FCC CFR47 PART 15 SUBPART E

CLASS II PERMISSIVE CHANGE
TEST REPORT FOR

802.11a/b/g ACCESS POINT

MODEL NUMBER: AR5BAP-00032

FCC ID: PPD-AR5BAP-00032

REPORT NUMBER: 06U10336-5

ISSUE DATE: OCTOBER 17, 2006

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	10/17/06	Initial Issue, based on 06U10336-1; Clarified Modifications, Changed reference to Report of RF test results	MH

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS 4

2. TEST METHODOLOGY 5

3. SCOPE OF REPORT 5

4. EQUIPMENT UNDER TEST 5

4.1. DESCRIPTION OF EUT 5

4.2. DESCRIPTION OF MODIFICATIONS 5

5. FACILITIES AND ACCREDITATION 6

6. CALIBRATION AND UNCERTAINTY 6

6.1. MEASURING INSTRUMENT CALIBRATION 6

6.2. MEASUREMENT UNCERTAINTY 6

7. LIMITS AND RESULTS 7

7.1. DYNAMIC FREQUENCY SELECTION: LIMITS, SETUP, EUT INFORMATION, AND PROCEDURES 7

7.1.1. LIMITS 7
7.1.2. DESCRIPTION OF EUT 10
7.1.3. TEST AND MEASUREMENT SYSTEM 11
7.1.4. TEST AND MEASUREMENT EQUIPMENT 14
7.1.5. SETUP OF EUT 15
7.1.6. PLOTS OF NOISE, RADAR WAVEFORMS, AND WLAN SIGNALS 17
7.1.7. TEST CHANNEL AND METHOD 25
7.1.8. CHANNEL AVAILABILITY CHECK TIME 25
7.1.9. CHANNEL MOVE TIME AND CHANNEL CLOSING TRANSMISSION TIME 30
7.1.10. NON-OCCUPANCY PERIOD 34
7.1.11. DETECTION BANDWIDTH 35
7.1.12. IN-SERVICE MONITORING 37

8. SETUP PHOTOS 44

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: ATHEROS COMMUNICATIONS, INC.
5480 Great America Parkway
Santa Clara, CA 95054, USA

EUT DESCRIPTION: 802.11a/b/g Access Point

MODEL TESTED: AR5BAP-00032

SERIAL NUMBER: AP 30-50-D7323

DATE TESTED: JUNE 26-29, 2006

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART E	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. 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 Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services 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: Tested By:

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15 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".

3. SCOPE OF REPORT

This report only covers DFS requirements, as specified by the above referenced procedures.

Reference is made to CCS Document 03U2012-2 for details of the RF characteristics in the 5250-5350 MHz band and CCS Document 06U10336-4 for details of the RF characteristics in the 5470-5725 MHz band.

4. EQUIPMENT UNDER TEST

4.1. DESCRIPTION OF EUT

The maximum output power is 20.65 dBm in the 5250-5350 MHz band and 17.43 dBm in the 5470-5725 MHz band. The antenna assembly gain is 4.0 dBi.

4.2. DESCRIPTION OF MODIFICATIONS

The EUT has the following software installed:

AP Software Version 5.1.0.17 was initially installed in the EUT. The software was revised to Version 5.1.0.42 to improve the closing time performance.

5. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

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

6. CALIBRATION AND UNCERTAINTY

6.1. 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.

6.2. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

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

7. LIMITS AND RESULTS

7.1. DYNAMIC FREQUENCY SELECTION: LIMITS, SETUP, EUT INFORMATION, AND PROCEDURES

7.1.1. LIMITS

§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

7.1.2. DESCRIPTION OF EUT

OVERVIEW WITH RESPECT TO §15.407 (h) REQUIREMENTS

The EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges.

The EUT is a Master Device.

The highest power level within these bands is 24.65 dBm EIRP in the 5250-5350 MHz band and 21.43 dBm EIRP in the 5470-5725 MHz band.

The only antenna assembly utilized with the EUT has a gain of 4.0 dBi. This antenna is manufactured with a non-detachable coaxial cable. Two identical antennas are utilized to meet the transmit diversity operational requirements.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is –64 dBm. After correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is –64 + 4 + 1 = -59 dBm.

The calibrated conducted DFS Detection Threshold level is set to –64 dBm. The tested level is lower than the required level hence it provides margin to the limit.

The EUT uses one transmitter connected to two 50-ohm coaxial antenna ports via a diversity switch. Both antenna ports are connected to the test system via a power divider to perform conducted tests.

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

WLAN 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 not required since the maximum EIRP is less than 500 mW (27 dBm).

The EUT utilizes the 802.11a architecture, with a nominal channel bandwidth of 20 MHz.

Test results show that the EUT requires 21.22 seconds to complete its initial power-up cycle.

MANUFACTURER’S STATEMENT REGARDING UNIFORM CHANNEL SPREADING

The end product implements an automatic channel selection feature at startup such that operation commences on channels distributed across the entire set of allowed 5GHz channels. This feature will ensure uniform spreading is achieved while avoiding non-allowed channels due to prior radar events.

7.1.3. TEST AND MEASUREMENT SYSTEM

SYSTEM OVERVIEW

The measurement system is based on a conducted test method.

The short pulse and long pulse signal generating system utilizes the NTIA software and the same manufacturer / model Vector Signal Generator as the NTIA. The hopping signal generating system utilizes the simulated hopping method.

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, with the initial starting point randomized at run-time.

The signal monitoring equipment consists of a spectrum analyzer with the capacity to display 8192 bins on the horizontal axis. A time-domain resolution of 2 msec / bin is achievable 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. A time-domain resolution of 3 msec / bin is achievable with a 24 second sweep time, meeting the 22 second long pulse reporting criteria and allowing a minimum of 10 seconds after the end of the long pulse waveform.

