Dynamic Frequency Selection (DFS) Test Results

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

U-NII devices operating in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems.

1.0 UNII Device Description

1. The **C3205WMIC-A-K9** operates in the following bands:
   a. 5250-5350 MHz
   b. 5470-5725 MHz

2. The maximum EIRP of the 5GHz equipment is 30 dBm plus the gain of the antenna, and the minimum possible EIRP is 10 dBm.

   Below are the available 50 ohm antenna assemblies and their corresponding gains. 6dBi gain was used to set the -58 dbm threshold level (-62dBm + 4 dB) during calibration of the test setup.

MODEL	GAIN dbi
AIR-ANT5114P-N Patch	14dbi
AIR-ANT5195P-R Patch	9.5dbi
AIR-ANT5170P-R Patch	7dbi
Air-ant 5180V-N omni	7.5dbi
AIR-ANT5175V-N omni	7.5dbi
AIR-ANT5160V-R omni	6dbi

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

4. This device exceeds 27dBm eirp, so transmit power control is implemented.

5. The Master requires 20 seconds to complete its power-on cycle.

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

7. 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.

2.0 DFS Detection Thresholds

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 4 dB has been added to the amplitude of the test transmission waveforms to account for the gain of the smallest antenna (6dbi) with a 2db margin . 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.

3.0 Radar Test Waveforms

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

1. **Short Pulse Radar Test Waveforms**

Radar Type	Pulse Width (µsec)	PRI (µsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

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. The aggregate is the average of the percentage of successful detections of short pulse radar types 1-4.

2. **Long Pulse Radar Test Waveform**

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

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

Each waveform is defined as follows:

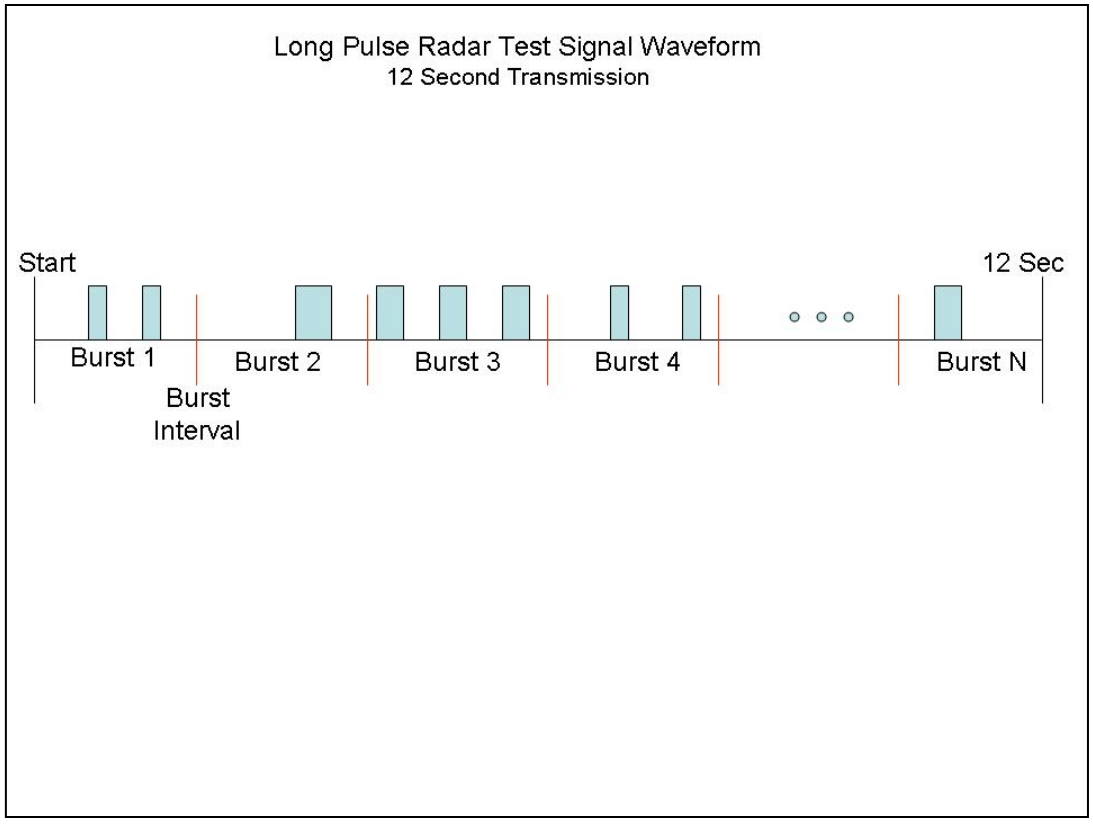
1) The transmission period for the Long Pulse Radar test signal is 12 seconds.
2) There are a total of 8 to 20 Bursts in the 12 second period, with the number of Bursts being randomly chosen. This number is Burst_Count.

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

A representative example of a Long Pulse radar test waveform:

1) The total test signal length is 12 seconds.
2) 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).

Graphical Representation of a Long Pulse radar Test Waveform



3. **Frequency Hopping Radar Test Waveform**

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

For the Frequency Hopping Radar Type, the same *Burst* parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected[1] from the hopping sequence defined by the following algorithm:

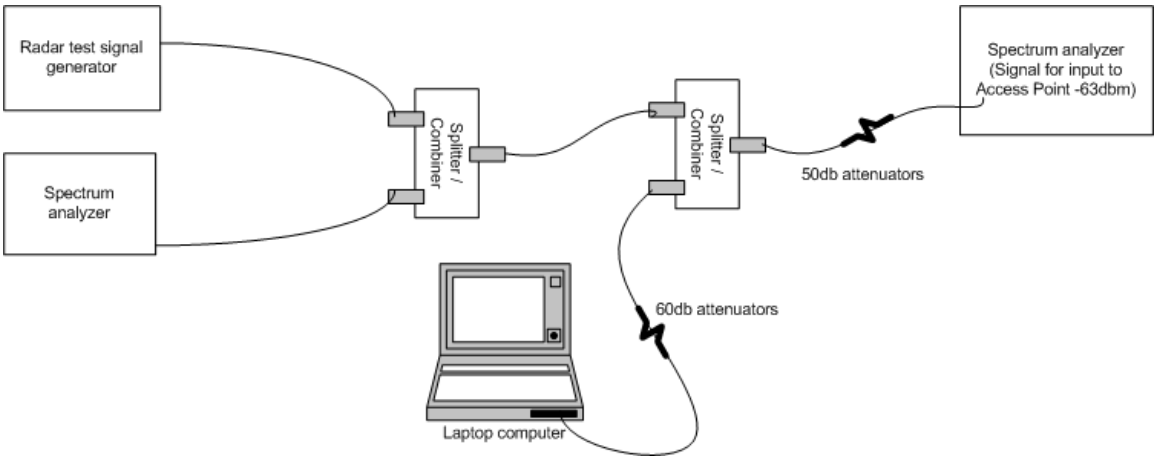
The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250 – 5724 MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This

process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

4.0 Radar Waveform Calibration

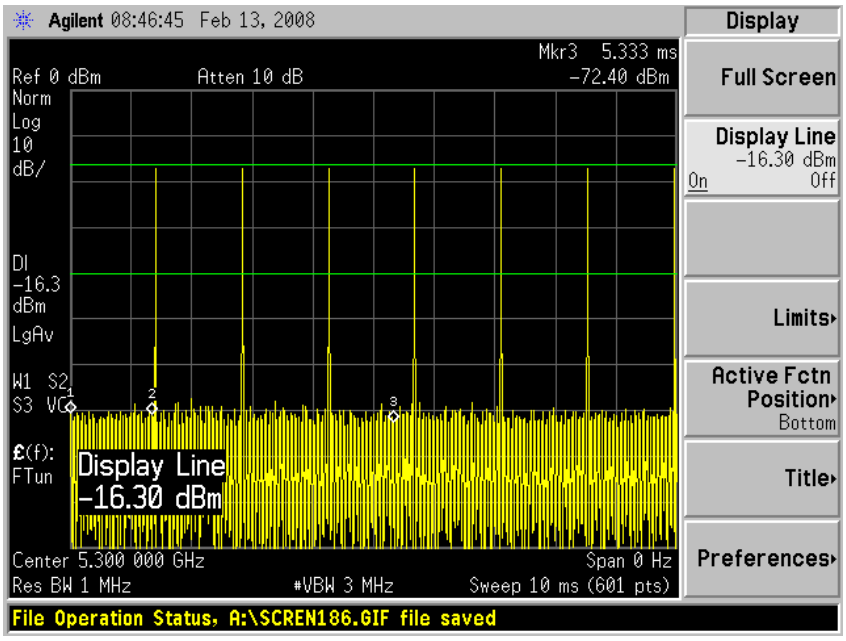
1. The following equipment setup was used to calibrate the conducted Radar Waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process there were no transmissions by either the Master or Client Device. The spectrum analyzer was switched to the zero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

   The signal generator amplitude was set so that the power level measured at the spectrum analyzer was -58dBm. The transmit signal of the radio and consequently the radar pulse were attenuated by 50db plus the system loss through the cable and splitter setup. The radar pulse from the signal generator was increased until the proper level (-58dbm) was attained at the input of the spectrum analyzer serving in place of the radio antenna input. This allowed for the radar signal at the monitoring analyzer to be sufficiently higher than the incoming radio transmit signal so that pulse triggering could be done at the monitor.

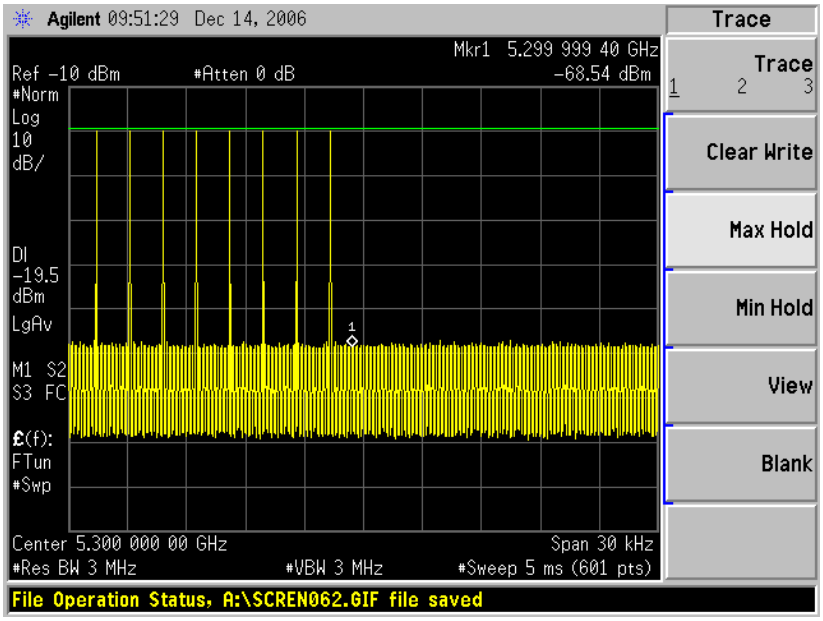


Conducted Calibration Setup

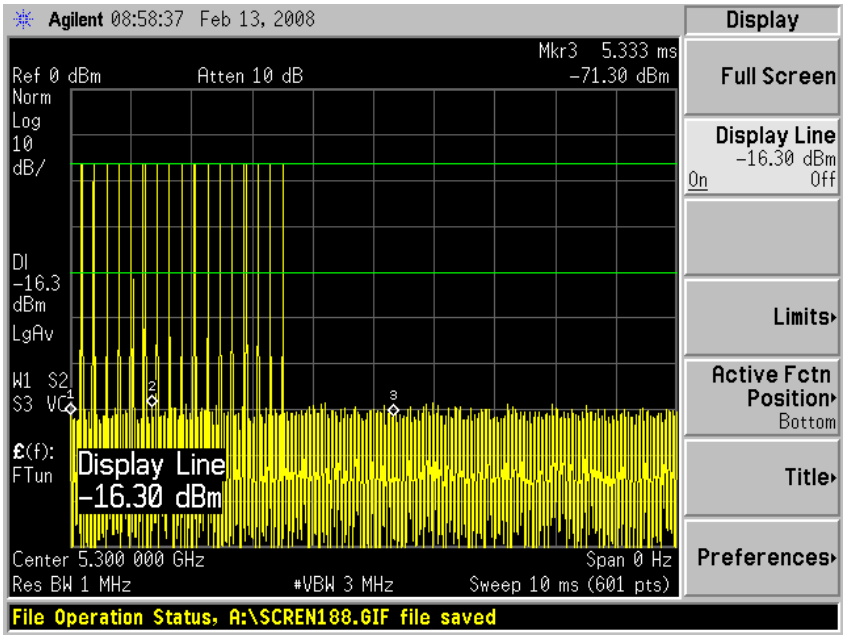
2. Following are the calibration plots for each of the required radar waveforms.
Signal input to radio



