



DFS MEASUREMENT REPORT

FCC PART 15.407 / IC RSS-210

FCC ID: QB8LT5G

IC: 4679A-LT5G

APPLICANT: DragonWave Inc.

Application Type: Certification

Product: Microwave Outdoor Unit

Model No.: Harmony Lite 5GHz

Brand Name:



FCC Classification: Unlicensed National Information Infrastructure (UNII)

FCC Rule Part(s): Part 15.407

IC Rule(s): RSS-210 Issue 8

Type of Device:

- ☒ Master Device
- ☐ Client Device (No radar detection)
- ☒ Client Device with radar detection

Test Date: January 13 ~ 21, 2014

Reviewed By : Robin Wu
(Robin Wu)

Approved By : Marlinchen
(Marlin Chen)

The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 905462. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date
1401RSU00703	Rev. 01	Initial report	04-24-2014
1401RSU00703	Rev. 02	Revised the antenna information	05-22-2014
1401RSU00703	Rev. 03	Delete the beam-forming description of the antenna	07-04-2014

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§2.1033 General Information

Applicant:	DragonWave Inc.
Applicant Address:	600-411 Legget Drive, Kanata ON K2K 3C9, CANADA
Manufacturer:	DragonWave Inc.
Manufacturer Address:	600-411 Legget Drive, Kanata ON K2K 3C9, CANADA
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
MRT FCC Registration No.:	809388
MRT IC Registration No.:	11384A
Model No.:	Harmony Lite 5GHz
FCC ID:	QB8LT5G
IC:	4679A-LT5G
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering
FCC Classification:	Unlicensed National Information Infrastructure (UNII)
Date(s) of Test:	January 13 ~ July 04, 2014
Test Report S/N:	1401RSU00703
Firmware Version:	1.5.32

1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on September 30, 2013.



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	Microwave Outdoor Unit
Model No.	Harmony Lite 5GHz
Radio Type	Intentional Transceiver
Power Type	From POE
Operation Mode	Master Device; Client Device with radar detection
Frequency Range	For 20MHz Channel Bandwidth: 5260~5320MHz, 5500~5580MHz, 5660~5700MHz For 40MHz Channel Bandwidth: 5270~5310MHz, 5510~5550MHz, 5670MHz
Maximum Output Power	20MHz Channel Bandwidth: 3.68dBm 40MHz Channel Bandwidth: 5.63dBm
Type of Modulation	OFDM
Power-on cycle	Requires 84 seconds to complete its power-on cycle.
Uniform Spreading	For the 5250-5350MHz, 5470-5725 MHz bands, the Master device provides, on aggregate, uniform loading of the spectrum across all devices by selecting an operating channel among the available channels using a random algorithm.

2.2. Description of Available Antennas

Integrated Antenna	Manufacturer	Model	Freq. (GHz)	Type	Tx Paths	Correlated Gain (dBi)
190mm	MTI	MT-485053/SVH/A	5.3~5.7	Cross-polarized antennas	2	19.5
190mm	Rosenberger	S-Wave 51-17-19D			2	19.5
305mm	MTI	MT-465017/SVH/B			2	23.5
305mm	Rosenberger	S-Wave 55-10-22D-SMA			2	23.5

Note:

The transmitter output signals are correlated as defined in attachment KDB 662911 D01, which don't support a 90-degree phase-shifted replica for MIMO antennas. Cross-polarized antennas with $N_{ANT} = 2$. In the case of a transmitter with only two outputs driving a pair of antennas that are cross-polarized (e.g., vertical and horizontal or left-circular and right-circular), directional gain is the gain of an individual antenna. If the two antennas have different gains, the larger gain applies.

Six configurations description and code number:

Harmony Lite 5.x GHz Integrated	
Code	Description
T561LT5G190.00	5.x GHz Lite with P+E and integrated 190mm dual-pol flat antenna
T561LT5G305.00	5.x GHz Lite with P+E and integrated 305mm dual-pol flat antenna
T561LT5G190.01	5.x GHz Lite with PoE+ and integrated 190mm dual-pol flat antenna
T561LT5G305.01	5.x GHz Lite with PoE+ and integrated 305mm dual-pol flat antenna
Harmony Lite 5.x GHz External	
Code	Description
T561LT5GSAN.00	5.x GHz Lite with P+E and box cover for external antenna
T561LT5GSAN.01	5.x GHz Lite with PoE+ and box cover for external antenna

2.3. DFS Band Carrier Frequencies Opreation

Channel for 20MHz Channel Bandwidth

Channel	Frequency	Channel	Frequency	Channel	Frequency
52	5260 MHz	56	5280 MHz	60	5300 MHz
64	5320 MHz	100	5500 MHz	104	5520 MHz
108	5540 MHz	112	5560 MHz	116	5580 MHz
132	5660 MHz	136	5680 MHz	140	5700 MHz

Channel for 40MHz Channel Bandwidth

Channel	Frequency	Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz	102	5510 MHz
110	5550 MHz	134	5670 MHz	--	--

3. DFS DETECTION THRESHOLDS AND RADAR TEST WAVEFORMS

3.1. Applicability

The following table from FCC 06-96 lists the applicable requirements for the DFS testing. The device has two operation modes (a master device and a client device without radar detection capability) which evaluated both in this report.

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spreading	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Tablet 3-1: DFS Applicability

3.2. DFS Devices Requirements

Per FCC 06-96 the following are the requirements for Master Devices:

- The Master Device will use DFS in order to detect Radar Waveforms with received signal strength above the DFS Detection Threshold in the 5250 ~ 5350 MHz and 5470 ~ 5725 MHz bands. DFS is not required in the 5150 ~ 5250 MHz or 5725 ~ 5825 MHz bands.
- Before initiating a network on a Channel, the Master Device will perform a Channel Availability Check for a specified time duration (Channel Availability Check Time) to ensure that there is no radar system operating on the Channel, using DFS described under subsection a) above.
- The Master Device initiates a U-NII network by transmitting control signals that will enable other U-NII devices to Associate with the Master Device.
- During normal operation, the Master Device will monitor the Channel (In-Service Monitoring) to ensure that there is no radar system operating on the Channel, using DFS described under a).
- If the Master Device has detected a Radar Waveform during In-Service Monitoring as described under d), the Operating Channel of the U-NII network is no longer an Available Channel. The Master Device will instruct all associated Client Device(s) to stop transmitting on this Channel within the Channel Move Time. The transmissions during the Channel Move Time will be limited

to the Channel Closing Transmission Time.

- (f) Once the Master Device has detected a Radar Waveform it will not utilize the Channel for the duration of the Non-Occupancy Period. ²
- (g) If the Master Device delegates the In-Service Monitoring to a Client Device, then the combination will be tested to the requirements described under d) through f) above.

Per FCC 06-96 the following are the requirements for Client Devices:

- (a) A Client Device will not transmit before having received appropriate control signals from a Master Device.
- (b) A Client Device will stop all its transmissions whenever instructed by a Master Device to which it is associated and will meet the Channel Move Time and Channel Closing Transmission Time requirements. The Client Device will not resume any transmissions until it has again received control signals from a Master Device.
- (c) If a Client Device is performing In-Service Monitoring and detects a Radar Waveform above the DFS Detection Threshold, it will inform the Master Device. This is equivalent to the Master Device detecting the Radar Waveform and d) through f) of section master device apply.
- (d) Irrespective of Client Device or Master Device detection the Channel Move Time and Channel Closing Transmission Time requirements remain the same.

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

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 80% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 1: The instant that the Channel Move Time and the Channel Closing Transmission Time begins is as follows: • For the Short Pulse Radar Test Signals this instant is the end of the Burst.	

- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar Burst generated.
- For the Long Pulse Radar Test Signal this instant is the end of the 12 second period defining the Radar Waveform.

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 1 is used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

Tablet 3-2: DFS Response Requirements

3.3. DFS Detection Threshold Values

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

Maximum Transmit Power	Value (See Notes 1 and 2)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 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.	

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

3.4. Parameters of DFS Test Signals

In case the EUT is a U-NII device operating as a Master Device and Client with Radar Detection. Radar Pulse type 1 was used in the evaluation of the Master device and Client with Radar Detection for the purpose of measuring the Channel Move Time and the Channel Closing Transmission Time. Table 3-4 lists the parameters for the Short Pulse Radar Waveforms. A plot of the Radar Pulse Type 1 used for testing is included in Section 5.2 of this report.

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
1	1	1428	18	60%	30
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

Tablet 3-4: Parameters for Short Pulse Radar Waveforms

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50 ~ 100	5 ~ 20	1000 ~ 2000	1 ~ 3	8 ~ 20	60%	30

Tablet 3-5: Parameters for Long Pulse Radar Waveforms

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

Tablet 3-6: Parameters for Frequency Hopping Radar Waveforms

3.5. Conducted Calibration Setup

The FCC 06-96 describes a radiated test setup and a conducted test setup. The conducted test setup was used for this testing. Figure 3-1, Figure 3-2 shows the typical test setup. In Band 2, one channel selected between 5260 and 5350 MHz is chosen for the testing. In Band 3, one channel selected between 5500 and 5700 MHz was chosen for testing.

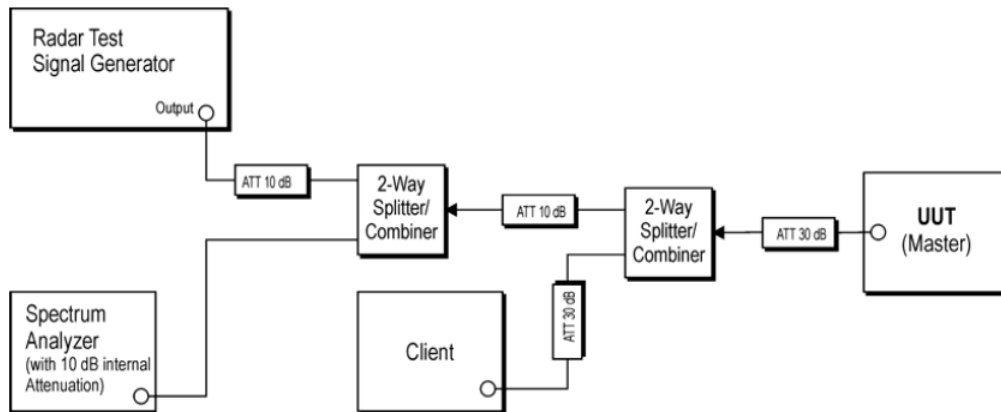


Figure 3-1: Conducted Test Setup where UUT is a Master and Radar Test Waveforms are injected into the Masters

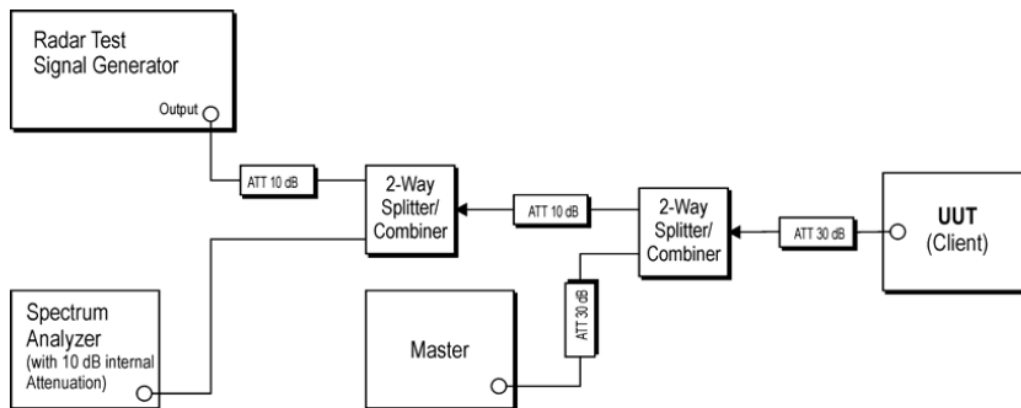


Figure 3-2: Conducted Test Setup where UUT is a Client and Radar Test Waveforms are injected into the Client

3.6. Radar Waveform Calibration Procedure

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

4. TEST EQUIPMENT CALIBRATION DATE

Dynamic Frequency Selection (DFS)

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	MY51440164	2014/08/15
ESG Vector Signal Generator	Agilent	N5172B	MY51350057	2014/11/08

Software	Manufacturer	Function
Pulse Building	Agilent	Radar Signal Generation Software
DFS Tool	Agilent	DFS Test Software

5. TEST RESULT

5.1. Summary

Company Name: DragonWave Inc.
FCC ID: QB8LT5G
IC: 4679A-LT5G
FCC Classification: Unlicensed National Information Infrastructure (UNII)
Data Rate(s) Tested: 13.0/14.4Mbps ~ 130.0/144.0Mbps (20MHz BW);
 27.0/30.0Mbps ~ 270.0/300.0Mbps (40MHz BW);

Type	Parameter	Limit	Test Result	Refer
Master	UNII Detection Bandwidth Measurement	Refer Tablet 3-2	Pass	Section 5.3
	Initial Channel Availability Check Time	Refer Tablet 3-2	Pass	Section 5.4
	Radar Burst at the Beginning of the Channel Availability Check Time	Refer Tablet 3-2	Pass	Section 5.5
	Radar Burst at the End of the Channel Availability Check Time	Refer Tablet 3-2	Pass	Section 5.6
	In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	Refer Tablet 3-2	Pass	Section 5.7
	Statistical Performance Check	Refer Tablet 3-2	Pass	Section 5.8
Client With Radar Detection	UNII Detection Bandwidth Measurement	Refer Tablet 3-2	Pass	Section 5.3
	In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	Refer Tablet 3-2	Pass	Section 5.7
	Statistical Performance Check	Refer Tablet 3-2	Pass	Section 5.8

5.2. Radar Waveform Calibration

5.2.1. Test Setup Operation

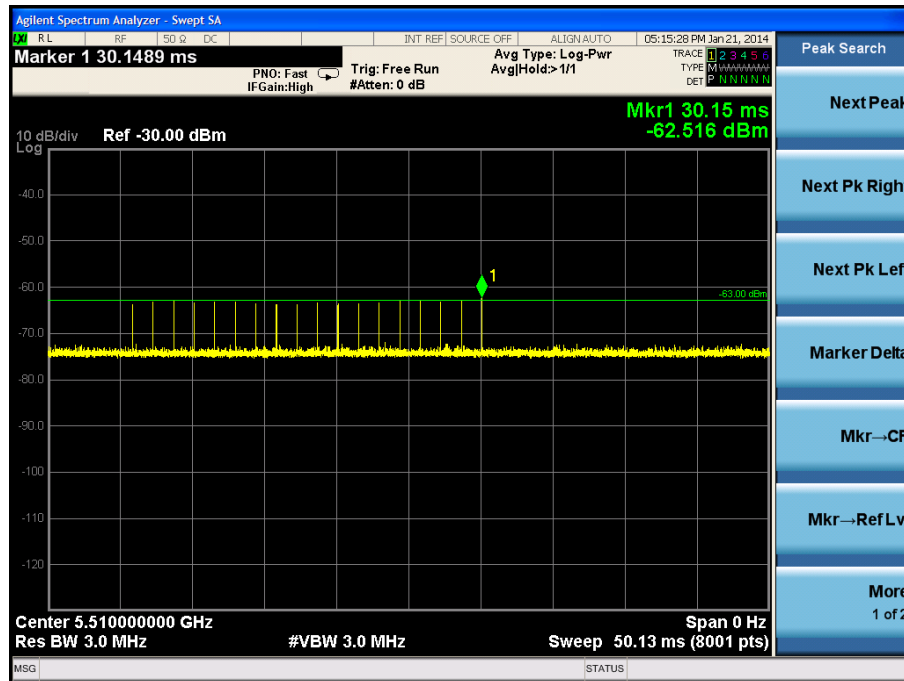
System testing was performed with the designated MPEG test file that streams full motion video from the Access Point to the Client in full motion video mode using the media player with the V2.61 Codec package. This file is used by IP and Frame based systems for loading the test channel during the In-service compliance testing of the U-NII device.

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

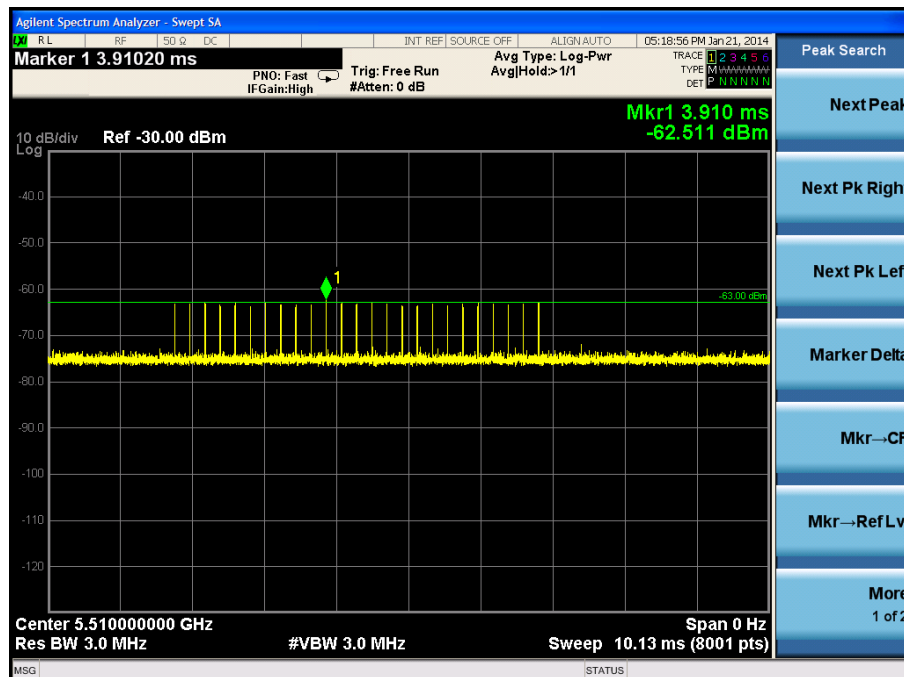
A spectrum analyzer is used as a monitor to verify that the EUT has vacated the Channel within the (Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the detection and Channel move. It is also used to monitor EUT transmissions during the Channel Availability Check Time.

