DFS PORTION of FCC 47 CFR PART 15 SUBPART E

CERTIFICATION TEST REPORT

FOR

BCM94709R-M 802.11a/n/ac ACCESS POINT

MODEL NUMBER: BCM94709R-M

FCC ID: QDS-BRCM1091

REPORT NUMBER: 11533080-E2V1

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: BROADCOM CORPORATION
190 MATHILDA PLACE
SUNNYVALE, CA 94086, U.S.A

EUT DESCRIPTION: BCM94709R-M 802.11a/n/ac ACCESS POINT

MODEL: BCM94709R-M

SERIAL NUMBER: 1839019

DATE TESTED: DECEMBER 05, 2016 to FEBRUARY 02, 2017

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
DFS Portion of CFR 47 Part 15 Subpart E	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.

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PROJECT LEAD
UL Verification Services Inc.

Tested By:

DOUG ANDERSON
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.

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
Conducted Disturbance, 0.15 to 30 MHz	± 3.52 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.94 dB
Radiated Disturbance, 1 to 6 GHz	± 3.86 dB
Radiated Disturbance, 6 to 18 GHz	± 4.23 dB
Radiated Disturbance, 18 to 26 GHz	± 5.30 dB
Radiated Disturbance, 26 to 40 GHz	± 5.23 dB

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

5. DYNAMIC FREQUENCY SELECTION

5.1. OVERVIEW

5.1.1. LIMITS

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”.

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

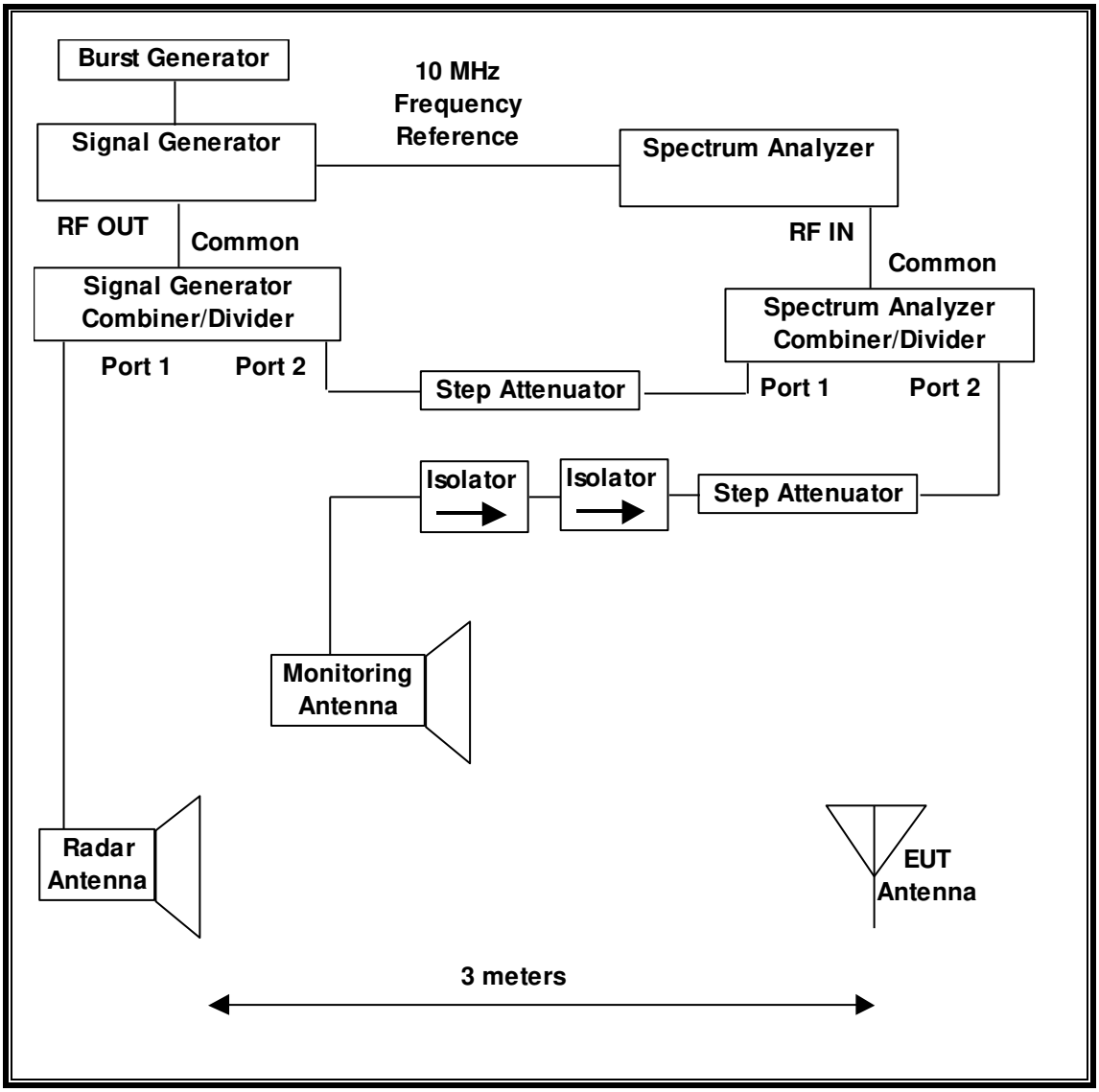
Radar Waveform Type	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

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

RADIATED 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.

SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). 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 distance 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 monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

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	US51350187	06/13/17
Signal Generator, MXG X-Series RF Vector	Agilent	N5182B	MY51350337	03/11/17
Arbitrary Waveform Generator	Agilent / HP	33220A	MY44037572	04/11/17

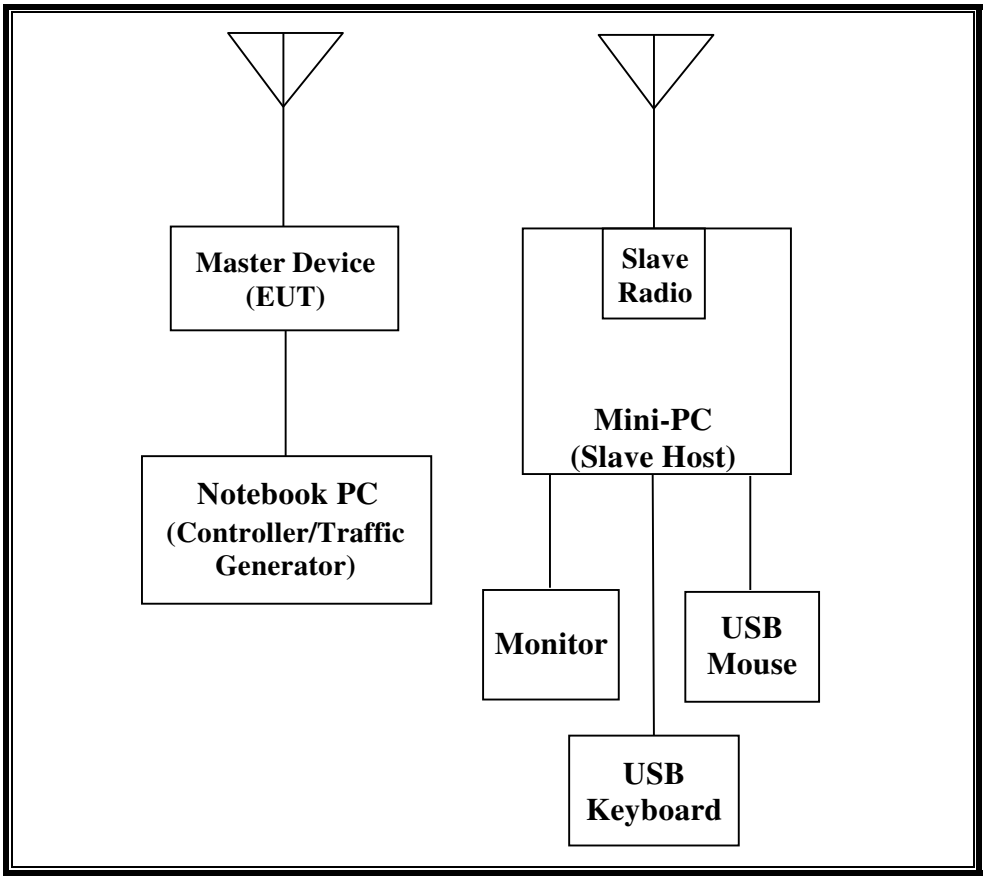
5.1.3. TEST AND MEASUREMENT SOFTWARE

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 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

5.1.4. SETUP OF EUT

RADIATED METHOD EUT TEST SETUP (STANDARD MODE CONFIGURATION)

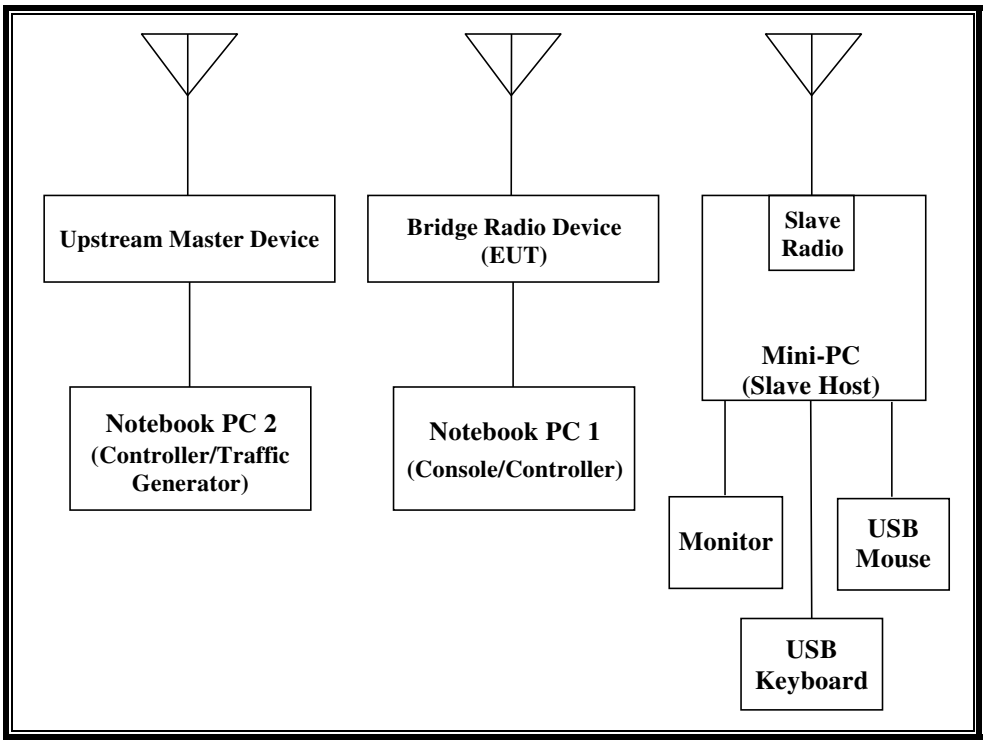


SUPPORT EQUIPMENT (STANDARD MODE CONFIGURATION)

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**
AC Adapter (EUT)	Condor	HK-H1-A12	None	DoC
Notebook PC (EUT Controller/Traffic Generator)	Lenovo	0679	CBU4495737	DoC
AC Asdapter (EUT PC)	Delta Electronics	ADP-65HK B	11S36001646ZZ1000A D9WJ	DoC
802.11a/n/ac Radio Module (Slave Radio Device)	Broadcom	BCM94366MC	001018FBD897	N/A
Mini-PC (Slave Host)	Gigabyte	P105	1517631219	DoC
AC Adapter (Host PC)	Asian Power Devices, Ltd.	NB-65B19	YE45315128015560400	DoC
Monitor	ASUS	VS197	E2LMTF118423	DoC
USB Keyboard	HP	KU-0316	BAUHPOILUZJ124	DoC
USB Mouse	HP	MOFYUO	FCMHH0AKZ8R3Z9	DoC

RADIATED METHOD EUT TEST SETUP (BRIDGE MODE CONFIGURATION)



SUPPORT EQUIPMENT(BRIDGE MODE CONFIGURATION)

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**
AC Adapter (EUT)	Condor	HK-H1-A12	None	DoC
Notebook PC 1 (EUT Console/Controller)	Lenovo	0679	CB06427441	DoC
AC Asdapter (EUT Console PC)	Lenovo	ADP-65KH B	11S36001646ZZ1000AD9WJ	DoC
802.11a/n/ac High-Power 5GHz AP (Upstream Master Device)	Broadcom	BCM94709R-H	2/2/7165	QDS-BRCM1092
AC Adapter (Upstream Master)	Condor	HK-H1-A12	None	DoC
Notebook PC 2 (Upstream Master Controller/Traffic Generator)	Lenovo	0679	CBU4495737	DoC
AC Asdapter (Upstream Master PC)	Delta Electronics	ADP-65YB B	11S42T4458Z1ZF4K96B09D	DoC
802.11a/n/ac Radio Module (Slave Radio Device)	Broadcom	BCM94366MC	001018FBD897	N/A
Mini-PC (Slave Host)	Gigabyte	P105	1517631219	DoC
AC Adapter (Host PC)	Asian Power Devices, Ltd.	NB-65B19	YE45315128015560400	DoC
Monitor	ASUS	VS197	E2LMTF118423	DoC
USB Keyboard	Dell	SK-8135	CN-0N6250-71616-646-1AUD	DoC
USB Mouse	Logitech	MU0026	None	DoC

5.1.5. DESCRIPTION OF EUT

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

The EUT is a Master Device which can also be configured as a Bridge Device.

The highest power level within these bands is 21.63 dBm EIRP in the 5250-5350 MHz band and 23.88 dBm EIRP in the 5470-5725 MHz band.

Each of the four individual antenna assemblies utilized with the EUT has a gain of 0.3 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 procedural adjustments, the required radiated threshold at the antenna port is –64 + 1 = -63 dBm.

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

The EUT utilizes the 802.11ac Phase II architecture. Four nominal channel bandwidths are implemented: 20 MHz, 40 MHz, 80 MHz and 160 MHz.

The EUT is a Master Device which can also be configured as a Bridge Device. The EUT supports standard 20/40/80 MHz DFS as well as Zero-Wait CAC and 20 MHz sub-band radar detection on standard 40/80 MHz and 80-Plus-80 contiguous 160 MHz channel bandwidths.

160 MHz contiguous channel bandwidth is composed of two adjacent 80 MHz channel components on separate transmit and receive radio chains with a guard band separation of approximately 4 MHz at the 160 MHz center. Each component is treated as a separate 80 MHz channel during testing. While functioning in 80-Plus-80 mode each of the two components shall be designated as “80L” (80-Low) and “80H” (80-High), respectively.

The EUT does not support Zero-Wait CAC while in 80-Plus-80 mode.

While functioning in 20 MHz, 40 MHz or standard 80 MHz 11 ac modes the EUT uses four transmitter/receiver chains, each connected to an antenna to perform radiated tests.

While functioning in 160 MHz 11 ac Phase II mode the EUT uses two transmitter/receiver chains for each of the 80-Plus-80 MHz components, each connected to an antenna to perform radiated tests.

The EUT was tested while configured in a manner that exercised combinations of channel frequencies, channel bandwidths and transmit chains to demonstrate compliance.

The EUT was tested at the center frequency of the test channel while configured in standard 80 MHz 11 ac mode. This frequency not only demonstrates compliance for standard 11ac mode but also demonstrates compliance for the lower 80 MHz component of the EUT while configured in 160 MHz 80-Plus-80 MHz mode.

The EUT was tested at the center frequency of the upper 80 MHz component while configured in 160 MHz 80-Plus-80 MHz mode to demonstrate compliance for 160 MHz 80-Plus-80 MHz mode.

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 implemented in all operating modes.

The software installed in the EUT is Rel 7.14.164.301.

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 Broadcom Corporation Access Point, FCC ID: QDS-BRCM1091. Each of the four individual antenna assemblies used by the Master Device has a minimum gain of 0.3 dBi.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is –64 dBm. After correction for procedural adjustments, the required radiated threshold at the antenna port is –64 + 1 = -63 dBm.

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

5.2. LOW BAND RESULTS FOR 20 MHz BANDWIDTH

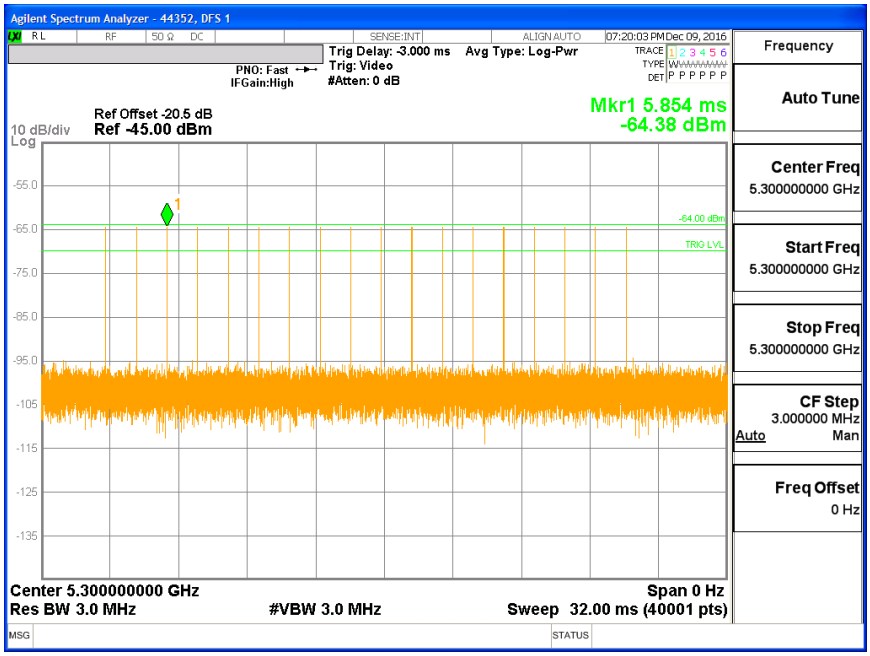
5.2.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5300 MHz.

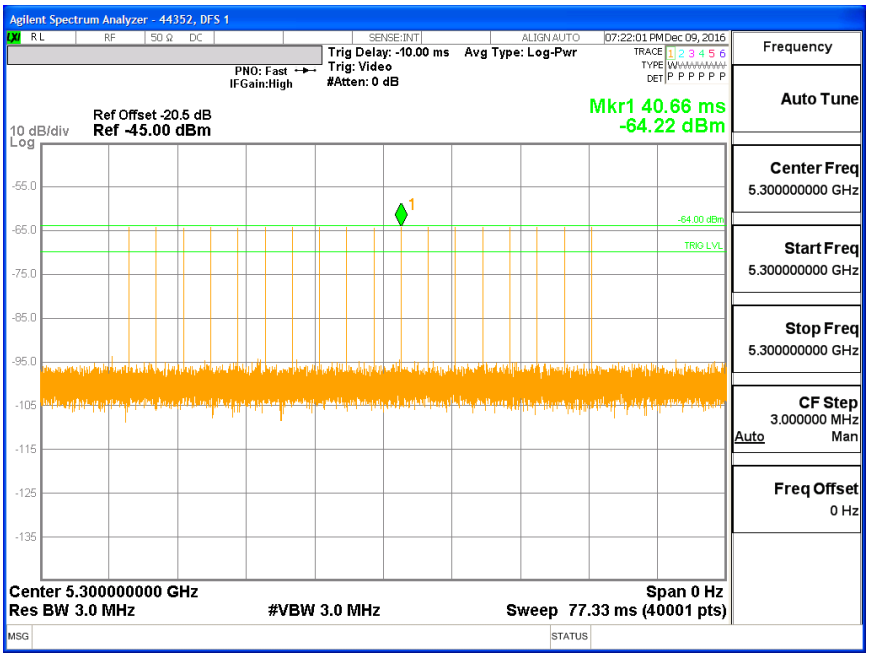
5.2.2. RADAR WAVEFORMS AND TRAFFIC

RADAR WAVEFORMS

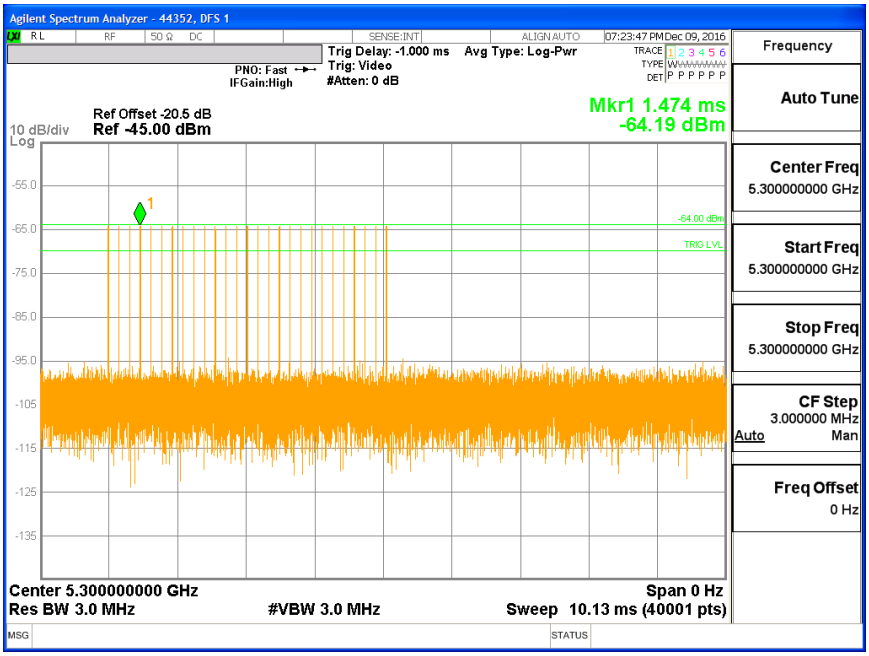
SHORT PULSE RADAR TYPE 0



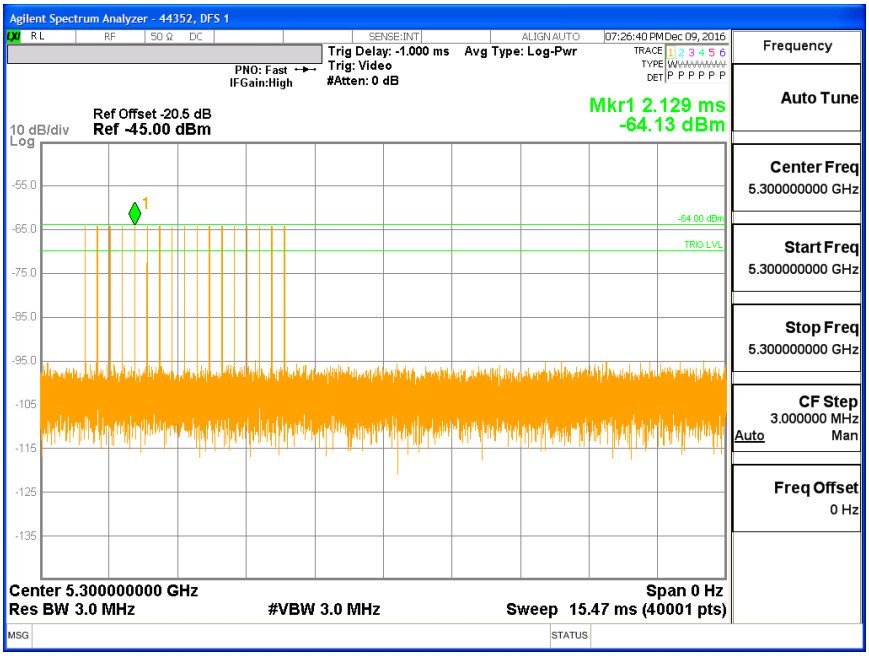
SAMPLE OF RADAR TYPE 1



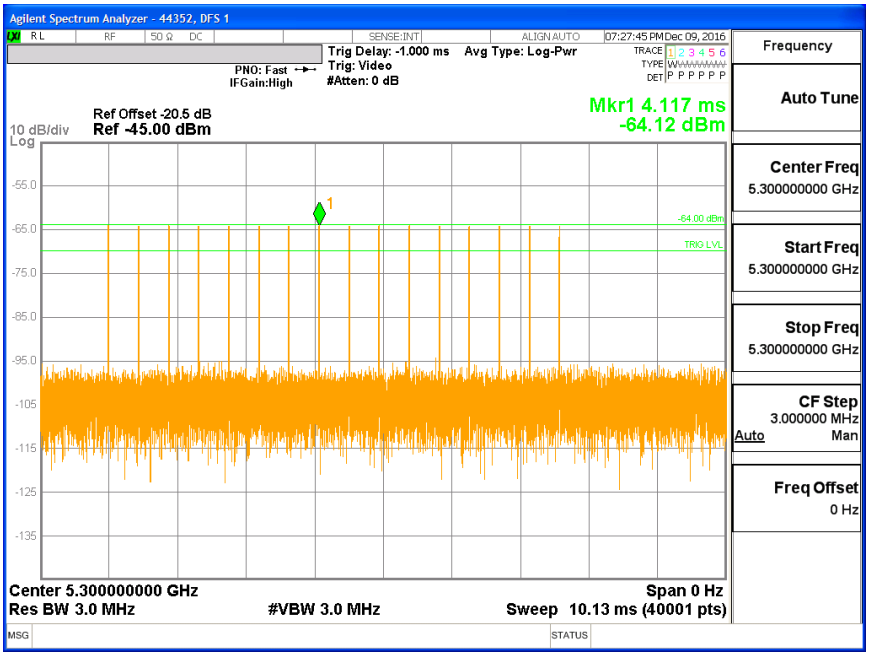
SAMPLE OF RADAR TYPE 2



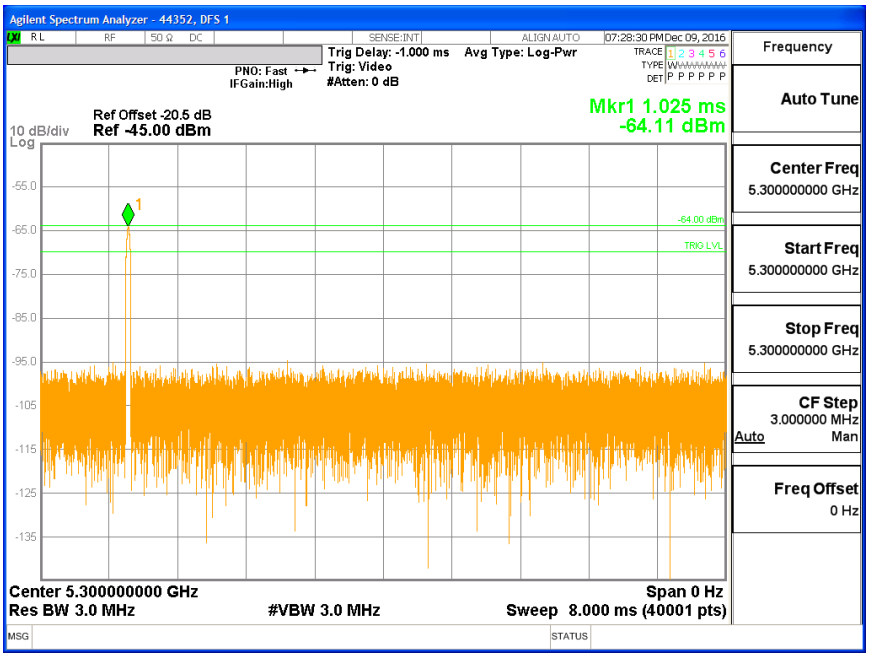
SAMPLE OF RADAR TYPE 3



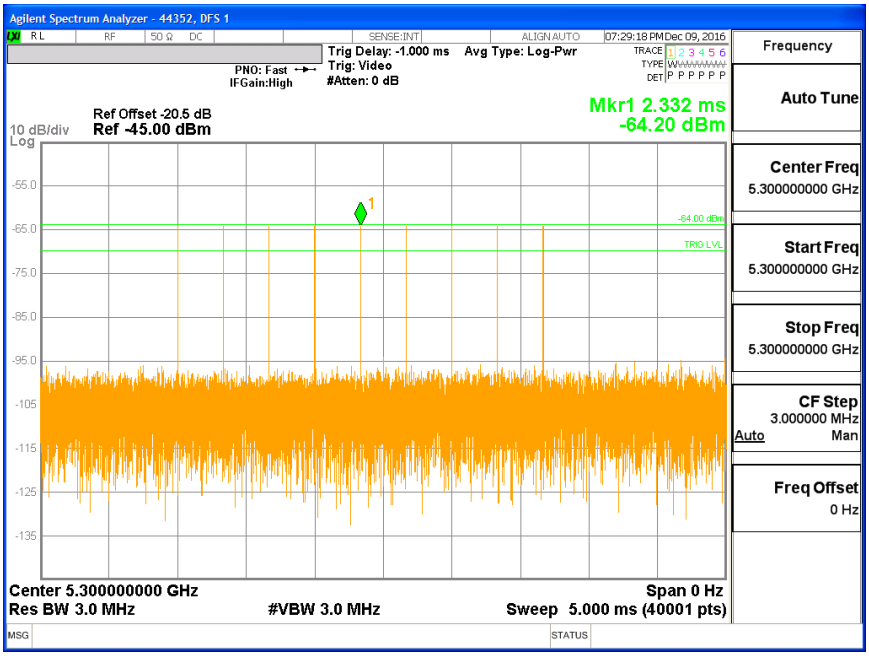
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

