DFS PORTION OF
FCC CFR47 PART 15 SUBPART E

CLASS 2 PERMISSIVE CHANGE TEST REPORT
FOR

BROADBAND WIRELESS ACCESS, POINT TO MUTIPOINT SYSTEM

MODEL NUMBER: AU-E-SA-5.X-VL

FCC ID: LKT-VL-53C

REPORT NUMBER: 07U10917-8

ISSUE DATE: JULY 23, 2007

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	7/23/2007	Initial Issue, based on 07U10917-1, removed references to 10 and 20 MHz bandwidth results, changed to Class 2 Permissive Change report.	M. Heckrotte

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: ALVARION
21A HABARZEL STREET
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EUT DESCRIPTION: BROADBAND WIRELESS ACCESS

MODEL: AU-E-SA-5.X-VL

SERIAL NUMBER: 00-10-E7-C4-00-81

DATE TESTED: MARCH 21-31, 2007

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
DFS PORTION OF 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:

MICHAEL HECKROTTE
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COMPLIANCE CERTIFICATION SERVICES

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EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with 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. FACILITIES AND ACCREDITATION

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

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
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%.

5. DESCRIPTION OF EUT

5.1. DESCRIPTION OF PERMISSIVE CHANGE

Operation in 40 MHz bandwidth is added to the EUT.

6. DYNAMIC FREQUENCY SELECTION

6.1. DFS OVERVIEW

6.1.1. 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

6.1.2. 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. 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.

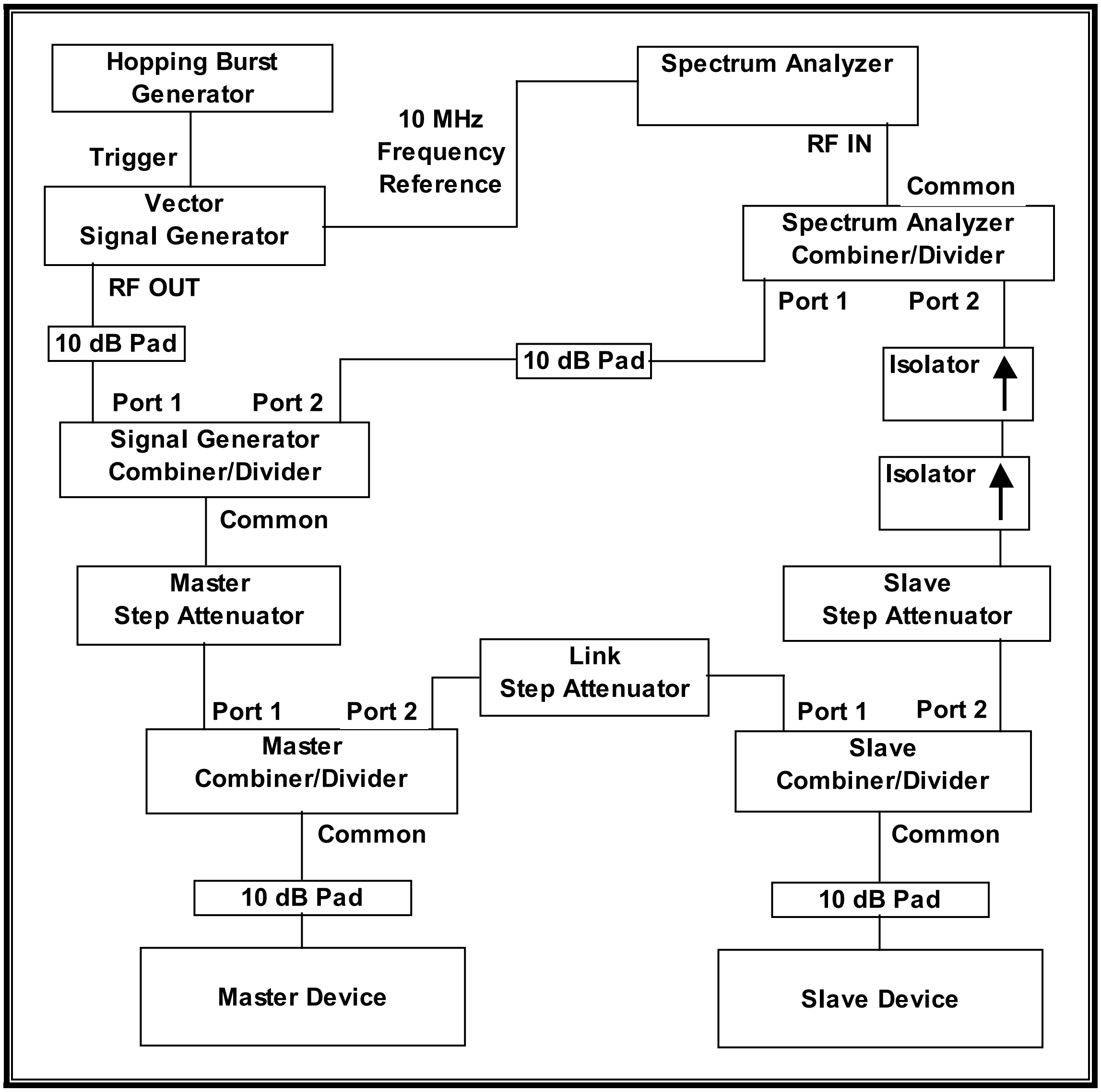
The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

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. The time-domain resolution is 3 msec / bin 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.

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 10 dB pad connected to the Master Device (and/or between the Slave Combiner/Divider and the 10 dB pad connected to the Slave Device). Additional 10 dB pads are connected as needed, such that there is one pad at each RF port on each EUT.

CONDUCTED METHOD SYSTEM BLOCK DIAGRAM



SYSTEM CALIBRATION

Connect the spectrum analyzer to the test system in place of the master device. Set the signal generator to CW mode. 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 and connect a 50 ohm load to the Master Device port of the test system.

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.

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. Confirm that the displayed traffic is from the Master Device. Confirm that the displayed traffic does not include Slave 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.

6.1.3. 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	7/26/2007
Vector Signal Generator 250kHz-20GHz	Agilent / HP	E8267C	US43320336	11/2/2007
High Speed Digital I/O Card	National Instruments	PCI-6534	HA1612845	1/16/2008

6.1.4. DESCRIPTION OF EUT

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

The EUT can be configured as a Master Device, or as a Slave Device without radar detection.

The highest power level within these bands is 30 dBm EIRP in 40 MHz bandwidth.

The highest gain antenna assembly utilized with the EUT has a gain of 23 dBi. The lowest gain antenna assembly utilized with the EUT has a gain of 15 dBi.

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 + 15 + 1 = -48 dBm.

The calibrated conducted DFS Detection Threshold level is set to –48 dBm.

The EUT uses one transmitter connected to a 50-ohm coaxial antenna to perform conducted tests.

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

The EUT utilizes the 802.11a architecture. One nominal channel bandwidths is added: 40 MHz.

The software installed in the access point is A4_5xx.bz revision C.

INFORMATION REGARDING TPC

The TPC power levels and EIRP calculations are in a separate document.

MANUFACTURER’S STATEMENT REGARDING UNIFORM CHANNEL SPREADING

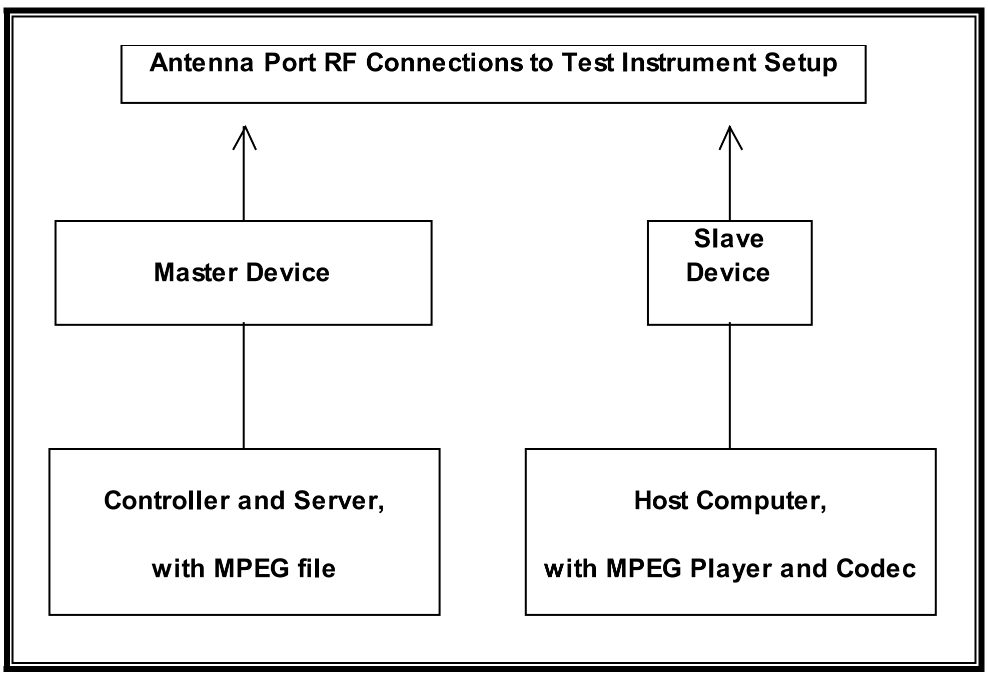
This statement is in a separate document.

