

**DFS PORTION of FCC 47 CFR PART 15 SUBPART E
DFS PORTION of ISCED CANADA RSS-247 ISSUE 2**

CERTIFICATION TEST REPORT

FOR

XE5-8 Wi-Fi 6e ACCESS POINT

MODEL NUMBER: XE5-8

FCC ID: Z8H89FT0072

ISED ID: 109W-0072

REPORT NUMBER: 14262395-E1V2

ISSUE DATE: JANUARY 27, 2023

Prepared for
**CAMBIUM NETWORKS, INC.
3800 GOLF RD., SUITE 360
ROLLING MEADOWS
IL., 60008, U.S.A.**

Prepared by
**UL VERIFICATION SERVICES INC.
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888**



Revision History

Rev.	Issue Date	Revisions	Revised By
V1	04/29/22	Initial Issue	--
V2	01/27/23	Removed dash from FCC ID per manufacturer request	Edgard Rincand

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	6
3. SUMMARY OF TEST RESULTS.....	6
4. REFERENCE DOCUMENTS.....	6
5. FACILITIES AND ACCREDITATION	6
6. DECISION RULES AND MEASUREMENT UNCERTAINTY	7
6.1. METROLOGICAL TRACEABILITY	7
6.2. DECISION RULES.....	7
7. DYNAMIC FREQUENCY SELECTION.....	8
7.1. OVERVIEW	8
7.1.1. LIMITS.....	8
7.1.2. TEST AND MEASUREMENT SYSTEM	12
7.1.3. TEST AND MEASUREMENT SOFTWARE	14
7.1.4. SETUP OF EUT.....	16
7.1.5. DESCRIPTION OF EUT	17
7.2. RESULTS FOR 20 MHz BANDWIDTH	19
7.2.1. TEST CHANNEL	19
7.2.2. RADAR WAVEFORMS AND TRAFFIC.....	19
7.2.3. CHANNEL AVAILABILITY CHECK TIME.....	28
7.2.4. OVERLAPPING CHANNEL TESTS.....	28
7.2.5. MOVE AND CLOSING TIME	28
7.2.6. DETECTION BANDWIDTH.....	29
7.2.7. IN-SERVICE MONITORING	31
7.3. RESULTS FOR 40 MHz BANDWIDTH	38
7.3.1. TEST CHANNEL	38
7.3.2. RADAR WAVEFORMS AND TRAFFIC.....	38
7.3.3. CHANNEL AVAILABILITY CHECK TIME.....	47
7.3.4. OVERLAPPING CHANNEL TESTS.....	47
7.3.5. MOVE AND CLOSING TIME	47
7.3.6. DETECTION BANDWIDTH.....	48
7.3.7. IN-SERVICE MONITORING	50
7.4. RESULTS FOR 80 MHz BANDWIDTH	57
7.4.1. TEST CHANNEL	57
7.4.2. RADAR WAVEFORMS AND TRAFFIC.....	57
7.4.3. CHANNEL AVAILABILITY CHECK TIME.....	66
7.4.4. OVERLAPPING CHANNEL TESTS.....	71
7.4.5. MOVE AND CLOSING TIME	71
7.4.6. NON-OCCUPANCY PERIOD	76
7.4.7. DETECTION BANDWIDTH.....	77
7.4.8. IN-SERVICE MONITORING	79
7.5. BRIDGE MODE RESULTS.....	87

8. SETUP PHOTOS.....88

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: CAMBIUM NETWORKS, INC.
3800 GOLF RD., SUITE 360
ROLLING MEADOWS, IL., 60008, U.S.A.

EUT DESCRIPTION: XE5-8 Wi-Fi 6e ACCESS POINT

MODEL: XE5-8

SERIAL NUMBER: W8XK060C58MK

DATE TESTED: MARCH 28 to 30, 2022

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
DFS Portion of CFR 47 Part 15 Subpart E	Complies
DFS Portion of ISED CANADA RSS-247 Issue 2	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

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.

Approved & Released For
UL Verification Services Inc. By:



Edgard Rincand
Operations Leader
CONSUMER TECHNOLOGY DIVISION
UL Verification Services Inc.

Prepared By:



DOUG ANDERSON
Test Engineer
CONSUMER TECHNOLOGY DIVISION
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 KDB 789033, KDB 905462 D02 and D03 and RSS-247 Issue 2.

3. SUMMARY OF TEST RESULTS

Requirement Description	Result	Remarks
DFS Portion of FCC 47 CFR PART 15 SUBPART E	Complies	
DFS Portion of ISED CANADA RSS-247 ISSUE 2	Complies	

4. REFERENCE DOCUMENTS

Measurements of transmitter parameters as referenced in this report and all other manufacturer's declarations relevant to the RF test requirements are documented in Sporton Labs FCC report and IC report #: 142255-02.

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

5. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, Certificate Number 0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☒	Building 1: 47173 Benicia Street, Fremont, California, USA	US0104	2324A	550739
	Building 2: 47266 Benicia Street, Fremont, California, USA	US0104	2324A	550739
	Building 4: 47658 Kato Rd, Fremont, California, USA	US0104	2324A	550739

6. DECISION RULES AND MEASUREMENT UNCERTAINTY

6.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

6.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement).

7. DYNAMIC FREQUENCY SELECTION

7.1. OVERVIEW

7.1.1. LIMITS

INNOVATION, SCIENCE and ECONOMIC DEVELOPMENT CANADA (ISED)

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

RSS-247 Issue 2

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

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

FCC

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

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)
<i>U-NII Detection Bandwidth and Statistical Performance Check</i>	All BW modes must be tested	Not required
<i>Channel Move Time and Channel Closing Transmission Time</i>	Test using widest BW mode available	Test using the widest BW mode available for the link
<i>All other tests</i>	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. $\geq$ 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
<i>Non-occupancy period</i>	30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds (See Note 1)
<i>Channel Closing Transmission Time</i>	200 milliseconds + approx. 60 milliseconds over remaining 10 second period. (See Notes 1 and 2)
<i>U-NII Detection Bandwidth</i>	Minimum 100% of the U- NII 99% transmission power bandwidth. (See Note 3)
Note 1: <i>Channel Move Time</i> and the <i>Channel Closing Transmission Time</i> should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The <i>Channel Closing Transmission Time</i> is comprised of 200 milliseconds starting at the beginning of the <i>Channel Move Time</i> plus any additional intermittent control signals required to facilitate a <i>Channel move</i> (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 <i>U-NII Detection Bandwidth</i> 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: $\{(1/360) \times (19 \times 10^6 \text{ PRI}_{\text{usec}})\}$	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 <i>Detection Bandwidth</i> test, <i>Channel Move Time</i> , and <i>Channel Closing Time</i> tests.					

Table 6 – Long Pulse Radar Test Signal

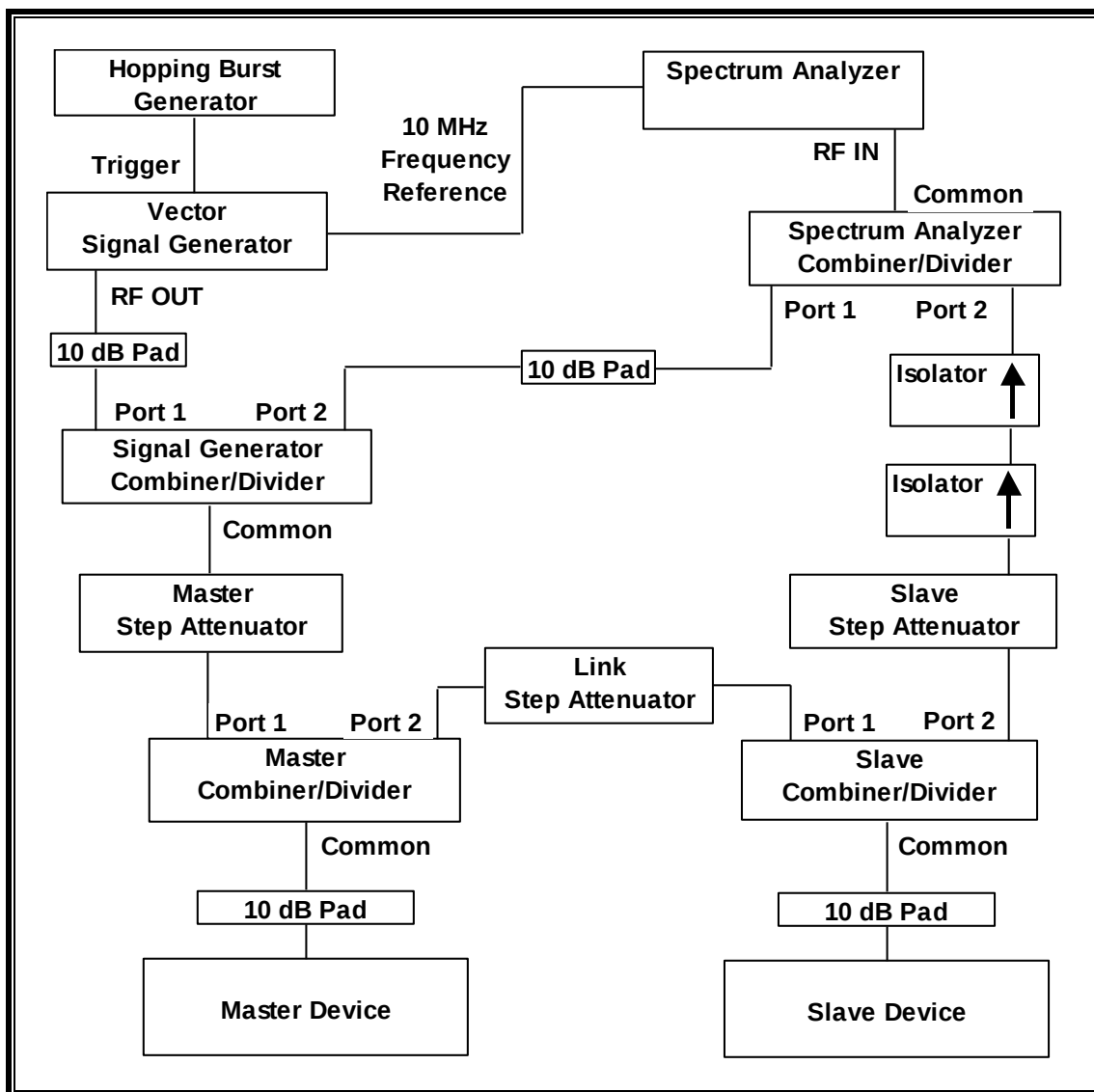
Radar Waveform Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

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

7.1.2. TEST AND MEASUREMENT SYSTEM

CONDUCTED METHOD SYSTEM BLOCK DIAGRAM



SYSTEM OVERVIEW

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

The short pulse types 1, 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of KDB 905462 D02. The frequency of the signal generator is incremented in 1 MHz steps from F_L to F_H for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold.

Should multiple RF ports be utilized for the Master and/or Slave devices (for example, for diversity or MIMO implementations), additional combiner/dividers are inserted between the Master Combiner/Divider and the pad connected to the Master Device (and/or between the Slave Combiner/Divider and the pad connected to the Slave Device). Additional pads may be utilized such that there is one pad at each RF port on each EUT.

SYSTEM CALIBRATION

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected in place of the master device. The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of -64 dBm as measured on the spectrum analyzer.

Without changing any of the instrument settings, the spectrum analyzer is reconnected to the Common port of the Spectrum Analyzer Combiner/Divider. The Reference Level Offset of the spectrum analyzer is adjusted so that the displayed amplitude of the signal is -64 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of -64 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Master and Slave and the Link Step Attenuator between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. Traffic that meets or exceed the minimum loading requirement is streamed from the Master device to the Slave Device. The WLAN traffic level, as displayed on the spectrum analyzer, is confirmed to be at lower amplitude than the radar detection threshold and is confirmed to be the Radar Detection Device rather than the associated device. If a different setting of the Master Step Attenuator is required to meet the above conditions, a new System Calibration is performed for the new Master Step Attenuator setting.

TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	ID No.	Cal Due
Spectrum Analyzer, PXA, 3Hz to 8.4GHz	Keysight	N9030A	150667	01/27/23
Signal Generator, MXG X-Series RF Vector	Agilent	N5182B	150666	01/26/23
Arbitrary Waveform Generator	Agilent	33220A	80815	01/24/23

7.1.3. 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	3.1	Channel Loading and Aggregate Closing Time
FCC 2014 Detection Bandwidth-PXA	3.1.1	Detection Bandwidth in 5 MHz Steps
In Service Monitoring-PXA	4.1	In-Service Monitoring (Probability of Detection)
PXA Read	3.1	Signal Generator Screen Capture
SGXProject.exe	1.7	Radar Waveform Generation and Download

TEST ROOM ENVIRONMENT

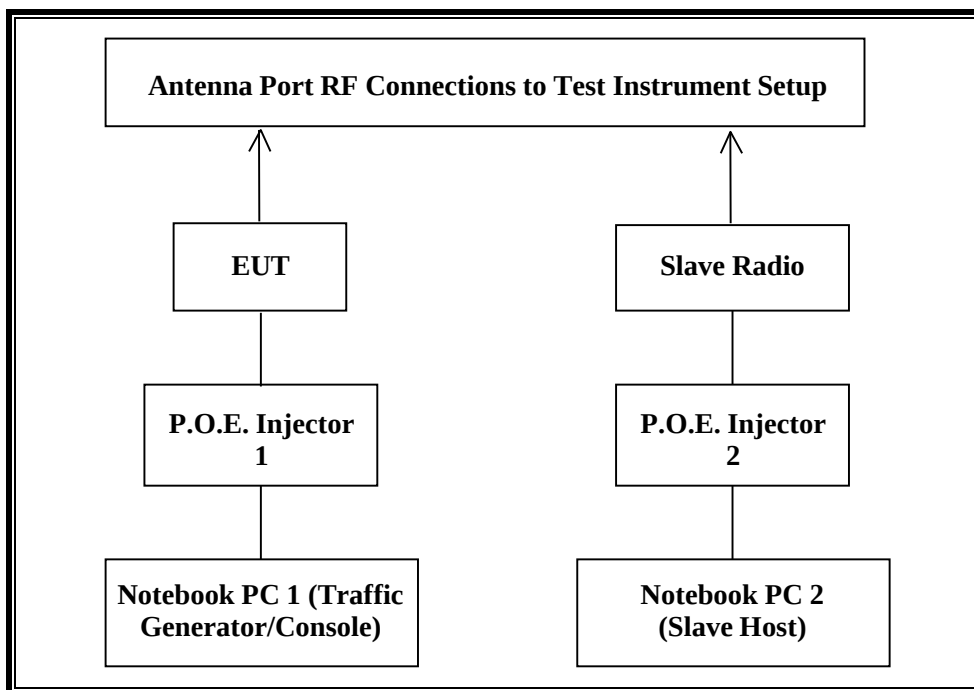
The test room temperature and humidity shall be maintained within normal temperature of 15~35 °C and normal humidity 20~75% (relative humidity).

ENVIRONMENT CONDITION

Parameter	Value
Temperature	25.4, 23.8 and 29.9 °C
Humidity	39, 41 and 38 %

7.1.4. SETUP OF EUT

CONDUCTED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

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

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
P.O.E. Injector 1 (EUT)	Cambium Networks	NET-P60-56IN	N000000L142A215 3000001	DoC
Notebook PC 1 (EUT Console)	Lenovo	Type 4236-B92	PB-HEX04 12/05	DoC
AC Adapter 1 (Notebook PC 1)	Lenovo	42T4418	11S42T4418Z1ZG WG08R90M	DoC
XE5-8 Wi-Fi 6e Access Point (Slave Radio)	Cambium Networks	XE5-8	W8XK061K89FD	Z8H89FT0072
P.O.E. Injector 2 (Slave)	Cambium Networks	NET-P60-56IN	N000000L142A202 80000149	DoC
Notebook PC 2 (Slave Host)	Lenovo	Type 20B7-S0A200	PF-02JN9J 14/06	DoC
AC Adapter 2 (Notebook PC 2)	Lenovo	ADLX65NLC2A	11S45N0259Z1ZS9 74594A9	DoC

7.1.5. DESCRIPTION OF EUT

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

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

The EUT is a Master Device.