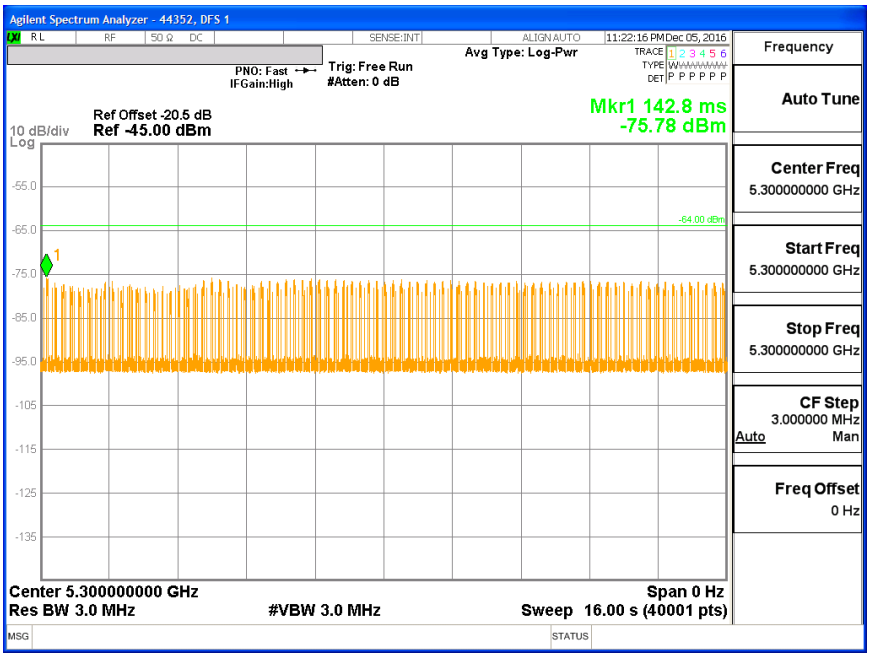


SINGLE BURST OF RADAR TYPE 6

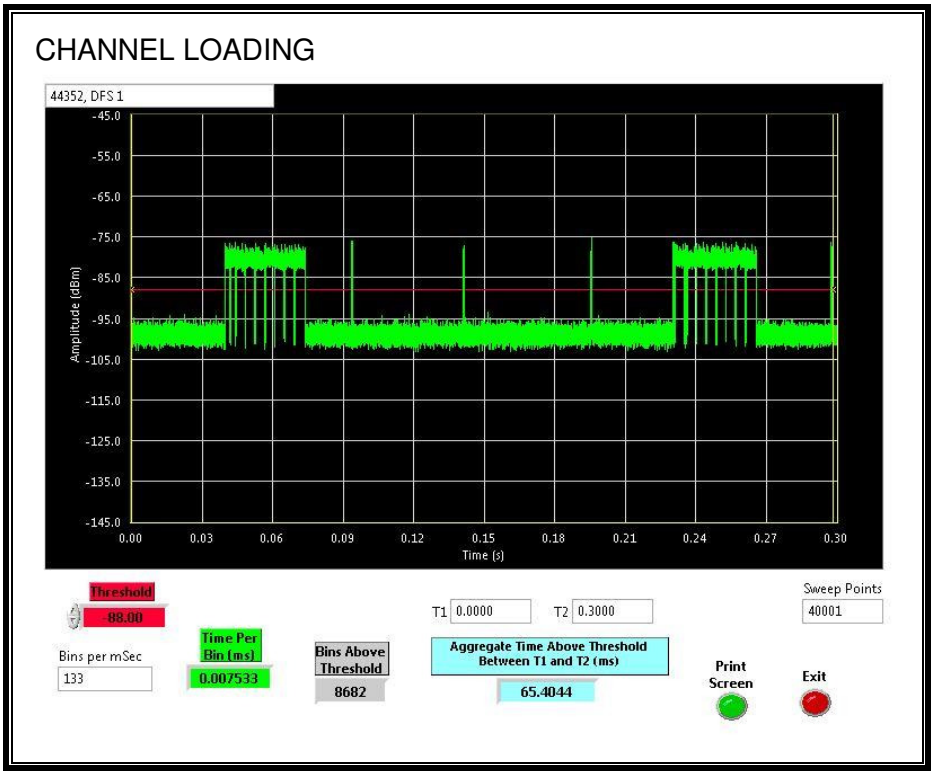


TRAFFIC

TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 21.8%

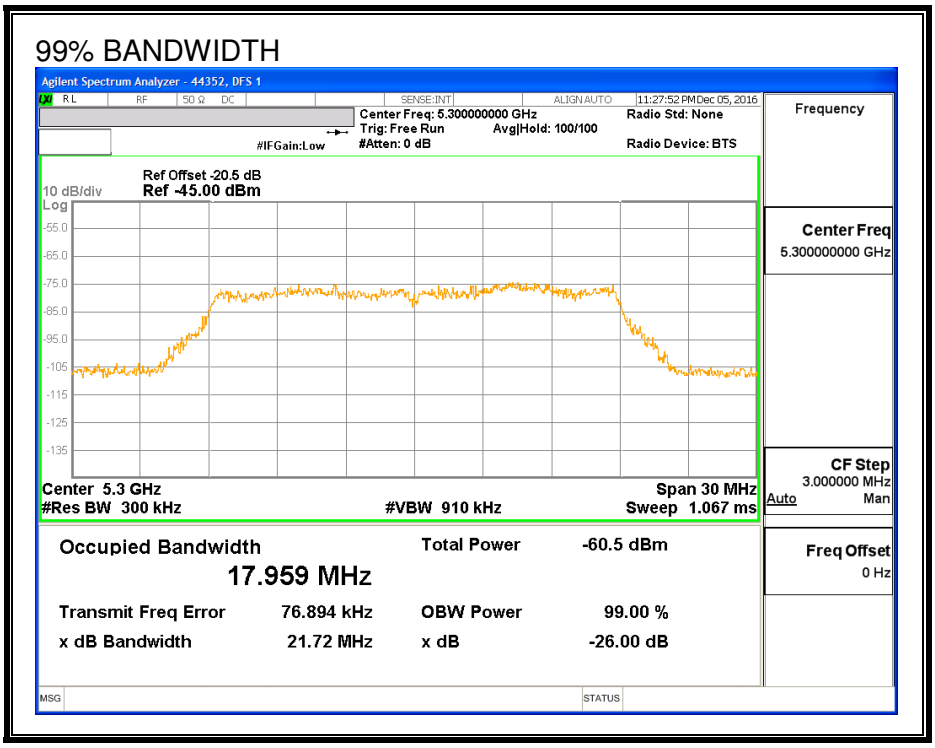
5.2.3. OVERLAPPING CHANNEL TESTS

RESULTS

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

5.2.4. 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 (%)
5290	5310	20	17.959	111.4	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
5289	10	0	0	
5290	10	10	100	FL
5295	10	10	100	
5300	10	10	100	
5305	10	10	100	
5310	10	10	100	FH
5311	10	0	0	

5.2.5. 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	5290	5310	17.96	DFS 1	29445	Version 3.0
FCC Short Pulse Type 2	30	83.33	60	Pass	5290	5310	17.96	DFS 1	29445	Version 3.0
FCC Short Pulse Type 3	30	70.00	60	Pass	5290	5310	17.96	DFS 1	29445	Version 3.0
FCC Short Pulse Type 4	30	70.00	60	Pass	5290	5310	17.96	DFS 1	29445	Version 3.0
Aggregate		80.83	80	Pass						
FCC Long Pulse Type 5	30	83.33	80	Pass	5290	5310	17.96	DFS 1	29445	Version 3.0
FCC Hopping Type 6	42	97.62	70	Pass	5290	5310	17.96	DFS 1	29445	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	5300	Yes
1002	1	938	57	A	5300	Yes
1003	1	638	83	A	5300	Yes
1004	1	758	70	A	5300	Yes
1005	1	738	72	A	5300	Yes
1006	1	878	61	A	5300	Yes
1007	1	818	65	A	5300	Yes
1008	1	618	86	A	5300	Yes
1009	1	658	81	A	5300	Yes
1010	1	898	59	A	5300	Yes
1011	1	518	102	A	5300	Yes
1012	1	778	68	A	5300	Yes
1013	1	718	74	A	5300	Yes
1014	1	858	62	A	5300	Yes
1015	1	838	63	A	5300	Yes
1016	1	1493	36	B	5300	Yes
1017	1	1514	35	B	5300	Yes
1018	1	2017	27	B	5300	Yes
1019	1	2167	25	B	5300	Yes
1020	1	2800	19	B	5300	Yes
1021	1	1885	28	B	5300	Yes
1022	1	2647	20	B	5300	Yes
1023	1	667	80	B	5300	Yes
1024	1	1558	34	B	5300	Yes
1025	1	2255	24	B	5300	Yes
1026	1	2082	26	B	5300	Yes
1027	1	2909	19	B	5300	Yes
1028	1	2864	19	B	5300	Yes
1029	1	2626	21	B	5300	Yes
1030	1	2712	20	B	5300	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	3	158	27	5300	Yes
2002	2.2	223	27	5300	Yes
2003	2	195	28	5300	Yes
2004	1.5	183	25	5300	Yes
2005	3.7	164	26	5300	Yes
2006	1.4	156	27	5300	Yes
2007	3.8	179	29	5300	Yes
2008	1.8	218	24	5300	No
2009	4.4	208	29	5300	Yes
2010	2.6	170	24	5300	No
2011	1.5	163	23	5300	Yes
2012	4	210	29	5300	Yes
2013	1	170	29	5300	Yes
2014	1.8	183	28	5300	Yes
2015	1.1	228	25	5300	Yes
2016	2.1	203	27	5300	Yes
2017	3.6	171	28	5300	No
2018	2.9	154	28	5300	Yes
2019	4.8	170	29	5300	Yes
2020	4.3	195	26	5300	Yes
2021	4.3	176	27	5300	Yes
2022	2.1	168	28	5300	Yes
2023	4.4	192	23	5300	Yes
2024	2.4	230	25	5300	Yes
2025	5	220	24	5300	Yes
2026	1.3	182	25	5300	Yes
2027	2.1	176	24	5300	No
2028	4.6	223	23	5300	Yes
2029	3.8	183	23	5300	Yes
2030	2.4	196	29	5300	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	6.8	281	17	5300	Yes
3002	7.7	335	18	5300	Yes
3003	9.5	487	17	5300	Yes
3004	6.6	436	18	5300	Yes
3005	8.5	483	17	5300	Yes
3006	8	445	16	5300	No
3007	6.1	254	17	5300	No
3008	9.9	479	17	5300	No
3009	8.2	434	18	5300	No
3010	6.1	421	18	5300	Yes
3011	6.8	389	18	5300	Yes
3012	9.1	271	16	5300	Yes
3013	9.9	251	18	5300	Yes
3014	8.3	279	18	5300	Yes
3015	7.5	273	18	5300	Yes
3016	6.1	314	17	5300	No
3017	9.6	453	16	5300	Yes
3018	8.6	256	17	5300	Yes
3019	8.2	290	16	5300	Yes
3020	9.4	357	18	5300	Yes
3021	7.2	404	16	5300	No
3022	6.7	365	18	5300	Yes
3023	8.9	425	17	5300	Yes
3024	8.6	399	16	5300	Yes
3025	6.9	354	17	5300	No
3026	8.9	341	17	5300	Yes
3027	9.6	309	17	5300	Yes
3028	7.8	442	18	5300	No
3029	8.6	423	17	5300	Yes
3030	7	451	17	5300	No

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	11.5	444	16	5300	Yes
4002	13.2	485	16	5300	Yes
4003	16.1	374	16	5300	Yes
4004	14	427	13	5300	No
4005	13	462	16	5300	Yes
4006	15.7	277	13	5300	Yes
4007	20	324	16	5300	No
4008	18.9	286	12	5300	Yes
4009	14.6	346	13	5300	Yes
4010	13.9	320	16	5300	No
4011	19.2	275	15	5300	Yes
4012	14.7	262	13	5300	Yes
4013	16.2	481	12	5300	Yes
4014	12.1	363	14	5300	No
4015	14.1	477	16	5300	Yes
4016	19.6	372	12	5300	Yes
4017	17.7	498	15	5300	No
4018	19.4	406	14	5300	No
4019	18	294	12	5300	No
4020	11.1	348	16	5300	Yes
4021	19.3	382	12	5300	Yes
4022	13.9	347	15	5300	Yes
4023	13.5	394	15	5300	No
4024	12.3	355	13	5300	Yes
4025	17.1	415	14	5300	Yes
4026	16.4	390	12	5300	Yes
4027	17.4	345	16	5300	No
4028	17.2	332	15	5300	Yes
4029	18.7	299	14	5300	Yes
4030	14.6	432	13	5300	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5		
Trial	Frequency (MHz)	Successful Detection (Yes/No)
1	5300	Yes
2	5300	Yes
3	5300	Yes
4	5300	Yes
5	5300	Yes
6	5300	No
7	5300	Yes
8	5300	Yes
9	5300	Yes
10	5300	Yes
11	5298	No
12	5297	Yes
13	5296	Yes
14	5298	Yes
15	5294	Yes
16	5298	Yes
17	5298	Yes
18	5295	Yes
19	5297	Yes
20	5299	Yes
21	5306	No
22	5306	Yes
23	5303	Yes
24	5301	Yes
25	5304	No
26	5303	Yes
27	5304	Yes
28	5305	No
29	5303	Yes
30	5305	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	207	5290	5	No
2	682	5291	1	Yes
3	1157	5292	6	Yes
4	1632	5293	4	Yes
5	2107	5294	4	Yes
6	2582	5295	4	Yes
7	3057	5296	7	Yes
8	3532	5297	4	Yes
9	4007	5298	6	Yes
10	4482	5299	4	Yes
11	4957	5300	2	Yes
12	5432	5301	2	Yes
13	5907	5302	6	Yes
14	6382	5303	3	Yes
15	6857	5304	3	Yes
16	7332	5305	6	Yes
17	7807	5306	5	Yes
18	8282	5307	6	Yes
19	8757	5308	2	Yes
20	9232	5309	5	Yes
21	9707	5310	1	Yes
22	10182	5290	2	Yes
23	10657	5291	5	Yes
24	11132	5292	4	Yes
25	11607	5293	5	Yes
26	12082	5294	3	Yes
27	12557	5295	5	Yes
28	13032	5296	5	Yes
29	13507	5297	2	Yes
30	13982	5298	3	Yes
31	14457	5299	7	Yes
32	14932	5300	6	Yes
33	15407	5301	4	Yes
34	15882	5302	3	Yes
35	16357	5303	3	Yes
36	16832	5304	3	Yes
37	17307	5305	3	Yes
38	17782	5306	3	Yes
39	18257	5307	5	Yes
40	18732	5308	6	Yes
41	19207	5309	7	Yes
42	19682	5310	6	Yes

5.3. LOW BAND RESULTS FOR 40 MHz BANDWIDTH

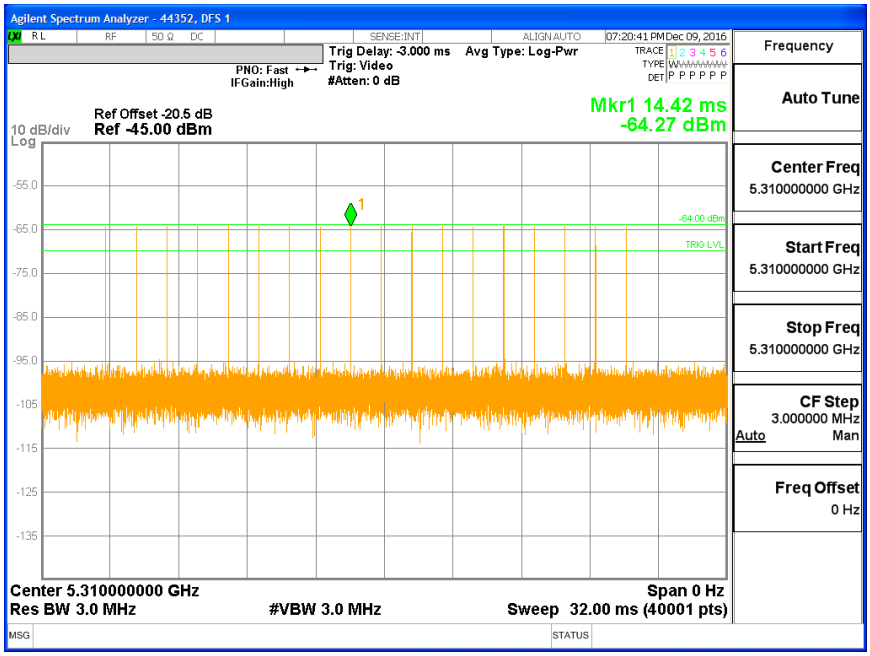
5.3.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5310 MHz.

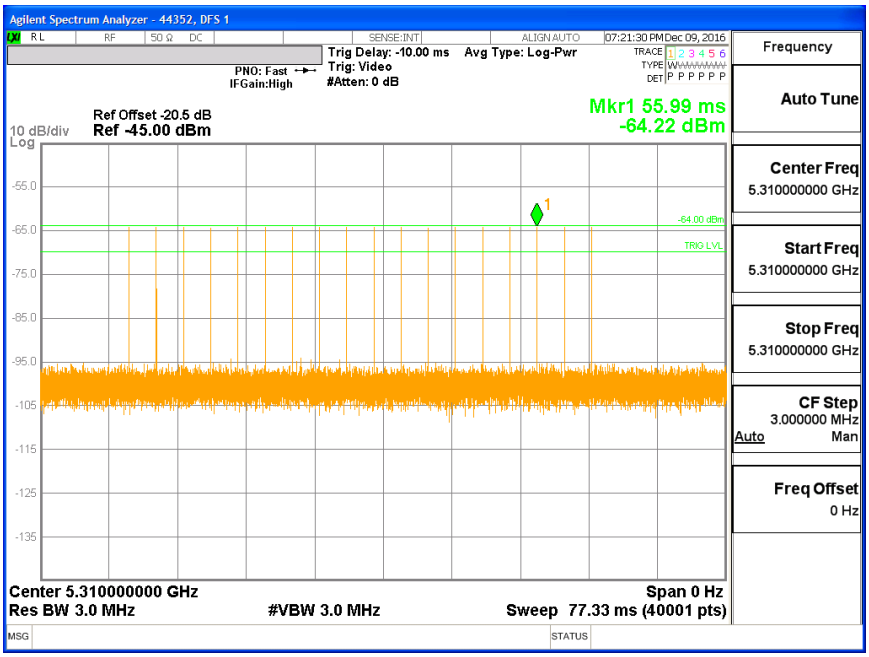
5.3.2. RADAR WAVEFORMS AND TRAFFIC

RADAR WAVEFORMS

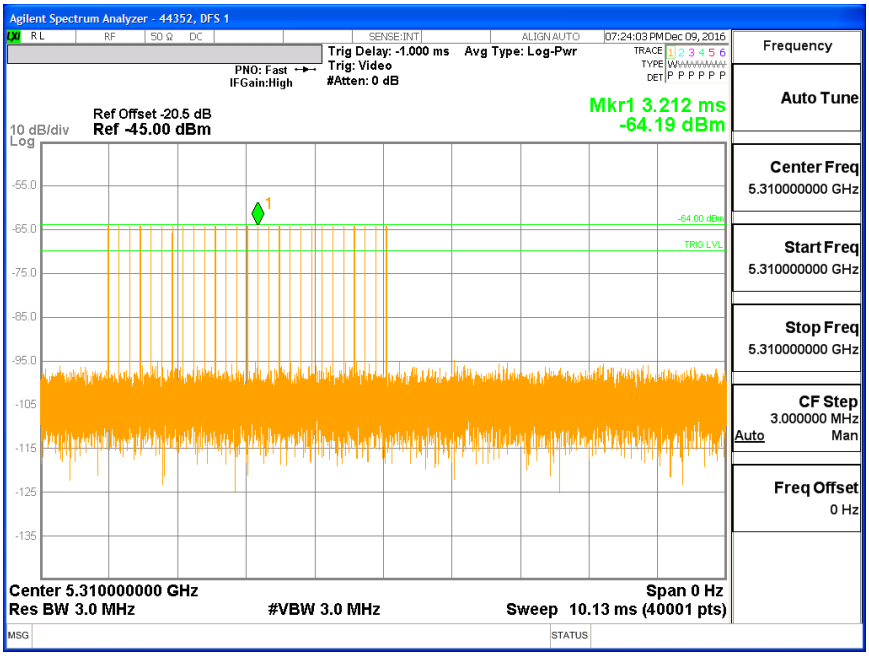
SHORT PULSE RADAR TYPE 0



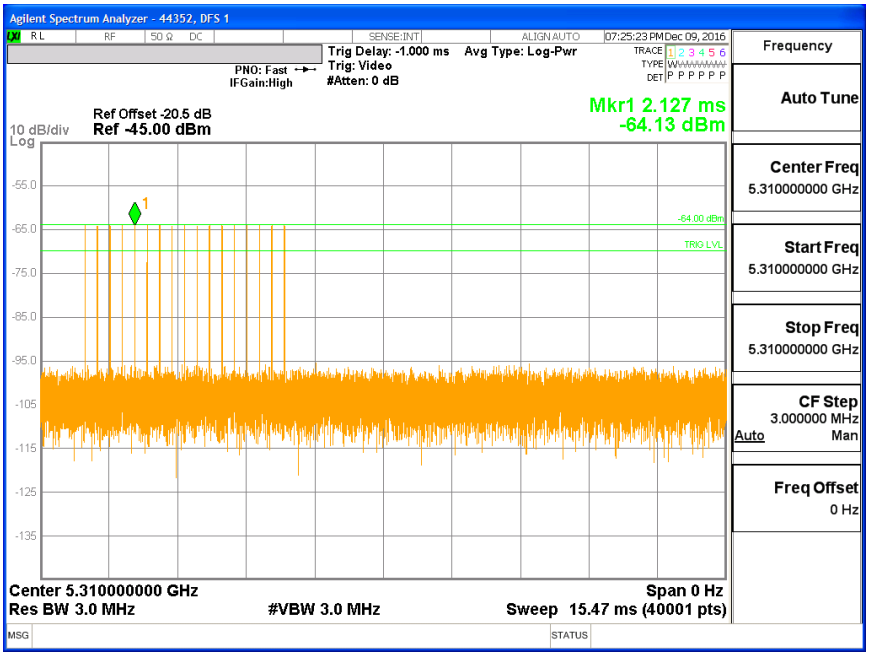
SAMPLE OF RADAR TYPE 1



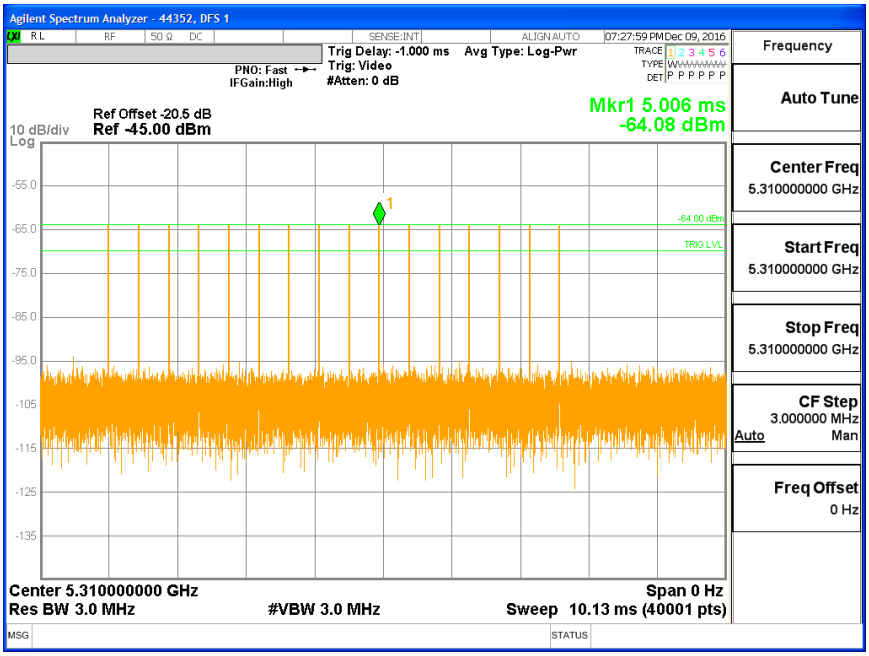
SAMPLE OF RADAR TYPE 2



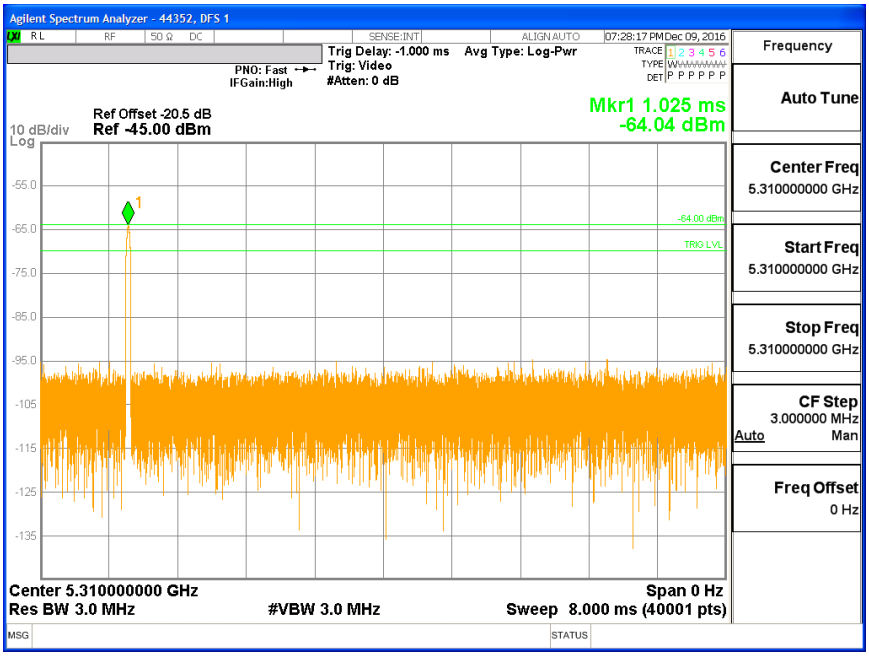
SAMPLE OF RADAR TYPE 3



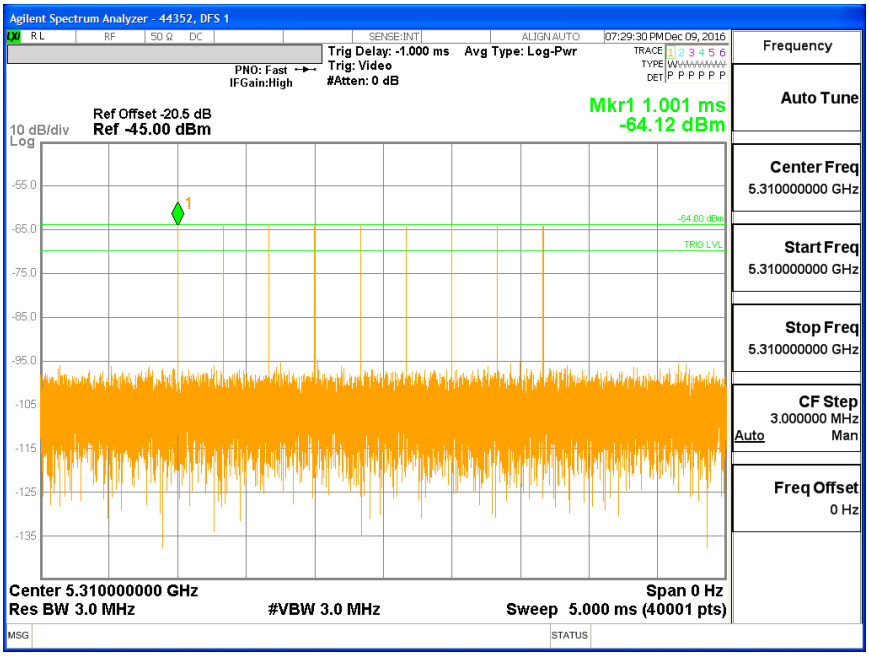
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

