst*, and note the response of the UUT. Repeat for a minimum of 10 trials. The UUT must detect the *Radar Waveform* within the DFS band using the specified *U-NII Detection Bandwidth* criterion shown in **Table 4**. 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.

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 4**. 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.

Starting at the center frequency of the UUT operating *Channel*, decrease 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 4**. Repeat this measurement in 1MHz steps at frequencies 5 MHz above where the detection rate begins to fall. 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.

The *U-NII Detection Bandwidth* is calculated as follows:
U-NII Detection Bandwidth = FH – FL

The *U-NII Detection Bandwidth* must meet the *U-NII Detection Bandwidth* criterion specified in **Table 4**. Otherwise, the UUT does not comply with DFS requirements. This is essential to ensure that the UUT is capable of detecting *Radar Waveforms* across the same frequency spectrum that contains the significant energy from the system. In the case that the *U-NII Detection Bandwidth* is greater than or equal to the 99 percent power bandwidth for the measured FH and FL, the test can be truncated and the *U-NII Detection Bandwidth* can be reported as the measured FH and FL.

All UNII 20 MHz channels for this device have identical Channel bandwidths, all 40 MHz channels have identical Channel bandwidths, and all 80 MHz channels have identical Channel bandwidths. Therefore, all DFS testing was done at 5500 MHz. The 99% channel bandwidth for 20MHz signals is 18 MHz, the the 99% channel bandwidth for 40MHz signals is 36 MHz, and the 99% channel bandwidth for 80MHz signals is 72. (See the 26dB BW section of the RF report for further measurement details).

The radar frequency is increased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The highest frequency at which detection is greater than or equal to 90% is denoted as Fh.

The radar frequency is decreased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The lowest frequency at which detection is greater than or equal to 90% is denoted as Fl.

The U-NII Detection Bandwidth must be at least 100% of the UUT transmitter 99% power bandwidth (20 MHz for 20MHz signals, 40 MHz for 40 MHz signals, and 80 MHz for 80 MHz signals), otherwise, the UUT does not comply with DFS requirements.

For the chirped Bin 5 radar, the U-NII Detection Bandwidth must be at least 80% of the UUT transmitter 99% power bandwidth (16 MHz for 20MHz signals, 32 MHz for 40 MHz signals, and 64 MHz for 80 MHz signals), otherwise, the UUT does not comply with DFS requirements.

UNII Detection Bandwidth Results, 20MHz Signal Bandwidth
Type 0 Radar Pulse

	DFS Detection Trials (1=Detection, Blank= No Detection)												
Radar Frequency	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)	Detection Bandwidth (MHz)	Limit (MHz)
5490	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		
5496	1	1	1	1	1	1	1	1	1	1	100		
5497	1	1	1	1	1	1	1	1	1	1	100		
5498	1	1	1	1	1	1	1	1	1	1	100		
5499	1	1	1	1	1	1	1	1	1	1	100		
5500	1	1	1	1	1	1	1	1	1	1	100	20	18
5501	1	1	1	1	1	1	1	1	1	1	100		
5502	1	1	1	1	1	1	1	1	1	1	100		
5503	1	1	1	1	1	1	1	1	1	1	100		
5504	1	1	1	1	1	1	1	1	1	1	100		
5505	1	1	1	1	1	1	1	1	1	1	100		
5506	1	1	1	1	1	1	1	1	1	1	100		
5507	1	1	1	1	1	1	1	1	1	1	100		
5508	1	1	1	1	1	1	1	1	1	1	100		
5509	1	1	1	1	1	1	1	1	1	1	100		
5510	1	1	1	1	1	1	1	1	1	1	100		

UNII Detection Bandwidth Results, 40MHz Signal Bandwidth
Type 0 Radar Pulse

	DFS Detection Trials (1=Detection, Blank= No Detection)												
Radar Frequency	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)	Detection Bandwidth (MHz)	Limit (MHz)
5490	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		
5496	1	1	1	1	1	1	1	1	1	1	100		
5497	1	1	1	1	1	1	1	1	1	1	100		
5498	1	1	1	1	1	1	1	1	1	1	100		
5499	1	1	1	1	1	1	1	1	1	1	100		
5500	1	1	1	1	1	1	1	1	1	1	100		
5501	1	1	1	1	1	1	1	1	1	1	100		
5502	1	1	1	1	1	1	1	1	1	1	100		
5503	1	1	1	1	1	1	1	1	1	1	100		
5504	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	40	36
5508	1	1	1	1	1	1	1	1	1	1	100		
5509	1	1	1	1	1	1	1	1	1	1	100		
5510	1	1	1	1	1	1	1	1	1	1	100		
5511	1	1	1	1	1	1	1	1	1	1	100		
5512	1	1	1	1	1	1	1	1	1	1	100		
5513	1	1	1	1	1	1	1	1	1	1	100		
5514	1	1	1	1	1	1	1	1	1	1	100		
5515	1	1	1	1	1	1	1	1	1	1	100		
5516	1	1	1	1	1	1	1	1	1	1	100		
5517	1	1	1	1	1	1	1	1	1	1	100		
5518	1	1	1	1	1	1	1	1	1	1	100		
5519	1	1	1	1	1	1	1	1	1	1	100		
5520	1	1	1	1	1	1	1	1	1	1	100		
5521	1	1	1	1	1	1	1	1	1	1	100		
5522	1	1	1	1	1	1	1	1	1	1	100		
5523	1	1	1	1	1	1	1	1	1	1	100		
5524	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	1	1	1	1	1	1	1	1	1	1	100		
5530	1	1	1	1	1	1	1	1	1	1	100		

UNII Detection Bandwidth Results, 80MHz Signal Bandwidth
Type 0 Radar Pulse

	DFS Detection Trials (1=Detection, Blank= No Detection)												
Radar Frequency	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)	Detection Bandwidth (MHz)	Limit (MHz)
5490	1	1	1	1	1	1	1	1	1	1	100	80	76
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		
5496	1	1	1	1	1	1	1	1	1	1	100		
5497	1	1	1	1	1	1	1	1	1	1	100		
5498	1	1	1	1	1	1	1	1	1	1	100		
5499	1	1	1	1	1	1	1	1	1	1	100		
5500	1	1	1	1	1	1	1	1	1	1	100		
5501	1	1	1	1	1	1	1	1	1	1	100		
5502	1	1	1	1	1	1	1	1	1	1	100		
5503	1	1	1	1	1	1	1	1	1	1	100		
5504	1	1	1	1	1	1	1	1	1	1	100		
5505	1	1	1	1	1	1	1	1	1	1	100		
5506	1	1	1	1	1	1	1	1	1	1	100		
5507	1	1	1	1	1	1	1	1	1	1	100		
5508	1	1	1	1	1	1	1	1	1	1	100		
5509	1	1	1	1	1	1	1	1	1	1	100		
5510	1	1	1	1	1	1	1	1	1	1	100		
5511	1	1	1	1	1	1	1	1	1	1	100		
5512	1	1	1	1	1	1	1	1	1	1	100		
5513	1	1	1	1	1	1	1	1	1	1	100		
5514	1	1	1	1	1	1	1	1	1	1	100		
5515	1	1	1	1	1	1	1	1	1	1	100		
5516	1	1	1	1	1	1	1	1	1	1	100		
5517	1	1	1	1	1	1	1	1	1	1	100		
5518	1	1	1	1	1	1	1	1	1	1	100		
5519	1	1	1	1	1	1	1	1	1	1	100		
5520	1	1	1	1	1	1	1	1	1	1	100		
5521	1	1	1	1	1	1	1	1	1	1	100		
5522	1	1	1	1	1	1	1	1	1	1	100		
5523	1	1	1	1	1	1	1	1	1	1	100		
5524	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	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	1	1	1	1	1	1	1	1	1	1	100
5535	1	1	1	1	1	1	1	1	1	1	100
5536	1	1	1	1	1	1	1	1	1	1	100
5537	1	1	1	1	1	1	1	1	1	1	100
5538	1	1	1	1	1	1	1	1	1	1	100
5539	1	1	1	1	1	1	1	1	1	1	100
5540	1	1	1	1	1	1	1	1	1	1	100
5541	1	1	1	1	1	1	1	1	1	1	100
5542	1	1	1	1	1	1	1	1	1	1	100
5543	1	1	1	1	1	1	1	1	1	1	100
5544	1	1	1	1	1	1	1	1	1	1	100
5545	1	1	1	1	1	1	1	1	1	1	100
5546	1	1	1	1	1	1	1	1	1	1	100
5547	1	1	1	1	1	1	1	1	1	1	100
5548	1	1	1	1	1	1	1	1	1	1	100
5549	1	1	1	1	1	1	1	1	1	1	100
5550	1	1	1	1	1	1	1	1	1	1	100
5551	1	1	1	1	1	1	1	1	1	1	100
5552	1	1	1	1	1	1	1	1	1	1	100
5553	1	1	1	1	1	1	1	1	1	1	100
5554	1	1	1	1	1	1	1	1	1	1	100
5555	1	1	1	1	1	1	1	1	1	1	100
5556	1	1	1	1	1	1	1	1	1	1	100
5557	1	1	1	1	1	1	1	1	1	1	100
5558	1	1	1	1	1	1	1	1	1	1	100
5559	1	1	1	1	1	1	1	1	1	1	100
5560	1	1	1	1	1	1	1	1	1	1	100
5561	1	1	1	1	1	1	1	1	1	1	100
5562	1	1	1	1	1	1	1	1	1	1	100
5563	1	1	1	1	1	1	1	1	1	1	100
5564	1	1	1	1	1	1	1	1	1	1	100
5565	1	1	1	1	1	1	1	1	1	1	100

5566	1	1	1	1	1	1	1	1	1	1	100		
5567	1	1	1	1	1	1	1	1	1	1	100		
5568	1	1	1	1	1	1	1	1	1	1	100		
5569	1	1	1	1	1	1	1	1	1	1	100		
5570	1	1	1	1	1	1	1	1	1	1	100		

Initial Channel Availability Check Time

Procedure from KDB 905462, Section 7.8.2.1 Initial Channel Availability Check Time:

The Initial *Channel Availability Check Time* tests that the UUT does not emit beacon, control, or data signals on the test *Channel* until the power-up sequence has been completed and the U-NII device checks for *Radar Waveforms* for one minute on the test *Channel*. This test does not use any *Radar Waveforms* and only needs to be performed one time.

a) 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 UUT 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.

b) The UUT should not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle.

c) Confirm that the UUT initiates transmission on the channel

This measurement can be used to determine the length of the power-on cycle if it is not supplied by the manufacturer. If the spectrum analyzer sweep is started at the same time the UUT is powered on and the UUT does not begin transmissions until it has completed the cycle, the power-on time can be determined by comparing the two times.

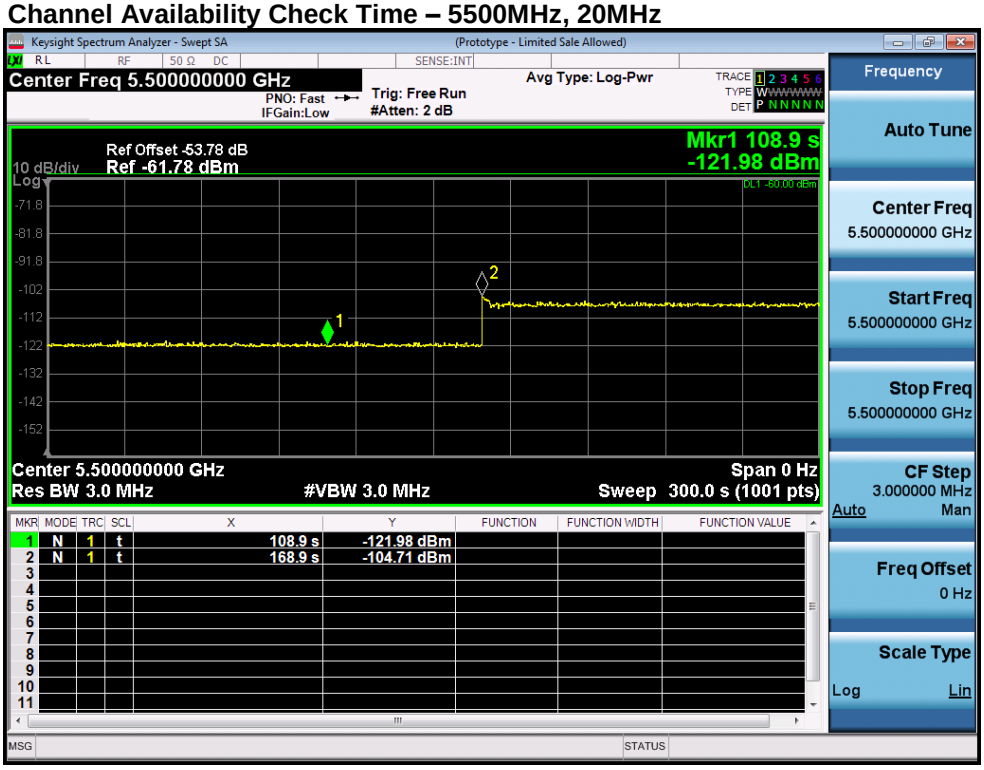
The tests that the UUT does not emit beacon, control, or data signals on the test Channel until the power-up sequence has been completed and the U-NII device checks for Radar Waveforms for one minute on the test Channel. This test does not use any Radar Waveforms.

The U-NII device is powered on and instructed to operate at 5500 MHz. At the same time the UUT is powered on, the spectrum analyzer is set to zero span mode with a 3 MHz resolution bandwidth at 5500MHz with a 2.5 minute sweep time. The analyzer's sweep will be started the same time power is applied to the U-NII device.

The UUT should not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle.

The initial power up time of the UUT is indicated by marker 1 in the plot. Initial beacons/data transmissions are indicated by marker 1R.

Initial Channel Availability Check Time – 5500MHz, 20MHz



Note: The EUT power-up cycle started at the beginning of the test.

Radar Burst at the Beginning of the Channel Availability Check Time

Procedure from KDB 905462, 7.8.2.2 Radar Burst at the Beginning of the Channel Availability Check Time:

The steps below define the procedure to verify successful radar detection on the test *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*. This is illustrated in **Figure 15**.

a) The *Radar Waveform* generator and UUT are connected using the applicable test setup described in the sections on configuration for Conducted Tests (7.2) or Radiated Tests (7.3) and the power of the UUT is switched off.

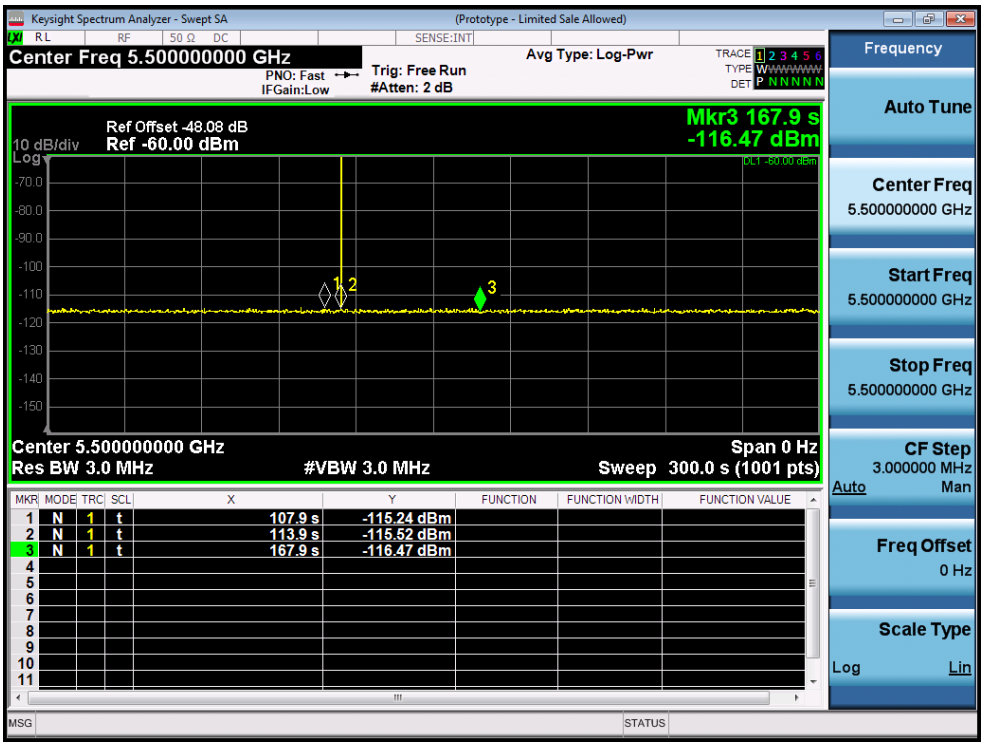
b) The UUT is powered on at T0. T1 denotes the instant when the UUT has completed its power-up sequence (Tpower_up). The *Channel Availability Check Time* commences on Chr at instant T1 and will end no sooner than T1 + Tch_avail_check.

c) A single *Burst* of one of the Short Pulse Radar Types 0-4 will commence within a 6 second window starting at T1. An additional 1 dB is added to the radar test signal to ensure it is at or above the *DFS Detection Threshold*, accounting for equipment variations/errors.

d) Visual indication or measured results on the UUT of successful detection of the radar *Burst* will be recorded and reported. Observation of Chr for UUT emissions will continue for 2.5 minutes after the radar *Burst* has been generated.

e) Verify that during the 2.5 minute measurement window no UUT transmissions occurred on Chr. The *Channel Availability Check* results will be recorded.

Radar Burst at the Beginning of the Channel Availability Check Time – 5500MHz, 20MHz



Note: As shown in the table, marker 1 is at 107.9 s and marker 2 at 113.9 s, therefore, the radar signal triggered exactly 6 seconds of CAC time.

Radar Burst at the End of the Channel Availability Check Time

Procedure from KDB 905462, 7.8.2.3 Radar Burst at the End of the Channel Availability Check Time:

The steps below define the procedure to verify successful radar detection on the test *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* + 1dB occurs at the end of the *Channel Availability Check Time*. This is illustrated in **Figure 16**.

a) The *Radar Waveform* generator and UUT are connected using the applicable test setup described in the sections for Conducted Tests (7.2) or Radiated Tests (7.3) and the power of the UUT is switched off.

