DFS PORTION of FCC 47 CFR PART 15 SUBPART E
DFS PORTION of ISED CANADA RSS-247 ISSUE 3

CERTIFICATION TEST REPORT

FOR

WIRELESS ACCESS POINT

MODEL NUMBER: V010001

FCC ID: 2AEM4-711917312
IC: 20631-711917312

REPORT NUMBER: 14749497-E8V4

ISSUE DATE: 2023-09-25

Prepared for
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ACCREDITED
CERT #0751.05

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2023-08-22	Initial Issue	--
V2	2023-09-14	Update to Add 240 MHz Channel Bandwidth	Doug Anderson
V3	2023-09-21	Update RSS-247 from Issue 2 to Issue 3	Doug Anderson
V4	2023-09-25	Added section 7.8	Edgard Rincand

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: eero LLC
660 3rd Street 4th Floor
San Francisco, CA 94107, U.S.A.

EUT DESCRIPTION: WIRELESS ACCESS POINT

MODEL: V010001

SERIAL NUMBER: GGB2-1E04-3062-002P (20/40/80/160 MHz BANDWIDTH) and GGB2-1E05-3164-01PA (240 MHz BANDWIDTH)

DATE TESTED: JUNE 08 to 12, 2023 2023 (20/40/80/160 MHz BANDWIDTH) and SEPTEMBER 11 and 13 (240 MHz BANDWIDTH)

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
DFS Portion of 47 CFR Part 15 Subpart E	Complies
DFS Portion of ISED CANADA RSS-247 Issue 3	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.

Reviewed By:

Frank Ibrahim
Staff Engineer
CONSUMER TECHNOLOGY DIVISION
UL Verification Services Inc.

Prepared By:

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CONSUMER TECHNOLOGY DIVISION
UL Verification Services Inc.

Approved & Released For
UL Verification Services Inc. By:

Edgard Rincand
Operations Leader
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UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the DFS portion of FCC 47 CFR Part 2, FCC 47 CFR Part 15, FCC KDB 789033, KDB 905462 D02 and D03 and RSS-247 Issue 3.

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 3	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 UL Verification Services report number 14749497-E5V1 and 14749497-E6V1.

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 3

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		
	Access Point	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		
	Access Point	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	Access Point 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, Access Point 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

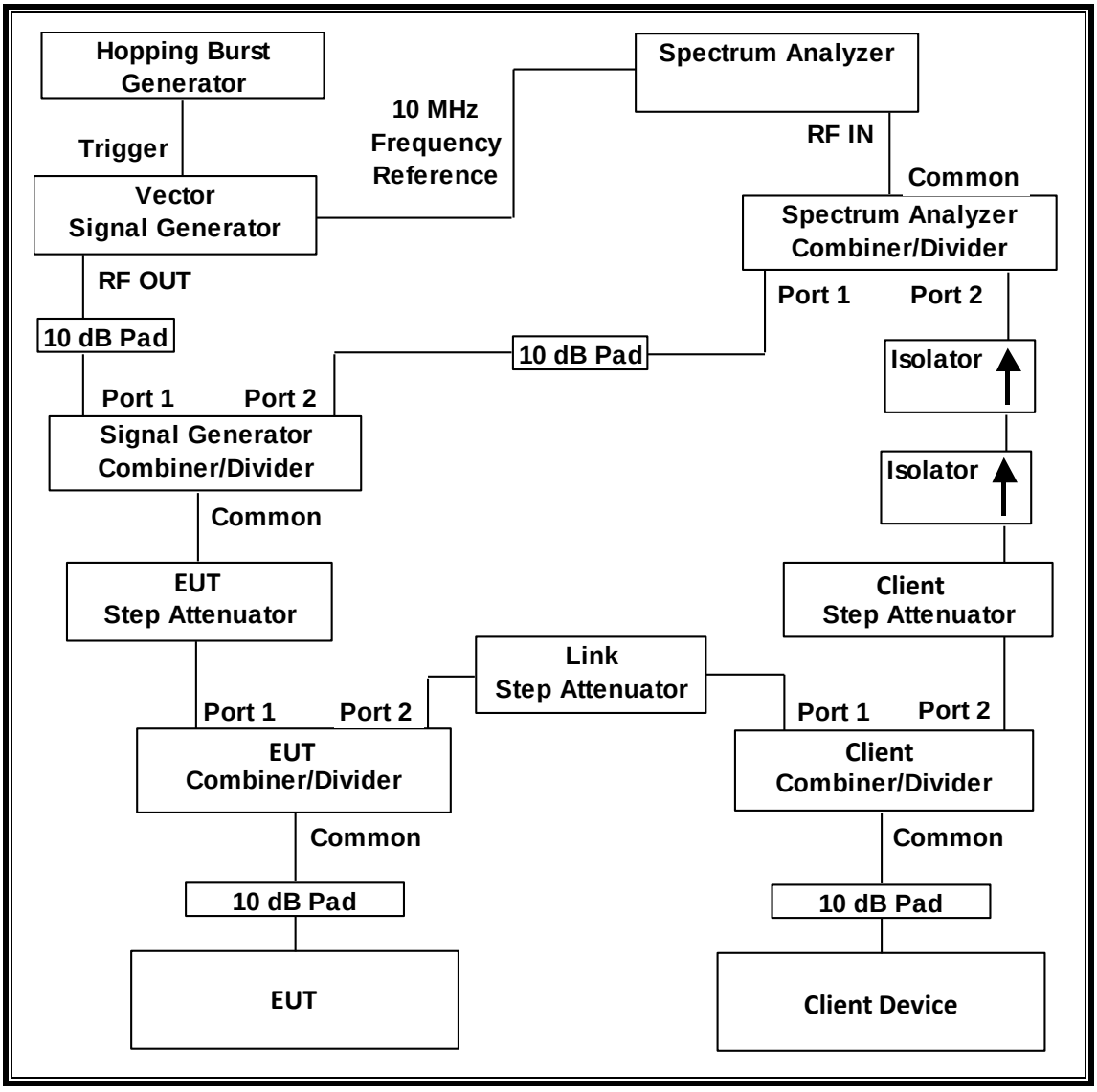
Radar Waveform Type	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 7 – Frequency Hopping Radar Test Signal

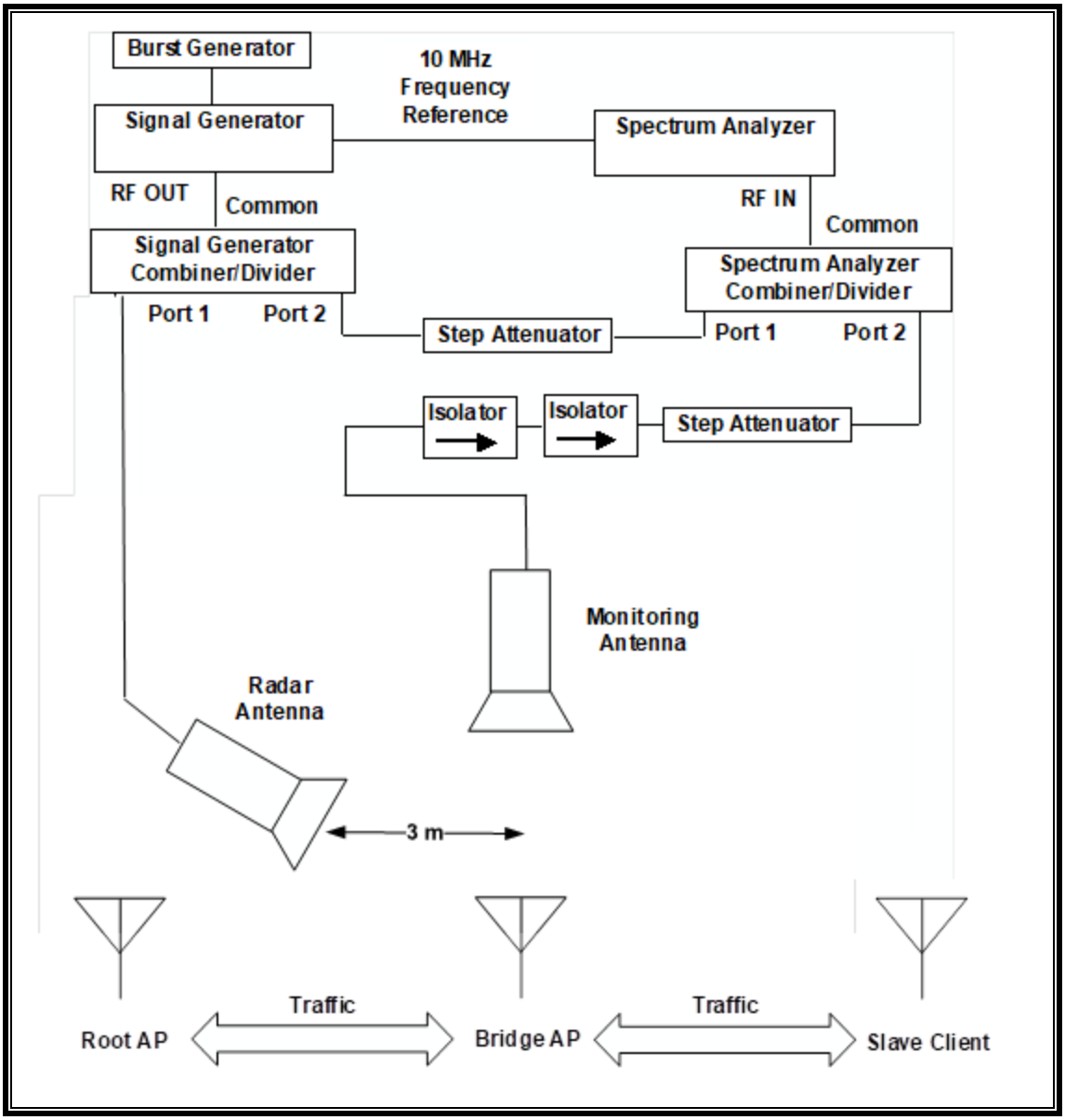
Radar Waveform Type	Pulse Width (µsec)	PRI (µsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	0.333	300	70%	30

7.1.2. TEST AND MEASUREMENT SYSTEM

CONDUCTED METHOD SYSTEM BLOCK DIAGRAM



BRIDGE MODE 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 Access Point and/or Client devices (for example, for diversity or MIMO implementations), additional combiner/dividers are inserted between the Access Point Combiner/Divider and the pad connected to the Access Point Device (and/or between the Client Combiner/Divider and the pad connected to the Client 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 Access Point 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 Access Point 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 Access Point Device.

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

A link is established between the Access Point and Client and the Link Step Attenuator between the units is adjusted as needed to provide a suitable received level at the Access Point and Client devices. Traffic that meets or exceed the minimum loading requirement is streamed from the Access Point device to the Client 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 Access Point Step Attenuator is required to meet the above conditions, a new System Calibration is performed for the new Access Point Step Attenuator setting.

TEST AND MEASUREMENT EQUIPMENT

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

20/40/80/160 MHz Channel Bandwidth:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**ID No.**	**Cal Due**
Spectrum Analyzer, PXA, 3Hz to 8.4GHz	Keysight	N9030A	150667	01/31/24
Signal Generator, MXG X-Series RF Vector	Keysight	N5182B	215999	02/07/24
Frequency Extender	Keysight	N5182BX	213906	02/06/24
Arbitrary Waveform Generator	Agilent / HP	33220A	80815	01/31/24

Note: An MXG series Signal Generator and separate external Frequency Extender module are shown in the preceding test system block diagram as a stand-alone Vector Signal Generator.

240 MHz Channel Bandwidth:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**ID No.**	**Cal Due**
Spectrum Analyzer, PXA, 3Hz to 8.4GHz	Keysight	N9030A	150667	01/31/24
Signal Generator 2, MXG X-Series RF Vector	Keysight	N5182B	150666	02/07/24
Arbitrary Waveform Generator	Agilent / HP	33220A	80815	01/31/24

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

7.1.4. TEST ROOM ENVIRONMENT

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

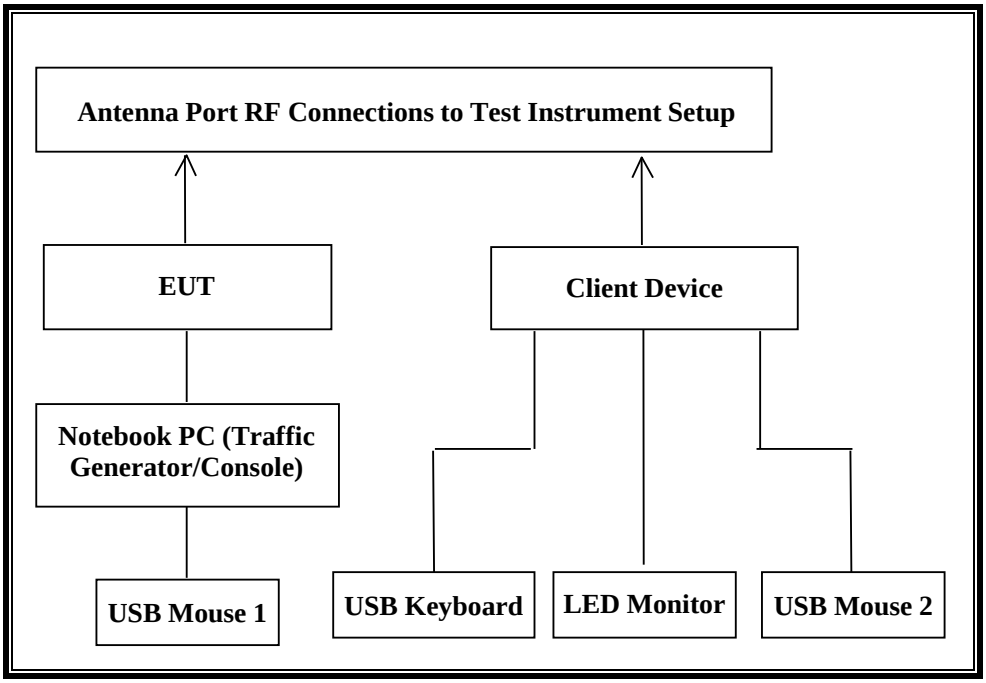
ENVIRONMENT CONDITION

Parameter	Value
Temperature	23.4, 23.5, 23.1, 22.6 and 23.2 °C
Humidity	48, 50, 52, 54 and 54 %

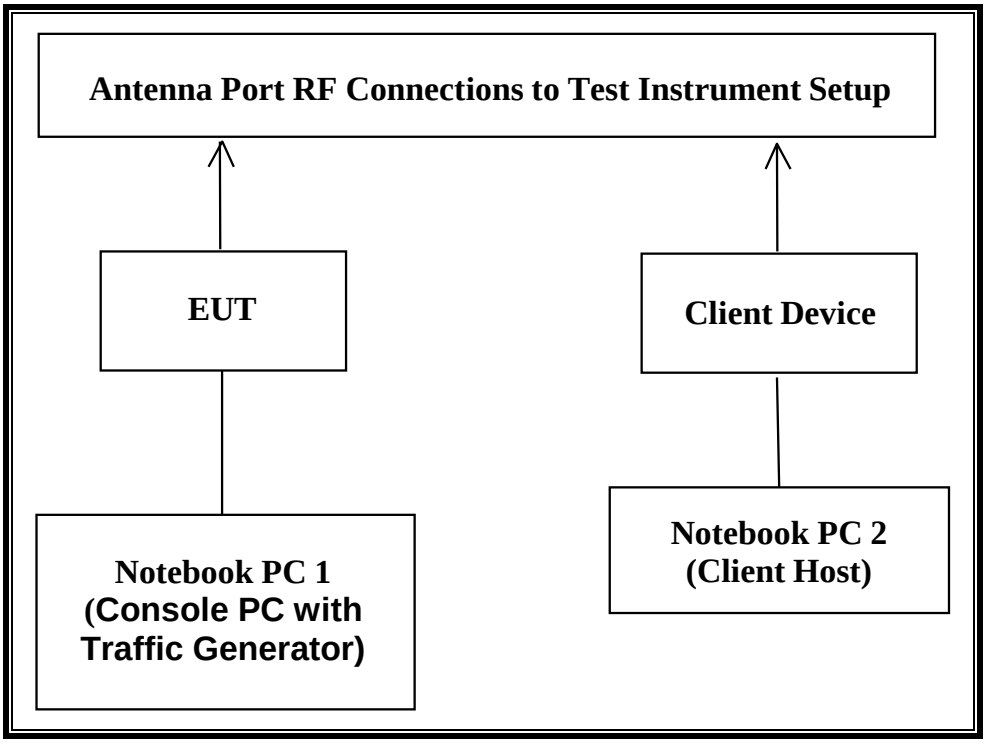
7.1.5. SETUP OF EUT

CONDUCTED METHOD EUT TEST SETUP

20/40/80/160 MHz Channel Bandwidth:

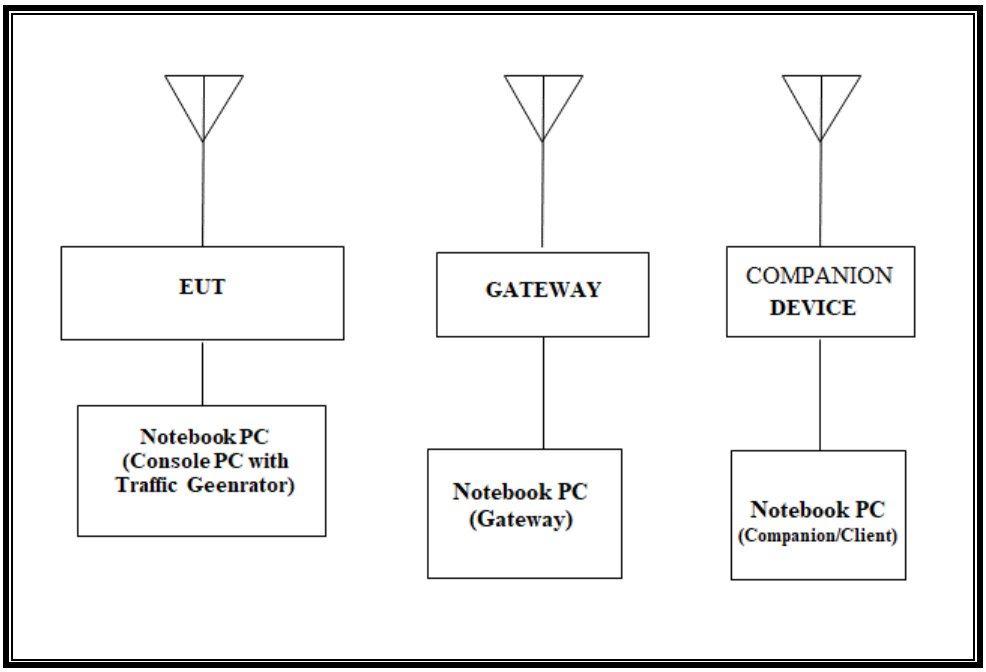


240 MHz Channel Bandwidth:



BRIDGE MODE EUT TEST SETUP

80/160/240 MHz Channel Bandwidth:



SUPPORT EQUIPMENT

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

20/40/80/160 MHz Channel Bandwidth:

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter 1 (EUT)	eero LLC	C310011	No Serial Number	DoC
Notebook PC (EUT Console)	Lenovo	Type 20W6-001VUS	PF-2YV2K6	DoC
AC Adapter 2 (Notebook PC)	Lenovo	ADLX65YCC2D	8SSA10R16875C1SG09PRSHT	DoC
USB Mouse 1 (Notebook PC)	Amazon Basics	B005EJH6RW (HM5129)	No Serial Number	DoC
Ultra Compact PC Kit (Client Device)	Giga-Byte Technology Co., Ltd.	GB-BRi5H-8250	2006632696	PD93168NG
AC Adapter 3 (Client)	Asian Power Devices	DA-65C19	YL93519D07000595800	DoC
USB Mouse 2 (Client)	QQfamily	QM500	QM500BK200700957	DoC
USB Keyboard (Client)	Monoprice	KB-C281	01410G082195	DoC
21.5-inch LED Monitor (Client)	HP	HP 22cwa Monitor	6CM1130NSF	DoC
AC Adapter 4 (Monitor)	TPV Electronics	ADPC1945	5317787A0064	DoC

240 MHz Channel Bandwidth:

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter 1 (EUT)	eero LLC	C310011	No Serial Number	DoC
Notebook PC 1 (EUT Console)	Lenovo	Type 20W6-001VUS	PF-2YV2K6	DoC
AC Adapter 2 (Notebook PC 1)	Lenovo	ADLX65YCC2D	8SSA10R16875C1SG09PRSHT	DoC
USB Mouse (Notebook PC 1)	QQfamily	QM500	QM500BK200700957	DoC
Wireless Router (Client Device)	eero LLC	V010001	GGB2-1E04-3062-001V	2AEM4-711917312
AC Adapter 3 (Client)	eero LLC	C310011	No Serial Number	DoC
Notebook PC 2 (Client Console)	Apple	A2442	V7N3WDGYQJ	DoC

7.1.6. DESCRIPTION OF EUT

For FCC the EUT operates over the 5250-5350 MHz and 5470-5730 MHz ranges.

For ISED the EUT operates over the 5250-5350 MHz and 5470-5730 MHz ranges, excluding the 5600-5650 MHz range.

The manufacturer has declared that the EUT is an Access Point Device operating in a mesh network environment.

The manufacturer has declared that the highest power level within these bands is 27.57 dBm EIRP in the 5250-5350 MHz band and 27.48 dBm EIRP in the 5470-5730 MHz band.

The manufacturer has declared that the highest gain antenna assembly utilized with the EUT has a gain of 3.76 dBi in the 5250-5350 MHz band, 3.59 dBi in the 5470-5725 MHz band and 3.62 dBi in the 5725-5850 MHz band. The manufacturer has declared that the lowest gain antenna assembly utilized with the EUT has a gain of 3.76 dBi in the 5250-5350 MHz band, 3.59 dBi in the 5470-5730 MHz band and 3.59 dBi in the 5725-5850 MHz band.

Four identical antennas are utilized to meet the diversity and MIMO operational requirements.

The rated output power of the Access Point unit is > 23dBm (EIRP). Therefore, the required interference threshold level is -64 dBm. After correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is -64 + 3.76 + 1 = -59.24 dBm in the 5250-5350 MHz, -64 + 3.59 + 1 = -59.41 dBm in the 5470-5725 MHz band and -64 + 3.62 + 1 = -59.38 dBm in the 5725-5850 MHz band.

The calibrated conducted DFS Detection Threshold level is set to -60.24 dBm in the 5250-5350 MHz band, -60.41 dBm in the 5470-5725 MHz band and -60.41 dBm in the 5725-5850 MHz band. The tested level is lower than the required level hence it provides a margin to the limit.

The EUT uses four transmitter/receiver chains, each connected to a 50-ohm coaxial antenna port. Only one of the four chains (chain 0) has radar detection capability, so it was the single chain connected to the test system via a power divider to perform conducted tests.

The Client 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 Access Point Device to the Client 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. Five nominal channel bandwidths are implemented in the DFS bands: 20 MHz, 40 MHz, 80 MHz, 160 MHz and 240 MHz.

Channel puncturing is not supported by the EUT.

For 20/40/80/160 MHz channel bandwidth testing the software installed in the EUT at the time of testing was OpenWrt 19.07-SNAPSHOT r0+12814-c9072d524e / LuCl pdekerat/ath 1210csu 1-ipq95xx branch gi8t-22.150.23015-5fbe521; Kernel Version: 5.4.164.

For 240 MHz channel bandwidth testing the software installed in the EUT at the time of testing was OpenWrt 19.07-SNAPSHOT r0+12814-c9072d524e / LuCl pdekerat/ath1210csu1/ath1210csu1-ipq95xx-jupiter.xml 2023-09-01T01:05:48+00:00.

Note: Per manufacturer's request, the term "Master" was replaced by "Access Point" or "EUT", and the term "Slave" was replaced by "Client" or "Client Device".

UNIFORM CHANNEL SPREADING

This function is not required per KDB 905462.