The highest power level within these bands is 30 dBm EIRP in the 5250-5350 MHz band and 30 dBm EIRP in the 5470-5725 MHz band.

The manufacturer has declared that the highest gain antenna assembly utilized with the EUT has a gain of 6 dBi in the 5250-5350 MHz band and 6 dBi in the 5470-5725 MHz band. The manufacturer has declared that the lowest gain antenna assembly utilized with the EUT has a gain of 6 dBi in the 5250-5350 MHz band and 6 dBi in the 5470-5725 MHz band.

Eight wideband antennas are utilized to meet the diversity and MIMO operational requirements.

The rated output power of the Master unit is > 23dBm (EIRP). Therefore the required interference threshold level is -64 dBm. After correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is $-64 + 6 + 1 = -57$ dBm.

The calibrated conducted DFS Detection Threshold level is set to -63 dBm.

The EUT is a multi-radio device with three radio modules that have DFS detection capability. Two of the three radio modules are identical therefore only one of the two identical devices was tested along with the third.

The EUT uses three transmitter/receiver chains to detect radar, one per radio module. Since two of the three radio modules are identical, two chains were tested. Each chain was connected to a 50-ohm coaxial antenna port. Both antenna ports are connected to the test system via a power divider to perform conducted tests.

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

WLAN traffic that meets or exceeds the minimum required loading was generated by transferring a data stream from the Master Device to the Slave Device using iPerf version 2.0.5 software package.

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

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

Channel puncturing is not supported by the EUT.

The software installed in the EUT is version 6.4.1-a0.

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 Cambium Networks XE5-8 Wi-Fi 6e Access Point with SDR, FCC ID: Z8H89FT0072. The minimum antenna gain for the Master Device is 6 dBi.

The rated output power of the Master unit is $> 23\text{dBm}$ (EIRP). Therefore the required interference threshold level is -64 dBm . After correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is $-64 + 6 + 1 = -57\text{ dBm}$.

The calibrated conducted DFS Detection Threshold level is set to -63 dBm .

The software installed in the Master EUT is 6.4-a1.

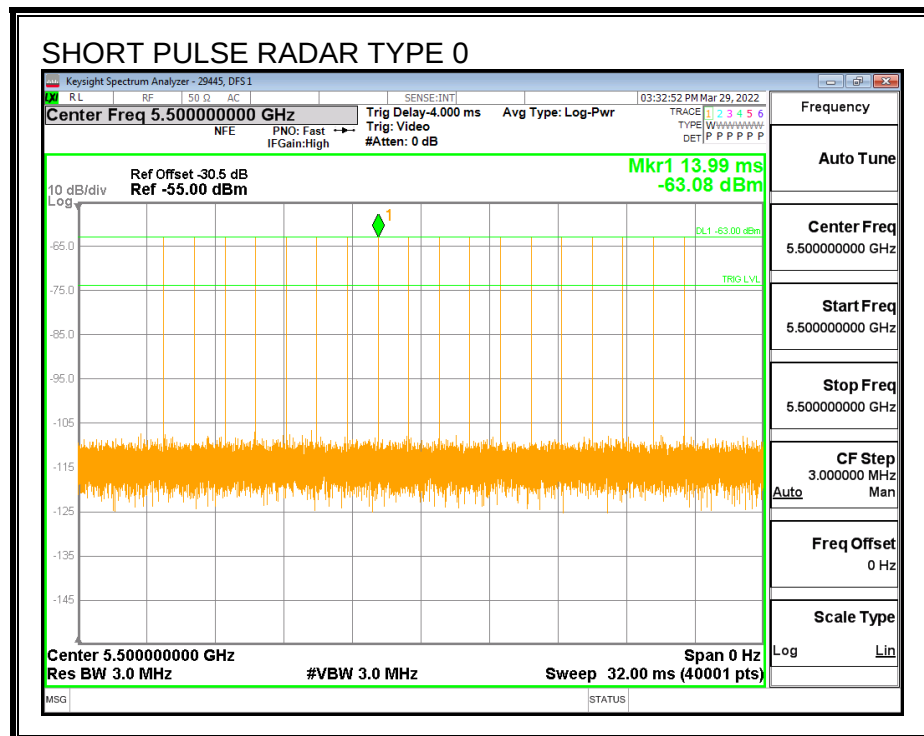
7.2. RESULTS FOR 20 MHz BANDWIDTH

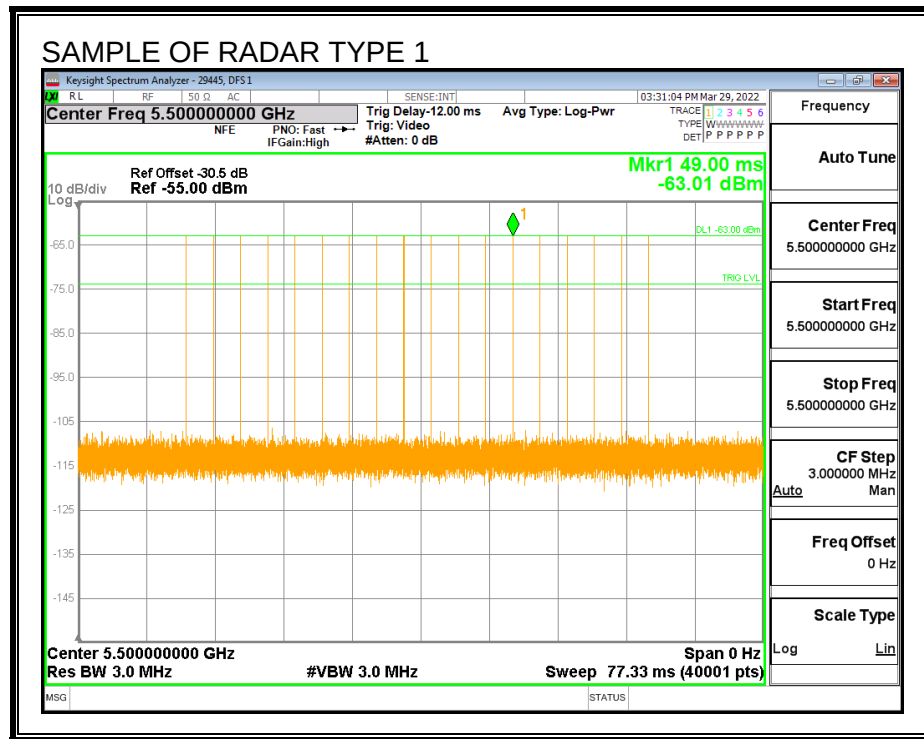
7.2.1. TEST CHANNEL

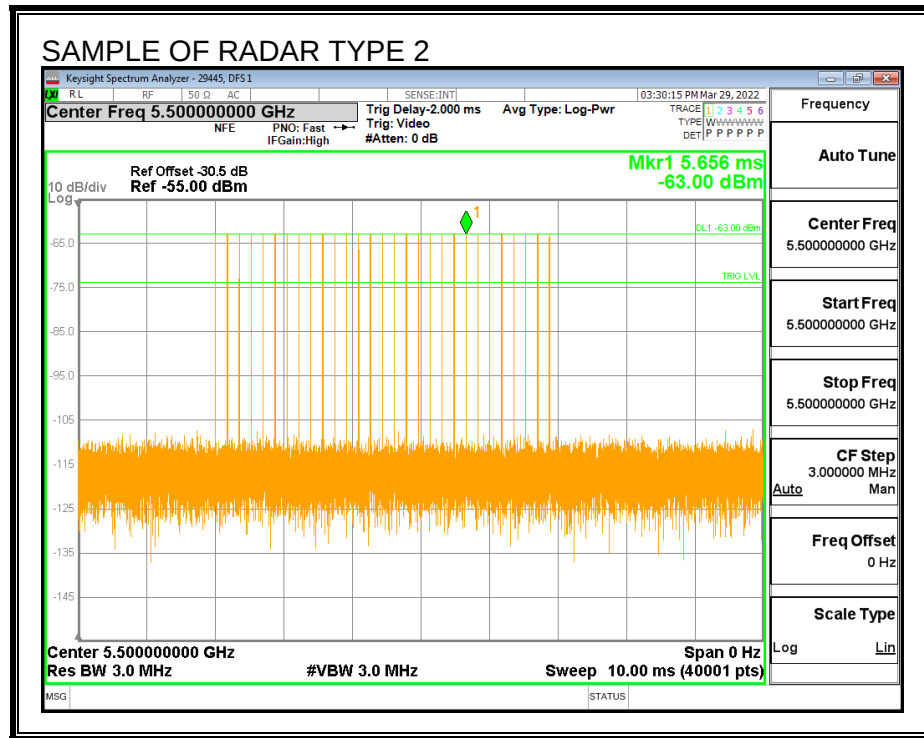
All tests were performed at a channel center frequency of 5500 MHz.

