

# Dynamic Frequency Selection (DFS) Test Report

## FCC Part15 Subpart E

Product Name : Wireless LAN access Point  
Model No. : H3C WA2620X-AGNP,  
BJNGA-FB0001  
FCC ID : O9C-WA2620XAGNP

Applicant : Hewlett Packard Corporation  
Address : 350 Campus Drive, Marlborough, MA United States

Date of Receipt : 03/06/2011  
Test Date : 16/03/2011~ 14/04/2011  
Issued Date : 08/06/2011  
Report No. : 116S012R-DFS-US-P08V01  
Report Version : V2.0

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# DFS Test Report

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Applicant : Hewlett Packard Corporation

Address : 350 Campus Drive, Marlborough, MA United States

Manufacturer : Hewlett Packard Corporation

Address : 350 Campus Drive, Marlborough, MA United States

Model No. : H3C WA2620X-AGNP, BJNGA-FB0001

EUT Voltage : 48Vdc, 0.5A (POE Input)

Brand Name : H3C, HP

Applicable Standard : FCC CFR Title 47 Part 15 Subpart E: 2008  
FCC OET Order 06-96A (2006)

Test Result : Pass

Performed Location : Suzhou EMC Laboratory  
No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech  
Development Zone., Suzhou, China  
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098  
FCC Registration Number: 800392

Operation Mode :  Master device  
(5250~5350MHz)  Slaver device with radar detection function  
 Slaver device without radar detection function

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## 1. UNII Device Information

1. The wireless LAN access point H3C WA2620X-AGNP operates in the following bands:
  - a. 2412~2462MHz
  - b. 5260~5320MHz
  - c. 5745~5825MHz
  
2. The maximum mean EIRP of the device for 5GHz band is 21dBm, and the minimum possible mean EIRP is 6.12dBm.
  
3. The device installed with 2\*Tx and 3\*Rx antenna delivery. Antenna corresponding gains are 11dBi for 5GHz. 0dBi gain was used to set the -62dBm threshold level (-62dBm +1 dB) during calibration of the test setup  
Antenna information shown below:
  - 1~ Manufacturer: H3C, Mode number: ANT-2012P-M3;
  - 2~ Manufacturer: H3C, Mode number: ANT-5011P-M3;
  - 3~ Manufacturer: HP, Mode number: JD907A;
  - 4~ Manufacturer: HP, Mode number: JG291A;
  - 5~ Manufacturer: HP, Mode number: JG292A
  
4. System test was performed with the designated MPEG test file (download from NTIA) that streams full motion video at 30 frames per second from the Master to the Client IP based system.
  
5. This Master does not exceed 27dBm EIRP, so no transmit power control is implemented.
  
6. The Master requires 47s for completing its power-on cycle.
  
7. Information regarding the parameters of the detected Radar Waveforms is not available to the end user.
  
8. For the 5250~5350 MHz band, 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. Test Equipment

Dynamic Frequency Selection (DFS) / TR-8

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	N9020A	MY49100159	2011-04-23
Vector Signal Generator	Agilent	E4438C	102168	2011-04-23

Instrument	Manufacturer	Type No.	Serial No
Splitter/Combiner (Qty: 2)	Mini-Circuits	ZAPD-50W 4.2-6.0 GHz	NN256400424
Splitter/Combiner (Qty: 2)	MCLI	PS3-7	4463/4464
ATT (Qty: 1)	Mini-Circuits	VAT-30+	30912
Laptop PC	Asus	N80V	8BN0AS226971468
RF Cable (Qty: 6)	Mini-Circuits	N/A	DFS-1~6

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

### 3. DFS Detection Threshold and Response Requirement

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

Maximum Transmit Power	Value (see note)
≥ 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.

#### 2. DFS Response requirement values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds (See Note 1)
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. (See Notes 1 and 2)
U-NII Detection Bandwidth	Minimum 80% of the 99% 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 transmission.

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 Channel changes (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%. Measurements are performed with no data traffic.

#### 4. Radar Wave Parameters

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

##### Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
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 Type 1-4)				80%	120

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. For Short Pulse Radar Type 1, the same waveform is used a minimum of 30 times. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms.

##### Long Pulse Radar Test Waveform

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

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

Each waveform is defined as follows:

- 1) The transmission period for the Long Pulse Radar test signal is 12 seconds.
- 2) There are a total of 8 to 20 Bursts in the 12 second period, with the number of Bursts being randomly chosen. This number is Burst\_Count.
- 3) Each Burst consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each Burst within the 12 second sequence may have a different number of pulses.
- 4) The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a Burst will have the same pulse width. Pulses in different Bursts may have different pulse widths.
- 5) Each pulse has a linear frequency modulated chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a Burst will have the same chirp width. Pulses in different Bursts may have different chirp widths. The chirp is centered on the pulse. For example, with a radar frequency of 5300 MHz and

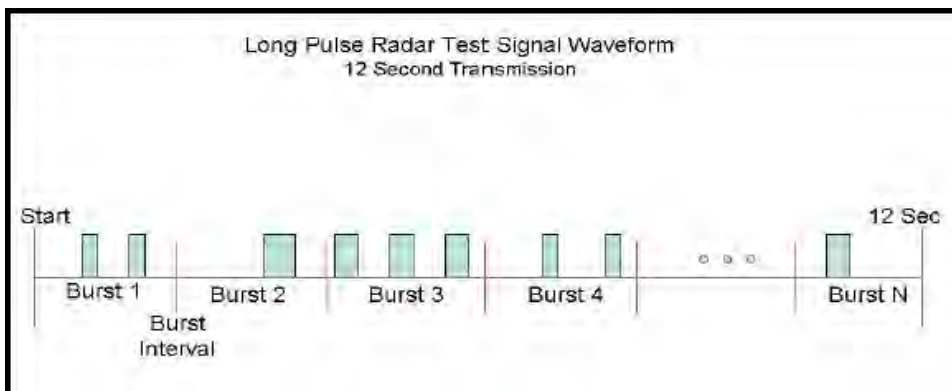
a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.

6) If more than one pulse is present in a Burst, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a Burst, the random time interval between the first and second pulses is chosen independently of the random time interval between the second and third pulses.

7) The 12 second transmission period is divided into even intervals. The number of intervals is equal to Burst\_Count. Each interval is of length  $(12,000,000 / \text{Burst\_Count})$  microseconds. Each interval contains one Burst. The start time for the Burst, relative to the beginning of the interval, is between 1 and  $[(12,000,000 / \text{Burst\_Count}) - (\text{Total Burst Length}) + (\text{One Random PRI Interval})]$  microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each Burst is chosen randomly.

A representative example of a Long Pulse Radar Type waveform:

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





Frequency Hopping Radar Test Waveform

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

For the Frequency Hopping Radar Type, the same Burst parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected from the hopping sequence defined by the following algorithm: 3

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

## 5. Test Setup

### Conducted Test Setup

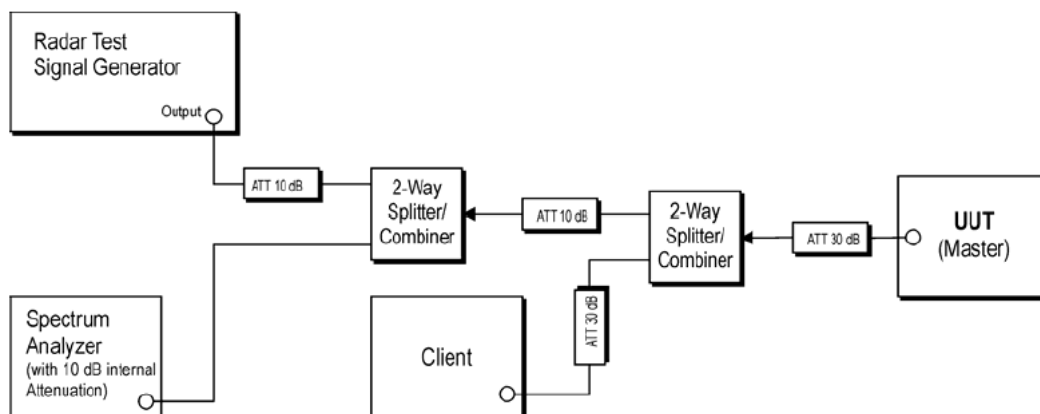
The sections below contain block diagrams that focus on the Radar Waveform injection path for each of the different conducted setups to be used. Each setup consists of a signal generator, analyzer (spectrum analyzer or vector signal analyzer), Master Device, Client Device, plus power combiner/splitters and attenuators. The Client Device is set up to Associate with the Master Device. The designation of the UUT (Master Device or Client Device) and the device into which the Radar Waveform is injected varies among the setups.

Other topologies may be used provided that: (1) the radar and UUT signals can be discriminated from each other on the analyzer and (2) the radar DFS Detection Threshold level at the UUT is stable.

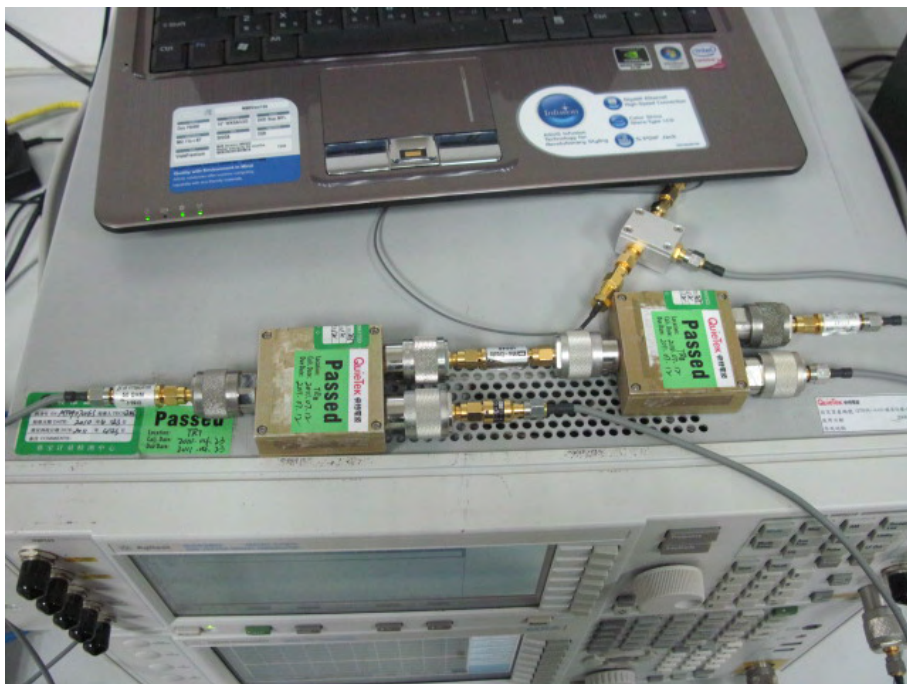
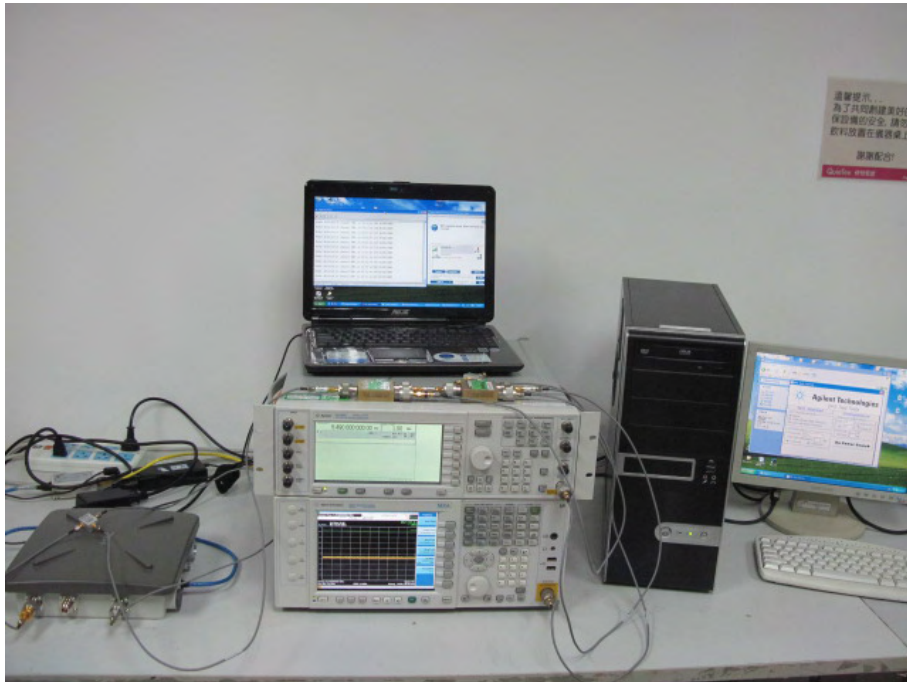
To address point (1), for typical UUT power levels and typical minimum antenna gains, the topologies shown will result in the following relative amplitudes of each signal as displayed on the analyzer: the Radar Waveform level is the highest, the signal from the UUT is the next highest, while the signal from the device that is associated with the UUT is the lowest. Attenuator values may need to be adjusted for particular configurations.

To address point (2), the isolation characteristic between ports 1 and 2 of a power combiner/splitter are extremely sensitive to the impedance presented to the common port, while the insertion loss characteristic between the common port and (port 1, for example) are relatively insensitive to the impedance presented to (port 2, in this example). Thus, the isolation between ports 1 and 2 should never be part of the path that establishes the radar DFS Detection Threshold. The 10 dB attenuator after the signal generator is specified as a precaution; since many of the radar test waveforms will require typical signal generators to operate with their ALC turned off, the source match will generally be degraded from the closed loop specifications.