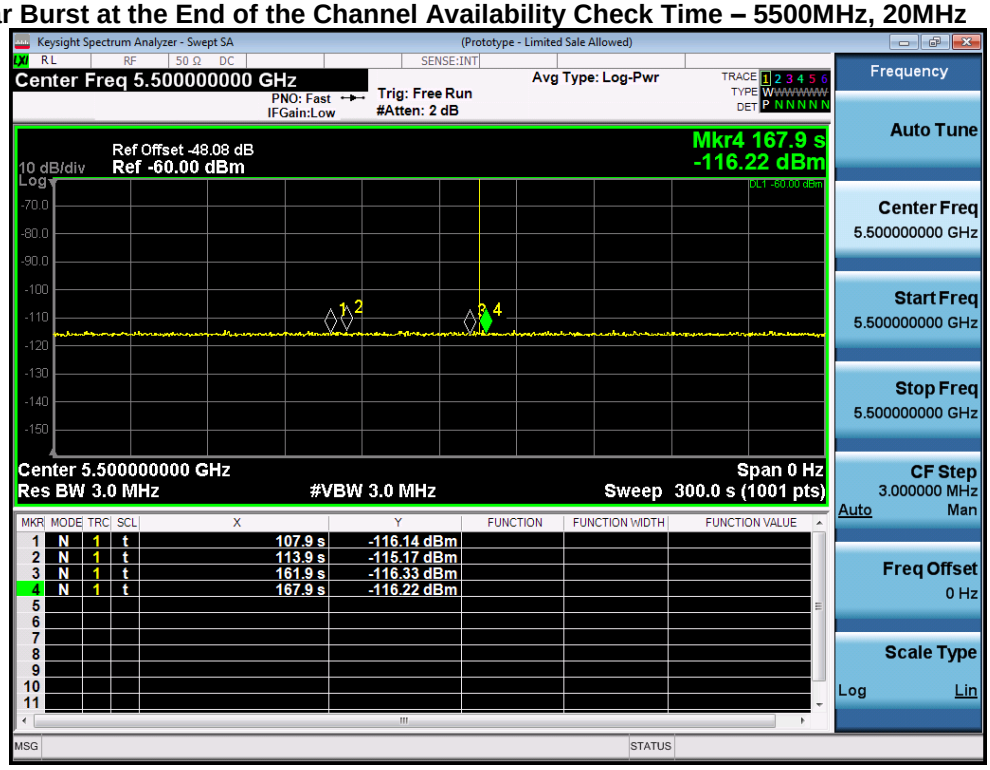
b) The UUT is powered on at T0. T1 denotes the instant when the UUT has completed its power-up sequence (Tpower_up). The *Channel Availability Check Time* commences on Chr at instant T1 and will end no sooner than T1 + Tch_avail_check.

c) A single *Burst* of one of the Short Pulse Radar Types 0-4 will commence within a 6 second window starting at T1 + 54 seconds. An additional 1 dB is added to the radar test signal to ensure it is at or above the *DFS Detection Threshold*, accounting for equipment variations/errors.

d) Visual indication or measured results on the UUT of successful detection of the radar *Burst* will be recorded and reported. Observation of Chr for UUT emissions will continue for 2.5 minutes after the radar *Burst* has been generated.

e) Verify that during the 2.5 minute measurement window no UUT transmissions occurred on Chr. The *Channel Availability Check* results will be recorded.

Radar Burst at the End of the Channel Availability Check Time – 5500MHz, 20MHz



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

Procedure from KDB 905462, 7.8.3 In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period:

These tests define how the following DFS parameters are verified during *In-Service Monitoring;*

- *Channel Closing Transmission Time*
- *Channel Move Time*
- *Non-Occupancy Period*

The steps below define the procedure to determine the above mentioned parameters 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).*

a) One frequency will be chosen from the *Operating Channels* of the UUT within the 5250-5350 MHz or 5470-5725 MHz bands. For 802.11 devices, the test frequency must contain control signals. This can be verified by disabling channel loading and monitoring the spectrum analyzer. If no control signals are detected, another frequency must be selected within the emission bandwidth where control signals are detected.

b) In case the UUT is a U-NII device operating as a *Client Device* (with or without DFS), a U-NII device operating as a *Master Device* will be used to allow the UUT (Client device) to *Associate* with the *Master Device*. In case the UUT is a *Master Device*, a U-NII device operating as a *Client Device* will be used and it is assumed that the Client will *Associate* with the UUT (Master). In both cases for conducted tests, the *Radar Waveform* generator will be connected to the *Master Device*. For radiated tests, the emissions of the *Radar Waveform* generator will be directed towards the *Master Device*. If the *Master Device* has antenna gain, the main beam of the antenna will be directed toward the radar emitter. Vertical polarization is used for testing.

c) Stream the channel loading test file from the *Master Device* to the *Client Device* on the test *Channel* for the entire period of the test.

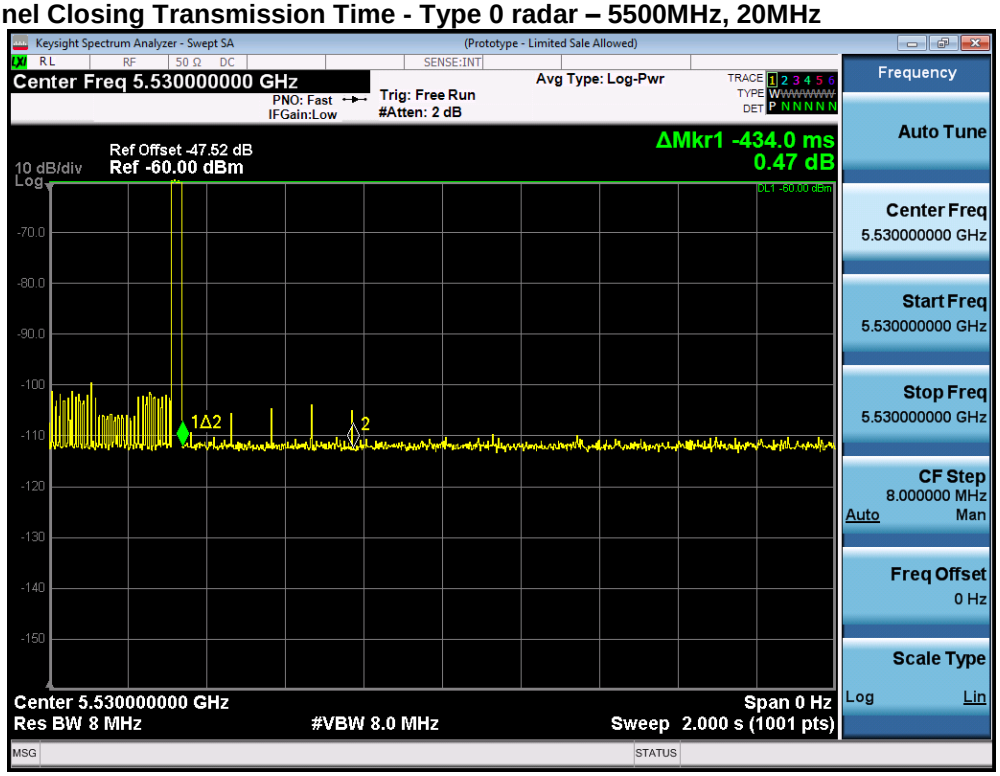
d) At time T0 the *Radar Waveform* generator sends a *Burst* of pulses for one of the Radar Type 0 in **Table 5** at levels defined in **Table 3**, on the *Operating Channel*. An additional 1 dB is added to the radar test signal to ensure it is at or above the *DFS Detection Threshold*, accounting for equipment variations/errors.

e) Observe the transmissions of the UUT at the end of the radar *Burst* on the *Operating Channel* for duration greater than 10 seconds. Measure and record the transmissions from the UUT during the observation time (*Channel Move Time)*. Measure and record the *Channel Move Time* and *Channel Closing Transmission Time* if radar detection occurs. **Figure 17** illustrates *Channel Closing Transmission Time.*

f) When operating as a *Master Device*, monitor the UUT for more than 30 minutes following instant T2 to verify that the UUT does not resume any transmissions on this *Channel*. Perform this test once and record the measurement result.

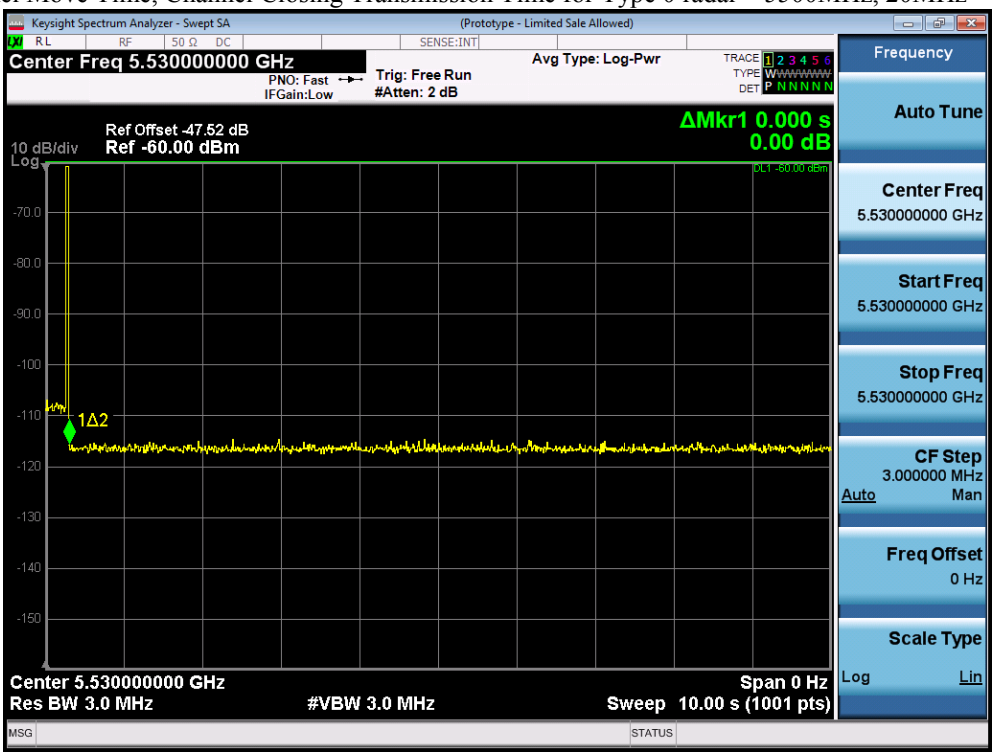
g) In case the UUT is a U-NII device operating as a *Client Device* with *In-Service Monitoring*, perform steps a) to f).

Channel Closing Transmission Time - Type 0 radar – 5500MHz, 20MHz

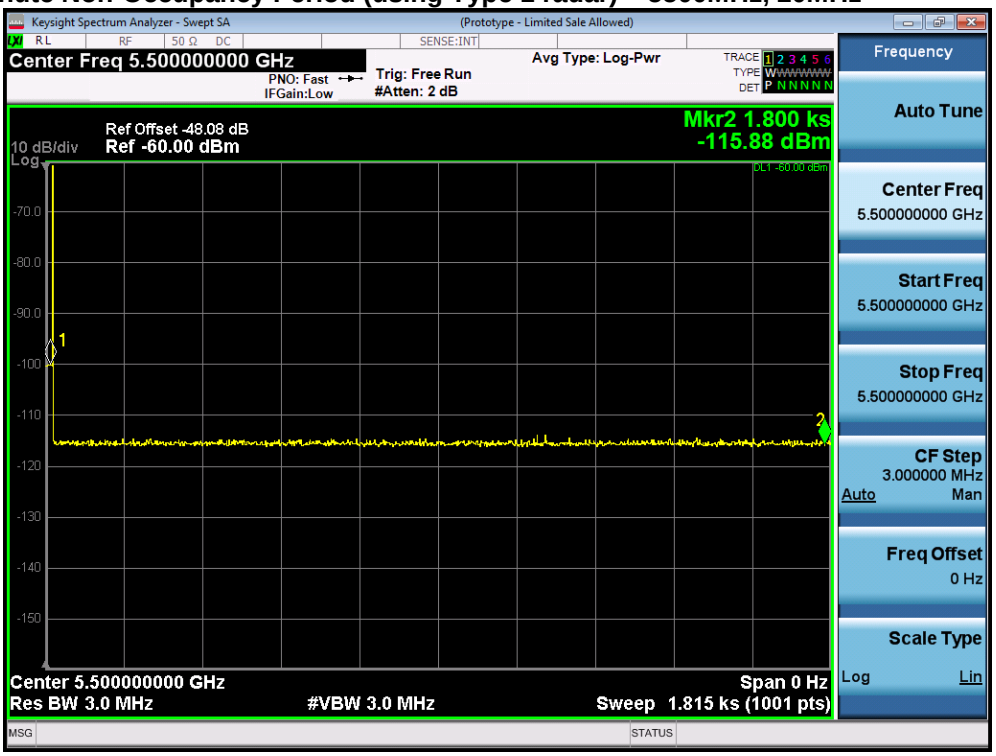


Note: The sweep time is 2 seconds and each division is 0.2s (200ms), therefore, the closing transmission time is less than 200 milliseconds plus an aggregate of 60 milliseconds over the 10-second.

Channel Move Time, Channel Closing Transmission Time for Type 0 radar – 5500MHz, 20MHz



30 Minute Non-Occupancy Period (using Type 1 radar) – 5500MHz, 20MHz



Statistical Performance Check

Procedure from KDB 905462, 7.8.4 Statistical Performance Check:

The steps below define the procedure to determine the minimum percentage of successful detection requirements found in **Tables 5-7** 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).*

a) One frequency will be chosen from the *Operating Channels* of the UUT within the 5250-5350 MHz or 5470-5725 MHz bands.

b) In case the UUT is a U-NII device operating as a *Client Device* (with or without Radar Detection), a U-NII device operating as a *Master Device* will be used to allow the UUT (Client device) to *Associate* with the *Master Device*. In case the UUT is a *Master Device*, a U-NII device operating as a *Client Device* will be used and it is assumed that the Client will *Associate* with the UUT (Master). In both cases for conducted tests, the *Radar Waveform* generator will be connected to the *Master Device*. For radiated tests, the emissions of the *Radar Waveform* generator will be directed towards the *Master Device*. If the *Master Device* has antenna gain, the main beam of the antenna will be directed toward the radar emitter. Vertical polarization is used for testing.

c) Stream the channel loading test file from the *Master Device* to the Client Device on the test *Channel* for the entire period of the test.

d) At time T0 the *Radar Waveform* generator sends the individual waveform for each of the Radar Types 1- 6 in **Tables 5-7**, at levels defined in **Table 3**, on the *Operating Channel*. An additional 1 dB is added to the radar test signal to ensure it is at or above the *DFS Detection Threshold*, accounting for equipment variations/errors.

e) Observe the transmissions of the UUT at the end of the Burst on the *Operating Channel* for duration greater than 10 seconds for Radar Type 0 to ensure detection occurs.

f) Observe the transmissions of the UUT 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.

g) In case the UUT is a U-NII device operating as a *Client Device* with *In-Service Monitoring*, perform steps a) to f).

7.8.4.1 Short Pulse Radar Test

Once the performance requirements check is complete, statistical data will be gathered, to determine the ability of the device to detect the radar test waveforms (Short Pulse Radar Types 1-4) found in **Table 5**. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trials. The percentage of successful detection is calculated by:

$$\frac{TotalWaveformDetections}{TotalWaveformTrials} \times 100 = \text{Percentage of Successful Detection } Radar\ Waveform\ \text{N} = P_d\text{N}$$

In addition an aggregate minimum percentage of successful detection across all Short Pulse Radar Types 1-4 is required and is calculated as follows:

$$\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4}$$

The minimum number of trails, minimum percentage of successful detection and the aggregate minimum percentage of successful detection are found in **Table 5**.

7.8.4.2 Long Pulse Radar Test

Statistical data will be gathered to determine the ability of the device to detect the Long Pulse Radar Type 5 found in **Table 6**. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trials. The percentage of successful detection is calculated by:

$$\frac{TotalWaveformDetections}{TotalWaveformTrials} \times 100$$

7.8.4.3 Frequency Hopping Radar Test

Statistical data will be gathered to determine the ability of the device to detect the Frequency Hopping radar test signal (radar type 6) found in **Table 7**. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trial runs. The probability of successful detection is calculated by:

$$\frac{TotalWaveformDetections}{TotalWaveformTrials} \times 100$$

Statistical Performance Check - 20MHz Bandwidth, Channel 5500MHz

Type 1A/1B Radar Statistical Performance – 20MHz BW, Channel 5500MHz

Trial	Frequency	Pulses	PW (uS)	PRI (uS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	5494	67	1	798	1	100.0%	60.0%
2	5494	57	1	938	1		
3	5494	76	1	698	1		
4	5494	67	1	798	1		
5	5494	67	1	798	1		
6	5494	59	1	898	1		
7	5495	63	1	838	1		
8	5495	102	1	518	1		
9	5495	89	1	598	1		
10	5495	65	1	818	1		
11	5495	99	1	538	1		
12	5495	67	1	798	1		
13	5500	86	1	618	1		
14	5500	81	1	658	1		
15	5500	89	1	598	1		
16	5500	34	1	1568	1		
17	5500	31	1	1750	1		
18	5500	22	1	2459	1		
19	5505	82	1	650	1		
20	5505	24	1	2276	1		
21	5505	19	1	2911	1		
22	5505	71	1	751	1		
23	5505	30	1	1778	1		
24	5505	59	1	900	1		
25	5506	20	1	2730	1		
26	5506	72	1	742	1		
27	5506	18	1	3019	1		
28	5506	19	1	2803	1		
29	5506	31	1	1727	1		
30	5506	22	1	2436	1		

Type 2 Radar Statistical Performance – 20MHz BW, Channel 5500MHz

Trial	Frequency	Pulses	PW (uS)	PRI (uS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	5494	23	4.1	205	1	93.3%	60.0%
2	5494	23	1.4	167	0		
3	5494	26	2.8	225	1		
4	5494	28	1.8	227	1		
5	5494	26	3.6	168	1		
6	5494	28	4.1	168	1		
7	5494	24	4.2	228	1		
8	5494	24	3.8	208	1		
9	5495	27	1.2	225	1		
10	5495	23	2	207	1		
11	5495	24	4.4	180	1		
12	5495	23	3.8	230	1		
13	5495	29	3.3	164	1		
14	5495	29	3.7	207	1		
15	5495	29	5	223	1		
16	5500	28	4.5	223	0		
17	5500	27	4.4	162	1		
18	5500	26	5	215	1		
19	5500	23	2.6	223	1		
20	5500	28	2.7	168	1		
21	5500	27	1.5	175	1		
22	5500	25	2.2	192	1		
23	5500	29	3.4	219	1		
24	5505	24	4	193	1		
25	5505	29	4.4	223	1		
26	5505	27	3.2	221	1		
27	5505	25	1.5	188	1		
28	5505	24	2.9	183	1		
29	5505	25	1.2	227	1		
30	5505	28	1.9	194	1		