5.2.2. Cablibration Result

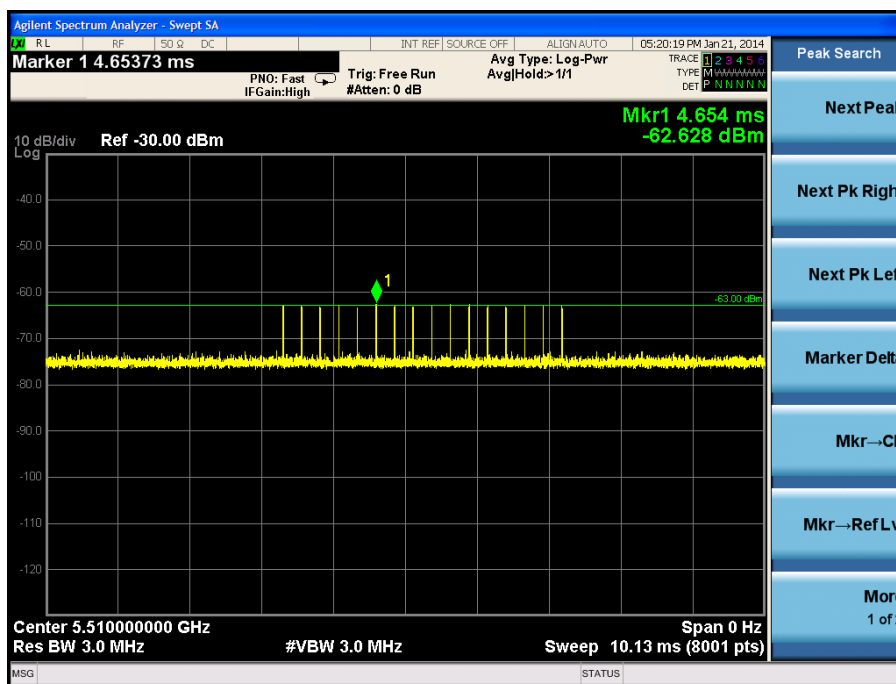
Radar #1 DFS detection threshold level and the burst of pulses on the Channel frequency



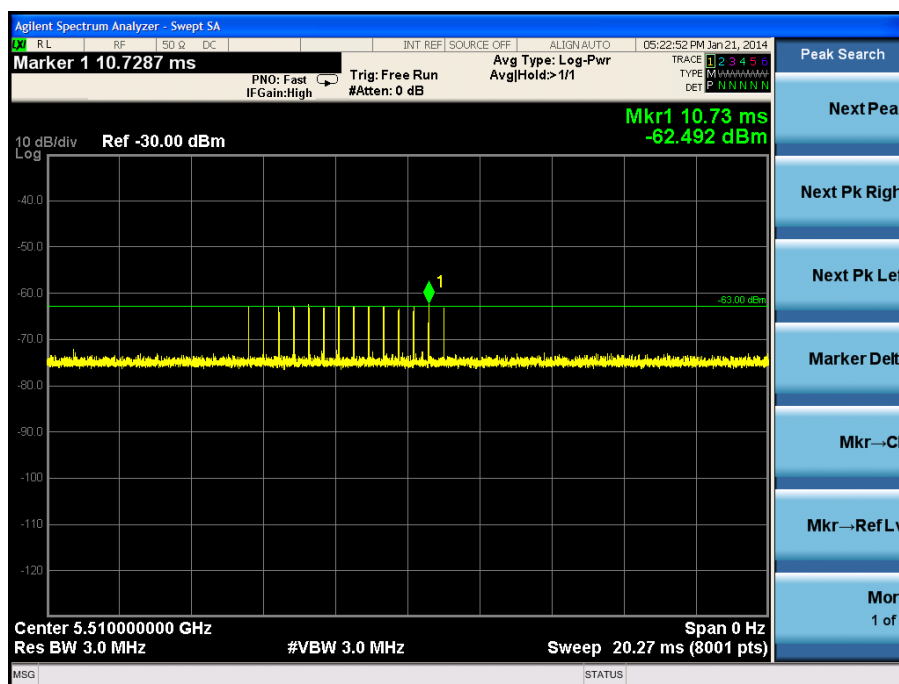
Radar #2 DFS detection threshold level and the burst of pulses on the Channel frequency



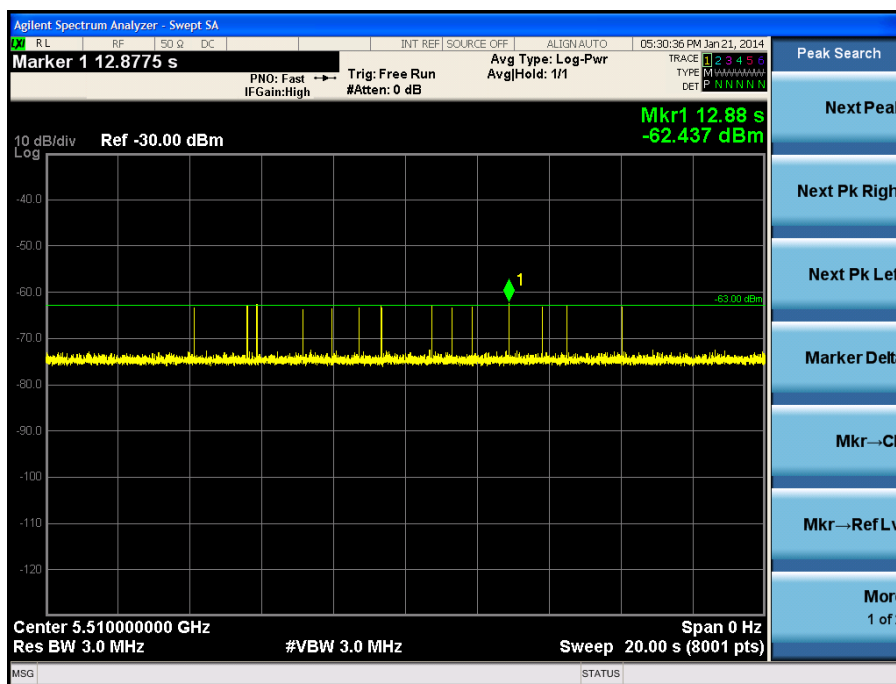
Radar #3 DFS detection threshold level and the burst of pulses on the Channel frequency



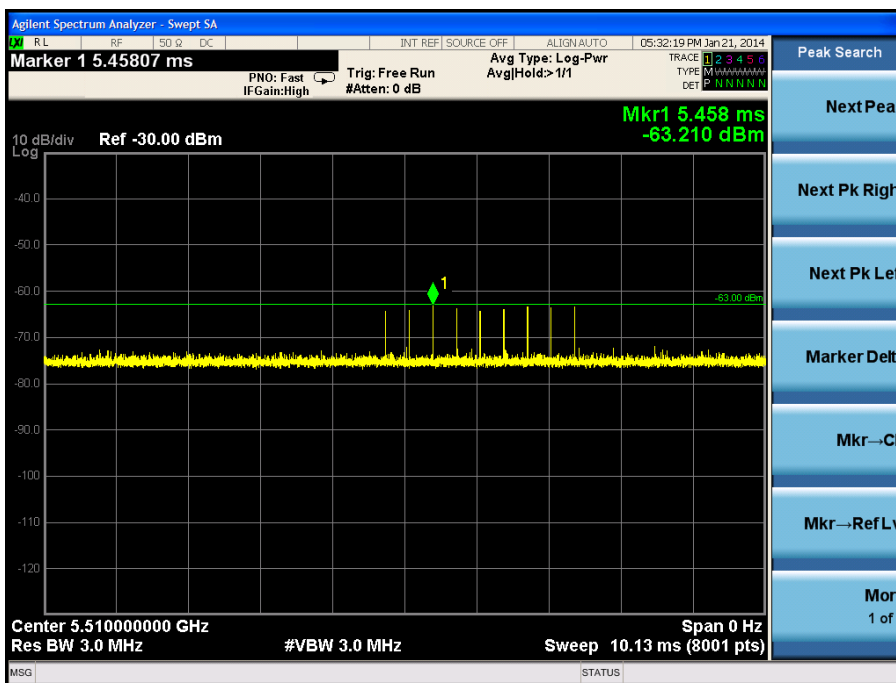
Radar #4 DFS detection threshold level and the burst of pulses on the Channel frequency



Radar #5 DFS detection threshold level and 12sec long burst on the Channel frequency

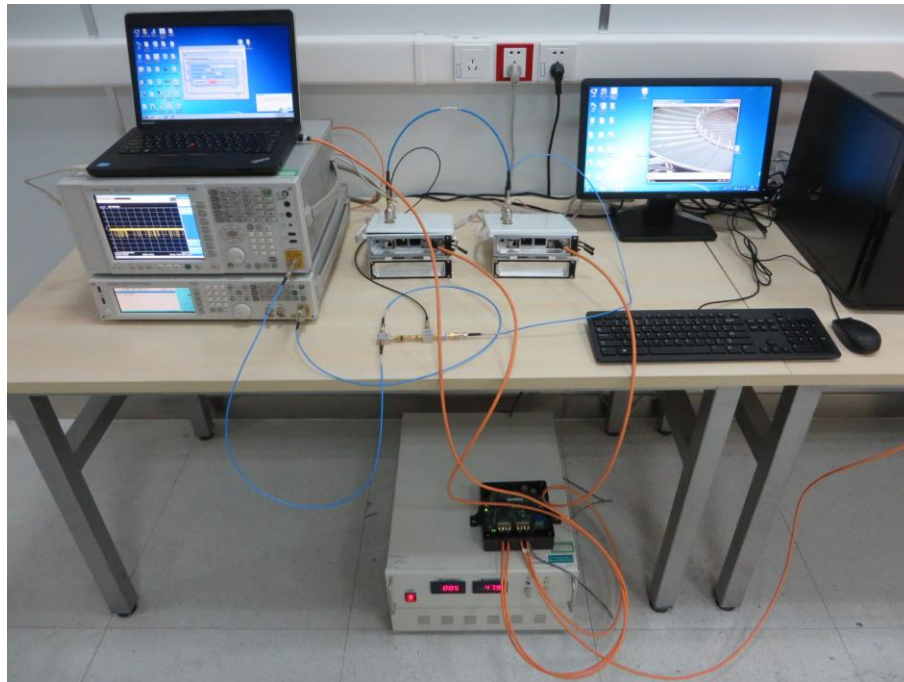


Radar #6 DFS detection threshold level and a single hop (9 pulses) on the Channel frequency within UNII detection bandwidth

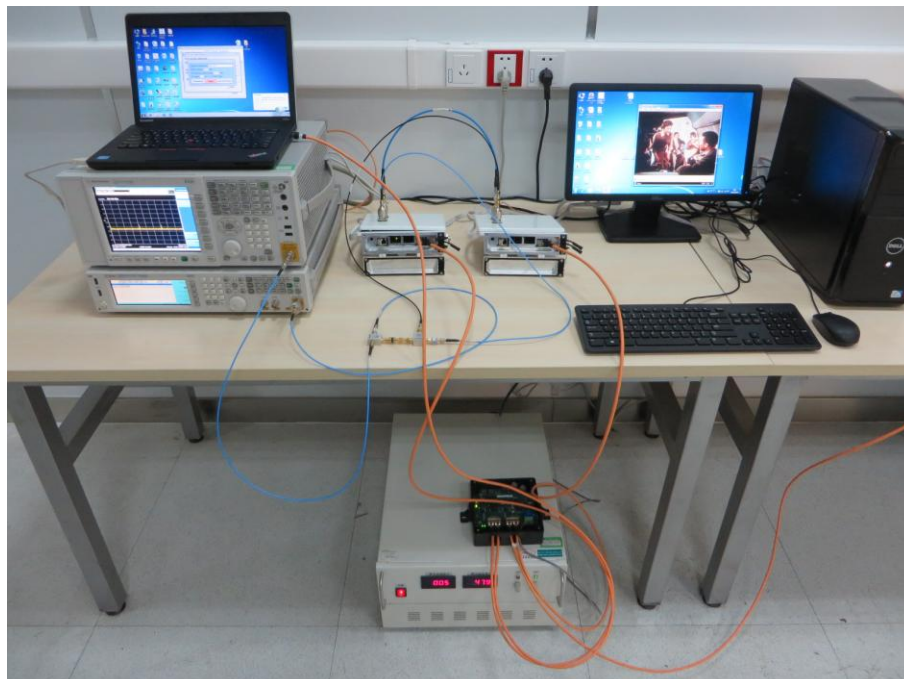


5.2.3. Test Setup Photo

Description: Test Setup Photo for Master Device



Description: Test Setup Photo for Client Device



5.3. UNII Detection Bandwidth Measurement

5.3.1. Test Limit

Minimum 80% of the UNII 99% transmission power bandwidth. During the U-NII Detection Bandwidth detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

5.3.2. Test Procedure

1. Adjust the equipment to produce a single Burst of the Short Pulse Radar Type 1 at the center frequency of the EUT Operating Channel at the specified DFS Detection Threshold level.
2. The generating equipment is configured as shown in the Conducted Test Setup above section 4.1.1.
3. The EUT is set up as a stand-alone device (no associated Client and no traffic). Frame based systems will be set to a talk/listen ratio of 0%/100% during this test.
4. Generate single radar Burst, and note the response of the EUT. Repeat for a minimum of 10 trials. The EUT must detect the Radar Waveform using the specified U-NII Detection Bandwidth criterion.
5. Starting at the center frequency of the EUT operating Channel, increase the radar frequency in 1 MHz steps, repeating the above item 4 test sequence, until the detection rate falls below the U-NII Detection Bandwidth criterion. Record the highest frequency (denote as FH) at which detection is greater than or equal to the U-NII Detection Bandwidth criterion. Recording the detection rate at frequencies above FH is not required to demonstrate compliance.
6. Starting at the center frequency of the EUT operating Channel, decrease the radar frequency in 1 MHz steps, repeating the above item 4 test sequence, until the detection rate falls below the U-NII Detection Bandwidth criterion. Record the lowest frequency (denote as FL) at which detection is greater than or equal to the U-NII Detection Bandwidth criterion. Recording the detection rate at frequencies below FL is not required to demonstrate compliance.
7. The U-NII Detection Bandwidth is calculated as follows: $\text{U-NII Detection Bandwidth} = \text{FH} - \text{FL}$
8. The U-NII Detection Bandwidth must be at least 80% of the EUT transmitter 99% power, otherwise, the EUT does not comply with DFS requirements.

5.3.3. Test Result for Master Device

EUT Frequency=5500MHz for 20MHz Bandwidth											
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5487	0	0	0	0	0	0	0	0	0	0	0%
5488 F1	1	0	1	1	1	1	1	1	1	1	90%
5489	1	1	1	0	1	1	1	1	1	1	90%
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%
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 Fh	1	1	1	1	1	1	1	0	1	1	90%
5512	1	1	1	1	1	1	1	0	1	0	80%
Detection Bandwidth = Fh-F1 = 5511MHz - 5488MHz = 23MHz											
EUT 99% Bandwidth = 17.71MHz (see note)											
UNII Detection Bandwidth Min. Limit (MHz): 17.71MHz x 80% = 14.17MHz											

Note: All UNII channels for this device have identical Channel bandwidths. Therefore, all DFS testing was done at 5500MHz. The 99% channel bandwidth is 17.71MHz. (See the 99% BW section of the RF report for further measurement details).

EUT Frequency=5510MHz for 40MHz Bandwidth											
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5389	0	0	0	0	0	0	0	0	0	0	0%
5490 FI	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%
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	0	1	1	1	1	1	90%
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	0	1	1	1	90%
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 Fh	1	1	1	1	1	1	1	1	1	1	100%
5528	1	1	1	0	1	0	1	1	1	1	80%
Detection Bandwidth = Fh-FI = 5527MHz - 5490MHz = 37MHz											
EUT 99% Bandwidth = 36.36MHz (see note)											
UNII Detection Bandwidth Min. Limit (MHz): 36.36MHz x 80% = 29.09MHz											

Note: All UNII channels for this device have identical Channel bandwidths. Therefore, all DFS testing was done at 5510MHz. The 99% channel bandwidth is 36.36MHz. (See the 99% BW section of the RF report for further measurement details).

5.3.4. Test Result for Client Device

EUT Frequency=5500MHz for 20MHz Bandwidth											
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5487	1	1	0	0	0	1	1	0	1	0	50%
5488 FI	1	1	1	1	1	1	1	1	1	1	100%
5489	1	1	1	1	1	1	1	1	1	1	100%
5490	1	1	1	1	1	1	1	1	1	1	100%
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 Fh	1	1	1	1	1	1	1	1	1	1	100%
5511	0	0	0	0	0	0	0	0	0	0	0%
Detection Bandwidth = Fh-FI = 5510MHz - 5488MHz = 22MHz											
EUT 99% Bandwidth = 17.71MHz (see note)											
UNII Detection Bandwidth Min. Limit (MHz): 17.71MHz x 80% = 14.17MHz											

Note: All UNII channels for this device have identical Channel bandwidths. Therefore, all DFS testing was done

at 5500MHz. The 99% channel bandwidth is 17.71MHz. (See the 99% BW section of the RF report for further measurement details).

EUT Frequency=5510MHz for 40MHz Bandwidth											
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, 0= No Detection)										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5389	0	0	0	0	0	0	0	0	0	0	0%
5490 FI	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%
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	0	1	1	1	1	1	90%
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	0	1	1	1	90%

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 Fh	1	1	1	1	1	1	1	1	1	1	100%
5528	1	1	1	0	1	0	1	1	1	1	80%
Detection Bandwidth = Fh-FI = 5527MHz - 5490MHz = 37MHz											
EUT 99% Bandwidth = 36.36MHz (see note)											
UNII Detection Bandwidth Min. Limit (MHz): 36.36MHz x 80% = 29.09MHz											

Note: All UNII channels for this device have identical Channel bandwidths. Therefore, all DFS testing was done at 5510MHz. The 99% channel bandwidth is 36.36MHz. (See the 99% BW section of the RF report for further measurement details).