Figure 1



**DFS Set-up Photo: Master and Spectrum Analyzer**

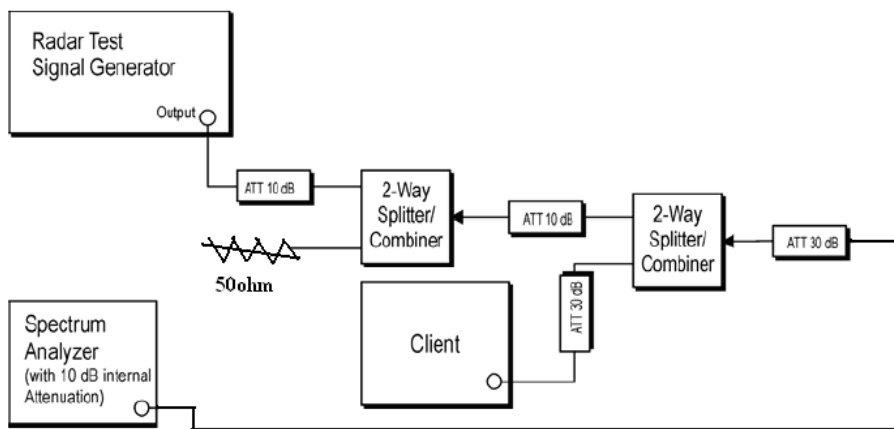


## 6. Radar Waveform Calibration

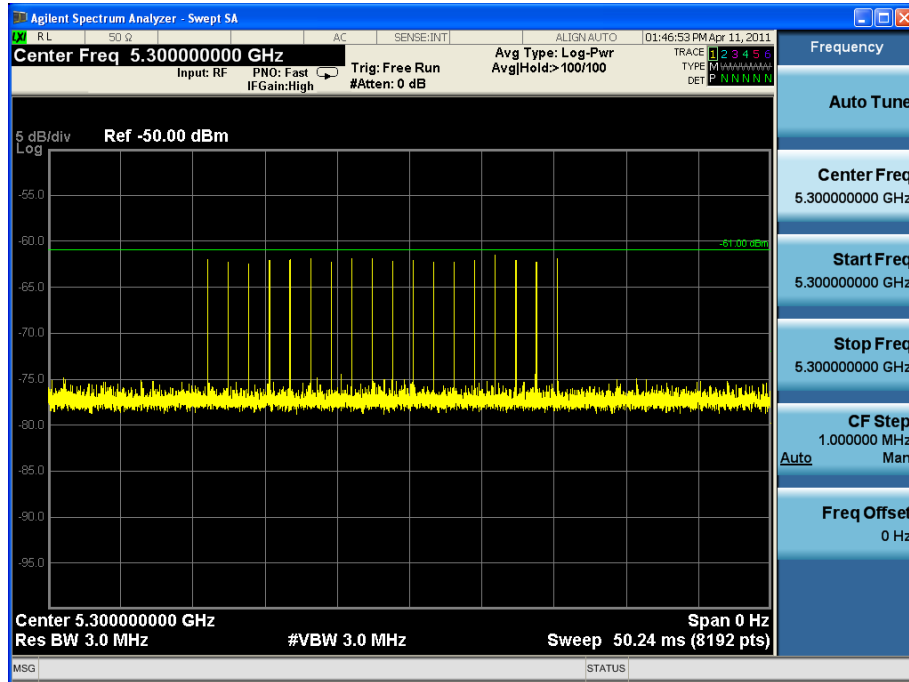
The following equipment setup was used to calibrate the conducted radar waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero spans (time domain) at the frequency of the radar waveform generator. Peak detection was utilized. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz and 3 MHz.

The signal generator amplitude was set so that the power level measured at the spectrum analyzer was -63dBm due to the interference threshold level.

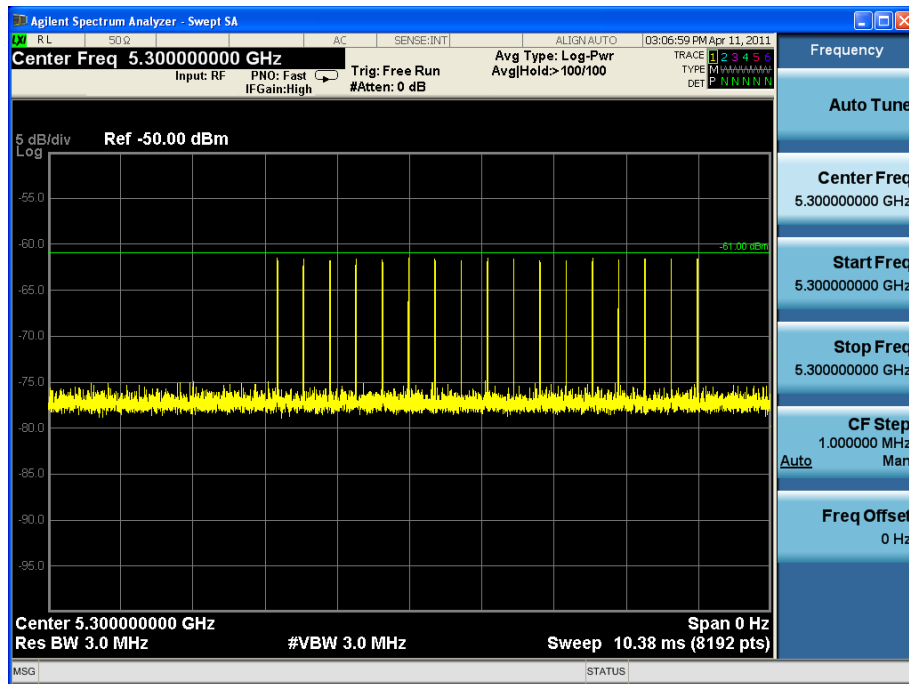
Figure 2: Conducted Calibration Setup



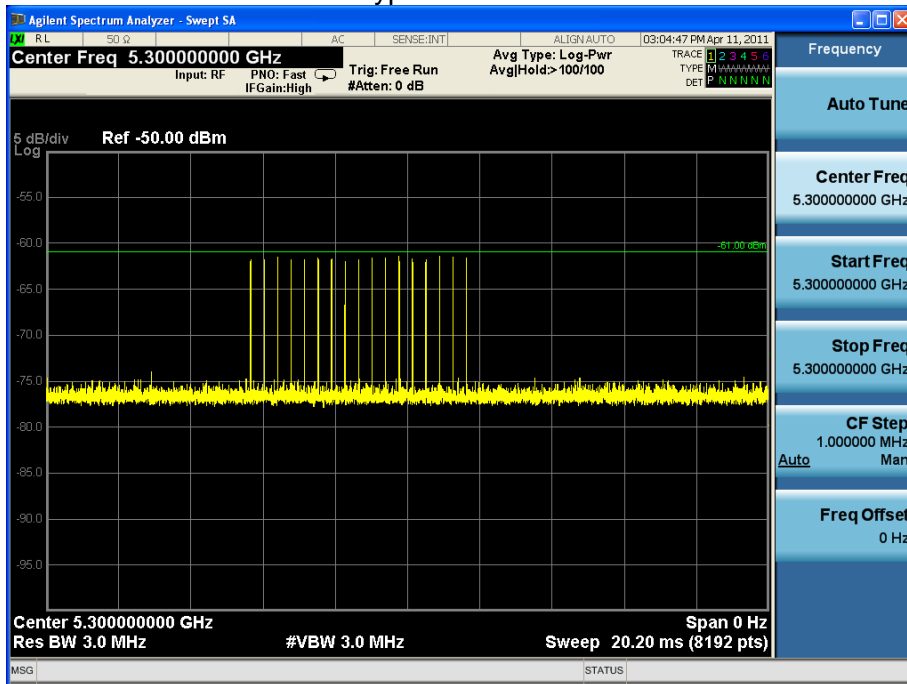
Radar Type 1 Calibration Plot



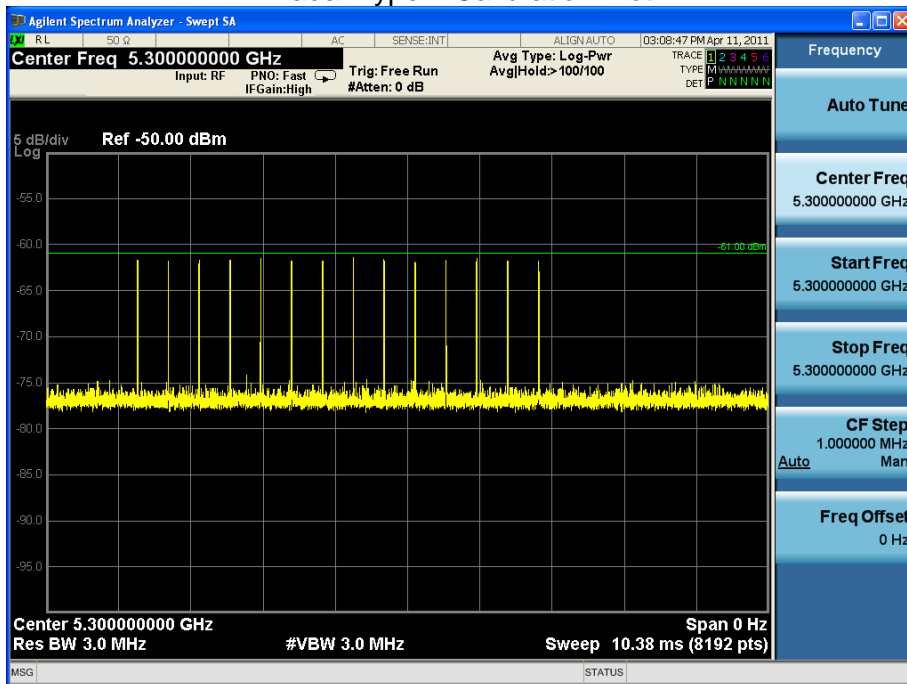
Radar Type 2 Calibration Plot



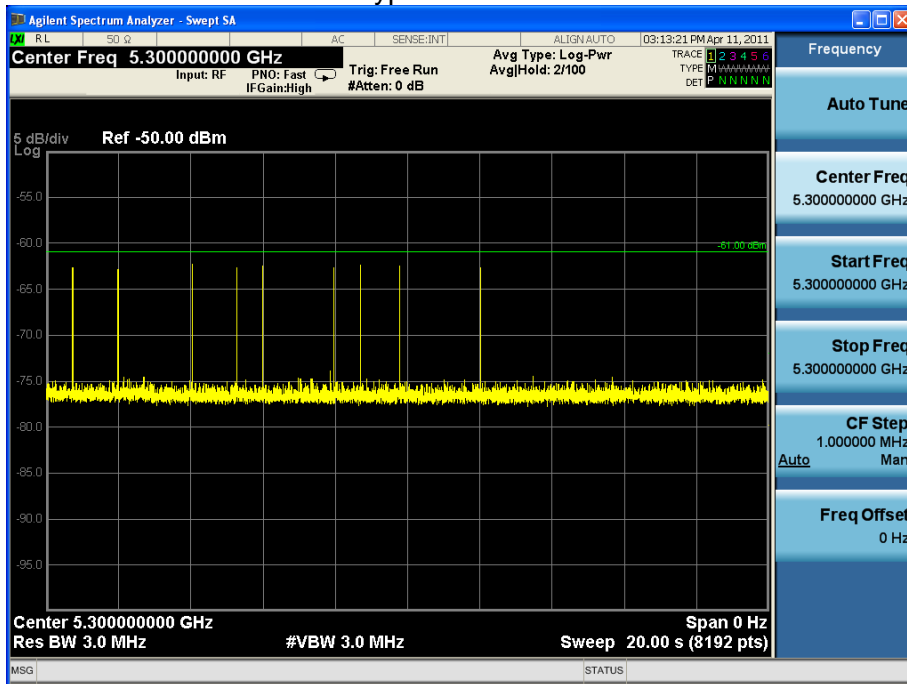
Radar Type 3 Calibration Plot



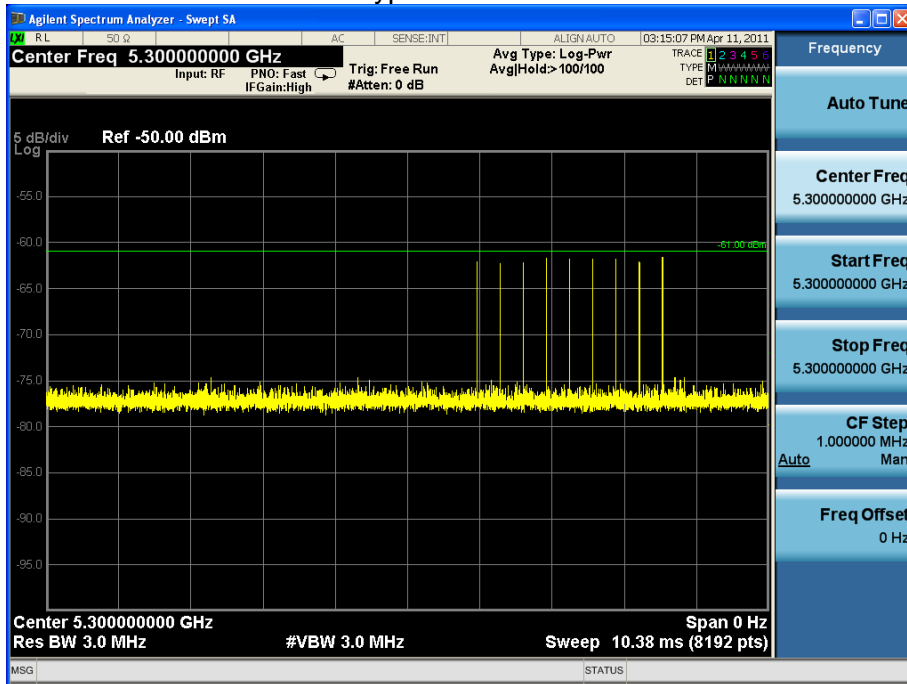
Radar Type 4 Calibration Plot



Radar Type 5 Calibration Plot



Radar Type 6 Calibration Plot





## 7. Test Procedures

### 7.1. U-NII Detection Bandwidth

Set up the generating equipment as shown in Figure 1, or equivalent. Set up the DFS timing monitoring equipment as shown in Figure 1. Set up the overall system for either radiated or conducted coupling to the UUT. Adjust the equipment to produce a single Burst of the Short Pulse Radar Type 1 at the center frequency of the UUT Operating Channel at the specified DFS Detection Threshold level.

Set the UUT up as a standalone device (no associated Client or Master, as appropriate) and no traffic. Frame based systems will be set to a talk/listen ratio of 0%/100% during this test. Generate a single radar Burst, and note the response of the UUT. Repeat for a minimum of 10 trials. The UUT must detect the Radar Waveform using the specified U-NII Detection Bandwidth criterion.

Starting at the center frequency of the UUT operating Channel, increase the radar frequency in 1 MHz steps, repeating the above 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.

