DFS PORTION of FCC 47 CFR PART 15 SUBPART E
DFS PORTION of INDUSTRY CANADA RSS-247 ISSUE 1

CERTIFICATION TEST REPORT

FOR

802.11a/b/g/n/ac WIRELESS ACCESS POINT

MODEL NUMBER: MR53E-HW

FCC ID: UDX-60064010
IC: 6961A-60064010

REPORT NUMBER: 11799821-E2V1

ISSUE DATE: OCTOBER 2, 2017

Prepared for
CISCO SYSTEMS, INC.
170 WEST TASMAN DRIVE
SAN JOSE, CA, 95134, USA

Prepared by
UL VERIFICATION SERVICES INC.
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	10/2/17	Initial Issue	Conan Cheung

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

TABLE OF CONTENTS

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: CISCO SYSTEMS, INC.
170 WEST TASMAN DRIVE
SAN JOSE, CA, 95134, USA

EUT DESCRIPTION: 802.11a/b/g/n/ac WIRELESS ACCESS POINT

MODEL: MR53E-HW

SERIAL NUMBER: Q2UD-9XFP-GPU2

DATE TESTED: AUGUST 7 – 8, 2017

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
DFS Portion of CFR 47 Part 15 Subpart E	Pass
INDUSTRY CANADA RSS-247 Issue 1	Pass

UL Verification Services Inc. 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 UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. 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 UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:

CONAN CHEUNG
PROJECT LEAD
UL Verification Services Inc.

Tested By:

HENRY LAU
EMC ENGINEER
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the DFS portion of FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 06-96, FCC KDB 789033, KDB 905462 D02 and D03 and RSS-247 Issue 1.

3. FACILITIES AND ACCREDITATION

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

UL Verification Services, Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/2000650.htm.

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. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Time	± 0.02 %

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

5. DYNAMIC FREQUENCY SELECTION

5.1. OVERVIEW

5.1.1. LIMITS

INDUSTRY CANADA

IC RSS-247 is closely harmonized with FCC Part 15 DFS rules. The deviations are as follows:

RSS-247 Issue 1

Note: For the band 5600–5650 MHz, no operation is permitted.

Until further notice, devices subject to this annex shall not be capable of transmitting in the band 5600–5650 MHz. This restriction is for the protection of Environment Canada weather radars operating in this band.

FCC

§15.407 (h), FCC KDB 905462 D02 “COMPLIANCE MEASUREMENT PROCEDURES FOR UNLICENSED-NATIONAL INFORMATION INFRASTRUCTURE DEVICES OPERATING IN THE 5250-5350 MHz AND 5470-5725 MHz BANDS INCORPORATING DYNAMIC FREQUENCY SELECTION” and KDB 905462 D03 “U-NII CLIENT DEVICES WITHOUT RADAR DETECTION CAPABILITY”.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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
U-NII Detection Bandwidth	Yes	Not required	Yes

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
U-NII Detection Bandwidth	Yes	Not required	Yes

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar DFS	Client (without DFS)
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in all 20 MHz channel blocks and a null frequency between the bonded 20 MHz channel blocks.		

Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring

Maximum Transmit Power	Value (see notes)
E.I.R.P. ≥ 200 mill watt	-64 dBm
E.I.R.P. < 200 mill watt and power spectral density < 10 dBm/MHz	-62 dBm
E.I.R.P. < 200 mill watt that do not meet power spectral density requirement	-64 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. **Note 3:** E.I.R.P. is based on the highest antenna gain. For MIMO devices refer to KDB publication 662911 D01.	

Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds (See Note 1)
Channel Closing Transmission Time	200 milliseconds + approx. 60 milliseconds over remaining 10 second period. (See Notes 1 and 2)
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. (See Note 3)
Note 1: *Channel Move Time* and the *Channel Closing Transmission Time* should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. **Note 2:** The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate a *Channel* move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. **Note 3:** During the *U-NII Detection Bandwidth* detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (usec)	PRI (usec)	Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in table 5a	Roundup: {(1/360) x (19 x 10^6 PRI_{usec})}	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 usec. With a minimum increment of 1 usec, excluding PRI values selected in Test A			
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
Note 1: Short Pulse Radar Type 0 should be used for the *Detection Bandwidth* test, *Channel Move Time*, and *Channel Closing Time* tests.					

Table 6 – Long Pulse Radar Test Signal

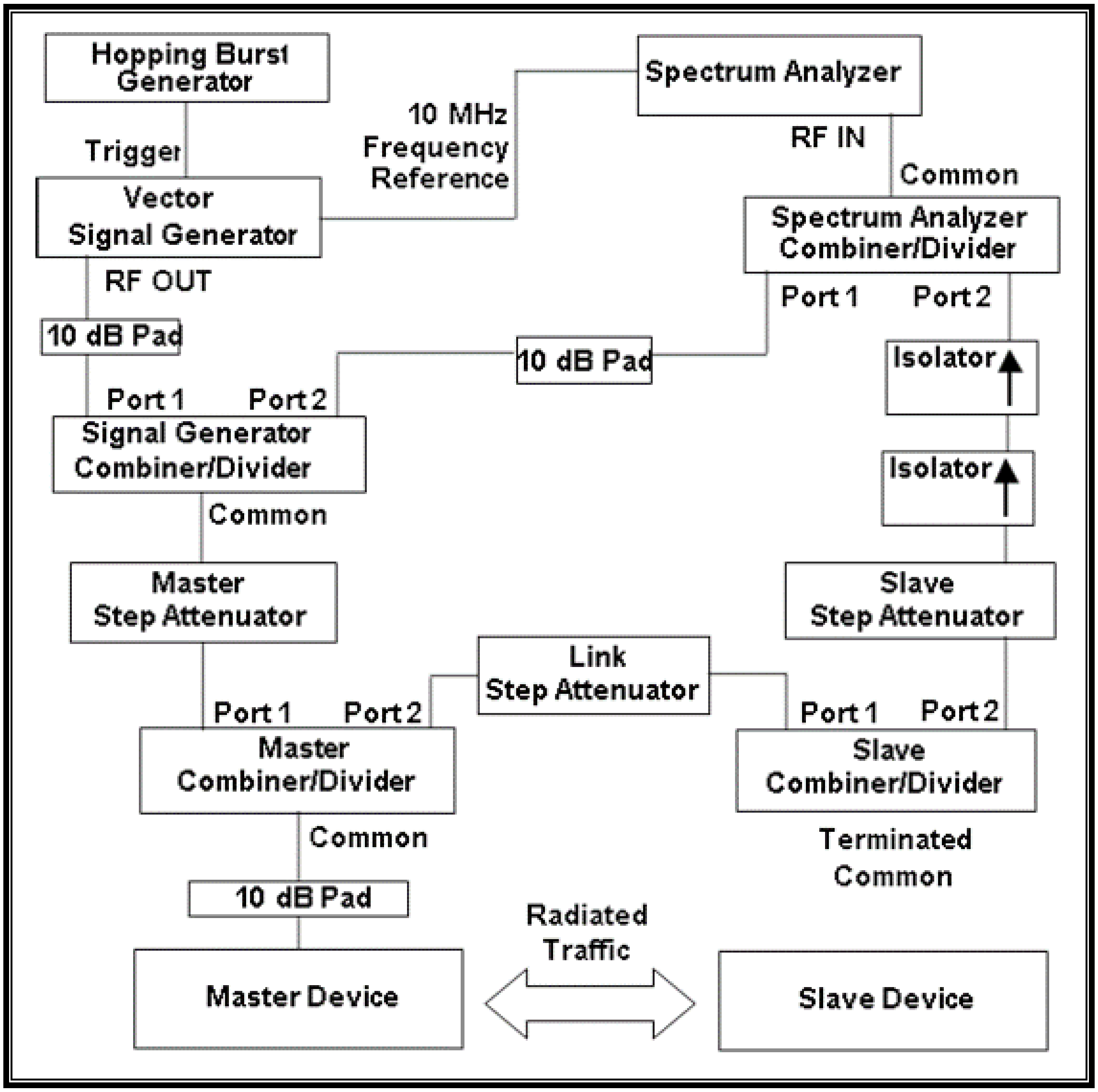
Radar Waveform Type	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 7 – Frequency Hopping Radar Test Signal

Radar Waveform Type	Pulse Width (µsec)	PRI (µsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	0.333	300	70%	30

5.1.2. 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 1, 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 Frequency Hopping Radar Waveform Generating Subsystem of KDB 905462 D02. 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. 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 may be 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. 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 analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is –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.

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the Link Step Attenuator between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The WLAN traffic level, as displayed on the spectrum analyzer, is confirmed to be at lower amplitude than the radar detection threshold and is confirmed to be the Radar Detection Device rather than the associated device. If a different setting of the Master Step Attenuator is required to meet the above conditions, a new System Calibration is performed 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, PXA, 3Hz to 44GHz	Keysight	N9030A	MY49430179	02/27/18
Signal Generator, MXG X-Series RF Vector	Agilent	N5182B	MY51350337	04/21/18
Arbitrary Waveform Generator	Agilent / HP	33220A	MY44037572	04/06/18

5.1.3. TEST AND MEASUREMENT SOFTWARE

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

TEST SOFTWARE LIST		
Name	**Version**	**Test / Function**
Aggregate Time-PXA	3.0	Channel Loading and Aggregate Closing Time
FCC 2006 Detection Bandwidth-PXA	3.0	Detection Bandwidth in 1 MHz Steps
FCC 2014 Detection Bandwidth-PXA	3.0	Detection Bandwidth in 5 MHz Steps
In Service Monitoring-PXA	3.0	In-Service Monitoring (Probability of Detection)
PXA Read	3.0.0.9	Signal Generator Screen Capture
SGXProject.exe	1.7	Radar Waveform Generation and Download

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

5.1.4. TEST ROOM ENVIRONMENT

The test room temperature and humidity shall be maintained within normal temperature of 15~35 °C and normal humidity 20~75% (relative humidity).

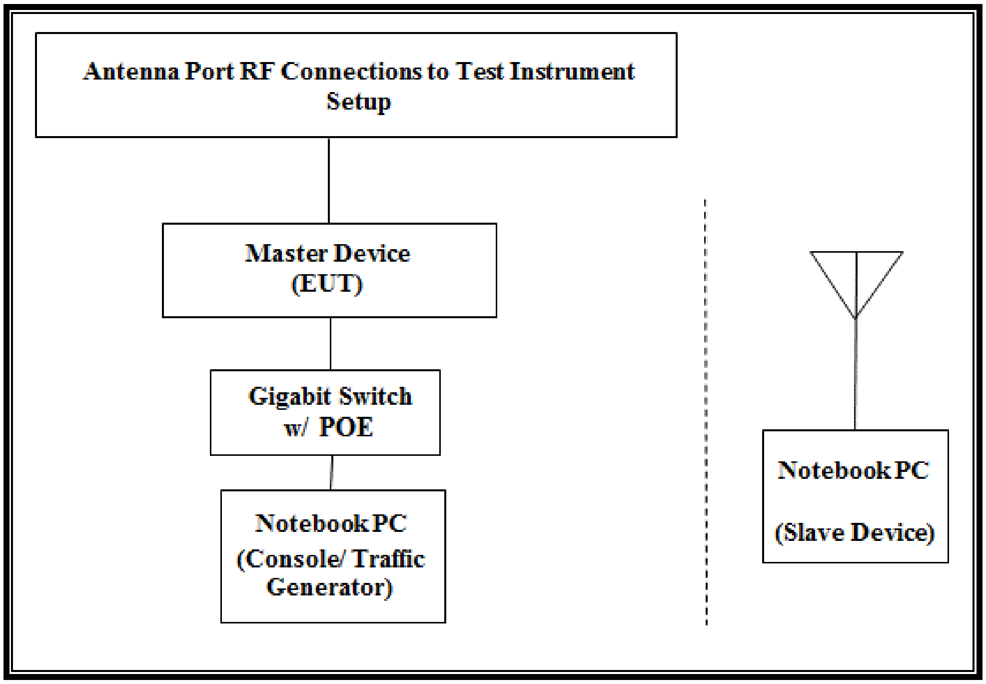
ENVIRONMENT CONDITION

Parameter	Value
Temperature	25.4 °C
Humidity	38 %

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

5.1.5. SETUP OF EUT

CONDUCTED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

The following support equipment was utilized for the DFS tests documented in this report:

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Notebook PC (Controller & Traffic Generator)	Apple	A1502	C02NT1VTG3QR	DoC
AC Adapter (Controller PC & Traffic Generator)	Apple	A1435	D39433601B4FTC0A1	DoC
Notebook PC (Slave Device)	Apple	A1465	C02KTGMPF5N7	QDS-BRCM1072
AC Adapter (Slave PC)	Apple	A1435	C04341216J2F288BT	DoC
Gigabit Switch with POE	Meraki	MS220-8P	Q2HP-DR3G-TQZS	DoC

5.1.6. DESCRIPTION OF EUT

The EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges, excluding the 5600-5650 MHz range.

The EUT is a Master Device.

The highest power level within these bands is 29.97 dBm EIRP in the 5250-5350 MHz band and 29.98 dBm EIRP in the 5470-5725 MHz band.

The highest gain antenna assembly utilized with the EUT has a gain of 10.94 dBi. The lowest gain antenna assembly utilized with the EUT has a gain of 3.95 dBi.

Four identical antennas are utilized to meet the diversity and MIMO 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 + 3.95 +1= -59.05 dBm.

The calibrated conducted DFS Detection Threshold level is set to –60.05 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

The EUT uses four transmitter/receiver chains and one receive only chain, each connected to a 50-ohm coaxial antenna port. All 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 that meets or exceeds the minimum required loading was generated by transferring a data stream from the Master Device to the Slave Device using iPerf version 2.0.5 software package.

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

The EUT utilizes the 802.11ac architecture. Three nominal channel bandwidths are implemented: 20 MHz, 40 MHz and 80 MHz.

The software installed in the EUT is version T-201706290646-Gcc4da9ce-L1b216739-aacharya.

UNIFORM CHANNEL SPREADING

This function is not required per KDB 905462.

OVERVIEW OF MASTER DEVICE WITH RESPECT TO §15.407 (h) REQUIREMENTS

The Master Device is a Cisco Meraki Access Point, FCC ID: UDX-60064010. The minimum antenna gain for the Master Device is 3.95 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 + 3 + 1 = -60 dBm.

The calibrated conducted DFS Detection Threshold level is set to –61 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

5.2. RESULTS FOR 20 MHz BANDWIDTH

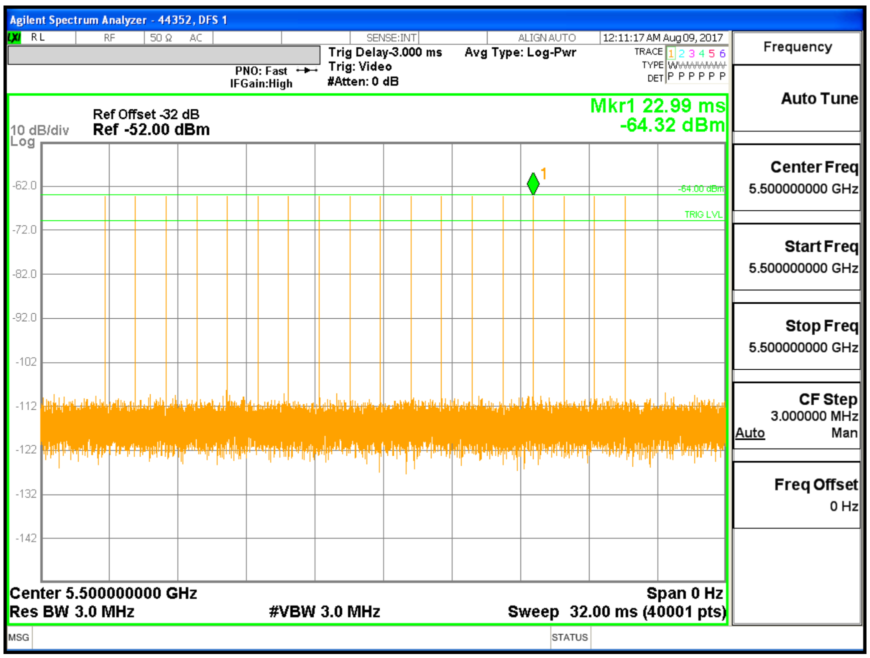
5.2.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5500 MHz.