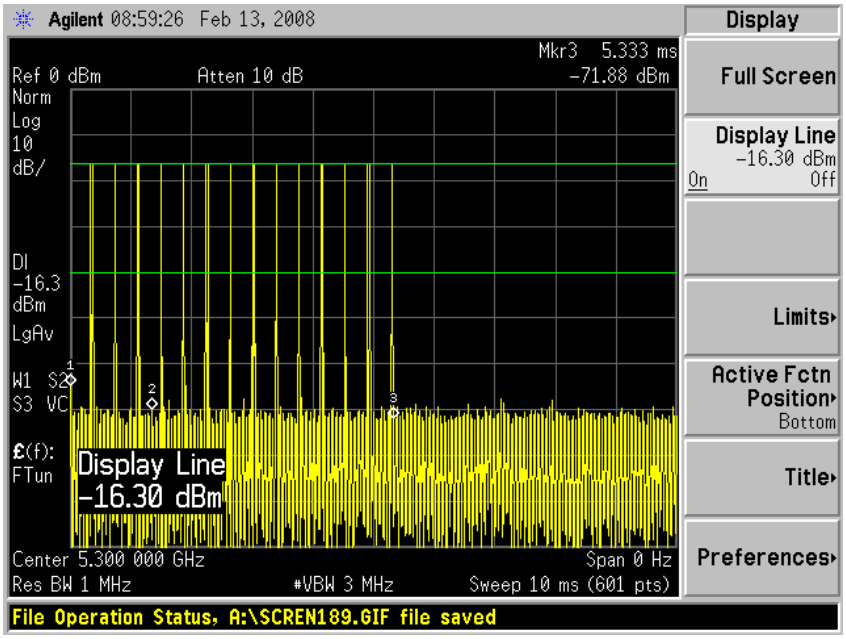
Bin 1 Radar Calibrat



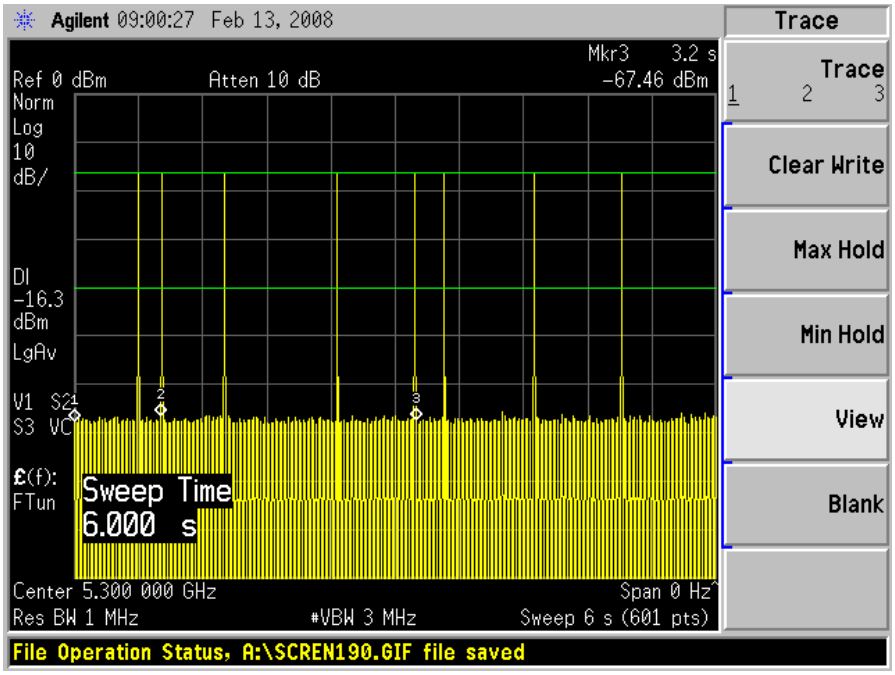
Bin 2 Radar Calibration



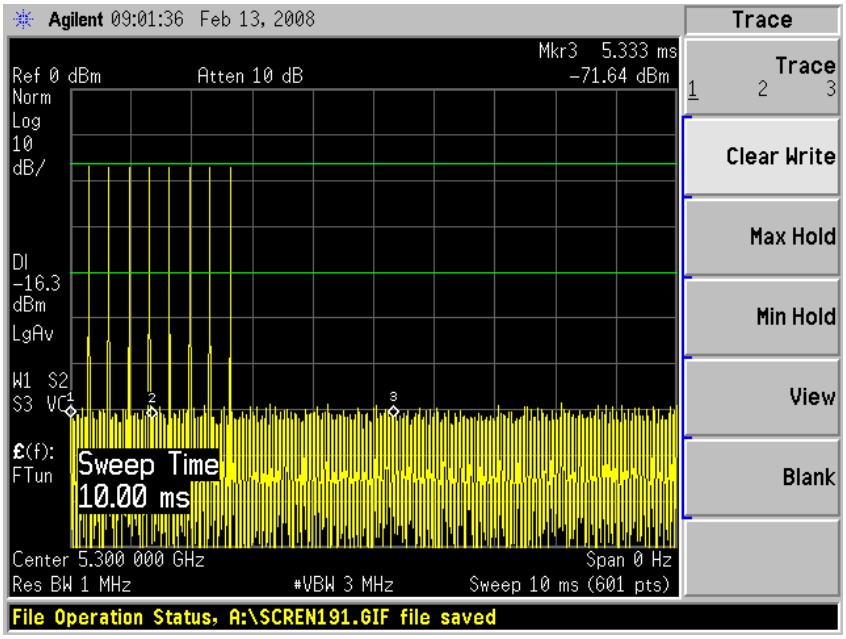
Bin 3 Radar Calibration



Bin 4 Radar Calibration



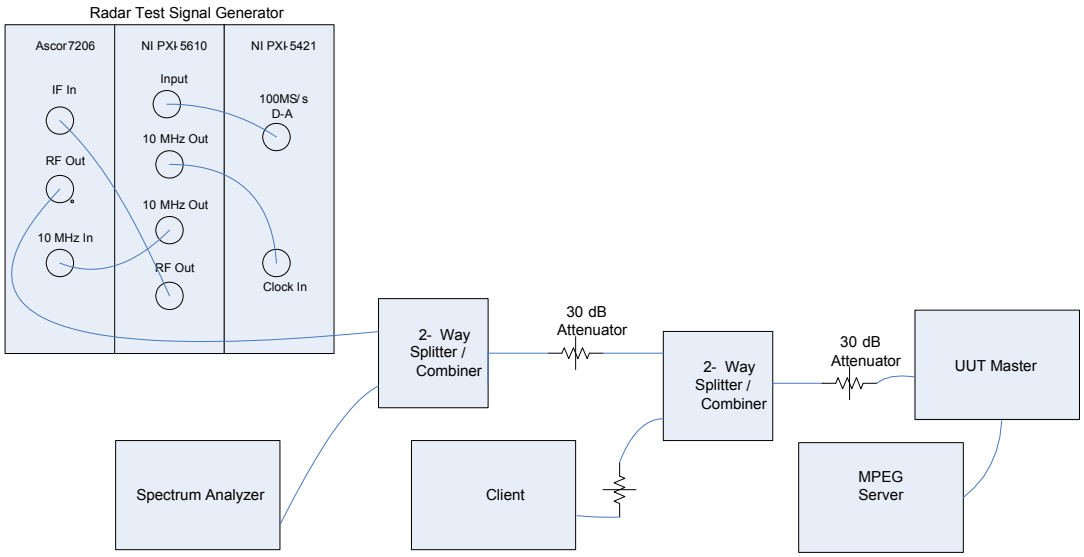
Bin 5 Radar Calibration



Bin 6 Radar Calibration

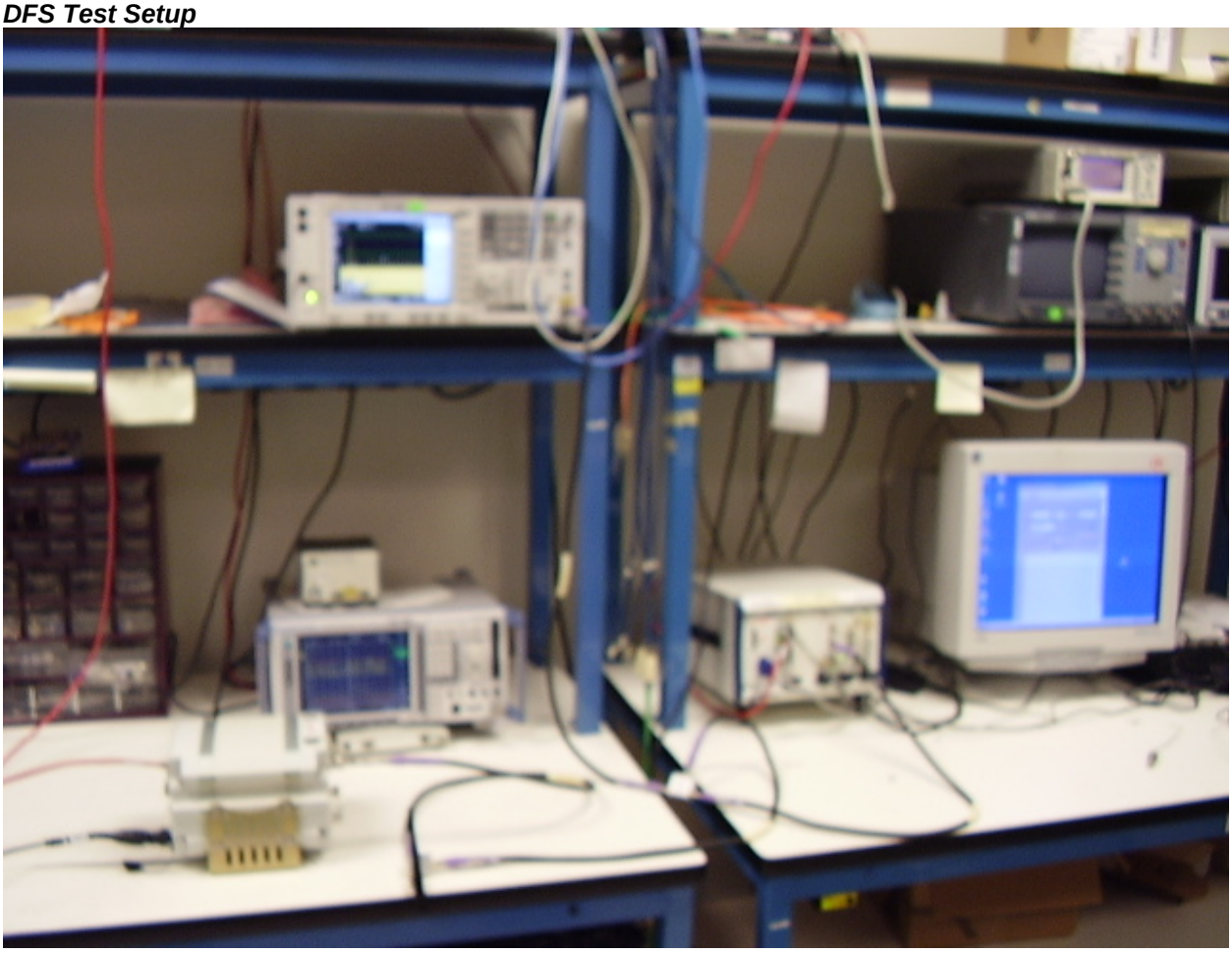
5.0 Test Procedure/Results

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



Conducted Setup: Radar Test Waveforms are injected into the Master

DFS Test Setup



The test setup is constructed of the following equipment:

Radar Test Signal Generator
National Instruments NI PXI-1042 8-Slot 3U Chassis
National Instruments NI PXI-5421 16-Bit 100MS/s Arbitrary Waveform Generator
National Instruments NI PXI-5610 2.7GHz RF Upconverter
Ascor 7206 PXI 4.9 to 6GHz Upconverter
Agilent E4448A Spectrum Analyzer
Rhode & Schwarz FSP Spectrum Analyzer
Mini-Circuits ZFSC-2-9G Splitter/Combiner (Qty. 2)
Mini-Circuits BW-S30W2 30dB/20db Attenuator (Qty. 2)
Megaphase SF26 S1S1 36" Coaxial Cable (Qty. 4)
Dell 600M Laptop (Qty. 2: 1 for wireless client, 1 for MPEG server)
Cisco AIR-CB21AG 802.11a/b/g NIC card (wireless client)

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

3. **UNII Detection Bandwidth**: All UNII channels for this device have identical Channel bandwidths. Therefore, all DFS testing was done at 5300 MHz. The 99% channel bandwidth is 16.5MHz. (See the 26dB BW section of of this report for further measurement details).

   The generating equipment is configured as shown in the Conducted Test Setup above. A single *Burst* of the short pulse radar type 1 is produced at 5300MHz at a -58 dBm level. The UUT is set up as a standalone device (no associated Client and no traffic).

   A single radar Burst is generated for a minimum of 10 trials, and the response of the UUT is noted. The UUT must detect the Radar Waveform 90% or more of the time.

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

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

   The U-NII Detection Bandwidth is calculated as follows:

   U-NII Detection Bandwidth = $F_H - F_L$

   The U-NII Detection Bandwidth must be at least 80% of the UUT transmitter 99% power, otherwise, the UUT does not comply with DFS requirements.

UNII Detection Bandwidth Results

EUT Frequency=5300MHz											
	DFS Detection Trials (1=Detection, 0 = No Detection)										
Radar Frequency (MHz)	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5289	1	1	1	1	1	1	1	0	0	0	70%
5290 fl	1	1	1	1	1	1	1	1	1	0	90%
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 fh	1	1	1	1	1	1	1	1	1	1	100%
5311	1	1	1	0	0	1	1	1	0	1	70%
Detection Bandwidth = Fh-Fl 5310 - 5.290= 20MHz											
EUT 99% Bandwidth = 16.5 MHz.											
16.5 MHz*80% = 12 MHz											

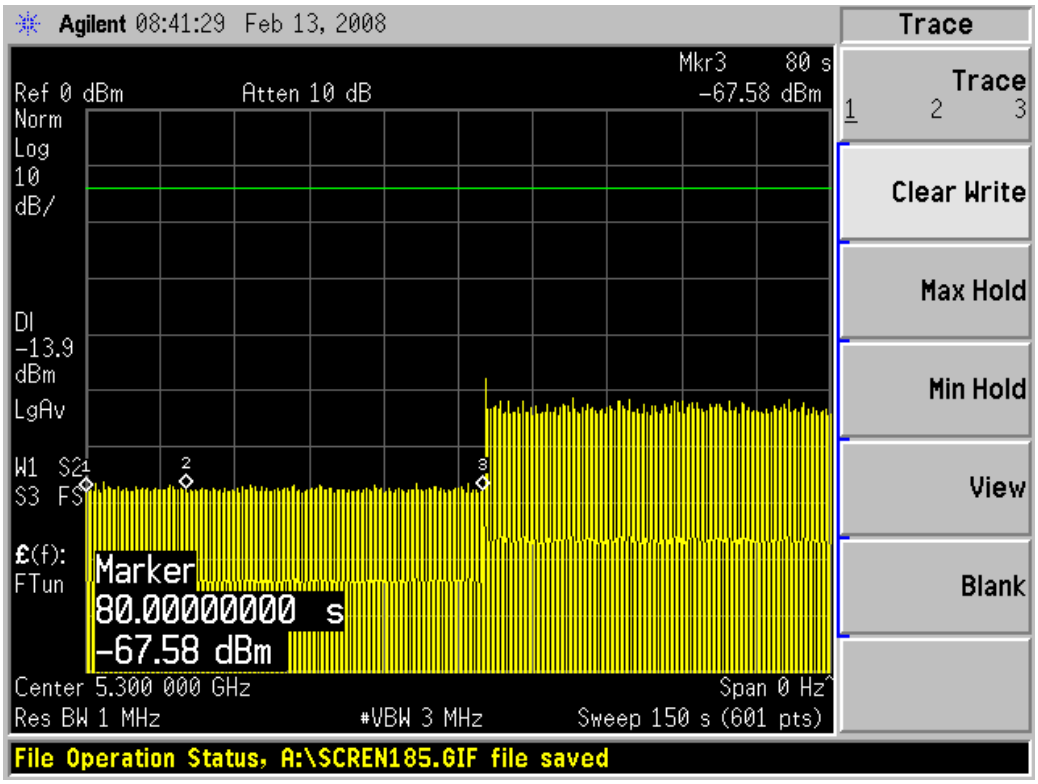
4. The **Initial Channel Availability Check Time** tests that the UUT does not emit beacon, control, or data signals on the test Channel until the power-up sequence has been completed and the U-NII device checks for Radar Waveforms for one minute on the test Channel. This test does not use any Radar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

   The U-NII device is powered on and be instructed to operate at 5300 MHz. At the same time the UUT is powered on, the spectrum analyzer is set to zero span mode with a 1 MHz resolution bandwidth at 5300MHz with a 2.5 minute sweep time. The analyzer's sweep will be started the 20 seconds before the CAC begins.

