Dynamic Frequency Selection (DFS) Test Report

FCC Part15 Subpart E

Product Name	：	Wireless LAN Access Point
Model No.	：	H3C WA2612-AGN, WL-607
FCC ID	：	O9C-WL607
Applicant	：	Hangzhou H3C Technologies Co., Ltd.
Address	：	310 Liuhe Road, Zhijiang Science Park, Hangzhou 310053, P.R.China

Date of Receipt	：	2009/09/16
Issued Date	：	2009/11/23
Report No.	：	09BS090R-RF-FCC-DFS
Report Version	：	V1.0

DFS Test Report

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Applicant	:	Hangzhou H3C Technologies Co., Ltd.
Address	:	310 Liuhe Road, Zhijiang Science Park, Hangzhou 310053, P.R.China
Model No.	:	H3C WA2612-AGN, WL-607
EUT Voltage	:	48Vdc, 180mA (POE Input)
Trade Name	:	H3C, 3Com
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart E: 2008 FCC OET Order 06-96A (2006) Industry Canada RSS-210 Issue 7
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 (5250~5350MHz, 5470~5725MHz)	:	☒ Master device ☐ Slaver device with radar detection function ☐ Slaver device without radar detection function

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(Marlin Chen)

Approved By : Gene Chang
(Gene Chang)

Content

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1. UNII Device Information

1. The wireless LAN access point H3C WA2612-AGN operates in the following bands:
   a. 2412~2462MHz
   b. 5180~5240MHz
   c. 5260~5320MHz
   d. 5500~5700MHz
   e. 5745~5825MHz

2. The maximum mean EIRP of the device for 5GHz band is 23.88dBm, and the minimum possible mean EIRP is -1dBm.

3. The device installed with 3*Tx and 3*Rx antenna delivery. Antenna corresponding gains are 8dBi for 5GHz. 0dBi gain was used to set the -63dBm threshold level (-64dBm +1 dB) during calibration of the test setup
   Antenna information shown below:
   Manufacturer: Airgain
   Mode number: N2480-100C

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 1 minute 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 and 5470~5725 MHz bands, the Master device provides, on aggregate, uniform loading of the spectrum across all devices by selecting an operating channel among the available channels using a random algorithm.

9. The Master can not operate in 5600~5650 MHz band in USA and Canada.

2. Test Equipment

Dynamic Frequency Selection (DFS) / AC-6

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer	Agilent	N9020A	MY49100159	2009-05-06
Vector Signal Generator	Agilent	E4438C	102168	2009-04-26

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 / Burst_Count) microseconds. Each interval contains one Burst. The start time for the Burst, relative to the beginning of the interval, is between 1 and [(12,000,000 / Burst_Count) – (Total Burst Length) + (One Random PRI Interval)] microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each Burst is chosen 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.

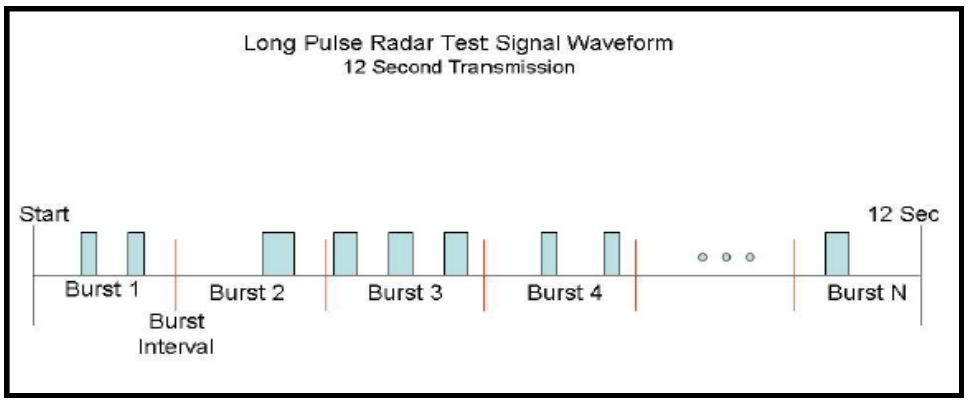
3) Burst 1 has 2 randomly generated pulses.

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

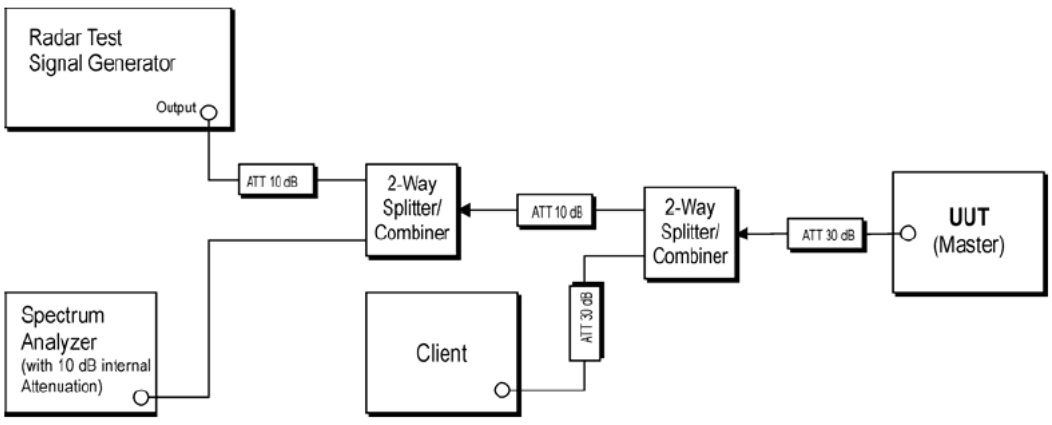
The sections below contain block diagrams that focus on the Radar Waveform injection path for each of the different conducted setups to be used. Each setup consists of a signal generator, analyzer (spectrum analyzer or vector signal analyzer), Master Device, Client Device, plus power combiner/splitters 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

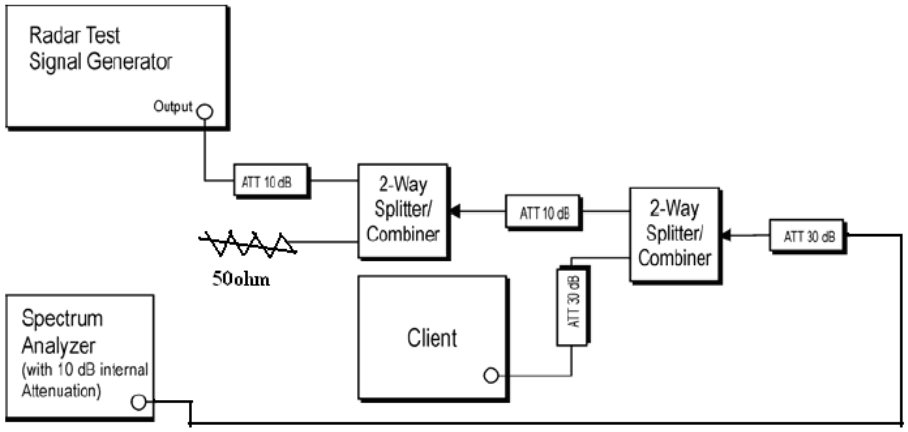


6. Radar Waveform Calibration

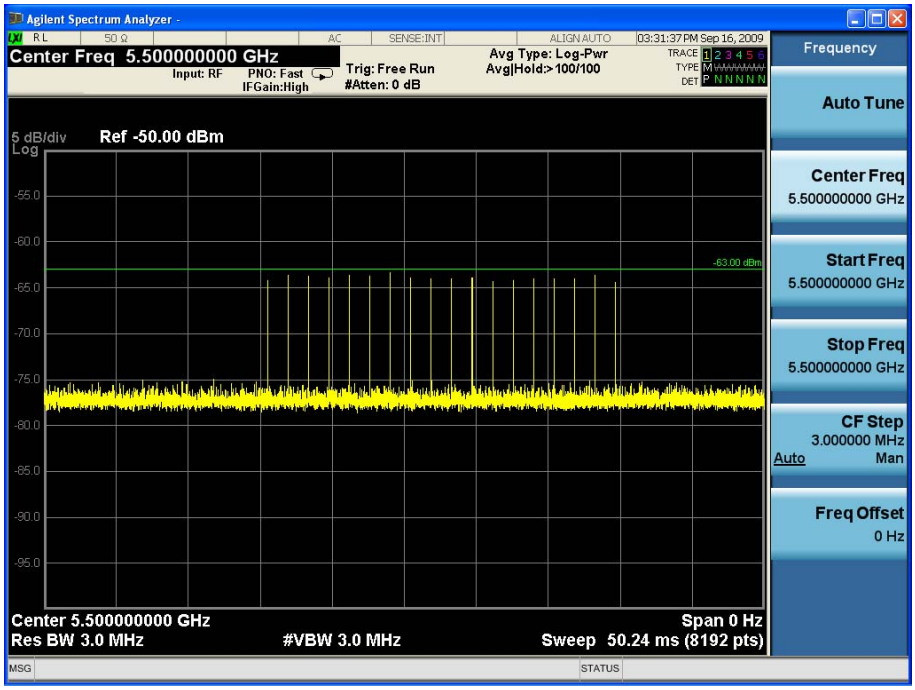
The following equipment setup was used to calibrate the conducted radar waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process there were no transmissions by either the master or client device. The spectrum analyzer was switched to the zero 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.