7.2. RESULTS FOR 20 MHz BANDWIDTH

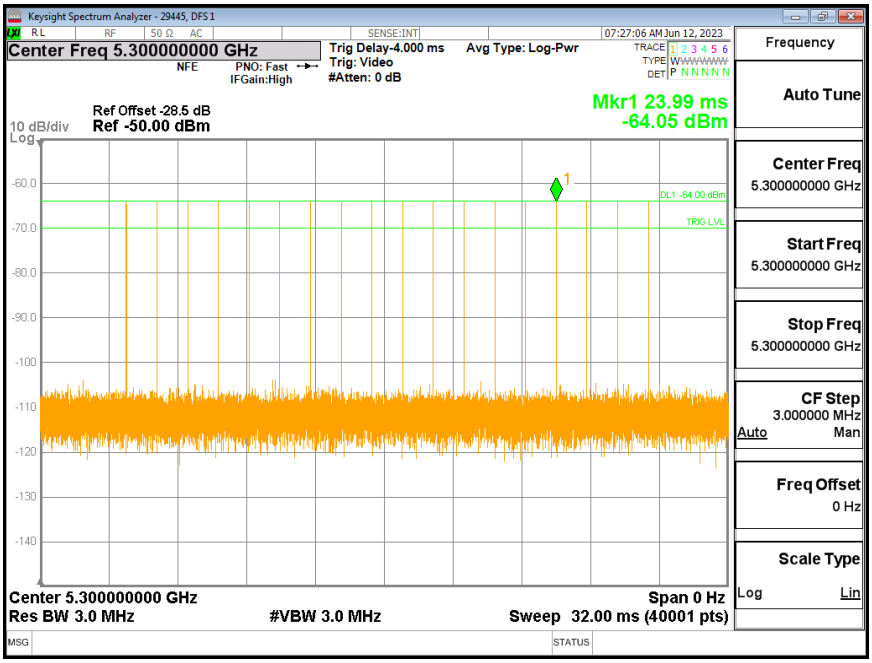
7.2.1. TEST CHANNEL

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

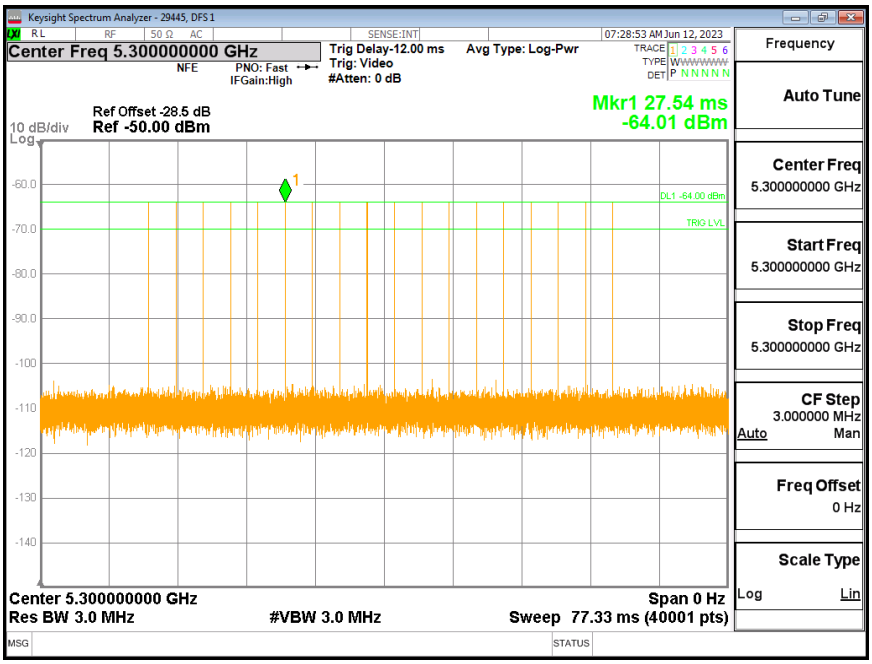
7.2.2. RADAR WAVEFORMS AND TRAFFIC

RADAR WAVEFORMS

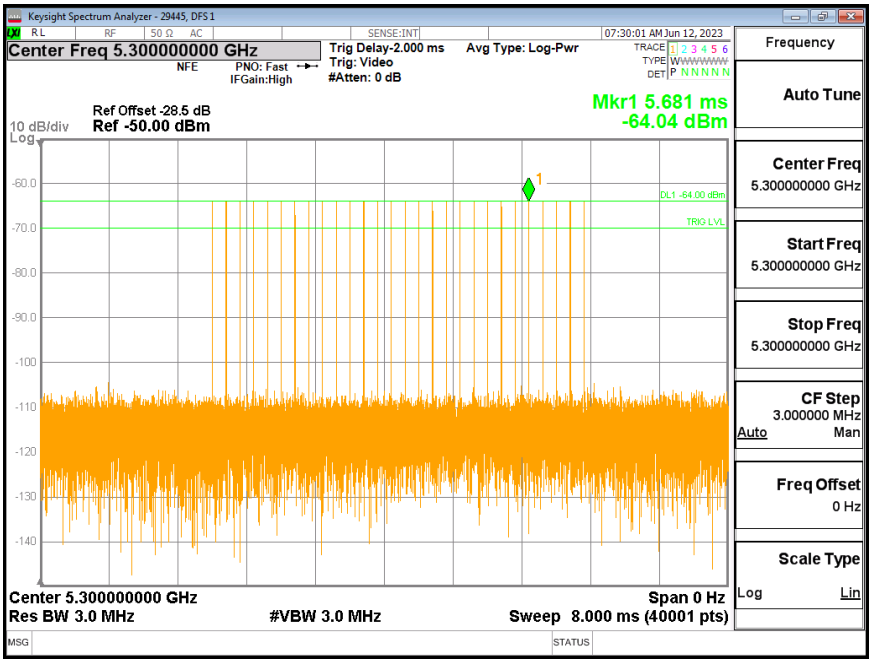
SHORT PULSE RADAR TYPE 0



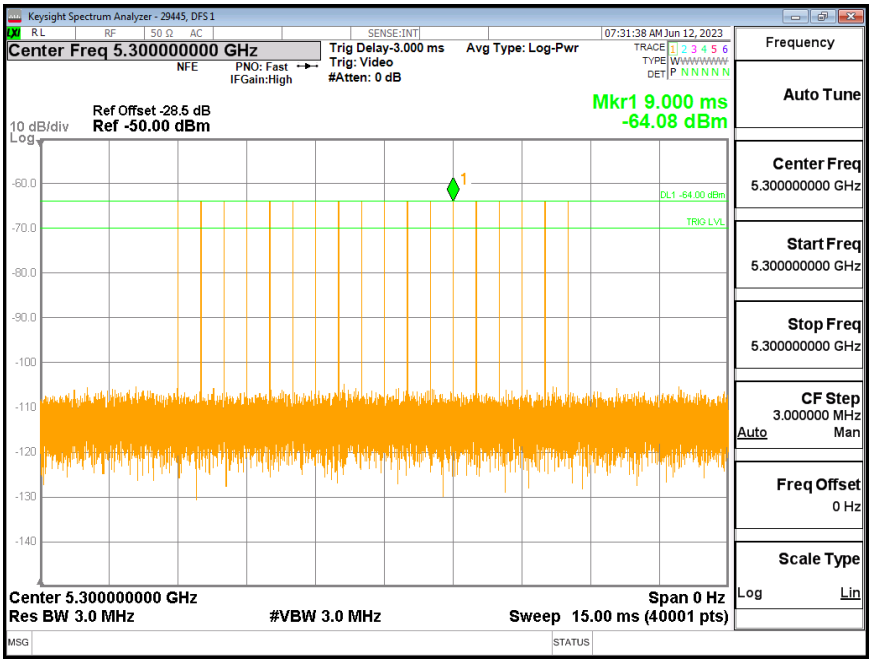
SAMPLE OF RADAR TYPE 1



SAMPLE OF RADAR TYPE 2



SAMPLE OF RADAR TYPE 3



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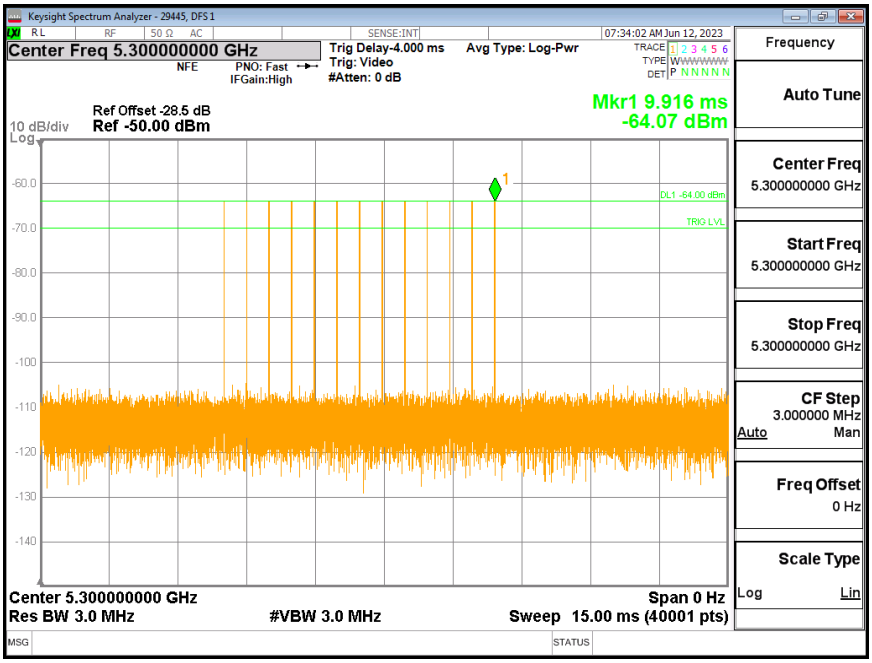
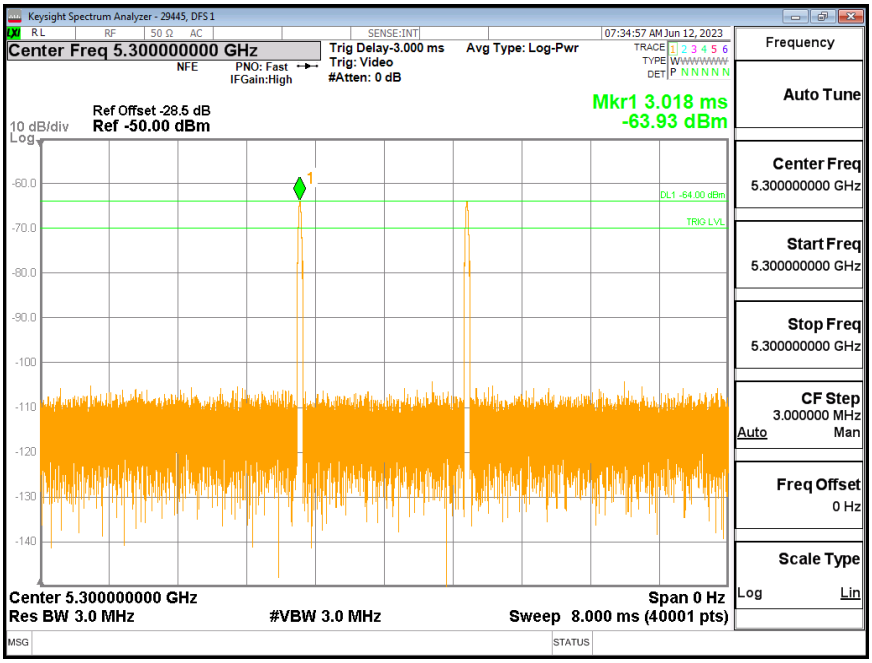
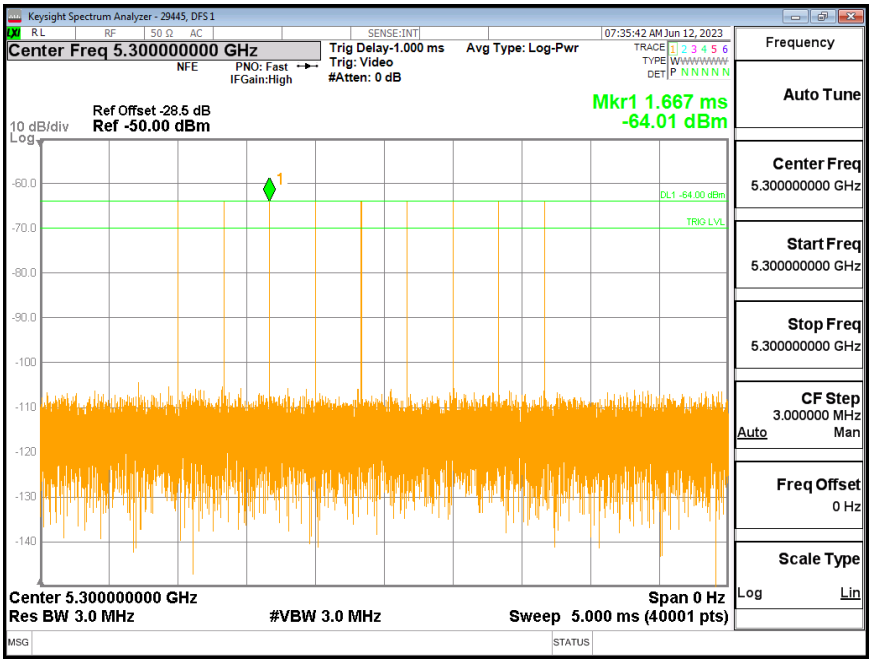


SAMPLE OF SINGLE BURST OF RADAR TYPE 5

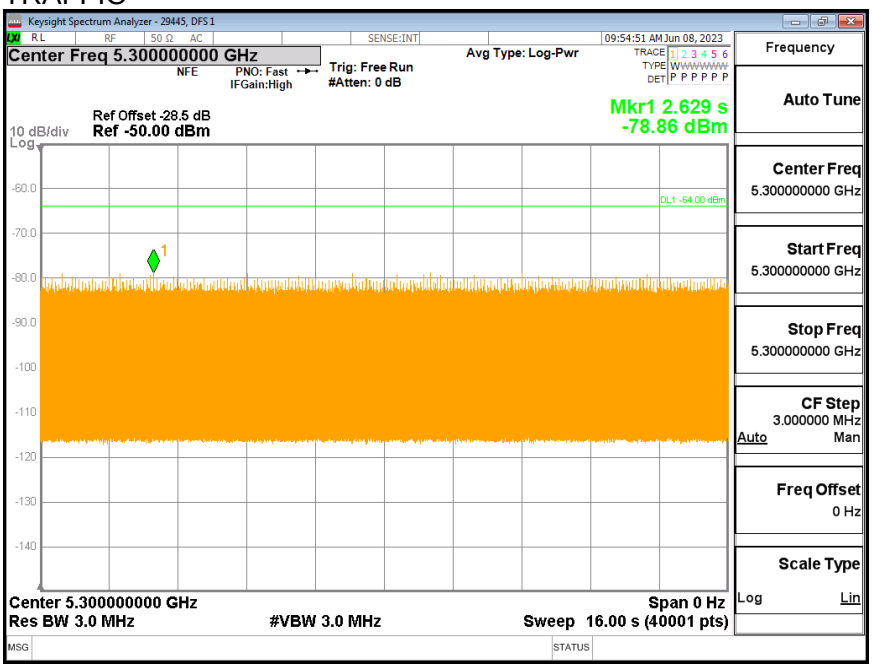


SINGLE BURST OF RADAR TYPE 6

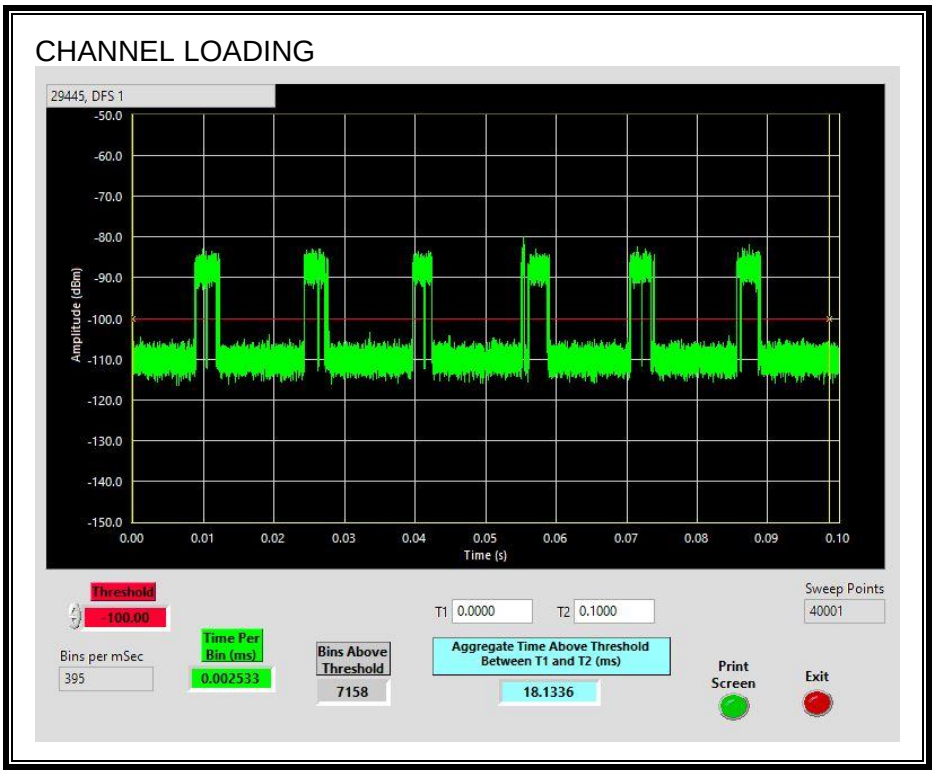


TRAFFIC

TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 18.13%

7.2.3. CHANNEL AVAILABILITY CHECK TIME

PROCEDURE TO DETERMINE CAC PERIOD TIME

A software command was issued to the EUT to change to the test channel. The measured time from the software command to the start of traffic was measured. The initialization time is the 60-second CAC period subtracted from the total measured time of the plot.

PROCEDURE FOR TIMING OF RADAR BURST

A software command was issued to the EUT to change to the test channel. A radar signal was triggered within 0 to 6 seconds after the beginning of the CAC period. Transmissions on the channel were monitored on the spectrum analyzer and a plot was captured.

The EUT was rebooted to clear the non-Occupancy list. A software command was issued to the EUT to change to the test channel. A radar signal was triggered within 54 to 60 seconds after the beginning of the CAC period. Transmissions on the channel were monitored on the spectrum analyzer and a plot was captured.

QUANTITATIVE RESULTS

No Radar Triggered

Timing of Software Command (sec)	Timing of Start of Traffic (sec)	Channel Initialization Time (sec)
0	68.31	8.31

Radar Near Beginning of CAC

Timing of Software Command (sec)	Timing of Radar Burst (sec)	Radar Relative to Beginning of CAC (sec)
0	11.20	2.89

Radar Near End of CAC

Timing of Software Command (sec)	Timing of Radar Burst (sec)	Radar Relative to Beginning of CAC (sec)
0	65.33	57.02

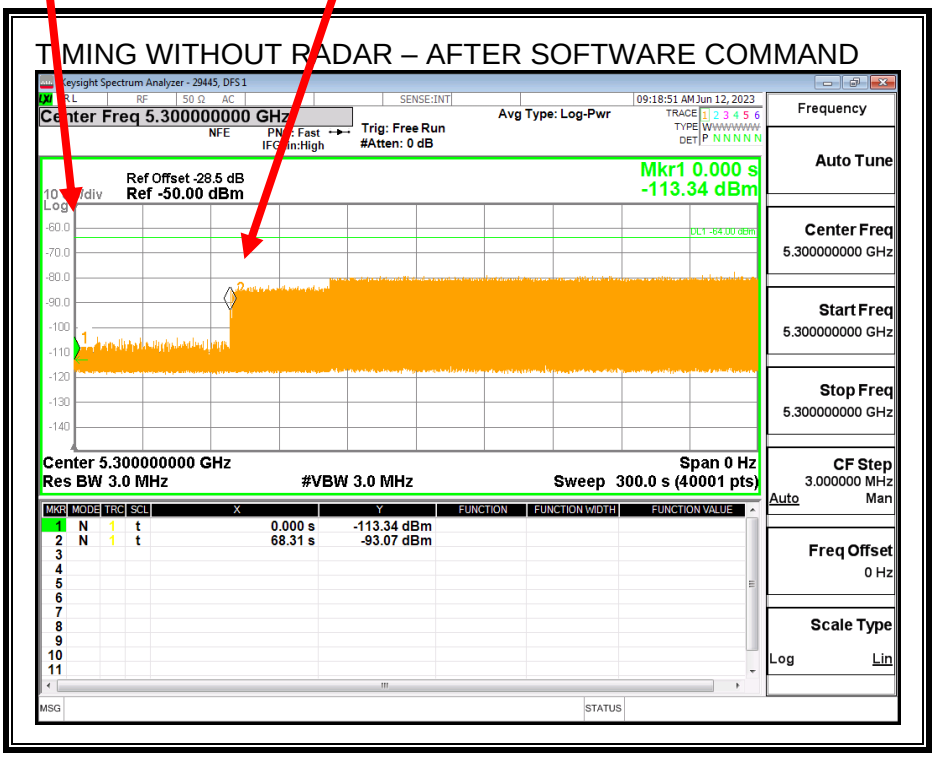
QUALITATIVE RESULTS

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 initialization 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

Software Command Issued
Change to Test Channel

End of CAC Period

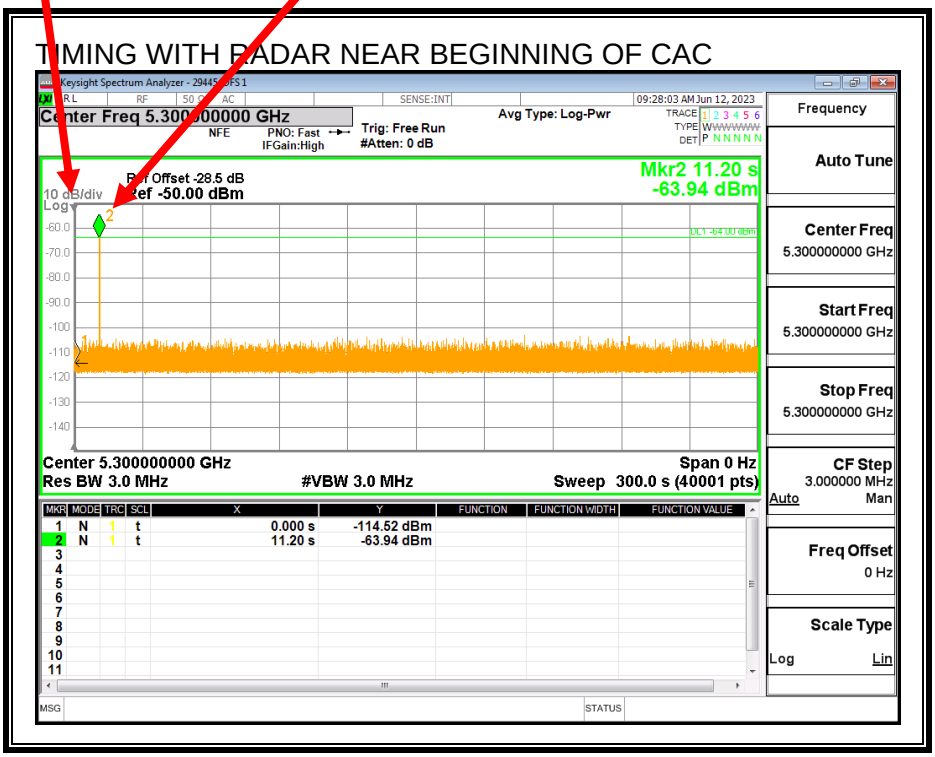


Transmissions begin on channel after completion of the initial power-up cycle and the CAC.

TIMING WITH RADAR NEAR BEGINNING OF CAC

Software Command Issued
Change to Test Channel

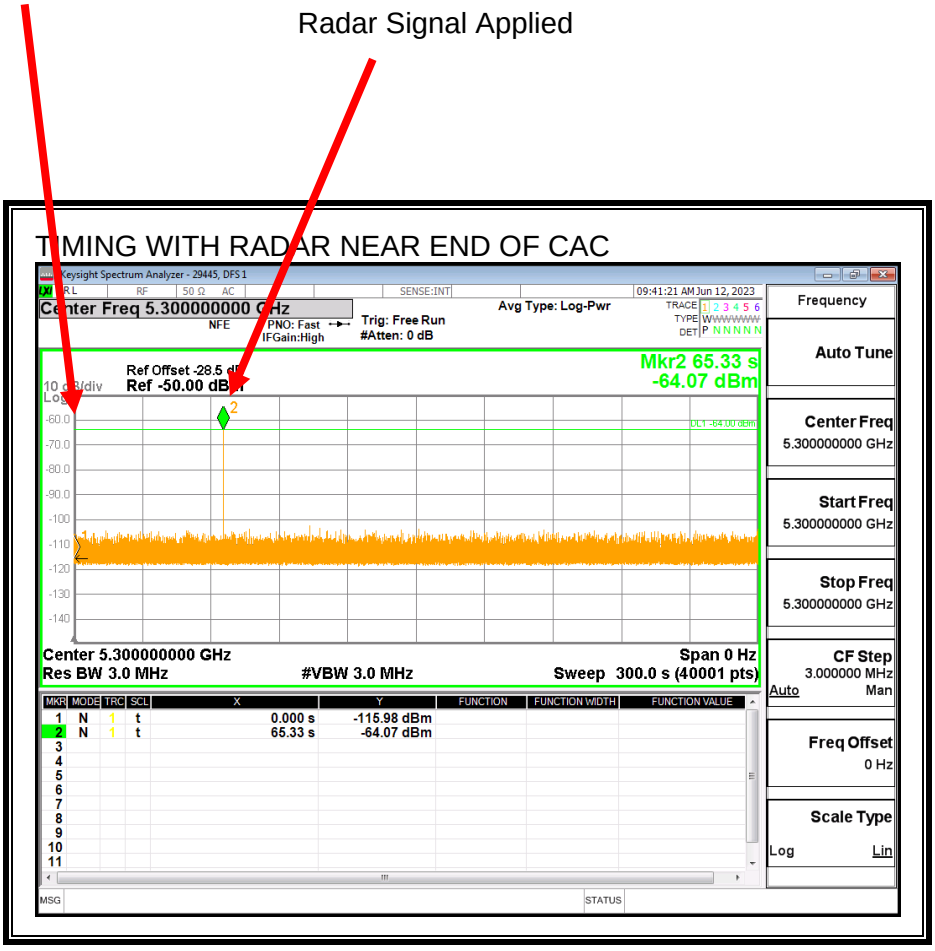
Radar Signal Applied



No EUT transmissions were observed after the radar signal.

TIMING WITH RADAR NEAR END OF CAC

Software Command Issued
Change to Test Channel



No EUT transmissions were observed after the radar signal.