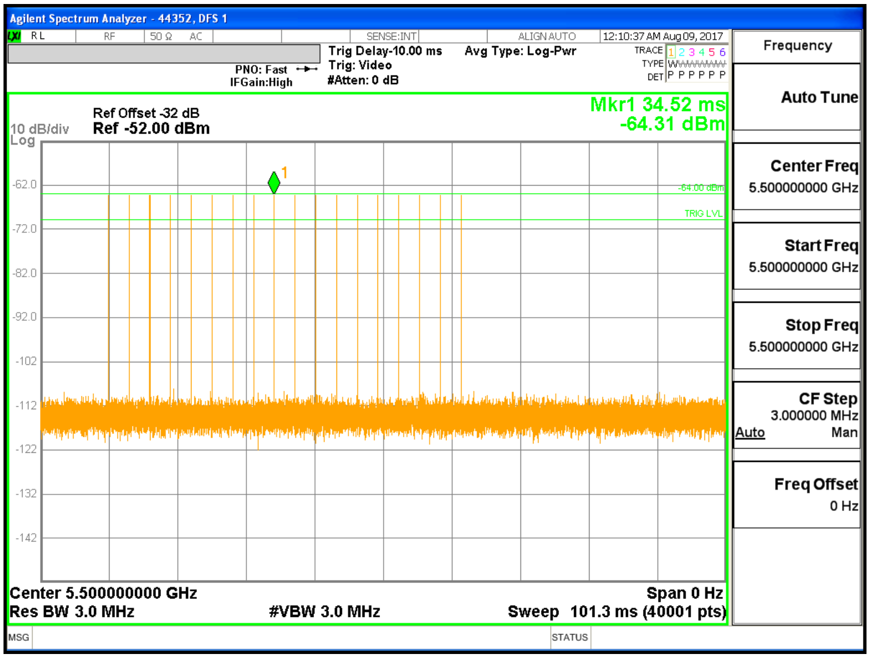
5.2.2. RADAR WAVEFORMS AND TRAFFIC

RADAR WAVEFORMS

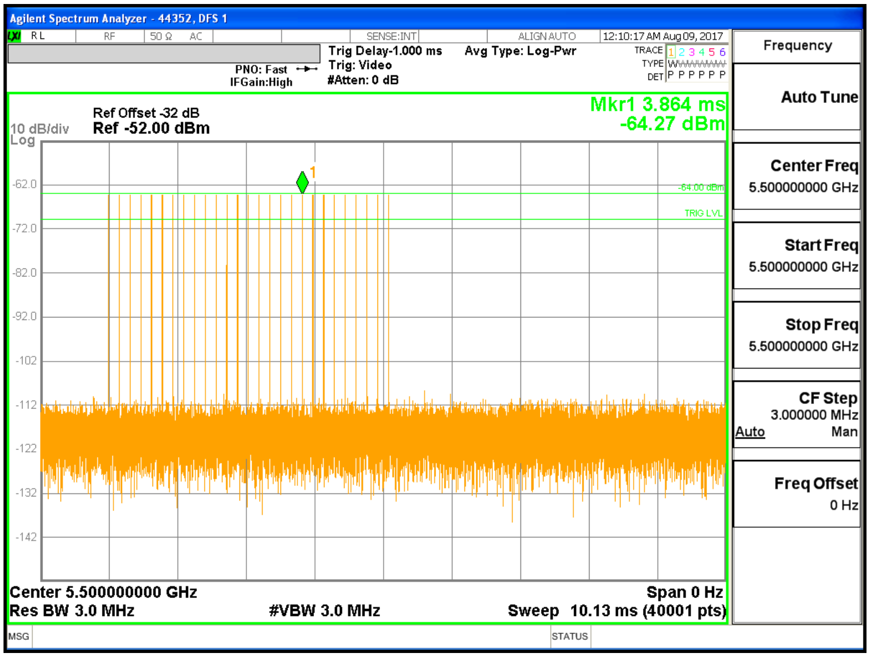
SHORT PULSE RADAR TYPE 0



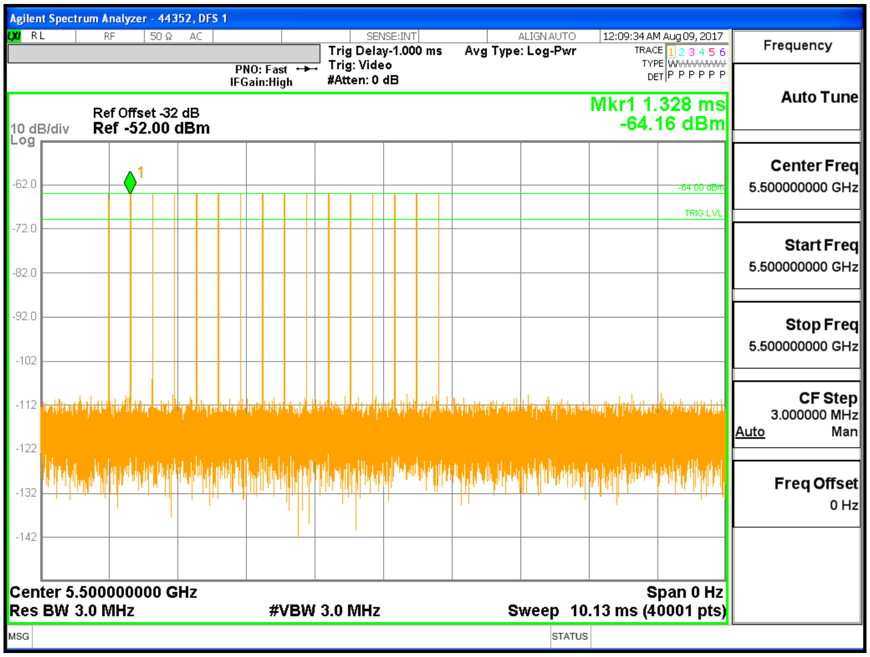
SAMPLE OF RADAR TYPE 1



SAMPLE OF RADAR TYPE 2



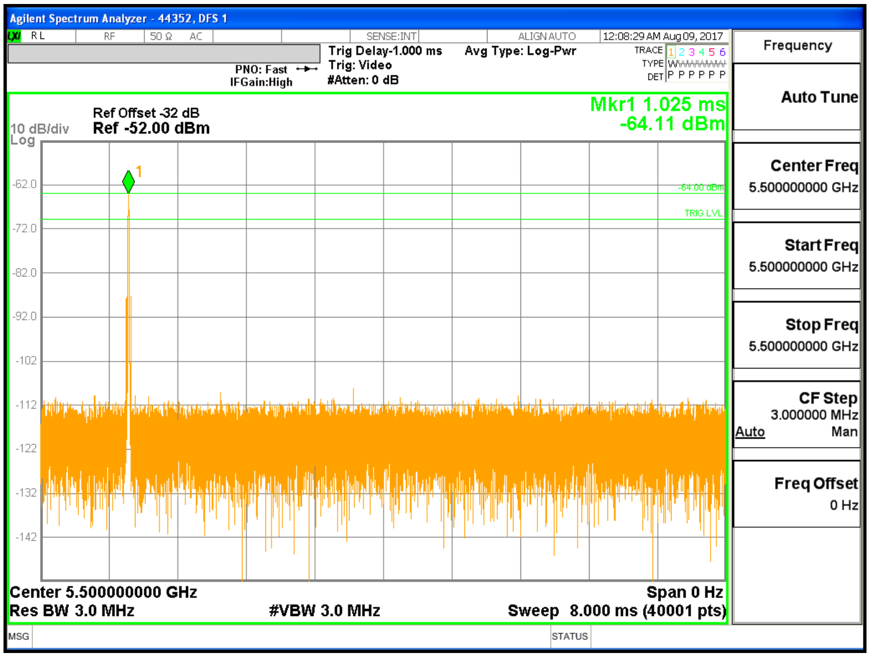
SAMPLE OF RADAR TYPE 3



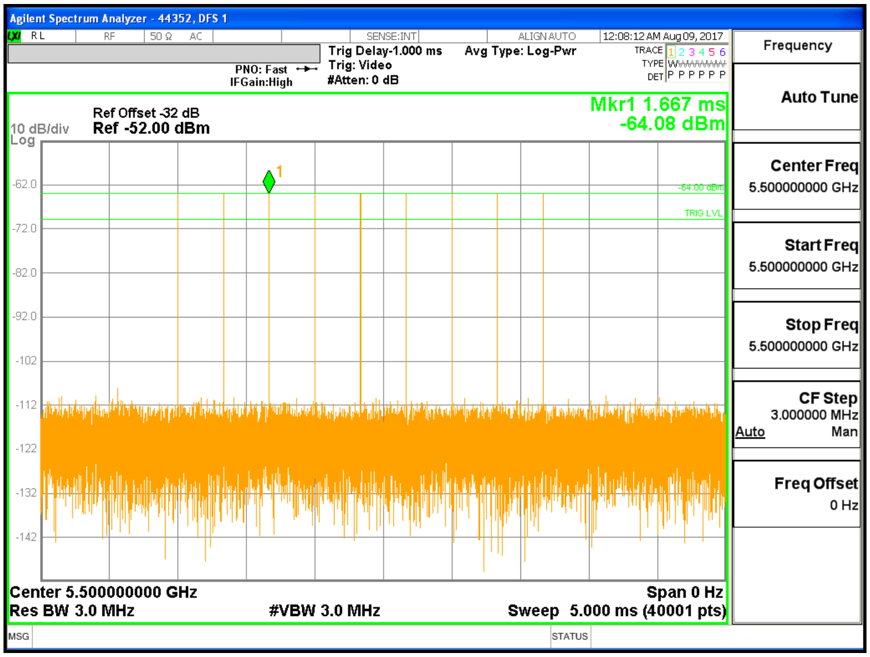
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

SAMPLE OF RADAR TYPE 4

SAMPLE OF SINGLE BURST OF RADAR TYPE 5

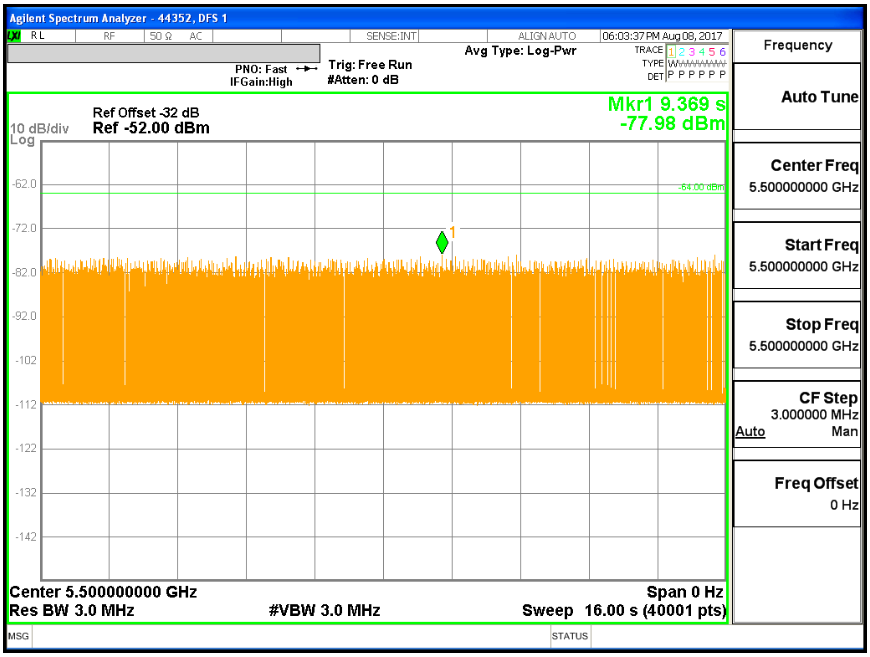


SINGLE BURST OF RADAR TYPE 6

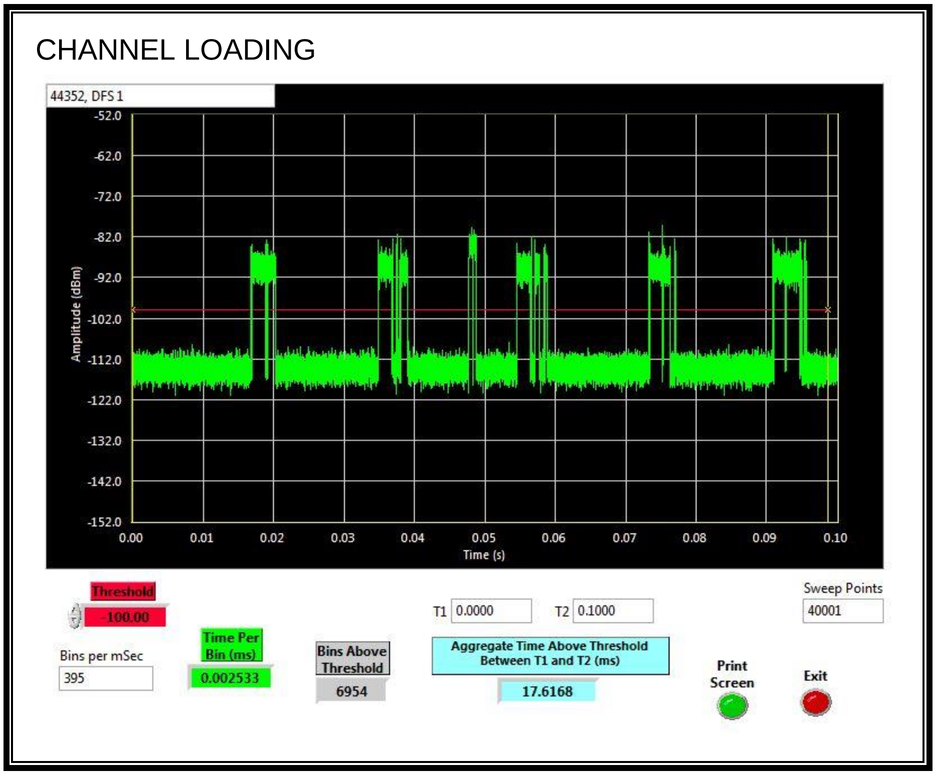


TRAFFIC

TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 17.6168%.

5.2.3. 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.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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)
30.44	178.9	148.5	88.5

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)
30.21	120.1	89.9	1.4

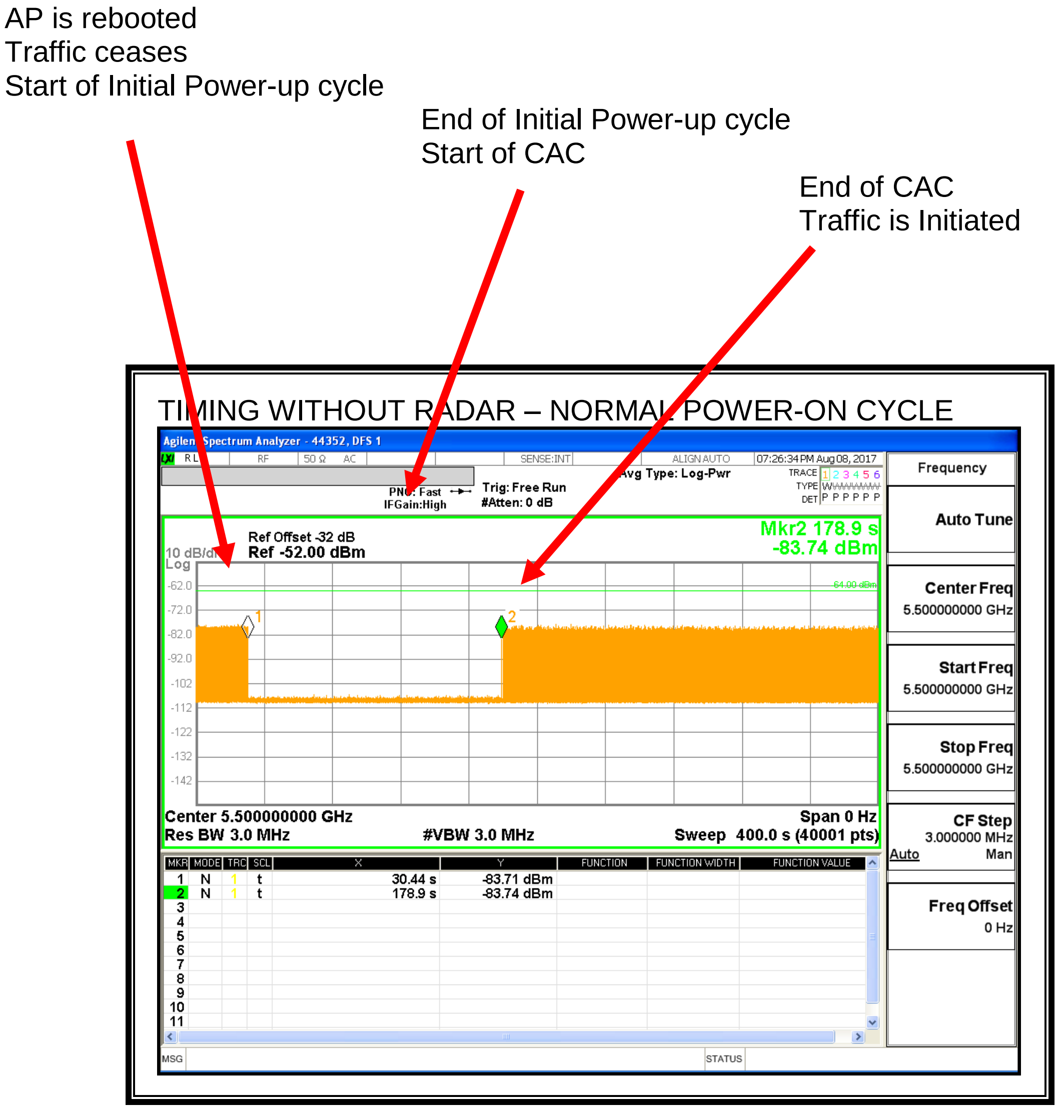
Radar Near End of CAC

Timing of Reboot (sec)	Timing of Radar Burst (sec)	Radar Relative to Reboot (sec)	Radar Relative to Start of CAC (sec)
30.43	177.1	146.7	58.2

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 WITHOUT RADAR DURING CAC



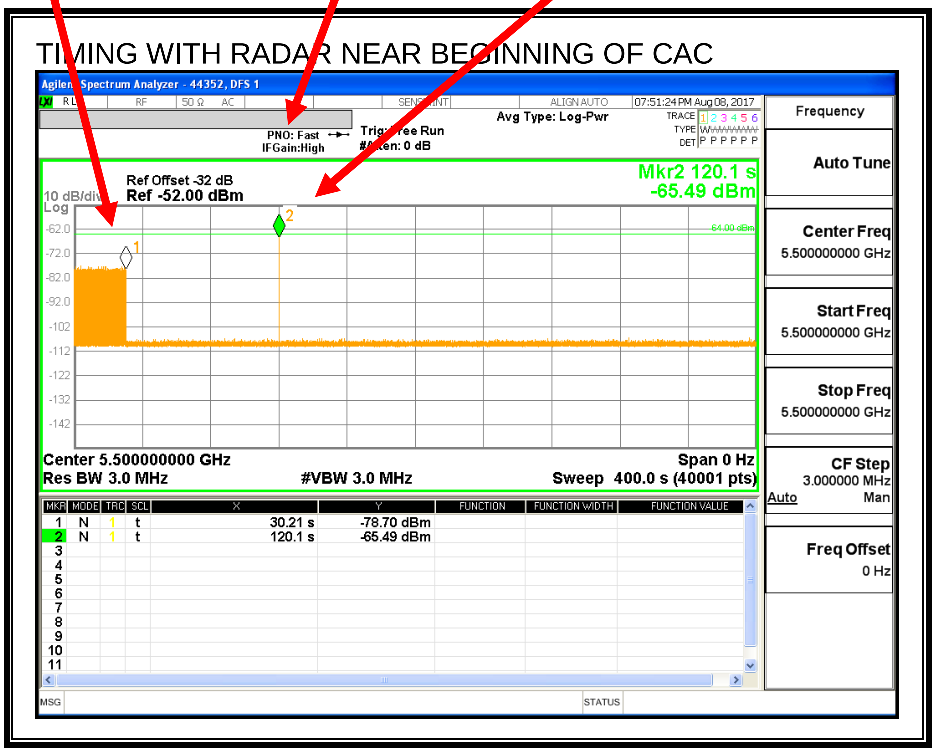
Transmissions begin on channel after completion of the initial power-up cycle and the CAC.