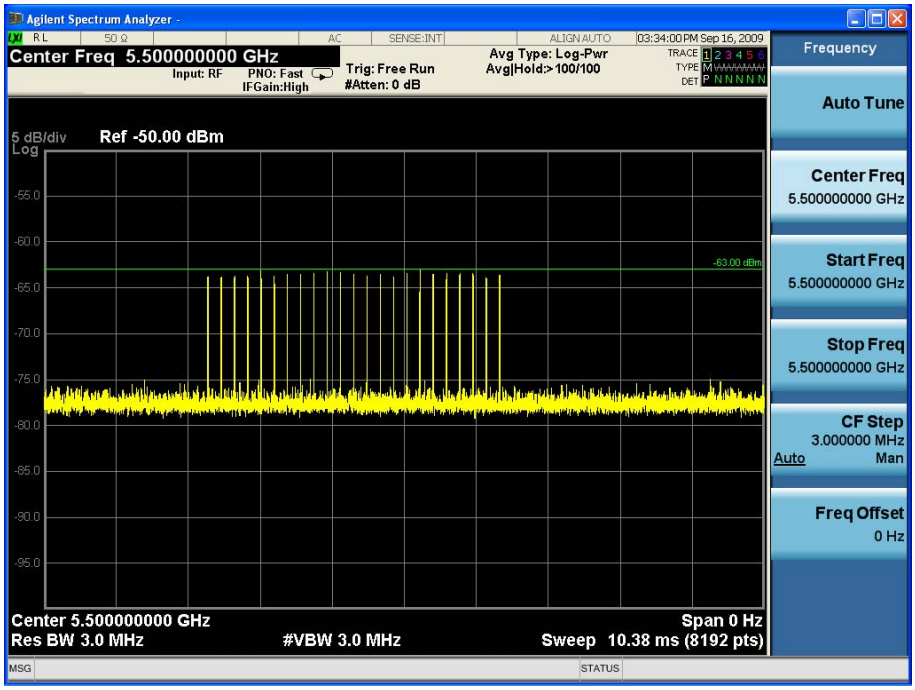
Figure 2: Conducted Calibration Setup



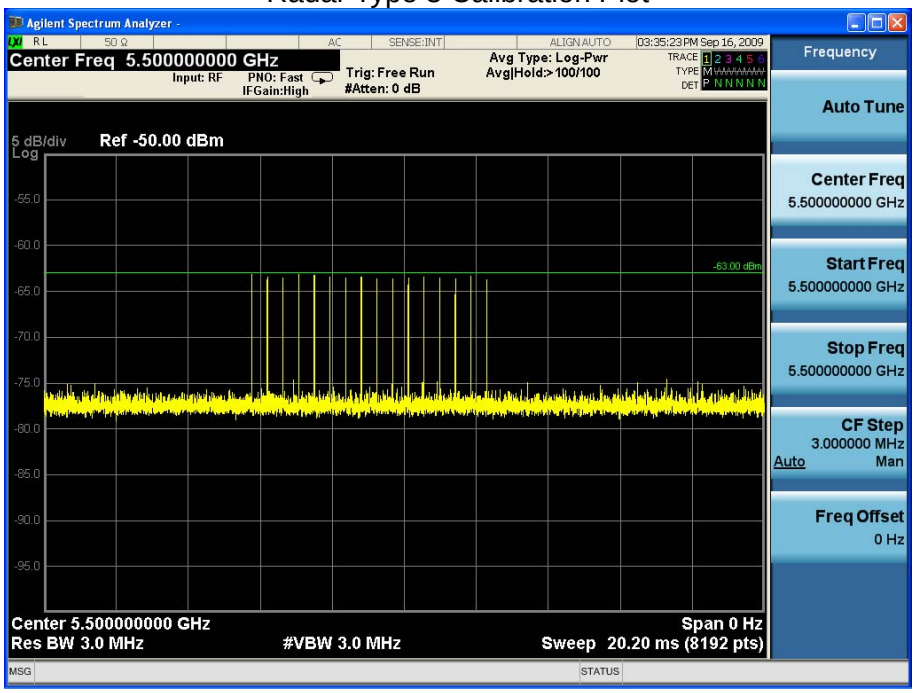
Radar Type 1 Calibration Plot



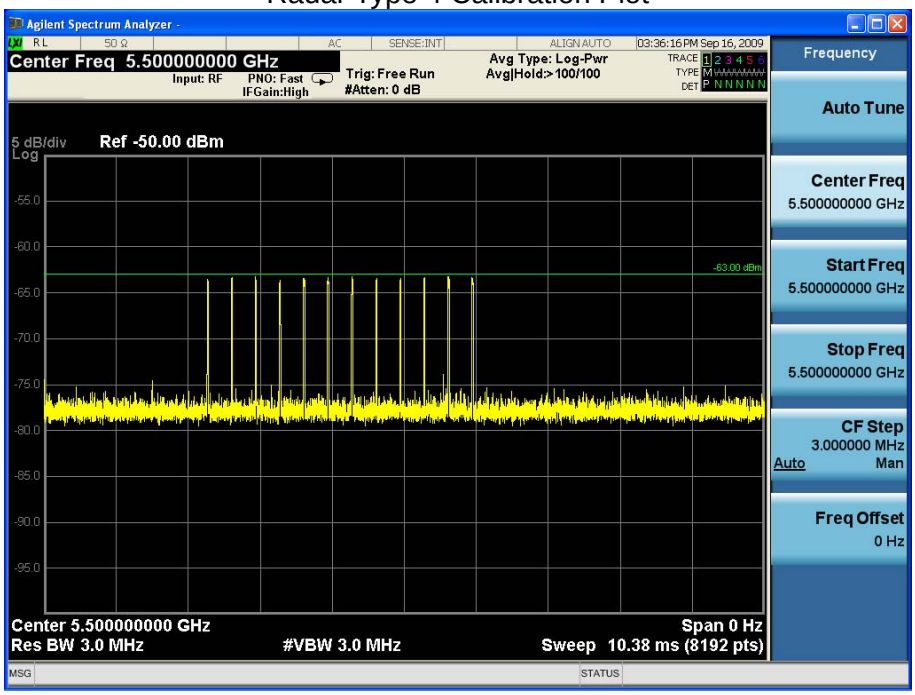
Radar Type 2 Calibration Plot



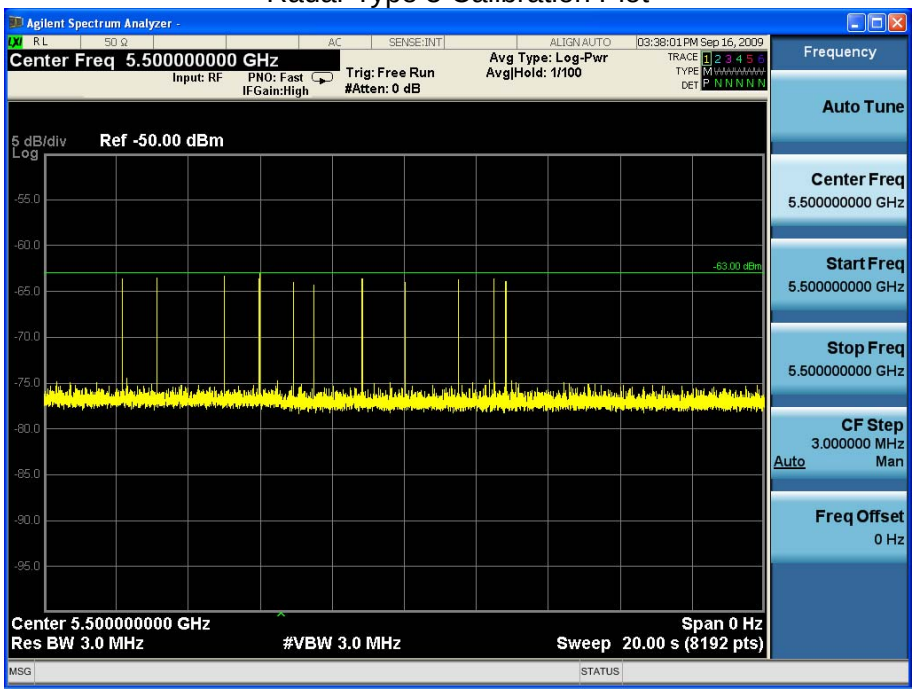
Radar Type 3 Calibration Plot



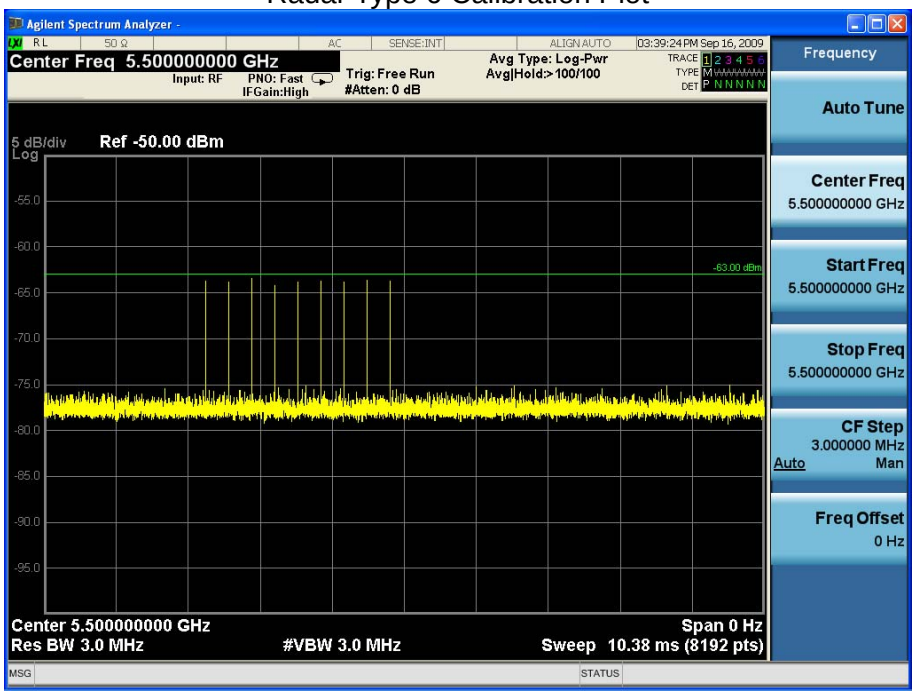
Radar Type 4 Calibration Plot



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.

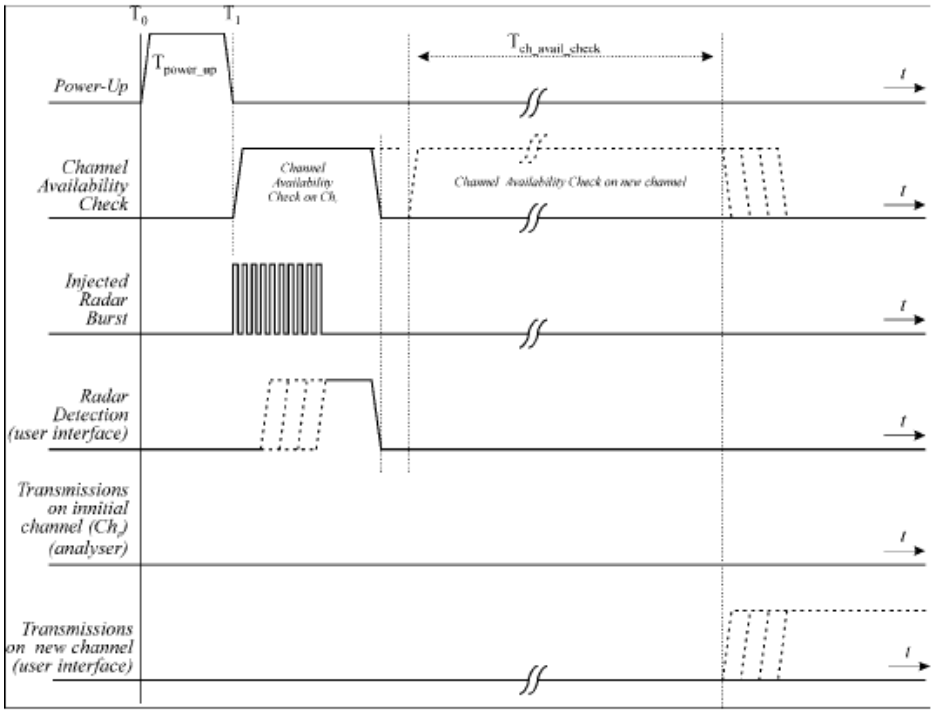
a) The Radar Waveform generator and UUT are connected using the applicable test setup described in the sections on configuration for Conducted Tests (7.2) or Radiated Tests (7.3) and the power of the UUT is switched off.

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

c) A single Burst of one of the Short Pulse Radar Types 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.

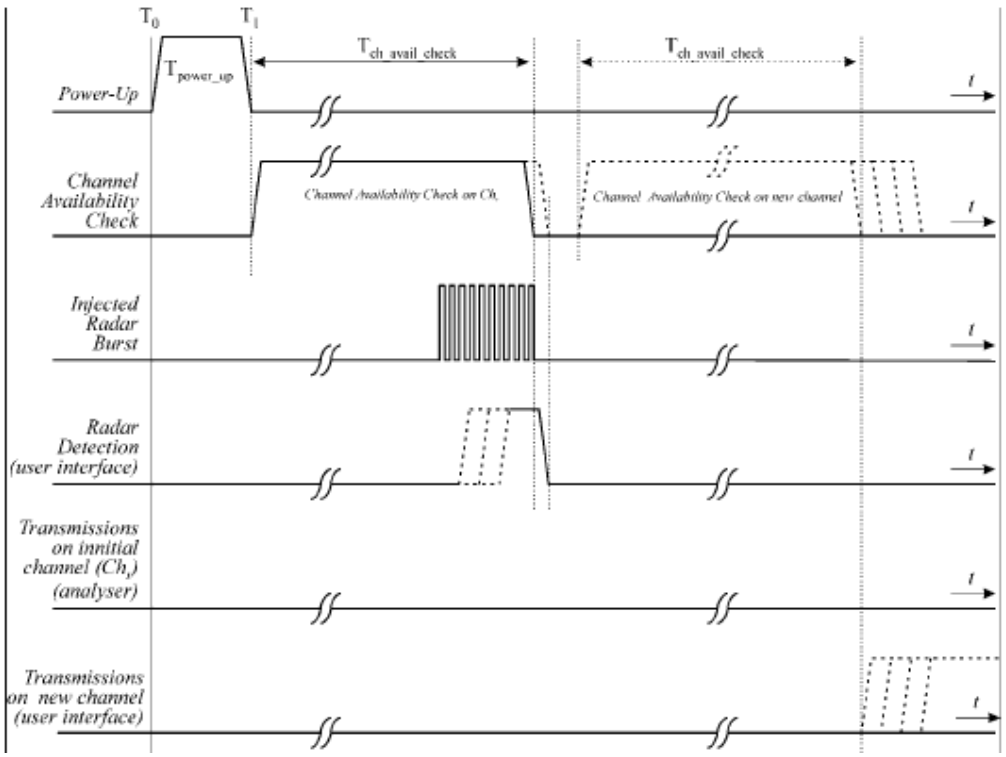
a) The Radar Waveform generator and UUT are connected using the applicable test setup described in the sections for Conducted Tests (7.2) or Radiated Tests (7.3) and the power of the UUT is switched off.