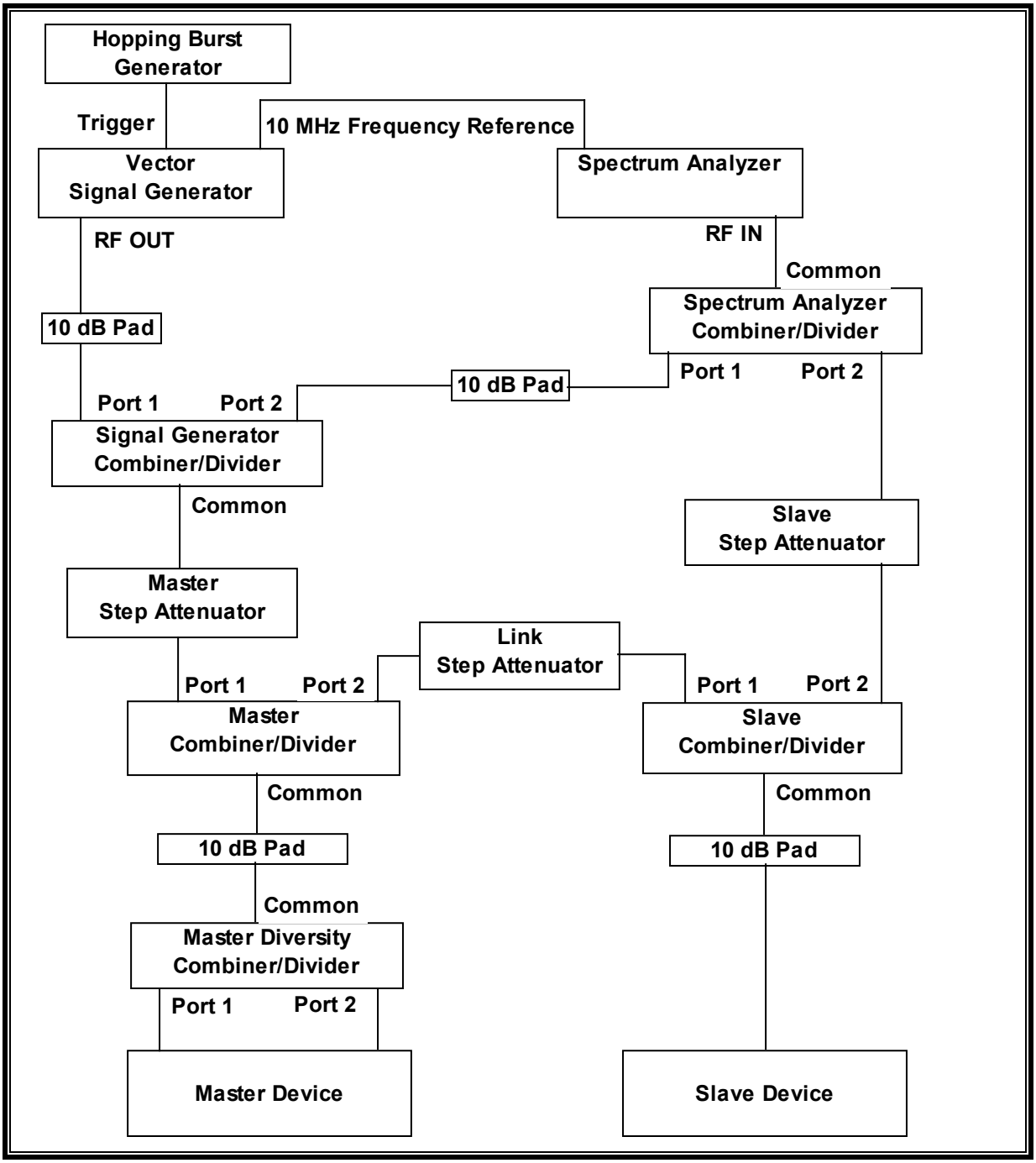
FREQUENCY HOPPING SIGNAL GENERATION

The hopping burst generator is a High Speed Digital I/O card plugged into the control computer. This card utilizes an independent hardware clock reference therefore the output pulse timing is unaffected by host computer operating system latency times.

The software selects the hopping sequence as a 100-length segment of the August 2005 NTIA hopping frequency list. This list contains 274 unique pseudorandom sequences. Each such sequence contains 475 frequencies ordered on a random without replacement basis. Each successive trial uses a contiguous 100-length segment from within each successive 475-length sequence in the list. The initial starting point within the list is randomized at run-time such that the first 100-length segment is entirely contained within the first 475-length sequence. The starting point of each successive trial 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.

CONDUCTED METHOD SYSTEM BLOCK DIAGRAM



MEASUREMENT SYSTEM FREQUENCY REFERENCE

Lock the signal generator and the spectrum analyer to the same reference source as follows: Connect the 10 MHz OUT (SWITCHED) on the spectrum analyer to the 10 MHz IN on the signal generator and set the spectrum analyzer 10 MHz Out to On.

SYSTEM CALIBRATION

Adjust the Master Step Attenuator to 40 dB, the Link Step Attenuator to 30 dB, and the Slave Step Attenuator to 70 dB.

If required, disconnect the spectrum analyzer, Master Device, and Slave Device from the test system. Terminate the Common port of the Spectrum Analyzer Combiner/Divider, Port 2 of the Master Diversity Combiner/Divider, and the pad at the Common port of the Slave Combiner/Divider. Leave, or connect, the appropriate cable to Port 1 of the Master Diversity Combiner/Divider and connect the free end (Master Device end) of this cable to the spectrum analyzer.

Adjust the signal generator and spectrum analyzer to the center frequency of the channel to be measured. Set the signal generator to CW mode. Set the RBW of the spectrum analyzer to 10 kHz and the span to 100 kHz. Adjust the amplitude of the signal generator to yield a measured level of –64 dBm on the spectrum analyzer.

Without changing any of the instrument settings, reconnect the spectrum analyer to the Common port of the Spectrum Analyzer Combiner/Divider, then remove the cable from Port 1 of the Master Diversity Combiner/Divider and replace this cable with a termination. Measure the amplitude and calculate the difference from –64 dBm. Adjust the Reference Level Offset of the spectrum analyzer to this difference. Confirm that the signal is displayed at –64 dBm. Readjust the RBW and VBW to 3 MHz, set the span to 10 MHz, and confirm that the signal is still displayed at –64 dBm.

This Reference Level Offset setting is used for all tests for which the Master Step Attenuator is set to 20 dB. 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.

The Link Step Attenuator and Slave Step Attenuator settings may be changed without affecting the System Calibration. The System Calibration process must be repeated for different settings of the Master Step Attenuator to determine the Reference Level Offset associated with each Master Step Attenuator setting.

INTERFERENCE DETECTION THRESHOLD ADJUSTMENT

Download the applicable radar waveforms to the signal generator. Select the radar waveform, trigger a burst manually and measure the amplitude 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 an adequate RSS 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. Confirm that the displayed traffic is from the Master Device by changing the setting of the Master Step Attenuator and verifying that the displayed traffic level changes accordingly. Confirm that the displayed traffic does not include Slave Device traffic by changing the setting of the Slave Step Attenuator and the Link Step Attenuator and verifying that the displayed traffic level does not change. Reset all Step Attenuators to their previous settings.

If the above conditions cannot be met, use a different setting of the Master Step Attenuator, performing a new System Calibration and Interference Detection Threshold Adjsutment as required for the new Master Step Attenuator setting.

7.1.4. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	US42070220	7/29/2006
Vector Signal Generator 250kHz-20GHz	Agilent / HP	E8267C	US43320336	11/2/2007
High Speed Digital I/O Card	National Instruments	PCI-6534	HA1612845	1/16/2007
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	4/22/2007

7.1.5. SETUP OF EUT

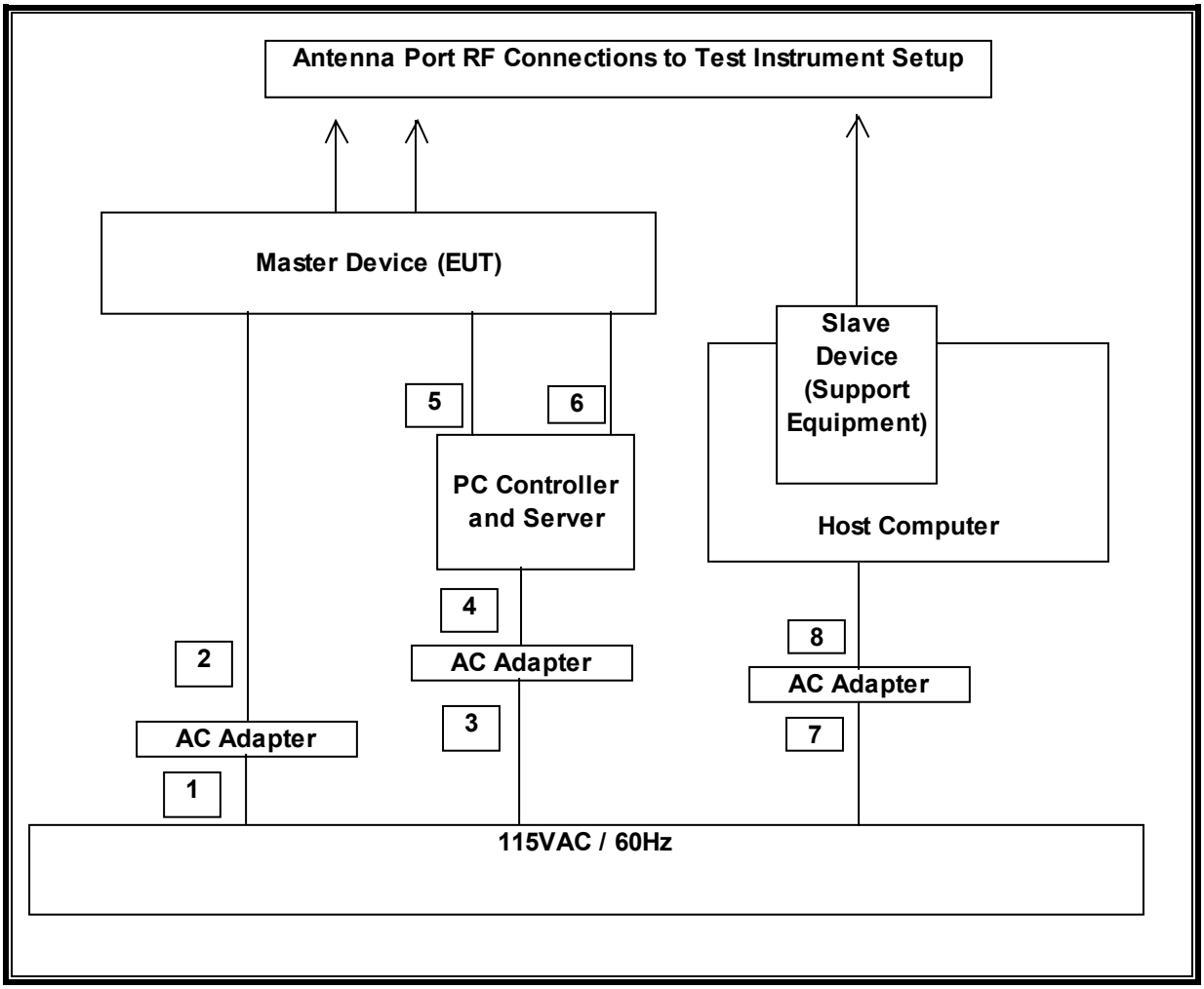
SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	CUI	DSA-0151A	4403	DoC
Laptop	IBM	Thinkpad T42	ZZ-27004	DoC
AC Adapter	IBM	08K8204	85910TF	DoC
Laptop	IBM	Thinkpad T42p	ZZ-27259	DoC
AC Adapter	IBM	02K6746	28106J	DoC
Wirless PCI Card	Atheros	AR5BCB-00032A	CB32-45-L0422	N/A*
* NOTE: This is a prototype card, modified to enable the 5470-5725 MHz band. It is not on the market.				