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

   The initial power up time of the UUT is indicated by marker 2 in the plot. Initial beacons/data transmissions are indicated by marker 3.

   Initial Channel Availability Check Time



5. **Radar Burst at the Beginning of the Channel Availability Check Time:** The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold (-58 dBm) occurs at the beginning of the Channel Availability Check Time.

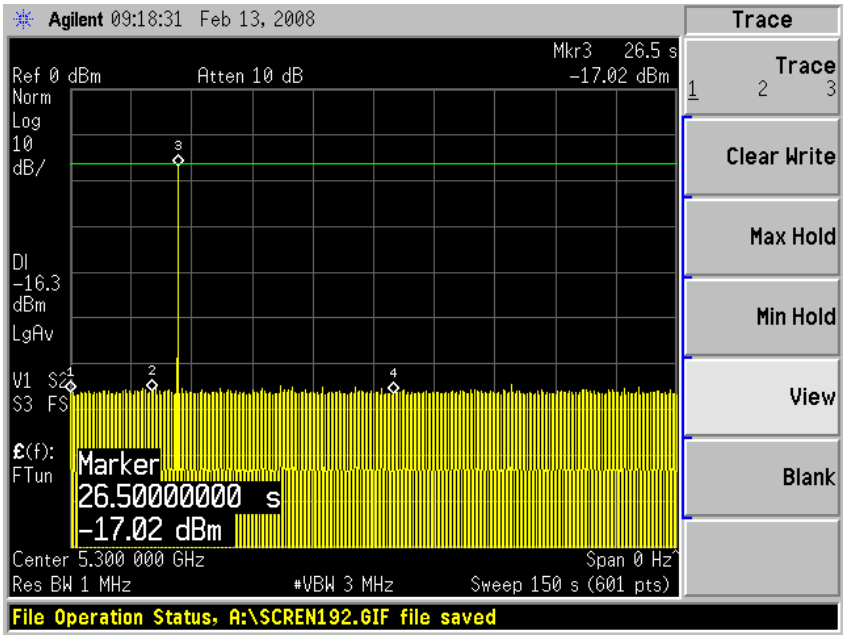
   The UUT is powered on and is fully running with the radio channel at the random channel that was selected. At T_2 the channel will be forced to 5300MHz using the special test command. T_3 will be the radar pulse at T_2+6s

   A single Burst of short pulse of radar type 1 at -58 dBm will commence within a 6 second window starting at T_2.

   Visual indication on the UUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions at 5300MHz will continue for 2.5 minutes after the radar Burst has been generated.

   Verify that during the 2.5 minute measurement window no UUT transmissions occurred at 5300MHz.

Radar Burst at the Beginning of the Channel Availability Check Time



6. **Radar Burst at the End of the Channel Availability Check Time:** The steps below define the procedure to verify successful radar detection on the selected Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold (-58) occurs at the end of the Channel Availability Check Time.

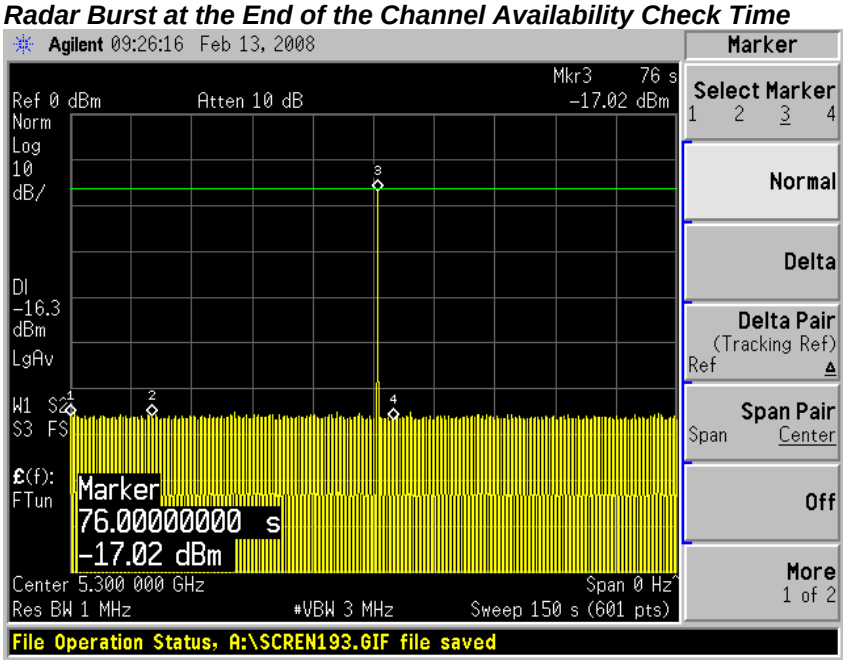
   The UUT is powered on and is fully running with the radio channel at the random channel that was selected. At T_2 the channel will be forced to 5300MHz using the special test command. T_3 will be the radar pulse at T_2+54s

   A single Burst of short pulse of radar type 1 at -58 dbm will commence within a 6 second window starting at T_2+ 54 seconds.

   Visual indication on the UUT of successful detection of the radar Burst will be recorded and reported. Observation of emissions at 5300MHz will continue for 2.5 minutes after the radar Burst has been generated.

   Verify that during the 2.5 minute measurement window no UUT transmissions occurred at 5300MHz.

Radar Burst at the End of the Channel Availability Check Time



6. 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, and 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 (-58dBm) is generated on the Operating Channel of the U-NII device.

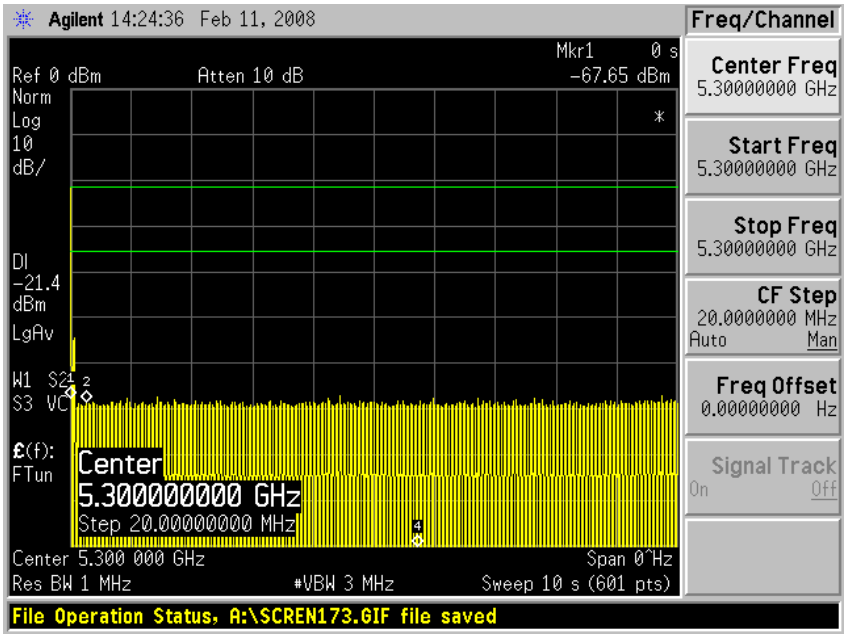
A U-NII device operating as a Client Device will associate with the UUT (Master) at 5300 MHz. Stream the MPEG test file from the Master Device to the Client Device on the selected Channel for the entire period of the test.

At time T_1 the Radar Waveform generator sends a Burst of pulses for each of the radar types at -58dBm. T_2 will mark the 260ms time the radio is allotted to close the channel.

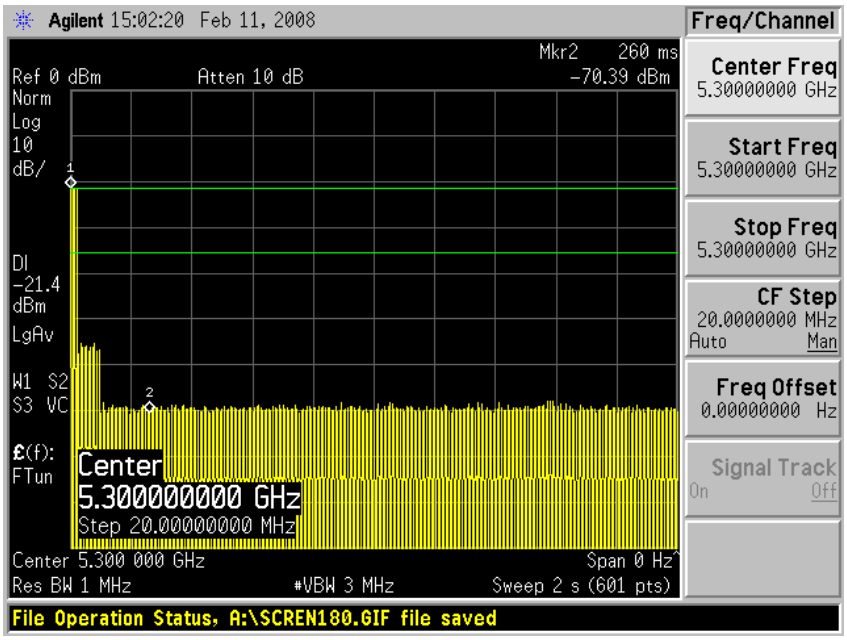
The event will be shown in a 2 second period as well as the 10 seconds to better graphically depict the channel closing

Observe the transmissions of the UUT at the end of the radar Burst on the Operating Channel for duration of 10 seconds. Measure and record the transmissions from the UUT during the observation time (Channel Move Time). Compare the Channel Move Time and Channel Closing Transmission Time results to the limits defined in the *DFS Response requirement values table***.**

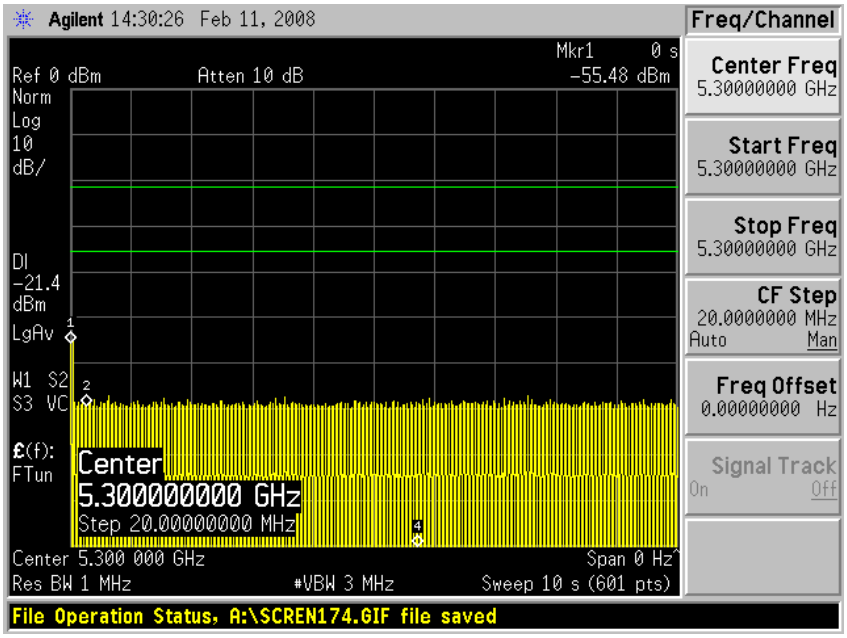
Channel Move Time, Channel Closing Transmission Time for Type 1 radar.



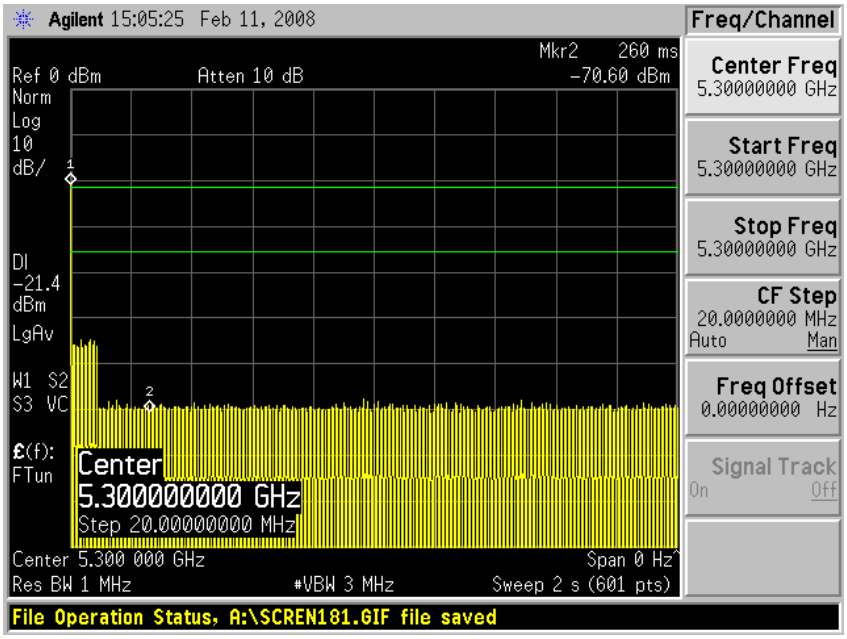
Closing time 2s sweep



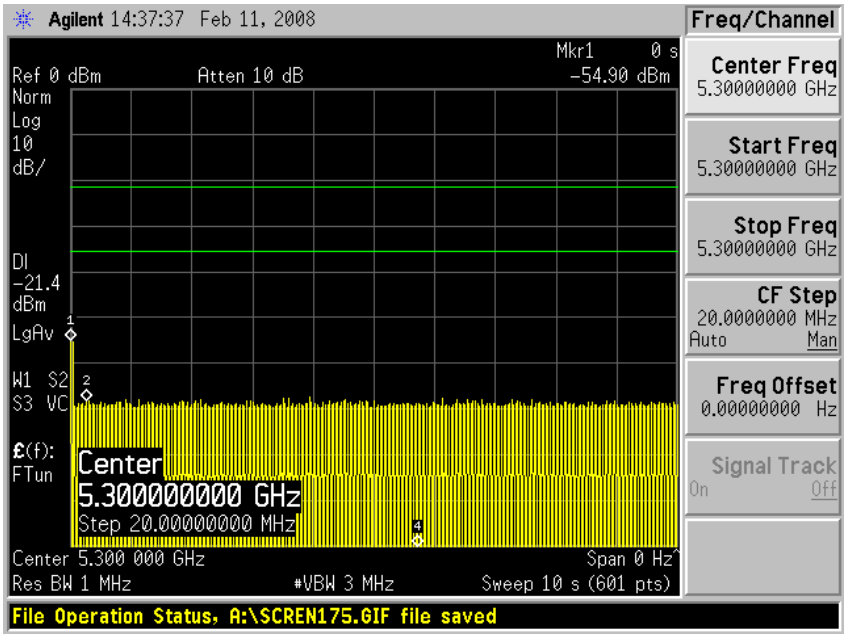
Channel Move Time, Channel Closing Transmission Time for Type 2 radar.



