QUANTITATIVE RESULTS BASED ON EUT TEST MODE LOG FILE TIME STAMPS

No Radar Triggered

Start of CAC at 5315 MHz (hh:mm:ss)	End of CAC at 5315 MHz (hh:mm:ss)	CAC Time (hh:mm:ss)
0:02:14	0:03:15	0:01:01

Radar Near Beginning of CAC

Start of CAC at 5315 MHz (hh:mm:ss)	Radar Detected at 5315 MHz (hh:mm:ss)	Radar Relative to Start of CAC (hh:mm:ss)
0:02:13	0:02:17	0:00:04

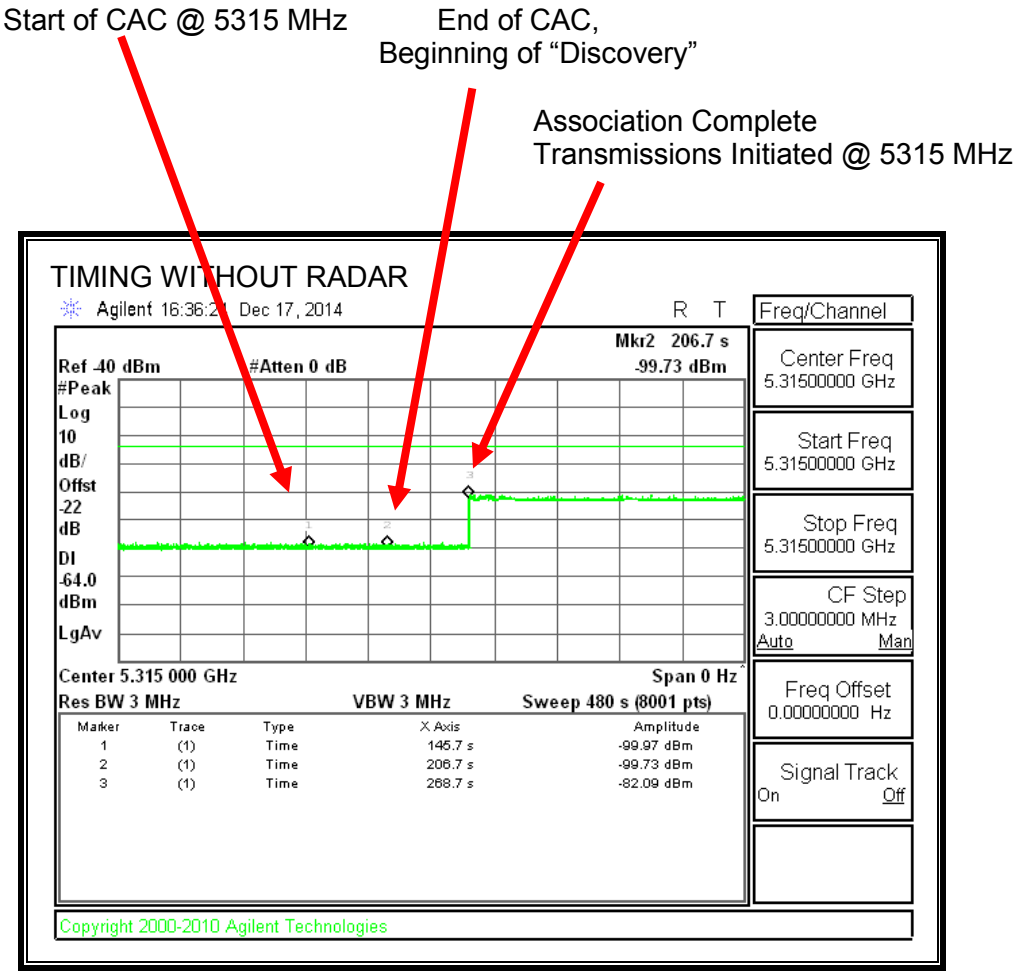
Radar Near End of CAC

Start of CAC at 5315 MHz (hh:mm:ss)	Radar Detected at 5315 MHz (hh:mm:ss)	Radar Relative to Start of CAC (hh:mm:ss)
0:02:18	0:03:16	0:00:58

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 the completion of the association period following 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 intended channel after completion of CAC.

EUT RADAR EVENTS LOG FILE - CAC TIMING WITHOUT RADAR

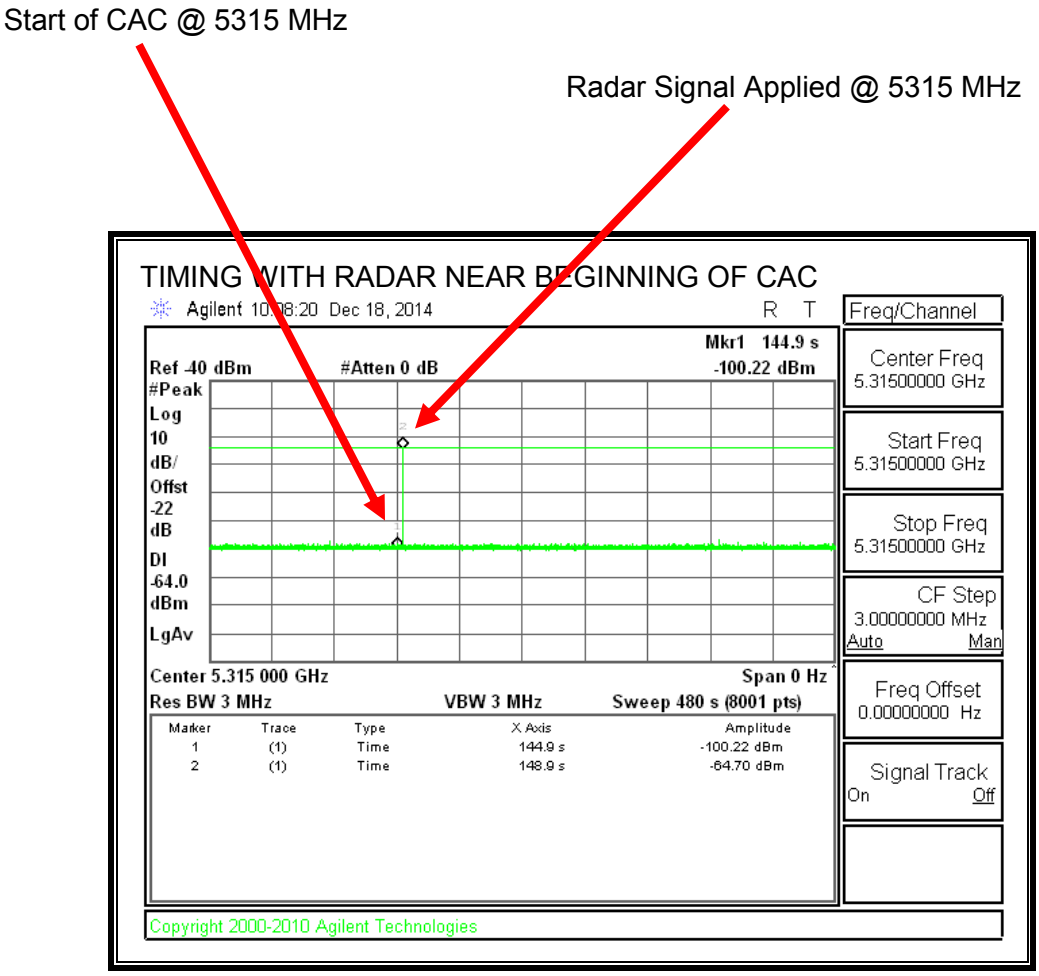
Jan 1 00:02:14 IBR daemon.notice mgd: RRC DFS: TStamp = 64289 msec, CAC START ... wait for 60-secs,

Jan 1 00:03:15 IBR daemon.notice mgd: RRC DFS: TStamp = 125289 msec, CAC DONE

Jan 1 00:03:27 IBR daemon.notice mgd: RRC MASTER : ENTER -> STATE_WAIT_SYNCH
Jan 1 00:03:48 IBR daemon.notice mgd: RRC MASTER : ENTER -> STATE_PICK_TOP_ANTS
Jan 1 00:03:48 IBR daemon.notice mgd: RRC MASTER : ENTER -> STATE_WAIT_NODE_INFO
Jan 1 00:03:48 IBR daemon.notice mgd: RRC MASTER : ENTER -> STATE_EXCH_FREQ_MASK
Jan 1 00:03:49 IBR daemon.notice mgd: RRC MASTER : ENTER -> STATE_WAIT_COORD_TRANS
Jan 1 00:03:49 IBR daemon.notice mgd: RRC MASTER : ENTER -> STATE_DL_XS

Jan 1 00:04:17 IBR daemon.notice mgd: RX: Changing frequency to 5315, antennas to 8716, and BW to 0

TIMING WITH RADAR NEAR BEGINNING OF CAC



No EUT transmissions on the intended channel were observed.

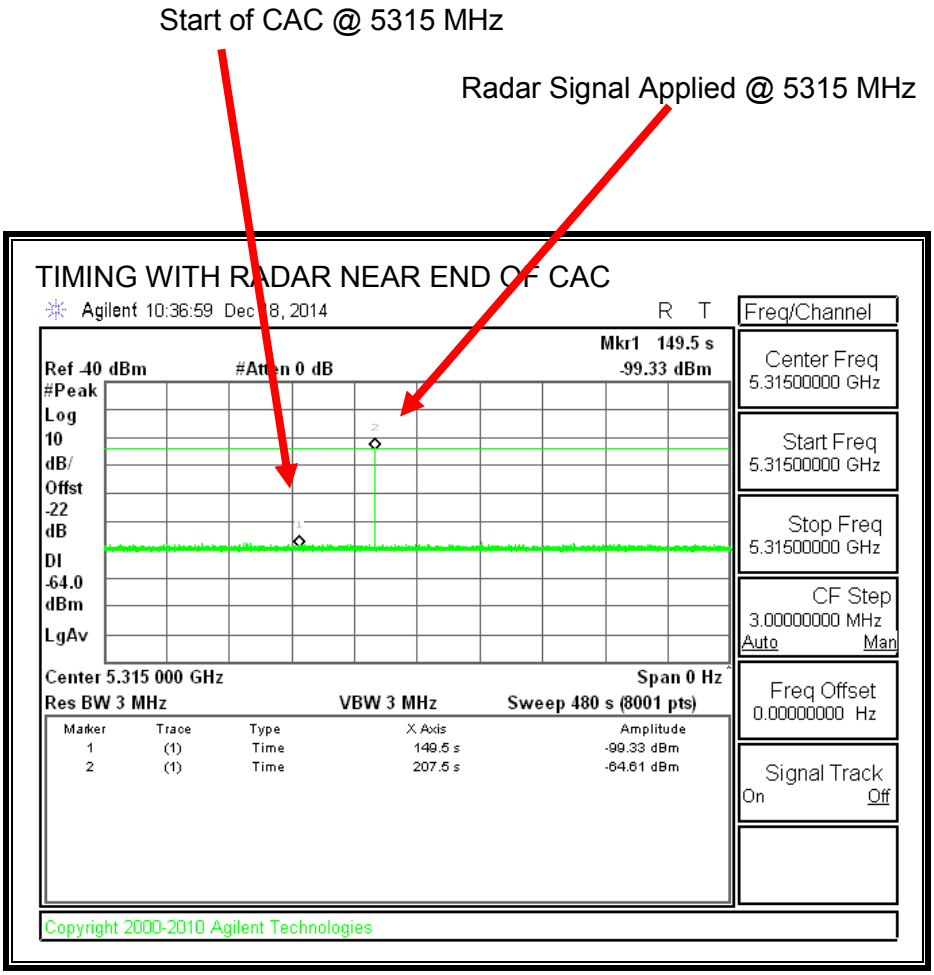
EUT RADAR EVENTS LOG FILE - BEGINNING OF CAC

Jan 1 00:02:13 IBR daemon.notice mgd: RRC DFS: TStamp = 64294 msec, CAC START ... wait for 60-secs,

Jan 1 00:02:17 IBR daemon.notice mgd: RRC_DFS_RX: TStamp:67515 msec,RADAR DETECTED in freq_band lbe= 58,ube= 65,start=5290,end=5329

Jan 1 00:02:17 IBR daemon.notice mgd: DFS Blackout Table
Jan 1 00:02:17 IBR daemon.notice mgd: 5250 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:02:17 IBR daemon.notice mgd: 5270 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:02:17 IBR daemon.notice mgd: 5290 Mhz: 31:00 31:00 31:00 31:00
Jan 1 00:02:17 IBR daemon.notice mgd: 5310 Mhz: 31:00 31:00 31:00 31:00
Jan 1 00:02:17 IBR daemon.notice mgd: 5330 Mhz: 00:00 00:00 00:00 00:00

TIMING WITH RADAR NEAR END OF CAC



No EUT transmissions on the intended channel were observed.

EUT RADAR EVENTS LOG FILE - END OF CAC

Jan 1 00:02:18 IBR daemon.notice mgd: RRC DFS: TStamp = 64275 msec, CAC START ... wait for 60-secs,

Jan 1 00:03:16 IBR daemon.notice mgd: RRC_DFS_RX: TStamp:123088 msec,RADAR DETECTED in freq_band lbe= 58,ube= 65,start=5290,end=5329

Jan 1 00:03:16 IBR daemon.notice mgd: DFS Blackout Table
Jan 1 00:03:16 IBR daemon.notice mgd: 5250 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:16 IBR daemon.notice mgd: 5270 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:16 IBR daemon.notice mgd: 5290 Mhz: 31:00 31:00 31:00 31:00
Jan 1 00:03:16 IBR daemon.notice mgd: 5310 Mhz: 31:00 31:00 31:00 31:00
Jan 1 00:03:16 IBR daemon.notice mgd: 5330 Mhz: 00:00 00:00 00:00 00:00

11.5.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.5.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

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

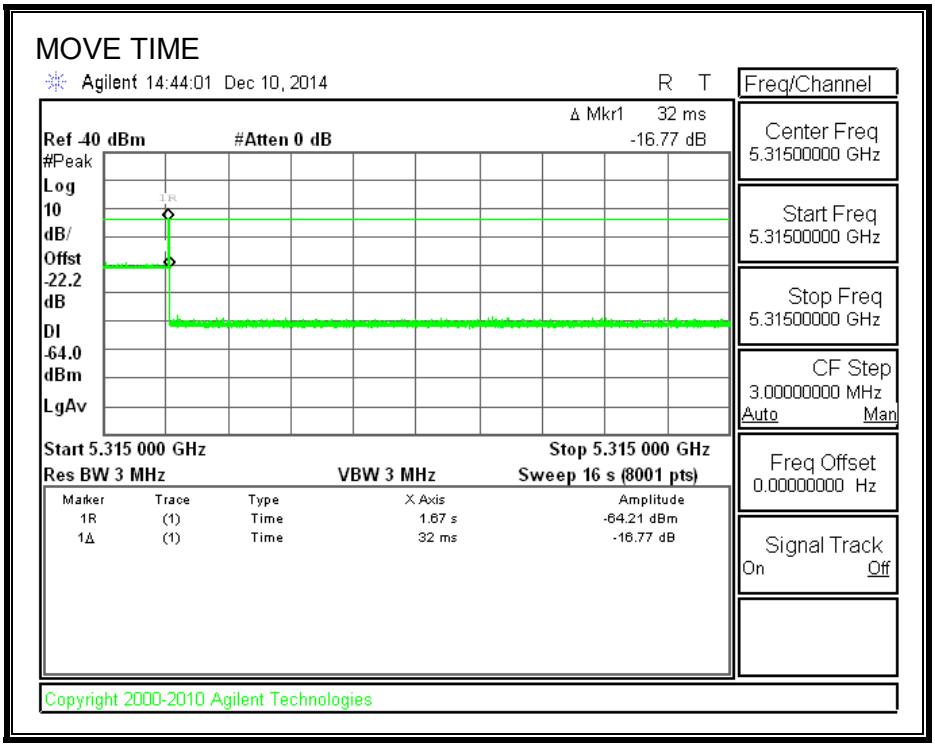
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

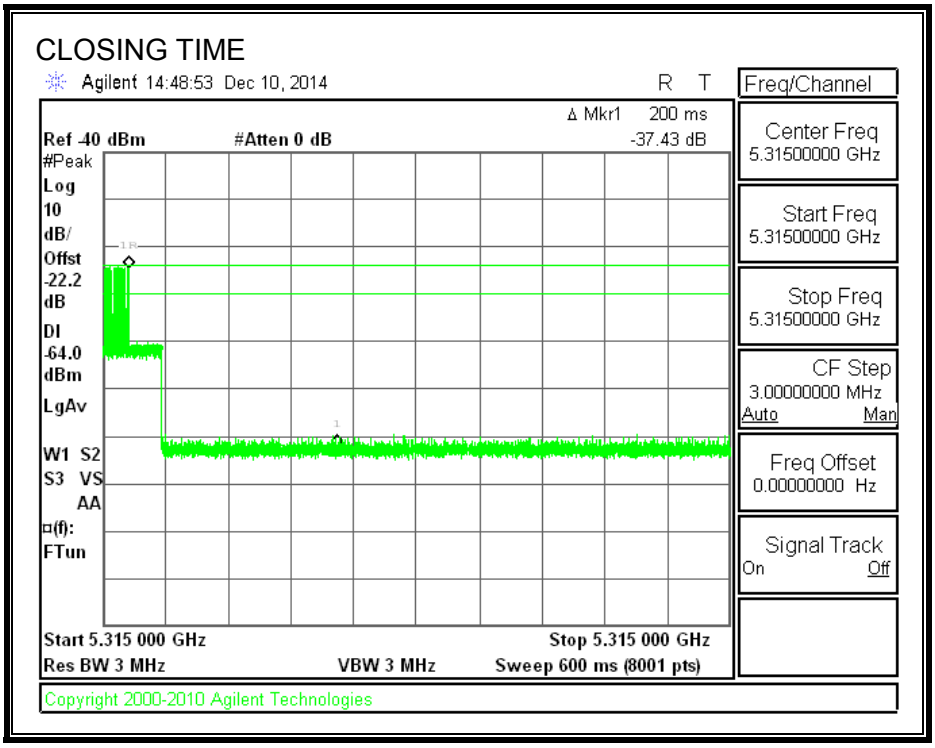
Channel Move Time (sec)	Limit (sec)
0.032	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
0.0	60

