**DFS PORTION of FCC 47 CFR PART 15 SUBPART E**

**CERTIFICATION TEST REPORT**

**FOR**

**BCM94709R-H 802.11a/n/ac ACCESS POINT**

**MODEL NUMBER: BCM94709R-H**

**FCC ID: QDS-BRCM1092**

**REPORT NUMBER: 11533147-E2V1**

**ISSUE DATE: FEBRUARY 14, 2017**

*Prepared for*
**BROADCOM CORPORATION**
**190 MATHILDA PLACE**
**SUNNYVALE, CA, 94086, U.S.A**


*Prepared by*
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NVLAP LAB CODE 200065-0

## Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V1 | 02/14/17 | Initial Issue | Conan Cheung |
| | | | |


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# TABLE OF CONTENTS

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701J
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# 1. ATTESTATION OF TEST RESULTS

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

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

**MODEL:** BCM94709R-H

**SERIAL NUMBER:** 1923036

**DATE TESTED:** DECEMBER 09, 2016 to FEBRUARY 02, 2017

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| DFS Portion of CFR 47 Part 15 Subpart E | Pass |

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:

CONAN CHEUNG
PROJECT LEAD
UL Verification Services Inc.

Tested By:

DOUG ANDERSON
EMC ENGINEER
UL Verification Services Inc.

# 2. TEST METHODOLOGY

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

# 3. FACILITIES AND ACCREDITATION

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

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

# 4. CALIBRATION AND UNCERTAINTY

## 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

## 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

## 4.3. MEASUREMENT UNCERTAINTY

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

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

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

# 5. DYNAMIC FREQUENCY SELECTION

## 5.1. OVERVIEW

### 5.1.1. LIMITS

**FCC**

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

**Table 1: Applicability of DFS requirements prior to use of a channel**

| Requirement | Operational Mode | | |
|---|---|---|---|
| | Master | Client (without radar detection) | Client (with radar detection) |
| Non-Occupancy Period | Yes | Not required | Yes |
| DFS Detection Threshold | Yes | Not required | Yes |
| Channel Availability Check Time | Yes | Not required | Not required |
| U-NII Detection Bandwidth | Yes | Not required | Yes |

**Table 2: Applicability of DFS requirements during normal operation**

| Requirement | Operational Mode | | |
|---|---|---|---|
| | Master | Client **(without DFS)** | Client **(with DFS)** |
| DFS Detection Threshold | Yes | Not required | Yes |
| Channel Closing Transmission Time | Yes | Yes | Yes |
| Channel Move Time | Yes | Yes | Yes |
| U-NII Detection Bandwidth | Yes | Not required | Yes |

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

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

| Maximum Transmit Power | Value (see notes) |
|---|---|
| E.I.R.P. ≥ 200 mill watt | -64 dBm |
| E.I.R.P. < 200 mill watt and power spectral density < 10 dBm/MHz | -62 dBm |
| E.I.R.P. < 200 mill watt that do not meet power spectral density requirement | -64 dBm |

**Note 1:** This is the level at the input of the receiver assuming a 0 dBi receive antenna
**Note 2:** Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.
**Note 3:** E.I.R.P. is based on the highest antenna gain. For MIMO devices refer to KDB publication 662911 D01.

**Table 4: DFS Response requirement values**

| Parameter | Value |
|---|---|
| *Non-occupancy period* | 30 minutes |
| *Channel Availability Check Time* | 60 seconds |
| *Channel Move Time* | 10 seconds (See Note 1) |
| *Channel Closing Transmission Time* | 200 milliseconds + approx. 60 milliseconds over remaining 10 second period. (See Notes 1 and 2) |
| *U-NII Detection Bandwidth* | Minimum 100% of the U-NII 99% transmission power bandwidth. (See Note 3) |

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

**Table 5 – Short Pulse Radar Test Waveforms**

| Radar Type | Pulse Width (usec) | PRI (usec) | Pulses | Minimum Percentage of Successful Detection | Minimum Trials |
|---|---|---|---|---|---|
| 0 | 1 | 1428 | 18 | See Note 1 | See Note 1 |
| 1 | 1 | Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in table 5a | Roundup: {(1/360) x (19 x $10^6$ $PRI_{usec}$)} | 60% | 30 |
| | | Test B: 15 unique PRI values randomly selected within the range of 518-3066 usec. With a minimum increment of 1 usec, excluding PRI values selected in Test A | | | |
| 2 | 1-5 | 150-230 | 23-29 | 60% | 30 |
| 3 | 6-10 | 200-500 | 16-18 | 60% | 30 |
| 4 | 11-20 | 200-500 | 12-16 | 60% | 30 |
| Aggregate (Radar Types 1-4) | | | | 80% | 120 |

**Note 1:** Short Pulse Radar Type 0 should be used for the *Detection Bandwidth* test, *Channel Move Time*, and *Channel Closing Time* tests.

*Table 6 – Long Pulse Radar Test Signal*

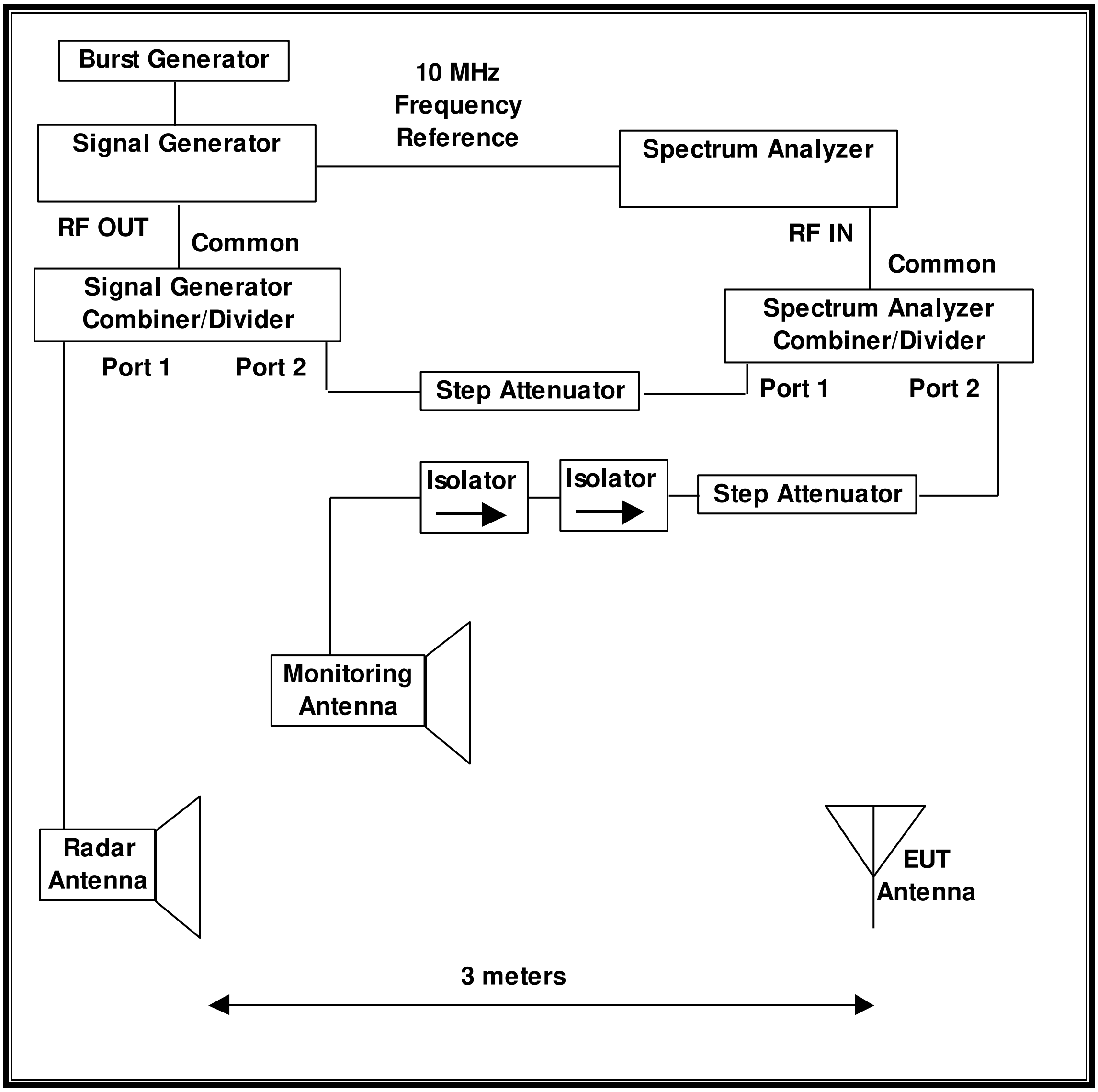
| Radar Waveform Type | Pulse Width (μsec) | Chirp Width (MHz) | PRI (μsec) | Pulses per Burst | Number of Bursts | Minimum Percentage of Successful Detection | Minimum Trials |
|---|---|---|---|---|---|---|---|
| 5 | 50-100 | 5-20 | 1000-2000 | 1-3 | 8-20 | 80% | 30 |

**Table 7 – Frequency Hopping Radar Test Signal**

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

### 5.1.2. TEST AND MEASUREMENT SYSTEM

**RADIATED METHOD SYSTEM BLOCK DIAGRAM**





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**SYSTEM OVERVIEW**

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

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

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

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

**SYSTEM CALIBRATION**

A 50-ohm load is connected in place of the spectrum analyzer, and the spectrum analyzer is connected to a horn antenna via a coaxial cable, with the reference level offset set to (horn antenna gain – coaxial cable loss). The signal generator is set to CW mode. The amplitude of the signal generator is adjusted to yield a level of –64 dBm as measured on the spectrum analyzer.

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

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


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**ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL**

A link is established between the Master and Slave and the distance between the units is adjusted as needed to provide a suitable received level at the Master and Slave devices. The video test file is streamed to generate WLAN traffic. The monitoring antenna is adjusted so that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold.