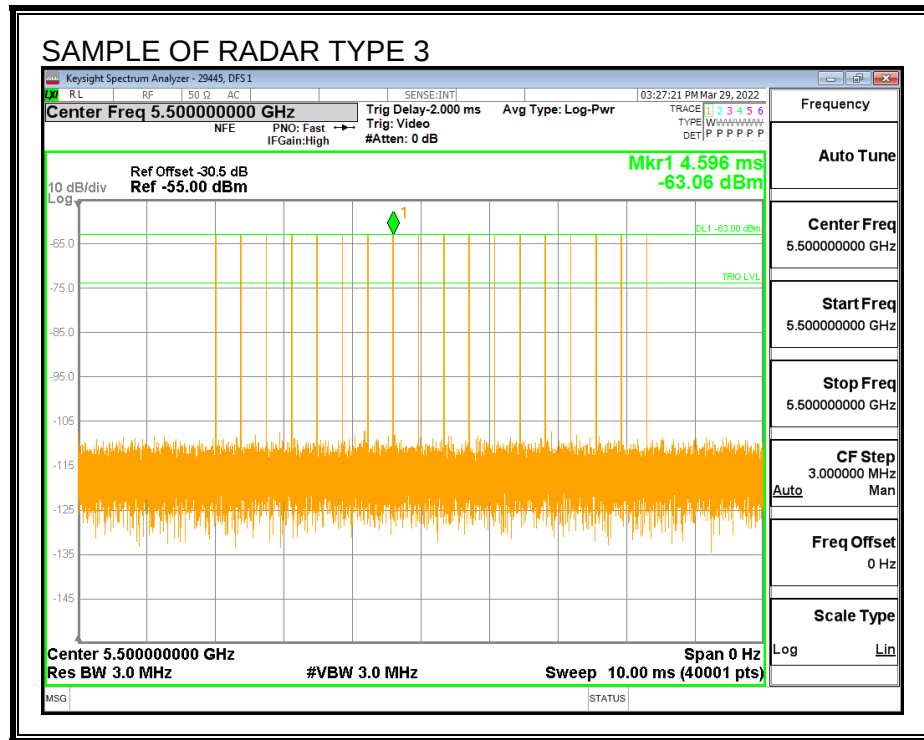
7.2.2. RADAR WAVEFORMS AND TRAFFIC

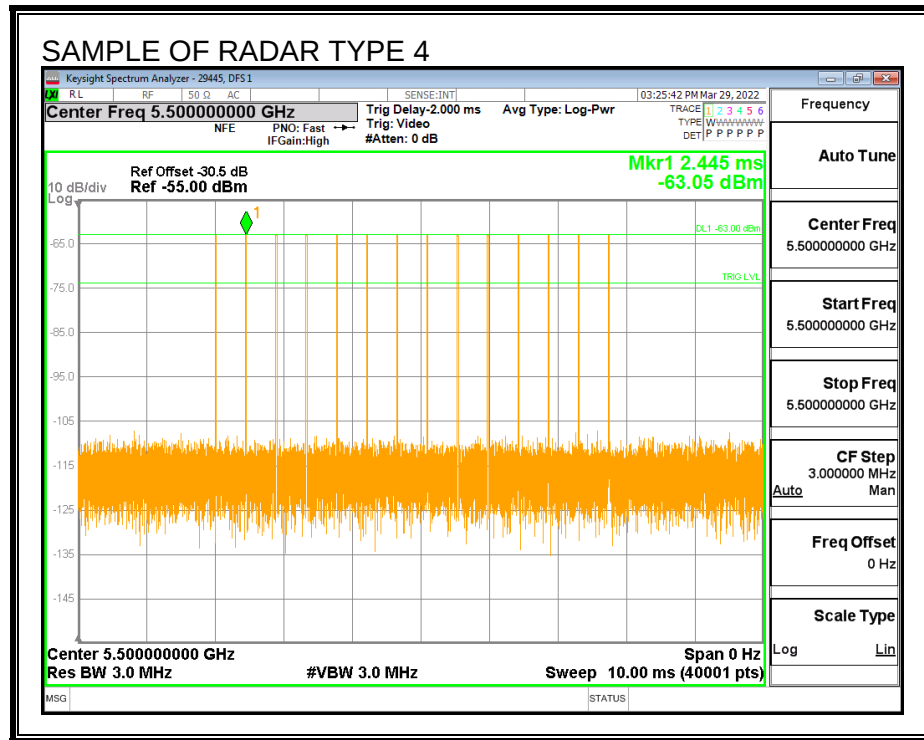
RADAR WAVEFORMS

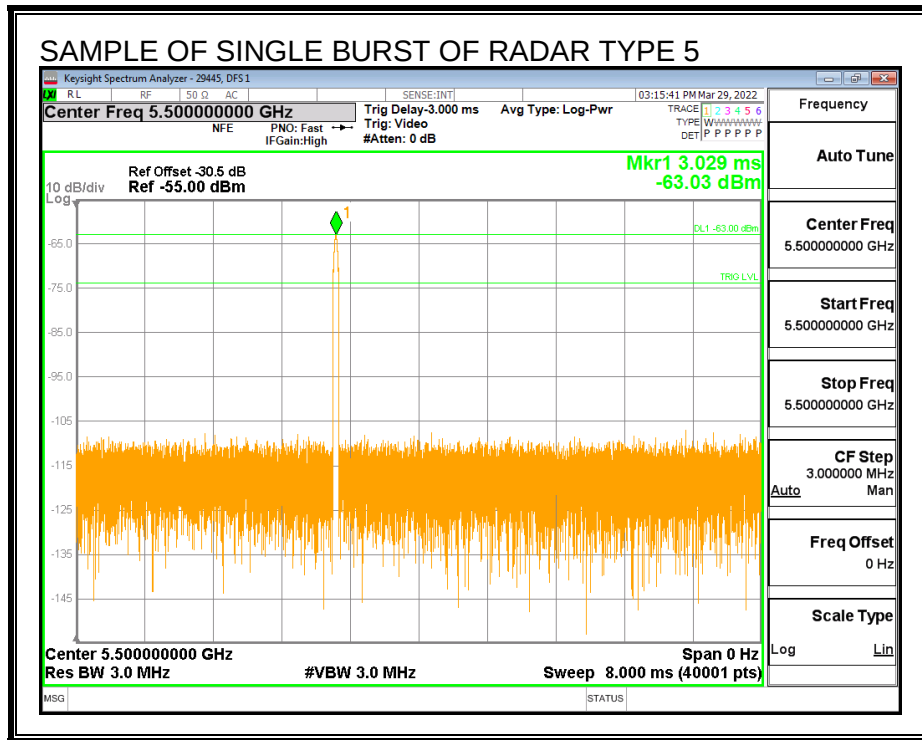


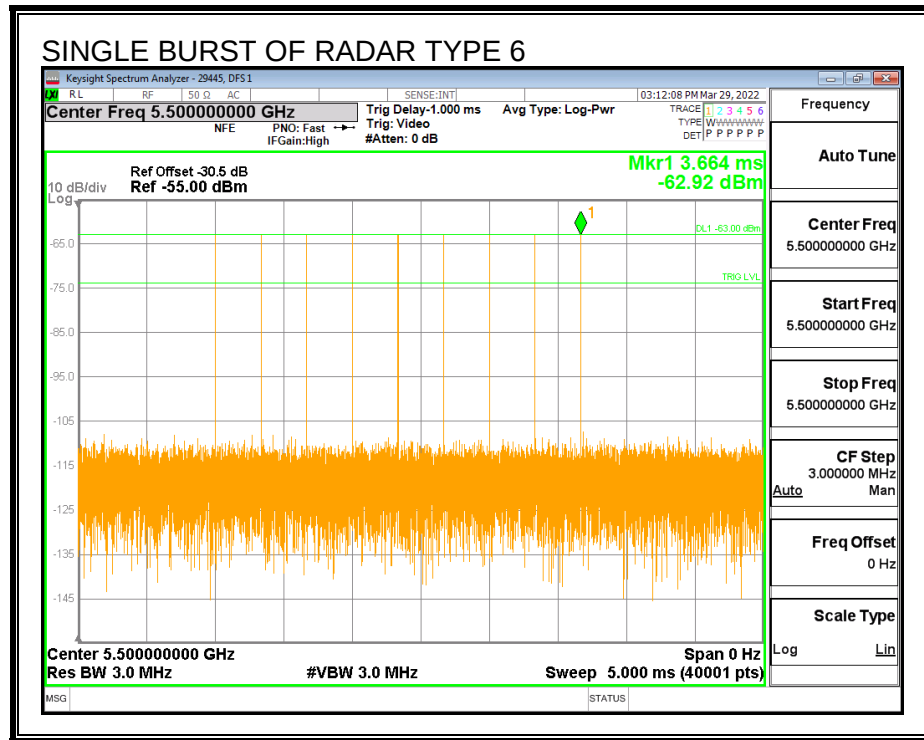




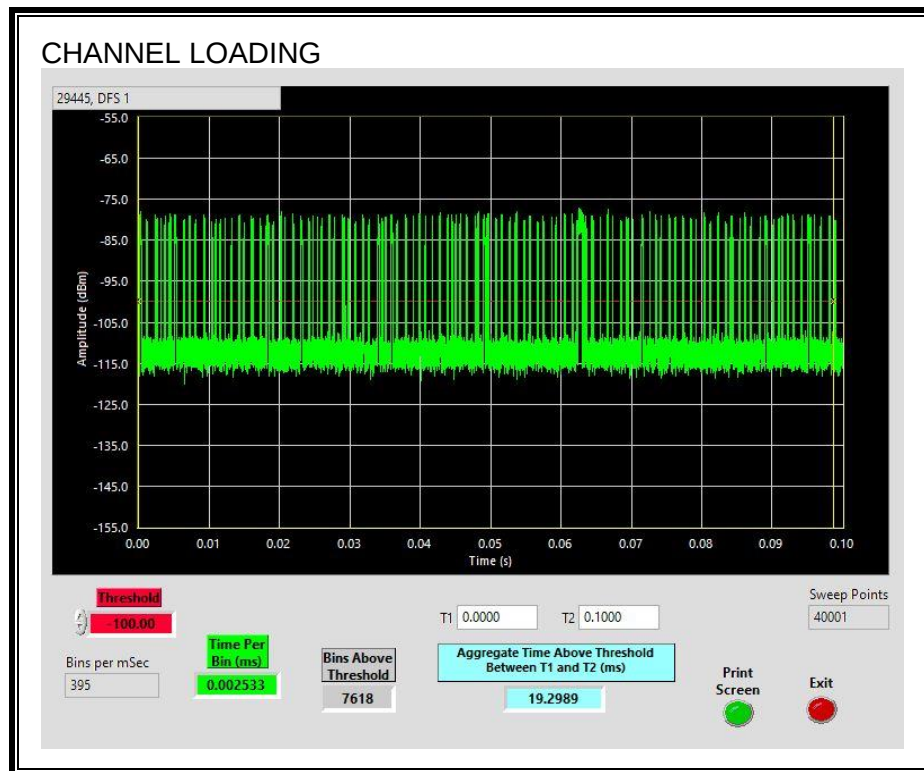








CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 19.299%

7.2.3. CHANNEL AVAILABILITY CHECK TIME

Per Table 2 on page 6 of KDB 905462 D02, Channel Move Time and Channel Closing Transmission Time are only required to be tested using the widest supported channel bandwidth mode and all other timing tests may be tested using any single channel bandwidth mode. Therefore this test has not been performed for this channel bandwidth.

7.2.4. OVERLAPPING CHANNEL TESTS

RESULTS

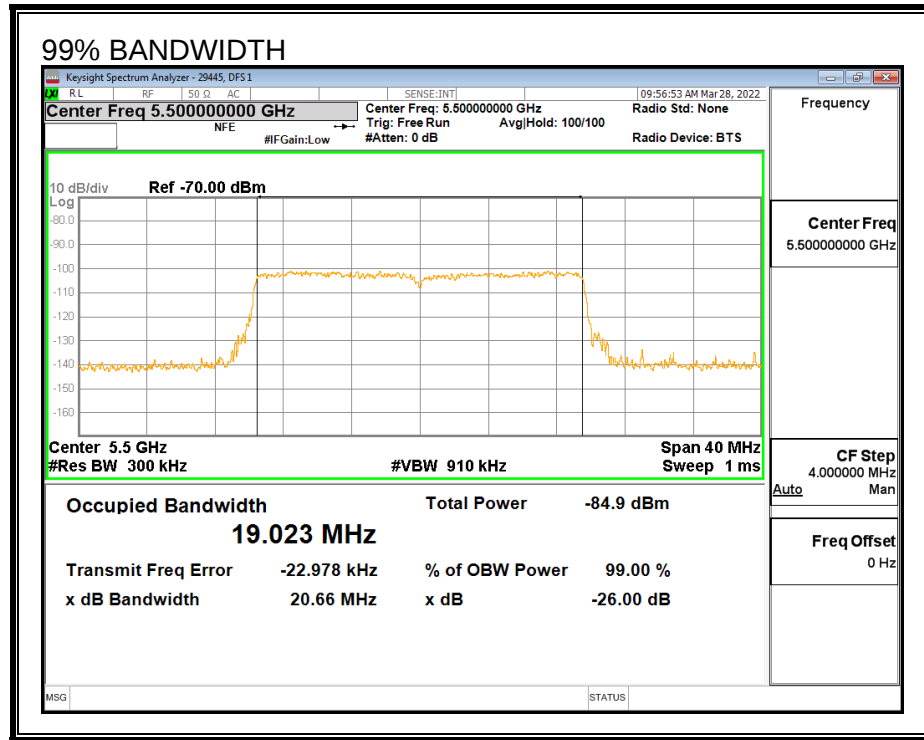
The channel spacing is not less than the channel bandwidth therefore the EUT does not have an overlapping channel plan.

7.2.5. MOVE AND CLOSING TIME

Per Table 2 on page 6 of KDB 905462 D02, Channel Move Time and Channel Closing Transmission Time are only required to be tested using the widest supported channel bandwidth mode and all other timing tests may be tested using any single channel bandwidth mode. Therefore this test has not been performed for this channel bandwidth.

7.2.6. DETECTION BANDWIDTH

REFERENCE PLOT OF 99% POWER BANDWIDTH



RESULTS

F_L (MHz)	F_H (MHz)	Detection Bandwidth (MHz)	99% Power Bandwidth (MHz)	Ratio of Detection BW to 99% Power BW (%)	Minimum Limit (%)
5490	5510	20	19.023	105.1	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	FH

7.2.7. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary										
Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail	Detection Bandwidth		OBW	Test Location	Employee Number	In-Service Monitoring Version
					FL	FH				
FCC Short Pulse Type 1	30	90.00	60	Pass	5490	5510	19.02	DFS 1	29445	v4.1
FCC Short Pulse Type 2	30	100.00	60	Pass	5490	5510	19.02	DFS 1	29445	v4.1
FCC Short Pulse Type 3	30	90.00	60	Pass	5490	5510	19.02	DFS 1	29445	v4.1
FCC Short Pulse Type 4	30	86.67	60	Pass	5490	5510	19.02	DFS 1	29445	v4.1
Aggregate		91.67	80	Pass						
FCC Long Pulse Type 5	30	100.00	80	Pass	5490	5510	19.02	DFS 1	29445	v4.1
FCC Hopping Type 6	42	100.00	70	Pass	5490	5510		DFS 1	29445	v4.1

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	5506	Yes
1002	1	898	59	A	5503	No
1003	1	738	72	A	5503	No
1004	1	878	61	A	5492	Yes
1005	1	698	76	A	5500	Yes
1006	1	818	65	A	5494	Yes
1007	1	558	95	A	5499	Yes
1008	1	918	58	A	5508	Yes
1009	1	638	83	A	5506	Yes
1010	1	798	67	A	5494	Yes
1011	1	938	57	A	5499	Yes
1012	1	778	68	A	5505	Yes
1013	1	718	74	A	5493	No
1014	1	838	63	A	5506	Yes
1015	1	518	102	A	5510	Yes
1016	1	2299	23	B	5508	Yes
1017	1	1254	43	B	5498	Yes
1018	1	533	100	B	5506	Yes
1019	1	2166	25	B	5503	Yes
1020	1	2928	19	B	5505	Yes
1021	1	948	56	B	5496	Yes
1022	1	1840	29	B	5506	Yes
1023	1	2537	21	B	5504	Yes
1024	1	2363	23	B	5498	Yes
1025	1	642	83	B	5497	Yes
1026	1	1951	28	B	5497	Yes
1027	1	2908	19	B	5490	Yes
1028	1	1798	30	B	5492	Yes
1029	1	1690	32	B	5499	Yes
1030	1	710	75	B	5495	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	3.6	174	29	5507	Yes
2002	1.5	213	23	5510	Yes
2003	4.1	202	29	5498	Yes
2004	2.3	164	24	5505	Yes
2005	1.2	158	23	5492	Yes
2006	3.7	205	29	5504	Yes
2007	4.8	165	28	5496	Yes
2008	1.5	178	27	5498	Yes
2009	5	223	24	5491	Yes
2010	1.8	159	24	5504	Yes
2011	1.4	209	24	5502	Yes
2012	4.8	192	24	5494	Yes
2013	2.6	207	25	5505	Yes
2014	2.1	152	29	5510	Yes
2015	2.1	214	24	5495	Yes
2016	4	206	25	5498	Yes
2017	2.3	229	27	5495	Yes
2018	4.3	187	28	5496	Yes
2019	2.8	177	27	5507	Yes
2020	3.2	220	28	5504	Yes
2021	4	213	28	5496	Yes
2022	2.4	179	26	5498	Yes
2023	1.6	220	26	5503	Yes
2024	4.3	153	25	5508	Yes
2025	3.7	197	29	5506	Yes
2026	4.6	215	25	5503	Yes
2027	2.3	183	29	5495	Yes
2028	3.5	166	26	5491	Yes
2029	1.3	182	23	5496	Yes
2030	4.9	169	27	5497	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	8	370	18	5499	Yes
3002	7.7	345	18	5500	Yes
3003	6	300	16	5505	Yes
3004	8	287	17	5498	Yes
3005	8.7	254	16	5507	Yes
3006	6.9	387	17	5507	Yes
3007	7.7	368	17	5510	Yes
3008	6.1	396	16	5490	Yes
3009	9.4	390	16	5499	Yes
3010	8	430	16	5491	Yes
3011	7.4	319	17	5493	Yes
3012	6.4	372	16	5497	Yes
3013	6	407	17	5493	No
3014	7.2	473	16	5508	No
3015	9.2	270	18	5493	Yes
3016	8.6	482	16	5497	Yes
3017	6.7	291	16	5502	Yes
3018	6.4	265	18	5504	Yes
3019	8.8	471	18	5493	Yes
3020	6.7	458	16	5501	Yes
3021	7.4	426	18	5490	Yes
3022	9.7	308	16	5505	Yes
3023	6.5	289	16	5504	Yes
3024	8.9	317	18	5504	No
3025	8.1	310	17	5509	Yes
3026	8.9	351	16	5495	Yes
3027	6.1	490	16	5491	Yes
3028	9.2	293	18	5491	Yes
3029	8.8	328	16	5504	Yes
3030	10	394	18	5495	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	15.2	441	14	5509	Yes
4002	14	403	14	5504	Yes
4003	18.8	463	15	5490	Yes
4004	18.1	437	13	5491	Yes
4005	14.3	392	12	5505	Yes
4006	18.9	379	16	5505	Yes
4007	11.3	347	15	5493	Yes
4008	16.3	480	16	5502	Yes
4009	18.3	343	13	5500	No
4010	14.7	488	15	5508	Yes
4011	12.8	364	12	5499	Yes
4012	14.6	272	16	5494	Yes
4013	13.2	411	14	5505	Yes
4014	15.3	465	14	5497	No
4015	14.4	499	12	5496	No
4016	12.8	314	14	5501	Yes
4017	12.3	362	15	5500	Yes
4018	11.1	323	13	5492	Yes
4019	16	383	14	5497	Yes
4020	15.2	357	12	5494	Yes
4021	16.3	312	16	5499	No
4022	16	299	14	5502	Yes
4023	17.5	267	13	5497	Yes
4024	13.5	400	12	5493	Yes
4025	15.4	263	12	5494	Yes
4026	16.7	409	13	5509	Yes
4027	19.1	285	15	5499	Yes
4028	11.7	443	15	5497	Yes
4029	19.4	332	12	5499	Yes
4030	12.5	267	12	5495	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5		
Trial	Frequency (MHz)	Successful Detection (Yes/No)
1	5500	Yes
2	5500	Yes
3	5500	Yes
4	5500	Yes
5	5500	Yes
6	5500	Yes
7	5500	Yes
8	5500	Yes
9	5500	Yes
10	5500	Yes
11	5495	Yes
12	5497	Yes
13	5498	Yes
14	5495	Yes
15	5494	Yes
16	5497	Yes
17	5494	Yes
18	5497	Yes
19	5494	Yes
20	5497	Yes
21	5506	Yes
22	5503	Yes
23	5503	Yes
24	5506	Yes
25	5505	Yes
26	5506	Yes
27	5507	Yes
28	5505	Yes
29	5506	Yes
30	5507	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	486	5490	6	Yes
2	961	5491	5	Yes
3	1436	5492	3	Yes
4	1911	5493	7	Yes
5	2386	5494	5	Yes
6	2861	5495	4	Yes
7	3336	5496	4	Yes
8	3811	5497	5	Yes
9	4286	5498	5	Yes
10	4761	5499	4	Yes
11	5236	5500	5	Yes
12	5711	5501	4	Yes
13	6186	5502	3	Yes
14	6661	5503	4	Yes
15	7136	5504	5	Yes
16	7611	5505	5	Yes
17	8086	5506	6	Yes
18	8561	5507	5	Yes
19	9036	5508	5	Yes
20	9511	5509	2	Yes
21	9986	5510	4	Yes
22	10461	5490	3	Yes
23	10936	5491	1	Yes
24	11411	5492	4	Yes
25	11886	5493	4	Yes
26	12361	5494	4	Yes
27	12836	5495	5	Yes
28	13311	5496	3	Yes
29	13786	5497	2	Yes
30	14261	5498	1	Yes
31	14736	5499	4	Yes
32	15211	5500	6	Yes
33	15686	5501	5	Yes
34	16161	5502	4	Yes
35	16636	5503	3	Yes
36	17111	5504	4	Yes
37	17586	5505	5	Yes
38	18061	5506	7	Yes
39	18536	5507	6	Yes
40	19011	5508	7	Yes
41	19486	5509	2	Yes
42	19961	5510	4	Yes