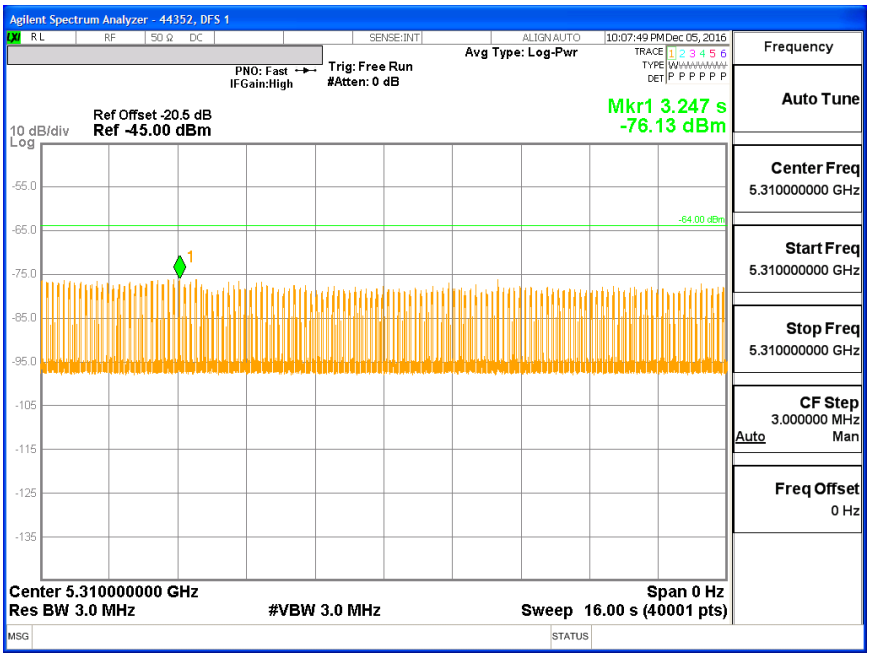


SINGLE BURST OF RADAR TYPE 6

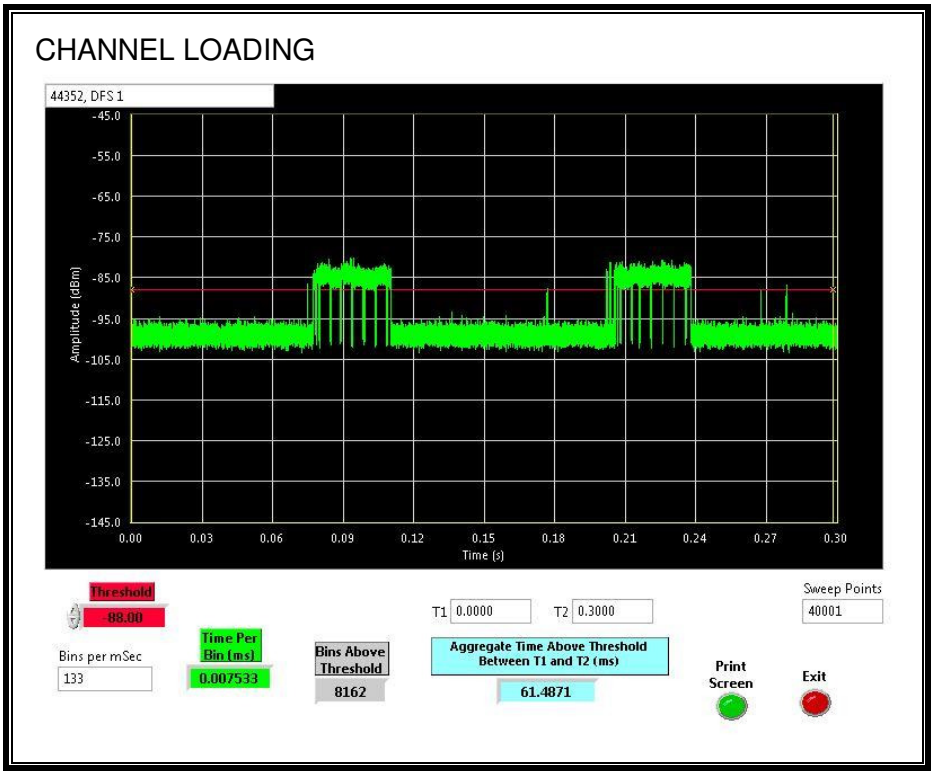


TRAFFIC

TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 20.495%

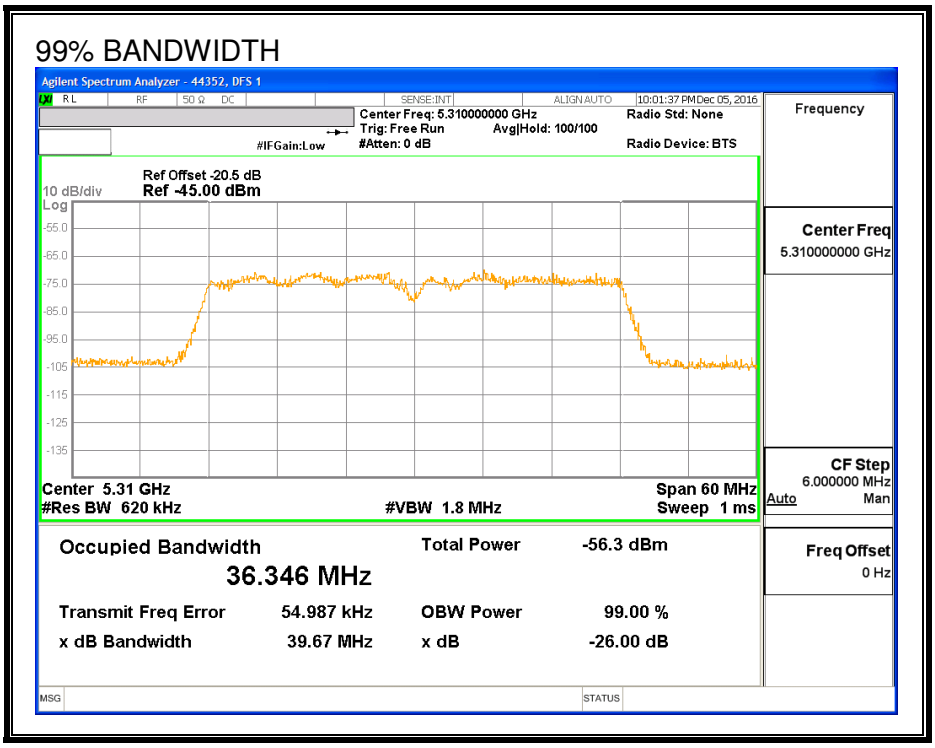
5.3.3. OVERLAPPING CHANNEL TESTS

RESULTS

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

5.3.4. 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 (%)
5290	5330	40	36.346	110.1	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
5289	10	0	0	
5290	10	10	100	FL
5295	10	10	100	
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	FH
5331	10	0	0	

5.3.5. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary

Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail	Detection Bandwidth FL	Detection Bandwidth FH	80% of Det BW FL5	80% of Det BW FH5	OBW	Test Location	Employee Number	In-Service Monitoring Version
FCC Short Pulse Type 1	30	100.00	60	Pass	5290	5330			36.35	DFS 1	44352	Version 3.0
FCC Short Pulse Type 2	30	86.67	60	Pass	5290	5330			36.35	DFS 1	44352	Version 3.0
FCC Short Pulse Type 3	30	80.00	60	Pass	5290	5330			36.35	DFS 1	44352	Version 3.0
FCC Short Pulse Type 4	30	80.00	60	Pass	5290	5330			36.35	DFS 1	44352	Version 3.0
Aggregate		86.67	80	Pass								
FCC Long Pulse Type 5	30	80.00	80	Pass	5290	5330	5294	5326	36.35	DFS 1	44352	Version 3.0
FCC Hopping Type 6	41	100.00	70	Pass	5290	5330				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	5310	Yes
1002	1	938	57	A	5310	Yes
1003	1	638	83	A	5310	Yes
1004	1	758	70	A	5310	Yes
1005	1	738	72	A	5310	Yes
1006	1	878	61	A	5310	Yes
1007	1	818	65	A	5310	Yes
1008	1	618	86	A	5310	Yes
1009	1	658	81	A	5310	Yes
1010	1	898	59	A	5310	Yes
1011	1	518	102	A	5310	Yes
1012	1	778	68	A	5310	Yes
1013	1	718	74	A	5310	Yes
1014	1	858	62	A	5310	Yes
1015	1	838	63	A	5310	Yes
1016	1	1493	36	B	5310	Yes
1017	1	1514	35	B	5310	Yes
1018	1	2017	27	B	5310	Yes
1019	1	2167	25	B	5310	Yes
1020	1	2800	19	B	5310	Yes
1021	1	1885	28	B	5310	Yes
1022	1	2647	20	B	5310	Yes
1023	1	667	80	B	5310	Yes
1024	1	1558	34	B	5310	Yes
1025	1	2255	24	B	5310	Yes
1026	1	2082	26	B	5310	Yes
1027	1	2909	19	B	5310	Yes
1028	1	2864	19	B	5310	Yes
1029	1	2626	21	B	5310	Yes
1030	1	2712	20	B	5310	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	3	158	27	5310	Yes
2002	2.2	223	27	5310	Yes
2003	2	195	28	5310	Yes
2004	1.5	183	25	5310	Yes
2005	3.7	164	26	5310	Yes
2006	1.4	156	27	5310	Yes
2007	3.8	179	29	5310	Yes
2008	1.8	218	24	5310	Yes
2009	4.4	208	29	5310	Yes
2010	2.6	170	24	5310	Yes
2011	1.5	163	23	5310	Yes
2012	4	210	29	5310	Yes
2013	1	170	29	5310	Yes
2014	1.8	183	28	5310	Yes
2015	1.1	228	25	5310	Yes
2016	2.1	203	27	5310	Yes
2017	3.6	171	28	5310	Yes
2018	2.9	154	28	5310	Yes
2019	4.8	170	29	5310	Yes
2020	4.3	195	26	5310	No
2021	4.3	176	27	5310	Yes
2022	2.1	168	28	5310	No
2023	4.4	192	23	5310	Yes
2024	2.4	230	25	5310	Yes
2025	5	220	24	5310	No
2026	1.3	182	25	5310	Yes
2027	2.1	176	24	5310	No
2028	4.6	223	23	5310	Yes
2029	3.8	183	23	5310	Yes
2030	2.4	196	29	5310	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	6.8	281	17	5310	No
3002	7.7	335	18	5310	No
3003	9.5	487	17	5310	Yes
3004	6.6	436	18	5310	Yes
3005	8.5	483	17	5310	Yes
3006	8	445	16	5310	Yes
3007	6.1	254	17	5310	Yes
3008	9.9	479	17	5310	Yes
3009	8.2	434	18	5310	Yes
3010	6.1	421	18	5310	No
3011	6.8	389	18	5310	No
3012	9.1	271	16	5310	Yes
3013	9.9	251	18	5310	Yes
3014	8.3	279	18	5310	Yes
3015	7.5	273	18	5310	Yes
3016	6.1	314	17	5310	Yes
3017	9.6	453	16	5310	Yes
3018	8.6	256	17	5310	Yes
3019	8.2	290	16	5310	Yes
3020	9.4	357	18	5310	No
3021	7.2	404	16	5310	No
3022	6.7	365	18	5310	Yes
3023	8.9	425	17	5310	Yes
3024	8.6	399	16	5310	Yes
3025	6.9	354	17	5310	Yes
3026	8.9	341	17	5310	Yes
3027	9.6	309	17	5310	Yes
3028	7.8	442	18	5310	Yes
3029	8.6	423	17	5310	Yes
3030	7	451	17	5310	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	11.5	444	16	5310	No
4002	13.2	485	16	5310	Yes
4003	16.1	374	16	5310	No
4004	14	427	13	5310	Yes
4005	13	462	16	5310	Yes
4006	15.7	277	13	5310	Yes
4007	20	324	16	5310	No
4008	18.9	286	12	5310	Yes
4009	14.6	346	13	5310	Yes
4010	13.9	320	16	5310	Yes
4011	19.2	275	15	5310	Yes
4012	14.7	262	13	5310	Yes
4013	16.2	481	12	5310	Yes
4014	12.1	363	14	5310	Yes
4015	14.1	477	16	5310	Yes
4016	19.6	372	12	5310	Yes
4017	17.7	498	15	5310	Yes
4018	19.4	406	14	5310	No
4019	18	294	12	5310	Yes
4020	11.1	348	16	5310	Yes
4021	19.3	382	12	5310	No
4022	13.9	347	15	5310	Yes
4023	13.5	394	15	5310	Yes
4024	12.3	355	13	5310	No
4025	17.1	415	14	5310	Yes
4026	16.4	390	12	5310	Yes
4027	17.4	345	16	5310	Yes
4028	17.2	332	15	5310	Yes
4029	18.7	299	14	5310	Yes
4030	14.6	432	13	5310	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5		
Trial	Frequency (MHz)	Successful Detection (Yes/No)
1	5310	Yes
2	5310	Yes
3	5310	Yes
4	5310	No
5	5310	Yes
6	5310	Yes
7	5310	No
8	5310	Yes
9	5310	Yes
10	5310	Yes
11	5299	Yes
12	5298	Yes
13	5297	Yes
14	5299	Yes
15	5294	Yes
16	5299	Yes
17	5299	No
18	5296	Yes
19	5298	Yes
20	5300	Yes
21	5325	No
22	5325	Yes
23	5323	Yes
24	5320	Yes
25	5323	No
26	5323	Yes
27	5323	Yes
28	5324	No
29	5323	Yes
30	5324	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	249	5290	10	Yes
2	724	5291	6	Yes
3	1199	5292	8	Yes
4	1674	5293	6	Yes
5	2149	5294	7	Yes
6	2624	5295	9	Yes
7	3099	5296	7	Yes
8	3574	5297	5	Yes
9	4049	5298	10	Yes
10	4524	5299	7	Yes
11	4999	5300	3	Yes
12	5474	5301	8	Yes
13	5949	5302	9	Yes
14	6424	5303	9	Yes
15	6899	5304	7	Yes
16	7374	5305	10	Yes
17	7849	5306	9	Yes
18	8324	5307	10	Yes
19	8799	5308	8	Yes
20	9274	5309	8	Yes
21	9749	5310	5	Yes
22	10224	5311	9	Yes
23	10699	5312	10	Yes
24	11174	5313	8	Yes
25	11649	5314	12	Yes
26	12124	5315	5	Yes
27	12599	5316	12	Yes
28	13074	5317	7	Yes
29	13549	5318	9	Yes
30	14024	5319	3	Yes
31	14499	5320	14	Yes
32	14974	5321	7	Yes
33	15449	5322	7	Yes
34	15924	5323	6	Yes
35	16399	5324	5	Yes
36	16874	5325	6	Yes
37	17349	5326	11	Yes
38	17824	5327	5	Yes
39	18299	5328	10	Yes
40	18774	5329	10	Yes
41	19249	5330	11	Yes

5.4. LOW BAND RESULTS FOR 80 MHz BANDWIDTH

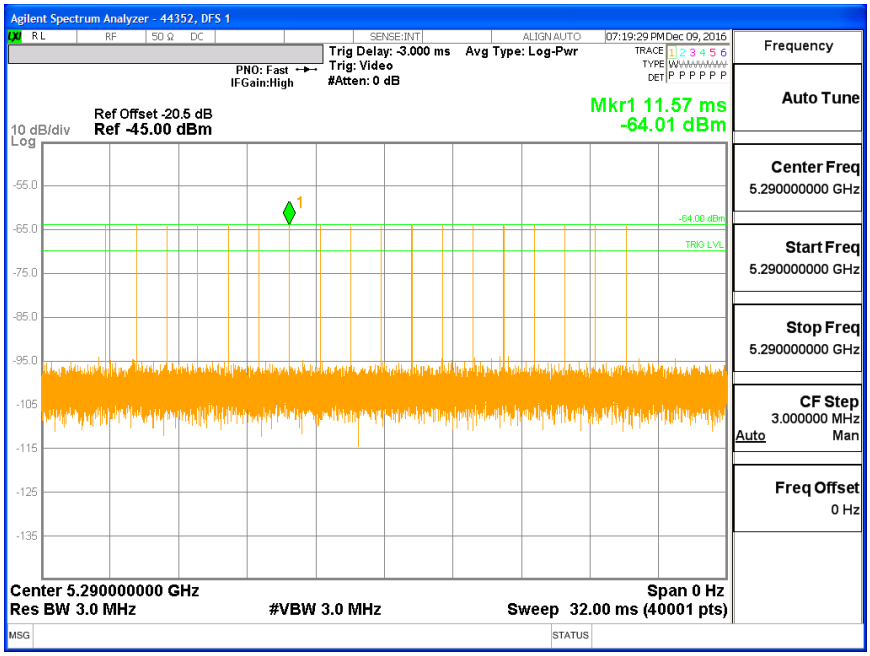
5.4.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5290 MHz.

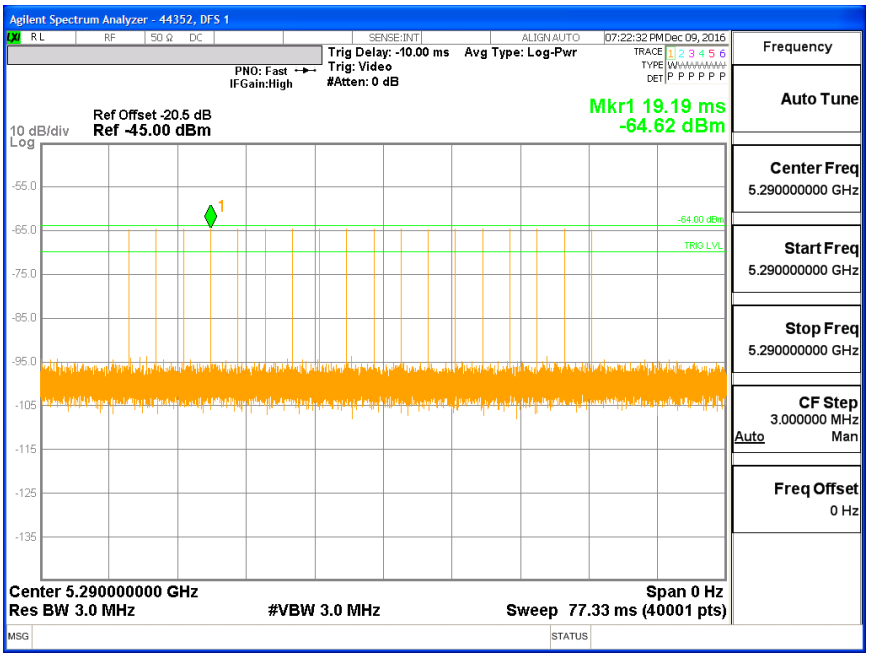
5.4.2. RADAR WAVEFORMS AND TRAFFIC

RADAR WAVEFORMS

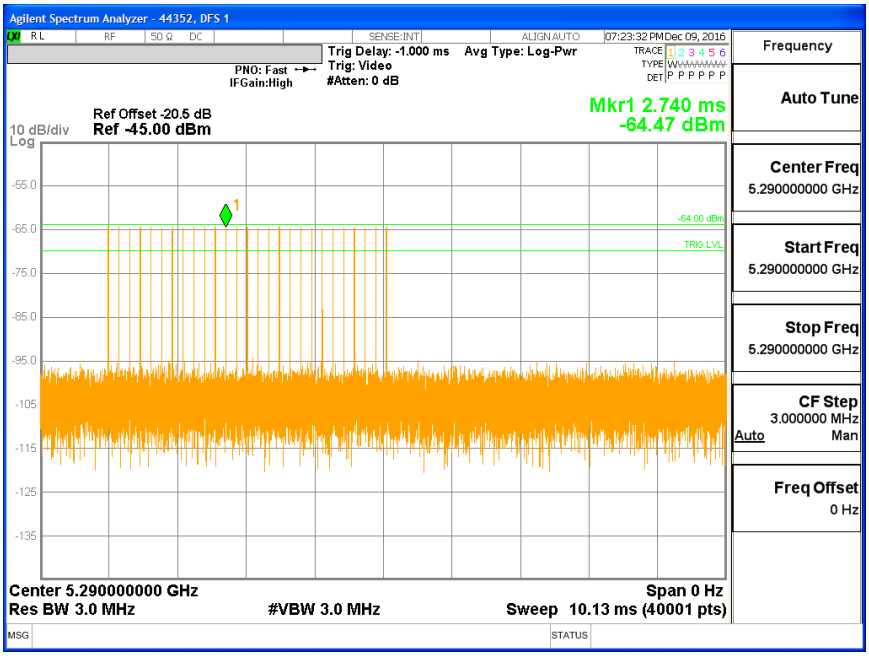
SHORT PULSE RADAR TYPE 0



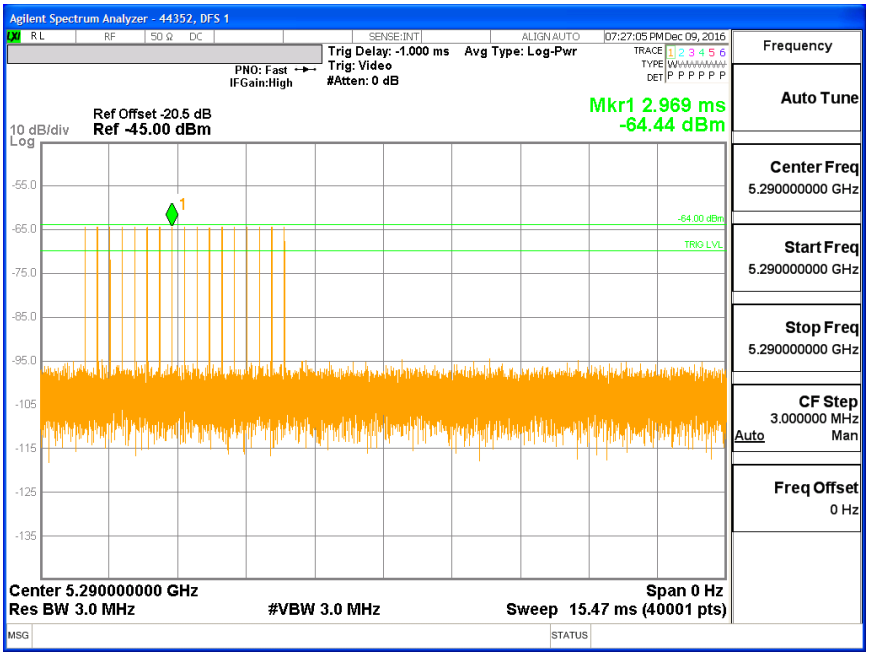
SAMPLE OF RADAR TYPE 1



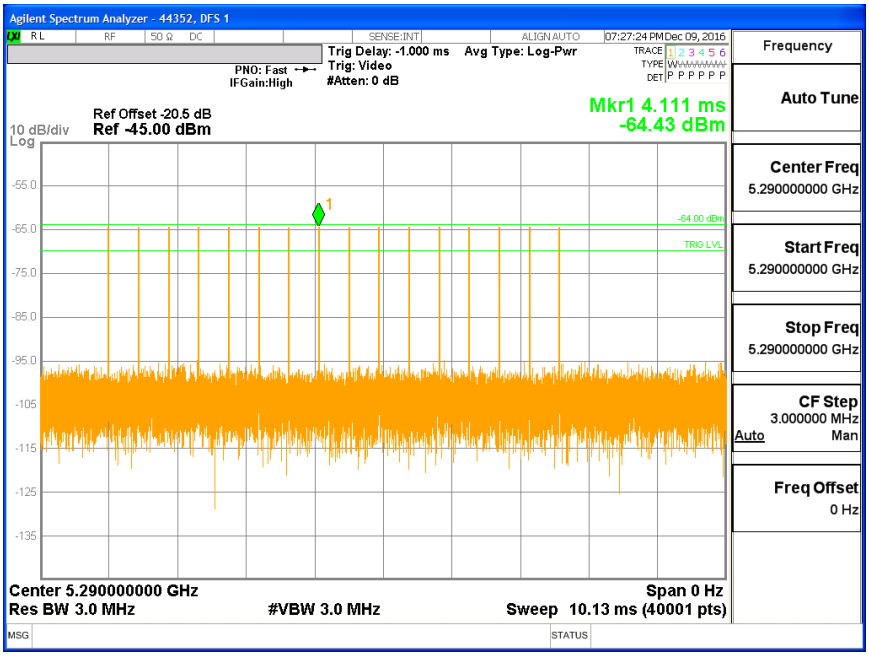
SAMPLE OF RADAR TYPE 2



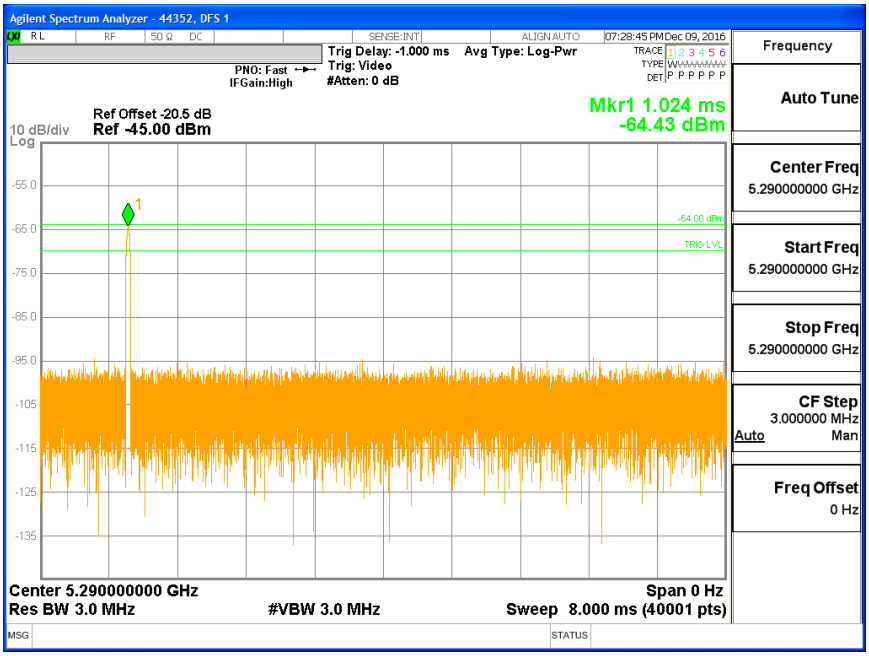
SAMPLE OF RADAR TYPE 3



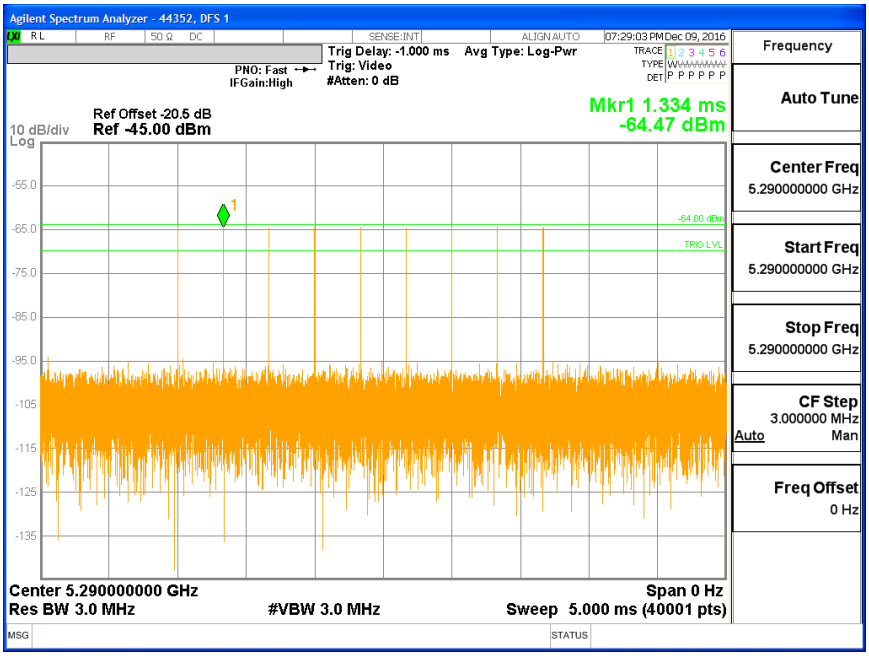
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

