FCC CFR47 PART 15 SUBPART E
INDUSTRY CANADA RSS-210 ISSUE 7

CLASS II PERMISSIVE CHANGE TEST REPORT

FOR

CANOPY 5.2GHZ FIXED DIGITAL WIRELESS ACCESS POINT

MODEL NUMBER: 5200XX

FCC ID: ABZ89FC3789
IC: 109W-5200

REPORT NUMBER: 09U12356-1

ISSUE DATE: JANUARY 23, 2009

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	01/23/09	Initial Issue	M.Heckrotte

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: MOTOROLA-SCHAUMBURG
1299 E. ALGONQUIN RD.
SCHAUMBURG, IL., 60156, U.S.A.

EUT DESCRIPTION: CANOPY 5.2GHZ FIXED DIGITAL WIRELESS ACCESS POINT

MODEL: 5200XX

SERIAL NUMBER: 0A-00-3E-04-99-41 (MASTER)
0A-00-3E-04-99-40 (SLAVE)

DATE TESTED: JANUARY 20 TO 23, 2009

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Pass
INDUSTRY CANADA RSS-210 Issue 7 Annex 9	Pass

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

MICHAEL HECKROTTE
DIRECTOR OF ENGINEERING
COMPLIANCE CERTIFICATION SERVICES

Tested By:

DOUGLAS ANDERSON
EMC TECHNICIAN
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC 06-96 and the DFS portions of FCC CFR 47 Part 15 and RSS-210 Issue 7.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Power Line Conducted Emission	+/- 2.3 dB
Radiated Emission	+/- 3.4 dB

Uncertainty figures are valid to a confidence level of 95%.

5. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

Changed the power amplifier from discrete to integrated circuit.

6. DYNAMIC FREQUENCY SELECTION

6.1. OVERVIEW

6.1.1. LIMITS

INDUSTRY CANADA

IC RSS-210 is closely harmonized with FCC Part 15 DFS rules. The deviations are as follows:

RSS-210 Issue 7 A9.4 (b) (ii) **Channel Availability Check Time:** …

Additional requirements for the band 5600-5650 MHz: Until further notice, devices subject to this Section shall not be capable of transmitting in the band 5600-5650 MHz, so that Environment Canada weather radars operating in this band are protected.

RSS-210 Issue 7 A9.4 (b) (iv) **Channel closing time:** the maximum channel closing time is 260 ms.

FCC

§15.407 (h) and FCC 06-96 APPENDIX "COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVCIES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION".

Table 1: Applicability of DFS requirements prior to use of a channel

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client (with radar detection)
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spreading	Yes	Not required	Not required

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client **(without DFS)**	Client **(with DFS)**
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes

Table 3: 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.		

Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds
Channel Closing Transmission Time	200 milliseconds + approx. 60 milliseconds over remaining 10 second period
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. 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 approximately 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.	

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (Microseconds)	PRI (Microseconds)	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

Table 6 – Long Pulse Radar Test Signal

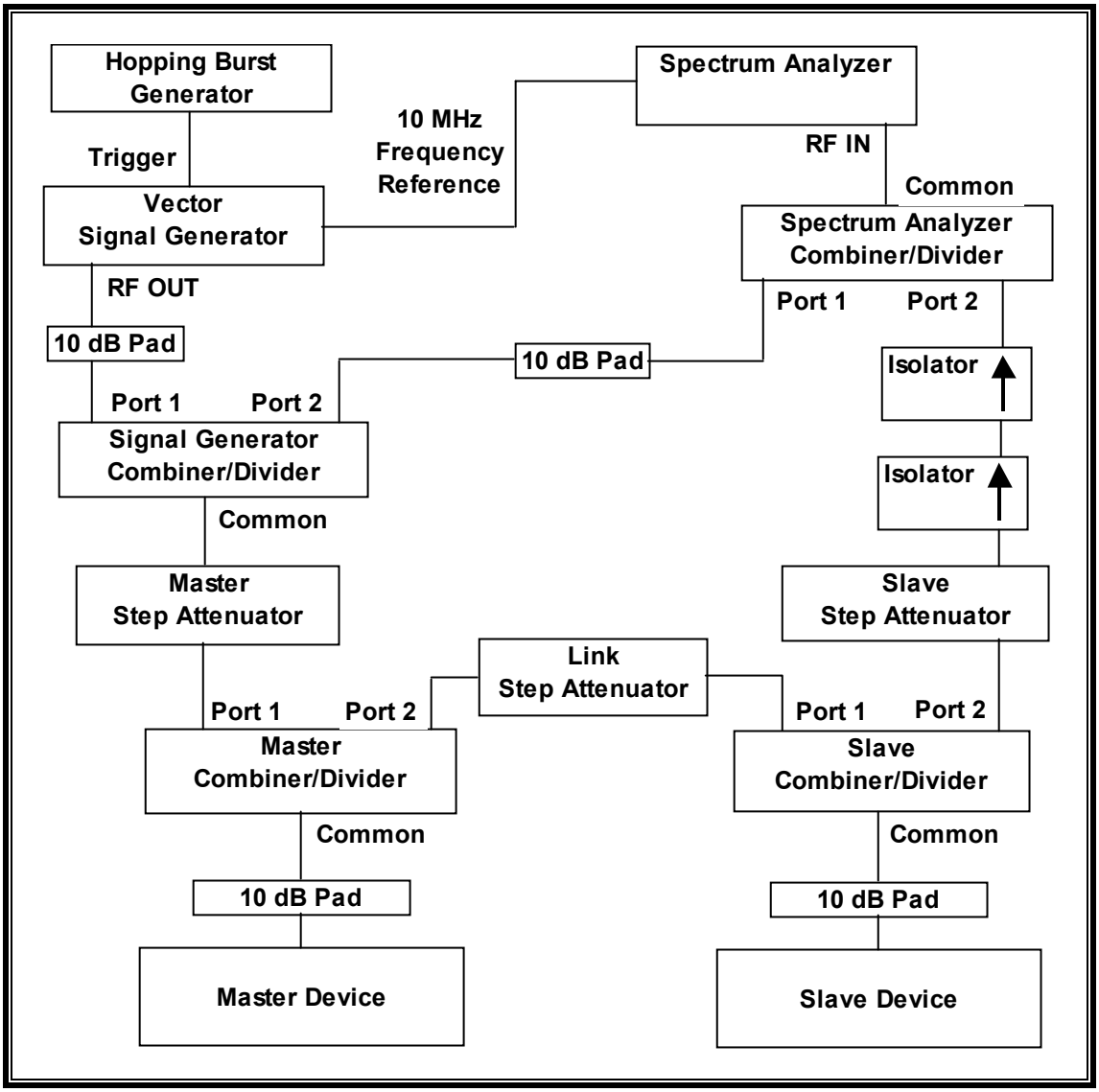
Radar Waveform	Bursts	Pulses per Burst	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Minimum Percentage of Successful Detection	Minimum Trials
5	8-20	1-3	50-100	5-20	1000-2000	80%	30

Table 7 – Frequency Hopping Radar Test Signal

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

6.1.2. TEST AND MEASUREMENT SYSTEM

CONDUCTED METHOD SYSTEM BLOCK DIAGRAM



SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Freqeuncy Hopping Radar Waveform Generating Subsystem of FCC 06-96 APPENDIX. The frequency of the signal generator is incremented in 1 MHz steps from F_L to F_H for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer set to display 8001 bins on the horizontal axis. The time-domain resolution is 2 msec / bin with a 16 second sweep time, meeting the 10 second short pulse reporting criteria. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

Should multiple RF ports be utilized for the Master and/or Slave devices (for example, for diversity or MIMO implementations), additional combiner/dividers are inserted between the Master Combiner/Divider and the pad connected to the Master Device (and/or between the Slave Combiner/Divider and the pad connected to the Slave Device). Additional pads are utilized such that there is one pad at each RF port on each EUT.

SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected in place of the master device and the signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. Measure the amplitude and calculate the difference from –64 dBm. Adjust the Reference Level Offset of the spectrum analyzer to this difference.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

Set the signal generator to produce a radar waveform, trigger a burst manually and measure the level on the spectrum analyzer. Readjust the amplitude of the signal generator as required so that the peak level of the waveform is at a displayed level equal to the required or desired interference detection threshold. Separate signal generator amplitude settings are determined as required for each radar type.

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

Establish a link between the Master and Slave, adjusting the Link Step Attenuator as needed to provide a suitable received level at the Master and Slave devices. Stream the video test file to generate WLAN traffic. Confirm that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold. For Master Device testing confirm that the displayed traffic does not include Slave Device traffic. For Slave Device testing confirm that the displayed traffic does not include Master Device traffic.

If a different setting of the Master Step Attenuator is required to meet the above conditions, perform a new System Calibration for the new Master Step Attenuator setting.