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

c) A single Burst of one of the Short Pulse Radar Types 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.

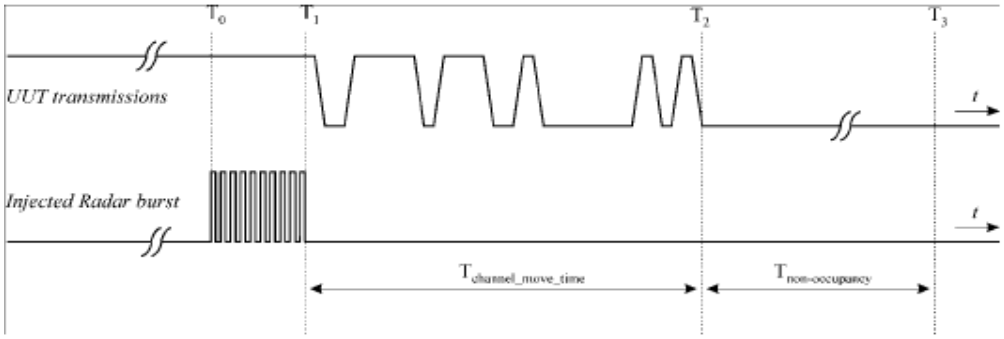
c) Stream the MPEG test file from the Master Device to the Client Device on the test Channel for the entire period of the test.

d) At time T0 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 T2 to verify that the UUT does not resume any transmissions on this Channel. Perform this test once and record the measurement result.

g) In case the UUT is 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 = 5500MHz											
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, Blank= No Detection)										
	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5489											0%
5490 Fl	1	1	1	1	1	1	1	1	1	1	100%
5491	1	1	1	1	1	1	1	1	1	1	100%
5492	1	1	1	1	1	1	1	1	1	1	100%
5493	1	1	1	1	1	1	1	1	1	1	100%
5494	1	1	1	1	1	1	1	1	1	1	100%
5495	1	1	1	1	1	1	1	1	1	1	100%
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 Fh	1	1	1	1	1	1	1	1	1	1	100%
5510	1	1		1	1	1		1	1	1	80%
20 MHz Detection Bandwidth = Fh-Fl = 5509MHz - 5490MHz = 19MHz											
EUT 99% Bandwidth = 16.6MHz											
16.6MHz × 80% = 13.3MHz											

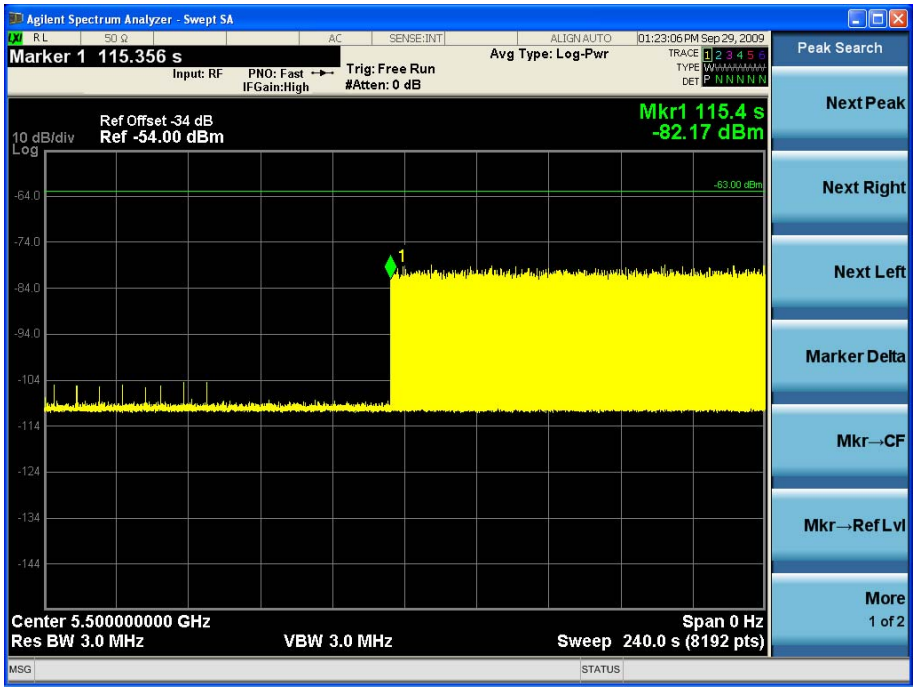
40 MHz Signal Bandwidth											
EUT Frequency = 5510MHz											
Radar Frequency (MHz)	DFS Detection Trials (1=Detection, Blank= No Detection)										
	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5489											0%
5490 Fl	1	1	1	1	1	1	1	1	1	1	100%
5491	1	1	1	1	1	1	1	1	1	1	100%
5492	1	1	1	1	1	1	1	1	1	1	100%
5493	1	1	1	1	1	1	1	1	1	1	100%
5494	1	1	1	1	1	1	1	1	1	1	100%
5495	1	1	1	1	1	1	1	1	1	1	100%
5496	1	1	1	1	1	1	1	1	1	1	100%
5497	1	1	1	1	1	1	1	1	1	1	100%
5498	1	1	1	1	1	1	1	1	1	1	100%
5499	1	1	1	1	1	1	1	1	1	1	100%
5500	1	1	1	1	1	1	1	1	1	1	100%
5501	1	1	1	1	1	1	1	1	1	1	100%
5502	1	1	1	1	1	1	1	1	1	1	100%
5503	1	1	1	1	1	1	1	1	1	1	100%
5504	1	1	1	1	1	1	1	1	1	1	100%
5505	1	1	1	1	1	1	1	1	1	1	100%
5506	1	1	1	1	1	1	1	1	1	1	100%
5507	1	1	1	1	1	1	1	1	1	1	100%
5508	1	1	1	1	1	1	1	1	1	1	100%
5509	1	1	1	1	1	1	1	1	1	1	100%
5510	1	1	1	1	1	1	1	1	1	1	100%
5511	1	1	1	1	1	1	1	1	1	1	100%
5512	1	1	1	1	1	1	1	1	1	1	100%
5513	1	1	1	1	1	1	1	1	1	1	100%
5514	1	1	1	1	1	1	1	1	1	1	100%
5515	1	1	1	1	1	1	1	1	1	1	100%
5516	1	1	1	1	1	1	1	1	1	1	100%
5517	1	1	1	1	1	1	1	1	1	1	100%
5518	1	1	1	1	1	1	1	1	1	1	100%
5519	1	1	1	1	1	1	1	1	1	1	100%
5520	1	1	1	1	1	1	1	1	1	1	100%
5521	1	1	1	1	1	1	1	1	1	1	100%

5522	1	1	1	1	1	1	1	1	1	1	100%
5523	1	1	1	1	1	1	1	1	1	1	100%
5524	1	1	1	1	1	1	1	1	1	1	100%
5525	1	1	1	1	1	1	1	1	1	1	100%
5526	1	1	1	1	1	1	1	1	1	1	100%
5527	1	1	1	1	1	1	1	1	1	1	100%
5528	1	1	1	1	1	1	1	1	1	1	100%
5529	1	1	1	1	1	1	1	1	1	1	100%
5530 Fh	1	1	1	1	1	1	1	1	1	1	100%
5531											0%
40 MHz Detection Bandwidth = Fh - Fl = 5530MHz - 5490MHz = 40MHz											
EUT 99% Bandwidth = 36.5MHz											
36.5MHz × 80% = 29.0MHz											

8.2. Channel Available Check

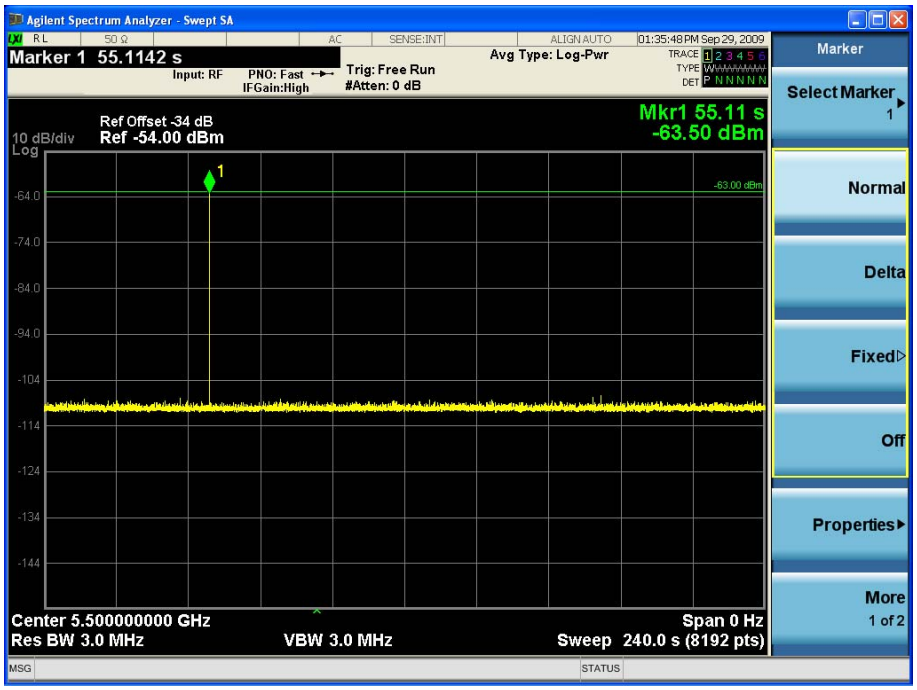
The following results reflect both 20 MHz and 40 MHz Channel Bandwidth operation.

Initial Channel Availability Check Time



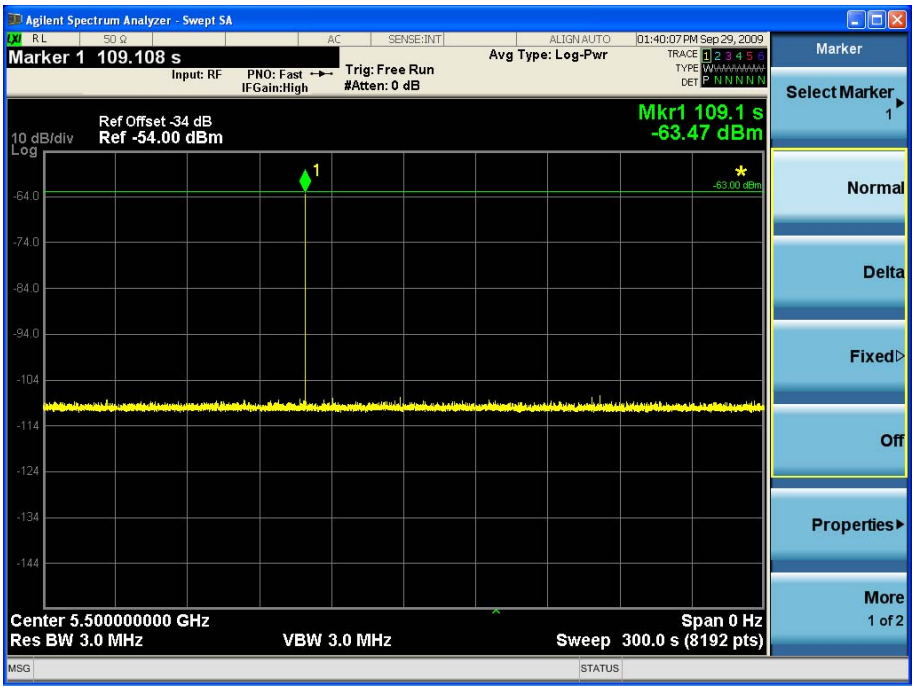
8.2.1. Test result with a radar burst at the beginning of the Channel Availability Check Time