6.1.5. SETUP OF EUT

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	Compaq	PPP012L	3300371601	DoC
Laptop	Compaq	Presario 3000	CNU327025L	DoC
AC Adapter	Compaq	PPP012L	N/A	DoC
Laptop	Compaq	Presario 3000	N/A	DoC

TEST SETUP



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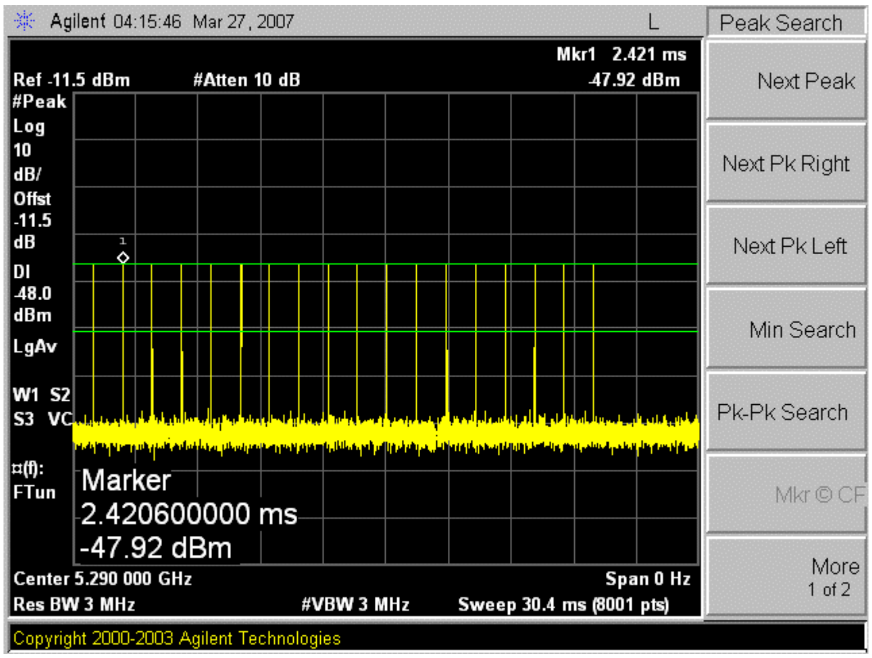
6.2. MASTER CONFIGURATION IN 40 MHz BANDWIDTH

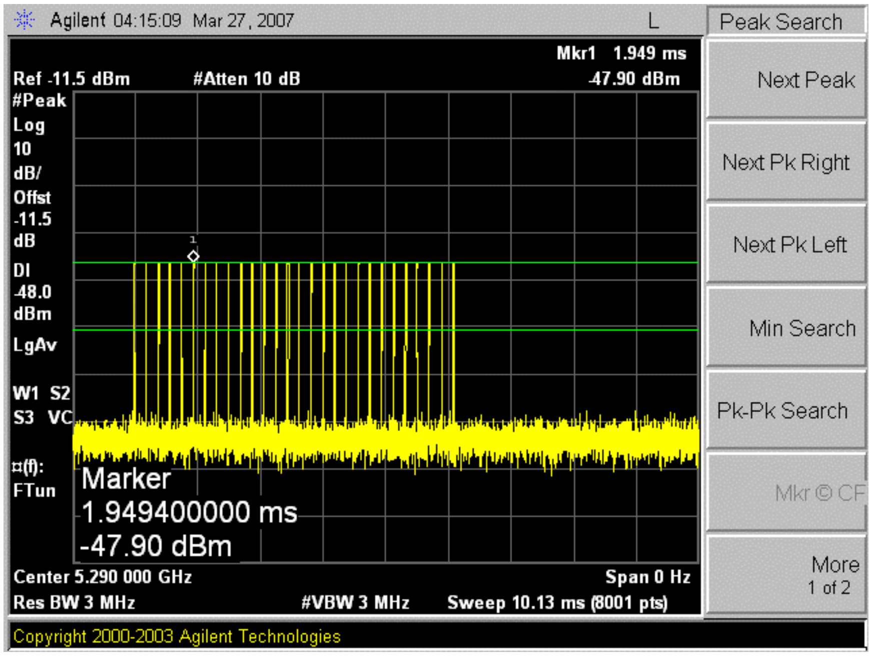
6.2.1. PLOTS OF RADAR WAVEFORM, AND WLAN TRAFFIC