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

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)

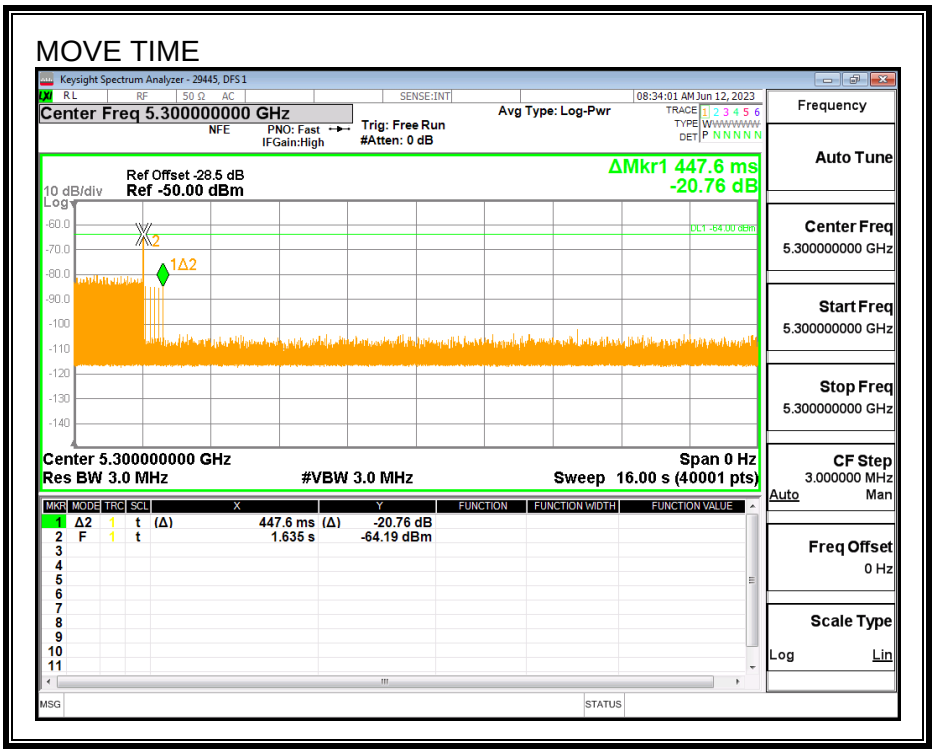
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

Channel Move Time (sec)	Limit (sec)
0.4476	10

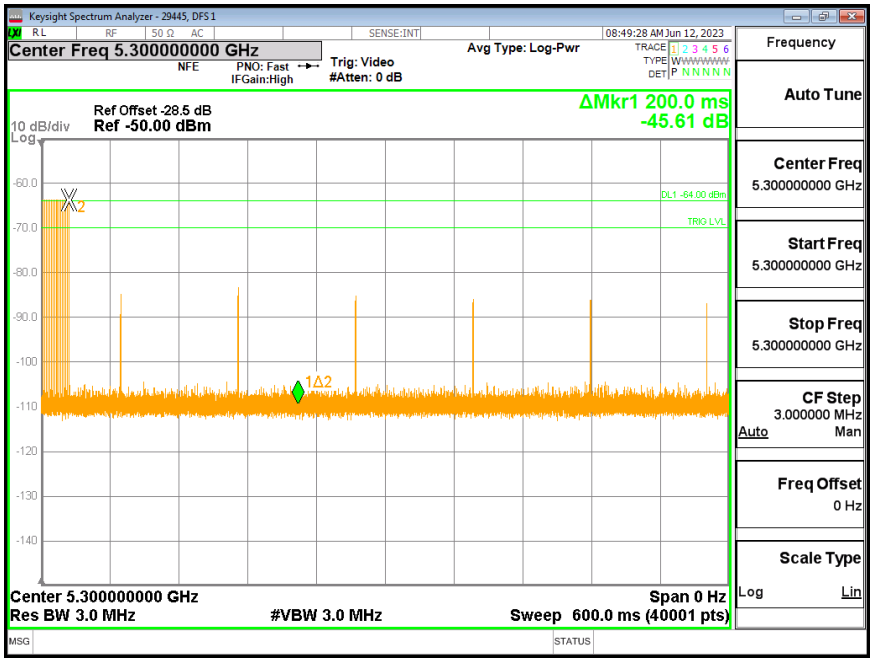
Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
2.4	60

MOVE TIME



CHANNEL CLOSING TIME

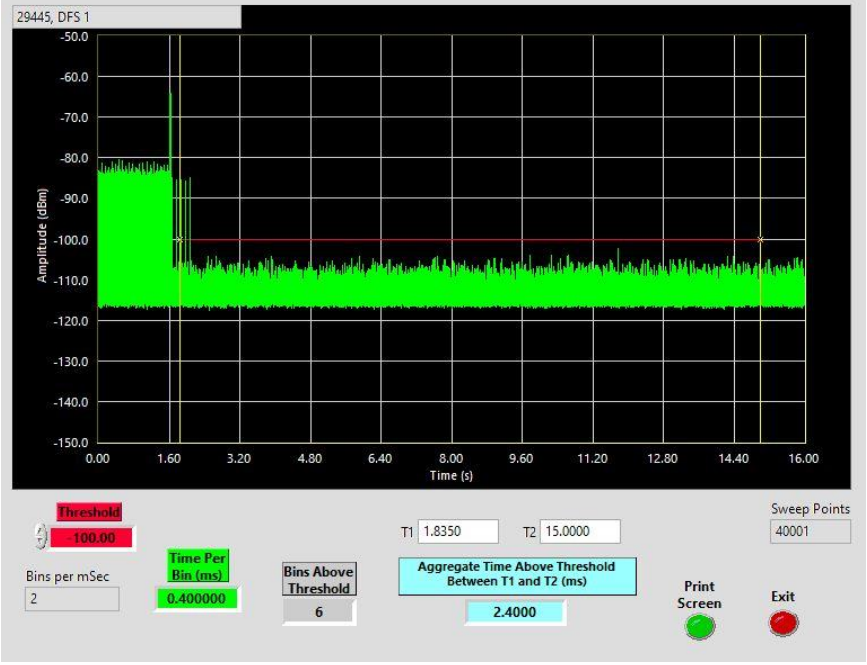
CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

Only intermittent transmissions are observed during the aggregate monitoring period.

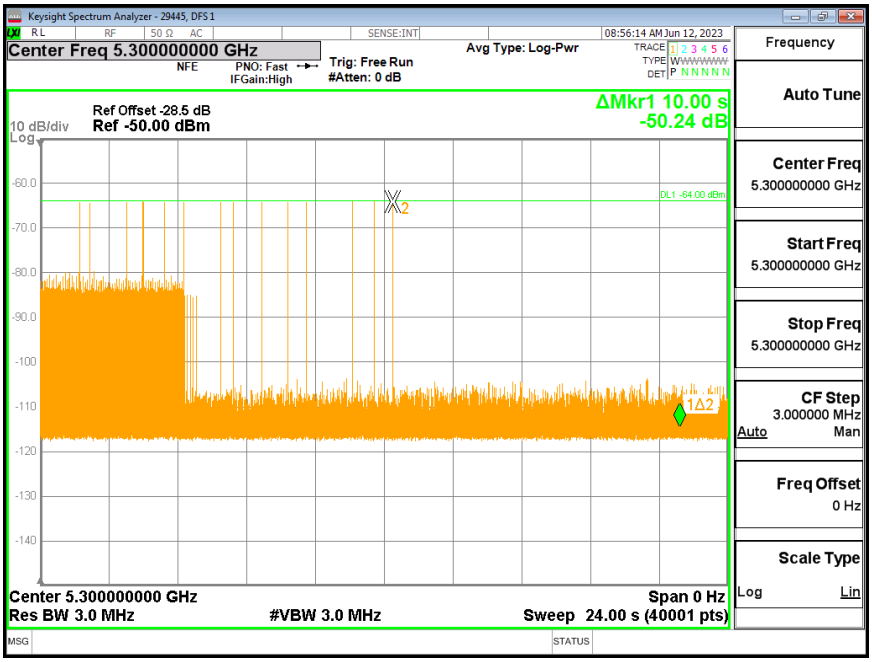
AGGREGATE CLOSING TIME



LONG PULSE CHANNEL MOVE TIME

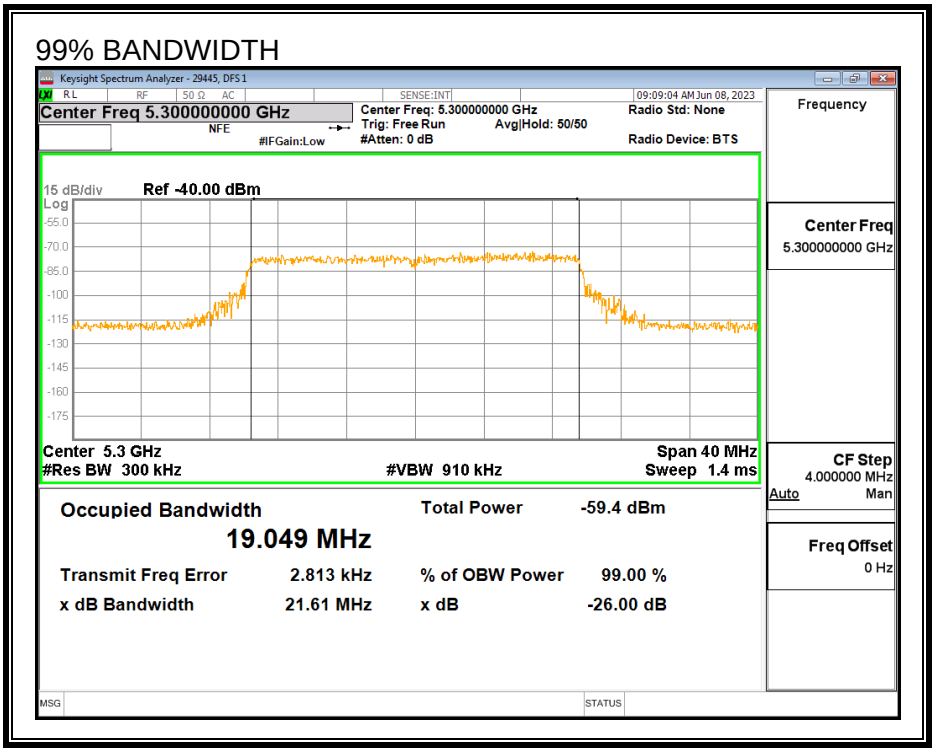
The traffic ceases prior to 10 seconds after the end of the radar waveform.

MOVE TIME FOR LONG PULSE RADAR



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 (%)
5290	5310	20	19.049	105.0	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
5290	10	10	100	FL
5295	10	10	100	
5300	10	10	100	
5305	10	10	100	
5310	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 FL	Detection Bandwidth FH	OBW	Test Location	Employee Number	In-Service Monitoring Version
FCC Short Pulse Type 1	30	96.67	60	Pass	5290	5310	19.05	DFS 1	29445	v4.1
FCC Short Pulse Type 2	30	93.33	60	Pass	5290	5310	19.05	DFS 1	29445	v4.1
FCC Short Pulse Type 3	30	80.00	60	Pass	5290	5310	19.05	DFS 1	29445	v4.1
FCC Short Pulse Type 4	30	86.67	60	Pass	5290	5310	19.05	DFS 1	29445	v4.1
Aggregate		89.17	80	Pass						
FCC Long Pulse Type 5	30	100.00	80	Pass	5290	5310	19.05	DFS 1	29445	v4.1
FCC Hopping Type 6	42	97.62	70	Pass	5290	5310		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	5299	Yes
1002	1	758	70	A	5307	Yes
1003	1	698	76	A	5299	Yes
1004	1	658	81	A	5309	Yes
1005	1	638	83	A	5298	Yes
1006	1	918	58	A	5297	Yes
1007	1	558	95	A	5307	Yes
1008	1	598	89	A	5310	Yes
1009	1	538	99	A	5291	Yes
1010	1	678	78	A	5303	Yes
1011	1	778	68	A	5293	Yes
1012	1	618	86	A	5303	Yes
1013	1	578	92	A	5298	Yes
1014	1	718	74	A	5295	No
1015	1	938	57	A	5292	Yes
1016	1	1840	29	B	5297	Yes
1017	1	990	54	B	5296	Yes
1018	1	2493	22	B	5303	Yes
1019	1	1773	30	B	5296	Yes
1020	1	2211	24	B	5310	Yes
1021	1	2973	18	B	5306	Yes
1022	1	2187	25	B	5305	Yes
1023	1	1885	28	B	5298	Yes
1024	1	1228	43	B	5292	Yes
1025	1	1055	51	B	5294	Yes
1026	1	1882	29	B	5304	Yes
1027	1	643	83	B	5295	Yes
1028	1	1599	34	B	5298	Yes
1029	1	3038	18	B	5296	Yes
1030	1	2929	19	B	5295	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	1.5	160	28	5302	Yes
2002	2.6	201	24	5304	No
2003	3.3	172	24	5303	Yes
2004	2.7	179	27	5304	Yes
2005	3.7	196	27	5296	Yes
2006	3.3	164	24	5301	Yes
2007	2.5	228	27	5295	Yes
2008	2.3	201	28	5305	Yes
2009	1.8	188	25	5299	Yes
2010	4	208	27	5300	Yes
2011	1.7	161	24	5296	Yes
2012	4.1	185	23	5298	Yes
2013	2.1	224	24	5299	Yes
2014	4.7	213	23	5294	Yes
2015	2.8	175	25	5295	Yes
2016	3.7	169	24	5301	Yes
2017	4.3	216	23	5306	Yes
2018	1.3	176	29	5292	Yes
2019	2	189	28	5306	Yes
2020	1.4	153	25	5293	Yes
2021	2.4	170	25	5293	No
2022	2	219	25	5303	Yes
2023	1.2	203	25	5309	Yes
2024	1	175	26	5296	Yes
2025	4.6	163	23	5301	Yes
2026	2.7	225	25	5301	Yes
2027	4.5	217	26	5305	Yes
2028	2.8	159	27	5299	Yes
2029	4.9	198	29	5299	Yes
2030	3.4	188	28	5294	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	6.5	500	18	5292	Yes
3002	9.6	481	18	5299	Yes
3003	8	376	18	5298	Yes
3004	9.1	251	17	5292	Yes
3005	9.8	292	17	5292	Yes
3006	9.2	432	16	5303	Yes
3007	6.1	485	18	5305	Yes
3008	9.8	386	16	5307	No
3009	9	335	16	5300	Yes
3010	6.9	382	16	5302	Yes
3011	6.4	461	18	5309	Yes
3012	6.4	404	18	5303	Yes
3013	8.2	378	16	5294	Yes
3014	6.5	451	17	5309	Yes
3015	8.6	320	17	5308	Yes
3016	7.1	288	17	5304	No
3017	7.4	421	17	5306	No
3018	8.3	401	17	5299	Yes
3019	6.7	296	17	5302	Yes
3020	9.9	423	16	5297	No
3021	8.5	464	16	5296	Yes
3022	7.9	352	18	5308	No
3023	8.9	406	16	5301	Yes
3024	6.5	307	18	5301	Yes
3025	7.7	256	16	5307	Yes
3026	9.7	303	18	5309	Yes
3027	9.2	264	17	5298	Yes
3028	7.2	324	18	5308	Yes
3029	6.9	299	18	5297	Yes
3030	9.3	254	16	5304	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	13.9	492	13	5298	No
4002	15.4	459	12	5298	Yes
4003	11.3	341	13	5292	No
4004	13.3	322	13	5305	No
4005	18.8	350	12	5310	Yes
4006	16.9	343	12	5293	Yes
4007	13.8	384	16	5300	Yes
4008	12.4	273	14	5301	Yes
4009	19.4	326	16	5303	Yes
4010	18.5	361	14	5295	Yes
4011	12	427	16	5294	Yes
4012	16.4	475	14	5297	Yes
4013	15.2	436	12	5294	Yes
4014	20	496	16	5304	Yes
4015	19.3	470	14	5304	No
4016	15.5	425	15	5304	Yes
4017	11	412	16	5302	Yes
4018	12.5	380	15	5296	Yes
4019	17.6	262	12	5294	Yes
4020	19.5	494	16	5305	Yes
4021	15.9	271	15	5306	Yes
4022	14.1	264	13	5298	Yes
4023	15.8	305	12	5295	Yes
4024	18.6	444	12	5297	Yes
4025	16.5	498	14	5299	Yes
4026	15.6	281	12	5299	Yes
4027	18.2	348	15	5299	Yes
4028	13.5	395	13	5295	Yes
4029	12.3	357	13	5295	Yes
4030	17.2	417	14	5291	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	Yes
7	5300	Yes
8	5300	Yes
9	5300	Yes
10	5300	Yes
11	5293	Yes
12	5298	Yes
13	5299	Yes
14	5297	Yes
15	5294	Yes
16	5298	Yes
17	5298	Yes
18	5293	Yes
19	5295	Yes
20	5299	Yes
21	5304	Yes
22	5306	Yes
23	5302	Yes
24	5302	Yes
25	5307	Yes
26	5305	Yes
27	5302	Yes
28	5304	Yes
29	5306	Yes
30	5302	Yes

TYPE 5 RADAR WAVEFORM PARAMETERS

FCC Long Pulse 06-07-2023 07:18:07

Waveform Num = 1
Num of Bursts = 14
Burst Interval (us) = 857143

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	708647									
1		2	8	70	1942	1924	0	708647	0	857142
	342570									
2		3	8	95	1437	1976	1642	1055083	857143	1714285
	1281503									
3		3	8	55	1421	1112	1994	2341641	1714286	2571428
	568912									
4		3	8	100	1506	1882	1446	2915080	2571429	3428571
	750921									
5		1	8	50	1693	0	0	3670835	3428572	4285714
	650870									
6		2	8	55	1471	1163	0	4323398	4285715	5142857
	1293207									
7		1	8	60	1574	0	0	5619239	5142858	6000000
	445506									
8		2	8	75	1454	1069	0	6066319	6000001	6857143
	979177									
9		1	8	95	1582	0	0	7048019	6857144	7714286
	921517									
10		2	8	90	1094	1368	0	7971118	7714287	8571429
	628613									
11		2	8	80	1514	1078	0	8602193	8571430	9428572
	1607717									
12		1	8	85	1326	0	0	10212502	9428573	10285715
	753210									
13		1	8	90	1104	0	0	10967038	10285716	11142858
	656800									
14		3	8	100	1351	1207	1189	11624942	11142859	12000001

Total number of pulses in waveform = 27

```
Waveform Num = 2
Num of Bursts = 9
Burst Interval (us) = 1333333

Burst   Off Time   #        Chirp   PW     Pulse 1   Pulse 2   Pulse 3   Start Loc   Start Burst   End Burst
#       (us)       Pulses   (MHz)   (us)   Pri(us)   Pri(us)   Pri(us)   (us)        Interval(us)  Interval(us)

        1136844
1               3        6       85     1908      1967      1215      1136844     0             1333332
        193263
2               1        6       70     1728      0         0         1335197     1333333       2666665
        1512849
3               3        6       60     1240      1147      1180      2849774     2666666       3999998
        2351263
4               3        6       65     1959      1549      1266      5204604     3999999       5333331
        193461
5               1        6       70     1779      0         0         5402839     5333332       6666664
        2218072
6               3        6       65     1823      1197      1763      7622690     6666665       7999997
        1500713
7               2        6       65     1009      1600      0         9128186     7999998       9333330
        1046335
8               2        6       90     1479      1360      0         10177130    9333331       10666663
        1524834
9               1        6       95     1874      0         0         11704803    10666664      11999996
Total number of pulses in waveform = 19
```

Waveform Num = 3
Num of Bursts = 18
Burst Interval (us) = 666667

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	596153									
1		2	17	70	1592	1651	0	596153	0	666666
	522245									
2		2	17	95	1061	1411	0	1121641	666667	1333333
	781977									
3		2	17	100	1924	1831	0	1906090	1333334	2000000
	718552									
4		3	17	70	1976	1642	1232	2628397	2000001	2666667
	694517									
5		1	17	70	1112	0	0	3327764	2666668	3333334
	299393									
6		3	17	85	1993	1506	1882	3628269	3333335	4000001
	554382									
7		2	17	50	1026	1693	0	4188032	4000002	4666668
	505201									
8		2	17	55	1471	1163	0	4695952	4666669	5333335
	1005074									
9		1	17	60	1574	0	0	5703660	5333336	6000002
	346306									
10		2	17	75	1454	1069	0	6051540	6000003	6666669
	760987									
11		1	17	95	1582	0	0	6815050	6666670	7333336
	716298									
12		2	17	90	1094	1368	0	7532930	7333337	8000003
	488518									
13		2	17	80	1514	1078	0	8023910	8000004	8666670
	1249622									
14		1	17	85	1326	0	0	9276124	8666671	9333337
	585610									
15		1	17	90	1104	0	0	9863060	9333338	10000004
	510325									
16		3	17	100	1351	1207	1189	10374489	10000005	10666671
	760827									
17		1	17	50	1703	0	0	11139063	10666672	11333338
	442843									
18		3	17	100	1215	1856	1155	11583609	11333339	12000005

Total number of pulses in waveform = 34

Waveform Num = 4
Num of Bursts = 17
Burst Interval (us) = 705882

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	96708									
1		3	5	60	1240	1147	1180	96708	0	705881
	1241302									
2		3	5	65	1959	1549	1266	1341577	705882	1411763
	102167									
3		1	5	70	1779	0	0	1448518	1411764	2117645
	1171860									
4		3	5	65	1823	1197	1763	2622157	2117646	2823527
	792823									
5		2	5	65	1009	1600	0	3419763	2823528	3529409
	552908									
6		2	5	90	1479	1360	0	3975280	3529410	4235291
	806088									
7		1	5	95	1874	0	0	4784207	4235292	4941173
	611355									
8		3	5	90	1386	1394	1592	5397436	4941174	5647055
	725824									
9		3	5	75	1839	1061	1411	6127632	5647056	6352937
	827633									
10		2	5	100	1924	1831	0	6959576	6352938	7058819
	761119									
11		3	5	70	1976	1642	1232	7724450	7058820	7764701
	735451									
12		1	5	70	1112	0	0	8464751	7764702	8470583
	317144									
13		3	5	85	1993	1506	1882	8783007	8470584	9176465
	587214									
14		2	5	50	1026	1693	0	9375602	9176466	9882347
	535040									
15		2	5	55	1471	1163	0	9913361	9882348	10588229
	1064394									
16		1	5	60	1574	0	0	10980389	10588230	11294111
	366729									
17		2	5	75	1454	1069	0	11348692	11294112	11999993

Total number of pulses in waveform = 37

```
Waveform Num = 5
Num of Bursts = 11
Burst Interval (us) = 1090909

Burst   Off Time   #        Chirp   PW     Pulse 1   Pulse 2   Pulse 3   Start Loc   Start Burst   End Burst
#       (us)       Pulses   (MHz)   (us)   Pri(us)   Pri(us)   Pri(us)   (us)        Interval(us)  Interval(us)

        103217
1               2        18      60     1522      1745      0         103217      0             1090908
        1543599
2               2        18      65     1625      1608      0         1650083     1090909       2181817
        1247327
3               1        18      50     1120      0         0         2900643     2181818       3272726
        1248318
4               1        18      100    1164      0         0         4150081     3272727       4363635
        1247815
5               1        18      90     1677      0         0         5399060     4363636       5454544
        194833
6               2        18      60     1189      1565      0         5595570     5454545       6545453
        1936013
7               1        18      85     1711      0         0         7534337     6545454       7636362
        890976
8               3        18      60     1856      1155      1378      8427024     7636363       8727271
        557811
9               1        18      100    1258      0         0         8989224     8727272       9818180
        1648407
10              1        18      55     1137      0         0         10638889    9818181       10909089
        558616
11              1        18      100    1549      0         0         11198642    10909090      11999998
Total number of pulses in waveform = 16
```

Waveform Num = 6
Num of Bursts = 19
Burst Interval (us) = 631579

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	193968									
1		2	8	90	1052	1985	0	193968	0	631578
	649678									
2		3	8	60	1763	1720	1335	846683	631579	1263157
	719407									
3		1	8	80	1848	0	0	1570908	1263158	1894736
	880816									
4		3	8	75	1360	1634	1034	2453572	1894737	2526315
	315599									
5		3	8	90	1814	1771	1386	2773199	2526316	3157894
	906484									
6		2	8	85	1899	1540	0	3684654	3157895	3789473
	489963									
7		1	8	70	1685	0	0	4178056	3789474	4421052
	514713									
8		3	8	100	1831	1864	1822	4694454	4421053	5052631
	616493									
9		3	8	85	1232	1950	1121	5316464	5052632	5684210
	783990									
10		1	8	100	1736	0	0	6104757	5684211	6315789
	221019									
11		3	8	75	1882	1446	1403	6327512	6315790	6947368
	950065									
12		1	8	85	1283	0	0	7282308	6947369	7578947
	323158									
13		1	8	75	1163	0	0	7606749	7578948	8210526
	953402									
14		1	8	60	1574	0	0	8561314	8210527	8842105
	328032									
15		2	8	75	1454	1069	0	8890920	8842106	9473684
	720794									
16		1	8	95	1582	0	0	9614237	9473685	10105263
	678494									
17		2	8	90	1094	1368	0	10294313	10105264	10736842
	462711									
18		2	8	80	1514	1078	0	10759486	10736843	11368421
	1183656									
19		1	8	85	1326	0	0	11945734	11368422	12000000

Total number of pulses in waveform = 36

Waveform Num = 7
Num of Bursts = 10
Burst Interval (us) = 1200000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	1139126									
1		1	17	90	1677	0	0	1139126	0	1199999
	214360									
2		2	17	60	1189	1565	0	1355163	1200000	2399999
	2130010									
3		1	17	85	1711	0	0	3487927	2400000	3599999
	980408									
4		3	17	60	1856	1155	1378	4470046	3600000	4799999
	613742									
5		1	17	100	1258	0	0	5088177	4800000	5999999
	1813429									
6		1	17	55	1137	0	0	6902864	6000000	7199999
	614547									
7		1	17	100	1549	0	0	7518548	7200000	8399999
	2056631									
8		3	17	60	1429	1779	1052	9576728	8400000	9599999
	932980									
9		1	17	95	1197	0	0	10513968	9600000	10799999
	1298845									
10		3	17	65	1343	1009	1600	11814010	10800000	11999999

Total number of pulses in waveform = 17

Waveform Num = 8
Num of Bursts = 14
Burst Interval (us) = 857143

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	760910									
1		2	17	65	1634	1034	0	760910	0	857142
	429321									
2		3	17	90	1814	1771	1386	1192899	857143	1714285
	1232333									
3		2	17	85	1899	1540	0	2430203	1714286	2571428
	665519									
4		1	17	70	1685	0	0	3099161	2571429	3428571
	699631									
5		3	17	100	1831	1864	1822	3800477	3428572	4285714
	838425									
6		3	17	85	1232	1950	1121	4644419	4285715	5142857
	1065291									
7		1	17	100	1736	0	0	5714013	5142858	6000000
	300192									
8		3	17	75	1882	1446	1403	6015941	6000001	6857143
	1291276									
9		1	17	85	1283	0	0	7311948	6857144	7714286
	438804									
10		1	17	75	1163	0	0	7752035	7714287	8571429
	1294613									
11		1	17	60	1574	0	0	9047811	8571430	9428572
	445506									
12		2	17	75	1454	1069	0	9494891	9428573	10285715
	979177									
13		1	17	95	1582	0	0	10476591	10285716	11142858
	921517									
14		2	17	90	1094	1368	0	11399690	11142859	12000001

Total number of pulses in waveform = 26

Waveform Num = 9
Num of Bursts = 16
Burst Interval (us) = 750000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	493278									
1		2	14	50	1036	1120	0	493278	0	749999
	857454									
2		1	14	100	1164	0	0	1352888	750000	1499999
	857304									
3		1	14	90	1677	0	0	2211356	1500000	2249999
	133810									
4		2	14	60	1189	1565	0	2346843	2250000	2999999
	1329775									
5		1	14	85	1711	0	0	3679372	3000000	3749999
	611498									
6		3	14	60	1856	1155	1378	4292581	3750000	4499999
	383027									
7		1	14	100	1258	0	0	4679997	4500000	5249999
	1132714									
8		1	14	55	1137	0	0	5813969	5250000	5999999
	383832									
9		1	14	100	1549	0	0	6198938	6000000	6749999
	1283396									
10		3	14	60	1429	1779	1052	7483883	6750000	7499999
	582745									
11		1	14	95	1197	0	0	8070888	7500000	8249999
	810415									
12		3	14	65	1343	1009	1600	8882500	8250000	8999999
	587398									
13		2	14	90	1479	1360	0	9473850	9000000	9749999
	856625									
14		1	14	95	1874	0	0	10333314	9750000	10499999
	649769									
15		3	14	90	1386	1394	1592	10984957	10500000	11249999
	771468									
16		3	14	75	1839	1061	1411	11760797	11250000	11999999