**TEST AND MEASUREMENT EQUIPMENT**

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

| TEST EQUIPMENT LIST | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **Cal Due** |
| Spectrum Analyzer, PXA, 3Hz to 44GHz | Keysight | N9030A | US51350187 | 06/13/17 |
| Signal Generator, MXG X-Series RF Vector | Agilent | N5182B | MY51350337 | 03/11/17 |
| Arbitrary Waveform Generator | Agilent / HP | 33220A | MY44037572 | 04/11/17 |

### 5.1.3. TEST AND MEASUREMENT SOFTWARE

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

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


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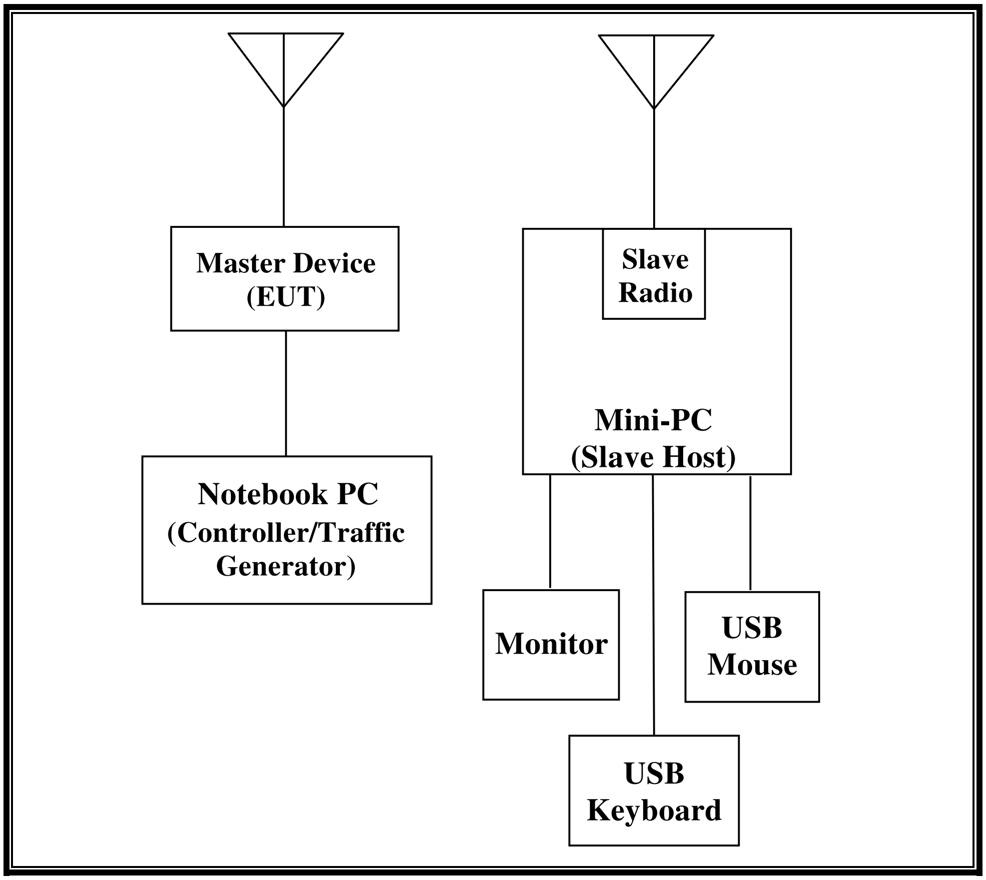
### 5.1.4. SETUP OF EUT

**RADIATED METHOD EUT TEST SETUP (STANDARD MODE CONFIGURATION)**





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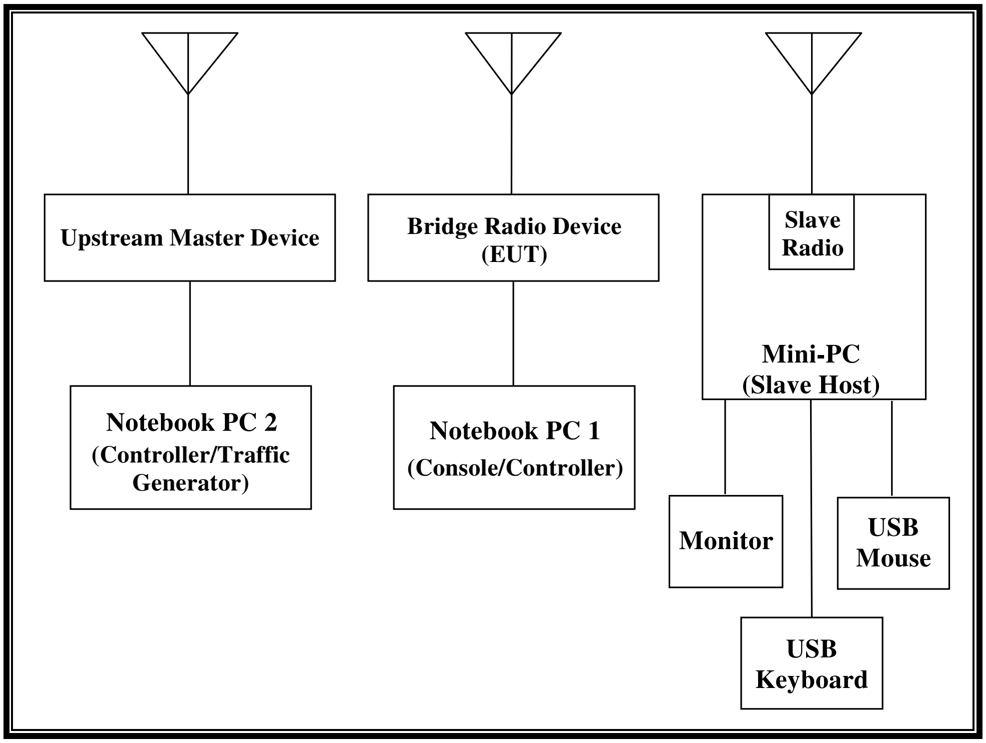
## SUPPORT EQUIPMENT (STANDARD MODE CONFIGURATION)

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

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

**RADIATED METHOD EUT TEST SETUP (BRIDGE MODE CONFIGURATION)**





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**SUPPORT EQUIPMENT(BRIDGE MODE CONFIGURATION)**

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

| PERIPHERAL SUPPORT EQUIPMENT LIST | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| AC Adapter (EUT) | Condor | HK-H1-A12 | None | DoC |
| Notebook PC 1 (EUT Console/Controller) | Lenovo | 0679 | CB06427441 | DoC |
| AC Asdapter (EUT Console PC) | Lenovo | ADP-65KH B | 11S36001646ZZ1000AD9WJ | DoC |
| 802.11a/n/ac Mid-Power 5GHz AP (Upstream Master Device) | Broadcom | BCM94709R-M | 1/22/6935 | QDS-BRCM1091 |
| AC Adapter (Upstream Master) | Condor | HK-H1-A12 | None | DoC |
| Notebook PC 2 (Upstream Master Controller/Traffic Generator) | Lenovo | 0679 | CBU4495737 | DoC |
| AC Asdapter (Upstream Master PC) | Delta Electronics | ADP-65YB B | 11S42T4458Z1ZF4K96B09D | DoC |
| 802.11a/n/ac Radio Module (Slave Radio Device) | Broadcom | BCM94366MC | 001018FBD897 | N/A |
| Mini-PC (Slave Host) | Gigabyte | P105 | 1517631219 | DoC |
| AC Adapter (Host PC) | Asian Power Devices, Ltd. | NB-65B19 | YE45315128015560400 | DoC |
| Monitor | ASUS | VS197 | E2LMTF118423 | DoC |
| USB Keyboard | Dell | SK-8135 | CN-0N6250-71616-646-1AUD | DoC |
| USB Mouse | Logitech | MU0026 | None | DoC |


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### 5.1.5. DESCRIPTION OF EUT

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

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

The highest power level within these bands is 22.82 dBm EIRP in the 5250-5350 MHz band and 23.55 dBm EIRP in the 5470-5725 MHz band.

Each of the four individual antenna assemblies utilized with the EUT has a gain of 0.3 dBi.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

TPC is implemented in all operating modes.

The software installed in the EUT is Rel 7.14.164.301.

## UNIFORM CHANNEL SPREADING

This function is not required per KDB 905462.