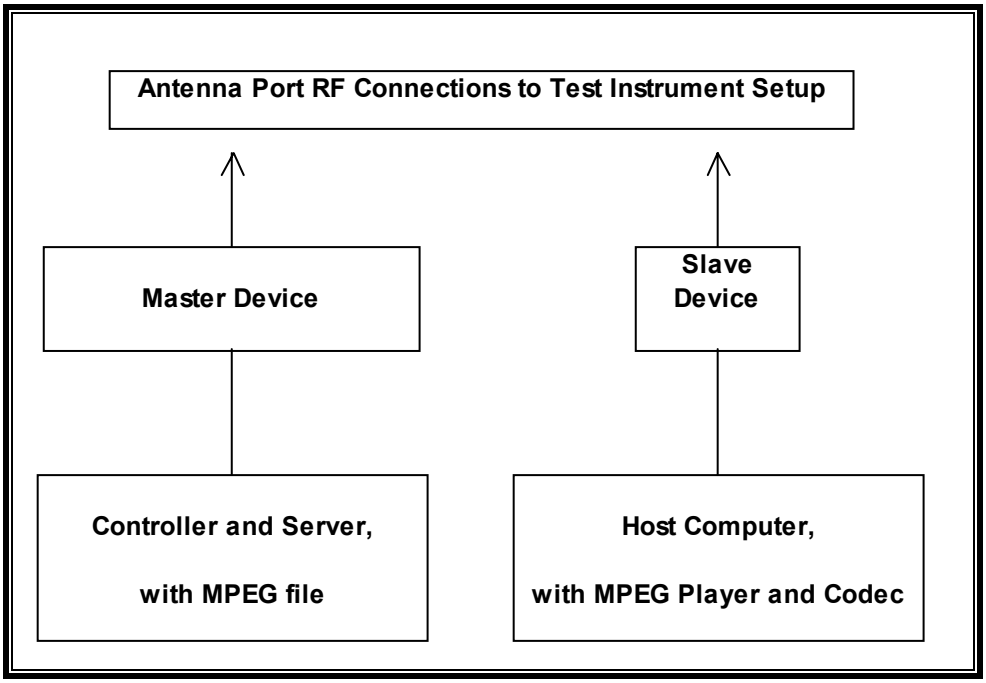
TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the DFS tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
Spectrum Analyzer 9 kHz ~ 26.5 GHz	**Agilent / HP**	**E4407B**	**US41444322**	**2/7/2010**
Vector Signal Generator 250kHz-20GHz	**Agilent / HP**	**E8267C**	**US43320336**	**11/16/2009**
Arbitrary Waveform Generator	**Agilent / HP**	**33220A**	**MY44037572**	**12/8/2009**

6.1.3. SETUP OF EUT

CONDUCTED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

The following test and measurement equipment was utilized for the DFS tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter (Master EUT)	Phihong	PSA15R-295 (MOT)	P81000868A1	DoC
AC Adapter (Slave EUT)	Phihong	PSA15R-295 (MOT)	P81000483A1	DoC
Notebook PC (Master)	Motorola	HK1322	3433JC0021	DoC
AC Adapter (Master PC)	Hipro	HP-OW120F13	F3-070900274301	DoC
Notebook PC (Slave)	Dell	PP18L	36778905757	DoC
AC Adapter (Slave PC)	Liteon Technology	LA65NS0-00	CN-0DF263-71615-66C-2E22	DoC

6.1.4. DESCRIPTION OF EUT

The EUT operates over the 5470-57250 MHz range.

The EUT can be configured as a Master Device or a Slave Device without Radar Detection.

The highest power level is 30 dBm EIRP.

The highest gain antenna assembly utilized with the EUT has a gain of 10 dBi. The lowest gain antenna assembly utilized with the EUT has a gain 7 dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is –64 dBm. Given a minimum antenna gain of 7 dBi the required conducted threshold at the antenna port is –64 + 7 + 1 = -56 dBm.

The calibrated conducted DFS Detection Threshold level is set to –56 dBm for the Detection Bandwdith test. The calibrated conducted DFS Detection Threshold level is set to –63 dBm for all other tests.

The Slave device associated with the EUT during these tests does not have radar detection capability.

The EUT is a Frame-bassed system. The Frame timing is set to a listen / talk ratio of 60%/40%.

Traffic is generated by streaming the video file TestFile.mp2 “6 ½ Magic Hours” from the Master to the Slave in full motion video mode using the media player with the V2.61 Codec package.

TPC is required since the maximum EIRP is greater than 500 mW (27 dBm).

One nominal channel bandwidth, 20 MHz, is implemented, using FSK modulation.

The software installed in the access point is Canopy 9.3.

The FPGA version installed in the access point is 011609.

MANUFACTURER’S STATEMENT REGARDING UNIFORM CHANNEL SPREADING

This statement is in a separate document.

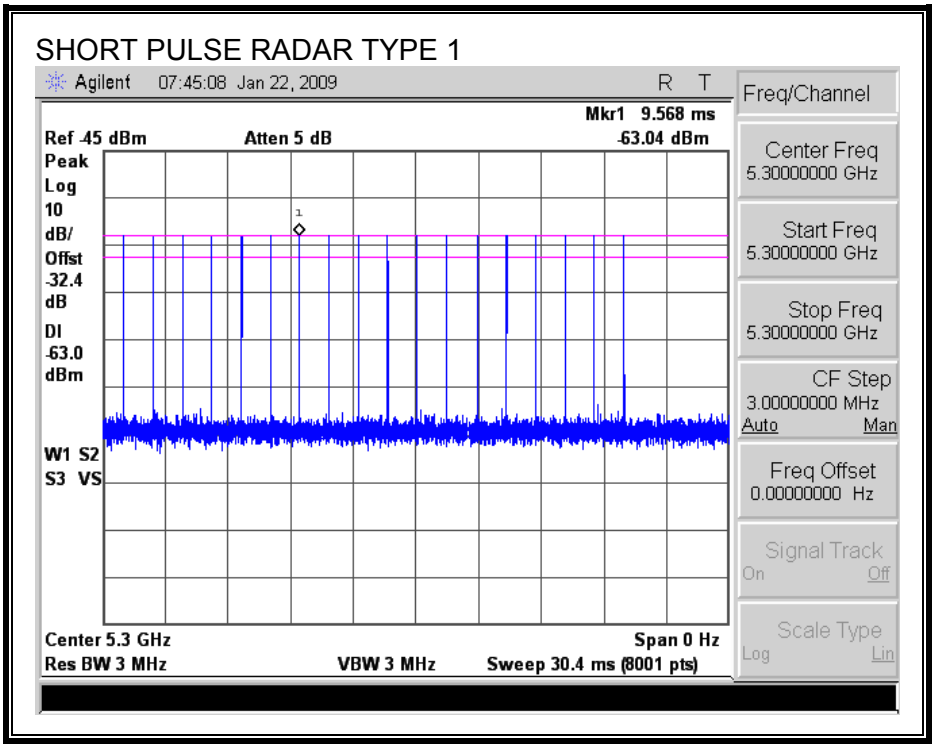
6.2. MASTER DEVICE CONFIGURATION

6.2.1. TEST CHANNEL

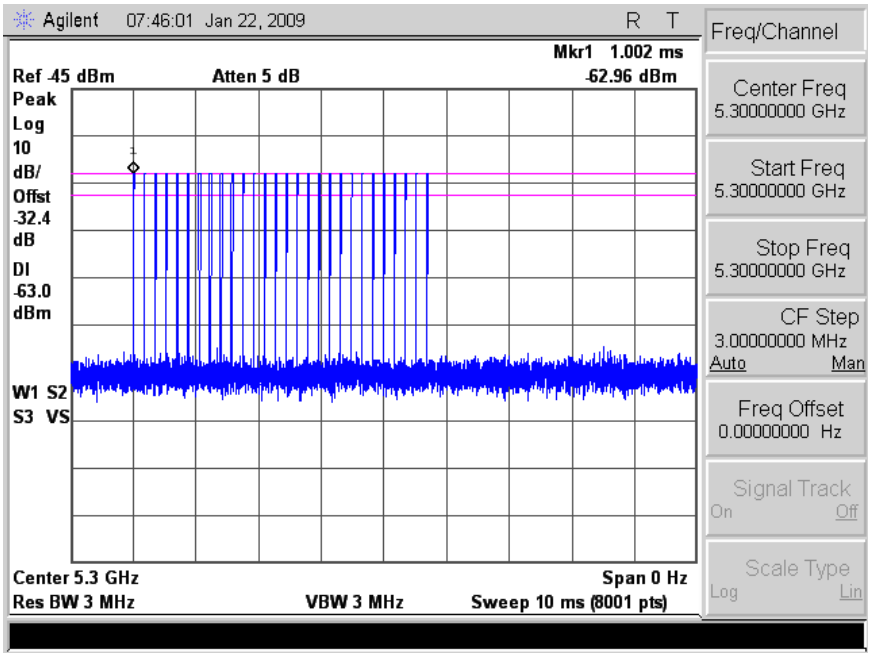
All tests were performed at a channel center frequency of 5300 MHz. Measurements were performed using conducted test methods.