Type 3 Radar Statistical Performance – 20MHz BW, Channel 5500MHz

Trial	Frequency	Pulses	PW (uS)	PRI (uS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	5494	17	9.6	300	1	73.3%	60.0%
2	5494	16	6.5	374	1		
3	5494	16	8	241	1		
4	5494	18	9	482	1		
5	5494	16	6.9	225	1		
6	5494	18	9.7	225	1		
7	5495	18	7.2	221	1		
8	5495	17	7.1	244	1		
9	5495	16	6.7	336	0		
10	5495	17	9.6	385	1		
11	5495	16	9.8	325	1		
12	5495	17	9.9	383	1		
13	5500	16	8.9	389	0		
14	5500	18	9.8	286	0		
15	5500	18	6.5	325	0		
16	5500	16	7.2	293	0		
17	5500	16	9.3	359	0		
18	5500	17	6.5	382	1		
19	5505	17	8.6	466	1		
20	5505	16	6.3	312	1		
21	5505	17	8.4	445	0		
22	5505	17	10	453	1		
23	5505	16	9.1	263	1		
24	5505	17	6.8	210	1		
25	5506	16	9.1	250	1		
26	5506	17	8.3	317	1		
27	5506	16	9.8	202	1		
28	5506	18	8.3	463	1		
29	5506	17	8.3	489	0		
30	5506	16	6.9	499	1		

Type 4 Radar Statistical Performance – 20MHz BW, Channel 5500MHz

Trial	Frequency	Pulses	PW (uS)	PRI (uS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	5494	12	15.2	468	1	60.0%	60.0%
2	5494	13	13.9	204	1		
3	5494	14	15.2	251	1		
4	5494	12	13.1	448	1		
5	5494	12	16.5	462	0		
6	5494	13	17.2	220	0		
7	5495	12	12.2	420	1		
8	5495	12	12.9	243	1		
9	5495	15	11.6	465	1		
10	5495	12	13.8	300	0		
11	5495	15	15	408	1		
12	5495	16	11.9	479	0		
13	5500	13	11.6	466	0		
14	5500	16	12.6	240	0		
15	5500	14	19.7	234	0		
16	5500	15	16.8	420	0		
17	5500	15	11.9	225	0		
18	5500	12	19.5	230	0		
19	5505	13	19.8	344	1		
20	5505	16	14.8	435	1		
21	5505	12	19.9	211	1		
22	5505	13	19.3	498	1		
23	5505	16	18	232	0		
24	5505	16	15.2	463	1		
25	5506	14	16	205	1		
26	5506	14	14	261	1		
27	5506	16	13.7	337	1		
28	5506	15	13.4	480	1		
29	5506	14	15.3	488	1		
30	5506	13	12.2	370	0		

In addition an average minimum percentage of successful detection across all four Short pulse radar test waveforms is required and is calculated as follows:

$$\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4}$$ = 100% + 93.3% + 73.3% + 60%)/4 = 81.80% (> 80%)

Type 5 Long Pulse Radar Statistical Performance – 20MHz BW, Channel 5500MHz

Trial	Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)	1=Detection 0=No Detection	Detection Percentage	Limit
1	1	3	5494.2	8	65	1039	1697	0.025505	1		
2	1	2	5496.6	14	85	1360		0.99701	1		
3	1	1	5495	10	95			0.011542	1		
4	1	3	5494.2	8	90	1126	1916	0.295329	1		
5	1	1	5495.8	12	50			0.891976	1		
6	1	1	5495.4	11	90			0.354966	1		
7	1	1	5494.2	8	65			1.033923	1		
8	1	2	5499	20	90	1693		0.167128	1		
9	1	1	5495.4	11	60			0.397899	1		
10	1	3	5497.8	17	65	1077	1991	0.651253	1		
11	1	3	5500	15	100	1631	1487	0.804852	1		
12	1	3	5500	20	50	1995	1930	0.000595	1		
13	1	2	5500	18	90	1234		0.465487	1		
14	1	1	5500	9	90			0.307212	1		
15	1	3	5500	10	70	1503	1449	0.052857	1		
16	1	1	5500	17	65			0.447498	1	100.0%	80.0%
17	1	3	5500	5	90	1849	1932	0.200556	1		
18	1	2	5500	5	55	1689		0.650548	1		
19	1	3	5500	8	55	1799	1117	0.009523	1		
20	1	2	5500	19	75	1125		0.144353	1		
21	1	3	5505.8	8	50	1857	1562	0.223856	1		
22	1	2	5506.2	7	70	1769		0.228437	1		
23	1	1	5502.6	16	70			0.83464	1		
24	1	3	5502.6	16	75	1351	1900	0.622612	1		
25	1	3	5504.6	11	95	1933	1548	1.179488	1		
26	1	2	5505	10	55	1629		0.418073	1		
27	1	2	5507	5	75	1884		0.529581	1		
28	1	3	5505	10	60	1244	1525	0.765976	1		
29	1	3	5505	10	90	1826	1569	0.368005	1		
30	1	2	5507	5	75	1943		0.137236	1		

Type 5 Long Pulse Radar Statistical Performance – 20MHz BW, Channel 5500MHz – Details

USA Bin 5 Trial #1							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5494.2	8	65	1039	1697	0.025505
2	3	5494.2	8	70	1150	1133	1.713175
3	2	5494.2	8	80	1706		2.275337
4	1	5494.2	8	75			3.351988
5	1	5494.2	8	90			4.437521
6	3	5494.2	8	90	1301	1123	4.865746
7	3	5494.2	8	70	1751	1090	5.95332
8	3	5494.2	8	70	1754	1966	6.863123
9	3	5494.2	8	100	1569	1734	8.136294
10	3	5494.2	8	95	1688	1535	8.612243
11	3	5494.2	8	75	1477	1275	9.42623
12	3	5494.2	8	80	1605	1174	10.739021
13	1	5494.2	8	90			11.479059
USA Bin 5 Trial #2							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5496.6	14	85	1360		0.99701
2	3	5496.6	14	75	1780	1678	2.010262
3	1	5496.6	14	70			3.547894
4	3	5496.6	14	55	1810	1041	4.511625
5	3	5496.6	14	100	1650	1279	5.789722
6	3	5496.6	14	65	1628	1087	6.866064
7	1	5496.6	14	100			8.590166
8	3	5496.6	14	90	1559	1490	10.572166
9	1	5496.6	14	95			11.250483
USA Bin 5 Trial #3							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5495	10	95			0.011542
2	3	5495	10	60	1131	1041	1.291681
3	1	5495	10	100			2.25257
4	3	5495	10	55	1603	1246	3.191302
5	2	5495	10	85	1704		4.675292
6	3	5495	10	75	1283	1291	5.393127

7	3	5495	10	100	1447	1440	6.325883
8	1	5495	10	100			7.547783
9	1	5495	10	60			8.778472
10	1	5495	10	60			9.423114
11	1	5495	10	65			10.874494
12	3	5495	10	55	1299	1949	11.80079
USA Bin 5 Trial #4							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5494.2	8	90	1126	1916	0.295329
2	3	5494.2	8	90	1066	1190	2.191121
3	3	5494.2	8	95	1495	1904	3.952353
4	1	5494.2	8	55			4.253792
5	3	5494.2	8	75	1207	1456	5.605998
6	2	5494.2	8	70	1525		7.249216
7	2	5494.2	8	70	1700		9.239674
8	3	5494.2	8	90	1235	1399	9.535318
9	1	5494.2	8	70			11.500459
USA Bin 5 Trial #5							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5495.8	12	50			0.891976
2	2	5495.8	12	55	1480		2.902114
3	1	5495.8	12	95			3.339997
4	1	5495.8	12	95			4.819691
5	2	5495.8	12	100	1984		6.710367
6	1	5495.8	12	85			7.521288
7	2	5495.8	12	65	1486		9.28396
8	3	5495.8	12	80	1044	1031	11.474708
USA Bin 5 Trial #6							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5495.4	11	90			0.354966
2	3	5495.4	11	75	1576	1792	1.253714
3	2	5495.4	11	50	1683		1.630324
4	3	5495.4	11	70	1156	1862	2.618539
5	3	5495.4	11	65	1247	1751	3.426745
6	2	5495.4	11	60	1420		4.068155

7	3	5495.4	11	95	1976	1892	4.431485
8	2	5495.4	11	95	1495		5.400484
9	3	5495.4	11	80	1663	1045	6.303981
10	1	5495.4	11	95			6.710747
11	1	5495.4	11	95			7.088118
12	1	5495.4	11	80			8.446685
13	3	5495.4	11	85	1553	1963	8.54533
14	2	5495.4	11	70	1492		9.824539
15	3	5495.4	11	85	1186	1536	10.45622
16	1	5495.4	11	85			10.821473
17	1	5495.4	11	75			11.751247
USA Bin 5 Trial #7							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5494.2	8	65			1.033923
2	3	5494.2	8	50	1444	1591	2.87373
3	2	5494.2	8	70	1794		3.414895
4	3	5494.2	8	65	1570	1292	5.391425
5	3	5494.2	8	55	1862	1758	6.793288
6	2	5494.2	8	80	1840		8.21196
7	1	5494.2	8	85			9.630333
8	1	5494.2	8	100			11.127146
USA Bin 5 Trial #8							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5499	20	90	1693		0.167128
2	3	5499	20	70	1259	1980	1.256126
3	2	5499	20	75	1871		2.644103
4	2	5499	20	60	1076		3.448824
5	3	5499	20	80	1917	1413	4.95217
6	1	5499	20	95			5.602955
7	1	5499	20	70			6.134721
8	1	5499	20	95			7.821213
9	2	5499	20	60	1550		8.668172
10	1	5499	20	50			9.268625
11	3	5499	20	50	1102	1368	10.16274
12	2	5499	20	90	1083		11.495593
USA Bin 5 Trial #9							

Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5495.4	11	60			0.397899
2	3	5495.4	11	55	1400	1728	0.896545
3	2	5495.4	11	100	1415		2.353399
4	1	5495.4	11	80			2.621643
5	2	5495.4	11	70	1484		4.058861
6	3	5495.4	11	65	1340	1853	4.863815
7	1	5495.4	11	85			5.28091
8	3	5495.4	11	100	1707	1019	6.423966
9	1	5495.4	11	75			7.439325
10	2	5495.4	11	80	1606		8.114642
11	2	5495.4	11	85	1336		9.305382
12	2	5495.4	11	60	1683		9.669293
13	2	5495.4	11	50	1292		11.019135
14	3	5495.4	11	100	1962	1992	11.889108
USA Bin 5 Trial #10							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5497.8	17	65	1077	1991	0.651253
2	1	5497.8	17	85			1.311314
3	2	5497.8	17	60	1311		2.08975
4	2	5497.8	17	50	1520		3.523804
5	3	5497.8	17	50	1000	1950	4.527296
6	2	5497.8	17	60	1997		5.081342
7	2	5497.8	17	100	1181		5.626193
8	1	5497.8	17	50			6.631065
9	1	5497.8	17	100			8.302504
10	1	5497.8	17	100			8.3998
11	1	5497.8	17	95			9.775719
12	3	5497.8	17	60	1978	1819	10.917985
13	3	5497.8	17	100	1094	1373	11.499131
USA Bin 5 Trial #11							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5500	15	100	1631	1487	0.804852
2	1	5500	15	95			1.09949
3	1	5500	15	70			1.857436

4	1	5500	15	70			2.729151
5	3	5500	15	95	1403	1848	3.65942
6	1	5500	15	60			4.458377
7	1	5500	15	80			5.875146
8	1	5500	15	55			6.734093
9	2	5500	15	80	1401		7.192642
10	1	5500	15	65			7.898243
11	2	5500	15	50	1269		9.063301
12	1	5500	15	60			10.160756
13	1	5500	15	85			10.300311
14	2	5500	15	95	1073		11.814635
USA Bin 5 Trial #12							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5500	20	50	1995	1930	0.000595
2	3	5500	20	60	1449	1024	1.223849
3	3	5500	20	85	1455	1096	1.974742
4	2	5500	20	95	1157		2.554945
5	2	5500	20	85	1215		2.903768
6	3	5500	20	90	1760	1845	3.991179
7	1	5500	20	100			4.545542
8	2	5500	20	75	1305		5.513552
9	1	5500	20	85			6.10397
10	1	5500	20	85			6.478141
11	2	5500	20	85	1199		7.105824
12	2	5500	20	80	1005		7.767015
13	2	5500	20	80	1523		8.62608
14	2	5500	20	75	1195		9.875849
15	2	5500	20	70	1389		10.387435
16	2	5500	20	80	1374		10.811176
17	2	5500	20	95	1425		11.549056
USA Bin 5 Trial #13							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5500	18	90	1234		0.465487
2	3	5500	18	95	1490	1116	0.746522
3	3	5500	18	75	1710	1193	1.60682
4	3	5500	18	80	1056	1897	2.30568
5	2	5500	18	95	1113		3.452207

6	2	5500	18	70	1806		3.699714
7	1	5500	18	75			4.337481
8	2	5500	18	80	1253		5.643712
9	2	5500	18	50	1042		6.25964
10	2	5500	18	60	1608		6.527937
11	2	5500	18	55	1545		7.483188
12	1	5500	18	55			8.184463
13	3	5500	18	90	1790	1201	8.472969
14	1	5500	18	60			9.204197
15	1	5500	18	60			9.907712
16	3	5500	18	80	1963	1778	11.202594
17	2	5500	18	70	1335		11.566219
USA Bin 5 Trial #14							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5500	9	90			0.307212
2	3	5500	9	85	1909	1501	0.688584
3	3	5500	9	80	1535	1754	1.639828
4	2	5500	9	90	1293		1.953301
5	3	5500	9	80	1690	1678	2.479074
6	1	5500	9	85			3.234353
7	3	5500	9	75	1886	1957	3.771751
8	3	5500	9	85	1894	1410	4.580126
9	1	5500	9	70			4.890987
10	2	5500	9	60	1050		5.405975
11	3	5500	9	55	1508	1645	6.390296
12	3	5500	9	70	1778	1668	7.111999
13	3	5500	9	85	1658	1569	7.224771
14	2	5500	9	60	1231		7.943261
15	2	5500	9	85	1498		8.763383
16	2	5500	9	65	1544		9.55058
17	3	5500	9	50	1344	1790	9.873275
18	1	5500	9	50			10.251825
19	3	5500	9	60	1526	1455	11.006101
20	1	5500	9	100			11.855742
USA Bin 5 Trial #15							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5500	10	70	1503	1449	0.052857

2	3	5500	10	60	1123	1896	1.837496
3	3	5500	10	70	1954	1961	2.392682
4	1	5500	10	80			3.017031
5	1	5500	10	80			4.454547
6	2	5500	10	65	1196		5.526752
7	1	5500	10	95			6.076577
8	1	5500	10	90			7.933454
9	2	5500	10	70	1223		8.978149
10	2	5500	10	60	1946		9.681696
11	2	5500	10	55	1039		10.303357
12	2	5500	10	95	1016		11.845229
USA Bin 5 Trial #16							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5500	17	65			0.447498
2	3	5500	17	100	1981	1939	0.957703
3	3	5500	17	65	1559	1840	2.259146
4	2	5500	17	55	1260		2.663868
5	3	5500	17	100	1048	1411	3.318218
6	1	5500	17	80			4.499699
7	3	5500	17	100	1357	1310	5.127802
8	2	5500	17	85	1720		5.650975
9	3	5500	17	95	2000	1305	7.063127
10	1	5500	17	95			7.957488
11	2	5500	17	100	1634		8.270921
12	2	5500	17	85	1489		8.802842
13	1	5500	17	100			9.828932
14	2	5500	17	55	1467		11.115396
15	2	5500	17	90	1026		11.565178
USA Bin 5 Trial #17							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5500	5	90	1849	1932	0.200556
2	3	5500	5	85	1232	1159	0.859508
3	2	5500	5	90	1966		1.316517
4	2	5500	5	65	1125		2.459892
5	3	5500	5	65	1473	1021	2.659819
6	2	5500	5	60	1996		3.675715
7	1	5500	5	55			3.900207

8	3	5500	5	75	1870	1616	4.451383
9	1	5500	5	55			5.501602
10	3	5500	5	60	1487	1084	5.712387
11	2	5500	5	85	1855		6.866073
12	1	5500	5	80			7.184474
13	1	5500	5	65			7.599573
14	3	5500	5	50	1363	1323	8.262637
15	2	5500	5	100	1445		9.152983
16	3	5500	5	100	1029	1861	10.033085
17	2	5500	5	70	1269		10.620333
18	2	5500	5	75	1464		11.116655
19	1	5500	5	100			11.534617
USA Bin 5 Trial #18							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5500	5	55	1689		0.650548
2	3	5500	5	85	1024	1738	1.796533
3	2	5500	5	65	1517		2.184159
4	1	5500	5	90			3.390617
5	1	5500	5	60			4.581141
6	3	5500	5	80	1963	1671	4.816723
7	3	5500	5	60	1346	1019	5.836875
8	2	5500	5	55	1260		6.759936
9	2	5500	5	70	1532		8.120666
10	3	5500	5	80	1194	1731	8.628542
11	3	5500	5	95	1082	1753	9.466594
12	1	5500	5	90			10.812553
13	2	5500	5	75	1507		11.840566
USA Bin 5 Trial #19							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5500	8	55	1799	1117	0.009523
2	2	5500	8	80	1054		1.013504
3	3	5500	8	85	1766	1604	1.853222
4	1	5500	8	65			2.434427
5	3	5500	8	95	1998	1273	3.377223
6	3	5500	8	95	1993	1352	3.598096
7	1	5500	8	50			4.768417
8	2	5500	8	75	1636		5.296069

9	2	5500	8	80	1278		6.098015
10	2	5500	8	80	1347		6.970319
11	3	5500	8	90	1785	1988	7.302082
12	3	5500	8	90	1931	1050	8.42147
13	3	5500	8	50	1951	1992	8.515109
14	1	5500	8	50			9.254621
15	2	5500	8	90	1393		10.414227
16	2	5500	8	70	1414		11.223455
17	1	5500	8	65			11.972327
USA Bin 5 Trial #20							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5500	19	75	1125		0.144353
2	2	5500	19	70	1561		0.941876
3	2	5500	19	80	1329		1.804105
4	2	5500	19	90	1961		2.419703
5	2	5500	19	65	1650		3.311905
6	3	5500	19	85	1703	1136	4.028003
7	2	5500	19	70	1404		4.720359
8	3	5500	19	65	1692	1195	5.235918
9	3	5500	19	75	1867	1964	5.881047
10	2	5500	19	90	1085		6.863556
11	1	5500	19	60			7.679742
12	3	5500	19	60	1998	1724	8.410164
13	3	5500	19	75	1631	1009	9.048874
14	3	5500	19	55	1347	1540	9.839269
15	1	5500	19	50			9.913759
16	3	5500	19	60	1631	1806	11.257144
17	1	5500	19	100			11.390892
USA Bin 5 Trial #21							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5505.8	8	50	1857	1562	0.223856
2	1	5505.8	8	50			1.985326
3	1	5505.8	8	85			2.272234
4	1	5505.8	8	60			3.623006
5	3	5505.8	8	60	1553	1394	4.601822
6	2	5505.8	8	90	1634		5.728548
7	1	5505.8	8	75			6.241443