Channel 100 5500MHz



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

Channel 100 5500MHz



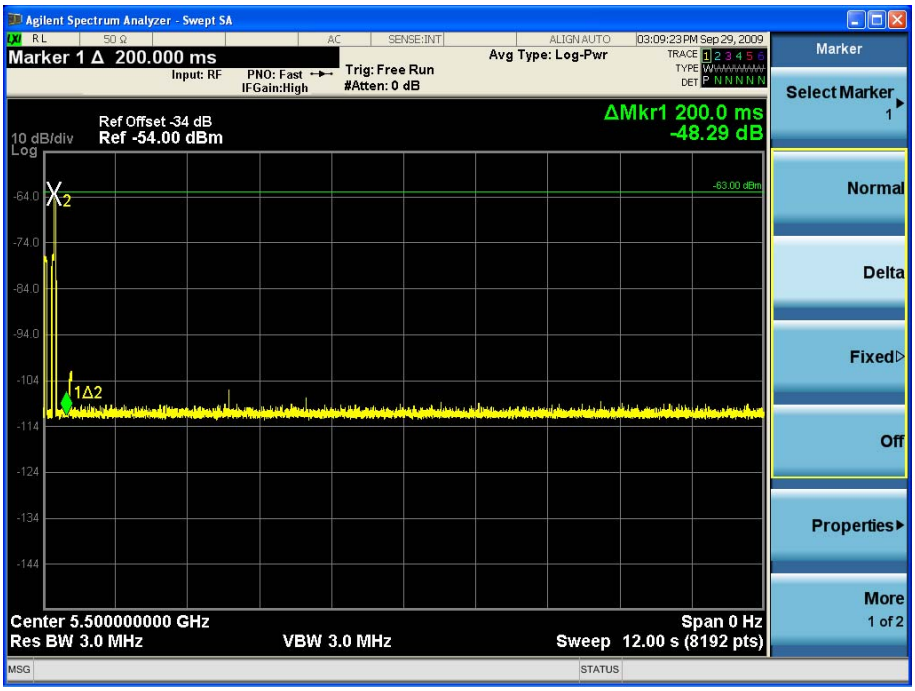
Test Item	Limit	Results
Channel Availability Check Time	60 s	Pass

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

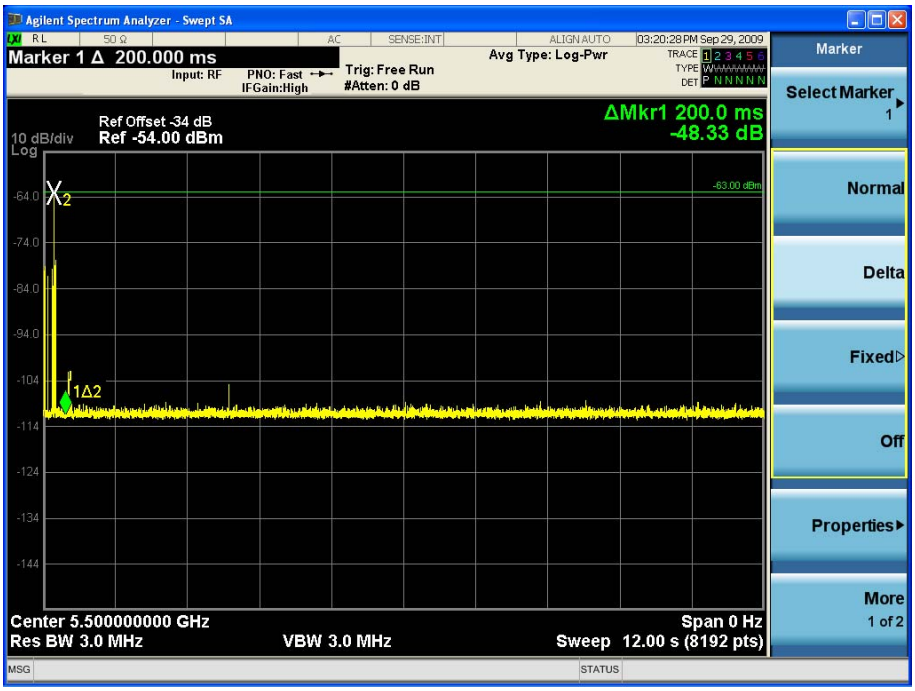
The following results reflect both 20 MHz and 40 MHz Channel Bandwidth operation.

8.3.1. Channel Move Time and Closing Transmission Time

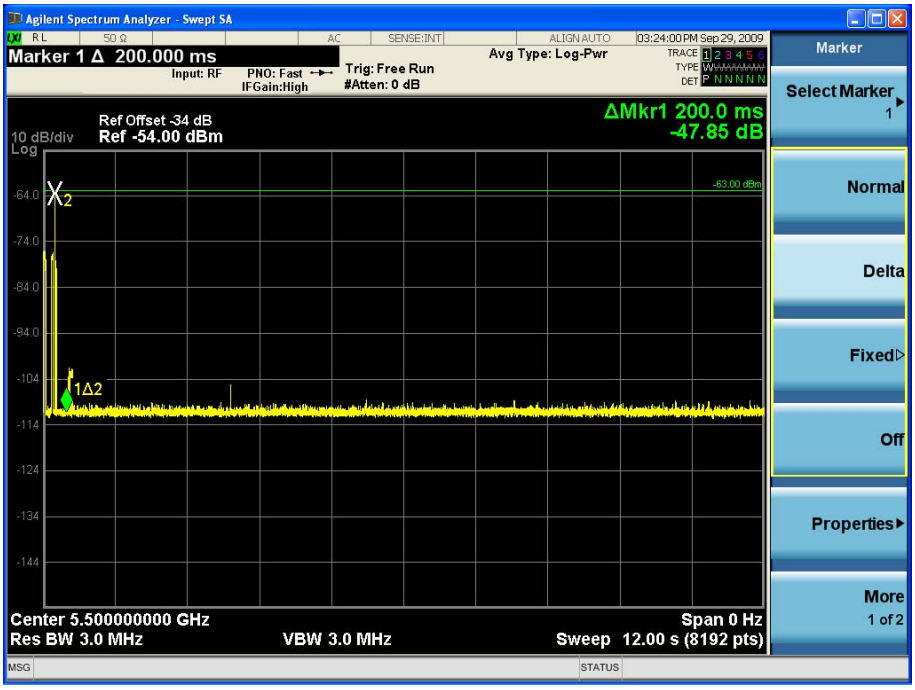
Channel Move Time, Channel Closing Transmission Time for Type 1 radar



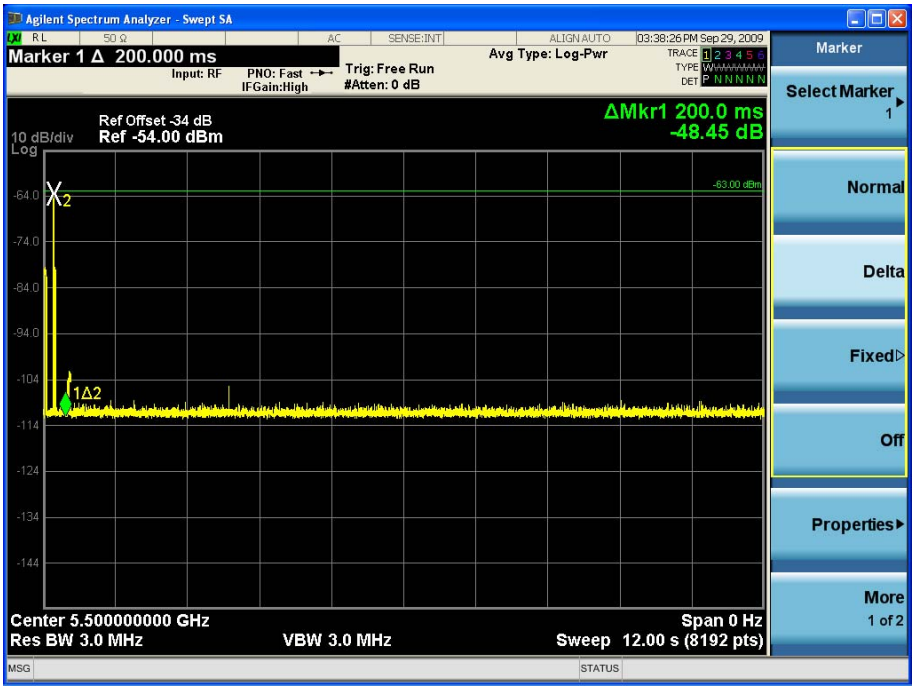
Channel Move Time, Channel Closing Transmission Time for Type 2 radar



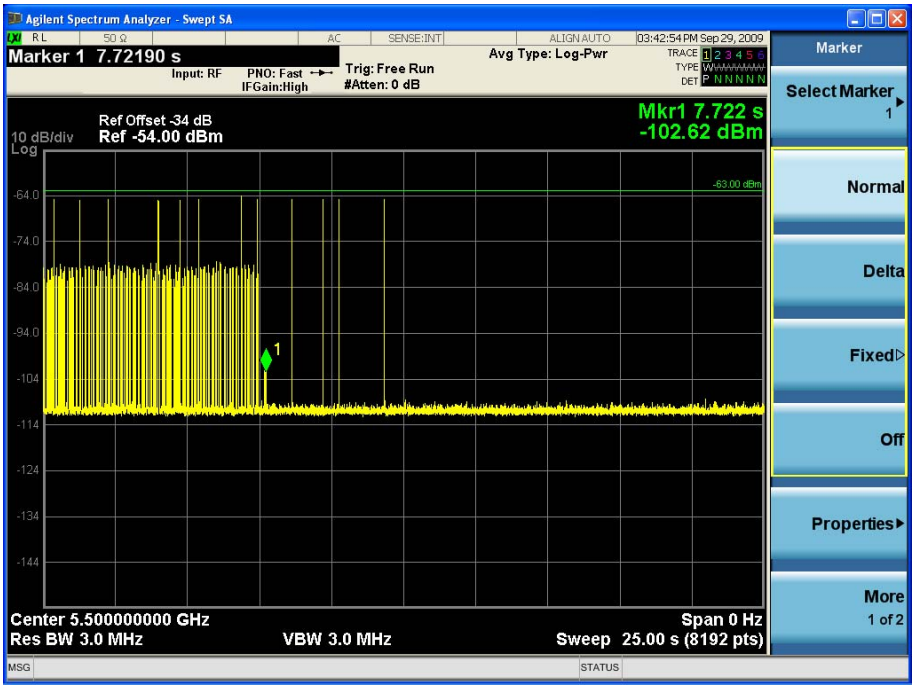
Channel Move Time, Channel Closing Transmission Time for Type 3 radar



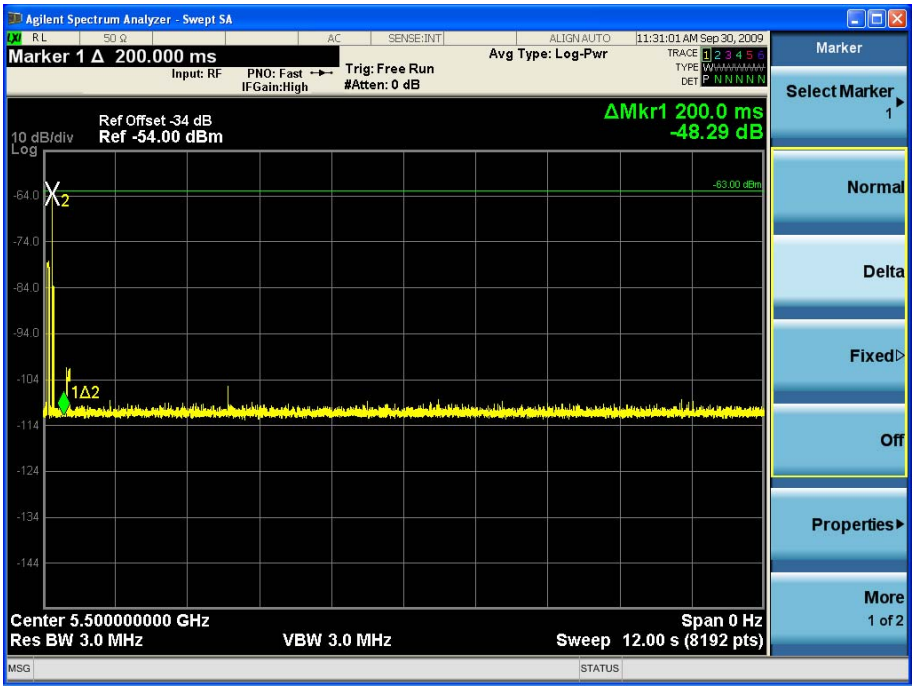
Channel Move Time, Channel Closing Transmission Time for Type 4 radar