6.2.2. PLOTS OF RADAR WAVEFORMS AND WLAN TRAFFIC

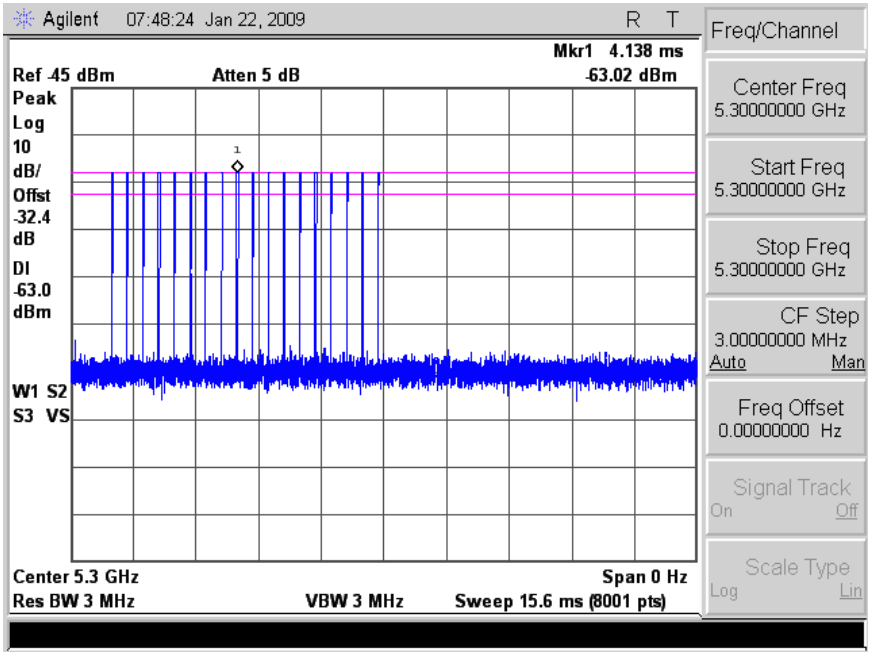
PLOTS OF RADAR WAVEFORMS



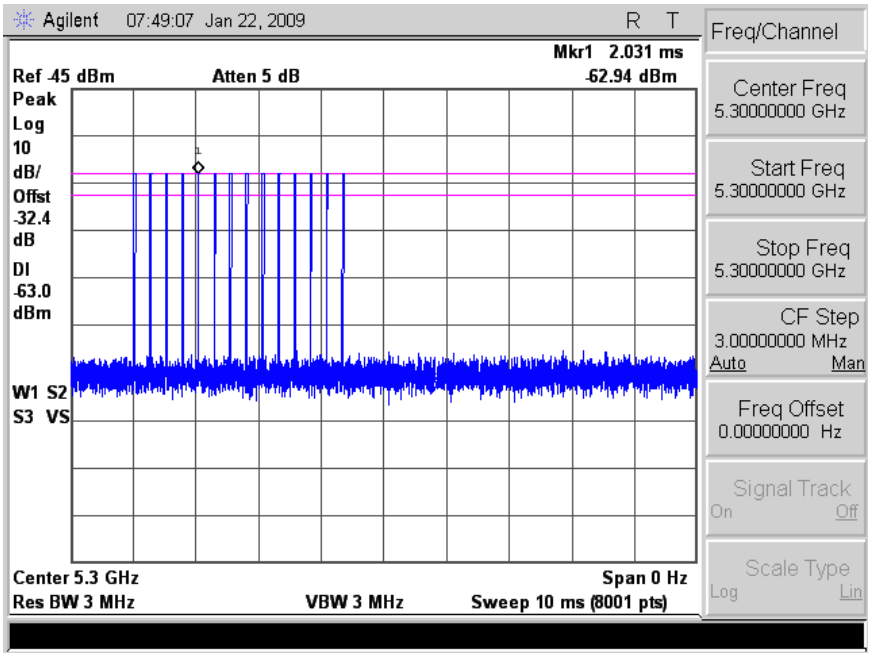
SAMPLE OF RADAR TYPE 2



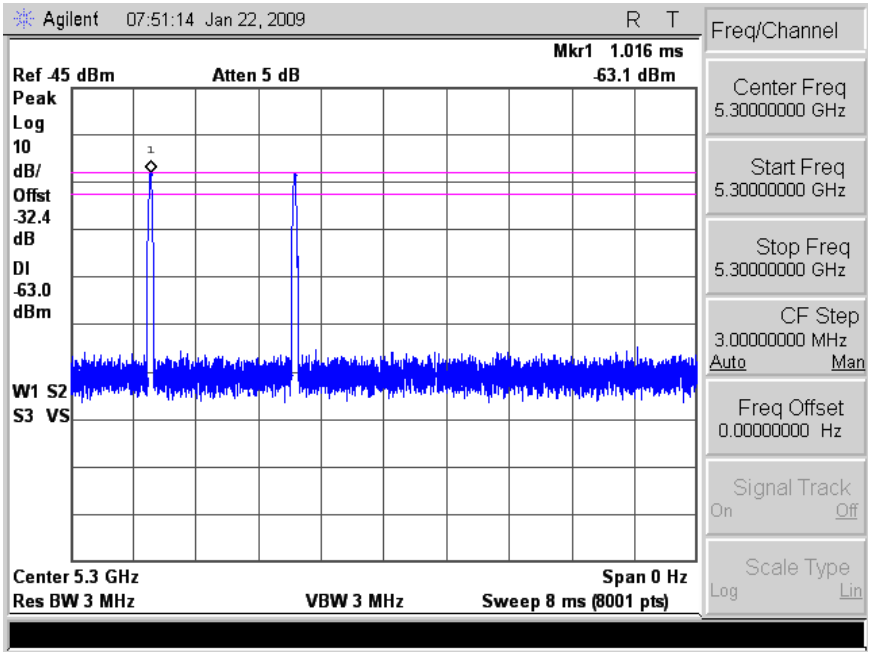
SAMPLE OF RADAR TYPE 3



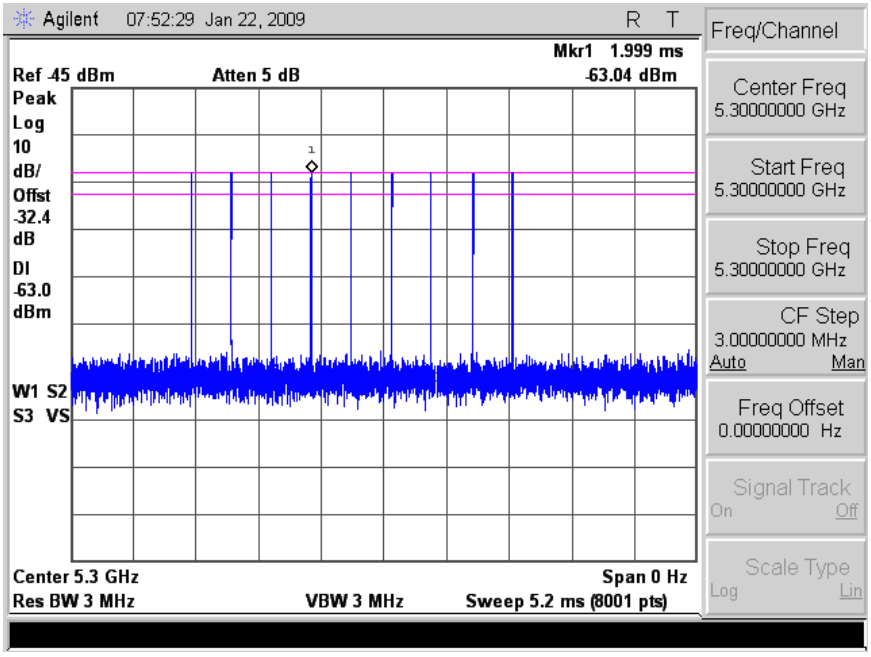
SAMPLE OF RADAR TYPE 4



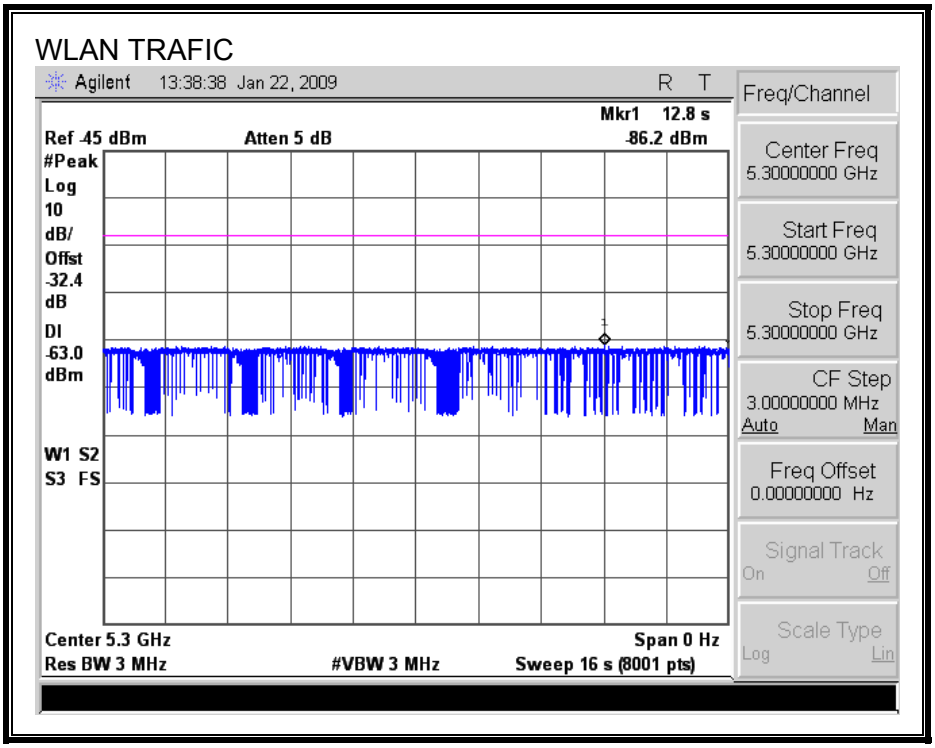
SAMPLE OF SINGLE BURST OF RADAR TYPE 5



SINGLE BURST OF RADAR TYPE 6



PLOT OF WLAN TRAFFIC FROM MASTER



6.2.3. CHANNEL AVAILABILITY CHECK TIME

PROCEDURE TO DETERMINE INITIAL POWER-UP CYCLE TIME

A link was established on channel then the EUT was rebooted. The time from the cessation of traffic to the re-initialization of traffic was measured as the time required for the EUT to complete the total power-up cycle. The time to complete the initial power-up period is 60 seconds less than this total power-up time.

PROCEDURE FOR TIMING OF RADAR BURST

With a link established on channel, the EUT was rebooted. A radar signal was triggered within 0 to 6 seconds after the initial power-up period, and transmissions on the channel were monitored on the spectrum analyzer.

The Non-Occupancy list was cleared. With a link established on channel, the EUT was rebooted. A radar signal was triggered within 54 to 60 seconds after the initial power-up period, and transmissions on the channel were monitored on the spectrum analyzer.