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

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

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

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

# 5.2. LOW BAND RESULTS FOR 20 MHz BANDWIDTH

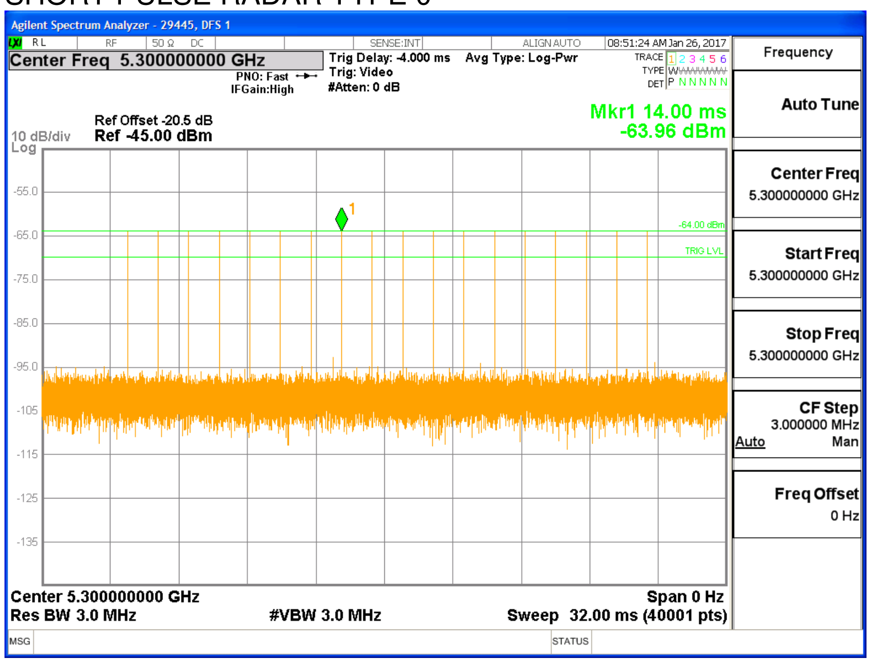
## 5.2.1. TEST CHANNEL

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

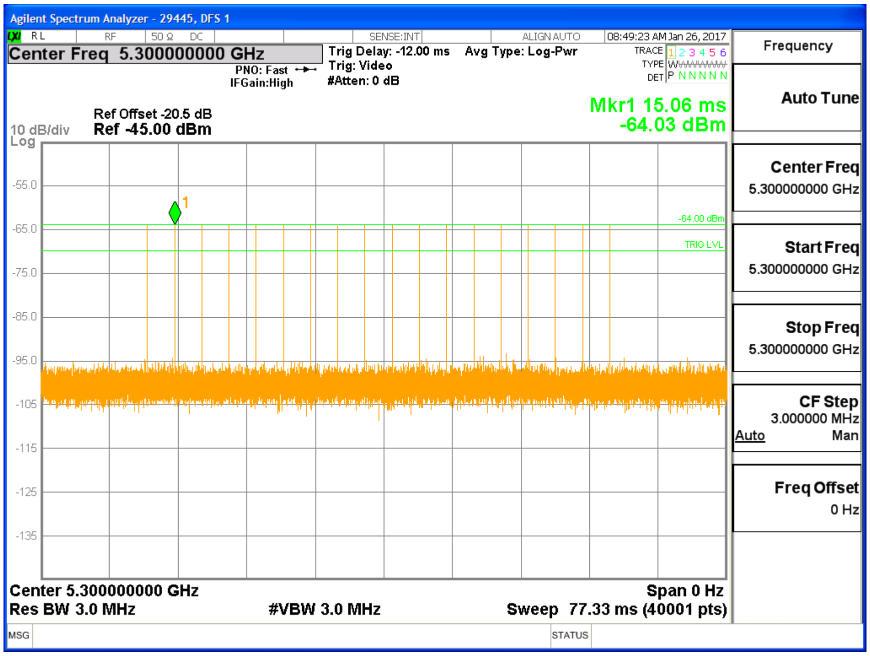
## 5.2.2. RADAR WAVEFORMS AND TRAFFIC

**RADAR WAVEFORMS**

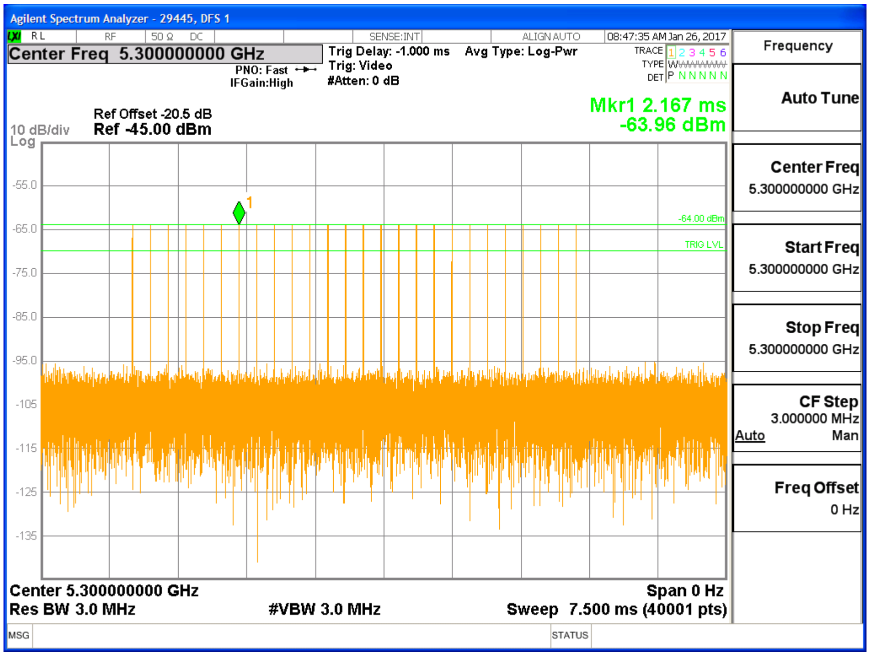
SHORT PULSE RADAR TYPE 0



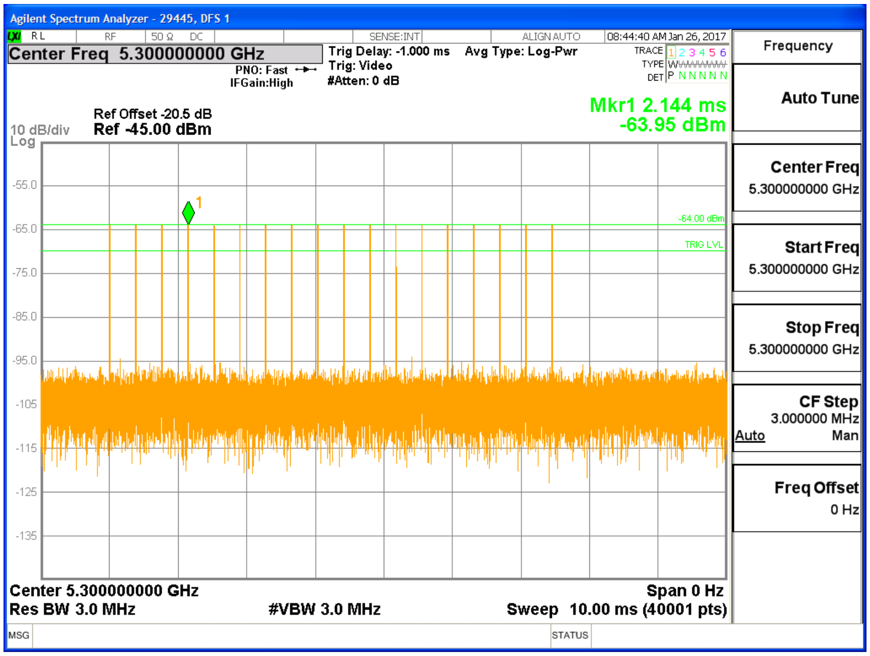
SAMPLE OF RADAR TYPE 1



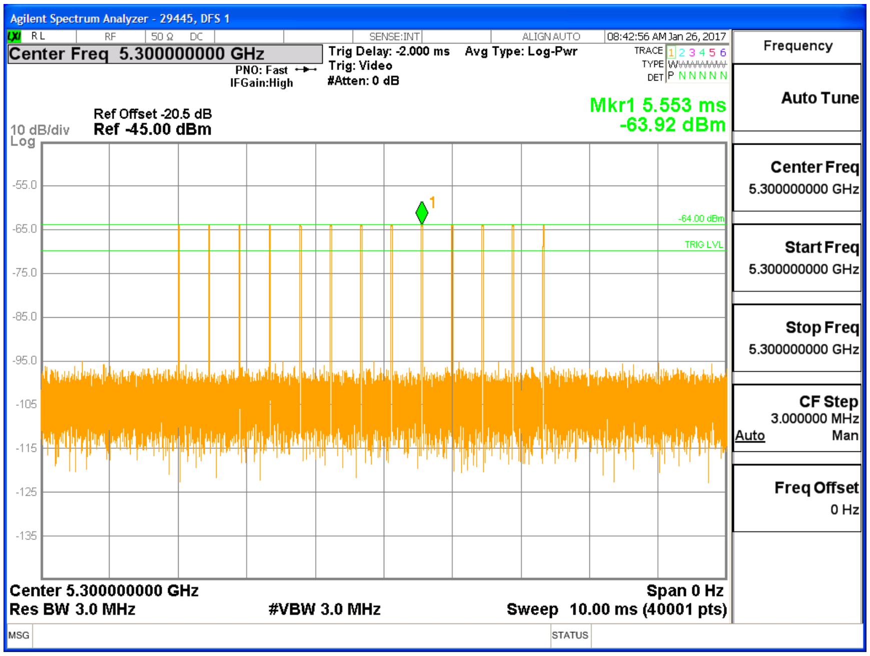
SAMPLE OF RADAR TYPE 2



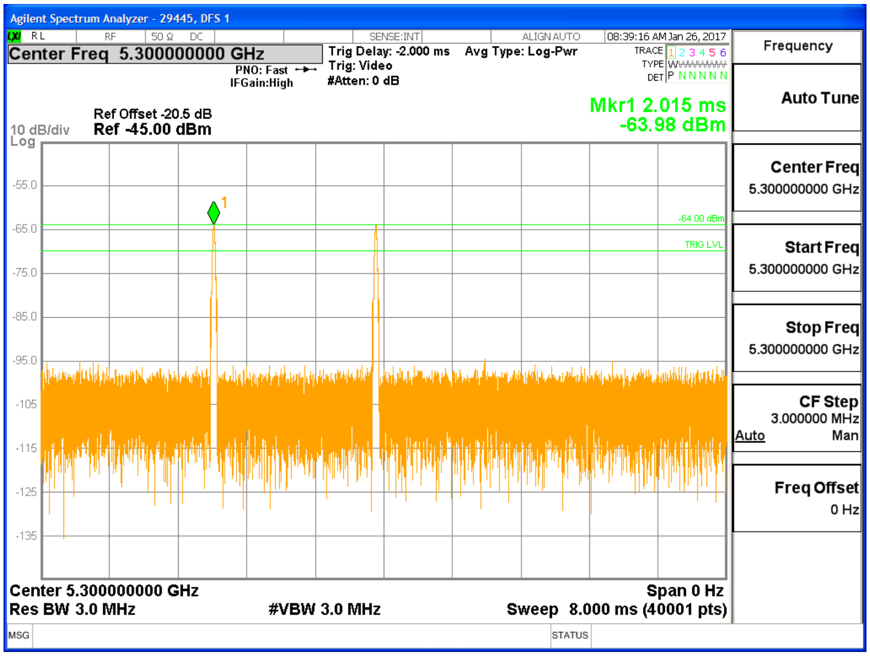
SAMPLE OF RADAR TYPE 3



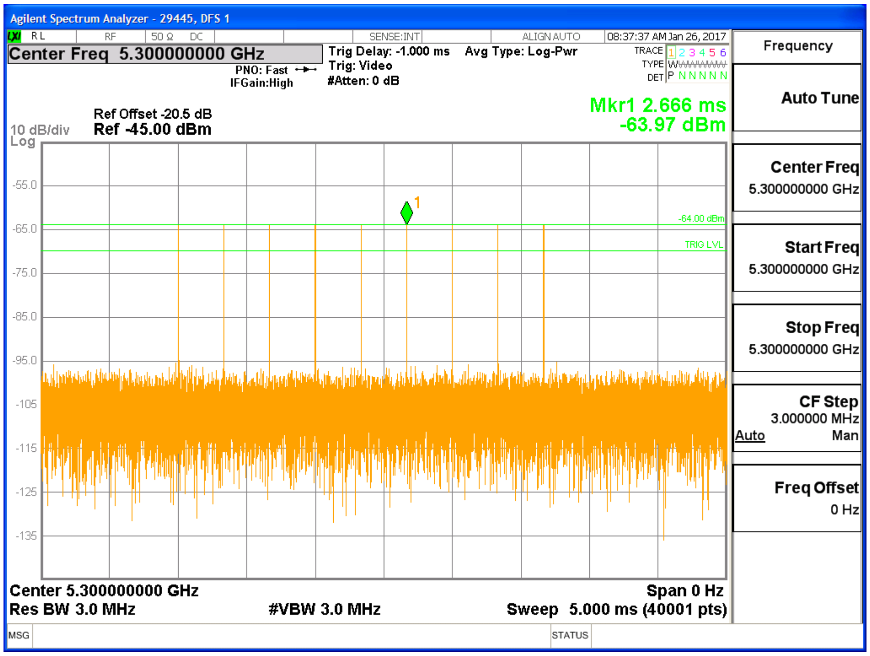
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