PLOTS OF RADAR WAVEFORMS

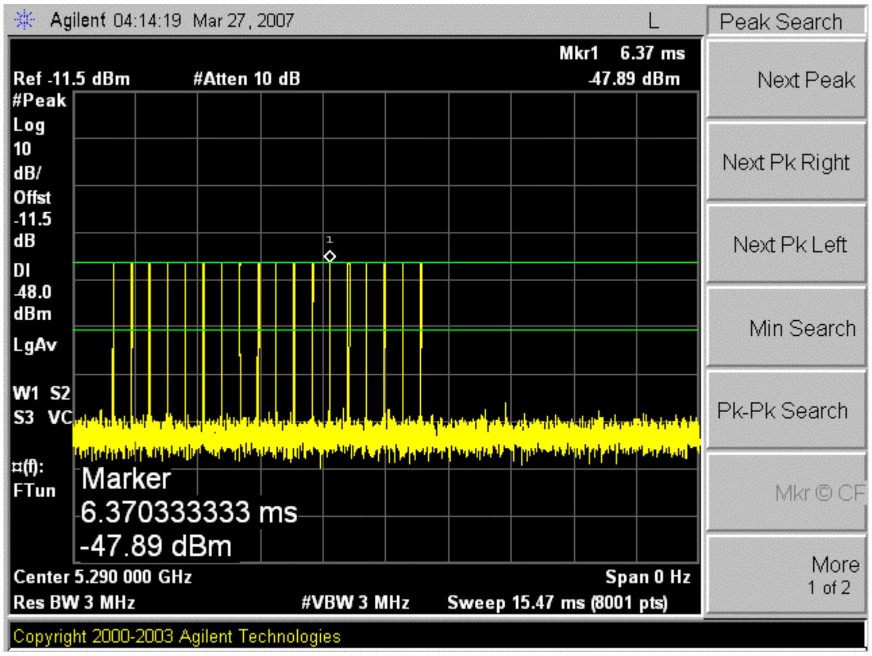
SHORT PULSE RADAR TYPE 1



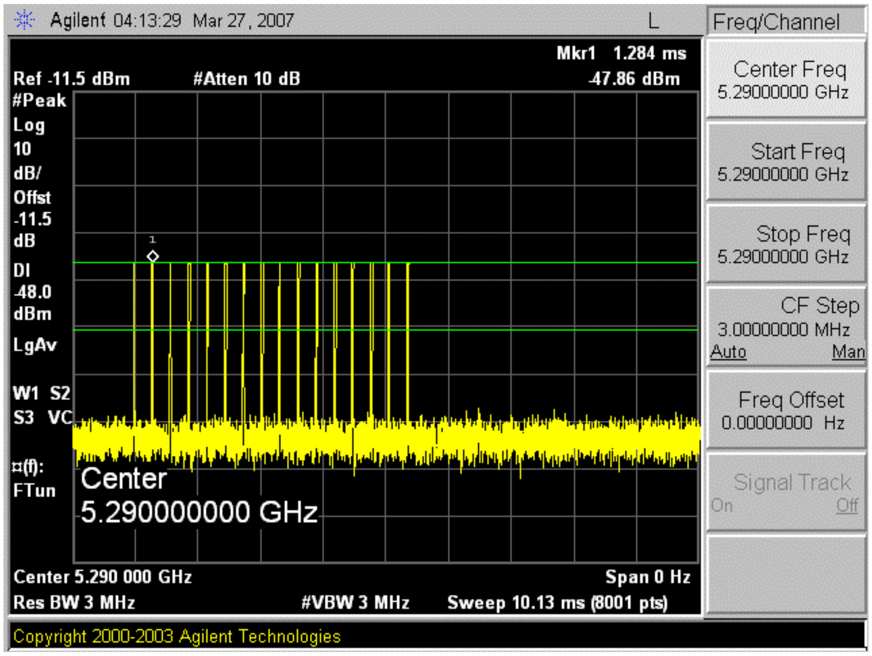
SAMPLE OF SHORT PULSE RADAR TYPE 2



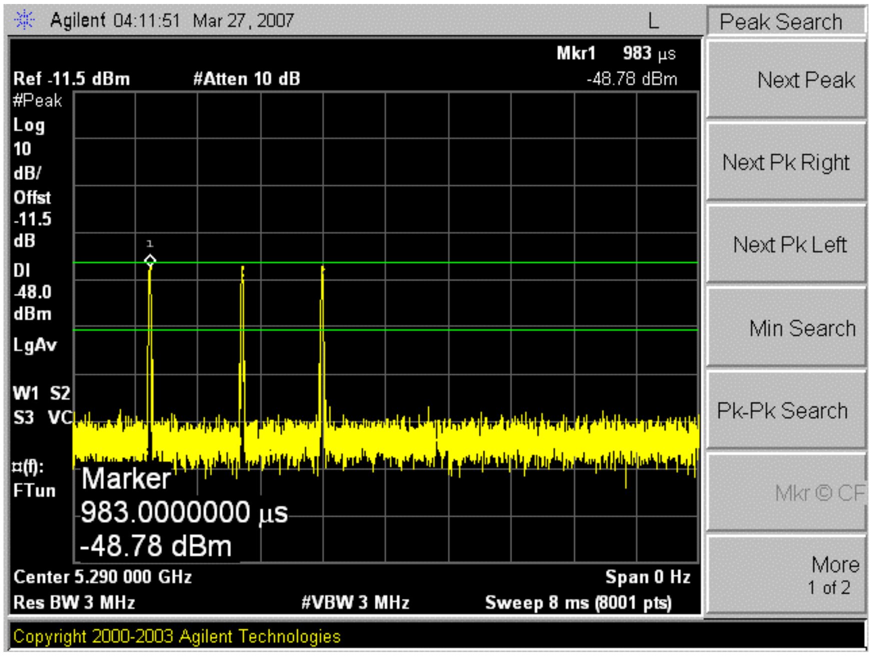
SAMPLE OF SHORT PULSE RADAR TYPE 3



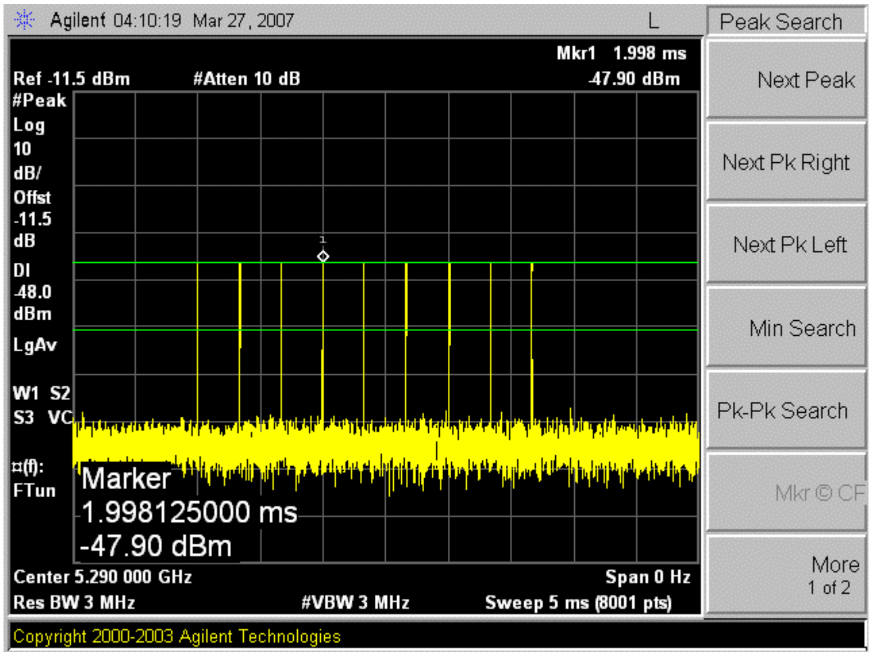
SAMPLE OF SHORT PULSE RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

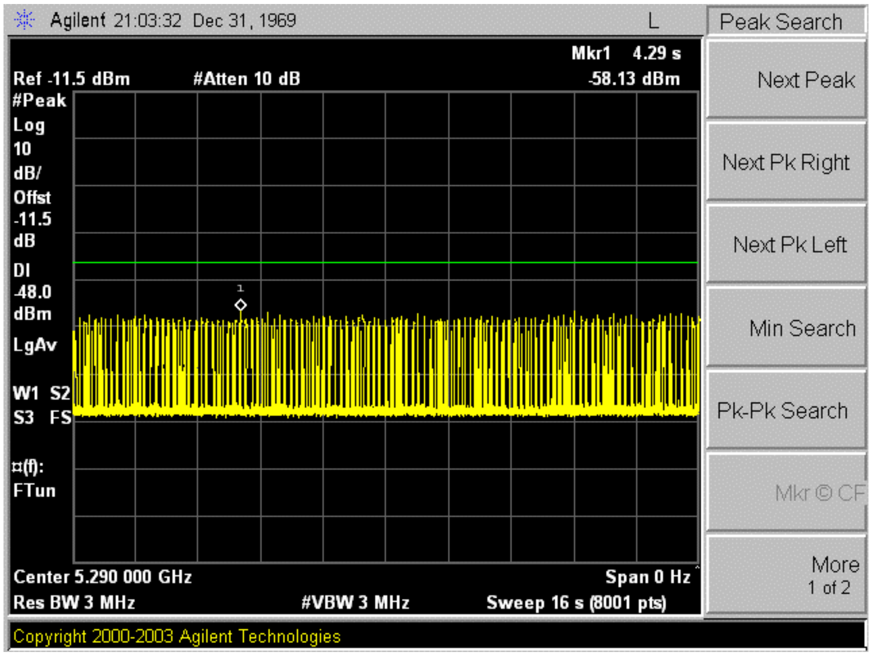


SINGLE BURST OF RADAR TYPE 6



PLOT OF WLAN TRAFFIC FROM MASTER

WLAN TRAFIC



6.2.2. TEST CHANNEL AND METHOD

All tests were performed at a channel center frequency of 5290 MHz utilizing a conducted test method.

6.2.3. 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, 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.

CHANNEL AVAILABILITY CHECK TIME RESULTS

No non-compliance noted:

Time required for EUT to complete the initial power-up cycle (sec)
21.30

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 does not display any radar parameter values	No transmissions on channel
Within 54 to 60 second window	EUT does not display any radar parameter values	No transmissions on channel

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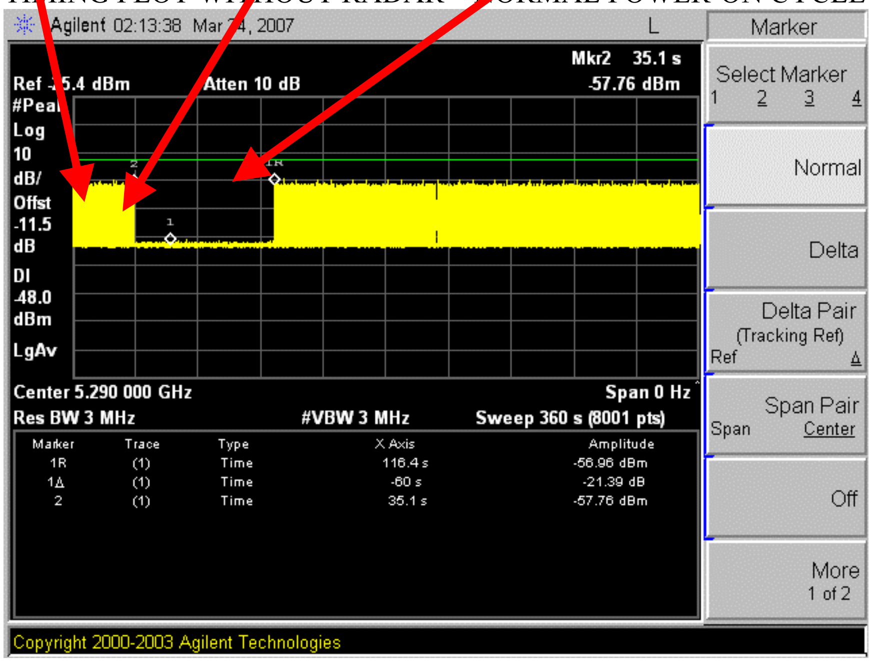
TIMING PLOT WITHOUT RADAR DURING CAC

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

TIMING PLOT WITHOUT RADAR – NORMAL POWER-ON CYCLE



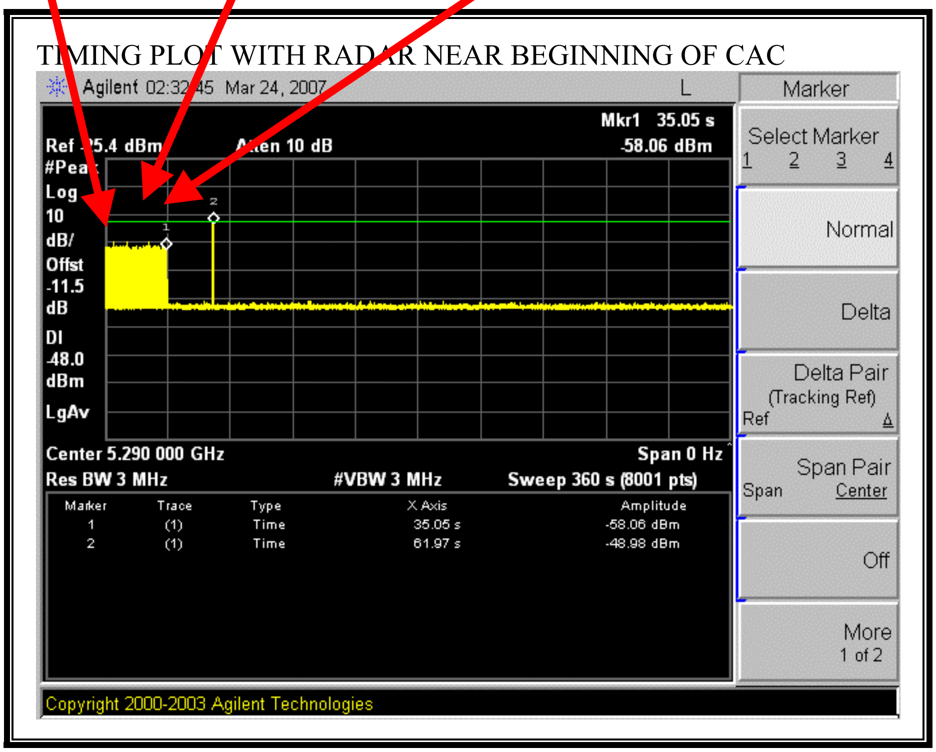
Note: The initial power-up cycle requires (116.4 – 35.1 – 60) = 21.3 seconds.