8	3	5505.8	8	70	1676	1009	7.670626
9	1	5505.8	8	85			8.003773
10	3	5505.8	8	65	1370	1134	9.475459
11	2	5505.8	8	55	1298		10.731239
12	1	5505.8	8	50			11.680471
USA Bin 5 Trial #22							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5506.2	7	70	1769		0.228437
2	3	5506.2	7	55	1065	1432	1.395079
3	3	5506.2	7	80	1588	1744	3.294003
4	1	5506.2	7	80			4.92623
5	3	5506.2	7	100	1591	1119	6.002285
6	1	5506.2	7	60			7.868985
7	1	5506.2	7	80			8.873694
8	3	5506.2	7	70	1686	1565	9.713421
9	1	5506.2	7	100			11.746228
USA Bin 5 Trial #23							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5502.6	16	70			0.83464
2	2	5502.6	16	65	1508		2.342706
3	3	5502.6	16	60	1786	1174	2.993716
4	1	5502.6	16	80			4.399212
5	2	5502.6	16	60	1638		5.402998
6	3	5502.6	16	75	1922	1592	6.046502
7	2	5502.6	16	65	1832		7.816486
8	3	5502.6	16	70	1260	1519	8.794781
9	2	5502.6	16	95	1138		9.881275
10	1	5502.6	16	70			11.922875
USA Bin 5 Trial #24							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5502.6	16	75	1351	1900	0.622612
2	1	5502.6	16	95			1.524124
3	2	5502.6	16	70	1280		2.502383
4	1	5502.6	16	95			2.842792
5	2	5502.6	16	100	1865		4.11167

6	3	5502.6	16	50	1911	1920	4.820559
7	3	5502.6	16	70	1928	1635	5.645575
8	2	5502.6	16	75	1699		6.619809
9	1	5502.6	16	60			7.027173
10	1	5502.6	16	80			7.867079
11	3	5502.6	16	80	1535	1820	8.580401
12	2	5502.6	16	75	1365		9.726091
13	1	5502.6	16	60			10.770548
14	2	5502.6	16	100	1552		11.180553
USA Bin 5 Trial #25							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5504.6	11	95	1933	1548	1.179488
2	2	5504.6	11	75	1195		2.603744
3	3	5504.6	11	90	1591	1094	3.958936
4	1	5504.6	11	75			5.032704
5	3	5504.6	11	75	1044	1484	7.462144
6	1	5504.6	11	100			7.645645
7	2	5504.6	11	90	1761		9.270421
8	1	5504.6	11	70			11.50432
USA Bin 5 Trial #26							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5505	10	55	1629		0.418073
2	1	5505	10	55			1.911581
3	3	5505	10	70	1096	1308	4.207563
4	1	5505	10	60			5.244726
5	1	5505	10	100			6.195569
6	1	5505	10	50			8.759437
7	1	5505	10	90			10.487408
8	2	5505	10	75	1137		11.859057
USA Bin 5 Trial #27							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5507	5	75	1884		0.529581
2	2	5507	5	90	1901		2.385805
3	3	5507	5	85	1164	1650	3.509775
4	1	5507	5	75			4.915731

5	3	5507	5	70	1295	1399	6.473149
6	1	5507	5	85			6.684557
7	3	5507	5	60	1295	1171	8.178179
8	3	5507	5	65	1171	1924	9.961962
9	1	5507	5	60			11.307673
USA Bin 5 Trial #28							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5505	10	60	1244	1525	0.765976
2	1	5505	10	55			1.487896
3	1	5505	10	75			1.994499
4	2	5505	10	65	1206		2.879856
5	1	5505	10	80			3.889923
6	3	5505	10	65	1621	1582	4.634598
7	3	5505	10	65	1155	1950	6.449631
8	2	5505	10	65	1390		6.707839
9	1	5505	10	95			8.151427
10	1	5505	10	85			8.723419
11	2	5505	10	100	1301		9.630484
12	3	5505	10	100	1388	1630	10.657725
13	1	5505	10	55			11.14462
USA Bin 5 Trial #29							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5505	10	90	1826	1569	0.368005
2	2	5505	10	65	1908		1.049075
3	3	5505	10	60	1255	1293	1.640128
4	1	5505	10	100			2.48533
5	3	5505	10	50	1946	1794	2.9284
6	1	5505	10	65			4.188363
7	2	5505	10	80	1778		4.720254
8	2	5505	10	85	1512		5.331255
9	1	5505	10	95			5.924656
10	1	5505	10	65			6.569209
11	3	5505	10	85	1099	1758	7.439365
12	2	5505	10	95	1691		8.253768
13	3	5505	10	80	1893	1966	9.024892
14	2	5505	10	80	1371		9.819425
15	1	5505	10	65			9.92036

16	3	5505	10	60	1071	1388	11.21007
17	2	5505	10	50	1522		11.326596
USA Bin 5 Trial #30							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5507	5	75	1943		0.137236
2	1	5507	5	65			1.303152
3	2	5507	5	50	1018		3.308791
4	3	5507	5	50	1598	1355	4.064518
5	1	5507	5	95			5.429682
6	2	5507	5	70	1428		6.362511
7	2	5507	5	70	1297		7.442627
8	2	5507	5	55	1200		9.001304
9	3	5507	5	85	1222	1244	10.611663
10	2	5507	5	75	1770		10.834613

Type 6 Frequency Hopping Radar Statistical Performance – 20MHz BW, Channel 5500MHz

Trial	Hop #	Freq (GHz)	Pulse Start (mS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	16	5492	48	1	100.0%	70.0%
2	21	5506	63	1		
3	13	5505	39	1		
4	10	5506	30	1		
5	49	5505	147	1		
6	3	5509	9	1		
7	29	5496	87	1		
8	35	5503	105	1		
9	5	5501	15	1		
10	9	5505	27	1		
11	29	5495	87	1		
12	22	5496	66	1		
13	3	5501	9	1		
14	27	5497	81	1		
15	21	5502	63	1		
16	79	5505	237	1		
17	2	5505	6	1		
18	4	5493	12	1		
19	37	5509	111	1		
20	26	5496	78	1		
21	21	5498	63	1		
22	6	5491	18	1		
23	13	5504	39	1		
24	45	5492	135	1		
25	1	5499	3	1		
26	29	5502	87	1		
27	49	5495	147	1		
28	55	5504	165	1		
29	50	5493	150	1		
30	23	5505	69	1		

Type 6 Frequency Hopping Radar Statistical Performance – 20MHz BW, Channel 5500MHz –Details

USA Frequency Hopping Trial #1		
Hop #	Freq (GHz)	Pulse Start (mS)
16	5492	48
87	5493	261
USA Frequency Hopping Trial #2		
Hop #	Freq (GHz)	Pulse Start (mS)
21	5506	63
34	5505	102
43	5494	129
55	5491	165
77	5495	231
USA Frequency Hopping Trial #3		
Hop #	Freq (GHz)	Pulse Start (mS)
13	5505	39
28	5506	84
84	5509	252
USA Frequency Hopping Trial #4		
Hop #	Freq (GHz)	Pulse Start (mS)
10	5506	30
77	5502	231
85	5491	255
95	5496	285
USA Frequency Hopping Trial #5		
Hop #	Freq (GHz)	Pulse Start (mS)
49	5505	147
79	5497	237
81	5499	243
88	5509	264
92	5503	276
USA Frequency Hopping Trial #6		
Hop #	Freq (GHz)	Pulse Start (mS)
3	5509	9
18	5498	54
59	5491	177

70	5508	210
USA Frequency Hopping Trial #7		
Hop #	Freq (GHz)	Pulse Start (mS)
29	5496	87
45	5503	135
50	5494	150
86	5491	258
USA Frequency Hopping Trial #8		
Hop #	Freq (GHz)	Pulse Start (mS)
35	5503	105
98	5500	294
USA Frequency Hopping Trial #9		
Hop #	Freq (GHz)	Pulse Start (mS)
5	5501	15
19	5505	57
39	5500	117
46	5502	138
54	5503	162
85	5493	255
90	5495	270
USA Frequency Hopping Trial #10		
Hop #	Freq (GHz)	Pulse Start (mS)
9	5505	27
17	5497	51
21	5502	63
USA Frequency Hopping Trial #11		
Hop #	Freq (GHz)	Pulse Start (mS)
29	5495	87
46	5493	138
51	5509	153
52	5496	156
91	5503	273
USA Frequency Hopping Trial #12		
Hop #	Freq (GHz)	Pulse Start (mS)
22	5496	66

32	5494	96
58	5501	174
67	5499	201
USA Frequency Hopping Trial #13		
Hop #	Freq (GHz)	Pulse Start (mS)
3	5501	9
22	5495	66
31	5509	93
54	5504	162
USA Frequency Hopping Trial #14		
Hop #	Freq (GHz)	Pulse Start (mS)
27	5497	81
29	5495	87
62	5496	186
71	5501	213
88	5498	264
USA Frequency Hopping Trial #15		
Hop #	Freq (GHz)	Pulse Start (mS)
21	5502	63
34	5507	102
63	5503	189
98	5500	294
USA Frequency Hopping Trial #16		
Hop #	Freq (GHz)	Pulse Start (mS)
79	5505	237
99	5491	297
USA Frequency Hopping Trial #17		
Hop #	Freq (GHz)	Pulse Start (mS)
2	5505	6
59	5508	177
76	5502	228
USA Frequency Hopping Trial #18		
Hop #	Freq (GHz)	Pulse Start (mS)
4	5493	12
5	5506	15

15	5502	45
85	5501	255
91	5492	273
USA Frequency Hopping Trial #19		
Hop #	Freq (GHz)	Pulse Start (mS)
37	5509	111
41	5495	123
81	5492	243
USA Frequency Hopping Trial #20		
Hop #	Freq (GHz)	Pulse Start (mS)
26	5496	78
72	5502	216
78	5506	234
95	5499	285
USA Frequency Hopping Trial #21		
Hop #	Freq (GHz)	Pulse Start (mS)
21	5498	63
30	5501	90
USA Frequency Hopping Trial #22		
Hop #	Freq (GHz)	Pulse Start (mS)
6	5491	18
27	5507	81
57	5498	171
88	5497	264
94	5502	282
USA Frequency Hopping Trial #23		
Hop #	Freq (GHz)	Pulse Start (mS)
13	5504	39
29	5505	87
67	5507	201
93	5498	279
USA Frequency Hopping Trial #24		
Hop #	Freq (GHz)	Pulse Start (mS)
45	5492	135
54	5509	162

72	5505	216
75	5502	225
USA Frequency Hopping Trial #25		
Hop #	Freq (GHz)	Pulse Start (mS)
1	5499	3
9	5493	27
28	5503	84
38	5498	114
68	5497	204
76	5492	228
81	5495	243
USA Frequency Hopping Trial #26		
Hop #	Freq (GHz)	Pulse Start (mS)
29	5502	87
30	5506	90
42	5496	126
97	5504	291
USA Frequency Hopping Trial #27		
Hop #	Freq (GHz)	Pulse Start (mS)
49	5495	147
71	5509	213
86	5504	258
USA Frequency Hopping Trial #28		
Hop #	Freq (GHz)	Pulse Start (mS)
55	5504	165
93	5505	279
USA Frequency Hopping Trial #29		
Hop #	Freq (GHz)	Pulse Start (mS)
50	5493	150
USA Frequency Hopping Trial #30		
Hop #	Freq (GHz)	Pulse Start (mS)
23	5505	69
33	5498	99
75	5493	225

Statistical Performance Check - 40MHz Bandwidth

Type 1A/1B Radar Statistical Performance – 40MHz BW, Channel 5500MHz

Trial	Frequency	Pulses	PW (uS)	PRI (uS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	5495	63	1	838	1	83.3%	60.0%
2	5495	89	1	598	1		
3	5495	59	1	898	1		
4	5495	78	1	678	1		
5	5495	81	1	658	1		
6	5495	61	1	878	1		
7	5500	99	1	538	1		
8	5500	78	1	678	1		
9	5500	74	1	718	0		
10	5500	74	1	718	0		
11	5500	59	1	898	1		
12	5500	86	1	618	1		
13	5510	18	1	3066	0		
14	5510	70	1	758	0		
15	5510	78	1	678	1		
16	5510	30	1	1782	1		
17	5510	62	1	856	1		
18	5510	26	1	2107	1		
19	5520	19	1	2875	0		
20	5520	28	1	1903	1		
21	5520	21	1	2583	1		
22	5520	93	1	573	1		
23	5520	26	1	2085	1		
24	5520	32	1	1666	1		
25	5525	18	1	3062	1		
26	5525	29	1	1870	1		
27	5525	22	1	2433	1		
28	5525	41	1	1317	1		
29	5525	18	1	2952	1		
30	5525	23	1	2367	1		

Type 2 Radar Statistical Performance – 40MHz BW, Channel 5500MHz

Trial	Frequency	Pulses	PW (uS)	PRI (uS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	5495	25	4.5	159	1	86.7%	60.0%
2	5495	23	3.7	151	1		
3	5495	28	1.1	171	1		
4	5495	25	3.6	165	1		
5	5495	28	2.1	222	1		
6	5495	27	2.1	188	1		
7	5500	24	2	217	1		
8	5500	28	1.9	228	1		
9	5500	24	2.5	225	1		
10	5500	27	2.5	179	1		
11	5500	25	2.8	182	1		
12	5500	23	2	193	1		
13	5510	23	1.1	179	1		
14	5510	26	2.6	195	1		
15	5510	24	4.4	210	1		
16	5510	25	1.3	203	1		
17	5510	29	4.4	200	1		
18	5510	23	2.8	190	1		
19	5520	28	1.2	213	1		
20	5520	27	1.1	188	1		
21	5520	26	2	175	1		
22	5520	26	4.4	206	1		
23	5520	28	3.6	189	1		
24	5520	23	4.1	217	0		
25	5525	29	3.3	156	0		
26	5525	23	1.3	191	0		
27	5525	25	3.5	229	0		
28	5525	26	4.6	167	1		
29	5525	25	2.6	188	1		
30	5525	23	2.1	161	1		

Type 3 Radar Statistical Performance – 40MHz BW, Channel 5500MHz

Trial	Frequency	Pulses	PW (uS)	PRI (uS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	5495	18	7.5	367	1	96.7%	60.0%
2	5495	16	9.4	235	1		
3	5495	18	8.8	306	1		
4	5495	18	6.8	228	0		
5	5495	18	9.7	461	1		
6	5495	16	8.7	462	1		
7	5500	18	7	331	1		
8	5500	17	9.4	203	1		
9	5500	18	6.5	272	1		
10	5500	16	9.5	404	1		
11	5500	16	9	456	1		
12	5500	18	9.7	249	1		
13	5510	17	8.2	383	1		
14	5510	18	6.7	225	1		
15	5510	17	9.1	277	1		
16	5510	18	8.5	301	1		
17	5510	16	6.8	294	1		
18	5510	16	6	486	1		
19	5520	16	6.7	483	1		
20	5520	16	7.4	200	1		
21	5520	18	8.9	240	1		
22	5520	16	7.9	405	1		
23	5520	18	9.3	216	1		
24	5520	17	8.2	420	1		
25	5525	16	8.3	321	1		
26	5525	16	7.7	308	1		
27	5525	16	7.7	359	1		
28	5525	16	9.3	497	1		
29	5525	17	6.7	353	1		
30	5525	16	7.3	341	1		

Type 4 Radar Statistical Performance – 40MHz BW, Channel 5500MHz

Trial	Frequency	Pulses	PW (uS)	PRI (uS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	5495	15	16.3	483	1	96.7%	60.0%
2	5495	14	13.5	413	1		
3	5495	14	18.3	484	1		
4	5495	14	14.5	479	1		
5	5495	15	16.3	385	1		
6	5495	14	11.3	217	1		
7	5500	15	19.5	370	1		
8	5500	12	16.5	422	1		
9	5500	16	18	384	1		
10	5500	12	14.5	468	1		
11	5500	15	19	334	1		
12	5500	15	16.7	445	1		
13	5510	13	18	428	1		
14	5510	12	15.2	434	1		
15	5510	14	12.1	269	1		
16	5510	16	11.7	202	1		
17	5510	14	19.4	500	1		
18	5510	16	15.4	229	1		
19	5520	16	19.3	341	1		
20	5520	13	19.3	350	1		
21	5520	12	14.9	300	1		
22	5520	13	14.9	482	0		
23	5520	13	19.7	324	1		
24	5520	12	17.2	364	1		
25	5525	16	11.6	351	1		
26	5525	15	18.2	484	1		
27	5525	14	16	440	1		
28	5525	12	13.4	357	1		
29	5525	16	19.4	426	1		
30	5525	13	11.7	311	1		

In addition an average minimum percentage of successful detection across all four Short pulse radar test waveforms is required and is calculated as follows:

$$\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4}$$ = (83.3% + 86.7% + 96.7% + 96.7%)/4 = 90.85% (>80%)

Type 5 Long Pulse Radar Statistical Performance – 40MHz BW, Channel 5500MHz

Trial	Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)	1=Detection 0=No Detection	Detection Percentage	Limit
1	1	2	5497.6	14	50	1682		0.233816	1	100.0%	80.0%
2	1	1	5500	20	65			0.132567	1		
3	1	3	5499.2	18	100	1859	1115	0.364138	1		
4	1	1	5499.6	19	85			0.952282	1		
5	1	1	5498.8	17	70			0.358672	1		
6	1	2	5497.6	14	60	1722		0.425717	1		
7	1	3	5495.6	9	95	1948	1989	0.62266	1		
8	1	3	5498.4	16	85	1648	1649	0.665127	1		
9	1	2	5500	20	75	1586		0.331275	1		
10	1	3	5494.8	7	100	1042	1166	0.483472	1		
11	1	3	5510	14	65	1564	1325	0.03486	1		
12	1	1	5510	13	65			0.529505	1		
13	1	1	5510	11	55			1.086754	1		
14	1	2	5510	16	50	1609		0.080219	1		
15	1	1	5510	12	70			0.268618	1		
16	1	3	5510	14	55	1159	1571	0.246847	1		
17	1	2	5510	10	65	1139		0.44457	1		
18	1	2	5510	20	70	1632		0.246255	1		
19	1	2	5510	8	80	1495		0.022743	1		
20	1	3	5510	16	65	1231	1149	0.072871	1		
21	1	1	5524	10	60			0.24328	1		
22	1	3	5520.4	19	85	1371	1010	1.465024	1		
23	1	1	5522	15	95			0.05881	1		
24	1	2	5522	15	85	1697		0.298258	1		
25	1	1	5523.2	12	95			0.984801	1		
26	1	2	5520.8	18	65	1404		0.405945	1		
27	1	1	5522.4	14	80			0.473888	1		
28	1	1	5523.2	12	80			0.595076	1		
29	1	1	5524	10	90			0.884851	1		
30	1	1	5525.6	6	70			1.004491	1		

Type 5 Long Pulse Radar Statistical Performance – 40MHz BW, Channel 5500MHz - Details