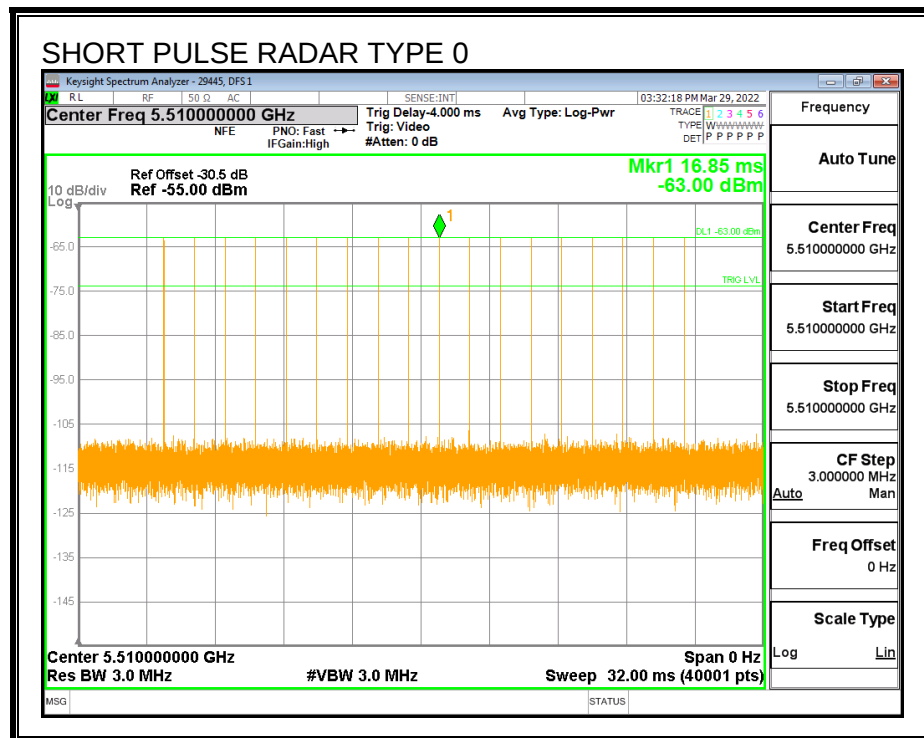
7.3. RESULTS FOR 40 MHz BANDWIDTH

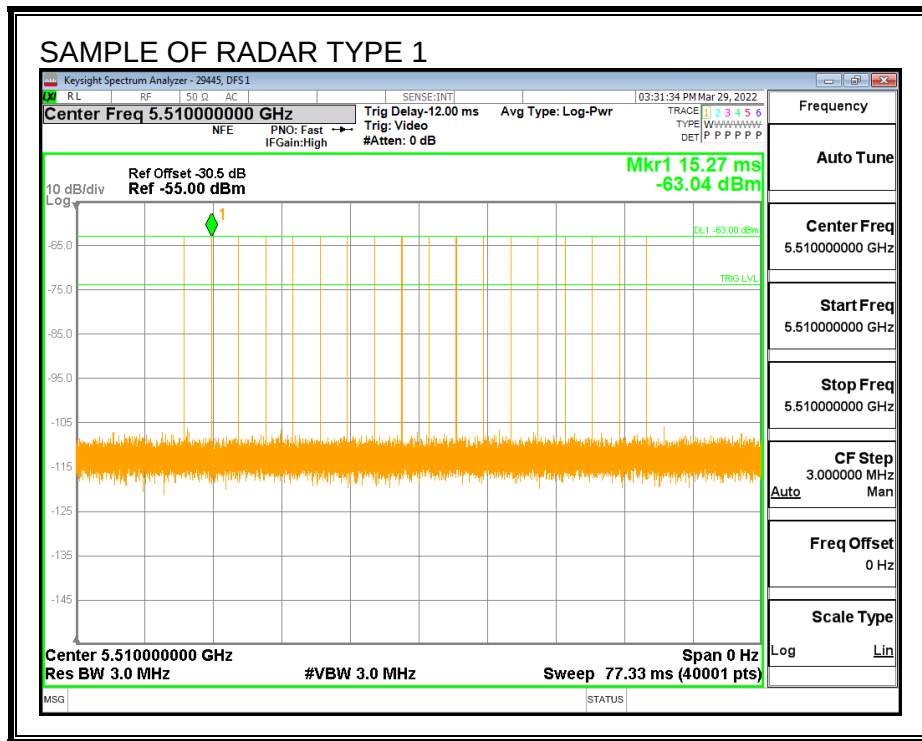
7.3.1. TEST CHANNEL

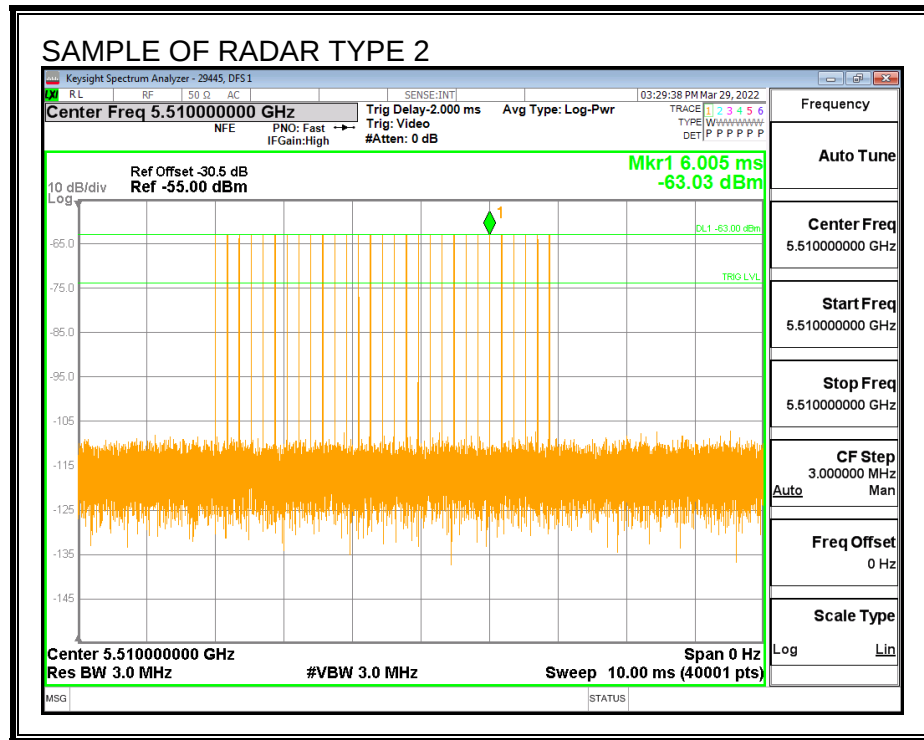
All tests were performed at a channel center frequency of 5510 MHz.