MOVE TIME



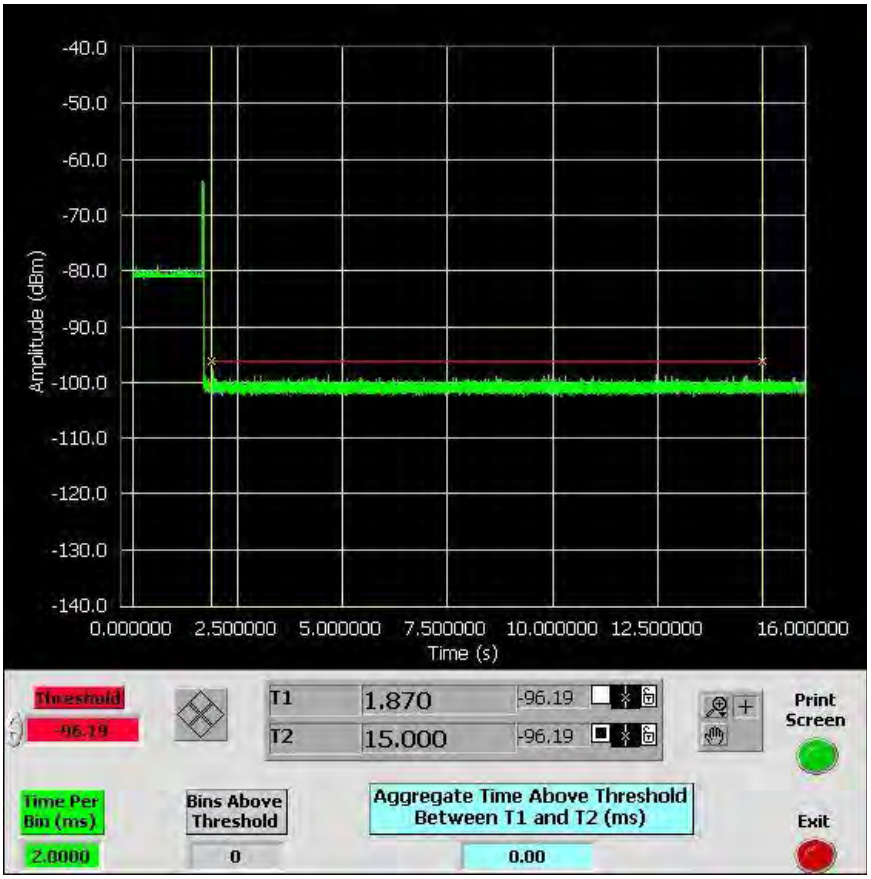
CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

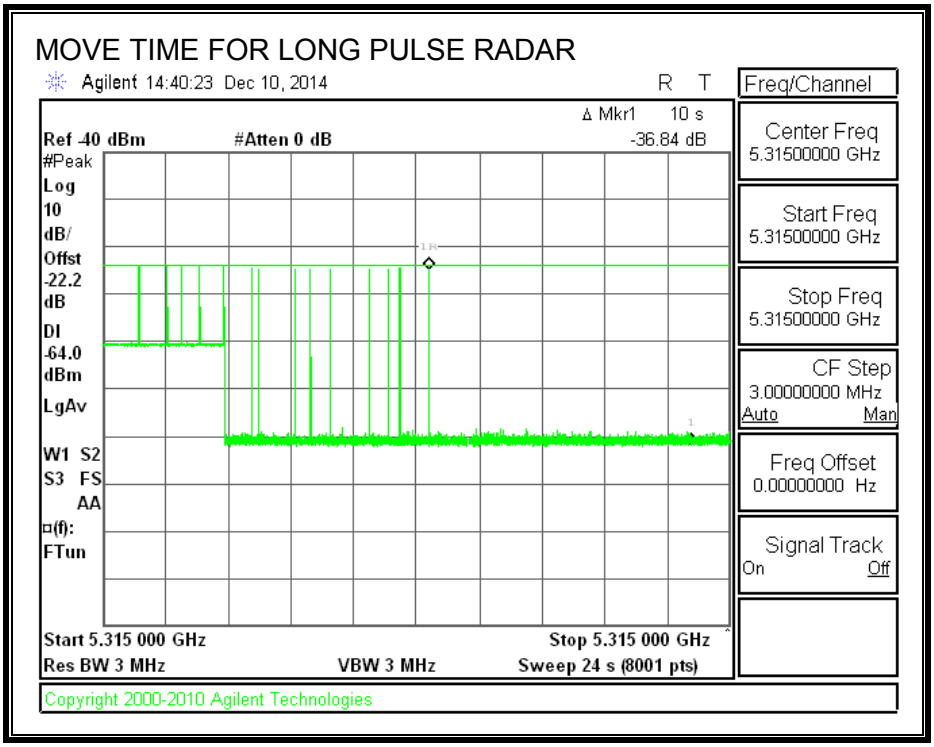
No transmissions are observed during the aggregate monitoring period.

AGGREGATE CLOSING TIME



LONG PULSE CHANNEL MOVE TIME

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

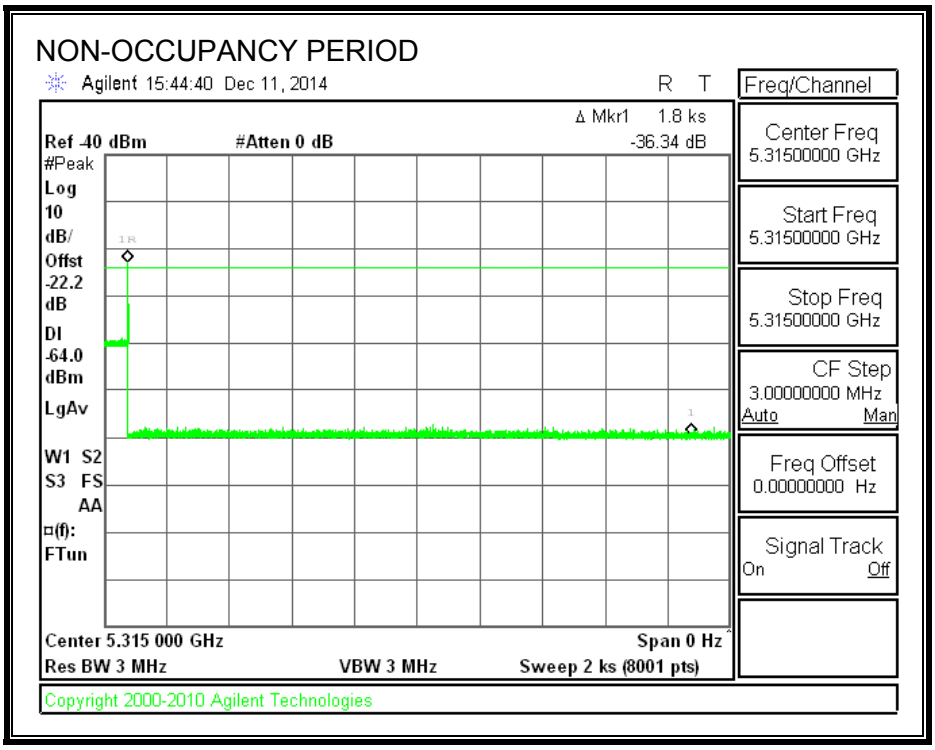


11.5.5. NON-OCCUPANCY PERIOD

RESULTS

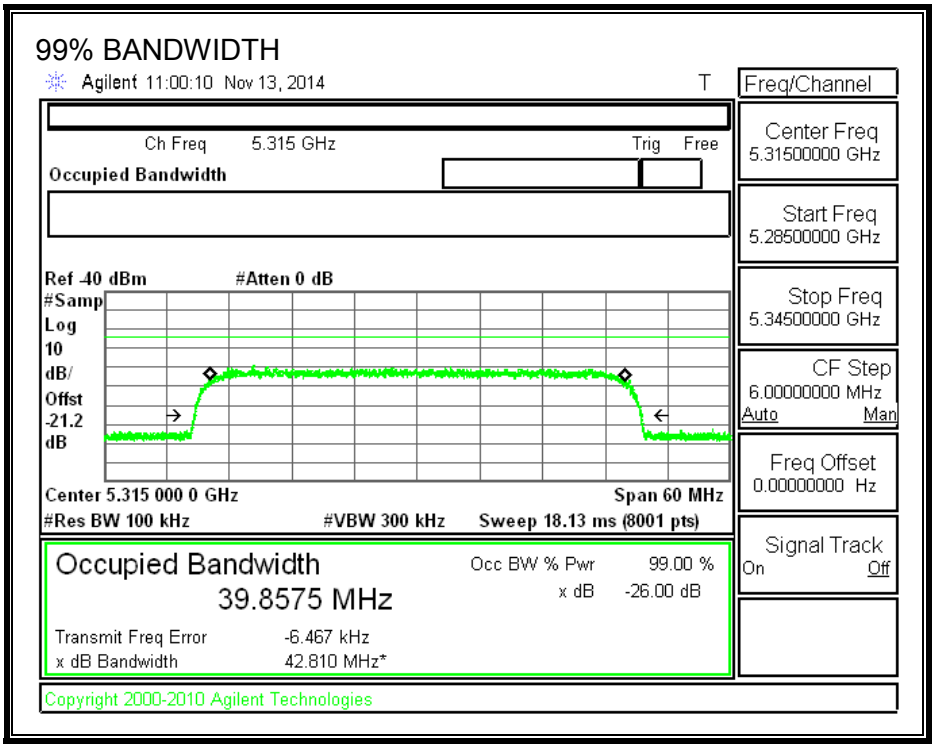
No EUT transmissions were observed on the test channel during the 30-minute observation time.

Testing of 40MHz bandwidth is considered representative of all other bandwidths.



11.5.6. 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 (%)
5295	5335	40	39.858	100.4	100

DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results				
FCC Type 0 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst				
Frequency (MHz)	Number of Trials	Number Detected	Detection (%)	Mark
5294	10	0	0	
5295	10	10	100	FL
5300	10	10	100	
5305	10	10	100	
5310	10	10	100	
5315	10	10	100	
5320	10	10	100	
5325	10	10	100	
5330	10	10	100	
5335	10	10	100	FH
5336	10	1	10	

11.5.7. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary				
Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail
FCC Short Pulse Type 1	30	93.33	60	Pass
FCC Short Pulse Type 2	30	100.00	60	Pass
FCC Short Pulse Type 3	30	100.00	60	Pass
FCC Short Pulse Type 4	30	100.00	60	Pass
Aggregate		98.33	80	Pass
FCC Long Pulse Type 5	30	96.67	80	Pass
FCC Hopping Type 6	41	90.24	70	Pass

TYPE 1 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 1				
1 us Pulse Width				
Waveform	PRI (us)	Pulses Per Burst	Test (A/B)	Successful Detection (Yes/No)
1001	3066	18	A	Yes
1002	678	78	A	Yes
1003	578	92	A	Yes
1004	598	89	A	Yes
1005	838	63	A	Yes
1006	898	59	A	Yes
1007	718	74	A	Yes
1008	818	65	A	Yes
1009	918	58	A	Yes
1010	638	83	A	Yes
1011	738	72	A	Yes
1012	938	57	A	Yes
1013	518	102	A	Yes
1014	758	70	A	Yes
1015	558	95	A	Yes
1016	798	67	B	Yes
1017	1774	30	B	Yes
1018	3042	18	B	Yes
1019	1355	39	B	Yes
1020	2953	18	B	Yes
1021	1813	30	B	Yes
1022	1505	36	B	Yes
1023	1442	37	B	Yes
1024	1093	49	B	Yes
1025	724	73	B	Yes
1026	1545	35	B	Yes
1027	865	62	B	Yes
1028	2279	24	B	No
1029	1061	50	B	No
1030	752	71	B	Yes

TYPE 2 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 2				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
2001	3.9	183.00	28	Yes
2002	2.1	211.00	24	Yes
2003	3.3	185.00	28	Yes
2004	4.7	211.00	26	Yes
2005	1.1	203.00	24	Yes
2006	1.6	151.00	24	Yes
2007	3.3	174.00	25	Yes
2008	1.7	218.00	29	Yes
2009	4.5	196.00	29	Yes
2010	1.9	193.00	25	Yes
2011	2.4	171.00	23	Yes
2012	3.9	162.00	23	Yes
2013	4.8	194.00	26	Yes
2014	1.5	207.00	29	Yes
2015	1.6	178.00	29	Yes
2016	4.1	191.00	27	Yes
2017	4.3	165.00	27	Yes
2018	2.5	213.00	23	Yes
2019	1.1	199.00	28	Yes
2020	2	176.00	27	Yes
2021	1.4	156.00	26	Yes
2022	4.6	166.00	28	Yes
2023	3.8	179.00	28	Yes
2024	1.8	222.00	29	Yes
2025	2.1	173.00	28	Yes
2026	4.2	203.00	23	Yes
2027	2.7	172.00	28	Yes
2028	1.5	230.00	23	Yes
2029	4.9	166.00	24	Yes
2030	4.2	192.00	26	Yes

TYPE 3 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 3				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
3001	7.7	278.00	18	Yes
3002	6.5	388.00	18	Yes
3003	7.8	341.00	18	Yes
3004	6.4	372.00	18	Yes
3005	5	285.00	18	Yes
3006	8.1	303.00	16	Yes
3007	6.9	346.00	18	Yes
3008	8.7	349.00	16	Yes
3009	5.8	283.00	17	Yes
3010	5.1	277.00	16	Yes
3011	5.5	500.00	16	Yes
3012	7.7	393.00	18	Yes
3013	7.7	432.00	17	Yes
3014	5	380.00	17	Yes
3015	5.9	388.00	16	Yes
3016	8.2	394.00	18	Yes
3017	5.8	313.00	16	Yes
3018	7.8	496.00	16	Yes
3019	6.2	392.00	18	Yes
3020	6.3	385.00	18	Yes
3021	6.2	366.00	18	Yes
3022	8.4	495.00	16	Yes
3023	5.8	460.00	18	Yes
3024	7.1	299.00	18	Yes
3025	9.3	416.00	17	Yes
3026	8.1	403.00	16	Yes
3027	6.7	491.00	17	Yes
3028	5.8	472.00	16	Yes
3029	5.8	295	17	Yes
3030	7.6	271	17	Yes

TYPE 4 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 4				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
4001	14.4	397.00	12	Yes
4002	10	269.00	16	Yes
4003	19.4	383.00	16	Yes
4004	18.8	307.00	16	Yes
4005	17.8	324.00	15	Yes
4006	16.2	340.00	12	Yes
4007	16	349.00	16	Yes
4008	16.9	269.00	16	Yes
4009	16.9	283.00	15	Yes
4010	11.9	361.00	12	Yes
4011	16	316.00	13	Yes
4012	17.1	266.00	15	Yes
4013	17.6	263.00	12	Yes
4014	15.6	271.00	12	Yes
4015	10.8	276.00	13	Yes
4016	12.5	489.00	16	Yes
4017	12	499.00	13	Yes
4018	16.4	469.00	15	Yes
4019	17.9	495.00	13	Yes
4020	17.6	363.00	13	Yes
4021	11.4	406.00	15	Yes
4022	15.1	443.00	16	Yes
4023	14.7	410.00	13	Yes
4024	14.5	366.00	12	Yes
4025	19.8	304.00	15	Yes
4026	14.4	406.00	12	Yes
4027	19.1	416.00	15	Yes
4028	19.4	470.00	15	Yes
4029	12.7	483.00	12	Yes
4030	14.3	407.00	16	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5	
Trial	**Successful Detection (Yes/No)**
1	Yes
2	Yes
3	Yes
4	Yes
5	Yes
6	No
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

Note: Randomized parameters for the Type 5 In-Service Monitoring testing performed on 11/06/14 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	222	5295	9	Yes
2	697	5296	8	Yes
3	1172	5297	8	Yes
4	1647	5298	6	Yes
5	2122	5299	5	No
6	2597	5300	12	Yes
7	3072	5301	9	No
8	3547	5302	8	Yes
9	4022	5303	10	Yes
10	4497	5304	9	Yes
11	4972	5305	4	Yes
12	5447	5306	4	Yes
13	5922	5307	6	Yes
14	6397	5308	8	Yes
15	6872	5309	10	No
16	7347	5310	7	No
17	7822	5311	10	Yes
18	8297	5312	10	Yes
19	8772	5313	9	Yes
20	9247	5314	5	Yes
21	9722	5315	6	Yes
22	10197	5316	4	Yes
23	10672	5317	7	Yes
24	11147	5318	9	Yes
25	11622	5319	11	Yes
26	12097	5320	9	Yes
27	12572	5321	7	Yes
28	13047	5322	8	Yes
29	13522	5323	11	Yes
30	13997	5324	2	Yes
31	14472	5325	15	Yes
32	14947	5326	11	Yes
33	15422	5327	9	Yes
34	15897	5328	7	Yes
35	16372	5329	7	Yes
36	16847	5330	8	Yes
37	17322	5331	13	Yes
38	17797	5332	5	Yes
39	18272	5333	11	Yes
40	18747	5334	10	Yes
41	19222	5335	10	Yes

11.5.8. CAC DUAL SENSOR BAND BLOCKING VERIFICATION TEST PROCEDURE

The spectrum analyzer is tuned to 5315 MHz and the log file from the EUT records the events.

The power to the EUT is cycled and a sweep is concurrently started on the spectrum analyzer. After the EUT boots-up a CAC period is simultaneously performed on 5275 MHz and 5315 MHz.

A radar burst is triggered on 5315 MHz approximately 4 seconds into the CAC period. In response to this the EUT places 5315 MHz on the blocked channel list. A radar burst is then triggered approximately 53 seconds later on 5275 MHz. After the second detection the EUT places 5275 MHz on the blocked channel list and removes itself from service in the 5.3 GHz band.

Once the non-occupancy period is complete on 5315 MHz the channel is cleared from the blocked channel list. A CAC period is performed on the cleared channel and upon successful completion the EUT enters service.