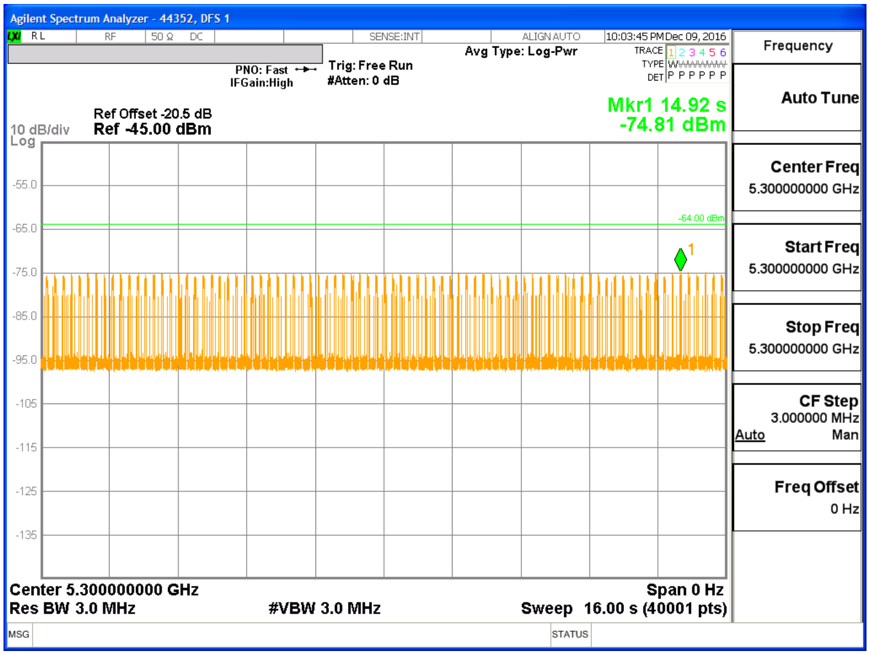


SINGLE BURST OF RADAR TYPE 6

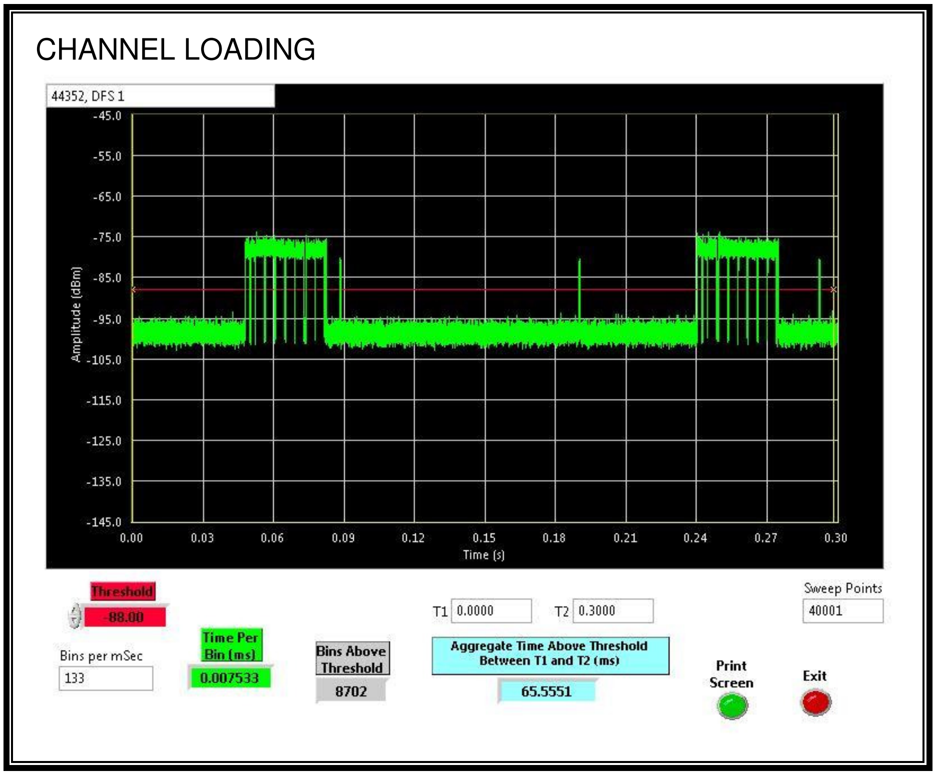


**TRAFFIC**

TRAFFIC



**CHANNEL LOADING**




The level of traffic loading on the channel by the EUT is 21.85%

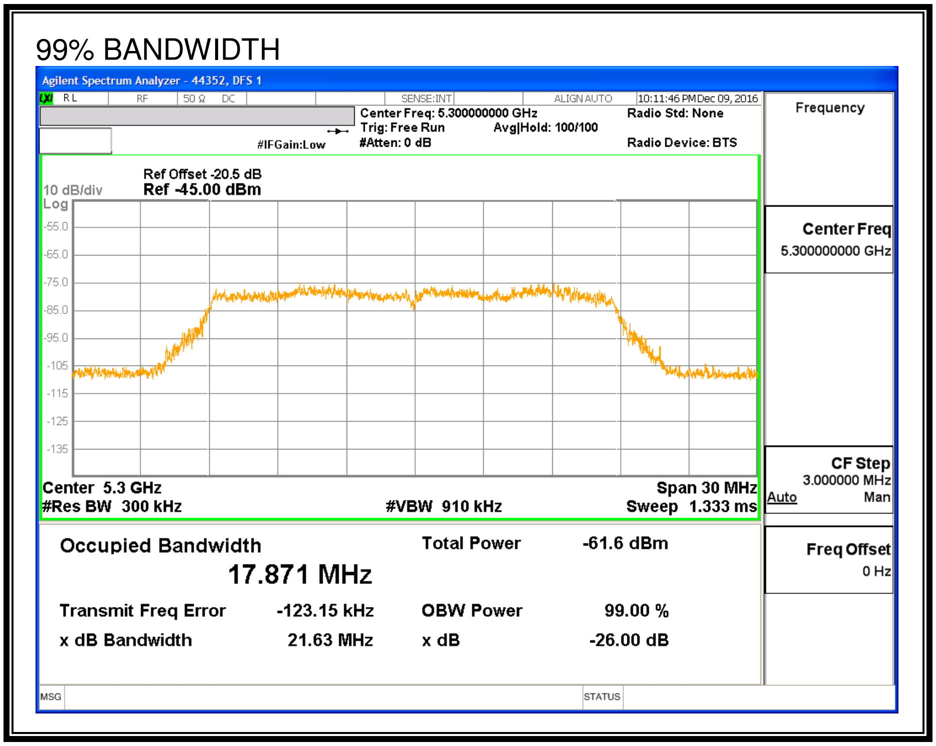
### 5.2.3. OVERLAPPING CHANNEL TESTS

**RESULTS**

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

### 5.2.4. DETECTION BANDWIDTH

**REFERENCE PLOT OF 99% POWER BANDWIDTH**




**RESULTS**

| FL (MHz) | FH (MHz) | Detection Bandwidth (MHz) | 99% Power Bandwidth (MHz) | Ratio of Detection BW to 99% Power BW (%) | Minimum Limit (%) |
|---|---|---|---|---|---|
| 5290 | 5310 | 20 | 17.871 | 111.9 | 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 |
| 5290 | 10 | 10 | 100 | FL |
| 5295 | 10 | 10 | 100 | |
| 5300 | 10 | 10 | 100 | |
| 5305 | 10 | 10 | 100 | |
| 5310 | 10 | 10 | 100 | FH |

### 5.2.5. IN-SERVICE MONITORING

**RESULTS**

FCC Radar Test Summary

| Signal Type | Number of Trials | Detection (%) | Limit (%) | Pass/Fail | Detection Bandwidth FL | Detection Bandwidth FH | OBW | Test Location | Employee Number | In-Service Monitoring Version |
|---|---|---|---|---|---|---|---|---|---|---|
| FCC Short Pulse Type 1 | 30 | 96.67 | 60 | Pass | 5290 | 5310 | 17.87 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 2 | 30 | 80.00 | 60 | Pass | 5290 | 5310 | 17.87 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 3 | 30 | 76.67 | 60 | Pass | 5290 | 5310 | 17.87 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 4 | 30 | 86.67 | 60 | Pass | 5290 | 5310 | 17.87 | DFS 1 | 29445 | Version 3.0 |
| Aggregate | | 85.00 | 80 | Pass | | | | | | |
| FCC Long Pulse Type 5 | 30 | 86.67 | 80 | Pass | 5290 | 5310 | 17.87 | DFS 1 | 29445 | Version 3.0 |
| FCC Hopping Type 6 | 42 | 100.00 | 70 | Pass | 5290 | 5310 | 17.87 | DFS 1 | 29445 | Version 3.0 |

**TYPE 1 DETECTION PROBABILITY**

Data Sheet for FCC Short Pulse Radar Type 1

| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Test (A/B) | Frequency (MHz) | Successful Detection (Yes/No) |
|---|---|---|---|---|---|---|
| 1001 | 1 | 3066 | 18 | A | 5300 | Yes |
| 1002 | 1 | 578 | 92 | A | 5300 | Yes |
| 1003 | 1 | 598 | 89 | A | 5300 | Yes |
| 1004 | 1 | 718 | 74 | A | 5300 | Yes |
| 1005 | 1 | 678 | 78 | A | 5300 | Yes |
| 1006 | 1 | 818 | 65 | A | 5300 | Yes |
| 1007 | 1 | 778 | 68 | A | 5300 | Yes |
| 1008 | 1 | 838 | 63 | A | 5300 | Yes |
| 1009 | 1 | 698 | 76 | A | 5300 | Yes |
| 1010 | 1 | 518 | 102 | A | 5300 | Yes |
| 1011 | 1 | 658 | 81 | A | 5300 | Yes |
| 1012 | 1 | 798 | 67 | A | 5300 | Yes |
| 1013 | 1 | 898 | 59 | A | 5300 | Yes |
| 1014 | 1 | 618 | 86 | A | 5300 | Yes |
| 1015 | 1 | 738 | 72 | A | 5300 | Yes |
| 1016 | 1 | 1638 | 33 | B | 5300 | Yes |
| 1017 | 1 | 2465 | 22 | B | 5300 | Yes |
| 1018 | 1 | 1226 | 44 | B | 5300 | Yes |
| 1019 | 1 | 2182 | 25 | B | 5300 | Yes |
| 1020 | 1 | 1073 | 50 | B | 5300 | Yes |
| 1021 | 1 | 964 | 55 | B | 5300 | Yes |
| 1022 | 1 | 2532 | 21 | B | 5300 | Yes |
| 1023 | 1 | 2553 | 21 | B | 5300 | Yes |
| 1024 | 1 | 1703 | 31 | B | 5300 | Yes |
| 1025 | 1 | 1291 | 41 | B | 5300 | Yes |
| 1026 | 1 | 2924 | 19 | B | 5300 | Yes |
| 1027 | 1 | 1138 | 47 | B | 5300 | Yes |
| 1028 | 1 | 2900 | 19 | B | 5300 | No |
| 1029 | 1 | 2597 | 21 | B | 5300 | Yes |
| 1030 | 1 | 747 | 71 | B | 5300 | Yes |