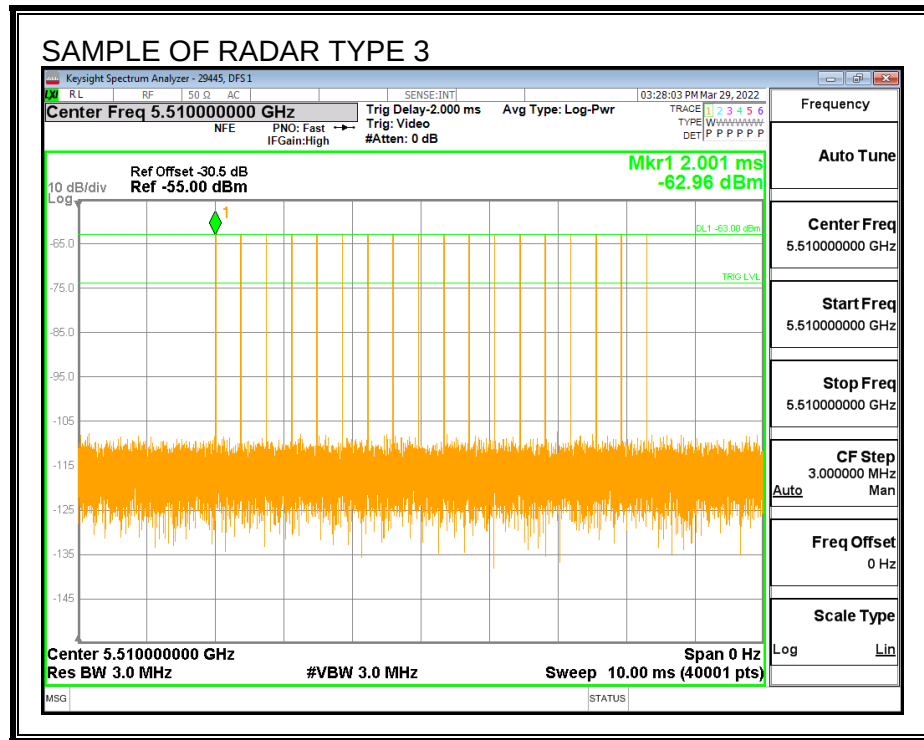
7.3.2. RADAR WAVEFORMS AND TRAFFIC

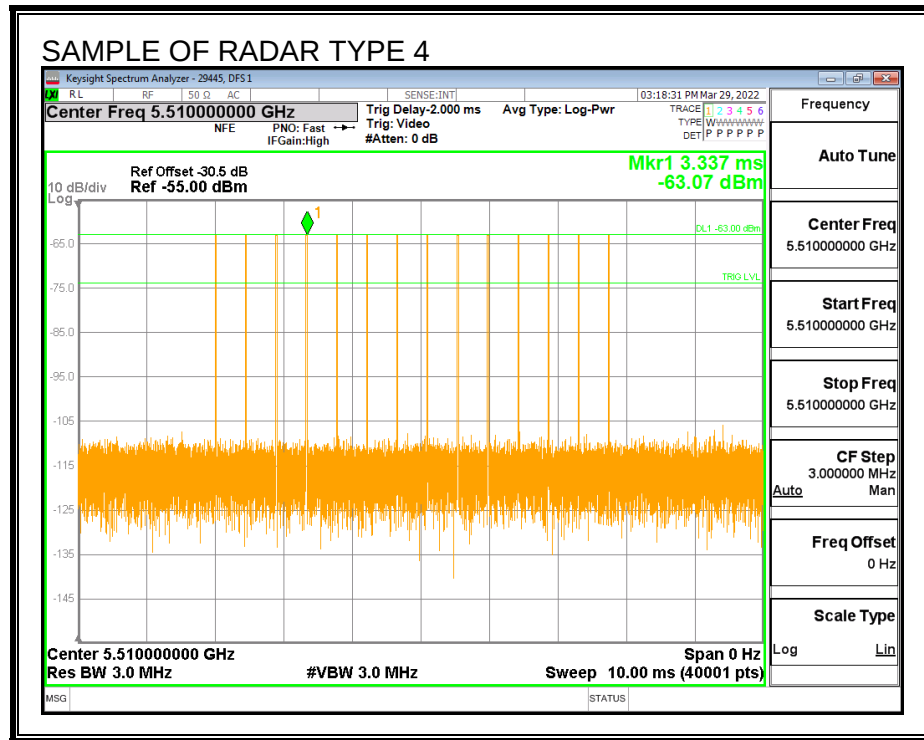
RADAR WAVEFORMS

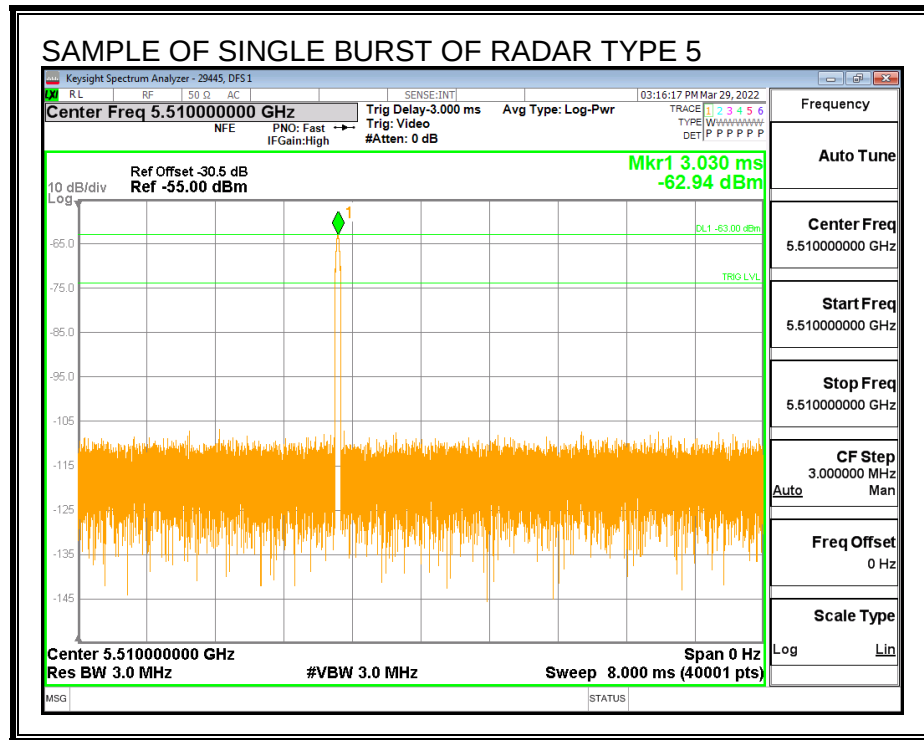


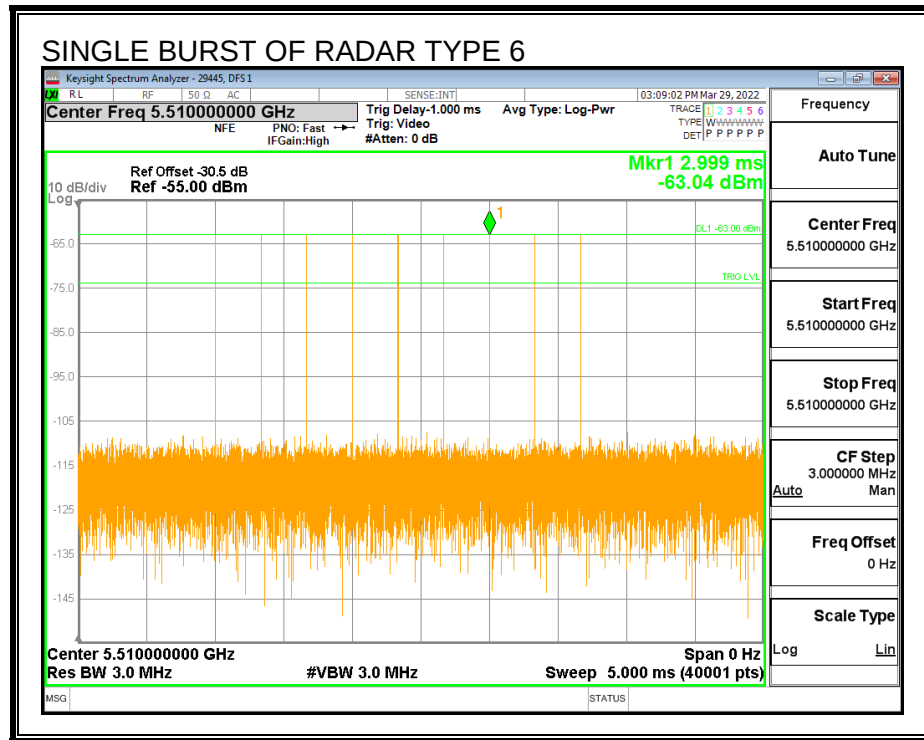




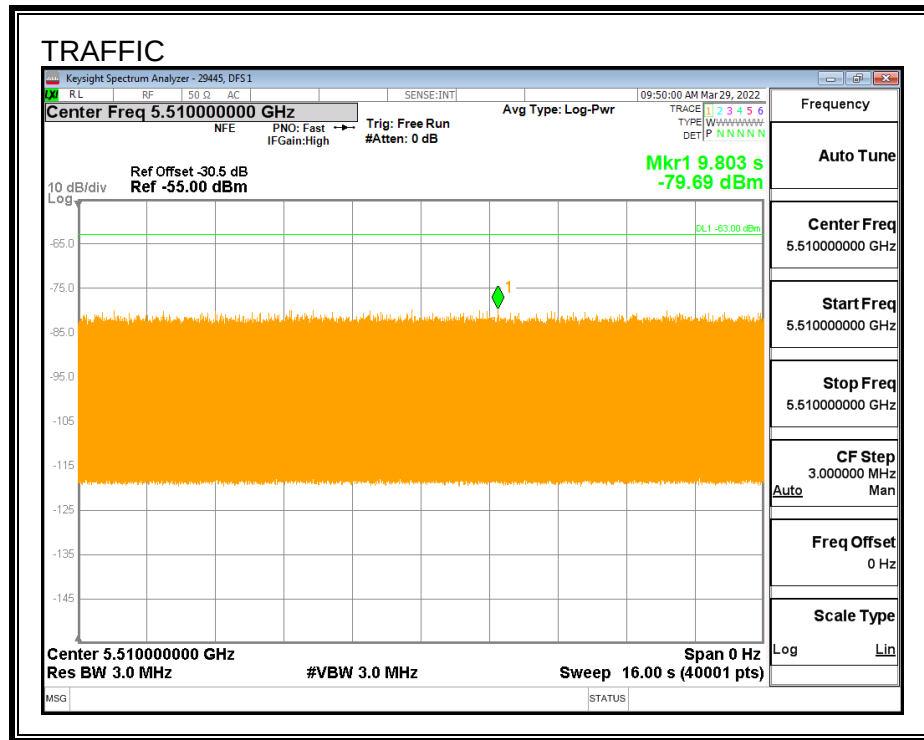




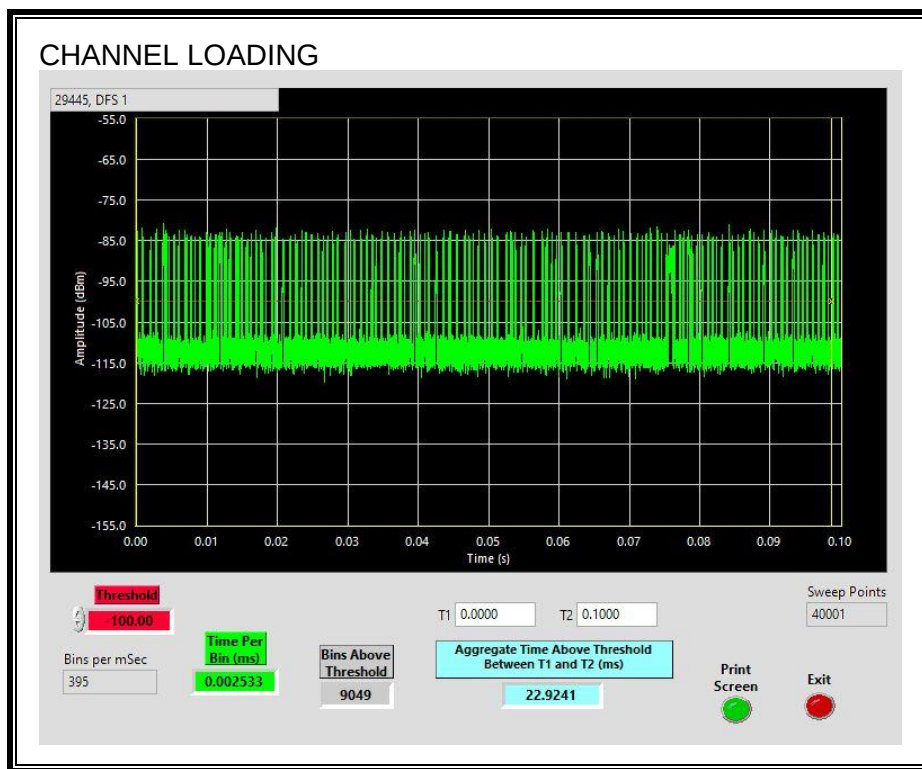




TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 22.92%

7.3.3. CHANNEL AVAILABILITY CHECK TIME

Per Table 2 on page 6 of KDB 905462 D02, Channel Move Time and Channel Closing Transmission Time are only required to be tested using the widest supported channel bandwidth mode and all other timing tests may be tested using any single channel bandwidth mode. Therefore this test has not been performed for this channel bandwidth.

7.3.4. OVERLAPPING CHANNEL TESTS

RESULTS

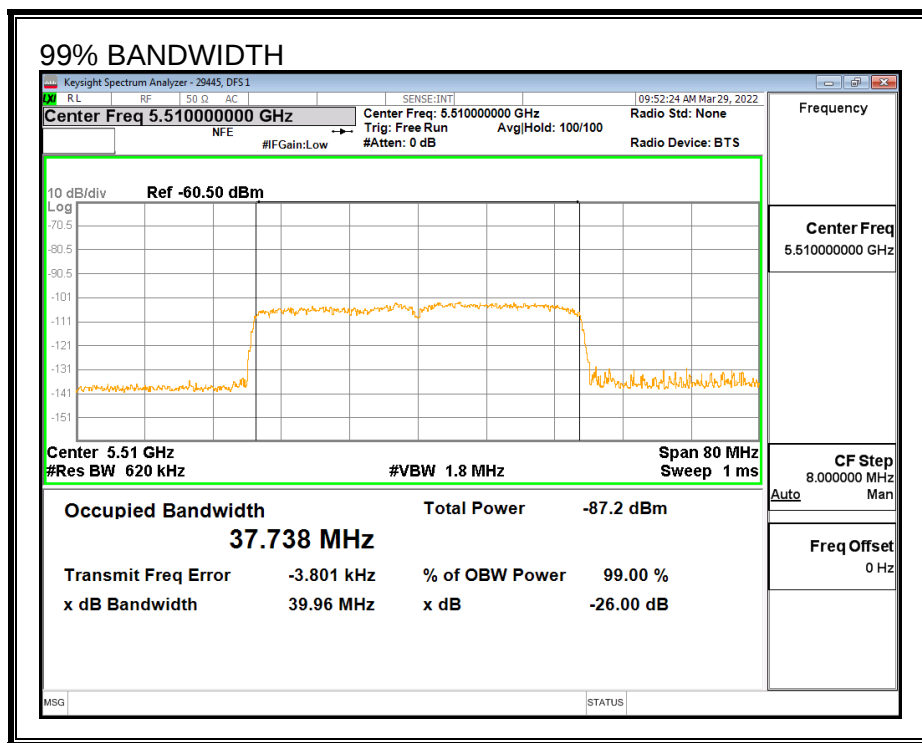
The channel spacing is not less than the channel bandwidth therefore the EUT does not have an overlapping channel plan.

7.3.5. MOVE AND CLOSING TIME

Per Table 2 on page 6 of KDB 905462 D02, Channel Move Time and Channel Closing Transmission Time are only required to be tested using the widest supported channel bandwidth mode and all other timing tests may be tested using any single channel bandwidth mode. Therefore this test has not been performed for this channel bandwidth.

7.3.6. DETECTION BANDWIDTH

REFERENCE PLOT OF 99% POWER BANDWIDTH



RESULTS

F_L (MHz)	F_H (MHz)	Detection Bandwidth (MHz)	99% Power Bandwidth (MHz)	Ratio of Detection BW to 99% Power BW (%)	Minimum Limit (%)
5490	5530	40	37.738	106.0	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

7.3.7. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary										
Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail	Detection Bandwidth		OBW	Test Location	Employee Number	In-Service Monitoring Version
					FL	FH				
FCC Short Pulse Type 1	30	93.33	60	Pass	5490	5530	37.74	DFS 1	29445	v4.1
FCC Short Pulse Type 2	30	100.00	60	Pass	5490	5530	37.74	DFS 1	29445	v4.1
FCC Short Pulse Type 3	30	96.67	60	Pass	5490	5530	37.74	DFS 1	29445	v4.1
FCC Short Pulse Type 4	30	90.00	60	Pass	5490	5530	37.74	DFS 1	29445	v4.1
Aggregate		95.00	80	Pass						
FCC Long Pulse Type 5	30	100.00	80	Pass	5490	5530	37.74	DFS 1	29445	v4.1
FCC Hopping Type 6	41	100.00	70	Pass	5490	5530		DFS 1	29445	v4.1

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	5513	Yes
1002	1	898	59	A	5523	Yes
1003	1	738	72	A	5527	Yes
1004	1	878	61	A	5505	Yes
1005	1	698	76	A	5513	Yes
1006	1	818	65	A	5498	Yes
1007	1	558	95	A	5529	Yes
1008	1	918	58	A	5493	Yes
1009	1	638	83	A	5491	Yes
1010	1	798	67	A	5508	No
1011	1	938	57	A	5503	Yes
1012	1	778	68	A	5495	Yes
1013	1	718	74	A	5496	Yes
1014	1	838	63	A	5504	Yes
1015	1	518	102	A	5526	Yes
1016	1	2299	23	B	5524	Yes
1017	1	1254	43	B	5518	Yes
1018	1	533	100	B	5511	Yes
1019	1	2166	25	B	5527	Yes
1020	1	2928	19	B	5519	Yes
1021	1	948	56	B	5507	Yes
1022	1	1840	29	B	5500	Yes
1023	1	2537	21	B	5503	Yes
1024	1	2363	23	B	5516	Yes
1025	1	642	83	B	5503	Yes
1026	1	1951	28	B	5495	Yes
1027	1	2908	19	B	5499	Yes
1028	1	1798	30	B	5517	Yes
1029	1	1690	32	B	5523	Yes
1030	1	710	75	B	5501	No

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	3.6	174	29	5490	Yes
2002	1.5	213	23	5504	Yes
2003	4.1	202	29	5511	Yes
2004	2.3	164	24	5502	Yes
2005	1.2	158	23	5518	Yes
2006	3.7	205	29	5494	Yes
2007	4.8	165	28	5509	Yes
2008	1.5	178	27	5509	Yes
2009	5	223	24	5512	Yes
2010	1.8	159	24	5524	Yes
2011	1.4	209	24	5508	Yes
2012	4.8	192	24	5493	Yes
2013	2.6	207	25	5527	Yes
2014	2.1	152	29	5509	Yes
2015	2.1	214	24	5492	Yes
2016	4	206	25	5494	Yes
2017	2.3	229	27	5509	Yes
2018	4.3	187	28	5509	Yes
2019	2.8	177	27	5527	Yes
2020	3.2	220	28	5493	Yes
2021	4	213	28	5500	Yes
2022	2.4	179	26	5493	Yes
2023	1.6	220	26	5515	Yes
2024	4.3	153	25	5516	Yes
2025	3.7	197	29	5493	Yes
2026	4.6	215	25	5522	Yes
2027	2.3	183	29	5521	Yes
2028	3.5	166	26	5528	Yes
2029	1.3	182	23	5515	Yes
2030	4.9	169	27	5491	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	8	370	18	5498	Yes
3002	7.7	345	18	5517	Yes
3003	6	300	16	5526	Yes
3004	8	287	17	5508	Yes
3005	8.7	254	16	5506	Yes
3006	6.9	387	17	5494	Yes
3007	7.7	368	17	5526	Yes
3008	6.1	396	16	5493	Yes
3009	9.4	390	16	5502	Yes
3010	8	430	16	5528	Yes
3011	7.4	319	17	5513	No
3012	6.4	372	16	5514	Yes
3013	6	407	17	5508	Yes
3014	7.2	473	16	5497	Yes
3015	9.2	270	18	5493	Yes
3016	8.6	482	16	5499	Yes
3017	6.7	291	16	5520	Yes
3018	6.4	265	18	5504	Yes
3019	8.8	471	18	5525	Yes
3020	6.7	458	16	5519	Yes
3021	7.4	426	18	5526	Yes
3022	9.7	308	16	5501	Yes
3023	6.5	289	16	5506	Yes
3024	8.9	317	18	5526	Yes
3025	8.1	310	17	5526	Yes
3026	8.9	351	16	5517	Yes
3027	6.1	490	16	5502	Yes
3028	9.2	293	18	5509	Yes
3029	8.8	328	16	5512	Yes
3030	10	394	18	5530	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	15.2	441	14	5508	No
4002	14	403	14	5504	Yes
4003	18.8	463	15	5524	Yes
4004	18.1	437	13	5517	Yes
4005	14.3	392	12	5517	Yes
4006	18.9	379	16	5513	Yes
4007	11.3	347	15	5503	Yes
4008	16.3	480	16	5510	Yes
4009	18.3	343	13	5509	No
4010	14.7	488	15	5528	Yes
4011	12.8	364	12	5497	Yes
4012	14.6	272	16	5522	Yes
4013	13.2	411	14	5518	Yes
4014	15.3	465	14	5503	Yes
4015	14.4	499	12	5502	No
4016	12.8	314	14	5500	Yes
4017	12.3	362	15	5504	Yes
4018	11.1	323	13	5523	Yes
4019	16	383	14	5496	Yes
4020	15.2	357	12	5515	Yes
4021	16.3	312	16	5511	Yes
4022	16	299	14	5513	Yes
4023	17.5	267	13	5510	Yes
4024	13.5	400	12	5500	Yes
4025	15.4	263	12	5509	Yes
4026	16.7	409	13	5507	Yes
4027	19.1	285	15	5495	Yes
4028	11.7	443	15	5495	Yes
4029	19.4	332	12	5494	Yes
4030	12.5	267	12	5518	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5		
Trial	Frequency (MHz)	Successful Detection (Yes/No)
1	5510	Yes
2	5510	Yes
3	5510	Yes
4	5510	Yes
5	5510	Yes
6	5510	Yes
7	5510	Yes
8	5510	Yes
9	5510	Yes
10	5510	Yes
11	5496	Yes
12	5498	Yes
13	5499	Yes
14	5495	Yes
15	5495	Yes
16	5497	Yes
17	5495	Yes
18	5497	Yes
19	5495	Yes
20	5497	Yes
21	5526	Yes
22	5522	Yes
23	5522	Yes
24	5525	Yes
25	5524	Yes
26	5526	Yes
27	5526	Yes
28	5524	Yes
29	5526	Yes
30	5526	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	713	5490	11	Yes
2	1188	5491	10	Yes
3	1663	5492	11	Yes
4	2138	5493	5	Yes
5	2613	5494	2	Yes
6	3088	5495	10	Yes
7	3563	5496	10	Yes
8	4038	5497	7	Yes
9	4513	5498	7	Yes
10	4988	5499	11	Yes
11	5463	5500	7	Yes
12	5938	5501	13	Yes
13	6413	5502	5	Yes
14	6888	5503	8	Yes
15	7363	5504	10	Yes
16	7838	5505	9	Yes
17	8313	5506	12	Yes
18	8788	5507	9	Yes
19	9263	5508	7	Yes
20	9738	5509	4	Yes
21	10213	5510	14	Yes
22	10688	5511	11	Yes
23	11163	5512	9	Yes
24	11638	5513	7	Yes
25	12113	5514	11	Yes
26	12588	5515	6	Yes
27	13063	5516	6	Yes
28	13538	5517	9	Yes
29	14013	5518	2	Yes
30	14488	5519	10	Yes
31	14963	5520	9	Yes
32	15438	5521	6	Yes
33	15913	5522	9	Yes
34	16388	5523	8	Yes
35	16863	5524	8	Yes
36	17338	5525	9	Yes
37	17813	5526	9	Yes
38	18288	5527	11	Yes
39	18763	5528	5	Yes
40	19238	5529	5	Yes
41	19713	5530	7	Yes