I/O CABLES

I/O CABLE LIST					
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**
1	AC	1	US 115V	Direct Plug	0m
2	DC	1	DC	Un-shielded	2m
3	AC	1	US 115V	Un-shielded	1m
4	DC	1	DC	Un-shielded	2m
5	Ethernet	1	RJ45	Un-shielded	2m
6	Serial	1	USB to DIN	Shielded	2.5m
7	AC	1	US 115V	Un-shielded	2m
8	DC	1	DC	Un-shielded	2m

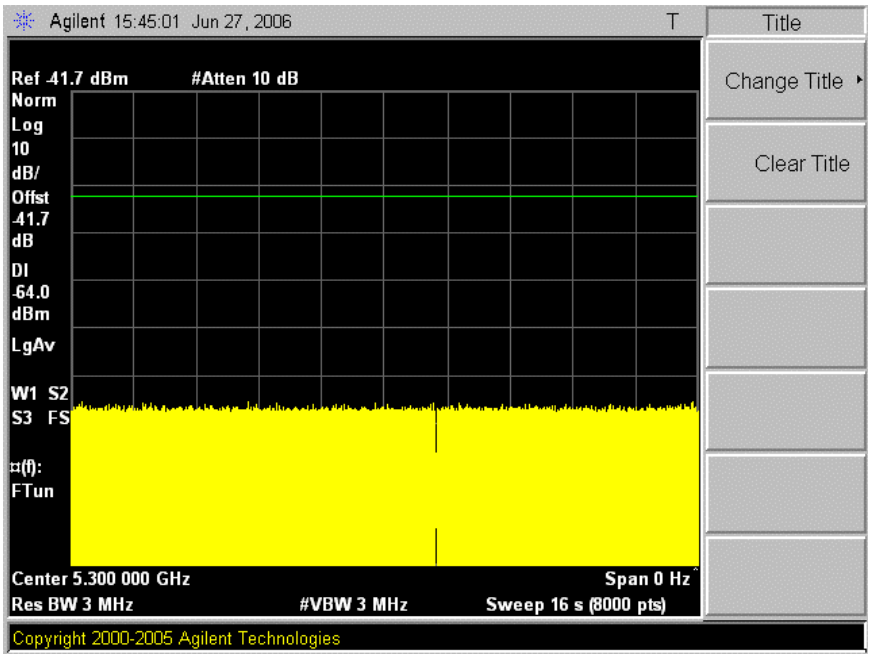
TEST SETUP



7.1.6. PLOTS OF NOISE, RADAR WAVEFORMS, AND WLAN SIGNALS

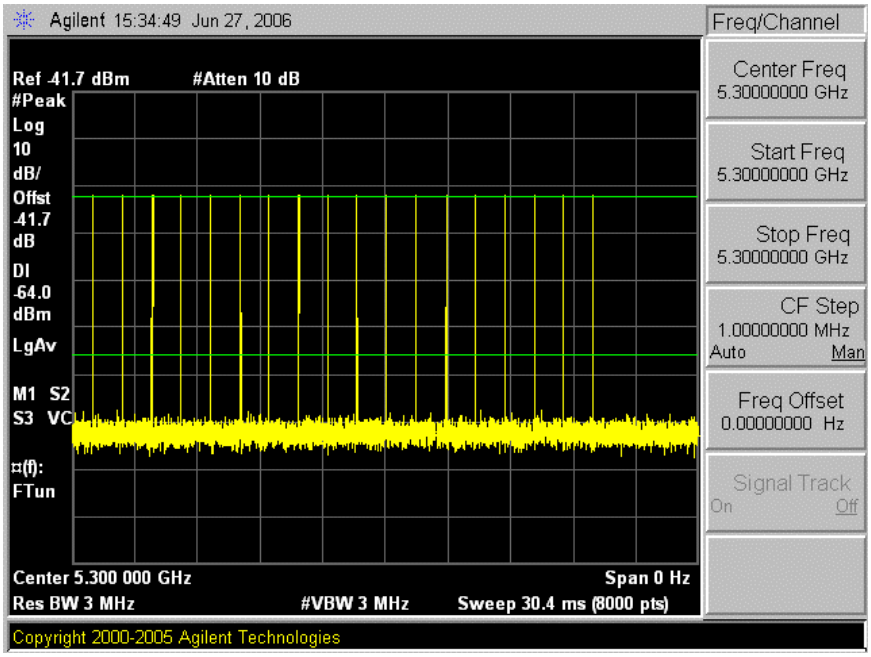