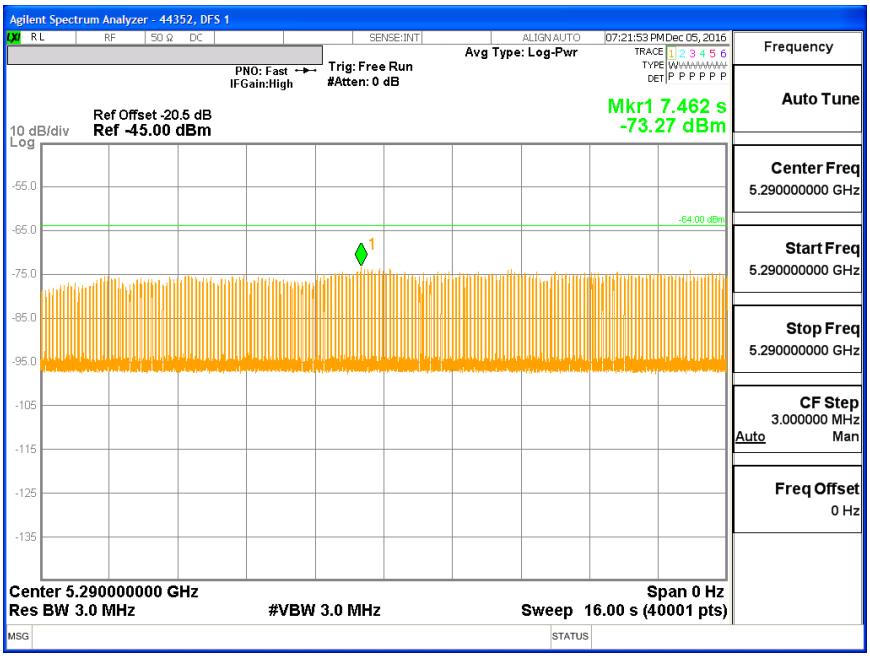


SINGLE BURST OF RADAR TYPE 6

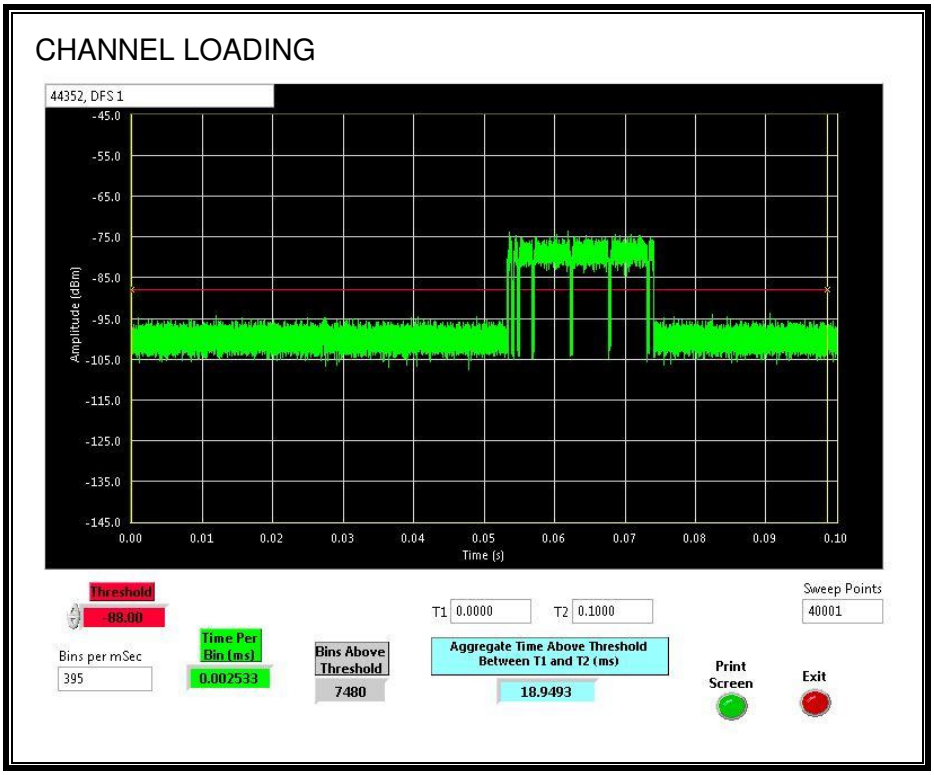


TRAFFIC

TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 18.9493%

5.4.1. OVERLAPPING CHANNEL TESTS

RESULTS

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

5.4.2. 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)

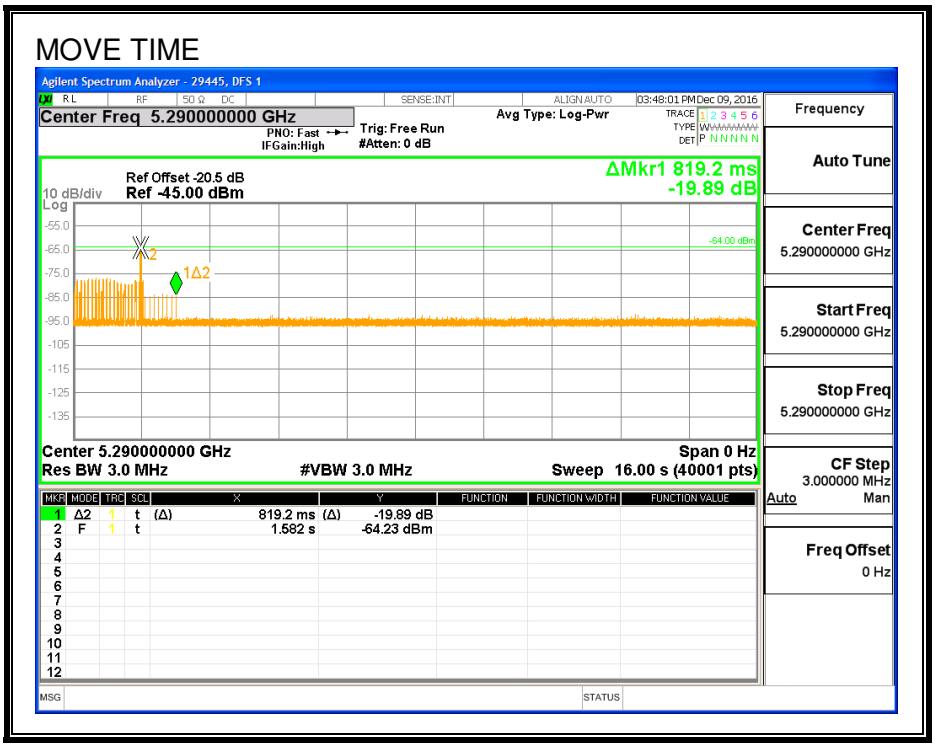
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

Channel Move Time (sec)	Limit (sec)
0.8192	10

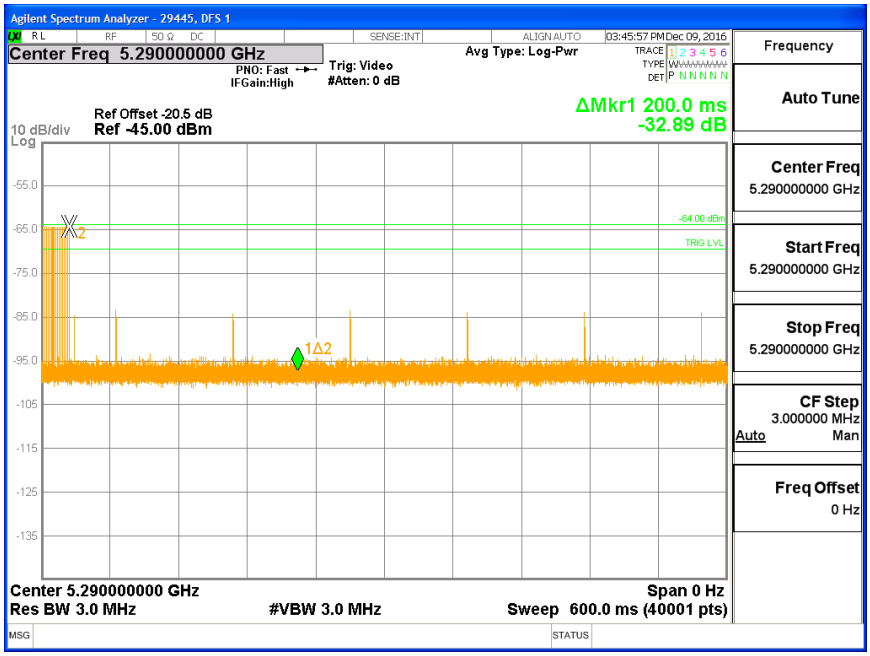
Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
5.6	60

MOVE TIME



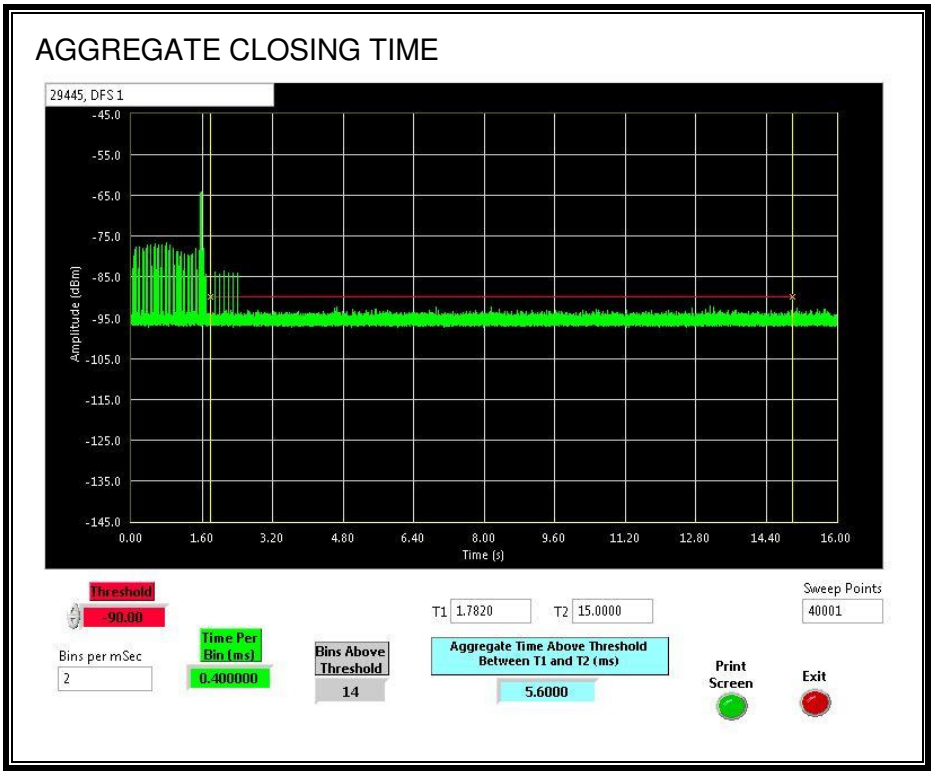
CHANNEL CLOSING TIME

CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

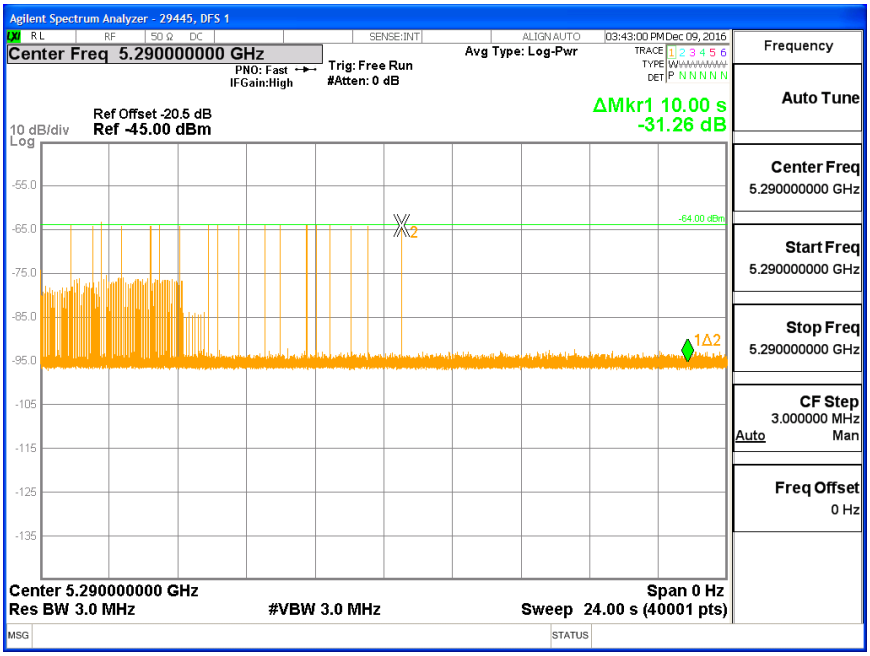
Only intermittent transmissions are observed during the aggregate monitoring period.



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

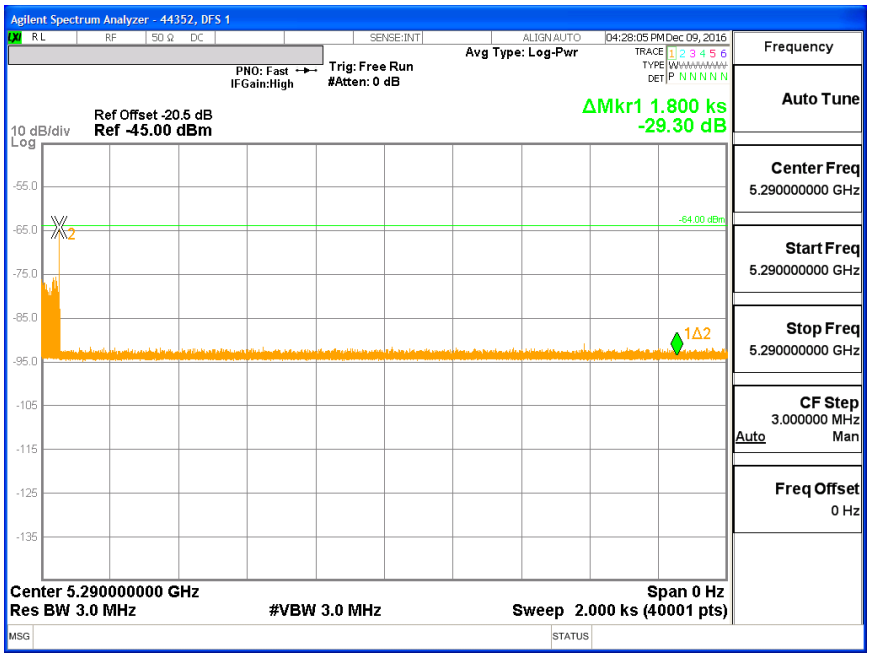


5.4.1. NON-OCCUPANCY PERIOD

RESULTS

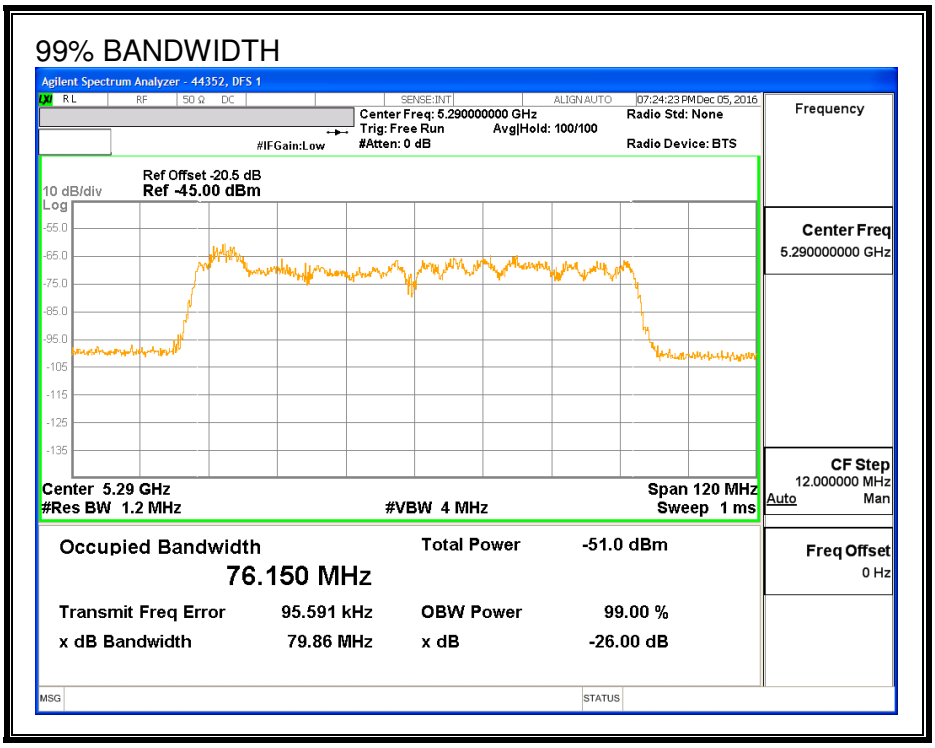
No EUT transmissions were observed on the test channel during the 30-minute observation time.

NON-OCCUPANCY PERIOD



5.4.2. 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 (%)
5250	5330	80	76.150	105.1	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
5249	10	0	0	
5250	10	10	100	FL
5255	10	10	100	
5260	10	10	100	
5265	10	10	100	
5270	10	10	100	
5275	10	10	100	
5280	10	10	100	
5285	10	10	100	
5290	10	10	100	
5295	10	10	100	
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	FH
5331	10	0	0	

5.4.3. 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	86.67	60	Pass	5250	5330	76.15	DFS 1	44352	Version 3.0
FCC Short Pulse Type 2	30	80.00	60	Pass	5250	5330	76.15	DFS 1	44352	Version 3.0
FCC Short Pulse Type 3	30	96.67	60	Pass	5250	5330	76.15	DFS 1	44352	Version 3.0
FCC Short Pulse Type 4	30	83.33	60	Pass	5250	5330	76.15	DFS 1	44352	Version 3.0
Aggregate		86.67	80	Pass						
FCC Long Pulse Type 5	30	83.33	80	Pass	5250	5330	76.15	DFS 1	29445	Version 3.0
FCC Hopping Type 6	81	97.53	70	Pass	5250	5330	76.15	DFS 1	29445	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	5290	Yes
1002	1	938	57	A	5290	Yes
1003	1	638	83	A	5290	Yes
1004	1	758	70	A	5290	Yes
1005	1	738	72	A	5290	Yes
1006	1	878	61	A	5290	Yes
1007	1	818	65	A	5290	No
1008	1	618	86	A	5290	Yes
1009	1	658	81	A	5290	Yes
1010	1	898	59	A	5290	Yes
1011	1	518	102	A	5290	No
1012	1	778	68	A	5290	Yes
1013	1	718	74	A	5290	Yes
1014	1	858	62	A	5290	No
1015	1	838	63	A	5290	Yes
1016	1	1493	36	B	5290	Yes
1017	1	1514	35	B	5290	Yes
1018	1	2017	27	B	5290	Yes
1019	1	2167	25	B	5290	Yes
1020	1	2800	19	B	5290	Yes
1021	1	1885	28	B	5290	Yes
1022	1	2647	20	B	5290	Yes
1023	1	667	80	B	5290	Yes
1024	1	1558	34	B	5290	Yes
1025	1	2255	24	B	5290	Yes
1026	1	2082	26	B	5290	Yes
1027	1	2909	19	B	5290	Yes
1028	1	2864	19	B	5290	No
1029	1	2626	21	B	5290	Yes
1030	1	2712	20	B	5290	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	3	158	27	5290	Yes
2002	2.2	223	27	5290	Yes
2003	2	195	28	5290	Yes
2004	1.5	183	25	5290	Yes
2005	3.7	164	26	5290	Yes
2006	1.4	156	27	5290	Yes
2007	3.8	179	29	5290	Yes
2008	1.8	218	24	5290	Yes
2009	4.4	208	29	5290	Yes
2010	2.6	170	24	5290	No
2011	1.5	163	23	5290	Yes
2012	4	210	29	5290	No
2013	1	170	29	5290	Yes
2014	1.8	183	28	5290	Yes
2015	1.1	228	25	5290	Yes
2016	2.1	203	27	5290	Yes
2017	3.6	171	28	5290	Yes
2018	2.9	154	28	5290	Yes
2019	4.8	170	29	5290	Yes
2020	4.3	195	26	5290	No
2021	4.3	176	27	5290	No
2022	2.1	168	28	5290	Yes
2023	4.4	192	23	5290	Yes
2024	2.4	230	25	5290	No
2025	5	220	24	5290	Yes
2026	1.3	182	25	5290	No
2027	2.1	176	24	5290	Yes
2028	4.6	223	23	5290	Yes
2029	3.8	183	23	5290	Yes
2030	2.4	196	29	5290	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	6.8	281	17	5290	Yes
3002	7.7	335	18	5290	Yes
3003	9.5	487	17	5290	Yes
3004	6.6	436	18	5290	Yes
3005	8.5	483	17	5290	Yes
3006	8	445	16	5290	Yes
3007	6.1	254	17	5290	No
3008	9.9	479	17	5290	Yes
3009	8.2	434	18	5290	Yes
3010	6.1	421	18	5290	Yes
3011	6.8	389	18	5290	Yes
3012	9.1	271	16	5290	Yes
3013	9.9	251	18	5290	Yes
3014	8.3	279	18	5290	Yes
3015	7.5	273	18	5290	Yes
3016	6.1	314	17	5290	Yes
3017	9.6	453	16	5290	Yes
3018	8.6	256	17	5290	Yes
3019	8.2	290	16	5290	Yes
3020	9.4	357	18	5290	Yes
3021	7.2	404	16	5290	Yes
3022	6.7	365	18	5290	Yes
3023	8.9	425	17	5290	Yes
3024	8.6	399	16	5290	Yes
3025	6.9	354	17	5290	Yes
3026	8.9	341	17	5290	Yes
3027	9.6	309	17	5290	Yes
3028	7.8	442	18	5290	Yes
3029	8.6	423	17	5290	Yes
3030	7	451	17	5290	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	11.5	444	16	5290	Yes
4002	13.2	485	16	5290	Yes
4003	16.1	374	16	5290	Yes
4004	14	427	13	5290	Yes
4005	13	462	16	5290	Yes
4006	15.7	277	13	5290	Yes
4007	20	324	16	5290	Yes
4008	18.9	286	12	5290	Yes
4009	14.6	346	13	5290	Yes
4010	13.9	320	16	5290	Yes
4011	19.2	275	15	5290	No
4012	14.7	262	13	5290	Yes
4013	16.2	481	12	5290	Yes
4014	12.1	363	14	5290	Yes
4015	14.1	477	16	5290	Yes
4016	19.6	372	12	5290	No
4017	17.7	498	15	5290	Yes
4018	19.4	406	14	5290	No
4019	18	294	12	5290	Yes
4020	11.1	348	16	5290	Yes
4021	19.3	382	12	5290	Yes
4022	13.9	347	15	5290	Yes
4023	13.5	394	15	5290	Yes
4024	12.3	355	13	5290	Yes
4025	17.1	415	14	5290	Yes
4026	16.4	390	12	5290	No
4027	17.4	345	16	5290	Yes
4028	17.2	332	15	5290	Yes
4029	18.7	299	14	5290	No
4030	14.6	432	13	5290	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5		
Trial	Frequency (MHz)	Successful Detection (Yes/No)
1	5290	Yes
2	5290	Yes
3	5290	No
4	5290	Yes
5	5290	Yes
6	5290	Yes
7	5290	Yes
8	5290	No
9	5290	Yes
10	5290	Yes
11	5259	No
12	5258	Yes
13	5257	Yes
14	5259	Yes
15	5255	Yes
16	5259	Yes
17	5259	Yes
18	5256	Yes
19	5258	Yes
20	5260	Yes
21	5325	No
22	5325	Yes
23	5322	Yes
24	5320	Yes
25	5323	Yes
26	5322	Yes
27	5323	Yes
28	5324	No
29	5322	Yes
30	5324	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	181	5250	18	No
2	656	5251	14	Yes
3	1131	5252	17	Yes
4	1606	5253	19	Yes
5	2081	5254	13	Yes
6	2556	5255	13	Yes
7	3031	5256	15	Yes
8	3506	5257	11	Yes
9	3981	5258	16	Yes
10	4456	5259	16	Yes
11	4931	5260	14	Yes
12	5406	5261	7	Yes
13	5881	5262	16	Yes
14	6356	5263	17	Yes
15	6831	5264	19	Yes
16	7306	5265	17	Yes
17	7781	5266	16	Yes
18	8256	5267	26	Yes
19	8731	5268	19	Yes
20	9206	5269	13	Yes
21	9681	5270	17	Yes
22	10156	5271	9	Yes
23	10631	5272	26	Yes
24	11106	5273	17	Yes
25	11581	5274	16	Yes
26	12056	5275	21	Yes
27	12531	5276	14	Yes
28	13006	5277	19	Yes
29	13481	5278	18	Yes
30	13956	5279	23	Yes
31	14431	5280	22	Yes
32	14906	5281	16	Yes
33	15381	5282	17	Yes
34	15856	5283	18	Yes
35	16331	5284	13	Yes
36	16806	5285	14	Yes
37	17281	5286	18	Yes
38	17756	5287	11	Yes
39	18231	5288	12	Yes

TYPE 6 DETECTION PROBABILITY (CONTINUED)

40	18706	5289	17	Yes
41	19181	5290	12	Yes
42	19656	5291	17	Yes
43	20131	5292	14	Yes
44	20606	5293	22	Yes
45	21081	5294	21	Yes
46	21556	5295	16	Yes
47	22031	5296	19	Yes
48	22506	5297	15	Yes
49	22981	5298	14	Yes
50	23456	5299	15	Yes
51	23931	5300	21	Yes
52	24406	5301	16	Yes
53	24881	5302	25	Yes
54	25356	5303	13	Yes
55	25831	5304	7	Yes
56	26306	5305	11	Yes
57	26781	5306	16	Yes
58	27256	5307	17	Yes
59	27731	5308	17	Yes
60	28206	5309	19	Yes
61	28681	5310	17	Yes
62	29156	5311	19	Yes
63	29631	5312	13	Yes
64	30106	5313	17	Yes
65	30581	5314	15	Yes
66	31056	5315	21	Yes
67	31531	5316	14	Yes
68	32006	5317	16	Yes
69	32481	5318	18	Yes
70	32956	5319	16	Yes
71	33431	5320	20	Yes
72	33906	5321	14	Yes
73	34381	5322	18	Yes
74	34856	5323	20	Yes
75	35331	5324	20	Yes
76	35806	5325	20	Yes
77	36281	5326	12	Yes
78	36756	5327	8	Yes
79	37231	5328	23	Yes
80	37706	5329	17	Yes
81	38181	5330	18	No

5.5. LOW BAND RESULTS FOR 160 MHz BANDWIDTH (80 MHz HIGH COMPONENT)

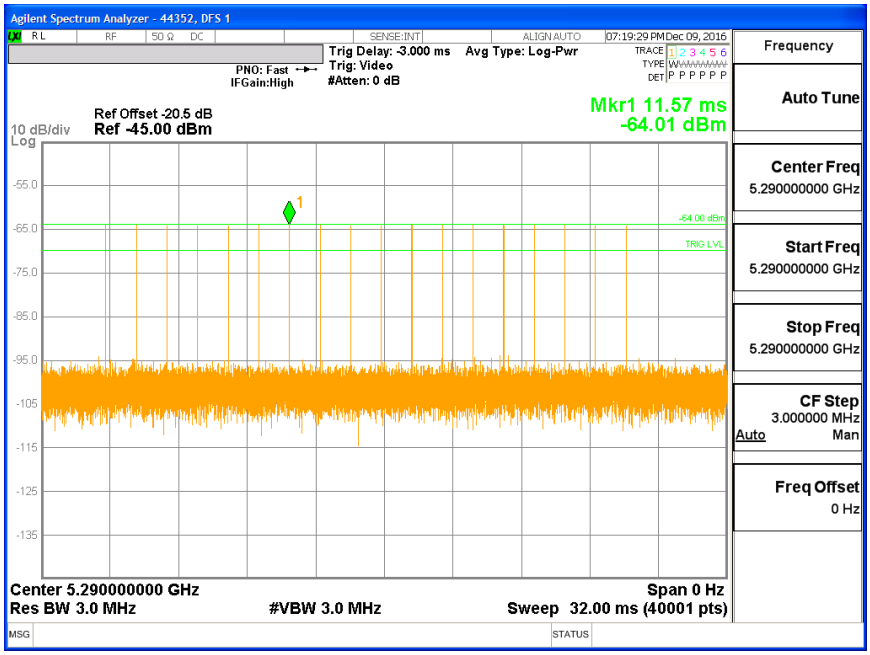
5.5.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5290 MHz.