Total number of pulses in waveform = 29

Waveform Num = 10
Num of Bursts = 16
Burst Interval (us) = 750000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	727000									
1		3	20	95	1864	1822	1437	727000	0	749999
	332035									
2		2	20	60	1950	1121	0	1064158	750000	1499999
	932387									
3		1	20	100	1736	0	0	1999616	1500000	2249999
	262584									
4		3	20	75	1882	1446	1403	2263936	2250000	2999999
	1129201									
5		1	20	85	1283	0	0	3397868	3000000	3749999
	383872									
6		1	20	75	1163	0	0	3783023	3750000	4499999
	1132538									
7		1	20	60	1574	0	0	4916724	4500000	5249999
	389706									
8		2	20	75	1454	1069	0	5308004	5250000	5999999
	856445									
9		1	20	95	1582	0	0	6166972	6000000	6749999
	806081									
10		2	20	90	1094	1368	0	6974635	6750000	7499999
	549809									
11		2	20	80	1514	1078	0	7526906	7500000	8249999
	1406288									
12		1	20	85	1326	0	0	8935786	8250000	8999999
	658935									
13		1	20	90	1104	0	0	9596047	9000000	9749999
	574407									
14		3	20	100	1351	1207	1189	10171558	9750000	10499999
	856285									
15		1	20	50	1703	0	0	11031590	10500000	11249999
	498460									
16		3	20	100	1215	1856	1155	11531753	11250000	11999999

Total number of pulses in waveform = 28

Waveform Num = 11
Num of Bursts = 17
Burst Interval (us) = 705882

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	96708									
1		3	5	60	1240	1147	1180	96708	0	705881
	1241302									
2		3	5	65	1959	1549	1266	1341577	705882	1411763
	102167									
3		1	5	70	1779	0	0	1448518	1411764	2117645
	1171860									
4		3	5	65	1823	1197	1763	2622157	2117646	2823527
	792823									
5		2	5	65	1009	1600	0	3419763	2823528	3529409
	552908									
6		2	5	90	1479	1360	0	3975280	3529410	4235291
	806088									
7		1	5	95	1874	0	0	4784207	4235292	4941173
	611355									
8		3	5	90	1386	1394	1592	5397436	4941174	5647055
	725824									
9		3	5	75	1839	1061	1411	6127632	5647056	6352937
	827633									
10		2	5	100	1924	1831	0	6959576	6352938	7058819
	761119									
11		3	5	70	1976	1642	1232	7724450	7058820	7764701
	735451									
12		1	5	70	1112	0	0	8464751	7764702	8470583
	317144									
13		3	5	85	1993	1506	1882	8783007	8470584	9176465
	587214									
14		2	5	50	1026	1693	0	9375602	9176466	9882347
	535040									
15		2	5	55	1471	1163	0	9913361	9882348	10588229
	1064394									
16		1	5	60	1574	0	0	10980389	10588230	11294111
	322912									
17		2	5	70	1392	1007	0	11304875	11294112	11999993

Total number of pulses in waveform = 37

```
Waveform Num = 12
Num of Bursts = 10
Burst Interval (us) = 1200000

Burst   Off Time   #        Chirp   PW     Pulse 1   Pulse 2   Pulse 3   Start Loc   Start Burst   End Burst
#       (us)       Pulses   (MHz)   (us)   Pri(us)   Pri(us)   Pri(us)   (us)        Interval(us)  Interval(us)

        39017
1               2        17      55     1460      1683      0         39017       0             1199999
        1811348
2               1        17      60     1563      0         0         1853508     1200000       2399999
        1259878
3               2        17      50     1974      1058      0         3114949     2400000       3599999
        1372561
4               1        17      95     1102      0         0         4490542     3600000       4799999
        1372882
5               1        17      90     1615      0         0         5864526     4800000       5999999
        736413
6               1        17      55     1127      0         0         6602554     6000000       7199999
        1372976
7               1        17      50     1640      0         0         7976657     7200000       8399999
        799029
8               3        17      95     1152      1794      1092      8777326     8400000       9599999
        1031810
9               2        17      100    1871      1195      0         9813174     9600000       10799999
        1811978
10              1        17      55     1075      0         0         11628218    10800000      11999999
Total number of pulses in waveform = 15
```

```
Waveform Num = 13
Num of Bursts = 10
Burst Interval (us) = 1200000

Burst   Off Time   #        Chirp   PW     Pulse 1   Pulse 2   Pulse 3   Start Loc   Start Burst   End Burst
#       (us)       Pulses   (MHz)   (us)   Pri(us)   Pri(us)   Pri(us)   (us)        Interval(us)  Interval(us)

        438465
1               2        19      60     1845      1143      0         438465      0             1199999
        920359
2               3        19      100    1922      1246      1760      1361812     1200000       2399999
        1675482
3               3        19      85     1273      1281      1948      3042222     2400000       3599999
        1237016
4               3        19      70     1726      1417      1298      4283740     3600000       4799999
        1357800
5               3        19      95     1811      1718      1751      5645981     4800000       5999999
        1053560
6               1        19      65     1529      0         0         6704821     6000000       7199999
        1237698
7               3        19      75     1777      2000      1349      7944048     7200000       8399999
        1409956
8               2        19      95     1862      1768      0         9359130     8400000       9599999
        1297623
9               3        19      70     1914      1580      1170      10660383    9600000       10799999
        1251177
10              1        19      65     1049      0         0         11916224    10800000      11999999
Total number of pulses in waveform = 24
```

Waveform Num = 14
Num of Bursts = 16
Burst Interval (us) = 750000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	712955									
1		3	14	70	1819	1384	1341	712955	0	749999
	337771									
2		3	14	80	1221	1469	1110	1055270	750000	1499999
	581170									
3		1	14	100	1255	0	0	1640240	1500000	2249999
	901169									
4		2	14	75	1401	1434	0	2542664	2250000	2999999
	1055628									
5		1	14	50	1213	0	0	3601127	3000000	3749999
	172007									
6		2	14	55	1460	1683	0	3774347	3750000	4499999
	1130633									
7		1	14	60	1563	0	0	4908123	4500000	5249999
	786478									
8		2	14	50	1974	1058	0	5696164	5250000	5999999
	857086									
9		1	14	95	1102	0	0	6556282	6000000	6749999
	857407									
10		1	14	90	1615	0	0	7414791	6750000	7499999
	459978									
11		1	14	55	1127	0	0	7876384	7500000	8249999
	857501									
12		1	14	50	1640	0	0	8735012	8250000	8999999
	498699									
13		3	14	95	1152	1794	1092	9235351	9000000	9749999
	643640									
14		2	14	100	1871	1195	0	9883029	9750000	10499999
	1131263									
15		1	14	55	1075	0	0	11017358	10500000	11249999
	383889									
16		1	14	95	1486	0	0	11402322	11250000	11999999

Total number of pulses in waveform = 26

Waveform Num = 15
Num of Bursts = 18
Burst Interval (us) = 666667

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	163236									
1		2	7	85	1990	1922	0	163236	0	666666
	685485									
2		3	7	55	1700	1657	1273	852633	666667	1333333
	752144									
3		3	7	75	1786	1426	1726	1609407	1333334	2000000
	936156									
4		1	7	80	1973	0	0	2550501	2000001	2666667
	333741									
5		3	7	85	1751	1708	1323	2886215	2666668	3333334
	957299									
6		2	7	80	1837	1477	0	3848296	3333335	4000001
	718502									
7		3	7	65	1623	1555	1879	4570112	4000002	4666668
	475240									
8		3	7	90	1759	1374	1914	5050409	4666669	5333335
	516301									
9		1	7	95	1059	0	0	5571757	5333336	6000002
	829774									
10		1	7	100	1674	0	0	6402590	6000003	6666669
	895661									
11		3	7	70	1819	1384	1341	7299925	6666670	7333336
	300047									
12		3	7	80	1221	1469	1110	7604516	7333337	8000003
	516319									
13		1	7	100	1255	0	0	8124635	8000004	8666670
	800804									
14		2	7	75	1401	1434	0	8926694	8666671	9333337
	938036									
15		1	7	50	1213	0	0	9867565	9333338	10000004
	152857									
16		2	7	55	1460	1683	0	10021635	10000005	10666671
	1004575									
17		1	7	60	1563	0	0	11029353	10666672	11333338
	698812									
18		2	7	50	1974	1058	0	11729728	11333339	12000005

Total number of pulses in waveform = 37

Waveform Num = 16
Num of Bursts = 11
Burst Interval (us) = 1090909

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	799527									
1		1	18	90	1041	0	0	799527	0	1090908
	428904									
2		2	18	95	1289	1144	0	1229472	1090909	2181817
	1655205									
3		2	18	50	1024	1640	0	2887110	2181818	3272726
	725861									
4		3	18	95	1152	1794	1092	3615635	3272727	4363635
	937708									
5		2	18	100	1871	1195	0	4557381	4363636	5454544
	1646956									
6		1	18	55	1075	0	0	6207403	5454545	6545453
	558673									
7		1	18	95	1486	0	0	6767151	6545454	7636362
	1868651									
8		3	18	55	1366	1716	1990	8637288	7636363	8727271
	847863									
9		1	18	90	1135	0	0	9490223	8727272	9818180
	911125									
10		2	18	65	1281	1948	0	10402483	9818181	10909089
	1124729									
11		3	18	70	1726	1417	1298	11530441	10909090	11999998

Total number of pulses in waveform = 21

Waveform Num = 17
Num of Bursts = 20
Burst Interval (us) = 600000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	197434									
1		3	18	85	1751	1708	1323	197434	0	599999
	860992									
2		2	18	80	1837	1477	0	1063208	600000	1199999
	646141									
3		3	18	65	1623	1555	1879	1712663	1200000	1799999
	427353									
4		3	18	90	1759	1374	1914	2145073	1800000	2399999
	464421									
5		1	18	95	1059	0	0	2614541	2400000	2999999
	746627									
6		1	18	100	1674	0	0	3362227	3000000	3599999
	805594									
7		3	18	70	1819	1384	1341	4169495	3600000	4199999
	269866									
8		3	18	80	1221	1469	1110	4443905	4200000	4799999
	464440									
9		1	18	100	1255	0	0	4912145	4800000	5399999
	720509									
10		2	18	75	1401	1434	0	5633909	5400000	5999999
	843963									
11		1	18	50	1213	0	0	6480707	6000000	6599999
	137537									
12		2	18	55	1460	1683	0	6619457	6600000	7199999
	903728									
13		1	18	60	1563	0	0	7526328	7200000	7799999
	628678									
14		2	18	50	1974	1058	0	8156569	7800000	8399999
	685261									
15		1	18	95	1102	0	0	8844862	8400000	8999999
	685582									
16		1	18	90	1615	0	0	9531546	9000000	9599999
	367833									
17		1	18	55	1127	0	0	9900994	9600000	10199999
	685676									
18		1	18	50	1640	0	0	10587797	10200000	10799999
	398589									
19		3	18	95	1152	1794	1092	10988026	10800000	11399999
	514250									
20		2	18	100	1871	1195	0	11506314	11400000	11999999

Total number of pulses in waveform = 37

```
Waveform Num = 18
Num of Bursts = 9
Burst Interval (us) = 1333333

Burst   Off Time   #        Chirp   PW     Pulse 1   Pulse 2   Pulse 3   Start Loc   Start Burst   End Burst
#       (us)       Pulses   (MHz)   (us)   Pri(us)   Pri(us)   Pri(us)   (us)        Interval(us)  Interval(us)

        1194098
1               1        6       85     1230      0         0         1194098     0             1333332
        625310
2               2        6       60     1845      1143      0         1820638     1333333       2666665
        1022906
3               3        6       100    1922      1246      1760      2846532     2666666       3999998
        1862387
4               3        6       85     1273      1281      1948      4713847     3999999       5333331
        1374976
5               3        6       70     1726      1417      1298      6093325     5333332       6666664
        1509294
6               3        6       95     1811      1718      1751      7607060     6666665       7999997
        1170892
7               1        6       65     1529      0         0         8783232     7999998       9333330
        1375645
8               3        6       75     1777      2000      1349      10160406    9333331       10666663
        1567155
9               2        6       95     1862      1768      0         11732687    10666664      11999996
Total number of pulses in waveform = 21
```

Waveform Num = 19
Num of Bursts = 17
Burst Interval (us) = 705882

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	251372									
1		3	10	80	1170	1887	1059	251372	0	705881
	876722									
2		1	10	100	1674	0	0	1132210	705882	1411763
	948640									
3		3	10	70	1819	1384	1341	2082524	1411764	2117645
	317800									
4		3	10	80	1221	1469	1110	2404868	2117646	2823527
	546836									
5		1	10	100	1255	0	0	2955504	2823528	3529409
	848034									
6		2	10	75	1401	1434	0	3804793	3529410	4235291
	993373									
7		1	10	50	1213	0	0	4801001	4235292	4941173
	161869									
8		2	10	55	1460	1683	0	4964083	4941174	5647055
	1063895									
9		1	10	60	1563	0	0	6031121	5647056	6352937
	740066									
10		2	10	50	1974	1058	0	6772750	6352938	7058819
	806549									
11		1	10	95	1102	0	0	7582331	7058820	7764701
	806870									
12		1	10	90	1615	0	0	8390303	7764702	8470583
	432876									
13		1	10	55	1127	0	0	8824794	8470584	9176465
	806964									
14		1	10	50	1640	0	0	9632885	9176466	9882347
	469255									
15		3	10	95	1152	1794	1092	10103780	9882348	10588229
	605583									
16		2	10	100	1871	1195	0	10713401	10588230	11294111
	1064526									
17		1	10	55	1075	0	0	11780993	11294112	11999993

Total number of pulses in waveform = 29

Waveform Num = 20
Num of Bursts = 10
Burst Interval (us) = 1200000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	438465									
1		2	19	60	1845	1143	0	438465	0	1199999
	920359									
2		3	19	100	1922	1246	1760	1361812	1200000	2399999
	1675482									
3		3	19	85	1273	1281	1948	3042222	2400000	3599999
	1237016									
4		3	19	70	1726	1417	1298	4283740	3600000	4799999
	1357800									
5		3	19	95	1811	1718	1751	5645981	4800000	5999999
	1053560									
6		1	19	65	1529	0	0	6704821	6000000	7199999
	1237698									
7		3	19	75	1777	2000	1349	7944048	7200000	8399999
	1409956									
8		2	19	95	1862	1768	0	9359130	8400000	9599999
	1297623									
9		3	19	70	1914	1580	1170	10660383	9600000	10799999
	1251177									
10		1	19	65	1049	0	0	11916224	10800000	11999999

Total number of pulses in waveform = 24

Waveform Num = 21
Num of Bursts = 16
Burst Interval (us) = 750000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	712955									
1		3	14	70	1819	1384	1341	712955	0	749999
	337771									
2		3	14	80	1221	1469	1110	1055270	750000	1499999
	581170									
3		1	14	100	1255	0	0	1640240	1500000	2249999
	901169									
4		2	14	75	1401	1434	0	2542664	2250000	2999999
	1055628									
5		1	14	50	1213	0	0	3601127	3000000	3749999
	172007									
6		2	14	55	1460	1683	0	3774347	3750000	4499999
	1130633									
7		1	14	60	1563	0	0	4908123	4500000	5249999
	786478									
8		2	14	50	1974	1058	0	5696164	5250000	5999999
	857086									
9		1	14	95	1102	0	0	6556282	6000000	6749999
	857407									
10		1	14	90	1615	0	0	7414791	6750000	7499999
	459978									
11		1	14	55	1127	0	0	7876384	7500000	8249999
	857501									
12		1	14	50	1640	0	0	8735012	8250000	8999999
	498699									
13		3	14	95	1152	1794	1092	9235351	9000000	9749999
	643640									
14		2	14	100	1871	1195	0	9883029	9750000	10499999
	1131263									
15		1	14	55	1075	0	0	11017358	10500000	11249999
	383889									
16		1	14	95	1486	0	0	11402322	11250000	11999999

Total number of pulses in waveform = 26

Waveform Num = 22
Num of Bursts = 18
Burst Interval (us) = 666667

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	163236									
1		2	7	85	1990	1922	0	163236	0	666666
	685485									
2		3	7	55	1700	1657	1273	852633	666667	1333333
	752144									
3		3	7	75	1786	1426	1726	1609407	1333334	2000000
	936156									
4		1	7	80	1973	0	0	2550501	2000001	2666667
	333741									
5		3	7	85	1751	1708	1323	2886215	2666668	3333334
	957299									
6		2	7	80	1837	1477	0	3848296	3333335	4000001
	718502									
7		3	7	65	1623	1555	1879	4570112	4000002	4666668
	475240									
8		3	7	90	1759	1374	1914	5050409	4666669	5333335
	516301									
9		1	7	95	1059	0	0	5571757	5333336	6000002
	829774									
10		1	7	100	1674	0	0	6402590	6000003	6666669
	895661									
11		3	7	70	1819	1384	1341	7299925	6666670	7333336
	300047									
12		3	7	80	1221	1469	1110	7604516	7333337	8000003
	516319									
13		1	7	100	1255	0	0	8124635	8000004	8666670
	800804									
14		2	7	75	1401	1434	0	8926694	8666671	9333337
	938036									
15		1	7	50	1213	0	0	9867565	9333338	10000004
	152857									
16		2	7	55	1460	1683	0	10021635	10000005	10666671
	1004575									
17		1	7	60	1563	0	0	11029353	10666672	11333338
	698812									
18		2	7	50	1974	1058	0	11729728	11333339	12000005

Total number of pulses in waveform = 37

```
Waveform Num = 23
Num of Bursts = 11
Burst Interval (us) = 1090909

Burst   Off Time   #        Chirp   PW     Pulse 1   Pulse 2   Pulse 3   Start Loc   Start Burst   End Burst
#       (us)       Pulses   (MHz)   (us)   Pri(us)   Pri(us)   Pri(us)   (us)        Interval(us)  Interval(us)

        799527
1               1        18      90     1041      0         0         799527      0             1090908
        428904
2               2        18      95     1289      1144      0         1229472     1090909       2181817
        1655205
3               2        18      50     1024      1640      0         2887110     2181818       3272726
        725861
4               3        18      95     1152      1794      1092      3615635     3272727       4363635
        937708
5               2        18      100    1871      1195      0         4557381     4363636       5454544
        1646956
6               1        18      55     1075      0         0         6207403     5454545       6545453
        558673
7               1        18      95     1486      0         0         6767151     6545454       7636362
        1868651
8               3        18      55     1366      1716      1990      8637288     7636363       8727271
        847863
9               1        18      90     1135      0         0         9490223     8727272       9818180
        911125
10              2        18      65     1281      1948      0         10402483    9818181       10909089
        1124729
11              3        18      70     1726      1417      1298      11530441    10909090      11999998
Total number of pulses in waveform = 21
```

Waveform Num = 24
Num of Bursts = 20
Burst Interval (us) = 600000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	197434									
1		3	18	85	1751	1708	1323	197434	0	599999
	860992									
2		2	18	80	1837	1477	0	1063208	600000	1199999
	646141									
3		3	18	65	1623	1555	1879	1712663	1200000	1799999
	427353									
4		3	18	90	1759	1374	1914	2145073	1800000	2399999
	464421									
5		1	18	95	1059	0	0	2614541	2400000	2999999
	746627									
6		1	18	100	1674	0	0	3362227	3000000	3599999
	805594									
7		3	18	70	1819	1384	1341	4169495	3600000	4199999
	269866									
8		3	18	80	1221	1469	1110	4443905	4200000	4799999
	464440									
9		1	18	100	1255	0	0	4912145	4800000	5399999
	720509									
10		2	18	75	1401	1434	0	5633909	5400000	5999999
	843963									
11		1	18	50	1213	0	0	6480707	6000000	6599999
	137537									
12		2	18	55	1460	1683	0	6619457	6600000	7199999
	903728									
13		1	18	60	1563	0	0	7526328	7200000	7799999
	628678									
14		2	18	50	1974	1058	0	8156569	7800000	8399999
	685261									
15		1	18	95	1102	0	0	8844862	8400000	8999999
	685582									
16		1	18	90	1615	0	0	9531546	9000000	9599999
	367833									
17		1	18	55	1127	0	0	9900994	9600000	10199999
	685676									
18		1	18	50	1640	0	0	10587797	10200000	10799999
	398589									
19		3	18	95	1152	1794	1092	10988026	10800000	11399999
	514250									
20		2	18	100	1871	1195	0	11506314	11400000	11999999

Total number of pulses in waveform = 37

```
Waveform Num = 25
Num of Bursts = 9
Burst Interval (us) = 1333333

Burst   Off Time   #        Chirp   PW     Pulse 1   Pulse 2   Pulse 3   Start Loc   Start Burst   End Burst
#       (us)       Pulses   (MHz)   (us)   Pri(us)   Pri(us)   Pri(us)   (us)        Interval(us)  Interval(us)

        1194098
1               1        6       85     1230      0         0         1194098     0             1333332
        625310
2               2        6       60     1845      1143      0         1820638     1333333       2666665
        1022906
3               3        6       100    1922      1246      1760      2846532     2666666       3999998
        1862387
4               3        6       85     1273      1281      1948      4713847     3999999       5333331
        1374976
5               3        6       70     1726      1417      1298      6093325     5333332       6666664
        1509294
6               3        6       95     1811      1718      1751      7607060     6666665       7999997
        1170892
7               1        6       65     1529      0         0         8783232     7999998       9333330
        1375645
8               3        6       75     1777      2000      1349      10160406    9333331       10666663
        1567155
9               2        6       95     1862      1768      0         11732687    10666664      11999996
Total number of pulses in waveform = 21
```

Waveform Num = 26
Num of Bursts = 17
Burst Interval (us) = 705882

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	251372									
1		3	10	80	1170	1887	1059	251372	0	705881
	876722									
2		1	10	100	1674	0	0	1132210	705882	1411763
	948640									
3		3	10	70	1819	1384	1341	2082524	1411764	2117645
	317800									
4		3	10	80	1221	1469	1110	2404868	2117646	2823527
	546836									
5		1	10	100	1255	0	0	2955504	2823528	3529409
	848034									
6		2	10	75	1401	1434	0	3804793	3529410	4235291
	993373									
7		1	10	50	1213	0	0	4801001	4235292	4941173
	161869									
8		2	10	55	1460	1683	0	4964083	4941174	5647055
	1063895									
9		1	10	60	1563	0	0	6031121	5647056	6352937
	740066									
10		2	10	50	1974	1058	0	6772750	6352938	7058819
	806549									
11		1	10	95	1102	0	0	7582331	7058820	7764701
	806870									
12		1	10	90	1615	0	0	8390303	7764702	8470583
	432876									
13		1	10	55	1127	0	0	8824794	8470584	9176465
	806964									
14		1	10	50	1640	0	0	9632885	9176466	9882347
	469255									
15		3	10	95	1152	1794	1092	10103780	9882348	10588229
	605583									
16		2	10	100	1871	1195	0	10713401	10588230	11294111
	1064526									
17		1	10	55	1075	0	0	11780993	11294112	11999993

Total number of pulses in waveform = 29

Waveform Num = 27
Num of Bursts = 10
Burst Interval (us) = 1200000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	438465									
1		2	19	60	1845	1143	0	438465	0	1199999
	920359									
2		3	19	100	1922	1246	1760	1361812	1200000	2399999
	1675482									
3		3	19	85	1273	1281	1948	3042222	2400000	3599999
	1237016									
4		3	19	70	1726	1417	1298	4283740	3600000	4799999
	1357800									
5		3	19	95	1811	1718	1751	5645981	4800000	5999999
	1053560									
6		1	19	65	1529	0	0	6704821	6000000	7199999
	1237698									
7		3	19	75	1777	2000	1349	7944048	7200000	8399999
	1409956									
8		2	19	95	1862	1768	0	9359130	8400000	9599999
	1297623									
9		3	19	70	1914	1580	1170	10660383	9600000	10799999
	1251177									
10		1	19	65	1049	0	0	11916224	10800000	11999999

Total number of pulses in waveform = 24

Waveform Num = 28
Num of Bursts = 16
Burst Interval (us) = 750000

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	712955									
1		3	14	70	1819	1384	1341	712955	0	749999
	337771									
2		3	14	80	1221	1469	1110	1055270	750000	1499999
	581170									
3		1	14	100	1255	0	0	1640240	1500000	2249999
	901169									
4		2	14	75	1401	1434	0	2542664	2250000	2999999
	1055628									
5		1	14	50	1213	0	0	3601127	3000000	3749999
	172007									
6		2	14	55	1460	1683	0	3774347	3750000	4499999
	1130633									
7		1	14	60	1563	0	0	4908123	4500000	5249999
	786478									
8		2	14	50	1974	1058	0	5696164	5250000	5999999
	857086									
9		1	14	95	1102	0	0	6556282	6000000	6749999
	857407									
10		1	14	90	1615	0	0	7414791	6750000	7499999
	459978									
11		1	14	55	1127	0	0	7876384	7500000	8249999
	857501									
12		1	14	50	1640	0	0	8735012	8250000	8999999
	498699									
13		3	14	95	1152	1794	1092	9235351	9000000	9749999
	643640									
14		2	14	100	1871	1195	0	9883029	9750000	10499999
	1131263									
15		1	14	55	1075	0	0	11017358	10500000	11249999
	383889									
16		1	14	95	1486	0	0	11402322	11250000	11999999

Total number of pulses in waveform = 26

Waveform Num = 29
Num of Bursts = 18
Burst Interval (us) = 666667

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	163236									
1		2	7	85	1990	1922	0	163236	0	666666
	685485									
2		3	7	55	1700	1657	1273	852633	666667	1333333
	752144									
3		3	7	75	1786	1426	1726	1609407	1333334	2000000
	936156									
4		1	7	80	1973	0	0	2550501	2000001	2666667
	333741									
5		3	7	85	1751	1708	1323	2886215	2666668	3333334
	957299									
6		2	7	80	1837	1477	0	3848296	3333335	4000001
	718502									
7		3	7	65	1623	1555	1879	4570112	4000002	4666668
	475240									
8		3	7	90	1759	1374	1914	5050409	4666669	5333335
	516301									
9		1	7	95	1059	0	0	5571757	5333336	6000002
	829774									
10		1	7	100	1674	0	0	6402590	6000003	6666669
	895661									
11		3	7	70	1819	1384	1341	7299925	6666670	7333336
	300047									
12		3	7	80	1221	1469	1110	7604516	7333337	8000003
	516319									
13		1	7	100	1255	0	0	8124635	8000004	8666670
	800804									
14		2	7	75	1401	1434	0	8926694	8666671	9333337
	938036									
15		1	7	50	1213	0	0	9867565	9333338	10000004
	152857									
16		2	7	55	1460	1683	0	10021635	10000005	10666671
	1004575									
17		1	7	60	1563	0	0	11029353	10666672	11333338
	698812									
18		2	7	50	1974	1058	0	11729728	11333339	12000005