Starting at the center frequency of the UUT operating Channel, decrease the radar frequency in 1 MHz steps, repeating the above test sequence, until the detection rate falls below the U-NII Detection Bandwidth criterion specified in Table 4. Record the lowest frequency (denote as FL) at which detection is greater than or equal to the U-NII Detection Bandwidth criterion. Recording the detection rate at frequencies below FL is not required to demonstrate compliance. The U-NII Detection Bandwidth is calculated as follows:

$$U\text{-NII Detection Bandwidth} = FH - FL$$

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

### 7.2. Channel Availability Check

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

- a) The U-NII devices will be powered on and be instructed to operate on the appropriate U-NII Channel that must incorporate DFS functions. At the same time the UUT is powered on, the spectrum analyzer will be set to zero span modes with a 3 MHz RBW and 3 MHz VBW on the Channel occupied by the radar (Chr) with a 2.5 minute sweep time. The spectrum analyzer's sweep will be started at the same time power is applied to the U-NII device.
- b) The UUT should not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle. This measurement can be used to determine the length of the power-on cycle if it is not supplied by the manufacturer. If the spectrum analyzer sweep is started at the same time the UUT is powered on

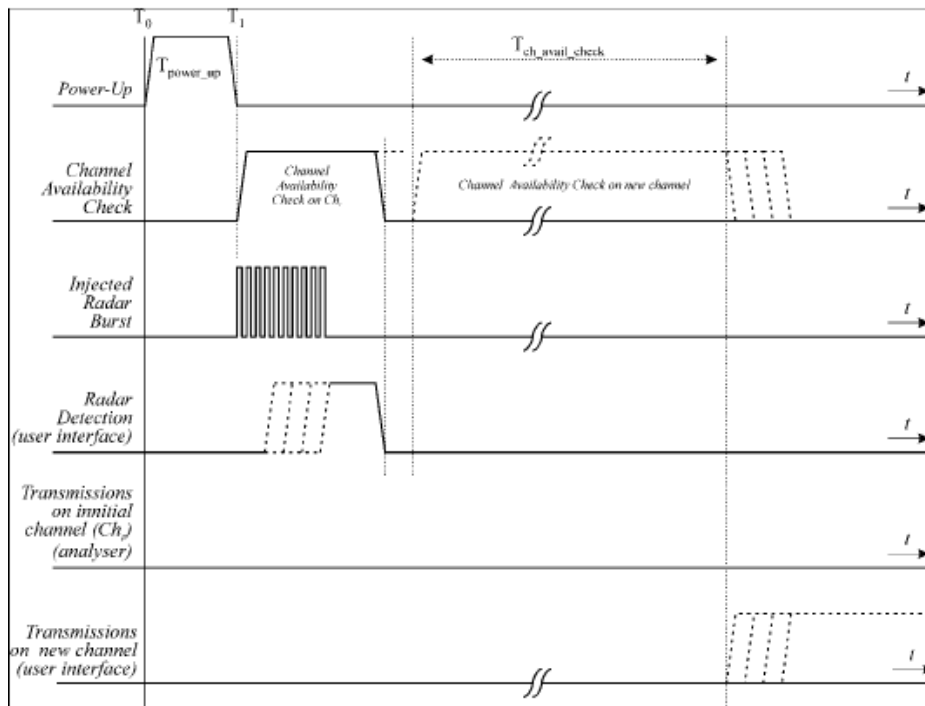


and the UUT does not begin transmissions until it has completed the cycle, the power-on time can be determined by comparing the two times.

**Radar Burst at the Beginning of the Channel Availability Check Time**

The steps below define the procedure to verify successful radar detection on the test Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB occurs at the beginning of the Channel Availability Check Time. This is illustrated as shown below.

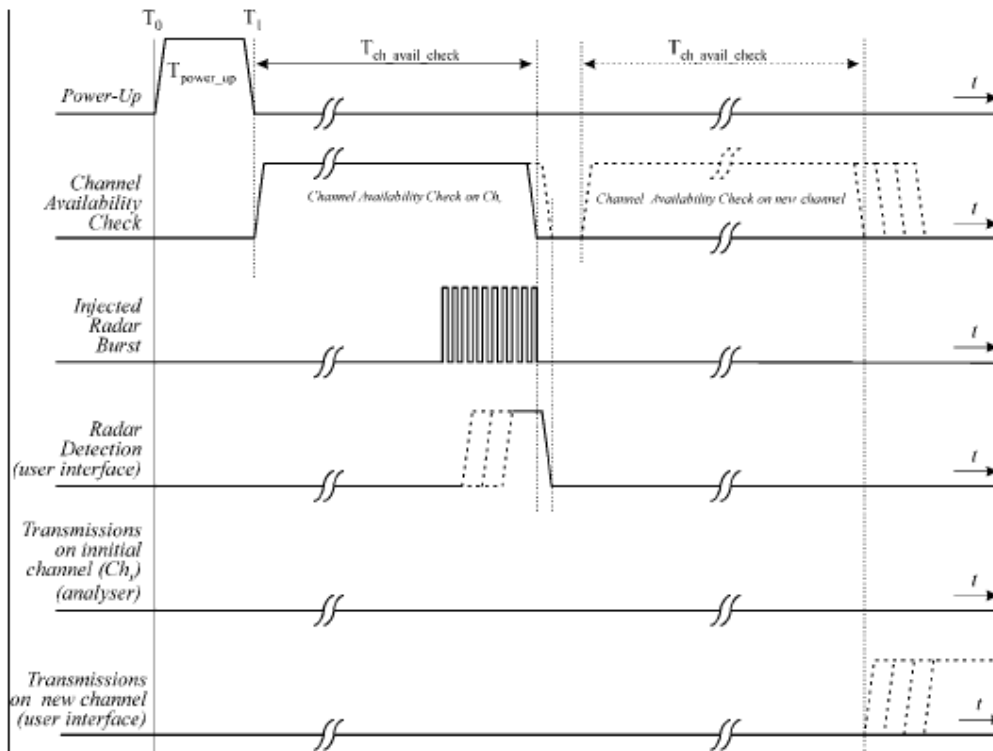
- a) The Radar Waveform generator and UUT are connected using the applicable test setup described in the sections on configuration for Conducted Tests (7.2) or Radiated Tests (7.3) and the power of the UUT is switched off.
- b) The UUT is powered on at T0. T1 denotes the instant when the UUT has completed its power-up sequence (T<sub>power\_up</sub>). The Channel Availability Check Time commences on Chr at instant T1 and will end no sooner than T1 + Tch\_avail\_check.
- c) A single Burst of one of the Short Pulse Radar Types 1-4 will commence within a 6 second window starting at T1. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
- d) Visual indication or measured results on the UUT of successful detection of the radar Burst will be recorded and reported. Observation of Chr for UUT emissions will continue for 2.5 minutes after the radar Burst has been generated.
- e) Verify that during the 2.5 minute measurement window no UUT transmissions occurred on Chr. The Channel Availability Check results will be recorded.



**Radar Burst at the End of the Channel Availability Check Time**

The steps below define the procedure to verify successful radar detection on the test Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1dB occurs at the end of the Channel Availability Check Time. This is illustrated as shown below.

- a) The Radar Waveform generator and UUT are connected using the applicable test setup described in the sections for Conducted Tests (7.2) or Radiated Tests (7.3) and the power of the UUT is switched off.
- b) The UUT is powered on at T0. T1 denotes the instant when the UUT has completed its power-up sequence (T<sub>power\_up</sub>). The Channel Availability Check Time commences on Chr at instant T1 and will end no sooner than T1 + Tch<sub>avail\_check</sub>.
- c) A single Burst of one of the Short Pulse Radar Types 1-4 will commence within a 6 second window starting at T1 + 54 seconds. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
- d) Visual indication or measured results on the UUT of successful detection of the radar Burst will be recorded and reported. Observation of Chr for UUT emissions will continue for 2.5 minutes after the radar Burst has been generated.
- e) Verify that during the 2.5 minute measurement window no UUT transmissions occurred on Chr. The Channel Availability Check results will be recorded.



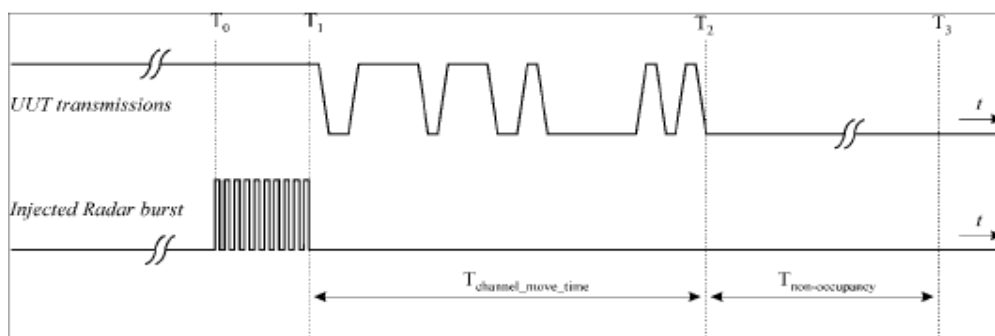
**7.3. In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period**

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

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

The steps below define the procedure to determine the above mentioned parameters when a radar Burst with a level equal to the DFS Detection Threshold + 1dB is generated on the Operating Channel of the UNII device (In-Service Monitoring).

- a) One frequency will be chosen from the Operating Channels of the UUT within the 5250-5350 MHz or 5470-5725 MHz bands.
- b) In case the UUT is a U-NII device operating as a Client Device (with or without DFS), a UNII device operating as a Master Device will be used to allow the UUT (Client device) to Associate with the Master Device. In case the UUT is a Master Device, a U-NII device operating as a Client Device will be used and it is assumed that the Client will associate with the UUT (Master). In both cases for conducted tests, the Radar Waveform generator will be connected to the Master Device. For radiated tests, the emissions of the Radar Waveform generator will be directed towards the Master Device. If the Master Device has antenna gain, the main beam of the antenna will be directed toward the radar emitter. Vertical polarization is used for testing.
- c) Stream the MPEG test file from the Master Device to the Client Device on the test Channel for the entire period of the test.
- d) At time  $T_0$  the Radar Waveform generator sends a Burst of pulses for one of the Short Pulse Radar Types 1-4, on the Operating Channel. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
- e) Observe the transmissions of the UUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the UUT during the observation time (Channel Move Time). Measure and record the Channel Move Time and Channel Closing Transmission Time if radar detection occurs. Figure shown below illustrates Channel Closing Transmission Time.
- f) When operating as a Master Device, monitor the UUT for more than 30 minutes following instant  $T_2$  to verify that the UUT does not resume any transmissions on this Channel. Perform this test once and record the measurement result.
- g) In case the UUT is U-NII device operating as Client Device with In-Service Monitoring, perform steps a) to f).



#### 7.4. Statistical Performance Check

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

- a) One frequency will be chosen from the Operating Channels of the UUT within the 5250-5350 MHz or 5470-5725 MHz bands.
- b) In case the UUT is a U-NII device operating as a Client Device (with or without Radar Detection), a U-NII device operating as a Master Device will be used to allow the UUT (Client device) to Associate with the Master Device. In case the UUT is a Master Device, a U-NII device operating as a Client Device will be used and it is assumed that the Client will associate with the UUT (Master). In both cases for conducted tests, the Radar Waveform generator will be connected to the Master Device. For radiated tests, the emissions of the Radar Waveform generator will be directed towards the Master Device. If the Master Device has antenna gain, the main beam of the antenna will be directed toward the radar emitter. Vertical polarization is used for testing.
- c) Stream the MPEG test file from the Master Device to the Client Device on the test Channel for the entire period of the test.
- d) At time T0 the Radar Waveform generator sends the individual waveform for each of the Radar Types 1-6, at levels defined shown above, on the Operating Channel. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
- e) Observe the transmissions of the UUT at the end of the Burst on the Operating Channel for duration greater than 10 seconds for Short Pulse Radar Types 1-4 and 6 to ensure detection occurs.
- f) Observe the transmissions of the UUT at the end of the Burst on the Operating Channel for duration greater than 22 seconds for Long Pulse Radar Type 5 to ensure detection occurs.
- g) In case the UUT is a U-NII device operating as a Client Device with In-Service Monitoring, perform steps a) to f).

8. Test Result

8.1. Detection Bandwidth

20 MHz Signal Bandwidth												
EUT Frequency = 5300MHz												
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, Blank= No Detection)										Detection Rate (%)	
	1	2	3	4	5	6	7	8	9	10		
5289												0%
5290 Fl	1	1	1	1	1	1	1	1	1	1	1	100%
5291	1	1	1	1	1	1	1	1	1	1	1	100%
5292	1	1	1	1	1	1	1	1	1	1	1	100%
5293	1	1	1	1	1	1	1	1	1	1	1	100%
5294	1	1	1	1	1	1	1	1	1	1	1	100%
5295	1	1	1	1	1	1	1	1	1	1	1	100%
5296	1	1	1	1	1	1	1	1	1	1	1	100%
5297	1	1	1	1	1	1	1	1	1	1	1	100%
5298	1	1	1	1	1	1	1	1	1	1	1	100%
5299	1	1	1	1	1	1	1	1	1	1	1	100%
5300	1	1	1	1	1	1	1	1	1	1	1	100%
5301	1	1	1	1	1	1	1	1	1	1	1	100%
5302	1	1	1	1	1	1	1	1	1	1	1	100%
5303	1	1	1	1	1	1	1	1	1	1	1	100%
5304	1	1	1	1	1	1	1	1	1	1	1	100%
5305	1	1	1	1	1	1	1	1	1	1	1	100%
5306	1	1	1	1	1	1	1	1	1	1	1	100%
5307	1	1	1	1	1	1	1	1	1	1	1	100%
5308	1	1	1	1	1	1	1	1	1	1	1	100%
5309	1	1	1	1	1	1	1	1	1	1	1	100%
5310 Fh	1	1	1	1	1	1	1	1	1	1	1	100%
5311												0%
20 MHz Detection Bandwidth = Fh-Fl = 5310MHz - 5290MHz = 20MHz												
EUT 99% Bandwidth = 16.5MHz												
16.5MHz × 80% = 13.2MHz												