Channel Move Time, Channel Closing Transmission Time for Type 5 radar



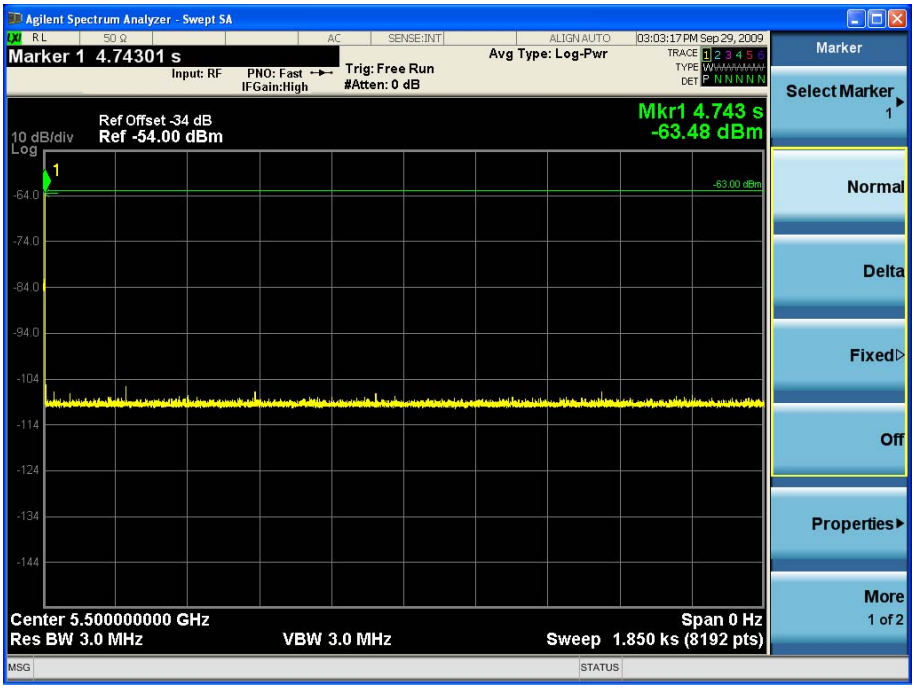
Channel Move Time, Channel Closing Transmission Time for Type 6 radar



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 5500 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 (-63dBm).

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	1.2	214	28	1
2	3.6	194	29	1
3	3.9	205	29	1
4	1.7	152	24	1
5	4.4	158	28	1
6	1.8	204	23	1
7	2.6	175	28	1
8	2.4	166	25	1
9	1.5	219	24	1
10	1.2	190	23	1
11	4.9	156	29	1
12	1.7	190	29	1
13	4.3	158	26	1
14	1.5	191	24	1
15	2.2	180	28	1
16	4.9	151	26	1
17	1.7	170	29	1
18	4.9	209	24	1
19	3.6	185	29	1
20	4.6	153	24	1
21	1.7	215	24	1
22	5.0	156	26	1
23	4.9	184	26	1
24	3.2	197	24	1
25	1.1	164	26	1
26	2.9	218	29	1
27	3.7	200	23	1
28	2.6	155	29	1
29	4.4	156	23	1
30	1.0	185	28	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	8.8	445	16	1
2	5.2	366	16	1
3	7.3	291	18	1
4	5.4	428	16	1
5	6.2	423	16	1
6	9.3	302	16	1
7	5.8	354	18	1
8	8.7	383	16	1
9	7.4	419	18	1
10	6.5	466	18	1
11	8.8	278	16	1
12	8.1	439	17	1
13	9.2	453	17	1
14	7.6	432	17	1
15	8.2	498	18	1
16	7.6	320	16	1
17	7.8	378	18	1
18	8.3	279	17	1
19	9.5	375	16	1
20	5.7	475	16	1
21	6.0	408	18	1
22	7.2	500	18	1
23	6.8	292	17	1
24	8.2	301	16	1
25	6.4	255	16	1
26	6.8	315	16	1
27	5.9	500	17	1
28	5.5	282	18	1
29	9.0	420	18	1
30	8.5	355	18	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	17.8	353	16	1
2	13.4	355	16	1
3	15.0	300	12	1
4	19.8	495	15	1
5	18.5	448	15	1
6	13.3	292	12	1
7	13.4	495	14	1
8	17.6	316	15	1
9	11.5	328	15	1
10	12.1	271	14	1
11	19.7	323	16	1
12	14.7	385	13	1
13	11.6	318	14	1
14	13.6	446	15	1
15	12.6	475	13	1
16	12.1	341	14	1
17	14.9	431	15	1
18	17.2	471	15	1
19	13.2	447	12	1
20	13.5	262	13	1
21	15.6	442	13	1
22	11.9	481	16	1
23	11.9	385	16	1
24	19.0	380	15	1
25	14.5	345	15	1
26	18.0	291	13	1
27	10.8	498	14	1
28	19.4	314	12	1
29	13.1	287	15	1
30	19.5	280	14	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 = 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(u
	394750									
1		2	10	50	1082	1763	0	394750	0	799999
	505869									
2		3	20	85	1895	1930	1064	903464	800000	1599999
	1201577									
3		3	6	85	1863	1905	1068	2109930	1600000	2399999
	434555									
4		3	13	100	1689	1765	1280	2549321	2400000	3199999
	1121130									
5		1	19	65	1528	0	0	3675185	3200000	3999999
	1065785									
6		3	11	85	1581	1740	1151	4742498	4000000	4799999
	203676									
7		2	10	80	1095	1139	0	4950646	4800000	5599999
	1192552									
8		3	16	60	1375	1546	1599	6145432	5600000	6399999
	658673									
9		3	10	65	1947	1742	1094	6808625	6400000	7199999
	686747									
10		3	15	70	1637	1748	1910	7500155	7200000	7999999
	760999									
11		3	20	60	1528	1290	1948	8266449	8000000	8799999
	866148									
12		2	13	80	1422	1631	0	9137363	8800000	9599999
	605692									
13		3	20	55	1527	1784	1930	9746108	9600000	10399999
	1119773									
14		1	14	95	1741	0	0	10871122	10400000	11199999
	680883									
15		2	15	95	1515	1842	0	11553746	11200000	11999999

Total number of pulses in waveform = 37

Type 5 Radar Waveform_2.txt

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)
	525275									
1		3	7	70	1108	1474	1625	525275	0	857142
	906921									
2		3	16	75	1048	1339	1535	1436403	857143	1714285
	953265									
3		1	20	55	1590	0	0	2393590	1714286	2571428
	634780									
4		3	19	65	1630	1607	1449	3029960	2571429	3428571
	736168									
5		2	18	80	1128	1336	0	3770814	3428572	4285714
	1317378									
6		3	14	60	1824	1315	1141	5090656	4285715	5142857
	172436									
7		1	12	80	1746	0	0	5267372	5142858	6000000
	1164681									
8		2	7	80	1005	1272	0	6433799	6000001	6857143
	596814									
9		3	19	100	1253	1265	1193	7032890	6857144	7714286
	941970									
10		3	16	75	1531	1439	1718	7978571	7714287	8571429
	1057807									
11		3	18	55	1852	1466	1982	9041066	8571430	9428572
	1231675									
12		3	8	100	1087	1273	1582	10278041	9428573	10285715
	485249									
13		3	6	75	1322	1539	1681	10767232	10285716	11142858
	556289									
14		3	5	85	1431	1737	1579	11328063	11142859	12000001

Total number of pulses in waveform = 36

Type 5 Radar Waveform_3.txt

Waveform Num = 3
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)
	760170									
1		2	16	95	1532	1305	0	760170	0	999999
	368851									
2		2	15	95	1084	1477	0	1131858	1000000	1999999
	1661925									
3		2	5	80	1101	1069	0	2796344	2000000	2999999
	1052753									
4		1	7	100	1397	0	0	3851267	3000000	3999999
	150698									
5		3	18	55	1681	1687	1450	4003362	4000000	4999999
	1285948									
6		1	12	95	1772	0	0	5294128	5000000	5999999
	1652503									
7		2	9	90	1434	1597	0	6948403	6000000	6999999
	313490									
8		2	8	80	1205	1033	0	7264924	7000000	7999999
	1212592									
9		1	19	90	1027	0	0	8479754	8000000	8999999
	1290830									
10		1	15	65	1820	0	0	9771611	9000000	9999999
	547739									
11		2	11	90	1285	1905	0	10321170	10000000	10999999
	1479495									
12		3	12	50	1356	1939	1354	11803855	11000000	11999999

Total number of pulses in waveform = 22

Type 5 Radar Waveform_4.txt

Waveform Num = 4
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)
	564915									
1		2	6	85	1739	1913	0	564915	0	999999
	679115									
2		1	15	95	1222	0	0	1247682	1000000	1999999
	1434587									
3		1	14	50	1730	0	0	2683491	2000000	2999999
	688866									
4		3	10	60	1668	1540	1441	3374087	3000000	3999999
	1006251									
5		1	6	80	1581	0	0	4384987	4000000	4999999
	761594									
6		3	12	65	1129	1266	1681	5148162	5000000	5999999
	1135298									
7		1	7	75	1762	0	0	6287536	6000000	6999999
	754507									
8		2	18	65	1930	1463	0	7043805	7000000	7999999
	1489726									
9		3	17	75	1781	1630	1257	8536924	8000000	8999999
	503688									
10		1	8	100	1772	0	0	9045280	9000000	9999999
	1465735									
11		3	16	90	1902	1638	1875	10512787	10000000	10999999
	1163945									
12		2	7	100	1889	1032	0	11682147	11000000	11999999

Total number of pulses in waveform = 23

Type 5 Radar Waveform_5.txt

Waveform Num = 5
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)
	346899									
1		2	19	100	1709	1597	0	346899	0	1499999
	2068123									
2		2	5	90	1471	1702	0	2418328	1500000	2999999
	1093352									
3		3	15	60	1175	1942	1718	3514853	3000000	4499999
	2350984									
4		1	19	60	1430	0	0	5870672	4500000	5999999
	1321214									
5		1	10	70	1926	0	0	7193316	6000000	7499999
	1559894									
6		2	8	95	1079	1763	0	8755136	7500000	8999999
	1535980									
7		3	15	60	1260	1311	1296	10293958	9000000	10499999
	1323759									
8		3	15	100	1319	1608	1797	11621584	10500000	11999999

Total number of pulses in waveform = 17

Type 5 Radar Waveform_6.txt

Waveform Num = 6
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)
	559532									
1		1	8	90	1617	0	0	559532	0	631578
	275728									
2		3	18	90	1264	1700	1177	836877	631579	1263157
	781428									
3		1	12	70	1519	0	0	1622446	1263158	1894736
	517804									
4		2	9	65	1176	1087	0	2141769	1894737	2526315
	385954									
5		1	9	85	1036	0	0	2529986	2526316	3157894
	656564									
6		2	7	70	1069	1983	0	3187586	3157895	3789473
	1136762									
7		1	5	55	1691	0	0	4327400	3789474	4421052
	380427									
8		1	10	50	1325	0	0	4709518	4421053	5052631
	692871									
9		1	19	75	1503	0	0	5403714	5052632	5684210
	735844									
10		3	5	80	1504	1820	1056	6141061	5684211	6315789
	536254									
11		3	5	95	1093	1165	1489	6681695	6315790	6947368
	860519									
12		1	15	70	1067	0	0	7545961	6947369	7578947
	594055									
13		1	17	50	1045	0	0	8141083	7578948	8210526
	548416									
14		1	19	80	1401	0	0	8690544	8210527	8842105
	177495									
15		3	7	90	1493	1378	1488	8869440	8842106	9473684
	1088447									
16		1	7	55	1495	0	0	9962246	9473685	10105263
	507612									
17		2	17	60	1943	1646	0	10471353	10105264	10736842
	807044									
18		3	11	75	1705	1786	1760	11281986	10736843	11368421
	111105									
19		2	13	80	1792	1951	0	11398342	11368422	12000000