Total number of pulses in waveform = 37

Waveform Num = 30
Num of Bursts = 11
Burst Interval (us) = 1090909

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	799527									
1		1	18	90	1041	0	0	799527	0	1090908
	428904									
2		2	18	95	1289	1144	0	1229472	1090909	2181817
	1655205									
3		2	18	50	1024	1640	0	2887110	2181818	3272726
	725861									
4		3	18	95	1152	1794	1092	3615635	3272727	4363635
	937708									
5		2	18	100	1871	1195	0	4557381	4363636	5454544
	1646956									
6		1	18	55	1075	0	0	6207403	5454545	6545453
	558673									
7		1	18	95	1486	0	0	6767151	6545454	7636362
	1868651									
8		3	18	55	1366	1716	1990	8637288	7636363	8727271
	847863									
9		1	18	90	1135	0	0	9490223	8727272	9818180
	911125									
10		2	18	65	1281	1948	0	10402483	9818181	10909089
	1124729									
11		3	18	70	1726	1417	1298	11530441	10909090	11999998

Total number of pulses in waveform = 21

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	704	5290	6	Yes
2	1179	5291	4	Yes
3	1654	5292	6	Yes
4	2129	5293	3	Yes
5	2604	5294	5	Yes
6	3079	5295	4	Yes
7	3554	5296	6	Yes
8	4029	5297	4	Yes
9	4504	5298	6	Yes
10	4979	5299	5	Yes
11	5454	5300	3	Yes
12	5929	5301	2	Yes
13	6404	5302	6	Yes
14	6879	5303	2	Yes
15	7354	5304	4	Yes
16	7829	5305	6	Yes
17	8304	5306	5	Yes
18	8779	5307	5	Yes
19	9254	5308	4	Yes
20	9729	5309	5	Yes
21	10204	5310	1	No
22	10679	5290	2	Yes
23	11154	5291	4	Yes
24	11629	5292	5	Yes
25	12104	5293	6	Yes
26	12579	5294	4	Yes
27	13054	5295	6	Yes
28	13529	5296	5	Yes
29	14004	5297	2	Yes
30	14479	5298	2	Yes
31	14954	5299	7	Yes
32	15429	5300	5	Yes
33	15904	5301	4	Yes
34	16379	5302	3	Yes
35	16854	5303	3	Yes
36	17329	5304	3	Yes
37	17804	5305	4	Yes
38	18279	5306	2	Yes
39	18754	5307	6	Yes
40	19229	5308	7	Yes
41	19704	5309	6	Yes
42	20179	5310	6	Yes

7.3. RESULTS FOR 40 MHz BANDWIDTH

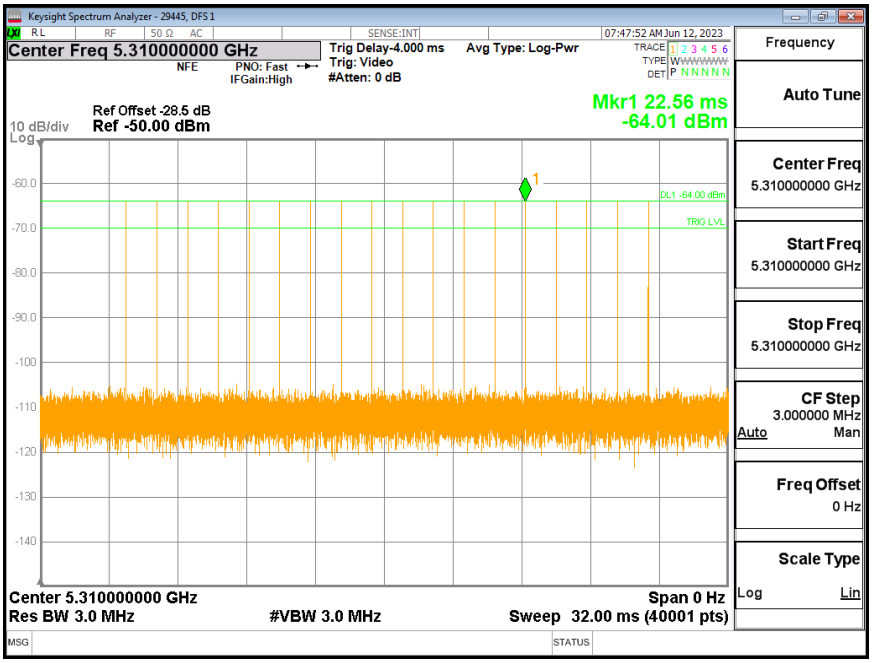
7.3.1. TEST CHANNEL

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

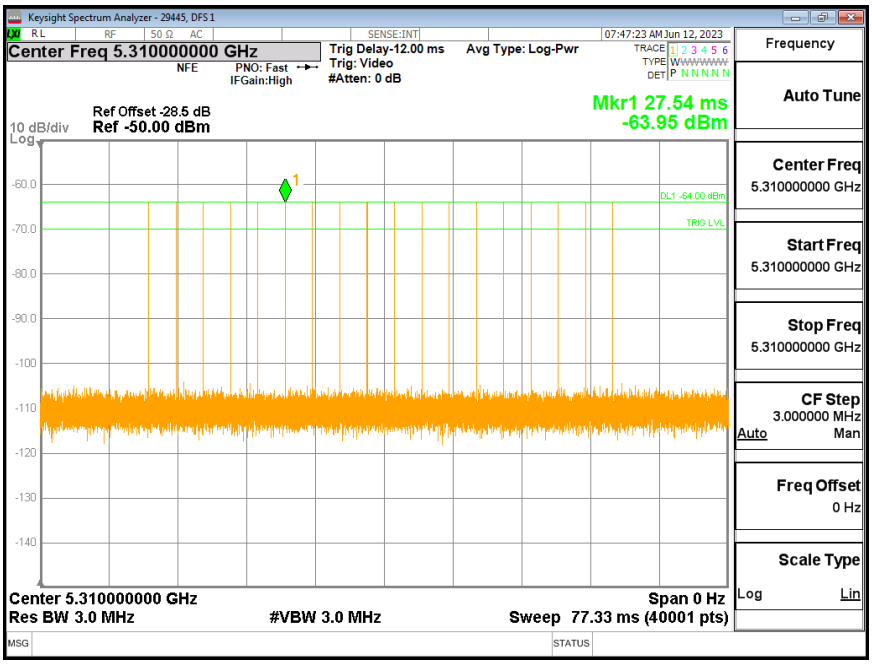
7.3.2. RADAR WAVEFORMS AND TRAFFIC

RADAR WAVEFORMS

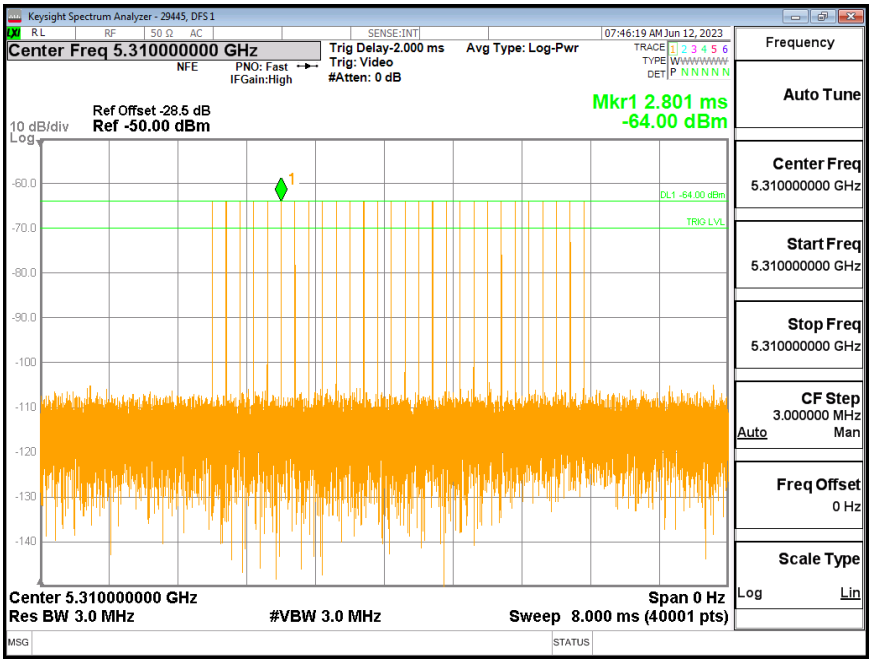
SHORT PULSE RADAR TYPE 0



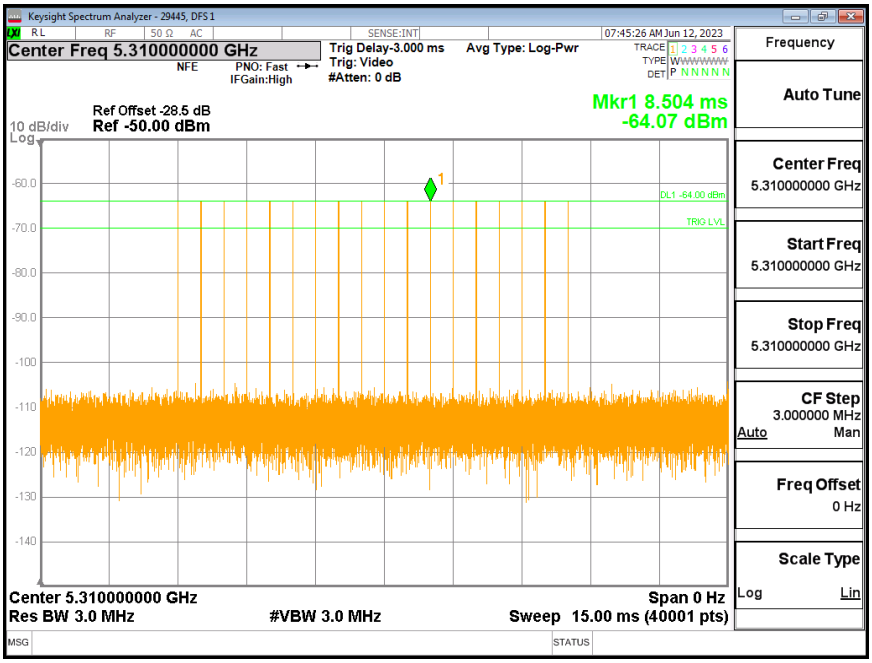
SAMPLE OF RADAR TYPE 1



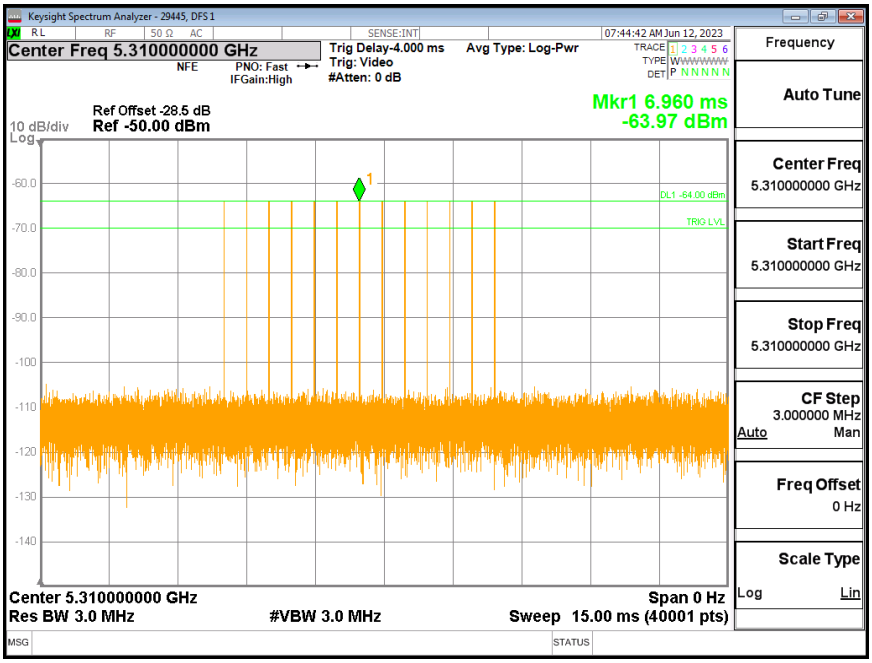
SAMPLE OF RADAR TYPE 2



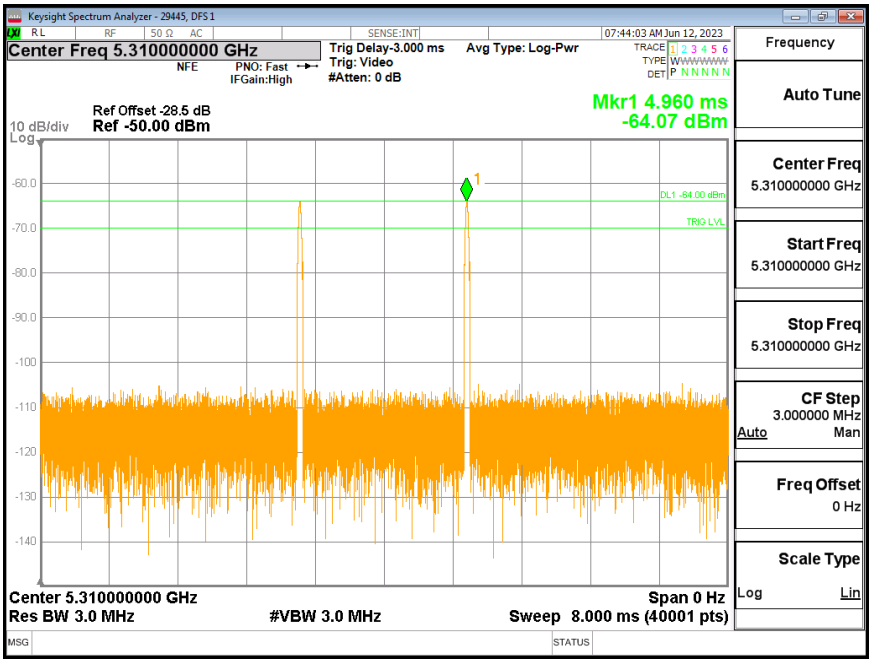
SAMPLE OF RADAR TYPE 3



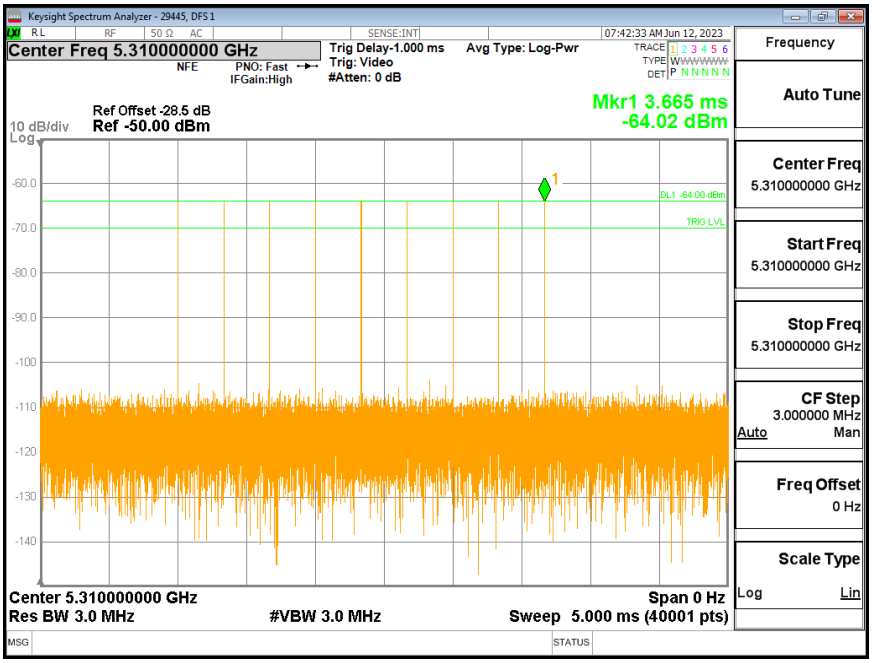
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

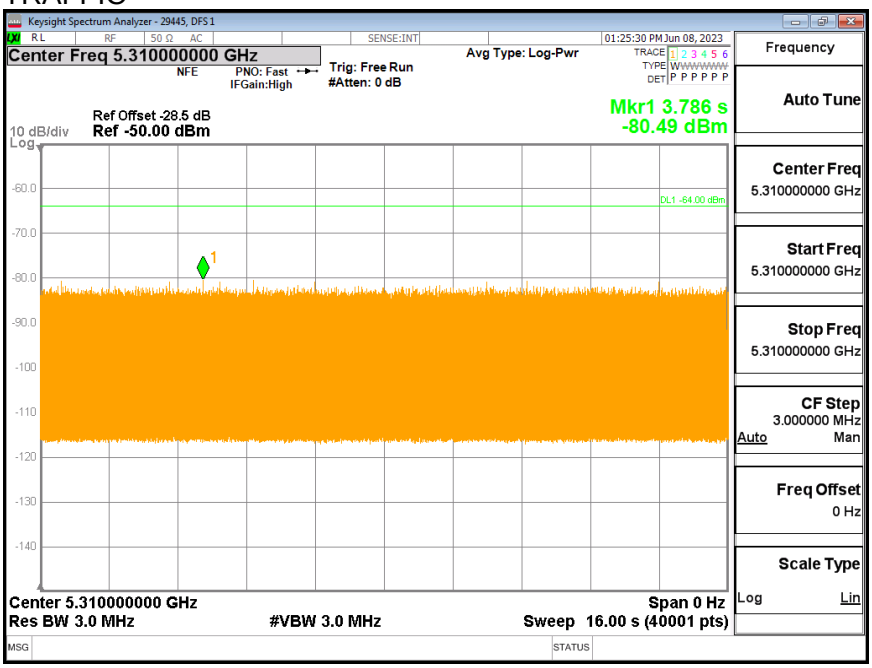


SINGLE BURST OF RADAR TYPE 6

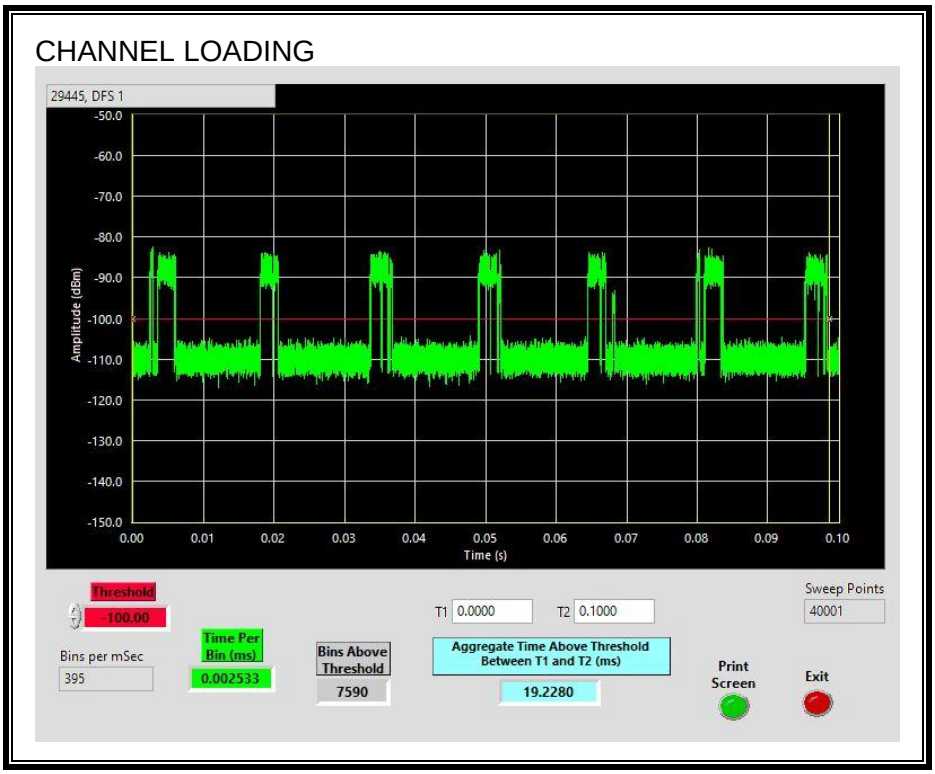


TRAFFIC

TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 19.22%

7.3.3. CHANNEL AVAILABILITY CHECK TIME

PROCEDURE TO DETERMINE CAC PERIOD TIME

A software command was issued to the EUT to change to the test channel. The measured time from the software command to the start of traffic was measured. The initialization time is the 60-second CAC period subtracted from the total measured time of the plot.

PROCEDURE FOR TIMING OF RADAR BURST

A software command was issued to the EUT to change to the test channel. A radar signal was triggered within 0 to 6 seconds after the beginning of the CAC period. Transmissions on the channel were monitored on the spectrum analyzer and a plot was captured

The was rebooted to clear the Non-Occupancy list. A software command was issued to the EUT to change to the test channel. A radar signal was triggered within 54 to 60 seconds after the beginning of the CAC period. Transmissions on the channel were monitored on the spectrum analyzer and a plot was captured

QUANTITATIVE RESULTS

No Radar Triggered

Timing of Software Command (sec)	Timing of Start of Traffic (sec)	Channel Initialization Time (sec)
0	68.28	8.28

Radar Near Beginning of CAC

Timing of Software Command (sec)	Timing of Radar Burst (sec)	Radar Relative to Beginning of CAC (sec)
0	11.30	3.02

Radar Near End of CAC

Timing of Software Command (sec)	Timing of Radar Burst (sec)	Radar Relative to Beginning of CAC (sec)
0	64.88	56.60

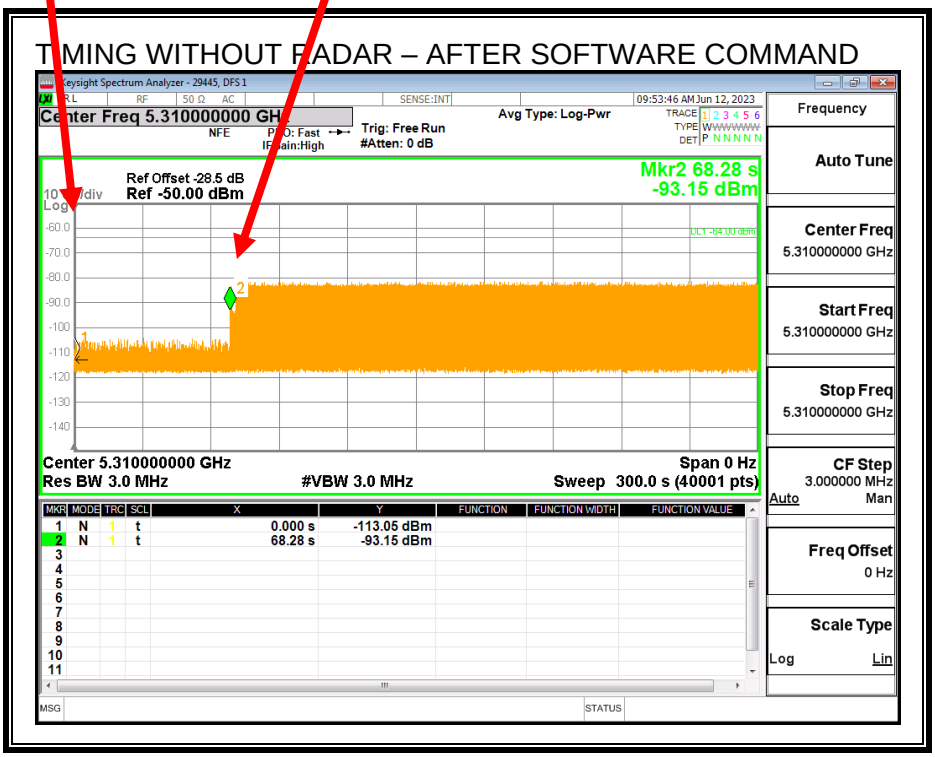
QUALITATIVE RESULTS

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 initialization 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

Software Command Issued
Change to Test Channel

End of CAC Period

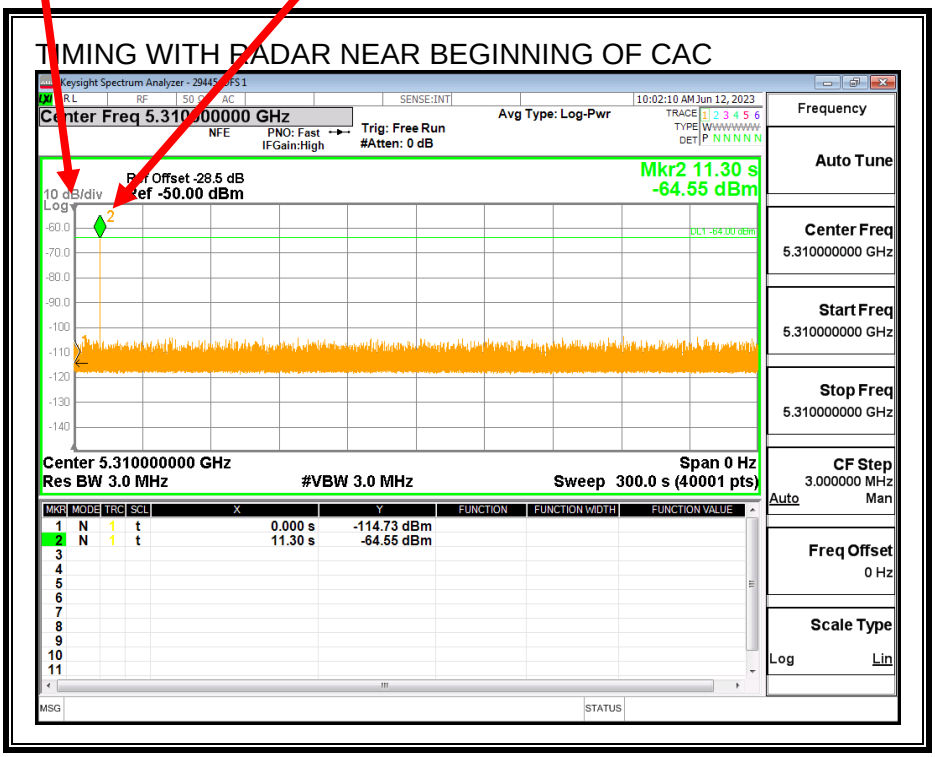


Transmissions begin on channel after completion of the initial power-up cycle and the CAC.