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



The radar signal is applied (61.97 – 35.05) = 26.69 seconds after reboot, which is (26.69 – 21.3) = 5.39 seconds after the completion of the initial power-up cycle / start of the CAC period.

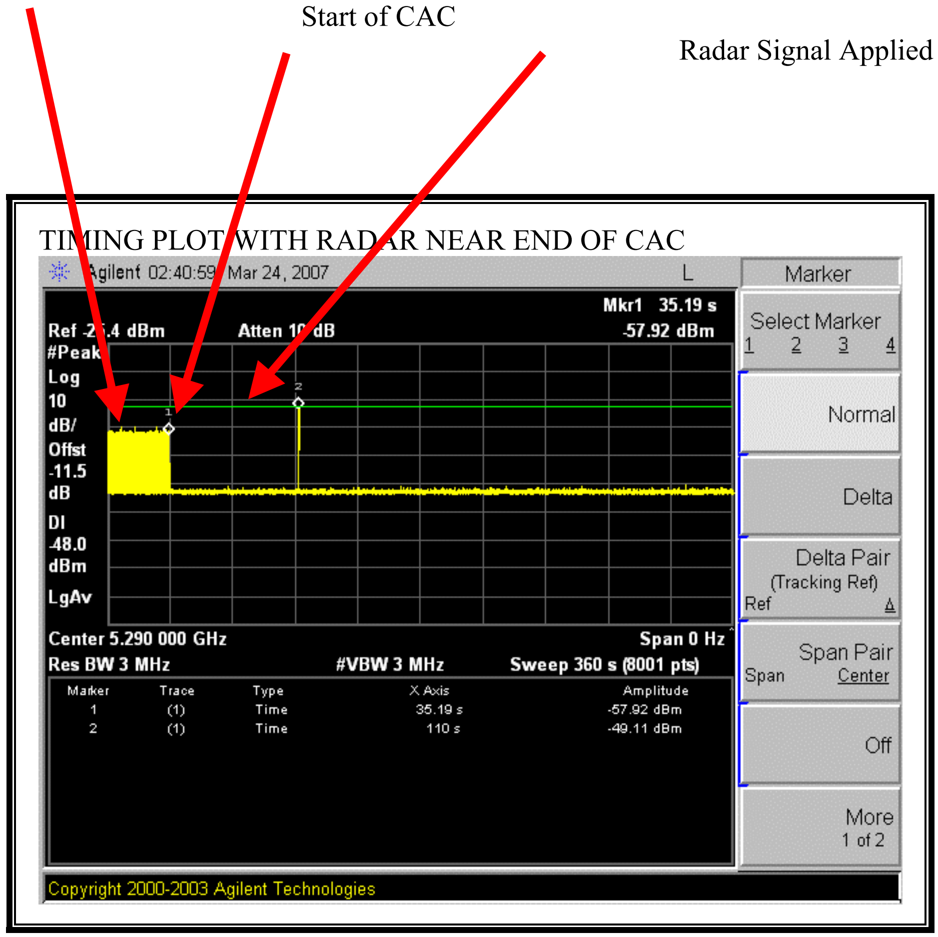
No EUT transmissions were observed after the radar signal.

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



The radar signal is applied (110 – 35.19) = 74.81 seconds after reboot, which is (78.41 – 21.3) = 53.51 seconds after the completion of the initial power-up cycle / start of the CAC period.

No EUT transmissions were observed after the radar signal.

6.2.4. CHANNEL MOVE TIME AND CHANNEL CLOSING TRANSMISSION TIME

GENERAL REPORTING NOTES

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

SHORT PULSE 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 for the FCC version
Begins at (Reference Marker + 200 msec)
and
Ends no earlier than (Reference Marker + 10 sec).

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

LONG PULSE RADAR REPORTING NOTES

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

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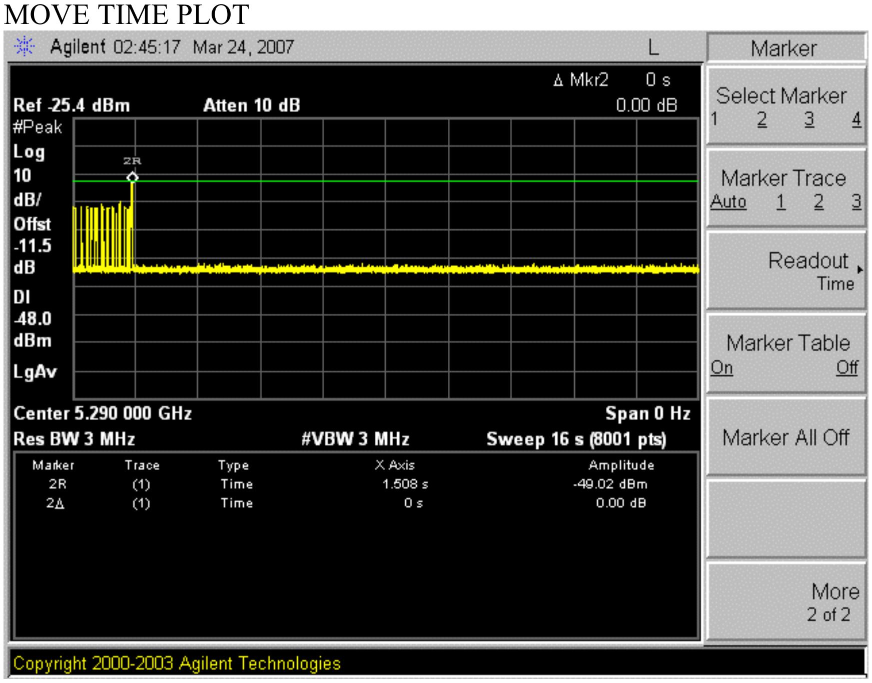
CHANNEL MOVE TIME RESULTS

No non-compliance noted:

Channel Move Time (s)	Limit (s)
0.000	10

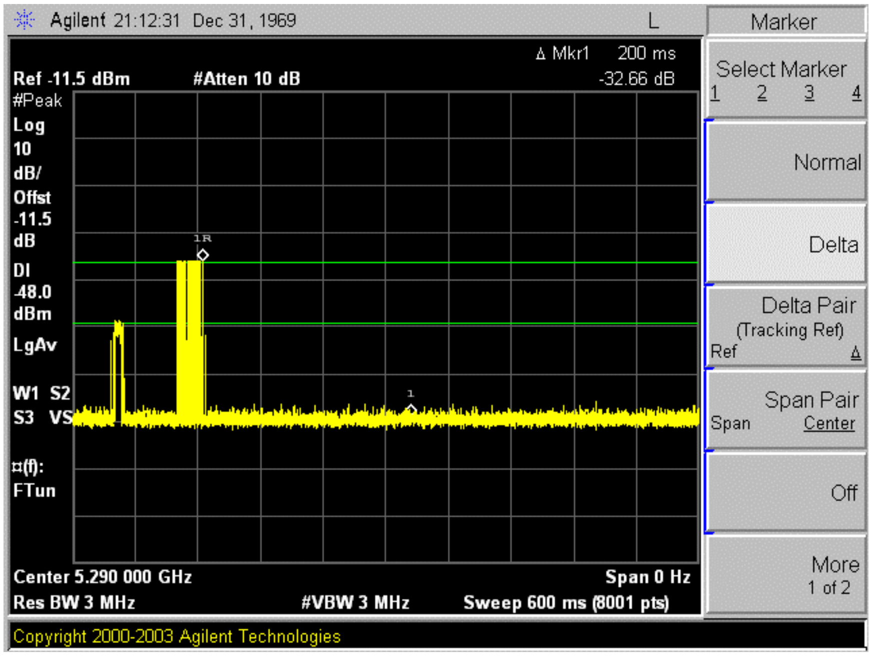
MOVE TIME PLOT



CHANNEL CLOSING TIME RESULTS

No non-compliance noted:

CLOSING TIME PLOT

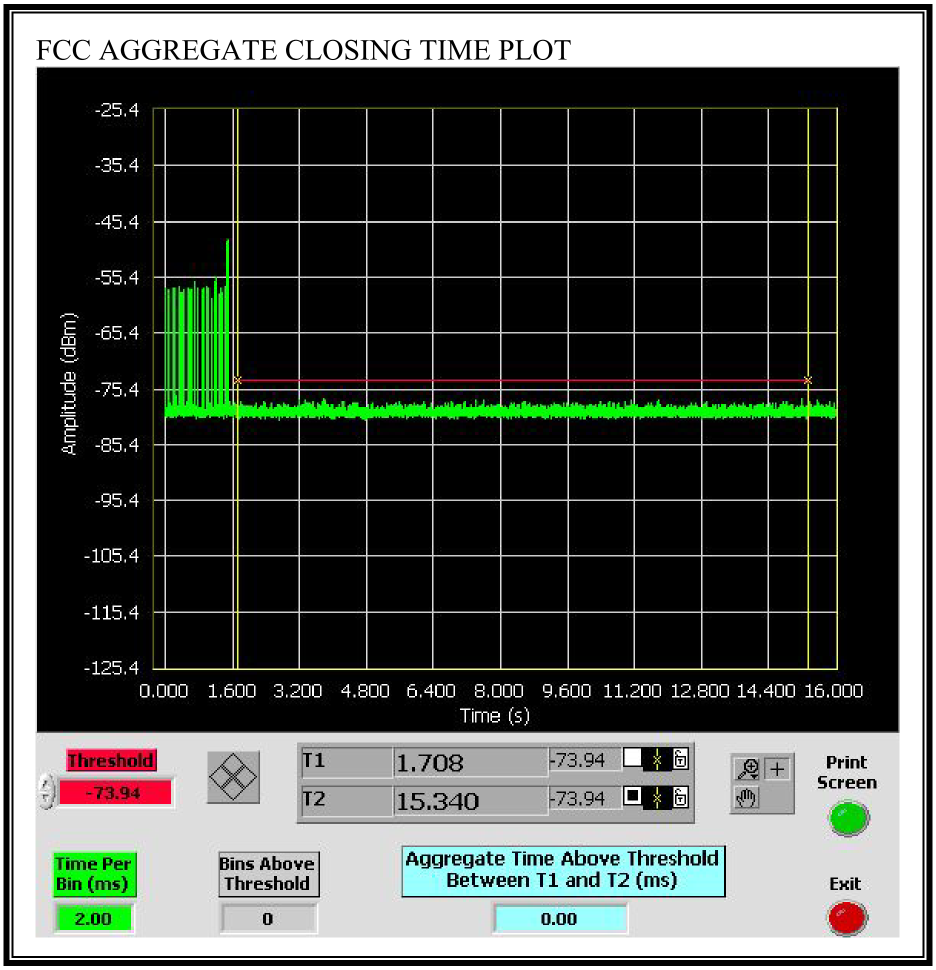


FCC AGGREGATE CHANNEL CLOSING TRANSMISSION TIME RESULTS

No non-compliance noted:

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
0.00	60	60.00

No transmissions are observed during the aggregate monitoring period.

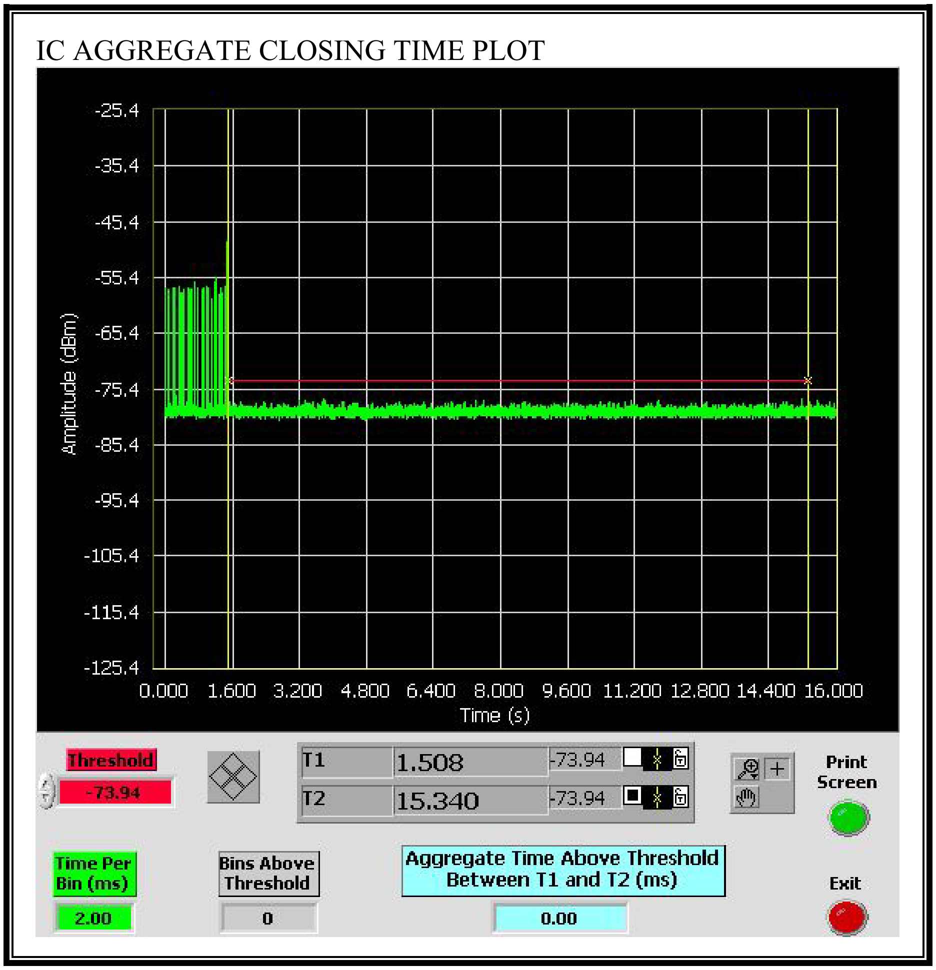


IC AGGREGATE CHANNEL CLOSING TRANSMISSION TIME RESULTS

No non-compliance noted:

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
0.00	260	260.00

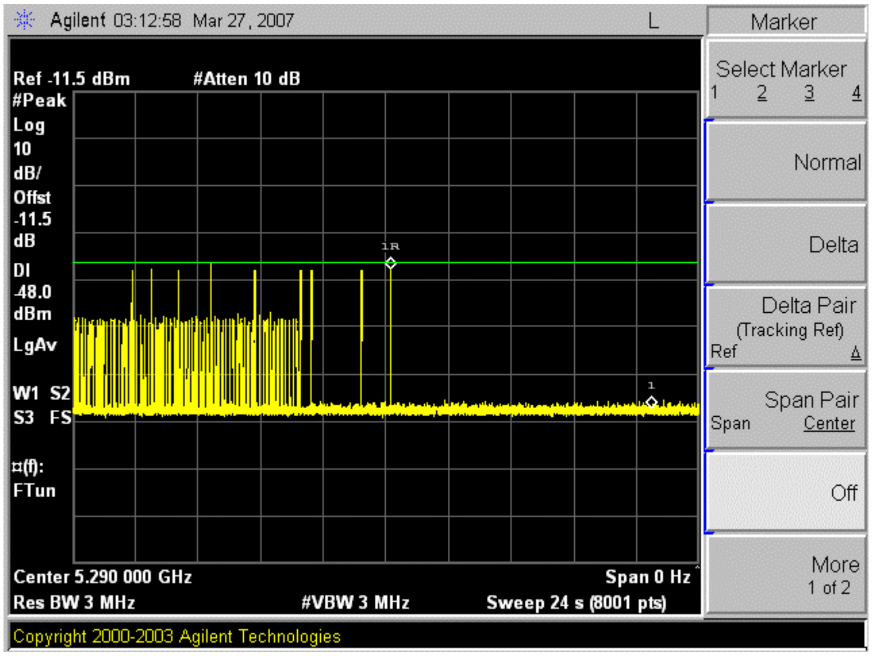
No transmissions are observed during the aggregate monitoring period.