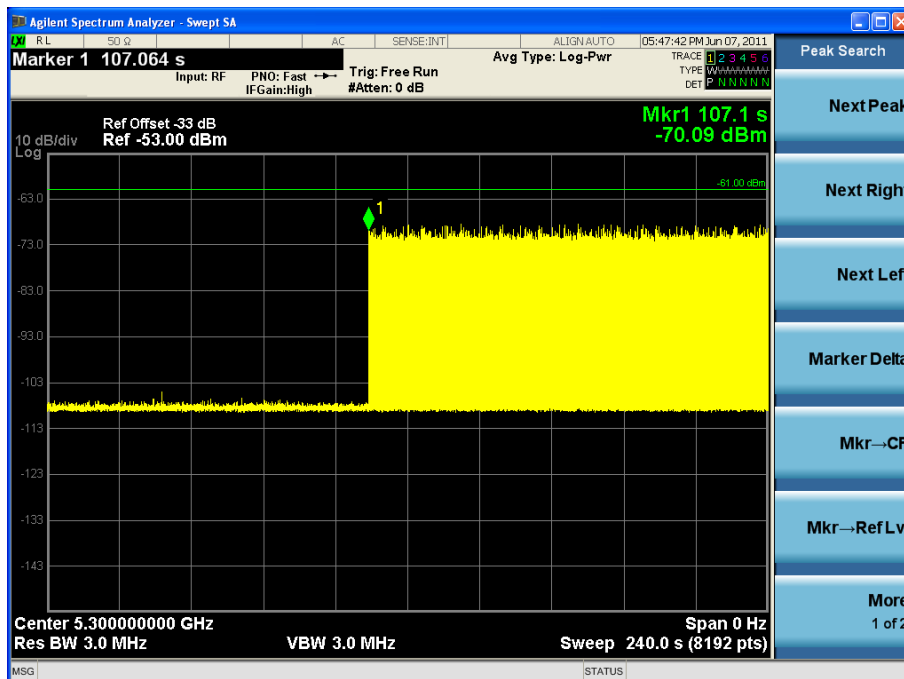
40 MHz Signal Bandwidth											
EUT Frequency = 5310MHz											
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, Blank= No Detection)										Detection Rate (%)
	1	2	3	4	5	6	7	8	9	10	
5289											0%
5290 Fl	1	1	1	1	1	1	1	1	1	1	100%
5291	1	1	1	1	1	1	1	1	1	1	100%
5292	1	1	1	1	1	1	1	1	1	1	100%
5293	1	1	1	1	1	1	1	1	1	1	100%
5294	1	1	1	1	1	1	1	1	1	1	100%
5295	1	1	1	1	1	1	1	1	1	1	100%
5296	1	1	1	1	1	1	1	1	1	1	100%
5297	1	1	1	1	1	1	1	1	1	1	100%
5298	1	1	1	1	1	1	1	1	1	1	100%
5299	1	1	1	1	1	1	1	1	1	1	100%
5300	1	1	1	1	1	1	1	1	1	1	100%
5301	1	1	1	1	1	1	1	1	1	1	100%
5302	1	1	1	1	1	1	1	1	1	1	100%
5303	1	1	1	1	1	1	1	1	1	1	100%
5304	1	1	1	1	1	1	1	1	1	1	100%
5305	1	1	1	1	1	1	1	1	1	1	100%
5306	1	1	1	1	1	1	1	1	1	1	100%
5307	1	1	1	1	1	1	1	1	1	1	100%
5308	1	1	1	1	1	1	1	1	1	1	100%
5309	1	1	1	1	1	1	1	1	1	1	100%
5310	1	1	1	1	1	1	1	1	1	1	100%
5311	1	1	1	1	1	1	1	1	1	1	100%
5312	1	1	1	1	1	1	1	1	1	1	100%
5313	1	1	1	1	1	1	1	1	1	1	100%
5314	1	1	1	1	1	1	1	1	1	1	100%
5315	1	1	1	1	1	1	1	1	1	1	100%
5316	1	1	1	1	1	1	1	1	1	1	100%
5317	1	1	1	1	1	1	1	1	1	1	100%
5318	1	1	1	1	1	1	1	1	1	1	100%
5319	1	1	1	1	1	1	1	1	1	1	100%
5320	1	1	1	1	1	1	1	1	1	1	100%
5321	1	1	1	1	1	1	1	1	1	1	100%

5322	1	1	1	1	1	1	1	1	1	1	100%
5323	1	1	1	1	1	1	1	1	1	1	100%
5324	1	1	1	1	1	1	1	1	1	1	100%
5325	1	1	1	1	1	1	1	1	1	1	100%
5326	1	1	1	1	1	1	1	1	1	1	100%
5327	1	1	1	1	1	1	1	1	1	1	100%
5328	1	1	1	1	1	1	1	1	1	1	100%
5329	1	1	1	1	1	1	1	1	1	1	100%
5330 Fh	1	1	1	1	1	1	1	1	1	1	100%
5331											0%
40 MHz Detection Bandwidth = Fh - Fl = 5330MHz - 5290MHz = 40MHz											
EUT 99% Bandwidth = 36.5MHz											
36.5MHz × 80% = 29.0MHz											

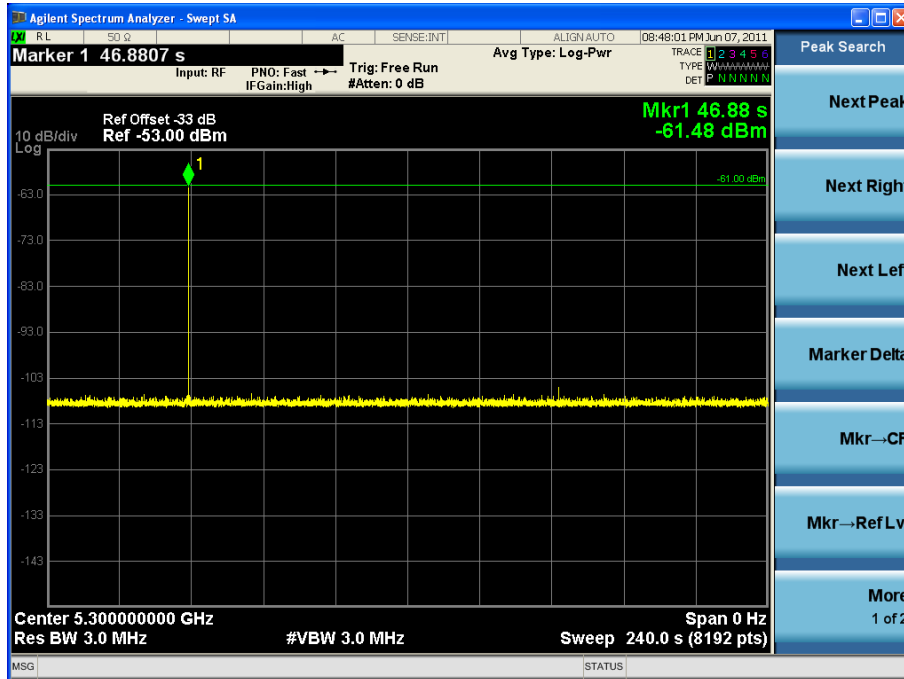
### 8.2. Channel Available Check

The following results reflect both 20 MHz and 40 MHz Channel Bandwidth operation.

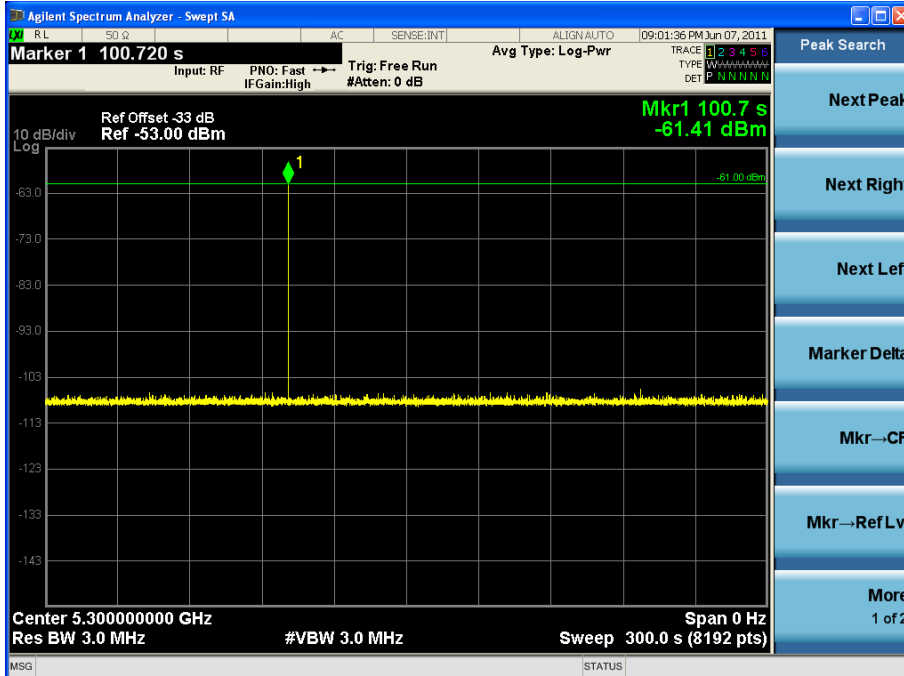
#### Initial Channel Availability Check Time



8.2.1. Test result with a radar burst at the beginning of the Channel Availability Check Time  
Channel 60 5300MHz



8.2.2. Test result with radar burst at the end of the Channel Availability Check Time  
Channel 60 5300MHz



Test Item	Limit	Results
Channel Availability Check Time	60 s	Pass

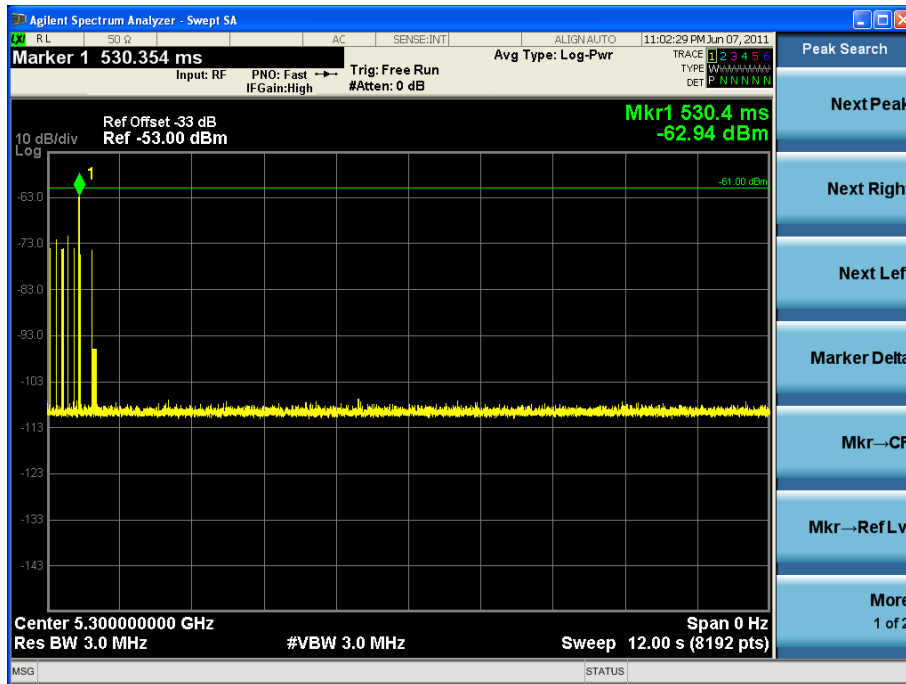


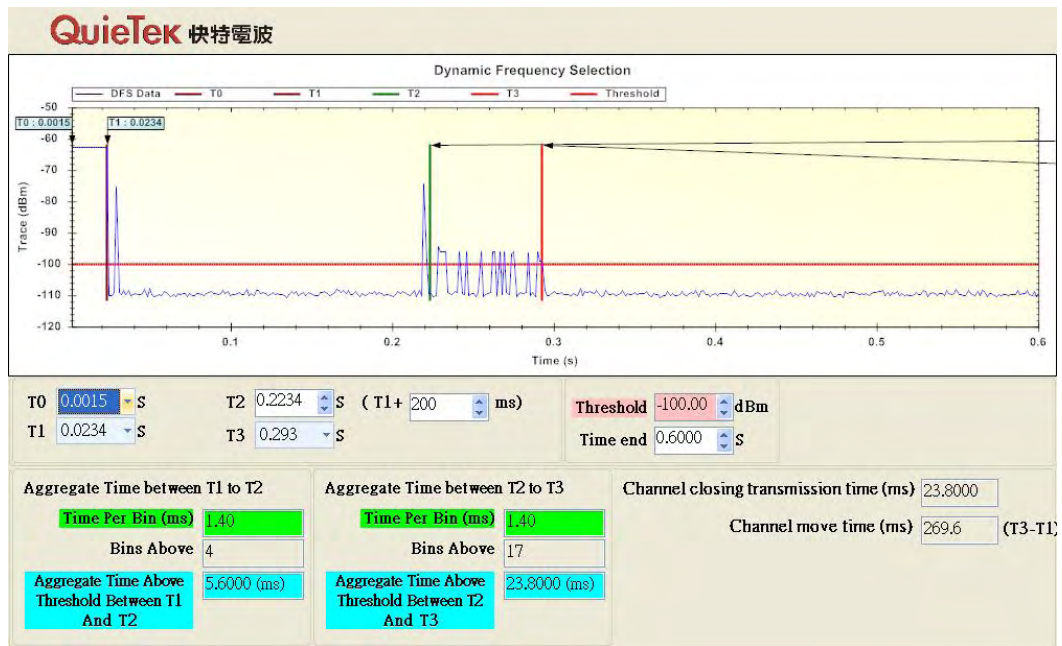
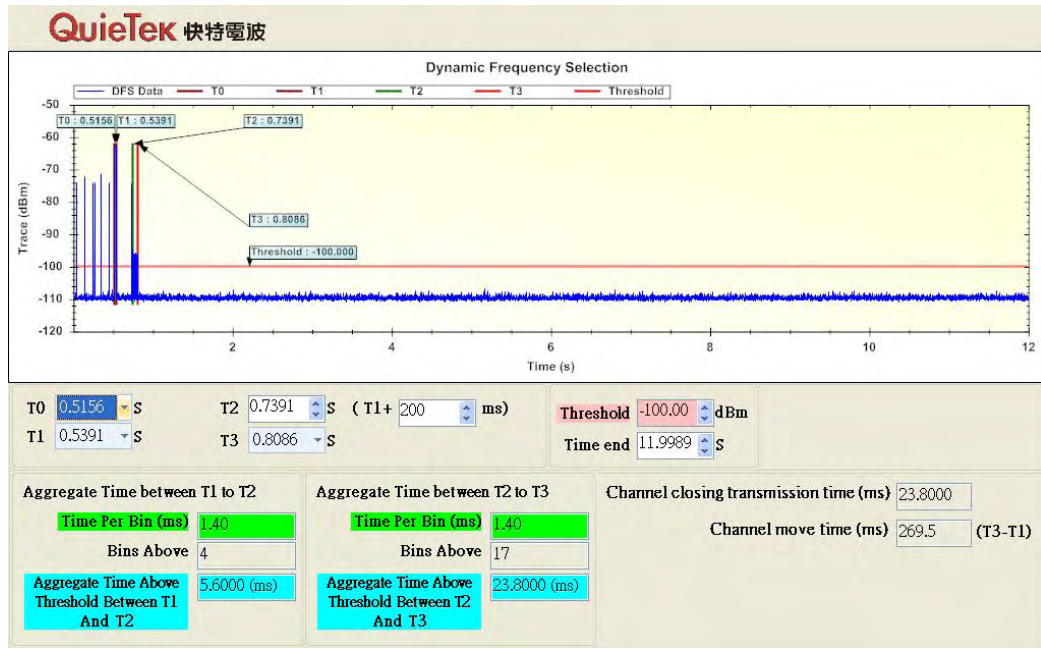
### 8.3. In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period

The following results reflect both 20 MHz and 40 MHz Channel Bandwidth operation.