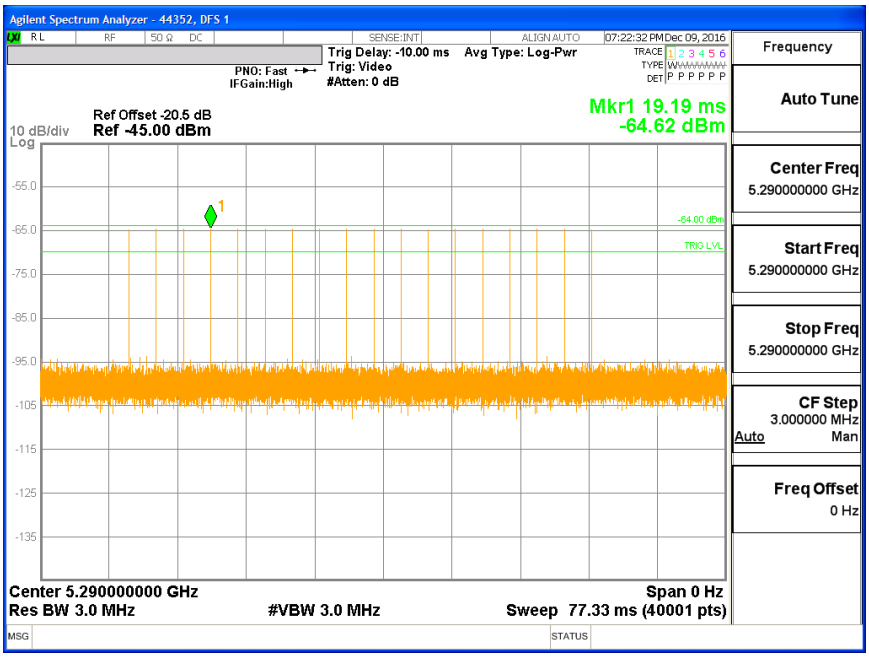
5.5.2. RADAR WAVEFORMS AND TRAFFIC

RADAR WAVEFORMS

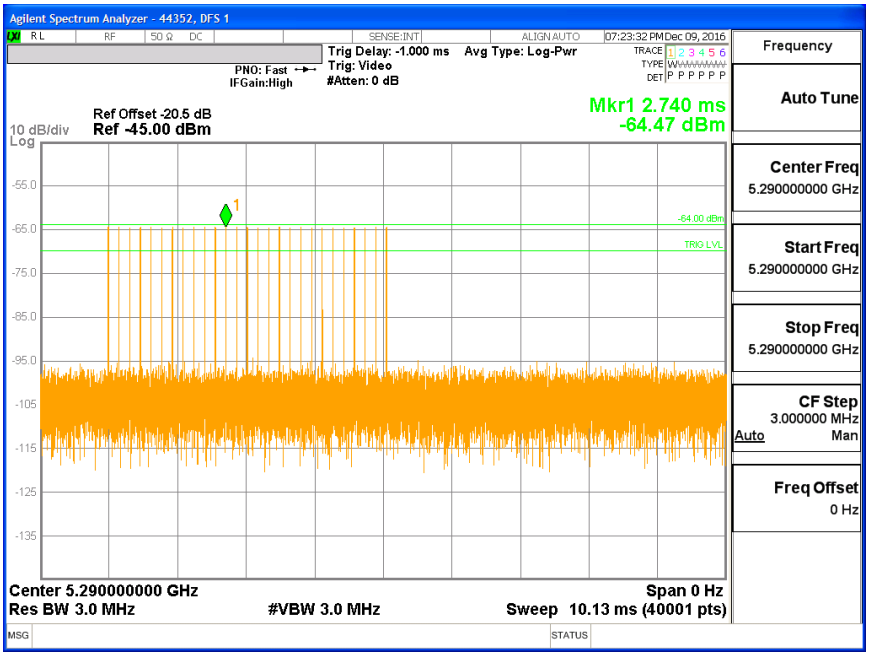
SHORT PULSE RADAR TYPE 0



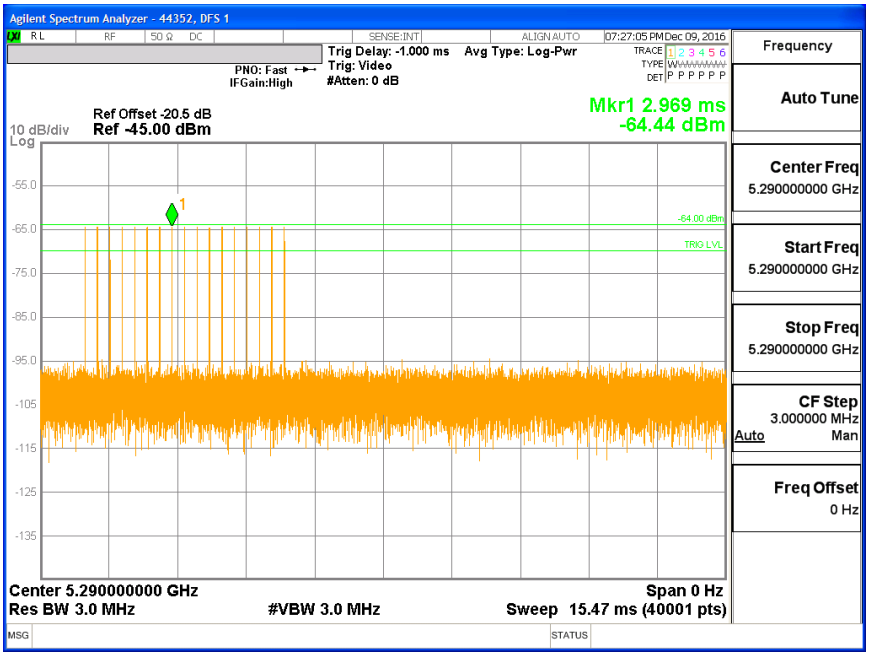
SAMPLE OF RADAR TYPE 1



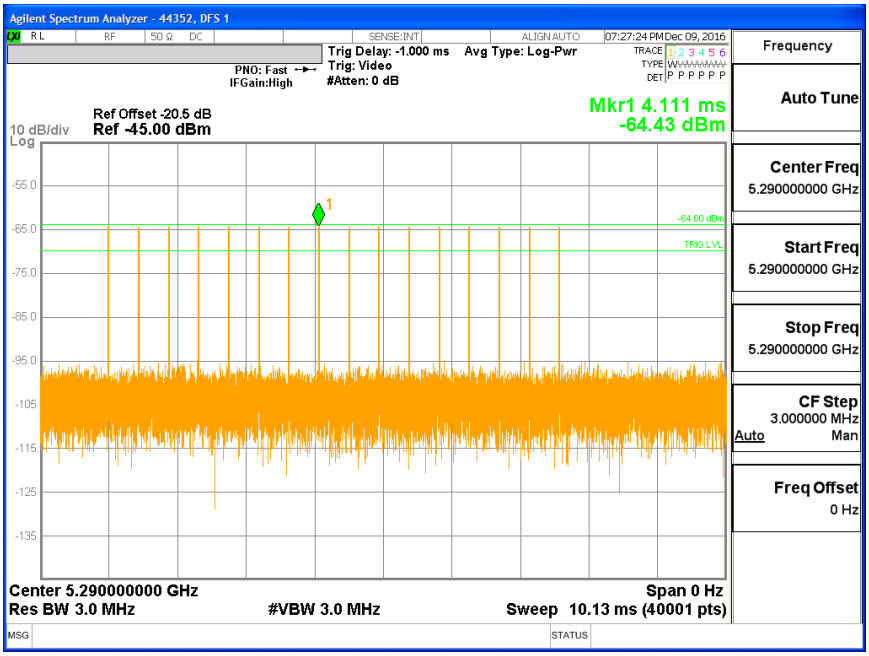
SAMPLE OF RADAR TYPE 2



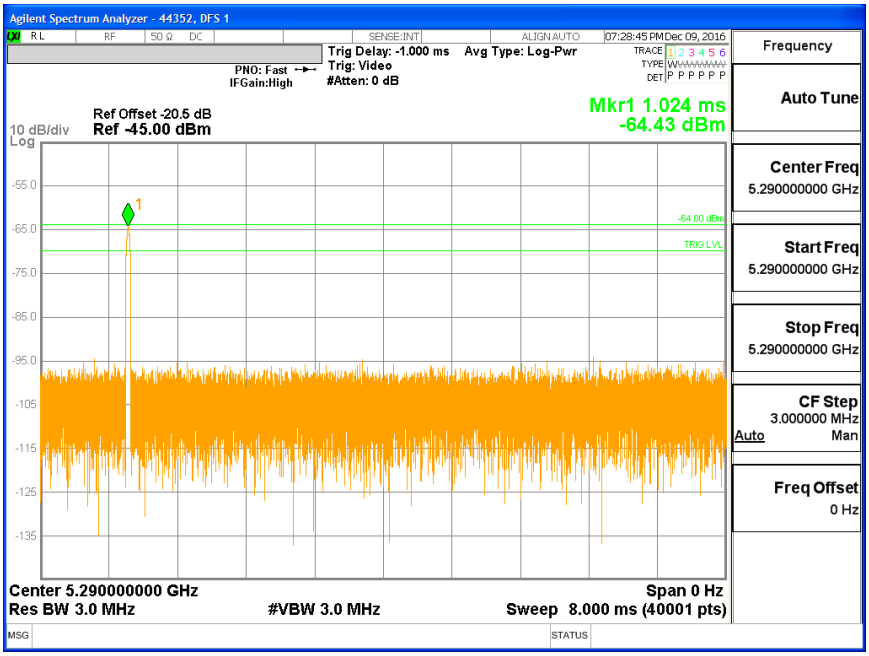
SAMPLE OF RADAR TYPE 3



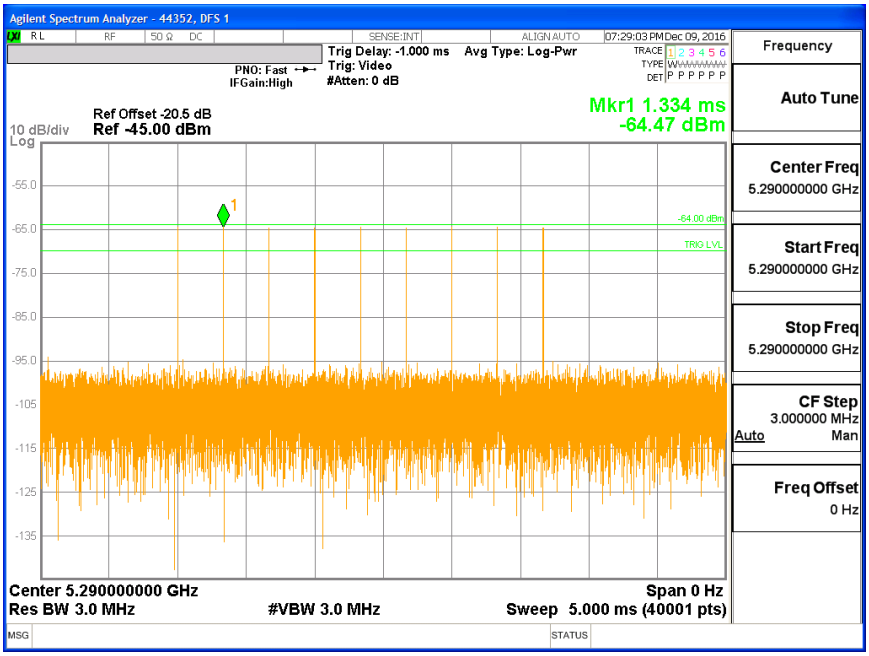
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

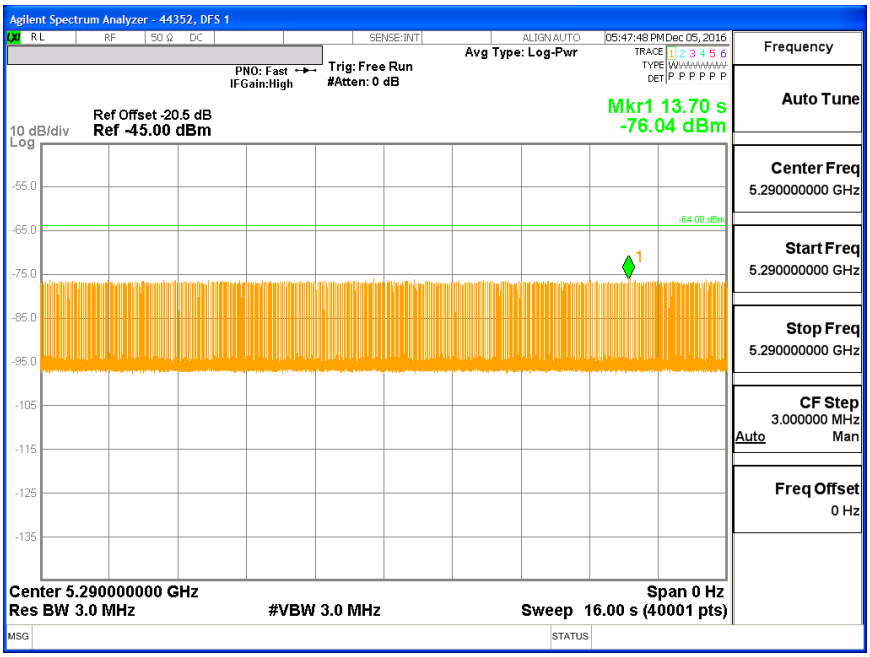


SINGLE BURST OF RADAR TYPE 6

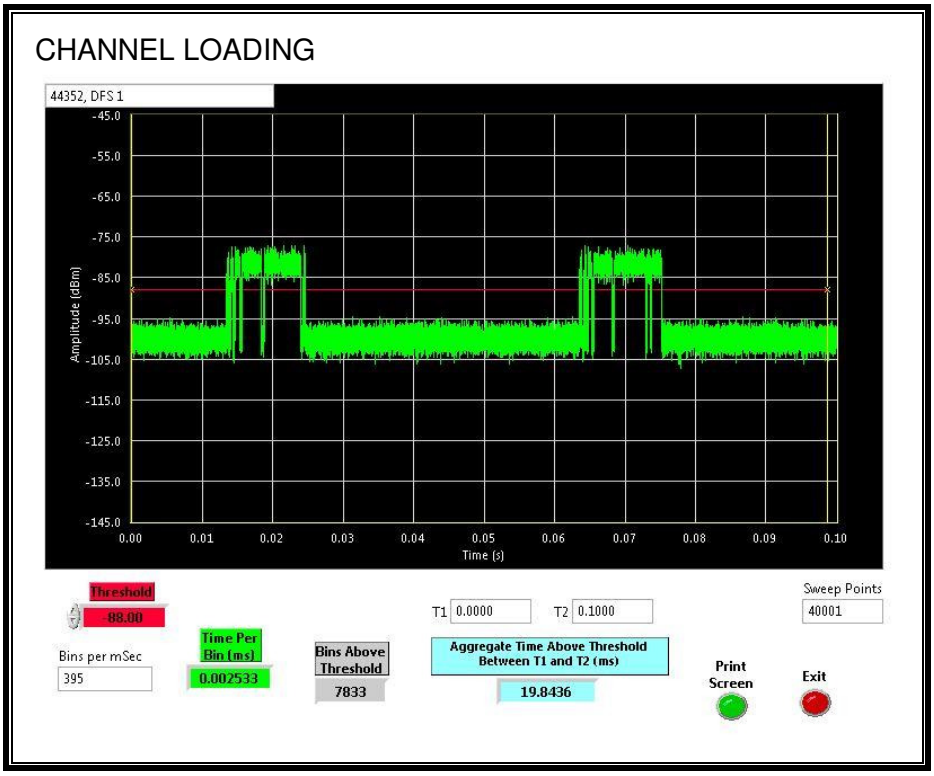


TRAFFIC

TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 19.8436%

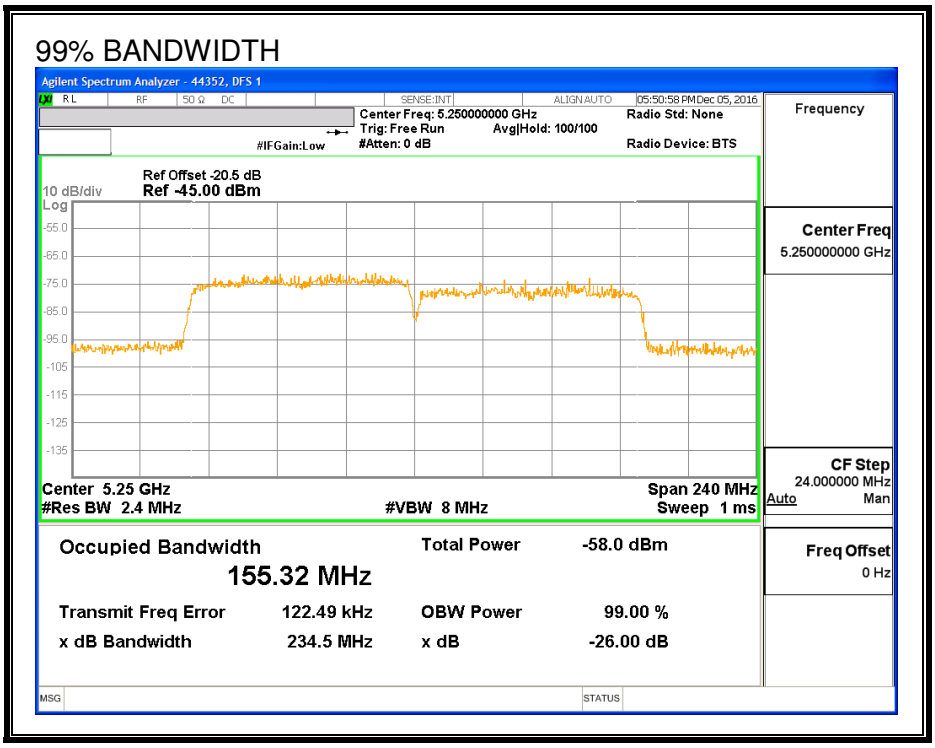
5.5.3. OVERLAPPING CHANNEL TESTS

RESULTS

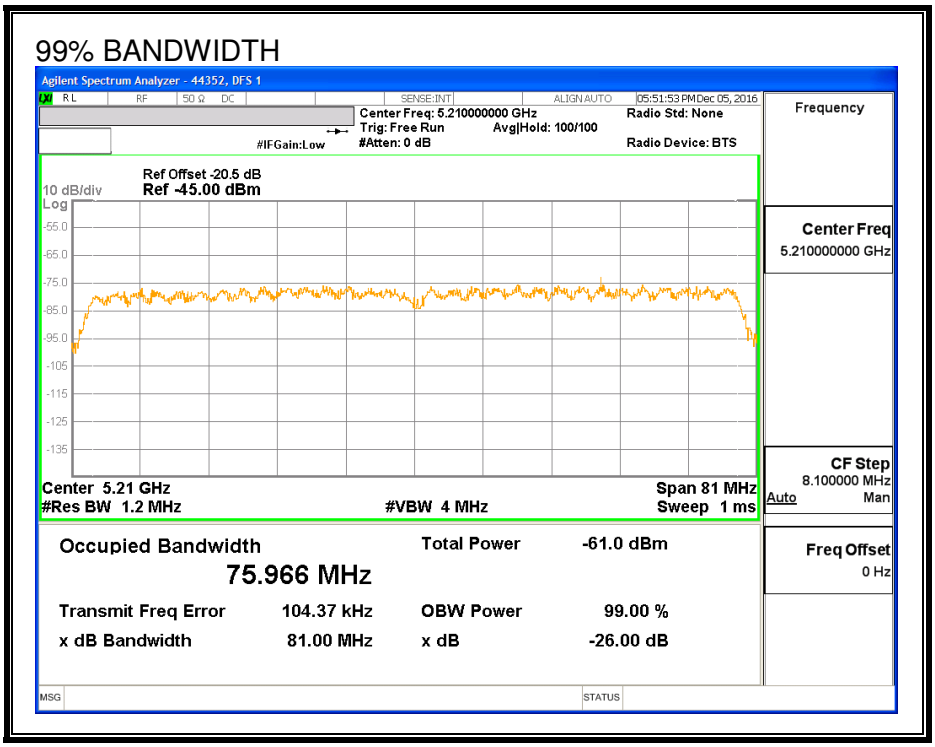
The channel spacing is not less than the channel bandwidth therefore the EUT does not have an overlapping channel plan.