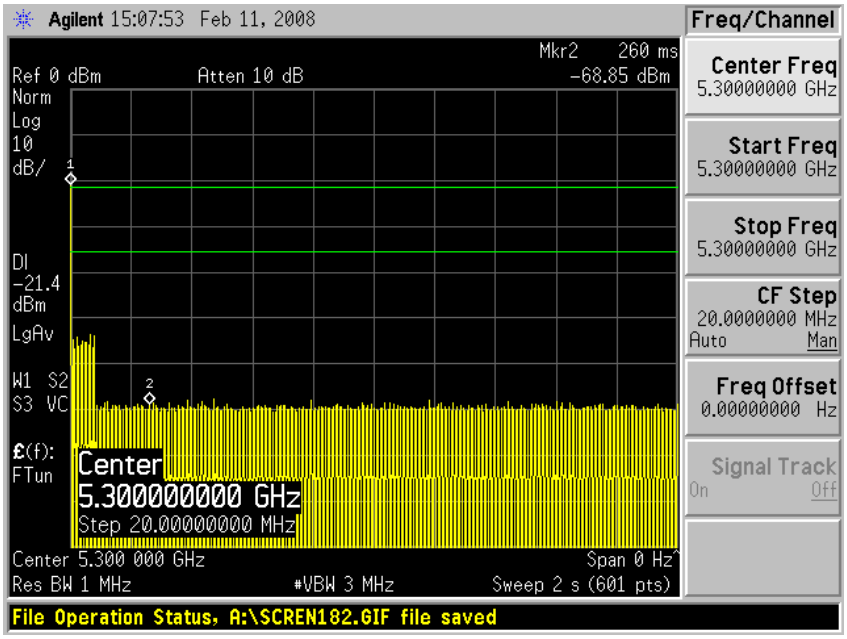
Closing time 2s sweep



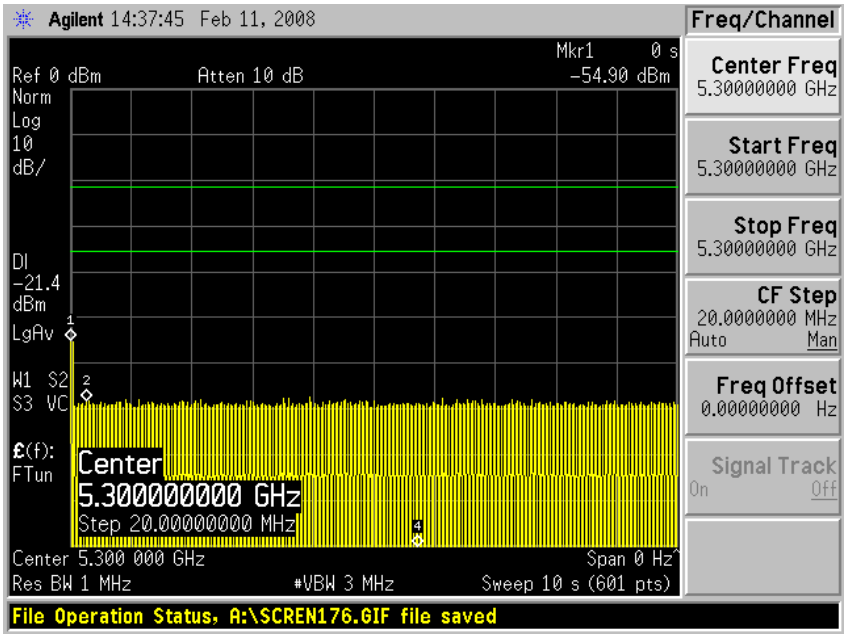
Channel Move Time, Channel Closing Transmission Time for Type 3 radar.



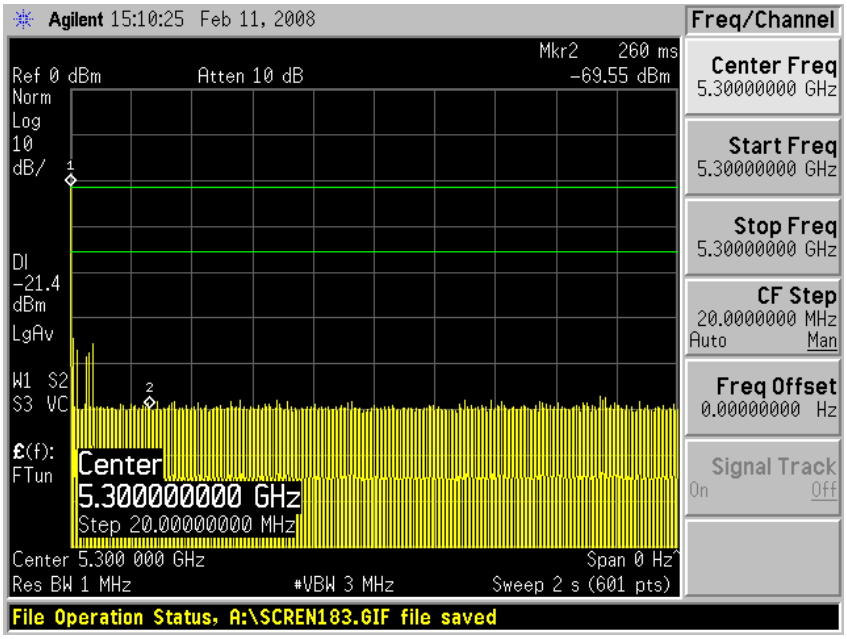
Closing time 2s sweep



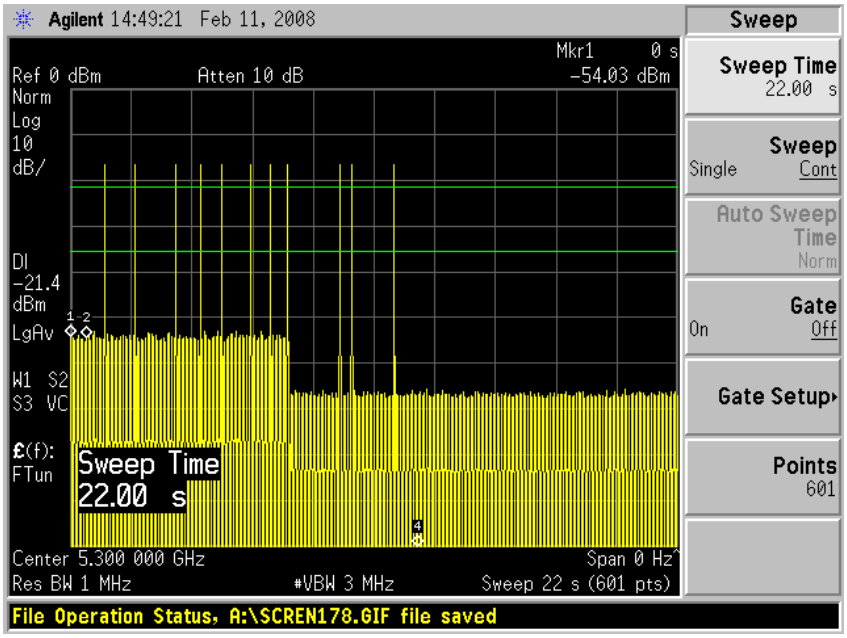
Channel Move Time, Channel Closing Transmission Time for Type 4 radar.



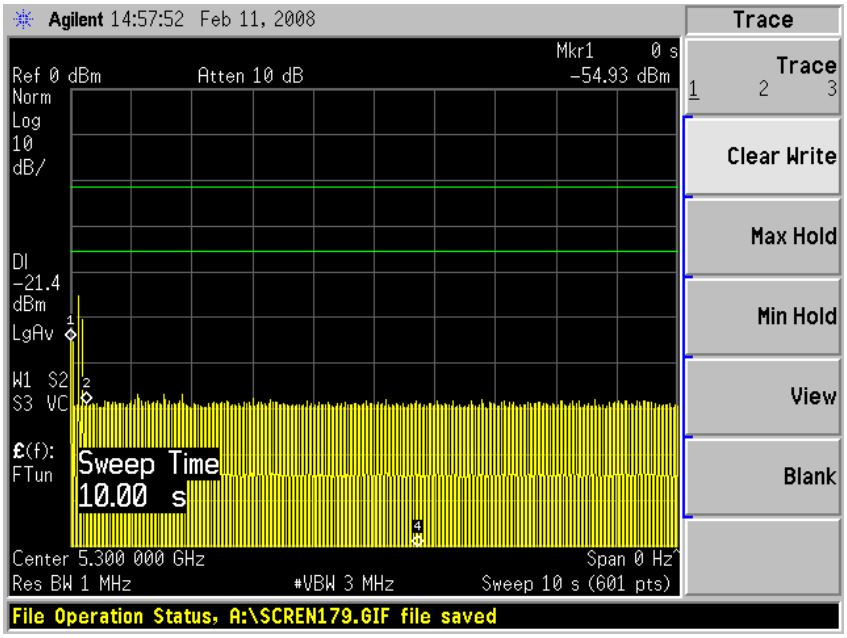
Closing time 2s sweep



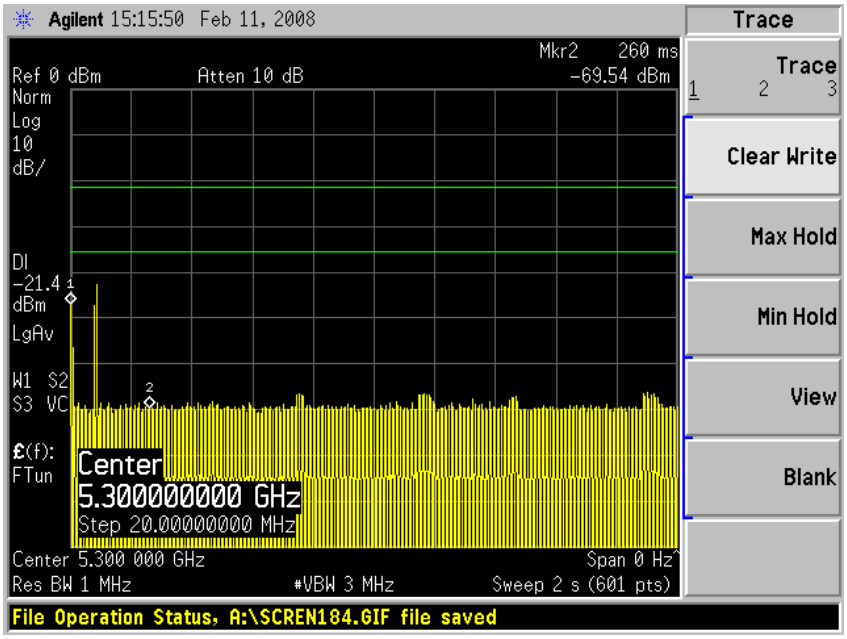
Channel Move Time, Channel Closing Transmission Time for Type 5 radar.



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

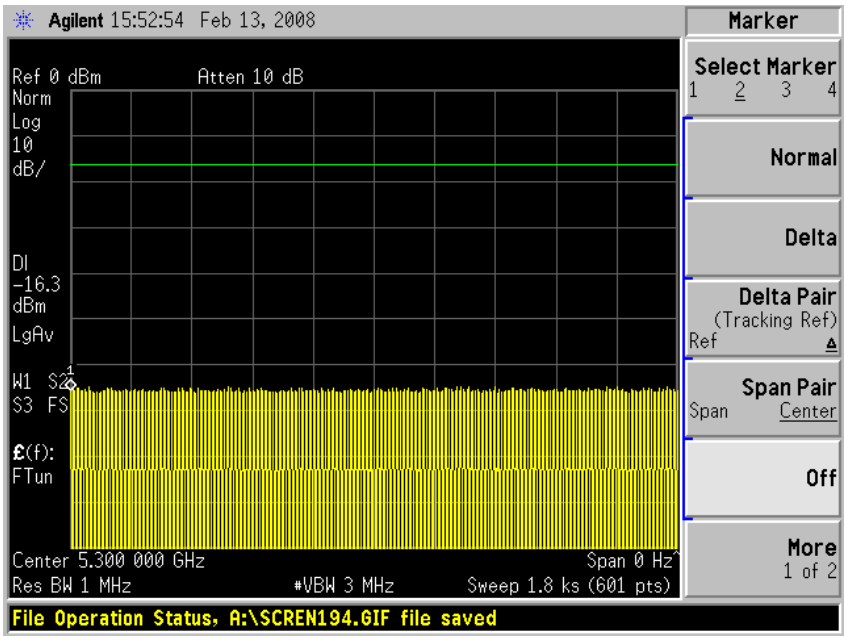


Closing time 2s sweep



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

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



7. Statistical Performance Check

The steps below define the procedure to determine the minimum percentage of detection when a radar burst with a level equal to the DFS Detection Threshold (-58dbm) is generated on the Operating Channel of the U-NII device.

A U-NII device operating as a Client Device will associate 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 Radar Waveform generator sends the individual waveform for each of the radar types 1-6 at -58dbm. Statistical data will be gathered to determine the ability of the device to detect the radar test waveforms. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trial runs. The percentage of successful detection is calculated by:

$$\frac{TotalWaveformDetections}{TotalWaveformTrials} \times 100$$ = Probability of Detection Radar Waveform

The Minimum number of trails, minimum percentage of successful detection and the average minimum percentage of successful detection are found in the *Radar Test Waveforms* section.