QUANTITATIVE RESULTS

No Radar Triggered

Timing of Reboot (sec)	Timing of Start of Traffic (sec)	Total Power-up Cycle Time (sec)	Initial Power-up Cycle Time (sec)
20.46	91.94	71.48	11.48

Radar Near Beginning of CAC

Timing of Reboot (sec)	Timing of Radar Burst (sec)	Radar Relative to Reboot (sec)	Radar Relative to Start of CAC (sec)
18.74	32.02	13.28	1.8

Radar Near End of CAC

Timing of Reboot (sec)	Timing of Radar Burst (sec)	Radar Relative to Reboot (sec)	Radar Relative to Start of CAC (sec)
18.6	88.0	69.4	58.0

QUALITATIVE RESULTS

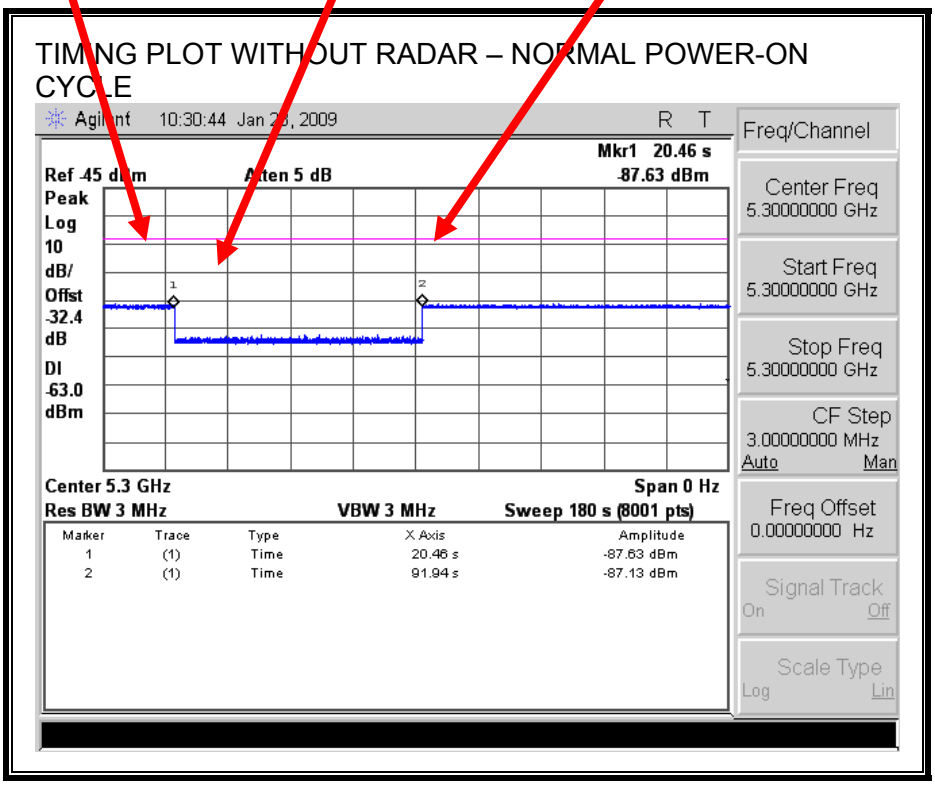
Timing of Radar Burst	Display on Control Computer	Spectrum Analyzer Display
No Radar Triggered	EUT marks Channel as active	Transmissions begin on channel after completion of the initial power-up cycle and the CAC
Within 0 to 6 second window	EUT indicates radar detected	No transmissions on channel
Within 54 to 60 second window	EUT indicates radar detected	No transmissions on channel

TIMING PLOT WITHOUT RADAR DURING CAC

AP is rebooted
Traffic ceases
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

End of CAC
Traffic is Initiated



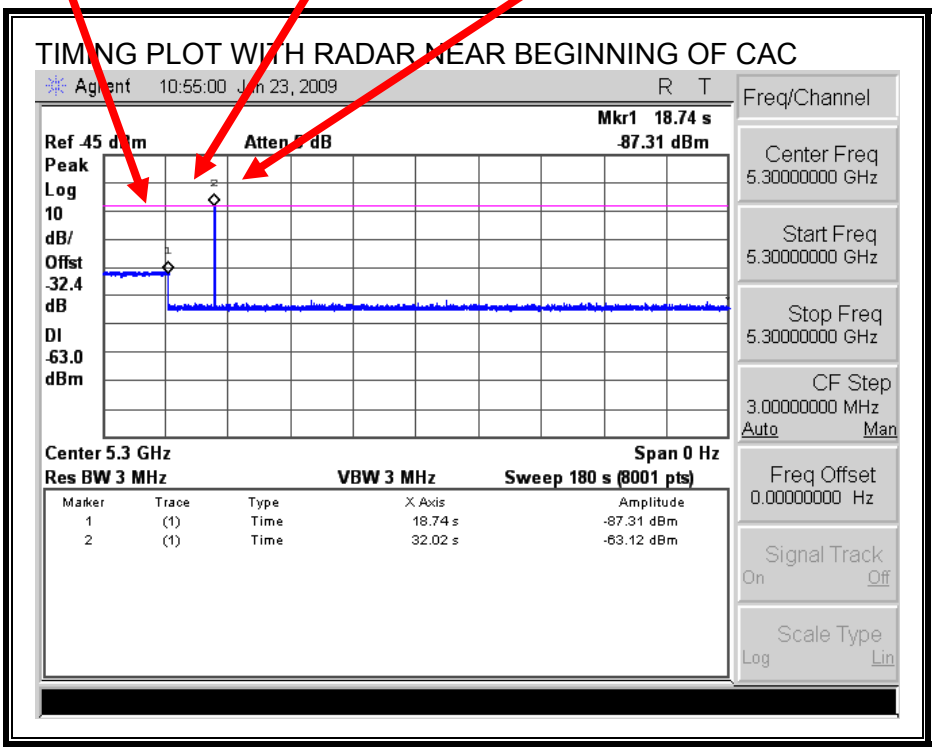
Transmissions begin on channel after completion of the initial power-up cycle and the CAC.

TIMING PLOT WITH RADAR NEAR BEGINNING OF CAC

AP is rebooted
Traffic ceases
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

Radar Signal Applied



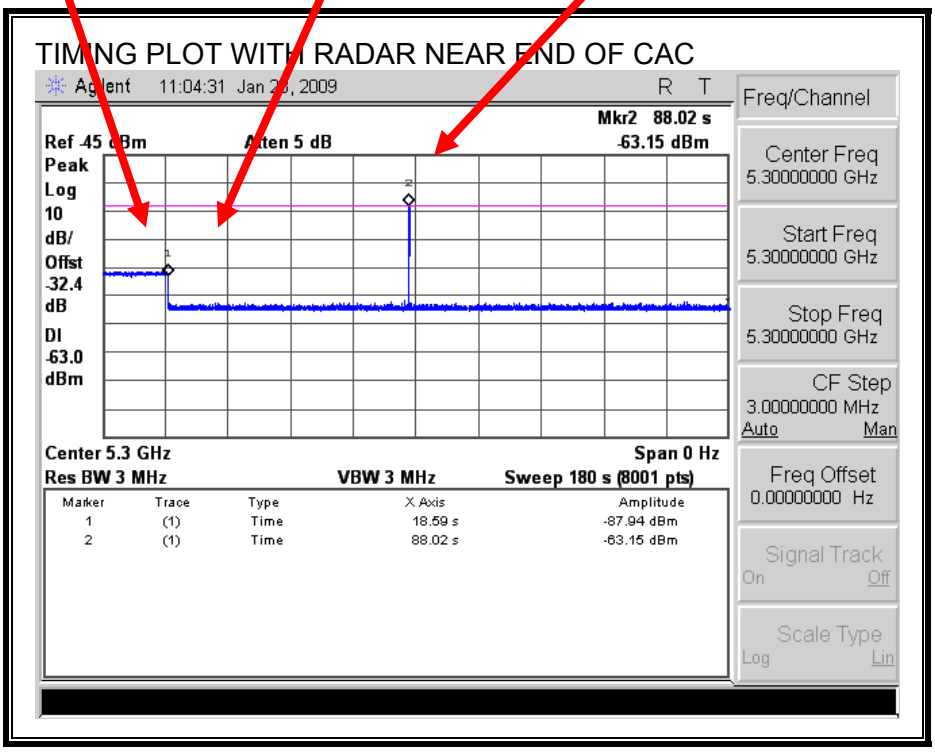
No EUT transmissions were observed after the radar signal.

TIMING PLOT WITH RADAR NEAR END OF CAC

AP is rebooted
Traffic ceases
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

Radar Signal Applied



No EUT transmissions were observed after the radar signal.

6.2.4. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

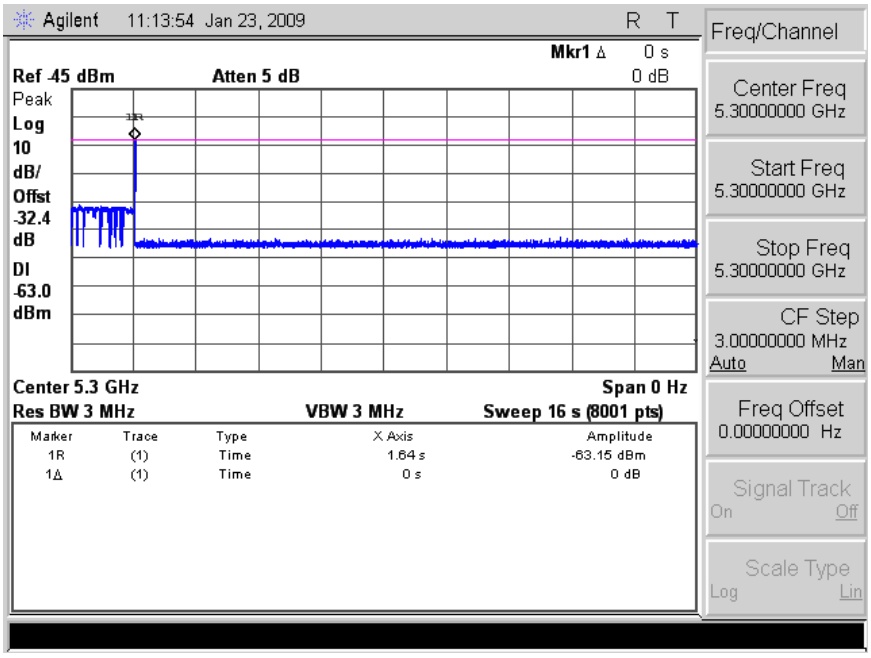
RESULTS

Agency	Channel Move Time (sec)	Limit (sec)
FCC / IC	0.000	10

Agency	Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
FCC	0.0	60
IC	0.0	260