5.5.4. DETECTION BANDWIDTH

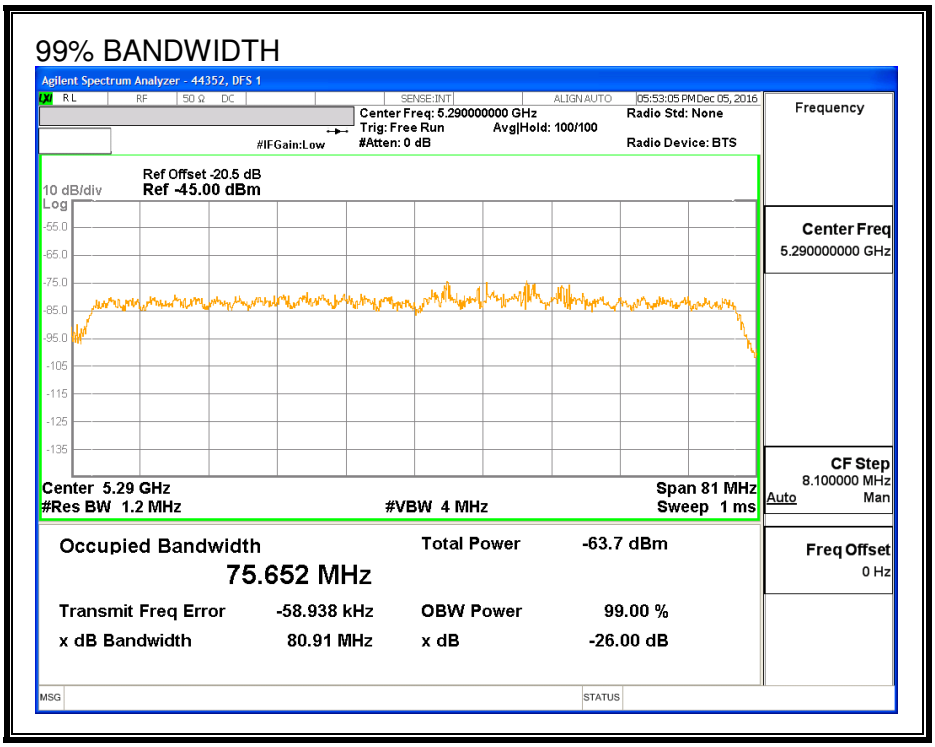
REFERENCE PLOT OF 99% POWER BANDWIDTH (80 PLUS 80 MODE)



REFERENCE PLOT OF 99% POWER BANDWIDTH (80 MHz LOW COMPONENT)



REFERENCE PLOT OF 99% POWER BANDWIDTH (80 MHz HIGH COMPONENT)



RESULTS

FL (MHz)	FH (MHz)	Detection Bandwidth (MHz)	99% Power Bandwidth (MHz)	Ratio of Detection BW to 99% Power BW (%)	Minimum Limit (%)
5252	5328	76	75.652	100.5	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
5250	10	9	90	FL
5255	10	10	100	
5260	10	10	100	
5265	10	10	100	
5270	10	10	100	
5275	10	9	90	
5280	10	10	100	
5285	10	10	100	
5290	10	10	100	
5295	10	9	90	
5300	10	10	100	
5305	10	10	100	
5310	10	10	100	
5315	10	9	90	
5320	10	10	100	
5325	10	10	100	
5330	10	10	100	FH

5.5.5. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary

Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail	Detection Bandwidth FL	Detection Bandwidth FH	80% of Det BW FL5	80% of Det BW FH5	OBW	Test Location	Employee Number	In-Service Monitoring Version
FCC Short Pulse Type 1	30	100.00	60	Pass	5250	5330			75.65	DFS 1	44352	Version 3.0
FCC Short Pulse Type 2	30	83.33	60	Pass	5250	5330			75.65	DFS 1	44352	Version 3.0
FCC Short Pulse Type 3	30	86.67	60	Pass	5250	5330			75.65	DFS 1	44352	Version 3.0
FCC Short Pulse Type 4	30	86.67	60	Pass	5250	5330			75.65	DFS 1	44352	Version 3.0
Aggregate		89.17	80	Pass								
FCC Long Pulse Type 5	30	80.00	80	Pass	5250	5330	5258	5322	75.65	DFS 1	44352	Version 3.0
FCC Hopping Type 6	81	97.53	70	Pass	5250	5330				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	5290	Yes
1002	1	938	57	A	5290	Yes
1003	1	638	83	A	5290	Yes
1004	1	758	70	A	5290	Yes
1005	1	738	72	A	5290	Yes
1006	1	878	61	A	5290	Yes
1007	1	818	65	A	5290	Yes
1008	1	618	86	A	5290	Yes
1009	1	658	81	A	5290	Yes
1010	1	898	59	A	5290	Yes
1011	1	518	102	A	5290	Yes
1012	1	778	68	A	5290	Yes
1013	1	718	74	A	5290	Yes
1014	1	858	62	A	5290	Yes
1015	1	838	63	A	5290	Yes
1016	1	1493	36	B	5290	Yes
1017	1	1514	35	B	5290	Yes
1018	1	2017	27	B	5290	Yes
1019	1	2167	25	B	5290	Yes
1020	1	2800	19	B	5290	Yes
1021	1	1885	28	B	5290	Yes
1022	1	2647	20	B	5290	Yes
1023	1	667	80	B	5290	Yes
1024	1	1558	34	B	5290	Yes
1025	1	2255	24	B	5290	Yes
1026	1	2082	26	B	5290	Yes
1027	1	2909	19	B	5290	Yes
1028	1	2864	19	B	5290	Yes
1029	1	2626	21	B	5290	Yes
1030	1	2712	20	B	5290	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	3	158	27	5290	Yes
2002	2.2	223	27	5290	No
2003	2	195	28	5290	Yes
2004	1.5	183	25	5290	Yes
2005	3.7	164	26	5290	No
2006	1.4	156	27	5290	Yes
2007	3.8	179	29	5290	Yes
2008	1.8	218	24	5290	Yes
2009	4.4	208	29	5290	Yes
2010	2.6	170	24	5290	Yes
2011	1.5	163	23	5290	Yes
2012	4	210	29	5290	Yes
2013	1	170	29	5290	Yes
2014	1.8	183	28	5290	Yes
2015	1.1	228	25	5290	Yes
2016	2.1	203	27	5290	Yes
2017	3.6	171	28	5290	Yes
2018	2.9	154	28	5290	Yes
2019	4.8	170	29	5290	Yes
2020	4.3	195	26	5290	No
2021	4.3	176	27	5290	Yes
2022	2.1	168	28	5290	Yes
2023	4.4	192	23	5290	Yes
2024	2.4	230	25	5290	Yes
2025	5	220	24	5290	No
2026	1.3	182	25	5290	Yes
2027	2.1	176	24	5290	Yes
2028	4.6	223	23	5290	No
2029	3.8	183	23	5290	Yes
2030	2.4	196	29	5290	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	6.8	281	17	5290	Yes
3002	7.7	335	18	5290	Yes
3003	9.5	487	17	5290	Yes
3004	6.6	436	18	5290	Yes
3005	8.5	483	17	5290	No
3006	8	445	16	5290	Yes
3007	6.1	254	17	5290	No
3008	9.9	479	17	5290	Yes
3009	8.2	434	18	5290	Yes
3010	6.1	421	18	5290	Yes
3011	6.8	389	18	5290	Yes
3012	9.1	271	16	5290	Yes
3013	9.9	251	18	5290	Yes
3014	8.3	279	18	5290	Yes
3015	7.5	273	18	5290	Yes
3016	6.1	314	17	5290	Yes
3017	9.6	453	16	5290	Yes
3018	8.6	256	17	5290	No
3019	8.2	290	16	5290	Yes
3020	9.4	357	18	5290	Yes
3021	7.2	404	16	5290	Yes
3022	6.7	365	18	5290	Yes
3023	8.9	425	17	5290	Yes
3024	8.6	399	16	5290	Yes
3025	6.9	354	17	5290	Yes
3026	8.9	341	17	5290	No
3027	9.6	309	17	5290	Yes
3028	7.8	442	18	5290	Yes
3029	8.6	423	17	5290	Yes
3030	7	451	17	5290	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	11.5	444	16	5290	Yes
4002	13.2	485	16	5290	Yes
4003	16.1	374	16	5290	Yes
4004	14	427	13	5290	Yes
4005	13	462	16	5290	Yes
4006	15.7	277	13	5290	Yes
4007	20	324	16	5290	Yes
4008	18.9	286	12	5290	Yes
4009	14.6	346	13	5290	Yes
4010	13.9	320	16	5290	Yes
4011	19.2	275	15	5290	Yes
4012	14.7	262	13	5290	Yes
4013	16.2	481	12	5290	Yes
4014	12.1	363	14	5290	Yes
4015	14.1	477	16	5290	Yes
4016	19.6	372	12	5290	No
4017	17.7	498	15	5290	Yes
4018	19.4	406	14	5290	Yes
4019	18	294	12	5290	Yes
4020	11.1	348	16	5290	Yes
4021	19.3	382	12	5290	Yes
4022	13.9	347	15	5290	Yes
4023	13.5	394	15	5290	No
4024	12.3	355	13	5290	Yes
4025	17.1	415	14	5290	Yes
4026	16.4	390	12	5290	Yes
4027	17.4	345	16	5290	Yes
4028	17.2	332	15	5290	No
4029	18.7	299	14	5290	No
4030	14.6	432	13	5290	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5		
Trial	Frequency (MHz)	Successful Detection (Yes/No)
1	5290	Yes
2	5290	Yes
3	5290	Yes
4	5290	Yes
5	5290	Yes
6	5290	No
7	5290	Yes
8	5290	Yes
9	5290	Yes
10	5290	Yes
11	5259	No
12	5258	Yes
13	5258	Yes
14	5259	Yes
15	5255	Yes
16	5259	Yes
17	5260	No
18	5256	Yes
19	5258	Yes
20	5260	Yes
21	5325	No
22	5325	Yes
23	5322	Yes
24	5320	Yes
25	5323	No
26	5322	Yes
27	5323	No
28	5324	Yes
29	5322	Yes
30	5323	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	17	5250	13	No
2	492	5251	15	No
3	967	5252	25	Yes
4	1442	5253	15	Yes
5	1917	5254	20	Yes
6	2392	5255	17	Yes
7	2867	5256	19	Yes
8	3342	5257	23	Yes
9	3817	5258	11	Yes
10	4292	5259	20	Yes
11	4767	5260	18	Yes
12	5242	5261	20	Yes
13	5717	5262	17	Yes
14	6192	5263	14	Yes
15	6667	5264	17	Yes
16	7142	5265	15	Yes
17	7617	5266	18	Yes
18	8092	5267	19	Yes
19	8567	5268	19	Yes
20	9042	5269	14	Yes
21	9517	5270	14	Yes
22	9992	5271	19	Yes
23	10467	5272	16	Yes
24	10942	5273	16	Yes
25	11417	5274	12	Yes
26	11892	5275	19	Yes
27	12367	5276	19	Yes
28	12842	5277	20	Yes
29	13317	5278	17	Yes
30	13792	5279	18	Yes
31	14267	5280	14	Yes
32	14742	5281	17	Yes
33	15217	5282	25	Yes
34	15692	5283	12	Yes
35	16167	5284	16	Yes
36	16642	5285	20	Yes
37	17117	5286	10	Yes
38	17592	5287	21	Yes

TYPE 6 DETECTION PROBABILITY (CONTINUED)

39	18067	5288	15	Yes
40	18542	5289	10	Yes
41	19017	5290	18	Yes
42	19492	5291	18	Yes
43	19967	5292	18	Yes
44	20442	5293	17	Yes
45	20917	5294	21	Yes
46	21392	5295	18	Yes
47	21867	5296	21	Yes
48	22342	5297	13	Yes
49	22817	5298	21	Yes
50	23292	5299	22	Yes
51	23767	5300	14	Yes
52	24242	5301	9	Yes
53	24717	5302	12	Yes
54	25192	5303	18	Yes
55	25667	5304	14	Yes
56	26142	5305	20	Yes
57	26617	5306	23	Yes
58	27092	5307	14	Yes
59	27567	5308	14	Yes
60	28042	5309	17	Yes
61	28517	5310	15	Yes
62	28992	5311	22	Yes
63	29467	5312	11	Yes
64	29942	5313	13	Yes
65	30417	5314	22	Yes
66	30892	5315	12	Yes
67	31367	5316	13	Yes
68	31842	5317	19	Yes
69	32317	5318	14	Yes
70	32792	5319	18	Yes
71	33267	5320	13	Yes
72	33742	5321	18	Yes
73	34217	5322	16	Yes
74	34692	5323	20	Yes
75	35167	5324	16	Yes
76	35642	5325	14	Yes
77	36117	5326	12	Yes
78	36592	5327	24	Yes
79	37067	5328	9	Yes
80	37542	5329	19	Yes
81	38017	5330	20	Yes

5.6. HIGH BAND RESULTS FOR 20 MHz BANDWIDTH

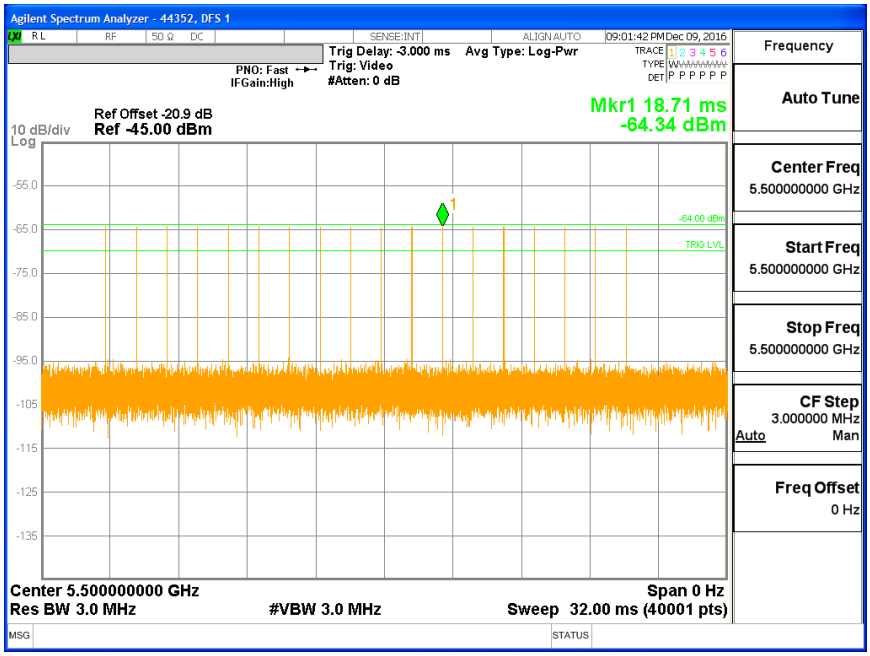
5.6.1. TEST CHANNEL

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

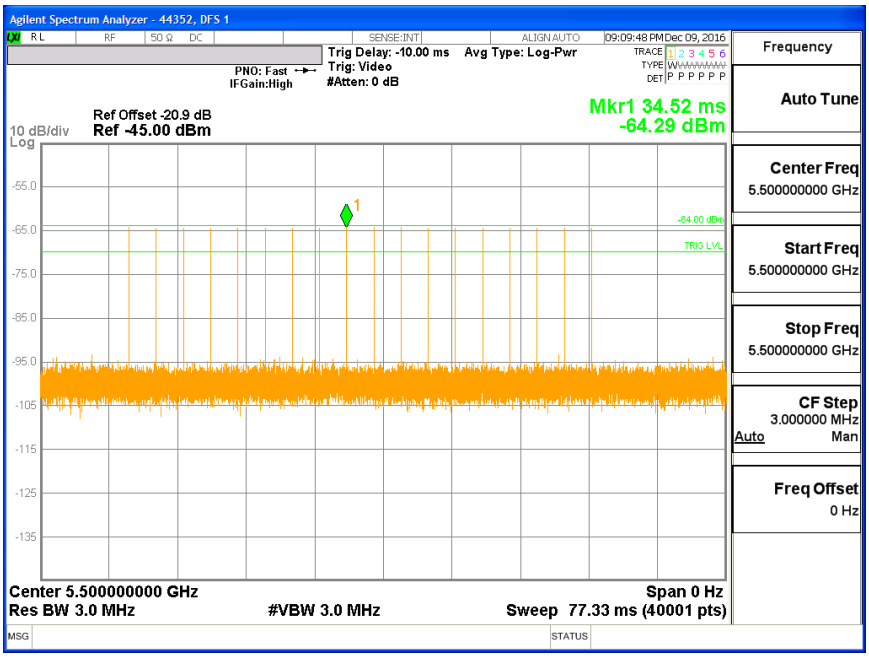
5.6.2. RADAR WAVEFORMS AND TRAFFIC

RADAR WAVEFORMS

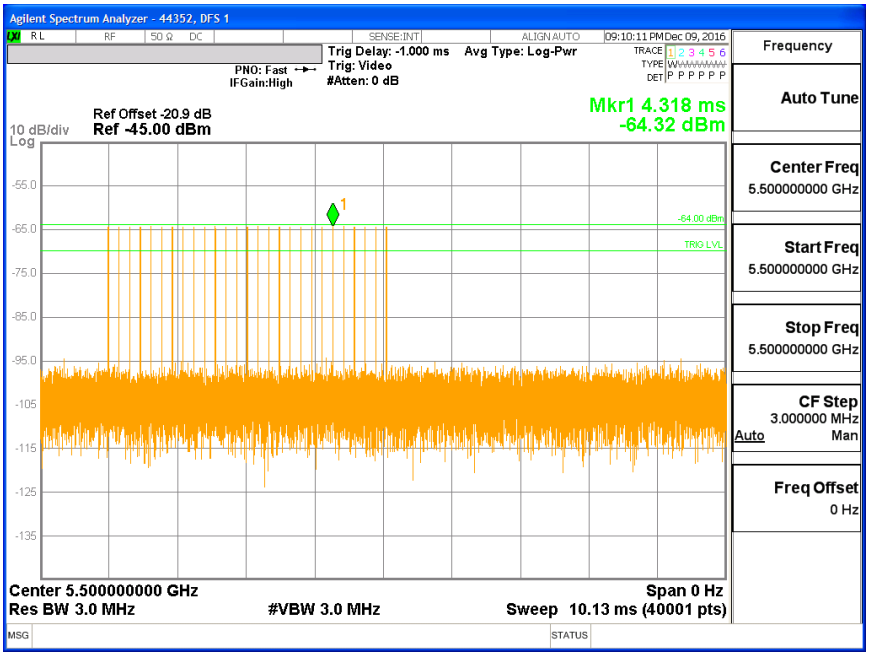
SHORT PULSE RADAR TYPE 0



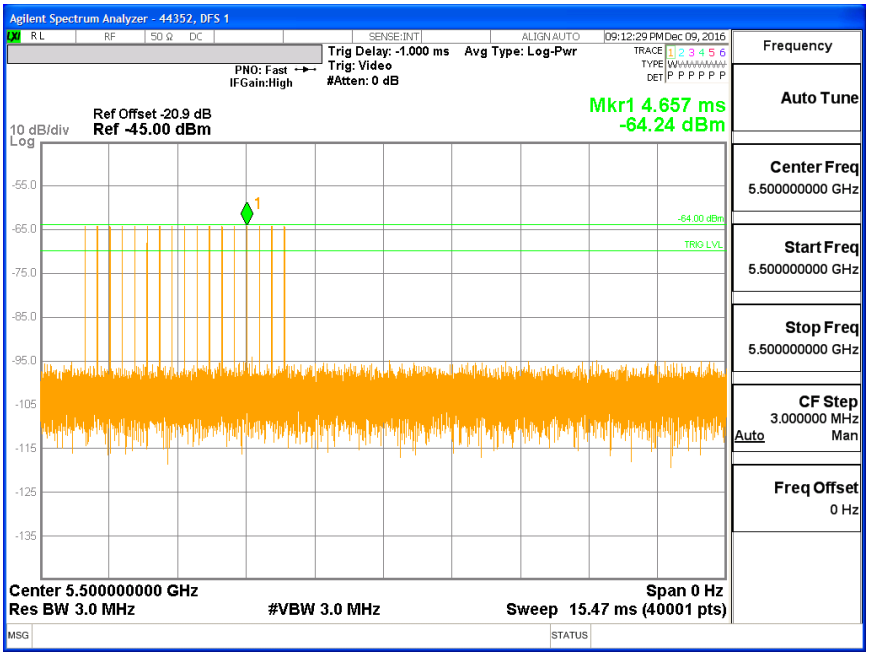
SAMPLE OF RADAR TYPE 1



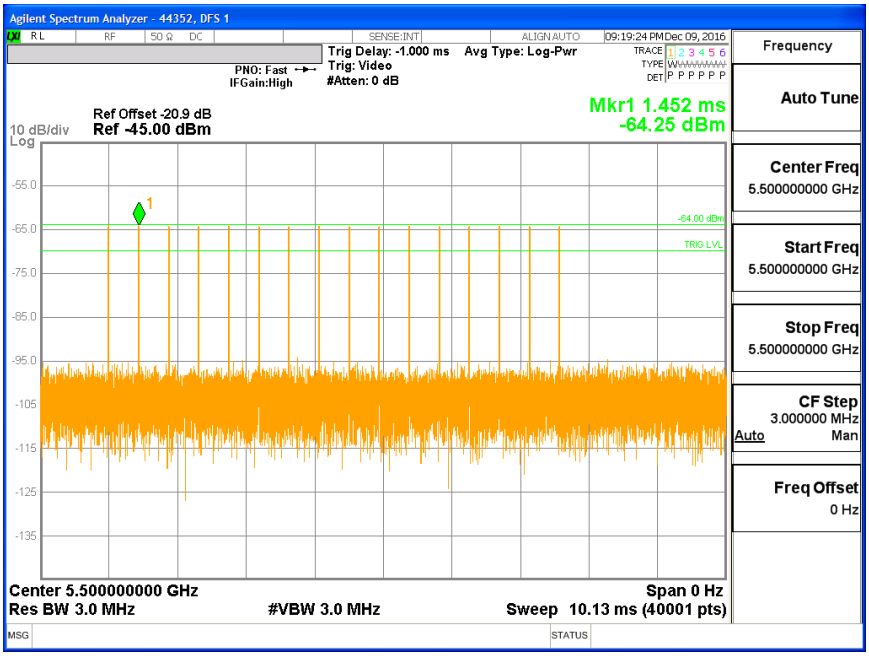
SAMPLE OF RADAR TYPE 2



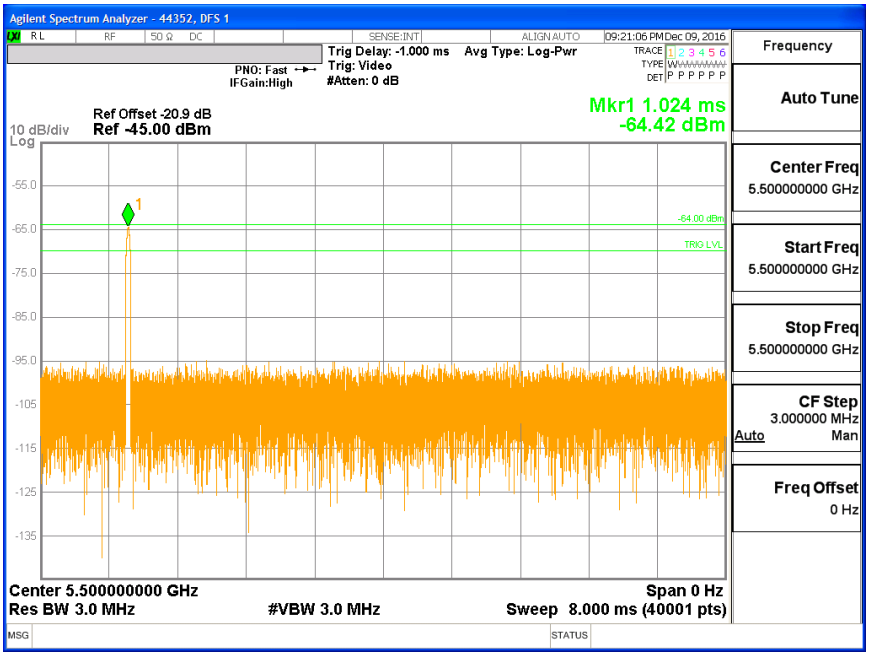
SAMPLE OF RADAR TYPE 3



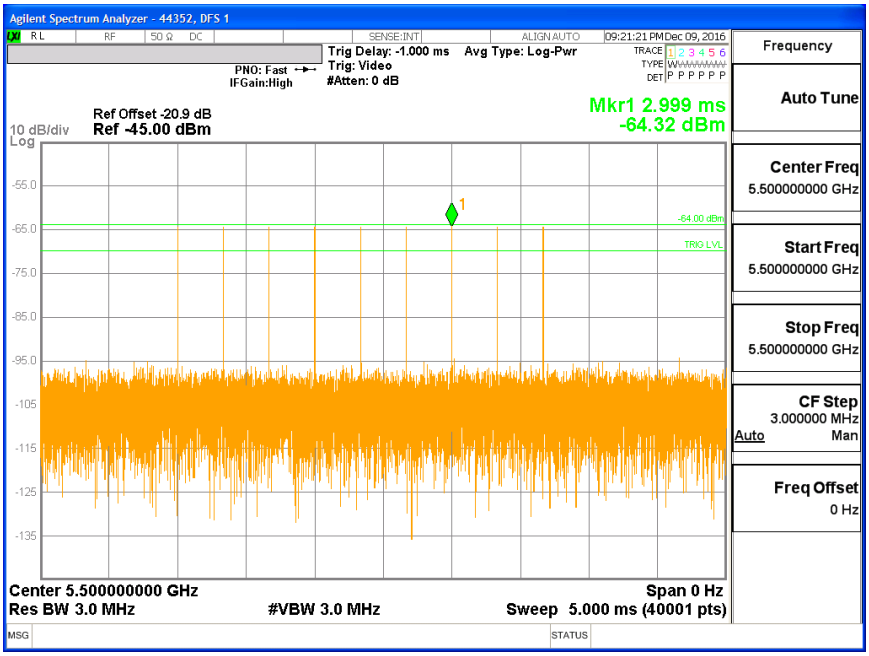
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