PLOT OF SYSTEM NOISE FLOOR

NOISE FLOOR

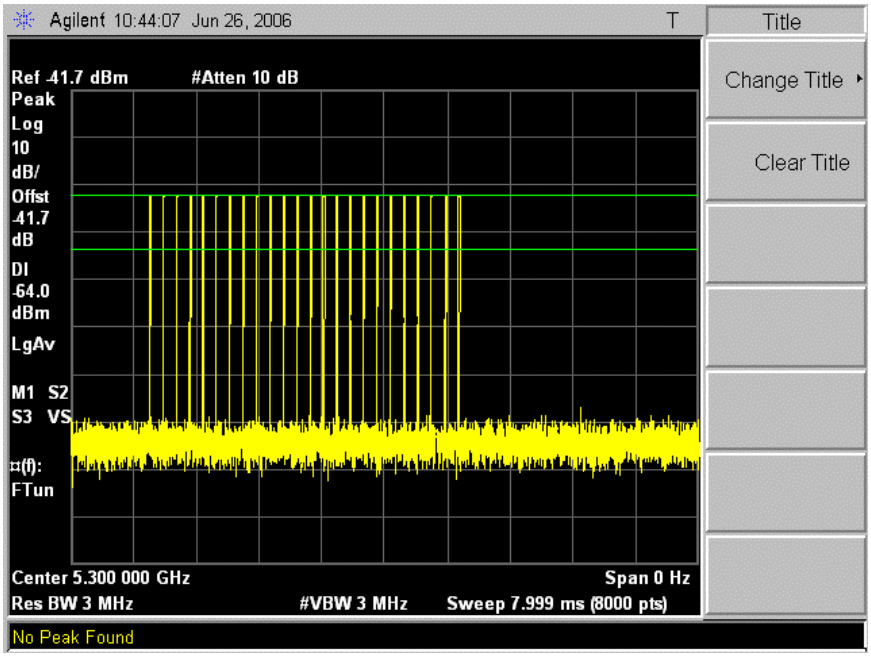


PLOTS OF RADAR WAVEFORMS

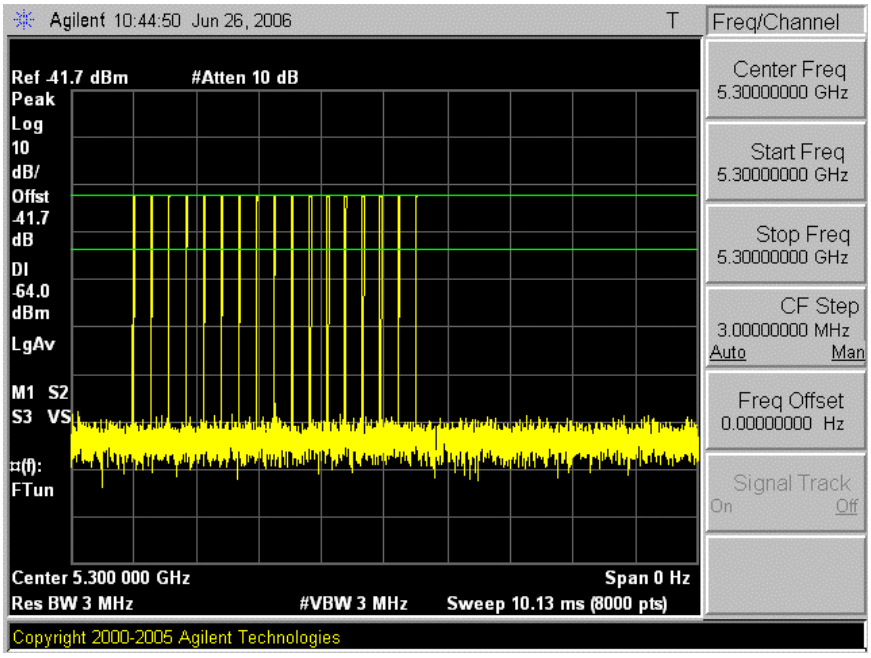
SHORT PULSE RADAR TYPE 1



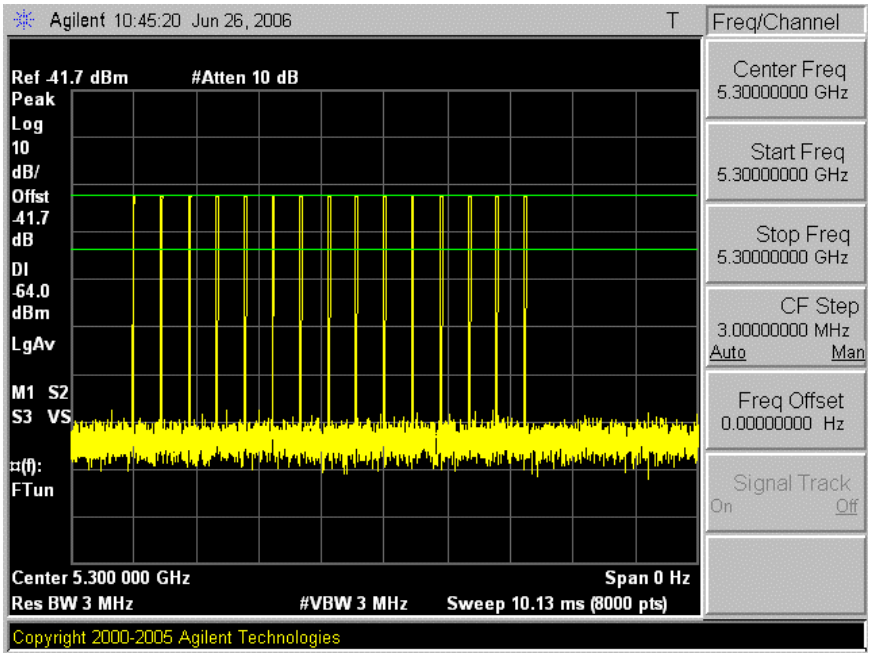
SAMPLE OF SHORT PULSE RADAR TYPE 2



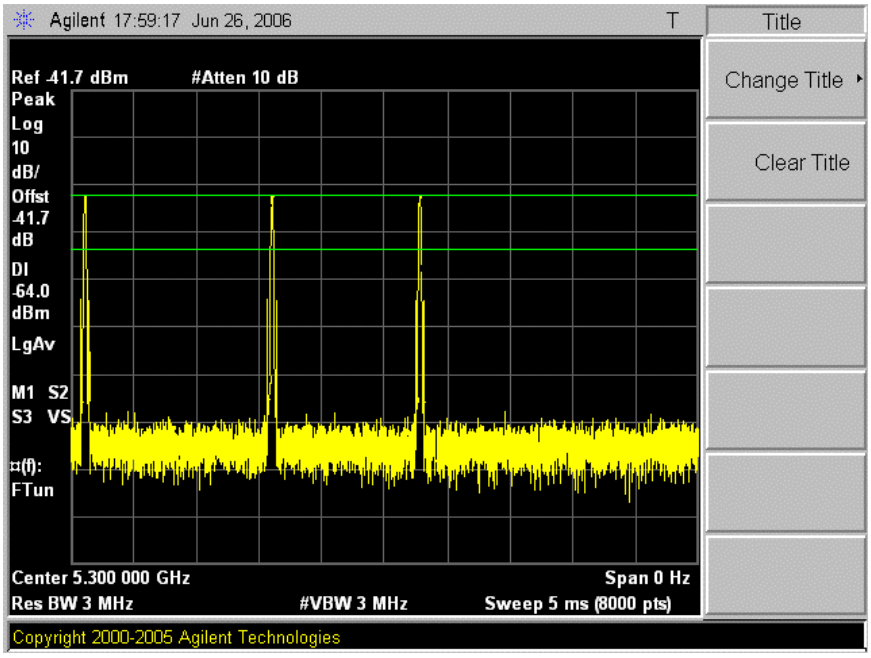
SAMPLE OF SHORT PULSE RADAR TYPE 3



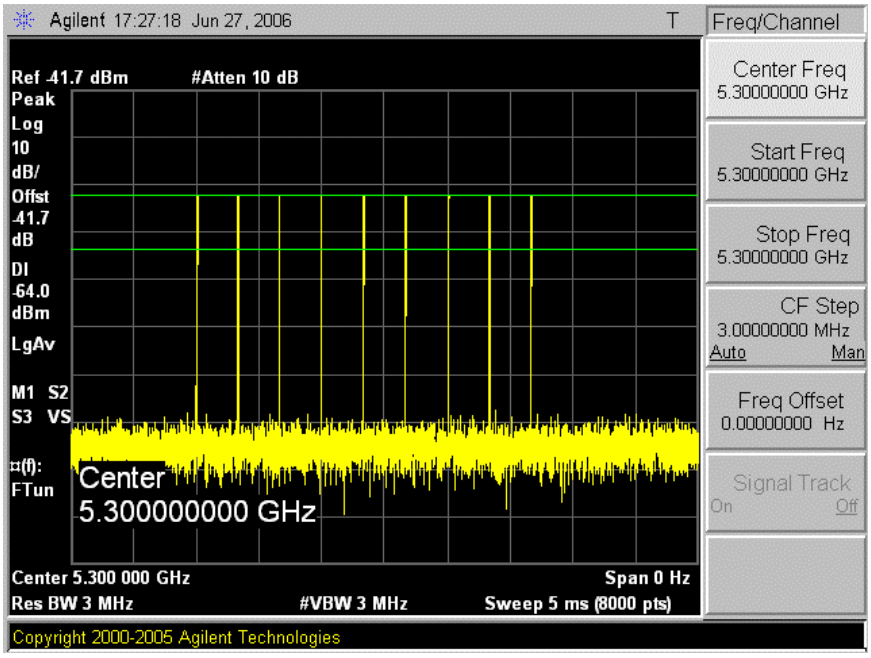
SAMPLE OF SHORT PULSE RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