LONG PULSE 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

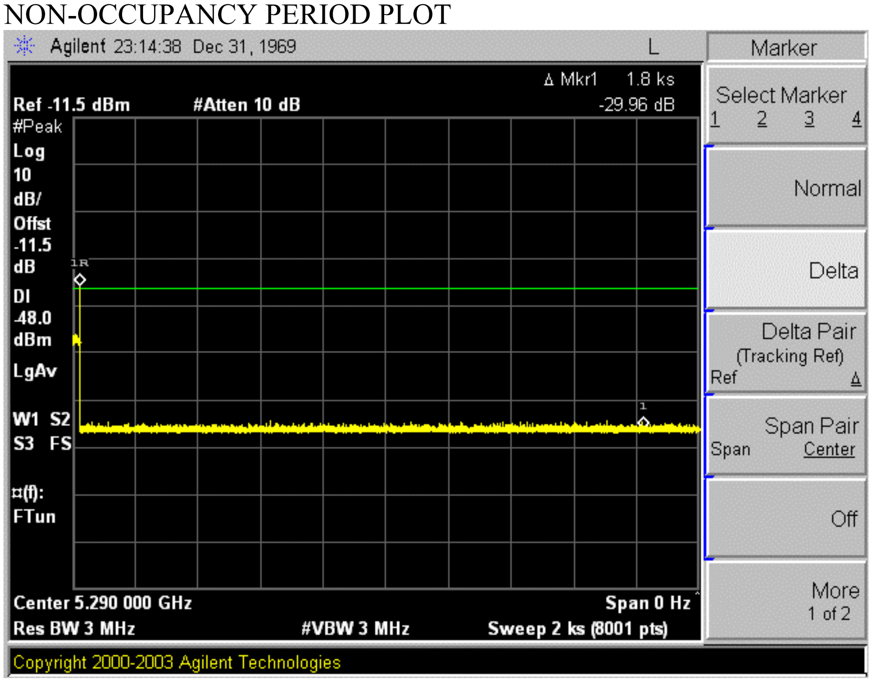


6.2.5. NON-OCCUPANCY PERIOD

RESULTS

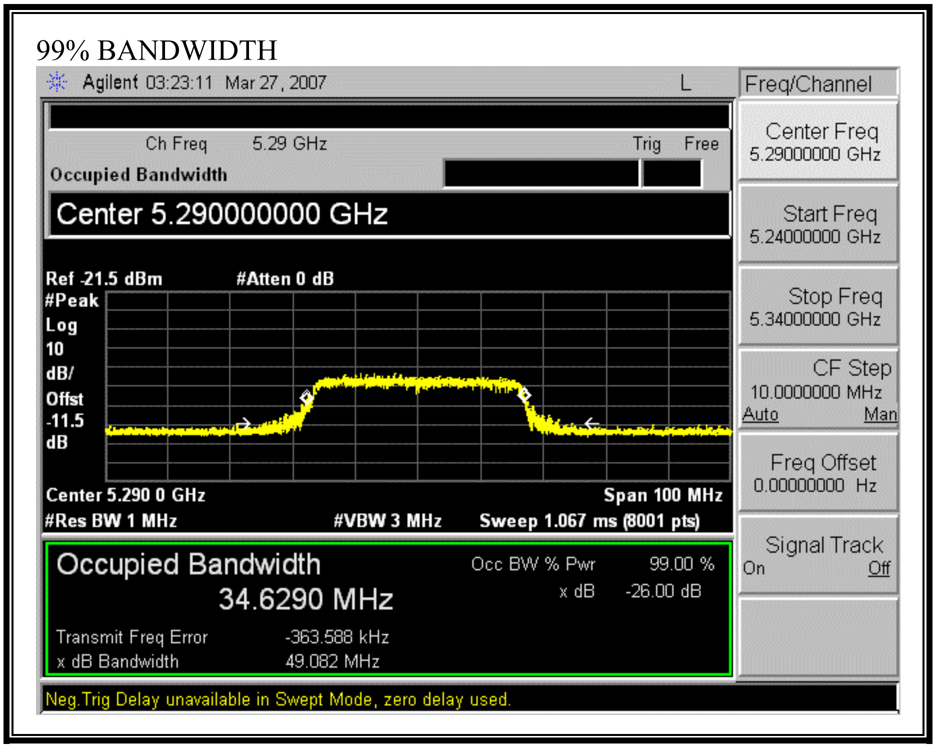
No non-compliance noted: No EUT transmissions were observed on the test channel during the 30 minute observation time.

NON-OCCUPANCY PERIOD PLOT



6.2.6. DETECTION BANDWIDTH

REFERENCE PLOT FOR 99% 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 (%)
5271	5309	38	34.629	109.7	80

DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results:			Waveform: TYPE 1	
Frequency (MHz)	**Number of Trials**	**Number Detected**	**Detection (%)**	**Mark**
5270	10	7	70.00	
5271	10	10	100.00	FL
5272	10	10	100.00	
5273	10	10	100.00	
5274	10	10	100.00	
5275	10	10	100.00	
5276	10	10	100.00	
5277	10	10	100.00	
5278	10	10	100.00	
5279	10	10	100.00	
5280	10	10	100.00	
5281	10	10	100.00	
5282	10	10	100.00	
5283	10	10	100.00	
5284	10	10	100.00	
5285	10	10	100.00	
5286	10	10	100.00	
5287	10	10	100.00	
5288	10	10	100.00	
5289	10	10	100.00	
5290	10	10	100.00	
5291	10	10	100.00	
5292	10	10	100.00	
5293	10	10	100.00	
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	
5307	10	10	100.00	
5308	10	10	100.00	
5309	10	10	100.00	FH
5310	10	5	50.00	

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6.2.7. IN-SERVICE MONITORING

RESULTS

No non-compliance noted:

Radar Test Summary:				
Signal Type	Waveform/Trial No.	Detection (%)	Limit (%)	Pas/Fail
FCC TYPE 1	30	100.00	60.00	Pass
FCC TYPE 2	30	93.33	60.00	Pass
FCC TYPE 3	30	100.00	60.00	Pass
FCC TYPE 4	30	96.67	60.00	Pass
Aggregate		97.50	80.00	Pass
FCC TYPE 5	30	100.00	80.00	Pass
FCC TYPE 6	39	100.00	70.00	Pass

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TYPE 1 DETECTION PROBABILITY

Data Sheet for Short Pulse Radar Type 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	Yes
25	Yes
26	Yes
27	Yes
28	Yes
29	Yes
30	Yes

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TYPE 2 DETECTION PROBABILITY

Data Sheet for Short Pulse Radar Type 2				
Waveform No.	# Pulses per burst	Pulse Width (us)	Pulse repetition Interval (us)	Successful Detection (Yes/No)
2001	28	4.40	191	Yes
2002	28	2.70	167	Yes
2003	23	3.80	218	Yes
2004	25	1.20	153	Yes
2005	27	4.70	159	Yes
2006	26	5.00	200	Yes
2007	27	2.80	229	Yes
2008	24	4.90	192	No
2009	27	1.90	189	Yes
2010	24	3.40	155	Yes
2011	23	1.40	228	Yes
2012	23	3.20	154	Yes
2013	25	1.30	184	Yes
2014	26	1.60	150	Yes
2015	28	4.60	222	Yes
2016	24	2.20	167	Yes
2017	24	1.70	222	Yes
2018	28	1.00	224	Yes
2019	25	3.90	228	No
2020	23	2.70	178	Yes
2021	23	1.70	203	Yes
2022	25	3.90	164	Yes
2023	27	2.40	190	Yes
2024	26	3.60	185	Yes
2025	27	4.30	204	Yes
2026	24	4.20	187	Yes
2027	23	2.40	167	Yes
2028	27	1.70	211	Yes
2029	29	2.90	182	Yes
2030	24	5.00	205	Yes

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TYPE 3 DETECTION PROBABILITY

Data Sheet for Short Pulse Radar Type 3				
Waveform No.	# Pulses per burst	Pulse Width (us)	Pulse repetition Interval (us)	Successful Detection (Yes/No)
3001	18	8.10	448	Yes
3002	18	9.10	412	Yes
3003	18	8.10	433	Yes
3004	17	8.40	260	Yes
3005	16	8.00	398	Yes
3006	18	6.10	388	Yes
3007	18	6.80	271	Yes
3008	16	8.40	454	Yes
3009	17	7.10	429	Yes
3010	16	8.50	408	Yes
3011	17	7.60	331	Yes
3012	18	5.00	375	Yes
3013	16	7.30	492	Yes
3014	17	8.70	270	Yes
3015	16	8.50	394	Yes
3016	16	9.90	382	Yes
3017	18	9.40	261	Yes
3018	17	7.60	361	Yes
3019	18	9.00	396	Yes
3020	17	9.00	480	Yes
3021	18	9.60	259	Yes
3022	16	6.00	324	Yes
3023	16	6.20	495	Yes
3024	17	6.60	396	Yes
3025	18	5.90	285	Yes
3026	18	7.30	328	Yes
3027	16	8.00	413	Yes
3028	17	6.90	254	Yes
3029	16	6.70	456	Yes
3030	17	7.10	363	Yes

TYPE 4 DETECTION PROBABILITY

Data Sheet for Short Pulse Radar Type 4				
Waveform No.	# Pulses per burst	Pulse Width (us)	Pulse repetition Interval (us)	Successful Detection (Yes/No)
4001	16	19.40	296	Yes
4002	12	12.70	293	Yes
4003	16	15.20	461	Yes
4004	13	12.10	285	Yes
4005	13	11.70	486	Yes
4006	12	15.20	400	Yes
4007	14	16.70	376	Yes
4008	12	17.90	499	Yes
4009	13	18.90	338	Yes
4010	13	10.90	353	Yes
4011	15	13.80	326	Yes
4012	12	18.90	487	Yes
4013	12	18.70	345	Yes
4014	12	16.30	456	Yes
4015	16	17.80	392	Yes
4016	13	12.90	354	Yes
4017	16	16.00	409	Yes
4018	14	10.00	286	Yes
4019	13	16.80	360	Yes
4020	15	12.10	387	Yes
4021	15	17.90	380	Yes
4022	16	13.60	488	Yes
4023	14	19.70	483	Yes
4024	13	16.90	306	Yes
4025	13	12.70	332	Yes
4026	14	16.20	476	Yes
4027	16	19.00	499	Yes
4028	14	19.20	435	Yes
4029	15	11.40	390	Yes
4030	15	15.40	304	No

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TYPE 5 DETECTION PROBABILITY

Data Sheet for Long Pulse Radar Type 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

Type 5 randomized parameters are in a separate document.