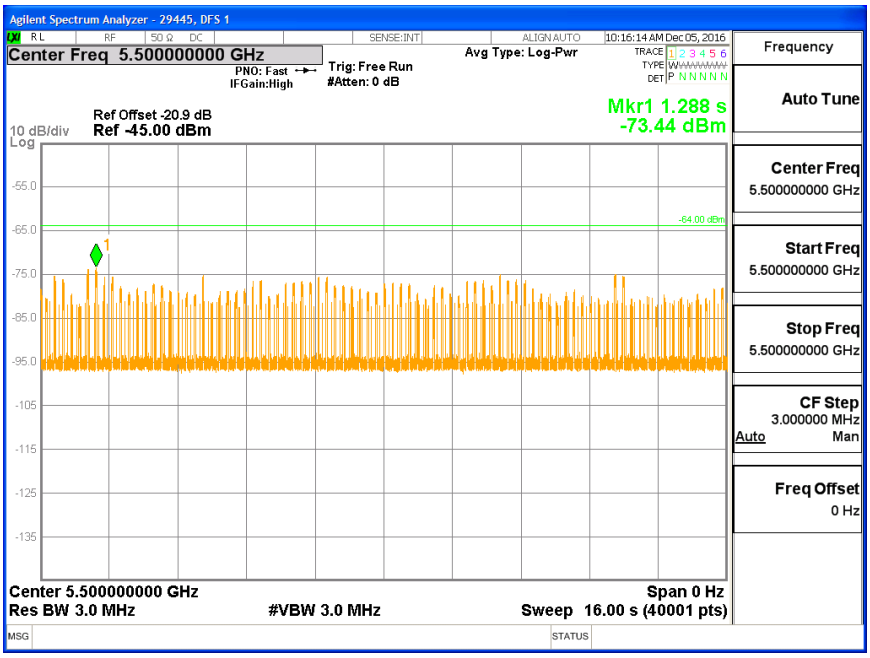


SINGLE BURST OF RADAR TYPE 6

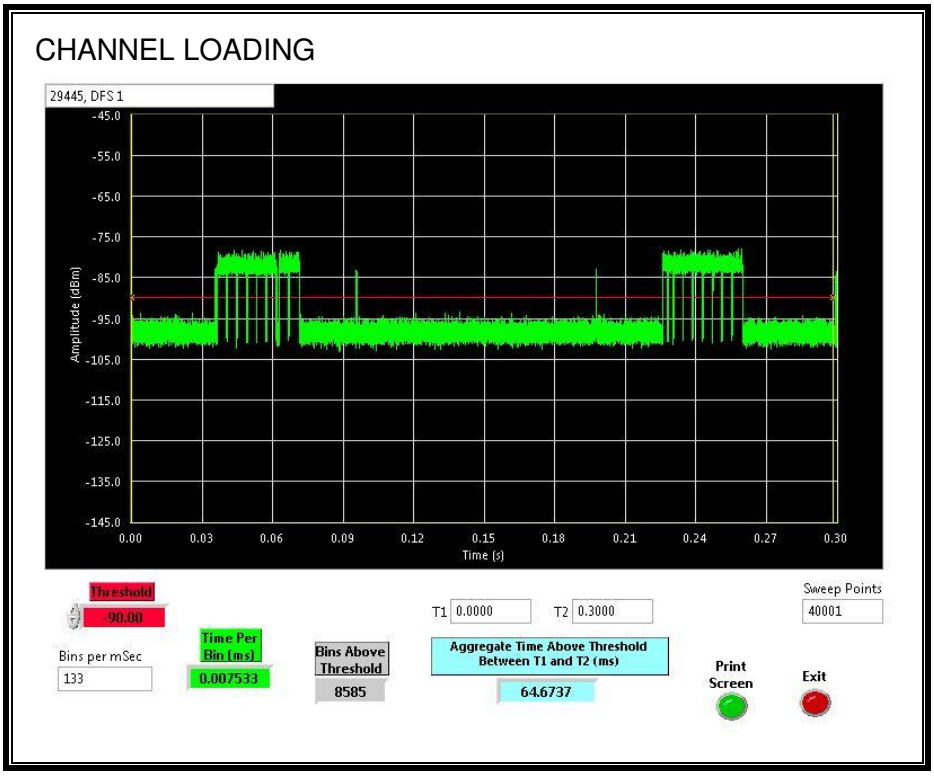


TRAFFIC

TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 21.55%

5.6.3. OVERLAPPING CHANNEL TESTS

RESULTS

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

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

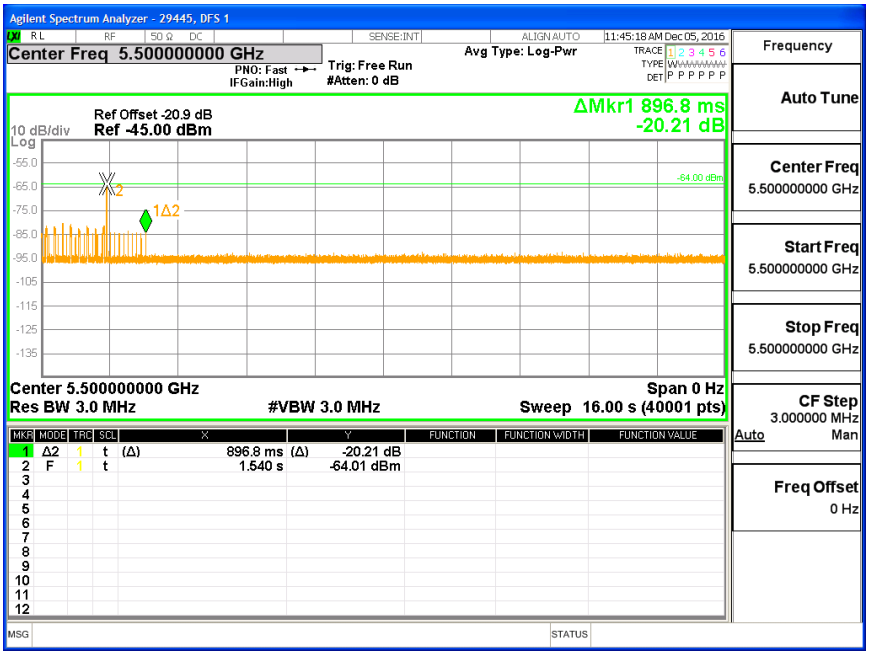
RESULTS

Channel Move Time (sec)	Limit (sec)
0.8968	10

Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
7.6	60

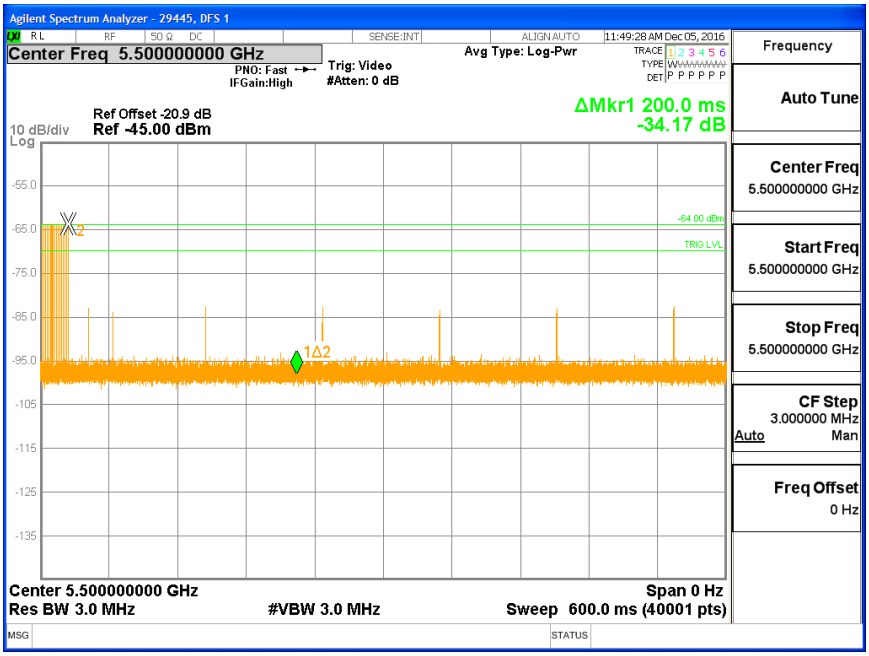
MOVE TIME

MOVE TIME



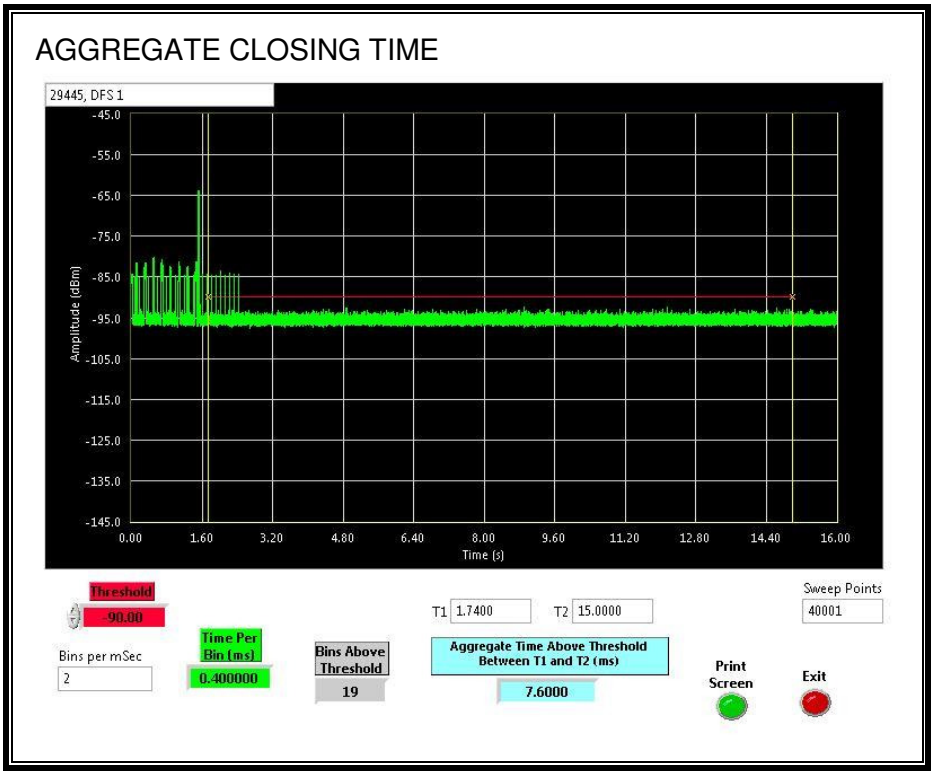
CHANNEL CLOSING TIME

CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

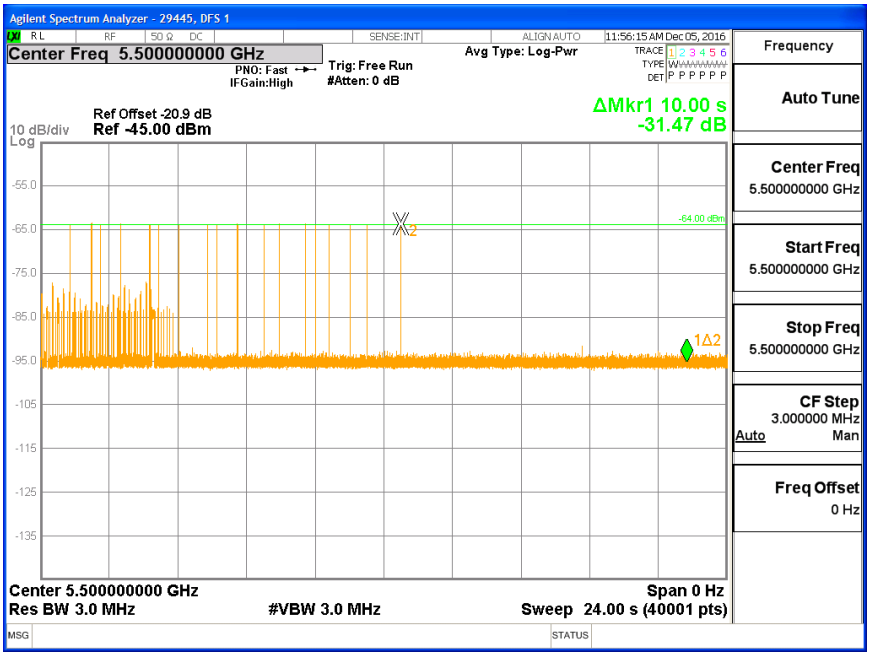
Only intermittent transmissions are observed during the aggregate monitoring period.



LONG PULSE CHANNEL MOVE TIME

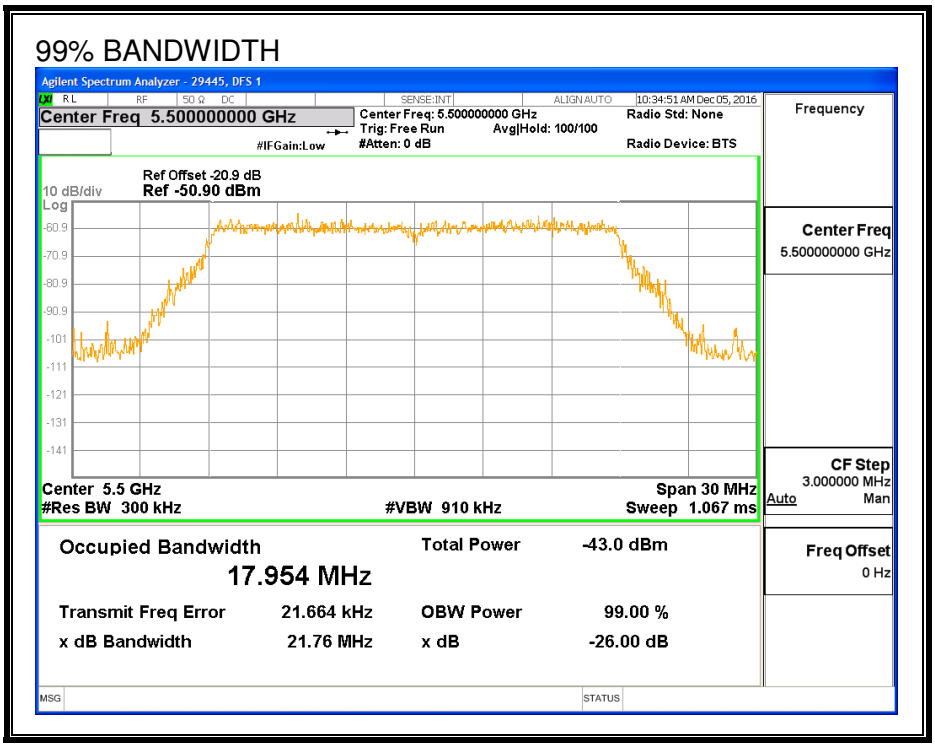
The traffic ceases prior to 10 seconds after the end of the radar waveform.

MOVE TIME FOR LONG PULSE RADAR



5.6.5. 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	5510	20	17.954	111.4	100

DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results		29445	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
5490	10	10	100	FL
5495	10	10	100	
5500	10	9	90	
5505	10	10	100	
5510	10	10	100	FH

5.6.6. 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	100.00	60	Pass	5490	5510	17.95	DFS 1	29445	Version 3.0
FCC Short Pulse Type 2	30	76.67	60	Pass	5490	5510	17.95	DFS 1	29445	Version 3.0
FCC Short Pulse Type 3	30	90.00	60	Pass	5490	5510	17.95	DFS 1	29445	Version 3.0
FCC Short Pulse Type 4	30	90.00	60	Pass	5490	5510	17.95	DFS 1	29445	Version 3.0
Aggregate		89.17	80	Pass						
FCC Long Pulse Type 5	30	80.00	80	Pass	5490	5510	17.95	DFS 1	29445	Version 3.0
FCC Hopping Type 6	42	97.62	70	Pass	5490	5510	17.95	DFS 1	29445	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	5500	Yes
1002	1	938	57	A	5500	Yes
1003	1	638	83	A	5500	Yes
1004	1	758	70	A	5500	Yes
1005	1	738	72	A	5500	Yes
1006	1	878	61	A	5500	Yes
1007	1	818	65	A	5500	Yes
1008	1	618	86	A	5500	Yes
1009	1	658	81	A	5500	Yes
1010	1	898	59	A	5500	Yes
1011	1	518	102	A	5500	Yes
1012	1	778	68	A	5500	Yes
1013	1	718	74	A	5500	Yes
1014	1	858	62	A	5500	Yes
1015	1	838	63	A	5500	Yes
1016	1	1493	36	B	5500	Yes
1017	1	1514	35	B	5500	Yes
1018	1	2017	27	B	5500	Yes
1019	1	2167	25	B	5500	Yes
1020	1	2800	19	B	5500	Yes
1021	1	1885	28	B	5500	Yes
1022	1	2647	20	B	5500	Yes
1023	1	667	80	B	5500	Yes
1024	1	1558	34	B	5500	Yes
1025	1	2255	24	B	5500	Yes
1026	1	2082	26	B	5500	Yes
1027	1	2909	19	B	5500	Yes
1028	1	2864	19	B	5500	Yes
1029	1	2626	21	B	5500	Yes
1030	1	2712	20	B	5500	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	3	158	27	5500	Yes
2002	2.2	223	27	5500	Yes
2003	2	195	28	5500	No
2004	1.5	183	25	5500	Yes
2005	3.7	164	26	5500	Yes
2006	1.4	156	27	5500	Yes
2007	3.8	179	29	5500	Yes
2008	1.8	218	24	5500	Yes
2009	4.4	208	29	5500	No
2010	2.6	170	24	5500	Yes
2011	1.5	163	23	5500	Yes
2012	4	210	29	5500	No
2013	1	170	29	5500	Yes
2014	1.8	183	28	5500	No
2015	1.1	228	25	5500	No
2016	2.1	203	27	5500	Yes
2017	3.6	171	28	5500	Yes
2018	2.9	154	28	5500	Yes
2019	4.8	170	29	5500	Yes
2020	4.3	195	26	5500	No
2021	4.3	176	27	5500	Yes
2022	2.1	168	28	5500	No
2023	4.4	192	23	5500	Yes
2024	2.4	230	25	5500	Yes
2025	5	220	24	5500	Yes
2026	1.3	182	25	5500	Yes
2027	2.1	176	24	5500	Yes
2028	4.6	223	23	5500	Yes
2029	3.8	183	23	5500	Yes
2030	2.4	196	29	5500	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	6.8	281	17	5500	Yes
3002	7.7	335	18	5500	Yes
3003	9.5	487	17	5500	Yes
3004	6.6	436	18	5500	Yes
3005	8.5	483	17	5500	Yes
3006	8	445	16	5500	No
3007	6.1	254	17	5500	Yes
3008	9.9	479	17	5500	Yes
3009	8.2	434	18	5500	Yes
3010	6.1	421	18	5500	Yes
3011	6.8	389	18	5500	Yes
3012	9.1	271	16	5500	Yes
3013	9.9	251	18	5500	Yes
3014	8.3	279	18	5500	Yes
3015	7.5	273	18	5500	No
3016	6.1	314	17	5500	Yes
3017	9.6	453	16	5500	Yes
3018	8.6	256	17	5500	Yes
3019	8.2	290	16	5500	Yes
3020	9.4	357	18	5500	Yes
3021	7.2	404	16	5500	Yes
3022	6.7	365	18	5500	Yes
3023	8.9	425	17	5500	Yes
3024	8.6	399	16	5500	Yes
3025	6.9	354	17	5500	Yes
3026	8.9	341	17	5500	Yes
3027	9.6	309	17	5500	Yes
3028	7.8	442	18	5500	Yes
3029	8.6	423	17	5500	Yes
3030	7	451	17	5500	No

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	11.5	444	16	5500	Yes
4002	13.2	485	16	5500	Yes
4003	16.1	374	16	5500	Yes
4004	14	427	13	5500	Yes
4005	13	462	16	5500	Yes
4006	15.7	277	13	5500	Yes
4007	20	324	16	5500	Yes
4008	18.9	286	12	5500	Yes
4009	14.6	346	13	5500	Yes
4010	13.9	320	16	5500	No
4011	19.2	275	15	5500	Yes
4012	14.7	262	13	5500	No
4013	16.2	481	12	5500	Yes
4014	12.1	363	14	5500	Yes
4015	14.1	477	16	5500	Yes
4016	19.6	372	12	5500	Yes
4017	17.7	498	15	5500	Yes
4018	19.4	406	14	5500	No
4019	18	294	12	5500	Yes
4020	11.1	348	16	5500	Yes
4021	19.3	382	12	5500	Yes
4022	13.9	347	15	5500	Yes
4023	13.5	394	15	5500	Yes
4024	12.3	355	13	5500	Yes
4025	17.1	415	14	5500	Yes
4026	16.4	390	12	5500	Yes
4027	17.4	345	16	5500	Yes
4028	17.2	332	15	5500	Yes
4029	18.7	299	14	5500	Yes
4030	14.6	432	13	5500	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	No
4	5500	Yes
5	5500	Yes
6	5500	No
7	5500	No
8	5500	Yes
9	5500	Yes
10	5500	Yes
11	5498	Yes
12	5497	Yes
13	5496	Yes
14	5498	Yes
15	5494	Yes
16	5498	No
17	5498	No
18	5495	Yes
19	5497	Yes
20	5499	Yes
21	5506	No
22	5506	Yes
23	5503	Yes
24	5501	Yes
25	5504	Yes
26	5503	Yes
27	5504	Yes
28	5505	Yes
29	5503	Yes
30	5504	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	70	5490	5	Yes
2	545	5491	6	Yes
3	1020	5492	5	Yes
4	1495	5493	4	Yes
5	1970	5494	5	Yes
6	2445	5495	7	Yes
7	2920	5496	7	Yes
8	3395	5497	2	Yes
9	3870	5498	4	Yes
10	4345	5499	4	Yes
11	4820	5500	5	No
12	5295	5501	6	Yes
13	5770	5502	3	Yes
14	6245	5503	7	Yes
15	6720	5504	3	Yes
16	7195	5505	4	Yes
17	7670	5506	5	Yes
18	8145	5507	3	Yes
19	8620	5508	4	Yes
20	9095	5509	5	Yes
21	9570	5510	4	Yes
22	10045	5490	5	Yes
23	10520	5491	1	Yes
24	10995	5492	4	Yes
25	11470	5493	6	Yes
26	11945	5494	10	Yes
27	12420	5495	3	Yes
28	12895	5496	6	Yes
29	13370	5497	6	Yes
30	13845	5498	2	Yes
31	14320	5499	7	Yes
32	14795	5500	2	Yes
33	15270	5501	4	Yes
34	15745	5502	3	Yes
35	16220	5503	2	Yes
36	16695	5504	5	Yes
37	17170	5505	2	Yes
38	17645	5506	5	Yes
39	18120	5507	6	Yes
40	18595	5508	5	Yes
41	19070	5509	2	Yes
42	19545	5510	4	Yes

5.7. HIGH BAND RESULTS FOR 40 MHz BANDWIDTH

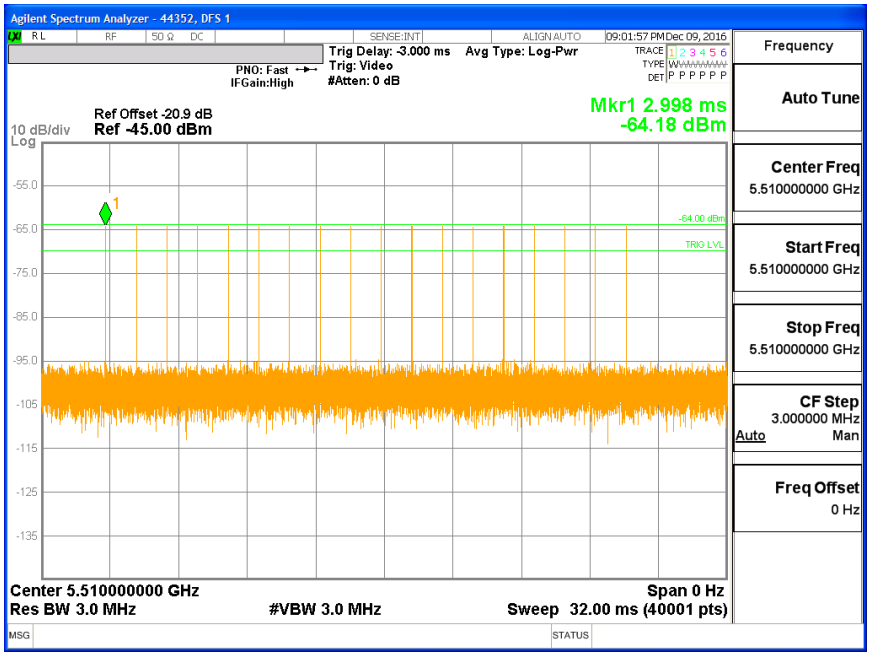
5.7.1. TEST CHANNEL

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

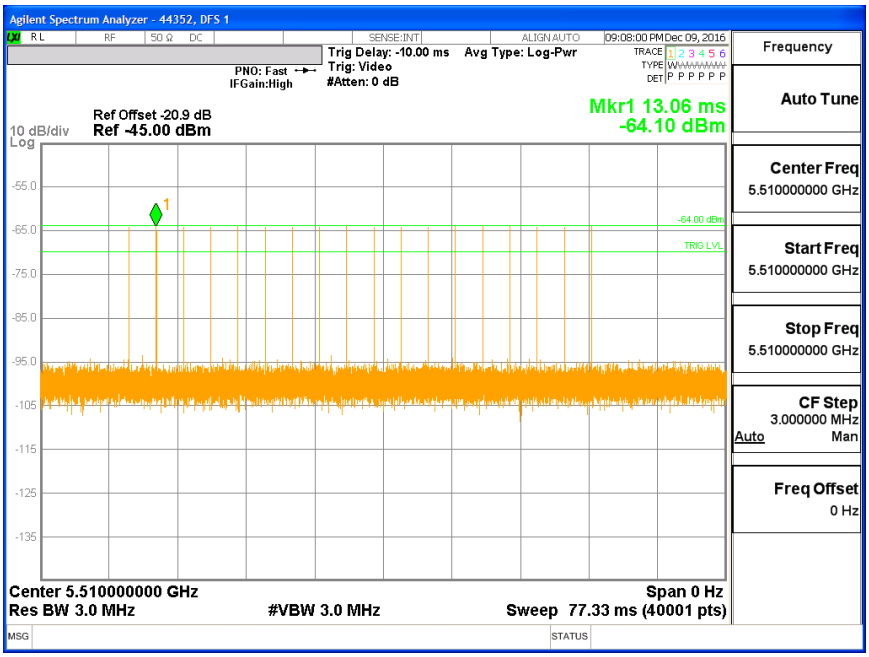
5.7.2. RADAR WAVEFORMS AND TRAFFIC

RADAR WAVEFORMS

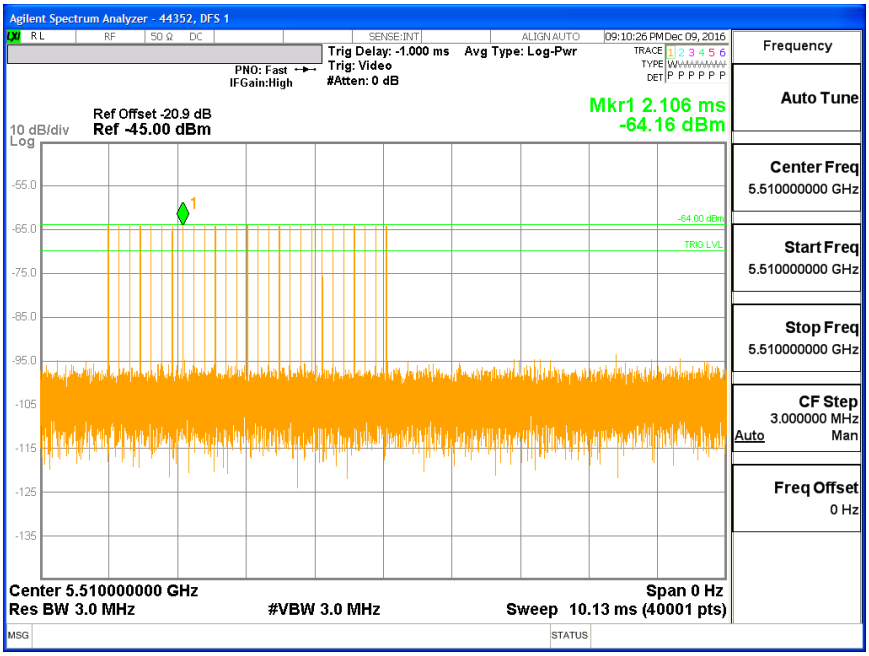
SHORT PULSE RADAR TYPE 0



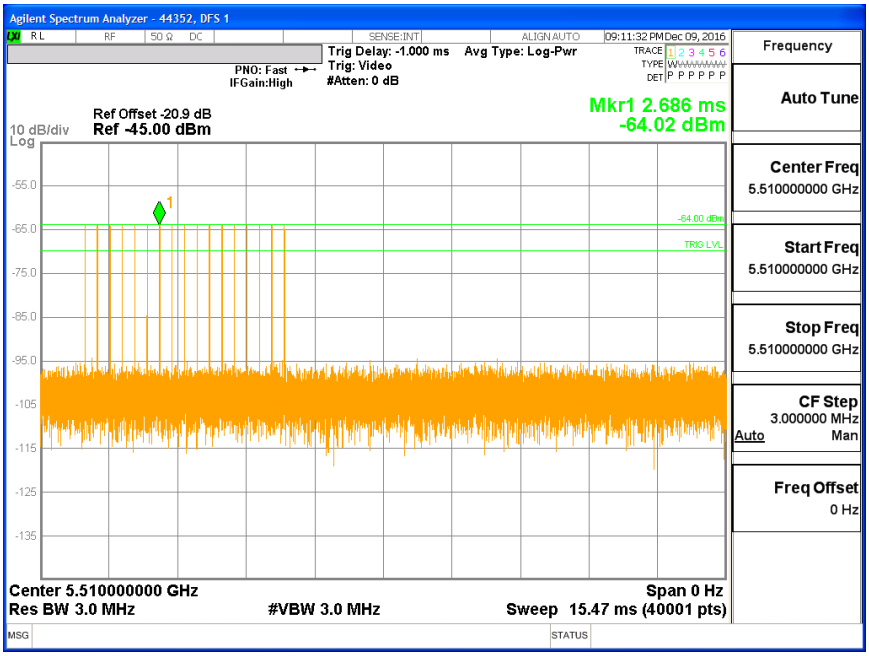
SAMPLE OF RADAR TYPE 1



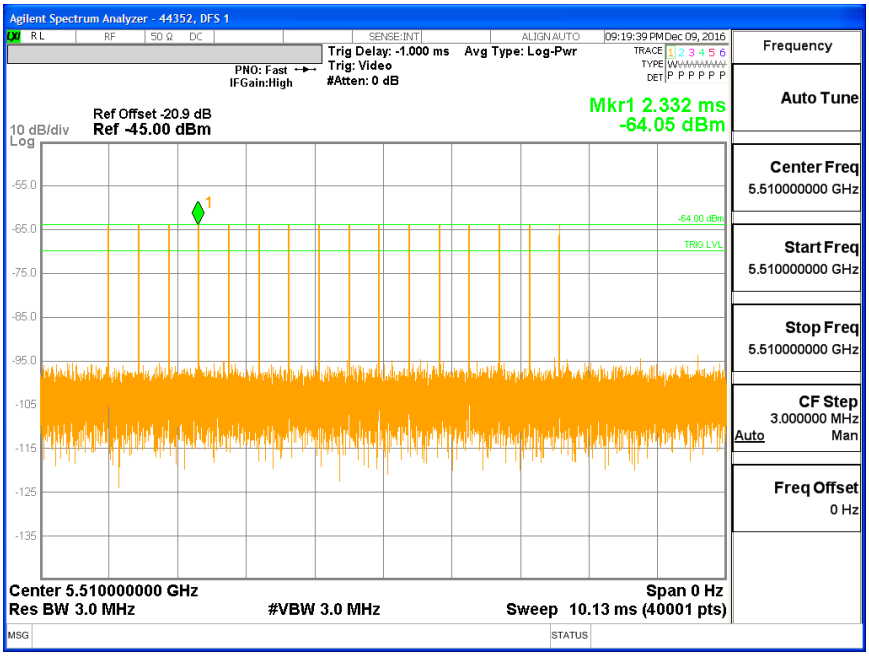
SAMPLE OF RADAR TYPE 2



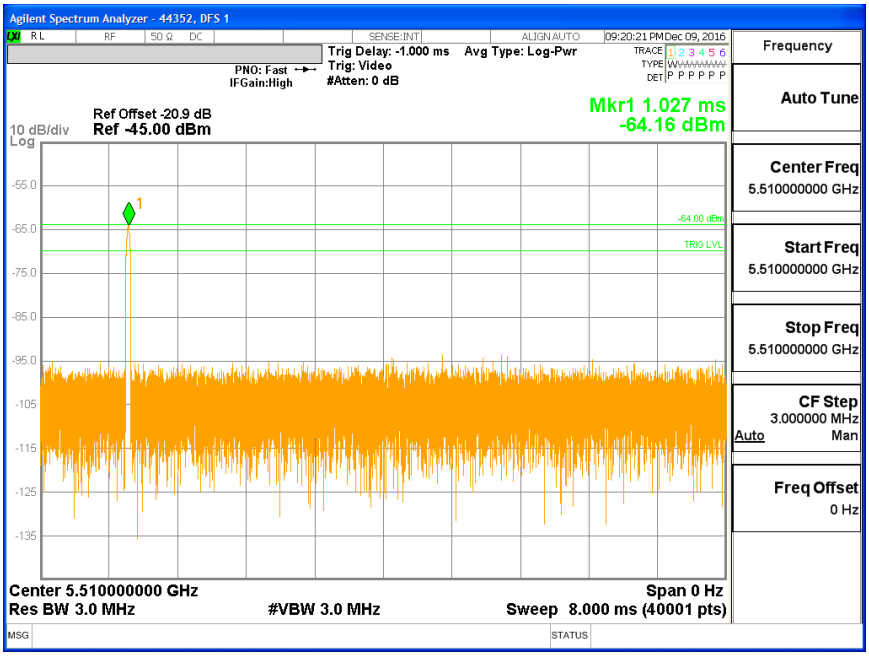
SAMPLE OF RADAR TYPE 3



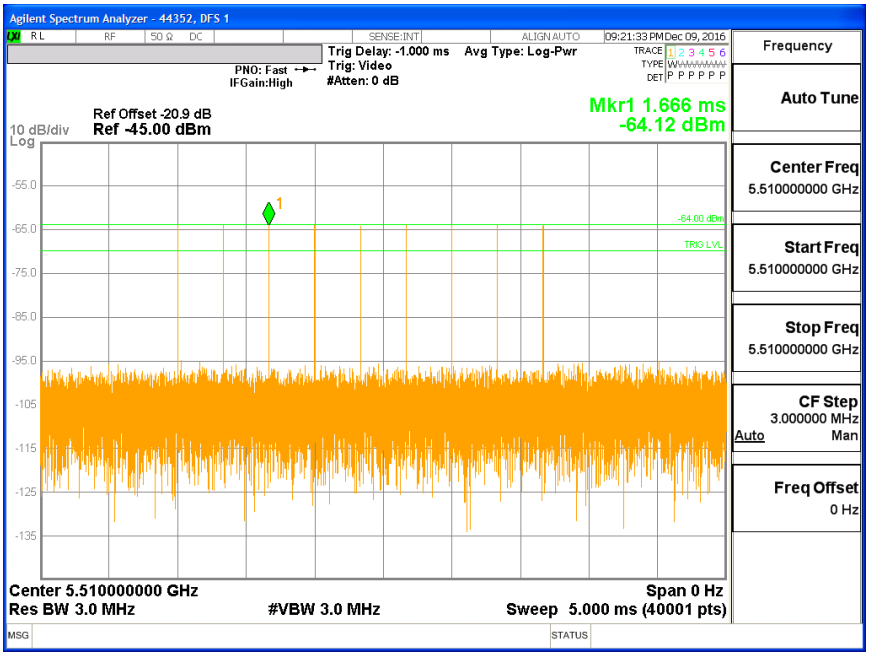
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