#### 8.3.1. Channel Move Time and Closing Transmission Time

Type 1 radar at 5300MHz

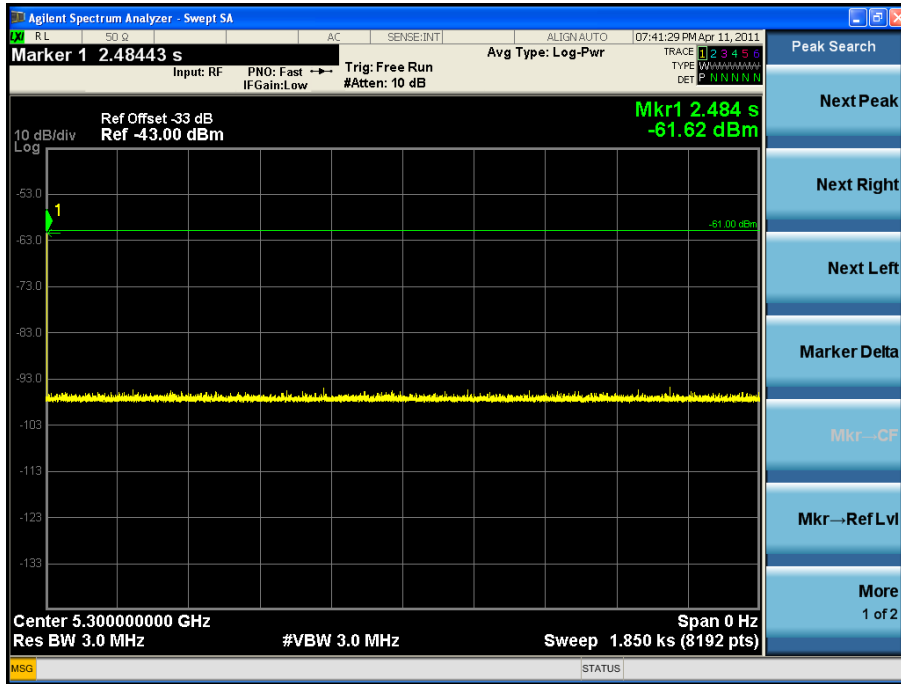




Test Item	Limit	Results
Channel Move Time	10 s	Pass
Channel Closing Transmission Time	200ms + an aggregate of 60ms over remaining 10 second period.	Pass

8.3.2. Non-Occupancy Period

30 Minute Non-Occupancy Period (using Type 1 radar)



Test Item	Limit	Results
Non-Occupancy Period	30 minutes	Pass

#### 8.4. Statistical Performance Check

A U-NII device operating as a Client Device associates with the UUT (Master) at 5300 MHz. Stream the MPEG test file from the Master Device to the Client Device on the selected Channel for the entire period of the test. The device can also utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trial runs.

The Radar Waveform generator sends the individual waveform for each of radar type 1~6 with a level equal to the DFS detection threshold level + 1dB (-61dBm).

The following results reflect both 20 MHz and 40 MHz Channel Bandwidth operation.

Type 1 Radar Statistical Performance

Trial Number	Pulse Width (us)	PRI (us)	Pulses/Burst	1=Detection Blank=No Detection
1	1	1428	18	1
2	1	1428	18	1
3	1	1428	18	1
4	1	1428	18	1
5	1	1428	18	1
6	1	1428	18	1
7	1	1428	18	1
8	1	1428	18	1
9	1	1428	18	1
10	1	1428	18	1
11	1	1428	18	1
12	1	1428	18	1
13	1	1428	18	1
14	1	1428	18	1
15	1	1428	18	1
16	1	1428	18	1
17	1	1428	18	1
18	1	1428	18	1
19	1	1428	18	1
20	1	1428	18	1
21	1	1428	18	1
22	1	1428	18	1
23	1	1428	18	1
24	1	1428	18	1
25	1	1428	18	1
26	1	1428	18	1
27	1	1428	18	1
28	1	1428	18	1
29	1	1428	18	1
30	1	1428	18	1
Detection Percentage				100% (>60%)

Type 2 Radar Statistical Performance

Trial Number	Pulse Width (us)	PRI (us)	Pulses/Burst	1=Detection Blank=No Detection
1	4.6	175	24	1
2	3.7	206	29	1
3	3.3	203	26	1
4	5.0	162	25	1
5	1.0	198	24	1
6	3.9	201	27	1
7	2.6	175	28	1
8	1.9	196	24	1
9	1.0	168	23	1
10	4.7	226	28	1
11	3.5	158	29	1
12	2.2	224	25	1
13	3.1	227	29	1
14	3.7	220	24	1
15	1.0	184	29	1
16	1.2	170	24	1
17	4.4	154	23	1
18	1.9	184	27	1
19	4.8	198	26	1
20	2.3	167	24	1
21	4.1	194	26	1
22	4.3	201	29	1
23	2.6	158	26	1
24	1.9	211	23	1
25	1.0	211	24	1
26	4.7	219	29	1
27	5.0	207	28	1
28	4.2	219	26	1
29	2.3	171	25	1
30	2.4	185	27	1
Detection Percentage				100% (>60%)

Type 3 Radar Statistical Performance

Trial Number	Pulse Width (us)	PRI (us)	Pulses/Burst	1=Detection Blank=No Detection
1	9.4	299	18	1
2	7.7	455	17	1
3	5.5	308	18	1
4	7.1	476	18	1
5	5.2	381	18	1
6	8.8	322	17	1
7	7.5	303	16	1
8	5.7	332	18	1
9	5.4	389	16	1
10	9.5	321	16	1
11	8.0	271	18	1
12	8.5	456	17	1
13	6.8	382	17	1
14	7.1	309	16	1
15	9.8	438	16	1
16	6.0	441	16	1
17	6.0	268	17	1
18	7.4	364	16	1
19	7.4	435	16	1
20	8.9	456	16	1
21	5.4	374	18	1
22	6.9	294	16	1
23	9.4	462	18	1
24	5.5	454	17	1
25	9.7	467	17	1
26	8.0	464	17	1
27	5.5	312	17	1
28	5.9	353	16	1
29	7.4	463	18	1
30	7.6	358	16	1
Detection Percentage				100% (>60%)

Type 4 Radar Statistical Performance

Trial Number	Pulse Width (us)	PRI (us)	Pulses/Burst	1=Detection Blank=No Detection
1	10.4	401	13	1
2	20.0	415	14	1
3	15.9	486	16	1
4	10.5	430	14	1
5	17.7	459	13	1
6	18.5	408	15	1
7	18.3	262	15	1
8	11.0	309	15	1
9	10.4	412	15	1
10	10.9	487	13	1
11	16.6	500	13	1
12	19.5	403	15	1
13	16.7	488	16	1
14	12.2	296	14	1
15	10.1	282	12	1
16	12.0	423	15	1
17	17.1	266	15	1
18	14.6	413	13	1
19	10.0	309	13	1
20	16.0	320	14	1
21	13.6	339	14	1
22	12.0	400	16	1
23	10.2	262	14	1
24	13.3	425	15	1
25	18.7	410	14	1
26	14.1	460	16	1
27	17.2	398	12	1
28	16.2	427	13	1
29	19.4	320	13	1
30	10.8	376	16	1
Detection Percentage				100% (>60%)

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

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



Type 5 Radar Statistical Performance

See the type 5 Radar Characteristics at the end of this report.

Trial Number	File name	1=Detection Blank=No Detection
1	Statistical_Check_RandParm_For_Radar_Type_5_1_trail	1
2	Statistical_Check_RandParm_For_Radar_Type_5_2_trail	1
3	Statistical_Check_RandParm_For_Radar_Type_5_3_trail	1
4	Statistical_Check_RandParm_For_Radar_Type_5_4_trail	1
5	Statistical_Check_RandParm_For_Radar_Type_5_5_trail	1
6	Statistical_Check_RandParm_For_Radar_Type_5_6_trail	1
7	Statistical_Check_RandParm_For_Radar_Type_5_7_trail	1
8	Statistical_Check_RandParm_For_Radar_Type_5_8_trail	1
9	Statistical_Check_RandParm_For_Radar_Type_5_9_trail	1
10	Statistical_Check_RandParm_For_Radar_Type_5_10_trail	1
11	Statistical_Check_RandParm_For_Radar_Type_5_11_trail	1
12	Statistical_Check_RandParm_For_Radar_Type_5_12_trail	1
13	Statistical_Check_RandParm_For_Radar_Type_5_13_trail	1
14	Statistical_Check_RandParm_For_Radar_Type_5_14_trail	1
15	Statistical_Check_RandParm_For_Radar_Type_5_15_trail	1
16	Statistical_Check_RandParm_For_Radar_Type_5_16_trail	1
17	Statistical_Check_RandParm_For_Radar_Type_5_17_trail	1
18	Statistical_Check_RandParm_For_Radar_Type_5_18_trail	1
19	Statistical_Check_RandParm_For_Radar_Type_5_19_trail	1
20	Statistical_Check_RandParm_For_Radar_Type_5_20_trail	1
21	Statistical_Check_RandParm_For_Radar_Type_5_21_trail	1
22	Statistical_Check_RandParm_For_Radar_Type_5_22_trail	1
23	Statistical_Check_RandParm_For_Radar_Type_5_23_trail	1
24	Statistical_Check_RandParm_For_Radar_Type_5_24_trail	1
25	Statistical_Check_RandParm_For_Radar_Type_5_25_trail	1
26	Statistical_Check_RandParm_For_Radar_Type_5_26_trail	1
27	Statistical_Check_RandParm_For_Radar_Type_5_27_trail	1
28	Statistical_Check_RandParm_For_Radar_Type_5_28_trail	1
29	Statistical_Check_RandParm_For_Radar_Type_5_29_trail	1
30	Statistical_Check_RandParm_For_Radar_Type_5_30_trail	1
Detection Percentage		100% (>80 %)

Type 6 Radar Statistical Performance

See the type 6 Radar Characteristics at the end of this report.

Trial Number	File name	1=Detection Blank=No Detection
1	Statistical_Check_RandParm_For_Radar_Type_6_1_trail	1
2	Statistical_Check_RandParm_For_Radar_Type_6_2_trail	1
3	Statistical_Check_RandParm_For_Radar_Type_6_3_trail	1
4	Statistical_Check_RandParm_For_Radar_Type_6_4_trail	1
5	Statistical_Check_RandParm_For_Radar_Type_6_5_trail	1
6	Statistical_Check_RandParm_For_Radar_Type_6_6_trail	1
7	Statistical_Check_RandParm_For_Radar_Type_6_7_trail	1
8	Statistical_Check_RandParm_For_Radar_Type_6_8_trail	1
9	Statistical_Check_RandParm_For_Radar_Type_6_9_trail	1
10	Statistical_Check_RandParm_For_Radar_Type_6_10_trail	1
11	Statistical_Check_RandParm_For_Radar_Type_6_11_trail	1
12	Statistical_Check_RandParm_For_Radar_Type_6_12_trail	1
13	Statistical_Check_RandParm_For_Radar_Type_6_13_trail	1
14	Statistical_Check_RandParm_For_Radar_Type_6_14_trail	1
15	Statistical_Check_RandParm_For_Radar_Type_6_15_trail	1
16	Statistical_Check_RandParm_For_Radar_Type_6_16_trail	1
17	Statistical_Check_RandParm_For_Radar_Type_6_17_trail	1
18	Statistical_Check_RandParm_For_Radar_Type_6_18_trail	1
19	Statistical_Check_RandParm_For_Radar_Type_6_19_trail	1
20	Statistical_Check_RandParm_For_Radar_Type_6_20_trail	1
21	Statistical_Check_RandParm_For_Radar_Type_6_21_trail	1
22	Statistical_Check_RandParm_For_Radar_Type_6_22_trail	1
23	Statistical_Check_RandParm_For_Radar_Type_6_23_trail	1
24	Statistical_Check_RandParm_For_Radar_Type_6_24_trail	1
25	Statistical_Check_RandParm_For_Radar_Type_6_25_trail	1
26	Statistical_Check_RandParm_For_Radar_Type_6_26_trail	1
27	Statistical_Check_RandParm_For_Radar_Type_6_27_trail	1
28	Statistical_Check_RandParm_For_Radar_Type_6_28_trail	1
29	Statistical_Check_RandParm_For_Radar_Type_6_29_trail	1
30	Statistical_Check_RandParm_For_Radar_Type_6_30_trail	1
Detection Percentage		100 % (>70 %)

Appendix for Type 5~6 radar waveform test characteristic

Type 5 Radar Waveform\_1.txt

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	1316910	2	6	65	1745	1382	0	1316910	0	1499999
2	226888	2	13	75	1396	1443	0	1546925	1500000	2999999
3	1870668	1	20	85	1278	0	0	3420432	3000000	4499999
4	1469505	2	19	70	1057	1590	0	4891215	4500000	5999999
5	2399000	1	17	55	1523	0	0	7292862	6000000	7499999
6	1140797	1	17	75	1723	0	0	8435182	7500000	8999999
7	1935143	2	7	65	1162	1824	0	10372048	9000000	10499999
8	957784	1	6	80	1086	0	0	11332818	10500000	11999999