5.4. Initial Channel Availability Check Time Measurement

5.4.1. Test Limit

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

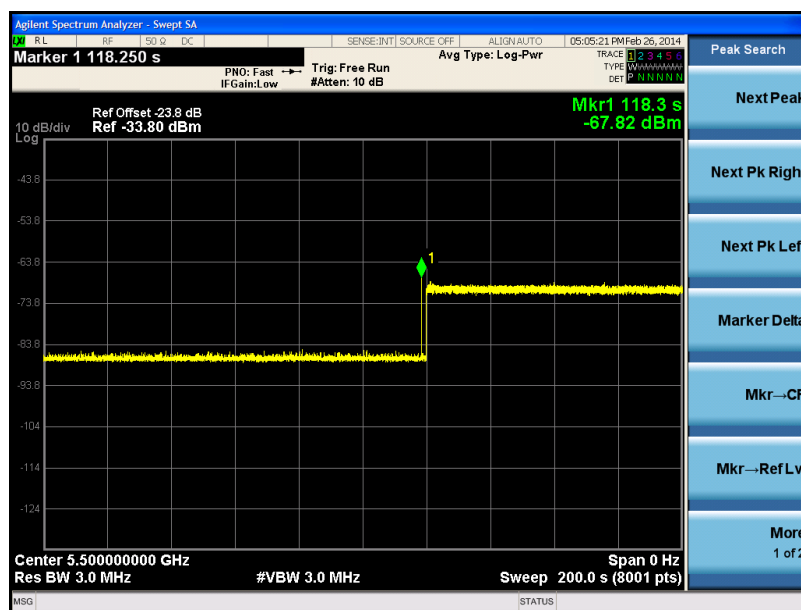
5.4.2. Test Procedure

1. The U-NII devices will be powered on and be instructed to operate on the appropriate 5500MHz (for 20MHz), 5510MHz (for 40MHz). The spectrum analyzer will be set to zero span mode with a 3 MHz RBW and 3 MHz VBW on the Channel occupied by the radar (Chr) with a 2.5 minute sweep time. The spectrum analyzer's sweep will be started at the same time power is applied to the U-NII device.
2. The EUT should not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle. Measurement system showing its nominal noise floor is marker 1.

5.4.3. Test Result

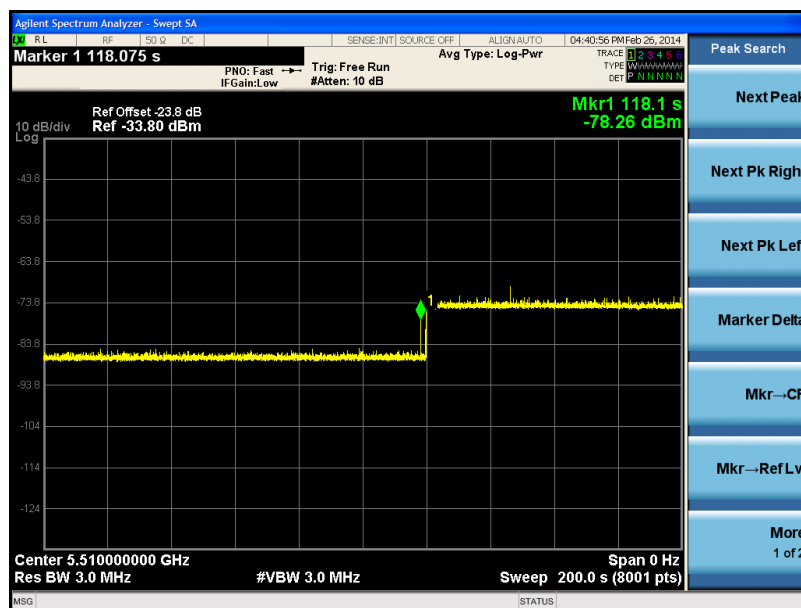
For 20MHz Bandwidth

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (58.3 sec). Initial beacons/data transmissions are indicated by marker 1 (118.3 sec).



For 40MHz Bandwidth

The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (58.1 sec). Initial beacons/data transmissions are indicated by marker 1 (118.1 sec).



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

5.5.1. Test Limit

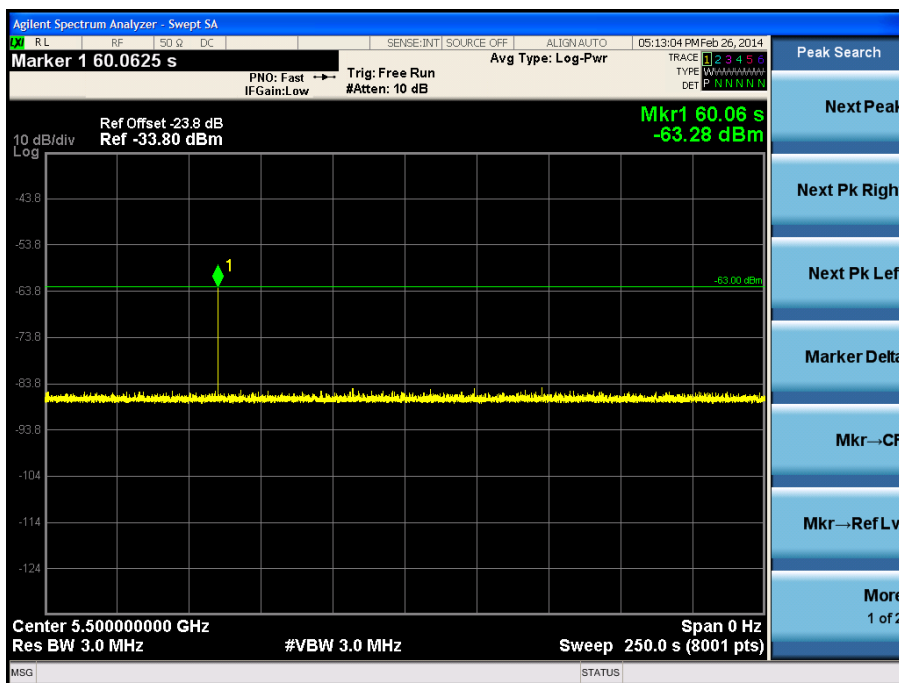
In beginning of the Channel Availability Check (CAC) Time, radar is detected on this channel, select another intended channel and perform a CAC on that channel.

5.5.2. Test Procedure

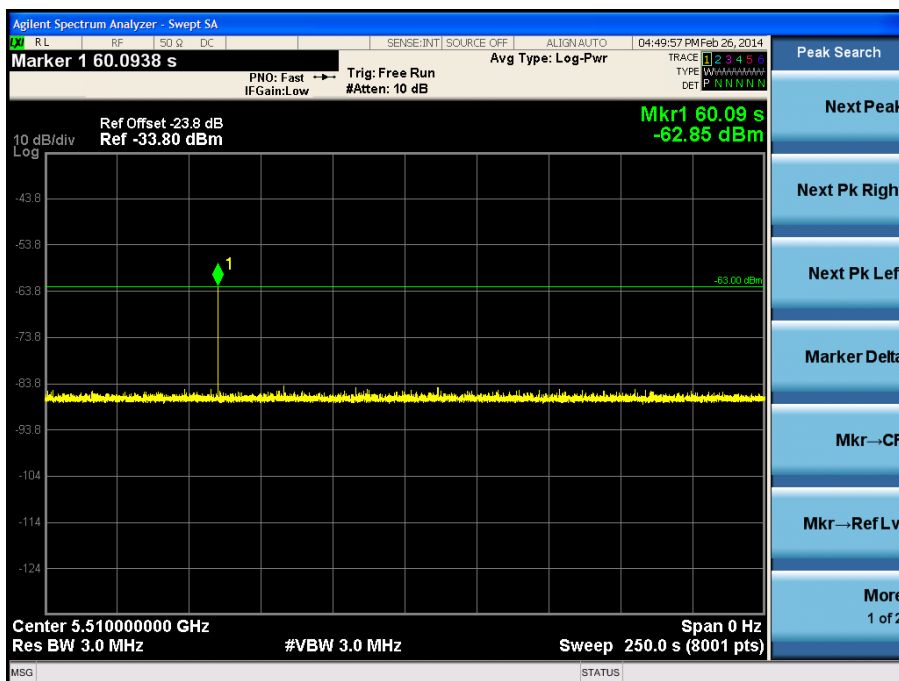
1. The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB occurs at the beginning of the Channel Availability Check Time.
2. The EUT is in completion power-up cycle (from T0 to T1). T1 denotes the instant when the EUT has completed its power-up sequence. The Channel Availability Check Time commences at instant T1 and will end no sooner than T1 + 60 seconds. A single Burst of short pulse of radar type 1 at DFS Detection Threshold + 1 dB will commence within a 6 second window starting at T1.
3. Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions at 5500MHz (for 20MHz), 5510MHz (for 40MHz) will continue for 60.06 seconds (for 20MHz), 60.09 seconds (for 40MHz) after the radar Burst has been generated. Verify that during the 2.5 minutes measurement window no EUT transmissions occurred at 5500MHz (for 20MHz), 5510MHz (for 40MHz)

5.5.3. Test Result

For 20MHz Bandwidth



For 40MHz Bandwidth



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

5.6.1. Test Limit

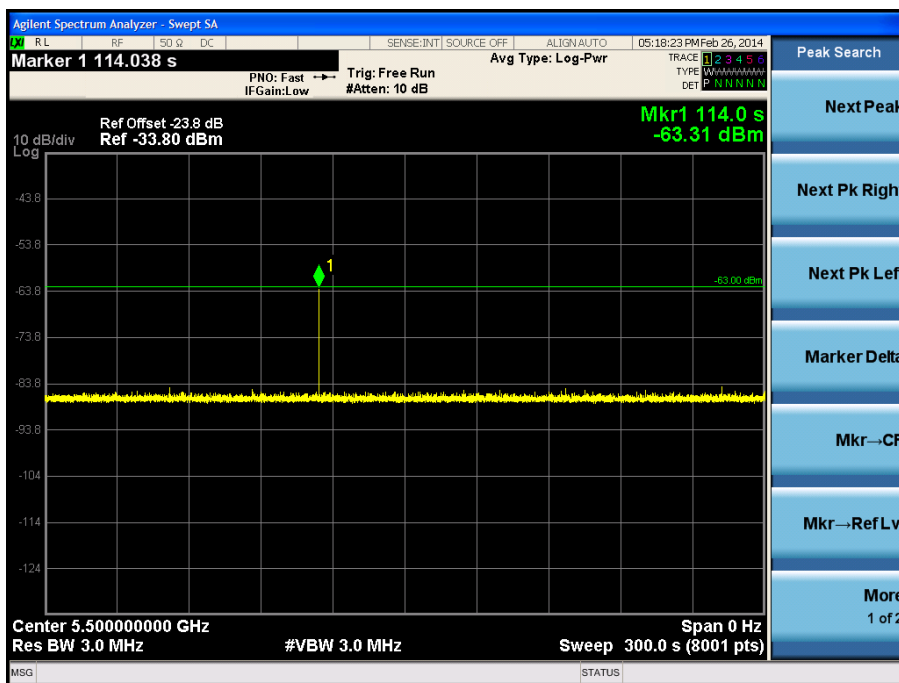
In the end of Channel Availability Check (CAC) Time, radar is detected on this channel, select another intended channel and perform a CAC on that channel.

5.6.2. Test Procedure

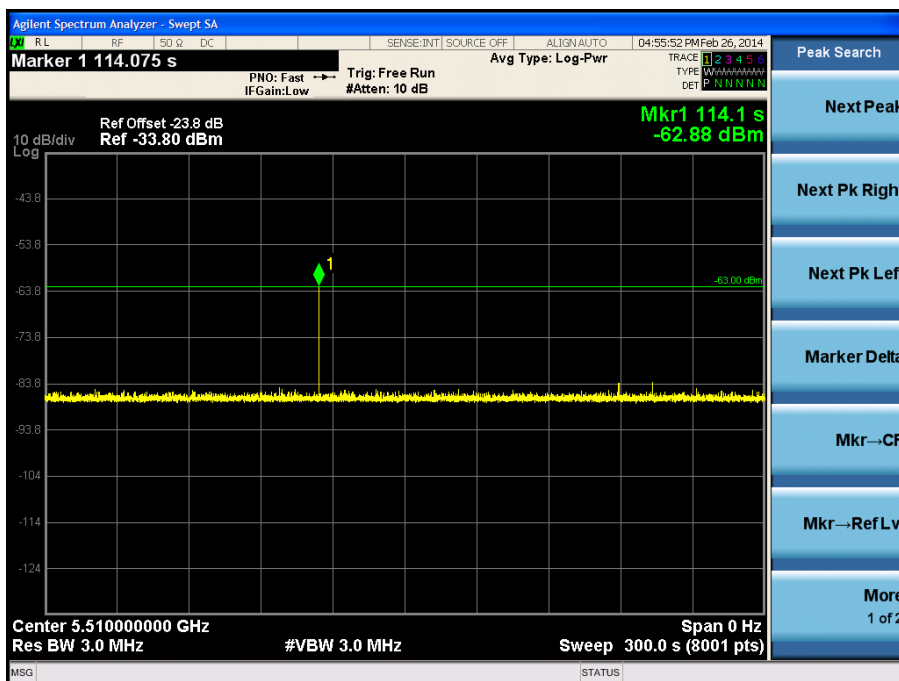
1. The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB occurs at the beginning of the Channel Availability Check Time.
2. The EUT is powered on at T0. T1 denotes the instant when the EUT has completed its power-up sequence. The Channel Availability Check Time commences at instant T1 and will end no sooner than T1 + 60 seconds. A single Burst of short pulse of radar type 1 at DFS Detection Threshold + 1 dB will commence within a 6 second window starting at T1+ 54 seconds.
3. Visual indication on the EUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions at 5500MHz (for 20MHz), 5510MHz (for 40MHz) will continue for 114.0 seconds (for 20MHz), 114.1 seconds (for 40MHz) after the radar Burst has been generated. Verify that during the 2.5 minutes measurement window no EUT transmissions occurred at 5500MHz (for 20MHz), 5510MHz (for 40MHz)

5.6.3. Test Result

For 20MHz Bandwidth



For 40MHz Bandwidth



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

5.7.1. Test Limit

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

5.7.2. Test Procedure Used

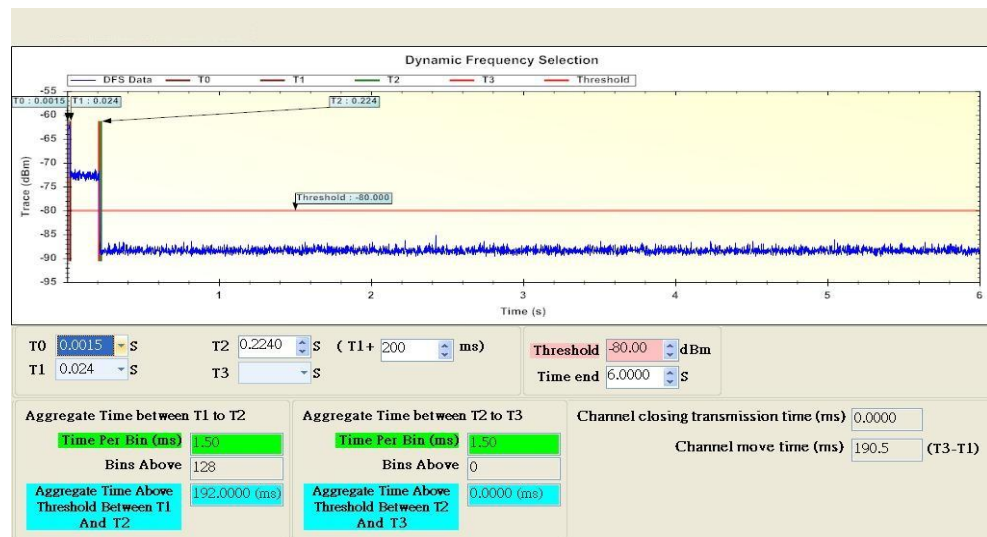
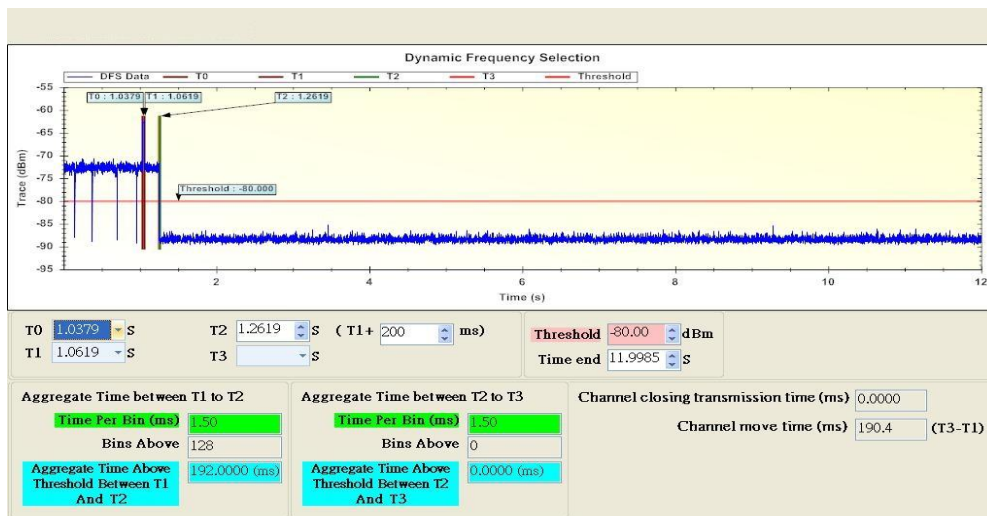
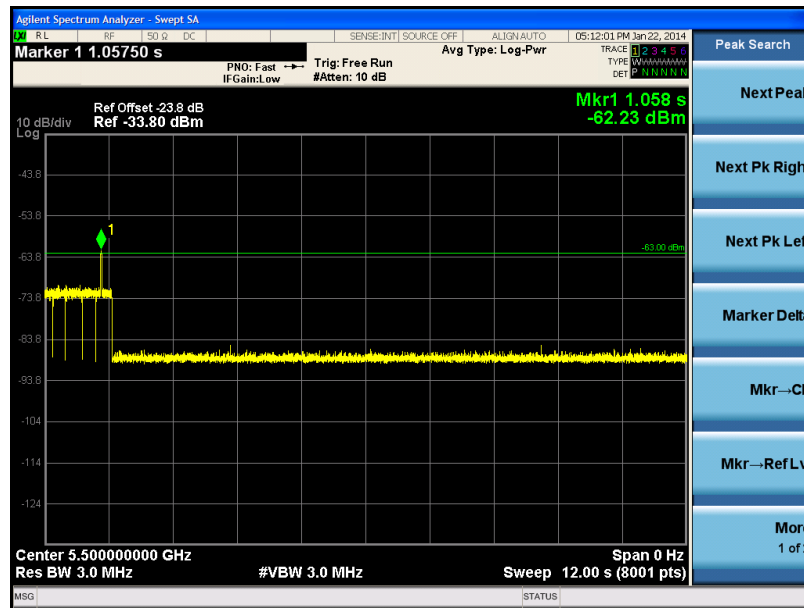
1. When a radar Burst with a level equal to the DFS Detection Threshold + 1dB is generated on the Operating Channel of the U-NII device. A U-NII device operating as a Client Device will associate with the Master at Channel. Stream the MPEG test file from the Master Device to the Client Device on the selected Channel for the entire period of the test. At time T0 the Radar Waveform generator sends a Burst of pulses for each of the radar types at Detection Threshold + 1dB.
2. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel. Measure and record the transmissions from the EUT during the observation time (Channel Move Time). One 10 second plot been reported for the Short Pulse Radar Types 1-4 and one for the Long Pulse Radar Type test in a 22 second plot. The plot for the Short Pulse Radar Types start at the end of the radar burst. The Channel Move Time will be calculated based on the plot of the Short Pulse Radar Type. The Long Pulse Radar Type plot show the device ceased transmissions within the 10 second window after detection has occurred. The plot for the Long Pulse Radar Type should start at the beginning of the 12 second waveform.
3. Measurement of the aggregate duration of the Channel Closing Transmission Time method. With the spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by:
$$\text{Dwell (0.125ms)} = S (1 \text{ sec}) / B (8000);$$
where Dwell is the dwell time per spectrum analyzer sampling bin, S is the sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission

Time is calculated by: 20MHz: $C (1.875 \text{ ms}) = N (15) \times \text{Dwell} (0.125 \text{ ms})$, 40MHz: $C (1.375 \text{ ms}) = N (11) \times \text{Dwell} (0.125 \text{ ms})$; where C is the Closing Time, N is the number of spectrum analyzer sampling bins (intermittent control signals) showing a U-NII transmission and Dwell is the dwell time per bin.

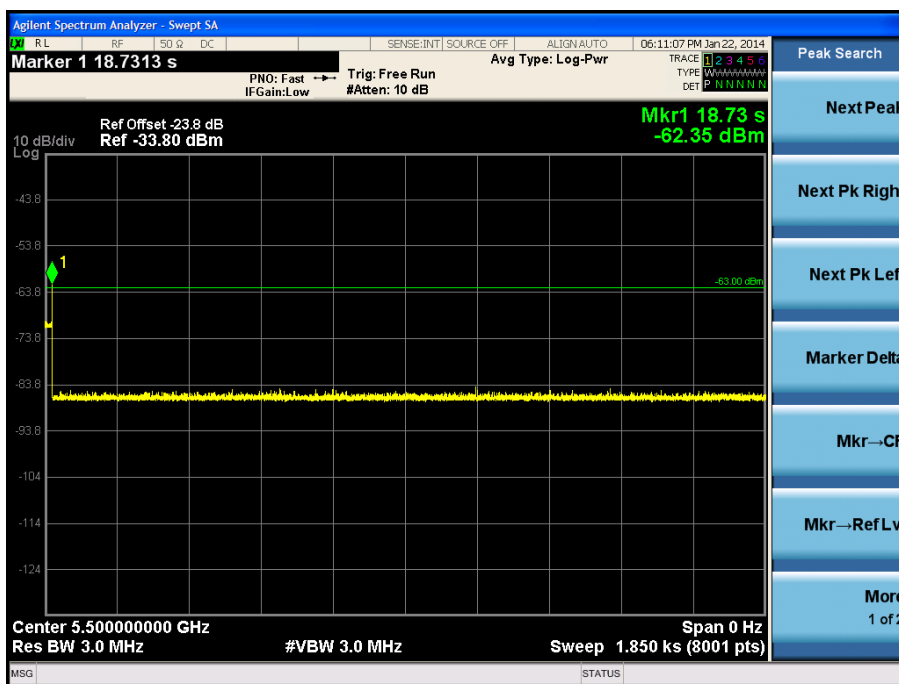
4. Measure the EUT for more than 30 minutes following the channel close/move time to verify that the EUT does not resume any transmissions on this Channel.

5.7.3. Test Result for Master Device

Channel Move Time and Channel Closing Transmission Time for 20MHz Bandwidth



Non-Occupancy Period for 20MHz Bandwidth

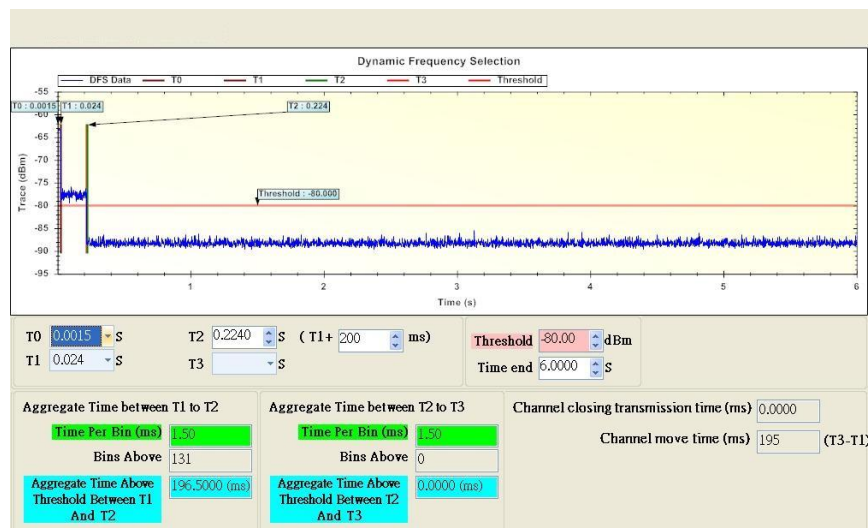
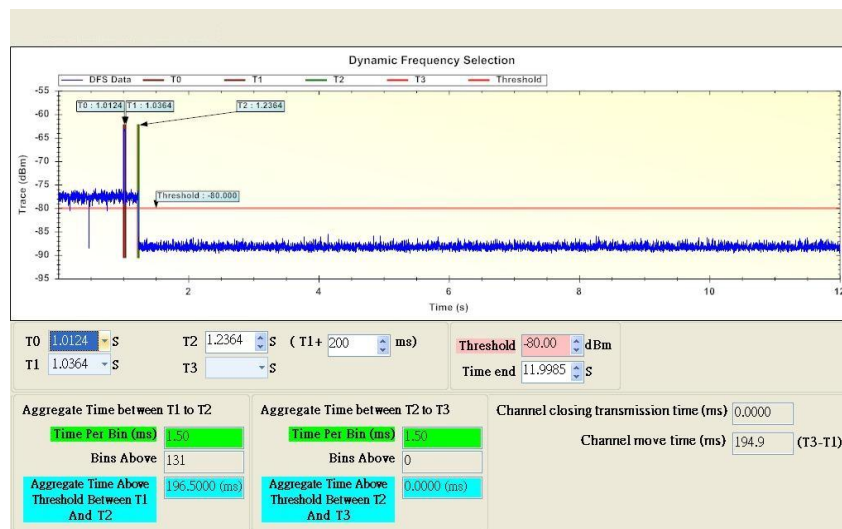
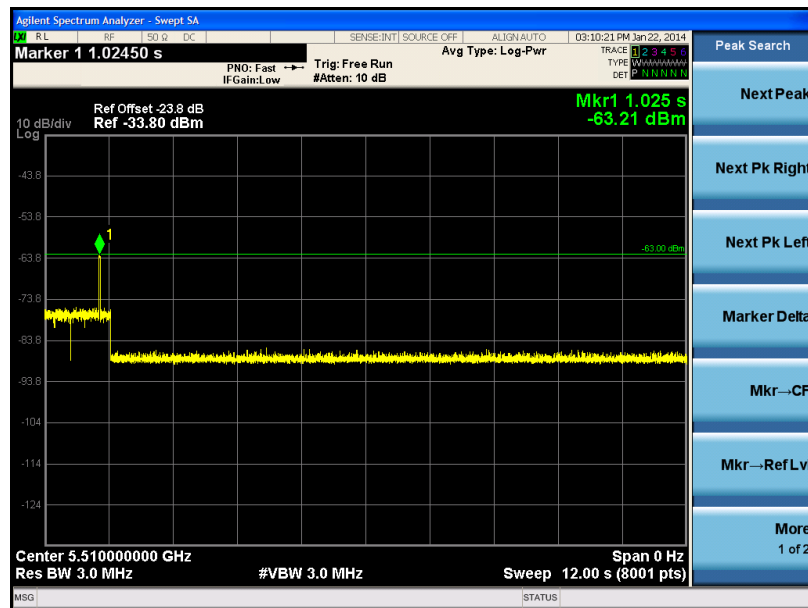


Parameter	Test Result	Limit
	Type 1	
Test Channel (MHz)	5500MHz	N/A
Channel Move Time (s)	0.1905s	<10s
Channel Closing Transmission Time (ms) (Note)	0ms	< 60ms
Non-Occupancy Period (min.)	≥ 30min	≥ 30 min

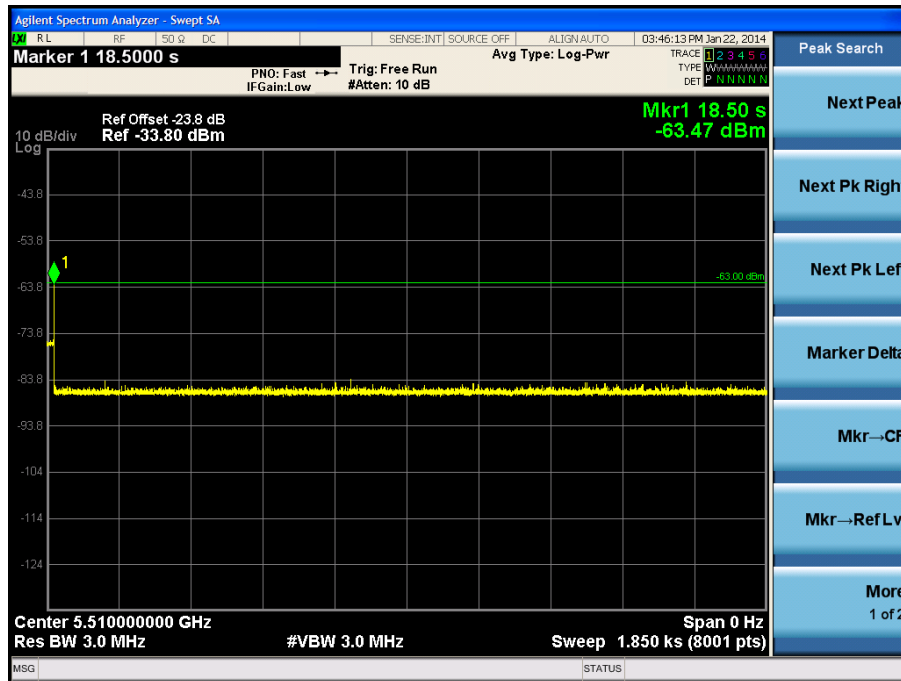
Note:

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

Channel Move Time, Channel Closing Transmission Time for 40MHz Bandwidth



Non-Occupancy Period for 40MHz Bandwidth



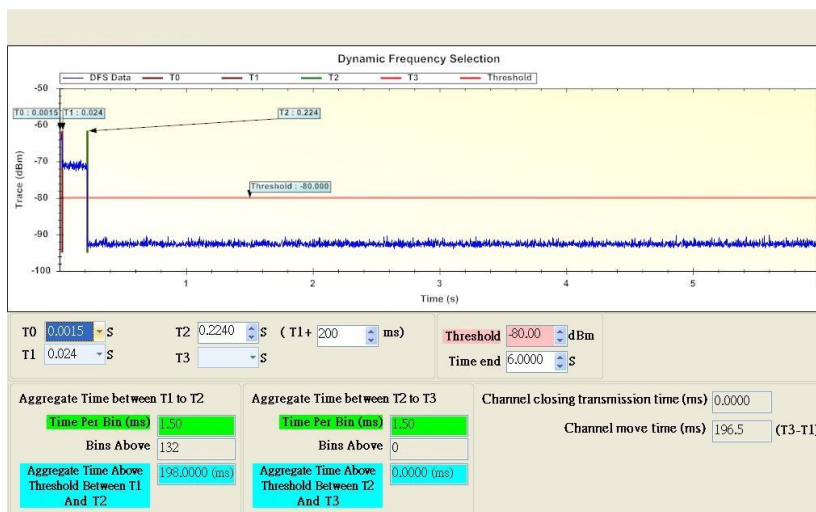
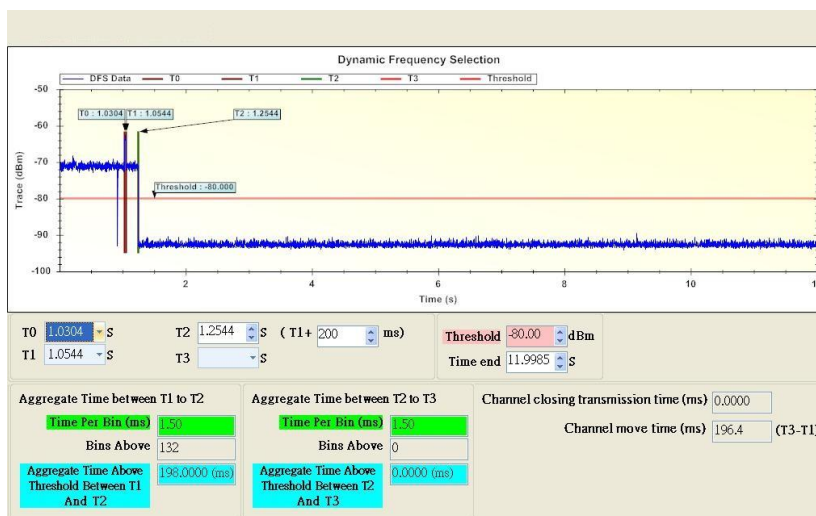
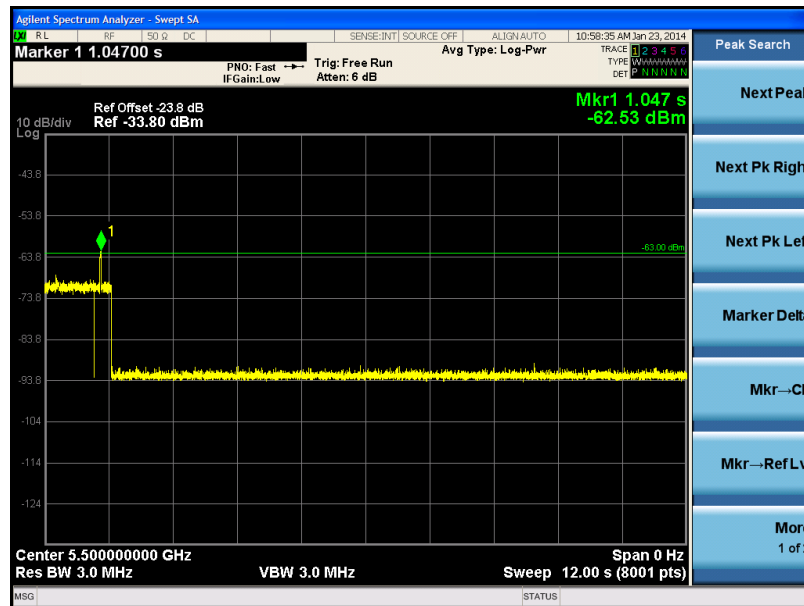
Parameter	Test Result	Limit
	Type 1	
Test Channel (MHz)	5510MHz	N/A
Channel Move Time (s)	0.195s	<10s
Channel Closing Transmission Time (ms) (Note)	0ms	< 60ms
Non-Occupancy Period (min.)	≥ 30min	≥ 30 min

Note:

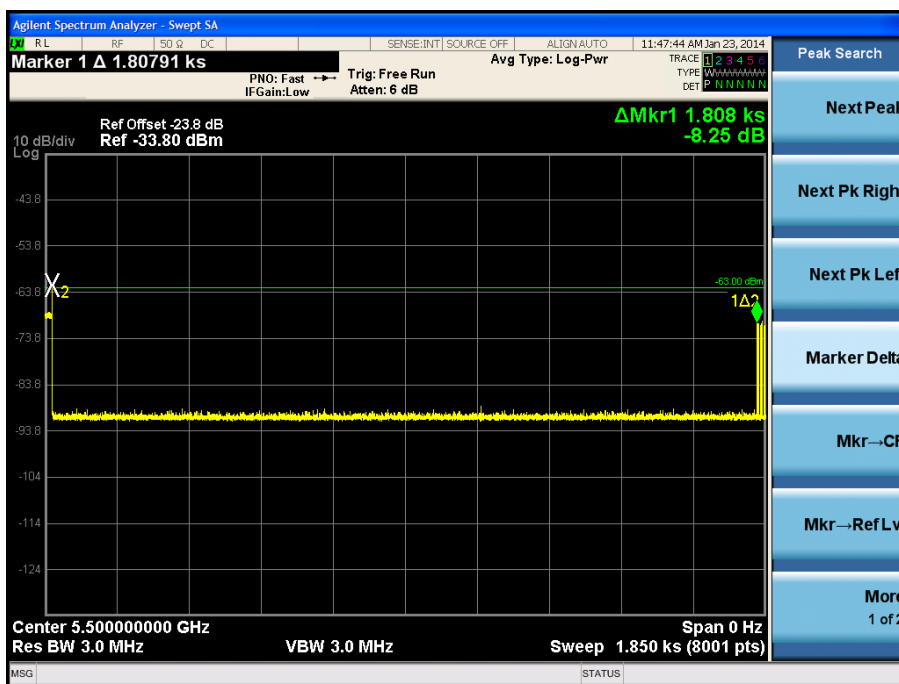
The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 seconds period. The aggregate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

5.7.4. Test Result for Client Device

Channel Move Time, Channel Closing Transmission Time for 20MHz Bandwidth



Non-Occupancy Period for 20MHz Bandwidth

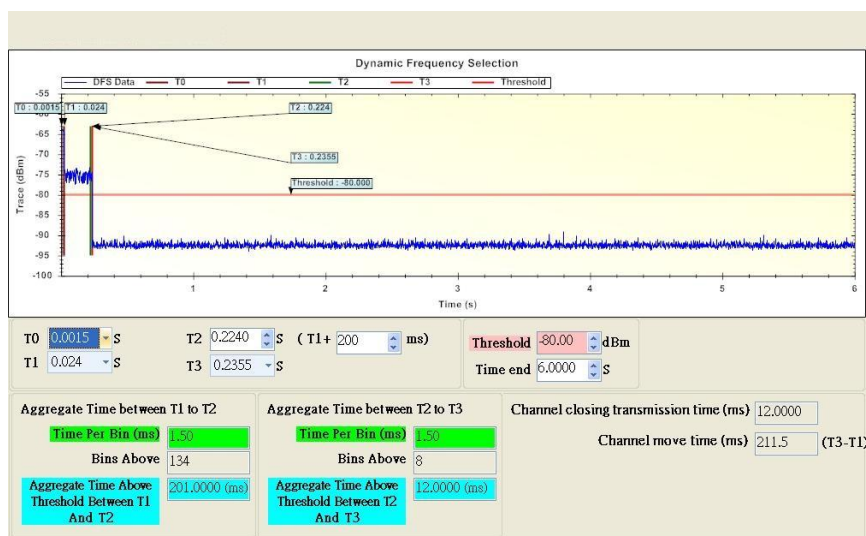
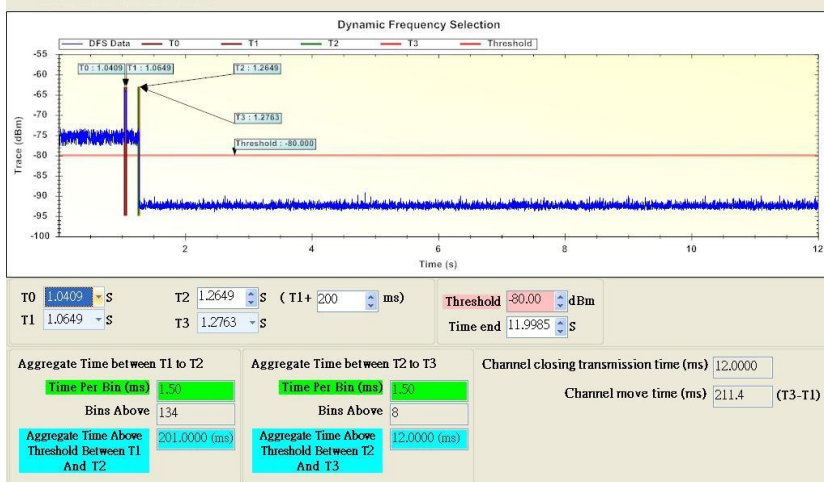
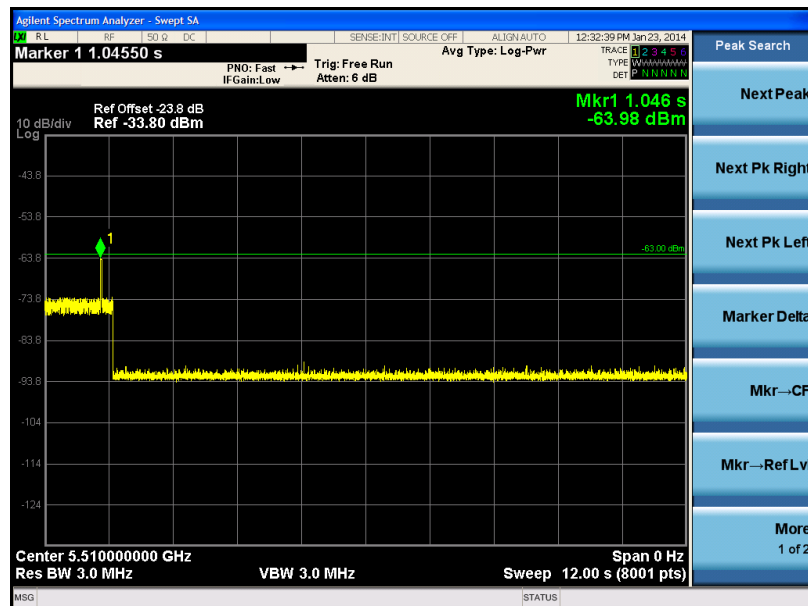


Parameter	Test Result	Limit
	Type 1	
Test Channel (MHz)	5500MHz	N/A
Channel Move Time (s)	0.1965s	<10s
Channel Closing Transmission Time (ms) (Note)	0ms	< 60ms
Non-Occupancy Period (min.)	≥ 30	≥ 30 min

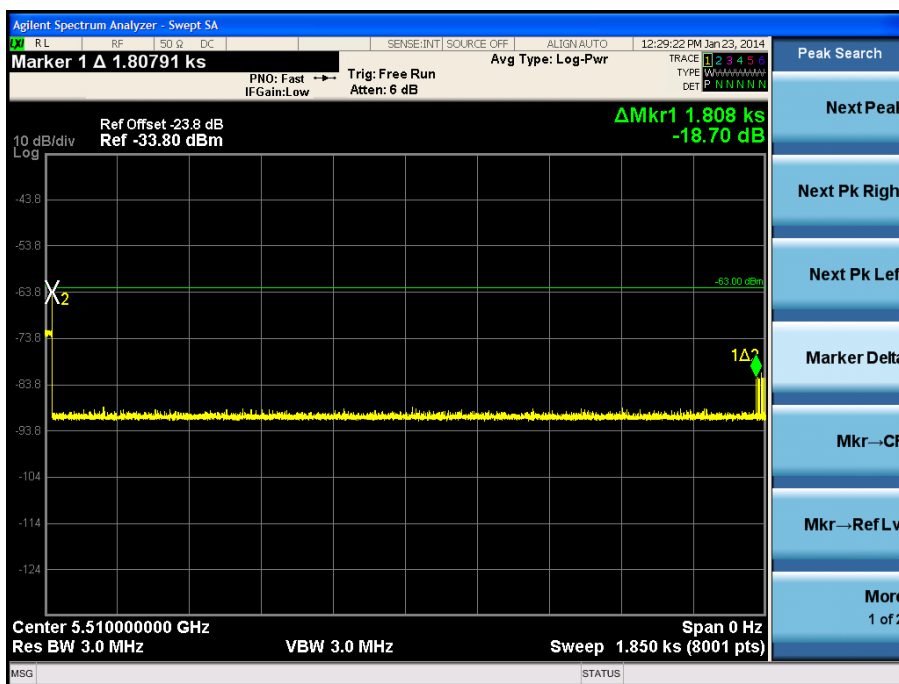
Note:

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

Channel Move Time, Channel Closing Transmission Time for 40MHz Bandwidth



Non-Occupancy Period for 40MHz Bandwidth



Parameter	Test Result	Limit
	Type 1	
Test Channel (MHz)	5510MHz	N/A
Channel Move Time (s)	0.2115s	<10s
Channel Closing Transmission Time (ms) (Note)	12ms	< 60ms
Non-Occupancy Period (min.)	≥ 30	≥ 30 min

Note:

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

5.8. Statistical Performance Check Measurement

5.8.1. Test Limit

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

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

The percentage of successful detection is calculated by:

$(\text{Total Waveform Detections} / \text{Total Waveform Trails}) * 100 = \text{Probability of Detection Radar Waveform}$ In addition an aggregate minimum percentage of successful detection across all Short Pulse Radar Types 1-4 is required and is calculated as follows: $(Pd1 + Pd2 + Pd3 + Pd4) / 4$.

5.8.2. Test Procedure

1. Stream the MPEG test file from the Master Device to the Client Device on the test Channel for the entire period of the test.
2. At time T0 the Radar Waveform generator sends the individual waveform for each of the Radar Types 1-6, at levels equal to the DFS Detection Threshold + 1dB, on the Operating Channel.
3. Observe the transmissions of the EUT at the end of the Burst on the Operating Channel for duration greater than 10 seconds for Short Pulse Radar Types 1-4 and 6 to ensure detection occurs.
4. Observe the transmissions of the EUT at the end of the Burst on the Operating Channel for duration greater than 22 seconds for Long Pulse Radar Type 5 to ensure detection occurs.

5. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trial runs.
6. The Minimum number of trials, minimum percentage of successful detection and the average minimum percentage of successful detection are found in below table.

5.8.3. Test Result For Master Device

For 20MHz Bandwidth

Type 1 Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5500	1	1428	18	1
2	5500	1	1428	18	1
3	5500	1	1428	18	1
4	5500	1	1428	18	1
5	5500	1	1428	18	1
6	5500	1	1428	18	1
7	5500	1	1428	18	1
8	5500	1	1428	18	1
9	5500	1	1428	18	1
10	5500	1	1428	18	1
11	5500	1	1428	18	1
12	5500	1	1428	18	1
13	5500	1	1428	18	1
14	5500	1	1428	18	1
15	5500	1	1428	18	1
16	5500	1	1428	18	1
17	5500	1	1428	18	1
18	5500	1	1428	18	1
19	5500	1	1428	18	1
20	5500	1	1428	18	1
21	5500	1	1428	18	1
22	5500	1	1428	18	1
23	5500	1	1428	18	1
24	5500	1	1428	18	1
25	5500	1	1428	18	1
26	5500	1	1428	18	1
27	5500	1	1428	18	1
28	5500	1	1428	18	1
29	5500	1	1428	18	1
30	5500	1	1428	18	1
Detection Percentage (%)					100%

Type 2 Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5500	2.3	189	24	1
2	5500	1.3	186	27	1
3	5500	5.0	201	29	1
4	5500	4.3	201	29	1
5	5500	4.4	158	28	1
6	5500	2.8	186	24	1
7	5500	3.3	229	23	1
8	5500	4.7	192	25	1
9	5500	1.3	191	28	1
10	5500	4.4	203	23	1
11	5500	4.0	192	24	1
12	5500	2.7	153	26	0
13	5500	3.1	186	29	1
14	5500	1.4	156	23	0
15	5500	2.6	199	26	1
16	5500	3.2	173	27	1
17	5500	2.0	219	27	1
18	5500	2.8	209	27	1
19	5500	1.1	171	26	1
20	5500	1.2	221	24	1
21	5500	2.8	224	25	1
22	5500	2.4	193	29	1
23	5500	1.3	188	29	1
24	5500	4.1	188	23	1
25	5500	4.0	194	27	1
26	5500	2.0	174	29	1
27	5500	1.7	174	24	1
28	5500	4.4	228	23	1
29	5500	2.8	161	27	1
30	5500	4.9	226	26	1
Detection Percentage (%)					93.3%

Type 3 Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5500	7.8	384	18	1
2	5500	7.9	281	16	1
3	5500	7.9	386	17	1
4	5500	6.0	481	18	1
5	5500	7.1	428	16	1
6	5500	7.7	357	17	1
7	5500	6.3	377	16	1
8	5500	9.7	337	18	1
9	5500	6.7	432	18	0
10	5500	7.9	354	18	1
11	5500	6.4	386	17	1
12	5500	10.0	414	16	1
13	5500	9.1	257	17	1
14	5500	7.0	406	16	1
15	5500	8.6	478	16	1
16	5500	6.2	368	17	1
17	5500	8.2	442	18	1
18	5500	8.3	452	16	1
19	5500	8.3	459	18	1
20	5500	7.1	288	16	1
21	5500	8.8	373	18	1
22	5500	7.4	271	16	0
23	5500	8.1	339	17	1
24	5500	6.9	371	16	1
25	5500	7.1	347	18	1
26	5500	7.4	304	16	0
27	5500	8.3	257	16	1
28	5500	8.8	385	17	1
29	5500	8.5	480	17	1
30	5500	7.4	495	16	1
Detection Percentage (%)					90%

Type 4 Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5500	14.0	489	15	1
2	5500	16.8	449	13	1
3	5500	15.5	476	14	1
4	5500	12.4	291	15	1
5	5500	17.0	366	14	1
6	5500	19.6	419	14	0
7	5500	13.9	450	12	1
8	5500	13.3	367	16	1
9	5500	15.9	465	13	1
10	5500	15.0	474	14	1
11	5500	19.9	320	12	1
12	5500	11.9	388	14	1
13	5500	18.9	392	15	1
14	5500	11.9	495	15	1
15	5500	17.8	434	13	1
16	5500	13.9	343	13	0
17	5500	18.6	429	16	1
18	5500	13.1	468	16	1
19	5500	15.1	429	15	1
20	5500	18.4	270	13	1
21	5500	15.1	369	14	1
22	5500	18.6	374	14	0
23	5500	12.6	268	16	1
24	5500	19.4	476	12	1
25	5500	12.0	419	12	0
26	5500	18.8	286	13	1
27	5500	18.7	333	16	1
28	5500	14.6	389	15	1
29	5500	12.7	414	13	0
30	5500	18.8	345	14	1
Detection Percentage (%)					83.3%

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

waveforms is as follows: $\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4} = (100\% + 93.3\% + 90\% + 83.3\%) / 4 = 91.65\% (>80\%)$



Type 5 Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5500	1	16	5500	1
2	5500	1	17	5500	1
3	5500	1	18	5500	1
4	5500	0	19	5500	1
5	5500	1	20	5500	1
6	5500	1	21	5500	1
7	5500	1	22	5500	1
8	5500	1	23	5500	1
9	5500	1	24	5500	1
10	5500	1	25	5500	0
11	5500	1	26	5500	1
12	5500	1	27	5500	1
13	5500	1	28	5500	1
14	5500	1	29	5500	1
15	5500	1	30	5500	1
Detection Percentage (%)					93.3%

Type 5 Radar Waveform_1

Waveform Num = 1
Num of Bursts = 8
Burst Interval (us)= 1500000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	701777	3	19	60	1896	1845	1500	701777	0	1499999
2	2219528	2	18	100	1192	1376	0	2926546	1500000	2999999
3	1113834	1	18	50	1585	0	0	4042948	3000000	4499999
4	458122	2	20	65	1359	1420	0	4502655	4500000	5999999
5	1646625	3	12	70	1401	1024	1373	6152059	6000000	7499999
6	1889304	1	14	65	1503	0	0	8045161	7500000	8999999
7	1258081	3	20	85	1901	1020	1655	9304745	9000000	10499999
8	1938946	3	17	75	1480	1532	1682	11248267	10500000	11999999

Total number of pulses in waveform = 18



Type 5 Radar Waveform_2

Waveform Num = 2
Num of Bursts = 18
Burst Interval (us) = 666667

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	624128	2	20	70	1691	1757	0	624128	0	666666
2	330810	2	9	70	1831	1441	0	958386	666667	1333333
3	778953	2	10	70	1178	1870	0	1740611	1333334	2000000
4	868156	1	18	85	1167	0	0	2611815	2000001	2666667
5	370127	1	20	75	1428	0	0	2983109	2666668	3333334
6	349951	2	15	85	1141	1696	0	3334488	3333335	4000001
7	942770	2	19	55	1616	1558	0	4280095	4000002	4666668
8	416919	2	12	70	1069	1086	0	4700188	4666669	5333335
9	707542	1	13	75	1490	0	0	5409885	5333336	6000002
10	1004924	3	19	70	1862	1118	1541	6416299	6000003	6666669
11	548832	2	20	50	1399	1962	0	6969652	6666670	7333336
12	866496	1	15	80	1450	0	0	7839509	7333337	8000003
13	344695	1	14	50	1164	0	0	8185654	8000004	8666670
14	843415	3	8	65	1714	1533	1193	9030233	8666671	9333337
15	822951	2	8	100	1800	1149	0	9857624	9333338	10000004
16	796481	1	12	95	1462	0	0	10657054	10000005	10666671
17	93695	1	9	55	1321	0	0	10752211	10666672	11333338
18	1098952	3	17	70	1404	1590	1704	11852484	11333339	12000005