Type 1 Radar Statistical Performance

Trial #	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	
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	
13	1	1428	18	1
14	1	1428	18	1
15	1	1428	18	
16	1	1428	18	1
17	1	1428	18	1
18	1	1428	18	1
19	1	1428	18	1
20	1	1428	18	
21	1	1428	18	1
22	1	1428	18	1
23	1	1428	18	1
24	1	1428	18	
25	1	1428	18	1
26	1	1428	18	1
27	1	1428	18	1
28	1	1428	18	1
29	1	1428	18	
30	1	1428	18	1
			Detection Percentage	80% (>60%)

Type 2 Radar Statistical Performance

Trial #	Pulses/Burst	Pulse Width (us)	PRI (us)	1=Detection Blank=No Detection
1	27	4.6	158	1
2	25	2.1	160	1
3	29	1.8	157	1
4	26	4.3	186	1
5	27	2.0	189	1
6	24	2.2	224	1
7	26	1.2	219	1
8	27	4.6	168	
9	28	3.9	197	1
10	25	1.1	154	1
11	26	3.1	161	1
12	26	4.2	221	1
13	24	5.0	229	1
14	25	2.2	193	
15	26	3.0	172	1
16	23	1.6	159	1
17	24	2.7	200	
18	23	2.9	158	1
19	24	1.1	159	1
20	23	3.8	227	1
21	27	3.1	162	1
22	27	2.0	195	1
23	25	3.3	160	1
24	28	1.0	224	1
25	24	1.9	202	
26	26	2.3	194	1
27	23	2.2	165	
28	27	2.7	176	1
29	24	3.3	162	1
30	25	1.1	177	1
			Detection Percentage	83% (>60%)

Type 3 Radar Statistical Performance

Trial #	Pulses/Burst	Pulse Width (us)	PRI (us)	1=Detection Blank=No Detection
1	18	8.2	300	1
2	17	6.7	235	1
3	17	9.9	493	1
4	18	8.1	402	1
5	16	9.8	356	1
6	18	9.3	303	1
7	17	8.1	317	1
8	16	8.0	405	1
9	18	6.5	369	1
10	16	6.9	369	1
11	16	8.4	281	1
12	17	7.7	449	1
13	18	9.0	386	1
14	18	7.9	358	1
15	17	9.9	321	1
16	18	9.8	258	1
17	18	8.4	250	1
18	16	8.3	494	
19	18	7	296	1
20	17	9.2	207	1
21	18	8.9	389	1
22	16	6.4	242	1
23	17	9.2	207	1
24	17	9.2	288	1
25	17	8.9	201	1
26	16	6.9	393	1
27	17	9.8	283	1
28	16	9	387	1
29	17	6.6	316	1
30	17	7.3	294	1
			Detection Percentage	90% (>60%)

Type 4 Radar Statistical Performance

Trial #	Pulses/Burst	Pulse Width (us)	PRI (us)	1=Detection Blank=No Detection
1	14	11.6	213	1
2	16	18.9	349	1
3	14	12	291	1
4	16	11.9	341	1
5	15	18	477	1
6	12	12.4	393	1
7	12	19.1	441	1
8	16	18	303	1
9	15	15.2	267	1
10	13	17.9	226	1
11	15	12.2	319	1
12	12	14.4	471	1
13	14	18.6	419	1
14	12	11.5	257	1
15	12	14.5	455	1
16	16	19.8	209	1
17	14	14.6	275	1
18	12	16.1	356	1
19	12	11.5	441	1
20	12	16.6	280	1
21	13	15.8	386	1
22	13	14.1	337	1
23	15	11.7	244	1
24	13	16.9	356	1
25	14	19.6	298	1
26	15	17.6	350	1
27	12	13.9	287	1
28	12	14.3	435	1
29	16	11.6	357	1
30	12	17.2	439	1
			Detection Percentage	100% (>60%)

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

$$\frac{P_d 1 + P_d 2 + P_d 3 + P_d 4}{4}$$ = (80%+83%+90%+100%)/4 = **88.25%** (>80%)

Type 5 Radar Statistical Performance

Trial #	Filename*	1=Detection Blank=No Detection
1	Bin 5 Radar Test1	1
2	Bin 5 Radar Test2	1
3	Bin 5 Radar Test3	1
4	Bin 5 Radar Test4	1
5	Bin 5 Radar Test5	1
6	Bin 5 Radar Test6	1
7	Bin 5 Radar Test 7	1
8	Bin 5 Radar Test 8	1
9	Bin 5 Radar Test 9	1
10	Bin 5 Radar Test 10	1
11	Bin 5 Radar Test 11	1
12	Bin 5 Radar Test 12	1
13	Bin 5 Radar Test 13	
14	Bin 5 Radar Test 14	1
15	Bin 5 Radar Test 15	1
16	Bin 5 Radar Test 16	
17	Bin 5 Radar Test 17	1
18	Bin 5 Radar Test 18	
19	Bin 5 Radar Test 19	1
20	Bin 5 Radar Test 20	1
21	Bin 5 Radar Test 21	1
22	Bin 5 Radar Test 22	1
23	Bin 5 Radar Test 23	1
24	Bin 5 Radar Test 24	1
25	Bin 5 Radar Test 25	1
26	Bin 5 Radar Test 26	
27	Bin 5 Radar Test 27	1
28	Bin 5 Radar Test 28	
29	Bin 5 Radar Test 29	1
30	Bin 5 Radar Test 30	1
Detection Percentage		83%(>80%)

*See the Bin5 Radar Characteristics at the end of this report.

Type 6 Radar Statistical Performance

Trial #	Filename*	1=Detection Blank=No Detection
1	Hopping Radar Test 1	1
2	Hopping Radar Test 2	1
3	Hopping Radar Test 3	1
4	Hopping Radar Test 4	1
5	Hopping Radar Test 5	1
6	Hopping Radar Test 6	1
7	Hopping Radar Test 7	1
8	Hopping Radar Test 8	1
9	Hopping Radar Test 9	1
10	Hopping Radar Test 10	1
11	Hopping Radar Test 11	1
12	Hopping Radar Test 12	1
13	Hopping Radar Test 13	1
14	Hopping Radar Test 14	1
15	Hopping Radar Test 15	1
16	Hopping Radar Test 16	1
17	Hopping Radar Test 17	1
18	Hopping Radar Test 18	1
19	Hopping Radar Test 19	1
20	Hopping Radar Test 20	1
21	Hopping Radar Test 21	1
22	Hopping Radar Test 22	1
23	Hopping Radar Test 23	1
24	Hopping Radar Test 24	1
25	Hopping Radar Test 25	1
26	Hopping Radar Test 26	1
27	Hopping Radar Test 27	1
28	Hopping Radar Test 28	1
29	File corrupted	1
30	File corrupted	1
Detection Percentage		100%(>80%)

USA Bin 5 Radar Test 1
2/14/2008 1:54:56 PM
Bursts: 16

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	2	14	60	1004	0.258185
2	3	5	75	1133,1423	0.896013
3	2	10	70	1706	1.912456
4	3	18	100	1724,1613	2.736405
5	1	11	90	NA	3.728403
6	1	14	90	NA	3.785211
7	3	6	95	1332,1821	4.874297
8	2	14	75	1248	5.581310
9	1	9	100	NA	6.657672
10	1	8	70	NA	6.965814
11	2	14	80	1400	7.612622
12	2	16	95	1620	8.901253
13	1	18	90	NA	9.201111
14	3	10	60	1174,1671	9.892364
15	2	12	60	1880	10.772351
16	3	6	95	1153,1280	11.594492

USA Bin 5 Radar Test2
2/14/2008 1:57:50 PM
Bursts: 19

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	3	15	70	1781,1555	0.482333
2	2	19	55	1906	0.976626
3	1	6	60	NA	1.539465
4	3	7	95	1417,1048	2.108653
5	2	15	70	1359	2.620728
6	2	12	100	1035	3.775820
7	1	8	90	NA	4.095027
8	3	6	75	1251,1963	4.564004
9	1	11	75	NA	5.150981
10	2	18	70	1243	6.133910
11	3	14	90	1178,1664	6.551703
12	2	20	55	1126	7.554814
13	3	14	60	1615,1977	7.949057
14	3	14	90	1247,1493	8.427114
15	3	16	95	1578,1552	8.925198
16	1	6	50	NA	9.924867
17	3	10	80	1242,1079	10.285477
18	2	13	70	1324	11.139403
19	3	5	80	1417,1099	11.431198

USA Bin 5 Radar Test3
2/14/2008 2:00:05 PM
Bursts: 13

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	2	7	55	1970	0.756636
2	1	9	90	NA	1.577657
3	2	17	80	1769	2.332649
4	1	7	100	NA	3.282354
5	2	17	55	1708	4.510095
6	3	15	65	1117,1898	4.738669
7	2	6	90	1054	6.084969
8	2	6	60	1689	6.845939
9	3	18	90	1951,1765	7.784883
10	3	7	85	1737,1174	8.405508
11	1	7	80	NA	10.034450
12	1	17	55	NA	10.270931
13	2	7	75	1678	11.118493

USA Bin 5 Radar Test4
2/14/2008 2:00:55 PM
Bursts: 18

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	3	5	50	1307,1565	0.404922
2	1	9	100	NA	0.817757
3	3	20	75	1861,1442	1.480847
4	2	10	80	1920	2.107688
5	3	10	100	1227,1592	3.274292
6	2	19	85	1921	3.749408
7	2	5	70	1714	4.153311
8	3	16	70	1675,1956	5.199169
9	2	15	80	1751	5.507111
10	2	19	100	1619	6.527648
11	1	10	50	NA	7.278005
12	3	16	100	1027,1991	7.592551
13	1	12	70	NA	8.429194
14	2	13	65	1607	9.206968
15	3	5	60	1228,1777	9.802353
16	2	19	70	1558	10.378554
17	1	20	80	NA	11.053431
18	1	10	65	NA	11.342690

USA Bin 5 Radar Test5
2/14/2008 2:03:07 PM
Bursts: 19

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	3	11	60	1452,1165	0.557760
2	2	13	60	1971	1.146916
3	1	11	60	NA	1.381290
4	3	9	90	1560,1944	2.153610
5	3	11	50	1538,1678	3.107282
6	2	5	80	1682	3.596690
7	3	9	85	1766,1004	4.324943
8	2	17	95	1132	5.020764
9	3	9	90	1523,1889	5.089008
10	3	9	50	1090,1761	5.983176
11	1	13	55	NA	6.743888
12	2	18	65	1506	7.086856
13	2	5	65	1173	8.122291
14	2	6	85	1127	8.635108
15	2	16	75	1328	9.157656
16	2	20	50	1726	9.881967
17	1	12	80	NA	10.231273
18	3	8	90	1455,1453	10.817440
19	1	9	80	NA	11.505262

USA Bin 5 Radar Test6
2/14/2008 2:05:38 PM
Bursts: 10

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	3	8	70	1468,1662	1.163791
2	3	11	55	1754,1008	1.405560
3	3	19	55	1374,1901	2.660820
4	3	13	65	1178,1606	4.383790
5	2	20	75	1875	5.977974
6	2	9	70	1956	7.069814
7	3	7	75	1191,1309	7.460051
8	1	9	65	NA	8.693845
9	3	17	80	1910,1300	10.016884
10	2	20	100	1881	11.895479

USA Bin 5 Radar Test7
2/14/2008 2:06:22 PM
Bursts: 20

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	3	16	60	1002,1694	0.063851
2	1	14	90	NA	1.156289
3	2	5	75	1601	1.699683
4	2	14	50	1776	1.912192
5	3	8	65	1640,1234	2.934544

6	3	11	95	1447,1041	3.095822
7	3	16	85	1136,1267	3.618299
8	2	10	60	1455	4.219519
9	1	17	55	NA	5.372584
10	2	14	50	1386	5.640829
11	3	8	80	1796,1503	6.025885
12	3	14	95	1088,1834	7.026695
13	2	8	50	1903	7.272692
14	3	11	85	1764,1926	8.256002
15	3	19	80	1781,1409	8.451752
16	1	19	100	NA	9.150553
17	2	5	50	1263	9.946586
18	2	11	55	1024	10.765353
19	3	11	60	1130,1369	11.348777
20	1	9	55	NA	11.995715

USA Bin 5 Radar Test8
2/14/2008 2:09:23 PM
Bursts: 12

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	1	11	55	NA	0.976749
2	1	9	80	NA	1.796059
3	1	8	65	NA	2.558690
4	2	17	80	1847	3.204960
5	2	13	60	1813	4.284974
6	1	16	60	NA	5.707175
7	1	12	50	NA	6.323553
8	3	6	55	1366,1424	7.892372
9	1	10	80	NA	8.396448
10	3	17	80	1724,1680	9.126680
11	3	9	65	1195,1815	10.666029
12	1	15	90	NA	11.752214

USA Bin 5 Radar Test9
2/14/2008 2:10:03 PM
Bursts: 9

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	1	5	75	NA	0.835907
2	2	20	65	1336	2.229036
3	3	14	85	1353,1923	3.709997
4	2	19	95	1596	4.964881
5	2	15	50	1998	6.198773
6	2	13	60	1329	7.161998
7	1	7	70	NA	9.207559
8	3	5	100	1652,1401	9.533447

9	1	12	95	NA	11.379750

USA Bin 5 Radar Test10
2/14/2008 2:12:31 PM
Bursts: 19

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	3	5	60	1789,1484	0.531827
2	1	16	100	NA	0.791338
3	1	17	50	NA	1.676880
4	1	11	95	NA	2.389800
5	1	18	95	NA	2.580935
6	3	16	95	1004,1876	3.351325
7	2	10	75	1092	4.149430
8	3	7	75	1601,1710	5.008670
9	3	9	85	1411,1561	5.274352
10	2	9	70	1522	5.869587
11	1	8	100	NA	6.711773
12	2	10	55	1665	7.433982
13	2	13	100	1951	7.994863
14	1	11	85	NA	8.579089
15	1	14	90	NA	9.396110
16	3	18	75	1270,1205	9.965655
17	1	12	95	NA	10.250297
18	1	13	65	NA	11.076915
19	3	15	55	1158,1550	11.929170

USA Bin 5 Radar Test11
2/14/2008 2:18:26 PM
Bursts: 16

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	3	7	70	1748,1822	0.051656
2	3	9	65	1576,1664	0.759234
3	2	11	70	1892	2.068371
4	3	14	65	1510,1235	2.445954
5	3	13	95	1181,1554	3.175866
6	1	11	65	NA	3.919104
7	1	18	60	NA	4.969888
8	1	15	100	NA	5.872083
9	1	13	55	NA	6.208820
10	1	11	100	NA	7.201844
11	1	12	85	NA	8.037855
12	2	16	55	1406	8.953010
13	2	18	70	1940	9.375395
14	3	10	90	1700,1031	10.276059
15	2	6	85	1147	11.218533