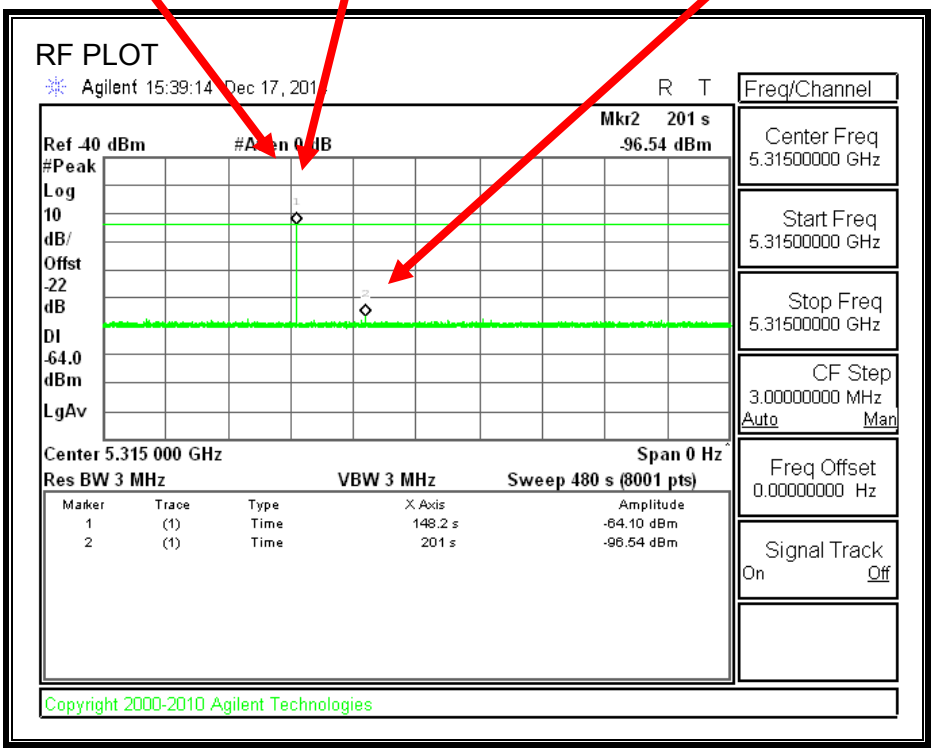
11.5.9. CAC DUAL SENSOR BAND BLOCKING VERIFICATION TEST RESULTS

RF PLOT

CAC @ 5275 MHz and 5315 MHz

Radar @ 5315 MHz

Radar @ 5275 MHz



LOG FILE

Jan 1 00:02:13 IBR daemon.notice mgd: RRC DFS: TStamp = 64355 msec, CAC START ... wait for

60-secs,

Jan 1 00:02:17 IBR daemon.notice mgd: RRC_DFS_RX: TStamp:68872 msec,RADAR DETECTED in freq_band

lbe= 58,ube= 65,start=5290,end=5329

Jan 1 00:02:17 IBR daemon.notice mgd: DFS Blackout Table
Jan 1 00:02:17 IBR daemon.notice mgd: 5250 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:02:17 IBR daemon.notice mgd: 5270 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:02:17 IBR daemon.notice mgd: 5290 Mhz: 31:00 31:00 31:00 31:00
Jan 1 00:02:17 IBR daemon.notice mgd: 5310 Mhz: 31:00 31:00 31:00 31:00
Jan 1 00:02:17 IBR daemon.notice mgd: 5330 Mhz: 00:00 00:00 00:00 00:00

Jan 1 00:03:10 IBR daemon.notice mgd: RRC_DFS_RX: TStamp:121670 msec,RADAR DETECTED in freq_band

lbe= 50,ube= 57,start=5250,end=5289

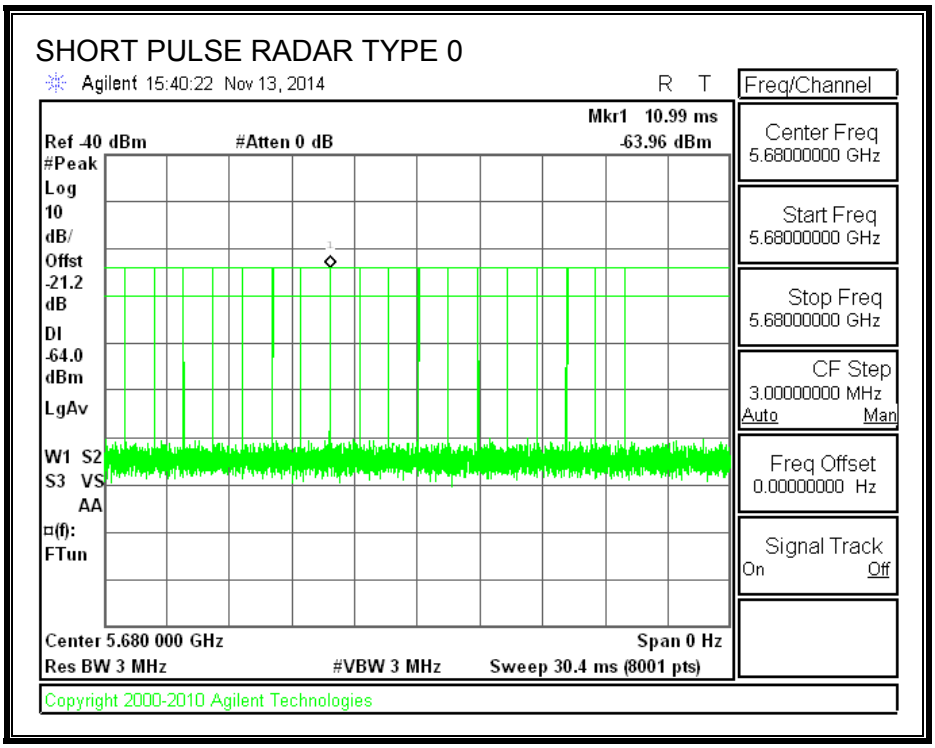
Jan 1 00:03:10 IBR daemon.notice mgd: DFS Blackout Table
Jan 1 00:03:10 IBR daemon.notice mgd: 5250 Mhz: 31:00 31:00 31:00 31:00
Jan 1 00:03:10 IBR daemon.notice mgd: 5270 Mhz: 31:00 31:00 31:00 31:00
Jan 1 00:03:10 IBR daemon.notice mgd: 5290 Mhz: 30:07 30:07 30:07 30:07
Jan 1 00:03:10 IBR daemon.notice mgd: 5310 Mhz: 30:07 30:07 30:07 30:07
Jan 1 00:03:10 IBR daemon.notice mgd: 5330 Mhz: 00:00 00:00 00:00 00:00

11.6. SECONDARY SENSOR UPPER HALF-BAND TEST CHANNEL

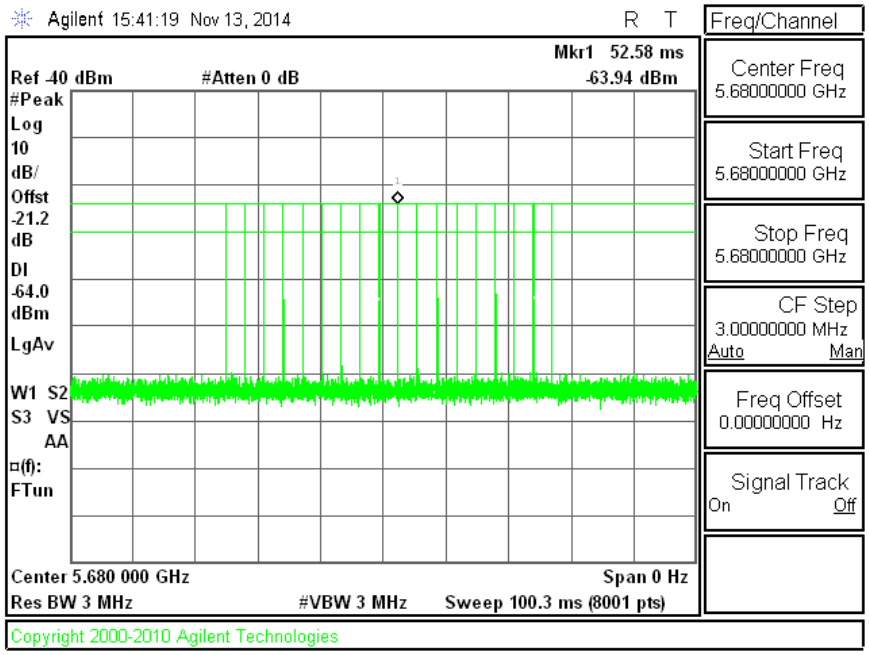
All tests were performed at a channel center frequency of 5680 MHz.

11.6.1. RADAR WAVEFORMS

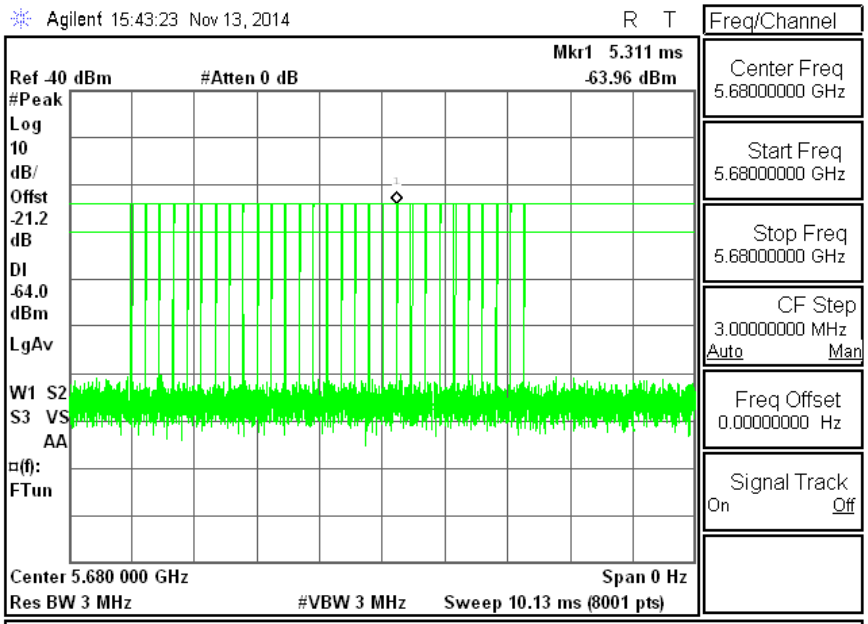
RADAR WAVEFORMS



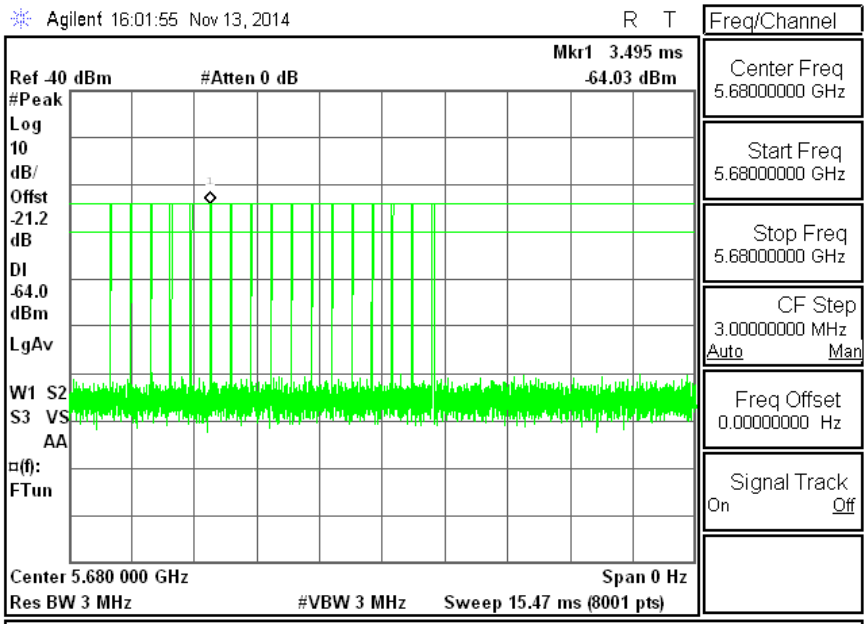
SAMPLE OF RADAR TYPE 1



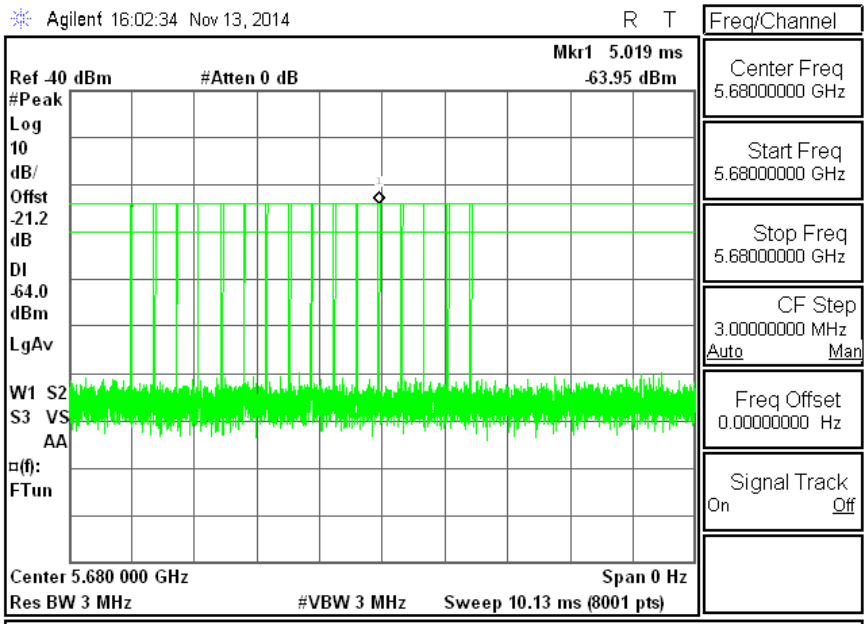
SAMPLE OF RADAR TYPE 2



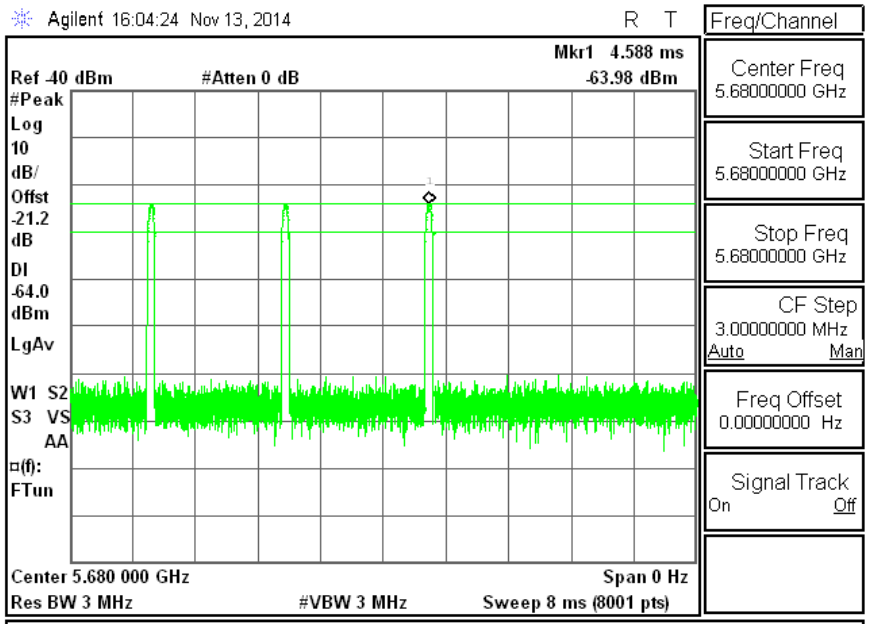
SAMPLE OF RADAR TYPE 3



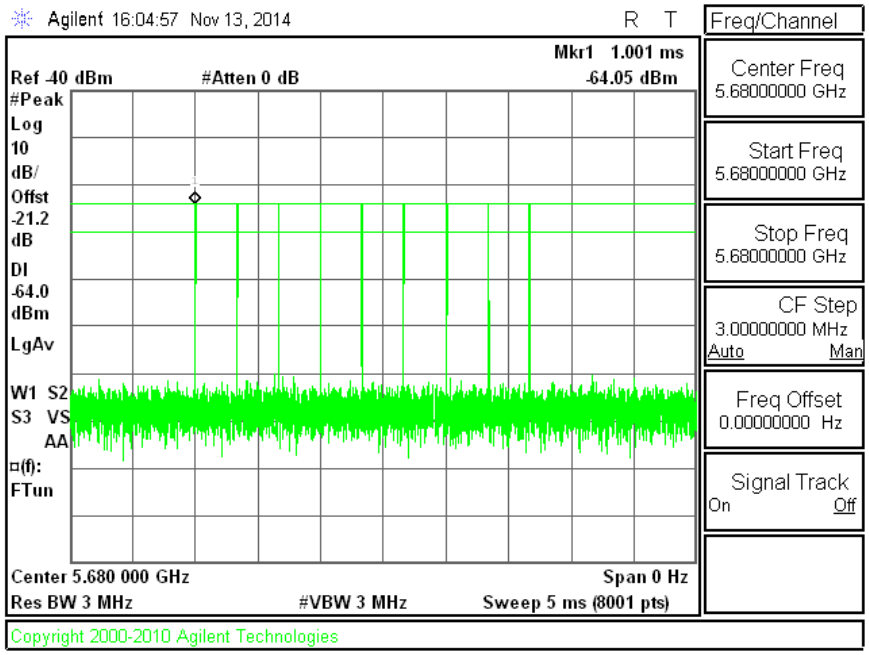
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

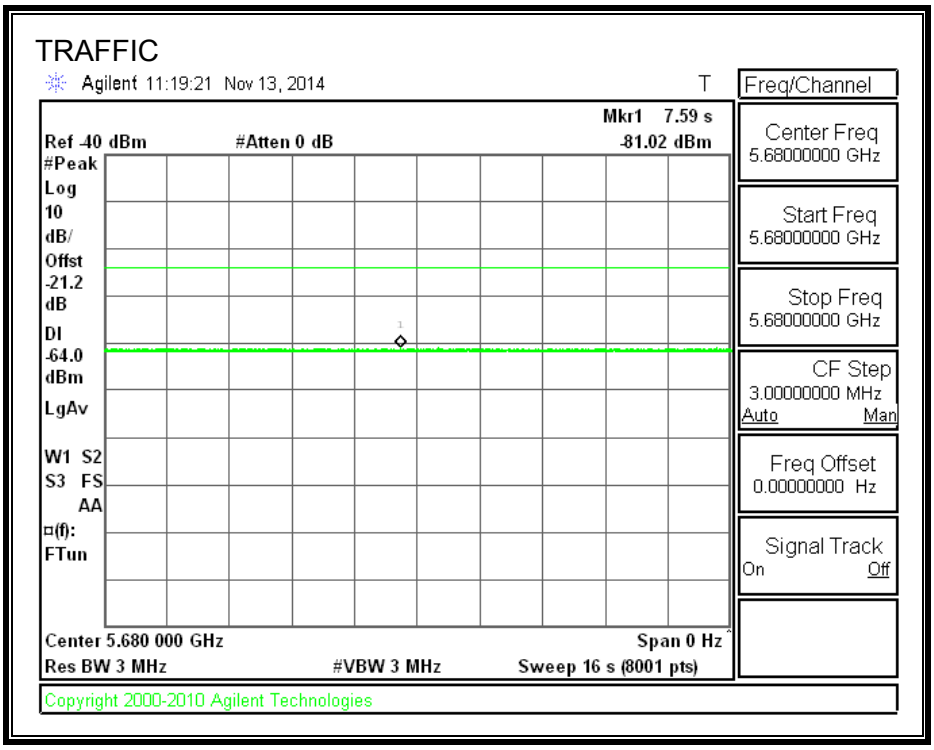


SINGLE BURST OF RADAR TYPE 6



11.7. RESULTS FOR 10 MHz BANDWIDTH

11.7.1. TRAFFIC



11.7.2. CHANNEL AVAILABILITY CHECK TIME

The DFS sensor bandwidth is always wider than the widest nominal channel bandwidth. Therefore, 40 MHz CAC testing covers all nominal channel bandwidths and this test was not performed for this channel bandwidth.