Total number of pulses in waveform = 32

Type 5 Radar Waveform_3

Waveform Num = 3
Num of Bursts = 17
Burst Interval (us) = 705882

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	223634	3	11	55	1796	1956	1484	223634	0	705881
2	697073	1	7	80	1208	0	0	925943	705882	1411763
3	711923	3	11	75	1556	1055	1791	1639074	1411764	2117645
4	1074999	1	6	100	1976	0	0	2718475	2117646	2823527
5	733700	2	16	100	1512	1729	0	3454151	2823528	3529409
6	756928	2	16	70	1500	1129	0	4214320	3529410	4235291
7	494325	1	13	50	1576	0	0	4711274	4235292	4941173
8	590452	2	15	70	1416	1510	0	5303302	4941174	5647055
9	603040	1	10	55	1833	0	0	5909268	5647056	6352937
10	691568	2	9	50	1704	1657	0	6602669	6352938	7058819
11	544917	1	11	100	1486	0	0	7150947	7058820	7764701
12	1037316	3	15	70	1939	1879	1478	8189749	7764702	8470583
13	555264	3	17	95	1549	1281	1127	8750309	8470584	9176465
14	562022	2	15	100	1350	1537	0	9316288	9176466	9882347
15	1005497	1	5	55	1542	0	0	10324672	9882348	10588229
16	816609	3	7	90	1382	1264	1858	11142823	10588230	11294111
17	234591	2	14	90	1619	1416	0	11381918	11294112	11999993

Total number of pulses in waveform = 33

Type 5 Radar Waveform_4

Waveform Num = 4
Num of Bursts = 8
Burst Interval (us) = 1500000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	1266603	1	13	90	1432	0	0	1266603	0	1499999
2	380161	3	9	95	1313	1249	1632	1648196	1500000	2999999
3	2767819	1	15	90	1981	0	0	4420209	3000000	4499999
4	311671	3	20	95	1064	1553	1791	4733861	4500000	5999999
5	2077487	1	5	75	1116	0	0	6815756	6000000	7499999
6	1038724	3	15	100	1042	1481	1177	7855596	7500000	8999999
7	1541964	1	10	60	1274	0	0	9401260	9000000	10499999
8	2081717	3	19	55	1347	1915	1582	11484251	10500000	11999999

Total number of pulses in waveform = 16



Type 5 Radar Waveform_5

Waveform Num = 5
Num of Bursts = 15
Burst Interval (us)= 800000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	751369	2	10	70	1802	1422	0	751369	0	799999
2	732842	2	9	65	1990	1967	0	1487435	800000	1599999
3	574167	2	7	100	1509	1880	0	2065559	1600000	2399999
4	825480	1	14	70	1795	0	0	2430706	2400000	3199999
5	936827	3	5	65	1078	1525	1400	3257981	3200000	3999999
6	1114611	2	6	95	1598	1574	0	4198811	4000000	4799999
7	381192	1	18	90	1690	0	0	5316594	4800000	5599999
8	880411	3	8	90	1064	1115	1109	5699476	5600000	6399999
9	830454	3	16	70	1952	1967	1325	6583175	6400000	7199999
10	974046	1	18	85	1389	0	0	7418873	7200000	7999999
11	478052	1	6	95	1662	0	0	8394308	8000000	8799999
12	1131987	2	5	50	1927	1574	0	8874022	8800000	9599999
13	1091064	2	14	100	1002	1120	0	10009510	9600000	10399999
14	150484	1	14	50	1058	0	0	11102696	10400000	11199999
15	150484	3	8	50	1276	1409	1376	11254238	11200000	11999999

Total number of pulses in waveform = 29

Type 5 Radar Waveform_6

Waveform Num = 6
Num of Bursts = 9
Burst Interval (us)= 1333333

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	299080	2	9	55	1632	1985	0	299080	0	1333332
2	1116779	1	15	100	1146	0	0	1419476	1333333	2666665
3	2461117	3	11	50	1964	1485	1548	3881739	2666666	3999998
4	1230592	3	20	60	1208	1616	1875	5117328	3999999	5333331
5	1355159	1	9	85	1423	0	0	6477186	5333332	6666664
6	1283680	1	20	50	1881	0	0	7762289	6666665	7999997
7	456460	1	20	100	1932	0	0	8220630	7999998	9333330
8	2388734	1	6	50	1766	0	0	10611296	9333331	10666663
9	1153506	3	10	90	1229	1177	1128	11766568	10666664	11999996

Total number of pulses in waveform = 16

Type 5 Radar Waveform_7

Waveform Num = 7
Num of Bursts = 19
Burst Interval (us)= 631579

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	202050	1	16	55	1069	0	0	202050	0	631578
2	996386	1	13	85	1104	0	0	1199505	631579	1263157
3	547709	2	12	75	1296	1157	0	1748318	1263158	1894736
4	162465	3	19	50	1366	1707	1217	1913236	1894737	2526315
5	762842	3	13	95	1502	1047	1764	2680368	2526316	3157894
6	686343	3	6	80	1902	1457	1769	3371024	3157895	3789473
7	610693	3	18	75	1307	1343	1121	3986845	3789474	4421052
8	763352	2	19	70	1538	1689	0	4753968	4421053	5052631
9	588154	1	12	80	1805	0	0	5345349	5052632	5684210
10	521766	3	5	55	1676	1591	1941	5868920	5684211	6315789
11	513728	3	20	65	1841	1684	1967	6387856	6315790	6947368
12	954272	2	12	85	1675	1539	0	7347620	6947369	7578947
13	243567	2	6	80	1701	1580	0	7594401	7578948	8210526
14	1135325	1	11	100	1765	0	0	8733007	8210527	8842105
15	433696	3	11	70	1891	1728	1750	9168468	8842106	9473684
16	681760	2	8	85	1674	1963	0	9855597	9473685	10105263
17	503363	1	15	95	1681	0	0	10362597	10105264	10736842
18	524259	3	19	100	1546	1003	1319	10888537	10736843	11368421
19	698090	1	10	55	1858	0	0	11590495	11368422	12000000

Total number of pulses in waveform = 40



Type 5 Radar Waveform_8

Waveform Num = 8
Num of Bursts = 20
Burst Interval (us) = 600000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	228888	3	17	85	1357	1690	1590	228888	0	599999
2	948460	3	6	55	1671	1198	1280	1181985	600000	1199999
3	194763	1	17	90	1946	0	0	1380897	1200000	1799999
4	622468	3	10	100	1338	1089	1674	2005311	1800000	2399999
5	776096	1	8	95	1980	0	0	2785508	2400000	2999999
6	402398	2	15	60	1439	1622	0	3189886	3000000	3599999
7	749812	2	15	85	1290	1533	0	3942759	3600000	4199999
8	363602	2	19	100	1929	1870	0	4309184	4200000	4799999
9	733378	3	14	85	1266	1045	1458	5046361	4800000	5399999
10	654886	2	13	65	1306	1029	0	5705016	5400000	5999999
11	652110	1	15	55	1978	0	0	6359461	6000000	6599999
12	455853	3	6	100	1037	1359	1766	6817292	6600000	7199999
13	517961	1	16	70	1483	0	0	7339415	7200000	7799999
14	579444	1	16	75	1415	0	0	7920342	7800000	8399999
15	988271	1	17	100	1750	0	0	8910028	8400000	8999999
16	671137	1	16	70	1263	0	0	9582915	9000000	9599999
17	468548	2	17	60	1288	1327	0	10052726	9600000	10199999
18	714303	2	6	55	1089	1406	0	10769644	10200000	10799999
19	516977	1	8	60	1330	0	0	11289116	10800000	11399999
20	123871	1	9	75	1858	0	0	11414317	11400000	11999999

Total number of pulses in waveform = 36

Type 5 Radar Waveform_9

Waveform Num = 9
Num of Bursts = 15
Burst Interval (us) = 800000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	59706	2	16	60	1476	1169	0	59706	0	799999
2	922729	3	17	55	1710	1620	1646	985080	800000	1599999
3	1100943	3	8	85	1806	1009	1259	2090999	1600000	2399999
4	675442	1	18	55	1782	0	0	2770515	2400000	3199999
5	1143925	3	5	60	1899	1344	1167	3916222	3200000	3999999
6	461375	1	18	65	1001	0	0	4382007	4000000	4799999
7	678938	2	13	90	1768	1805	0	5061946	4800000	5599999
8	1131870	2	13	50	1715	1627	0	6197389	5600000	6399999
9	520069	3	18	55	1662	1335	1848	6720800	6400000	7199999
10	621017	2	15	80	1157	1212	0	7346662	7200000	7999999
11	1223428	1	13	100	1583	0	0	8572459	8000000	8799999
12	679577	3	12	50	1132	1387	1930	9253619	8800000	9599999
13	831341	1	20	70	1636	0	0	10089409	9600000	10399999
14	321950	2	17	100	1850	1755	0	10412995	10400000	11199999
15	1536801	2	16	90	1234	1003	0	11953401	11200000	11999999

Total number of pulses in waveform = 31

Type 5 Radar Waveform_10

Waveform Num = 10
Num of Bursts = 14
Burst Interval (us) = 857143

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	712931	2	7	75	1829	1274	0	712931	0	857142
2	900923	2	7	70	1031	1107	0	1616957	857143	1714285
3	944131	1	8	80	1719	0	0	2563226	1714286	2571428
4	110276	1	10	95	1624	0	0	2675221	2571429	3428571
5	1192459	3	16	90	1136	1872	1357	3869304	3428572	4285714
6	830937	1	8	90	1587	0	0	4704606	4285715	5142857
7	1067935	2	20	65	1553	1308	0	5774128	5142858	6000000
8	383102	1	9	70	1141	0	0	6160091	6000001	6857143
9	1523567	1	15	85	1784	0	0	7684799	6857144	7714286
10	271441	1	12	100	1103	0	0	7958024	7714287	8571429
11	1070399	3	6	60	1292	1309	1020	9029526	8571430	9428572
12	561372	1	19	70	1113	0	0	9594519	9428573	10285715
13	960001	1	12	100	1051	0	0	10555633	10285716	11142858
14	877486	3	20	75	1176	1067	1447	11434170	11142859	12000001

Total number of pulses in waveform = 23



Type 5 Radar Waveform_11

Waveform Num = 11
Num of Bursts = 8
Burst Interval (us)= 1500000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	365641	1	15	100	1666	0	0	365641	0	1499999
2	2025536	2	5	100	1959	1527	0	2392843	1500000	2999999
3	1366817	2	7	55	1713	1806	0	3763146	3000000	4499999
4	1408031	2	5	95	1720	1700	0	5174696	4500000	5999999
5	2153522	2	17	60	1508	1341	0	7331638	6000000	7499999
6	1407554	1	11	65	1133	0	0	8742041	7500000	8999999
7	886400	3	14	100	1738	1211	1655	9629574	9000000	10499999
8	2340081	3	20	55	1067	1742	1567	11974259	10500000	11999999

Total number of pulses in waveform = 16

Type 5 Radar Waveform_12

Waveform Num = 12
Num of Bursts = 15
Burst Interval (us)= 800000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	116151	2	7	80	1999	1500	0	116151	0	799999
2	820986	1	17	90	1811	0	0	940636	800000	1599999
3	674578	1	20	80	1102	0	0	1617025	1600000	2399999
4	1424452	2	18	80	1182	1780	0	3042579	2400000	3199999
5	348574	3	16	65	1618	1016	1842	3394115	3200000	3999999
6	1391027	2	9	80	1459	1866	0	4789618	4000000	4799999
7	656139	1	11	60	1627	0	0	5449082	4800000	5599999
8	448196	3	5	85	1488	1732	1851	5898905	5600000	6399999
9	790165	3	9	90	1332	1926	1405	6694141	6400000	7199999
10	510486	3	16	75	1655	1120	1891	7209290	7200000	7999999
11	1006130	2	16	85	1429	1362	0	8220086	8000000	8799999
12	956670	1	20	85	1933	0	0	9179547	8800000	9599999
13	1138602	3	11	90	1101	1931	1130	10320082	9600000	10399999
14	811889	1	15	80	1766	0	0	11136133	10400000	11199999
15	434032	2	16	80	1296	1208	0	11571931	11200000	11999999

Total number of pulses in waveform = 30

Type 5 Radar Waveform_13

Waveform Num = 13
Num of Bursts = 20
Burst Interval (us)= 600000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	89576	2	16	75	1302	1136	0	89576	0	599999
2	943142	3	12	70	1021	1917	1880	1035156	600000	1199999
3	696757	3	12	55	1809	1553	1031	1736731	1200000	1799999
4	438337	1	7	60	1383	0	0	2179461	1800000	2399999
5	492230	3	9	85	1827	1456	1210	2673074	2400000	2999999
6	770821	3	6	55	1329	1824	1785	3448388	3000000	3599999
7	314683	3	18	70	1431	1643	1521	3768009	3600000	4199999
8	735985	3	9	90	1284	1216	1215	4508589	4200000	4799999
9	844688	2	10	70	1219	1538	0	5356992	4800000	5399999
10	160426	1	5	85	1950	0	0	5520175	5400000	5999999
11	632007	3	7	50	1439	1512	1669	6154132	6000000	6599999
12	510527	3	8	100	1623	1622	1913	6669279	6600000	7199999
13	602566	2	20	70	1025	1618	0	7277003	7200000	7799999
14	799036	2	5	50	1034	1527	0	8078682	7800000	8399999
15	742998	2	18	95	1444	1184	0	8824241	8400000	8999999
16	223292	2	13	50	1664	1106	0	9050161	9000000	9599999
17	1054136	2	5	50	1424	1150	0	10107067	9600000	10199999
18	622219	3	15	50	1700	1264	1560	10731860	10200000	10799999
19	217104	3	15	80	1457	1655	1965	10953488	10800000	11399999
20	902179	3	18	50	1098	1069	1518	11860744	11400000	11999999

Total number of pulses in waveform = 49



Type 5 Radar Waveform_14

Waveform Num = 14
Num of Bursts = 8
Burst Interval (us)= 1500000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	1049646	1	12	55	1257	0	0	1049646	0	1499999
2	714934	3	19	60	1461	1802	1300	1765837	1500000	2999999
3	2298723	2	13	90	1131	1195	0	4069123	3000000	4499999
4	1081950	3	20	80	1932	1951	1856	5153399	4500000	5999999
5	2190646	1	18	95	1539	0	0	7349784	6000000	7499999
6	588835	1	18	65	1368	0	0	7940158	7500000	8999999
7	2042942	2	13	80	1712	1345	0	9984468	9000000	10499999
8	966226	2	8	55	1456	1850	0	10953751	10500000	11999999

Total number of pulses in waveform = 15

Type 5 Radar Waveform_15

Waveform Num = 15
Num of Bursts = 18
Burst Interval (us)= 666667

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	243750	1	16	100	1860	0	0	243750	0	666666
2	525595	2	11	50	1255	1801	0	771205	666667	1333333
3	936119	1	16	55	1046	0	0	1710380	1333334	2000000
4	873592	3	6	100	1327	1448	1681	2585018	2000001	2666667
5	95796	2	6	65	1550	1400	0	2685270	2666668	3333334
6	702756	1	20	60	1426	0	0	3390976	3333335	4000001
7	661574	2	13	55	1643	1679	0	4053976	4000002	4666668
8	957302	2	15	75	1033	1332	0	5014600	4666669	5333335
9	882835	2	13	60	1094	1164	0	5899800	5333336	6000002
10	647797	1	20	85	1962	0	0	6549855	6000003	6666669
11	212724	3	6	100	1519	1916	1342	6764541	6666670	7333336
12	695937	3	16	65	1981	1822	1569	7465255	7333337	8000003
13	1014152	2	14	70	1506	1516	0	8484779	8000004	8666670
14	718069	3	7	60	1461	1880	1326	9205870	8666671	9333337
15	557561	1	15	75	1791	0	0	9768098	9333338	10000004
16	504082	2	8	60	1363	1972	0	10273971	10000005	10666671
17	732414	1	14	85	1699	0	0	11009720	10666672	11333338
18	368100	2	16	70	1435	1096	0	11379519	11333339	12000005

Total number of pulses in waveform = 34

Type 5 Radar Waveform_16

Waveform Num = 16
Num of Bursts = 15
Burst Interval (us)= 800000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	549213	1	13	80	1052	0	0	549213	0	799999
2	703607	1	15	70	1055	0	0	1253872	800000	1599999
3	421933	2	11	90	1912	1326	0	1676860	1600000	2399999
4	1413312	3	11	55	1847	1106	1372	3093410	2400000	3199999
5	872752	1	17	75	1081	0	0	3970487	3200000	3999999
6	808891	2	19	70	1919	1189	0	4780459	4000000	4799999
7	746952	1	9	85	1951	0	0	5530519	4800000	5599999
8	510231	3	8	65	1814	1636	1809	6042701	5600000	6399999
9	1038907	3	14	65	1595	1715	1858	7086867	6400000	7199999
10	188143	3	19	85	1430	1399	1051	7280178	7200000	7999999
11	1222513	3	20	90	1779	1742	1917	8506571	8000000	8799999
12	993498	2	7	100	1280	1881	0	9505507	8800000	9599999
13	739172	2	12	65	1837	1537	0	10247840	9600000	10399999
14	478774	2	14	95	1322	1021	0	10729988	10400000	11199999
15	759383	3	14	75	1231	1029	1063	11491714	11200000	11999999

Total number of pulses in waveform = 32

**Type 5 Radar Waveform_17**

Waveform Num = 17
Num of Bursts = 8
Burst Interval (us)= 1500000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	1495	3	11	95	1642	1953	1321	1495	0	1499999
2	2931398	2	10	100	1572	1463	0	2937809	1500000	2999999
3	337993	2	5	65	1031	1465	0	3278837	3000000	4499999
4	1846623	3	10	90	1013	1682	1418	5127956	4500000	5999999
5	1961135	2	6	55	1612	1785	0	7093204	6000000	7499999
6	428459	3	18	95	1219	1318	1937	7525060	7500000	8999999
7	2754131	3	5	90	1919	1120	1897	10283665	9000000	10499999
8	1393066	3	12	50	1602	1855	1651	11681667	10500000	11999999