TIMING 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



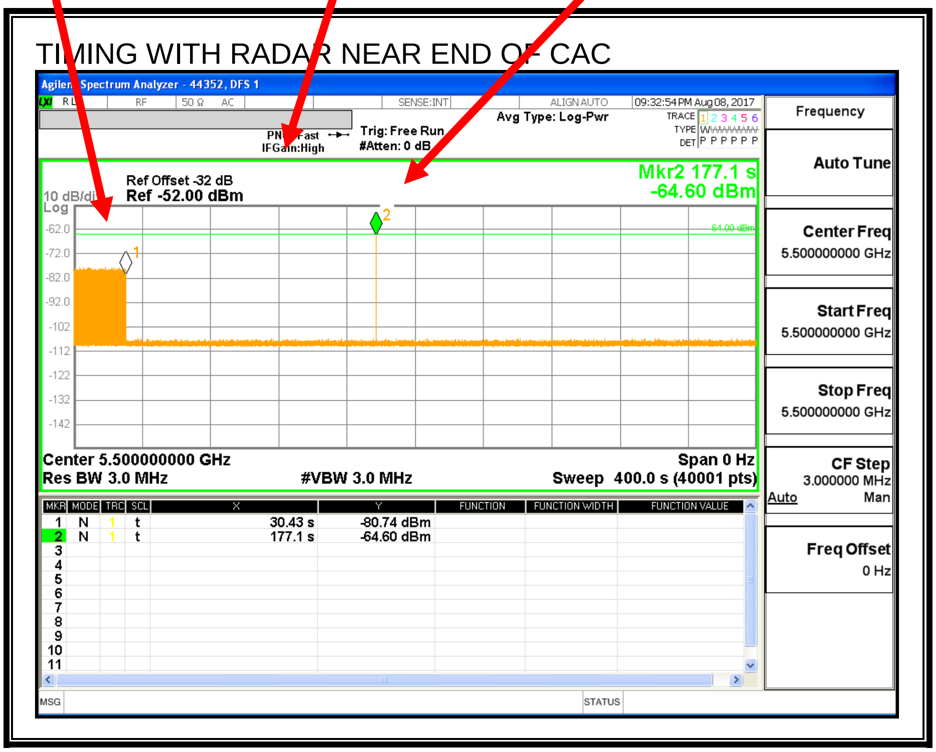
No EUT transmissions were observed after the radar signal.

TIMING 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.

5.2.4. OVERLAPPING CHANNEL TESTS

RESULTS

The channel spacing is not less than the channel bandwidth therefore the EUT does not have an overlapping channel plan.

These tests are not applicable.

5.2.5. 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 aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

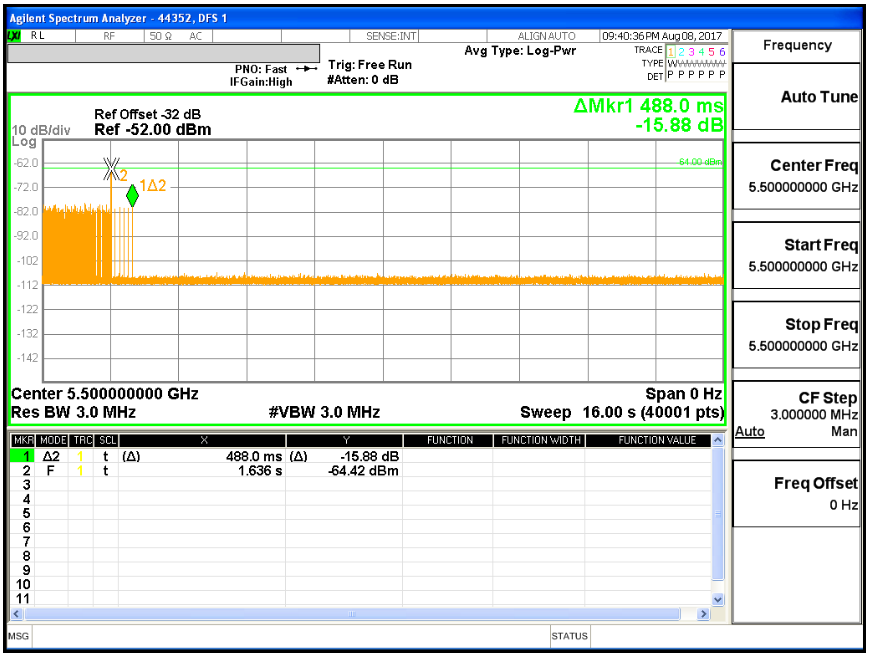
RESULTS

Channel Move Time (sec)	Limit (sec)
0.488	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
4.8	60

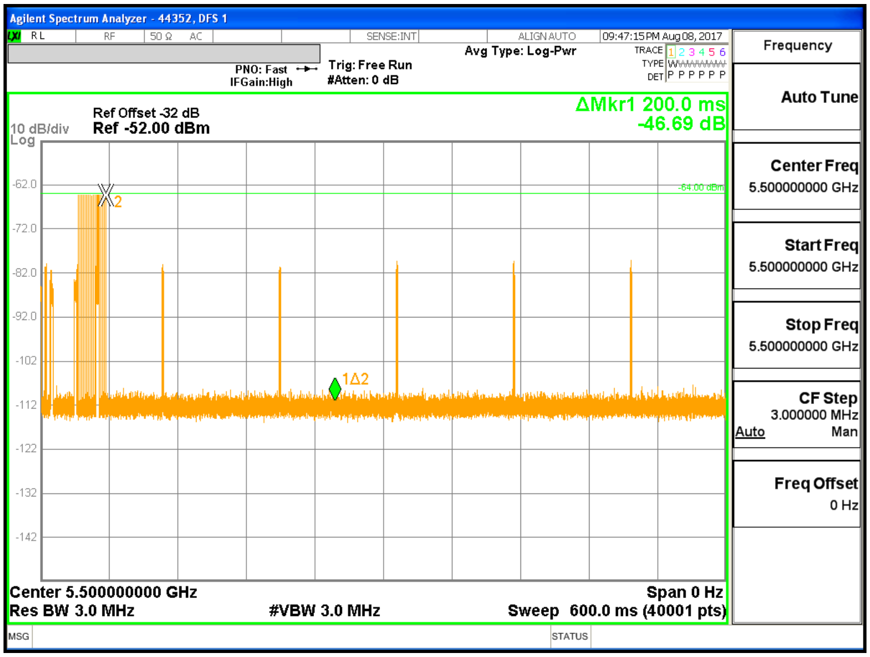
MOVE TIME

MOVE TIME



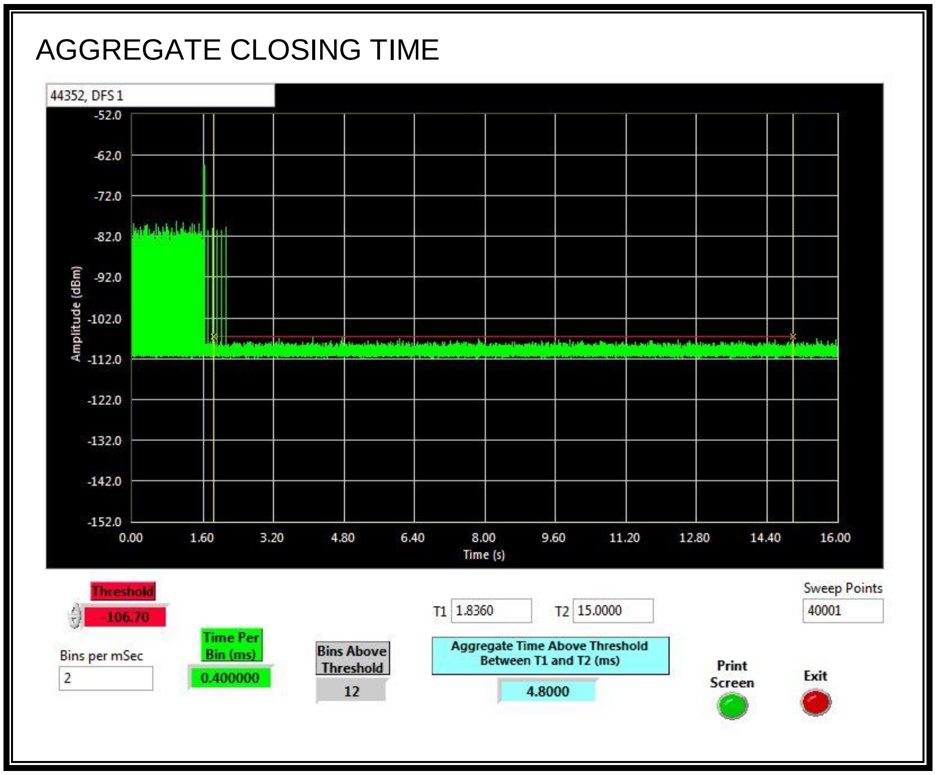
CHANNEL CLOSING TIME

CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

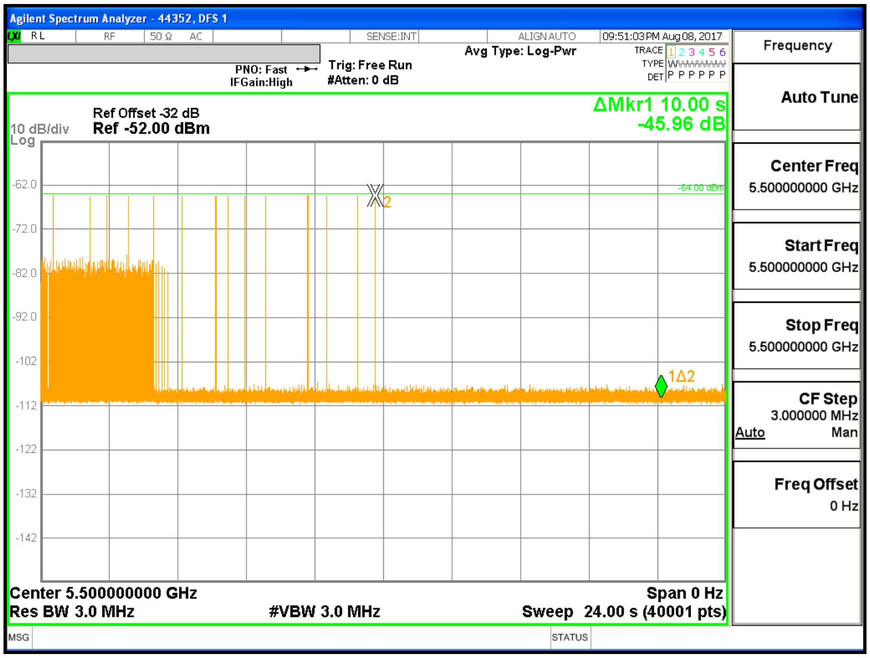
Only intermittent transmissions are observed during the aggregate monitoring period.



LONG PULSE CHANNEL MOVE TIME

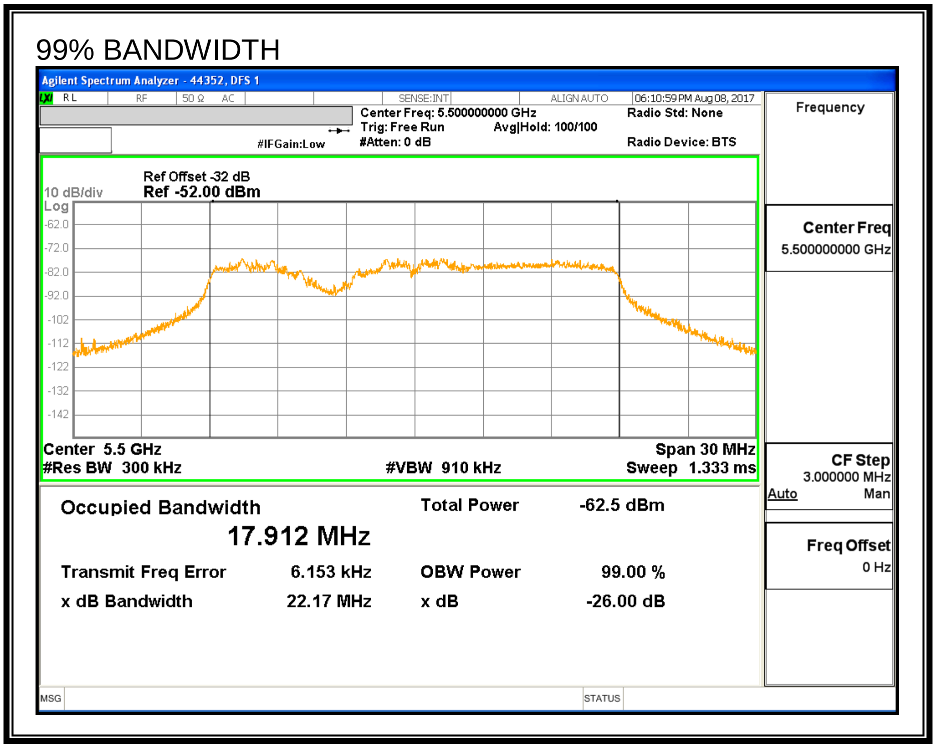
The traffic ceases prior to 10 seconds after the end of the radar waveform.

MOVE TIME FOR LONG PULSE RADAR



5.2.6. 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 (%)
5490	5510	20	17.912	111.7	100

DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results		44352	DFS 1	
FCC Type 0 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst				
Frequency (MHz)	Number of Trials	Number Detected	Detection (%)	Mark
5489	10	0	0	
5490	10	10	100	FL
5495	10	10	100	
5500	10	10	100	
5505	10	10	100	
5510	10	10	100	FH
5511	10	0	0	

5.2.7. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary

Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail	Detection Bandwidth FL	Detection Bandwidth FH	OBW	Test Location	Employee Number	In-Service Monitoring Version
FCC Short Pulse Type 1	30	100.00	60	Pass	5490	5510	17.91	DFS 1	44352	Version 3.0
FCC Short Pulse Type 2	30	76.67	60	Pass	5490	5510	17.91	DFS 1	44352	Version 3.0
FCC Short Pulse Type 3	30	70.00	60	Pass	5490	5510	17.91	DFS 1	44352	Version 3.0
FCC Short Pulse Type 4	30	83.33	60	Pass	5490	5510	17.91	DFS 1	44352	Version 3.0
Aggregate		82.50	80	Pass						
FCC Long Pulse Type 5	30	100.00	80	Pass	5490	5510	17.91	DFS 1	44352	Version 3.0
FCC Hopping Type 6	42	100.00	70	Pass	5490	5510	17.91	DFS 1	44352	Version 3.0

TYPE 1 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 1						
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Test (A/B)	Frequency (MHz)	Successful Detection (Yes/No)
1001	1	3066	18	A	5498	Yes
1002	1	898	59	A	5504	Yes
1003	1	638	83	A	5504	Yes
1004	1	578	92	A	5509	Yes
1005	1	558	95	A	5504	Yes
1006	1	518	102	A	5505	Yes
1007	1	538	99	A	5503	Yes
1008	1	798	67	A	5497	Yes
1009	1	878	61	A	5507	Yes
1010	1	858	62	A	5495	Yes
1011	1	658	81	A	5497	Yes
1012	1	918	58	A	5498	Yes
1013	1	598	89	A	5504	Yes
1014	1	818	65	A	5496	Yes
1015	1	618	86	A	5491	Yes
1016	1	2809	19	B	5492	Yes
1017	1	1764	30	B	5503	Yes
1018	1	1043	51	B	5491	Yes
1019	1	1482	36	B	5499	Yes
1020	1	2244	24	B	5498	Yes
1021	1	1458	37	B	5505	Yes
1022	1	1155	46	B	5500	Yes
1023	1	3047	18	B	5508	Yes
1024	1	2873	19	B	5506	Yes
1025	1	1152	46	B	5500	Yes
1026	1	2462	22	B	5503	Yes
1027	1	870	61	B	5491	Yes
1028	1	2308	23	B	5494	Yes
1029	1	2200	24	B	5494	Yes
1030	1	1220	44	B	5492	Yes

TYPE 2 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 2

Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Frequency (MHz)	Successful Detection (Yes/No)
2001	2.8	159	27	5510	Yes
2002	4.9	198	29	5507	No
2003	3.4	188	28	5496	Yes
2004	3.7	150	29	5499	No
2005	4.6	224	29	5502	Yes
2006	3	190	27	5497	No
2007	2.1	150	27	5505	Yes
2008	4.8	163	26	5493	No
2009	4.2	208	23	5505	No
2010	1.1	226	26	5491	Yes
2011	2.8	194	23	5493	Yes
2012	4	177	27	5510	Yes
2013	1.9	192	24	5498	No
2014	1.4	180	28	5495	Yes
2015	3.5	199	29	5509	Yes
2016	3.2	191	23	5497	Yes
2017	1.5	177	25	5490	Yes
2018	3.6	172	27	5497	Yes
2019	4.2	162	25	5495	Yes
2020	2.4	205	27	5504	Yes
2021	3.3	199	26	5501	Yes
2022	1.7	208	25	5503	Yes
2023	4.9	206	25	5509	Yes
2024	3.5	219	24	5495	Yes
2025	2.9	183	28	5503	Yes
2026	2	200	24	5501	No
2027	1.5	211	28	5496	Yes
2028	2.7	152	24	5495	Yes
2029	4.7	167	29	5498	Yes
2030	4.2	154	26	5492	Yes

TYPE 3 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 3					
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Frequency (MHz)	Successful Detection (Yes/No)
3001	7.2	325	16	5498	Yes
3002	6.9	299	18	5490	Yes
3003	9.3	254	16	5502	No
3004	7.3	492	16	5496	Yes
3005	7.9	460	16	5493	Yes
3006	6.1	342	17	5507	No
3007	7	322	16	5491	Yes
3008	9.5	350	16	5508	Yes
3009	8.6	344	17	5490	Yes
3010	9.4	385	17	5495	Yes
3011	6.6	273	17	5497	Yes
3012	9.8	327	18	5498	No
3013	9.3	361	17	5502	No
3014	6.4	427	18	5495	Yes
3015	8.4	475	17	5494	Yes
3016	7.9	436	18	5505	Yes
3017	6	496	18	5497	No
3018	9.7	470	17	5504	No
3019	8	425	16	5492	Yes
3020	6	412	18	5498	No
3021	6.7	380	18	5502	Yes
3022	8.9	262	16	5495	Yes
3023	9.8	376	17	5508	No
3024	8.2	271	18	5495	No
3025	7.4	398	16	5492	Yes
3026	8.1	305	16	5507	Yes
3027	7.5	445	17	5500	Yes
3028	8.5	498	17	5503	Yes
3029	8.1	282	16	5507	Yes
3030	7.3	348	17	5491	Yes

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

TYPE 4 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 4					
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Frequency (MHz)	Successful Detection (Yes/No)
4001	13.5	395	16	5501	Yes
4002	12.3	357	13	5509	Yes
4003	17.2	417	14	5506	Yes
4004	16.5	391	12	5498	No
4005	17.5	346	16	5494	Yes
4006	17.2	333	15	5505	No
4007	18.7	301	14	5495	Yes
4008	14.7	434	13	5508	Yes
4009	16.6	297	12	5506	Yes
4010	17.9	443	14	5495	No
4011	11.2	318	16	5506	Yes
4012	12.9	477	15	5500	No
4013	11.5	365	13	5505	Yes
4014	13.7	301	13	5508	Yes
4015	12.7	453	16	5495	Yes
4016	11.1	269	13	5492	Yes
4017	19.7	316	14	5498	Yes
4018	18.6	277	12	5510	Yes
4019	14.3	337	13	5499	No
4020	13.6	312	16	5496	Yes
4021	14.6	267	15	5509	Yes
4022	14.4	387	16	5502	Yes
4023	15.8	355	12	5501	Yes
4024	11.8	354	16	5492	Yes
4025	13.7	468	16	5506	Yes
4026	15	363	12	5509	Yes
4027	17.4	490	14	5498	Yes
4028	19.1	397	14	5495	Yes
4029	17.7	419	12	5495	Yes
4030	19.9	473	16	5493	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5