Total number of pulses in waveform = 33

Type 5 Radar Waveform_7.txt

Waveform Num = 7
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	26808	2	16	95	1280	1939	0	26808	0	705881
2	1058404	3	8	90	1733	1208	1223	1088431	705882	1411763
3	971617	2	12	85	1595	1308	0	2064212	1411764	2117645
4	428502	1	13	95	1254	0	0	2495617	2117646	2823527
5	531558	3	15	95	1295	1430	1453	3028429	2823528	3529409
6	706254	2	12	90	1287	1896	0	3738861	3529410	4235291
7	939027	2	15	95	1383	1091	0	4681071	4235292	4941173
8	613201	2	11	60	1603	1345	0	5296746	4941174	5647055
9	429357	3	17	90	1669	1017	1257	5729051	5647056	6352937
10	1322187	2	12	80	1785	1105	0	7055181	6352938	7058819
11	281637	3	16	70	1374	1419	1680	7339708	7058820	7764701
12	917865	3	17	60	1122	1289	1792	8262046	7764702	8470583
13	702601	2	6	50	1228	1030	0	8968850	8470584	9176465
14	674740	2	13	75	1337	1019	0	9645848	9176466	9882347
15	465073	1	12	95	1842	0	0	10113277	9882348	10588229
16	668131	1	5	95	1619	0	0	10783250	10588230	11294111
17	793277	3	15	55	1302	1203	1879	11578146	11294112	11999993

Total number of pulses in waveform = 37

Type 5 Radar Waveform_8.txt

Waveform Num = 8
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	1160855	3	10	50	1525	1237	1166	1160855	0	1333332
2	1271312	1	5	75	1004	0	0	2436095	1333333	2666665
3	588587	2	6	75	1573	1774	0	3025686	2666666	3999998
4	2122306	1	8	95	1897	0	0	5151339	3999999	5333331
5	1323090	3	8	50	1853	1381	1421	6476326	5333332	6666664
6	706484	2	10	70	1257	1498	0	7187465	6666665	7999997
7	2050680	1	13	75	1263	0	0	9240900	7999998	9333330
8	866633	2	8	75	1502	1067	0	10108796	9333331	10666663
9	1633997	2	10	95	1155	1611	0	11745362	10666664	11999996

Total number of pulses in waveform = 17

Type 5 Radar Waveform_9.txt

Waveform Num = 9
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)
	48936									
1		3	20	90	1453	1977	1254	48936	0	705881
	990559									
2		1	8	55	1665	0	0	1044179	705882	1411763
	1030372									
3		3	5	90	1657	1296	1253	2076216	1411764	2117645
	38305									
4		2	6	60	1319	1939	0	2118727	2117646	2823527
	1186517									
5		3	16	95	1838	1497	1359	3308502	2823528	3529409
	614844									
6		2	20	85	1903	1083	0	3928040	3529410	4235291
	573805									
7		1	10	65	1189	0	0	4504831	4235292	4941173
	832746									
8		1	19	85	1541	0	0	5338766	4941174	5647055
	789079									
9		3	11	55	1341	1965	1335	6129386	5647056	6352937
	468162									
10		3	9	85	1112	1598	1159	6602189	6352938	7058819
	470418									
11		1	8	95	1916	0	0	7076476	7058820	7764701
	1007256									
12		1	20	90	1847	0	0	8085648	7764702	8470583
	391043									
13		1	12	80	1369	0	0	8478538	8470584	9176465
	920312									
14		1	20	95	1343	0	0	9400219	9176466	9882347
	549838									
15		1	19	80	1522	0	0	9951400	9882348	10588229
	676635									
16		2	12	100	1847	1512	0	10629557	10588230	11294111
	877680									
17		3	20	95	1917	1556	1542	11510596	11294112	11999993

Total number of pulses in waveform = 32

Type 5 Radar Waveform_10.txt

Waveform Num = 10
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)
	336792									
1		1	8	70	1049	0	0	336792	0	631578
	584338									
2		3	11	80	1749	1404	1150	922179	631579	1263157
	483938									
3		3	6	90	1087	1109	1934	1410420	1263158	1894736
	849501									
4		3	7	75	1795	1480	1662	2264051	1894737	2526315
	294059									
5		3	16	50	1059	1562	1346	2563047	2526316	3157894
	867749									
6		3	17	75	1485	1627	1946	3434763	3157895	3789473
	714221									
7		2	16	60	1114	1086	0	4154042	3789474	4421052
	846012									
8		1	7	70	1567	0	0	5002254	4421053	5052631
	239623									
9		3	19	65	1985	1052	1518	5243444	5052632	5684210
	990426									
10		3	9	95	1729	1735	1282	6238425	5684211	6315789
	255361									
11		2	15	90	1024	1760	0	6498532	6315790	6947368
	527630									
12		1	5	55	1294	0	0	7028946	6947369	7578947
	994743									
13		2	18	95	1687	1581	0	8024983	7578948	8210526
	492579									
14		1	7	85	1431	0	0	8520830	8210527	8842105
	632279									
15		3	16	60	1566	1869	1635	9154540	8842106	9473684
	900370									
16		3	14	90	1240	1501	1332	10059980	9473685	10105263
	534676									
17		1	12	85	1531	0	0	10598729	10105264	10736842
	743615									
18		3	19	95	1532	1317	1562	11343875	10736843	11368421
	239682									
19		2	20	95	1178	1519	0	11587968	11368422	12000000

Total number of pulses in waveform = 43

Type 5 Radar Waveform_11.txt

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)
	844236									
1		3	11	80	1384	1927	1110	844236	0	1499999
	666944									
2		3	18	65	1999	1375	1207	1515601	1500000	2999999
	2091627									
3		1	18	70	1889	0	0	3611809	3000000	4499999
	954597									
4		2	19	75	1994	1534	0	4568295	4500000	5999999
	2545239									
5		1	14	60	1578	0	0	7117062	6000000	7499999
	751854									
6		2	15	55	1120	1446	0	7870494	7500000	8999999
	2068122									
7		2	9	50	1608	1047	0	9941182	9000000	10499999
	1851395									
8		2	6	55	1676	1635	0	11795232	10500000	11999999

Total number of pulses in waveform = 16

Type 5 Radar Waveform_12.txt

Waveform Num = 12
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)
	917097									
1		2	15	90	1588	1880	0	917097	0	923076
	702912									
2		2	6	80	1206	1638	0	1623477	923077	1846153
	1076769									
3		1	9	55	1286	0	0	2703090	1846154	2769230
	258224									
4		1	15	85	1600	0	0	2962600	2769231	3692307
	881229									
5		2	16	90	1976	1916	0	3845429	3692308	4615384
	1015282									
6		2	8	90	1649	1702	0	4864603	4615385	5538461
	1109876									
7		1	6	95	1316	0	0	5977830	5538462	6461538
	730179									
8		2	7	70	1548	1571	0	6709325	6461539	7384615
	1504883									
9		1	12	55	1818	0	0	8217327	7384616	8307692
	293893									
10		1	12	65	1571	0	0	8513038	8307693	9230769
	1062684									
11		3	5	50	1837	1071	1674	9577293	9230770	10153846
	985516									
12		2	17	80	1258	1529	0	10567391	10153847	11076923
	809672									
13		3	12	65	1947	1764	1716	11379850	11076924	12000000

Total number of pulses in waveform = 23

Type 5 Radar Waveform_13.txt

Waveform Num = 13
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	543109	3	11	55	1346	1737	1783	543109	0	799999
2	673466	3	7	70	1541	1510	1450	1221441	800000	1599999
3	421673	1	5	100	1020	0	0	1647615	1600000	2399999
4	916386	1	11	70	1889	0	0	2565021	2400000	3199999
5	1128570	3	11	50	1773	1679	1796	3695480	3200000	3999999
6	680538	2	17	70	1861	1443	0	4381266	4000000	4799999
7	1000139	2	20	50	1022	1720	0	5384709	4800000	5599999
8	381843	1	18	90	1270	0	0	5769294	5600000	6399999
9	883991	3	14	95	1128	1159	1209	6654555	6400000	7199999
10	1087006	1	11	100	1207	0	0	7745057	7200000	7999999
11	684979	2	7	90	1409	1307	0	8431243	8000000	8799999
12	430596	3	10	100	1077	1646	1373	8864555	8800000	9599999
13	1308671	3	7	85	1971	1143	1904	10177322	9600000	10399999
14	805618	1	16	65	1572	0	0	10987958	10400000	11199999
15	413929	3	18	100	1419	1146	1603	11403459	11200000	11999999

Total number of pulses in waveform = 32

Type 5 Radar Waveform_14.txt

Waveform Num = 14
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	262208	3	19	75	1903	1500	1632	262208	0	666666
2	567329	3	19	70	1601	1962	1391	834572	666667	1333333
3	861855	1	7	65	1809	0	0	1701381	1333334	2000000
4	531458	1	19	55	1878	0	0	2234648	2000001	2666667
5	748238	1	5	55	1119	0	0	2984764	2666668	3333334
6	867653	1	5	75	1688	0	0	3853536	3333335	4000001
7	225749	2	8	80	1938	1554	0	4080973	4000002	4666668
8	1122112	2	9	90	1923	1189	0	5206577	4666669	5333335
9	603965	2	11	95	1607	1074	0	5813654	5333336	6000002
10	498530	1	19	95	1888	0	0	6314865	6000003	6666669
11	842897	1	15	85	1529	0	0	7159650	6666670	7333336
12	737970	3	17	55	1333	1948	1947	7899149	7333337	8000003
13	641574	1	11	85	1860	0	0	8545951	8000004	8666670
14	403801	1	5	90	1335	0	0	8951612	8666671	9333337
15	1006562	3	7	60	1277	1615	1879	9959509	9333338	10000004
16	296395	1	16	100	1667	0	0	10260675	10000005	10666671
17	1027768	3	10	50	1471	1813	1709	11290110	10666672	11333338
18	443808	2	15	60	1032	1163	0	11738911	11333339	12000005

Total number of pulses in waveform = 32

Type 5 Radar Waveform_15.txt

Waveform Num = 15
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)
	131797									
1		3	12	50	1002	1660	1212	131797	0	799999
	742794									
2		3	13	100	1929	1807	1555	878465	800000	1599999
	860401									
3		1	16	60	1322	0	0	1744157	1600000	2399999
	992531									
4		2	6	65	1619	1252	0	2738010	2400000	3199999
	1102451									
5		2	5	60	1130	1817	0	3843332	3200000	3999999
	212711									
6		1	5	95	1184	0	0	4058990	4000000	4799999
	1305076									
7		1	15	60	1561	0	0	5365250	4800000	5599999
	513503									
8		1	11	70	1787	0	0	5880314	5600000	6399999
	766177									
9		3	5	85	1684	1909	1961	6648278	6400000	7199999
	898705									
10		3	13	85	1948	1851	1995	7552537	7200000	7999999
	1186066									
11		1	18	75	1830	0	0	8744397	8000000	8799999
	533161									
12		3	11	50	1320	1250	1994	9279388	8800000	9599999
	1011125									
13		3	10	50	1737	1050	1759	10295077	9600000	10399999
	262975									
14		1	15	85	1096	0	0	10562598	10400000	11199999
	1234612									
15		1	11	80	1718	0	0	11798306	11200000	11999999

Total number of pulses in waveform = 29

Type 5 Radar Waveform_16.txt

Waveform Num = 16
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)
	708325									
1		3	10	100	1913	1820	1181	708325	0	1333332
	1409295									
2		1	16	75	1225	0	0	2122534	1333333	2666665
	1239077									
3		3	16	55	1420	1055	1955	3362836	2666666	3999998
	1503930									
4		3	11	55	1190	1281	1731	4871196	3999999	5333331
	1263226									
5		3	18	90	1864	1407	1226	6138624	5333332	6666664
	1606293									
6		2	19	80	1173	1271	0	7749414	6666665	7999997
	1235261									
7		2	6	70	1754	1643	0	8987119	7999998	9333330
	390861									
8		2	10	55	1609	1040	0	9380577	9333331	10666663
	1743973									
9		1	18	55	1328	0	0	11127199	10666664	11999996