16	2	10	60	1976	11.829587

USA Bin 5 Radar Test12
2/14/2008 2:19:19 PM
Bursts: 9

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	3	18	60	1995,1344	0.698492
2	1	20	70	NA	1.540905
3	2	11	95	1395	3.407921
4	2	14	50	1932	4.314884
5	1	12	55	NA	6.184785
6	2	18	75	1769	7.764110
7	1	9	65	NA	8.070083
8	2	18	60	1336	9.904229
9	2	17	80	1178	11.841362

USA Bin 5 Radar Test13
2/14/2008 2:20:11 PM
Bursts: 15

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	3	6	60	1001,1474	0.094427
2	3	17	50	1990,1400	1.038421
3	3	9	50	1412,1021	1.849294
4	3	14	90	1698,1211	2.869279
5	2	6	80	1466	3.894497
6	1	11	90	NA	4.454755
7	2	11	95	1843	5.347612
8	2	14	70	1457	5.636047
9	1	7	65	NA	6.820316
10	3	7	90	1673,1590	7.387329
11	3	19	85	1080,1450	8.757582
12	1	6	95	NA	9.530621
13	3	18	75	1806,1260	9.727160
14	2	10	70	1924	10.638010
15	1	12	50	NA	11.303414

USA Bin 5 Radar Test14
2/14/2008 2:22:58 PM
Bursts: 19

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	2	19	60	1141	0.437663
2	3	10	65	1680,1217	0.865686
3	1	15	60	NA	1.642719
4	2	6	75	1492	2.047760
5	2	12	60	1582	3.041094

6	3	10	95	1059,1977	3.609009
7	1	6	90	NA	4.271223
8	2	14	65	1599	5.050272
9	2	12	50	1658	5.365909
10	2	6	55	1368	6.053025
11	2	15	50	1475	6.384048
12	2	11	85	1853	7.179137
13	2	16	55	1996	8.048175
14	3	10	85	1519,1992	8.611522
15	2	15	65	1362	9.231874
16	3	20	60	1317,1190	10.049625
17	2	9	90	1094	10.611558
18	1	11	80	NA	11.298449
19	1	17	65	NA	11.653201

USA Bin 5 Radar Test15
2/14/2008 2:23:44 PM
Bursts: 12

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	3	7	90	1980,1279	0.393505
2	3	20	55	1679,1251	1.760779
3	2	5	60	1665	2.040150
4	2	11	85	1253	3.980911
5	1	13	95	NA	4.200213
6	1	14	50	NA	5.089310
7	1	16	55	NA	6.688314
8	2	19	70	1055	7.399783
9	2	12	60	1470	8.287839
10	3	13	95	1906,1166	9.939571
11	2	19	55	1633	10.126920
12	2	18	80	1379	11.247160

USA Bin 5 Radar Test16
2/14/2008 2:26:08 PM
Bursts: 12

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	1	8	50	NA	0.308263
2	1	18	70	NA	1.457450
3	3	12	75	1433,1395	2.475696
4	2	8	85	1667	3.769450
5	1	12	70	NA	4.311473
6	2	18	95	1804	5.718592
7	3	20	55	1672,1386	6.730172
8	1	8	90	NA	7.808207
9	3	8	100	1135,1010	8.202777

10	1	17	55	NA	9.058432
11	2	6	60	1778	10.957552
12	3	20	95	1615,1348	11.241145

USA Bin 5 Radar Test17
2/14/2008 2:34:10 PM
Bursts: 15

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	2	10	60	1807	0.109466
2	3	12	65	1174,1670	1.116834
3	1	7	55	NA	2.131821
4	1	9	90	NA	2.513367
5	1	8	80	NA	3.253331
6	3	5	75	1129,1816	4.382574
7	1	15	85	NA	5.547429
8	3	8	60	1327,1181	5.738920
9	3	20	65	1610,1713	7.154600
10	3	14	55	1672,1429	7.421094
11	3	15	80	1407,1468	8.501007
12	2	20	100	1295	9.323826
13	1	11	90	NA	9.633387
14	3	18	100	1587,1465	10.831966
15	2	15	55	1626	11.916897

USA Bin 5 Radar Test18
2/14/2008 2:36:21 PM
Bursts: 12

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	2	16	60	1137	0.293508
2	2	18	60	1877	1.661207
3	2	6	100	1916	2.160031
4	3	8	100	1276,1878	3.875557
5	1	10	60	NA	4.663602
6	2	14	65	1800	5.698745
7	3	6	70	1050,1579	6.568006
8	3	5	85	1771,1416	7.090401
9	3	5	95	1191,1248	8.645828
10	1	11	75	NA	9.112661
11	3	16	100	1963,1683	10.111803
12	3	16	55	1238,1895	11.986971

USA Bin 5 Radar Test19
2/14/2008 2:37:10 PM
Bursts: 9

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)

1	3	10	60	1424,1651	0.068481
2	1	11	50	NA	1.500793
3	3	17	95	1877,1626	3.686847
4	1	16	95	NA	4.498144
5	3	13	100	1570,1169	6.570261
6	1	6	55	NA	7.455054
7	1	8	75	NA	9.030212
8	3	9	100	1834,1264	10.119012
9	3	20	70	1503,1890	10.712019

USA Bin 5 Radar Test20
2/14/2008 2:37:51 PM
Bursts: 11

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	2	11	100	1756	1.076532
2	2	7	60	1067	1.410144
3	2	5	75	1320	2.963558
4	1	15	70	NA	4.030606
5	3	13	75	1494,1871	4.586955
6	1	12	85	NA	6.050082
7	1	13	70	NA	6.718544
8	2	13	95	1339	8.177030
9	1	11	50	NA	9.694804
10	1	19	55	NA	9.892433
11	1	16	90	NA	11.626054

USA Bin 5 Radar Test21
2/14/2008 2:38:31 PM
Bursts: 8

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	2	18	55	1983	1.400372
2	3	11	60	1469,1347	2.940759
3	3	5	50	1239,1508	3.738378
4	3	6	75	1700,1642	5.666199
5	2	8	60	1785	7.366048
6	3	7	65	1670,1857	7.626882
7	2	13	55	1488	9.894502
8	1	5	80	NA	11.282473

USA Bin 5 Radar Test22
2/14/2008 2:39:31 PM
Bursts: 14

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	2	19	60	1014	0.689011
2	3	7	50	1406,1171	0.897492

3	3	19	100	1386,1607	2.498625
4	1	5	100	NA	2.952833
5	1	20	90	NA	3.910692
6	1	7	65	NA	4.802369
7	2	20	80	1468	5.830323
8	3	18	90	1635,1349	6.105082
9	1	12	65	NA	6.858193
10	2	8	60	1386	7.857305
11	3	9	50	1031,1007	9.022532
12	1	20	75	NA	9.602748
13	3	8	55	1987,1357	10.414787
14	2	6	90	1470	11.495296

USA Bin 5 Radar Test23
2/14/2008 2:44:06 PM
Bursts: 9

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	2	11	60	1941	0.942134
2	3	14	90	1479,1998	2.041281
3	1	6	55	NA	2.863975
4	3	20	95	1842,1715	4.336685
5	3	15	75	1632,1485	6.572923
6	2	14	55	1031	6.706946
7	3	19	65	1068,1905	9.279475
8	3	7	55	1034,1594	10.189546
9	3	12	55	1148,1637	10.926377

USA Bin 5 Radar Test24
2/14/2008 2:51:21 PM
Bursts: 11

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	2	11	70	1081	0.207289
2	3	15	85	1245,1954	1.624913
3	2	5	100	1250	2.626834
4	2	19	65	1845	3.915252
5	1	17	60	NA	4.739706
6	2	9	65	1400	5.488538
7	3	13	95	1728,1695	6.750347
8	3	17	65	1025,1830	7.995621
9	3	16	95	1689,1181	8.981287
10	2	5	65	1295	10.861471
11	1	19	65	NA	11.558926

USA Bin 5 Radar Test25
2/14/2008 2:55:17 PM

Bursts: 16

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	1	13	100	NA	0.613405
2	3	6	50	1828,1587	1.150671
3	1	11	95	NA	2.117973
4	2	18	80	1406	2.357193
5	3	20	80	1924,1134	3.365134
6	2	11	95	1798	4.014021
7	2	15	50	1024	5.239783
8	3	5	60	1080,1818	5.878701
9	1	9	60	NA	6.326146
10	1	5	70	NA	6.965475
11	1	13	55	NA	7.522571
12	3	6	80	1326,1595	8.287313
13	3	6	90	1350,1512	9.512794
14	1	7	55	NA	10.223869
15	1	13	70	NA	10.970368
16	1	8	80	NA	11.869204

USA Bin 5 Radar Test26
2/14/2008 2:55:52 PM
Bursts: 14

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	3	7	50	1789,1640	0.351067
2	3	18	60	1885,1926	0.867829
3	2	5	80	1549	2.500720
4	1	15	50	NA	2.838598
5	3	16	80	1055,1187	3.563470
6	3	14	80	1523,1743	4.940751
7	1	6	60	NA	5.939684
8	1	10	55	NA	6.150465
9	3	5	55	1749,1526	7.210154
10	2	20	60	1140	7.782583
11	1	15	90	NA	9.215058
12	3	18	70	1177,1632	10.089292
13	3	8	90	1878,1391	10.813178
14	2	20	60	1282	11.194266

USA Bin 5 Radar Test27
2/14/2008 2:58:08 PM
Bursts: 14

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	3	7	75	1747,1917	0.345223
2	2	20	65	1926	1.634620
3	3	9	80	1428,1268	2.423599

4	1	9	100	NA	3.145629
5	1	12	95	NA	4.239414
6	3	10	55	1269,1956	4.518666
7	1	5	55	NA	5.878593
8	2	9	70	1358	6.387081
9	2	15	75	1468	7.451825
10	1	11	65	NA	8.518589
11	1	16	95	NA	8.885267
12	1	10	50	NA	10.131656
13	1	13	60	NA	10.578788
14	1	15	100	NA	11.392781

USA Bin 5 Radar Test28
2/14/2008 2:58:54 PM
Bursts: 19

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	3	15	90	1770,1373	0.343213
2	1	14	60	NA	1.149081
3	1	12	95	NA	1.280346
4	1	19	85	NA	2.504313
5	1	8	80	NA	2.618819
6	2	16	80	1709	3.432548
7	1	7	55	NA	4.043140
8	2	13	80	1819	5.029737
9	2	8	95	1530	5.484747
10	3	19	70	1399,1012	5.757187
11	3	5	65	1718,1267	6.578143
12	1	5	100	NA	7.551135
13	1	8	55	NA	7.672667
14	3	13	50	1930,1225	8.796297
15	2	6	70	1698	9.093862
16	2	14	100	1731	9.636481
17	1	17	70	NA	10.272097
18	2	13	75	1136	11.289309
19	2	6	65	1383	11.717125

USA Bin 5 Radar Test29
2/14/2008 3:00:01 PM
Bursts: 20

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	1	8	85	NA	0.123826
2	2	20	75	1271	1.071425
3	3	16	80	1432,1636	1.387404
4	3	16	80	1331,1910	1.834717
5	1	6	60	NA	2.527698

6	1	12	100	NA	3.229847
7	1	9	75	NA	3.614007
8	1	13	90	NA	4.236901
9	2	14	70	1130	5.363595
10	1	15	50	NA	5.577113
11	3	17	70	1069,1349	6.332002
12	3	10	65	1234,1709	6.845343
13	3	18	100	1028,1244	7.274868
14	2	19	100	1655	8.022782
15	2	15	55	1017	8.445255
16	1	11	55	NA	9.500208
17	3	18	55	1948,1117	9.707793
18	1	15	65	NA	10.243751
19	3	9	90	1312,1425	11.282000
20	2	18	95	1215	11.519193

USA Bin 5 Radar Test30
2/14/2008 3:00:33 PM
Bursts: 12

Burst#	Pulses	Chirp(MHz)	PW(uS)	Inter-pulse spacing/s(uS)	Pulse Start(S)
1	3	6	90	1703,1807	0.186516
2	3	15	100	1611,1175	1.618655
3	2	17	75	1875	2.277181
4	2	13	70	1722	3.028921
5	2	6	85	1872	4.742779
6	2	18	60	1896	5.441096
7	1	10	60	NA	6.225508
8	1	14	65	NA	7.166363
9	1	9	75	NA	8.014063
10	1	20	60	NA	9.101703
11	3	7	75	1324,1141	10.497952
12	2	12	85	1456	11.688730

USA Frequency Hopping Radar Test1
2/14/2008 3:19:39 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
19	5.294000	57
20	5.303000	60
25	5.297000	75
63	5.309000	189
89	5.308000	267
93	5.293000	279

USA Frequency Hopping Radar Test2
2/14/2008 3:20:30 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
32	5.293000	96
96	5.309000	288
99	5.302000	297

USA Frequency Hopping Radar Test3
2/14/2008 3:21:42 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
10	5.294000	30
29	5.300000	87
45	5.307000	135
53	5.299000	159
67	5.292000	201
82	5.305000	246

USA Frequency Hopping Radar Test4
2/14/2008 3:22:19 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
24	5.307000	72
25	5.308000	75
35	5.300000	105
51	5.295000	153
92	5.304000	276
93	5.301000	279

USA Frequency Hopping Radar Test5
2/14/2008 3:23:01 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
65	5.292000	195
86	5.308000	258

USA Frequency Hopping Radar Test6
2/14/2008 3:23:59 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
5	5.302000	15
17	5.308000	51
25	5.291000	75

USA Frequency Hopping Radar Test7
2/14/2008 3:24:27 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
29	5.300000	87
86	5.292000	258

USA Frequency Hopping Radar Test8

2/14/2008 3:25:38 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
9	5.294000	27
17	5.308000	51
50	5.299000	150
78	5.304000	234

USA Frequency Hopping Radar Test9
2/14/2008 3:28:50 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
5	5.306000	15
45	5.301000	135
52	5.294000	156
63	5.295000	189

USA Frequency Hopping Radar Test10
2/14/2008 3:29:57 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
1	5.304000	3
31	5.299000	93

USA Frequency Hopping Radar Test11
2/14/2008 3:36:07 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
5	5.293000	15
78	5.292000	234

USA Frequency Hopping Radar Test12
2/14/2008 3:36:59 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
28	5.292000	84
33	5.306000	99
66	5.304000	198
91	5.301000	273