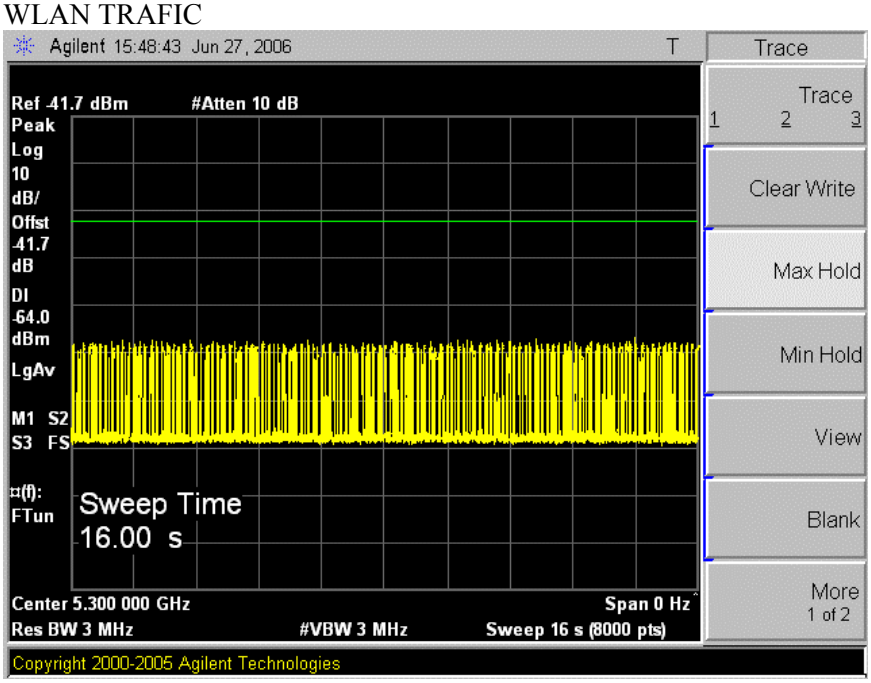


SINGLE BURST OF RADAR TYPE 6



PLOT OF WLAN TRAFFIC FROM MASTER

WLAN TRAFIC



7.1.7. TEST CHANNEL AND METHOD

All tests were performed at a channel center frequency of 5300 MHz utilizing a conducted test method.

7.1.8. CHANNEL AVAILABILITY CHECK TIME

TEST 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.

TEST 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, corresponding to the beginning of the CAC time, 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, corresponding to the end of the CAC time, and transmissions on the channel were monitored on the spectrum analyzer.

CHANNEL AVAILABILITY CHECK TIME RESULTS

No non-compliance noted:

Time required for EUT to complete the initial power-up cycle (sec)
21.22

If a radar signal is detected during the channel availability check then the PC controlling the EUT displays a message stating that radar was detected.

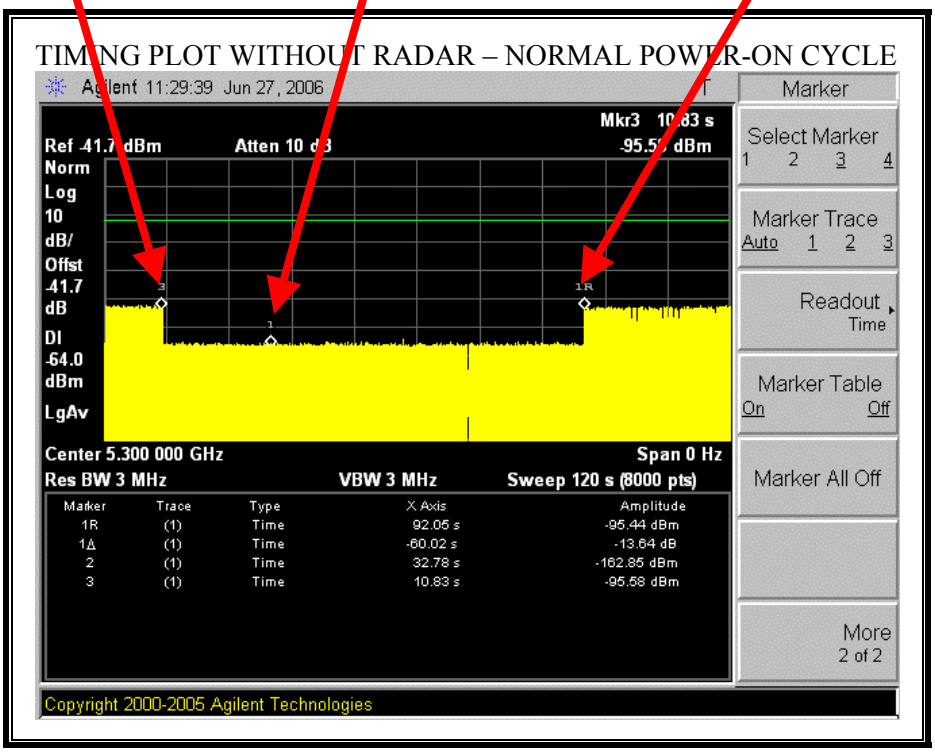
Timing of Radar Burst	Display on EUT / PC Control Computer	Spectrum Analyzer Display
No Radar Triggered	EUT Initiates Transmisisons	Transmissions begin on channel after completion of the initial power-up cycle and the 60 second CAC
Within 0 to 6 second window	EUT indicates radar detected EUT does not display any radar parameter values	No transmissions on channel
Within 54 to 60 second window	EUT indicates radar detected EUT does not display any radar parameter values	No transmissions on channel

TIMING PLOT WITHOUT RADAR DURING CAC

AP is rebooted
Traffic ceases
Start of Initial Power-up cycle
Marker = 10.83 sec

End of Initial Power-up cycle
Start of CAC
Delta from reboot = 21.22 sec

End of complete Power-up cycle
End of CAC
Traffic is Initiated
Marker = 92.05 sec
Delta from reboot = 81.22 sec



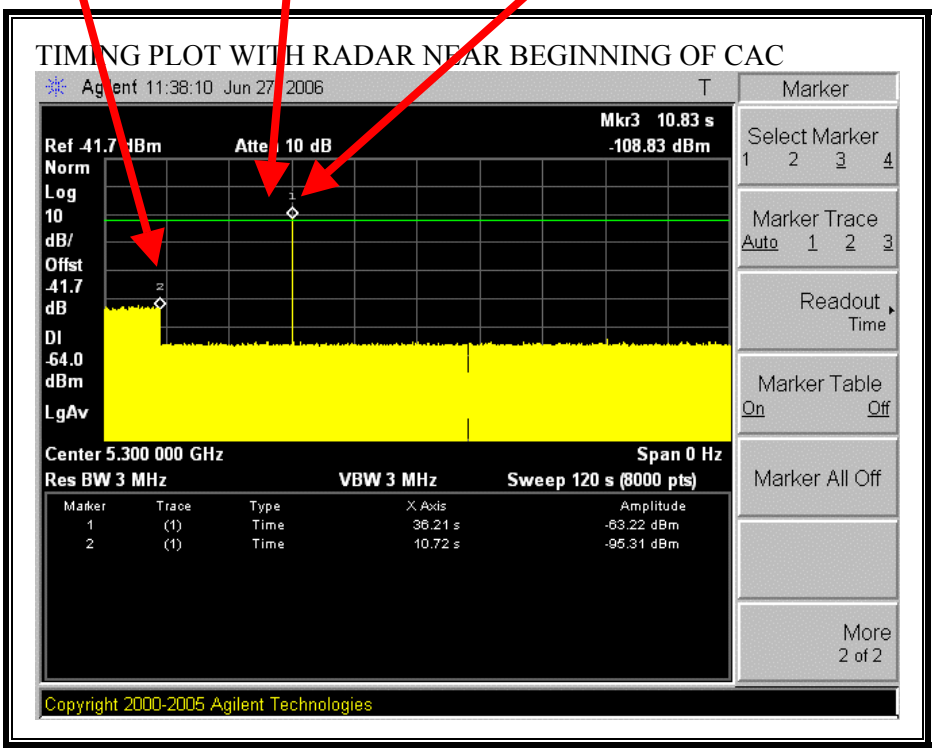
Note: The complete power-up cycle requires (92.05 – 10.83) = 81.22 seconds.
The initial power-up cycle requires (81.22 – 60) = 21.22 seconds.

TIMING PLOT WITH RADAR NEAR BEGINNING OF CAC

AP is rebooted
Traffic ceases
Start of Initial Power-up cycle
Marker = 10.72 sec

End of Initial Power-up cycle
Start of CAC
Delta from reboot = 21.22 sec

Radar Signal applied
Marker = 36.21 sec
Delta from reboot = 25.49 sec
Delta from Start of CAC = 4.27 sec



The radar signal is applied (36.21 – 10.72) = 25.49 seconds after reboot, which is 4.27 seconds after the completion of the initial power-up cycle.