Trial	Frequency (MHz)	Successful Detection (Yes/No)
1	5500	Yes
2	5500	Yes
3	5500	Yes
4	5500	Yes
5	5500	Yes
6	5500	Yes
7	5500	Yes
8	5500	Yes
9	5500	Yes
10	5500	Yes
11	5496	Yes
12	5498	Yes
13	5494	Yes
14	5494	Yes
15	5499	Yes
16	5499	Yes
17	5494	Yes
18	5496	Yes
19	5499	Yes
20	5497	Yes
21	5506	Yes
22	5501	Yes
23	5501	Yes
24	5506	Yes
25	5504	Yes
26	5501	Yes
27	5504	Yes
28	5502	Yes
29	5504	Yes
30	5502	Yes

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

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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	314	5490	3	Yes
2	789	5491	1	Yes
3	1264	5492	4	Yes
4	1739	5493	5	Yes
5	2214	5494	6	Yes
6	2689	5495	3	Yes
7	3164	5496	3	Yes
8	3639	5497	3	Yes
9	4114	5498	5	Yes
10	4589	5499	1	Yes
11	5064	5500	2	Yes
12	5539	5501	2	Yes
13	6014	5502	3	Yes
14	6489	5503	5	Yes
15	6964	5504	4	Yes
16	7439	5505	5	Yes
17	7914	5506	2	Yes
18	8389	5507	3	Yes
19	8864	5508	6	Yes
20	9339	5509	6	Yes
21	9814	5510	4	Yes
22	10289	5490	5	Yes
23	10764	5491	6	Yes
24	11239	5492	4	Yes
25	11714	5493	3	Yes
26	12189	5494	4	Yes
27	12664	5495	4	Yes
28	13139	5496	3	Yes
29	13614	5497	2	Yes
30	14089	5498	3	Yes
31	14564	5499	5	Yes
32	15039	5500	5	Yes
33	15514	5501	4	Yes
34	15989	5502	5	Yes
35	16464	5503	6	Yes
36	16939	5504	3	Yes
37	17414	5505	5	Yes
38	17889	5506	3	Yes
39	18364	5507	2	Yes
40	18839	5508	5	Yes
41	19314	5509	3	Yes
42	19789	5510	5	Yes

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

5.3. RESULTS FOR 40 MHz BANDWIDTH

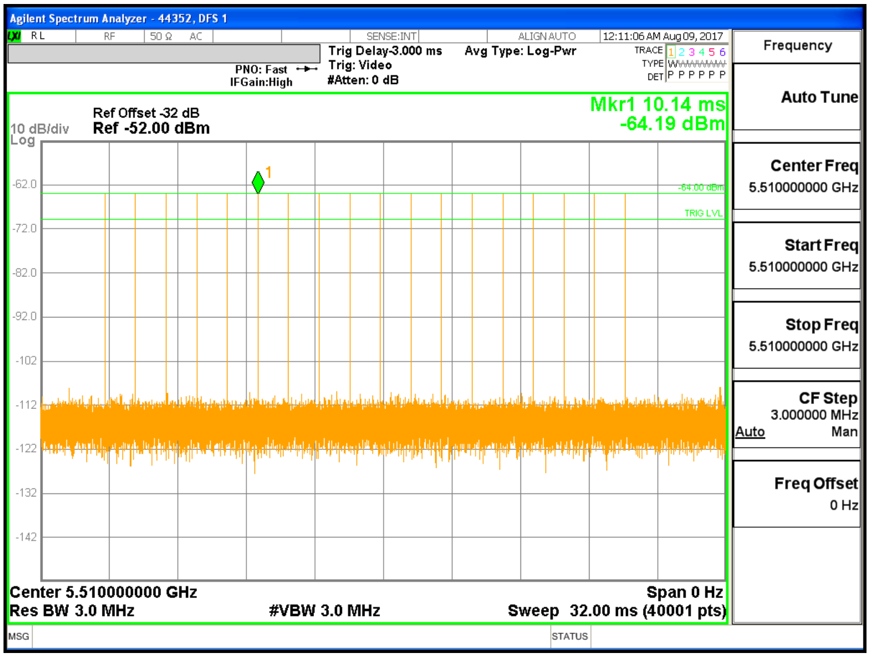
5.3.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5510 MHz.

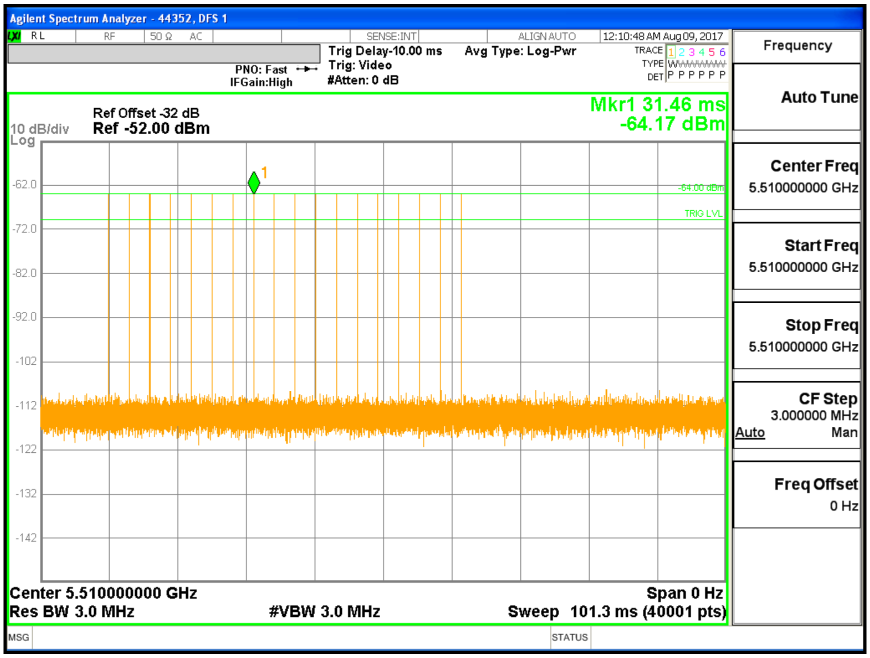
5.3.2. RADAR WAVEFORMS AND TRAFFIC

RADAR WAVEFORMS

SHORT PULSE RADAR TYPE 0



SAMPLE OF RADAR TYPE 1

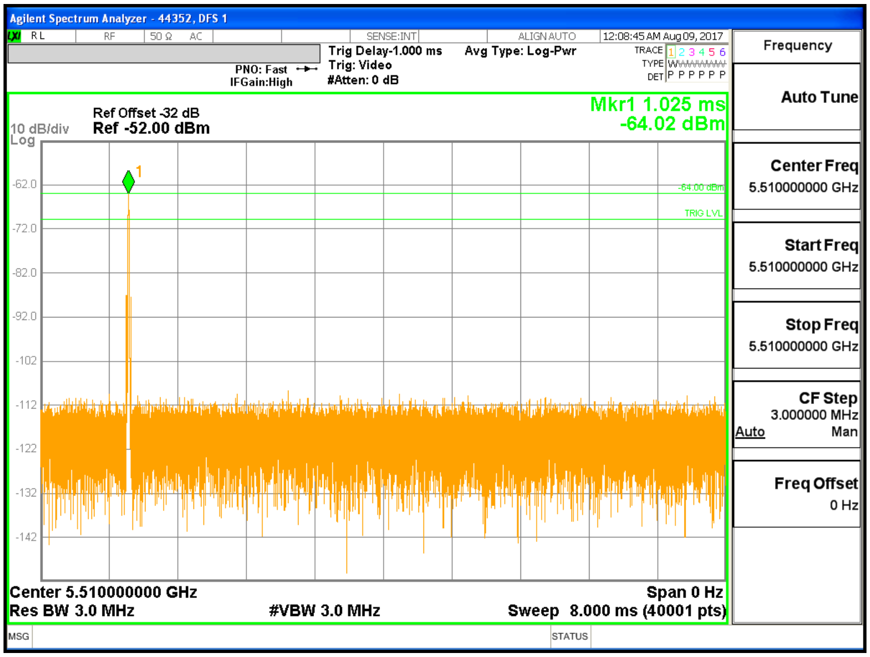


SAMPLE OF RADAR TYPE 2

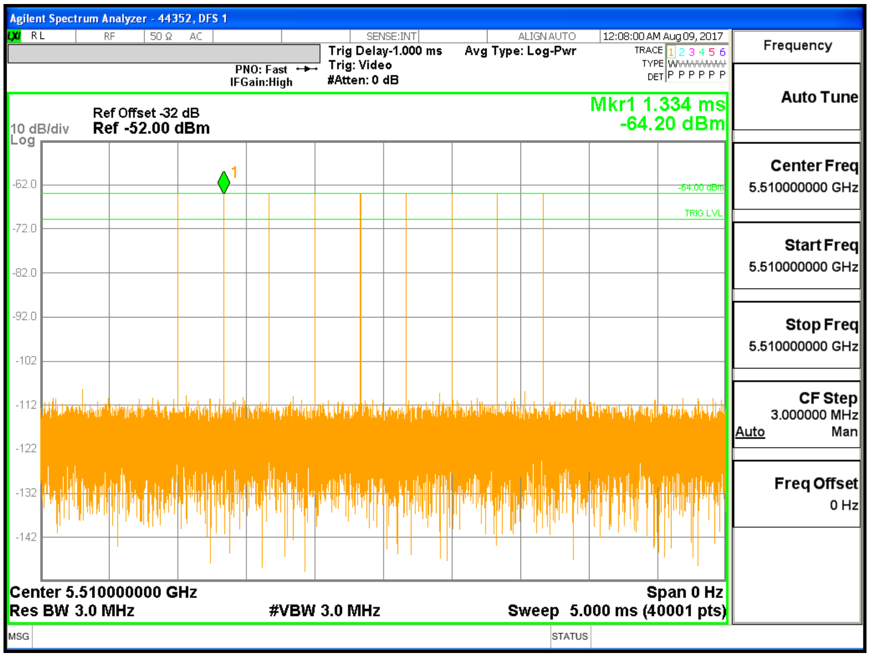
SAMPLE OF RADAR TYPE 3

SAMPLE OF RADAR TYPE 4

SAMPLE OF SINGLE BURST OF RADAR TYPE 5

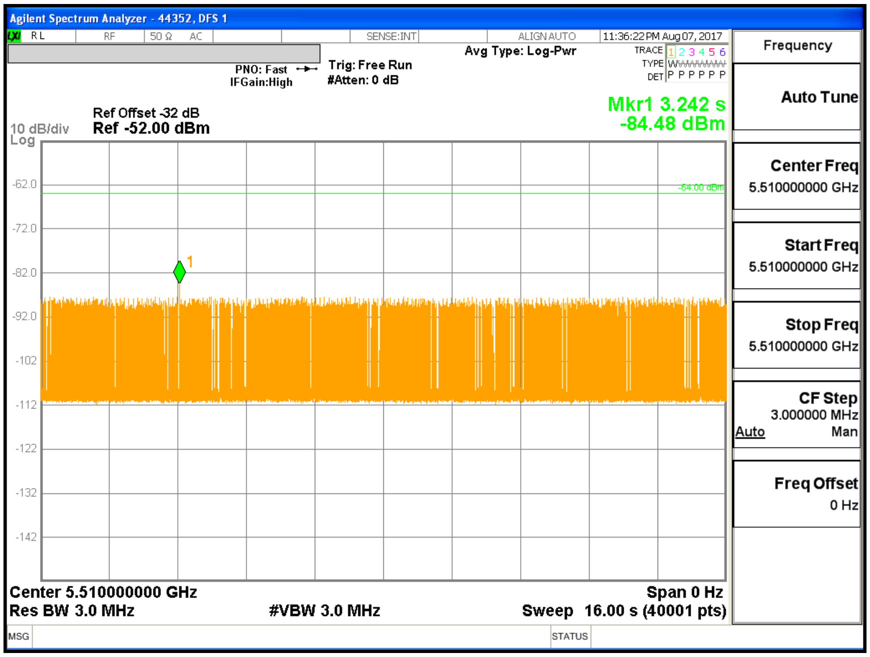


SINGLE BURST OF RADAR TYPE 6

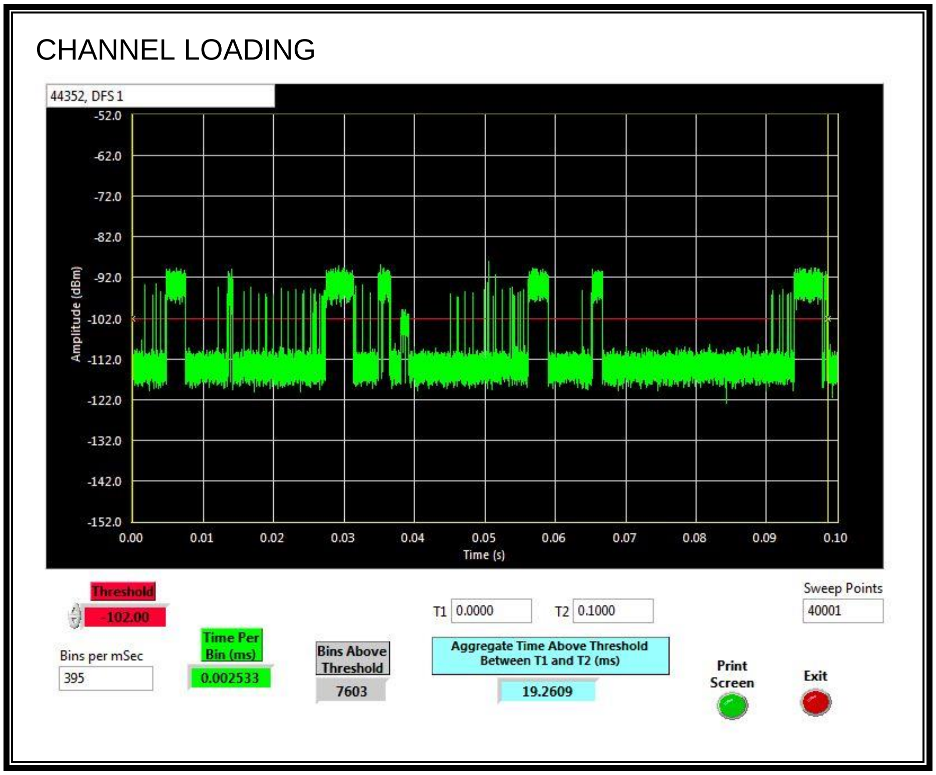


TRAFFIC

TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 19.2609%.

5.3.3. 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)
30.48	181.1	150.6	90.6

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)
30.54	122.4	91.9	1.2

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)
30.52	179.1	148.6	58.0

QUALITATIVE RESULTS

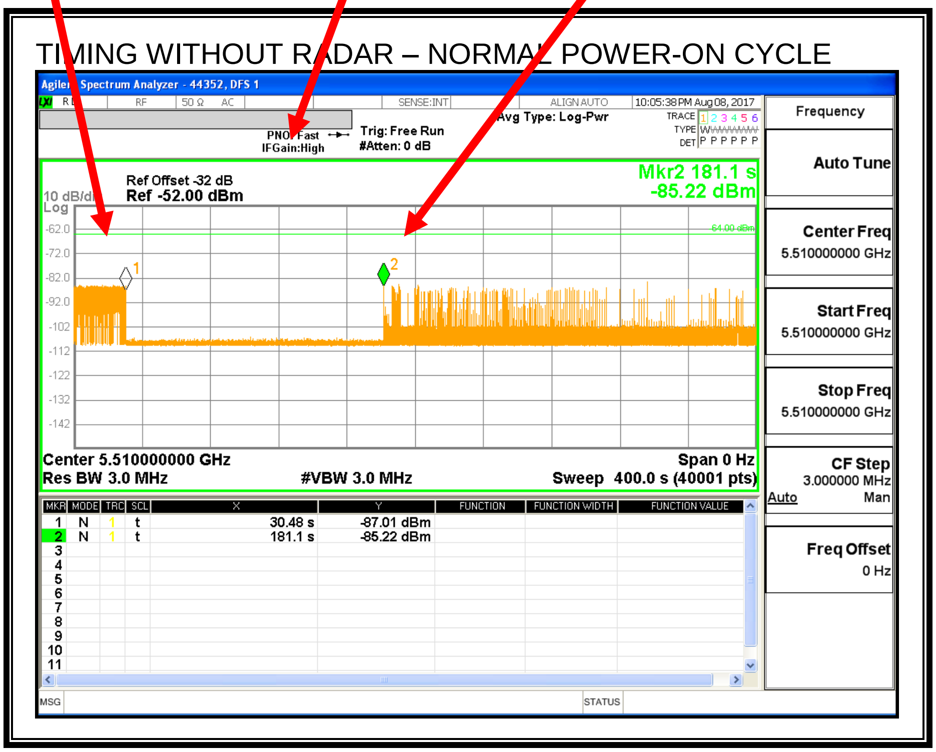
Timing of Radar Burst	Display on Control Computer	Spectrum Analyzer Display
No Radar Triggered	EUT marks Channel as active	Transmissions begin on channel after completion of the initial power-up cycle and the CAC
Within 0 to 6 second window	EUT indicates radar detected	No transmissions on channel
Within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

TIMING 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



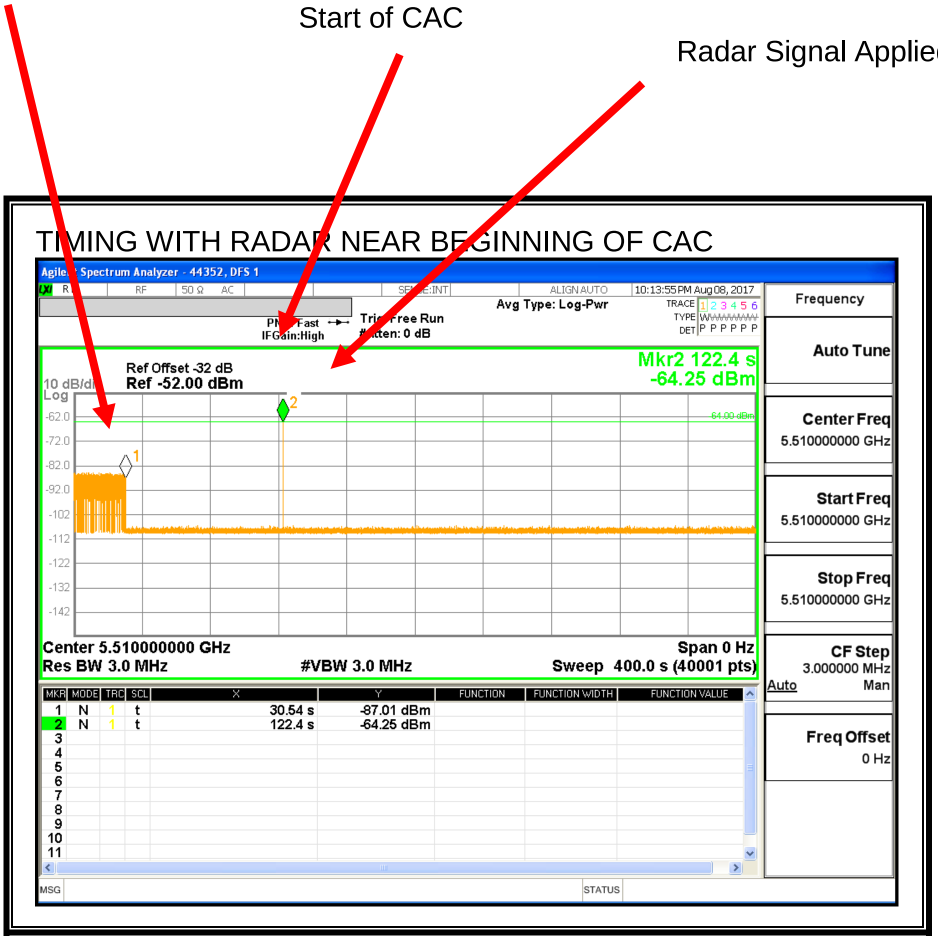
Transmissions begin on channel after completion of the initial power-up cycle and the CAC.