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TYPE 6 DETECTION PROBABILITY

Data Sheet for Hopping Signal

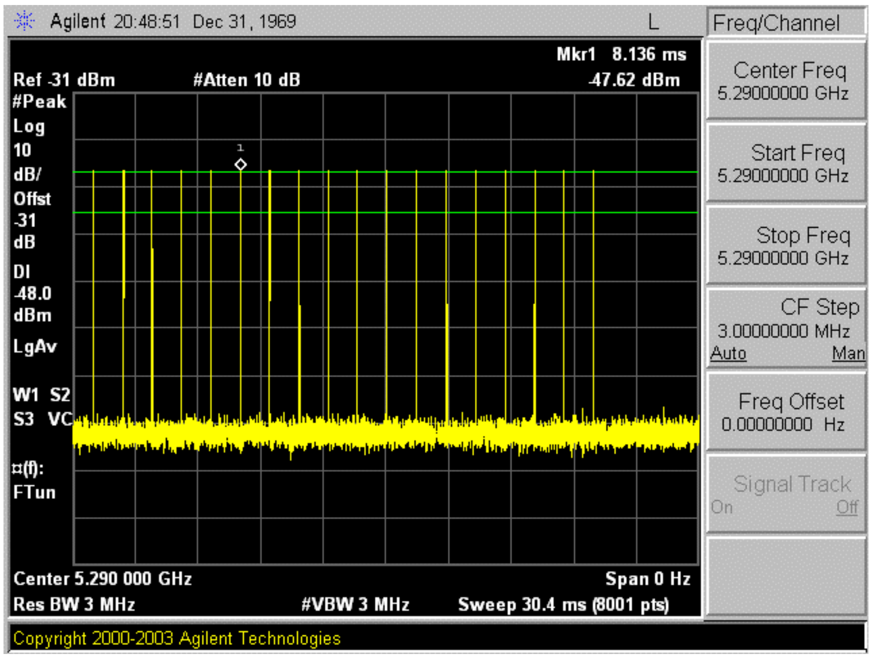
Trial No.	Starting Index within NTIA August 2005 Sequence	Signal Generator Frequency (MHz)	Hops within Detection BW	Successful Detection (Yes/No)
1	288	5271	8	Yes
2	763	5272	12	Yes
3	1238	5273	9	Yes
4	1713	5274	7	Yes
5	2188	5275	10	Yes
6	2663	5276	9	Yes
7	3138	5277	7	Yes
8	3613	5278	7	Yes
9	4088	5279	8	Yes
10	4563	5280	8	Yes
11	5038	5281	7	Yes
12	5513	5282	8	Yes
13	5988	5283	8	Yes
14	6463	5284	9	Yes
15	6938	5285	8	Yes
16	7413	5286	12	Yes
17	7888	5287	9	Yes
18	8363	5288	7	Yes
19	8838	5289	10	Yes
20	9313	5290	13	Yes
21	9788	5291	11	Yes
22	10263	5292	9	Yes
23	10738	5293	4	Yes
24	11213	5294	3	Yes
25	11688	5295	9	Yes
26	12163	5296	9	Yes
27	12638	5297	8	Yes
28	13113	5298	7	Yes
29	13588	5299	5	Yes
30	14063	5300	5	Yes
31	14538	5301	11	Yes
32	15013	5302	6	Yes
33	15488	5303	9	Yes
34	15963	5304	9	Yes
35	16438	5305	11	Yes
36	16913	5306	10	Yes
37	17388	5307	8	Yes
38	17863	5308	6	Yes
39	18338	5309	7	Yes

6.3. SLAVE CONFIGURATION IN 40 MHz BANDWIDTH

6.3.1. PLOTS OF RADAR WAVEFORM AND WLAN TRAFFIC

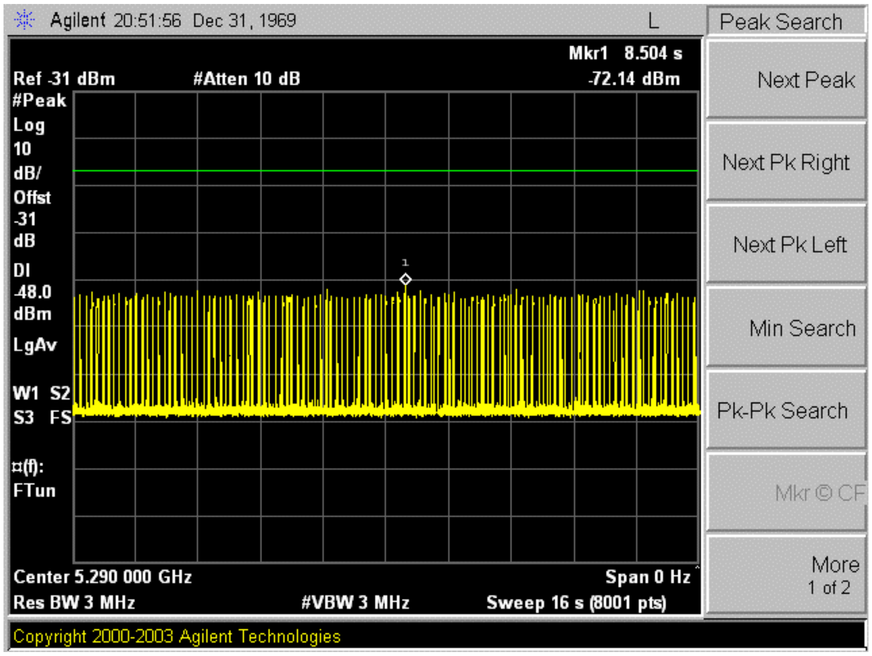
PLOT OF RADAR WAVEFORM

SHORT PULSE RADAR TYPE 1



PLOT OF WLAN TRAFFIC FROM SLAVE

WLAN TRAFIC



6.3.2. TEST CHANNEL AND METHOD

All tests were performed at a channel center frequency of 5290 MHz utilizing a conducted test method.

6.3.3. CHANNEL MOVE TIME AND CHANNEL CLOSING TRANSMISSION 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 aggregate time is calculated for the FCC version
Begins at (Reference Marker + 200 msec)
and
Ends no earlier than (Reference Marker + 10 sec).

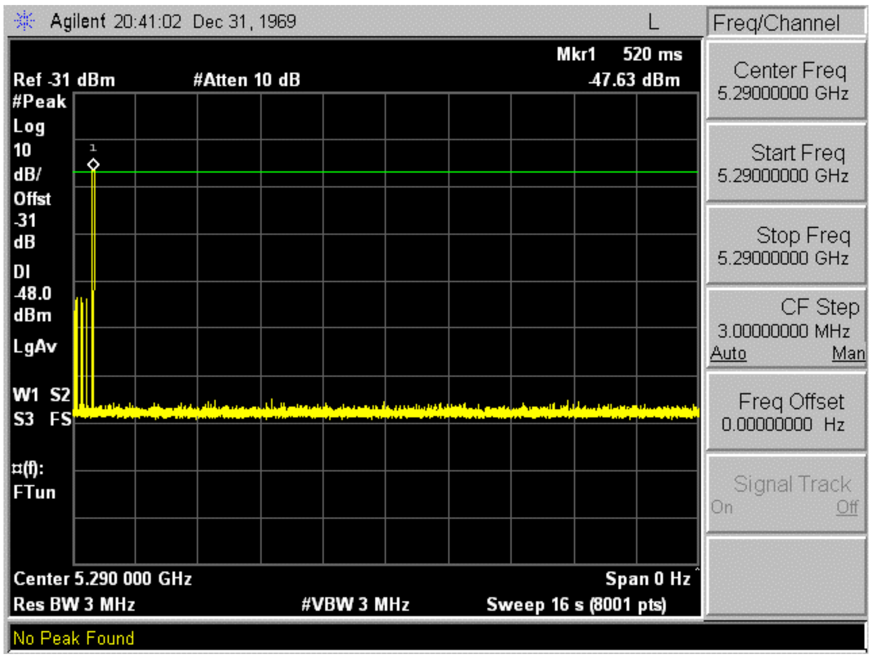
The observation period over which the aggregate time is calculated for the IC version
Begins at (Reference Marker)
and
Ends no earlier than (Reference Marker + 10 sec).