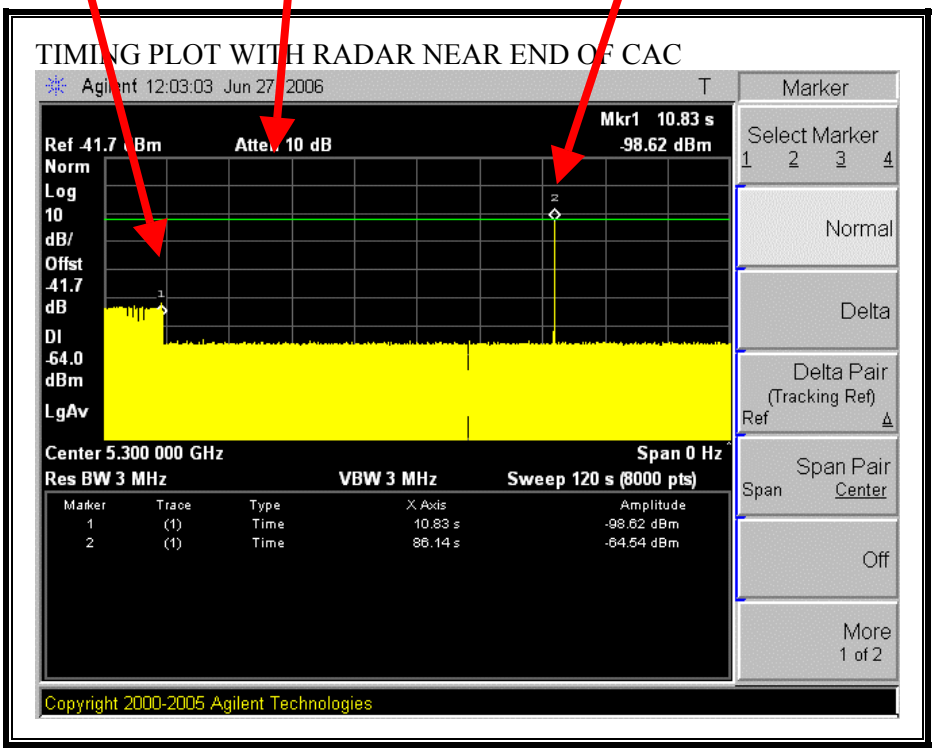
No EUT transmissions were observed after the radar signal.

TIMING PLOT WITH RADAR NEAR END OF CAC

AP is rebooted
Traffic ceases
Start of Initial Power-up cycle
Marker = 10.83 sec

End of Initial Power-up cycle
Start of CAC
Delta from reboot = 21.22 sec

Radar Signal applied
Marker = 86.14 sec
Delta from reboot = 75.31 sec
Delta from Start of CAC = 54.09 sec



The radar signal is applied (86.14 – 10.83) = 75.31 seconds after reboot, which is 54.09 seconds after the completion of the initial power-up cycle.

No EUT transmissions were observed after the radar signal.

7.1.9. CHANNEL MOVE TIME AND CHANNEL CLOSING TRANSMISSION TIME

GENERAL REPORTING NOTES

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

TYPE 1 RADAR REPORTING NOTES

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 aggregate time is calculated
Begins no later than (Reference Marker + 200 msec)
and
Ends no earlier than (Reference Marker + 10 sec).

TYPE 5 RADAR REPORTING NOTES

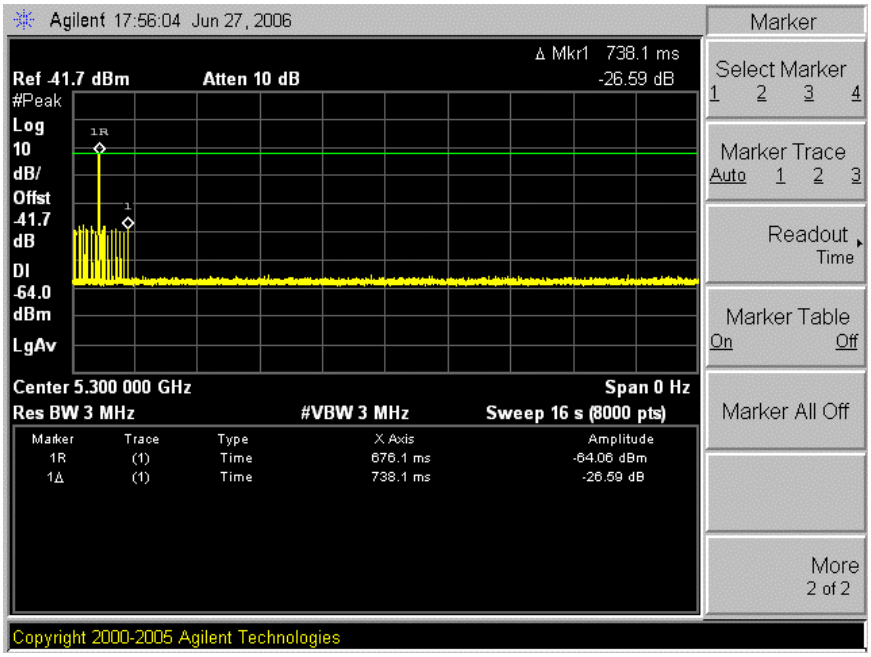
The delta marker is set to 10 seconds after the end of the radar pulse.

TYPE 1 CHANNEL MOVE TIME RESULTS

No non-compliance noted:

Channel Move Time (s)	Limit (s)
0.738	10

MOVE TIME PLOT FOR SHORT PULSE RADAR



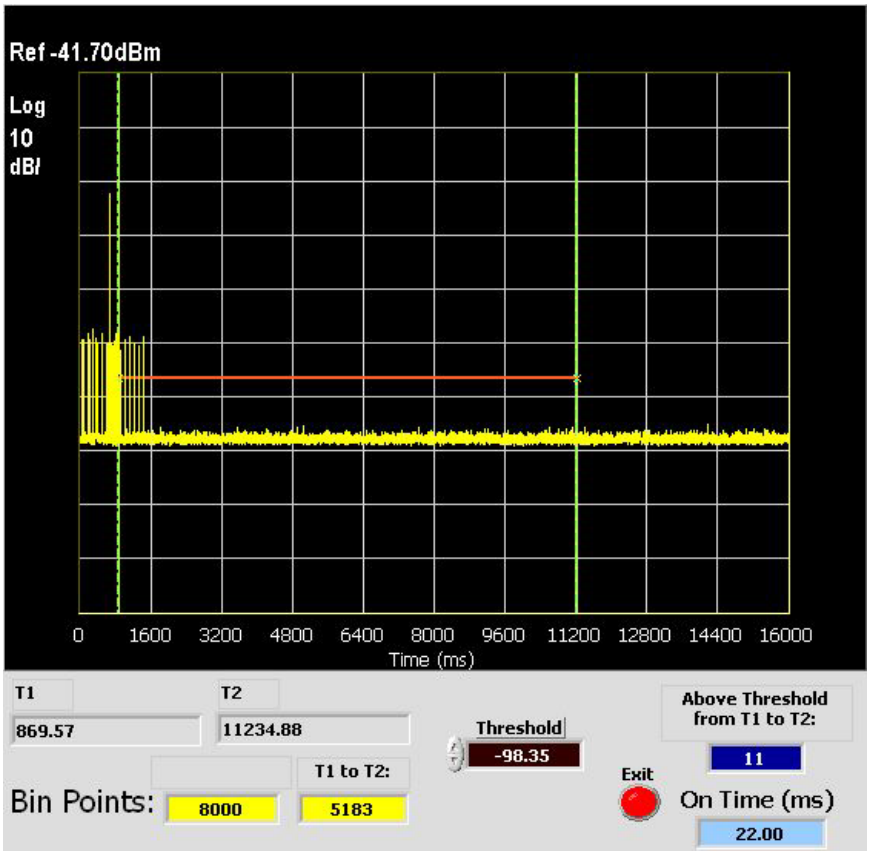
TYPE 1 CHANNEL CLOSING TRANSMISSION TIME RESULTS

No non-compliance noted:

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
22.00	60	38.00

Only intermittent transmissions are observed during the aggregate monitoring period.