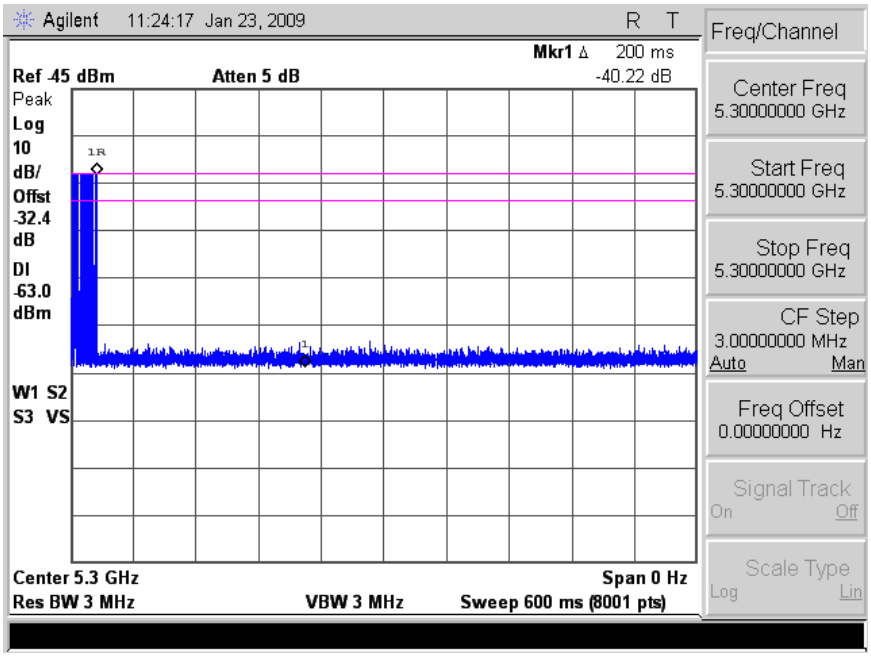
MOVE TIME

MOVE TIME PLOT



CHANNEL CLOSING TIME

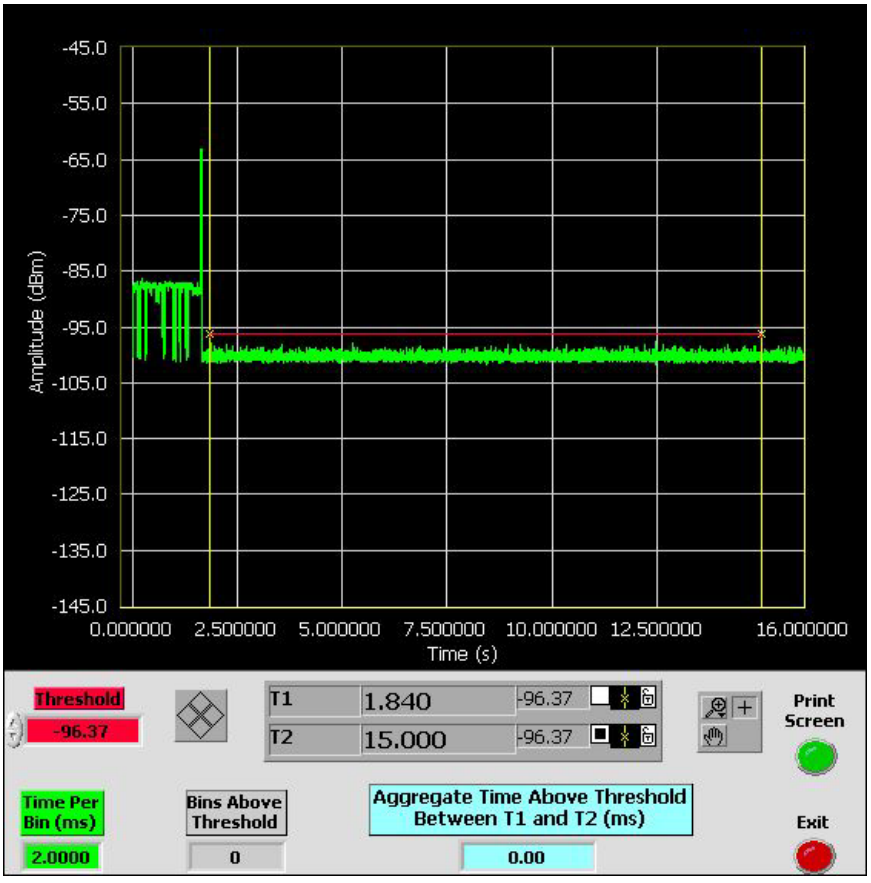
CLOSING TIME PLOT



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

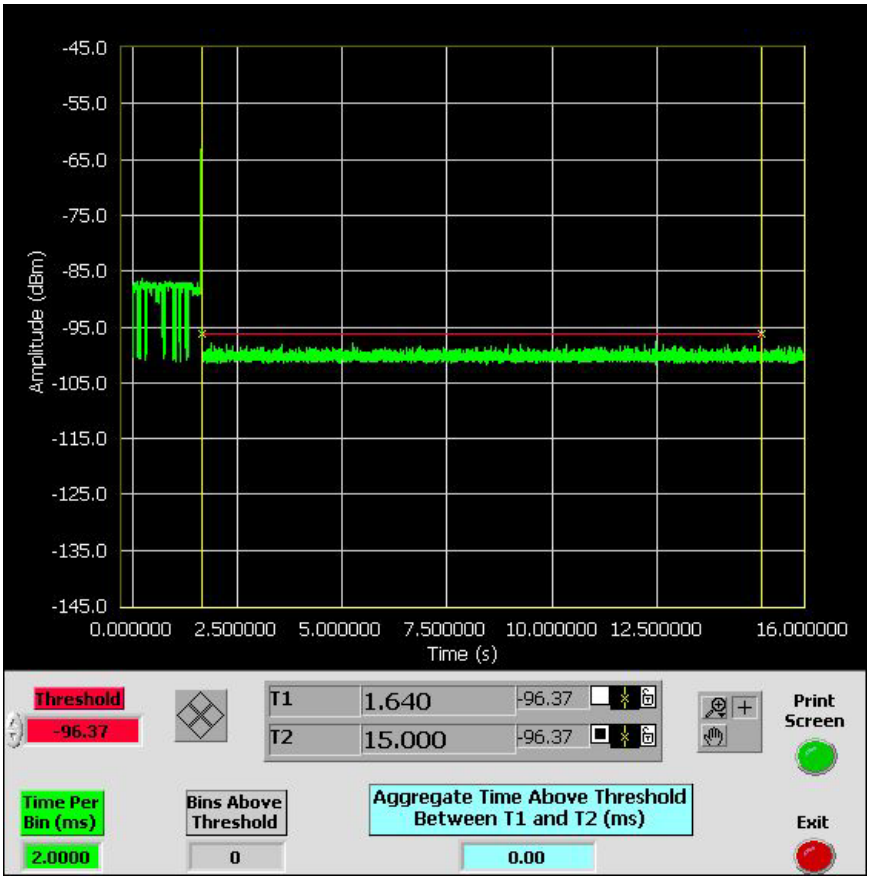
No transmissions are observed during the FCC aggregate monitoring period.

FCC AGGREGATE CLOSING TIME PLOT



No transmissions are observed during the IC aggregate monitoring period.

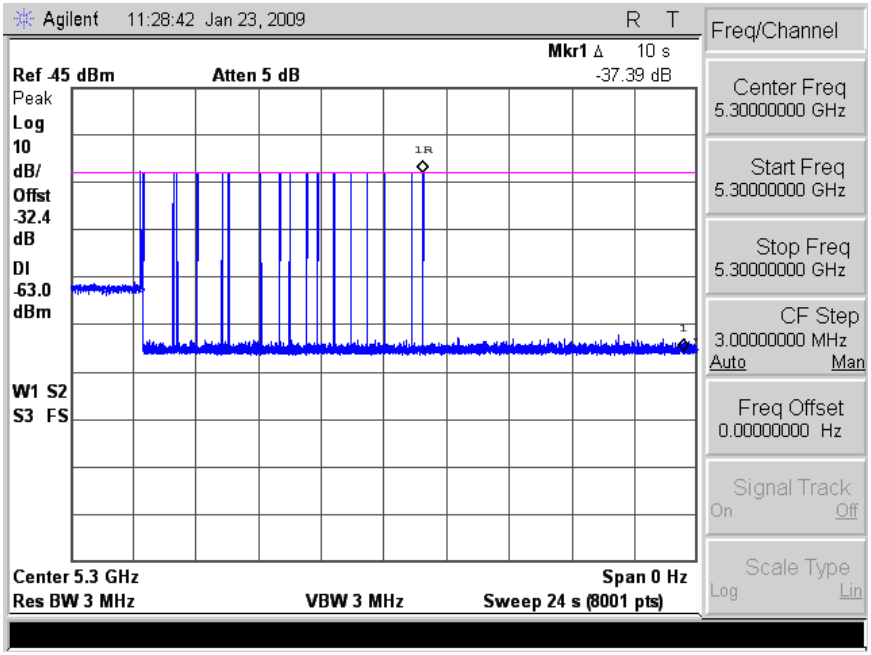
IC AGGREGATE CLOSING TIME PLOT



LONG PULSE CHANNEL MOVE TIME

The traffic ceases prior to 10 seconds after the end of the radar waveform.