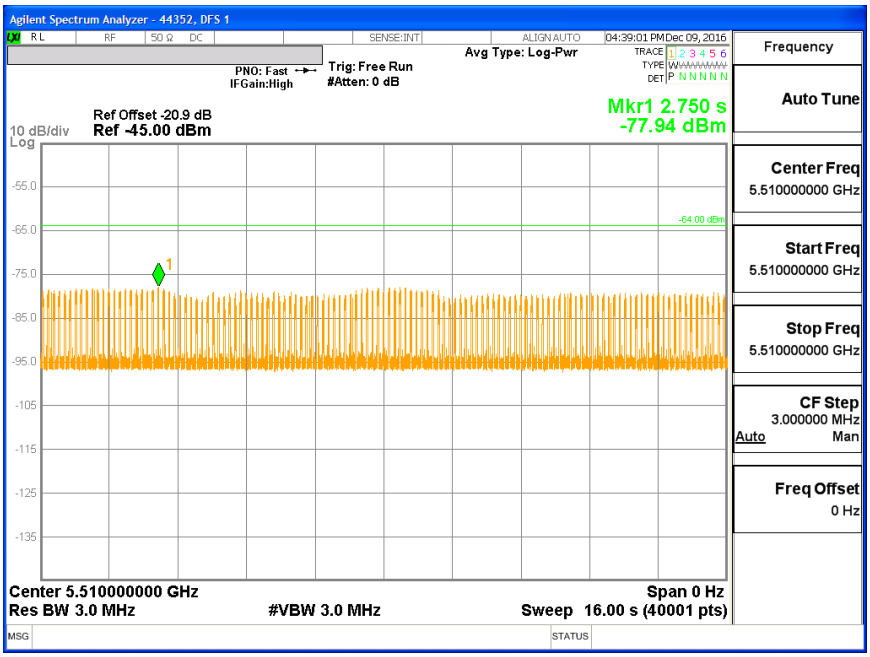


SINGLE BURST OF RADAR TYPE 6

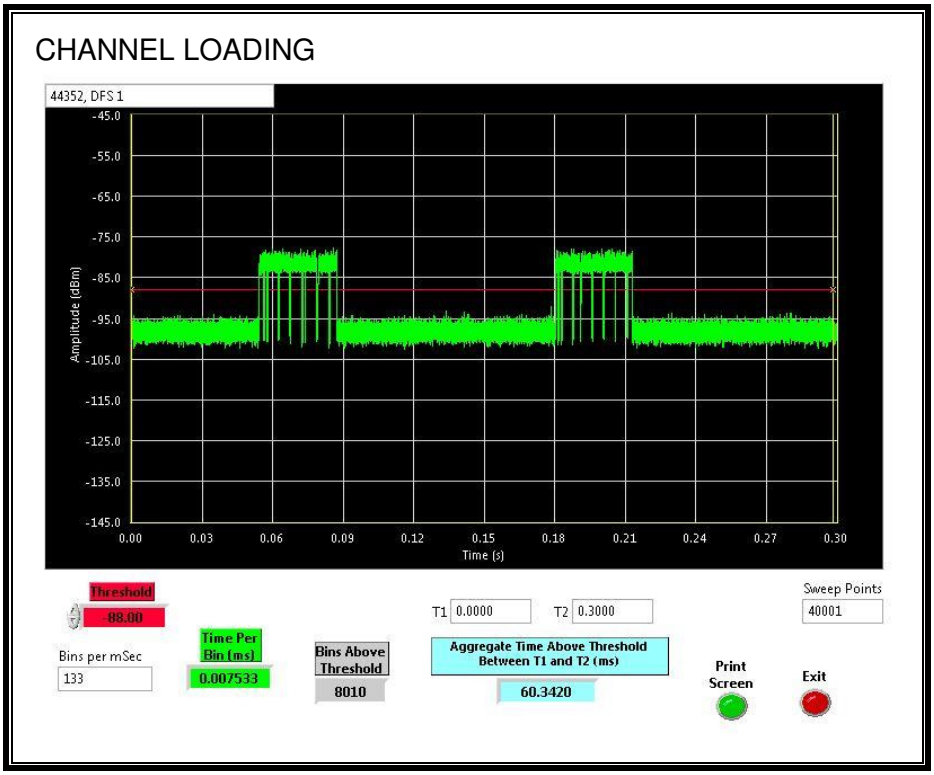


TRAFFIC

TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 20.114%

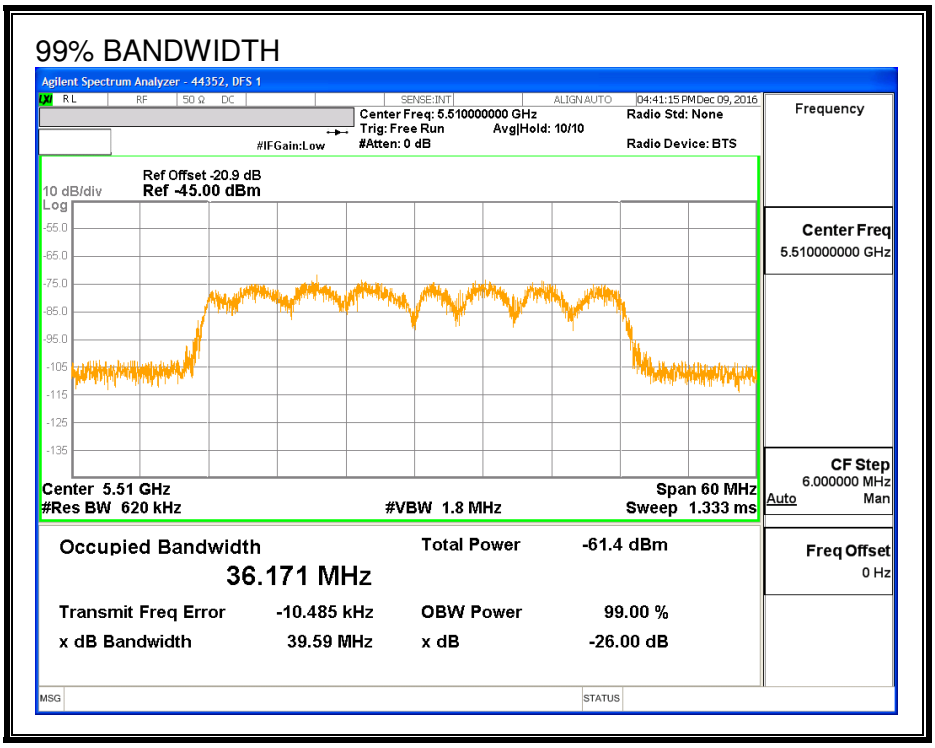
5.7.3. OVERLAPPING CHANNEL TESTS

RESULTS

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

5.7.4. 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	36.171	110.6	100

DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results		29445	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
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

5.7.5. 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	5520	36.17	DFS 1	29445	Version 3.0
FCC Short Pulse Type 2	30	80.00	60	Pass	5490	5520	36.17	DFS 1	29445	Version 3.0
FCC Short Pulse Type 3	30	73.33	60	Pass	5490	5520	36.17	DFS 1	29445	Version 3.0
FCC Short Pulse Type 4	30	70.00	60	Pass	5490	5520	36.17	DFS 1	29445	Version 3.0
Aggregate		80.83	80	Pass						
FCC Long Pulse Type 5	30	86.67	80	Pass	5490	5520	36.17	DFS 1	29445	Version 3.0
FCC Hopping Type 6	31	100.00	70	Pass	5490	5520	36.17	DFS 1	29445	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	5510	Yes
1002	1	938	57	A	5510	Yes
1003	1	638	83	A	5510	Yes
1004	1	758	70	A	5510	Yes
1005	1	738	72	A	5510	Yes
1006	1	878	61	A	5510	Yes
1007	1	818	65	A	5510	Yes
1008	1	618	86	A	5510	Yes
1009	1	658	81	A	5510	Yes
1010	1	898	59	A	5510	Yes
1011	1	518	102	A	5510	Yes
1012	1	778	68	A	5510	Yes
1013	1	718	74	A	5510	Yes
1014	1	858	62	A	5510	Yes
1015	1	838	63	A	5510	Yes
1016	1	1493	36	B	5510	Yes
1017	1	1514	35	B	5510	Yes
1018	1	2017	27	B	5510	Yes
1019	1	2167	25	B	5510	Yes
1020	1	2800	19	B	5510	Yes
1021	1	1885	28	B	5510	Yes
1022	1	2647	20	B	5510	Yes
1023	1	667	80	B	5510	Yes
1024	1	1558	34	B	5510	Yes
1025	1	2255	24	B	5510	Yes
1026	1	2082	26	B	5510	Yes
1027	1	2909	19	B	5510	Yes
1028	1	2864	19	B	5510	Yes
1029	1	2626	21	B	5510	Yes
1030	1	2712	20	B	5510	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	3	158	27	5510	Yes
2002	2.2	223	27	5510	Yes
2003	2	195	28	5510	Yes
2004	1.5	183	25	5510	Yes
2005	3.7	164	26	5510	Yes
2006	1.4	156	27	5510	Yes
2007	3.8	179	29	5510	Yes
2008	1.8	218	24	5510	Yes
2009	4.4	208	29	5510	Yes
2010	2.6	170	24	5510	Yes
2011	1.5	163	23	5510	Yes
2012	4	210	29	5510	No
2013	1	170	29	5510	Yes
2014	1.8	183	28	5510	Yes
2015	1.1	228	25	5510	Yes
2016	2.1	203	27	5510	Yes
2017	3.6	171	28	5510	Yes
2018	2.9	154	28	5510	Yes
2019	4.8	170	29	5510	Yes
2020	4.3	195	26	5510	Yes
2021	4.3	176	27	5510	Yes
2022	2.1	168	28	5510	Yes
2023	4.4	192	23	5510	No
2024	2.4	230	25	5510	Yes
2025	5	220	24	5510	No
2026	1.3	182	25	5510	Yes
2027	2.1	176	24	5510	Yes
2028	4.6	223	23	5510	No
2029	3.8	183	23	5510	No
2030	2.4	196	29	5510	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	6.8	281	17	5510	No
3002	7.7	335	18	5510	Yes
3003	9.5	487	17	5510	Yes
3004	6.6	436	18	5510	Yes
3005	8.5	483	17	5510	Yes
3006	8	445	16	5510	Yes
3007	6.1	254	17	5510	No
3008	9.9	479	17	5510	Yes
3009	8.2	434	18	5510	No
3010	6.1	421	18	5510	Yes
3011	6.8	389	18	5510	No
3012	9.1	271	16	5510	Yes
3013	9.9	251	18	5510	Yes
3014	8.3	279	18	5510	Yes
3015	7.5	273	18	5510	No
3016	6.1	314	17	5510	Yes
3017	9.6	453	16	5510	Yes
3018	8.6	256	17	5510	Yes
3019	8.2	290	16	5510	Yes
3020	9.4	357	18	5510	Yes
3021	7.2	404	16	5510	No
3022	6.7	365	18	5510	Yes
3023	8.9	425	17	5510	Yes
3024	8.6	399	16	5510	Yes
3025	6.9	354	17	5510	Yes
3026	8.9	341	17	5510	Yes
3027	9.6	309	17	5510	Yes
3028	7.8	442	18	5510	No
3029	8.6	423	17	5510	Yes
3030	7	451	17	5510	No

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	11.5	444	16	5510	Yes
4002	13.2	485	16	5510	Yes
4003	16.1	374	16	5510	Yes
4004	14	427	13	5510	Yes
4005	13	462	16	5510	Yes
4006	15.7	277	13	5510	Yes
4007	20	324	16	5510	No
4008	18.9	286	12	5510	Yes
4009	14.6	346	13	5510	Yes
4010	13.9	320	16	5510	Yes
4011	19.2	275	15	5510	Yes
4012	14.7	262	13	5510	No
4013	16.2	481	12	5510	Yes
4014	12.1	363	14	5510	Yes
4015	14.1	477	16	5510	Yes
4016	19.6	372	12	5510	No
4017	17.7	498	15	5510	Yes
4018	19.4	406	14	5510	No
4019	18	294	12	5510	Yes
4020	11.1	348	16	5510	Yes
4021	19.3	382	12	5510	Yes
4022	13.9	347	15	5510	Yes
4023	13.5	394	15	5510	No
4024	12.3	355	13	5510	No
4025	17.1	415	14	5510	Yes
4026	16.4	390	12	5510	Yes
4027	17.4	345	16	5510	No
4028	17.2	332	15	5510	No
4029	18.7	299	14	5510	No
4030	14.6	432	13	5510	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5		
Trial	Frequency (MHz)	Successful Detection (Yes/No)
1	5510	No
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	5499	No
12	5498	Yes
13	5497	Yes
14	5499	Yes
15	5495	Yes
16	5499	Yes
17	5499	No
18	5496	Yes
19	5498	Yes
20	5500	Yes
21	5525	No
22	5525	Yes
23	5522	Yes
24	5520	Yes
25	5523	Yes
26	5522	Yes
27	5523	Yes
28	5524	Yes
29	5522	Yes
30	5524	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	275	5490	8	Yes
2	750	5491	9	Yes
3	1225	5492	8	Yes
4	1700	5493	7	Yes
5	2175	5494	3	Yes
6	2650	5495	9	Yes
7	3125	5496	8	Yes
8	3600	5497	5	Yes
9	4075	5498	6	Yes
10	4550	5499	5	Yes
11	5025	5500	3	Yes
12	5500	5501	7	Yes
13	5975	5502	4	Yes
14	6450	5503	7	Yes
15	6925	5504	7	Yes
16	7400	5505	5	Yes
17	7875	5506	6	Yes
18	8350	5507	6	Yes
19	8825	5508	7	Yes
20	9300	5509	7	Yes
21	9775	5510	7	Yes
22	10250	5511	8	Yes
23	10725	5512	9	Yes
24	11200	5513	7	Yes
25	11675	5514	5	Yes
26	12150	5515	8	Yes
27	12625	5516	5	Yes
28	13100	5517	7	Yes
29	13575	5518	5	Yes
30	14050	5519	11	Yes
31	14525	5520	7	Yes

5.8. HIGH BAND RESULTS FOR 80 MHz BANDWIDTH

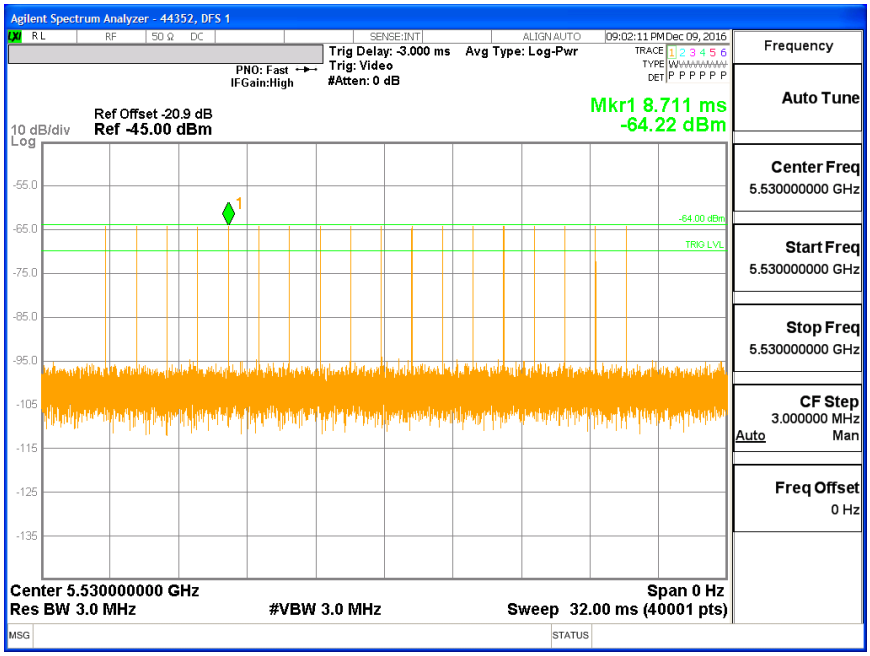
5.8.1. TEST CHANNEL

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

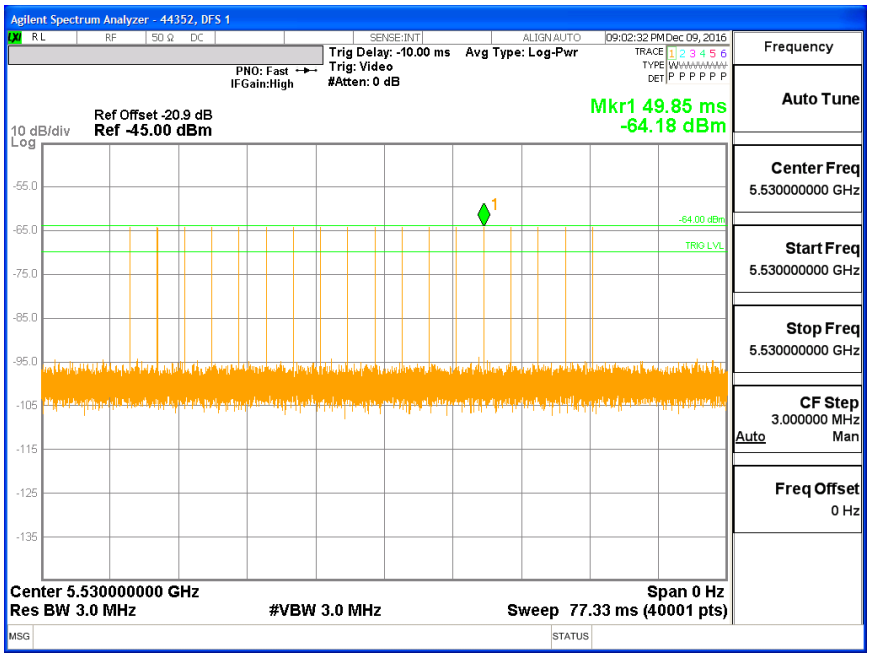
5.8.2. RADAR WAVEFORMS AND TRAFFIC

RADAR WAVEFORMS

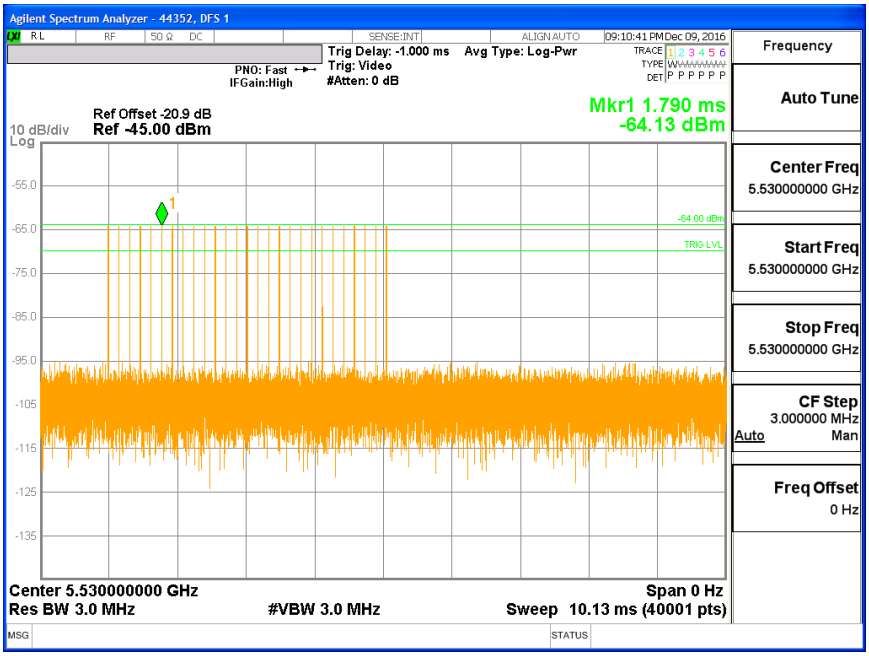
SHORT PULSE RADAR TYPE 0



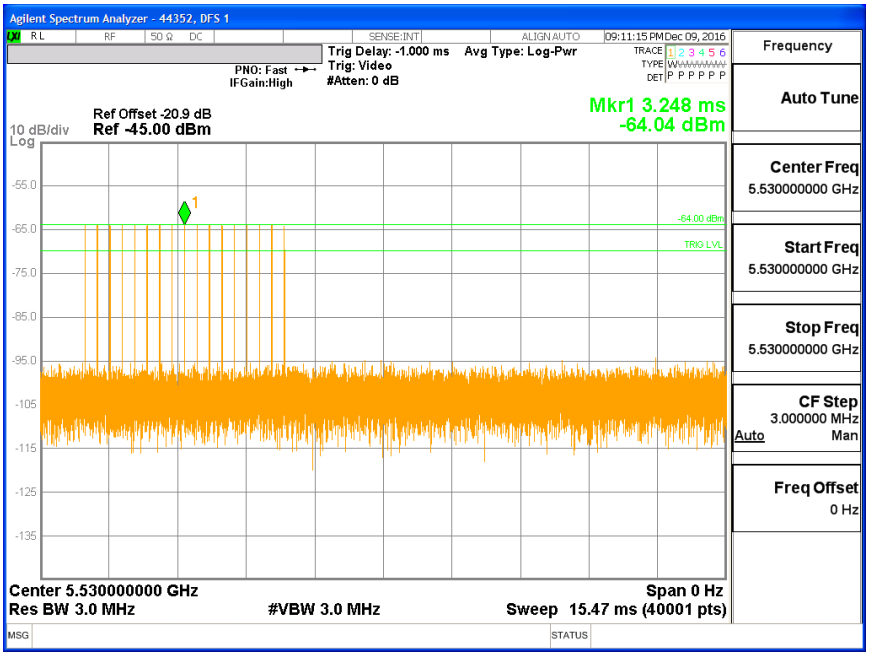
SAMPLE OF RADAR TYPE 1



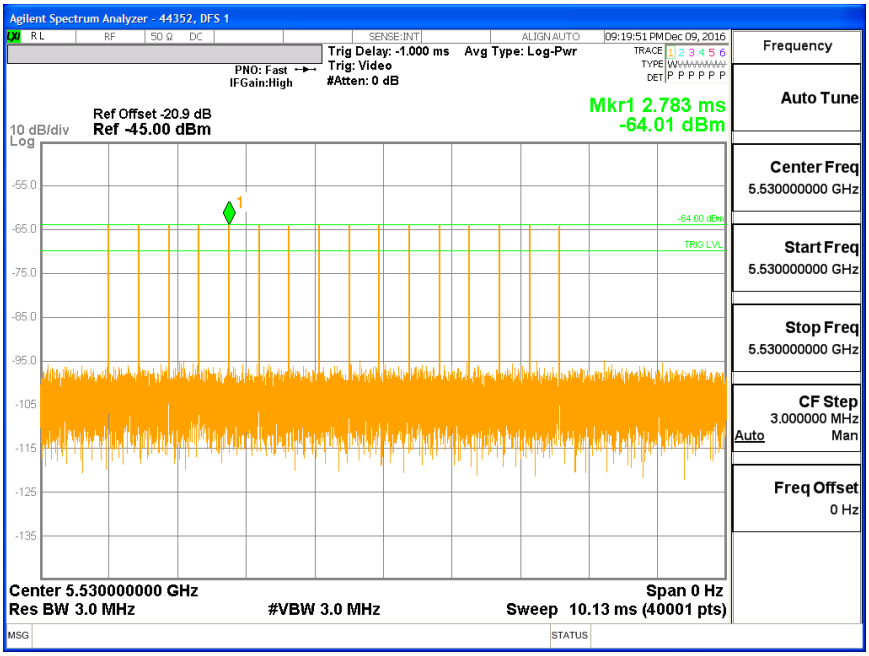
SAMPLE OF RADAR TYPE 2



SAMPLE OF RADAR TYPE 3



SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5