USA Frequency Hopping Radar Test13
2/14/2008 3:38:23 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
26	5.306000	78
51	5.296000	153
94	5.307000	282

USA Frequency Hopping Radar Test14
2/14/2008 3:38:56 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
24	5.294000	72

USA Frequency Hopping Radar Test15
2/14/2008 3:40:31 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
7	5.309000	21
11	5.304000	33
16	5.305000	48
65	5.302000	195
86	5.294000	258
87	5.303000	261
90	5.292000	270
98	5.301000	294

USA Frequency Hopping Radar Test16
2/14/2008 3:41:18 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
0	5.303000	0
68	5.291000	204
71	5.308000	213
86	5.293000	258

USA Frequency Hopping Radar Test17
2/14/2008 3:41:46 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
15	5.306000	45
42	5.295000	126
70	5.308000	210
87	5.303000	261

USA Frequency Hopping Radar Test18
2/14/2008 3:41:57 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
9	5.294000	27
51	5.291000	153
78	5.305000	234

USA Frequency Hopping Radar Test19
2/14/2008 3:42:13 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
0	5.293000	0
29	5.309000	87
47	5.307000	141
48	5.300000	144
76	5.294000	228
92	5.296000	276

USA Frequency Hopping Radar Test20
2/14/2008 3:42:24 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
58	5.305000	174
90	5.304000	270
95	5.308000	285

USA Frequency Hopping Radar Test21
2/14/2008 3:42:36 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
42	5.298000	126
43	5.309000	129
72	5.292000	216

USA Frequency Hopping Radar Test22
2/14/2008 3:42:51 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
49	5.305000	147
58	5.300000	174
74	5.307000	222

USA Frequency Hopping Radar Test23
2/14/2008 3:43:04 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
19	5.293000	57
27	5.298000	81
44	5.296000	132
72	5.305000	216
80	5.294000	240

USA Frequency Hopping Radar Test24
2/14/2008 3:43:14 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
2	5.306000	6
36	5.293000	108
72	5.296000	216
94	5.305000	282

USA Frequency Hopping Radar Test25
2/14/2008 3:43:31 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
52	5.298000	156
53	5.303000	159
84	5.301000	252

USA Frequency Hopping Radar Test26
2/14/2008 3:43:46 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
4	5.298000	12
38	5.294000	114
44	5.292000	132

USA Frequency Hopping Radar Test27
2/14/2008 3:44:00 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
51	5.293000	153
52	5.304000	156
65	5.300000	195
70	5.303000	210

USA Frequency Hopping Radar Test28
2/14/2008 3:44:25 PM

Hop#	Frequency(GHz)	Pulse Start (mS)
19	5.305000	57
26	5.292000	78
34	5.307000	102
54	5.303000	162
56	5.300000	168
65	5.298000	195
95	5.302000	285

Appendix B: Abbreviation Key and Definitions

The following table defines abbreviations used within this test report.

Abbreviation	Description	Abbreviation	Description
EMC	Electro Magnetic Compatibility	°F	Degrees Fahrenheit
EMI	Electro Magnetic Interference	°C	Degrees Celsius
EUT	Equipment Under Test	Temp	Temperature
ITE	Information Technology Equipment	S/N	Serial Number
TAP	Test Assessment Schedule	Qty	Quantity
ESD	Electro Static Discharge	emf	Electromotive force
EFT	Electric Fast Transient	RMS	Root mean square
EDCS	Engineering Document Control System	Qp	Quasi Peak
Config	Configuration	Av	Average
CIS#	Cisco Number (unique identification number for Cisco test equipment)	Pk	Peak
Cal	Calibration	kHz	Kilohertz $(1x10^3)$
EN	European Norm	MHz	MegaHertz $(1x10^6)$
IEC	International Electro technical Commission	GHz	Gigahertz $(1x10^9)$
CISPR	International Special Committee on Radio Interference	H	Horizontal
CDN	Coupling/Decoupling Network	V	Vertical
LISN	Line Impedance Stabilization Network	dB	decibel
PE	Protective Earth	V	Volt
GND	Ground	kV	Kilovolt $(1x10^3)$
L1	Line 1	µV	Microvolt $(1x10^{-6})$
L2	Line2	A	Amp
L3	Line 3	µA	Micro Amp $(1x10^{-6})$
DC	Direct Current	mS	Milli Second $(1x10^{-3})$
RAW	Uncorrected measurement value, as indicated by the measuring device	µS	Micro Second $(1x10^{-6})$
RF	Radio Frequency	µS	Micro Second $(1x10^{-6})$
SLCE	Signal Line Conducted Emissions	m	Meter
Meas dist	Measurement distance	Spec dist	Specification distance
N/A or NA	Not Applicable	SL	Signal Line (or Telecom Line)
P	Power Line	L	Live Line
N	Neutral Line	R	Return
S	Supply	AC	Alternating Current

Appendix C: Scope of Accreditation (A2LA certificate number1178-01)

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

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

Summary of accredited radio testing capabilities:

EMC/EMI

San Jose, CA, Building P**:**	LP0002: 2004 RRL no.2005-25
San Jose, CA, Building N**:**	LP0002: 2004 RRL no.2005-25
San Jose, CA, Building I**:**	LP0002: 2004 RRL no. 2005-25
San Jose, CA, Building B**:**	LP0002: 2004 (conducted measurements only) RRL no.2005-25 (conducted measurement only)

Appendix D: Test Equipment Used to perform the test

Equip#	Manufacturer/ Model	Description	Last Cal	Next Due	Test Number(s)
020975	Micro-Coax/ UFB311A-0-1344-520520	RF Coaxial Cable, to 18GHz, 134.4 in	16-MAR-07	16-MAR-08	[30416], [30418]
021116	Micro-Coax/ UFB311A-0-3540-520520	RF Coaxial Cable, to 18GHz, 354 in	16-MAR-07	16-MAR-08	[30416], [30418]
030559	Micro-Coax/ UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in	16-MAR-07	16-MAR-08	[30416], [30418]
030652	Sunol Sciences/ JB1	Combination Antenna, 30MHz-2GHz	16-JUL-07	16-JUL-08	[30416], [30418]
033988	Agilent/ E4446A	PSA Spectrum Analyzer	07-NOV-07	07-NOV-08	[30175], [30202], [30376], [30379], [30380], [30382], [30414], [30416], [30418]
035097	Micro-Coax/ UFA147A-0-0180-110200	RF Coaxial Cable, to 40 GHz, 18 in	07-MAR-07	07-MAR-08	[30175], [30202], [30376], [30379], [30380], [30382], [30414], [30416], [30418]
040523	Rohde & Schwarz/ ESCI	EMI Test Receiver	01-JUN-07	01-JUN-08	[30416], [30418]
040547	Megaphase/ F230-NKNK-320	RF N Type cable 9KHz to 18GHz	13-JUL-07	13-JUL-08	[30416], [30418]

Software used in the tests

A:Vasona File Version

Vasona File Version	Used in Subtests
N/A	N/A

B:Other Software Used

Software Name	Version	Vendor	Description	Start Date	End Date
ECAT - BurstWare	4.23	Thermo Keytek	EFT/Burst Test Software	01-JAN-2000	Current
ECAT - PQFWare	2.1.3	Thermo Keytek	Voltage Dips and Interrupts Test Software	01-JAN-1997	Current
ECAT - SurgeWare	4.23	Thermo Keytek	Surge Test Software	01-JAN-2000	Current
ECAT - SurgeWare	5.30	Thermo Keytek	Voltage Protection Coordination Software	04-FEB-2004	Current
HFTS	B.00.01	Agilent Technologies	Harmonics/Flicker Test System Software	02-JUL-2001	Current
CTS	3.0.19	California Instruments	Harmonics/Flicker Test System Software	26-APR-2004	Current
CEWare32	4.00	Thermo Keytek	EMC Pro surge, EFT/B, VDI, Mag Immunity test software.	21-JUL-2004	Current

Appendix E: Test Procedures

Test procedures are summarized below

6dB Bandwidth	EDCS # - 422115
26dB Bandwidth	EDCS # - 422115
Average Output Power	EDCS # - 422117
Co-Located Transmitter	EDCS # - 422118
Conducted Spurious Test	EDCS # - 422119
Peak Transmit Power Measurement	EDCS # - 422123
Power Spectral Density	EDCS # - 422113
Peak Excursion Test	EDCS # - 422121
Radiated Band Edge	EDCS # - 422124
Radiated Spurious Test	EDCS # - 422125
Extreme Test Condition	EDCS # - 450056
Equivalent Isotropic Radiated Power	EDCS # - 450047
Frequency Tolerance	EDCS # - 462996
Power per MHz	EDCS # - 463000

Appendix F: Test Assessment Plan(TAP)

EMC Test Plan

EMC-4650
Code Name: Beartooth CFR47 part15.409 only

Systems to be Tested: C3205WMIC-A-K9

Cisco Systems
EMC Laboratory
170 West Tasman Drive
San Jose, CA 95134

Revision 2.0
Date 04-Dec-2007
Author Donald Foster
TAP Template Revision Number 27

Overview

This test plan is to detail the requirements for FCC radio certification of the WMIC module which will be used in the various 3200 series mobile routers. Testing will be conducted according to the procedures for the 5250-5350 and 5475-5850 bands UNI I and II

Product Description

The C3205WMIC-A-K9 is a standalone A radio module that is installed in the 3200 series mobile router. The end user can stack several of these radios into a single chassis and build a poit to point to point network with association to both client and Master devices.

This EMC testing is intended to cover:

- Radio Intentional.
- Comments : N/A

Testing will be performed:

- Internally. Cisco testing facility.

Specific Test Laboratory Requirements

Ensure that the Test Laboratory meets the following requirements (where appropriate)

BSMI (Taiwan)	Designated laboratory
Australia,New Zealand,Singapore	ISO Guide 17025 accredited laboratory [ie NVLAP, A2LA] or equivalent
USA DOC Process	NVLAP, A2LA (Note: The DOC process is for Class B PC peripherals only.)
VCCI (Japan)	VCCI Listed laboratory
Customer requirements (e.g.GR1089)	Customer recognized Laboratory

Equipment Classification (see EDCS-5770)

	Equipment Type	Requirements Emissions	Immunity
☐	Telecommunication Network Equipment	47 CFR Part 15: 2006 CISPR22: 2005 EN55022: 2006 KN 22: 2005 EN61000-3-2: 2000 + A1 + A2 EN61000-3-3: 1995 + A1 EN300386: V1.3.3 : 2005 ICES-003 Issue 4 : 2004 VCCI: V-3/2006.04	EN300386: V1.3.3 : 2005 EN50082-1: 1992 EN50082-1: 1997 EN61000-6-1: 2001
☐	Cable Equipment	47 CFR Part 15: 2006 CISPR22: 2005 EN55022: 2006 KN 22: 2005 EN61000-3-2: 2000 + A1 + A2 EN61000-3-3: 1995 + A1 EN300386: V1.3.3 : 2005 ICES-003 Issue 4 : 2004 VCCI: V-3/2006.04	EN300386: V1.3.3 : 2005 CISPR24: 1997 + A1+ A2 EN55024: 1998 + A1+ A2 EN50082-1: 1992 EN50082-1: 1997 EN61000-6-1: 2001
☐	ITE/TTE/LAN Equipment	47 CFR Part 15: 2006 CISPR22: 2005 EN55022: 2006 KN 22: 2005 EN61000-3-2: 2000 + A1 + A2 EN61000-3-3: 1995 + A1 ICES-003 Issue 4 : 2004 VCCI: V-3/2006.04	CISPR24: 1997 + A1+ A2 EN55024: 1998 + A1+ A2 EN50082-1: 1992 EN50082-1: 1997 EN61000-6-1: 2001
☐	Medical Devices Equipment	47 CFR Part 15: 2006 CISPR22: 2005 EN55022: 2006 EN61000-3-2: 2000 + A1 + A2 EN61000-3-3: 1995 + A1 ICES-003 Issue 4 : 2004 VCCI: V-3/2006.04 EN60601-1-2:2001	CISPR24: 1997 + A1+ A2 EN55024: 1998 + A1+ A2 EN50082-1: 1992 EN50082-1: 1997 EN61000-6-1: 2001 EN60601-1-2:2001
☐	Radio (EMC)	CISPR22: 2005 EN55022: 2006 EN61000-3-2: 2000 EN61000-3-3: 1995 + A1	EN301 489-1 v1.4.1: 2002-08 EN301 489-17 v1.2.1: 2002-09 EN61000-6-1: 2001 EN50082-1: 1992 EN50082-1: 1997

☑	Radio Intentional	EN300328 RSS-210 47CFR15 EN301893 LP0002 RRL No.2005-25 AS/NZS 4268 ARIB STD-T33 ARIB STD-T66 ARIB STD-T71	
☐	Central Office Equipment [USA Only]	GR1089: Issue 4: June 2006 Applicable only if product requires NEBS compliance.	