**TYPE 2 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 2 | | | | | |
|---|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Frequency (MHz) | Successful Detection (Yes/No) |
| 2001 | 3.8 | 194 | 26 | 5300 | Yes |
| 2002 | 2.8 | 188 | 26 | 5300 | Yes |
| 2003 | 1.1 | 154 | 24 | 5300 | Yes |
| 2004 | 2.2 | 195 | 24 | 5300 | No |
| 2005 | 3 | 208 | 23 | 5300 | Yes |
| 2006 | 2.4 | 172 | 27 | 5300 | Yes |
| 2007 | 3.3 | 189 | 26 | 5300 | Yes |
| 2008 | 2.9 | 157 | 27 | 5300 | No |
| 2009 | 2.2 | 222 | 27 | 5300 | Yes |
| 2010 | 4.2 | 156 | 28 | 5300 | Yes |
| 2011 | 3.6 | 182 | 25 | 5300 | No |
| 2012 | 3.6 | 163 | 26 | 5300 | Yes |
| 2013 | 1.4 | 155 | 27 | 5300 | Yes |
| 2014 | 3.8 | 178 | 29 | 5300 | Yes |
| 2015 | 1.7 | 217 | 23 | 5300 | Yes |
| 2016 | 4.3 | 206 | 29 | 5300 | No |
| 2017 | 4.7 | 168 | 24 | 5300 | Yes |
| 2018 | 1.5 | 162 | 23 | 5300 | Yes |
| 2019 | 3.9 | 209 | 29 | 5300 | Yes |
| 2020 | 3.1 | 169 | 29 | 5300 | Yes |
| 2021 | 1.7 | 182 | 28 | 5300 | Yes |
| 2022 | 1.1 | 227 | 24 | 5300 | Yes |
| 2023 | 2 | 164 | 28 | 5300 | Yes |
| 2024 | 3.8 | 213 | 25 | 5300 | Yes |
| 2025 | 5 | 196 | 28 | 5300 | No |
| 2026 | 2.9 | 211 | 26 | 5300 | Yes |
| 2027 | 2.3 | 199 | 23 | 5300 | Yes |
| 2028 | 4.5 | 218 | 24 | 5300 | Yes |
| 2029 | 4.2 | 210 | 25 | 5300 | Yes |
| 2030 | 2.5 | 195 | 27 | 5300 | No |

**TYPE 3 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 3 | | | | | |
|---|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Frequency (MHz) | Successful Detection (Yes/No) |
| 3001 | 9.5 | 379 | 18 | 5300 | Yes |
| 3002 | 6.1 | 347 | 17 | 5300 | Yes |
| 3003 | 8.4 | 480 | 18 | 5300 | Yes |
| 3004 | 9.3 | 460 | 18 | 5300 | Yes |
| 3005 | 7.6 | 488 | 17 | 5300 | Yes |
| 3006 | 6.8 | 395 | 16 | 5300 | Yes |
| 3007 | 8.1 | 436 | 16 | 5300 | Yes |
| 3008 | 7.5 | 325 | 17 | 5300 | Yes |
| 3009 | 6.5 | 378 | 16 | 5300 | No |
| 3010 | 6.1 | 413 | 17 | 5300 | Yes |
| 3011 | 7.3 | 479 | 16 | 5300 | Yes |
| 3012 | 9.2 | 275 | 18 | 5300 | Yes |
| 3013 | 8.7 | 488 | 17 | 5300 | Yes |
| 3014 | 6.8 | 297 | 16 | 5300 | No |
| 3015 | 6.5 | 271 | 18 | 5300 | Yes |
| 3016 | 8.9 | 477 | 18 | 5300 | Yes |
| 3017 | 6.8 | 464 | 16 | 5300 | No |
| 3018 | 7.5 | 432 | 16 | 5300 | Yes |
| 3019 | 9.8 | 314 | 16 | 5300 | Yes |
| 3020 | 6.5 | 294 | 16 | 5300 | No |
| 3021 | 9 | 323 | 18 | 5300 | Yes |
| 3022 | 8.2 | 316 | 17 | 5300 | No |
| 3023 | 9 | 357 | 16 | 5300 | Yes |
| 3024 | 6.2 | 496 | 16 | 5300 | Yes |
| 3025 | 9.3 | 299 | 18 | 5300 | Yes |
| 3026 | 8.9 | 333 | 17 | 5300 | No |
| 3027 | 6 | 400 | 18 | 5300 | Yes |
| 3028 | 7.9 | 447 | 17 | 5300 | No |
| 3029 | 7.4 | 408 | 17 | 5300 | Yes |
| 3030 | 9.6 | 468 | 18 | 5300 | 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 | 18.3 | 443 | 13 | 5300 | Yes |
| 4002 | 14.5 | 398 | 12 | 5300 | Yes |
| 4003 | 19.1 | 385 | 16 | 5300 | Yes |
| 4004 | 11.5 | 352 | 15 | 5300 | Yes |
| 4005 | 16.6 | 485 | 16 | 5300 | Yes |
| 4006 | 18.5 | 348 | 13 | 5300 | Yes |
| 4007 | 14.9 | 494 | 15 | 5300 | Yes |
| 4008 | 13.1 | 370 | 12 | 5300 | Yes |
| 4009 | 14.8 | 277 | 16 | 5300 | Yes |
| 4010 | 13.4 | 417 | 14 | 5300 | Yes |
| 4011 | 15.5 | 470 | 14 | 5300 | Yes |
| 4012 | 14.6 | 254 | 12 | 5300 | Yes |
| 4013 | 13 | 320 | 14 | 5300 | Yes |
| 4014 | 12.5 | 368 | 15 | 5300 | Yes |
| 4015 | 11.3 | 329 | 13 | 5300 | Yes |
| 4016 | 16.2 | 389 | 14 | 5300 | Yes |
| 4017 | 15.5 | 363 | 12 | 5300 | No |
| 4018 | 16.5 | 318 | 16 | 5300 | Yes |
| 4019 | 16.2 | 305 | 14 | 5300 | No |
| 4020 | 17.7 | 273 | 13 | 5300 | Yes |
| 4021 | 13.7 | 406 | 12 | 5300 | Yes |
| 4022 | 15.6 | 269 | 12 | 5300 | Yes |
| 4023 | 16.9 | 415 | 13 | 5300 | No |
| 4024 | 19.3 | 290 | 16 | 5300 | Yes |
| 4025 | 11.9 | 449 | 15 | 5300 | Yes |
| 4026 | 19.6 | 337 | 13 | 5300 | Yes |
| 4027 | 12.7 | 273 | 12 | 5300 | No |
| 4028 | 11.7 | 425 | 13 | 5300 | Yes |
| 4029 | 14.9 | 374 | 15 | 5300 | Yes |
| 4030 | 14.5 | 421 | 16 | 5300 | Yes |

**TYPE 5 DETECTION PROBABILITY**

| Data Sheet for FCC Long Pulse Radar Type 5 | | |
|---|---|---|
| Trial | Frequency (MHz) | Successful Detection (Yes/No) |
| 1 | 5300 | No |
| 2 | 5300 | Yes |
| 3 | 5300 | Yes |
| 4 | 5300 | No |
| 5 | 5300 | Yes |
| 6 | 5300 | Yes |
| 7 | 5300 | Yes |
| 8 | 5300 | Yes |
| 9 | 5300 | Yes |
| 10 | 5300 | Yes |
| 11 | 5297 | Yes |
| 12 | 5297 | Yes |
| 13 | 5300 | Yes |
| 14 | 5298 | Yes |
| 15 | 5295 | Yes |
| 16 | 5297 | Yes |
| 17 | 5299 | Yes |
| 18 | 5298 | Yes |
| 19 | 5297 | Yes |
| 20 | 5299 | Yes |
| 21 | 5304 | No |
| 22 | 5303 | Yes |
| 23 | 5303 | Yes |
| 24 | 5301 | Yes |
| 25 | 5303 | Yes |
| 26 | 5303 | Yes |
| 27 | 5305 | No |
| 28 | 5301 | Yes |
| 29 | 5305 | Yes |
| 30 | 5303 | Yes |

Note: The Type 5 randomized parameters tested are shown in a separate document.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**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 | 115 | 5290 | 4 | Yes |
| 2 | 590 | 5291 | 2 | Yes |
| 3 | 1065 | 5292 | 2 | Yes |
| 4 | 1540 | 5293 | 3 | Yes |
| 5 | 2015 | 5294 | 1 | Yes |
| 6 | 2490 | 5295 | 7 | Yes |
| 7 | 2965 | 5296 | 6 | Yes |
| 8 | 3440 | 5297 | 4 | Yes |
| 9 | 3915 | 5298 | 6 | Yes |
| 10 | 4390 | 5299 | 3 | Yes |
| 11 | 4865 | 5300 | 3 | Yes |
| 12 | 5340 | 5301 | 3 | Yes |
| 13 | 5815 | 5302 | 1 | Yes |
| 14 | 6290 | 5303 | 3 | Yes |
| 15 | 6765 | 5304 | 4 | Yes |
| 16 | 7240 | 5305 | 6 | Yes |
| 17 | 7715 | 5306 | 2 | Yes |
| 18 | 8190 | 5307 | 3 | Yes |
| 19 | 8665 | 5308 | 6 | Yes |
| 20 | 9140 | 5309 | 2 | Yes |
| 21 | 9615 | 5310 | 6 | Yes |
| 22 | 10090 | 5290 | 3 | Yes |
| 23 | 10565 | 5291 | 5 | Yes |
| 24 | 11040 | 5292 | 7 | Yes |
| 25 | 11515 | 5293 | 3 | Yes |
| 26 | 11990 | 5294 | 7 | Yes |
| 27 | 12465 | 5295 | 2 | Yes |
| 28 | 12940 | 5296 | 4 | Yes |
| 29 | 13415 | 5297 | 8 | Yes |
| 30 | 13890 | 5298 | 7 | Yes |
| 31 | 14365 | 5299 | 7 | Yes |
| 32 | 14840 | 5300 | 3 | Yes |
| 33 | 15315 | 5301 | 7 | Yes |
| 34 | 15790 | 5302 | 6 | Yes |
| 35 | 16265 | 5303 | 5 | Yes |
| 36 | 16740 | 5304 | 2 | Yes |
| 37 | 17215 | 5305 | 2 | Yes |
| 38 | 17690 | 5306 | 7 | Yes |
| 39 | 18165 | 5307 | 4 | Yes |
| 40 | 18640 | 5308 | 6 | Yes |
| 41 | 19115 | 5309 | 5 | Yes |
| 42 | 19590 | 5310 | 6 | Yes |