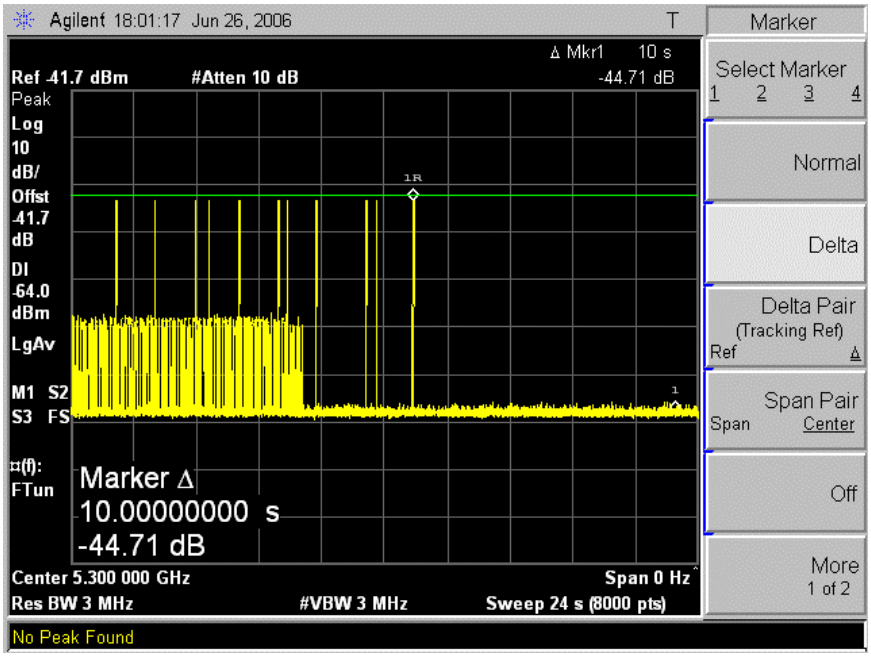
AGGREGATE CLOSING TIME PLOT



TYPE 5 CHANNEL MOVE TIME RESULTS

No non-compliance noted: The traffic ceases prior to the end of the radar waveform, therefore it also ceases prior to 10 seconds after the end of the radar waveform.

MOVE TIME PLOT FOR LONG PULSE RADAR

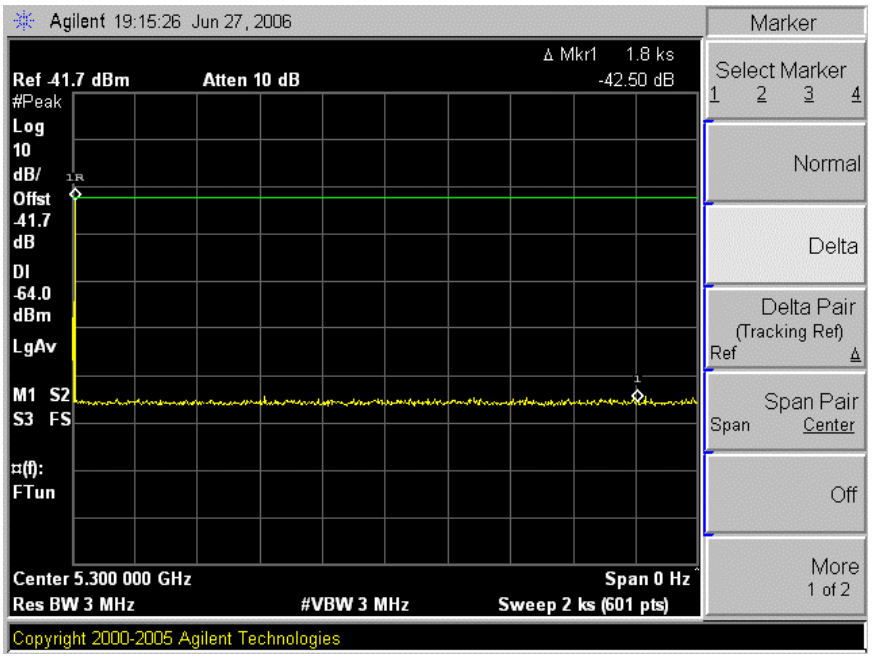


7.1.10. NON-OCCUPANCY PERIOD

RESULTS

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

NON-OCCUPANCY PERIOD PLOT



7.1.11. DETECTION BANDWIDTH

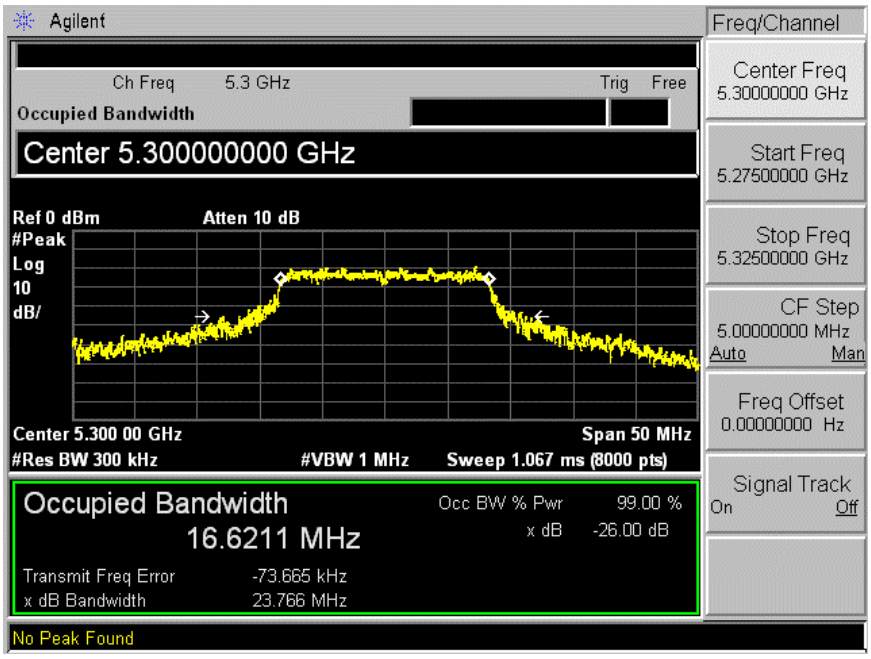
RESULTS

No non-compliance noted:

FL (MHz)	FH (MHz)	Detection Bandwidth (MHz)	99% Power Bandwidth (MHz)	Ratio of Detection BW to 99% Power BW (%)	Minimum Limit (%)
5293	5306	14	16.621	84.2	80

Fixed Waveform Test Results:		Waveform Name: FCC TYPE 1		
Frequency (MHz)	Number of Trials	Number Detected	Detection (%)	Mark
5292	20	1	5.00	
5293	10	9	90.00	FL
5294	10	10	100.00	
5295	10	10	100.00	
5296	10	10	100.00	
5297	10	10	100.00	
5298	10	10	100.00	
5299	10	10	100.00	
5300	10	10	100.00	
5301	10	10	100.00	
5302	10	10	100.00	
5303	10	10	100.00	
5304	10	10	100.00	
5305	10	10	100.00	
5306	10	10	100.00	FH
5307	20	13	65.00	

99% BANDWIDTH



7.1.12. IN-SERVICE MONITORING

RESULTS

No non-compliance noted:

SUMMARY OF DETECTION PROBABILITY

Summary of Detection Probability

Radar Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail
Short 1	30	96.67	60	Pass
Short 2	30	100.00	60	Pass
Short 3	30	83.33	60	Pass
Short 4	30	96.67	60	Pass
Aggregate of 1 to 4	30	94.17	80	Pass
Long 5	30	100.00	70	Pass
Hopping 6	30	100.00	80	Pass

TYPE 1 DETECTION PROBABILITY

Table 1: Data Sheet for Fixed Radar Signal 1	
Trial No.	Successful Detection (Yes/No)
1	Yes
2	Yes
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	Yes
23	Yes
24	No
25	Yes
26	Yes
27	Yes
28	Yes
29	Yes
30	Yes