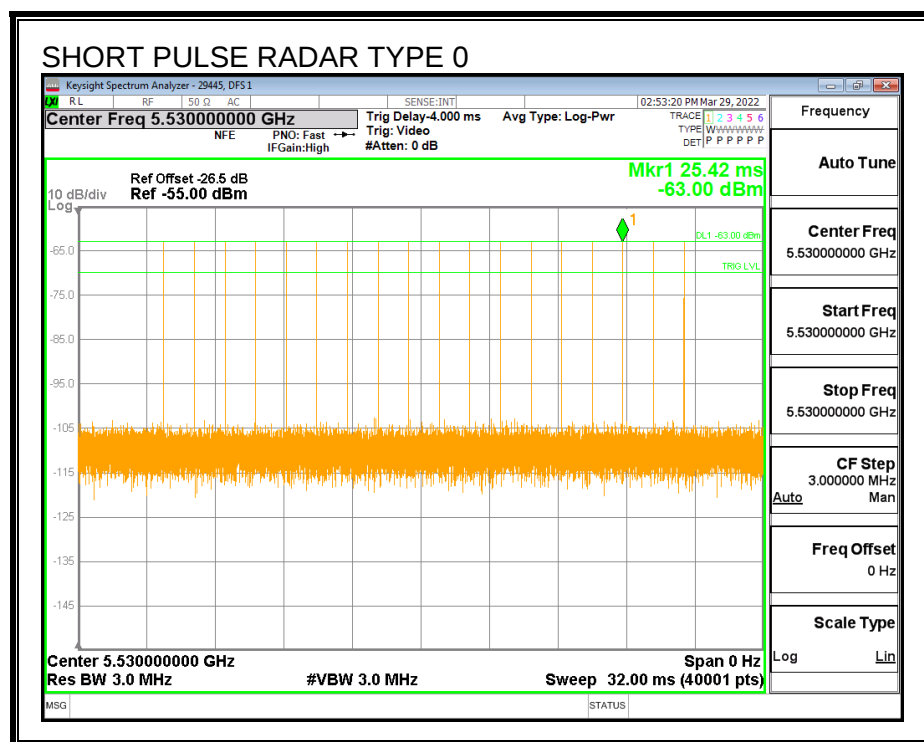
7.4. RESULTS FOR 80 MHz BANDWIDTH

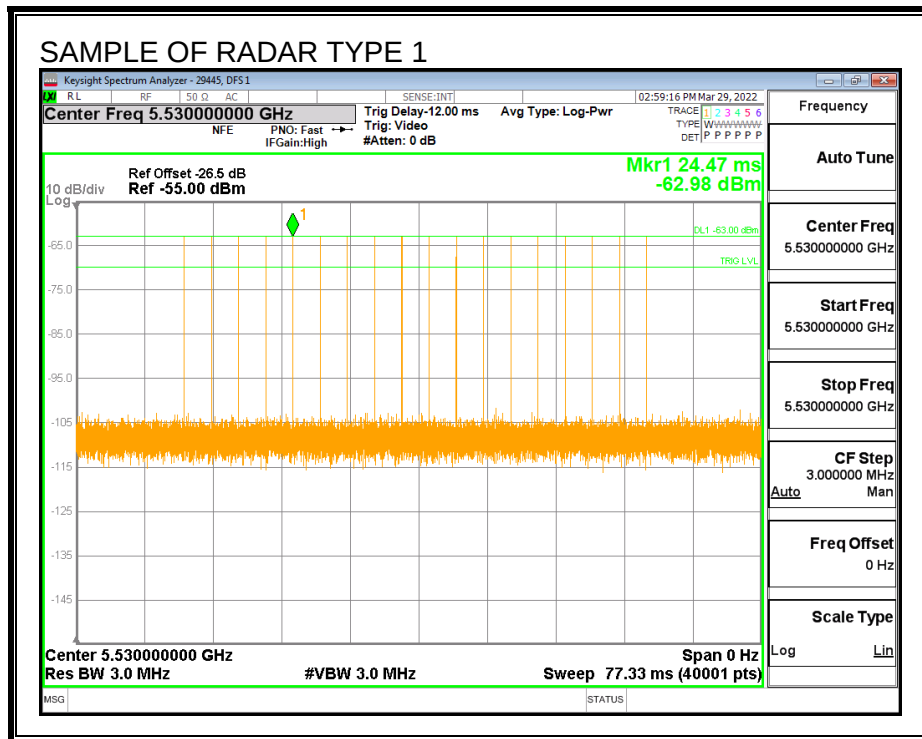
7.4.1. TEST CHANNEL

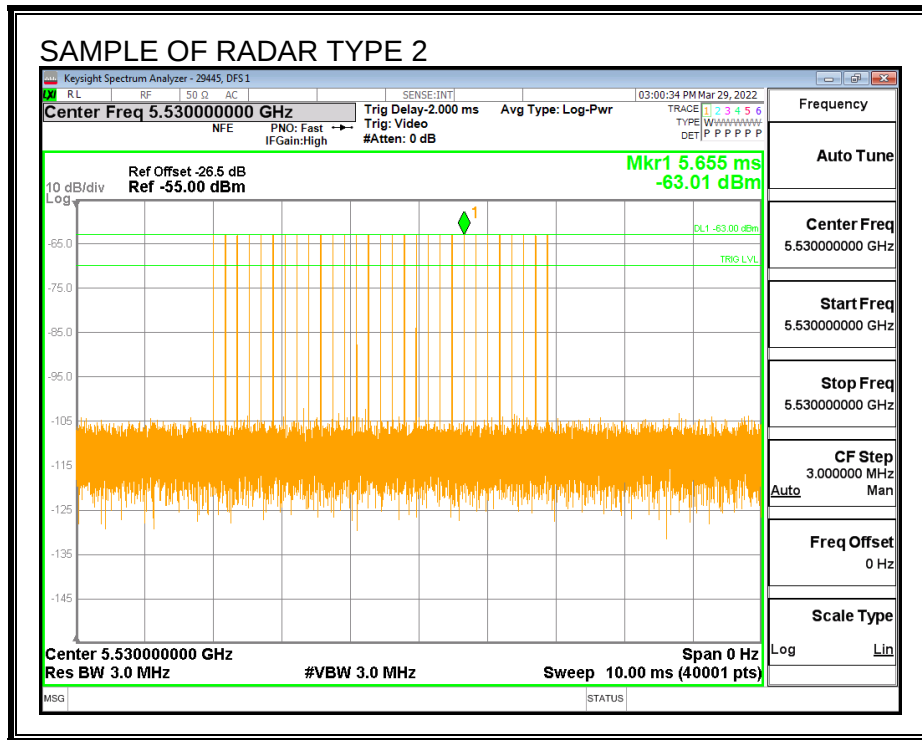
All tests were performed at a channel center frequency of 5530 MHz.