USA Bin 5 Trial #1							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5497.6	14	50	1682		0.233816
2	2	5497.6	14	90	1998		2.291298
3	1	5497.6	14	95			2.998491
4	1	5497.6	14	95			4.301491
5	1	5497.6	14	90			5.655267
6	3	5497.6	14	70	1263	1588	7.79684
7	1	5497.6	14	55			9.031115
8	3	5497.6	14	95	1997	1152	9.38066
9	3	5497.6	14	95	1916	1001	11.752015
USA Bin 5 Trial #2							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5500	20	65			0.132567
2	2	5500	20	70	1969		1.206101
3	3	5500	20	75	1309	1642	2.022627
4	1	5500	20	55			3.476129
5	1	5500	20	100			3.911775
6	1	5500	20	80			5.155469
7	2	5500	20	80	1182		6.413537
8	1	5500	20	80			6.805022
9	3	5500	20	60	1127	1273	8.152892
10	2	5500	20	70	1177		8.493309
11	3	5500	20	90	1116	1608	9.877115
12	2	5500	20	95	1811		10.606407
13	1	5500	20	70			11.856181
USA Bin 5 Trial #3							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5499.2	18	100	1859	1115	0.364138
2	1	5499.2	18	90			1.566692
3	1	5499.2	18	55			1.900981
4	2	5499.2	18	85	1497		2.561931
5	1	5499.2	18	90			3.427861
6	3	5499.2	18	55	1829	1250	4.616689

7	2	5499.2	18	50	1477		5.566525
8	3	5499.2	18	55	1084	1083	6.3836
9	3	5499.2	18	80	1276	1581	6.660906
10	3	5499.2	18	85	1433	1511	7.513383
11	1	5499.2	18	50			8.025557
12	1	5499.2	18	50			9.17513
13	1	5499.2	18	55			10.247315
14	3	5499.2	18	50	1621	1863	10.899075
15	3	5499.2	18	60	1713	1392	11.399929
USA Bin 5 Trial #4							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5499.6	19	85			0.952282
2	2	5499.6	19	80	1464		2.511004
3	3	5499.6	19	85	1888	1146	3.773926
4	1	5499.6	19	95			4.099223
5	1	5499.6	19	60			5.356033
6	1	5499.6	19	95			7.53411
7	2	5499.6	19	60	1250		8.18272
8	3	5499.6	19	65	1579	1141	9.684548
9	2	5499.6	19	100	1416		10.916004
USA Bin 5 Trial #5							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5498.8	17	70			0.358672
2	3	5498.8	17	60	1484	1517	0.871
3	1	5498.8	17	65			1.201018
4	3	5498.8	17	100	1233	1786	2.296761
5	2	5498.8	17	55	1475		2.77977
6	3	5498.8	17	55	1842	1794	3.296106
7	1	5498.8	17	95			3.830565
8	2	5498.8	17	90	1076		4.624621
9	1	5498.8	17	50			5.242483
10	2	5498.8	17	50	1264		5.805453
11	3	5498.8	17	70	1249	1259	6.36693
12	3	5498.8	17	100	1322	1065	6.704862
13	2	5498.8	17	100	1191		7.230004
14	1	5498.8	17	75			7.839828
15	1	5498.8	17	65			8.95257

16	3	5498.8	17	90	1861	1502	9.498556
17	2	5498.8	17	90	1019		9.641829
18	3	5498.8	17	80	1805	1800	10.733596
19	2	5498.8	17	75	1083		10.946538
20	3	5498.8	17	75	1610	1949	11.424081
USA Bin 5 Trial #6							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5497.6	14	60	1722		0.425717
2	2	5497.6	14	80	1345		1.19685
3	1	5497.6	14	80			2.989759
4	3	5497.6	14	70	1530	1753	3.645505
5	3	5497.6	14	70	1698	1896	4.63723
6	1	5497.6	14	80			5.550617
7	2	5497.6	14	95	1179		6.031253
8	3	5497.6	14	50	1997	1932	7.480768
9	3	5497.6	14	100	1033	1004	8.799409
10	2	5497.6	14	100	1948		9.94081
11	1	5497.6	14	60			10.221282
12	1	5497.6	14	80			11.864146
USA Bin 5 Trial #7							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5495.6	9	95	1948	1989	0.62266
2	2	5495.6	9	70	1593		2.333277
3	1	5495.6	9	75			3.139078
4	2	5495.6	9	95	1885		4.0333
5	1	5495.6	9	85			6.271441
6	3	5495.6	9	95	1799	1181	6.666833
7	2	5495.6	9	70	1771		8.100681
8	2	5495.6	9	65	1976		9.809443
9	2	5495.6	9	95	1563		11.110374
USA Bin 5 Trial #8							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5498.4	16	85	1648	1649	0.665127
2	1	5498.4	16	60			2.755192
3	1	5498.4	16	80			4.180683

4	3	5498.4	16	80	1770	1279	4.736839
5	1	5498.4	16	85			6.314895
6	3	5498.4	16	80	1556	1213	8.671782
7	2	5498.4	16	95	1266		9.893358
8	1	5498.4	16	55			11.933333
USA Bin 5 Trial #9							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5500	20	75	1586		0.331275
2	2	5500	20	100	1879		1.615043
3	3	5500	20	60	1914	1049	3.416479
4	1	5500	20	100			5.478734
5	1	5500	20	80			6.315325
6	1	5500	20	85			8.882217
7	1	5500	20	85			10.001591
8	2	5500	20	70	1004		11.258334
USA Bin 5 Trial #10							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5494.8	7	100	1042	1166	0.483472
2	2	5494.8	7	60	1833		1.522721
3	2	5494.8	7	60	1116		4.236088
4	3	5494.8	7	55	1795	1194	5.082718
5	1	5494.8	7	85			7.306511
6	1	5494.8	7	90			8.336061
7	2	5494.8	7	95	1864		9.918807
8	3	5494.8	7	55	1121	1578	11.433374
USA Bin 5 Trial #11							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5510	14	65	1564	1325	0.03486
2	2	5510	14	80	1573		0.946944
3	2	5510	14	95	1507		1.281699
4	1	5510	14	60			2.399364
5	1	5510	14	95			2.874732
6	1	5510	14	55			3.305137
7	3	5510	14	100	1940	1926	3.603705
8	3	5510	14	70	1582	1599	4.496722

9	2	5510	14	70	1970		5.044989
10	1	5510	14	55			5.668224
11	3	5510	14	65	1659	1352	6.409827
12	1	5510	14	80			6.759039
13	3	5510	14	65	1586	1504	7.302201
14	3	5510	14	70	1427	1544	8.372327
15	3	5510	14	80	1975	1948	8.585059
16	2	5510	14	80	1663		9.0828
17	3	5510	14	95	1361	1040	9.769353
18	1	5510	14	90			10.720562
19	2	5510	14	100	1767		10.958493
20	3	5510	14	60	1897	1989	11.505662
USA Bin 5 Trial #12							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5510	13	65			0.529505
2	3	5510	13	100	1896	1306	0.981167
3	1	5510	13	95			1.936438
4	1	5510	13	85			2.991695
5	1	5510	13	90			3.772568
6	3	5510	13	100	1954	1383	4.694393
7	1	5510	13	85			5.772983
8	1	5510	13	75			7.092568
9	2	5510	13	60	1680		7.887134
10	1	5510	13	90			8.504537
11	1	5510	13	65			9.412545
12	3	5510	13	80	1221	1810	10.447435
13	3	5510	13	75	1308	1892	11.298005
USA Bin 5 Trial #13							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5510	11	55			1.086754
2	3	5510	11	55	1900	1179	2.269456
3	1	5510	11	70			2.912742
4	3	5510	11	65	1460	1467	4.320554
5	2	5510	11	75	1149		5.069667
6	3	5510	11	60	1642	1314	6.624943
7	3	5510	11	55	1915	1145	7.396398
8	2	5510	11	55	1644		9.41704

9	3	5510	11	95	1359	1715	10.702352
10	3	5510	11	75	1520	1104	10.996208
USA Bin 5 Trial #14							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5510	16	50	1609		0.080219
2	1	5510	16	65			0.766302
3	3	5510	16	50	1152	1556	1.5421
4	1	5510	16	70			2.042634
5	3	5510	16	95	1251	1782	2.743872
6	1	5510	16	100			3.645417
7	1	5510	16	65			4.22609
8	1	5510	16	60			4.952972
9	1	5510	16	80			5.317761
10	1	5510	16	65			5.825252
11	2	5510	16	80	1632		6.856707
12	1	5510	16	100			7.538343
13	1	5510	16	90			7.664712
14	3	5510	16	95	1119	1503	8.701076
15	3	5510	16	100	1904	1741	9.141264
16	3	5510	16	90	1918	1160	9.617713
17	3	5510	16	65	1522	1192	10.449358
18	2	5510	16	80	1852		11.021474
19	3	5510	16	90	1914	1780	11.466357
USA Bin 5 Trial #15							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5510	12	70			0.268618
2	3	5510	12	70	1023	1721	1.184808
3	1	5510	12	70			2.248137
4	3	5510	12	55	1706	1789	2.493784
5	1	5510	12	85			3.379186
6	1	5510	12	75			3.793543
7	3	5510	12	85	1731	1224	5.174537
8	1	5510	12	90			5.930457
9	2	5510	12	65	1652		6.364254
10	3	5510	12	60	1526	1670	7.39299
11	3	5510	12	95	1882	1688	8.062147
12	2	5510	12	80	1028		8.918621

13	1	5510	12	70			9.026162
14	2	5510	12	70	1918		10.221063
15	2	5510	12	55	1547		10.98137
16	1	5510	12	100			11.385393
USA Bin 5 Trial #16							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5510	14	55	1159	1571	0.246847
2	3	5510	14	100	1667	1337	1.256219
3	1	5510	14	95			3.164542
4	2	5510	14	85	1848		3.637067
5	2	5510	14	95	1649		5.189662
6	1	5510	14	70			5.860303
7	3	5510	14	65	1182	1854	6.925482
8	2	5510	14	75	1813		7.883648
9	1	5510	14	75			9.10059
10	1	5510	14	65			10.81758
11	2	5510	14	65	1818		11.976951
USA Bin 5 Trial #17							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5510	10	65	1139		0.44457
2	3	5510	10	55	1941	1013	0.793583
3	3	5510	10	75	1826	1927	1.224875
4	2	5510	10	60	1207		2.281805
5	3	5510	10	95	1946	1424	2.9922
6	2	5510	10	70	1526		3.087882
7	2	5510	10	50	1863		4.099479
8	1	5510	10	50			4.720926
9	1	5510	10	80			5.185036
10	2	5510	10	80	1089		5.453982
11	3	5510	10	50	1477	1113	6.387562
12	3	5510	10	60	1681	1428	7.030262
13	1	5510	10	65			7.226218
14	2	5510	10	70	1220		8.018636
15	2	5510	10	70	1169		8.633371
16	3	5510	10	90	1019	1671	9.043509
17	2	5510	10	90	1758		10.066136
18	1	5510	10	95			10.37994

19	3	5510	10	85	1126	1338	11.050132
20	2	5510	10	50	1542		11.648022
USA Bin 5 Trial #18							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5510	20	70	1632		0.246255
2	2	5510	20	90	1997		0.845411
3	2	5510	20	80	1281		1.547387
4	2	5510	20	75	1123		2.952593
5	2	5510	20	75	1696		3.063737
6	2	5510	20	50	1364		3.774209
7	3	5510	20	75	1872	1490	5.193809
8	2	5510	20	60	1563		5.292783
9	3	5510	20	55	1188	1348	6.225504
10	1	5510	20	55			7.349806
11	1	5510	20	100			7.551138
12	3	5510	20	95	1175	1985	8.81951
13	2	5510	20	50	1388		9.0245
14	2	5510	20	65	1402		10.30829
15	1	5510	20	70			10.644646
16	3	5510	20	95	1380	1804	11.721221
USA Bin 5 Trial #19							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5510	8	80	1495		0.022743
2	3	5510	8	65	1555	1364	0.980559
3	1	5510	8	65			2.10624
4	3	5510	8	95	1397	1449	3.226619
5	2	5510	8	90	1070		3.66966
6	2	5510	8	70	1651		4.364541
7	1	5510	8	85			5.789292
8	3	5510	8	65	1478	1415	6.382857
9	3	5510	8	85	1792	1972	7.130509
10	2	5510	8	60	1241		8.19992
11	3	5510	8	85	1858	1292	9.127746
12	3	5510	8	90	1792	1973	9.903482
13	1	5510	8	100			10.989062
14	3	5510	8	85	1786	1118	11.801016
USA Bin 5 Trial #20							

Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5510	16	65	1231	1149	0.072871
2	3	5510	16	70	1229	1592	0.857192
3	2	5510	16	75	1177		1.803441
4	3	5510	16	95	1654	1870	2.62927
5	3	5510	16	85	1441	1689	3.64986
6	1	5510	16	60			4.353416
7	2	5510	16	80	1299		4.965189
8	2	5510	16	75	1446		5.785453
9	2	5510	16	60	1332		6.178353
10	1	5510	16	65			6.750833
11	3	5510	16	65	1830	1204	7.669
12	2	5510	16	60	1672		8.539503
13	2	5510	16	90	1496		9.255562
14	1	5510	16	70			9.83395
15	1	5510	16	80			10.670533
16	3	5510	16	65	1738	1292	11.995532
USA Bin 5 Trial #21							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5524	10	60			0.24328
2	3	5524	10	70	1379	1251	1.216602
3	3	5524	10	70	1569	1917	2.24278
4	3	5524	10	100	1971	1784	3.159432
5	3	5524	10	100	1598	1121	3.723084
6	2	5524	10	80	1177		4.339476
7	1	5524	10	85			5.474689
8	1	5524	10	95			6.792783
9	1	5524	10	100			7.06138
10	2	5524	10	65	1659		7.967817
11	2	5524	10	65	1249		8.683116
12	1	5524	10	95			10.275145
13	2	5524	10	95	1456		10.517135
14	3	5524	10	100	1486	1940	11.371982
USA Bin 5 Trial #22							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)

1	3	5520.4	19	85	1371	1010	1.465024
2	1	5520.4	19	80			2.925476
3	3	5520.4	19	90	1561	1038	4.411679
4	3	5520.4	19	60	1279	1328	5.926283
5	2	5520.4	19	85	1285		6.012138
6	2	5520.4	19	70	1812		7.661774
7	2	5520.4	19	65	1370		9.693454
8	1	5520.4	19	70			10.950454
USA Bin 5 Trial #23							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5522	15	95			0.05881
2	1	5522	15	75			0.858062
3	1	5522	15	90			2.329642
4	3	5522	15	95	1171	1100	2.589154
5	2	5522	15	85	1527		3.497923
6	1	5522	15	65			4.935028
7	2	5522	15	55	1968		5.495434
8	3	5522	15	75	1921	1555	6.377757
9	2	5522	15	80	1221		6.917424
10	3	5522	15	85	1794	1582	7.976569
11	3	5522	15	80	1367	1976	9.344244
12	3	5522	15	80	1073	1886	10.085987
13	1	5522	15	75			10.668345
14	3	5522	15	70	1117	1630	11.440758
USA Bin 5 Trial #24							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5522	15	85	1697		0.298258
2	1	5522	15	65			0.631269
3	2	5522	15	95	1947		1.736271
4	2	5522	15	60	1902		2.121841
5	2	5522	15	75	1335		2.602696
6	2	5522	15	55	1126		3.196066
7	1	5522	15	60			4.049633
8	2	5522	15	75	1610		4.793049
9	1	5522	15	55			4.80464
10	3	5522	15	95	1021	1395	5.754235
11	2	5522	15	90	1510		6.531517

12	3	5522	15	90	1374	1788	7.066634
13	2	5522	15	75	1996		7.655525
14	3	5522	15	95	1251	1694	7.916056
15	2	5522	15	55	1764		8.576921
16	1	5522	15	100			9.006239
17	1	5522	15	70			9.728847
18	2	5522	15	95	1728		10.716341
19	1	5522	15	60			10.875156
20	3	5522	15	90	1745	1622	11.664189
USA Bin 5 Trial #25							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5523.2	12	95			0.984801
2	1	5523.2	12	75			1.870805
3	3	5523.2	12	75	1394	1633	3.884015
4	3	5523.2	12	60	1448	1807	4.126345
5	1	5523.2	12	75			6.025317
6	3	5523.2	12	75	1696	1411	7.237826
7	3	5523.2	12	90	1883	1295	8.396076
8	2	5523.2	12	100	1872		10.318221
9	2	5523.2	12	100	1590		10.673847
USA Bin 5 Trial #26							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5520.8	18	65	1404		0.405945
2	2	5520.8	18	100	1808		1.801979
3	3	5520.8	18	65	1735	1940	2.644
4	3	5520.8	18	60	1748	1898	3.606224
5	1	5520.8	18	95			4.778186
6	2	5520.8	18	75	1763		6.039779
7	2	5520.8	18	95	1063		7.054867
8	1	5520.8	18	85			8.315071
9	2	5520.8	18	50	1794		9.647535
10	1	5520.8	18	95			10.286333
11	3	5520.8	18	60	1665	1508	11.309874
USA Bin 5 Trial #27							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)

1	1	5522.4	14	80			0.473888
2	2	5522.4	14	65	1254		2.393069
3	3	5522.4	14	60	1782	1039	2.683019
4	3	5522.4	14	65	1355	1409	4.399277
5	1	5522.4	14	50			6.36411
6	2	5522.4	14	95	1221		7.381815
7	2	5522.4	14	60	1014		8.618973
8	1	5522.4	14	80			10.18348
9	1	5522.4	14	90			10.899609
USA Bin 5 Trial #28							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5523.2	12	80			0.595076
2	3	5523.2	12	75	1475	1841	1.113311
3	2	5523.2	12	75	1527		1.995102
4	1	5523.2	12	65			2.653224
5	2	5523.2	12	55	1566		2.782489
6	1	5523.2	12	100			3.529402
7	2	5523.2	12	90	1053		4.103813
8	2	5523.2	12	65	1036		5.099883
9	2	5523.2	12	65	1716		5.986667
10	3	5523.2	12	60	1606	1660	6.193378
11	2	5523.2	12	65	1288		6.734338
12	1	5523.2	12	70			7.336023
13	3	5523.2	12	50	1028	1464	8.350751
14	2	5523.2	12	90	1981		8.880285
15	3	5523.2	12	95	1779	1351	9.597252
16	2	5523.2	12	100	1798		10.370247
17	2	5523.2	12	85	1426		10.963424
18	1	5523.2	12	50			11.484745
USA Bin 5 Trial #29							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5524	10	90			0.884851
2	1	5524	10	70			1.974007
3	2	5524	10	100	1493		2.32486
4	3	5524	10	90	1048	1692	3.271842
5	1	5524	10	90			4.723974
6	1	5524	10	85			5.528686

7	3	5524	10	85	1828	1267	6.249556
8	3	5524	10	70	1225	1090	7.439181
9	2	5524	10	75	1563		8.25499
10	1	5524	10	70			9.405207
11	1	5524	10	60			10.980696
12	3	5524	10	55	1542	1065	11.811626
USA Bin 5 Trial #30							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5525.6	6	70			1.004491
2	3	5525.6	6	50	1245	1701	2.706885
3	3	5525.6	6	70	1106	1503	4.006923
4	1	5525.6	6	85			4.741606
5	2	5525.6	6	70	1961		7.223877
6	3	5525.6	6	80	1165	1374	8.824626
7	3	5525.6	6	95	1917	1279	9.391135
8	2	5525.6	6	95	1085		11.993646