MOVE TIME PLOT FOR LONG PULSE RADAR



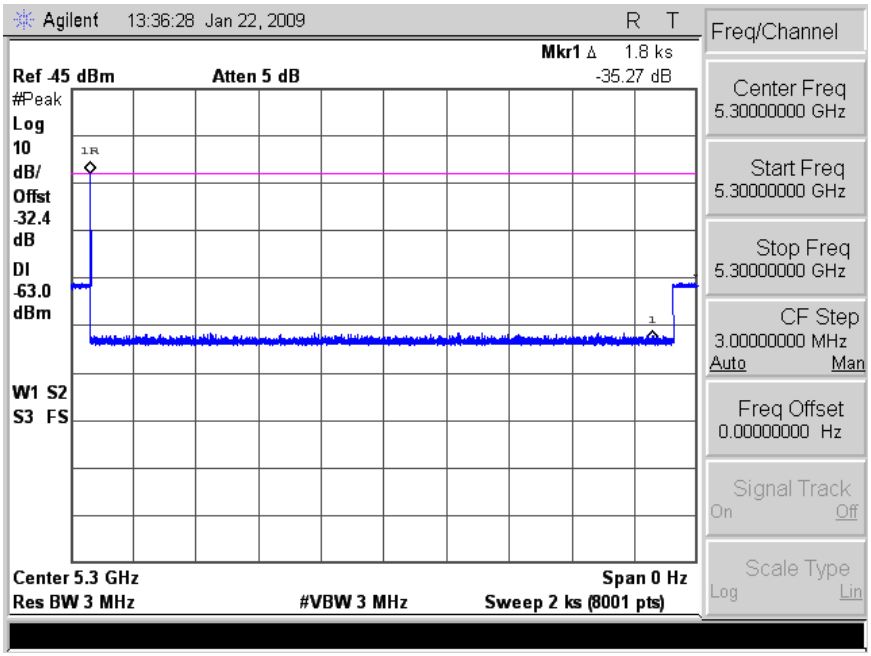
6.2.5. NON-OCCUPANCY PERIOD

RESULTS

No EUT transmissions were observed on the test channel during the 30-minute observation time.

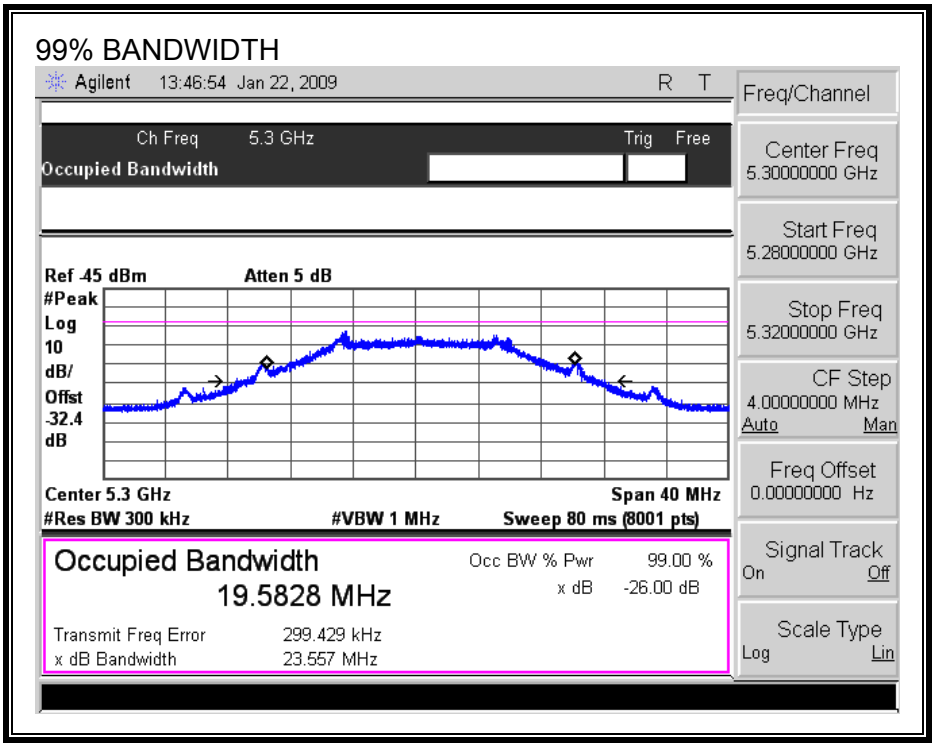
The Master device initiated a CAC after the end of the 30 minute non-occupancy period. No radar was triggered during this time therefore the Master re-initiated transmissions on the channel and the network link was re-established.

NON-OCCUPANCY PERIOD PLOT



6.2.6. DETECTION BANDWIDTH

REFERENCE PLOT OF 99% POWER BANDWIDTH



RESULTS

FL (MHz)	FH (MHz)	Detection Bandwidth (MHz)	99% Power Bandwidth (MHz)	Ratio of Detection BW to 99% Power BW (%)	Minimum Limit (%)
5292	5309	17	19.583	86.8	80

DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results				
FCC Type 1 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst				
Frequency (MHz)	Number of Trials	Number Detected	Detection (%)	Mark
5291	10	8	80	
5292	10	9	90	FL
5293	20	18	90	
5294	10	9	90	
5295	10	9	90	
5296	10	10	100	
5297	10	10	100	
5298	10	9	90	
5299	10	9	90	
5300	10	9	90	
5301	10	10	100	
5302	10	10	100	
5303	10	10	100	
5304	10	10	100	
5305	10	10	100	
5306	10	9	90	
5307	10	10	100	
5308	10	10	100	
5309	10	9	90	FH
5310	7	4	57	

6.2.7. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary				
Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail
FCC Short Pulse Type 1	30	60.00	60	Pass
FCC Short Pulse Type 2	30	93.33	60	Pass
FCC Short Pulse Type 3	30	100.00	60	Pass
FCC Short Pulse Type 4	30	100.00	60	Pass
Aggregate		88.33	80	Pass
FCC Long Pulse Type 5	30	93.33	80	Pass
FCC Hopping Type 6	36	77.78	70	Pass

TYPE 1 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 1	
1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst	
Trial	Successful Detection (Yes/No)
1	Yes
2	No
3	Yes
4	Yes
5	No
6	Yes
7	Yes
8	Yes
9	Yes
10	No
11	No
12	Yes
13	Yes
14	No
15	No
16	Yes
17	No
18	No
19	No
20	Yes
21	Yes
22	Yes
23	Yes
24	No
25	Yes
26	No
27	No
28	Yes
29	Yes
30	Yes

TYPE 2 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 2				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
2001	3.6	174.00	28	Yes
2002	3.5	158.00	29	Yes
2003	4.7	154.00	25	Yes
2004	4.7	218.00	23	Yes
2005	4.8	186.00	26	Yes
2006	3.1	200.00	28	Yes
2007	1.3	190.00	23	No
2008	2.9	206.00	26	Yes
2009	4.7	205.00	28	Yes
2010	3.4	222.00	23	Yes
2011	2.5	184.00	25	Yes
2012	2.4	201.00	28	Yes
2013	1.2	155.00	29	Yes
2014	1.9	174.00	26	Yes
2015	3.5	182.00	26	Yes
2016	3	165.00	27	Yes
2017	4	174.00	26	Yes
2018	1.6	176.00	29	Yes
2019	4.1	201.00	26	Yes
2020	3.3	212.00	24	Yes
2021	2.2	211.00	29	Yes
2022	1.4	181.00	27	No
2023	3.5	185.00	24	Yes
2024	1	194.00	26	Yes
2025	1.3	208.00	27	Yes
2026	2.3	193.00	25	Yes
2027	3.6	204.00	27	Yes
2028	1.4	154.00	23	Yes
2029	2.2	227.00	25	Yes
2030	4	216.00	29	Yes

TYPE 3 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 3				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
3001	7	392.00	18	Yes
3002	6.2	489.00	17	Yes
3003	7.4	270.00	18	Yes
3004	8.8	307.00	17	Yes
3005	5.3	391.00	17	Yes
3006	8.3	455.00	16	Yes
3007	6.1	260.00	18	Yes
3008	8.1	318.00	17	Yes
3009	5.5	422.00	18	Yes
3010	7	332.00	17	Yes
3011	9.9	363.00	18	Yes
3012	6.6	368.00	17	Yes
3013	5.6	421.00	16	Yes
3014	6	463.00	17	Yes
3015	8.6	316.00	18	Yes
3016	7.2	359.00	16	Yes
3017	9.7	266.00	18	Yes
3018	5.4	477.00	18	Yes
3019	10	432.00	17	Yes
3020	6.7	267.00	16	Yes
3021	5.8	424.00	18	Yes
3022	7.5	371.00	17	Yes
3023	7.4	346.00	17	Yes
3024	6.8	495.00	18	Yes
3025	10	337.00	18	Yes
3026	6.6	313.00	16	Yes
3027	6.8	315.00	18	Yes
3028	9.7	456.00	16	Yes
3029	7.4	298	17	Yes
3030	5.8	440	17	Yes

TYPE 4 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 4				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
4001	14.2	257.00	14	Yes
4002	13.9	416.00	14	Yes
4003	16	337.00	13	Yes
4004	13.2	374.00	15	Yes
4005	12.5	404.00	15	Yes
4006	17.8	285.00	12	Yes
4007	10.7	478.00	16	Yes
4008	18.5	295.00	15	Yes
4009	15.4	309.00	13	Yes
4010	14.7	281.00	12	Yes
4011	18.4	251.00	13	Yes
4012	18.8	477.00	14	Yes
4013	17.3	414.00	16	Yes
4014	12.8	338.00	14	Yes
4015	15.3	417.00	12	Yes
4016	19.8	375.00	16	Yes
4017	18.4	403.00	16	Yes
4018	13.6	369.00	12	Yes
4019	14.2	425.00	12	Yes
4020	10.8	324.00	16	Yes
4021	19.2	493.00	16	Yes
4022	18.1	330.00	13	Yes
4023	15.5	360.00	16	Yes
4024	13.8	345.00	15	Yes
4025	16.5	324.00	15	Yes
4026	11	400.00	16	Yes
4027	15.8	252.00	16	Yes
4028	18.4	486.00	13	Yes
4029	17.6	285.00	12	Yes
4030	12.7	310.00	16	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5	
Trial	Successful Detection (Yes/No)
1	Yes
2	No
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
11	Yes
12	Yes
13	Yes
14	Yes
15	Yes
16	Yes
17	Yes
18	Yes
19	Yes
20	Yes
21	Yes
22	No
23	Yes
24	Yes
25	Yes
26	Yes
27	Yes
28	Yes
29	Yes
30	Yes

Note: The Type 5 randomized parameters are shown in a separate document.