Total number of pulses in waveform = 12

Type 5 Radar Waveform\_2.txt

Waveform Num = 2  
 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	1029375	1	8	100	1913	0	0	1029375	0	1499999
2	1137844	3	8	95	1623	1515	1310	2169132	1500000	2999999
3	1299323	2	14	85	1531	1955	0	3472903	3000000	4499999
4	1200650	1	12	80	1208	0	0	4677039	4500000	5999999
5	1575814	1	7	70	1180	0	0	6254061	6000000	7499999
6	1690180	2	6	60	1915	1882	0	7945421	7500000	8999999
7	1163500	3	5	65	1839	1891	1798	9112718	9000000	10499999
8	2421093	3	8	70	1576	1405	1642	11539339	10500000	11999999

Total number of pulses in waveform = 16

## Type 5 Radar Waveform\_3.txt

Waveform Num = 3  
 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	231159	1	17	90	1321	0	0	231159	0	666666
2	708062	3	19	80	1047	1755	1988	940542	666667	1333333
3	872796	1	10	70	1871	0	0	1818128	1333334	2000000
4	547765	1	7	60	1520	0	0	2367764	2000001	2666667
5	370061	3	16	85	1316	1825	1339	2739345	2666668	3333334
6	621692	2	19	95	1153	1669	0	3365517	3333335	4000001
7	867868	1	16	75	1961	0	0	4236207	4000002	4666668
8	673154	2	14	80	1262	1588	0	4911322	4666669	5333335
9	984343	3	20	100	1186	1612	1285	5898515	5333336	6000002
10	754040	1	14	85	1776	0	0	6656638	6000003	6666669
11	159677	1	5	55	1283	0	0	6818091	6666670	7333336
12	528229	2	20	70	1165	1092	0	7347603	7333337	8000003
13	1099646	3	16	65	1849	1200	1108	8449506	8000004	8666670
14	274497	2	5	65	1077	1286	0	8728160	8666671	9333337
15	1151109	1	20	80	1558	0	0	9881632	9333338	10000004
16	508948	3	12	55	1035	1586	1731	10392138	10000005	10666671
17	860688	1	15	55	1333	0	0	11257178	10666672	11333338
18	438830	1	9	75	1502	0	0	11697341	11333339	12000005

Total number of pulses in waveform = 32

## Type 5 Radar Waveform\_4.txt

Waveform Num = 4  
 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	66482	3	19	100	1029	1863	1756	66482	0	799999
2	1031986	2	15	85	1110	1897	0	1103116	800000	1599999
3	594903	2	11	85	1047	1596	0	1701026	1600000	2399999
4	1170695	2	11	80	1957	1716	0	2874364	2400000	3199999
5	1008858	2	16	95	1918	1294	0	3886895	3200000	3999999
6	429955	2	9	100	1205	1835	0	4320062	4000000	4799999
7	658252	1	7	80	1824	0	0	4981354	4800000	5599999
8	1028188	3	19	80	1950	1004	1742	6011366	5600000	6399999
9	1040591	1	12	60	1772	0	0	7056653	6400000	7199999
10	665449	2	11	70	1984	1927	0	7723874	7200000	7999999
11	855540	2	20	95	1341	1023	0	8583325	8000000	8799999
12	878769	2	17	90	1531	1201	0	9464458	8800000	9599999
13	739343	3	17	85	1967	1958	1250	10206533	9600000	10399999
14	910625	2	8	70	1199	1092	0	11122333	10400000	11199999
15	851426	3	15	80	1183	1993	1027	11976050	11200000	11999999

Total number of pulses in waveform = 32

Type 5 Radar Waveform\_5.txt

Waveform Num = 5  
 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	601149	1	11	60	1004	0	0	601149	0	631578
2	555278	2	17	65	1303	1542	0	1157431	631579	1263157
3	390014	2	9	75	1432	1392	0	1550290	1263158	1894736
4	719165	2	13	65	1283	1570	0	2272279	1894737	2526315
5	774818	2	15	90	1387	1354	0	3049950	2526316	3157894
6	552243	2	19	65	1592	1379	0	3604934	3157895	3789473
7	211485	1	14	80	1428	0	0	3819390	3789474	4421052
8	967453	1	15	75	1726	0	0	4788271	4421053	5052631
9	865168	2	8	50	1388	1978	0	5655165	5052632	5684210
10	47243	2	14	70	1752	1399	0	5705774	5684211	6315789
11	913920	2	20	60	1872	1957	0	6622845	6315790	6947368
12	551592	1	5	100	1713	0	0	7178266	6947369	7578947
13	642097	1	19	65	1314	0	0	7822076	7578948	8210526
14	839093	1	19	90	1295	0	0	8662483	8210527	8842105
15	597630	1	15	95	1001	0	0	9261408	8842106	9473684
16	704869	1	19	75	1150	0	0	9967278	9473685	10105263
17	579280	1	12	80	1342	0	0	10547708	10105264	10736842
18	662914	2	16	75	1586	1214	0	11211964	10736843	11368421
19	522369	2	19	90	1483	1042	0	11737133	11368422	12000000

Total number of pulses in waveform = 29

Type 5 Radar Waveform\_6.txt

Waveform Num = 6  
 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	320382	3	17	80	1404	1683	1020	320382	0	749999
2	722744	1	16	80	1890	0	0	1047233	750000	1499999
3	1094860	1	14	100	1236	0	0	2143983	1500000	2249999
4	610769	1	10	70	1206	0	0	2755988	2250000	2999999
5	831254	3	6	80	1433	1096	1651	3588448	3000000	3749999
6	546355	2	7	80	1824	1918	0	4138983	3750000	4499999
7	1014562	1	19	55	1814	0	0	5157287	4500000	5249999
8	598636	3	17	100	1899	1981	1281	5757737	5250000	5999999
9	594520	3	7	95	1862	1317	1403	6357418	6000000	6749999
10	988721	1	11	50	1733	0	0	7350721	6750000	7499999
11	508308	3	5	85	1869	1777	1339	7860762	7500000	8249999
12	393069	2	10	80	1104	1822	0	8258816	8250000	8999999
13	912449	3	17	75	1954	1373	1434	9174191	9000000	9749999
14	796023	1	9	60	1744	0	0	9974975	9750000	10499999
15	993616	2	14	95	1175	1467	0	10970335	10500000	11249999
16	1019696	3	15	95	1191	1561	1295	11992673	11250000	11999999

Total number of pulses in waveform = 33

## Type 5 Radar Waveform\_7.txt

Waveform Num = 7  
 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	570351	2	18	50	1584	1612	0	570351	0	599999
2	596033	1	20	75	1290	0	0	1169580	600000	1199999
3	159324	3	5	95	1603	1358	1865	1330194	1200000	1799999
4	796502	3	20	55	1297	1280	1644	2131522	1800000	2399999
5	375084	3	14	90	1116	1381	1481	2510827	2400000	2999999
6	952373	3	20	60	1708	1685	1394	3467178	3000000	3599999
7	371511	3	11	50	1686	1561	1655	3843476	3600000	4199999
8	593659	2	20	60	1124	1872	0	4442037	4200000	4799999
9	697999	2	17	50	1944	1010	0	5143032	4800000	5399999
10	639615	1	19	70	1565	0	0	5785601	5400000	5999999
11	646372	2	9	95	1378	1927	0	6433538	6000000	6599999
12	677664	1	16	55	1645	0	0	7114507	6600000	7199999
13	653222	2	19	70	1742	1312	0	7769374	7200000	7799999
14	478742	3	14	65	1386	1292	1656	8251170	7800000	8399999
15	161654	2	17	75	1676	1680	0	8417158	8400000	8999999
16	628862	1	5	75	1214	0	0	9049376	9000000	9599999
17	897524	2	7	50	1465	1372	0	9948114	9600000	10199999
18	662360	1	10	90	1805	0	0	10613311	10200000	10799999
19	673290	3	15	85	1557	1273	1412	11288406	10800000	11399999
20	465924	1	7	100	1900	0	0	11758572	11400000	11999999

Total number of pulses in waveform = 41

## Type 5 Radar Waveform\_8.txt

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	360143	2	12	80	1854	1704	0	360143	0	599999
2	458962	2	9	55	1767	1100	0	822663	600000	1199999
3	944185	1	14	90	1115	0	0	1769715	1200000	1799999
4	214768	2	14	60	1005	1347	0	1985598	1800000	2399999
5	481903	2	11	70	1376	1970	0	2469853	2400000	2999999
6	1024218	2	11	70	1261	1835	0	3497417	3000000	3599999
7	277695	3	7	100	1713	1091	1105	3778208	3600000	4199999
8	466444	3	12	95	1379	1660	1758	4248561	4200000	4799999
9	885901	3	17	55	1911	1867	1042	5139259	4800000	5399999
10	815066	1	5	100	1414	0	0	5959145	5400000	5999999
11	445150	3	12	60	1167	1571	1259	6405709	6000000	6599999
12	518801	2	20	95	1282	1277	0	6928507	6600000	7199999
13	580113	3	13	100	1397	1085	1046	7511179	7200000	7799999
14	693626	3	9	70	1912	1351	1130	8208333	7800000	8399999
15	758576	3	19	65	1908	1854	1716	8971302	8400000	8999999
16	165749	3	11	80	1114	1461	1019	9142529	9000000	9599999
17	967375	3	12	85	1426	1215	1753	10113498	9600000	10199999
18	495641	1	18	85	1303	0	0	10613533	10200000	10799999
19	396650	1	8	75	1207	0	0	11011486	10800000	11399999
20	630626	2	5	90	1697	1606	0	11643319	11400000	11999999

Total number of pulses in waveform = 45

## Type 5 Radar Waveform\_9.txt

Waveform Num = 9  
 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	27456	1	13	95	1242	0	0	27456	0	857142
2	1333045	1	12	75	1866	0	0	1361743	857143	1714285
3	984256	3	5	95	1551	1632	1252	2347865	1714286	2571428
4	625278	2	12	95	1709	1994	0	2977578	2571429	3428571
5	967682	3	19	90	1018	1291	1775	3948963	3428572	4285714
6	476768	3	11	70	1172	1898	1325	4429815	4285715	5142857
7	1136304	2	15	85	1619	1832	0	5570514	5142858	6000000
8	702386	1	14	90	1917	0	0	6276351	6000001	6857143
9	1255420	3	15	85	1995	1948	1750	7533688	6857144	7714286
10	716855	3	10	80	1308	1565	1527	8256236	7714287	8571429
11	1016664	3	16	90	1996	1607	1650	9277300	8571430	9428572
12	846946	2	5	70	1712	1307	0	10129499	9428573	10285715
13	587564	1	19	95	1913	0	0	10720082	10285716	11142858
14	917921	3	12	80	1280	1849	1766	11639916	11142859	12000001

Total number of pulses in waveform = 31

## Type 5 Radar Waveform\_10.txt

Waveform Num = 10  
 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	986456	1	18	90	1540	0	0	986456	0	1499999
2	928542	1	20	80	1761	0	0	1916538	1500000	2999999
3	1502882	1	12	50	1991	0	0	3421181	3000000	4499999
4	1356555	3	13	70	1749	1222	1615	4779727	4500000	5999999
5	1810715	2	10	95	1869	1841	0	6595028	6000000	7499999
6	1478728	1	10	75	1251	0	0	8077466	7500000	8999999
7	1621000	1	9	80	1454	0	0	9699717	9000000	10499999
8	1140920	2	8	85	1041	1442	0	10842091	10500000	11999999

Total number of pulses in waveform = 12



## Type 5 Radar Waveform\_11.txt

Waveform Num = 11  
 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	1292844	2	15	75	1349	1993	0	1292844	0	1333332
2	1158233	3	20	50	1256	1167	1631	2454419	1333333	2666665
3	1519191	3	15	85	1422	1511	1643	3977664	2666666	3999998
4	902328	3	15	80	1389	1243	1359	4884568	3999999	5333331
5	1011523	3	18	55	1090	1630	1788	5900082	5333332	6666664
6	1576612	3	12	55	1913	1689	1344	7481202	6666665	7999997
7	1221843	2	8	85	1087	1156	0	8707991	7999998	9333330
8	1562203	2	5	60	1702	1101	0	10272437	9333331	10666663
9	938136	3	19	50	1664	1246	1552	11213376	10666664	11999996

Total number of pulses in waveform = 24

## Type 5 Radar Waveform\_12.txt

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	117070	1	17	90	1759	0	0	117070	0	799999
2	685680	3	10	65	1910	1451	1803	804509	800000	1599999
3	928154	1	14	95	1575	0	0	1737827	1600000	2399999
4	988936	1	10	95	1574	0	0	2728338	2400000	3199999
5	1050811	3	6	70	1906	1881	1443	3780723	3200000	3999999
6	951997	2	14	50	1353	1014	0	4737950	4000000	4799999
7	460889	3	9	75	1918	1652	1898	5201206	4800000	5599999
8	978853	2	17	60	1643	1434	0	6185527	5600000	6399999
9	282693	1	7	50	1708	0	0	6471297	6400000	7199999
10	794011	2	5	50	1604	1862	0	7267016	7200000	7999999
11	1217066	2	18	65	1448	1821	0	8487548	8000000	8799999
12	728517	1	13	75	1060	0	0	9219334	8800000	9599999
13	740807	3	11	95	1841	1780	1642	9961201	9600000	10399999
14	719724	2	18	80	1447	1135	0	10686188	10400000	11199999
15	704077	1	13	65	1920	0	0	11392847	11200000	11999999

Total number of pulses in waveform = 28



Type 5 Radar Waveform\_13.txt

Waveform Num = 13  
 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	671073	3	12	95	1288	1699	1156	671073	0	749999
2	119818	3	14	90	1334	1763	1920	795034	750000	1499999
3	924159	3	14	70	1043	1772	1293	1724210	1500000	2249999
4	1064211	2	12	70	1606	1533	0	2792529	2250000	2999999
5	703365	2	20	75	1636	1727	0	3499033	3000000	3749999
6	951495	1	5	95	1556	0	0	4453891	3750000	4499999
7	457476	2	7	90	1824	1308	0	4912923	4500000	5249999
8	434058	2	5	100	1531	1296	0	5350113	5250000	5999999
9	1365791	2	15	70	1709	1371	0	6718731	6000000	6749999
10	185086	1	16	100	1753	0	0	6906897	6750000	7499999
11	1268727	2	9	80	1424	1693	0	8177377	7500000	8249999
12	733776	2	20	65	1675	1049	0	8914270	8250000	8999999
13	444281	2	18	95	1695	1815	0	9361275	9000000	9749999
14	654062	3	11	85	1800	1010	1749	10018847	9750000	10499999
15	768747	1	20	75	1542	0	0	10792153	10500000	11249999
16	1116520	2	11	80	1430	1334	0	11910215	11250000	11999999