TIMING 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



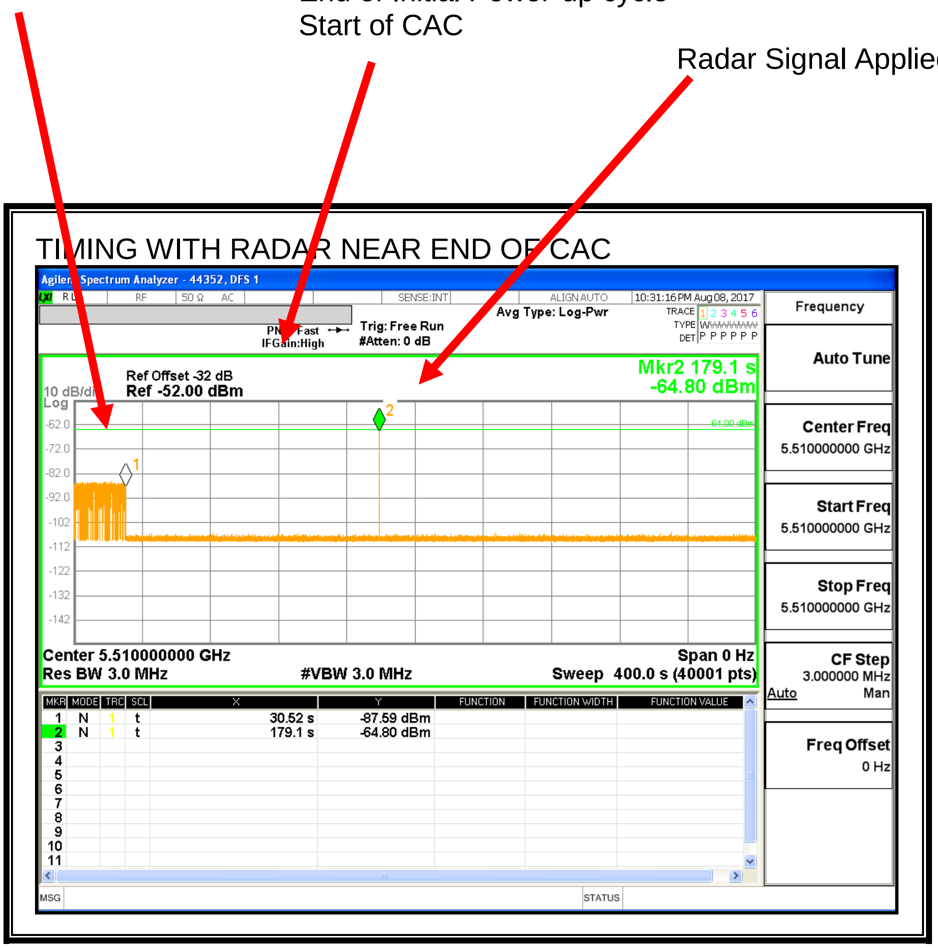
No EUT transmissions were observed after the radar signal.

TIMING 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.

5.3.4. OVERLAPPING CHANNEL TESTS

RESULTS

The channel spacing is not less than the channel bandwidth therefore the EUT does not have an overlapping channel plan.

These tests are not applicable.

5.3.5. 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)

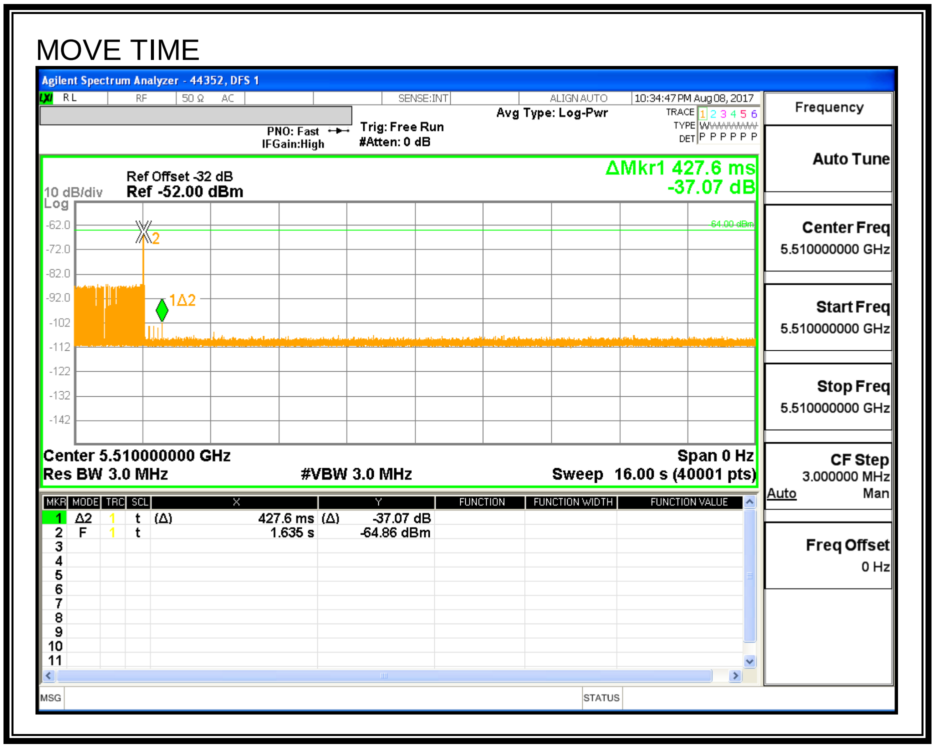
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

Channel Move Time (sec)	Limit (sec)
0.428	10

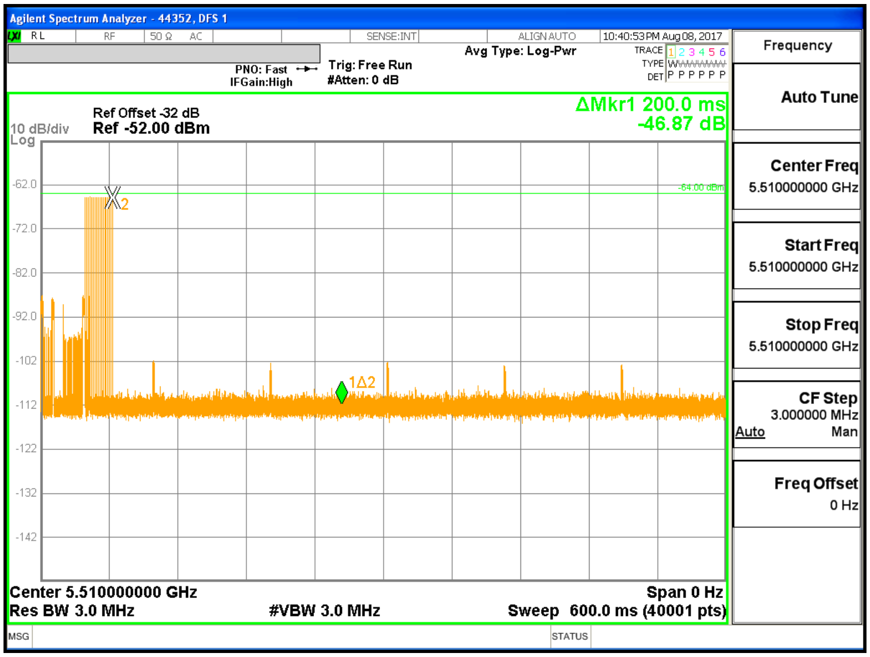
Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
4.8	60

MOVE TIME


MOVE TIME
Agilent Spectrum Analyzer - 44352, DFS 1
Avg Type: Log-Pwr
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
10:34:47 PM Aug 08, 2017
Ref Offset -32 dB
10 dB/div
Ref -52.00 dBm
ΔMkr1 427.6 ms
-37.07 dB
Center 5.510000000 GHz
Res BW 3.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 16.00 s (40001 pts)
1 Δ2 1 t (Δ) 427.6 ms (Δ) -37.07 dB
2 F 1 t 1.635 s -64.86 dBm
Frequency
Auto Tune
Center Freq
5.510000000 GHz
Start Freq
5.510000000 GHz
Stop Freq
5.510000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz

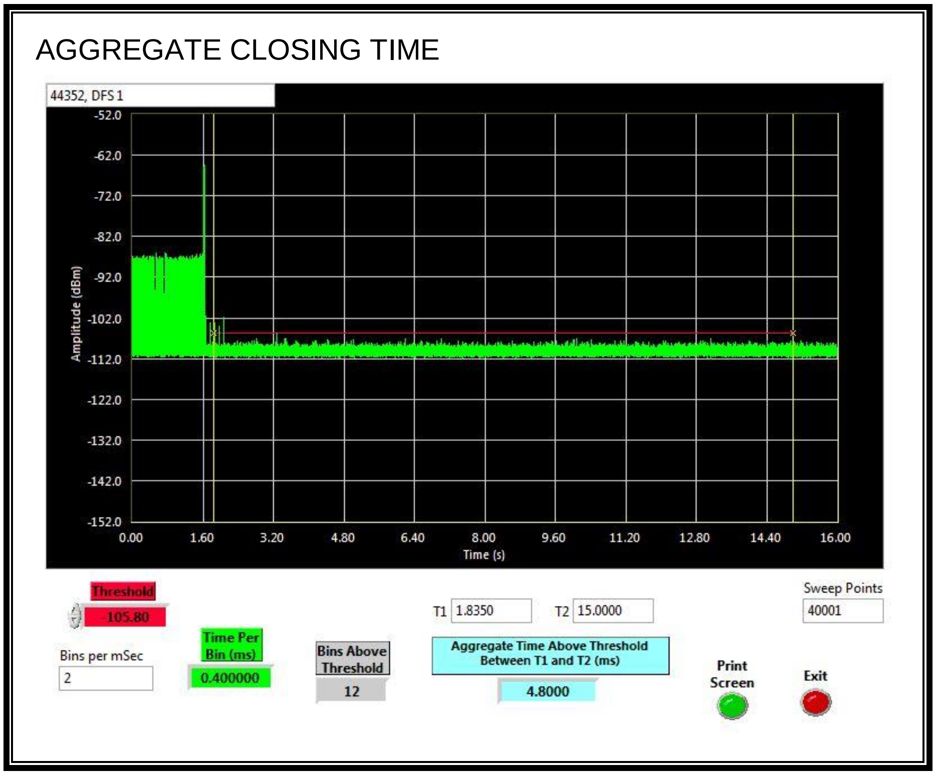
CHANNEL CLOSING TIME

CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

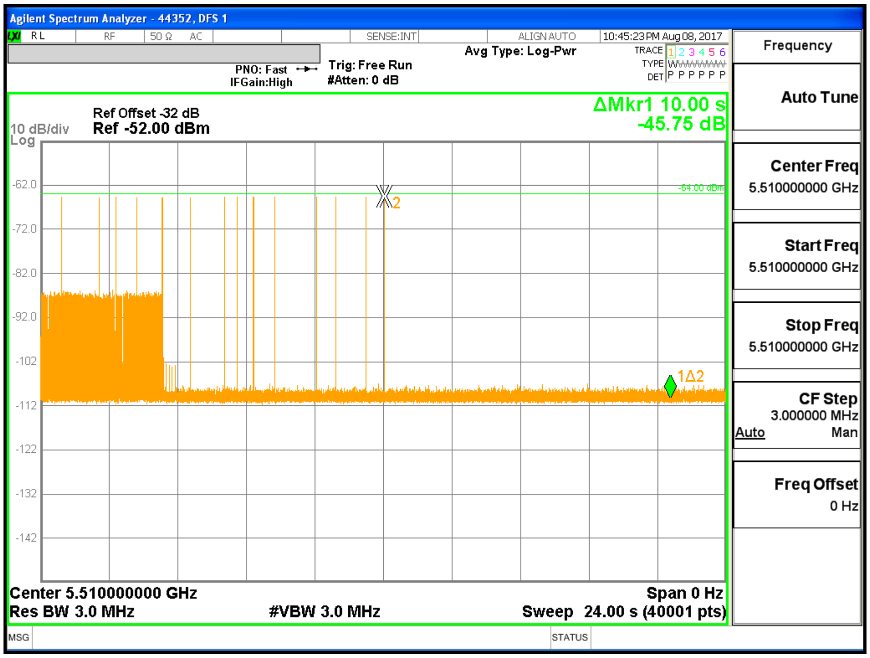
Only intermittent transmissions are observed during the aggregate monitoring period.



LONG PULSE CHANNEL MOVE TIME

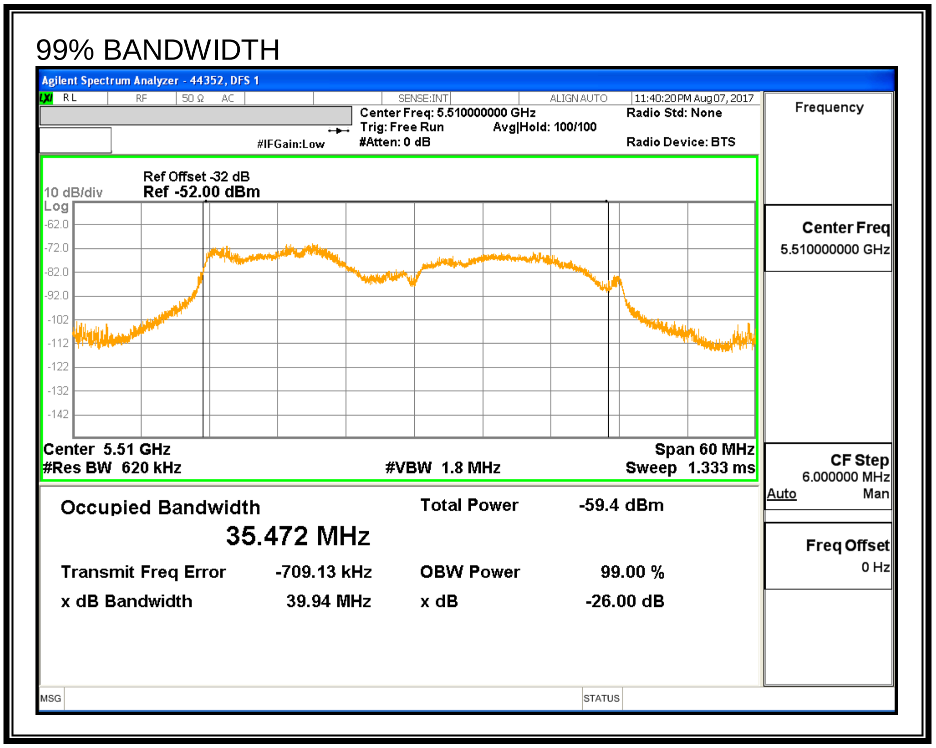
The traffic ceases prior to 10 seconds after the end of the radar waveform.