TYPE 6 DETECTION PROBABILITY

Data Sheet for FCC Hopping Radar Type 6				
1 us Pulse Width, 333 us PRI, 9 Pulses per Burst, 1 Burst per Hop				
NTIA August 2005 Hopping Sequence				
Trial	Starting Index Within Sequence	Signal Generator Frequency (MHz)	Hops within Detection BW	Successful Detection (Yes/No)
1	84	5292	3	Yes
2	559	5293	2	No
3	1034	5294	4	Yes
4	1509	5295	4	Yes
5	1984	5296	5	Yes
6	2934	5297	5	Yes
7	3409	5298	3	Yes
8	3884	5299	6	No
9	4359	5300	3	No
10	4834	5301	4	Yes
11	5309	5302	4	Yes
12	5784	5303	2	Yes
13	6259	5304	2	No
14	6734	5305	4	No
15	7209	5306	4	Yes
16	7684	5307	1	Yes
17	8159	5308	1	No
18	8634	5309	5	No
19	9109	5292	2	Yes
20	9584	5293	5	Yes
21	10059	5294	3	Yes
22	10534	5295	2	Yes
23	11009	5296	7	Yes
24	11484	5297	4	Yes
25	11959	5298	4	Yes
26	12434	5299	4	Yes
27	12909	5300	5	Yes
28	13384	5301	9	Yes
29	13859	5302	7	Yes
30	14334	5303	4	Yes
31	14809	5304	3	Yes
32	15284	5305	4	Yes
33	15759	5306	4	Yes
34	16234	5307	4	Yes
35	16709	5308	2	Yes
36	17184	5309	2	No

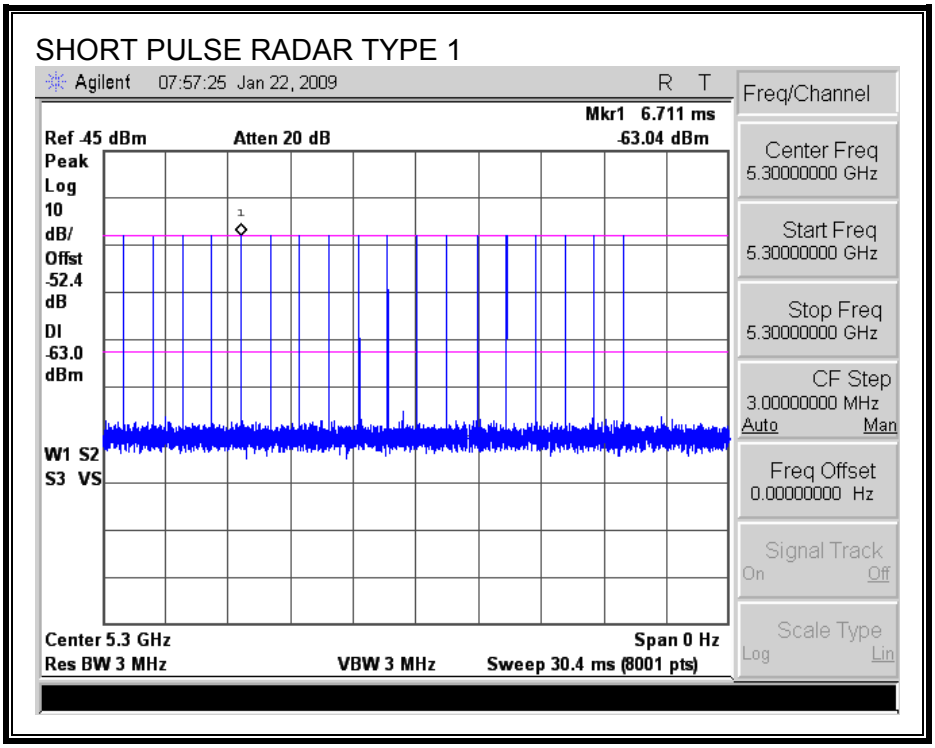
6.3. SLAVE DEVICE CONFIGURATION

6.3.1. TEST CHANNEL

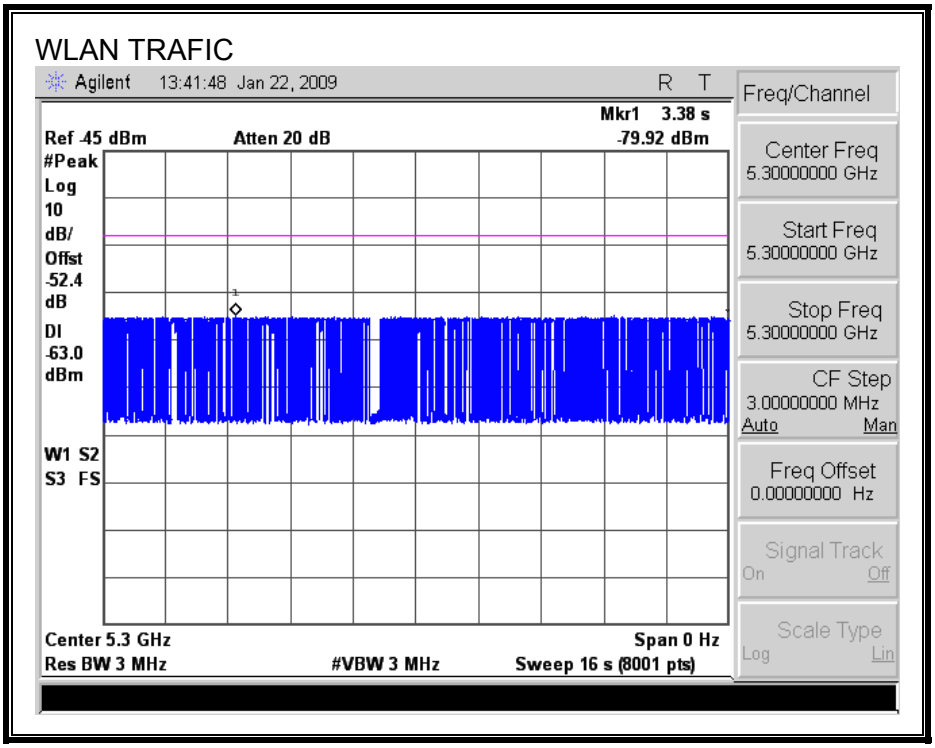
All tests were performed at a channel center frequency of 5300 MHz. Measurements were performed using conducted test methods.

6.3.2. PLOTS OF RADAR WAVEFORM AND WLAN TRAFFIC

PLOTS OF RADAR WAVEFORM



PLOT OF WLAN TRAFFIC



6.3.3. MOVE AND CLOSING TIME

REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =
(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the FCC aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

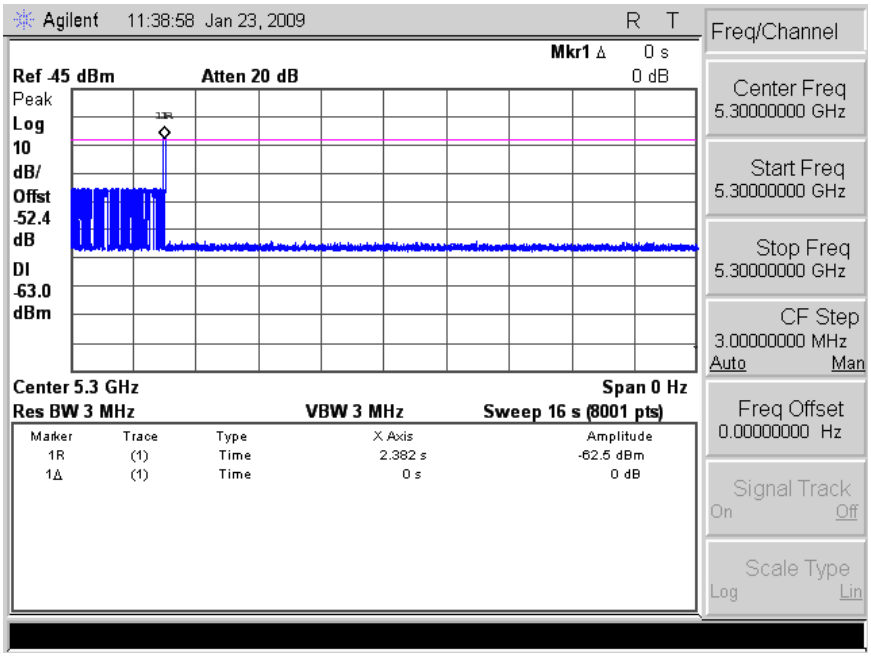
RESULTS

Agency	Channel Move Time (sec)	Limit (sec)
FCC / IC	0.000	10

Agency	Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
FCC	0.0	60
IC	0.0	260