Emissions Classification

- Class B (e.g. non- central office, domestic)

Immunity Classification

- Country Requirements (normal levels)

Power/ Interface Details

DC	Indoor Cables
RF Port	Indoor Cables

Chassis

- Desktop (Table Top)

Information for Test Personnel

Type of Emission	OFDM
Frequency Range	5250-5350 and 5475-5580 5660-5725
Power Rating	*AIR-ANT5175V-N 7.5dbi omni 16/23.5dbmAir-ant 5180V-N 7.5dbi omni 16/23.5dbmAIR-ANT5160V-R 6dbi omni 16/23dbm*AIR-ANT5114P-N 14dbi patch 16/30dbmAIR-ANT5195P-R 9.5dbi patch 16/25.5dbmAIR-ANT5170P-R 7dbi patch 16/23dbm
Maximum Conducted Power Rating Allowed	16dbm
List Temperature	+5.0 V 0.4 amps 2.0 W ISA and PCI connectors +3.3 V 1.7 amps 5.6 W PCI connectors
Eut Description	This is a 5Ghz modular radio which is incorporated into the 3200 series mobile router
Tune up Procedures	ART instructions

Applicable Specifications testing required

Conducted emissions

Spec Id	Basic Standard	Applied to	Class	Freq Range	Test Details / Comments
651	CFR47 Part 15.247(a)	RF Ports	N/A	2400MHz - 5850MHz	26dB Bandwidth also complies wiht RSS 210, LP0002, HKTA1039
800	CFR47 Part 15.247(a)(2)	RF Ports	B	5725MHz - 5850MHz	6dB Bandwidth also complies with LP0002, RSS210, HKTA1039
463	CFR47 Part 15.247b3 (LP0002 3.10.1.2)	RF Ports	N/A	2400MHz - 2483.5MHz	Peak Output Power: 1WattAlso complies with HKTA1039
649	CFR47 Part 15.407(a)6	RF Ports	N/A	5150MHz - 5725MHz	Peak Excursion also complies with LP0002, RSS 210, HKTA1039
474	CFR47 Part 15.407a (LP0002 4.7.2, RSS210)	RF Ports	N/A	5150MHz - 5725MHz	Peak Power Spectral Density (LP0002 limit 4dBm from 5250-5350MHz)Also complies withHKTA1039
478	CFR47 Part 15.407a (LP0002 4.7.2, RSS210)	RF Ports	N/A	5150MHz - 5725MHz	Peak Transmit Power (LP0002 limit 17dBm or formula from 5250-5350MHz), Also complieswith HKTA1039
652	Conducted Spurious Emissions	RF Ports	N/A	30MHz - xGHz	Also complies with RSS 210, LP0002, HKTA1039

Radiated emissions

Spec Id	Basic Standard	Applied to	Class	Freq Range	Test Details / Comments
966	Radiated Spurious Emissions	Enclosure	N/A	30MHz - 40GHz	CFR47 Part 15.109, CFR47 Part 15.407, RSS-210, LP0002 HKTA1039
648	Restricted Bandedge Measurements	Enclosure	B	2.4GHz - 5.825GHz	CFR47 Part 15.205,CFR47 Part 15.209,LP002, RSS210HKTA1039

Customer Additional Specifications

N/A

Applicable Specifications testing not required

Conducted emissions

Spec Id	Basic Standard	Applied to	Class	Freq Range	Test Details / Comments	Justification
650	CFR47 Part 15.247(a)(2)	RF Ports	N/A	2400MHz - 2483.5MHz	6dB Bandwidth, aslo complies with RSS 210, LP0002, HKTA1039	2 ,3
653	CFR47 Part 15.247a3 (LP0002 3.10.6.2.2, RSS210)	RF Ports	N/A	2400MHz - 2483.5MHz	Power Spectral Density, Also complies withHKTA1039	3
477	CFR47 Part 15.247a3 (LP0002 3.10.6.2.2, RSS210)	RF Ports	N/A	5725MHz - 5850MHz	Power Spectral DensityAlso complies with HKTA1039	3
462	CFR47 Part 15.247b3 (LP0002 4.7.2)	RF Ports	N/A	5725MHz - 5850MHz	Peak Output Power: 1wattAlso complies with HKTA1039	3
804	DSPR (Japan) - Adjacent Channel Power	RF Ports	N/A	5150MHz - 5350MHz	DSPR (Japan)- 802.11A	1
805	DSPR (Japan) - Out-band Leakage Power	RF Ports	N/A	5150MHz - 5350MHz	DSPR(Japan) - 802.11a	1
803	DSPR (Japan) - Receiver Spurious Emissions	RF Ports	N/A	10MHz - 8GHz	DSPR (Japan) - 802.11b,g Rx mode	1
671	DSPR (Japan) - Spread Band Width	RF Ports	N/A	2400MHz - 2483.5MHz	DSPR-(Japan) 802.11b,g	1
801	DSPR (Japan) - Transmiter	RF Ports	N/A	5MHz - 15.75GHz	DSPR(Japan) - 802.11A Tx mode	1

	Spurious Emissions					
674	DSPR (Japan) - Transmiter Spurious Emissions	RF Ports	N/A	10MHz - 8GHz	DSPR(Japan) 2400MHz-2483.5MHz	1
669	DSPR(Japan) - Frequency Tolerance	RF Ports	N/A	2400MHz - 5350MHz	DSPR (Japan)- 802.11a,b,g	1
673	DSPR(Japan)- Channel Power	RF Ports	N/A	2400MHz - 5350MHz	DSPR(Japan)	1
670	DSPR(Japan)- Occupied Bandwidth	RF Ports	N/A	2400MHz - 5350MHz	DSPR(Japan)- 802.11a,b,g	1
672	DSPR(Japan)-Total Output Power	RF Ports	N/A	2400MHz - 5350MHz	DSPR(Japan)	1
661	EN 300 893 clause 4.2 Carrier frequencies	RF Ports	N/A	5150MHz - 5725MHz	The actual carrier centre frequency for anygiven channel given in table 1 shall bemaintained within the range fc A?20ppm over normal and extreme test conditions.	1
892	EN 300 893 clause 4.3.2 Occupied Channel Bandwidth	RF Ports	N/A	5150-5725MHz	The occupied channel bandwidth shall bebetween 80% to 100% of the declared nominalchannel bandwidth.	1
662	EN 300 893 clause 4.3.2 RF output power and TPC	RF Ports	N/A	5150MHz - 5725MHz	The RF output power when configured shall notexceed the levels given in table 2 & 3 overnormal and extreme test conditions.	1
663	EN 300 893 clause 4.3.2.1 Power density	RF Ports	N/A	5150MHz - 5725MHz	The power density when configured to operateat the highest stated power level shall notexceed the levels given in table 2 overnormal and extreme test conditions.	1
664	EN 300 893 clause 4.4.1 Transmitter unwanted	RF Ports	N/A	30MHz - 26.5GHz	The level of unwanted emission shall notexceed the limits given in table 4.	1

	emissions outside 5GHz bands					
666	EN 300 893 clause 4.4.2 Transmitter unwanted emissions within 5GHz bands	RF Ports	N/A	5150MHz - 5725MHz	The average level of the transmitted spectrumwithin the 5 GHz RLAN bands shall not exceedthe limits given in figure 2.	1
667	EN 300 893 clause 4.5.2 Receiver spurious emissions	RF Ports	N/A	30MHz - 26.5GHz	The spurious emissions of the receiver shallnot exceed the limits given in table 5.	1
660	EN 300-328 clause 4.3.1 Effective radiated power	RF Ports	N/A	2.4GHz - 2.4835GHz	The effective radiated power shall be equalto or less than 20dBm (100 mW) e.i.r.p overnormal and extreme test conditions.	1
659	EN 300-328 clause 4.3.2 Maximum spectral power density	RF Ports	N/A	2.4GHz - 2.4835GHz	For modulation other than FHSS, the maximumspectral power density shall belimited to -20 dBW (10 mW) per MHz e.i.r.p.	1
658	EN 300-328 clause 4.3.3 Frequency Range	RF Ports	N/A	2.4GHz - 2.4835GHz	For all equipment the frequency range shalllie within the band 2.4 GHz to 2.4835 GHz (fL> 2.4 GHz and fH < 2.4835 GHz). Normal andExtreme conditions apply.	1
654	EN 300-328 clause 4.3.4 Transmitter Spurious Emissions	RF Ports	B & N/A	30MHz - 12.75GHz	802.11b,g	1
657	EN 300-328 clause 4.3.5 Receiver Spurious	RF Ports	B & N/A	30MHz - 12.75GHz	802.11b,g	1

	Emissions					
964	RRL no.2007-20 Rx Spurious Emissions	RF Ports	N/A	2400MHz - 5825MHz	Strength of radio waves additionally emittedfrom the receiving equipment (Article 9.1 ofregulations) -54dBmW	1
960	RRL no.2007-22 Frequency Tolerance	RF Ports	N/A	2400MHz - 5825MHz	Frequency tolerance (kHz): 50ppm	1
962	RRL no.2007-22 Occupied Bandwidth	RF Ports	N/A	2400MHz - 5825MHz	Occupied Bandwidth: 26MHz	1
959	RRL no.2007-22 Power Density	RF Ports	N/A	2400MHz - 5825MHz	Power Density: WAS1 limit 2.5mW/MHz, WAS2limit 10mW/MHz, WAS3 limit 10mW/MHz.	1
963	RRL no.2007-22 Tx Unwanted Emissions	RF Ports	N/A	2400MHz - 5825MHz	2.4GHz - Unwanted emission: less than -30dBmwhen measured using 100kHz of decompositionbandwidth. 5GHz - the frequency under table 1 should beless than -27dBm/MHz	1

Radiated emissions

Spec Id	Basic Standard	Applied to	Class	Freq Range	Test Details / Comments	Justification
441	Co-Located Transmitters	Enclosure	N/A	1GHz-0.0GHz	Compliance based upon meeting the emission levels for radiated spurious emissions as stated in RSS-210, FCC part 15.209 and HKTA1039. CISPR limits are not applicable for this test	1
665	EN 300 893 clause 4.4.1 Transmitter unwanted emissions outside 5GHz bands	Enclosure	N/A	30MHz - 26.5GHz	The level of unwanted emission shall notexceed the limits given in table 4.	1
668	EN 300 893 clause 4.5.2 Receiver spurious	Enclosure	N/A	30MHz - 26.5GHz	The spurious emissions of the receiver shallnot exceed the limits given in table 5.	1

	emissions					
655	EN 300-328 clause 4.3.4 Transmitter Spurious Emissions	Enclosure	N/A	30MHz - 12.75GHz	802.11b,g	1
656	EN 300-328 clause 4.3.5 Receiver Spurious Emissions	Enclosure	N/A	30MHz - 12.75GHz	802.11b,g	1
647	Radiated Spurious Emissions	Enclosure	B	30MHz - 26.5GHz	CFR47 Part 15.109CFR47 Part 15.247, RSS-210, LP0002 HKTA1039	3
965	Radiated Spurious Emissions	Enclosure	N/A	30MHz - 40GHz	CFR47 Part 15.109, CFR47 Part 15.407, RSS-210, LP0002 HKTA1039	2 ,3
860	Restricted Bandedge Measurements	Enclosure	N/A	2.4GHz - 5.825GHz	CFR47 Part 15.205,CFR47 Part 15.209,LP002, RSS210HKTA1039	2 ,3

Justification(s)

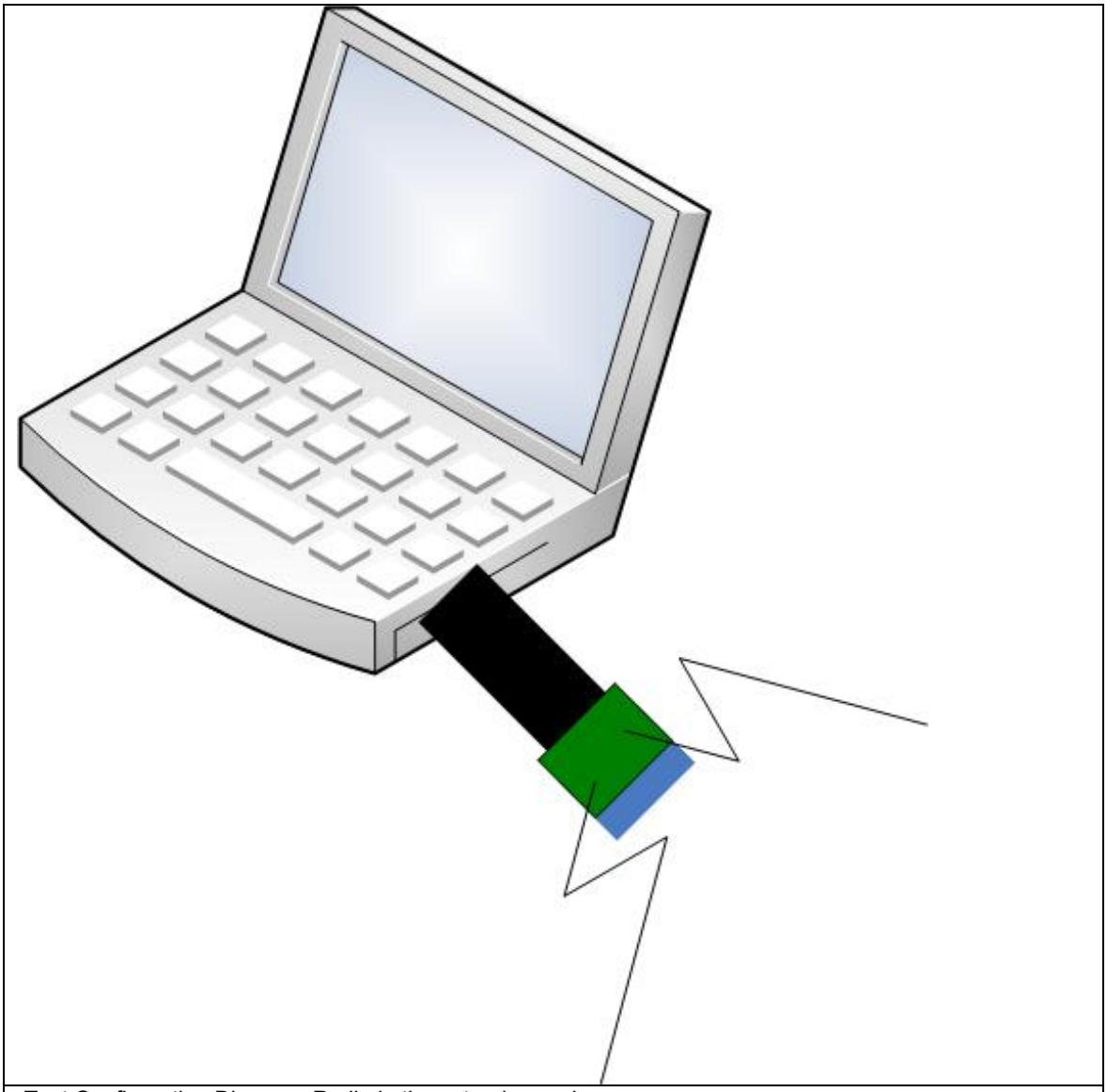
1.The testing will cover only the requirements for 5GHz A bband radio for market in the USA.

2.Testing will be preformed to the rules for the band 5725-5850 only

3.Testing will be preformed to the rules for the bands 5250-5350 and 5475-5725 UNI I and II

Test configuration description:

The system will be configured as a standalone radio and will be running the ART diag to put the transmitter into contiuous transmit mode.



Test Configuration Diagram: Radio in the extender card

Justification of the worst case test configuration and mode of operation:

This configuration meets the requirements for testing to the applicable countries

Cabling Details and Block Diagram (Mandatory for VCCI and Korea)

Cable Letter	Connection	Manufacturer	Length	Shield	Remarks
A	Antenna port			Yes	

Copper Interfaces

Ref	Connection	Type	Shielded	Indoor/ Outdoor	CE	CI	EFT/B	Surge	Dips
A	Antenna port	RF Ports	Yes	Indoor	Yes	N/A	N/A	N/A	N/A

Legend

Indoor	Interface which is not intended to be directly connected to a cable that will leave the building e.g. Ethernet, RS232
Outdoor	Interfaces that can be directly connected to lines that leave the building e.g. POTS, DSL

Justifications For Not Testing An Interface