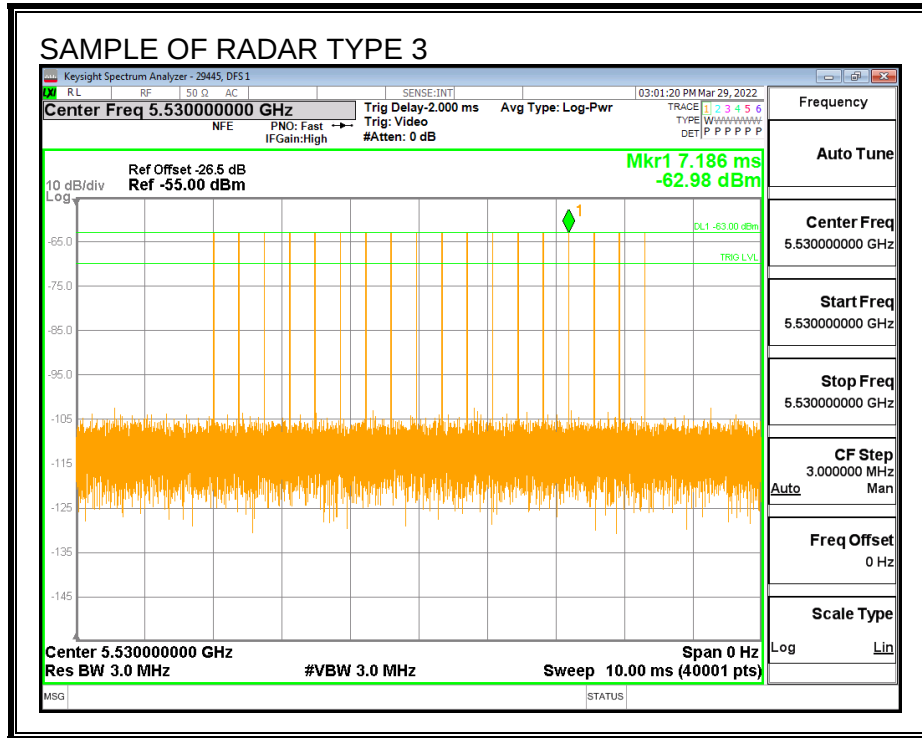
7.4.2. RADAR WAVEFORMS AND TRAFFIC

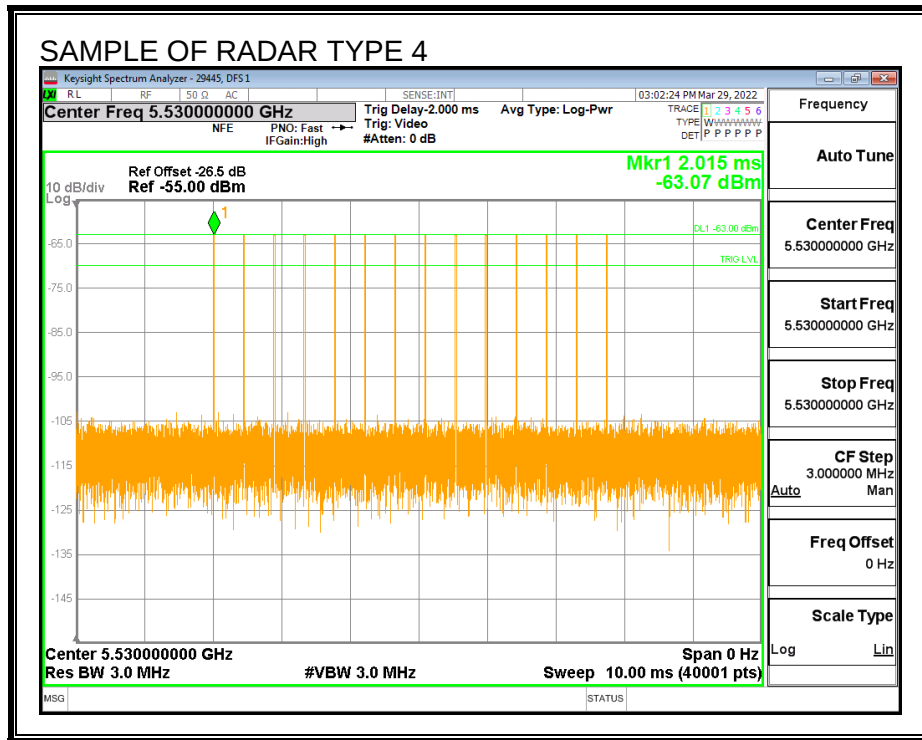
RADAR WAVEFORMS

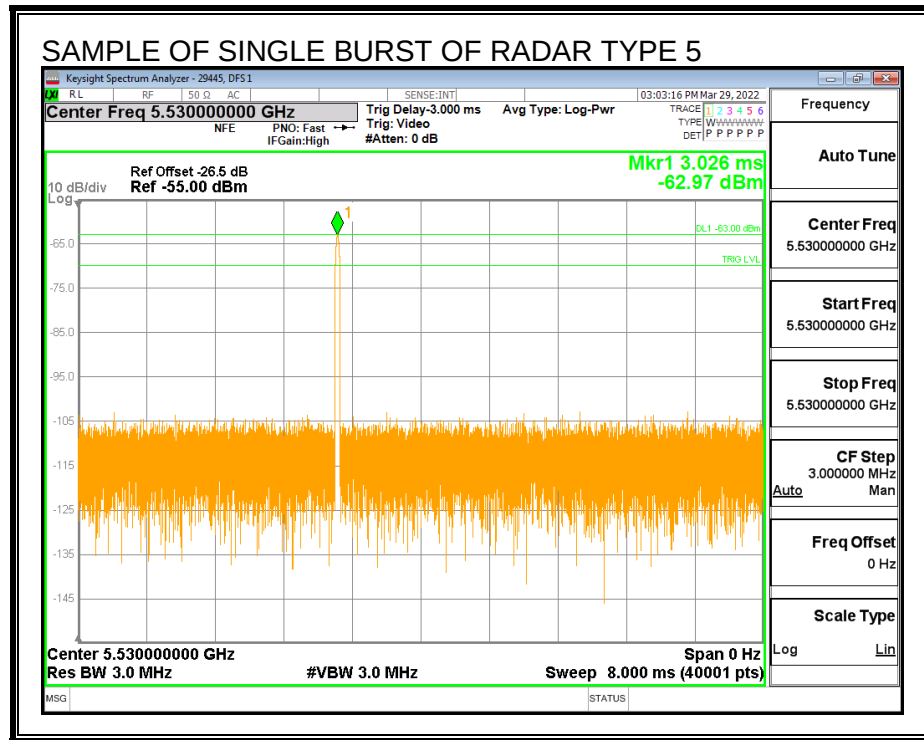


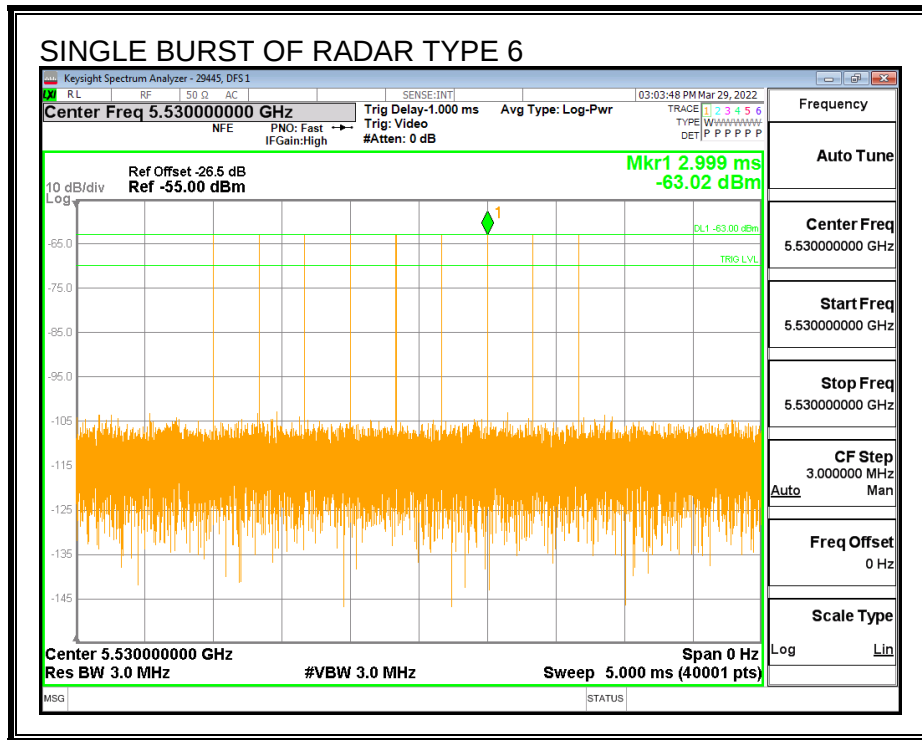




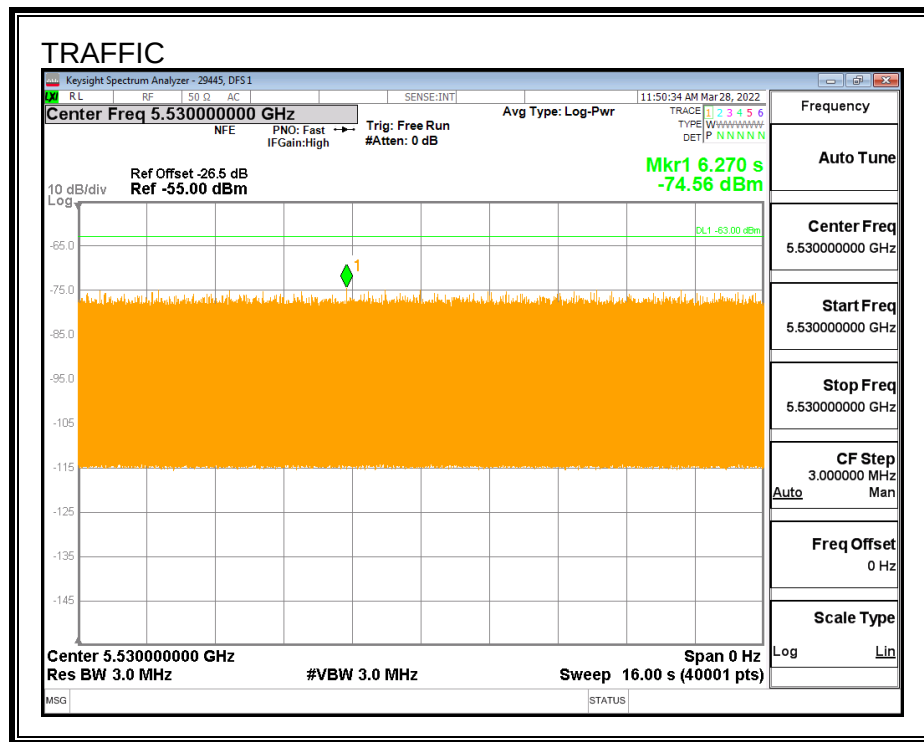




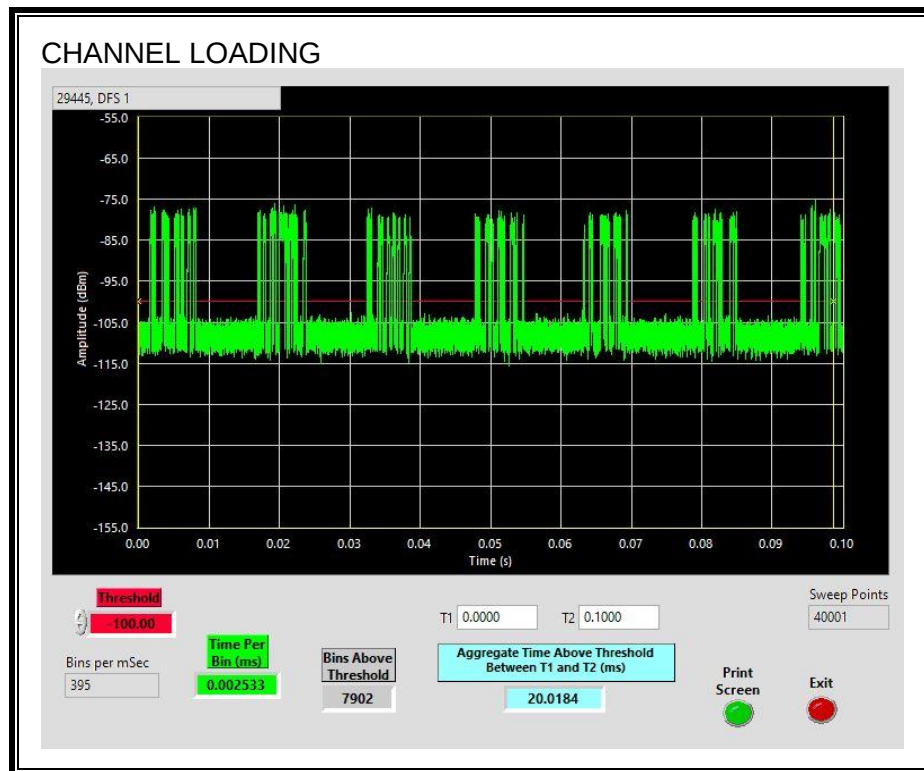




TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 20.018%

7.4.3. CHANNEL AVAILABILITY CHECK TIME

PROCEDURE TO DETERMINE INITIAL POWER-UP CYCLE TIME

A link was established on channel then the EUT was rebooted. The time from the cessation of traffic to the re-initialization of traffic was measured as the time required for the EUT to complete the total power-up cycle. The time to complete the initial power-up period is 60 seconds less than this total power-up time.

PROCEDURE FOR TIMING OF RADAR BURST

With a link established on channel, the EUT was rebooted. A radar signal was triggered within 0 to 6 seconds after the initial power-up period, and transmissions on the channel were monitored on the spectrum analyzer.

The Non-Occupancy list was cleared. With a link established on channel, the EUT was rebooted. A radar signal was triggered within 54 to 60 seconds after the initial power-up period, and transmissions on the channel were monitored on the spectrum analyzer.

QUANTITATIVE RESULTS

No Radar Triggered

Timing of Reboot (sec)	Timing of Start of Traffic (sec)	Total Power-up Cycle Time (sec)	Initial Power-up Cycle Time (sec)
30.78	275.7	244.9	184.9

Radar Near Beginning of CAC

Timing of Reboot (sec)	Timing of Radar Burst (sec)	Radar Relative to Reboot (sec)	Radar Relative to Start of CAC (sec)
30.18	218.2	188.0	3.1

Radar Near End of CAC

Timing of Reboot (sec)	Timing of Radar Burst (sec)	Radar Relative to Reboot (sec)	Radar Relative to Start of CAC (sec)
30.33	272.5	242.2	57.3

QUALITATIVE RESULTS

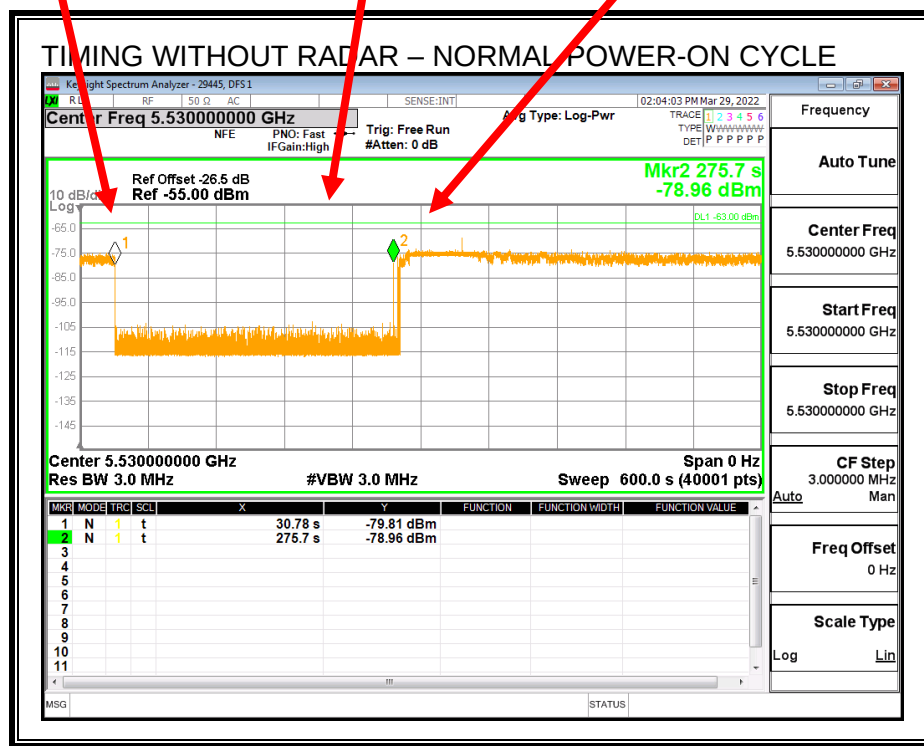
Timing of Radar Burst	Display on Control Computer	Spectrum Analyzer Display
No Radar Triggered	EUT marks Channel as active	Transmissions begin on channel after completion of the initial power-up cycle and the CAC
Within 0 to 6 second window	EUT indicates radar detected	No transmissions on channel
Within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

TIMING WITHOUT RADAR DURING CAC

AP is rebooted
Traffic ceases
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

End of CAC
Traffic is Initiated



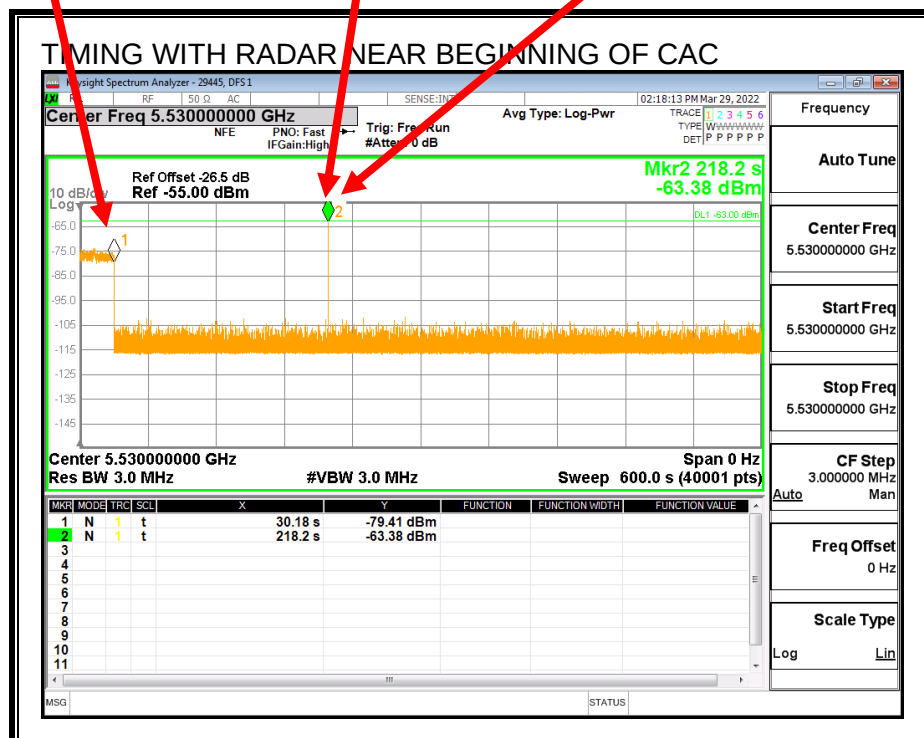
Transmissions begin on channel after completion of the initial power-up cycle and the CAC.

TIMING WITH RADAR NEAR BEGINNING OF CAC

AP is rebooted
Traffic ceases
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

Radar Signal Applied



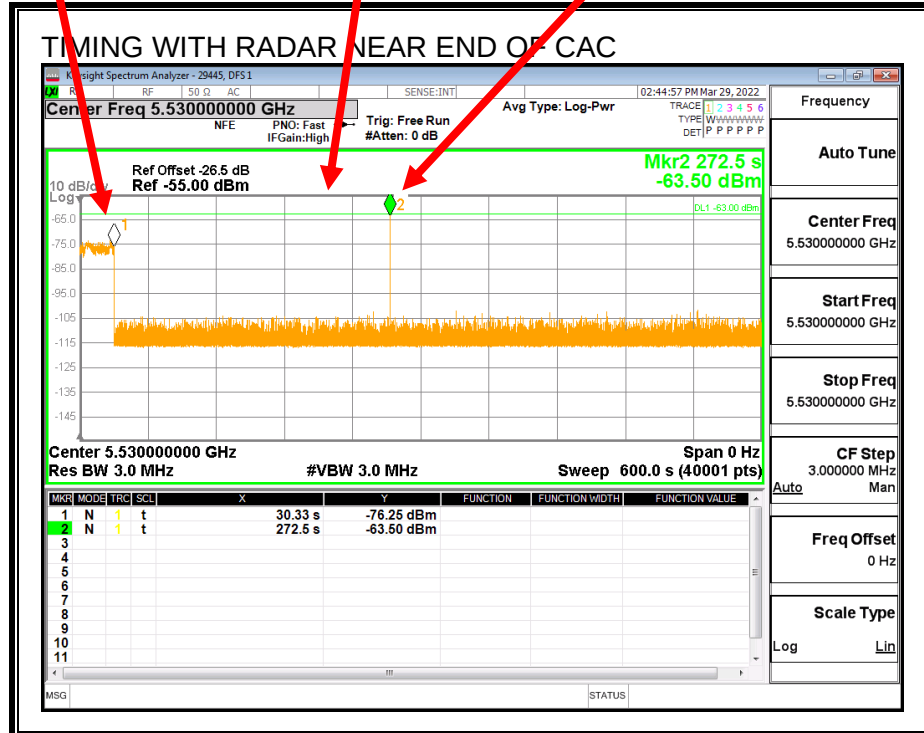
No EUT transmissions were observed after the radar signal.

TIMING WITH RADAR NEAR END OF CAC

AP is rebooted
Traffic ceases
Start of Initial Power-up cycle

End of Initial Power-up cycle
Start of CAC

Radar Signal Applied



No EUT transmissions were observed after the radar signal.

7.4.4. OVERLAPPING CHANNEL TESTS

RESULTS

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

7.4.5. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

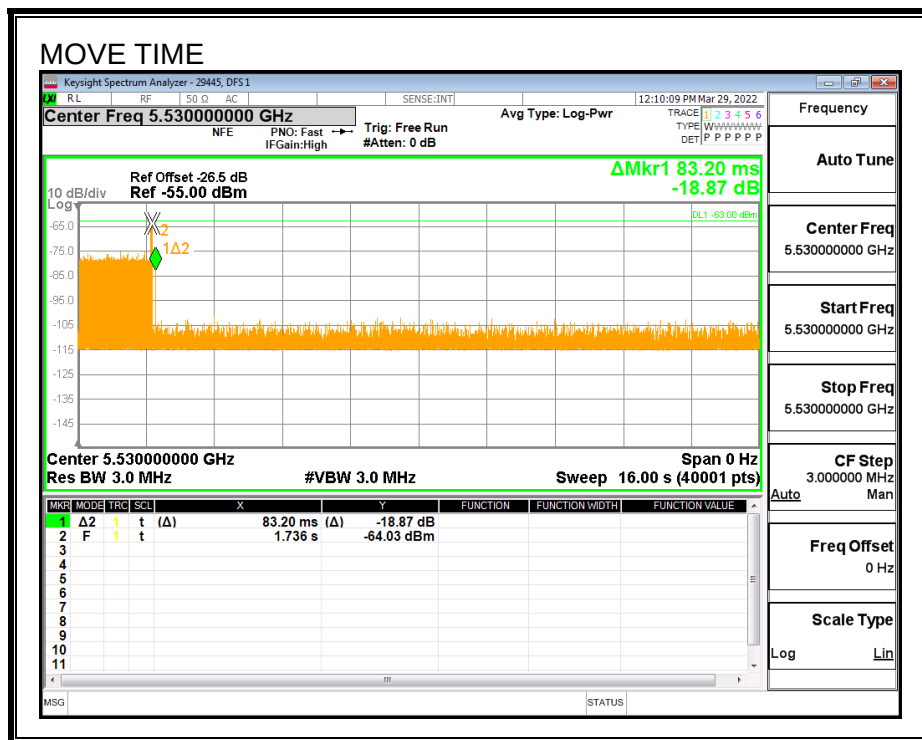
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

Channel Move Time (sec)	Limit (sec)
0.0832	10

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

MOVE TIME



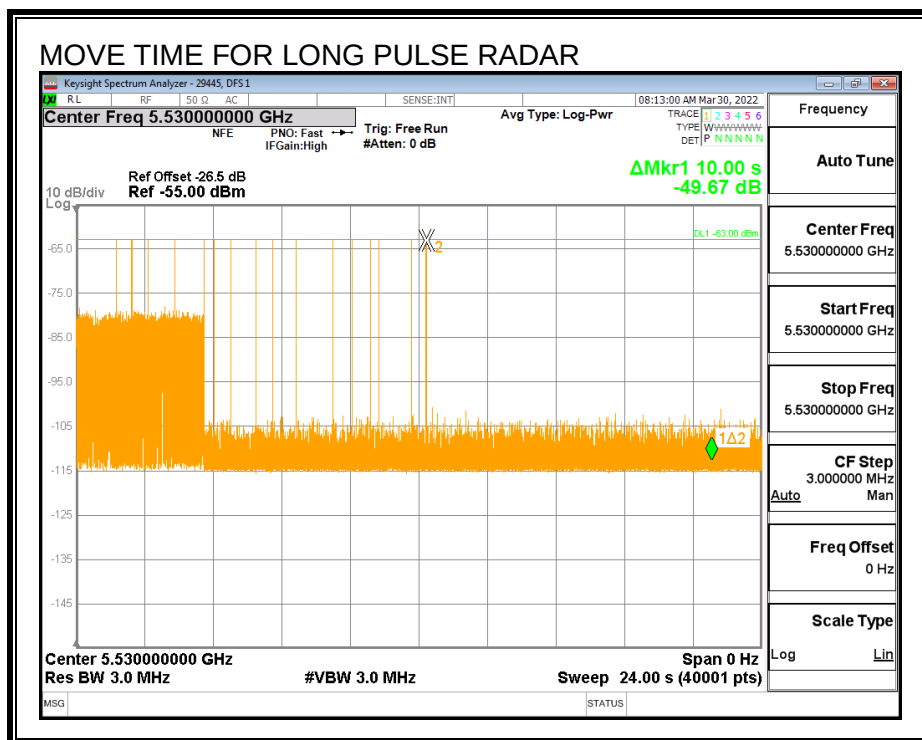
AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

Only intermittent transmissions are observed during the aggregate monitoring period.