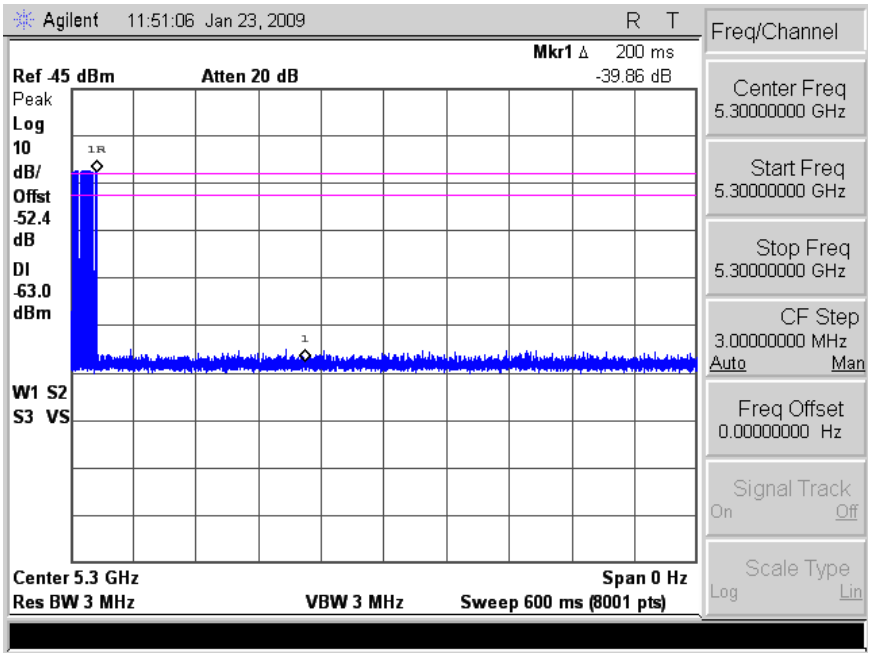
MOVE TIME

MOVE TIME PLOT



CHANNEL CLOSING TIME

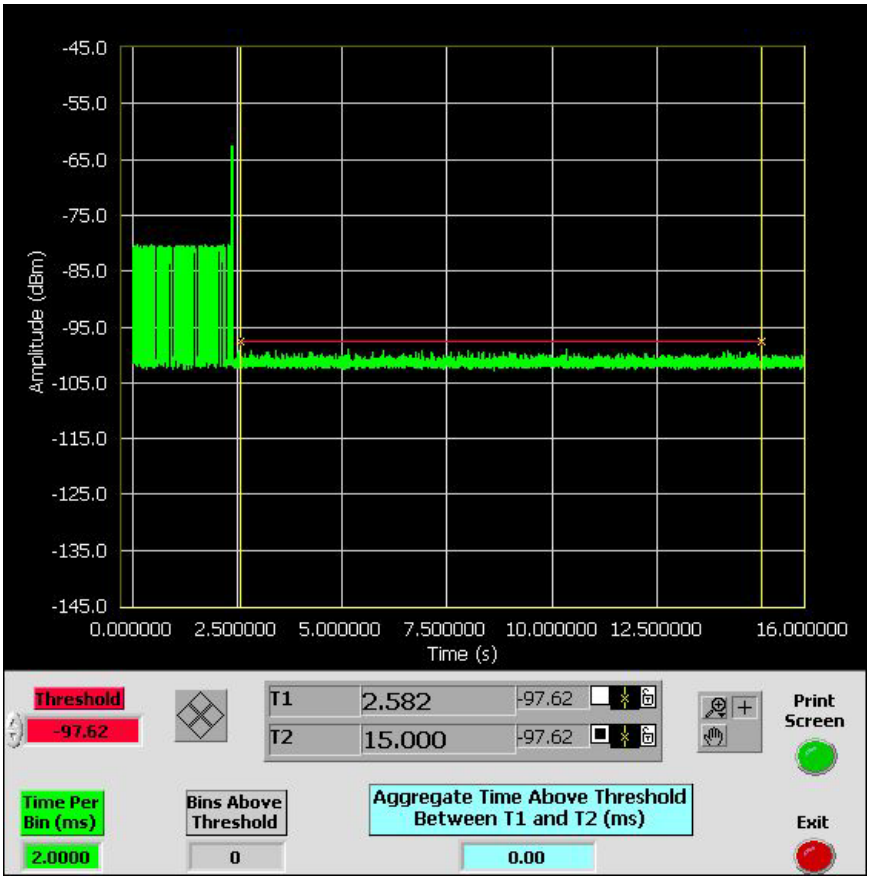
CLOSING TIME PLOT



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

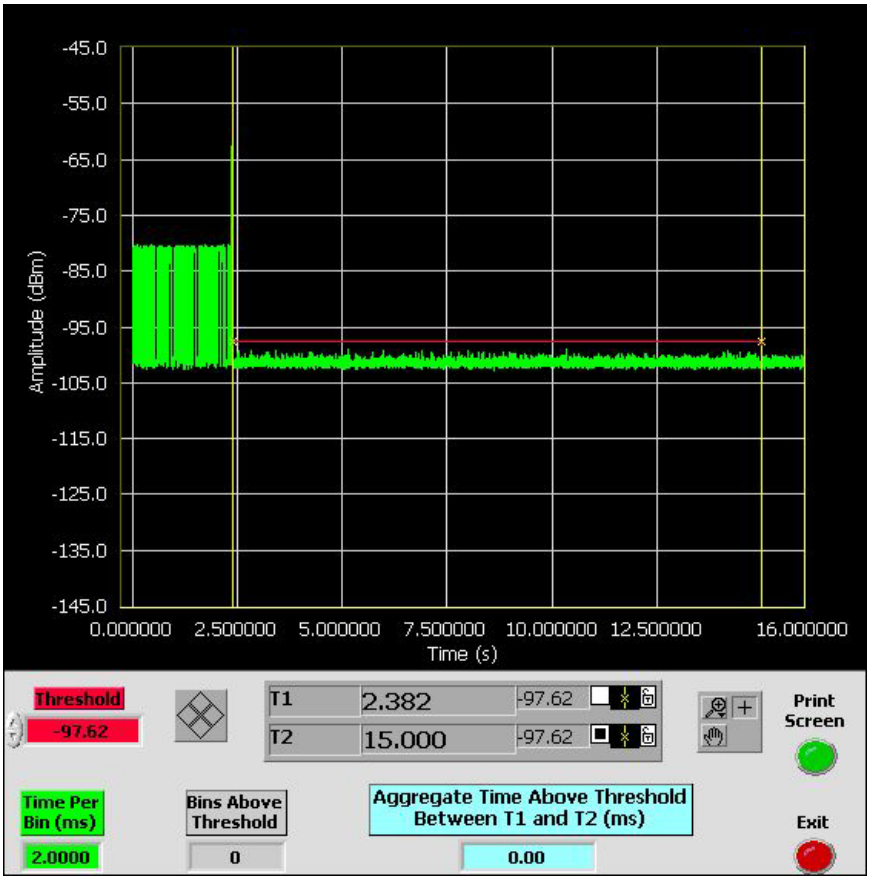
No transmissions are observed during the FCC aggregate monitoring period.

FCC AGGREGATE CLOSING TIME PLOT



No transmissions are observed during the IC aggregate monitoring period.

IC AGGREGATE CLOSING TIME PLOT

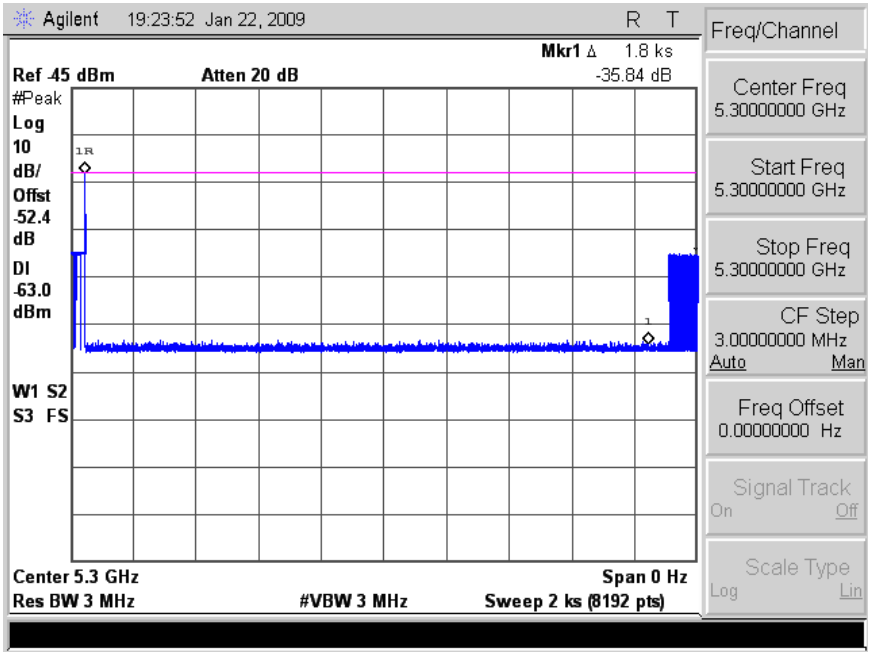


6.3.4. NON-OCCUPANCY

No EUT transmissions were observed on the test channel during the 30-minute observation time.

The Master device initiated a CAC after the end of the 30 minute non-occupancy period. No radar was triggered during this time therefore the Master re-initiated transmissions on the channel and the network link was re-established.

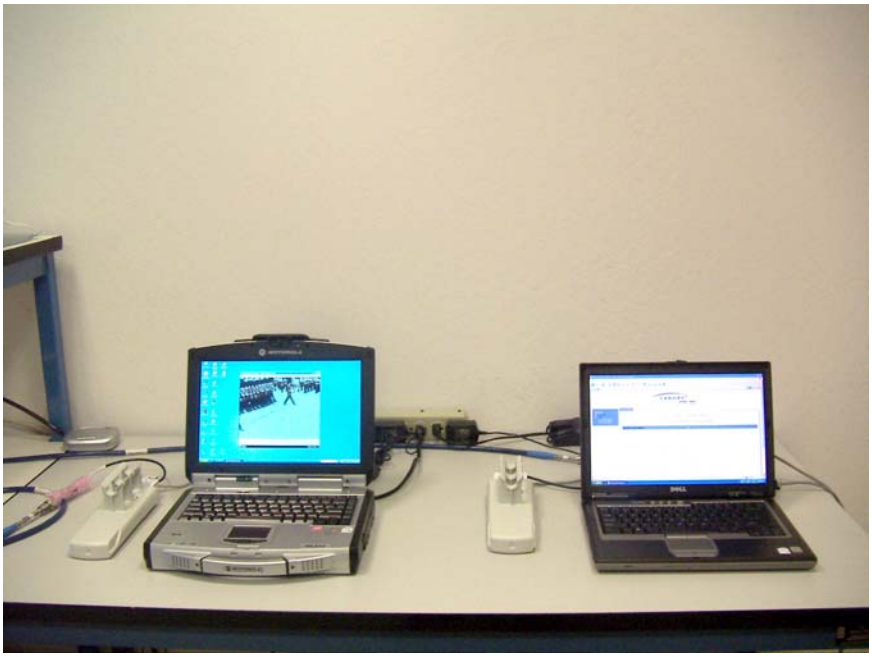
NON-OCCUPANCY PERIOD



7. SETUP PHOTOS

DYNAMIC FREQUENCY SELECTION MEASUREMENT SETUP

DFS FRONT PHOTO



DFS SIDE PHOTO

END OF REPORT