11.7.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.7.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

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

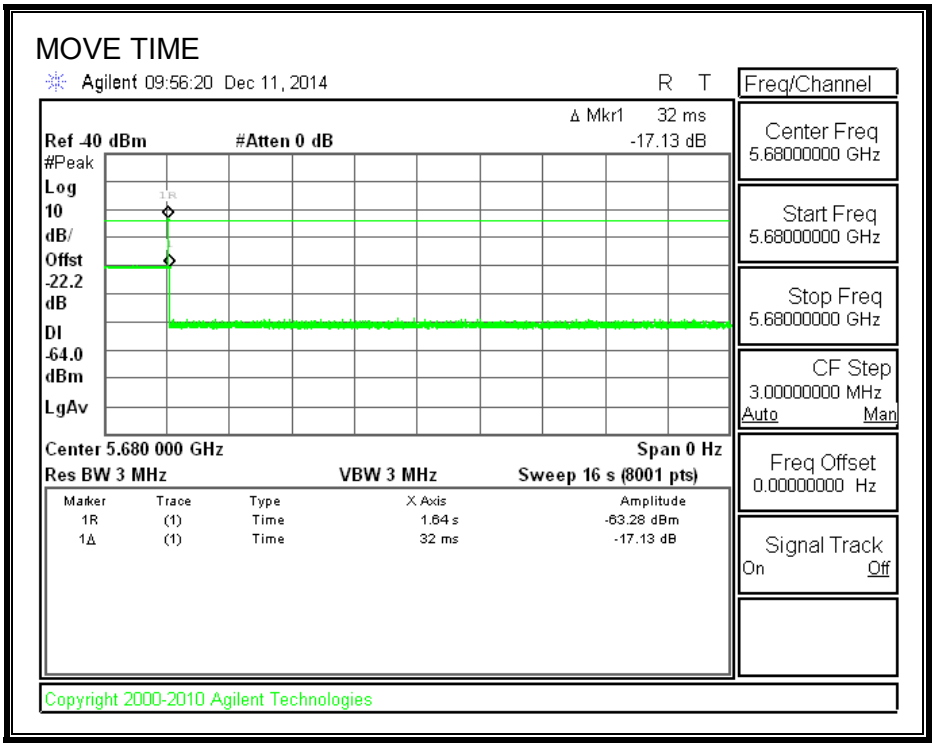
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

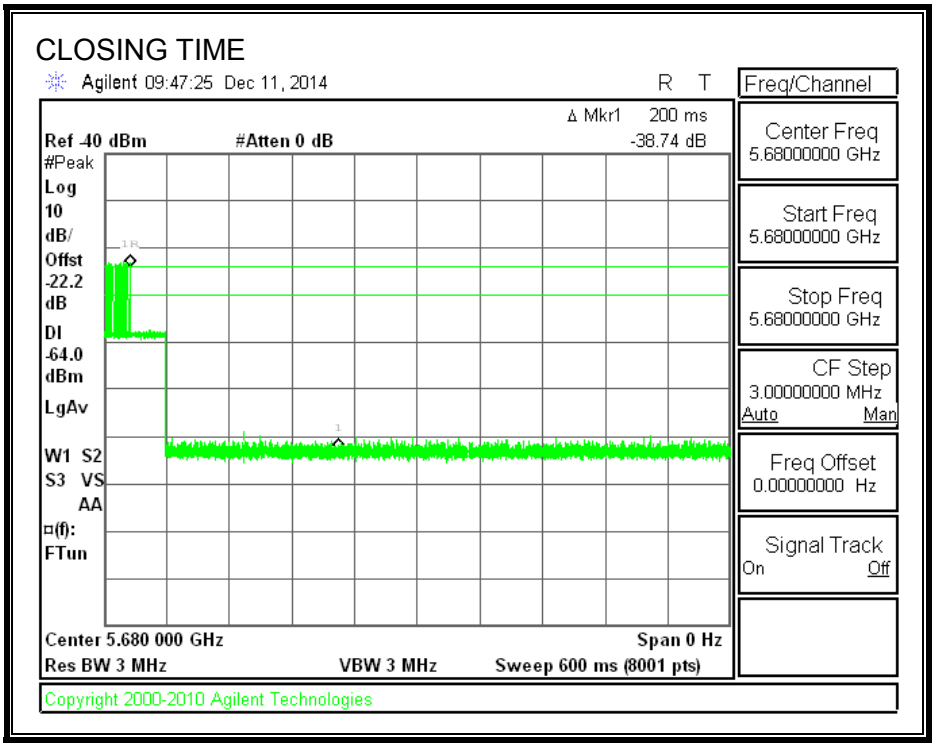
Channel Move Time (sec)	Limit (sec)
0.032	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
0.0	60

MOVE TIME



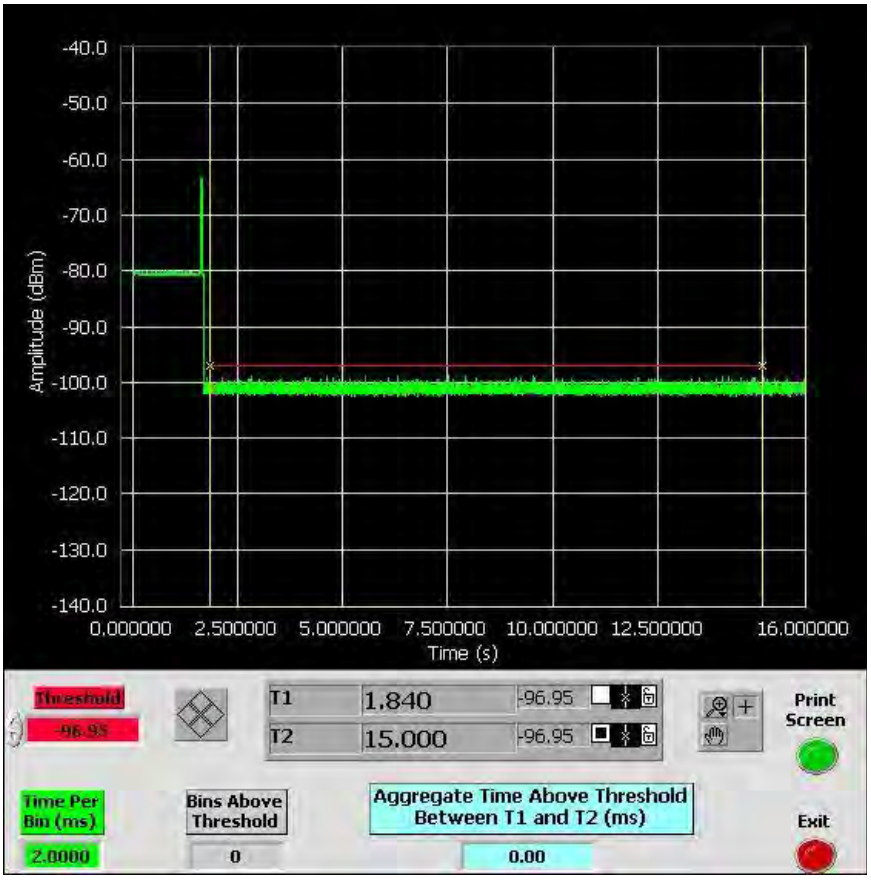
CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

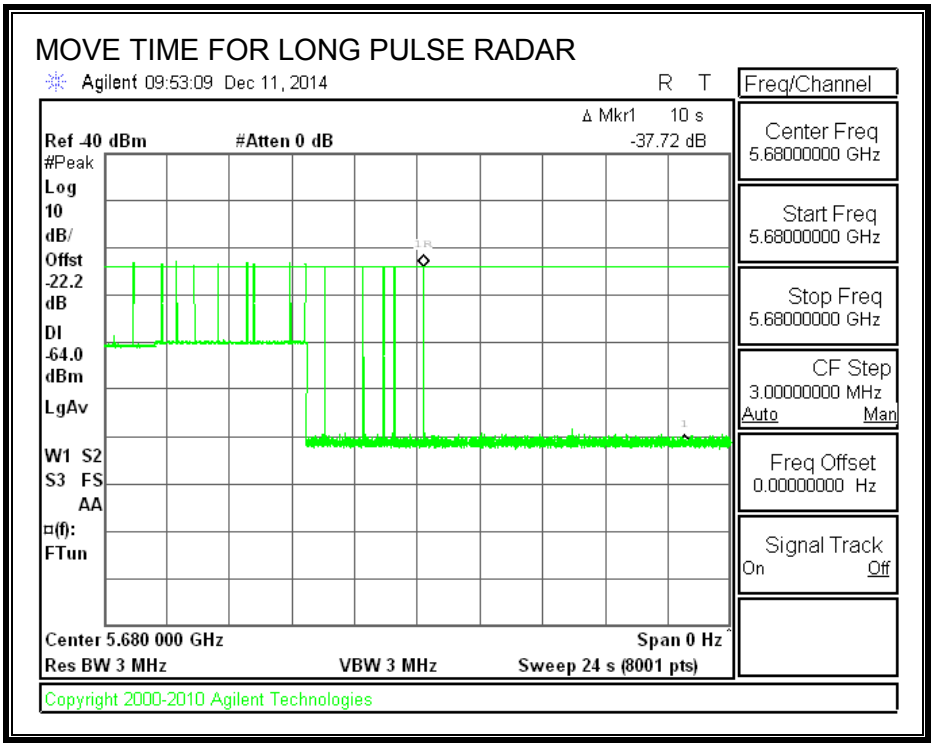
No transmissions are observed during the aggregate monitoring period.

AGGREGATE CLOSING TIME



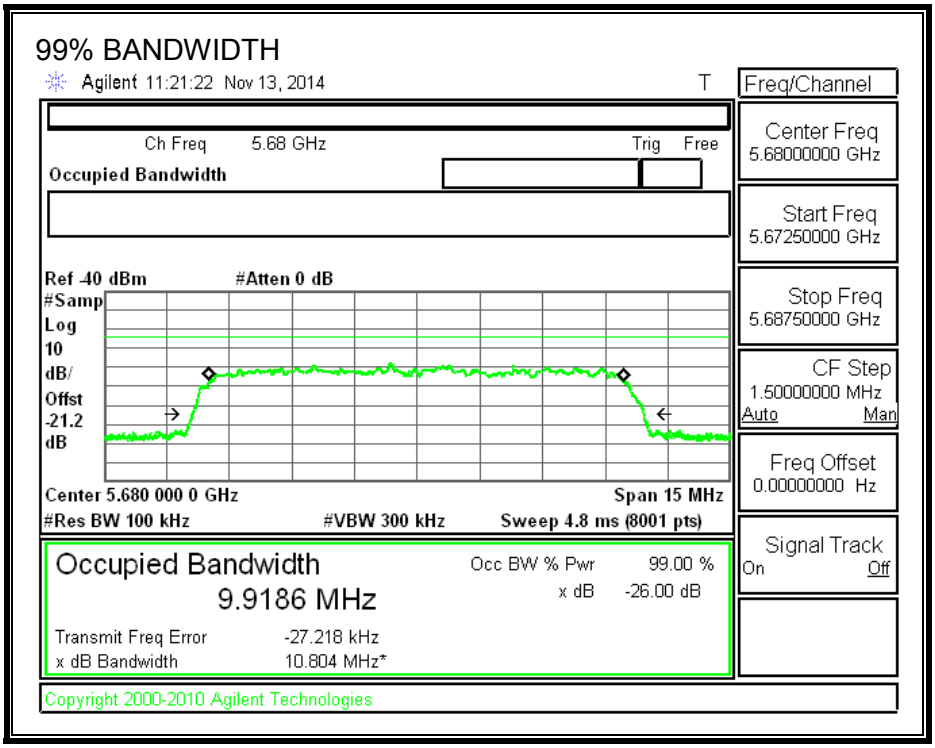
LONG PULSE CHANNEL MOVE TIME

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



11.7.5. 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 (%)
5675	5685	10	9.919	100.8	100

DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results				
FCC Type 0 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst				
Frequency (MHz)	Number of Trials	Number Detected	Detection (%)	Mark
5675	10	10	100	FL
5680	10	9	90	
5685	10	10	100	FH

11.7.6. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary				
Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail
FCC Short Pulse Type 1	30	100.00	60	Pass
FCC Short Pulse Type 2	30	100.00	60	Pass
FCC Short Pulse Type 3	30	100.00	60	Pass
FCC Short Pulse Type 4	30	100.00	60	Pass
Aggregate		100.00	80	Pass
FCC Long Pulse Type 5	30	93.33	80	Pass
FCC Hopping Type 6	33	100.00	70	Pass

TYPE 1 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 1				
1 us Pulse Width				
Waveform	PRI (us)	Pulses Per Burst	Test (A/B)	Successful Detection (Yes/No)
1001	3066	18	A	Yes
1002	678	78	A	Yes
1003	858	62	A	Yes
1004	638	83	A	Yes
1005	898	59	A	Yes
1006	558	95	A	Yes
1007	778	68	A	Yes
1008	718	74	A	Yes
1009	918	58	A	Yes
1010	698	76	A	Yes
1011	758	70	A	Yes
1012	938	57	A	Yes
1013	838	63	A	Yes
1014	738	72	A	Yes
1015	598	89	A	Yes
1016	798	67	B	Yes
1017	1224	44	B	Yes
1018	993	54	B	Yes
1019	2874	19	B	Yes
1020	1435	37	B	Yes
1021	1032	52	B	Yes
1022	931	57	B	Yes
1023	1399	38	B	Yes
1024	1476	36	B	Yes
1025	2706	20	B	Yes
1026	1979	27	B	Yes
1027	894	60	B	Yes
1028	3029	18	B	Yes
1029	1613	33	B	Yes
1030	1078	49	B	Yes

TYPE 2 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 2				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
2001	4.4	227.00	29	Yes
2002	3.3	159.00	29	Yes
2003	4.2	211.00	29	Yes
2004	3.1	191.00	23	Yes
2005	4.1	167.00	23	Yes
2006	3.8	160.00	24	Yes
2007	2.8	193.00	26	Yes
2008	3.7	170.00	29	Yes
2009	1.7	202.00	26	Yes
2010	1.4	213.00	26	Yes
2011	3.9	223.00	28	Yes
2012	3.4	210.00	25	Yes
2013	4.5	158.00	25	Yes
2014	2.2	170.00	23	Yes
2015	4.9	183.00	27	Yes
2016	4.9	206.00	29	Yes
2017	1.4	205.00	29	Yes
2018	1.2	182.00	27	Yes
2019	3.8	222.00	26	Yes
2020	1.2	178.00	29	Yes
2021	1.4	153.00	25	Yes
2022	2.9	172.00	24	Yes
2023	1.9	192.00	24	Yes
2024	2.4	213.00	24	Yes
2025	2.4	154.00	26	Yes
2026	1.9	222.00	28	Yes
2027	1.7	169.00	29	Yes
2028	3.3	158.00	29	Yes
2029	3	216.00	23	Yes
2030	1.4	210.00	25	Yes

TYPE 3 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 3				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
3001	10	499.00	17	Yes
3002	8.8	319.00	18	Yes
3003	9.4	379.00	18	Yes
3004	9.4	430.00	17	Yes
3005	9.4	308.00	17	Yes
3006	8.1	373.00	18	Yes
3007	9.7	414.00	16	Yes
3008	6.9	475.00	18	Yes
3009	7.1	497.00	17	Yes
3010	9.5	409.00	17	Yes
3011	6.5	262.00	17	Yes
3012	6.4	351.00	17	Yes
3013	9.3	277.00	17	Yes
3014	5.4	335.00	17	Yes
3015	8.1	408.00	17	Yes
3016	7.9	387.00	18	Yes
3017	6.7	302.00	17	Yes
3018	7.9	445.00	16	Yes
3019	5.5	309.00	16	Yes
3020	6	444.00	16	Yes
3021	8	480.00	17	Yes
3022	8	384.00	17	Yes
3023	8.6	456.00	17	Yes
3024	7	401.00	18	Yes
3025	7.4	282.00	18	Yes
3026	6.8	366.00	17	Yes
3027	7.2	305.00	17	Yes
3028	7.5	468.00	18	Yes
3029	6.1	420	18	Yes
3030	6.5	401	17	Yes