Type 6 Frequency Hopping Radar Statistical Performance – 40MHz BW, Channel 5500MHz

Trial	Hop #	Freq (GHz)	Pulse Start (mS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	34	5524	102	1	100.0%	70.0%
2	15	5510	45	1		
3	1	5497	3	1		
4	14	5493	42	1		
5	26	5506	78	1		
6	10	5495	30	1		
7	6	5515	18	1		
8	24	5497	72	1		
9	3	5513	9	1		
10	29	5501	87	1		
11	29	5510	87	1		
12	6	5519	18	1		
13	4	5505	12	1		
14	6	5527	18	1		
15	10	5501	30	1		
16	6	5503	18	1		
17	8	5505	24	1		
18	4	5516	12	1		
19	10	5518	30	1		
20	6	5517	18	1		
21	1	5493	3	1		
22	3	5498	9	1		
23	7	5526	21	1		
24	13	5513	39	1		
25	18	5527	54	1		
26	5	5522	15	1		
27	11	5528	33	1		
28	0	5512	0	1		
29	13	5497	39	1		
30	2	5494	6	1		

Type 6 Frequency Hopping Radar Statistical Performance – 40MHz BW, Channel 5500MHz - Details

USA Frequency Hopping Trial #1		
Hop #	Freq (GHz)	Pulse Start (mS)
34	5524	102
47	5527	141
59	5508	177
83	5492	249
USA Frequency Hopping Trial #2		
Hop #	Freq (GHz)	Pulse Start (mS)
15	5510	45
26	5519	78
29	5523	87
32	5512	96
44	5504	132
50	5493	150
66	5500	198
80	5528	240
82	5506	246
92	5507	276
USA Frequency Hopping Trial #3		
Hop #	Freq (GHz)	Pulse Start (mS)
1	5497	3
25	5510	75
30	5506	90
32	5511	96
34	5503	102
35	5507	105
65	5514	195
75	5493	225
90	5498	270
USA Frequency Hopping Trial #4		
Hop #	Freq (GHz)	Pulse Start (mS)
14	5493	42
16	5523	48
30	5500	90
46	5524	138
68	5498	204

79	5496	237
85	5516	255
86	5528	258
98	5518	294
USA Frequency Hopping Trial #5		
Hop #	Freq (GHz)	Pulse Start (mS)
26	5506	78
30	5520	90
31	5528	93
33	5493	99
43	5513	129
44	5526	132
57	5494	171
85	5501	255
USA Frequency Hopping Trial #6		
Hop #	Freq (GHz)	Pulse Start (mS)
10	5495	30
18	5524	54
23	5503	69
39	5519	117
45	5498	135
56	5512	168
73	5492	219
79	5527	237
83	5520	249
USA Frequency Hopping Trial #7		
Hop #	Freq (GHz)	Pulse Start (mS)
6	5515	18
28	5514	84
97	5524	291
USA Frequency Hopping Trial #8		
Hop #	Freq (GHz)	Pulse Start (mS)
24	5497	72
35	5526	105
48	5511	144
52	5507	156
79	5499	237

81	5494	243
84	5502	252
USA Frequency Hopping Trial #9		
Hop #	Freq (GHz)	Pulse Start (mS)
3	5513	9
9	5507	27
26	5499	78
34	5522	102
35	5525	105
45	5505	135
59	5528	177
61	5500	183
USA Frequency Hopping Trial #10		
Hop #	Freq (GHz)	Pulse Start (mS)
29	5501	87
35	5494	105
41	5500	123
44	5499	132
86	5518	258
95	5508	285
USA Frequency Hopping Trial #11		
Hop #	Freq (GHz)	Pulse Start (mS)
29	5510	87
33	5523	99
36	5518	108
37	5508	111
51	5519	153
53	5512	159
66	5524	198
90	5501	270
USA Frequency Hopping Trial #12		
Hop #	Freq (GHz)	Pulse Start (mS)
6	5519	18
20	5505	60
21	5515	63
29	5496	87
64	5501	192

67	5521	201
82	5510	246
86	5527	258
USA Frequency Hopping Trial #13		
Hop #	Freq (GHz)	Pulse Start (mS)
4	5505	12
7	5500	21
10	5522	30
29	5510	87
43	5519	129
44	5520	132
48	5502	144
58	5498	174
62	5512	186
66	5495	198
68	5523	204
72	5524	216
75	5493	225
78	5511	234
USA Frequency Hopping Trial #14		
Hop #	Freq (GHz)	Pulse Start (mS)
6	5527	18
22	5495	66
48	5526	144
60	5514	180
76	5511	228
94	5525	282
USA Frequency Hopping Trial #15		
Hop #	Freq (GHz)	Pulse Start (mS)
10	5501	30
28	5507	84
36	5506	108
39	5527	117
69	5516	207
79	5521	237
87	5492	261
96	5523	288
USA Frequency Hopping Trial #16		

Hop #	Freq (GHz)	Pulse Start (mS)
6	5503	18
16	5498	48
45	5497	135
69	5508	207
74	5523	222
84	5519	252
92	5516	276
93	5524	279
95	5507	285
97	5521	291
USA Frequency Hopping Trial #17		
Hop #	Freq (GHz)	Pulse Start (mS)
8	5505	24
21	5503	63
28	5524	84
36	5516	108
44	5528	132
59	5506	177
81	5522	243
83	5502	249
87	5510	261
95	5494	285
USA Frequency Hopping Trial #18		
Hop #	Freq (GHz)	Pulse Start (mS)
4	5516	12
5	5503	15
35	5494	105
43	5512	129
48	5502	144
64	5499	192
66	5495	198
71	5520	213
73	5526	219
84	5523	252
90	5507	270
USA Frequency Hopping Trial #19		

Hop #	Freq (GHz)	Pulse Start (mS)
10	5518	30
17	5528	51
20	5509	60
76	5497	228
USA Frequency Hopping Trial #20		
Hop #	Freq (GHz)	Pulse Start (mS)
6	5517	18
9	5503	27
35	5514	105
50	5523	150
57	5495	171
75	5525	225
85	5527	255
88	5492	264
98	5502	294
USA Frequency Hopping Trial #21		
Hop #	Freq (GHz)	Pulse Start (mS)
1	5493	3
10	5522	30
12	5503	36
14	5508	42
20	5517	60
29	5492	87
35	5507	105
41	5496	123
47	5506	141
52	5524	156
68	5514	204
76	5502	228
79	5525	237
86	5526	258
91	5523	273
USA Frequency Hopping Trial #22		
Hop #	Freq (GHz)	Pulse Start (mS)
3	5498	9
10	5516	30

26	5508	78
49	5512	147
USA Frequency Hopping Trial #23		
Hop #	Freq (GHz)	Pulse Start (mS)
7	5526	21
16	5503	48
23	5508	69
31	5500	93
56	5493	168
57	5527	171
69	5520	207
90	5504	270
94	5499	282
USA Frequency Hopping Trial #24		
Hop #	Freq (GHz)	Pulse Start (mS)
13	5513	39
27	5520	81
35	5522	105
37	5496	111
45	5501	135
67	5527	201
85	5498	255
USA Frequency Hopping Trial #25		
Hop #	Freq (GHz)	Pulse Start (mS)
18	5527	54
29	5507	87
45	5499	135
53	5523	159
59	5520	177
82	5524	246
88	5518	264
USA Frequency Hopping Trial #26		
Hop #	Freq (GHz)	Pulse Start (mS)
5	5522	15
25	5515	75
30	5495	90
45	5527	135

51	5510	153
73	5524	219
78	5528	234
83	5512	249
87	5494	261
USA Frequency Hopping Trial #27		
Hop #	Freq (GHz)	Pulse Start (mS)
11	5528	33
15	5520	45
21	5501	63
41	5518	123
56	5495	168
62	5525	186
67	5505	201
68	5508	204
78	5500	234
89	5509	267
94	5492	282
USA Frequency Hopping Trial #28		
Hop #	Freq (GHz)	Pulse Start (mS)
0	5512	0
17	5502	51
25	5505	75
28	5499	84
USA Frequency Hopping Trial #29		
Hop #	Freq (GHz)	Pulse Start (mS)
13	5497	39
17	5511	51
70	5523	210
73	5520	219
98	5502	294
USA Frequency Hopping Trial #30		
Hop #	Freq (GHz)	Pulse Start (mS)
2	5494	6
26	5509	78
29	5514	87
38	5511	114

39	5508	117
43	5523	129
46	5499	138
62	5522	186
65	5500	195
67	5493	201
69	5506	207

Statistical Performance Check - 80MHz Bandwidth

Type 1A/1B Radar Statistical Performance – 80MHz BW, Channel 5500MHz

Trial	Frequency	Pulses	PW (uS)	PRI (uS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	5495	18	1	3066	1	90.0%	60.0%
2	5495	102	1	518	1		
3	5495	61	1	878	1		
4	5495	59	1	898	1		
5	5495	62	1	858	1		
6	5500	81	1	658	1		
7	5500	70	1	758	1		
8	5500	68	1	778	1		
9	5500	67	1	798	1		
10	5520	65	1	818	1		
11	5520	59	1	898	1		
12	5520	57	1	938	1		
13	5520	57	1	938	1		
14	5530	63	1	838	0		
15	5530	67	1	798	1		
16	5530	25	1	2196	1		
17	5530	23	1	2347	1		
18	5530	52	1	1029	1		
19	5540	25	1	2151	0		
20	5540	51	1	1039	0		
21	5540	83	1	637	1		
22	5540	40	1	1349	1		
23	5560	55	1	976	1		
24	5560	28	1	1885	1		
25	5560	59	1	900	1		
26	5560	47	1	1143	1		
27	5565	55	1	967	1		
28	5565	22	1	2441	1		
29	5565	77	1	689	1		
30	5565	21	1	2541	1		

Type 2 Radar Statistical Performance – 80MHz BW, Channel 5500MHz

Trial	Frequency	Pulses	PW (uS)	PRI (uS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	5495	25	3.4	219	1	93.3%	60.0%
2	5495	28	4.4	201	1		
3	5495	23	4.1	201	0		
4	5495	29	2.7	158	1		
5	5495	29	3.2	199	1		
6	5500	23	2.5	152	1		
7	5500	29	4.5	172	1		
8	5500	24	4.9	197	1		
9	5500	29	1.9	225	1		
10	5520	24	1	185	1		
11	5520	24	1.1	207	1		
12	5520	26	3.5	154	1		
13	5520	24	2.1	218	1		
14	5530	29	4.2	174	1		
15	5530	24	2.1	223	1		
16	5530	26	4.1	174	1		
17	5530	25	2.2	220	1		
18	5530	26	1.5	174	1		
19	5540	23	1.3	203	1		
20	5540	23	2.3	150	1		
21	5540	28	2.2	169	1		
22	5540	24	2.5	223	1		
23	5560	25	3.6	189	1		
24	5560	29	3.9	209	1		
25	5560	25	4.4	154	1		
26	5560	28	2.6	192	1		
27	5565	26	3.7	182	1		
28	5565	28	3.3	213	1		
29	5565	24	4.1	207	1		
30	5565	27	3.8	205	0		

Type 3 Radar Statistical Performance – 80MHz BW, Channel 5500MHz

Trial	Frequency	Pulses	PW (uS)	PRI (uS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	5495	18	6.5	224	1	90.0%	60.0%
2	5495	16	6.4	480	1		
3	5495	16	8.9	484	1		
4	5495	18	7	206	1		
5	5495	18	7.8	292	1		
6	5500	16	8	274	0		
7	5500	17	8.2	480	0		
8	5500	17	9.4	315	1		
9	5500	18	8.7	461	1		
10	5520	17	6.7	351	1		
11	5520	18	6.4	343	1		
12	5520	18	9.4	417	1		
13	5520	18	7.5	338	1		
14	5530	16	9.3	318	1		
15	5530	16	6.6	364	1		
16	5530	18	6.3	256	1		
17	5530	16	9	490	1		
18	5530	18	8.8	250	1		
19	5540	17	6.4	366	0		
20	5540	17	6.4	209	1		
21	5540	18	10	215	1		
22	5540	18	9.5	347	1		
23	5560	17	6	412	1		
24	5560	17	9.7	237	1		
25	5560	17	9.3	368	1		
26	5560	16	8.7	497	1		
27	5565	16	8.3	381	1		
28	5565	18	7.2	287	1		
29	5565	17	9.2	442	1		
30	5565	18	9.8	245	1		

Type 4 Radar Statistical Performance – 80MHz BW, Channel 5500MHz

Trial	Frequency	Pulses	PW (uS)	PRI (uS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	5495	14	12.4	228	1	90.0%	60.0%
2	5495	15	13.6	421	1		
3	5495	12	12.3	200	1		
4	5495	13	15.9	265	1		
5	5495	14	19.9	286	1		
6	5500	13	14	254	1		
7	5500	13	19.4	263	1		
8	5500	15	19.6	299	1		
9	5500	12	13.5	214	1		
10	5520	15	17.6	204	1		
11	5520	13	18	388	1		
12	5520	12	14.5	340	1		
13	5520	15	18.6	283	1		
14	5530	12	13.4	216	0		
15	5530	16	19.3	419	1		
16	5530	14	15	424	1		
17	5530	14	15.7	404	1		
18	5530	14	19.6	228	1		
19	5540	13	12.2	239	0		
20	5540	16	19	399	1		
21	5540	16	19.3	423	1		
22	5540	16	15.4	270	1		
23	5560	13	15	205	1		
24	5560	15	19.9	436	1		
25	5560	16	18	297	1		
26	5560	15	12.8	495	1		
27	5565	15	12.7	381	1		
28	5565	12	17.6	255	0		
29	5565	12	19.6	261	1		
30	5565	16	13.7	356	1		

In addition an average minimum percentage of successful detection across all four Short pulse radar test waveforms is required and is calculated as follows:

$$\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4}$$ = (90% + 93.3% + 90% + 90%)/4 = 90.83% (>80%)

Type 5 Long Pulse Radar Statistical Performance – 80MHz BW, Channel 5500MHz

Trial	Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)	1=Detection 0=No Detection	Detection Percentage	Limit
1	1	1	5496	10	95			0.615995	1		
2	1	2	5496	10	55	1482		0.93017	1		
3	1	3	5496.8	12	75	1857	1372	0.202123	1		
4	1	2	5496.4	11	75	1577		0.999342	1		
5	1	3	5495.6	9	80	1297	1548	0.3449	1		
6	1	1	5494.4	6	90			0.016825	1		
7	1	2	5496.8	12	50	1609		0.941301	1		
8	1	3	5497.6	14	75	1199	1106	0.51277	0		
9	1	3	5499.2	18	80	1983	1728	0.417089	1		
10	1	3	5498	15	65	1666	1054	0.680427	1		
11	1	1	5530	18	95			0.519052	1		
12	1	2	5530	5	75	1721		0.10323	1		
13	1	2	5530	13	70	1171		0.483546	1		
14	1	2	5530	9	95	1528		0.361893	1		
15	1	3	5530	9	100	1991	1608	0.149646	1		
16	1	2	5530	10	90	1384		0.540604	1	96.7%	80.0%
17	1	2	5530	17	95	1763		0.29013	1		
18	1	3	5530	18	60	1769	1448	0.327295	1		
19	1	2	5530	8	100	1398		0.328511	1		
20	1	2	5530	15	90	1380		0.626509	1		
21	1	2	5562.4	14	95	1016		0.010067	1		
22	1	2	5565.6	6	80	1131		0.04728	1		
23	1	2	5564	10	95	1202		1.46415	1		
24	1	1	5561.2	17	60			0.327969	1		
25	1	2	5563.6	11	70	1200		0.720874	1		
26	1	2	5560.4	19	80	1235		0.78292	1		
27	1	1	5566	5	55			0.527772	1		
28	1	3	5564.4	9	90	1530	1270	0.533608	1		
29	1	2	5564.8	8	95	1985		0.063426	1		
30	1	2	5560.8	18	95	1254		0.902996	1		

Type 5 Long Pulse Radar Statistical Performance – 80MHz BW, Channel 5500MHz – Details

USA Bin 5 Trial #1							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5496	10	95			0.615995
2	3	5496	10	60	1550	1275	1.332209
3	3	5496	10	75	1165	1967	2.076777
4	3	5496	10	60	1267	1246	2.594672
5	2	5496	10	95	1751		4.005581
6	2	5496	10	75	1635		4.41555
7	2	5496	10	85	1054		5.505886
8	3	5496	10	95	1407	1496	6.203004
9	3	5496	10	65	1721	1608	7.175416
10	2	5496	10	70	1814		8.118539
11	1	5496	10	85			8.95642
12	2	5496	10	75	1491		9.664488
13	1	5496	10	85			11.034135
14	3	5496	10	85	1124	1263	11.735536
USA Bin 5 Trial #2							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5496	10	55	1482		0.93017
2	3	5496	10	60	1844	1458	1.943927
3	1	5496	10	55			3.856393
4	1	5496	10	50			5.850231
5	3	5496	10	75	1776	1788	7.479013
6	2	5496	10	70	1748		7.643308
7	2	5496	10	100	1680		9.966156
8	1	5496	10	65			11.422671
USA Bin 5 Trial #3							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5496.8	12	75	1857	1372	0.202123
2	2	5496.8	12	60	1349		0.998875
3	1	5496.8	12	65			1.37302
4	2	5496.8	12	75	1192		2.211781
5	3	5496.8	12	50	1350	1134	2.981281

6	1	5496.8	12	55			3.727417
7	2	5496.8	12	55	1656		4.296885
8	1	5496.8	12	55			4.952881
9	3	5496.8	12	90	1871	1223	5.381816
10	2	5496.8	12	95	1057		6.158959
11	1	5496.8	12	80			6.685483
12	1	5496.8	12	90			7.063496
13	2	5496.8	12	70	1909		7.718651
14	3	5496.8	12	55	1997	1929	8.532536
15	1	5496.8	12	100			9.164195
16	2	5496.8	12	70	1465		10.087886
17	2	5496.8	12	90	1346		10.255542
18	3	5496.8	12	70	1798	1147	10.944788
19	2	5496.8	12	90	1799		11.862103
USA Bin 5 Trial #4							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5496.4	11	75	1577		0.999342
2	2	5496.4	11	90	1882		1.866218
3	2	5496.4	11	95	1238		2.657502
4	1	5496.4	11	65			3.608539
5	3	5496.4	11	65	1989	1428	4.416516
6	1	5496.4	11	65			6.269174
7	1	5496.4	11	90			6.660222
8	1	5496.4	11	85			8.015123
9	3	5496.4	11	90	1617	1264	8.898575
10	2	5496.4	11	60	1915		9.829967
11	1	5496.4	11	100			11.716505
USA Bin 5 Trial #5							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5495.6	9	80	1297	1548	0.3449
2	3	5495.6	9	80	1599	1142	2.335673
3	3	5495.6	9	85	1214	1769	3.401538
4	3	5495.6	9	80	1754	1656	4.206162
5	1	5495.6	9	55			6.290185
6	3	5495.6	9	80	1941	1529	6.948958
7	2	5495.6	9	85	1926		9.015077
8	3	5495.6	9	95	1367	1628	9.547363