TIMING WITH RADAR NEAR BEGINNING OF CAC

Software Command Issued
Change to Test Channel

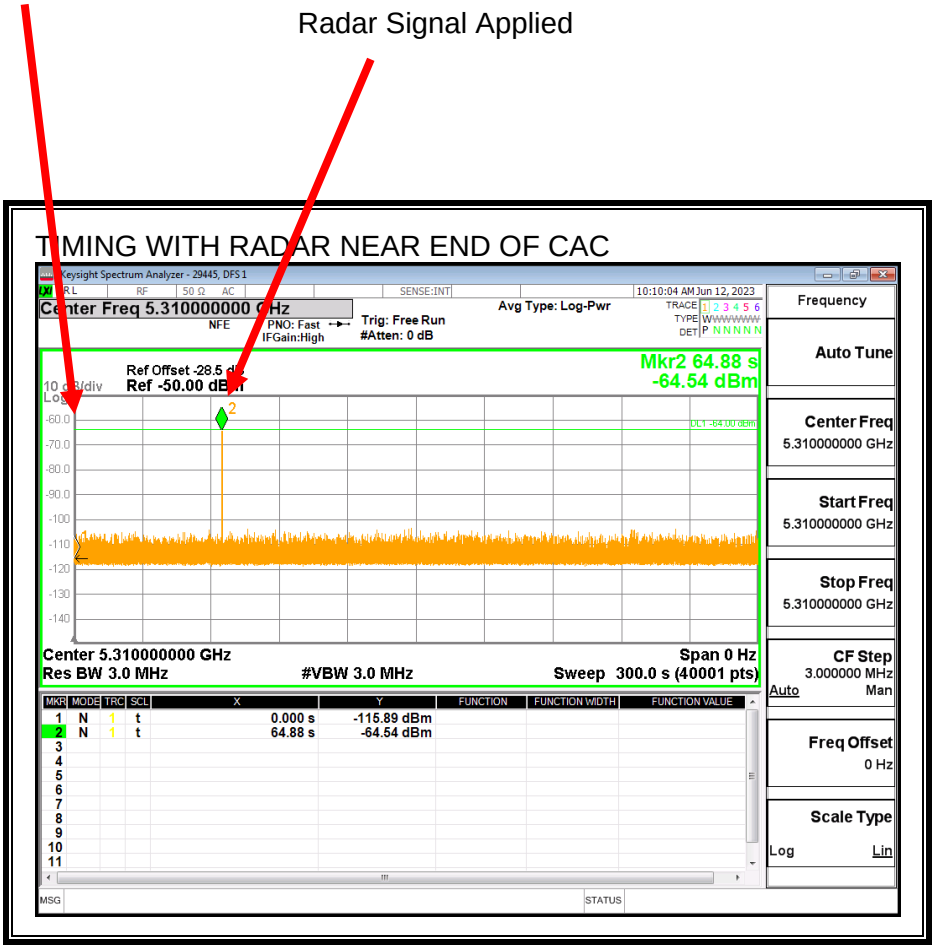
Radar Signal Applied



No EUT transmissions were observed after the radar signal.

TIMING WITH RADAR NEAR END OF CAC

Software Command Issued
Change to Test Channel



No EUT transmissions were observed after the radar signal.

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

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)

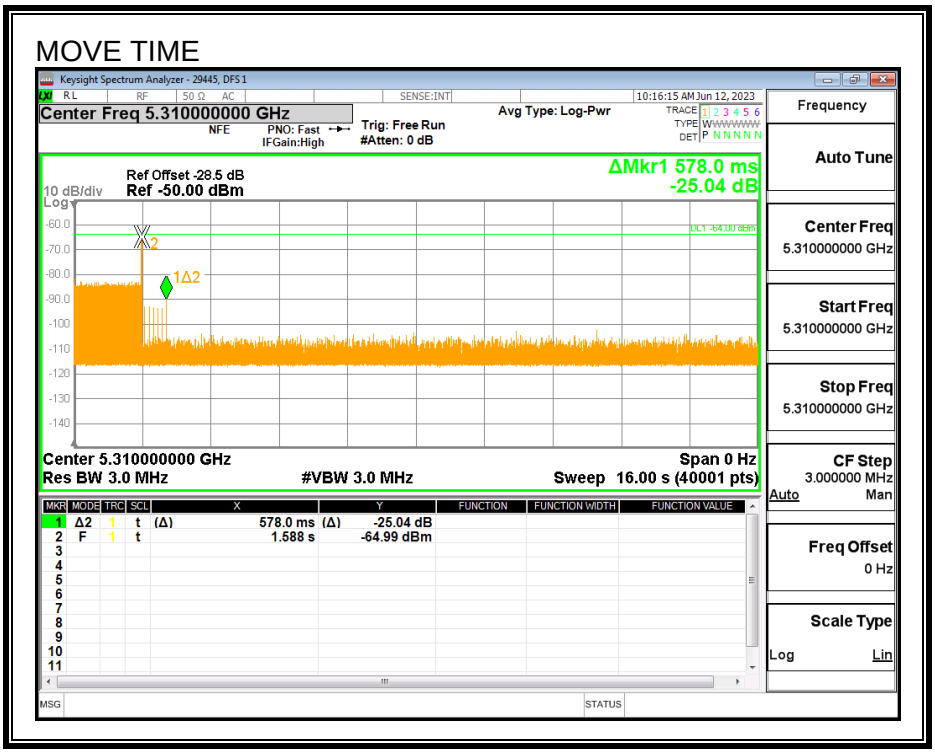
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

Channel Move Time (sec)	Limit (sec)
0.578	10

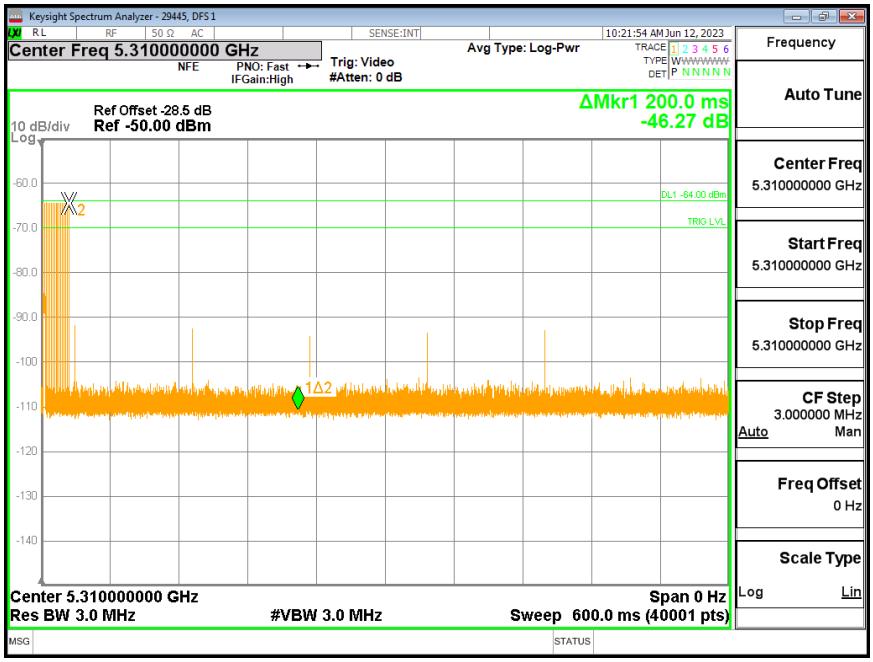
Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
2.8	60

MOVE TIME



CHANNEL CLOSING TIME

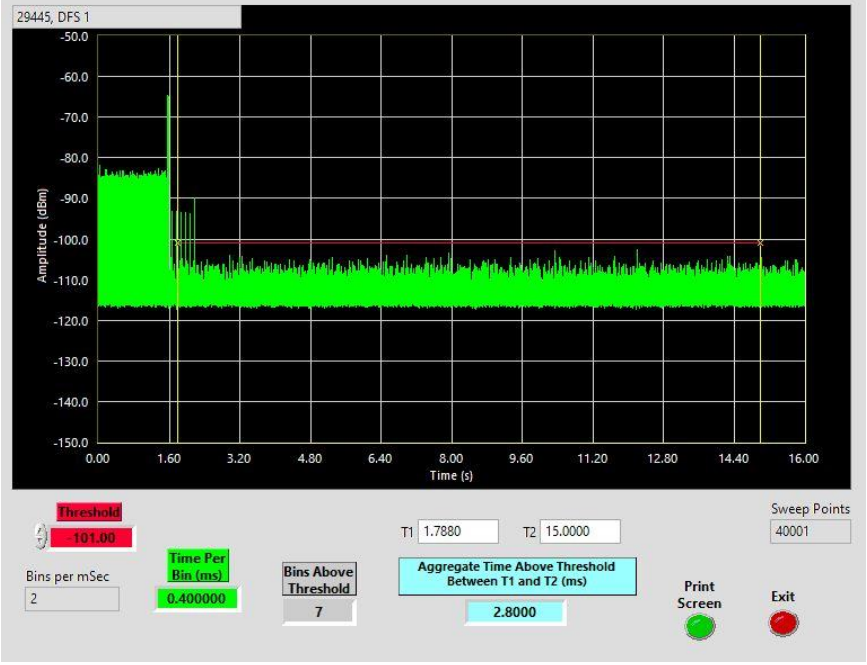
CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

Only intermittent transmissions are observed during the aggregate monitoring period.

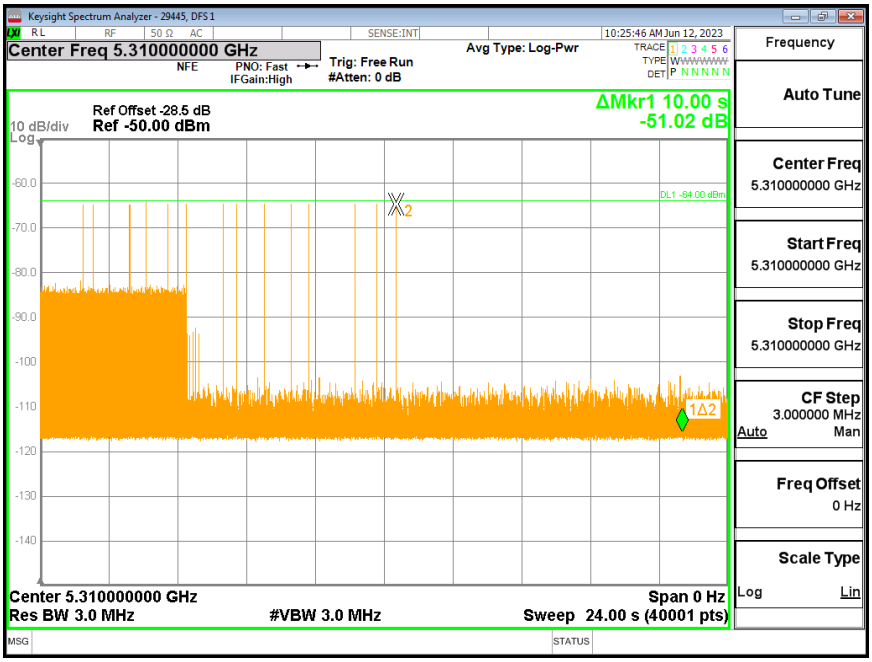
AGGREGATE CLOSING TIME



LONG PULSE CHANNEL MOVE TIME

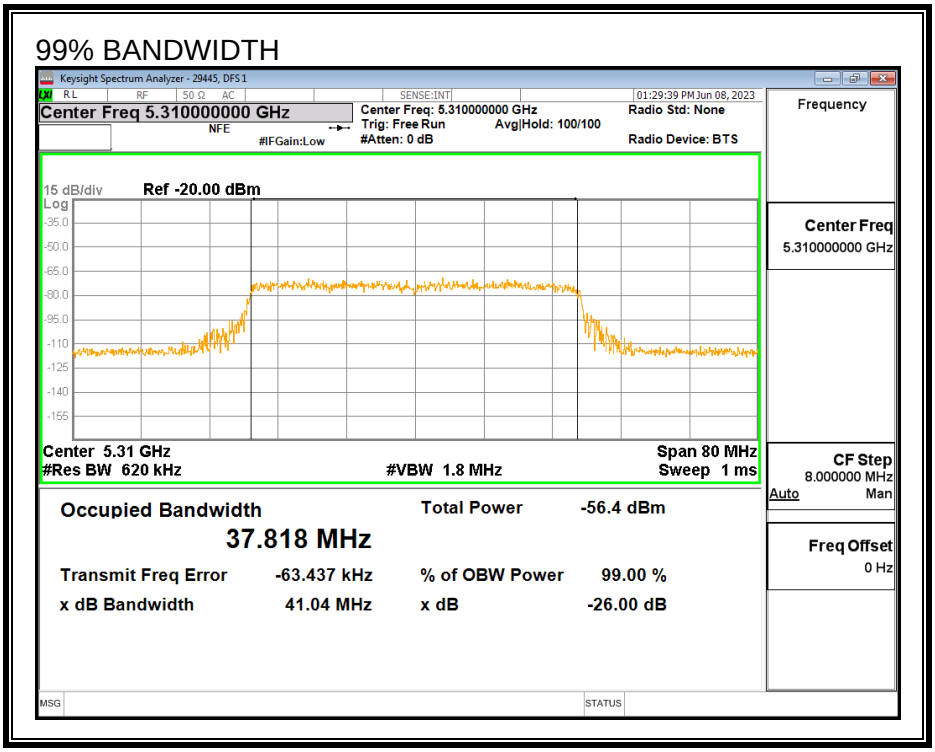
The traffic ceases prior to 10 seconds after the end of the radar waveform.

MOVE TIME FOR LONG PULSE RADAR



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 (%)
5290	5330	40	37.818	105.8	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
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

7.3.7. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary

Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail	Detection Bandwidth FL	Detection Bandwidth FH	OBW	Test Location	Employee Number	In-Service Monitoring Version
FCC Short Pulse Type 1	30	96.67	60	Pass	5290	5330	37.82	DFS 1	29445	v4.1
FCC Short Pulse Type 2	30	86.67	60	Pass	5290	5330	37.82	DFS 1	29445	v4.1
FCC Short Pulse Type 3	30	93.33	60	Pass	5290	5330	37.82	DFS 1	29445	v4.1
FCC Short Pulse Type 4	30	90.00	60	Pass	5290	5330	37.82	DFS 1	29445	v4.1
Aggregate		91.67	80	Pass						
FCC Long Pulse Type 5	30	100.00	80	Pass	5290	5330	37.82	DFS 1	29445	v4.1
FCC Hopping Type 6	41	100.00	70	Pass	5290	5330		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	5322	Yes
1002	1	758	70	A	5296	Yes
1003	1	698	76	A	5317	Yes
1004	1	658	81	A	5328	Yes
1005	1	638	83	A	5295	Yes
1006	1	918	58	A	5309	Yes
1007	1	558	95	A	5306	Yes
1008	1	598	89	A	5311	Yes
1009	1	538	99	A	5307	Yes
1010	1	678	78	A	5321	Yes
1011	1	778	68	A	5300	Yes
1012	1	618	86	A	5325	Yes
1013	1	578	92	A	5324	Yes
1014	1	718	74	A	5317	No
1015	1	938	57	A	5300	Yes
1016	1	1840	29	B	5310	Yes
1017	1	990	54	B	5323	Yes
1018	1	2493	22	B	5301	Yes
1019	1	1773	30	B	5309	Yes
1020	1	2211	24	B	5329	Yes
1021	1	2973	18	B	5291	Yes
1022	1	2187	25	B	5322	Yes
1023	1	1885	28	B	5292	Yes
1024	1	1228	43	B	5330	Yes
1025	1	1055	51	B	5318	Yes
1026	1	1882	29	B	5322	Yes
1027	1	643	83	B	5316	Yes
1028	1	1599	34	B	5318	Yes
1029	1	3038	18	B	5315	Yes
1030	1	2929	19	B	5317	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	1.5	160	28	5318	Yes
2002	2.6	201	24	5301	Yes
2003	3.3	172	24	5327	Yes
2004	2.7	179	27	5299	Yes
2005	3.7	196	27	5305	Yes
2006	3.3	164	24	5298	Yes
2007	2.5	228	27	5306	Yes
2008	2.3	201	28	5314	Yes
2009	1.8	188	25	5293	Yes
2010	4	208	27	5318	Yes
2011	1.7	161	24	5313	Yes
2012	4.1	185	23	5296	No
2013	2.1	224	24	5311	Yes
2014	4.7	213	23	5315	Yes
2015	2.8	175	25	5330	No
2016	3.7	169	24	5303	Yes
2017	4.3	216	23	5294	No
2018	1.3	176	29	5293	Yes
2019	2	189	28	5319	Yes
2020	1.4	153	25	5290	Yes
2021	2.4	170	25	5307	No
2022	2	219	25	5319	Yes
2023	1.2	203	25	5304	Yes
2024	1	175	26	5323	Yes
2025	4.6	163	23	5327	Yes
2026	2.7	225	25	5292	Yes
2027	4.5	217	26	5321	Yes
2028	2.8	159	27	5299	Yes
2029	4.9	198	29	5301	Yes
2030	3.4	188	28	5325	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	6.5	500	18	5308	Yes
3002	9.6	481	18	5307	Yes
3003	8	376	18	5303	Yes
3004	9.1	251	17	5316	Yes
3005	9.8	292	17	5319	Yes
3006	9.2	432	16	5294	Yes
3007	6.1	485	18	5326	Yes
3008	9.8	386	16	5321	Yes
3009	9	335	16	5325	Yes
3010	6.9	382	16	5293	Yes
3011	6.4	461	18	5308	Yes
3012	6.4	404	18	5318	Yes
3013	8.2	378	16	5296	Yes
3014	6.5	451	17	5292	Yes
3015	8.6	320	17	5329	Yes
3016	7.1	288	17	5304	Yes
3017	7.4	421	17	5300	Yes
3018	8.3	401	17	5298	Yes
3019	6.7	296	17	5296	No
3020	9.9	423	16	5309	Yes
3021	8.5	464	16	5309	Yes
3022	7.9	352	18	5328	Yes
3023	8.9	406	16	5328	Yes
3024	6.5	307	18	5299	Yes
3025	7.7	256	16	5322	Yes
3026	9.7	303	18	5294	No
3027	9.2	264	17	5311	Yes
3028	7.2	324	18	5297	Yes
3029	6.9	299	18	5321	Yes
3030	9.3	254	16	5296	Yes

TYPE 4 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 4

Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Frequency (MHz)	Successful Detection (Yes/No)
4001	13.9	492	13	5302	Yes
4002	15.4	459	12	5324	Yes
4003	11.3	341	13	5304	No
4004	13.3	322	13	5295	Yes
4005	18.8	350	12	5300	Yes
4006	16.9	343	12	5328	Yes
4007	13.8	384	16	5309	Yes
4008	12.4	273	14	5326	Yes
4009	19.4	326	16	5326	Yes
4010	18.5	361	14	5314	Yes
4011	12	427	16	5301	Yes
4012	16.4	475	14	5313	Yes
4013	15.2	436	12	5318	Yes
4014	20	496	16	5319	Yes
4015	19.3	470	14	5298	Yes
4016	15.5	425	15	5305	Yes
4017	11	412	16	5305	Yes
4018	12.5	380	15	5293	Yes
4019	17.6	262	12	5313	Yes
4020	19.5	494	16	5306	Yes
4021	15.9	271	15	5302	No
4022	14.1	264	13	5316	No
4023	15.8	305	12	5315	Yes
4024	18.6	444	12	5303	Yes
4025	16.5	498	14	5325	Yes
4026	15.6	281	12	5302	Yes
4027	18.2	348	15	5328	Yes
4028	13.5	395	13	5295	Yes
4029	12.3	357	13	5294	Yes
4030	17.2	417	14	5321	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	Yes
5	5310	Yes
6	5310	Yes
7	5310	Yes
8	5310	Yes
9	5310	Yes
10	5310	Yes
11	5294	Yes
12	5298	Yes
13	5299	Yes
14	5297	Yes
15	5294	Yes
16	5299	Yes
17	5299	Yes
18	5294	Yes
19	5296	Yes
20	5299	Yes
21	5323	Yes
22	5326	Yes
23	5321	Yes
24	5321	Yes
25	5326	Yes
26	5325	Yes
27	5321	Yes
28	5323	Yes
29	5326	Yes
30	5321	Yes

TYPE 5 RADAR WAVEFORM PARAMETERS

The Type 5 radar waveform parameters for the 40 MHz channel bandwidth tests are the same as the Type 5 radar waveform parameters documented in the 20 MHz channel bandwidth results section.

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	757	5290	12	Yes
2	1232	5291	9	Yes
3	1707	5292	7	Yes
4	2182	5293	9	Yes
5	2657	5294	13	Yes
6	3132	5295	9	Yes
7	3607	5296	6	Yes
8	4082	5297	3	Yes
9	4557	5298	9	Yes
10	5032	5299	10	Yes
11	5507	5300	9	Yes
12	5982	5301	11	Yes
13	6457	5302	9	Yes
14	6932	5303	12	Yes
15	7407	5304	6	Yes
16	7882	5305	11	Yes
17	8357	5306	9	Yes
18	8832	5307	10	Yes
19	9307	5308	7	Yes
20	9782	5309	9	Yes
21	10257	5310	8	Yes
22	10732	5311	10	Yes
23	11207	5312	8	Yes
24	11682	5313	7	Yes
25	12157	5314	12	Yes
26	12632	5315	5	Yes
27	13107	5316	13	Yes
28	13582	5317	6	Yes
29	14057	5318	9	Yes
30	14532	5319	7	Yes
31	15007	5320	7	Yes
32	15482	5321	5	Yes
33	15957	5322	7	Yes
34	16432	5323	8	Yes
35	16907	5324	7	Yes
36	17382	5325	9	Yes
37	17857	5326	9	Yes
38	18332	5327	5	Yes
39	18807	5328	11	Yes
40	19282	5329	11	Yes
41	19757	5330	12	Yes