LONG PULSE CHANNEL MOVE TIME

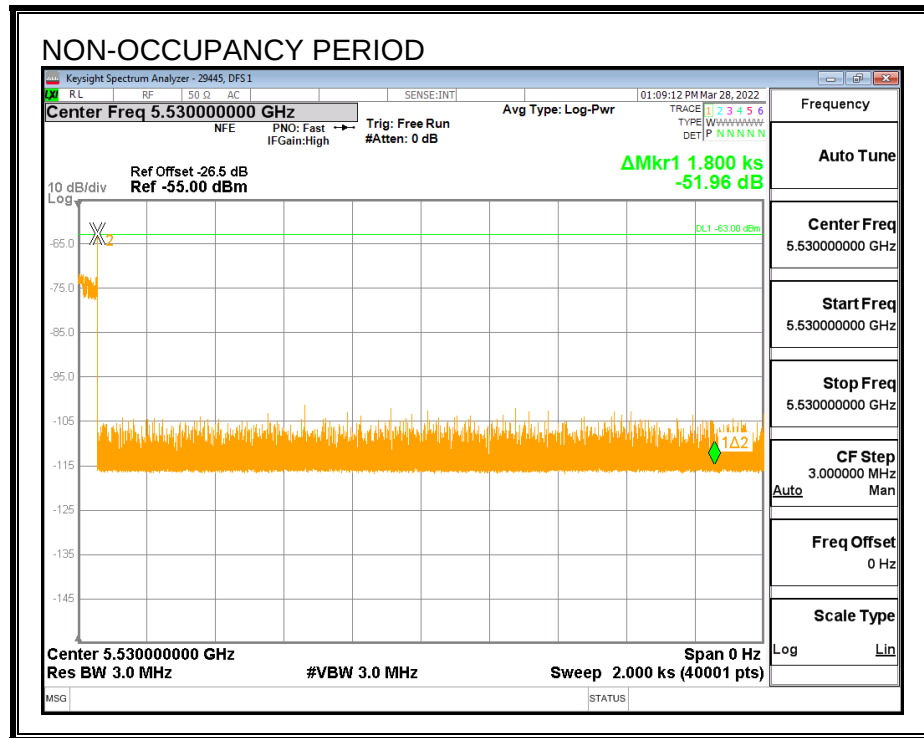
The traffic ceases prior to 10 seconds after the end of the radar waveform.



7.4.6. NON-OCCUPANCY PERIOD

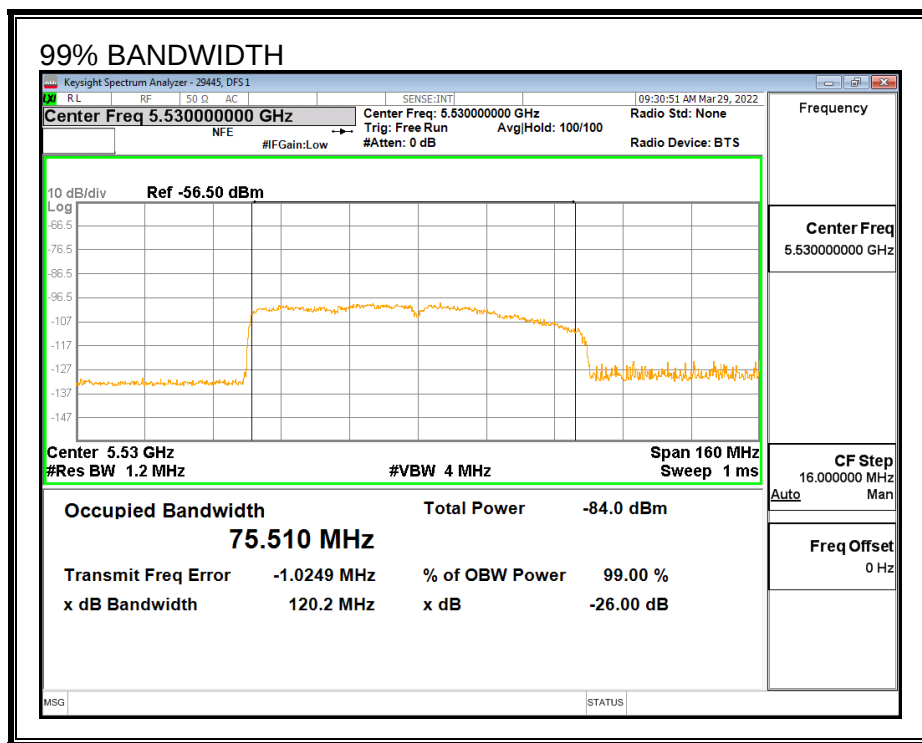
RESULTS

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



7.4.7. DETECTION BANDWIDTH

REFERENCE PLOT OF 99% POWER BANDWIDTH



RESULTS

F_L (MHz)	F_H (MHz)	Detection Bandwidth (MHz)	99% Power Bandwidth (MHz)	Ratio of Detection BW to 99% Power BW (%)	Minimum Limit (%)
5490	5570	80	75.510	105.9	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	
5535	10	10	100	
5540	10	10	100	
5545	10	10	100	
5550	10	10	100	
5555	10	10	100	
5560	10	10	100	
5565	10	10	100	
5570	10	10	100	FH

7.4.8. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary										
Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail	Detection Bandwidth		OBW	Test Location	Employee Number	In-Service Monitoring Version
					FL	FH				
FCC Short Pulse Type 1	30	90.00	60	Pass	5490	5570	76.23	DFS 1	29445	v4.1
FCC Short Pulse Type 2	30	96.67	60	Pass	5490	5570	76.23	DFS 1	29445	v4.1
FCC Short Pulse Type 3	30	96.67	60	Pass	5490	5570	76.23	DFS 1	29445	v4.1
FCC Short Pulse Type 4	30	93.33	60	Pass	5490	5570	76.23	DFS 1	29445	v4.1
Aggregate		94.17	80	Pass						
FCC Long Pulse Type 5	30	93.33	80	Pass	5490	5570	76.23	DFS 1	29445	v4.1
FCC Hopping Type 6	81	100.00	70	Pass	5490	5570		DFS 1	29445	v4.1

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	5512	Yes
1002	1	898	59	A	5560	Yes
1003	1	738	72	A	5492	No
1004	1	878	61	A	5519	Yes
1005	1	698	76	A	5561	Yes
1006	1	818	65	A	5552	Yes
1007	1	558	95	A	5505	Yes
1008	1	918	58	A	5497	Yes
1009	1	638	83	A	5513	Yes
1010	1	798	67	A	5493	Yes
1011	1	938	57	A	5528	Yes
1012	1	778	68	A	5494	Yes
1013	1	718	74	A	5567	Yes
1014	1	838	63	A	5512	Yes
1015	1	518	102	A	5548	Yes
1016	1	2299	23	B	5505	Yes
1017	1	1254	43	B	5543	Yes
1018	1	533	100	B	5511	Yes
1019	1	2166	25	B	5566	Yes
1020	1	2928	19	B	5523	Yes
1021	1	948	56	B	5565	Yes
1022	1	1840	29	B	5550	No
1023	1	2537	21	B	5507	No
1024	1	2363	23	B	5539	Yes
1025	1	642	83	B	5515	Yes
1026	1	1951	28	B	5494	Yes
1027	1	2908	19	B	5570	Yes
1028	1	1798	30	B	5505	Yes
1029	1	1690	32	B	5525	Yes
1030	1	710	75	B	5535	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	3.6	174	29	5498	Yes
2002	1.5	213	23	5505	No
2003	4.1	202	29	5555	Yes
2004	2.3	164	24	5513	Yes
2005	1.2	158	23	5492	Yes
2006	3.7	205	29	5490	Yes
2007	4.8	165	28	5547	Yes
2008	1.5	178	27	5498	Yes
2009	5	223	24	5518	Yes
2010	1.8	159	24	5493	Yes
2011	1.4	209	24	5492	Yes
2012	4.8	192	24	5535	Yes
2013	2.6	207	25	5510	Yes
2014	2.1	152	29	5557	Yes
2015	2.1	214	24	5559	Yes
2016	4	206	25	5551	Yes
2017	2.3	229	27	5499	Yes
2018	4.3	187	28	5529	Yes
2019	2.8	177	27	5567	Yes
2020	3.2	220	28	5525	Yes
2021	4	213	28	5543	Yes
2022	2.4	179	26	5509	Yes
2023	1.6	220	26	5548	Yes
2024	4.3	153	25	5532	Yes
2025	3.7	197	29	5551	Yes
2026	4.6	215	25	5529	Yes
2027	2.3	183	29	5511	Yes
2028	3.5	166	26	5498	Yes
2029	1.3	182	23	5533	Yes
2030	4.9	169	27	5534	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	8	370	18	5495	Yes
3002	7.7	345	18	5568	Yes
3003	6	300	16	5564	Yes
3004	8	287	17	5565	No
3005	8.7	254	16	5496	Yes
3006	6.9	387	17	5544	Yes
3007	7.7	368	17	5505	Yes
3008	6.1	396	16	5523	Yes
3009	9.4	390	16	5498	Yes
3010	8	430	16	5568	Yes
3011	7.4	319	17	5507	Yes
3012	6.4	372	16	5539	Yes
3013	6	407	17	5493	Yes
3014	7.2	473	16	5524	Yes
3015	9.2	270	18	5499	Yes
3016	8.6	482	16	5523	Yes
3017	6.7	291	16	5533	Yes
3018	6.4	265	18	5525	Yes
3019	8.8	471	18	5500	Yes
3020	6.7	458	16	5554	Yes
3021	7.4	426	18	5492	Yes
3022	9.7	308	16	5496	Yes
3023	6.5	289	16	5549	Yes
3024	8.9	317	18	5530	Yes
3025	8.1	310	17	5492	Yes
3026	8.9	351	16	5559	Yes
3027	6.1	490	16	5534	Yes
3028	9.2	293	18	5528	Yes
3029	8.8	328	16	5546	Yes
3030	10	394	18	5532	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	15.2	441	14	5494	Yes
4002	14	403	14	5499	Yes
4003	18.8	463	15	5542	Yes
4004	18.1	437	13	5550	Yes
4005	14.3	392	12	5496	Yes
4006	18.9	379	16	5521	Yes
4007	11.3	347	15	5507	Yes
4008	16.3	480	16	5535	Yes
4009	18.3	343	13	5562	Yes
4010	14.7	488	15	5493	No
4011	12.8	364	12	5520	Yes
4012	14.6	272	16	5560	Yes
4013	13.2	411	14	5555	Yes
4014	15.3	465	14	5545	No
4015	14.4	499	12	5537	Yes
4016	12.8	314	14	5565	Yes
4017	12.3	362	15	5517	Yes
4018	11.1	323	13	5538	Yes
4019	16	383	14	5568	Yes
4020	15.2	357	12	5501	Yes
4021	16.3	312	16	5566	Yes
4022	16	299	14	5516	Yes
4023	17.5	267	13	5528	Yes
4024	13.5	400	12	5539	Yes
4025	15.4	263	12	5493	Yes
4026	16.7	409	13	5568	Yes
4027	19.1	285	15	5508	Yes
4028	11.7	443	15	5556	Yes
4029	19.4	332	12	5536	Yes
4030	12.5	267	12	5540	Yes

TYPE 5 DETECTION PROBABILITY

Data Sheet for FCC Long Pulse Radar Type 5		
Trial	Frequency (MHz)	Successful Detection (Yes/No)
1	5530	Yes
2	5530	No
3	5530	Yes
4	5530	Yes
5	5530	Yes
6	5530	Yes
7	5530	Yes
8	5530	Yes
9	5530	Yes
10	5530	Yes
11	5497	Yes
12	5498	Yes
13	5500	Yes
14	5496	Yes
15	5495	Yes
16	5498	Yes
17	5495	Yes
18	5498	Yes
19	5495	Yes
20	5498	Yes
21	5565	Yes
22	5561	Yes
23	5561	Yes
24	5565	Yes
25	5564	Yes
26	5565	Yes
27	5566	Yes
28	5564	Yes
29	5565	No
30	5566	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	641	5490	19	Yes
2	1116	5491	19	Yes
3	1591	5492	15	Yes
4	2066	5493	12	Yes
5	2541	5494	16	Yes
6	3016	5495	18	Yes
7	3491	5496	19	Yes
8	3966	5497	18	Yes
9	4441	5498	10	Yes
10	4916	5499	22	Yes
11	5391	5500	14	Yes
12	5866	5501	16	Yes
13	6341	5502	14	Yes
14	6816	5503	15	Yes
15	7291	5504	19	Yes
16	7766	5505	18	Yes
17	8241	5506	22	Yes
18	8716	5507	16	Yes
19	9191	5508	18	Yes
20	9666	5509	25	Yes
21	10141	5510	19	Yes
22	10616	5511	12	Yes
23	11091	5512	14	Yes
24	11566	5513	19	Yes
25	12041	5514	16	Yes
26	12516	5515	15	Yes
27	12991	5516	18	Yes
28	13466	5517	23	Yes
29	13941	5518	18	Yes
30	14416	5519	9	Yes
31	14891	5520	24	Yes
32	15366	5521	21	Yes
33	15841	5522	19	Yes
34	16316	5523	15	Yes
35	16791	5524	19	Yes
36	17266	5525	14	Yes
37	17741	5526	17	Yes
38	18216	5527	20	Yes
39	18691	5528	17	Yes

TYPE 6 DETECTION PROBABILITY (CONTINUED)

39	18691	5528	17	Yes
40	19166	5529	15	Yes
41	19641	5530	20	Yes
42	20116	5531	16	Yes
43	20591	5532	22	Yes
44	21066	5533	14	Yes
45	21541	5534	10	Yes
46	22016	5535	13	Yes
47	22491	5536	14	Yes
48	22966	5537	21	Yes
49	23441	5538	15	Yes
50	23916	5539	14	Yes
51	24391	5540	15	Yes
52	24866	5541	16	Yes
53	25341	5542	20	Yes
54	25816	5543	15	Yes
55	26291	5544	21	Yes
56	26766	5545	17	Yes
57	27241	5546	21	Yes
58	27716	5547	11	Yes
59	28191	5548	11	Yes
60	28666	5549	18	Yes
61	29141	5550	18	Yes
62	29616	5551	20	Yes
63	30091	5552	16	Yes
64	30566	5553	17	Yes
65	31041	5554	18	Yes
66	31516	5555	21	Yes
67	31991	5556	18	Yes
68	32466	5557	11	Yes
69	32941	5558	16	Yes
70	33416	5559	17	Yes
71	33891	5560	8	Yes
72	34366	5561	18	Yes
73	34841	5562	16	Yes
74	35316	5563	16	Yes
75	35791	5564	15	Yes
76	36266	5565	12	Yes
77	36741	5566	18	Yes
78	37216	5567	20	Yes
79	37691	5568	13	Yes
80	38166	5569	12	Yes
81	38641	5570	14	Yes

7.5. BRIDGE MODE RESULTS

Per KDB 905462 D02, Section 5.1 (footnote 2):

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

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