9	3	5495.6	9	90	1802	1850	10.918916
USA Bin 5 Trial #6							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5494.4	6	90			0.016825
2	1	5494.4	6	80			0.932533
3	1	5494.4	6	90			1.513394
4	1	5494.4	6	95			1.998447
5	1	5494.4	6	50			2.998842
6	2	5494.4	6	55	1387		3.239897
7	3	5494.4	6	65	1366	1496	3.977668
8	3	5494.4	6	90	1258	1890	4.633769
9	1	5494.4	6	75			5.304285
10	1	5494.4	6	80			6.052529
11	1	5494.4	6	85			6.438725
12	1	5494.4	6	80			7.201746
13	1	5494.4	6	85			7.950557
14	1	5494.4	6	80			8.661592
15	2	5494.4	6	55	1357		9.435146
16	2	5494.4	6	90	1824		9.943076
17	2	5494.4	6	70	1566		10.415457
18	1	5494.4	6	85			10.954815
19	2	5494.4	6	55	1338		11.389149
USA Bin 5 Trial #7							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5496.8	12	50	1609		0.941301
2	1	5496.8	12	85			1.505945
3	1	5496.8	12	95			2.14014
4	2	5496.8	12	90	1068		3.33891
5	2	5496.8	12	75	1295		4.854723
6	1	5496.8	12	60			5.039972
7	2	5496.8	12	80	1816		6.920571
8	1	5496.8	12	70			7.444236
9	1	5496.8	12	100			8.337547
10	3	5496.8	12	65	1478	1605	9.046824
11	1	5496.8	12	95			10.154499
12	1	5496.8	12	85			11.459329
USA Bin 5 Trial #8							

Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5497.6	14	75	1199	1106	0.51277
2	1	5497.6	14	55			1.005343
3	1	5497.6	14	90			2.004999
4	1	5497.6	14	80			3.21715
5	2	5497.6	14	85	1849		3.550978
6	2	5497.6	14	85	1206		4.615641
7	2	5497.6	14	85	1263		5.230327
8	2	5497.6	14	65	1992		6.415131
9	3	5497.6	14	55	1267	1865	6.903191
10	3	5497.6	14	95	1127	1523	8.251828
11	1	5497.6	14	55			8.581341
12	3	5497.6	14	60	1711	1439	9.573665
13	1	5497.6	14	50			10.697587
14	1	5497.6	14	55			11.360337
USA Bin 5 Trial #9							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5499.2	18	80	1983	1728	0.417089
2	1	5499.2	18	95			0.936631
3	1	5499.2	18	65			1.593202
4	3	5499.2	18	90	1068	1124	2.315522
5	2	5499.2	18	95	1785		2.816593
6	3	5499.2	18	60	1584	1974	3.097092
7	1	5499.2	18	65			4.142731
8	1	5499.2	18	65			4.705981
9	2	5499.2	18	80	1942		4.809538
10	1	5499.2	18	65			5.543021
11	3	5499.2	18	80	1548	1775	6.089937
12	1	5499.2	18	55			6.931501
13	1	5499.2	18	75			7.786138
14	2	5499.2	18	90	1032		8.087537
15	2	5499.2	18	55	1405		8.569986
16	2	5499.2	18	60	1681		9.54144
17	2	5499.2	18	100	1367		9.992122
18	1	5499.2	18	80			10.645491
19	3	5499.2	18	85	1914	1956	11.089554
20	1	5499.2	18	95			11.593798

USA Bin 5 Trial #10							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5498	15	65	1666	1054	0.680427
2	2	5498	15	65	1130		1.289298
3	2	5498	15	50	1482		2.151638
4	3	5498	15	60	1129	1954	3.436782
5	3	5498	15	50	1079	1605	4.67774
6	1	5498	15	90			5.28585
7	3	5498	15	100	1562	1433	6.40898
8	3	5498	15	80	1625	1778	7.970261
9	3	5498	15	75	1957	1421	8.118172
10	2	5498	15	65	1945		9.304625
11	3	5498	15	50	1298	1454	10.830809
12	1	5498	15	95			11.94771
USA Bin 5 Trial #11							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5530	18	95			0.519052
2	2	5530	18	55	1037		1.77494
3	1	5530	18	70			2.218968
4	1	5530	18	100			3.47478
5	1	5530	18	80			3.930621
6	2	5530	18	85	1076		4.697278
7	1	5530	18	60			5.914707
8	1	5530	18	50			6.466319
9	3	5530	18	70	1196	1618	8.011812
10	3	5530	18	85	1117	1865	9.046114
11	2	5530	18	75	1192		10.129641
12	1	5530	18	80			10.599183
13	3	5530	18	50	1406	1250	11.554681
USA Bin 5 Trial #12							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5530	5	75	1721		0.10323
2	3	5530	5	85	1774	1511	1.878833
3	1	5530	5	55			3.175046
4	2	5530	5	60	1699		3.482293

5	1	5530	5	65			5.415157
6	3	5530	5	65	1745	1754	5.640133
7	2	5530	5	100	1187		7.342274
8	2	5530	5	50	1797		8.046418
9	1	5530	5	60			9.73405
10	2	5530	5	75	1654		9.818221
11	2	5530	5	70	1805		10.930308
USA Bin 5 Trial #13							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5530	13	70	1171		0.483546
2	1	5530	13	95			0.876344
3	2	5530	13	75	1230		2.039117
4	3	5530	13	70	1930	1966	2.682247
5	2	5530	13	100	1928		3.221401
6	2	5530	13	85	1555		4.552747
7	2	5530	13	80	1696		5.567191
8	1	5530	13	65			5.882352
9	2	5530	13	95	1734		6.443486
10	2	5530	13	95	1549		7.310049
11	1	5530	13	80			8.655899
12	3	5530	13	55	1923	1285	8.809768
13	1	5530	13	75			9.90288
14	3	5530	13	55	1615	1040	10.851082
15	1	5530	13	85			11.967464
USA Bin 5 Trial #14							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5530	9	95	1528		0.361893
2	1	5530	9	60			1.091843
3	1	5530	9	65			2.568073
4	1	5530	9	50			3.103374
5	2	5530	9	75	1711		3.652581
6	3	5530	9	75	1996	1754	4.756416
7	3	5530	9	75	1142	1255	5.635889
8	2	5530	9	75	1101		6.25779
9	1	5530	9	65			7.135541
10	3	5530	9	80	1584	1598	8.193091
11	2	5530	9	55	1037		8.788644

12	2	5530	9	95	1479		10.122898
13	2	5530	9	95	1469		10.515712
14	1	5530	9	80			11.765545
USA Bin 5 Trial #15							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5530	9	100	1991	1608	0.149646
2	2	5530	9	70	1132		2.365084
3	2	5530	9	85	1542		2.717766
4	2	5530	9	100	1034		4.629784
5	3	5530	9	55	1412	1642	5.493478
6	3	5530	9	80	1160	1151	6.019299
7	2	5530	9	65	1894		8.29649
8	1	5530	9	85			8.580122
9	3	5530	9	85	1111	1661	10.747496
10	2	5530	9	100	1887		11.418307
USA Bin 5 Trial #16							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5530	10	90	1384		0.540604
2	1	5530	10	95			1.281783
3	1	5530	10	75			1.947728
4	3	5530	10	80	1423	1674	2.477869
5	2	5530	10	70	1658		3.633066
6	1	5530	10	90			4.2798
7	1	5530	10	90			5.081333
8	2	5530	10	85	1654		5.633809
9	1	5530	10	95			6.56765
10	2	5530	10	55	1961		7.468103
11	3	5530	10	75	1220	1625	7.982837
12	1	5530	10	60			8.523689
13	1	5530	10	90			9.106264
14	2	5530	10	80	1620		9.99556
15	1	5530	10	85			10.616079
16	3	5530	10	70	1236	1174	11.294949
USA Bin 5 Trial #17							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)

1	2	5530	17	95	1763		0.29013
2	1	5530	17	60			1.338828
3	3	5530	17	55	1066	1917	1.791926
4	1	5530	17	95			3.223872
5	3	5530	17	70	1362	1907	3.874881
6	3	5530	17	80	1399	1174	5.020999
7	3	5530	17	90	1936	1084	5.932306
8	1	5530	17	85			6.800637
9	1	5530	17	50			7.14038
10	1	5530	17	95			8.044692
11	1	5530	17	75			8.864869
12	3	5530	17	95	1401	1804	9.800532
13	3	5530	17	90	1412	1866	10.590416
14	2	5530	17	100	1830		11.168133
USA Bin 5 Trial #18							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5530	18	60	1769	1448	0.327295
2	3	5530	18	100	1545	1366	0.81532
3	3	5530	18	95	1747	1992	1.267712
4	1	5530	18	75			1.943825
5	3	5530	18	70	1645	1853	2.930508
6	1	5530	18	100			3.488164
7	3	5530	18	65	1619	1121	4.089739
8	2	5530	18	50	1453		4.53193
9	3	5530	18	65	1029	1707	5.237349
10	2	5530	18	50	1491		5.488545
11	1	5530	18	80			6.45533
12	1	5530	18	50			7.100559
13	1	5530	18	65			7.239087
14	1	5530	18	100			8.037399
15	2	5530	18	50	1924		8.72782
16	3	5530	18	60	1381	1418	9.259107
17	2	5530	18	100	1983		9.928252
18	1	5530	18	60			10.524669
19	1	5530	18	75			11.178245
20	3	5530	18	65	1173	1761	11.462399
USA Bin 5 Trial #19							

Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5530	8	100	1398		0.328511
2	2	5530	8	70	1389		1.646469
3	3	5530	8	70	1402	1775	3.315026
4	1	5530	8	95			4.142881
5	3	5530	8	95	1519	1678	6.184192
6	2	5530	8	95	1641		7.412252
7	1	5530	8	90			8.889073
8	3	5530	8	75	1705	1584	10.503432
9	1	5530	8	65			11.090462
USA Bin 5 Trial #20							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5530	15	90	1380		0.626509
2	3	5530	15	85	1931	1015	1.860702
3	1	5530	15	65			3.834769
4	1	5530	15	100			4.941035
5	1	5530	15	75			7.471058
6	1	5530	15	90			7.745428
7	1	5530	15	75			9.436454
8	1	5530	15	55			10.786628
USA Bin 5 Trial #21							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5562.4	14	95	1016		0.010067
2	3	5562.4	14	80	1893	1317	0.869795
3	2	5562.4	14	55	1517		1.761369
4	2	5562.4	14	95	1683		1.94132
5	2	5562.4	14	55	1894		2.981199
6	3	5562.4	14	55	1210	1269	3.54957
7	3	5562.4	14	60	1851	1755	4.312562
8	1	5562.4	14	85			4.558018
9	1	5562.4	14	95			5.654501
10	2	5562.4	14	80	1991		6.065259
11	3	5562.4	14	80	1225	1087	6.655175
12	3	5562.4	14	65	1943	1761	7.014303
13	2	5562.4	14	95	1982		7.869698

14	3	5562.4	14	55	1390	1628	8.50602
15	1	5562.4	14	65			8.888931
16	3	5562.4	14	100	1432	1496	9.556026
17	2	5562.4	14	60	1600		10.240972
18	2	5562.4	14	70	1790		11.215386
19	3	5562.4	14	100	1798	1099	11.771867
USA Bin 5 Trial #22							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5565.6	6	80	1131		0.04728
2	1	5565.6	6	95			0.96428
3	1	5565.6	6	95			1.446024
4	2	5565.6	6	95	1509		2.369392
5	2	5565.6	6	80	1966		2.839137
6	1	5565.6	6	85			3.430901
7	2	5565.6	6	70	1714		4.38169
8	3	5565.6	6	55	1490	1829	4.672517
9	1	5565.6	6	80			5.304064
10	1	5565.6	6	50			6.281498
11	2	5565.6	6	95	1846		6.379433
12	1	5565.6	6	100			6.95397
13	3	5565.6	6	55	1071	1110	7.829528
14	1	5565.6	6	50			8.363663
15	2	5565.6	6	75	1641		8.866066
16	1	5565.6	6	70			10.002954
17	1	5565.6	6	55			10.451525
18	2	5565.6	6	55	1269		10.832163
19	1	5565.6	6	50			11.550692
USA Bin 5 Trial #23							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5564	10	95	1202		1.46415
2	3	5564	10	75	1640	1658	2.482969
3	3	5564	10	75	1579	1389	3.354351
4	2	5564	10	85	1031		5.176051
5	2	5564	10	85	1964		6.999125
6	3	5564	10	75	1489	1050	7.593023
7	3	5564	10	100	1170	1922	10.256813
8	1	5564	10	65			11.514848

USA Bin 5 Trial #24							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5561.2	17	60			0.327969
2	2	5561.2	17	65	1567		1.73231
3	1	5561.2	17	75			2.390751
4	1	5561.2	17	90			2.875503
5	3	5561.2	17	55	1299	1122	3.890715
6	1	5561.2	17	100			4.6811
7	3	5561.2	17	50	1020	1318	5.977179
8	1	5561.2	17	65			6.992639
9	2	5561.2	17	85	1692		7.888146
10	1	5561.2	17	80			8.711523
11	2	5561.2	17	70	1914		10.066269
12	1	5561.2	17	85			10.232523
13	3	5561.2	17	50	1996	1973	11.957969
USA Bin 5 Trial #25							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5563.6	11	70	1200		0.720874
2	2	5563.6	11	50	1363		1.100142
3	3	5563.6	11	55	1701	1180	2.106039
4	2	5563.6	11	70	1520		2.369697
5	1	5563.6	11	95			3.270788
6	3	5563.6	11	90	1626	1105	4.491447
7	3	5563.6	11	80	1409	1815	5.167251
8	1	5563.6	11	70			5.736439
9	2	5563.6	11	75	1174		6.243254
10	1	5563.6	11	100			6.880857
11	2	5563.6	11	85	1553		7.59765
12	2	5563.6	11	100	1172		8.997035
13	2	5563.6	11	55	1671		9.219583
14	3	5563.6	11	80	1636	1029	10.061874
15	3	5563.6	11	60	1364	1786	10.685792
16	3	5563.6	11	65	1361	1124	11.255782
USA Bin 5 Trial #26							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)

1	2	5560.4	19	80	1235		0.78292
2	3	5560.4	19	80	1356	1702	1.472129
3	1	5560.4	19	95			1.658309
4	3	5560.4	19	80	1385	1667	2.786501
5	2	5560.4	19	90	1414		3.591052
6	2	5560.4	19	85	1867		4.389529
7	2	5560.4	19	55	1466		5.453187
8	3	5560.4	19	60	1133	1337	6.073948
9	1	5560.4	19	65			6.52838
10	1	5560.4	19	85			7.483058
11	1	5560.4	19	100			8.753166
12	3	5560.4	19	50	1326	1808	9.489285
13	3	5560.4	19	75	1372	1632	10.387177
14	2	5560.4	19	70	1906		10.991685
15	3	5560.4	19	55	1109	1730	11.713896
USA Bin 5 Trial #27							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	1	5566	5	55			0.527772
2	2	5566	5	100	1552		1.142775
3	2	5566	5	90	1754		1.289445
4	1	5566	5	55			1.957028
5	2	5566	5	80	1947		2.81645
6	1	5566	5	70			3.558665
7	1	5566	5	80			3.799163
8	2	5566	5	70	1411		4.580929
9	3	5566	5	50	1783	1660	5.274748
10	1	5566	5	60			6.189413
11	1	5566	5	50			6.651913
12	3	5566	5	65	1361	1188	7.216245
13	1	5566	5	90			7.798339
14	2	5566	5	70	1674		8.576511
15	2	5566	5	55	1221		9.192232
16	2	5566	5	75	1056		10.097196
17	2	5566	5	85	1180		10.692578
18	3	5566	5	75	1352	1169	10.975681
19	1	5566	5	90			11.425566
USA Bin 5 Trial #28							

Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	3	5564.4	9	90	1530	1270	0.533608
2	1	5564.4	9	75			1.234427
3	3	5564.4	9	50	1407	1306	2.650591
4	2	5564.4	9	55	1002		3.609353
5	2	5564.4	9	70	1077		4.467277
6	1	5564.4	9	75			5.306557
7	2	5564.4	9	75	1847		5.717352
8	3	5564.4	9	65	1406	1570	6.725715
9	2	5564.4	9	75	1201		8.116985
10	2	5564.4	9	100	1014		8.814081
11	1	5564.4	9	50			9.336923
12	1	5564.4	9	50			11.048712
13	1	5564.4	9	100			11.82844
USA Bin 5 Trial #29							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5564.8	8	95	1985		0.063426
2	2	5564.8	8	85	1089		1.27271
3	3	5564.8	8	50	1564	1235	3.410554
4	1	5564.8	8	55			4.094346
5	3	5564.8	8	70	1921	1600	5.362803
6	1	5564.8	8	95			6.451475
7	1	5564.8	8	75			8.251449
8	3	5564.8	8	75	1533	1276	8.587081
9	2	5564.8	8	95	1994		10.199523
10	2	5564.8	8	75	1995		11.611945
USA Bin 5 Trial #30							
Burst #	Pulses	Frequency (MHz)	Chirp (MHz)	PW (uS)	Inter-pulse spacing (uS)	Inter-pulse spacing (uS)	Pulse Start (S)
1	2	5560.8	18	95	1254		0.902996
2	1	5560.8	18	85			2.204807
3	2	5560.8	18	70	1560		3.835813
4	3	5560.8	18	95	1435	1648	4.176411
5	1	5560.8	18	55			5.920537
6	2	5560.8	18	60	1849		7.408659
7	3	5560.8	18	100	1028	1465	9.30682

8	3	5560.8	18	55	1995	1433	9.829407
9	3	5560.8	18	55	1841	1250	11.83058

Type 6 Frequency Hopping Radar Statistical Performance – 80MHz BW, Channel 5500MHz

Trial	Hop #	Freq (GHz)	Pulse Start (mS)	1=Detection 0=No Detection	Detection Percentage	Limit
1	2	5499	6	1	100.0%	70.0%
2	9	5524	27	1		
3	23	5530	69	1		
4	1	5507	3	1		
5	0	5516	0	1		
6	20	5500	60	1		
7	1	5552	3	1		
8	13	5567	39	1		
9	1	5567	3	1		
10	9	5554	27	1		
11	13	5545	39	1		
12	1	5549	3	1		
13	3	5523	9	1		
14	4	5556	12	1		
15	1	5508	3	1		
16	4	5560	12	1		
17	11	5492	33	1		
18	1	5557	3	1		
19	3	5534	9	1		
20	1	5544	3	1		
21	1	5527	3	1		
22	2	5518	6	1		
23	1	5542	3	1		
24	2	5534	6	1		
25	1	5526	3	1		
26	6	5554	18	1		
27	10	5551	30	1		
28	7	5557	21	1		
29	0	5560	0	1		
30	2	5527	6	1		