# 5.3. LOW BAND RESULTS FOR 40 MHz BANDWIDTH

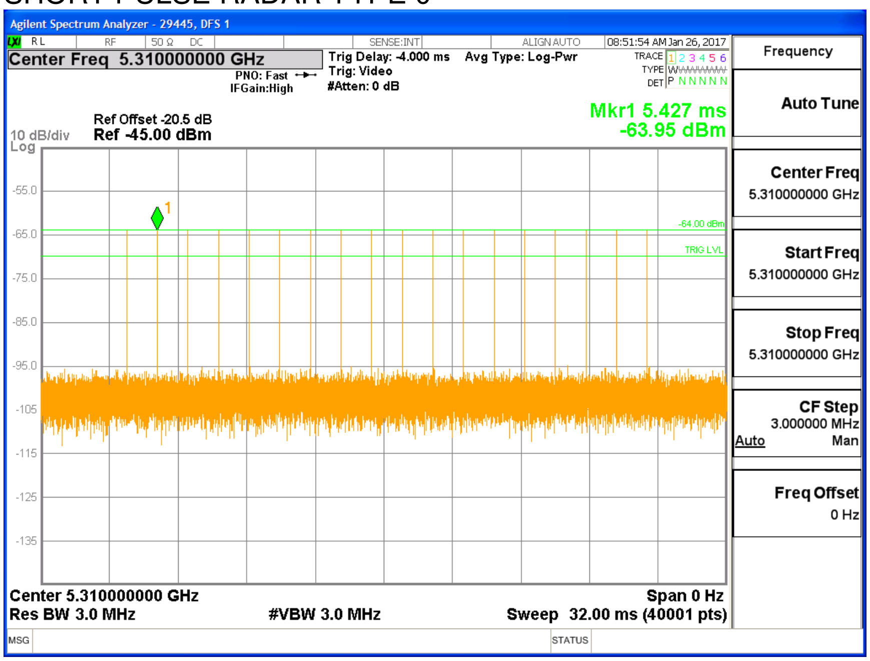
## 5.3.1. TEST CHANNEL

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

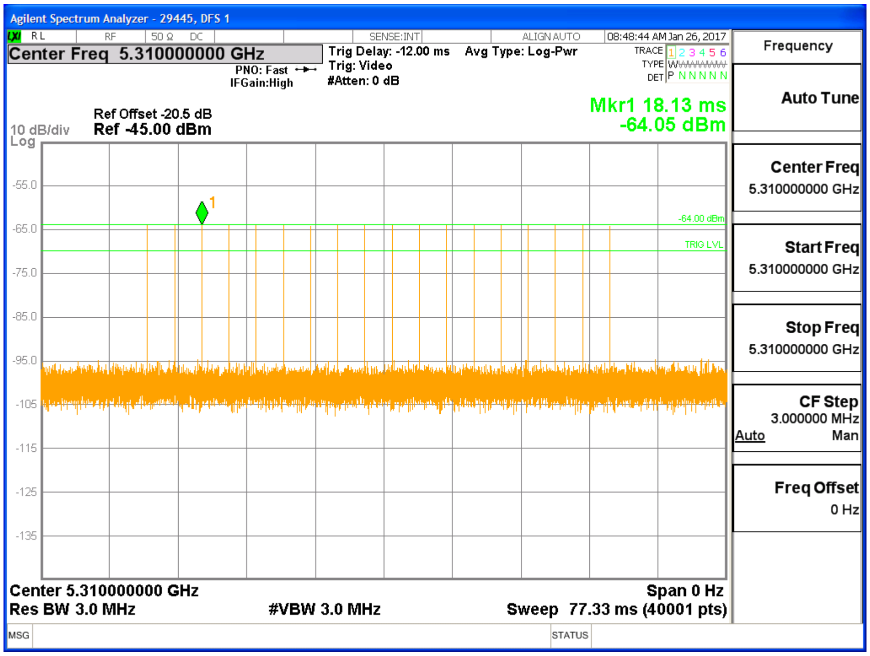
## 5.3.2. RADAR WAVEFORMS AND TRAFFIC

**RADAR WAVEFORMS**

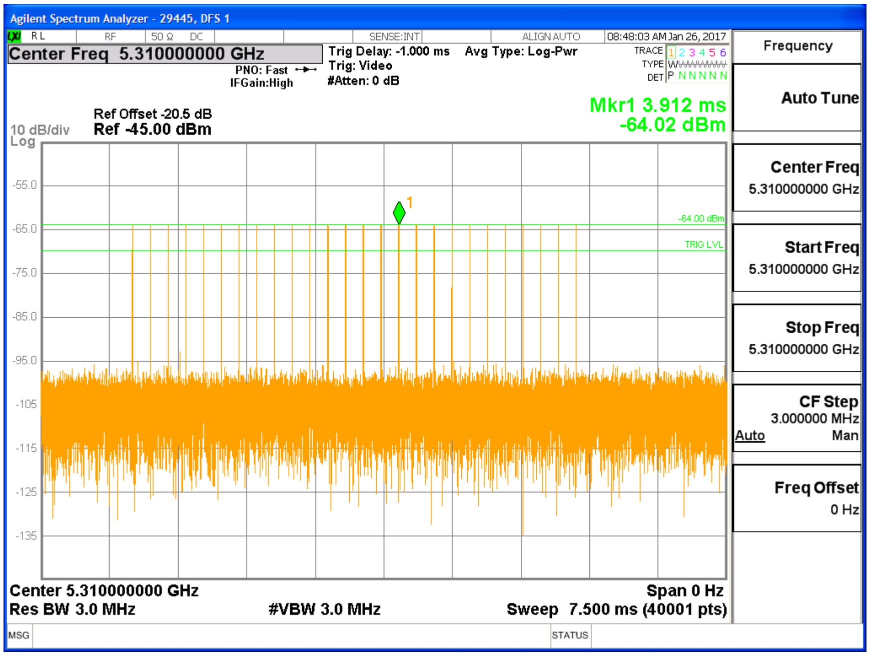
SHORT PULSE RADAR TYPE 0



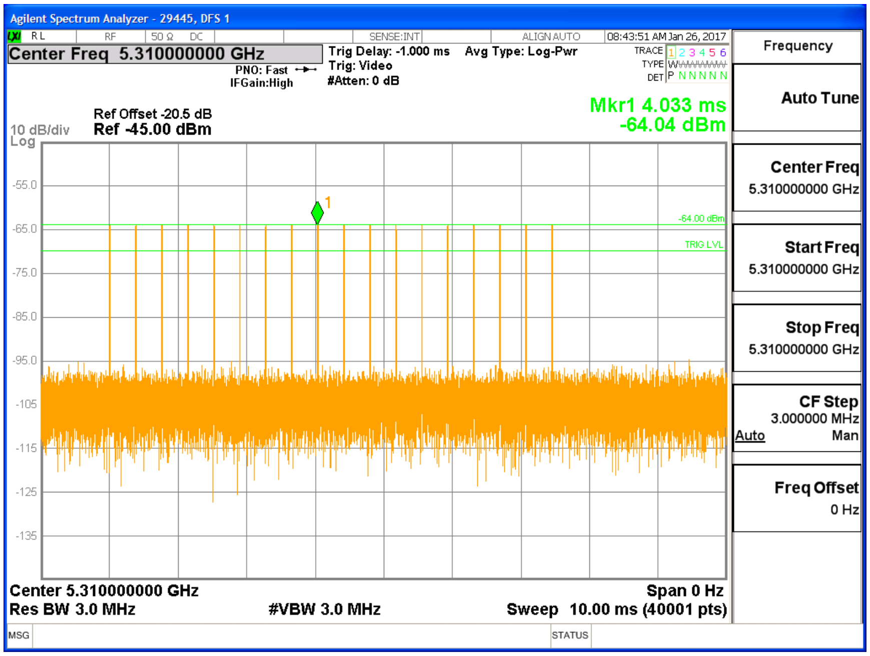
SAMPLE OF RADAR TYPE 1



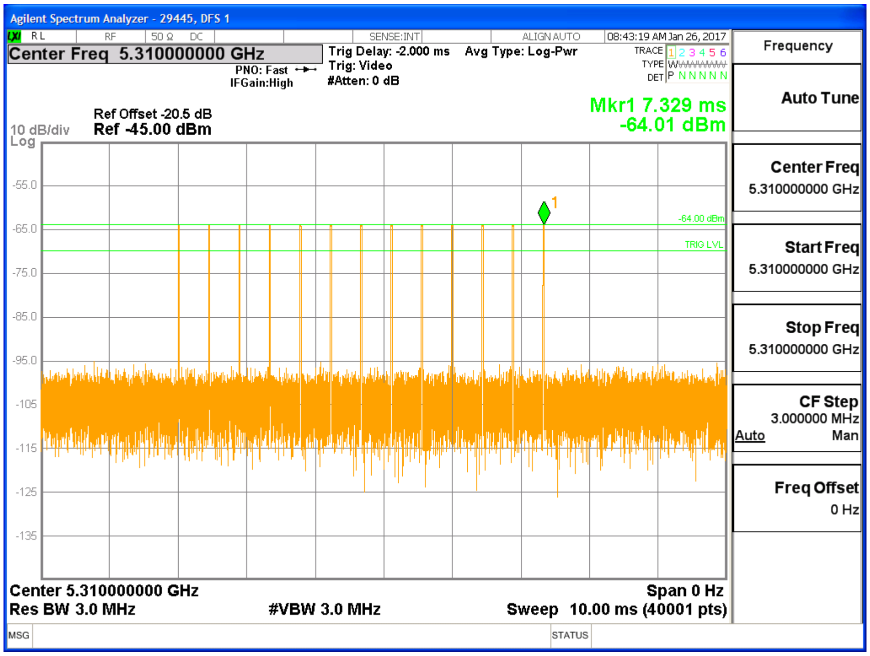
SAMPLE OF RADAR TYPE 2



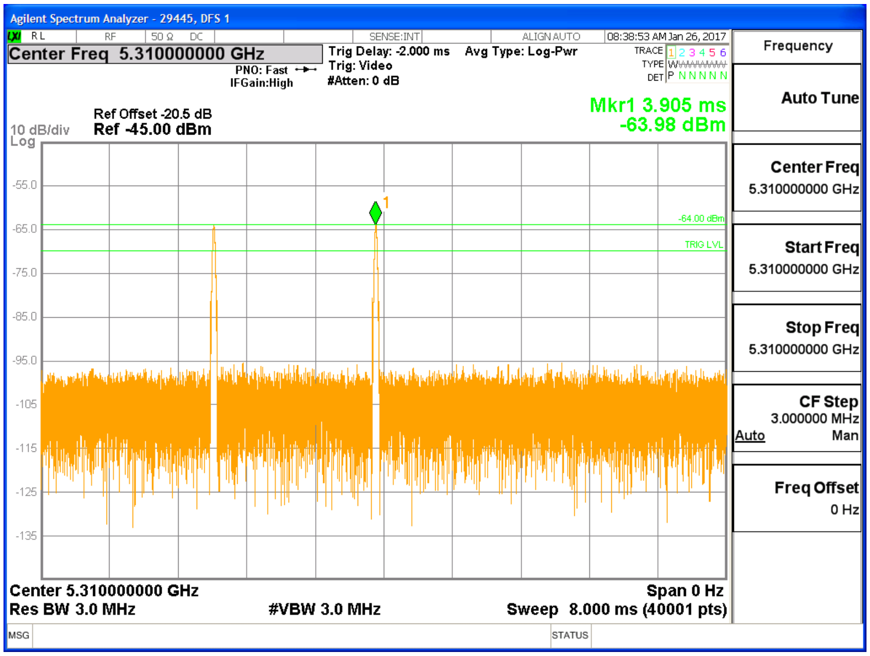
SAMPLE OF RADAR TYPE 3



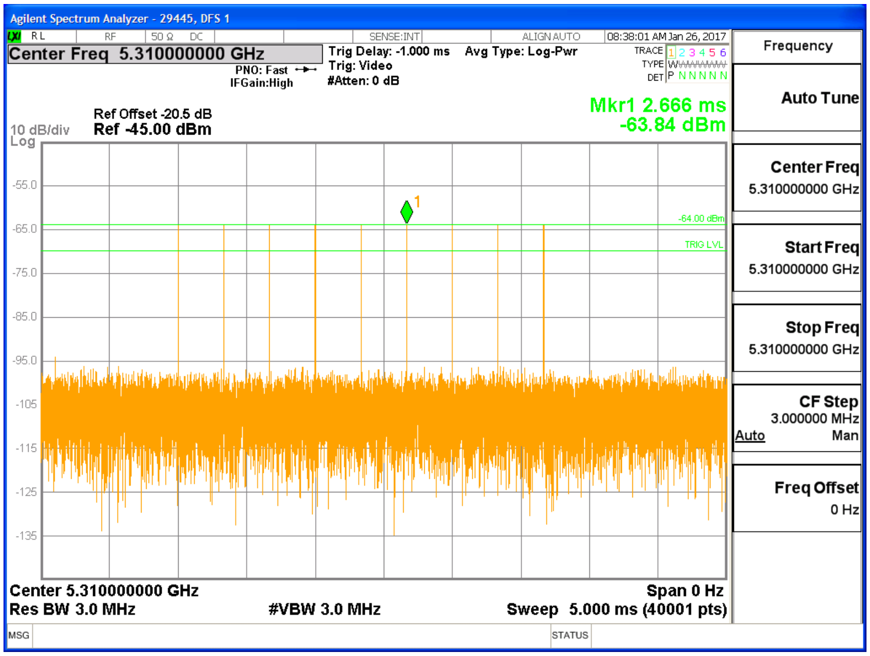
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

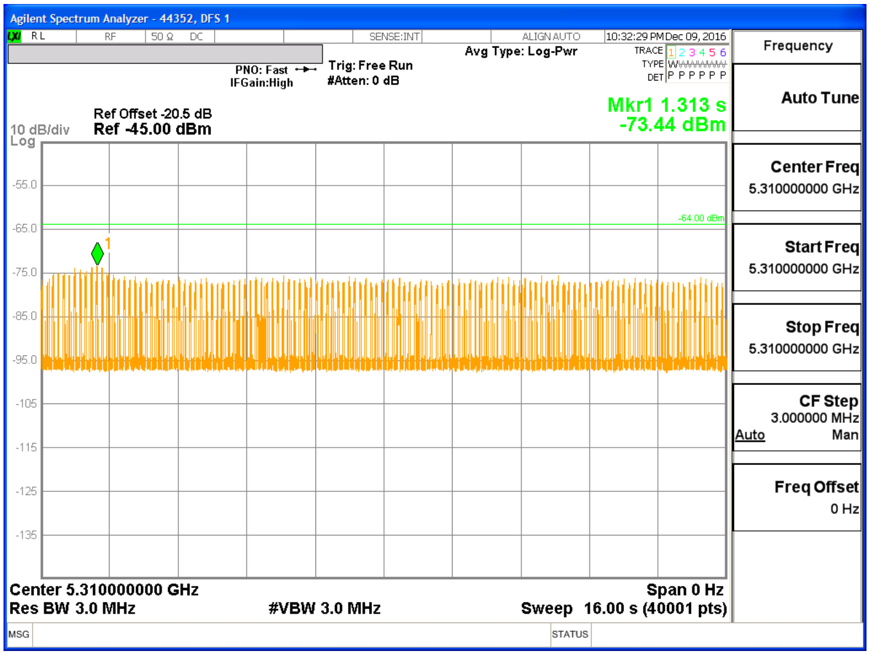