MOVE TIME FOR LONG PULSE RADAR



5.3.6. 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 (%)
5490	5530	40	35.472	112.8	100

DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results		44352	DFS 1	
FCC Type 0 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst				
Frequency (MHz)	Number of Trials	Number Detected	Detection (%)	Mark
5489	10	0	0	
5490	10	10	100	FL
5495	10	10	100	
5500	10	10	100	
5505	10	10	100	
5510	10	10	100	
5515	10	10	100	
5520	10	10	100	
5525	10	10	100	
5530	10	10	100	FH
5531	10	0	0	

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

5.3.7. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary										
Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail	Detection Bandwidth FL	Detection Bandwidth FH	OBW	Test Location	Employee Number	In-Service Monitoring Version
FCC Short Pulse Type 1	30	100.00	60	Pass	5490	5530	35.47	DFS 1	44352	Version 3.0
FCC Short Pulse Type 2	30	90.00	60	Pass	5490	5530	35.47	DFS 1	44352	Version 3.0
FCC Short Pulse Type 3	30	70.00	60	Pass	5490	5530	35.47	DFS 1	44352	Version 3.0
FCC Short Pulse Type 4	30	73.33	60	Pass	5490	5530	35.47	DFS 1	44352	Version 3.0
Aggregate		83.33	80	Pass						
FCC Long Pulse Type 5	30	100.00	80	Pass	5490	5530	35.47	DFS 1	44352	Version 3.0
FCC Hopping Type 6	41	100.00	70	Pass	5490	5530	35.47	DFS 1	44352	Version 3.0

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

TYPE 1 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 1

Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Test (A/B)	Frequency (MHz)	Successful Detection (Yes/No)
1001	1	3066	18	A	5527	Yes
1002	1	898	59	A	5513	Yes
1003	1	638	83	A	5515	Yes
1004	1	578	92	A	5521	Yes
1005	1	558	95	A	5492	Yes
1006	1	518	102	A	5500	Yes
1007	1	538	99	A	5492	Yes
1008	1	798	67	A	5494	Yes
1009	1	878	61	A	5499	Yes
1010	1	858	62	A	5493	Yes
1011	1	658	81	A	5517	Yes
1012	1	918	58	A	5494	Yes
1013	1	598	89	A	5519	Yes
1014	1	818	65	A	5502	Yes
1015	1	618	86	A	5523	Yes
1016	1	2809	19	B	5497	Yes
1017	1	1764	30	B	5512	Yes
1018	1	1043	51	B	5529	Yes
1019	1	1482	36	B	5522	Yes
1020	1	2244	24	B	5514	Yes
1021	1	1458	37	B	5503	Yes
1022	1	1155	46	B	5497	Yes
1023	1	3047	18	B	5512	Yes
1024	1	2873	19	B	5512	Yes
1025	1	1152	46	B	5497	Yes
1026	1	2462	22	B	5491	Yes
1027	1	870	61	B	5512	Yes
1028	1	2308	23	B	5504	Yes
1029	1	2200	24	B	5514	Yes
1030	1	1220	44	B	5494	Yes

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

TYPE 2 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 2					
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Frequency (MHz)	Successful Detection (Yes/No)
2001	2.8	159	27	5517	Yes
2002	4.9	198	29	5504	Yes
2003	3.4	188	28	5499	Yes
2004	3.7	150	29	5512	Yes
2005	4.6	224	29	5497	Yes
2006	3	190	27	5517	Yes
2007	2.1	150	27	5514	Yes
2008	4.8	163	26	5524	Yes
2009	4.2	208	23	5529	Yes
2010	1.1	226	26	5518	No
2011	2.8	194	23	5492	Yes
2012	4	177	27	5521	Yes
2013	1.9	192	24	5505	No
2014	1.4	180	28	5514	Yes
2015	3.5	199	29	5521	Yes
2016	3.2	191	23	5516	Yes
2017	1.5	177	25	5528	Yes
2018	3.6	172	27	5496	Yes
2019	4.2	162	25	5501	Yes
2020	2.4	205	27	5499	Yes
2021	3.3	199	26	5492	Yes
2022	1.7	208	25	5501	Yes
2023	4.9	206	25	5527	Yes
2024	3.5	219	24	5499	Yes
2025	2.9	183	28	5511	Yes
2026	2	200	24	5525	Yes
2027	1.5	211	28	5500	Yes
2028	2.7	152	24	5523	Yes
2029	4.7	167	29	5523	Yes
2030	4.2	154	26	5508	No

TYPE 3 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 3					
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Frequency (MHz)	Successful Detection (Yes/No)
3001	7.2	325	16	5523	No
3002	6.9	299	18	5507	Yes
3003	9.3	254	16	5507	No
3004	7.3	492	16	5505	Yes
3005	7.9	460	16	5495	No
3006	6.1	342	17	5503	No
3007	7	322	16	5511	No
3008	9.5	350	16	5493	Yes
3009	8.6	344	17	5507	Yes
3010	9.4	385	17	5499	Yes
3011	6.6	273	17	5511	Yes
3012	9.8	327	18	5498	Yes
3013	9.3	361	17	5492	No
3014	6.4	427	18	5500	Yes
3015	8.4	475	17	5502	Yes
3016	7.9	436	18	5530	Yes
3017	6	496	18	5526	Yes
3018	9.7	470	17	5512	Yes
3019	8	425	16	5516	Yes
3020	6	412	18	5504	No
3021	6.7	380	18	5517	Yes
3022	8.9	262	16	5498	Yes
3023	9.8	376	17	5514	Yes
3024	8.2	271	18	5523	Yes
3025	7.4	398	16	5505	Yes
3026	8.1	305	16	5513	Yes
3027	7.5	445	17	5518	Yes
3028	8.5	498	17	5512	No
3029	8.1	282	16	5517	No
3030	7.3	348	17	5506	Yes

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

TYPE 4 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 4					
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Frequency (MHz)	Successful Detection (Yes/No)
4001	13.5	395	16	5509	Yes
4002	12.3	357	13	5524	Yes
4003	17.2	417	14	5508	No
4004	16.5	391	12	5526	Yes
4005	17.5	346	16	5522	Yes
4006	17.2	333	15	5508	Yes
4007	18.7	301	14	5530	Yes
4008	14.7	434	13	5528	No
4009	16.6	297	12	5506	Yes
4010	17.9	443	14	5516	No
4011	11.2	318	16	5504	No
4012	12.9	477	15	5491	Yes
4013	11.5	365	13	5520	Yes
4014	13.7	301	13	5523	Yes
4015	12.7	453	16	5530	No
4016	11.1	269	13	5493	Yes
4017	19.7	316	14	5502	Yes
4018	18.6	277	12	5493	Yes
4019	14.3	337	13	5519	Yes
4020	13.6	312	16	5523	Yes
4021	14.6	267	15	5491	Yes
4022	14.4	387	16	5505	Yes
4023	15.8	355	12	5505	No
4024	11.8	354	16	5506	Yes
4025	13.7	468	16	5492	No
4026	15	363	12	5515	No
4027	17.4	490	14	5511	Yes
4028	19.1	397	14	5527	Yes
4029	17.7	419	12	5509	Yes
4030	19.9	473	16	5523	Yes

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5

Trial	Frequency (MHz)	Successful Detection (Yes/No)
1	5510	Yes
2	5510	Yes
3	5510	Yes
4	5510	Yes
5	5510	Yes
6	5510	Yes
7	5510	Yes
8	5510	Yes
9	5510	Yes
10	5510	Yes
11	5497	Yes
12	5500	Yes
13	5495	Yes
14	5496	Yes
15	5500	Yes
16	5500	Yes
17	5495	Yes
18	5497	Yes
19	5500	Yes
20	5498	Yes
21	5525	Yes
22	5520	Yes
23	5520	Yes
24	5525	Yes
25	5523	Yes
26	5520	Yes
27	5523	Yes
28	5521	Yes
29	5523	Yes
30	5521	Yes

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

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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	81	5490	8	Yes
2	556	5491	11	Yes
3	1031	5492	5	Yes
4	1506	5493	9	Yes
5	1981	5494	11	Yes
6	2456	5495	11	Yes
7	2931	5496	10	Yes
8	3406	5497	6	Yes
9	3881	5498	10	Yes
10	4356	5499	7	Yes
11	4831	5500	9	Yes
12	5306	5501	8	Yes
13	5781	5502	11	Yes
14	6256	5503	10	Yes
15	6731	5504	6	Yes
16	7206	5505	8	Yes
17	7681	5506	7	Yes
18	8156	5507	10	Yes
19	8631	5508	7	Yes
20	9106	5509	14	Yes
21	9581	5510	7	Yes
22	10056	5511	8	Yes
23	10531	5512	5	Yes
24	11006	5513	6	Yes
25	11481	5514	9	Yes
26	11956	5515	14	Yes
27	12431	5516	7	Yes
28	12906	5517	13	Yes
29	13381	5518	17	Yes
30	13856	5519	4	Yes
31	14331	5520	9	Yes
32	14806	5521	6	Yes
33	15281	5522	10	Yes
34	15756	5523	8	Yes
35	16231	5524	7	Yes
36	16706	5525	8	Yes
37	17181	5526	8	Yes
38	17656	5527	9	Yes
39	18131	5528	11	Yes
40	18606	5529	7	Yes
41	19081	5530	5	Yes

5.4. RESULTS FOR 80 MHz BANDWIDTH

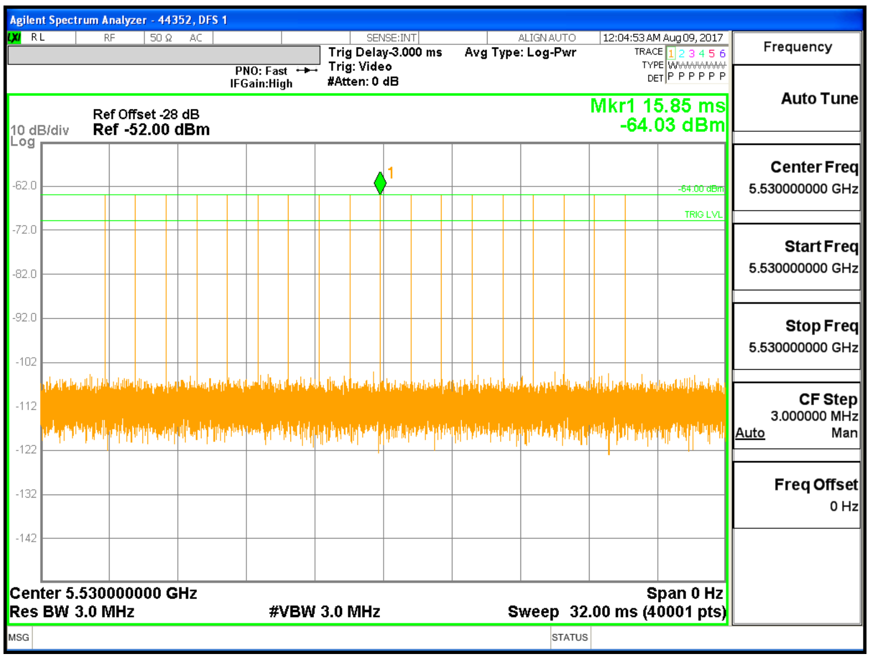
5.4.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5530 MHz.

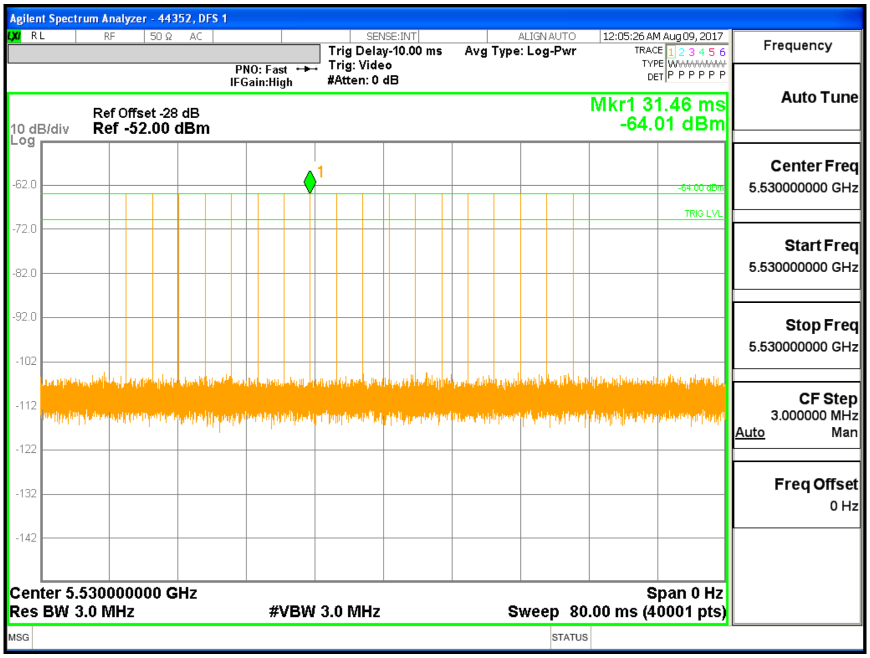
5.4.2. RADAR WAVEFORMS AND TRAFFIC

RADAR WAVEFORMS

SHORT PULSE RADAR TYPE 0

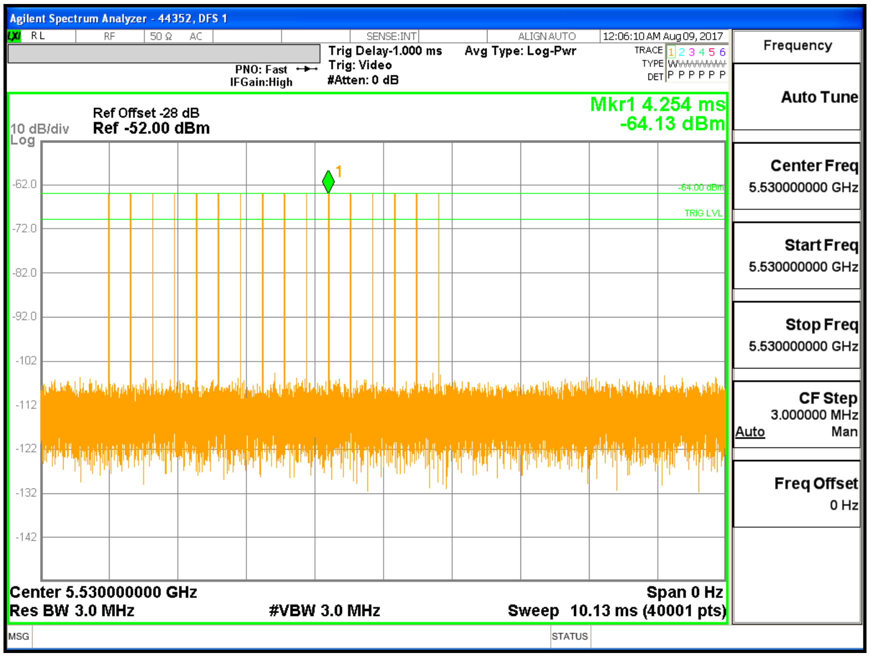


SAMPLE OF RADAR TYPE 1

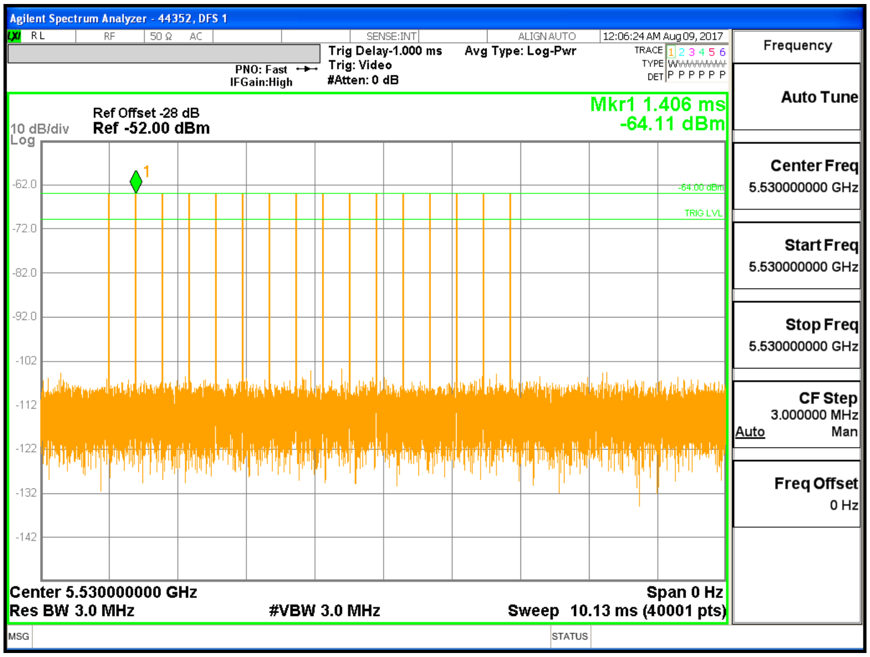


SAMPLE OF RADAR TYPE 2

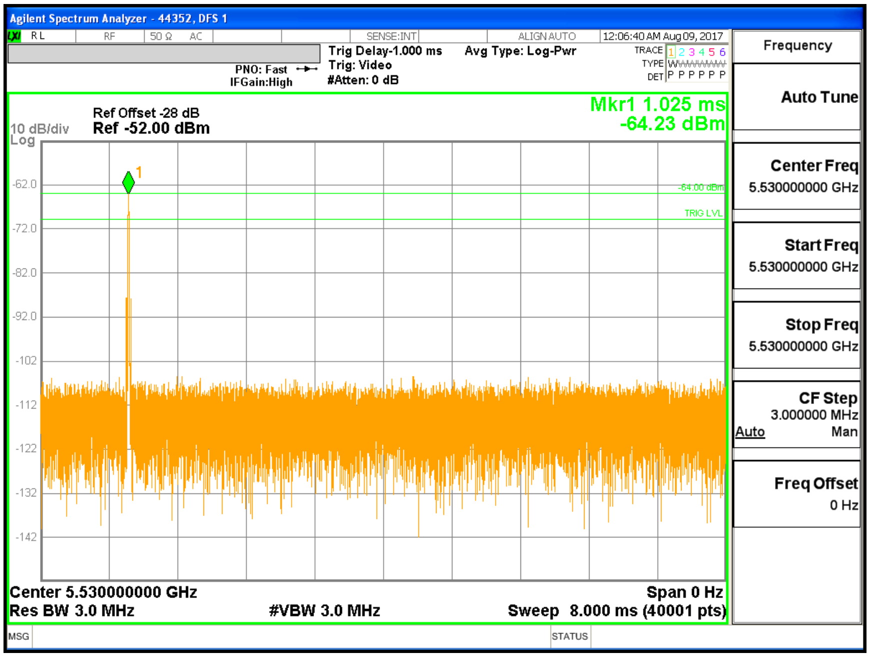
SAMPLE OF RADAR TYPE 3



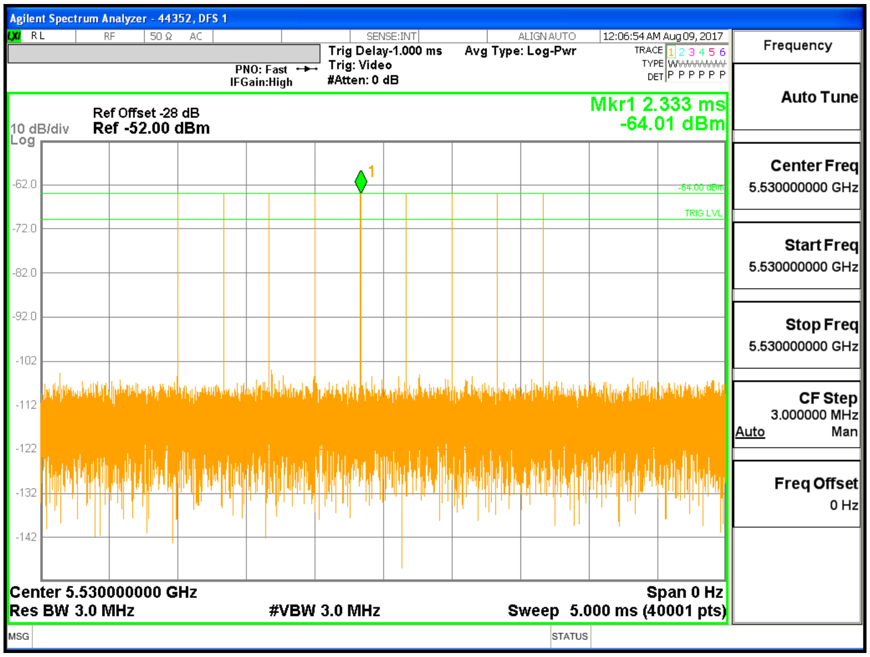
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