7.4. RESULTS FOR 80 MHz BANDWIDTH

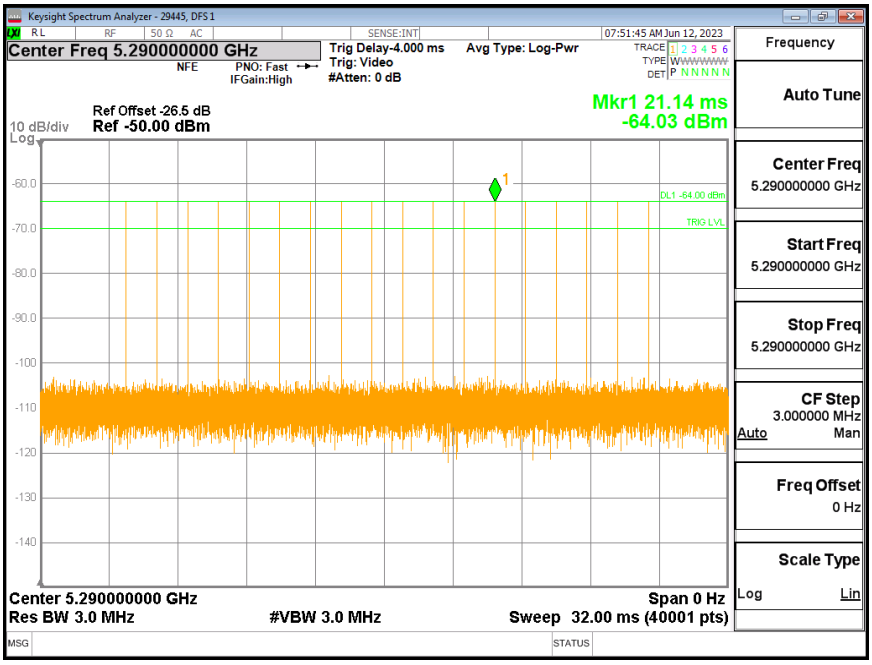
7.4.1. TEST CHANNEL

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

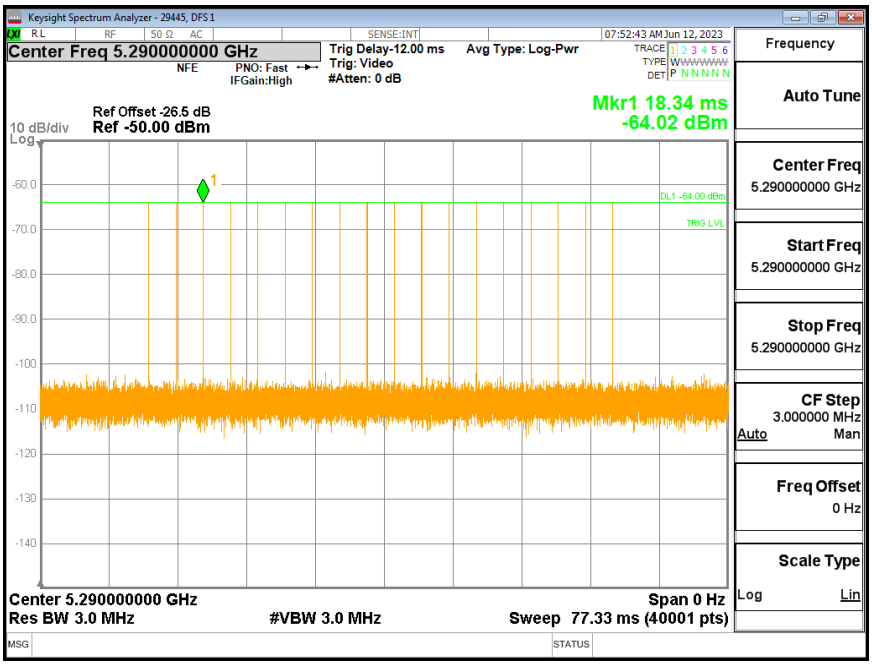
7.4.2. RADAR WAVEFORMS AND TRAFFIC

RADAR WAVEFORMS

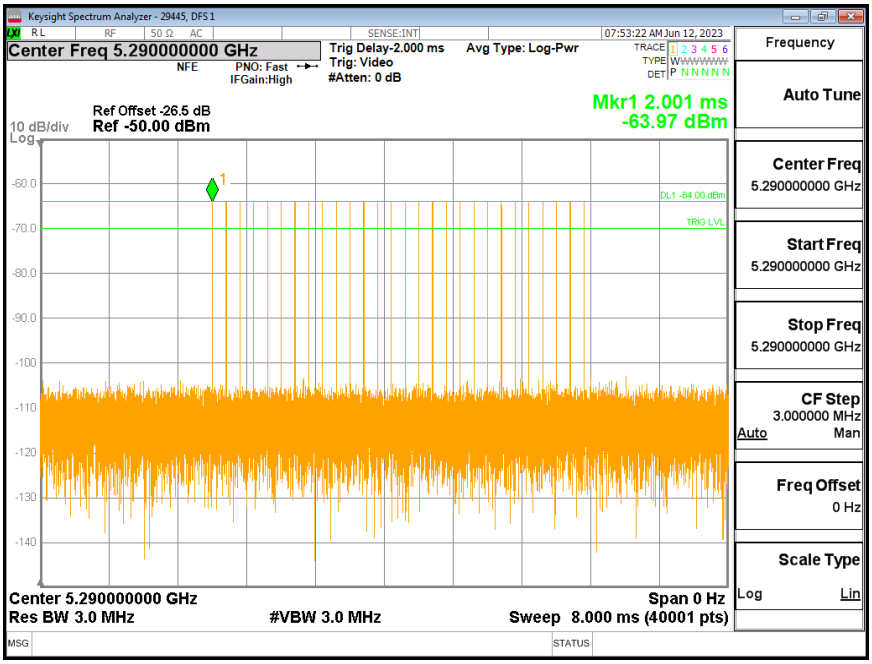
SHORT PULSE RADAR TYPE 0



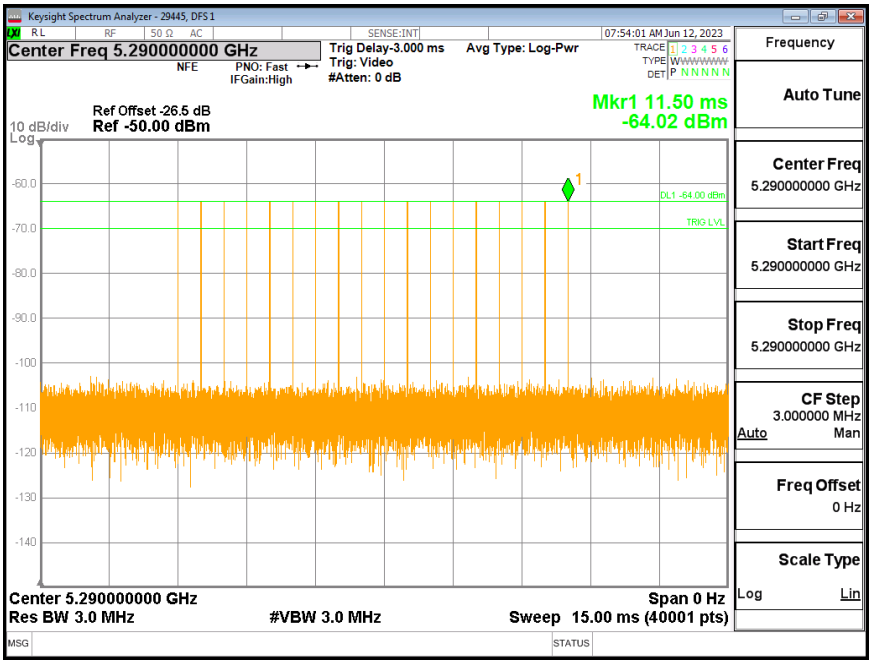
SAMPLE OF RADAR TYPE 1



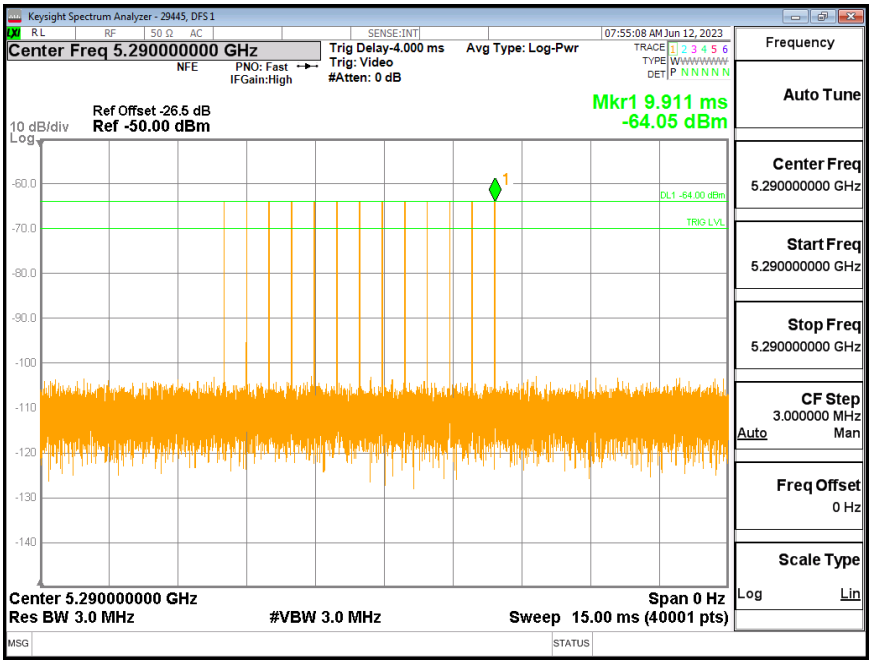
SAMPLE OF RADAR TYPE 2



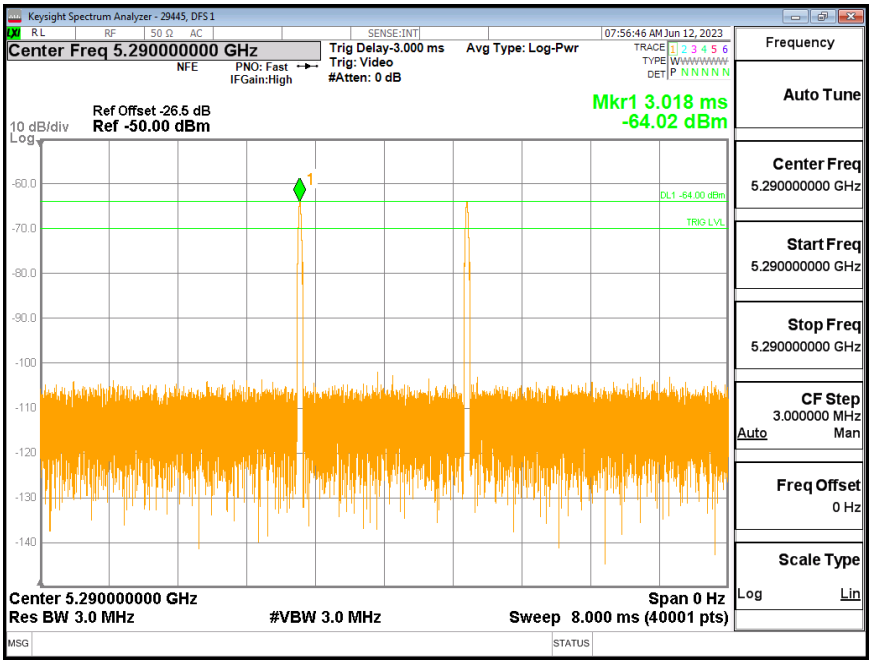
SAMPLE OF RADAR TYPE 3



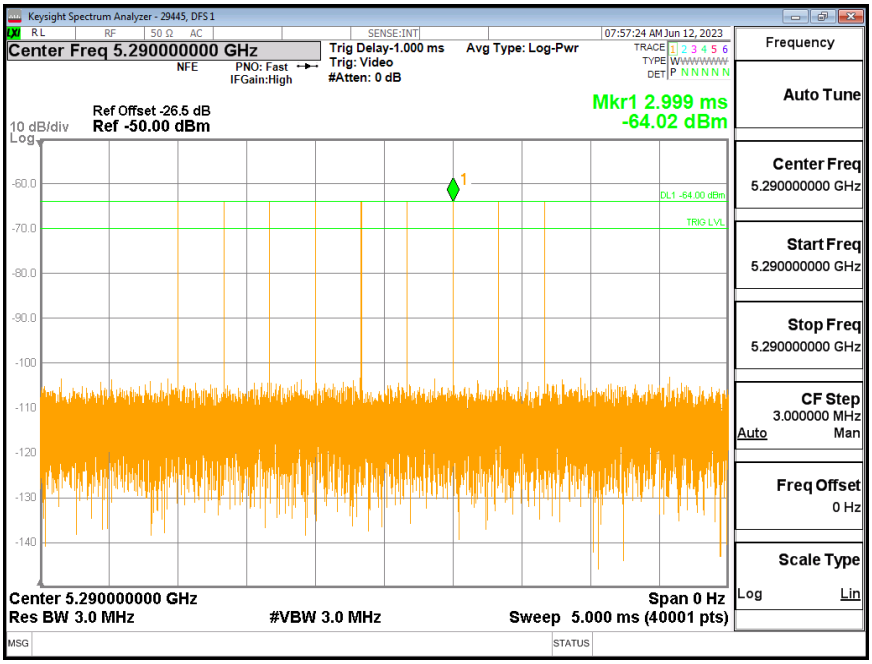
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

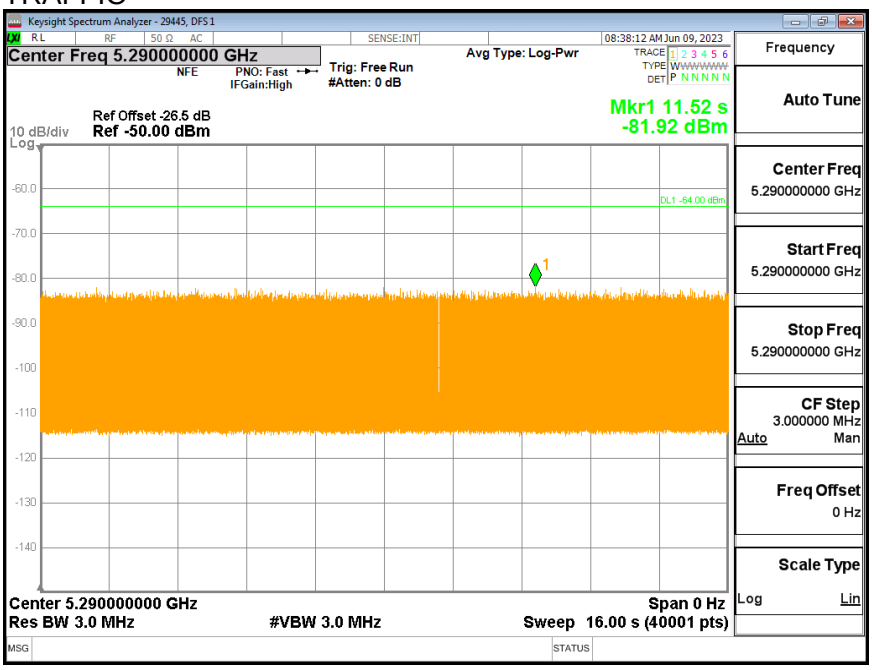


SINGLE BURST OF RADAR TYPE 6

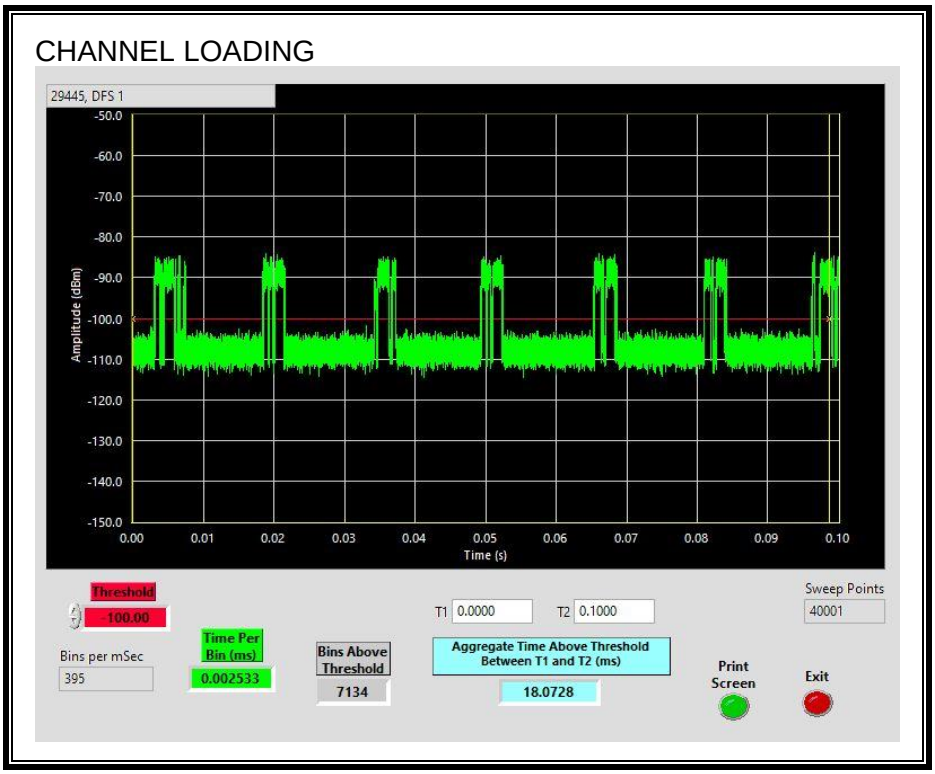


TRAFFIC

TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 18.07%

7.4.3. CHANNEL AVAILABILITY CHECK TIME

PROCEDURE TO DETERMINE CAC PERIOD TIME

A software command was issued to the EUT to change to the test channel. The measured time from the software command to the start of traffic was measured. The initialization time is the 60-second CAC period subtracted from the total measured time of the plot.

PROCEDURE FOR TIMING OF RADAR BURST

A software command was issued to the EUT to change to the test channel. A radar signal was triggered within 0 to 6 seconds after the beginning of the CAC period. Transmissions on the channel were monitored on the spectrum analyzer and a plot was captured

The was rebooted to clear the Non-Occupancy list. A software command was issued to the EUT to change to the test channel. A radar signal was triggered within 54 to 60 seconds after the beginning of the CAC period. Transmissions on the channel were monitored on the spectrum analyzer and a plot was captured

QUANTITATIVE RESULTS

No Radar Triggered

Timing of Software Command (sec)	Timing of Start of Traffic (sec)	Channel Initialization Time (sec)
0	68.36	8.36

Radar Near Beginning of CAC

Timing of Software Command (sec)	Timing of Radar Burst (sec)	Radar Relative to Beginning of CAC (sec)
0	10.79	2.43

Radar Near End of CAC

Timing of Software Command (sec)	Timing of Radar Burst (sec)	Radar Relative to Beginning of CAC (sec)
0	65.25	56.89

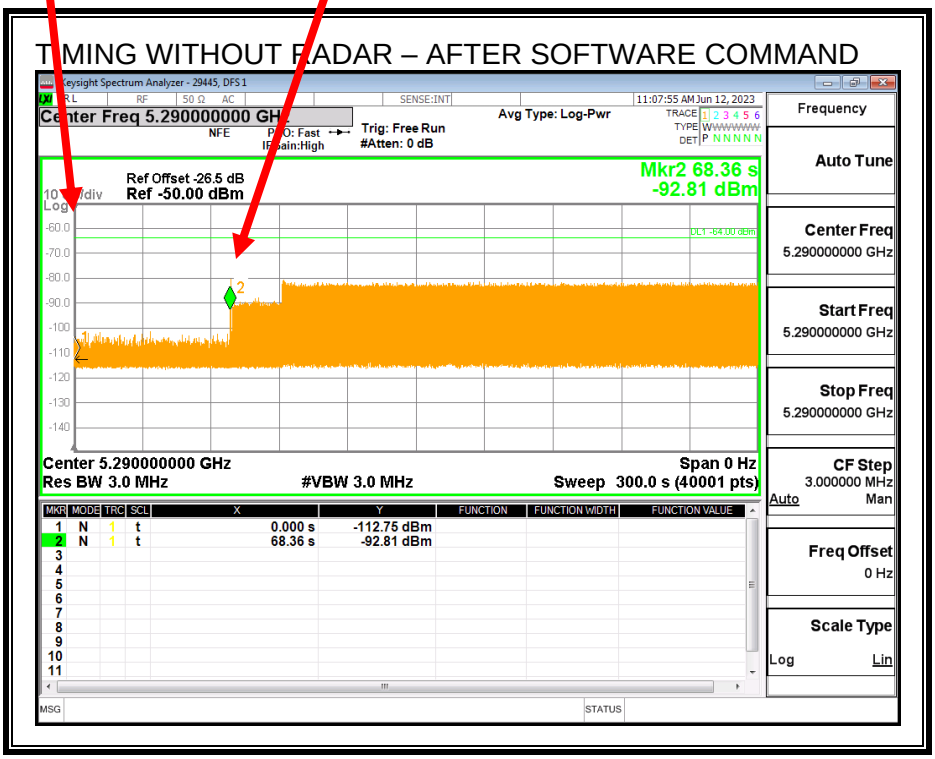
QUALITATIVE RESULTS

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 initialization 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

Software Command Issued
Change to Test Channel

End of CAC Period

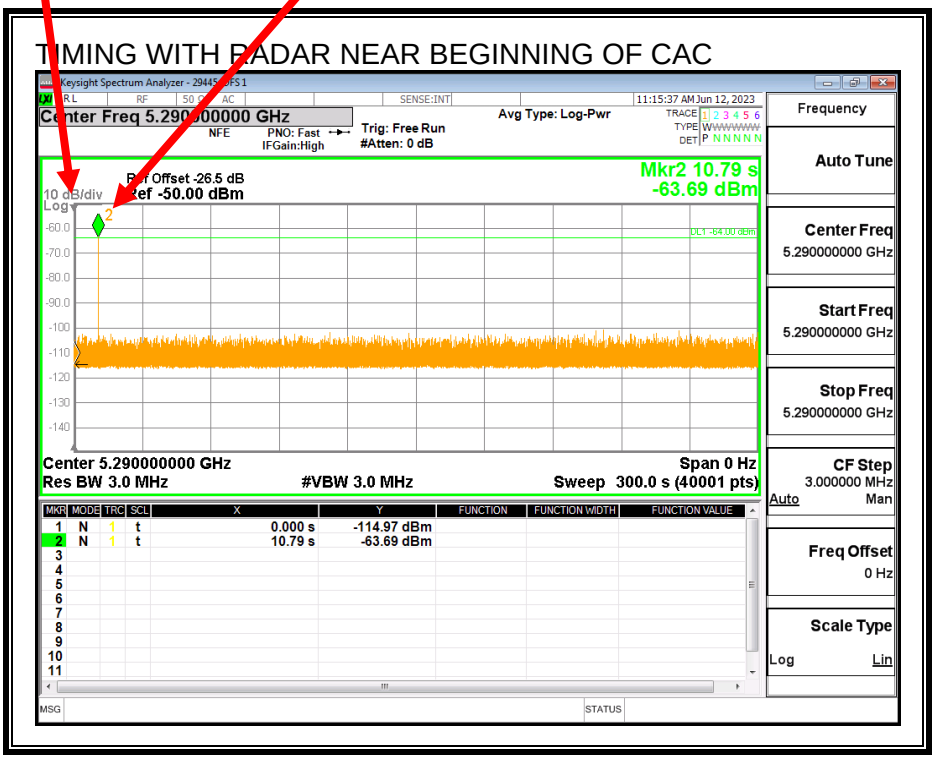


Transmissions begin on channel after completion of the initial power-up cycle and the CAC.

TIMING WITH RADAR NEAR BEGINNING OF CAC

Software Command Issued
Change to Test Channel

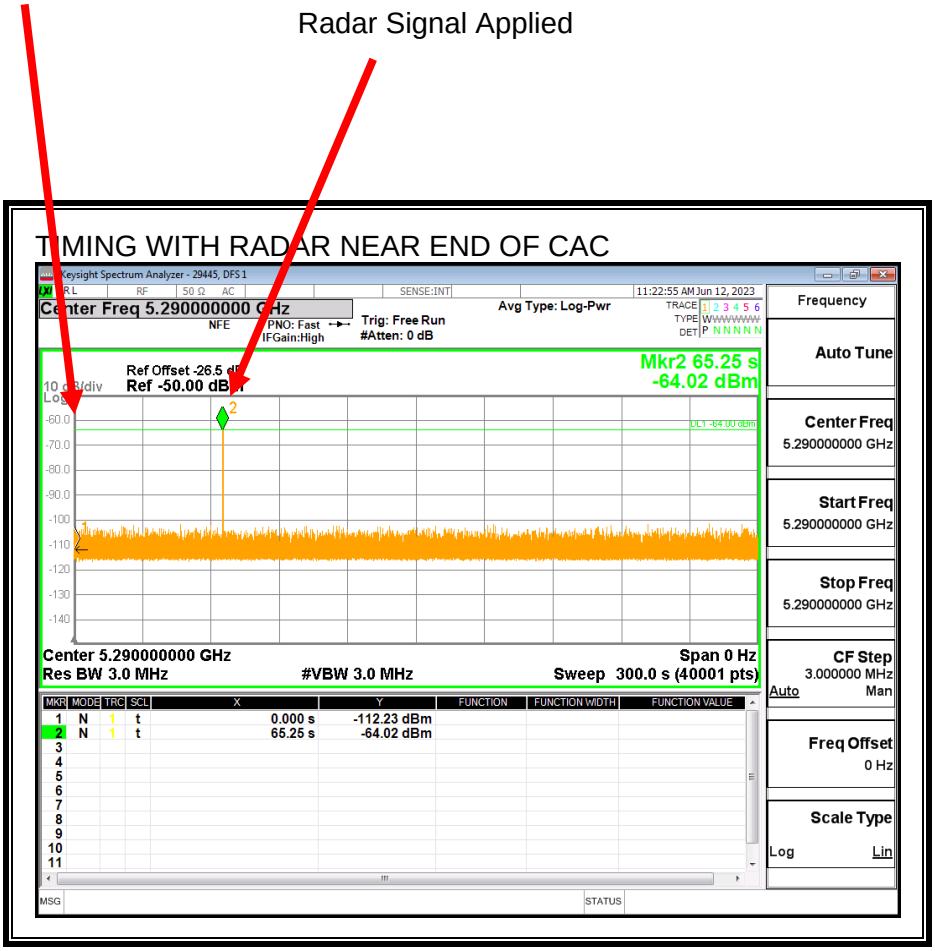
Radar Signal Applied



No EUT transmissions were observed after the radar signal.

TIMING WITH RADAR NEAR END OF CAC

Software Command Issued
Change to Test Channel



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)

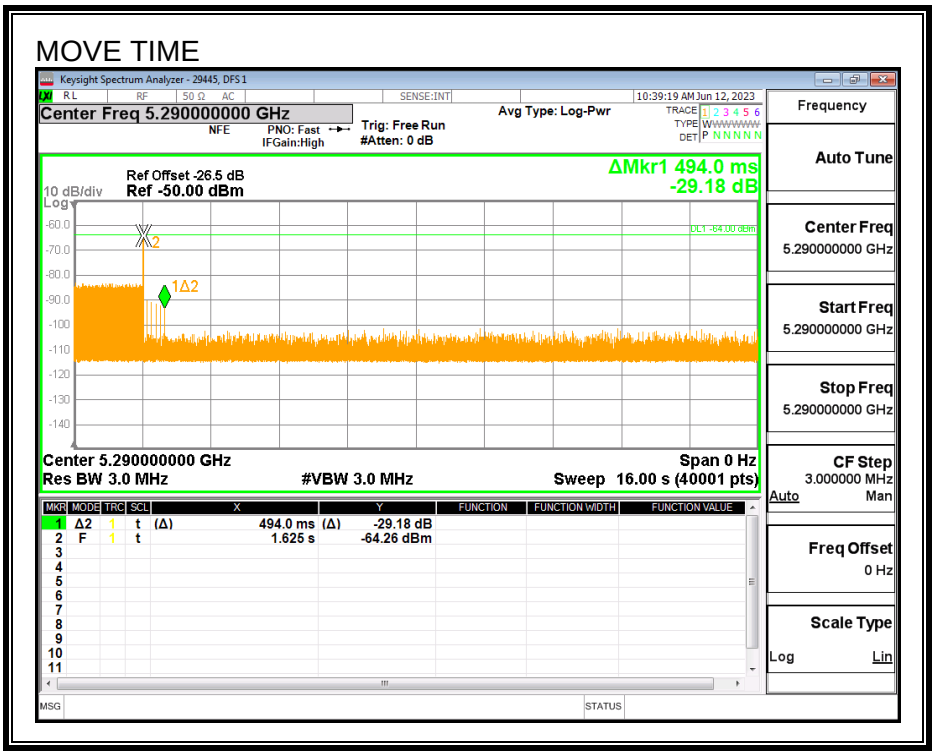
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

Channel Move Time (sec)	Limit (sec)
0.494	10

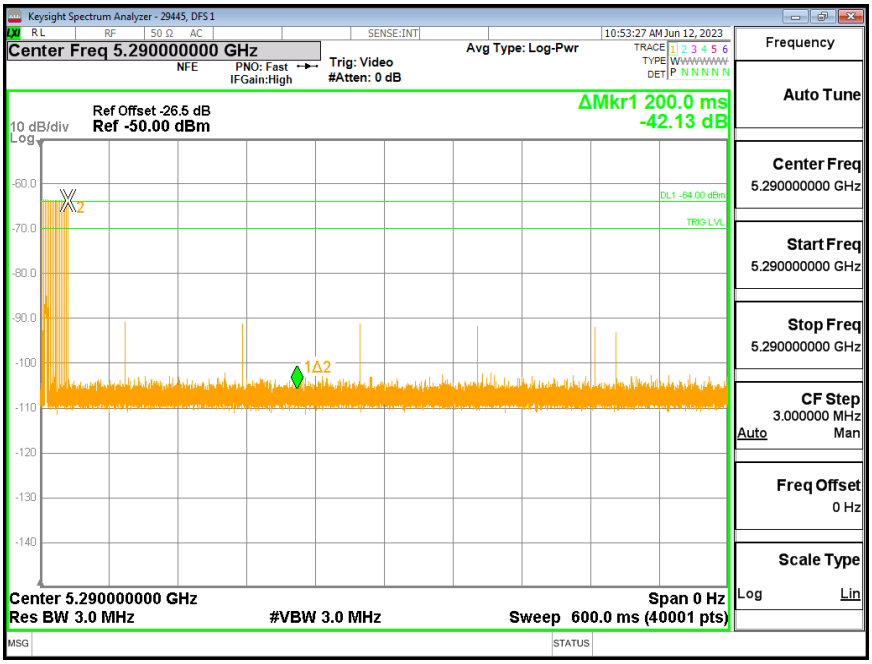
Aggregate Channel Closing Transmission Time (msec)	Limit (msec)
2.4	60