TYPE 4 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 4				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
4001	14.5	365.00	16	Yes
4002	13.4	433.00	12	Yes
4003	15.3	438.00	12	Yes
4004	19.4	374.00	14	Yes
4005	16.8	250.00	12	Yes
4006	11.6	375.00	15	Yes
4007	13.1	250.00	16	Yes
4008	16	404.00	16	Yes
4009	17.3	354.00	16	Yes
4010	16.6	282.00	15	Yes
4011	19.9	294.00	13	Yes
4012	15.4	253.00	15	Yes
4013	18.4	312.00	12	Yes
4014	16.6	307.00	16	Yes
4015	19.5	435.00	13	Yes
4016	15.5	253.00	13	Yes
4017	15	321.00	13	Yes
4018	11.7	475.00	13	Yes
4019	11.6	319.00	14	Yes
4020	17.2	451.00	15	Yes
4021	16.6	331.00	16	Yes
4022	17.6	485.00	13	Yes
4023	14.6	306.00	15	Yes
4024	17.4	327.00	13	Yes
4025	14.8	319.00	13	Yes
4026	17.3	303.00	15	Yes
4027	13.7	361.00	13	Yes
4028	18.2	395.00	16	Yes
4029	18.6	455.00	16	Yes
4030	15.6	420.00	14	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5	
Trial	Successful Detection (Yes/No)
1	No
2	Yes
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes
8	Yes
9	Yes
10	Yes
11	No
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

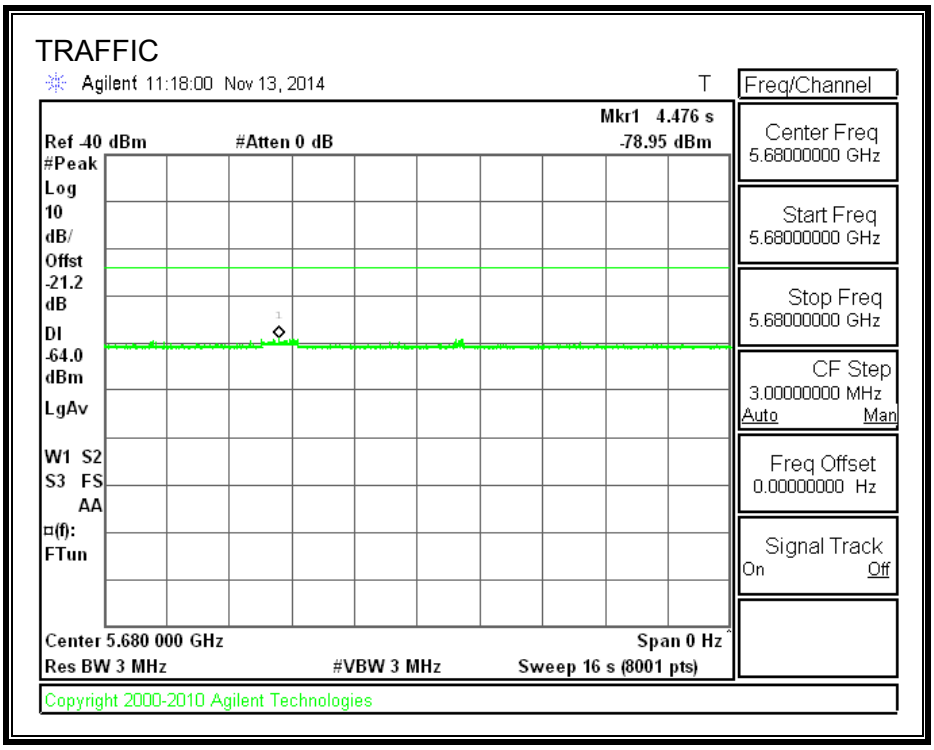
Note: Randomized parameters for the Type 5 In-Service Monitoring testing performed on 11/13/14 are shown in a separate document.

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	333	5675	2	Yes
2	808	5676	6	Yes
3	1283	5677	1	Yes
4	1758	5678	2	Yes
5	2233	5679	2	Yes
6	2708	5680	2	Yes
7	3183	5681	6	Yes
8	3658	5682	1	Yes
9	4133	5683	1	Yes
10	4608	5684	3	Yes
11	5083	5685	3	Yes
12	5558	5675	1	Yes
13	6033	5676	3	Yes
14	6983	5677	4	Yes
15	7458	5678	1	Yes
16	7933	5679	3	Yes
17	8408	5680	1	Yes
18	8883	5681	1	Yes
19	9358	5682	2	Yes
20	9833	5683	3	Yes
21	10308	5684	3	Yes
22	11258	5685	1	Yes
23	11733	5675	3	Yes
24	12208	5676	3	Yes
25	12683	5677	3	Yes
26	13158	5678	5	Yes
27	13633	5679	1	Yes
28	14108	5680	4	Yes
29	15058	5681	3	Yes
30	15533	5682	2	Yes
31	16008	5683	3	Yes
32	16483	5684	1	Yes
33	16958	5685	3	Yes

11.8. RESULTS FOR 20 MHz BANDWIDTH

11.8.1. TRAFFIC



11.8.2. CHANNEL AVAILABILITY CHECK TIME

The DFS sensor bandwidth is always wider than the widest nominal channel bandwidth. Therefore, 40 MHz CAC testing covers all nominal channel bandwidths and this test was not performed for this channel bandwidth.

11.8.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.8.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

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

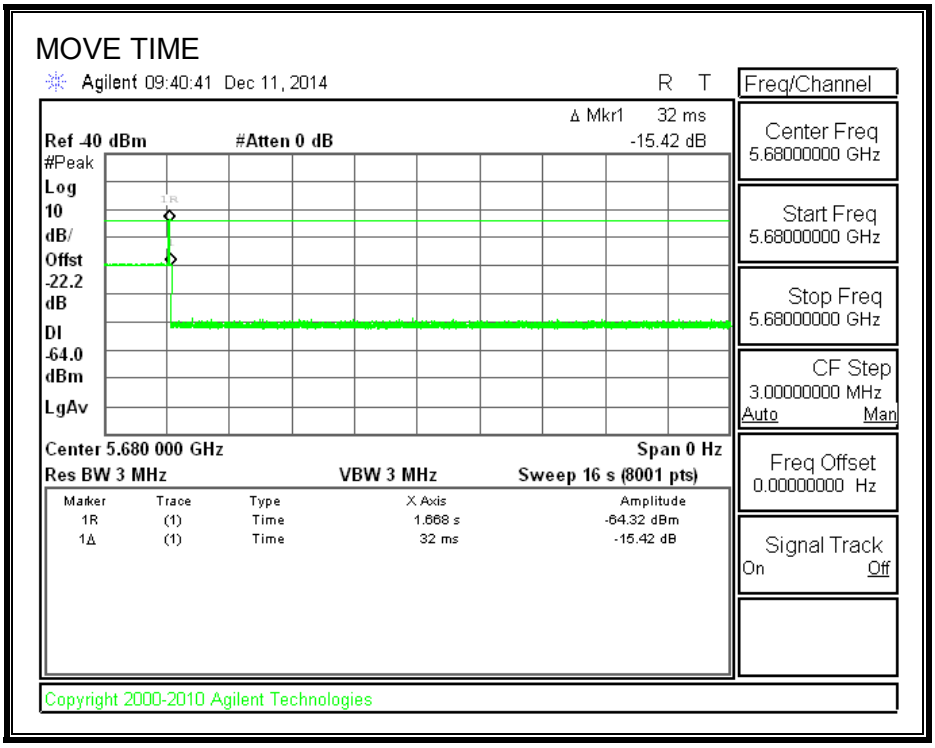
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

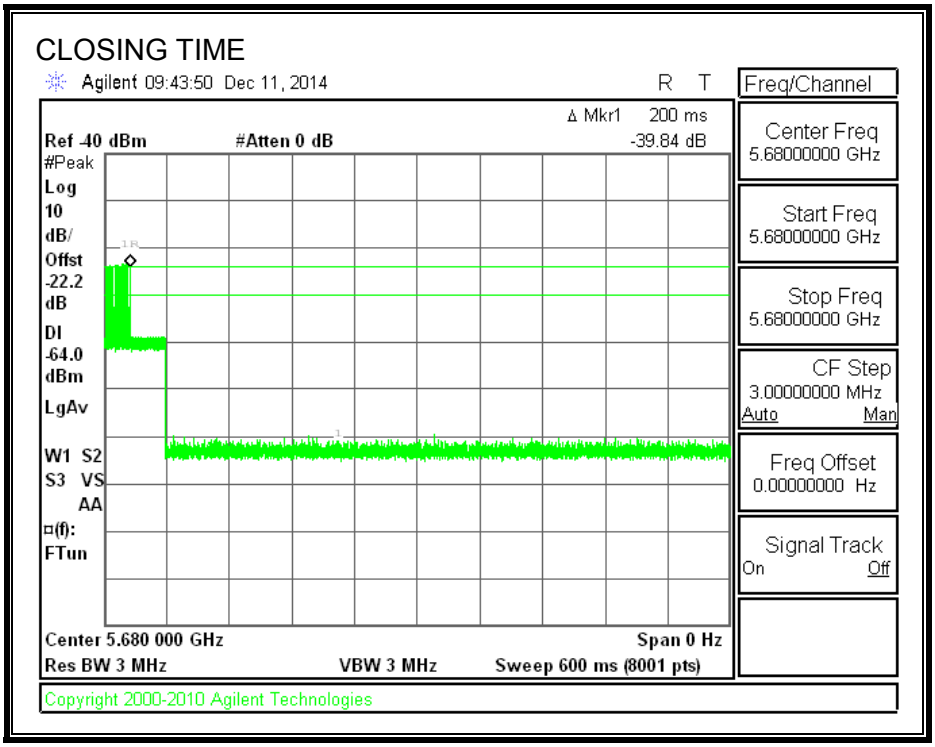
Channel Move Time (sec)	Limit (sec)
0.032	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
0.0	60

MOVE TIME



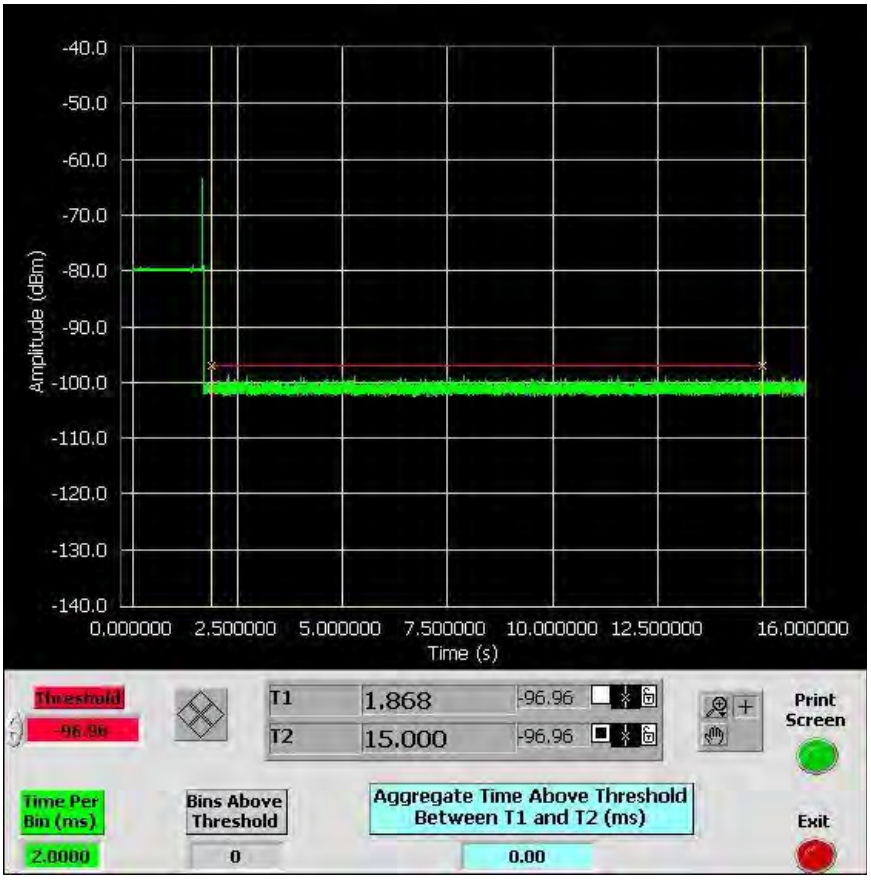
CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

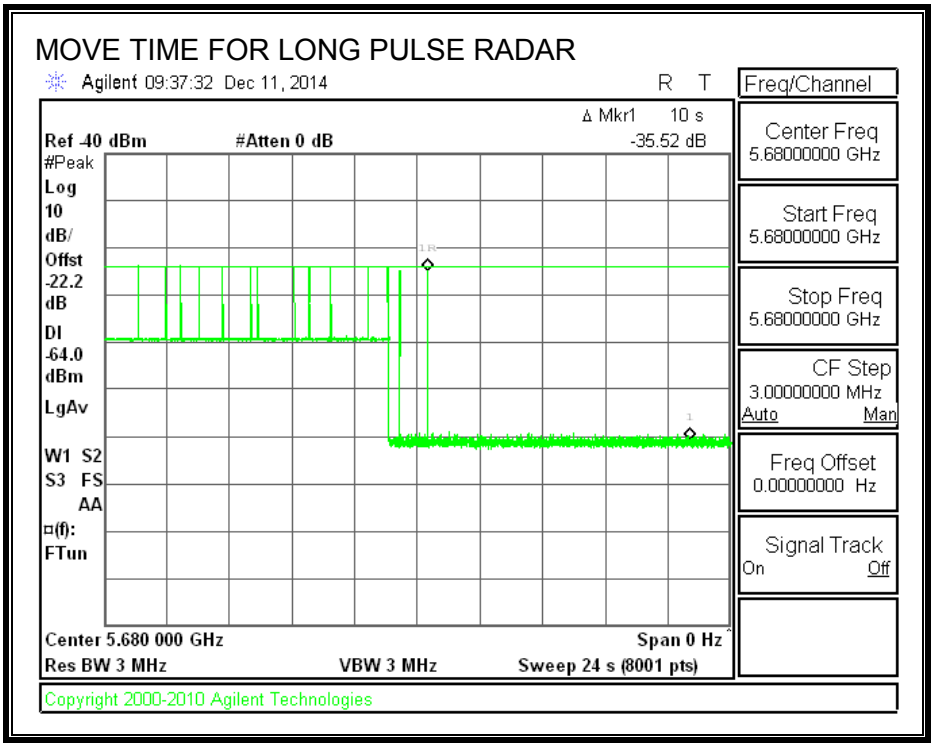
No transmissions are observed during the aggregate monitoring period.

AGGREGATE CLOSING TIME



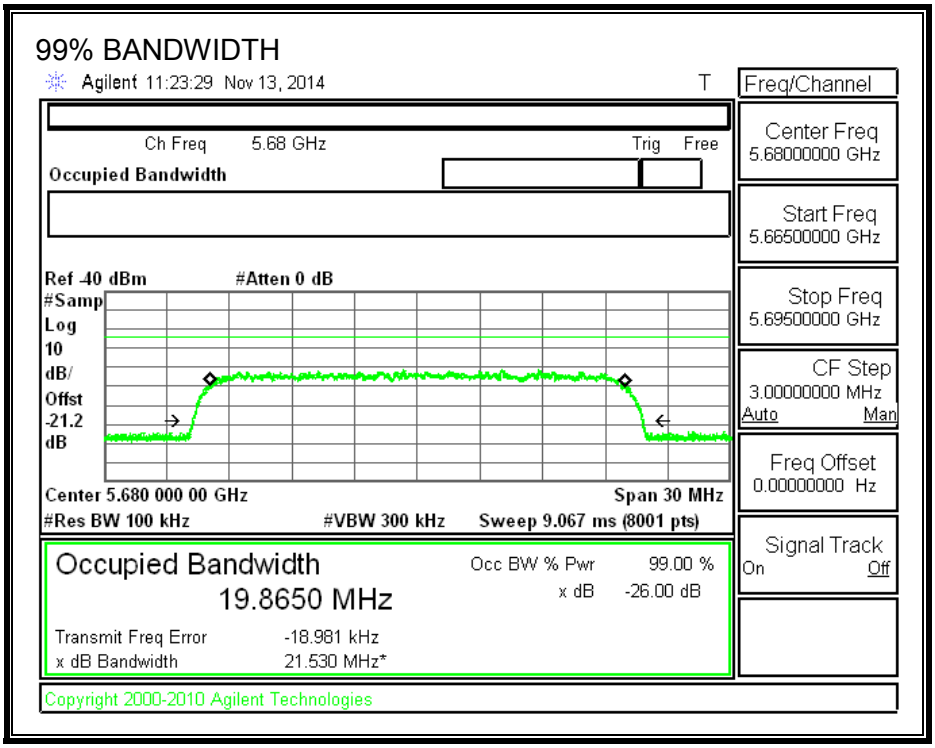
LONG PULSE CHANNEL MOVE TIME

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



11.8.5. 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 (%)
5670	5690	20	19.865	100.7	100

DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results				
FCC Type 0 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst				
Frequency (MHz)	Number of Trials	Number Detected	Detection (%)	Mark
5670	10	10	100	FL
5675	10	10	100	
5680	10	9	90	
5685	10	10	100	
5690	10	10	100	FH

11.8.6. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary				
Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail
FCC Short Pulse Type 1	30	100.00	60	Pass
FCC Short Pulse Type 2	30	100.00	60	Pass
FCC Short Pulse Type 3	30	100.00	60	Pass
FCC Short Pulse Type 4	30	100.00	60	Pass
Aggregate		100.00	80	Pass
FCC Long Pulse Type 5	30	93.33	80	Pass
FCC Hopping Type 6	42	100.00	70	Pass