Total number of pulses in waveform = 33

Type 5 Radar Waveform\_14.txt

Waveform Num = 14  
 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	1100711	3	17	85	1846	1682	1867	1100711	0	1199999
2	810206	3	19	80	1897	1033	1361	1916312	1200000	2399999
3	539015	3	18	80	1982	1541	1870	2459618	2400000	3599999
4	1712868	2	7	70	1838	1246	0	4177879	3600000	4799999
5	1011999	1	10	55	1813	0	0	5192962	4800000	5999999
6	1965936	2	17	100	1205	1291	0	7160711	6000000	7199999
7	98570	3	13	85	1700	1083	1637	7261777	7200000	8399999
8	1544330	1	7	80	1174	0	0	8810527	8400000	9599999
9	1832827	2	14	60	1942	1475	0	10644528	9600000	10799999
10	818891	3	16	60	1314	1490	1298	11466836	10800000	11999999

Total number of pulses in waveform = 23

## Type 5 Radar Waveform\_15.txt

Waveform Num = 15  
 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	684655	2	7	90	1358	1305	0	684655	0	1333332
2	1383082	2	5	65	1341	1302	0	2070400	1333333	2666665
3	1464109	2	14	50	1208	1131	0	3537152	2666666	3999998
4	1429161	3	15	55	1030	1069	1504	4968652	3999999	5333331
5	864346	3	13	60	1591	1271	1813	5836601	5333332	6666664
6	1149881	1	7	75	1775	0	0	6991157	6666665	7999997
7	1179989	1	9	65	1742	0	0	8172921	7999998	9333330
8	1944036	1	20	65	1400	0	0	10118699	9333331	10666663
9	1256165	2	9	90	1878	1449	0	11376264	10666664	11999996

Total number of pulses in waveform = 17

## Type 5 Radar Waveform\_16.txt

Waveform Num = 17  
 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	39766	3	17	60	1177	1894	1108	39766	0	631578
2	1095341	1	10	70	1524	0	0	1139286	631579	1263157
3	491994	2	18	50	1561	1864	0	1632804	1263158	1894736
4	832155	1	19	60	1277	0	0	2468384	1894737	2526315
5	67461	3	9	50	1332	1716	1852	2537122	2526316	3157894
6	1041674	2	7	60	1257	1908	0	3583696	3157895	3789473
7	822255	2	14	80	1610	1641	0	4409116	3789474	4421052
8	538517	1	7	70	1005	0	0	4950884	4421053	5052631
9	591479	1	8	80	1850	0	0	5543368	5052632	5684210
10	717015	1	8	90	1116	0	0	6262233	5684211	6315789
11	208932	3	7	50	1233	1556	1824	6472281	6315790	6947368
12	751555	2	16	95	1829	1193	0	7228449	6947369	7578947
13	791839	2	15	95	1053	1793	0	8023310	7578948	8210526
14	746605	3	15	70	1616	1892	1932	8772761	8210527	8842105
15	561225	3	13	100	1313	1920	1541	9339426	8842106	9473684
16	432972	2	13	75	1608	1874	0	9777172	9473685	10105263
17	760824	2	17	65	1413	1943	0	10541478	10105264	10736842
18	410924	1	17	55	1176	0	0	10955758	10736843	11368421
19	655760	1	11	95	1668	0	0	11612694	11368422	12000000

Total number of pulses in waveform = 36

## Type 5 Radar Waveform\_17.txt

Waveform Num = 17  
 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	39766	3	17	60	1177	1894	1108	39766	0	631578
2	1095341	1	10	70	1524	0	0	1139286	631579	1263157
3	491994	2	18	50	1561	1864	0	1632804	1263158	1894736
4	832155	1	19	60	1277	0	0	2468384	1894737	2526315
5	67461	3	9	50	1332	1716	1852	2537122	2526316	3157894
6	1041674	2	7	60	1257	1908	0	3583696	3157895	3789473
7	822255	2	14	80	1610	1641	0	4409116	3789474	4421052
8	538517	1	7	70	1005	0	0	4950884	4421053	5052631
9	591479	1	8	80	1850	0	0	5543368	5052632	5684210
10	717015	1	8	90	1116	0	0	6262233	5684211	6315789
11	208932	3	7	50	1233	1556	1824	6472281	6315790	6947368
12	751555	2	16	95	1829	1193	0	7228449	6947369	7578947
13	791839	2	15	95	1053	1793	0	8023310	7578948	8210526
14	746605	3	15	70	1616	1892	1932	8772761	8210527	8842105
15	561225	3	13	100	1313	1920	1541	9339426	8842106	9473684
16	432972	2	13	75	1608	1874	0	9777172	9473685	10105263
17	760824	2	17	65	1413	1943	0	10541478	10105264	10736842
18	410924	1	17	55	1176	0	0	10955758	10736843	11368421
19	655760	1	11	95	1668	0	0	11612694	11368422	12000000

Total number of pulses in waveform = 36

## Type 5 Radar Waveform\_18.txt

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	1022202	3	9	55	1346	1886	1325	1022202	0	1333332
2	1259551	2	10	90	1992	1154	0	2286310	1333333	2666665
3	699158	2	10	55	1696	1990	0	2988614	2666666	3999998
4	1860649	1	9	85	1956	0	0	4852949	3999999	5333331
5	1051055	3	20	55	1383	1967	1010	5905960	5333332	6666664
6	1789843	3	16	90	1298	1198	1199	7700163	6666665	7999997
7	465560	1	12	65	1603	0	0	8169418	7999998	9333330
8	2264469	3	17	50	1896	1885	1453	10435490	9333331	10666663
9	372083	2	18	80	1851	1518	0	10812807	10666664	11999996

Total number of pulses in waveform = 20

Type 5 Radar Waveform\_19.txt

Waveform Num = 19  
 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	937826	1	5	80	1475	0	0	937826	0	999999
	795563									
2	631578	1	8	90	1398	0	0	1734864	1000000	1999999
3	1084624	2	15	60	1509	1562	0	2367840	2000000	2999999
4	1499868	3	8	60	1156	1028	1611	3455535	3000000	3999999
5	652848	2	20	75	1762	1657	0	4959198	4000000	4999999
6	1147266	1	7	60	1273	0	0	5615465	5000000	5999999
7	966612	3	7	70	1190	1736	1686	6764004	6000000	6999999
8	487546	3	16	90	1783	1238	1405	7735228	7000000	7999999
9	882853	3	16	65	1815	1259	1303	8227200	8000000	8999999
10	1429188	3	6	60	1214	1792	1075	9114430	9000000	9999999
11	1020196	2	8	55	1311	1203	0	10547699	10000000	10999999
12		1	12	65	1496	0	0	11570409	11000000	11999999

Total number of pulses in waveform = 25

Type 5 Radar Waveform\_20.txt

Waveform Num = 20  
 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	294818	1	19	85	1520	0	0	294818	0	666666
2	579705	1	10	50	1167	0	0	876043	666667	1333333
3	598564	3	14	100	1959	1252	1117	1475774	1333334	2000000
4	851382	1	16	50	1988	0	0	2331484	2000001	2666667
5	598331	1	7	50	1068	0	0	2931803	2666668	3333334
6	444254	1	10	50	1356	0	0	3377125	3333335	4000001
7	1014334	2	8	55	1665	1176	0	4392815	4000002	4666668
8	545787	3	18	65	1545	1262	1529	4941443	4666669	5333335
9	1046992	3	13	55	1761	1864	1790	5992771	5333336	6000002
10	177518	2	13	85	1678	1085	0	6175704	6000003	6666669
11	818399	3	18	55	1673	1538	1976	6996866	6666670	7333336
12	957601	2	16	95	1122	1503	0	7959654	7333337	8000003
13	477209	2	17	100	1183	1939	0	8439488	8000004	8666670
14	347877	3	10	85	1845	1332	1221	8790487	8666671	9333337
15	603721	1	20	60	1615	0	0	9398606	9333338	10000004
16	871000	3	18	100	1543	1564	1295	10271221	10000005	10666671
17	434358	1	8	95	1396	0	0	10709981	10666672	11333338
18	783467	3	11	55	1905	1825	1222	11494844	11333339	12000005

Total number of pulses in waveform = 36

## Type 5 Radar Waveform\_21.txt

Waveform Num = 21  
 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	396816	1	14	80	1533	0	0	396816	0	666666
2	867259	1	18	65	1170	0	0	1265608	666667	1333333
3	511546	3	13	65	1368	1183	1155	1778324	1333334	2000000
4	304506	3	16	75	1968	1318	1011	2086536	2000001	2666667
5	639687	3	10	60	1343	1225	1501	2730520	2666668	3333334
6	1001483	2	13	85	1250	1775	0	3736072	3333335	4000001
7	680872	3	8	70	1572	1768	1129	4419969	4000002	4666668
8	605778	1	5	80	1515	0	0	5030216	4666669	5333335
9	427886	1	17	75	1316	0	0	5459617	5333336	6000002
10	599625	2	12	55	1670	1534	0	6060558	6000003	6666669
11	899146	2	8	55	1276	1710	0	6962908	6666670	7333336
12	900132	1	19	55	1254	0	0	7866026	7333337	8000003
13	422850	3	16	85	1422	1656	1266	8290130	8000004	8666670
14	973777	1	5	60	1525	0	0	9268251	8666671	9333337
15	472395	2	11	55	1365	1810	0	9742171	9333338	10000004
16	406902	3	6	75	1293	1504	1466	10152248	10000005	10666671
17	708649	3	5	100	1513	1617	1130	10865160	10666672	11333338
18	546652	1	12	100	1984	0	0	11416072	11333339	12000005

Total number of pulses in waveform = 36

## Type 5 Radar Waveform\_22.txt

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	488022	3	16	90	1501	1753	1041	488022	0	666666
2	258764	3	18	55	1577	1266	1340	751081	666667	1333333
3	1176159	2	12	85	1545	1272	0	1931423	1333334	2000000
4	79286	3	10	95	1534	1745	1047	2013526	2000001	2666667
5	862412	2	14	75	1901	1159	0	2880264	2666668	3333334
6	734499	2	19	50	1325	1567	0	3617823	3333335	4000001
7	411643	1	19	90	1309	0	0	4032358	4000002	4666668
8	1102730	1	17	50	1870	0	0	5136397	4666669	5333335
9	212445	3	15	95	1865	1413	1491	5350712	5333336	6000002
10	871605	1	9	80	1705	0	0	6227086	6000003	6666669
11	1102559	1	6	95	1961	0	0	7331350	6666670	7333336
12	163265	3	9	55	1738	1433	1456	7496576	7333337	8000003
13	1008321	3	10	50	1267	1211	1587	8509524	8000004	8666670
14	596332	2	5	50	1832	1987	0	9109921	8666671	9333337
15	826838	3	12	60	1587	1251	1159	9940578	9333338	10000004
16	117081	2	8	65	1907	1875	0	10061656	10000005	10666671
17	922076	1	16	80	1657	0	0	10987514	10666672	11333338
18	758174	1	13	55	1153	0	0	11747345	11333339	12000005

Total number of pulses in waveform = 37

Type 5 Radar Waveform\_23.txt

Waveform Num = 23  
 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	384441	2	13	75	1487	1314	0	384441	0	705881
2	994320	2	7	55	1836	1535	0	1381562	705882	1411763
3	382391	1	19	50	1684	0	0	1767324	1411764	2117645
4	1016736	2	11	65	1788	1077	0	2785744	2117646	2823527
5	162594	1	18	85	1025	0	0	2951203	2823528	3529409
6	1110812	2	10	50	1782	1963	0	4063040	3529410	4235291
7	337807	1	7	55	1468	0	0	4404592	4235292	4941173
8	966215	3	17	75	1177	1482	1394	5372275	4941174	5647055
9	853631	3	17	80	1177	1854	1477	6229959	5647056	6352937
10	541313	2	18	90	1865	1228	0	6775780	6352938	7058819
11	694484	1	9	60	1902	0	0	7473357	7058820	7764701
12	531616	2	11	80	1092	1441	0	8006875	7764702	8470583
13	616501	2	13	65	1388	1163	0	8625909	8470584	9176465
14	1219606	1	17	65	1494	0	0	9848066	9176466	9882347
15	221803	2	9	50	1885	1212	0	10071363	9882348	10588229
16	754455	3	16	80	1975	1729	1736	10828915	10588230	11294111
17	503743	1	20	80	1470	0	0	11338098	11294112	11999993

Total number of pulses in waveform = 31

Type 5 Radar Waveform\_24.txt

Waveform Num = 24  
 Num of Bursts = 20  
 Burst Interval (us)= 6000000

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	496385	2	16	65	1313	1549	0	496385	0	5999999
2	267358	1	19	55	1529	0	0	766605	6000000	11999999
3	706106	2	16	90	1635	1263	0	1474240	12000000	17999999
4	543768	2	10	50	1346	1274	0	2020906	18000000	23999999
5	422817	3	15	65	1456	1113	1725	2446343	24000000	29999999
6	834045	2	13	95	1934	1740	0	3284682	30000000	35999999
7	644662	2	17	60	1451	1763	0	3933018	36000000	41999999
8	750650	1	18	55	1260	0	0	4686882	42000000	47999999
9	283359	3	10	100	1939	1989	1626	4971501	48000000	53999999
10	868798	3	10	55	1999	1044	1559	5845853	54000000	59999999
11	323158	3	10	80	1857	1073	1727	6173613	60000000	65999999
12	1013950	3	5	70	1630	1807	1688	7192220	66000000	71999999
13	285411	2	14	100	1740	1437	0	7482756	72000000	77999999
14	607505	3	7	65	1910	1540	1703	8093438	78000000	83999999
15	693285	3	19	55	1678	1003	1323	8791876	84000000	89999999
16	375769	1	14	70	1404	0	0	9171649	90000000	95999999
17	545837	2	12	75	1462	1139	0	9718890	96000000	101999999
18	919332	3	11	75	1509	1070	1062	10640823	102000000	107999999
19	327566	3	6	80	1604	1811	1831	10972030	108000000	113999999
20	959030	1	10	100	1000	0	0	11936306	114000000	119999999