Type 6 Frequency Hopping Radar Statistical Performance – 80MHz BW, Channel 5500MHz – Details

USA Frequency Hopping Trial #1		
Hop #	Freq (GHz)	Pulse Start (mS)
2	5499	6
3	5544	9
5	5539	15
16	5497	48
24	5556	72
33	5505	99
40	5547	120
54	5551	162
69	5517	207
74	5506	222
75	5536	225
76	5522	228
84	5525	252
88	5562	264
95	5519	285
USA Frequency Hopping Trial #2		
Hop #	Freq (GHz)	Pulse Start (mS)
9	5524	27
13	5510	39
34	5551	102
37	5554	111
39	5495	117
44	5532	132
62	5509	186
63	5497	189
73	5534	219
92	5519	276
96	5544	288
98	5506	294
USA Frequency Hopping Trial #3		
Hop #	Freq (GHz)	Pulse Start (mS)
23	5530	69
29	5512	87
36	5514	108
41	5533	123

43	5502	129
46	5524	138
60	5545	180
64	5510	192
66	5547	198
68	5550	204
96	5500	288
98	5497	294
USA Frequency Hopping Trial #4		
Hop #	Freq (GHz)	Pulse Start (mS)
1	5507	3
2	5497	6
6	5495	18
20	5538	60
28	5499	84
29	5496	87
32	5517	96
35	5561	105
37	5509	111
39	5492	117
40	5531	120
41	5544	123
42	5525	126
95	5510	285
USA Frequency Hopping Trial #5		
Hop #	Freq (GHz)	Pulse Start (mS)
0	5516	0
13	5552	39
18	5557	54
23	5548	69
29	5510	87
49	5531	147
54	5547	162
66	5529	198
76	5555	228
90	5550	270
99	5521	297
USA Frequency Hopping Trial #6		

Hop #	Freq (GHz)	Pulse Start (mS)
20	5500	60
22	5564	66
25	5493	75
26	5551	78
34	5519	102
44	5512	132
51	5523	153
52	5506	156
56	5504	168
59	5503	177
68	5528	204
71	5534	213
78	5548	234
80	5492	240
83	5558	249
85	5546	255
92	5514	276
99	5531	297
USA Frequency Hopping Trial #7		
Hop #	Freq (GHz)	Pulse Start (mS)
1	5552	3
7	5526	21
21	5551	63
25	5517	75
26	5508	78
35	5528	105
36	5516	108
41	5518	123
54	5527	162
67	5507	201
71	5505	213
73	5523	219
75	5497	225
80	5506	240
95	5541	285
96	5560	288
USA Frequency Hopping Trial #8		

Hop #	Freq (GHz)	Pulse Start (mS)
13	5567	39
20	5517	60
23	5512	69
26	5548	78
31	5518	93
45	5529	135
58	5543	174
62	5536	186
70	5553	210
74	5508	222
76	5537	228
84	5505	252
87	5559	261
89	5554	267
95	5501	285
USA Frequency Hopping Trial #9		
Hop #	Freq (GHz)	Pulse Start (mS)
1	5567	3
2	5547	6
3	5514	9
5	5502	15
12	5568	36
29	5506	87
39	5516	117
41	5536	123
44	5533	132
50	5498	150
51	5523	153
54	5518	162
61	5513	183
64	5510	192
84	5530	252
87	5496	261
91	5524	273
96	5564	288
USA Frequency Hopping Trial #10		
Hop #	Freq (GHz)	Pulse Start (mS)

9	5554	27
13	5560	39
20	5545	60
22	5500	66
24	5504	72
28	5547	84
29	5536	87
36	5517	108
37	5496	111
42	5555	126
51	5549	153
66	5551	198
68	5497	204
81	5509	243
94	5503	282
USA Frequency Hopping Trial #11		
Hop #	Freq (GHz)	Pulse Start (mS)
13	5545	39
17	5566	51
26	5509	78
53	5516	159
63	5565	189
75	5508	225
77	5536	231
79	5539	237
83	5562	249
87	5493	261
91	5513	273
93	5552	279
94	5558	282
99	5561	297
USA Frequency Hopping Trial #12		
Hop #	Freq (GHz)	Pulse Start (mS)
1	5549	3
3	5519	9
10	5539	30
17	5535	51
18	5504	54
27	5553	81

32	5496	96
34	5523	102
46	5502	138
52	5532	156
54	5565	162
85	5538	255
87	5518	261
91	5555	273
USA Frequency Hopping Trial #13		
Hop #	Freq (GHz)	Pulse Start (mS)
3	5523	9
10	5555	30
22	5515	66
25	5563	75
29	5533	87
32	5545	96
42	5511	126
47	5532	141
57	5537	171
66	5539	198
70	5564	210
79	5512	237
81	5530	243
82	5526	246
88	5529	264
92	5557	276
93	5551	279
96	5522	288
97	5517	291
98	5498	294
USA Frequency Hopping Trial #14		
Hop #	Freq (GHz)	Pulse Start (mS)
4	5556	12
11	5554	33
15	5522	45
17	5505	51
18	5561	54
21	5508	63
26	5546	78

41	5529	123
43	5498	129
46	5543	138
50	5559	150
66	5516	198
67	5553	201
82	5552	246
85	5532	255
92	5534	276
USA Frequency Hopping Trial #15		
Hop #	Freq (GHz)	Pulse Start (mS)
1	5508	3
8	5548	24
9	5499	27
10	5541	30
19	5519	57
22	5556	66
25	5496	75
29	5504	87
34	5503	102
52	5534	156
59	5500	177
66	5501	198
67	5505	201
68	5543	204
69	5545	207
70	5514	210
73	5532	219
74	5510	222
75	5561	225
79	5562	237
80	5554	240
89	5493	267
97	5492	291
USA Frequency Hopping Trial #16		
Hop #	Freq (GHz)	Pulse Start (mS)
4	5560	12
11	5554	33
12	5540	36

14	5499	42
25	5551	75
26	5558	78
32	5512	96
40	5539	120
55	5501	165
56	5568	168
57	5513	171
62	5529	186
63	5543	189
73	5515	219
75	5531	225
81	5511	243
95	5533	285
USA Frequency Hopping Trial #17		
Hop #	Freq (GHz)	Pulse Start (mS)
11	5492	33
18	5504	54
23	5521	69
38	5551	114
39	5566	117
47	5558	141
50	5501	150
64	5563	192
68	5557	204
75	5568	225
78	5545	234
80	5517	240
90	5493	270
USA Frequency Hopping Trial #18		
Hop #	Freq (GHz)	Pulse Start (mS)
1	5557	3
5	5544	15
19	5503	57
20	5556	60
25	5494	75
32	5534	96
50	5532	150
57	5559	171

61	5548	183
71	5531	213
74	5517	222
75	5537	225
88	5500	264
89	5505	267
USA Frequency Hopping Trial #19		
Hop #	Freq (GHz)	Pulse Start (mS)
3	5534	9
13	5499	39
25	5504	75
31	5532	93
35	5492	105
38	5533	114
44	5563	132
53	5506	159
58	5548	174
59	5497	177
66	5523	198
71	5518	213
72	5529	216
92	5521	276
94	5538	282
98	5545	294
USA Frequency Hopping Trial #20		
Hop #	Freq (GHz)	Pulse Start (mS)
1	5544	3
7	5532	21
13	5534	39
15	5524	45
20	5556	60
30	5566	90
32	5558	96
42	5492	126
58	5533	174
59	5518	177
68	5510	204
80	5494	240
84	5504	252

86	5562	258
89	5567	267
USA Frequency Hopping Trial #21		
Hop #	Freq (GHz)	Pulse Start (mS)
1	5527	3
4	5552	12
9	5505	27
11	5540	33
20	5497	60
31	5507	93
36	5506	108
56	5525	168
58	5558	174
59	5514	177
72	5547	216
75	5529	225
87	5510	261
91	5516	273
92	5551	276
USA Frequency Hopping Trial #22		
Hop #	Freq (GHz)	Pulse Start (mS)
2	5518	6
3	5525	9
5	5548	15
11	5537	33
24	5531	72
26	5506	78
32	5500	96
33	5509	99
43	5519	129
50	5534	150
53	5564	159
56	5510	168
62	5513	186
65	5498	195
69	5538	207
75	5522	225
80	5539	240
82	5550	246

86	5520	258
88	5496	264
92	5547	276
94	5544	282
99	5559	297
USA Frequency Hopping Trial #23		
Hop #	Freq (GHz)	Pulse Start (mS)
1	5542	3
19	5495	57
25	5539	75
26	5511	78
33	5501	99
34	5506	102
46	5515	138
53	5535	159
56	5547	168
59	5538	177
72	5522	216
75	5498	225
79	5493	237
96	5533	288
99	5529	297
USA Frequency Hopping Trial #24		
Hop #	Freq (GHz)	Pulse Start (mS)
2	5534	6
17	5496	51
21	5531	63
22	5512	66
37	5546	111
40	5501	120
41	5539	123
42	5541	126
49	5499	147
82	5494	246
85	5556	255
89	5536	267
USA Frequency Hopping Trial #25		
Hop #	Freq (GHz)	Pulse Start (mS)

1	5526	3
14	5516	42
21	5538	63
22	5521	66
26	5520	78
31	5529	93
47	5556	141
54	5499	162
59	5508	177
68	5505	204
71	5547	213
74	5537	222
75	5567	225
79	5551	237
80	5566	240
93	5492	279
USA Frequency Hopping Trial #26		
Hop #	Freq (GHz)	Pulse Start (mS)
6	5554	18
10	5568	30
12	5525	36
27	5548	81
30	5499	90
38	5565	114
49	5566	147
50	5520	150
55	5552	165
57	5510	171
65	5505	195
84	5514	252
90	5503	270
94	5533	282
USA Frequency Hopping Trial #27		
Hop #	Freq (GHz)	Pulse Start (mS)
10	5551	30
30	5542	90
34	5499	102
36	5546	108
46	5568	138

48	5534	144
51	5550	153
56	5558	168
59	5544	177
64	5560	192
66	5553	198
74	5533	222
75	5519	225
78	5545	234
82	5512	246
84	5513	252
96	5556	288
USA Frequency Hopping Trial #28		
Hop #	Freq (GHz)	Pulse Start (mS)
7	5557	21
13	5537	39
15	5550	45
17	5508	51
25	5531	75
30	5516	90
33	5538	99
38	5512	114
42	5541	126
43	5505	129
48	5566	144
49	5511	147
50	5509	150
55	5494	165
56	5548	168
57	5543	171
67	5497	201
71	5495	213
85	5503	255
89	5517	267
92	5502	276
USA Frequency Hopping Trial #29		
Hop #	Freq (GHz)	Pulse Start (mS)
0	5560	0
3	5498	9

9	5542	27
10	5567	30
11	5505	33
13	5503	39
16	5524	48
19	5531	57
20	5545	60
25	5516	75
27	5529	81
36	5566	108
38	5515	114
40	5561	120
47	5554	141
50	5538	150
54	5521	162
62	5500	186
63	5544	189
70	5502	210
79	5549	237
82	5541	246
83	5517	249
USA Frequency Hopping Trial #30		
Hop #	Freq (GHz)	Pulse Start (mS)
2	5527	6
8	5535	24
12	5537	36
20	5505	60
30	5518	90
35	5520	105
43	5528	129
44	5561	132
51	5513	153
59	5504	177
65	5515	195
71	5562	213
73	5547	219
78	5543	234
79	5568	237
82	5549	246
88	5533	264

92	5511	276

Appendix C: List of Test Equipment Used to perform the test

Equip No	Model Manufacturer	Description	Last Cal	Cal Due Date
44583	MINI-CIRCUITS / ZFSC-2-10G	SPLITTER, 2-10GHZ	26-Jun-18	26-Jun-19
54397	HUBER + SUHNER / Sucoflex 102	RF Cable 2.4mm - N Type 18GHz	24-Apr-18	24-Apr-19
54404	HUBER + SUHNER / Sucoflex 102	RF Cable 2.4mm - N Type 18GHz	24-Apr-18	24-Apr-19
54632	MEGAPHASE / GC12-S1S1-18	SMA Cable	10-May-18	10-May-19
54634	MEGAPHASE / F120-S1S1-48	SMA Cable	29-Sep-17	29-Sep-18
54657	MINI-CIRCUITS / ZFSC-2-10G	SPLITTER, 2-10GHZ	29-Sep-17	29-Sep-18
54659	PULSAR / PS4-09-452/4S	SPLITTER	21-Sep-17	21-Sep-18
54696	DITOM / D3C2060	Splitter	16-Nov-17	16-Nov-18
55107	Keysight (Agilent/HP) / N5182B	MXG X-Series RF Vector Signal Generator	7-Sep-17	7-Sep-18
55107 (Note 1)	Keysight (Agilent/HP) / N5182B	MXG X-Series RF Vector Signal Generator	30-Aug-18	30-Aug-19
55109	Keysight (Agilent/HP) / N9030A-550	PXA Signal Analyzer, 3Hz to 50GHz	29-Sep-17	29-Sep-18
55558	MINI-CIRCUITS / ZFSC-2-10G	SPLITTER, 2-10GHZ	6-Jul-18	6-Jul-19
55564	MEGAPHASE / F120-S1S1-36	SMA Cable	29-Sep-17	29-Sep-18
55594	MEGAPHASE / GC12-8181-16	SMA Cable	10-May-18	10-May-19
55611	MINI-CIRCUITS / BW-S20-2W263	SMA 20dB Attenuator	29-Sep-17	29-Sep-18
55612	MINI-CIRCUITS / BW-S20-2W263	SMA 20dB Attenuator	29-Sep-17	29-Sep-18
55864	DYNAWAVE / SMSM-A2PH-012	SMA Cable, 12 IN	29-Sep-17	29-Sep-18
55873	DYNAWAVE / SMSM-A2PH-024	SMA Cable, 24 IN	23-Oct-17	23-Oct-18
55914	DYNAWAVE / SMSM-A2PH-012	SMA Cable, 12 IN	23-Oct-17	23-Oct-18
56116	PASTERNACK / PE6072	SMA 50 Ohm Termination	1-Dec-17	1-Dec-18
56122	PASTERNACK / PE6072	SMA 50 Ohm Termination	1-Dec-17	1-Dec-18
56123	PASTERNACK / PE6072	SMA 50 Ohm Termination	1-Dec-17	1-Dec-18
57219	DYNAWAVE / SMSM-A2PH-012	SMA Cable, 12 IN	27-Jun-18	27-Jun-19
57220	DYNAWAVE / SMSM-A2PH-012	SMA Cable, 12 IN	27-Jun-18	27-Jun-19
57229	National Instruments / PXI-5422	200 MS/s, 16bit Arbitrary Waveform Generator	Verified before use	Verified before use
57230	National Instruments / PXI-5422	200 MS/s, 16bit Arbitrary Waveform Generator	Verified before use	Verified before use
57239	National Instruments / PXI-8815	Embedded Controller Card	Verified before use	Verified before use
57250	National Instruments / PXI-2796	40GHz Dual 6x1 Multiplexer (SP6T)	Verified before use	Verified before use

44583	MINI-CIRCUITS / ZFSC-2-10G	SPLITTER, 2-10GHZ	26-Jun-18	26-Jun-19

Note 1: Calibration date after August 20th.

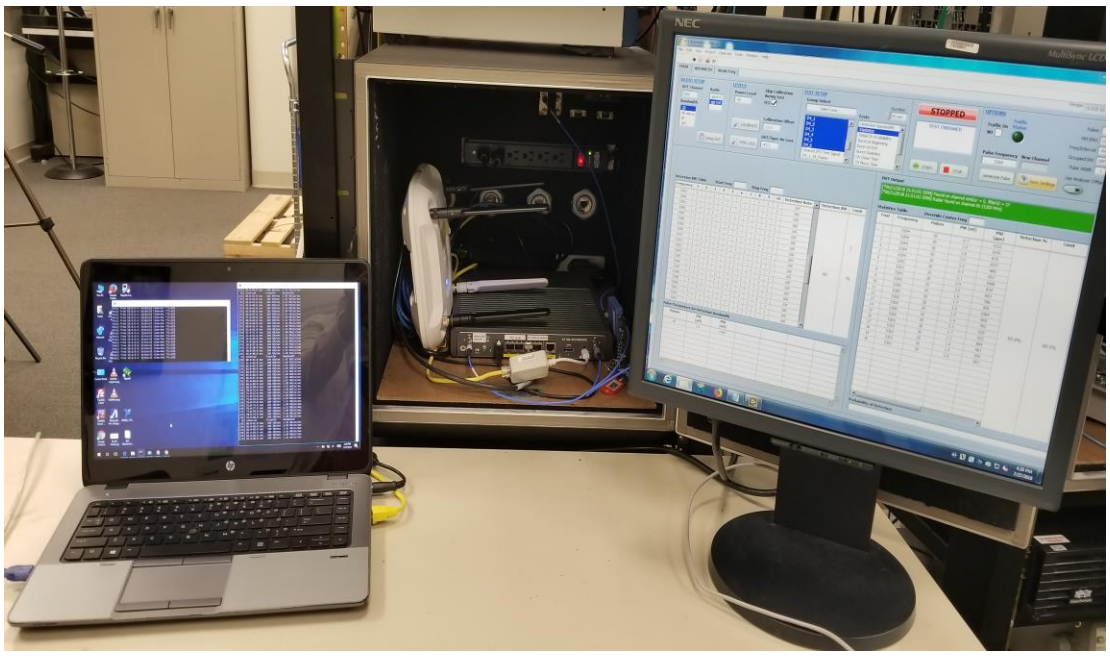
Appendix D: Abbreviation Key and Definitions

The following table defines abbreviations used within this test report.

Abbreviation	Description
DFS	Dynamic Frequency Selection
EIRP	Equivalent Isotropic Radiated Power
CAC	Channel Availability Check
TPC	Transmit Power Control
PRI	Pulse Repetition Interval
U-NII	Unlicensed National Information Infrastructure
RSS	Received Signal Strength
UUT	Unit Under Test
RDD	Radar Detection Device
RBW	Resolution Bandwidth
VBW	Video Bandwidth

Appendix E: Photographs of Test Setups

Title: DFS Test Setup



Appendix F: Software Used to Perform Testing

DFS_Automation.vi

Appendix G: Test Procedures

Measurements were made in accordance with

- KDB Publication 905462 D02 UNII DFS Compliance Procedures New Rules v02

Test procedures are summarized below:

FCC 5GHz DFS Test Procedures	EDCS # - 1445052

Appendix H: Scope of Accreditation (A2LA certificate number 1178-01)

The scope of accreditation of Cisco Systems, Inc. can be found on the A2LA web page at:

http://www.a2la.org/scopepdf/1178-01.pdf