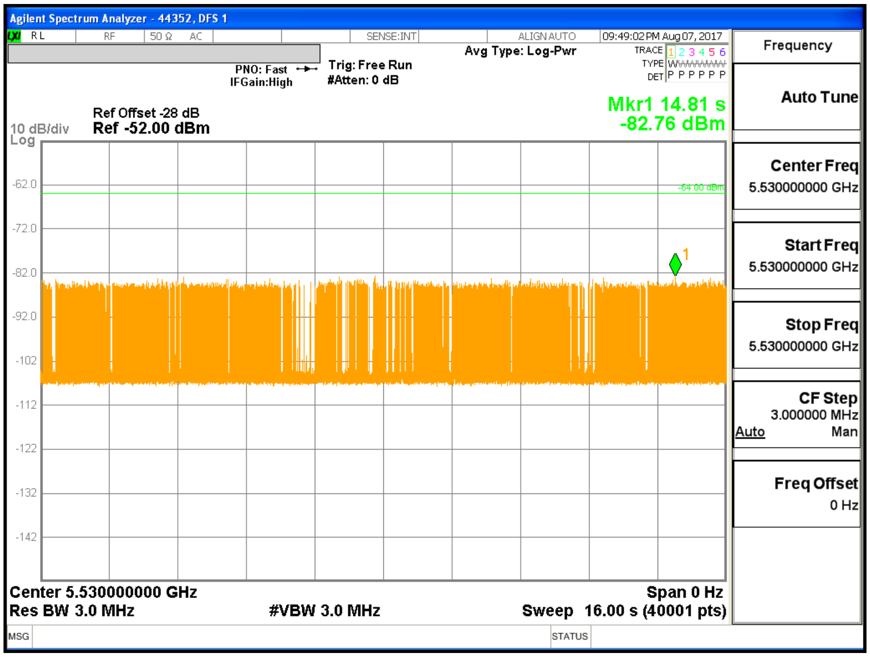


SINGLE BURST OF RADAR TYPE 6

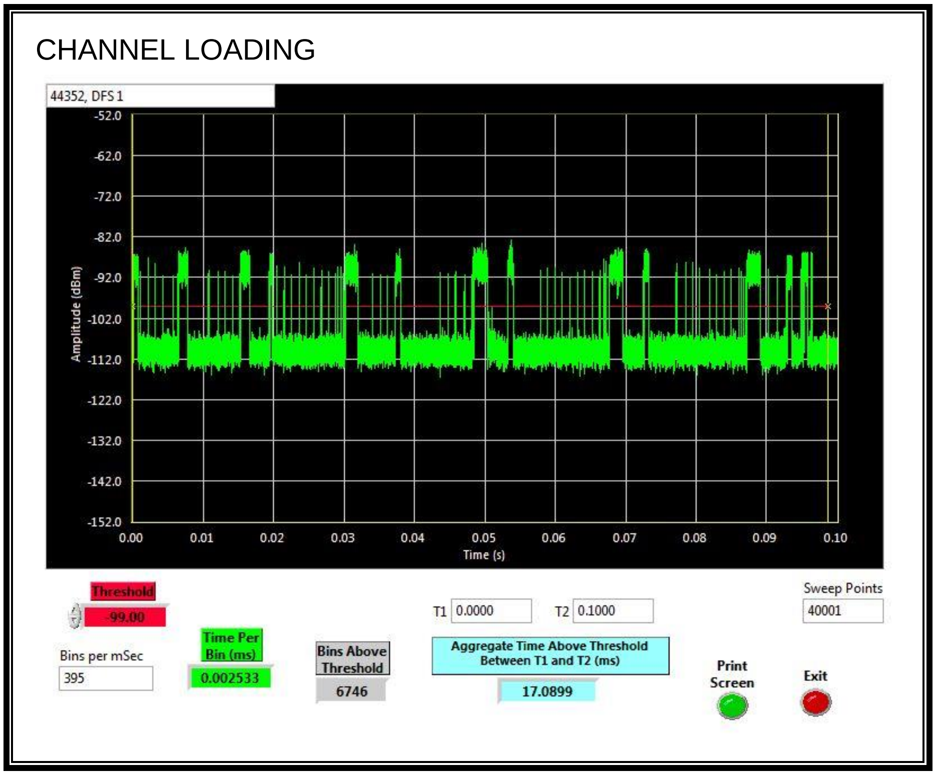


TRAFFIC

TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 17.0899%.

5.4.1. 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)
30.03	181.3	151.3	91.3

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)
30.55	123.2	92.7	1.4

Radar Near End of CAC

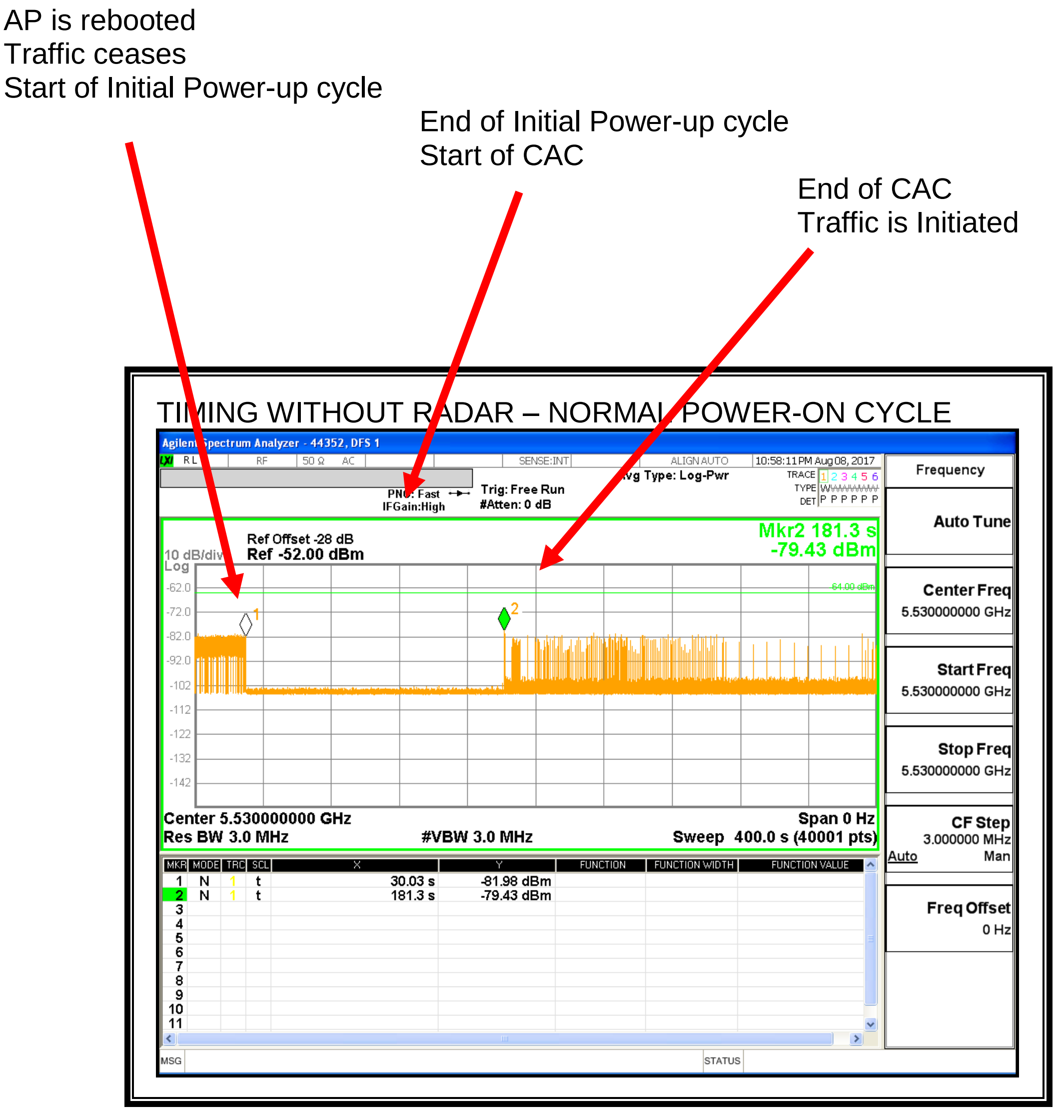
Timing of Reboot (sec)	Timing of Radar Burst (sec)	Radar Relative to Reboot (sec)	Radar Relative to Start of CAC (sec)
30.56	179.8	149.2	58.0

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

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

TIMING WITHOUT RADAR DURING CAC



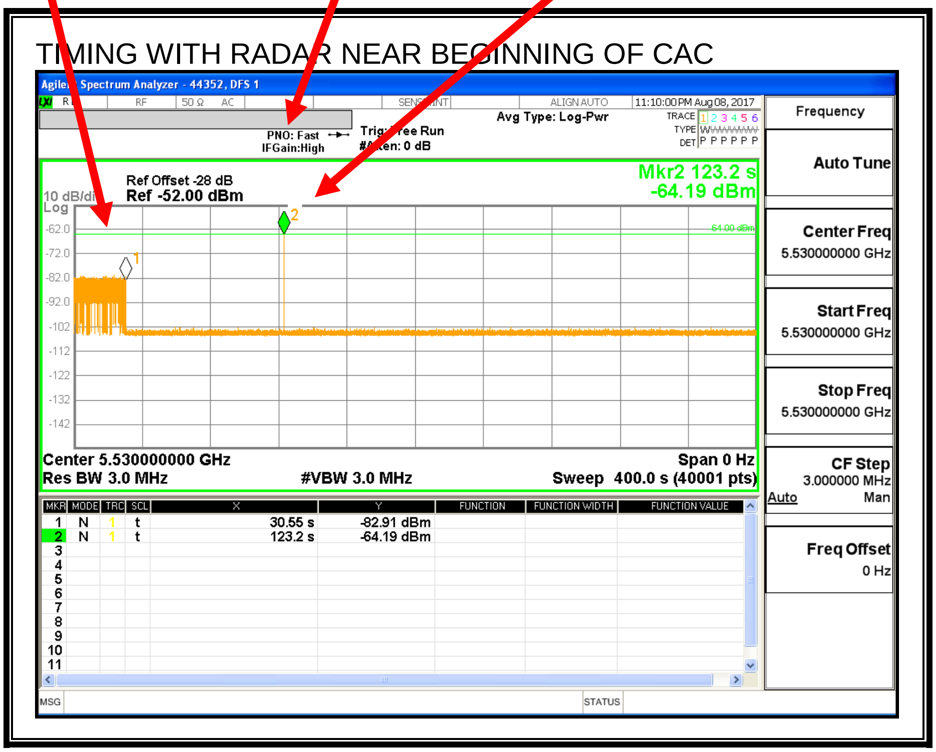
Transmissions begin on channel after completion of the initial power-up cycle and the CAC.

TIMING 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



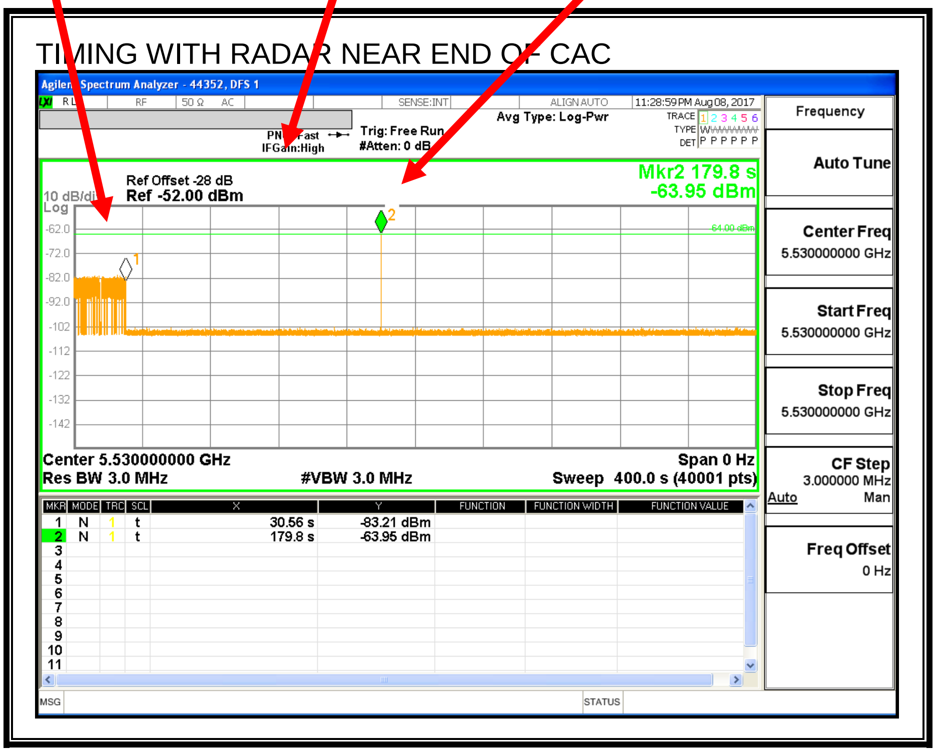
No EUT transmissions were observed after the radar signal.

TIMING 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.

5.4.2. OVERLAPPING CHANNEL TESTS

RESULTS

The channel spacing is not less than the channel bandwidth therefore the EUT does not have an overlapping channel plan.

These tests are not applicable.

5.4.3. 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 aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

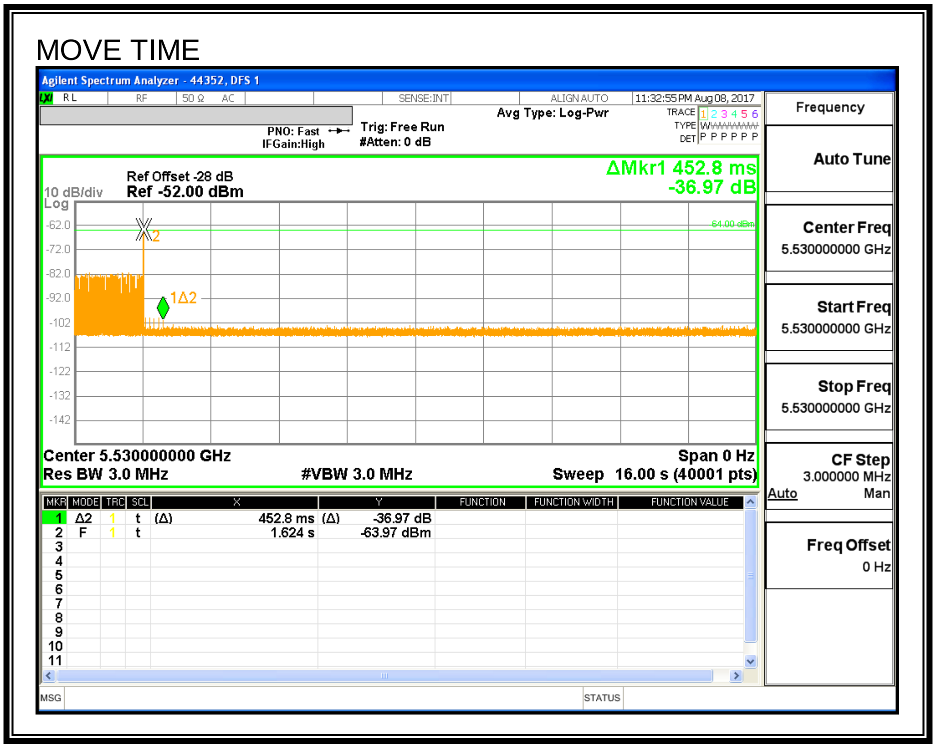
RESULTS

Channel Move Time (sec)	Limit (sec)
0.453	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
2.4	60

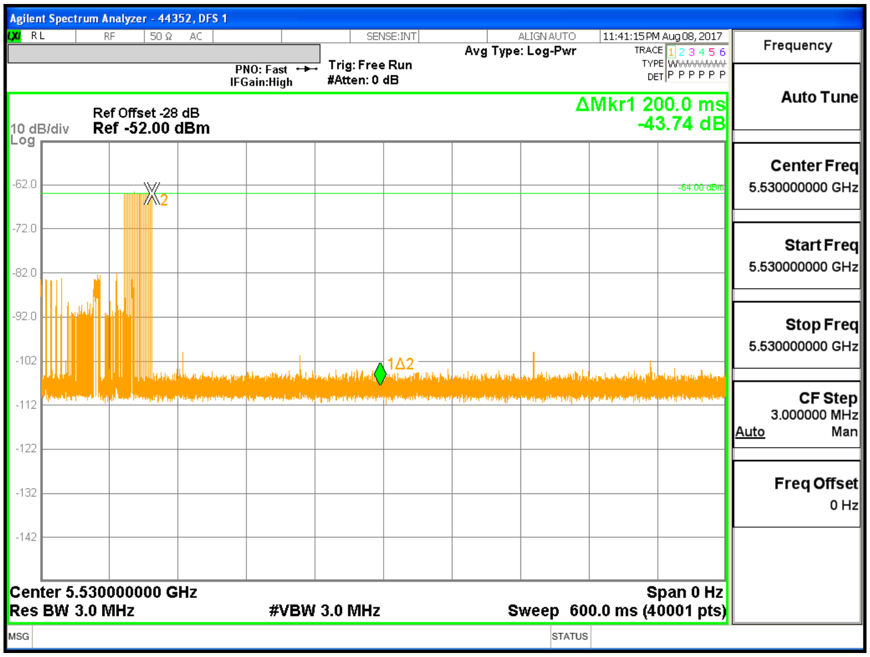
UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

MOVE TIME


MOVE TIME
Agilent Spectrum Analyzer - 44352, DFS 1
Avg Type: Log-Pwr
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
11:32:55 PM Aug 08, 2017
Ref Offset -28 dB
10 dB/div
Ref -52.00 dBm
ΔMkr1 452.8 ms
-36.97 dB
Center 5.530000000 GHz
Res BW 3.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 16.00 s (40001 pts)
1 Δ2 1 t (Δ) 452.8 ms (Δ) -36.97 dB
2 F 1 t 1.624 s -63.97 dBm
Frequency
Auto Tune
Center Freq
5.530000000 GHz
Start Freq
5.530000000 GHz
Stop Freq
5.530000000 GHz
CF Step
3.000000 MHz
Auto
Man
Freq Offset
0 Hz