TYPE 2 DETECTION PROBABILITY

Table 2: Data Sheet for Fixed Radar Test Signal 2				
Waveform No.	# Pulses per burst	Pulse Width (us)	Pulse repetition Interval (us)	Successful Detection (Yes/No)
2001	24	1.90	171	Yes
2002	27	1.30	165	Yes
2003	23	3.70	210	Yes
2004	26	4.30	208	Yes
2005	24	1.70	199	Yes
2006	26	2.20	150	Yes
2007	28	4.50	181	Yes
2008	28	4.40	176	Yes
2009	25	2.70	215	Yes
2010	24	2.30	207	Yes
2011	24	4.70	155	Yes
2012	27	4.30	229	Yes
2013	23	2.10	159	Yes
2014	23	1.00	212	Yes
2015	25	1.50	156	Yes
2016	28	1.30	184	Yes
2017	23	4.20	207	Yes
2018	27	4.20	182	Yes
2019	24	4.00	230	Yes
2020	29	2.80	173	Yes
2021	27	4.90	150	Yes
2022	27	2.10	166	Yes
2023	24	3.10	217	Yes
2024	24	2.40	160	Yes
2025	27	4.20	206	Yes
2026	29	3.30	181	Yes
2027	26	1.70	177	Yes
2028	27	2.90	211	Yes
2029	23	2.50	177	Yes
2030	23	5.00	173	Yes

TYPE 3 DETECTION PROBABILITY

Table 3: Data Sheet for Fixed Radar Test Signal 3				
Waveform No.	# Pulses per burst	Pulse Width (us)	Pulse repetition Interval (us)	Successful Detection (Yes/No)
3001	17	9.20	257	Yes
3002	17	7.40	286	Yes
3003	17	5.70	261	Yes
3004	17	8.00	493	Yes
3005	16	5.60	417	Yes
3006	17	7.00	489	Yes
3007	18	9.50	346	Yes
3008	17	6.00	487	Yes
3009	16	8.20	279	Yes
3010	18	9.80	476	Yes
3011	17	6.80	269	Yes
3012	17	5.40	432	Yes
3013	18	5.00	298	Yes
3014	17	7.40	355	Yes
3015	16	9.50	286	Yes
3016	16	6.50	288	Yes
3017	17	9.90	383	Yes
3018	17	8.20	308	Yes
3019	17	6.50	349	No
3020	16	5.50	274	No
3021	16	8.00	287	Yes
3022	17	8.00	497	No
3023	18	8.20	427	Yes
3024	16	6.10	420	Yes
3025	18	6.70	414	No
3026	16	8.70	316	Yes
3027	18	5.60	499	Yes
3028	18	7.90	393	Yes
3029	17	6.10	417	Yes
3030	18	6.00	271	No

TYPE 4 DETECTION PROBABILITY

Table 4: Data Sheet for Fixed Radar Test Signal 4				
Waveform No.	# Pulses per burst	Pulse Width (us)	Pulse repetition Interval (us)	Successful Detection (Yes/No)
4001	16	19.10	474	Yes
4002	15	19.90	446	Yes
4003	14	10.50	250	Yes
4004	13	17.00	297	Yes
4005	15	17.90	451	Yes
4006	13	18.80	432	Yes
4007	14	12.40	331	Yes
4008	15	18.20	286	Yes
4009	15	15.30	325	Yes
4010	14	11.90	408	No
4011	15	11.60	409	Yes
4012	15	18.00	309	Yes
4013	15	17.60	364	Yes
4014	13	14.70	345	Yes
4015	14	13.90	251	Yes
4016	12	12.50	465	Yes
4017	15	11.10	267	Yes
4018	14	16.40	452	Yes
4019	12	14.10	278	Yes
4020	14	11.40	265	Yes
4021	14	19.10	499	Yes
4022	14	11.50	347	Yes
4023	16	16.90	423	Yes
4024	14	19.10	255	Yes
4025	13	10.80	276	Yes
4026	15	11.10	368	Yes
4027	13	10.20	405	Yes
4028	15	13.90	407	Yes
4029	15	16.40	256	Yes
4030	13	18.40	361	Yes

TYPE 5 DETECTION PROBABILITY

Table 5: Data Sheet for Long Pulse Radar Test Signal 5

Waveform No.	Successful Detection (Yes/No)
5001	Yes
5002	Yes
5003	Yes
5004	Yes
5005	Yes
5006	Yes
5007	Yes
5008	Yes
5009	Yes
5010	Yes
5011	Yes
5012	Yes
5013	Yes
5014	Yes
5015	Yes
5016	Yes
5017	Yes
5018	Yes
5019	Yes
5020	Yes
5021	Yes
5022	Yes
5023	Yes
5024	Yes
5025	Yes
5026	Yes
5027	Yes
5028	Yes
5029	Yes
5030	Yes

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

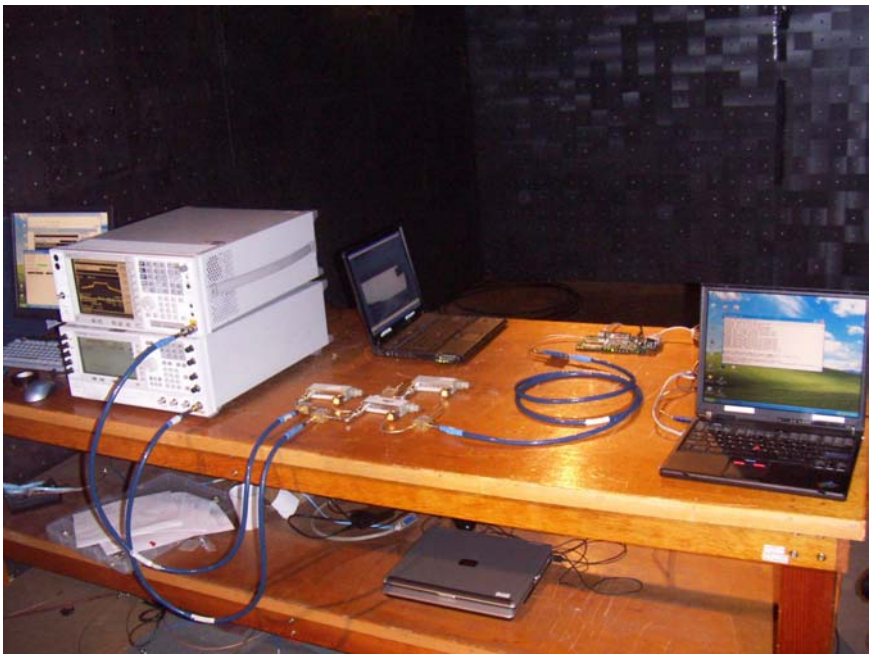
TYPE 6 DETECTION PROBABILITY

Table 6: Data Sheet for Hopping Signal				
Trial No.	Starting Index within NTIA Sequence	Signal Generator Frequency (MHz)	Hops within Detection BW	Successful Detection (Yes/No)
1	243	5293	4	Yes
2	718	5294	2	Yes
3	1193	5295	4	Yes
4	1668	5296	1	Yes
5	2143	5297	4	Yes
6	2618	5298	2	Yes
7	3093	5299	4	Yes
8	3568	5300	2	Yes
9	4043	5301	4	Yes
10	4518	5302	3	Yes
11	4993	5303	2	Yes
12	5468	5304	3	Yes
13	5943	5305	3	Yes
14	6418	5306	1	Yes
15	6893	5293	4	Yes
16	7368	5294	4	Yes
17	7843	5295	5	Yes
18	8318	5296	4	Yes
19	8793	5297	3	Yes
20	9268	5298	5	Yes
21	9743	5299	1	Yes
22	10218	5300	2	Yes
23	10693	5301	3	Yes
24	11168	5302	2	Yes
25	11643	5303	5	Yes
26	12118	5304	3	Yes
27	12593	5305	5	Yes
28	13068	5306	3	Yes
29	13543	5293	1	Yes
30	14018	5294	1	Yes
31	14493	5295	6	Yes
32	14968	5296	3	Yes
33	15443	5297	4	Yes
34	15918	5298	3	Yes
35	16868	5299	3	Yes
36	17343	5300	4	Yes
37	17818	5301	1	Yes
38	18293	5302	3	Yes
39	18768	5303	5	Yes
40	19243	5304	6	Yes
41	19718	5305	5	Yes
42	20193	5306	5	Yes

8. SETUP PHOTOS

DFS MEASUREMENT SETUP

FRONT VIEW



BACK VIEW

END OF REPORT