SINGLE BURST OF RADAR TYPE 6

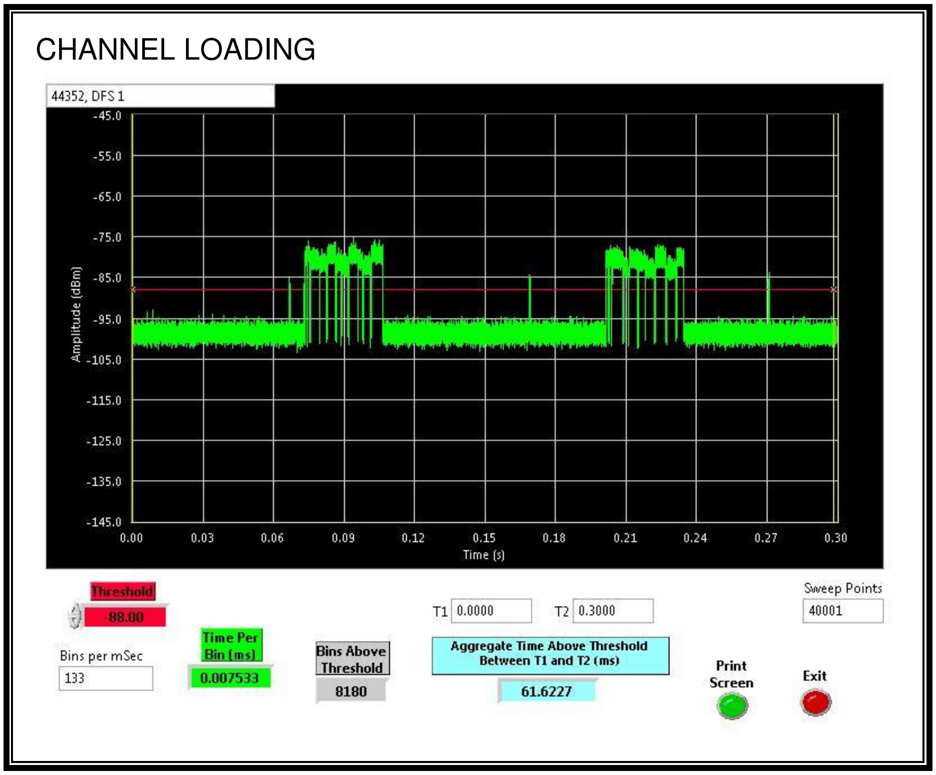


**TRAFFIC**

TRAFFIC



**CHANNEL LOADING**




The level of traffic loading on the channel by the EUT is 20.54%

## 5.3.3. OVERLAPPING CHANNEL TESTS

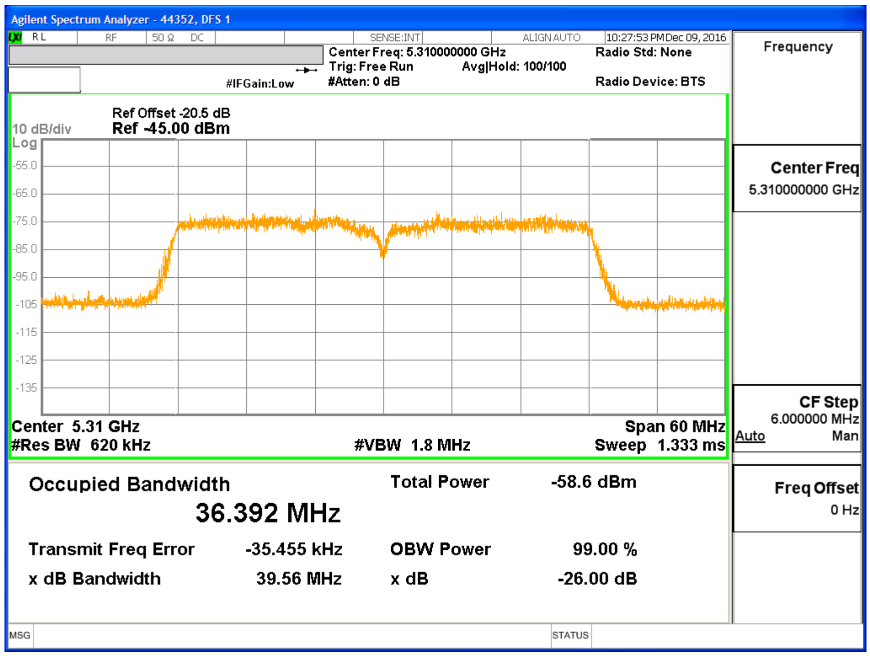
**RESULTS**

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

### 5.3.4. DETECTION BANDWIDTH

**REFERENCE PLOT OF 99% POWER BANDWIDTH**

99% BANDWIDTH




**RESULTS**

| FL (MHz) | FH (MHz) | Detection Bandwidth (MHz) | 99% Power Bandwidth (MHz) | Ratio of Detection BW to 99% Power BW (%) | Minimum Limit (%) |
|---|---|---|---|---|---|
| 5290 | 5330 | 40 | 36.392 | 109.9 | 100 |