Total number of pulses in waveform = 45

Type 5 Radar Waveform\_25.txt

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	73894	2	14	95	1376	1052	0	73894	0	631578
2	610247	1	11	60	1133	0	0	686569	631579	1263157
3	968454	3	9	100	1780	1547	1837	1656156	1263158	1894736
4	749610	3	17	50	1561	1835	1382	2410930	1894737	2526315
5	618600	3	8	60	1594	1661	1698	3034308	2526316	3157894
6	407172	3	10	55	1815	1959	1736	3446433	3157895	3789473
7	717808	1	7	85	1317	0	0	4169751	3789474	4421052
8	309073	2	12	80	1169	1659	0	4480141	4421053	5052631
9	1123031	3	17	100	1207	1508	1530	5606000	5052632	5684210
10	425188	1	17	100	1970	0	0	6035433	5684211	6315789
11	573001	3	10	85	1295	1234	1134	6610404	6315790	6947368
12	686066	3	13	55	1989	1778	1188	7300133	6947369	7578947
13	470455	3	11	65	1310	1173	1730	7775543	7578948	8210526
14	667677	3	6	80	1317	1517	1673	8447433	8210527	8842105
15	571552	2	16	85	1668	1775	0	9023492	8842106	9473684
16	961633	2	11	100	1618	1740	0	9988568	9473685	10105263
17	513318	3	12	70	1436	1606	1131	10505244	10105264	10736842
18	584310	1	11	90	1038	0	0	11093727	10736843	11368421
19	351570	2	5	80	1144	1671	0	11446335	11368422	12000000

Total number of pulses in waveform = 44

Type 5 Radar Waveform\_26.txt

Waveform Num = 26  
 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	724752	2	16	65	1303	1561	0	724752	0	799999
2	406843	2	9	90	1794	1303	0	1134459	800000	1599999
3	590398	2	9	75	1057	1512	0	1727954	1600000	2399999
4	1038265	1	16	95	1055	0	0	2768788	2400000	3199999
5	996878	3	8	55	1363	1946	1881	3766721	3200000	3999999
6	390952	1	17	60	1175	0	0	4162863	4000000	4799999
7	911642	1	5	60	1448	0	0	5075680	4800000	5599999
8	887372	2	10	95	1884	1515	0	5964500	5600000	6399999
9	625288	1	7	80	1894	0	0	6593187	6400000	7199999
10	1226892	2	18	80	1873	1323	0	7821973	7200000	7999999
11	919866	3	7	70	1041	1842	1019	8745035	8000000	8799999
12	463306	1	15	55	1919	0	0	9212243	8800000	9599999
13	968550	2	12	80	1669	1574	0	10182712	9600000	10399999
14	327251	3	9	70	1472	1048	1530	10513206	10400000	11199999
15	823792	1	8	80	1969	0	0	11341048	11200000	11999999

Total number of pulses in waveform = 27



Type 5 Radar Waveform\_27.txt

Waveform Num = 27  
 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	694694	2	5	95	1927	1164	0	694694	0	705881
2	106831	2	12	95	1923	1792	0	804616	705882	1411763
3	1294217	2	6	70	1556	1847	0	2102548	1411764	2117645
4	276829	1	12	50	1851	0	0	2382780	2117646	2823527
5	834117	1	13	100	1497	0	0	3218748	2823528	3529409
6	697710	2	12	80	1321	1271	0	3917955	3529410	4235291
7	656300	1	16	80	1374	0	0	4576847	4235292	4941173
8	828008	2	17	95	1798	1257	0	5406229	4941174	5647055
9	293913	2	10	80	1882	1122	0	5703197	5647056	6352937
10	1074165	1	13	60	1844	0	0	6780366	6352938	7058819
11	708806	3	17	85	1263	1660	1491	7491016	7058820	7764701
12	478801	1	7	65	1581	0	0	7974231	7764702	8470583
13	768218	3	11	80	1332	1467	1777	8744030	8470584	9176465
14	451079	3	15	100	1760	1508	1744	9199685	9176466	9882347
15	917986	3	8	100	1085	1269	1561	10122683	9882348	10588229
16	681295	2	11	80	1129	1671	0	10807893	10588230	11294111
17	602805	2	15	70	1551	1959	0	11413498	11294112	11999933

Total number of pulses in waveform = 33

Type 5 Radar Waveform\_28.txt

Waveform Num = 28  
 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	922236	1	15	60	1863	0	0	922236	0	1499999
2	1882964	2	16	50	1715	1513	0	2807063	1500000	2999999
3	750675	3	18	80	1374	1630	1608	3560966	3000000	4499999
4	1512998	1	20	85	1878	0	0	5078576	4500000	5999999
5	1462521	2	15	100	1465	1327	0	6542975	6000000	7499999
6	1825628	1	11	85	1999	0	0	8371395	7500000	8999999
7	1450035	2	15	70	1693	1631	0	9823429	9000000	10499999
8	993794	1	14	65	1343	0	0	10820547	10500000	11999999

Total number of pulses in waveform = 13



Type 5 Radar Waveform\_29.txt

Waveform Num = 29  
 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	145724	3	13	55	1504	1677	1659	145724	0	999999
2	938064	2	5	50	1832	1415	0	1088628	1000000	1999999
3	1227877	2	20	80	1018	1910	0	2319752	2000000	2999999
4	1096615	1	14	85	1954	0	0	3419295	3000000	3999999
5	1290127	3	11	70	1271	1737	1891	4711376	4000000	4999999
6	974486	2	12	60	1780	1642	0	5690761	5000000	5999999
7	1018701	1	5	60	1192	0	0	6712884	6000000	6999999
8	960646	2	14	75	1350	1342	0	7674722	7000000	7999999
9	889175	1	18	60	1204	0	0	8566589	8000000	8999999
10	851730	1	20	60	1298	0	0	9419523	9000000	9999999
11	619316	1	11	70	1473	0	0	10040137	10000000	10999999
12	1895995	2	15	80	1545	1787	0	11937605	11000000	11999999

Total number of pulses in waveform = 21

Type 5 Radar Waveform\_30.txt

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	370442	2	12	85	1847	1700	0	370442	0	1199999
2	977738	2	5	70	1824	1327	0	1351727	1200000	2399999
3	1759364	3	6	50	1955	1668	1285	3114242	2400000	3599999
4	1341744	3	12	85	1089	1172	1351	4460894	3600000	4799999
5	366842	2	20	75	1997	1961	0	4831348	4800000	5999999
6	1740367	3	9	80	1892	1168	1095	6575673	6000000	7199999
7	1026477	2	18	95	1135	1815	0	7606305	7200000	8399999
8	1625046	1	12	90	1250	0	0	9234301	8400000	9599999
9	785927	3	11	80	1247	1087	1509	10021478	9600000	10799999
10	1631290	3	13	55	1727	1820	1611	11656611	10800000	11999999

Total number of pulses in waveform = 24

Type 6 Radar Waveform\_1.txt

Hop number	Frequency (MHz)	Pulse Start (ms)
22	5284	66
34	5293	102
35	5270	105
42	5308	126
53	5326	159
54	5299	162
57	5298	171
58	5309	174
73	5300	219
75	5278	225
86	5281	258
96	5288	288

Type 6 Radar Waveform\_2.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
0	5314	0
5	5290	15
9	5317	27
21	5308	63
24	5295	72
33	5298	99
43	5311	129
44	5323	132
46	5328	138
52	5324	156
86	5310	258
98	5275	294

Type 6 Radar Waveform\_3.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
18	5294	54
23	5303	69
27	5316	81
36	5274	108
44	5282	132
45	5300	135
48	5328	144
53	5291	159
85	5287	255

Type 6 Radar Waveform\_4.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
20	5326	60
24	5278	72
29	5319	87
35	5328	105
36	5277	108
42	5304	126
52	5313	156
55	5320	165
65	5293	195
69	5276	207
76	5284	228
90	5305	270
93	5300	279

Type 6 Radar Waveform\_5.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
7	5321	21
9	5302	27
15	5277	45
18	5287	54
26	5297	78
27	5275	81
33	5329	99
36	5314	108
37	5317	111
42	5304	126
45	5301	135
50	5309	150
58	5283	174
64	5298	192
65	5323	195
67	5316	201

Type 6 Radar Waveform\_6.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
20	5280	60
22	5315	66
29	5304	87
37	5305	111
43	5319	129
47	5288	141
48	5306	144
49	5297	147
61	5307	183
65	5292	195

Type 6 Radar Waveform\_7.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
12	5297	36
25	5326	75
28	5307	84
29	5316	87
30	5279	90
39	5282	117
52	5294	156
54	5283	162
56	5301	168
59	5319	177
63	5320	189
64	5330	192
66	5305	198
74	5273	222
76	5270	228
89	5277	267
98	5317	294

Type 6 Radar Waveform\_8.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
15	5287	45
25	5326	75
35	5275	105
36	5273	108
61	5313	183
63	5318	189
69	5303	207
71	5312	213
78	5297	234
86	5293	258
96	5323	288
99	5327	297

Type 6 Radar Waveform\_9.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
11	5323	33
14	5326	42
18	5311	54
21	5314	63
37	5315	111
52	5276	156
53	5304	159
54	5272	162
55	5318	165
77	5285	231
91	5329	273

Type 6 Radar Waveform\_10.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
20	5280	60
35	5316	105
50	5293	150
61	5290	183
80	5299	240
84	5278	252
92	5297	276
95	5288	285

Type 6 Radar Waveform\_11.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
1	5292	3
22	5318	66
42	5276	126
48	5270	144
54	5279	162
61	5313	183
66	5309	198
69	5321	207
73	5278	219
83	5324	249
85	5327	255
90	5287	270
91	5297	273

Type 6 Radar Waveform\_12.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
5	5318	15
10	5309	30
16	5298	48
19	5276	57
27	5326	81
30	5301	90
40	5282	120
47	5277	141
52	5284	156
54	5299	162
56	5303	168
68	5295	204
87	5286	261
90	5288	270
92	5305	276
93	5319	279
99	5275	297

Type 6 Radar Waveform\_13.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
2	5283	6
8	5289	24
9	5298	27
24	5278	72
28	5280	84
29	5310	87
31	5305	93
37	5309	111
54	5299	162
60	5272	180
66	5270	198
72	5323	216
73	5284	219
82	5282	246
84	5301	252
98	5279	294

Type 6 Radar Waveform\_14.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
14	5329	42
15	5295	45
17	5314	51
18	5310	54
23	5330	69
27	5291	81
37	5271	111
41	5327	123
44	5293	132
46	5275	138
50	5326	150
51	5303	153
75	5289	225
89	5284	267



Type 6 Radar Waveform\_15.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
9	5283	27
11	5276	33
12	5328	36
13	5284	39
21	5312	63
22	5323	66
24	5322	72
26	5292	78
34	5293	102
43	5325	129
46	5274	138
50	5313	150
54	5309	162
65	5296	195
76	5315	228
91	5279	273

Type 6 Radar Waveform\_16.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
12	5306	36
19	5326	57
30	5304	90
37	5312	111
39	5319	117
44	5318	132
45	5285	135
74	5316	222

Type 6 Radar Waveform\_17.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
7	5290	21
10	5330	30
23	5300	69
35	5319	105
37	5270	111
41	5272	123
53	5275	159
78	5295	234
79	5284	237
80	5293	240
88	5323	264
89	5329	267
92	5299	276
95	5302	285

Type 6 Radar Waveform\_18.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
13	5309	39
35	5314	105
53	5307	159
54	5324	162
68	5286	204
78	5278	234
80	5313	240
87	5282	261
98	5302	294
99	5277	297

Type 6 Radar Waveform\_19.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
2	5285	6
10	5318	30
23	5329	69
29	5297	87
33	5286	99
48	5293	144
54	5280	162
58	5302	174
59	5277	177
78	5324	234

Type 6 Radar Waveform\_20.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
16	5318	48
20	5291	60
29	5322	87
35	5294	105
37	5325	111
42	5329	126
61	5319	183
66	5326	198
76	5284	228
77	5277	231
78	5285	234
82	5316	246
85	5273	255
87	5288	261
92	5312	276
97	5323	291

Type 6 Radar Waveform\_21.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
2	5294	6
14	5270	42
20	5306	60
24	5330	72
31	5317	93
34	5297	102
37	5318	111
45	5324	135
49	5305	147
66	5303	198
80	5310	240
84	5283	252
87	5273	261
92	5329	276
94	5282	282
95	5304	285
97	5313	291
98	5274	294

Type 6 Radar Waveform\_22.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
2	5272	6
8	5314	34
11	5283	33
13	5286	39
38	5290	114
42	5315	126
63	5302	189
79	5309	237
87	5307	261
95	5291	285

Type 6 Radar Waveform\_23.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
2	5301	6
4	5295	12
16	5280	48
17	5270	51
18	5285	54
22	5299	66
28	5276	84
36	5314	108
39	5298	117
49	5300	147
52	5279	156
56	5283	168
57	5310	171
63	5304	189
66	5286	198
70	5290	210
73	5307	219
82	5320	246
83	5289	249
89	5329	267
94	5302	282

Type 6 Radar Waveform\_24.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
6	5288	18
10	5286	30
13	5292	39
17	5296	51
29	5318	87
40	5324	120
48	5281	144
50	5302	150
80	5274	240
88	5298	264

Type 6 Radar Waveform\_25.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
1	5288	3
27	5275	81
32	5309	96
40	5273	120
43	5302	129
45	5319	135
50	5284	150
54	5299	162
58	5296	174
62	5281	186
63	5298	189
78	5330	234
86	5325	258
97	5272	291
99	5297	297

Type 6 Radar Waveform\_26.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
7	5309	21
11	5329	33
36	5313	108
37	5275	111
40	5298	120
47	5326	141
49	5310	147
52	5299	156
72	5312	216
77	5282	231
82	5292	246
90	5297	270
92	5295	276

Type 6 Radar Waveform\_27.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
17	5280	51
26	5311	78
33	5294	99
41	5284	123
44	5292	132
48	5328	144
56	5301	168
73	5296	219
77	5281	231
82	5302	246
84	5282	252
97	5307	291

Type 6 Radar Waveform\_28.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
5	5316	15
9	5277	27
11	5278	33
18	5282	54
27	5294	81
30	5295	90
62	5329	186
63	5276	189
68	5274	204
92	5285	276
96	5327	288

Type 6 Radar Waveform\_29.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
6	5317	18
19	5280	57
23	5303	69
27	5298	81
36	5302	108
44	5271	132
50	5328	150
56	5281	168
58	5276	174
70	5315	210
71	5275	213
85	5288	255
88	5316	264
93	5324	279

Type 6 Radar Waveform\_30.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
2	5313	6
12	5275	36
26	5290	78
38	5305	114
52	5301	156
66	5303	198
69	5315	207
76	5320	228
78	5280	234
84	5329	252
87	5272	261
93	5293	279