Total number of pulses in waveform = 20

Type 5 Radar Waveform_17.txt

Waveform Num = 17
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)
	243231									
1		2	14	90	1321	1214	0	243231	0	749999
	705029									
2		2	10	100	1798	1071	0	950795	750000	1499999
	1015789									
3		1	8	50	1982	0	0	1969453	1500000	2249999
	744416									
4		2	15	90	1696	1592	0	2715851	2250000	2999999
	901584									
5		2	6	50	1259	1693	0	3620723	3000000	3749999
	721679									
6		3	16	80	1428	1572	1906	4345354	3750000	4499999
	208445									
7		3	6	50	1534	1522	1820	4558705	4500000	5249999
	1051317									
8		1	11	60	1984	0	0	5614898	5250000	5999999
	681541									
9		3	6	70	1117	1801	1639	6298423	6000000	6749999
	837746									
10		2	14	95	1942	1053	0	7140726	6750000	7499999
	390769									
11		2	19	50	1720	1278	0	7534490	7500000	8249999
	1415952									
12		2	17	60	1558	1850	0	8953440	8250000	8999999
	98179									
13		2	13	90	1075	1531	0	9055027	9000000	9749999
	909417									
14		3	12	65	1226	1388	1454	9967050	9750000	10499999
	886804									
15		2	10	75	1810	1686	0	10857922	10500000	11249999
	792172									
16		1	6	55	1819	0	0	11653590	11250000	11999999

Total number of pulses in waveform = 33

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)
	407012									
1		3	6	90	1964	1927	1404	407012	0	1333332
	1137945									
2		1	8	95	1809	0	0	1550252	1333333	2666665
	1835966									
3		3	13	55	1395	1209	1565	3388027	2666666	3999998
	636714									
4		1	13	90	1240	0	0	4028910	3999999	5333331
	2540326									
5		2	9	55	1054	1786	0	6570476	5333332	6666664
	1406050									
6		3	10	85	1879	1302	1790	7979366	6666665	7999997
	306366									
7		2	14	90	1532	1551	0	8290703	7999998	9333330
	1308340									
8		3	14	50	1119	1278	1446	9602126	9333331	10666663
	2335928									
9		2	7	65	1466	1267	0	11941897	10666664	11999996

Total number of pulses in waveform = 20

Type 5 Radar Waveform_19.txt

Waveform Num = 19
Num of Bursts = 11
Burst Interval (us)= 1090909

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)
	953394									
1		3	5	50	1237	1044	1162	953394	0	1090908
	213674									
2		2	15	75	1335	1924	0	1170511	1090909	2181817
	1069541									
3		1	8	85	2000	0	0	2243311	2181818	3272726
	1998510									
4		3	11	85	1845	1966	1799	4243821	3272727	4363635
	489375									
5		1	19	85	1199	0	0	4738806	4363636	5454544
	1159963									
6		3	8	80	1875	1211	1804	5899968	5454545	6545453
	1569428									
7		3	10	70	1173	1373	1705	7474286	6545454	7636362
	1076128									
8		1	12	85	1426	0	0	8554665	7636363	8727271
	385268									
9		2	18	100	1783	1502	0	8941359	8727272	9818180
	1583092									
10		2	15	70	1058	1408	0	10527736	9818181	10909089
	439210									
11		2	5	65	1950	1902	0	10969412	10909090	11999998

Total number of pulses in waveform = 23

Type 5 Radar Waveform_20.txt

Waveform Num = 20
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)
	384472									
1		3	7	90	1954	1938	1482	384472	0	705881
	359485									
2		3	19	55	1834	1200	1555	749331	705882	1411763
	868340									
3		1	8	60	1161	0	0	1622260	1411764	2117645
	547628									
4		3	6	80	1332	1009	1964	2171049	2117646	2823527
	737188									
5		3	19	100	1565	1519	1618	2912542	2823528	3529409
	653888									
6		1	17	70	1519	0	0	3571132	3529410	4235291
	1336808									
7		3	15	60	1345	1945	1800	4909459	4235292	4941173
	117582									
8		1	10	80	1662	0	0	5032131	4941174	5647055
	733613									
9		3	13	75	1797	1372	1915	5767406	5647056	6352937
	1234442									
10		3	12	70	1106	1581	1944	7006932	6352938	7058819
	724834									
11		2	13	85	1364	1742	0	7736397	7058820	7764701
	424521									
12		2	7	70	1056	1749	0	8164024	7764702	8470583
	443425									
13		1	11	95	1702	0	0	8610254	8470584	9176465
	586974									
14		3	8	65	1032	1971	1758	9198930	9176466	9882347
	768211									
15		3	16	50	1181	1967	1760	9971902	9882348	10588229
	1249330									
16		1	5	55	1090	0	0	11226140	10588230	11294111
	114849									
17		2	12	70	1555	1980	0	11342079	11294112	11999993

Total number of pulses in waveform = 38

Type 5 Radar Waveform_21.txt

Waveform Num = 21
Num of Bursts = 11
Burst Interval (us)= 1090909

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)
	946393									
1		3	10	65	1842	1386	1547	946393	0	1090908
	1121507									
2		3	11	50	1071	1523	1221	2072675	1090909	2181817
	243675									
3		3	7	100	1141	1849	1457	2320165	2181818	3272726
	1264188									
4		2	6	70	1563	1921	0	3588880	3272727	4363635
	1382740									
5		1	15	65	1221	0	0	4975024	4363636	5454544
	778278									
6		3	17	90	1350	1348	1204	5754523	5454545	6545453
	1861249									
7		2	18	80	1980	1201	0	7619674	6545454	7636362
	494522									
8		1	20	90	1827	0	0	8117377	7636363	8727271
	713495									
9		1	6	65	1566	0	0	8832699	8727272	9818180
	1603417									
10		2	13	100	1406	1463	0	10437682	9818181	10909089
	1304518									
11		2	18	60	1236	1747	0	11745069	10909090	11999998

Total number of pulses in waveform = 23

Type 5 Radar Waveform_22.txt

Waveform Num = 22
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)
	712313									
1		3	18	100	1166	1898	1179	712313	0	1199999
	1419556									
2		2	13	85	1059	1135	0	2136112	1200000	2399999
	557213									
3		2	9	85	1908	1181	0	2695519	2400000	3599999
	1992176									
4		1	12	70	1169	0	0	4690784	3600000	4799999
	593441									
5		3	16	75	1383	1476	1260	5285394	4800000	5999999
	1228660									
6		2	8	80	1613	1280	0	6518173	6000000	7199999
	1658154									
7		3	8	50	1984	1214	1866	8179220	7200000	8399999
	1027484									
8		2	15	70	1640	1897	0	9211768	8400000	9599999
	1280014									
9		2	7	75	1635	1039	0	10495319	9600000	10799999
	830270									
10		1	10	80	1166	0	0	11328263	10800000	11999999

Total number of pulses in waveform = 21

Type 5 Radar Waveform_23.txt

Waveform Num = 23
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)
	220416									
1		3	18	65	1951	1496	1417	220416	0	1333332
	1648145									
2		3	18	85	1716	1754	1542	1873425	1333333	2666665
	2114534									
3		1	13	95	1058	0	0	3992971	2666666	3999998
	279796									
4		3	7	90	1283	1898	1317	4273825	3999999	5333331
	1086212									
5		1	8	75	1369	0	0	5364535	5333332	6666664
	1584878									
6		2	19	90	1993	1310	0	6950782	6666665	7999997
	1093051									
7		3	5	85	1854	1570	1276	8047136	7999998	9333330
	2040383									
8		3	9	85	1286	1533	1920	10092219	9333331	10666663
	1856161									
9		2	7	70	1171	1792	0	11953119	10666664	11999996

Total number of pulses in waveform = 21

Type 5 Radar Waveform_24.txt

Waveform Num = 24
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)
	33033									
1		1	14	60	1115	0	0	33033	0	857142
	1570962									
2		2	20	80	1617	1950	0	1605110	857143	1714285
	569862									
3		3	17	75	1923	1382	1910	2178539	1714286	2571428
	649517									
4		1	6	80	1417	0	0	2833271	2571429	3428571
	1345273									
5		3	18	55	1412	1777	1886	4179961	3428572	4285714
	852573									
6		1	8	65	1822	0	0	5037609	4285715	5142857
	477657									
7		2	12	65	1593	1539	0	5517088	5142858	6000000
	1121062									
8		2	11	50	1620	1342	0	6641282	6000001	6857143
	758494									
9		1	10	65	1788	0	0	7402738	6857144	7714286
	655233									
10		3	19	95	1955	1495	1378	8059759	7714287	8571429
	574153									
11		3	8	60	1976	1074	1283	8638740	8571430	9428572
	931079									
12		2	16	50	1979	1390	0	9574152	9428573	10285715
	726560									
13		2	14	65	1421	1230	0	10304081	10285716	11142858
	1094710									
14		1	13	85	1505	0	0	11401442	11142859	12000001

Total number of pulses in waveform = 27

Type 5 Radar Waveform_25.txt

Waveform Num = 25
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)
	438539									
1		3	18	100	1860	1500	1837	438539	0	599999
	268270									
2		1	10	90	1072	0	0	712006	600000	1199999
	751028									
3		3	9	75	1455	1917	1719	1464106	1200000	1799999
	641315									
4		3	9	85	1956	1681	1695	2110512	1800000	2399999
	366853									
5		1	5	65	1809	0	0	2482697	2400000	2999999
	528854									
6		2	7	60	1541	1039	0	3013360	3000000	3599999
	837637									
7		1	14	95	1545	0	0	3853577	3600000	4199999
	388036									
8		1	9	75	1699	0	0	4243158	4200000	4799999
	788134									
9		3	11	55	1409	1019	1333	5032991	4800000	5399999
	444248									
10		3	8	50	1028	1208	1938	5481000	5400000	5999999
	796452									
11		3	15	75	1939	1849	1473	6281626	6000000	6599999
	610982									
12		1	6	70	1075	0	0	6897869	6600000	7199999
	474850									
13		1	6	70	1175	0	0	7373794	7200000	7799999
	647818									
14		2	12	65	1680	1409	0	8022787	7800000	8399999
	756992									
15		1	19	90	1346	0	0	8782868	8400000	8999999
	268097									
16		3	13	65	1823	1500	1351	9052311	9000000	9599999
	659941									
17		1	10	55	1942	0	0	9716926	9600000	10199999
	730881									
18		3	20	50	1335	1478	1620	10449749	10200000	10799999
	822774									
19		2	6	75	1142	1707	0	11276956	10800000	11399999
	554237									
20		3	15	80	1302	1340	1432	11834042	11400000	11999999

Total number of pulses in waveform = 41

Type 5 Radar Waveform_26.txt

Waveform Num = 26
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)
	327472									
1		1	9	70	1843	0	0	327472	0	749999
	982826									
2		2	19	80	1180	1897	0	1312141	750000	1499999
	513052									
3		1	12	85	1120	0	0	1828270	1500000	2249999
	614182									
4		2	7	85	1800	1393	0	2443572	2250000	2999999
	1034597									
5		2	14	55	1455	1493	0	3481362	3000000	3749999
	792750									
6		2	5	75	1321	1328	0	4277060	3750000	4499999
	337101									
7		1	12	50	1270	0	0	4616810	4500000	5249999
	1087364									
8		1	17	85	1444	0	0	5705444	5250000	5999999
	994449									
9		1	11	65	1244	0	0	6701337	6000000	6749999
	436481									
10		3	9	80	1146	1712	1920	7139062	6750000	7499999
	494079									
11		1	5	75	1412	0	0	7637919	7500000	8249999
	905599									
12		2	10	70	1570	1289	0	8544930	8250000	8999999
	1060248									
13		1	12	95	1757	0	0	9608037	9000000	9749999
	738754									
14		3	6	85	1716	1446	1197	10348548	9750000	10499999
	324901									
15		2	17	80	1572	1666	0	10677808	10500000	11249999
	901879									
16		2	20	50	1658	1732	0	11582925	11250000	11999999