Total number of pulses in waveform = 21

Type 5 Radar Waveform_18

Waveform Num = 18
Num of Bursts = 9
Burst Interval (us)= 1333333

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	853546	1	10	75	1276	0	0	853546	0	1333332
2	1126325	2	19	70	1922	1392	0	1981147	1333333	2666665
3	792499	1	7	60	1831	0	0	2776960	2666666	3999998
4	1330519	2	12	95	1466	1236	0	4109310	3999999	5333331
5	1702076	1	5	80	1205	0	0	5814088	5333332	6666664
6	1778024	2	15	60	1176	1870	0	7593317	6666665	7999997
7	1450462	2	17	80	1339	1340	0	9046825	7999998	9333330
8	1382693	2	16	100	1349	1214	0	10432197	9333331	10666663
9	1197960	1	6	80	1429	0	0	11632720	10666664	11999996

Total number of pulses in waveform = 14

Type 5 Radar Waveform_19

Waveform Num = 19
Num of Bursts = 16
Burst Interval (us)= 750000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	616850	1	20	100	1492	0	0	616850	0	749999
2	197822	2	17	100	1073	1240	0	816164	750000	1499999
3	913119	3	19	95	1205	1996	1247	1731596	1500000	2249999
4	979278	2	12	60	1759	1447	0	2715322	2250000	2999999
5	548036	3	17	55	1301	1581	1310	3266564	3000000	3749999
6	1031917	3	15	70	1974	1077	1094	4302673	3750000	4499999
7	447087	2	14	60	1654	1360	0	4753905	4500000	5249999
8	1216221	2	8	65	1704	1742	0	5973140	5250000	5999999
9	263347	1	19	95	1252	0	0	6239933	6000000	6749999
10	742077	3	5	80	1477	1443	1867	6983262	6750000	7499999
11	755723	3	8	95	1759	1716	1759	7743772	7500000	8249999
12	884228	1	16	50	1286	0	0	8633234	8250000	8999999
13	905408	2	13	95	1681	1464	0	9539928	9000000	9749999
14	813335	2	19	55	1590	1314	0	10356408	9750000	10499999
15	775505	1	10	60	1735	0	0	11134817	10500000	11249999
16	729498	3	7	80	1541	1898	1808	11866050	11250000	11999999

Total number of pulses in waveform = 34



Type 5 Radar Waveform_20

Waveform Num = 20
Num of Bursts = 12
Burst Interval (us)= 1000000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	197533	2	17	50	1455	1713	0	197533	0	999999
2	1393147	2	12	80	1025	1270	0	1593848	1000000	1999999
3	701678	2	20	70	1520	1723	0	2297821	2000000	2999999
4	762845	3	5	80	1628	1997	1558	3063909	3000000	3999999
5	1172110	2	12	50	1207	1108	0	4241202	4000000	4999999
6	1640261	1	6	70	1926	0	0	5883778	5000000	5999999
7	1053294	2	15	90	1405	1038	0	6938998	6000000	6999999
8	343680	2	19	75	1623	1300	0	7285121	7000000	7999999
9	1336913	2	20	100	1491	1921	0	8624957	8000000	8999999
10	1150786	1	10	80	1171	0	0	9779155	9000000	9999999
11	695997	1	9	70	1989	0	0	10476323	10000000	10999999
12	1268977	1	9	55	1569	0	0	11747289	11000000	11999999

Total number of pulses in waveform = 21

Type 5 Radar Waveform_21

Waveform Num = 21
Num of Bursts = 13
Burst Interval (us)= 923077

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	412330	3	16	80	1617	1562	1521	412330	0	923076
2	608528	3	14	100	1860	1658	1319	1025558	923077	1846153
3	1230728	2	5	95	1029	1684	0	2261123	1846154	2769230
4	775325	2	13	90	1864	1605	0	3039161	2769231	3692307
5	1213112	3	15	55	1475	1189	1156	4255742	3692308	4615384
6	462508	1	8	80	1210	0	0	4722070	4615385	5538461
7	1695526	1	17	85	1424	0	0	6418806	5538462	6461538
8	287160	3	17	65	1050	1068	1384	6707390	6461539	7384615
9	1554496	1	13	80	1447	0	0	8265388	7384616	8307692
10	274414	1	9	60	1977	0	0	8541249	8307693	9230769
11	1041517	3	12	50	1258	1639	1041	9584743	9230770	10153846
12	1114399	1	8	95	1475	0	0	10703080	10153847	11076923
13	502655	3	19	60	1522	1574	1805	11207210	11076924	12000000

Total number of pulses in waveform = 27

Type 5 Radar Waveform_22

Waveform Num = 22
Num of Bursts = 18
Burst Interval (us)= 666667

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	175936	1	13	95	1892	0	0	175936	0	666666
2	808748	3	9	100	1701	1244	1106	986576	666667	1333333
3	794170	1	15	85	1427	0	0	1784797	1333334	2000000
4	395983	1	15	80	1300	0	0	2182207	2000001	2666667
5	622194	1	18	100	1184	0	0	2805701	2666668	3333334
6	616685	2	16	55	1995	1194	0	3423570	3333335	4000001
7	1002112	2	11	90	1193	1207	0	4428871	4000002	4666668
8	778461	1	20	95	1003	0	0	5209732	4666669	5333335
9	723774	1	7	80	1629	0	0	5934509	5333336	6000002
10	713048	1	14	65	1496	0	0	6649186	6000003	6666669
11	22520	1	11	70	1345	0	0	6673202	6666670	7333336
12	981052	1	20	80	1625	0	0	7655599	7333337	8000003
13	667546	3	13	95	1134	1008	1177	8324770	8000004	8666670
14	581243	2	6	55	1998	1111	0	8909332	8666671	9333337
15	868977	3	10	90	1575	1856	1073	9781418	9333338	10000004
16	866322	3	15	85	1299	1190	1865	10652244	10000005	10666671
17	477452	2	10	50	1355	1725	0	11134050	10666672	11333338
18	509938	2	11	75	1117	1517	0	11647068	11333339	12000005

Total number of pulses in waveform = 31



Type 5 Radar Waveform_23

Waveform Num = 23
Num of Bursts = 20
Burst Interval (us)= 600000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	532932	3	20	85	1534	1212	1992	532932	0	599999
2	425654	2	12	50	1580	1884	0	963324	600000	1199999
3	318624	3	20	80	1035	1475	1338	1285412	1200000	1799999
4	776712	3	11	90	1546	1922	1877	2065972	1800000	2399999
5	417551	2	19	90	1264	1475	0	2488868	2400000	2999999
6	993667	2	9	100	1532	1525	0	3485274	3000000	3599999
7	134830	1	5	70	1605	0	0	3623161	3600000	4199999
8	759680	2	12	65	1198	1620	0	4384446	4200000	4799999
9	843148	1	8	80	1465	0	0	5230412	4800000	5399999
10	693033	1	9	100	1728	0	0	5924910	5400000	5999999
11	129495	1	17	90	1526	0	0	6056133	6000000	6599999
12	736207	2	13	85	1085	1610	0	6793866	6600000	7199999
13	465393	1	12	70	1743	0	0	7261954	7200000	7799999
14	920322	3	15	90	1491	1465	1613	8184019	7800000	8399999
15	774143	1	12	80	1743	0	0	8962731	8400000	8999999
16	300712	2	13	95	1190	1569	0	9265186	9000000	9599999
17	638895	2	11	95	1138	1780	0	9906840	9600000	10199999
18	667199	2	9	65	1164	1869	0	10576957	10200000	10799999
19	654303	2	18	70	1586	1365	0	11234293	10800000	11399999
20	591303	3	19	75	1386	1130	1811	11828547	11400000	11999999

Total number of pulses in waveform = 39

Type 5 Radar Waveform_24

Waveform Num = 24
Num of Bursts = 9
Burst Interval (us)= 1333333

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	889124	1	5	60	1106	0	0	889124	0	1333332
2	1488557	1	5	85	1248	0	0	2378787	1333333	2666665
3	683770	3	18	65	1746	1145	1733	3063805	2666666	3999998
4	1164156	2	6	100	1668	1700	0	4232585	3999999	5333331
5	1382661	2	6	80	1192	1635	0	5618614	5333332	6666664
6	1949866	3	17	65	1797	1959	1210	7571307	6666665	7999997
7	973017	1	11	70	1543	0	0	8549290	7999998	9333330
8	940812	1	11	90	1262	0	0	9491645	9333331	10666663
9	1477362	3	11	70	1197	1620	1074	10970269	10666664	11999996

Total number of pulses in waveform = 17

Type 5 Radar Waveform_25

Waveform Num = 25
Num of Bursts = 19
Burst Interval (us)= 631579

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	350719	3	13	85	1813	1735	1847	350719	0	631578
2	533974	1	6	75	1943	0	0	890088	631579	1263157
3	375612	3	9	100	1458	1488	1268	1267643	1263158	1894736
4	739166	2	7	60	1235	1346	0	2011023	1894737	2526315
5	582587	2	9	75	1232	1092	0	2596191	2526316	3157894
6	1053143	1	16	70	1435	0	0	3651658	3157895	3789473
7	316084	2	12	100	1419	1293	0	3969177	3789474	4421052
8	616704	1	20	80	1012	0	0	4588593	4421053	5052631
9	1022889	3	13	55	1435	1430	1633	5612494	5052632	5684210
10	179641	1	20	90	1369	0	0	5796633	5684211	6315789
11	1142736	1	16	55	1037	0	0	6940738	6315790	6947368
12	225297	2	18	85	1398	1605	0	7167072	6947369	7578947
13	959742	3	17	65	1915	1130	1430	8129817	7578948	8210526
14	647634	3	9	80	1588	1269	1101	8781926	8210527	8842105
15	94734	3	18	75	1878	1780	1237	8880618	8842106	9473684
16	817377	3	12	100	1136	1517	1549	9702890	9473685	10105263
17	593662	3	12	85	1574	1745	1560	10300754	10105264	10736842
18	815352	3	9	85	1169	1049	1940	11120985	10736843	11368421
19	865498	3	9	70	1706	1186	1098	11990641	11368422	12000000

Total number of pulses in waveform = 43



Type 5 Radar Waveform_26

Waveform Num = 26
Num of Bursts = 14
Burst Interval (us) = 857143

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	811981	1	6	90	1908	0	0	811981	0	857142
2	864242	1	20	100	1287	0	0	1678131	857143	1714285
3	502393	3	9	65	1032	1354	1774	2181811	1714286	2571428
4	1154869	2	7	60	1431	1162	0	3340840	2571429	3428571
5	211409	3	17	55	1054	1164	1657	3554842	3428572	4285714
6	1364539	2	7	75	1719	1872	0	4923256	4285715	5142857
7	590147	1	12	100	1254	0	0	5516994	5142858	6000000
8	589809	2	14	80	1229	1177	0	6108057	6000001	6857143
9	828221	3	8	55	1167	1474	1285	6938684	6857144	7714286
10	946100	2	7	75	1893	1784	0	7888710	7714287	8571429
11	1209827	3	14	95	1430	1066	1547	9102214	8571430	9428572
12	369201	3	10	50	1391	1626	1605	9475458	9428573	10285715
13	1140230	1	6	80	1240	0	0	10620310	10285716	11142858
14	1230556	3	17	55	1037	1279	1621	11852106	11142859	12000001

Total number of pulses in waveform = 30

Type 5 Radar Waveform_27

Waveform Num = 27
Num of Bursts = 12
Burst Interval (us) = 1000000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	262570	1	7	90	1335	0	0	262570	0	999999
2	1148540	2	20	75	1149	1677	0	1412445	1000000	1999999
3	808178	3	7	70	1177	1665	1112	2223449	2000000	2999999
4	1521602	3	8	95	1697	1499	1991	3749005	3000000	3999999
5	1136087	3	10	90	1496	1770	1989	4890279	4000000	4999999
6	772661	2	9	95	1391	1823	0	5668195	5000000	5999999
7	664420	1	11	80	1399	0	0	6335829	6000000	6999999
8	1452709	3	5	70	1391	1665	1184	7789937	7000000	7999999
9	576072	3	12	50	1540	1649	1496	8370249	8000000	8999999
10	1457959	3	10	55	1305	1593	1764	9832893	9000000	9999999
11	201952	3	14	90	1373	1856	1639	10039507	10000000	10999999
12	1474838	1	8	85	1792	0	0	11519213	11000000	11999999

Total number of pulses in waveform = 28

Type 5 Radar Waveform_28

Waveform Num = 28
Num of Bursts = 19
Burst Interval (us) = 631579

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	438648	3	13	95	1328	1848	1280	438648	0	631578
2	285650	1	12	85	1035	0	0	728754	631579	1263157
3	572855	1	14	80	1383	0	0	1302644	1263158	1894736
4	1172526	1	17	50	1064	0	0	2476553	1894737	2526315
5	334402	3	9	65	1948	1707	1428	2812019	2526316	3157894
6	556837	1	5	60	1892	0	0	3373939	3157895	3789473
7	1003572	3	14	70	1775	1764	1385	4379403	3789474	4421052
8	549247	2	6	85	1748	1493	0	4933574	4421053	5052631
9	400239	1	15	60	1506	0	0	5337054	5052632	5684210
10	445542	2	13	60	1701	1683	0	5784102	5684211	6315789
11	547934	1	18	95	1722	0	0	6335420	6315790	6947368
12	686955	3	17	80	1370	1299	1750	7024097	6947369	7578947
13	753133	2	16	55	1328	1152	0	7781649	7578948	8210526
14	1047318	1	12	100	1327	0	0	8831447	8210527	8842105
15	482653	1	15	50	1055	0	0	9315427	8842106	9473684
16	518703	1	7	55	1462	0	0	9835185	9473685	10105263
17	420963	2	15	80	1166	1148	0	10257610	10105264	10736842
18	1015340	1	19	90	1056	0	0	11275264	10736843	11368421
19	378939	2	5	85	1313	1153	0	11655259	11368422	12000000

Total number of pulses in waveform = 32

**Type 5 Radar Waveform_29**

Waveform Num = 29
Num of Bursts = 15
Burst Interval (us)= 800000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	440719	3	10	60	1320	1151	1963	440719	0	799999
2	1120986	3	20	60	1148	1484	1322	1566139	800000	1599999
3	412488	2	14	75	1161	1283	0	1982581	1600000	2399999
4	584958	2	14	65	1496	1387	0	2569983	2400000	3199999
5	1138158	1	7	50	1496	0	0	3711024	3200000	3999999
6	579018	1	14	60	1707	0	0	4291538	4000000	4799999
7	873156	2	11	85	1164	1178	0	5166401	4800000	5599999
8	695653	2	12	65	1715	1769	0	5864396	5600000	6399999
9	1152962	3	6	95	1934	1896	1975	7020842	6400000	7199999
10	913341	2	17	80	1343	1592	0	7939988	7200000	7999999
11	281873	2	16	50	1459	1505	0	8224796	8000000	8799999
12	1258468	2	7	60	1031	1028	0	9486228	8800000	9599999
13	457357	2	15	90	1809	1413	0	9945644	9600000	10399999
14	609846	1	14	80	1879	0	0	10558712	10400000	11199999
15	687130	3	7	55	1014	1384	1571	11247721	11200000	11999999

Total number of pulses in waveform = 31

Type 5 Radar Waveform_30

Waveform Num = 30
Num of Bursts = 10
Burst Interval (us)= 1200000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	51268	1	9	100	1388	0	0	51268	0	1199999
2	1328062	3	13	85	1252	1104	1799	1380718	1200000	2399999
3	1121067	1	10	50	1019	0	0	2505940	2400000	3599999
4	1600958	2	7	85	1381	1765	0	4107917	3600000	4799999
5	1346868	1	5	90	1933	0	0	5457931	4800000	5999999
6	1159293	2	9	85	1765	1976	0	6619157	6000000	7199999
7	678329	1	19	90	1875	0	0	7301227	7200000	8399999
8	1329135	1	17	90	1921	0	0	8632237	8400000	9599999
9	1585241	3	5	95	1738	1741	1167	10219399	9600000	10799999
10	1004890	3	14	55	1353	1294	1124	11228935	10800000	11999999

Total number of pulses in waveform = 18

Type 6 Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5500	1	16	5500	1
2	5500	1	17	5500	1
3	5500	1	18	5500	0
4	5500	1	19	5500	1
5	5500	1	20	5500	1
6	5500	1	21	5500	1
7	5500	1	22	5500	1
8	5500	1	23	5500	1
9	5500	1	24	5500	1
10	5500	1	25	5500	1
11	5500	0	26	5500	1
12	5500	1	27	5500	1
13	5500	1	28	5500	1
14	5500	1	29	5500	1
15	5500	1	30	5500	1
Detection Percentage (%)					93.3%

Radar waveform #1			Radar waveform #2		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
0	5472	0	16	5470	48
10	5502	30	22	5479	66
15	5489	45	24	5497	72
21	5501	63	25	5510	75
25	5497	75	32	5496	96
65	5505	195	37	5525	111
73	5485	219	56	5507	168
75	5493	225	74	5516	222
94	5530	282	75	5502	225
--	--	--	77	5511	231
--	--	--	91	5530	273

Radar waveform #3			Radar waveform #4		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
2	5526	6	4	5521	12
13	5479	39	8	5486	24
36	5470	108	9	5519	27
40	5471	120	15	5513	45
47	5512	141	21	5492	63
55	5523	165	27	5512	81
58	5524	174	34	5509	102
65	5529	195	35	5500	105
66	5501	198	39	5482	117
70	5494	210	69	5470	207
72	5500	216	73	5491	219
79	5520	237	76	5516	228
87	5487	261	89	5490	267
--	--	--	99	5493	297

Radar waveform #5			Radar waveform #6		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
5	5499	15	6	5497	18
16	5476	48	13	5513	39
19	5478	57	14	5503	42
20	5509	60	42	5517	126
21	5516	63	45	5522	135
23	5527	69	48	5478	144
26	5480	78	55	5481	165
46	5520	138	87	5494	261
68	5511	204	88	5470	264
75	5477	225	89	5484	267
78	5505	234	99	5515	297
88	5470	264	--	--	--
92	5489	276	--	--	--