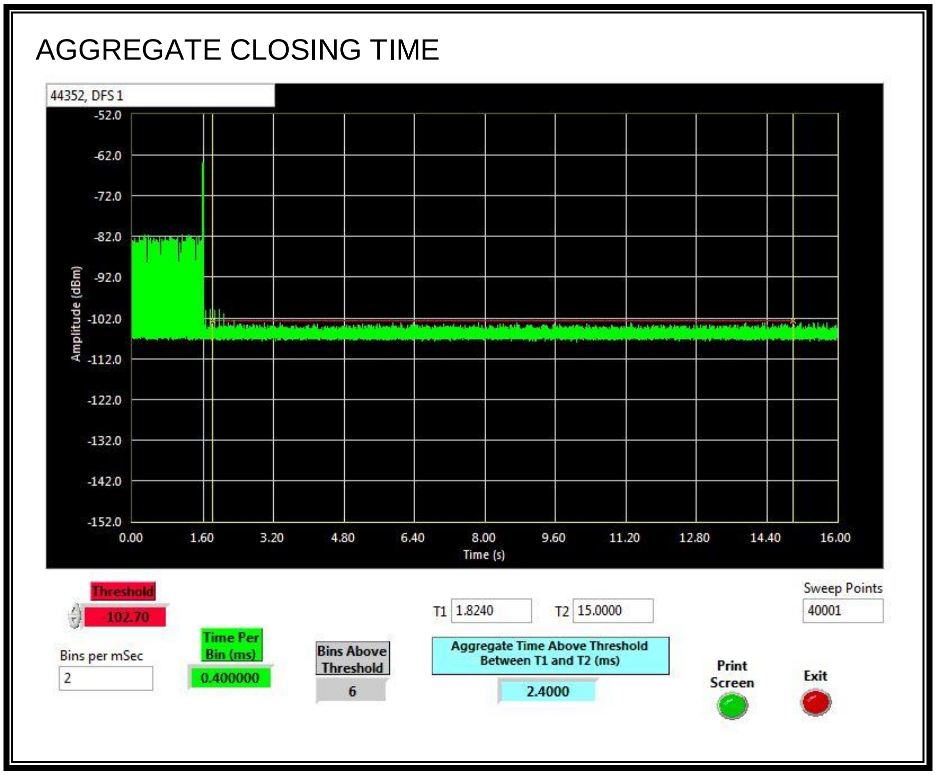
CHANNEL CLOSING TIME

CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

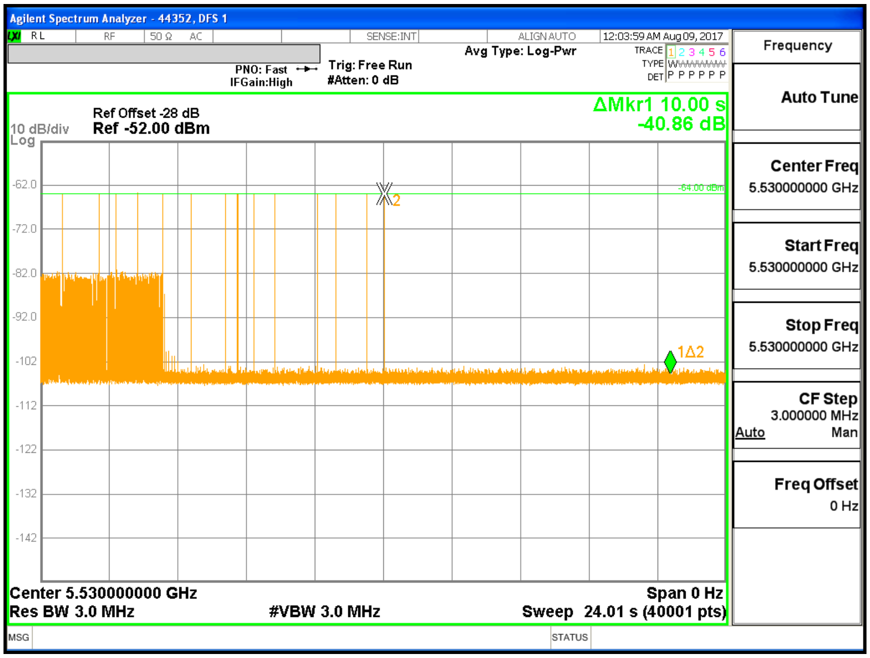
Only intermittent transmissions are observed during the aggregate monitoring period.



LONG PULSE CHANNEL MOVE TIME

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

MOVE TIME FOR LONG PULSE RADAR

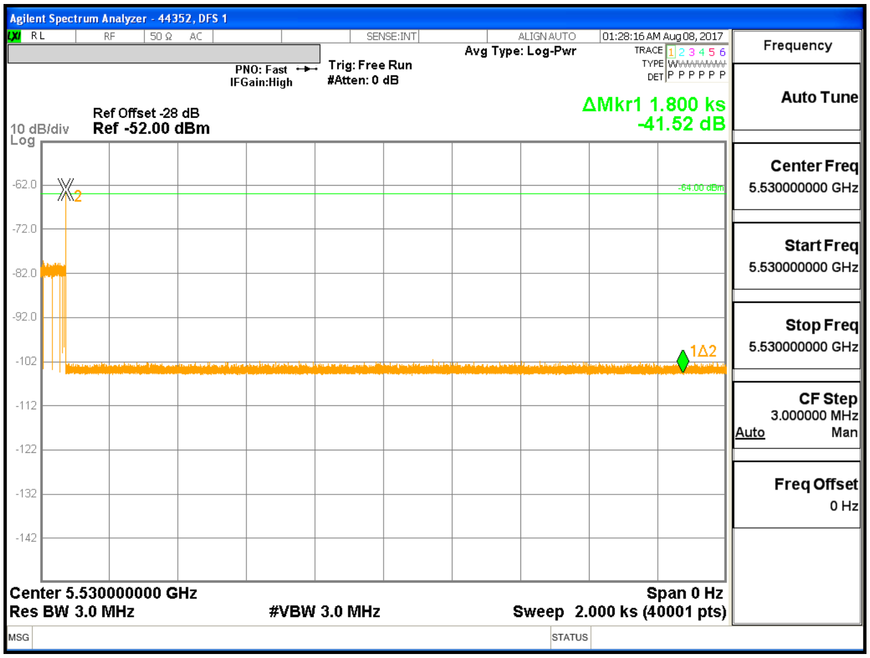


5.4.4. NON-OCCUPANCY PERIOD

RESULTS

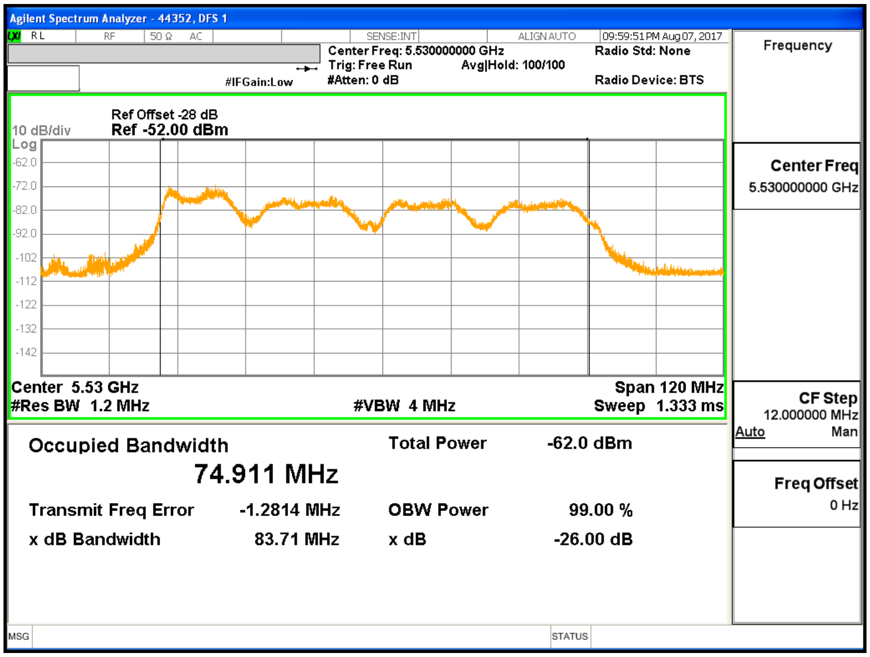
No EUT transmissions were observed on the test channel during the 30-minute observation time.

NON-OCCUPANCY PERIOD



5.4.5. 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 (%)
5490	5570	80	74.911	106.8	100

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results 44352 DFS 1

FCC Type 0 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst

Frequency (MHz)	Number of Trials	Number Detected	Detection (%)	Mark
5489	10	0	0	
5490	10	10	100	FL
5495	10	10	100	
5500	10	10	100	
5505	10	10	100	
5510	10	10	100	
5515	10	10	100	
5520	10	10	100	
5525	10	10	100	
5530	10	10	100	
5535	10	10	100	
5540	10	10	100	
5545	10	10	100	
5550	10	10	100	
5555	10	10	100	
5560	10	10	100	
5565	10	10	100	
5570	10	10	100	FH
5571	10	0	0	

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

5.4.6. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary

Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail	Detection Bandwidth FL	Detection Bandwidth FH	OBW	Test Location	Employee Number	In-Service Monitoring Version
FCC Short Pulse Type 1	30	96.67	60	Pass	5490	5570	74.91	DFS 1	44352	Version 3.0
FCC Short Pulse Type 2	30	90.00	60	Pass	5490	5570	74.91	DFS 1	44352	Version 3.0
FCC Short Pulse Type 3	30	90.00	60	Pass	5490	5570	74.91	DFS 1	44352	Version 3.0
FCC Short Pulse Type 4	30	86.67	60	Pass	5490	5570	74.91	DFS 1	44352	Version 3.0
Aggregate		90.83	80	Pass						
FCC Long Pulse Type 5	30	100.00	80	Pass	5490	5570	74.91	DFS 1	44352	Version 3.0
FCC Hopping Type 6	81	100.00	70	Pass	5490	5570		DFS 1	44352	Version 3.0

TYPE 1 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 1

Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Test (A/B)	Frequency (MHz)	Successful Detection (Yes/No)
1001	1	3066	18	A	5505	Yes
1002	1	898	59	A	5517	Yes
1003	1	638	83	A	5497	Yes
1004	1	578	92	A	5507	Yes
1005	1	558	95	A	5503	No
1006	1	518	102	A	5520	Yes
1007	1	538	99	A	5515	Yes
1008	1	798	67	A	5496	Yes
1009	1	878	61	A	5551	Yes
1010	1	858	62	A	5559	Yes
1011	1	658	81	A	5518	Yes
1012	1	918	58	A	5556	Yes
1013	1	598	89	A	5533	Yes
1014	1	818	65	A	5507	Yes
1015	1	618	86	A	5506	Yes
1016	1	2809	19	B	5531	Yes
1017	1	1764	30	B	5556	Yes
1018	1	1043	51	B	5515	Yes
1019	1	1482	36	B	5528	Yes
1020	1	2244	24	B	5538	Yes
1021	1	1458	37	B	5562	Yes
1022	1	1155	46	B	5549	Yes
1023	1	3047	18	B	5503	Yes
1024	1	2873	19	B	5545	Yes
1025	1	1152	46	B	5534	Yes
1026	1	2462	22	B	5536	Yes
1027	1	870	61	B	5499	Yes
1028	1	2308	23	B	5558	Yes
1029	1	2200	24	B	5495	Yes
1030	1	1220	44	B	5527	Yes

TYPE 2 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 2					
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Frequency (MHz)	Successful Detection (Yes/No)
2001	2.8	159	27	5498	Yes
2002	4.9	198	29	5496	Yes
2003	3.4	188	28	5550	Yes
2004	3.7	150	29	5552	Yes
2005	4.6	224	29	5491	Yes
2006	3	190	27	5502	Yes
2007	2.1	150	27	5518	Yes
2008	4.8	163	26	5526	Yes
2009	4.2	208	23	5527	Yes
2010	1.1	226	26	5504	Yes
2011	2.8	194	23	5540	Yes
2012	4	177	27	5514	Yes
2013	1.9	192	24	5495	Yes
2014	1.4	180	28	5549	Yes
2015	3.5	199	29	5562	Yes
2016	3.2	191	23	5561	Yes
2017	1.5	177	25	5551	No
2018	3.6	172	27	5570	No
2019	4.2	162	25	5510	Yes
2020	2.4	205	27	5554	Yes
2021	3.3	199	26	5543	Yes
2022	1.7	208	25	5519	Yes
2023	4.9	206	25	5532	Yes
2024	3.5	219	24	5556	Yes
2025	2.9	183	28	5567	No
2026	2	200	24	5518	Yes
2027	1.5	211	28	5535	Yes
2028	2.7	152	24	5537	Yes
2029	4.7	167	29	5515	Yes
2030	4.2	154	26	5495	Yes

TYPE 3 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 3

Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Frequency (MHz)	Successful Detection (Yes/No)
3001	7.2	325	16	5495	No
3002	6.9	299	18	5494	Yes
3003	9.3	254	16	5532	Yes
3004	7.3	492	16	5497	Yes
3005	7.9	460	16	5502	Yes
3006	6.1	342	17	5568	Yes
3007	7	322	16	5553	Yes
3008	9.5	350	16	5505	Yes
3009	8.6	344	17	5560	Yes
3010	9.4	385	17	5547	Yes
3011	6.6	273	17	5510	Yes
3012	9.8	327	18	5497	Yes
3013	9.3	361	17	5517	Yes
3014	6.4	427	18	5569	Yes
3015	8.4	475	17	5538	Yes
3016	7.9	436	18	5507	Yes
3017	6	496	18	5524	Yes
3018	9.7	470	17	5522	Yes
3019	8	425	16	5537	Yes
3020	6	412	18	5491	No
3021	6.7	380	18	5523	Yes
3022	8.9	262	16	5508	No
3023	9.8	376	17	5527	Yes
3024	8.2	271	18	5516	Yes
3025	7.4	398	16	5517	Yes
3026	8.1	305	16	5544	Yes
3027	7.5	445	17	5556	Yes
3028	8.5	498	17	5513	Yes
3029	8.1	282	16	5553	Yes
3030	7.3	348	17	5517	Yes

TYPE 4 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 4					
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Frequency (MHz)	Successful Detection (Yes/No)
4001	13.5	395	16	5535	Yes
4002	12.3	357	13	5541	Yes
4003	17.2	417	14	5504	Yes
4004	16.5	391	12	5502	No
4005	17.5	346	16	5511	Yes
4006	17.2	333	15	5530	Yes
4007	18.7	301	14	5569	Yes
4008	14.7	434	13	5501	Yes
4009	16.6	297	12	5518	Yes
4010	17.9	443	14	5491	Yes
4011	11.2	318	16	5537	Yes
4012	12.9	477	15	5537	Yes
4013	11.5	365	13	5541	Yes
4014	13.7	301	13	5513	Yes
4015	12.7	453	16	5508	Yes
4016	11.1	269	13	5547	Yes
4017	19.7	316	14	5502	Yes
4018	18.6	277	12	5563	Yes
4019	14.3	337	13	5531	No
4020	13.6	312	16	5544	Yes
4021	14.6	267	15	5505	Yes
4022	14.4	387	16	5518	Yes
4023	15.8	355	12	5548	Yes
4024	11.8	354	16	5496	No
4025	13.7	468	16	5566	Yes
4026	15	363	12	5565	Yes
4027	17.4	490	14	5508	Yes
4028	19.1	397	14	5565	Yes
4029	17.7	419	12	5527	No
4030	19.9	473	16	5549	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5

Trial	Frequency (MHz)	Successful Detection (Yes/No)
1	5530	Yes
2	5530	Yes
3	5530	Yes
4	5530	Yes
5	5530	Yes
6	5530	Yes
7	5530	Yes
8	5530	Yes
9	5530	Yes
10	5530	Yes
11	5498	Yes
12	5500	Yes
13	5496	Yes
14	5496	Yes
15	5500	Yes
16	5500	Yes
17	5496	Yes
18	5497	Yes
19	5501	Yes
20	5499	Yes
21	5564	Yes
22	5560	Yes
23	5560	Yes
24	5565	Yes
25	5563	Yes
26	5559	Yes
27	5563	Yes
28	5561	Yes
29	5563	Yes
30	5560	Yes

Note: The Type 5 randomized parameters tested 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	311	5490	13	Yes
2	786	5491	16	Yes
3	1261	5492	20	Yes
4	1736	5493	21	Yes
5	2211	5494	16	Yes
6	2686	5495	14	Yes
7	3161	5496	14	Yes
8	3636	5497	9	Yes
9	4111	5498	17	Yes
10	4586	5499	9	Yes
11	5061	5500	9	Yes
12	5536	5501	16	Yes
13	6011	5502	13	Yes
14	6486	5503	17	Yes
15	6961	5504	20	Yes
16	7436	5505	18	Yes
17	7911	5506	18	Yes
18	8386	5507	14	Yes
19	8861	5508	23	Yes
20	9336	5509	15	Yes
21	9811	5510	20	Yes
22	10286	5511	20	Yes
23	10761	5512	17	Yes
24	11236	5513	21	Yes
25	11711	5514	13	Yes
26	12186	5515	16	Yes
27	12661	5516	23	Yes
28	13136	5517	15	Yes
29	13611	5518	14	Yes
30	14086	5519	20	Yes
31	14561	5520	13	Yes
32	15036	5521	16	Yes
33	15511	5522	16	Yes
34	15986	5523	18	Yes
35	16461	5524	16	Yes
36	16936	5525	11	Yes
37	17411	5526	11	Yes
38	17886	5527	14	Yes

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

TYPE 6 DETECTION PROBABILITY (CONTINUED)

39	18361	5528	16	Yes
40	18836	5529	19	Yes
41	19311	5530	21	Yes
42	19786	5531	20	Yes
43	20261	5532	20	Yes
44	20736	5533	13	Yes
45	21211	5534	25	Yes
46	21686	5535	20	Yes
47	22161	5536	16	Yes
48	22636	5537	18	Yes
49	23111	5538	15	Yes
50	23586	5539	14	Yes
51	24061	5540	12	Yes
52	24536	5541	10	Yes
53	25011	5542	14	Yes
54	25486	5543	16	Yes
55	25961	5544	14	Yes
56	26436	5545	15	Yes
57	26911	5546	18	Yes
58	27386	5547	25	Yes
59	27861	5548	17	Yes
60	28336	5549	21	Yes
61	28811	5550	20	Yes
62	29286	5551	18	Yes
63	29761	5552	13	Yes
64	30236	5553	18	Yes
65	30711	5554	13	Yes
66	31186	5555	18	Yes
67	31661	5556	12	Yes
68	32136	5557	22	Yes
69	32611	5558	15	Yes
70	33086	5559	18	Yes
71	33561	5560	24	Yes
72	34036	5561	18	Yes
73	34511	5562	13	Yes
74	34986	5563	24	Yes
75	35461	5564	18	Yes
76	35936	5565	22	Yes
77	36411	5566	19	Yes
78	36886	5567	19	Yes
79	37361	5568	18	Yes
80	37836	5569	17	Yes
81	38311	5570	20	Yes

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

5.5. BRIDGE MODE RESULTS

Per KDB 905462, Section 5.1 (footnote 1):

Networks Access Points with Bridge and/or MESH modes of operation are permitted to operate in the DFS bands but must employ a DFS function. The functionality of the Bridge mode as specified in §15.403(a) must be validated in the DFS test report. Devices operating as relays must also employ DFS function. The method used to validate the functionality must be documented and validation data must be documented. Bridge mode can be validated by performing a test statistical performance check (Section 7.8.4) on any one of the radar types. This is an abbreviated test to verify DFS functionality. MESH mode operational methodology must be submitted in the application for certification for evaluation by the FCC.

This device does not support Bridge Mode therefore this test was not performed.