TYPE 1 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 1				
1 us Pulse Width				
Waveform	PRI (us)	Pulses Per Burst	Test (A/B)	Successful Detection (Yes/No)
1001	3066	18	A	Yes
1002	678	78	A	Yes
1003	858	62	A	Yes
1004	638	83	A	Yes
1005	898	59	A	Yes
1006	558	95	A	Yes
1007	778	68	A	Yes
1008	718	74	A	Yes
1009	918	58	A	Yes
1010	698	76	A	Yes
1011	758	70	A	Yes
1012	938	57	A	Yes
1013	838	63	A	Yes
1014	738	72	A	Yes
1015	598	89	A	Yes
1016	798	67	B	Yes
1017	1224	44	B	Yes
1018	993	54	B	Yes
1019	2874	19	B	Yes
1020	1435	37	B	Yes
1021	1032	52	B	Yes
1022	931	57	B	Yes
1023	1399	38	B	Yes
1024	1476	36	B	Yes
1025	2706	20	B	Yes
1026	1979	27	B	Yes
1027	894	60	B	Yes
1028	3029	18	B	Yes
1029	1613	33	B	Yes
1030	1078	49	B	Yes

TYPE 2 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 2				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
2001	4.4	227.00	29	Yes
2002	3.3	159.00	29	Yes
2003	4.2	211.00	29	Yes
2004	3.1	191.00	23	Yes
2005	4.1	167.00	23	Yes
2006	3.8	160.00	24	Yes
2007	2.8	193.00	26	Yes
2008	3.7	170.00	29	Yes
2009	1.7	202.00	26	Yes
2010	1.4	213.00	26	Yes
2011	3.9	223.00	28	Yes
2012	3.4	210.00	25	Yes
2013	4.5	158.00	25	Yes
2014	2.2	170.00	23	Yes
2015	4.9	183.00	27	Yes
2016	4.9	206.00	29	Yes
2017	1.4	205.00	29	Yes
2018	1.2	182.00	27	Yes
2019	3.8	222.00	26	Yes
2020	1.2	178.00	29	Yes
2021	1.4	153.00	25	Yes
2022	2.9	172.00	24	Yes
2023	1.9	192.00	24	Yes
2024	2.4	213.00	24	Yes
2025	2.4	154.00	26	Yes
2026	1.9	222.00	28	Yes
2027	1.7	169.00	29	Yes
2028	3.3	158.00	29	Yes
2029	3	216.00	23	Yes
2030	1.4	210.00	25	Yes

TYPE 3 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 3				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
3001	10	499.00	17	Yes
3002	8.8	319.00	18	Yes
3003	9.4	379.00	18	Yes
3004	9.4	430.00	17	Yes
3005	9.4	308.00	17	Yes
3006	8.1	373.00	18	Yes
3007	9.7	414.00	16	Yes
3008	6.9	475.00	18	Yes
3009	7.1	497.00	17	Yes
3010	9.5	409.00	17	Yes
3011	6.5	262.00	17	Yes
3012	6.4	351.00	17	Yes
3013	9.3	277.00	17	Yes
3014	5.4	335.00	17	Yes
3015	8.1	408.00	17	Yes
3016	7.9	387.00	18	Yes
3017	6.7	302.00	17	Yes
3018	7.9	445.00	16	Yes
3019	5.5	309.00	16	Yes
3020	6	444.00	16	Yes
3021	8	480.00	17	Yes
3022	8	384.00	17	Yes
3023	8.6	456.00	17	Yes
3024	7	401.00	18	Yes
3025	7.4	282.00	18	Yes
3026	6.8	366.00	17	Yes
3027	7.2	305.00	17	Yes
3028	7.5	468.00	18	Yes
3029	6.1	420	18	Yes
3030	6.5	401	17	Yes

TYPE 4 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 4				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
4001	14.5	365.00	16	Yes
4002	13.4	433.00	12	Yes
4003	15.3	438.00	12	Yes
4004	19.4	374.00	14	Yes
4005	16.8	250.00	12	Yes
4006	11.6	375.00	15	Yes
4007	13.1	250.00	16	Yes
4008	16	404.00	16	Yes
4009	17.3	354.00	16	Yes
4010	16.6	282.00	15	Yes
4011	19.9	294.00	13	Yes
4012	15.4	253.00	15	Yes
4013	18.4	312.00	12	Yes
4014	16.6	307.00	16	Yes
4015	19.5	435.00	13	Yes
4016	15.5	253.00	13	Yes
4017	15	321.00	13	Yes
4018	11.7	475.00	13	Yes
4019	11.6	319.00	14	Yes
4020	17.2	451.00	15	Yes
4021	16.6	331.00	16	Yes
4022	17.6	485.00	13	Yes
4023	14.6	306.00	15	Yes
4024	17.4	327.00	13	Yes
4025	14.8	319.00	13	Yes
4026	17.3	303.00	15	Yes
4027	13.7	361.00	13	Yes
4028	18.2	395.00	16	Yes
4029	18.6	455.00	16	Yes
4030	15.6	420.00	14	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5	
Trial	Successful Detection (Yes/No)
1	No
2	Yes
3	Yes
4	Yes
5	No
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

Note: Randomized parameters for the Type 5 In-Service Monitoring testing performed on 11/13/14 are shown in a separate document.

TYPE 6 DETECTION PROBABILITY

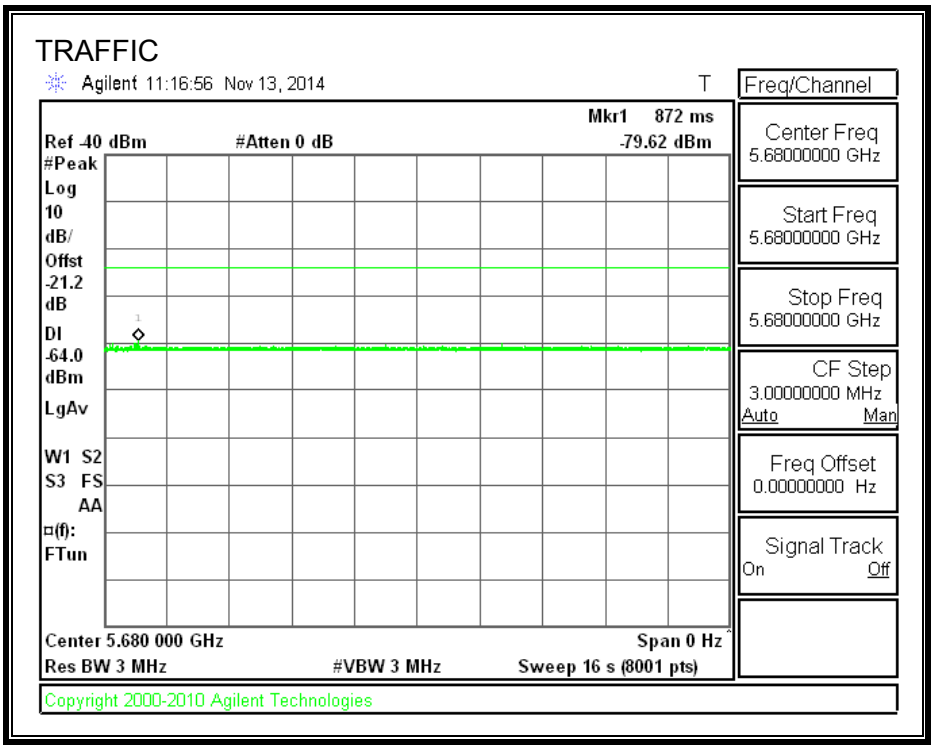
Data Sheet for FCC Hopping Radar Type 6				
1 us Pulse Width, 333 us PRI, 9 Pulses per Burst, 1 Burst per Hop				
NTIA August 2005 Hopping Sequence				
Trial	Starting Index Within Sequence	Signal Generator Frequency (MHz)	Hops within Detection BW	Successful Detection (Yes/No)
1	297	5670	3	Yes
2	772	5671	8	Yes
3	1247	5672	3	Yes
4	1722	5673	8	Yes
5	2197	5674	5	Yes
6	2672	5675	3	Yes
7	3147	5676	4	Yes
8	3622	5677	3	Yes
9	4097	5678	2	Yes
10	4572	5679	6	Yes
11	5047	5680	5	Yes
12	5522	5681	6	Yes
13	5997	5682	6	Yes
14	6472	5683	7	Yes
15	6947	5684	4	Yes
16	7422	5685	2	Yes
17	7897	5686	4	Yes
18	8372	5687	6	Yes
19	8847	5688	6	Yes
20	9322	5689	4	Yes

TYPE 6 DETECTION PROBABILITY (CONT.)

21	9797	5690	5	Yes
22	10272	5670	3	Yes
23	10747	5671	4	Yes
24	11222	5672	1	Yes
25	11697	5673	4	Yes
26	12172	5674	3	Yes
27	12647	5675	5	Yes
28	13122	5676	7	Yes
29	13597	5677	9	Yes
30	14072	5678	2	Yes
31	14547	5679	5	Yes
32	15022	5680	7	Yes
33	15497	5681	4	Yes
34	15972	5682	2	Yes
35	16447	5683	1	Yes
36	16922	5684	5	Yes
37	17397	5685	4	Yes
38	17872	5686	4	Yes
39	18347	5687	4	Yes
40	18822	5688	4	Yes
41	19297	5689	3	Yes
42	19772	5690	5	Yes

11.9. RESULTS FOR 40 MHz BANDWIDTH

11.9.1. TRAFFIC



11.9.2. CHANNEL AVAILABILITY CHECK TIME

PROCEDURE TO DETERMINE TEST CHANNEL CYCLE TIME

The AC power was toggled off and then on to re-boot the EUT while a spectrum analyzer sweep was started to monitor the test channel (5680 MHz) and a log file was generated. Upon completion of the CAC period on the test channel the 5.3 GHz uplink (which includes the 5.2 GHz non-DFS band) begins a “discovery phase” while 5.8GHz (which includes the 5.7 GHz DFS band) In-Service Monitoring continues. When the 5.8 GHz downlink connects the 5.3 GHz uplink Transmitter is enabled. The 5.3 GHz Receive Radio then associates to the 5.3 GHz Transmit Radio. After the association process was complete, transmissions began on the test channel. The elapsed time between the end of the CAC period and the start of transmissions on the test channel is the discovery time and association period. This reference measurement and the time stamps within the log file were used to determine when radar bursts were to be triggered at the beginning and end of the CAC period.

PROCEDURE FOR TIMING OF RADAR BURST

The AC power was toggled off and then on to re-boot the EUT while a spectrum analyzer sweep was started to monitor the test channel (5680 MHz) and a log file was generated. A radar signal was triggered on the test channel between 0 to 6 seconds after the beginning of the CAC period and transmissions on the test channel were monitored on the spectrum analyzer.

The AC power was then again toggled off and then on to re-boot the EUT while a spectrum analyzer sweep was started to monitor the test channel (5680 MHz) and a log file was generated. A radar signal was triggered on the test channel between 54 to 60 seconds after the beginning of the CAC period and transmissions on the test channel were monitored on the spectrum analyzer.

The log file recorded the timing of these events. The time from the beginning of the CAC on the test channel to the detection of the radar burst on the test channel was measured.

APPROXIMATE QUANTITATIVE RESULTS BASED ON RF MARKERS

NO RADAR TRIGGERED ON THE TEST CHANNEL

The time between the beginning of the CAC period and the start of transmissions on the test channel minus the elapsed time for the Receive Radio to associate to the Transmit Radio is the CAC time.

RADAR TRIGGERED ON THE TEST CHANNEL

The time from the beginning of the CAC period to the radar burst on the test channel was measured as the approximate relative time from the start of the CAC.

No Radar Triggered

Start of CAC at 5680 MHz (sec)	End of CAC at 5680 MHz (sec)	CAC Time (sec)
205.7	266.7	61.0

Radar Near Beginning of CAC

Start of CAC at 5680 MHz (sec)	Timing of Radar Burst at 5680 MHz (sec)	Radar Relative to Start of CAC at 5680 MHz (sec)
207.1	210.1	3.0

Radar Near End of CAC

Start of CAC at 5680 MHz (sec)	Timing of Radar Burst at 5680 MHz (sec)	Radar Relative to Start of CAC at 5680 MHz (sec)
203.2	259.2	56.0

QUANTITATIVE RESULTS BASED ON EUT TEST MODE LOG FILE TIME STAMPS

No Radar Triggered

Start of CAC at 5680 MHz (hh:mm:ss)	End of CAC at 5680 MHz (hh:mm:ss)	CAC Time (hh:mm:ss)
0:03:14	0:04:15	0:01:01

Radar Near Beginning of CAC

Start of CAC at 5680 MHz (hh:mm:ss)	Radar Detected at 5680 MHz (hh:mm:ss)	Radar Relative to Start of CAC (hh:mm:ss)
0:03:15	0:03:18	0:00:03

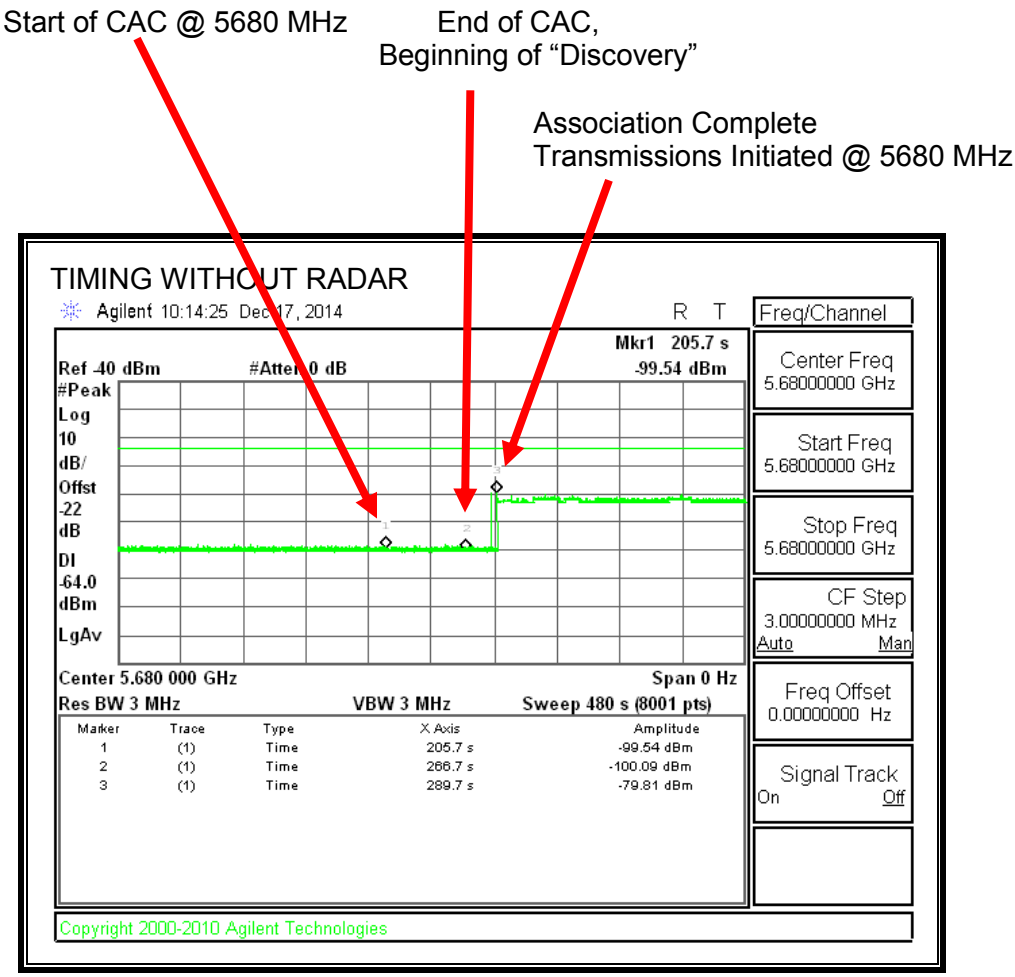
Radar Near End of CAC

Start of CAC at 5680 MHz (hh:mm:ss)	Radar Detected at 5680 MHz (hh:mm:ss)	Radar Relative to Start of CAC (hh:mm:ss)
0:03:12	0:04:08	0:00:56

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 the completion of the association period following 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 intended channel after completion of CAC.

EUT RADAR EVENTS LOG FILE - CAC TIMING WITHOUT RADAR

Jan 1 00:03:14 IBR daemon.notice mgd: RRC DFS: TStamp = 122683 msec, CAC START ... wait for 60-secs,

Jan 1 00:04:15 IBR daemon.notice mgd: RRC DFS: TStamp = 183683 msec, CAC DONE

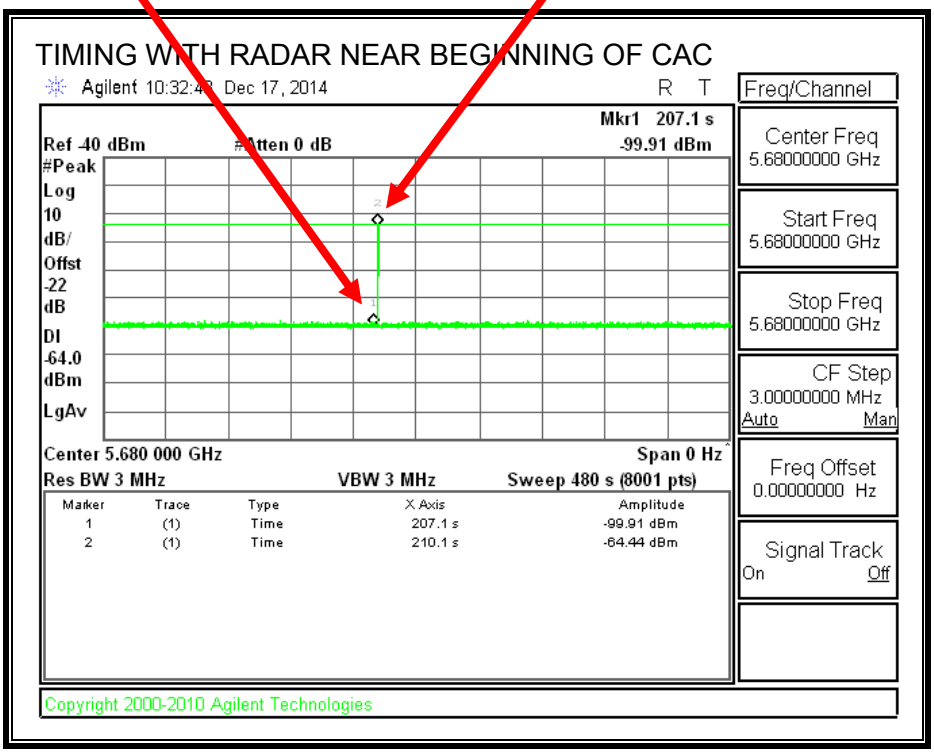
Jan 1 00:04:16 IBR daemon.notice mgd: RRC CLIENT : ENTER -> STATE_WAIT_SYNCH
Jan 1 00:04:16 IBR daemon.notice mgd: RRC CLIENT : ENTER -> STATE_PICK_TOP_ANTS

Jan 1 00:04:38 IBR daemon.notice mgd: Rx Frequency change: From [5840] / To [5680], ant combo change: From 2138 to 2138

TIMING WITH RADAR NEAR BEGINNING OF CAC

Start of CAC @ 5680 MHz

Radar Signal Applied @ 5680 MHz



No EUT transmissions on the intended channel were observed.