Radar waveform #7			Radar waveform #8		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
4	5495	12	3	5470	9
5	5491	15	7	5529	21
15	5505	45	10	5525	30
43	5475	129	15	5494	45
50	5492	150	23	5474	69
55	5515	165	37	5476	111
56	5527	168	51	5489	153
58	5481	174	54	5509	162
64	5488	192	63	5505	189
66	5499	198	68	5484	204
72	5516	216	83	5499	249
79	5511	237	96	5478	288
85	5528	255	97	5512	291
92	5471	276	98	5521	294

Radar waveform #9			Radar waveform #10		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
3	5481	9	0	5505	0
30	5472	90	1	5472	3
37	5518	111	3	5506	9
50	5511	150	7	5511	21
57	5528	171	23	5521	69
58	5493	174	26	5475	78
65	5495	195	28	5501	84
67	5494	201	33	5487	99
68	5510	204	34	5499	102
78	5488	234	36	5508	108
80	5484	240	41	5483	123
82	5499	246	55	5485	165
97	5527	291	56	5525	168
99	5501	297	57	5478	171
--	--	--	74	5529	222
--	--	--	76	5527	228
--	--	--	79	5492	237
--	--	--	83	5471	249
--	--	--	95	5476	285

Radar waveform #11			Radar waveform #12		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
4	5415	12	2	5509	6
12	5470	36	6	5478	18
18	5488	54	11	5477	33
23	5506	69	13	5530	39
29	5473	87	15	5503	45
43	5519	129	51	5471	153
44	5474	132	62	5515	186
50	5512	150	64	5494	192
52	5514	156	66	5473	198
54	5509	162	69	5493	207
56	5482	168	70	5525	210
62	5511	186	71	5484	213
67	5501	201	76	5514	228
68	5494	204	81	5479	243
81	5484	243	--	--	--
94	5522	282	--	--	--

Radar waveform #13			Radar waveform #14		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
0	5527	0	14	5474	42
8	5510	24	21	5493	63
17	5486	51	22	5485	66
28	5484	84	26	5513	78
29	5520	87	31	5488	93
35	5471	105	33	5501	99
37	5514	111	36	5507	108
40	5475	120	49	5525	147
46	5525	138	52	5496	156
55	5530	165	54	5520	162
58	5515	174	66	5514	198
61	5483	183	74	5489	222
74	5470	222	76	5483	228
--	--	--	80	5476	240
--	--	--	90	5503	270
--	--	--	96	5477	288
--	--	--	97	5470	291

Radar waveform #15			Radar waveform #16		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
0	5530	0	3	5512	9
4	5493	12	18	5473	54
10	5516	30	20	5484	60
17	5488	51	39	5477	117
23	5508	69	41	5508	123
45	5496	135	53	5490	159
54	5474	162	61	5498	183
55	5480	165	71	5486	213
61	5526	183	79	5485	237
75	5525	225	81	5515	243
86	5487	258	90	5505	270
91	5528	273	99	5483	297
94	5501	282	--	--	--

Radar waveform #17			Radar waveform #18		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
4	5502	12	3	5482	9
6	5504	18	4	5519	12
20	5526	60	8	5530	24
27	5519	81	10	5497	30
31	5497	93	16	5514	48
33	5473	99	20	5483	60
35	5517	105	28	5516	84
49	5481	147	29	5505	87
54	5522	162	30	5480	90
73	5491	219	42	5498	126
74	5507	222	46	5500	138
84	5523	252	47	5509	141
--	--	--	51	5504	153
--	--	--	56	5502	168
--	--	--	60	5491	180
--	--	--	63	5495	189

Radar waveform #19			Radar waveform #20		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
2	5504	6	4	5491	12
3	5509	9	15	5493	45
47	5493	141	22	5474	66
52	5497	156	24	5476	72
63	5485	189	25	5496	75
71	5515	213	34	5471	102
80	5497	240	38	5483	114
84	5470	252	44	5508	132
87	5530	261	51	5485	153
--	--	--	83	5479	249
--	--	--	94	5470	282
--	--	--	99	5490	297

Radar waveform #21			Radar waveform #22		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
12	5483	36	0	5487	0
16	5520	48	3	5528	9
24	5471	72	8	5527	24
52	5496	156	17	5494	51
90	5477	270	18	5478	54
99	5519	297	23	5482	69
--	--	--	43	5475	129
--	--	--	49	5521	147
--	--	--	61	5483	183
--	--	--	63	5495	189
--	--	--	66	5496	198
--	--	--	80	5498	240

Radar waveform #23			Radar waveform #24		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
2	5528	6	0	5504	0
5	5504	15	27	5515	81
9	5498	27	32	5484	96
24	5505	72	36	5511	108
29	5508	87	46	5487	138
52	5479	156	52	5502	156
56	5501	168	85	5529	255
59	5474	177	88	5475	264
62	5488	186	--	--	--
65	5520	195	--	--	--
69	5524	207	--	--	--
70	5482	210	--	--	--
78	5477	234	--	--	--
80	5478	240	--	--	--
96	5470	288	--	--	--

Radar waveform #25			Radar waveform #26		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
1	5521	3	9	5497	27
22	5516	66	12	5502	36
24	5505	72	13	5482	39
29	5496	87	47	5477	141
45	5508	135	48	5519	144
49	5517	147	68	5524	204
55	5504	165	69	5479	207
60	5484	180	85	5506	255
76	5486	228	88	5521	264
70	5470	210	--	--	--
88	5494	264	--	--	--
93	5472	279	--	--	--
96	5509	288	--	--	--

Radar waveform #27			Radar waveform #28		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
17	5481	51	3	5512	9
20	5511	60	5	5498	15
32	5494	96	15	5517	45
36	5509	108	28	5514	84
40	5473	120	37	5482	111
45	5476	135	38	5526	114
59	5521	177	39	5528	117
62	5505	186	40	5530	120
67	5527	201	42	5492	126
77	5514	231	50	5479	150
79	5496	237	76	5480	228
83	5478	249	82	5525	246
84	5530	252	85	5521	255
86	5507	258	--	--	--
92	5498	276	--	--	--
94	5510	282	--	--	--
96	5512	288	--	--	--

Radar waveform #29			Radar waveform #30		
Hopping Number	Frequency (MHz)	Pulse Start (ms)	Hopping Number	Frequency (MHz)	Pulse Start (ms)
34	5502	102	3	5485	9
40	5479	120	9	5496	27
43	5482	129	17	5514	51
44	5510	132	18	5493	54
62	5512	186	45	5521	135
67	5511	201	57	5516	171
73	5471	219	74	5505	222
91	5477	273	84	5520	252
94	5509	282	93	5512	279
95	5492	285	--	--	--

For 40MHz Bandwidth

Type 1 Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5510	1	1428	18	1
2	5510	1	1428	18	1
3	5510	1	1428	18	1
4	5510	1	1428	18	1
5	5510	1	1428	18	1
6	5510	1	1428	18	1
7	5510	1	1428	18	1
8	5510	1	1428	18	1
9	5510	1	1428	18	1
10	5510	1	1428	18	1
11	5510	1	1428	18	1
12	5510	1	1428	18	1
13	5510	1	1428	18	1
14	5510	1	1428	18	1
15	5510	1	1428	18	1
16	5510	1	1428	18	1
17	5510	1	1428	18	1
18	5510	1	1428	18	1
19	5510	1	1428	18	1
20	5510	1	1428	18	1
21	5510	1	1428	18	1
22	5510	1	1428	18	1
23	5510	1	1428	18	1
24	5510	1	1428	18	1
25	5510	1	1428	18	1
26	5510	1	1428	18	1
27	5510	1	1428	18	1
28	5510	1	1428	18	1
29	5510	1	1428	18	1
30	5510	1	1428	18	1
Detection Percentage (%)					100%

Type 2 Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5510	4.6	175	24	1
2	5510	3.2	181	29	1
3	5510	2.5	187	25	0
4	5510	1.5	164	28	1
5	5510	4.1	150	29	1
6	5510	3.5	222	29	1
7	5510	4.0	173	28	1
8	5510	1.6	217	26	1
9	5510	3.3	173	28	1
10	5510	2.7	162	29	1
11	5510	2.7	202	24	1
12	5510	4.7	200	27	1
13	5510	1.9	196	29	1
14	5510	2.4	190	24	0
15	5510	4.9	151	26	1
16	5510	1.4	188	24	1
17	5510	2.8	186	25	1
18	5510	3.2	189	28	1
19	5510	3.0	196	23	1
20	5510	4.9	181	29	1
21	5510	2.5	170	23	0
22	5510	1.6	212	24	1
23	5510	2.9	172	27	1
24	5510	1.3	152	29	1
25	5510	3.0	192	23	1
26	5510	3.0	171	29	1
27	5510	3.0	190	29	1
28	5510	1.9	171	27	1
29	5510	2.9	208	28	1
30	5510	3.7	190	27	1
Detection Percentage (%)					90%

Type 3 Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5510	6.1	446	16	1
2	5510	9.8	436	16	1
3	5510	6.2	250	17	1
4	5510	9.9	446	16	1
5	5510	8.4	442	16	1
6	5510	8.0	347	16	1
7	5510	6.4	413	16	1
8	5510	8.9	406	18	1
9	5510	7.8	410	18	1
10	5510	7.0	402	18	1
11	5510	6.7	329	16	1
12	5510	7.3	282	16	1
13	5510	8.7	344	16	1
14	5510	6.0	328	17	1
15	5510	7.6	372	16	1
16	5510	9.2	258	18	1
17	5510	7.6	320	18	1
18	5510	9.0	466	17	1
19	5510	7.7	295	17	1
20	5510	9.4	380	17	1
21	5510	9.2	441	16	1
22	5510	6.4	464	18	1
23	5510	6.4	475	17	1
24	5510	9.6	439	18	1
25	5510	9.5	429	17	1
26	5510	7.9	330	17	1
27	5510	9.9	442	18	1
28	5510	9.5	422	17	1
29	5510	9.2	289	16	1
30	5510	7.8	396	18	1
Detection Percentage (%)					100%

Type 4 Radar Statistical Performance

Trail #	Test Freq. (MHz)	Pulse Width (us)	PRI (us)	Pulses / Burst	1=Detection 0=No Detection
1	5510	19.4	405	13	1
2	5510	16.4	335	15	1
3	5510	18.6	363	16	1
4	5510	14.7	395	13	1
5	5510	18.4	270	12	1
6	5510	15.2	340	14	1
7	5510	15.5	309	12	1
8	5510	17.2	479	14	1
9	5510	16.5	481	16	1
10	5510	11.2	420	13	1
11	5510	16.7	495	12	1
12	5510	18.8	275	15	1
13	5510	13.4	493	13	1
14	5510	15.2	269	15	1
15	5510	16.6	364	12	1
16	5510	12.1	468	14	1
17	5510	19.3	456	12	1
18	5510	15.8	364	14	1
19	5510	16.8	408	15	1
20	5510	12.9	427	13	1
21	5510	13.3	312	13	1
22	5510	18.3	444	16	1
23	5510	12.3	392	14	1
24	5510	16.7	303	16	1
25	5510	17.4	279	15	1
26	5510	18.5	352	15	1
27	5510	20.0	440	12	1
28	5510	20.0	310	15	1
29	5510	16.4	492	13	1
30	5510	19.3	291	12	1
Detection Percentage (%)					100%

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

waveforms is as follows: $\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4} = (100\% + 90\% + 100\% + 100\%) / 4 = 97.5\% (>80\%)$



Type 5 Radar Statistical Performance

Trail #	Test Freq. (MHz)	1=Detection 0=No Detection	Trail #	Test Freq. (MHz)	1=Detection 0=No Detection
1	5510	1	16	5510	1
2	5510	1	17	5510	1
3	5510	1	18	5510	1
4	5510	1	19	5510	1
5	5510	1	20	5510	1
6	5510	1	21	5510	1
7	5510	0	22	5510	1
8	5510	1	23	5510	1
9	5510	1	24	5510	1
10	5510	1	25	5510	1
11	5510	1	26	5510	1
12	5510	1	27	5510	1
13	5510	1	28	5510	1
14	5510	1	29	5510	1
15	5510	1	30	5510	1
Detection Percentage (%)					96.7%

Type 5 Radar Waveform_1

Waveform Num = 1
Num of Bursts = 17
Burst Interval (us) = 705882

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	160738	1	14	60	1300	0	0	160738	0	705881
2	681776	2	6	55	1388	1573	0	843814	705882	1411763
3	749403	1	6	75	1538	0	0	1596178	1411764	2117645
4	725953	1	13	85	1417	0	0	2323669	2117646	2823527
5	971328	1	7	90	1070	0	0	3296414	2823528	3529409
6	860684	2	16	85	1535	1018	0	4158168	3529410	4235291
7	407926	3	14	75	1985	1318	1924	4568647	4235292	4941173
8	691457	1	18	80	1180	0	0	5265331	4941174	5647055
9	1027122	3	18	80	1706	1623	1350	6293633	5647056	6352937
10	500100	2	7	60	1843	1965	0	6798412	6352938	7058819
11	437813	2	15	70	1661	1362	0	7240033	7058820	7764701
12	688322	1	6	90	1376	0	0	7931378	7764702	8470583
13	898385	3	18	65	1155	1617	1844	8831139	8470584	9176465
14	903095	3	9	75	1054	1386	1695	9738850	9176466	9882347
15	779974	2	11	50	1577	1035	0	10522959	9882348	10588229
16	232178	1	11	80	1346	0	0	10757749	10588230	11294111
17	861520	2	11	85	1968	1910	0	11620615	11294112	11999993
Total number of pulses in waveform = 31										



Type 5 Radar Waveform_2

Waveform Num = 2
Num of Bursts = 14
Burst Interval (us) = 857143

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	142103	3	5	55	1026	1380	1424	142103	0	857142
2	761957	3	8	50	1093	1875	1419	907890	857143	1714285
3	857556	2	13	55	1335	1873	0	1769833	1714286	2571428
4	1022008	3	17	70	1621	1574	1158	2795049	2571429	3428571
5	917074	3	8	85	1560	1813	1841	3716476	3428572	4285714
6	1385457	1	13	55	1389	0	0	5107147	4285715	5142857
7	378494	1	17	90	1739	0	0	5487030	5142858	6000000
8	1326468	2	7	90	1268	1387	0	6815237	6000001	6857143
9	311957	3	16	90	1877	1560	1316	7129849	6857144	7714286
10	606012	2	19	70	1595	1874	0	7740614	7714287	8571429
11	1601977	1	10	65	1554	0	0	9346060	8571430	9428572
12	855731	2	8	65	1402	1944	0	10203345	9428573	10285715
13	457185	2	5	75	1442	1607	0	10663876	10285716	11142858
14	1095742	2	19	85	1899	1355	0	11762667	11142859	12000001

Total number of pulses in waveform = 30

Type 5 Radar Waveform_3

Waveform Num = 3
Num of Bursts = 20
Burst Interval (us) = 600000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	519004	3	17	65	1231	1257	1876	519004	0	599999
2	146032	2	6	80	1629	1090	0	669400	600000	1199999
3	637104	2	20	50	1893	1663	0	1309223	1200000	1799999
4	590857	1	9	50	1624	0	0	1903636	1800000	2399999
5	958601	2	16	80	1596	1144	0	2863861	2400000	2999999
6	683814	3	8	70	1026	1629	1372	3550415	3000000	3599999
7	323902	2	12	70	1490	1969	0	3878344	3600000	4199999
8	852761	2	20	50	1239	1586	0	4734564	4200000	4799999
9	621034	2	12	50	1313	1281	0	5358423	4800000	5399999
10	190148	2	16	55	1573	1151	0	5551165	5400000	5999999
11	687573	1	19	75	1446	0	0	6241462	6000000	6599999
12	747334	3	8	90	1130	1938	1829	6990242	6600000	7199999
13	515405	2	14	100	1968	1286	0	7510544	7200000	7799999
14	757910	2	9	85	1769	1033	0	8271708	7800000	8399999
15	400320	2	13	55	1250	1997	0	8674820	8400000	8999999
16	516773	1	9	100	1744	0	0	9194840	9000000	9599999
17	479777	3	18	50	1903	1259	1831	9676361	9600000	10199999
18	920218	2	14	85	1312	1139	0	10601572	10200000	10799999
19	470713	3	14	60	1095	1670	1314	11074736	10800000	11399999
20	385195	1	5	60	1769	0	0	11464010	11400000	11999999

Total number of pulses in waveform = 41

Type 5 Radar Waveform_4

Waveform Num = 4
Num of Bursts = 16
Burst Interval (us) = 750000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri (us)	Pulse 2 Pri (us)	Pulse 3 Pri (us)	Start Loc (us)	Start Burst Interval (us)	End Burst Interval (us)
1	147708	3	18	50	1976	1843	1298	147708	0	749999
2	1211178	2	6	65	1935	1868	0	1364003	750000	1499999
3	859437	3	11	80	1919	1306	1212	2227243	1500000	2249999
4	705830	1	9	60	1436	0	0	2937510	2250000	2999999
5	349282	3	18	90	1904	1046	1658	3288228	3000000	3749999
6	546109	2	16	50	1219	1841	0	3838945	3750000	4499999
7	1252704	1	11	100	1746	0	0	5094709	4500000	5249999
8	714999	1	7	75	1529	0	0	5811454	5250000	5999999
9	808964	2	13	55	1381	1811	0	6621947	6000000	6749999
10	721974	1	7	100	1374	0	0	7347113	6750000	7499999
11	345797	2	7	80	1371	1516	0	7694284	7500000	8249999
12	923733	3	19	70	1310	1775	1131	8620904	8250000	8999999
13	945345	1	16	60	1832	0	0	9570465	9000000	9749999
14	562622	2	17	90	1608	1055	0	10134919	9750000	10499999
15	659803	2	17	75	1122	1783	0	10797385	10500000	11249999
16	1164341	3	13	90	1080	1269	1729	11964631	11250000	11999999

Total number of pulses in waveform = 32