CHANNEL MOVE TIME RESULTS

No non-compliance noted:

Channel Move Time (s)/	Limit (s)
0.000	10

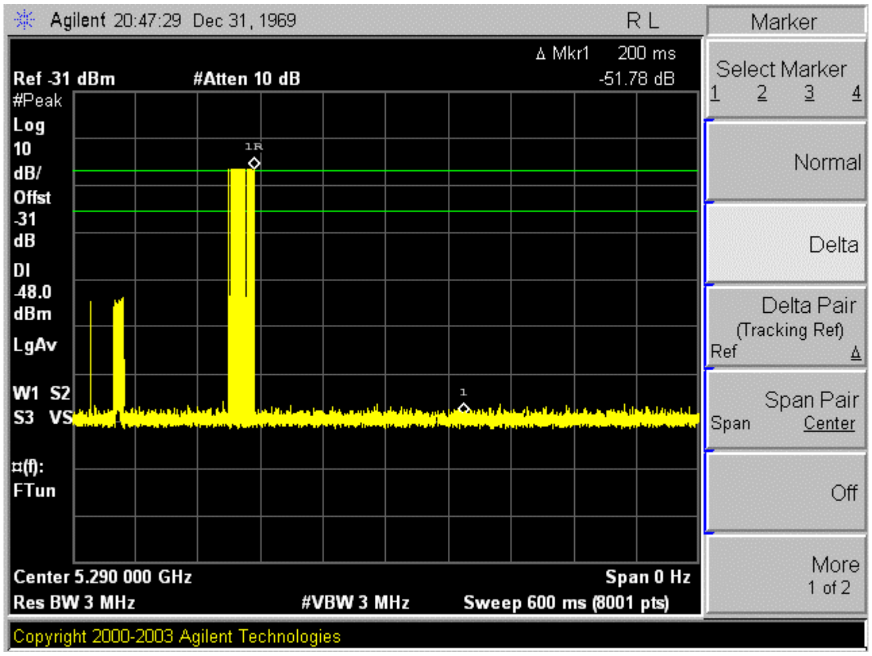
MOVE TIME PLOT



CHANNEL CLOSING TIME RESULTS

No non-compliance noted:

CLOSING TIME PLOT

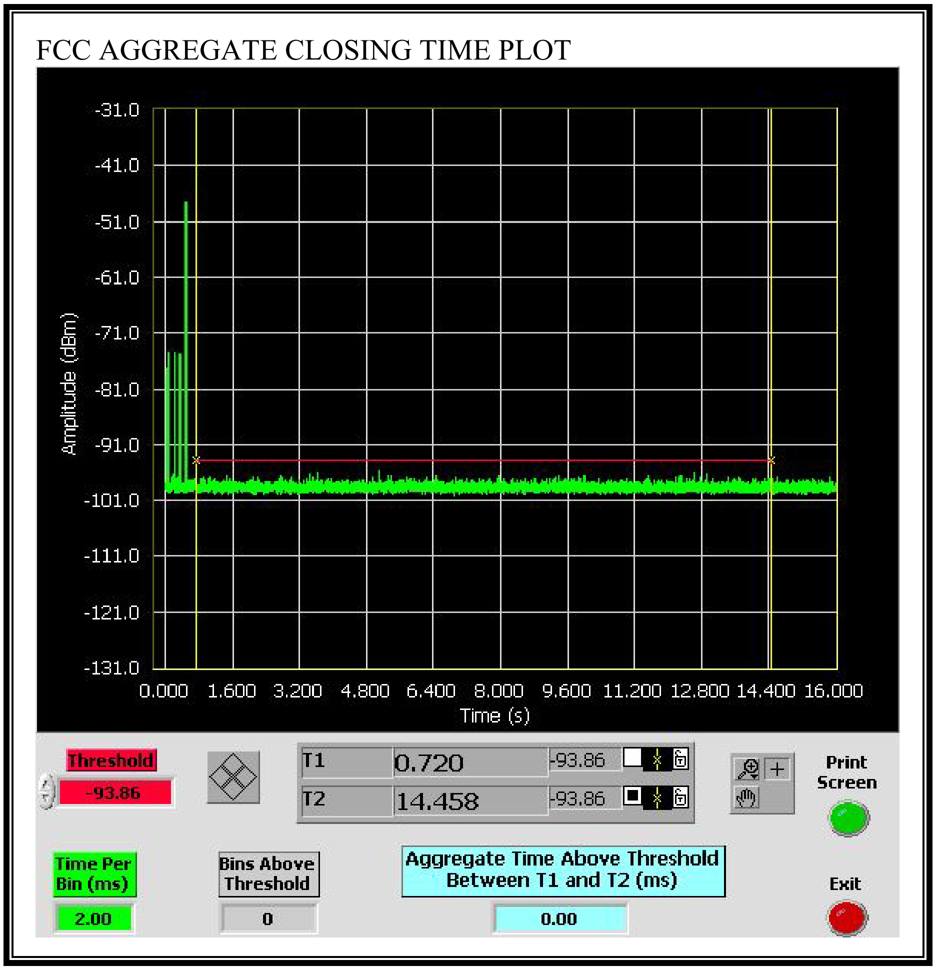


FCC AGGREGATE CHANNEL CLOSING TRANSMISSION TIME RESULTS

No non-compliance noted:

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
0.00	60	60.00

No transmissions are observed during the aggregate monitoring period.

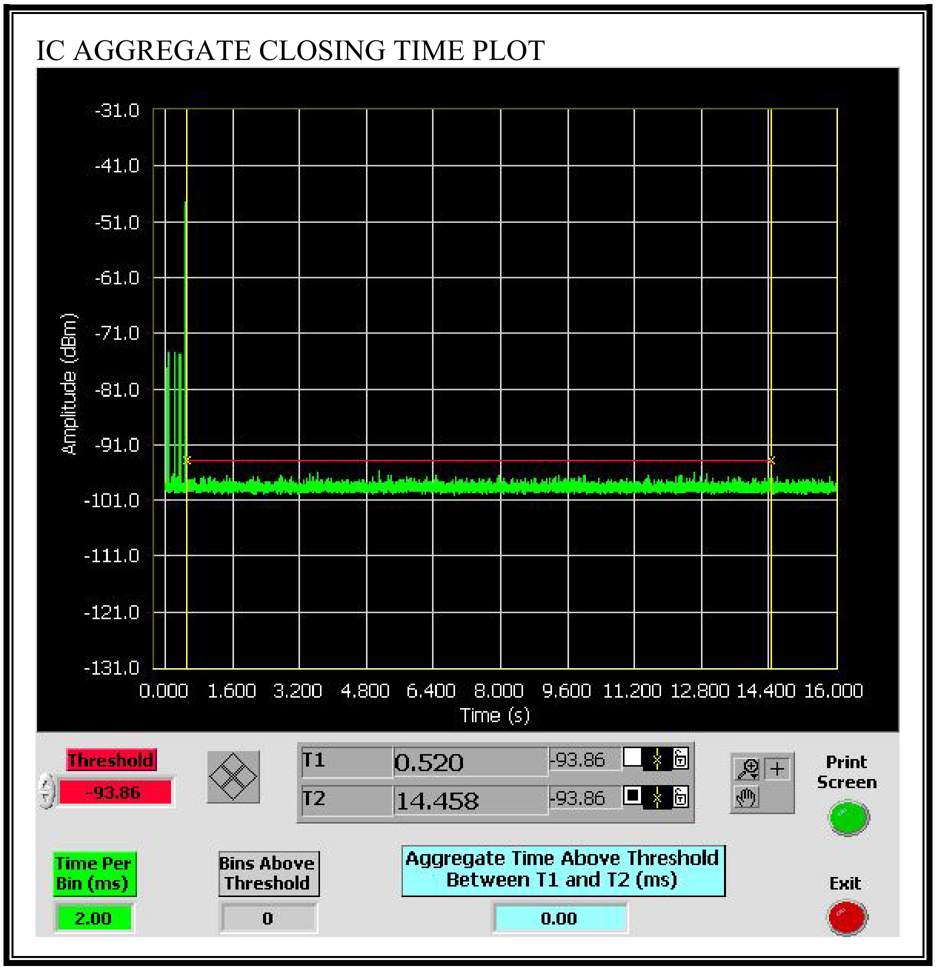


IC AGGREGATE CHANNEL CLOSING TRANSMISSION TIME RESULTS

No non-compliance noted:

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
0.00	260	260.00

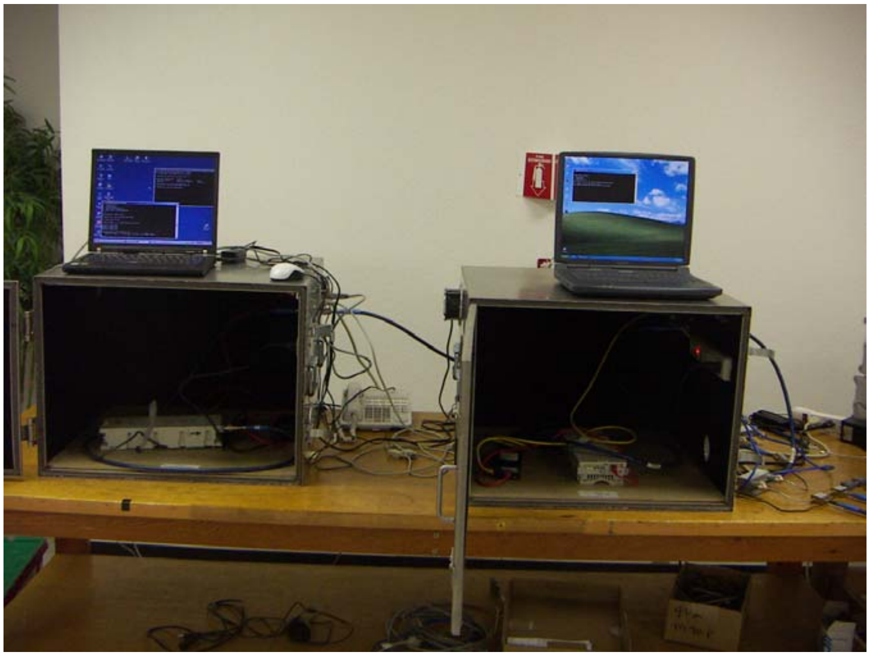
No transmissions are observed during the aggregate monitoring period.



7. SETUP PHOTOS

DFS MEASUREMENT SETUP

DFS ANTENNA PORT CONDUCTED PHOTO



END OF REPORT

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