MOVE TIME



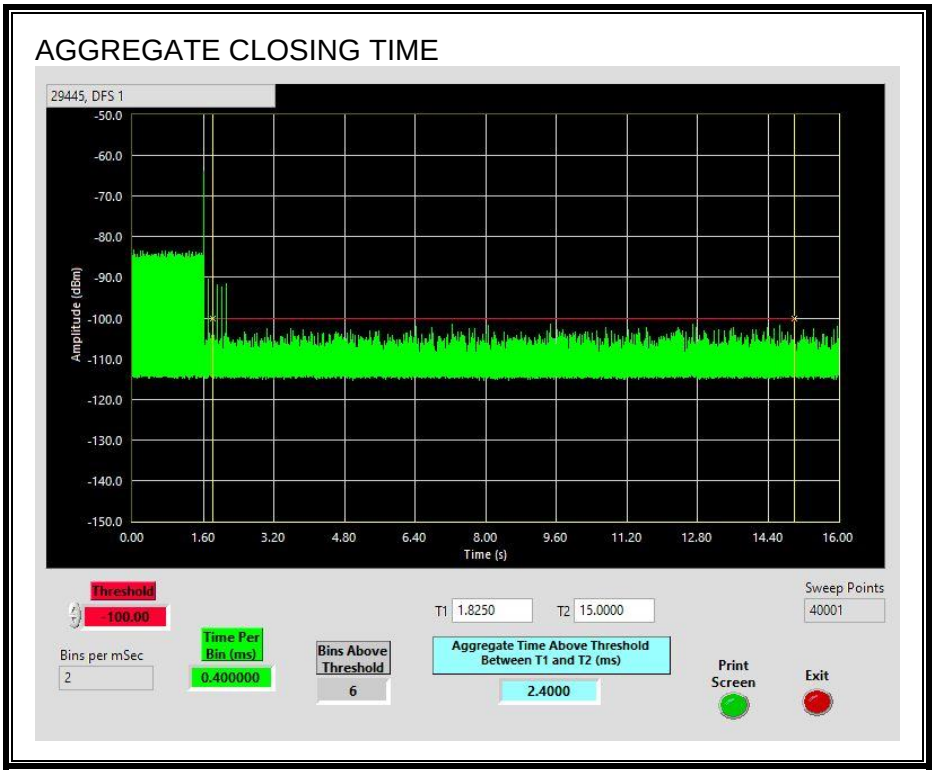
CHANNEL CLOSING TIME

CLOSING TIME



AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

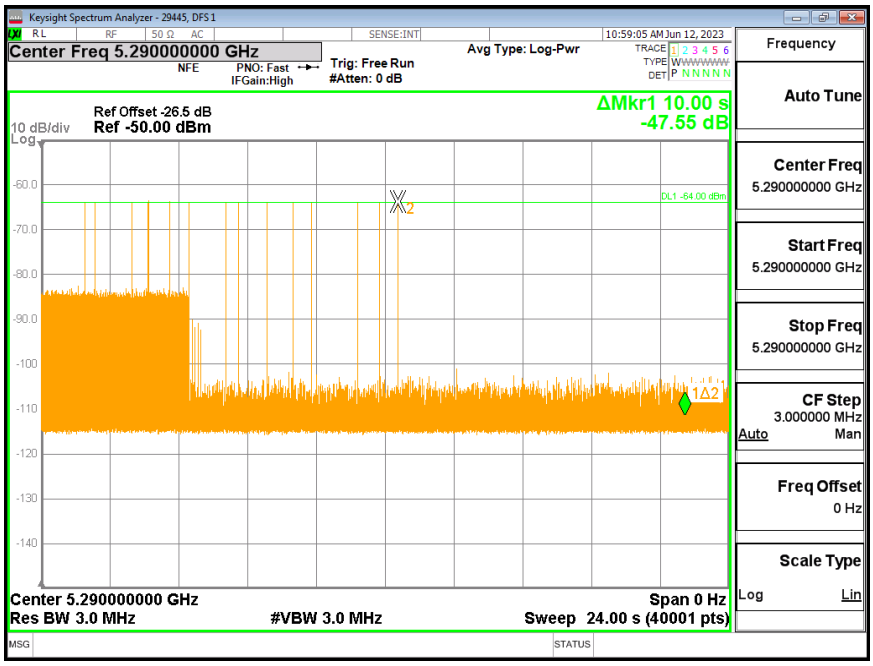
Only intermittent transmissions are observed during the aggregate monitoring period.



LONG PULSE CHANNEL MOVE TIME

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

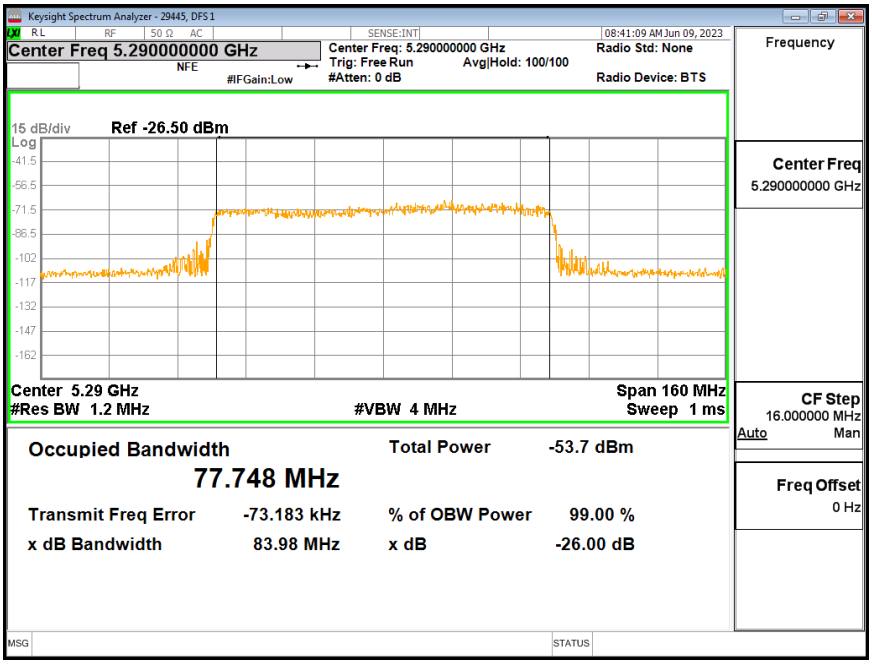
MOVE TIME FOR LONG PULSE RADAR



7.4.6. DETECTION BANDWIDTH

REFERENCE PLOT OF 99% POWER BANDWIDTH

99% 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 (%)
5250	5330	80	77.748	102.9	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
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

7.4.7. IN-SERVICE MONITORING

RESULTS

FCC Radar Test Summary

Signal Type	Number of Trials	Detection (%)	Limit (%)	Pass/Fail	Detection Bandwidth FL	Detection Bandwidth FH	OBW	Test Location	Employee Number	In-Service Monitoring Version
FCC Short Pulse Type 1	30	96.67	60	Pass	5250	5330	77.75	DFS 1	29445	v4.1
FCC Short Pulse Type 2	30	86.67	60	Pass	5250	5330	77.75	DFS 1	29445	v4.1
FCC Short Pulse Type 3	30	73.33	60	Pass	5250	5330	77.75	DFS 1	29445	v4.1
FCC Short Pulse Type 4	30	80.00	60	Pass	5250	5330	77.75	DFS 1	29445	v4.1
Aggregate		84.17	80	Pass						
FCC Long Pulse Type 5	30	100.00	80	Pass	5250	5330	77.75	DFS 1	29445	v4.1
FCC Hopping Type 6	81	100.00	70	Pass	5250	5330		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	5271	Yes
1002	1	758	70	A	5251	Yes
1003	1	698	76	A	5264	Yes
1004	1	658	81	A	5315	Yes
1005	1	638	83	A	5268	Yes
1006	1	918	58	A	5329	Yes
1007	1	558	95	A	5283	Yes
1008	1	598	89	A	5260	Yes
1009	1	538	99	A	5265	Yes
1010	1	678	78	A	5322	Yes
1011	1	778	68	A	5324	Yes
1012	1	618	86	A	5267	Yes
1013	1	578	92	A	5324	Yes
1014	1	718	74	A	5295	No
1015	1	938	57	A	5300	Yes
1016	1	1840	29	B	5322	Yes
1017	1	990	54	B	5277	Yes
1018	1	2493	22	B	5284	Yes
1019	1	1773	30	B	5264	Yes
1020	1	2211	24	B	5302	Yes
1021	1	2973	18	B	5291	Yes
1022	1	2187	25	B	5296	Yes
1023	1	1885	28	B	5300	Yes
1024	1	1228	43	B	5305	Yes
1025	1	1055	51	B	5252	Yes
1026	1	1882	29	B	5267	Yes
1027	1	643	83	B	5254	Yes
1028	1	1599	34	B	5265	Yes
1029	1	3038	18	B	5279	Yes
1030	1	2929	19	B	5320	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	1.5	160	28	5314	Yes
2002	2.6	201	24	5277	Yes
2003	3.3	172	24	5258	Yes
2004	2.7	179	27	5260	Yes
2005	3.7	196	27	5280	Yes
2006	3.3	164	24	5299	Yes
2007	2.5	228	27	5310	Yes
2008	2.3	201	28	5294	Yes
2009	1.8	188	25	5293	Yes
2010	4	208	27	5250	Yes
2011	1.7	161	24	5277	No
2012	4.1	185	23	5323	Yes
2013	2.1	224	24	5269	Yes
2014	4.7	213	23	5279	Yes
2015	2.8	175	25	5252	Yes
2016	3.7	169	24	5295	Yes
2017	4.3	216	23	5327	Yes
2018	1.3	176	29	5252	Yes
2019	2	189	28	5312	Yes
2020	1.4	153	25	5326	Yes
2021	2.4	170	25	5321	Yes
2022	2	219	25	5259	Yes
2023	1.2	203	25	5260	Yes
2024	1	175	26	5301	Yes
2025	4.6	163	23	5312	No
2026	2.7	225	25	5253	No
2027	4.5	217	26	5316	Yes
2028	2.8	159	27	5293	No
2029	4.9	198	29	5269	Yes
2030	3.4	188	28	5314	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	6.5	500	18	5294	Yes
3002	9.6	481	18	5320	Yes
3003	8	376	18	5327	Yes
3004	9.1	251	17	5254	No
3005	9.8	292	17	5320	Yes
3006	9.2	432	16	5294	No
3007	6.1	485	18	5309	Yes
3008	9.8	386	16	5294	Yes
3009	9	335	16	5292	No
3010	6.9	382	16	5293	Yes
3011	6.4	461	18	5259	Yes
3012	6.4	404	18	5304	Yes
3013	8.2	378	16	5279	Yes
3014	6.5	451	17	5289	Yes
3015	8.6	320	17	5276	Yes
3016	7.1	288	17	5302	No
3017	7.4	421	17	5251	No
3018	8.3	401	17	5276	No
3019	6.7	296	17	5263	Yes
3020	9.9	423	16	5258	Yes
3021	8.5	464	16	5329	Yes
3022	7.9	352	18	5259	Yes
3023	8.9	406	16	5259	Yes
3024	6.5	307	18	5320	Yes
3025	7.7	256	16	5309	No
3026	9.7	303	18	5267	Yes
3027	9.2	264	17	5283	Yes
3028	7.2	324	18	5287	No
3029	6.9	299	18	5274	Yes
3030	9.3	254	16	5253	Yes

TYPE 4 DETECTION PROBABILITY

Data Sheet for FCC Short Pulse Radar Type 4					
Waveform	Pulse Width (us)	PRI (us)	Pulses Per Burst	Frequency (MHz)	Successful Detection (Yes/No)
4001	13.9	492	13	5252	No
4002	15.4	459	12	5268	Yes
4003	11.3	341	13	5281	Yes
4004	13.3	322	13	5305	Yes
4005	18.8	350	12	5258	Yes
4006	16.9	343	12	5317	No
4007	13.8	384	16	5254	Yes
4008	12.4	273	14	5330	Yes
4009	19.4	326	16	5303	Yes
4010	18.5	361	14	5297	Yes
4011	12	427	16	5260	Yes
4012	16.4	475	14	5260	No
4013	15.2	436	12	5268	No
4014	20	496	16	5314	No
4015	19.3	470	14	5312	Yes
4016	15.5	425	15	5261	Yes
4017	11	412	16	5266	Yes
4018	12.5	380	15	5317	Yes
4019	17.6	262	12	5254	Yes
4020	19.5	494	16	5315	Yes
4021	15.9	271	15	5256	Yes
4022	14.1	264	13	5252	Yes
4023	15.8	305	12	5315	Yes
4024	18.6	444	12	5279	Yes
4025	16.5	498	14	5256	Yes
4026	15.6	281	12	5284	Yes
4027	18.2	348	15	5281	Yes
4028	13.5	395	13	5297	Yes
4029	12.3	357	13	5274	No
4030	17.2	417	14	5315	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	Yes
7	5290	Yes
8	5290	Yes
9	5290	Yes
10	5290	Yes
11	5254	Yes
12	5259	Yes
13	5259	Yes
14	5257	Yes
15	5255	Yes
16	5259	Yes
17	5259	Yes
18	5254	Yes
19	5256	Yes
20	5259	Yes
21	5323	Yes
22	5326	Yes
23	5321	Yes
24	5321	Yes
25	5326	Yes
26	5324	Yes
27	5321	Yes
28	5323	Yes
29	5326	Yes
30	5321	Yes

TYPE 5 RADAR WAVEFORM PARAMETERS

The Type 5 radar waveform parameters for the 80 MHz channel bandwidth tests are the same as the Type 5 radar waveform parameters documented in the 20 MHz channel bandwidth results section.

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	723	5250	18	Yes
2	1198	5251	13	Yes
3	1673	5252	13	Yes
4	2148	5253	15	Yes
5	2623	5254	16	Yes
6	3098	5255	19	Yes
7	3573	5256	21	Yes
8	4048	5257	14	Yes
9	4523	5258	23	Yes
10	4998	5259	13	Yes
11	5473	5260	12	Yes
12	5948	5261	11	Yes
13	6423	5262	20	Yes
14	6898	5263	15	Yes
15	7373	5264	12	Yes
16	7848	5265	16	Yes
17	8323	5266	14	Yes
18	8798	5267	12	Yes
19	9273	5268	21	Yes
20	9748	5269	17	Yes
21	10223	5270	17	Yes
22	10698	5271	18	Yes
23	11173	5272	18	Yes
24	11648	5273	15	Yes
25	12123	5274	17	Yes
26	12598	5275	12	Yes
27	13073	5276	19	Yes
28	13548	5277	16	Yes
29	14023	5278	21	Yes
30	14498	5279	17	Yes
31	14973	5280	21	Yes
32	15448	5281	15	Yes
33	15923	5282	11	Yes
34	16398	5283	17	Yes
35	16873	5284	14	Yes
36	17348	5285	17	Yes
37	17823	5286	15	Yes
38	18298	5287	13	Yes
39	18773	5288	13	Yes

TYPE 6 DETECTION PROBABILITY (CONTINUED)

40	19248	5289	19	Yes
41	19723	5290	17	Yes
42	20198	5291	12	Yes
43	20673	5292	18	Yes
44	21148	5293	18	Yes
45	21623	5294	14	Yes
46	22098	5295	20	Yes
47	22573	5296	17	Yes
48	23048	5297	19	Yes
49	23523	5298	10	Yes
50	23998	5299	15	Yes
51	24473	5300	21	Yes
52	24948	5301	26	Yes
53	25423	5302	24	Yes
54	25898	5303	16	Yes
55	26373	5304	18	Yes
56	26848	5305	17	Yes
57	27323	5306	17	Yes
58	27798	5307	18	Yes
59	28273	5308	18	Yes
60	28748	5309	19	Yes
61	29223	5310	10	Yes
62	29698	5311	15	Yes
63	30173	5312	17	Yes
64	30648	5313	14	Yes
65	31123	5314	16	Yes
66	31598	5315	20	Yes
67	32073	5316	20	Yes
68	32548	5317	17	Yes
69	33023	5318	19	Yes
70	33498	5319	14	Yes
71	33973	5320	16	Yes
72	34448	5321	19	Yes
73	34923	5322	20	Yes
74	35398	5323	16	Yes
75	35873	5324	16	Yes
76	36348	5325	21	Yes
77	36823	5326	18	Yes
78	37298	5327	18	Yes
79	37773	5328	16	Yes
80	38248	5329	16	Yes
81	38723	5330	14	Yes

7.5. LOWER BAND RESULTS FOR 160 MHz BANDWIDTH

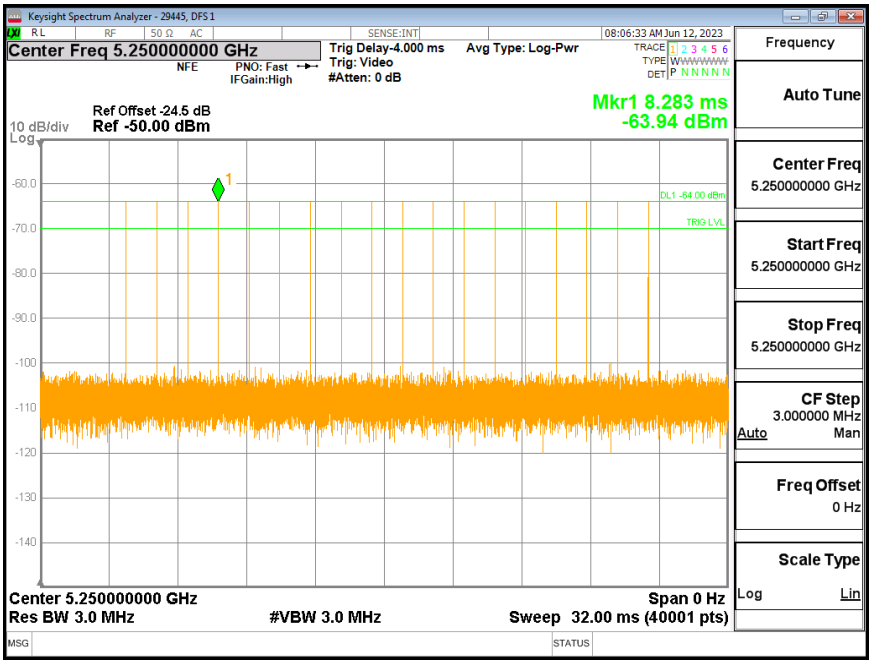
7.5.1. TEST CHANNEL

All tests were performed at a channel center frequency of 5250 MHz.

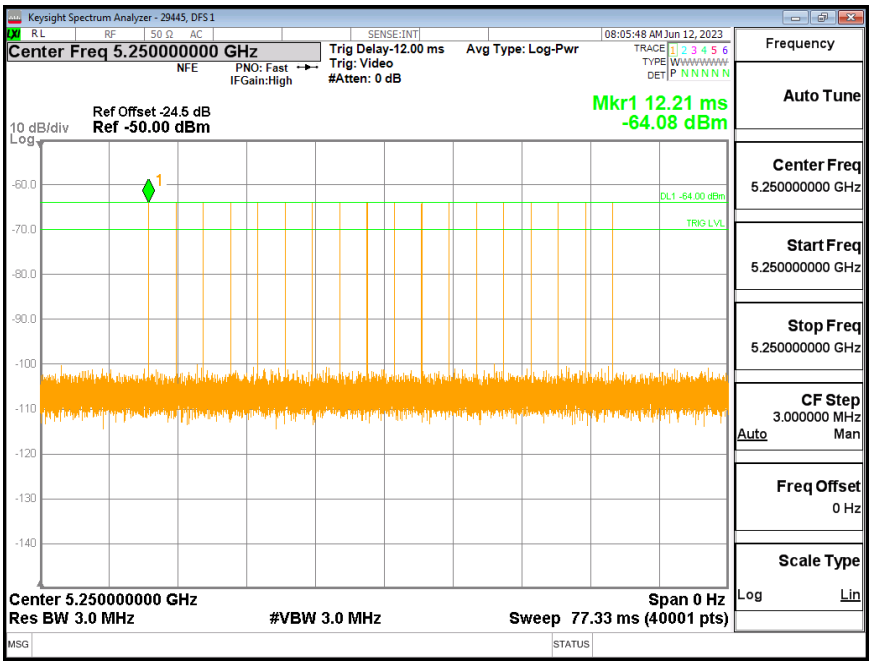
7.5.2. RADAR WAVEFORMS AND TRAFFIC

RADAR WAVEFORMS

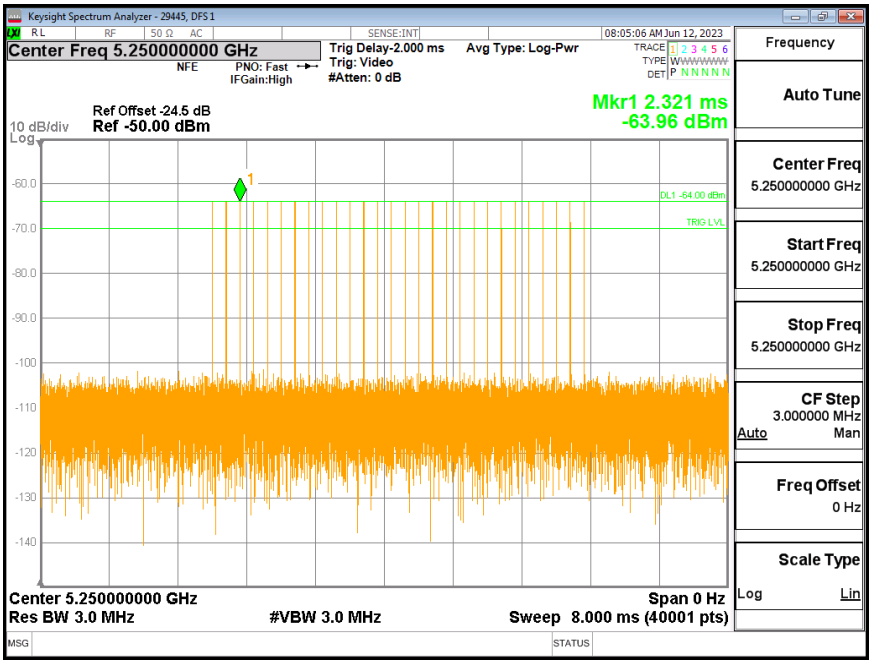
SHORT PULSE RADAR TYPE 0



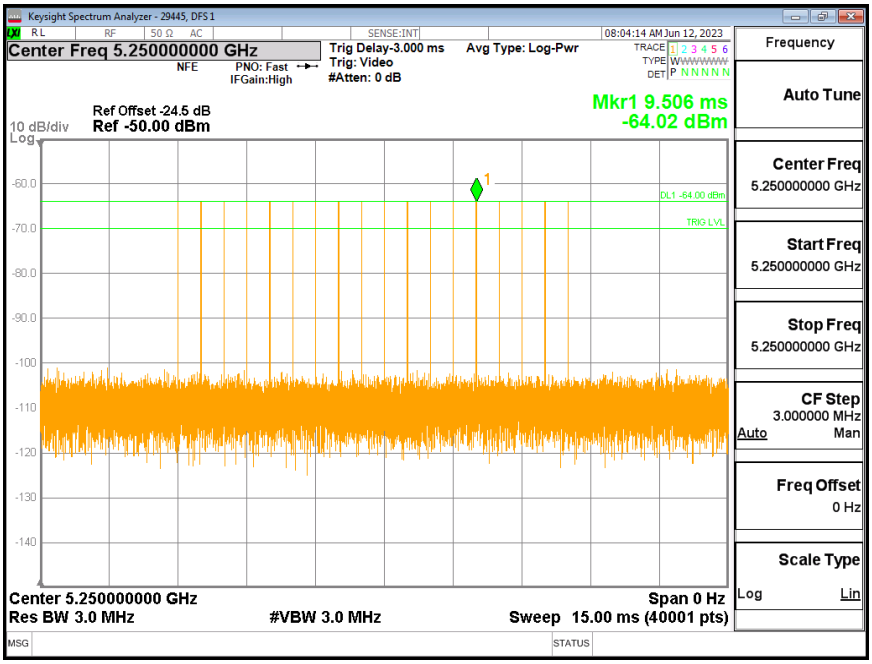
SAMPLE OF RADAR TYPE 1



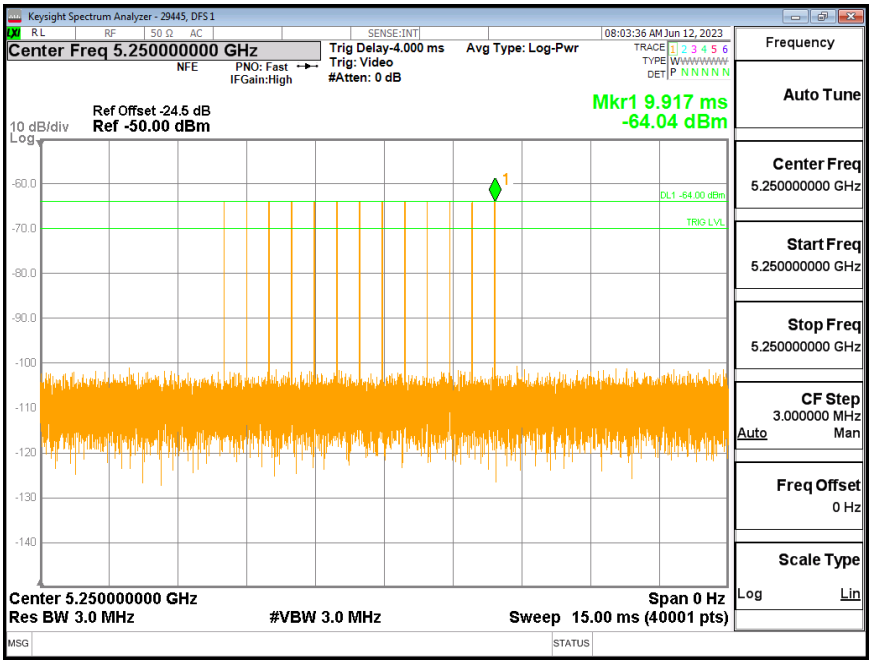
SAMPLE OF RADAR TYPE 2



SAMPLE OF RADAR TYPE 3



SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5