EUT RADAR EVENTS LOG FILE - BEGINNING OF CAC

Jan 1 00:03:15 IBR daemon.notice mgd: RRC DFS[1]: Sensor Init Complete on freq band 5685 - 5724 MHz

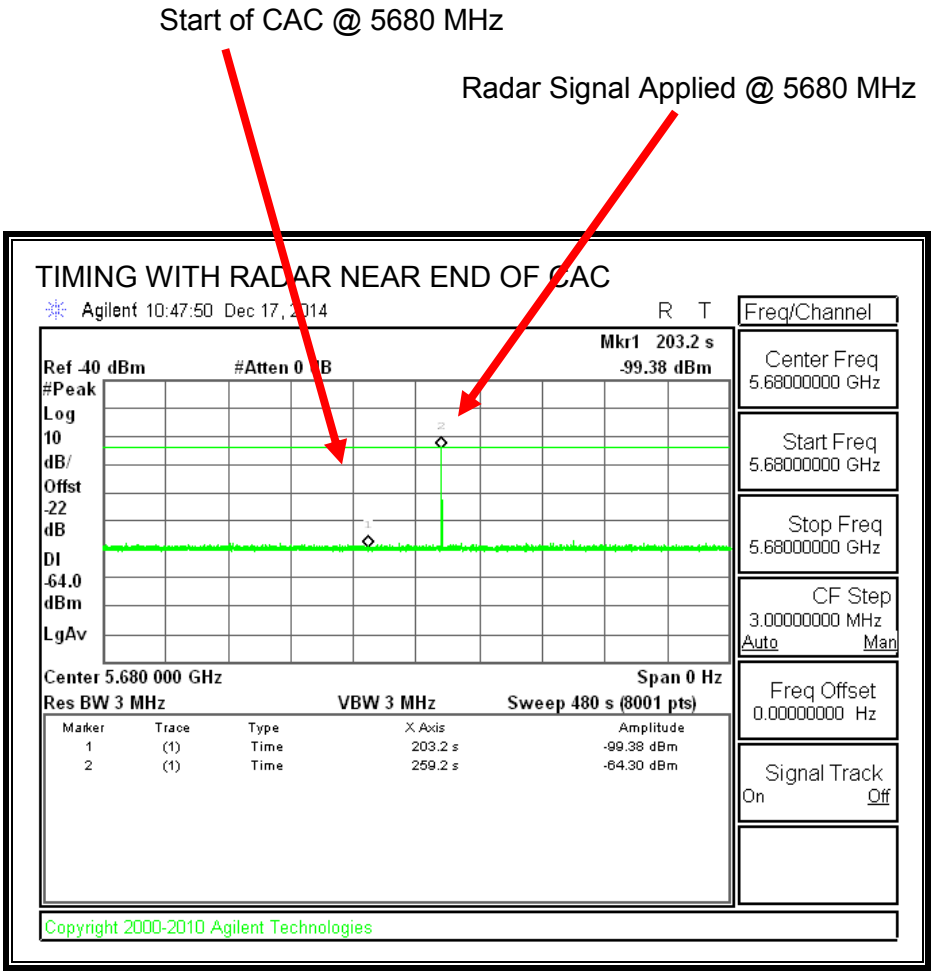
Jan 1 00:03:15 IBR daemon.notice mgd: RRC DFS: TStamp = 121712 msec, CAC START ... wait for 60-secs,

Jan 1 00:03:18 IBR daemon.notice mgd: RRC_DFS_RX: TStamp:124686 msec,RADAR DETECTED in freq_band lbe= 130,ube= 137,start=5650,end=5689

Jan 1 00:03:18 IBR daemon.info mgd: TRAP: 24|DFS Radar Detected in freq_band 5650 - 5689
Jan 1 00:03:18 IBR daemon.notice mgd: DFS Blackout Table
Jan 1 00:03:18 IBR daemon.notice mgd: 5470 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:18 IBR daemon.notice mgd: 5490 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:18 IBR daemon.notice mgd: 5510 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:18 IBR daemon.notice mgd: 5530 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:18 IBR daemon.notice mgd: 5550 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:18 IBR daemon.notice mgd: 5570 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:18 IBR daemon.notice mgd: 5590 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:18 IBR daemon.notice mgd: 5610 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:18 IBR daemon.notice mgd: 5630 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:18 IBR daemon.notice mgd: 5650 Mhz: 31:00 31:00 31:00 31:00
Jan 1 00:03:18 IBR daemon.notice mgd: 5670 Mhz: 31:00 31:00 31:00 00:00
Jan 1 00:03:18 IBR daemon.notice mgd: 5690 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:18 IBR daemon.notice mgd: 5710 Mhz: 00:00 00:00 00:00 00:00

Jan 1 00:03:18 IBR daemon.notice mgd: RRC CLIENT : ENTER -> STATE_IAS

TIMING WITH RADAR NEAR END OF CAC



No EUT transmissions on the intended channel were observed.

EUT RADAR EVENTS LOG FILE - END OF CAC

Jan 1 00:03:12 IBR daemon.notice mgd: RRC DFS: TStamp = 121751 msec, CAC START ... wait for 60-secs,

Jan 1 00:04:08 IBR daemon.notice mgd: RRC_DFS_RX: TStamp:177425 msec,RADAR DETECTED in freq_band lbe= 130,ube= 137,start=5650,end=5689

Jan 1 00:04:08 IBR daemon.notice mgd: DFS Blackout Table
Jan 1 00:04:08 IBR daemon.notice mgd: 5470 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:08 IBR daemon.notice mgd: 5490 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:08 IBR daemon.notice mgd: 5510 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:08 IBR daemon.notice mgd: 5530 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:08 IBR daemon.notice mgd: 5550 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:08 IBR daemon.notice mgd: 5570 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:08 IBR daemon.notice mgd: 5590 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:08 IBR daemon.notice mgd: 5610 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:08 IBR daemon.notice mgd: 5630 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:08 IBR daemon.notice mgd: 5650 Mhz: 31:00 31:00 31:00 31:00
Jan 1 00:04:08 IBR daemon.notice mgd: 5670 Mhz: 31:00 31:00 31:00 00:00
Jan 1 00:04:08 IBR daemon.notice mgd: 5690 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:08 IBR daemon.notice mgd: 5710 Mhz: 00:00 00:00 00:00 00:00

11.9.3. OVERLAPPING CHANNEL TESTS

RESULTS

These tests are not applicable.

11.9.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

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

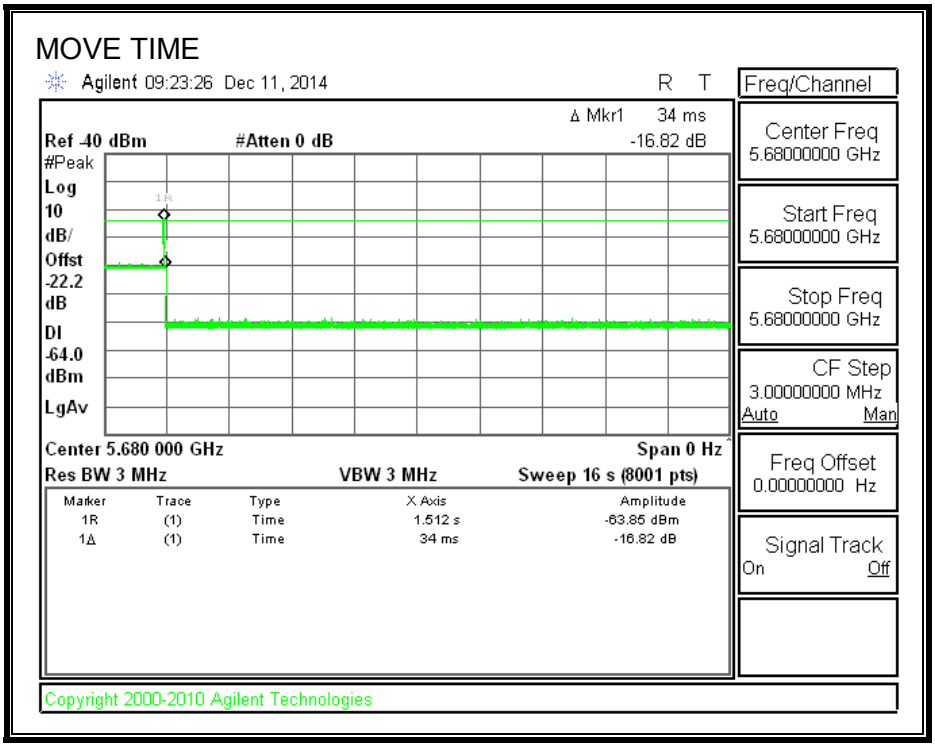
The observation period over which the IC aggregate time is calculated begins at (Reference Marker) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

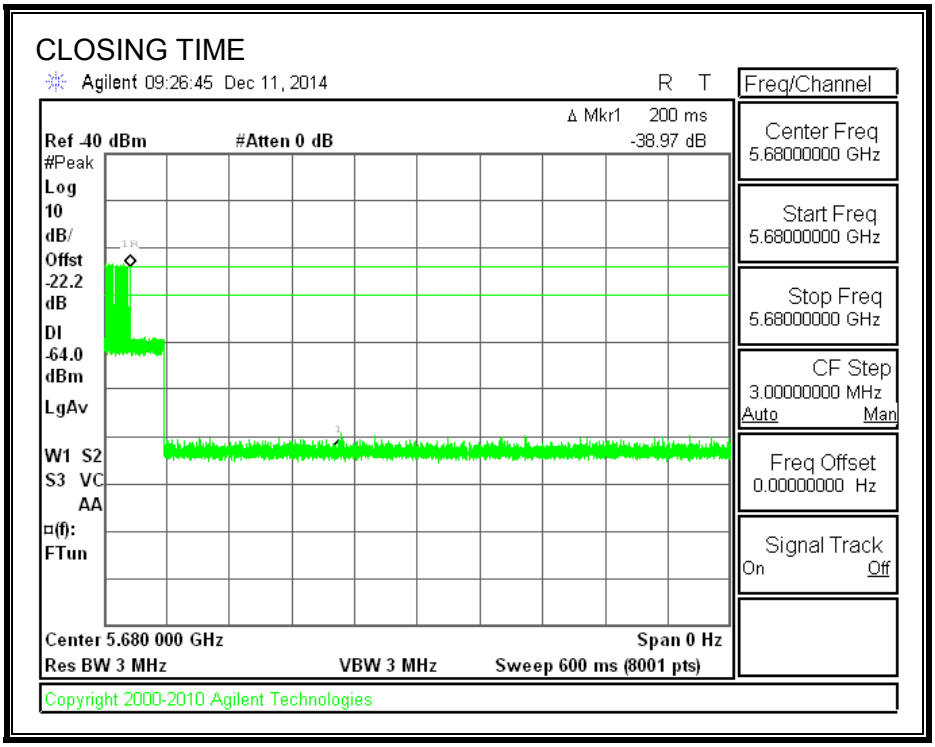
Channel Move Time (sec)	Limit (sec)
0.034	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
0.0	60

MOVE TIME



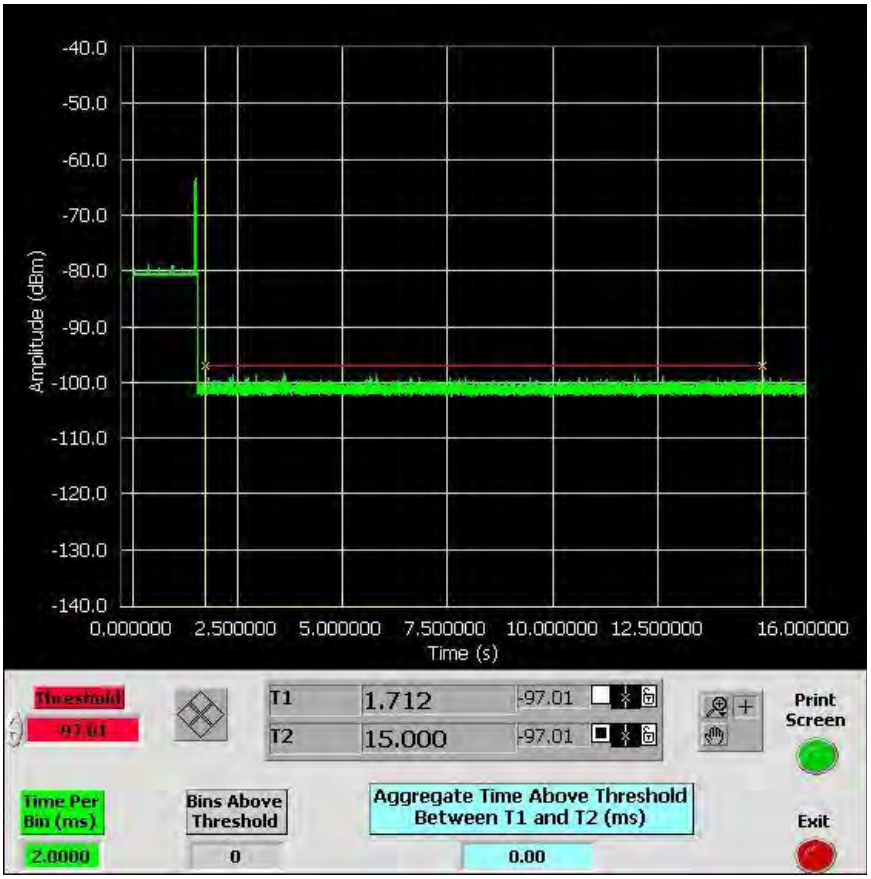
CHANNEL CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

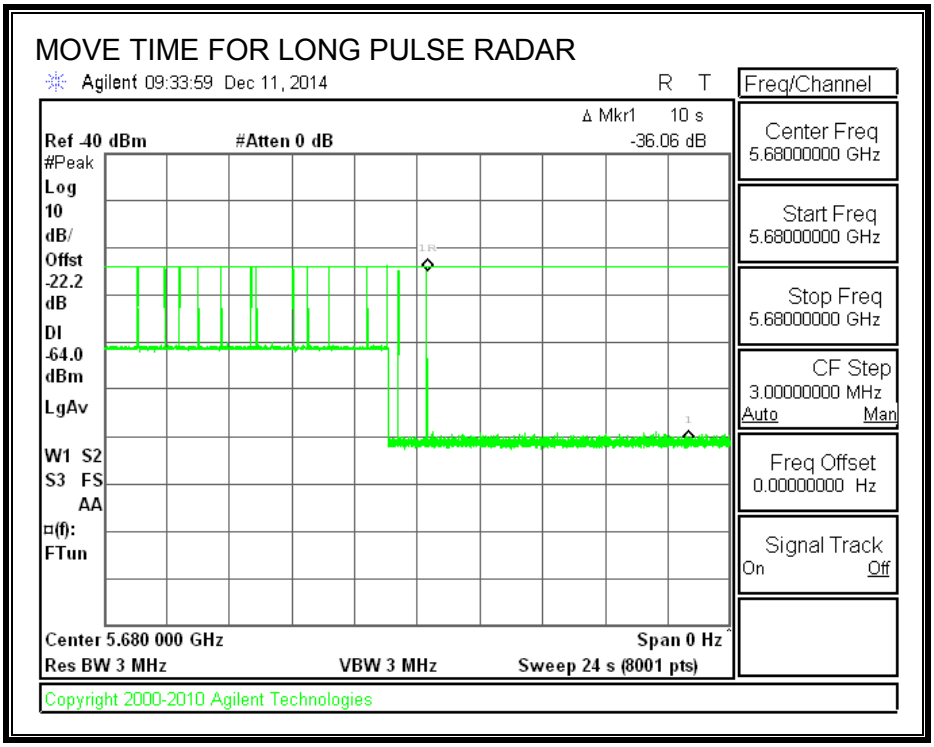
No transmissions are observed during the aggregate monitoring period.