Total number of pulses in waveform = 27

Type 5 Radar Waveform_27.txt

Waveform Num = 27
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	565971	3	14	80	1343	1018	1364	565971	0	631578
2	478016	2	8	100	1787	1981	0	1047712	631579	1263157
3	508642	1	8	55	1241	0	0	1560122	1263158	1894736
4	669835	1	15	60	1677	0	0	2231198	1894737	2526315
5	710575	3	8	80	1134	1115	1727	2943450	2526316	3157894
6	497848	1	10	85	1132	0	0	3445274	3157895	3789473
7	529073	1	20	90	1184	0	0	3975479	3789474	4421052
8	750058	3	12	55	1277	1525	1423	4726721	4421053	5052631
9	698276	3	16	60	1825	1677	1645	5429222	5052632	5684210
10	572211	3	16	70	1849	1916	1312	6006580	5684211	6315789
11	799905	1	6	80	1555	0	0	6811562	6315790	6947368
12	601313	1	6	95	1471	0	0	7414430	6947369	7578947
13	415585	2	15	65	1702	1319	0	7831486	7578948	8210526
14	393236	3	11	55	1361	1913	1284	8227743	8210527	8842105
15	1056298	2	18	70	1147	1131	0	9288599	8842106	9473684
16	211590	1	15	55	1402	0	0	9502467	9473685	10105263
17	942276	3	15	50	1476	1409	1391	10446145	10105264	10736842
18	844195	2	11	75	1072	1818	0	11294616	10736843	11368421
19	568557	3	11	95	1972	1268	1967	11866063	11368422	12000000

Total number of pulses in waveform = 39

Type 5 Radar Waveform_28.txt

Waveform Num = 28
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	340776	1	15	90	1160	0	0	340776	0	1333332
2	1598583	3	16	80	1262	1882	1290	1940519	1333333	2666665
3	1240595	1	18	55	1860	0	0	3185548	2666666	3999998
4	1799852	2	11	75	1467	1124	0	4987260	3999999	5333331
5	1585683	1	17	75	1006	0	0	6575534	5333332	6666664
6	755940	3	11	80	1187	1295	1048	7332480	6666665	7999997
7	1989345	1	11	80	1383	0	0	9325355	7999998	9333330
8	1120169	3	15	50	1386	1234	1374	10446907	9333331	10666663
9	724320	3	10	80	1984	1589	1679	11175221	10666664	11999996

Total number of pulses in waveform = 18

Type 5 Radar Waveform_29.txt

Waveform Num = 29
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)
	1189875									
1		2	9	95	1649	1847	0	1189875	0	1333332
	336230									
2		2	9	60	1986	1613	0	1529601	1333333	2666665
	2249482									
3		2	7	100	1104	1966	0	3782682	2666666	3999998
	1229137									
4		2	12	100	1339	1272	0	5014889	3999999	5333331
	875551									
5		2	13	100	1087	1018	0	5893051	5333332	6666664
	1775735									
6		1	9	80	1330	0	0	7670891	6666665	7999997
	702635									
7		3	11	100	1788	1017	1439	8374856	7999998	9333330
	2027073									
8		1	12	50	1775	0	0	10406173	9333331	10666663
	1160032									
9		1	5	50	1751	0	0	11567980	10666664	11999996

Total number of pulses in waveform = 16

Type 5 Radar Waveform_30.txt

Waveform Num = 30
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)
	77083									
1		2	18	100	1839	1144	0	77083	0	857142
	1041078									
2		2	8	65	1785	1084	0	1121144	857143	1714285
	1073410									
3		3	5	75	1874	1731	1007	2197423	1714286	2571428
	536445									
4		3	9	90	1433	1944	1511	2738480	2571429	3428571
	736878									
5		3	14	70	1059	1854	1471	3480246	3428572	4285714
	1304985									
6		2	16	55	1496	1398	0	4789615	4285715	5142857
	361993									
7		2	16	95	1169	1463	0	5154502	5142858	6000000
	1165678									
8		3	9	80	1331	1789	1484	6322812	6000001	6857143
	1055946									
9		1	20	100	1365	0	0	7383362	6857144	7714286
	1071596									
10		3	12	95	1439	1284	1283	8456323	7714287	8571429
	548868									
11		3	15	55	1814	1895	1813	9009197	8571430	9428572
	569375									
12		1	5	70	1816	0	0	9584094	9428573	10285715
	835225									
13		3	6	80	1085	1960	1734	10421135	10285716	11142858
	1035276									
14		3	11	75	1727	1066	1130	11461190	11142859	12000001

Total number of pulses in waveform = 34

Type 6 Radar Waveform_1.txt

Hop number	Frequency (MHz)	Pulse Start (ms)
7	5507	21
13	5524	39
27	5489	81
46	5518	138
62	5497	186
66	5517	198
68	5525	204
79	5530	237
81	5484	243
84	5515	252
94	5501	282

Type 6 Radar Waveform_2.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
4	5475	12
14	5490	42
16	5521	48
19	5499	57
22	5486	66
28	5520	84
32	5471	96
50	5508	150
51	5473	153
58	5498	174
66	5527	198
72	5509	216
79	5514	237
82	5529	246
91	5478	273

Type 6 Radar Waveform_3.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
24	5517	72
39	5481	117
51	5471	153
52	5498	156
63	5490	189
70	5511	210
75	5483	225
82	5473	246
84	5477	252

Type 6 Radar Waveform_4.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
3	5481	9
9	5499	27
12	5471	36
15	5529	45
24	5504	72
33	5523	99
38	5517	114
49	5514	147
52	5518	156
53	5489	159
55	5476	165
66	5480	198
70	5509	210
74	5520	222
83	5521	249
86	5500	258

Type 6 Radar Waveform_5.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
4	5511	12
8	5516	24
17	5505	51
19	5520	57
41	5500	123
48	5507	144
62	5522	186
69	5512	207
80	5493	240
81	5496	243
89	5518	267

Type 6 Radar Waveform_6.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
13	5477	39
22	5482	66
23	5515	69
24	5475	72
44	5507	132
45	5472	135
53	5500	159
55	5480	165
58	5525	174
63	5485	189
71	5499	213
81	5471	243
82	5474	246
84	5495	252
88	5521	264

Type 6 Radar Waveform_7.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
0	5518	0
4	5472	12
9	5508	27
11	5500	33
12	5490	36
20	5524	60
31	5514	93
32	5526	96
44	5478	132
57	5479	171
63	5505	189
71	5497	213
75	5484	225
80	5480	240
84	5504	252
96	5515	288

Type 6 Radar Waveform_8.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
4	5495	12
5	5516	15
9	5509	27
16	5501	48
19	5504	57
22	5475	66
27	5497	81
31	5519	93
34	5480	102
43	5514	129
57	5499	171
61	5487	183
67	5474	201
79	5492	237
85	5525	255
92	5484	276
97	5498	291

Type 6 Radar Waveform_9.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
2	5491	6
8	5482	24
16	5476	48
20	5528	60
64	5520	192
68	5470	204
76	5519	228
83	5497	249
86	5478	258
88	5500	264
89	5527	267
91	5523	273

Type 6 Radar Waveform_10.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
19	5478	57
21	5474	63
28	5473	84
41	5475	123
52	5480	156
53	5512	159
54	5518	162
55	5502	165
70	5515	210
77	5523	231
82	5499	246
84	5498	252

Type 6 Radar Waveform_11.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
4	5499	12
14	5474	42
29	5523	87
33	5479	99
34	5495	102
35	5529	105
37	5528	111
43	5514	129
79	5524	237
83	5511	249
84	5494	252
87	5504	261
88	5488	264
90	5512	270
99	5487	297

Type 6 Radar Waveform_12.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
1	5502	3
7	5509	21
13	5490	39
18	5504	54
19	5528	57
31	5491	93
34	5508	102
48	5518	144
56	5515	168
66	5530	198
77	5520	231
89	5486	267

Type 6 Radar Waveform_13.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
10	5472	30
17	5529	51
19	5476	57
25	5507	75
38	5509	114
42	5489	126
43	5493	129
47	5471	141
55	5496	165
72	5518	216
74	5499	222
95	5512	285
98	5480	294
99	5508	297

Type 6 Radar Waveform_14.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
1	5508	3
10	5476	30
15	5496	45
23	5527	69
32	5519	96
36	5511	108
37	5493	111
39	5509	117
40	5504	120
51	5524	153
56	5528	168
62	5490	186
69	5503	207
72	5484	216
73	5523	219
74	5505	222
76	5520	228
95	5482	285
99	5477	297

Type 6 Radar Waveform_15.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
0	5509	0
3	5511	9
14	5523	42
32	5480	96
37	5526	111
49	5528	147
52	5507	156
53	5499	159
56	5482	168
57	5495	171
61	5498	183
62	5503	186
63	5530	189
81	5489	243
91	5476	273
99	5520	297

Type 6 Radar Waveform_16.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
2	5491	6
4	5481	12
10	5490	30
14	5501	42
23	5489	69
34	5517	102
37	5475	111
64	5495	192
74	5472	222
77	5527	231
90	5529	270

Type 6 Radar Waveform_17.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
1	5510	3
7	5493	21
11	5503	33
12	5517	36
20	5522	60
22	5477	66
30	5486	90
32	5527	96
33	5483	99
38	5484	114
41	5488	123
42	5506	126
49	5509	147
55	5481	165
77	5476	231
79	5523	237
91	5520	273

Type 6 Radar Waveform_18.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
29	5509	87
30	5487	90
32	5492	96
34	5512	102
36	5481	108
40	5523	120
41	5507	123
48	5476	144
55	5525	165
66	5503	198
73	5475	219
80	5508	240
85	5522	255
87	5477	261
97	5524	291

Type 6 Radar Waveform_19.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
13	5491	39
28	5524	84
35	5498	105
44	5489	132
46	5528	138
49	5479	147
70	5512	210
81	5497	243
83	5474	249
92	5487	276

Type 6 Radar Waveform_20.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
11	5522	33
12	5507	36
31	5470	93
45	5527	135
46	5477	138
48	5528	144
53	5493	159
59	5480	177
69	5521	207
73	5488	219
77	5486	231
78	5496	234
86	5523	258
91	5487	273
94	5489	282
97	5482	291

Type 6 Radar Waveform_21.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
4	5528	12
5	5471	15
6	5485	18
25	5508	75
26	5473	78
30	5521	90
33	5490	99
42	5504	126
61	5483	183
68	5513	204
74	5484	222
79	5475	237
94	5502	282

Type 6 Radar Waveform_22.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
16	5524	48
23	5496	69
36	5473	108
63	5474	189
68	5486	204
85	5506	255
95	5481	285
99	5497	297

Type 6 Radar Waveform_23.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
1	5520	3
2	5527	6
3	5490	9
8	5514	24
9	5509	27
12	5505	36
30	5481	90
46	5497	138
52	5476	156
58	5510	174
62	5508	186
65	5485	195
76	5512	228
84	5503	252
93	5521	279

Type 6 Radar Waveform_24.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
23	5470	69
24	5503	72
51	5522	153
56	5508	168
67	5484	201
72	5505	216
80	5518	240
88	5481	264
99	5502	297

Type 6 Radar Waveform_25.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
8	5486	24
19	5471	57
21	5483	63
25	5506	75
40	5530	120
48	5499	144
49	5527	147
56	5517	168
63	5493	189
82	5487	246
91	5496	273

Type 6 Radar Waveform_26.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
2	5474	24
5	5475	6
9	5514	15
25	5528	27
32	5489	75
35	5491	96
44	5492	105
48	5500	132
49	5526	144
50	5521	147
56	5510	150
64	5487	168
68	5517	192
81	5490	204

Type 6 Radar Waveform_27.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
8	5500	24
21	5517	63
27	5511	81
40	5498	120
55	5470	165
67	5471	201
75	5519	225
80	5527	240
88	5486	264
92	5524	276
95	5505	285

Type 6 Radar Waveform_28.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
2	5479	6
11	5474	33
22	5490	66
26	5505	78
31	5484	93
32	5493	96
34	5503	102
39	5475	117
62	5520	186
67	5499	201
74	5472	222
77	5471	231
80	5524	240

Type 6 Radar Waveform_29.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
32	5473	96
41	5507	123
42	5485	126
49	5471	147
53	5490	159
61	5506	183
63	5476	189
73	5521	219
75	5474	225
88	5503	264
95	5499	285
97	5516	291

Type 6 Radar Waveform_30.txt

Hop number	Frequency (GHz)	Pulse Start (ms)
1	5521	3
4	5506	12
23	5495	69
27	5486	81
33	5528	99
45	5516	135
60	5522	180
64	5490	192