FCC AGGREGATE CLOSING TIME



LONG PULSE CHANNEL MOVE TIME

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

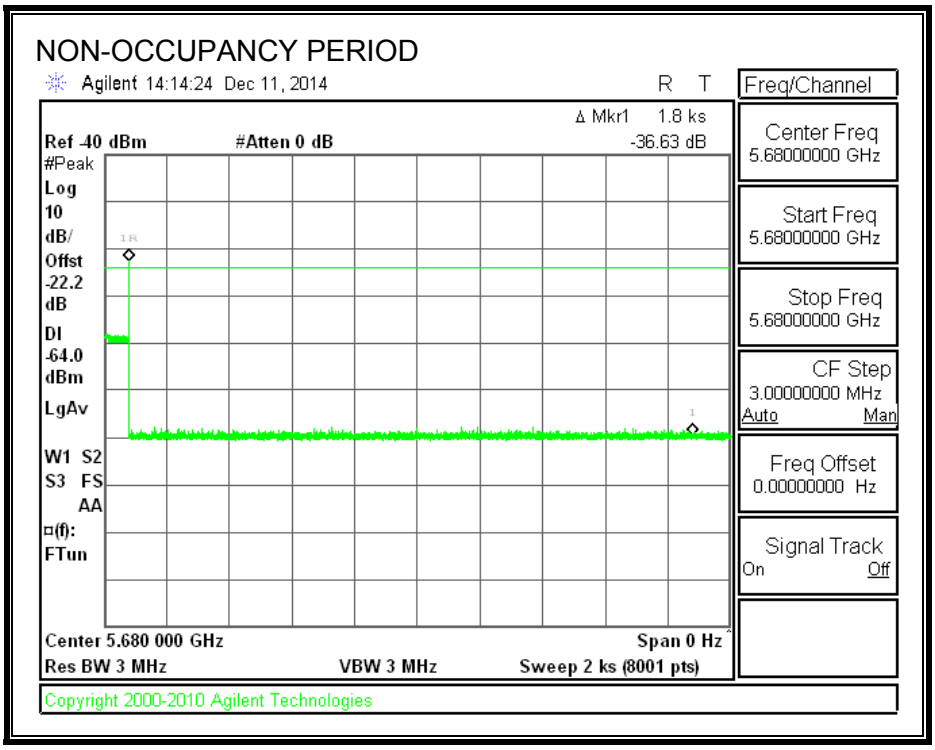


11.9.5. NON-OCCUPANCY PERIOD

RESULTS

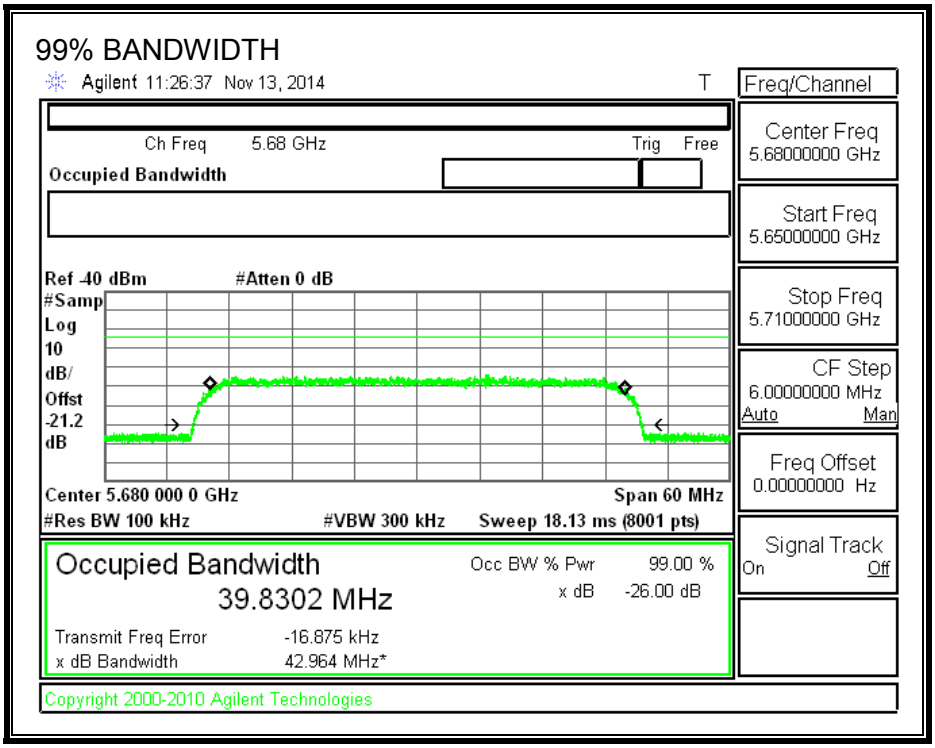
No EUT transmissions were observed on the test channel during the 30-minute observation time.

Testing of 40MHz bandwidth is considered representative of all other bandwidths.



11.9.6. 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 (%)
5660	5700	40	39.830	100.4	100

DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results				
FCC Type 0 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst				
Frequency (MHz)	Number of Trials	Number Detected	Detection (%)	Mark
5659	10	0	0	
5660	10	10	100	FL
5665	10	10	100	
5670	10	10	100	
5675	10	10	100	
5680	10	9	90	
5685	10	10	100	
5690	10	10	100	
5695	10	10	100	
5700	10	10	100	FH
5701	10	0	0	

11.9.7. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary				
Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail
FCC Short Pulse Type 1	30	100.00	60	Pass
FCC Short Pulse Type 2	30	90.00	60	Pass
FCC Short Pulse Type 3	30	90.00	60	Pass
FCC Short Pulse Type 4	30	100.00	60	Pass
Aggregate		95.00	80	Pass
FCC Long Pulse Type 5	30	86.67	80	Pass
FCC Hopping Type 6	41	100.00	70	Pass

TYPE 1 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 1				
1 us Pulse Width				
Waveform	PRI (us)	Pulses Per Burst	Test (A/B)	Successful Detection (Yes/No)
1001	3066	18	A	Yes
1002	678	78	A	Yes
1003	858	62	A	Yes
1004	638	83	A	Yes
1005	898	59	A	Yes
1006	558	95	A	Yes
1007	778	68	A	Yes
1008	718	74	A	Yes
1009	918	58	A	Yes
1010	698	76	A	Yes
1011	758	70	A	Yes
1012	938	57	A	Yes
1013	838	63	A	Yes
1014	738	72	A	Yes
1015	598	89	A	Yes
1016	798	67	B	Yes
1017	1224	44	B	Yes
1018	993	54	B	Yes
1019	2874	19	B	Yes
1020	1435	37	B	Yes
1021	1032	52	B	Yes
1022	931	57	B	Yes
1023	1399	38	B	Yes
1024	1476	36	B	Yes
1025	2706	20	B	Yes
1026	1979	27	B	Yes
1027	894	60	B	Yes
1028	3029	18	B	Yes
1029	1613	33	B	Yes
1030	1078	49	B	Yes

TYPE 2 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 2				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
2001	4.4	227.00	29	No
2002	3.3	159.00	29	Yes
2003	4.2	211.00	29	Yes
2004	3.1	191.00	23	Yes
2005	4.1	167.00	23	Yes
2006	3.8	160.00	24	Yes
2007	2.8	193.00	26	Yes
2008	3.7	170.00	29	Yes
2009	1.7	202.00	26	Yes
2010	1.4	213.00	26	Yes
2011	3.9	223.00	28	No
2012	3.4	210.00	25	Yes
2013	4.5	158.00	25	Yes
2014	2.2	170.00	23	Yes
2015	4.9	183.00	27	Yes
2016	4.9	206.00	29	Yes
2017	1.4	205.00	29	Yes
2018	1.2	182.00	27	Yes
2019	3.8	222.00	26	Yes
2020	1.2	178.00	29	Yes
2021	1.4	153.00	25	Yes
2022	2.9	172.00	24	Yes
2023	1.9	192.00	24	No
2024	2.4	213.00	24	Yes
2025	2.4	154.00	26	Yes
2026	1.9	222.00	28	Yes
2027	1.7	169.00	29	Yes
2028	3.3	158.00	29	Yes
2029	3	216.00	23	Yes
2030	1.4	210.00	25	Yes

TYPE 3 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 3				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
3001	10	499.00	17	Yes
3002	8.8	319.00	18	No
3003	9.4	379.00	18	Yes
3004	9.4	430.00	17	Yes
3005	9.4	308.00	17	Yes
3006	8.1	373.00	18	Yes
3007	9.7	414.00	16	Yes
3008	6.9	475.00	18	Yes
3009	7.1	497.00	17	Yes
3010	9.5	409.00	17	Yes
3011	6.5	262.00	17	Yes
3012	6.4	351.00	17	Yes
3013	9.3	277.00	17	Yes
3014	5.4	335.00	17	Yes
3015	8.1	408.00	17	Yes
3016	7.9	387.00	18	No
3017	6.7	302.00	17	Yes
3018	7.9	445.00	16	Yes
3019	5.5	309.00	16	Yes
3020	6	444.00	16	Yes
3021	8	480.00	17	Yes
3022	8	384.00	17	Yes
3023	8.6	456.00	17	Yes
3024	7	401.00	18	Yes
3025	7.4	282.00	18	Yes
3026	6.8	366.00	17	Yes
3027	7.2	305.00	17	Yes
3028	7.5	468.00	18	No
3029	6.1	420	18	Yes
3030	6.5	401	17	Yes

TYPE 4 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 4				
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Successful Detection (Yes/No)
4001	14.5	365.00	16	Yes
4002	13.4	433.00	12	Yes
4003	15.3	438.00	12	Yes
4004	19.4	374.00	14	Yes
4005	16.8	250.00	12	Yes
4006	11.6	375.00	15	Yes
4007	13.1	250.00	16	Yes
4008	16	404.00	16	Yes
4009	17.3	354.00	16	Yes
4010	16.6	282.00	15	Yes
4011	19.9	294.00	13	Yes
4012	15.4	253.00	15	Yes
4013	18.4	312.00	12	Yes
4014	16.6	307.00	16	Yes
4015	19.5	435.00	13	Yes
4016	15.5	253.00	13	Yes
4017	15	321.00	13	Yes
4018	11.7	475.00	13	Yes
4019	11.6	319.00	14	Yes
4020	17.2	451.00	15	Yes
4021	16.6	331.00	16	Yes
4022	17.6	485.00	13	Yes
4023	14.6	306.00	15	Yes
4024	17.4	327.00	13	Yes
4025	14.8	319.00	13	Yes
4026	17.3	303.00	15	Yes
4027	13.7	361.00	13	Yes
4028	18.2	395.00	16	Yes
4029	18.6	455.00	16	Yes
4030	15.6	420.00	14	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5	
Trial	Successful Detection (Yes/No)
1	No
2	Yes
3	Yes
4	No
5	Yes
6	Yes
7	No
8	Yes
9	Yes
10	Yes
11	Yes
12	No
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

Note: Randomized parameters for the Type 5 In-Service Monitoring testing performed on 11/13/14 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	97	5660	9	Yes
2	572	5661	4	Yes
3	1047	5662	10	Yes
4	1522	5663	10	Yes
5	1997	5664	10	Yes
6	2472	5665	6	Yes
7	2947	5666	5	Yes
8	3422	5667	7	Yes
9	3897	5668	7	Yes
10	4372	5669	6	Yes
11	4847	5670	8	Yes
12	5322	5671	11	Yes
13	5797	5672	8	Yes
14	6272	5673	6	Yes
15	6747	5674	6	Yes
16	7222	5675	4	Yes
17	7697	5676	6	Yes
18	8172	5677	6	Yes
19	8647	5678	13	Yes
20	9122	5679	10	Yes

TYPE 6 DETECTION PROBABILITY (CONT.)

21	9597	5680	12	Yes
22	10072	5681	8	Yes
23	10547	5682	13	Yes
24	11022	5683	8	Yes
25	11497	5684	6	Yes
26	11972	5685	5	Yes
27	12447	5686	9	Yes
28	12922	5687	7	Yes
29	13397	5688	9	Yes
30	13872	5689	9	Yes
31	14347	5690	10	Yes
32	14822	5691	10	Yes
33	15297	5692	9	Yes
34	15772	5693	8	Yes
35	16247	5694	10	Yes
36	16722	5695	9	Yes
37	17197	5696	8	Yes
38	17672	5697	5	Yes
39	18147	5698	11	Yes
40	18622	5699	10	Yes
41	19097	5700	10	Yes

11.9.8. CAC DUAL SENSOR BAND BLOCKING VERIFICATION TEST PROCEDURE

The spectrum analyzer is tuned to 5680 MHz and the log file from the EUT records the events.

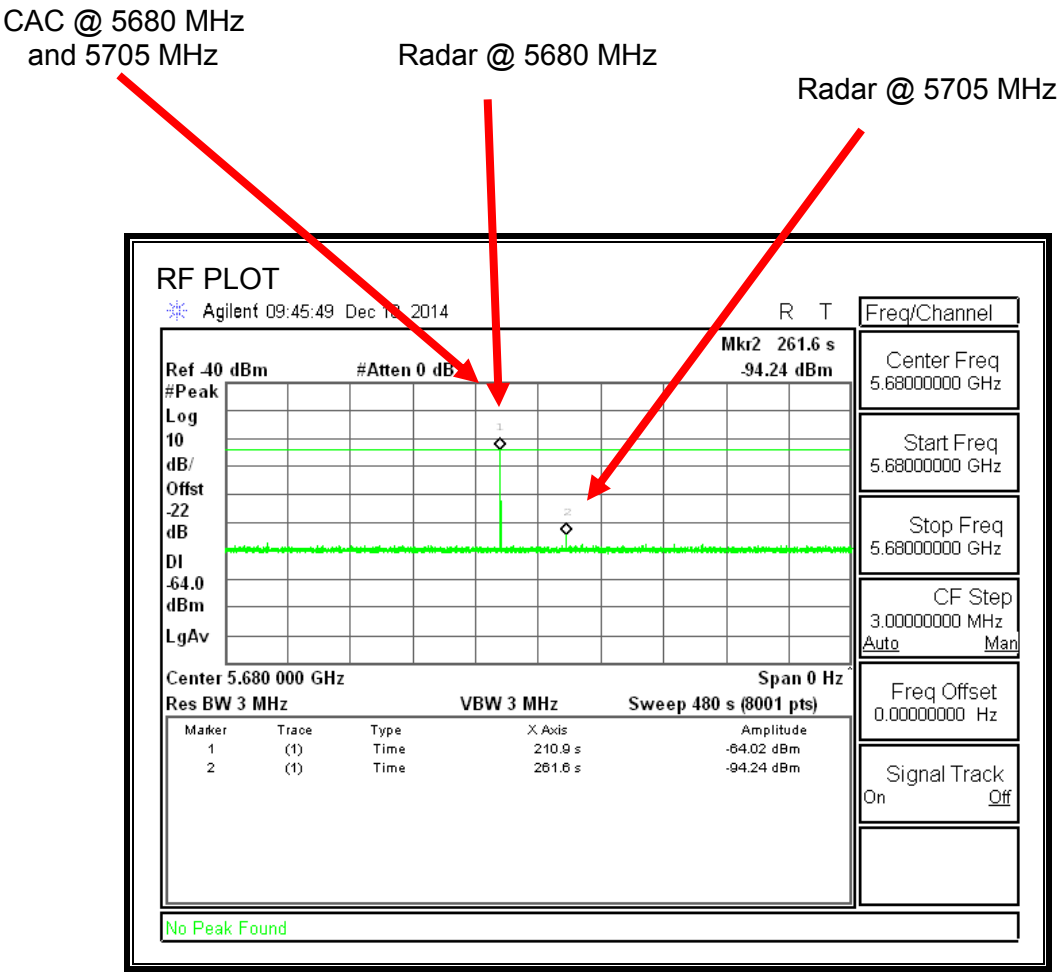
The power to the EUT is cycled and a sweep is concurrently started on the spectrum analyzer. After the EUT boots-up a CAC period is simultaneously performed on 5680 MHz and 5705 MHz.

A radar burst is triggered on 5680 MHz approximately 6 seconds into the CAC period. In response to this the EUT places 5680 MHz on the blocked channel list. A radar burst is then triggered approximately 51 seconds later on 5705 MHz. After the second detection the EUT places 5705 MHz on the blocked channel list and removes itself from service in the 5470 MHz to 5725 MHz band.

Once the non-occupancy period is complete on 5680 MHz the channel is cleared from the blocked channel list. A CAC period is performed on the cleared channel and upon successful completion the EUT enters service.

11.9.9. CAC DUAL SENSOR BAND BLOCKING VERIFICATION TEST RESULTS

RF PLOT



LOG FILE

Jan 1 00:03:13 IBR daemon.notice mgd: RRC DFS: TStamp = 123757 msec, CAC START ... wait for 60-secs,

Jan 1 00:03:19 IBR daemon.notice mgd: RRC_DFS_RX: TStamp:129187 msec,RADAR DETECTED in freq_band lbe= 130,ube= 137,start=5650,end=5689

Jan 1 00:03:19 IBR daemon.notice mgd: DFS Blackout Table
Jan 1 00:03:19 IBR daemon.notice mgd: 5470 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:19 IBR daemon.notice mgd: 5490 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:19 IBR daemon.notice mgd: 5510 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:19 IBR daemon.notice mgd: 5530 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:19 IBR daemon.notice mgd: 5550 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:19 IBR daemon.notice mgd: 5570 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:19 IBR daemon.notice mgd: 5590 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:19 IBR daemon.notice mgd: 5610 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:19 IBR daemon.notice mgd: 5630 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:19 IBR daemon.notice mgd: 5650 Mhz: 31:00 31:00 31:00 31:00
Jan 1 00:03:19 IBR daemon.notice mgd: 5670 Mhz: 31:00 31:00 31:00 31:00
Jan 1 00:03:19 IBR daemon.notice mgd: 5690 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:03:19 IBR daemon.notice mgd: 5710 Mhz: 00:00 00:00 00:00 00:00

Jan 1 00:04:10 IBR daemon.notice mgd: RRC_DFS_RX: TStamp:179890 msec,RADAR DETECTED in freq_band lbe= 137,ube= 144,start=5685,end=5724

Jan 1 00:04:10 IBR daemon.notice mgd: DFS Blackout Table
Jan 1 00:04:10 IBR daemon.notice mgd: 5470 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:10 IBR daemon.notice mgd: 5490 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:10 IBR daemon.notice mgd: 5510 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:10 IBR daemon.notice mgd: 5530 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:10 IBR daemon.notice mgd: 5550 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:10 IBR daemon.notice mgd: 5570 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:10 IBR daemon.notice mgd: 5590 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:10 IBR daemon.notice mgd: 5610 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:10 IBR daemon.notice mgd: 5630 Mhz: 00:00 00:00 00:00 00:00
Jan 1 00:04:10 IBR daemon.notice mgd: 5650 Mhz: 30:10 30:10 30:10 30:10
Jan 1 00:04:10 IBR daemon.notice mgd: 5670 Mhz: 30:10 30:10 30:10 30:10
Jan 1 00:04:10 IBR daemon.notice mgd: 5690 Mhz: 31:00 31:00 31:00 31:00
Jan 1 00:04:10 IBR daemon.notice mgd: 5710 Mhz: 31:00 31:00 31:00 00:00