**DETECTION BANDWIDTH PROBABILITY**

DETECTION BANDWIDTH PROBABILITY RESULTS

| Detection Bandwidth Test Results | | 44352 | DFS 1 | |
|---|---|---|---|---|
| FCC Type 0 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst | | | | |
| Frequency (MHz) | Number of Trials | Number Detected | Detection (%) | Mark |
| 5289 | 10 | 0 | 0 | |
| 5290 | 10 | 10 | 100 | FL |
| 5295 | 10 | 10 | 100 | |
| 5300 | 10 | 10 | 100 | |
| 5305 | 10 | 10 | 100 | |
| 5310 | 10 | 10 | 100 | |
| 5315 | 10 | 10 | 100 | |
| 5320 | 10 | 10 | 100 | |
| 5325 | 10 | 10 | 100 | |
| 5330 | 10 | 10 | 100 | FH |
| 5331 | 10 | 0 | 0 | |

### 5.3.5. IN-SERVICE MONITORING

**RESULTS**

FCC Radar Test Summary

| Signal Type | Number of Trials | Detection (%) | Limit (%) | Pass/Fail | Detection Bandwidth FL | Detection Bandwidth FH | OBW | Test Location | Employee Number | In-Service Monitoring Version |
|---|---|---|---|---|---|---|---|---|---|---|
| FCC Short Pulse Type 1 | 30 | 96.67 | 60 | Pass | 5290 | 5330 | 36.39 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 2 | 30 | 90.00 | 60 | Pass | 5290 | 5330 | 36.39 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 3 | 30 | 63.33 | 60 | Pass | 5290 | 5330 | 36.39 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 4 | 30 | 80.00 | 60 | Pass | 5290 | 5330 | 36.39 | DFS 1 | 29445 | Version 3.0 |
| Aggregate | | 82.50 | 80 | Pass | | | | | | |
| FCC Long Pulse Type 5 | 30 | 90.00 | 80 | Pass | 5290 | 5330 | 36.39 | DFS 1 | 29445 | Version 3.0 |
| FCC Hopping Type 6 | 41 | 100.00 | 70 | Pass | 5290 | 5330 | 36.39 | DFS 1 | 29445 | Version 3.0 |

**TYPE 1 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 1 | | | | | | |
|---|---|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Test (A/B) | Frequency (MHz) | Successful Detection (Yes/No) |
| 1001 | 1 | 3066 | 18 | A | 5310 | Yes |
| 1002 | 1 | 578 | 92 | A | 5310 | Yes |
| 1003 | 1 | 598 | 89 | A | 5310 | Yes |
| 1004 | 1 | 718 | 74 | A | 5310 | Yes |
| 1005 | 1 | 678 | 78 | A | 5310 | Yes |
| 1006 | 1 | 818 | 65 | A | 5310 | Yes |
| 1007 | 1 | 778 | 68 | A | 5310 | Yes |
| 1008 | 1 | 838 | 63 | A | 5310 | Yes |
| 1009 | 1 | 698 | 76 | A | 5310 | Yes |
| 1010 | 1 | 518 | 102 | A | 5310 | Yes |
| 1011 | 1 | 658 | 81 | A | 5310 | Yes |
| 1012 | 1 | 798 | 67 | A | 5310 | Yes |
| 1013 | 1 | 898 | 59 | A | 5310 | Yes |
| 1014 | 1 | 618 | 86 | A | 5310 | Yes |
| 1015 | 1 | 738 | 72 | A | 5310 | Yes |
| 1016 | 1 | 1638 | 33 | B | 5310 | No |
| 1017 | 1 | 2465 | 22 | B | 5310 | Yes |
| 1018 | 1 | 1226 | 44 | B | 5310 | Yes |
| 1019 | 1 | 2182 | 25 | B | 5310 | Yes |
| 1020 | 1 | 1073 | 50 | B | 5310 | Yes |
| 1021 | 1 | 964 | 55 | B | 5310 | Yes |
| 1022 | 1 | 2532 | 21 | B | 5310 | Yes |
| 1023 | 1 | 2553 | 21 | B | 5310 | Yes |
| 1024 | 1 | 1703 | 31 | B | 5310 | Yes |
| 1025 | 1 | 1291 | 41 | B | 5310 | Yes |
| 1026 | 1 | 2924 | 19 | B | 5310 | Yes |
| 1027 | 1 | 1138 | 47 | B | 5310 | Yes |
| 1028 | 1 | 2900 | 19 | B | 5310 | Yes |
| 1029 | 1 | 2597 | 21 | B | 5310 | Yes |
| 1030 | 1 | 747 | 71 | B | 5310 | Yes |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**TYPE 2 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 2 | | | | | |
|---|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Frequency (MHz) | Successful Detection (Yes/No) |
| 2001 | 3.8 | 194 | 26 | 5310 | No |
| 2002 | 2.8 | 188 | 26 | 5310 | Yes |
| 2003 | 1.1 | 154 | 24 | 5310 | Yes |
| 2004 | 2.2 | 195 | 24 | 5310 | Yes |
| 2005 | 3 | 208 | 23 | 5310 | Yes |
| 2006 | 2.4 | 172 | 27 | 5310 | Yes |
| 2007 | 3.3 | 189 | 26 | 5310 | Yes |
| 2008 | 2.9 | 157 | 27 | 5310 | No |
| 2009 | 2.2 | 222 | 27 | 5310 | Yes |
| 2010 | 4.2 | 156 | 28 | 5310 | Yes |
| 2011 | 3.6 | 182 | 25 | 5310 | Yes |
| 2012 | 3.6 | 163 | 26 | 5310 | Yes |
| 2013 | 1.4 | 155 | 27 | 5310 | Yes |
| 2014 | 3.8 | 178 | 29 | 5310 | Yes |
| 2015 | 1.7 | 217 | 23 | 5310 | Yes |
| 2016 | 4.3 | 206 | 29 | 5310 | Yes |
| 2017 | 4.7 | 168 | 24 | 5310 | Yes |
| 2018 | 1.5 | 162 | 23 | 5310 | Yes |
| 2019 | 3.9 | 209 | 29 | 5310 | Yes |
| 2020 | 3.1 | 169 | 29 | 5310 | Yes |
| 2021 | 1.7 | 182 | 28 | 5310 | Yes |
| 2022 | 1.1 | 227 | 24 | 5310 | Yes |
| 2023 | 2 | 164 | 28 | 5310 | Yes |
| 2024 | 3.8 | 213 | 25 | 5310 | Yes |
| 2025 | 5 | 196 | 28 | 5310 | No |
| 2026 | 2.9 | 211 | 26 | 5310 | Yes |
| 2027 | 2.3 | 199 | 23 | 5310 | Yes |
| 2028 | 4.5 | 218 | 24 | 5310 | Yes |
| 2029 | 4.2 | 210 | 25 | 5310 | Yes |
| 2030 | 2.5 | 195 | 27 | 5310 | Yes |

**TYPE 3 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 3 | | | | | |
|---|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Frequency (MHz) | Successful Detection (Yes/No) |
| 3001 | 9.5 | 379 | 18 | 5310 | Yes |
| 3002 | 6.1 | 347 | 17 | 5310 | Yes |
| 3003 | 8.4 | 480 | 18 | 5310 | Yes |
| 3004 | 9.3 | 460 | 18 | 5310 | Yes |
| 3005 | 7.6 | 488 | 17 | 5310 | Yes |
| 3006 | 6.8 | 395 | 16 | 5310 | Yes |
| 3007 | 8.1 | 436 | 16 | 5310 | No |
| 3008 | 7.5 | 325 | 17 | 5310 | No |
| 3009 | 6.5 | 378 | 16 | 5310 | No |
| 3010 | 6.1 | 413 | 17 | 5310 | Yes |
| 3011 | 7.3 | 479 | 16 | 5310 | Yes |
| 3012 | 9.2 | 275 | 18 | 5310 | No |
| 3013 | 8.7 | 488 | 17 | 5310 | No |
| 3014 | 6.8 | 297 | 16 | 5310 | Yes |
| 3015 | 6.5 | 271 | 18 | 5310 | Yes |
| 3016 | 8.9 | 477 | 18 | 5310 | Yes |
| 3017 | 6.8 | 464 | 16 | 5310 | Yes |
| 3018 | 7.5 | 432 | 16 | 5310 | Yes |
| 3019 | 9.8 | 314 | 16 | 5310 | Yes |
| 3020 | 6.5 | 294 | 16 | 5310 | Yes |
| 3021 | 9 | 323 | 18 | 5310 | No |
| 3022 | 8.2 | 316 | 17 | 5310 | No |
| 3023 | 9 | 357 | 16 | 5310 | Yes |
| 3024 | 6.2 | 496 | 16 | 5310 | No |
| 3025 | 9.3 | 299 | 18 | 5310 | No |
| 3026 | 8.9 | 333 | 17 | 5310 | No |
| 3027 | 6 | 400 | 18 | 5310 | Yes |
| 3028 | 7.9 | 447 | 17 | 5310 | Yes |
| 3029 | 7.4 | 408 | 17 | 5310 | No |
| 3030 | 9.6 | 468 | 18 | 5310 | Yes |


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**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 | 18.3 | 443 | 13 | 5310 | Yes |
| 4002 | 14.5 | 398 | 12 | 5310 | Yes |
| 4003 | 19.1 | 385 | 16 | 5310 | Yes |
| 4004 | 11.5 | 352 | 15 | 5310 | Yes |
| 4005 | 16.6 | 485 | 16 | 5310 | Yes |
| 4006 | 18.5 | 348 | 13 | 5310 | No |
| 4007 | 14.9 | 494 | 15 | 5310 | Yes |
| 4008 | 13.1 | 370 | 12 | 5310 | Yes |
| 4009 | 14.8 | 277 | 16 | 5310 | Yes |
| 4010 | 13.4 | 417 | 14 | 5310 | Yes |
| 4011 | 15.5 | 470 | 14 | 5310 | No |
| 4012 | 14.6 | 254 | 12 | 5310 | Yes |
| 4013 | 13 | 320 | 14 | 5310 | No |
| 4014 | 12.5 | 368 | 15 | 5310 | No |
| 4015 | 11.3 | 329 | 13 | 5310 | Yes |
| 4016 | 16.2 | 389 | 14 | 5310 | Yes |
| 4017 | 15.5 | 363 | 12 | 5310 | Yes |
| 4018 | 16.5 | 318 | 16 | 5310 | Yes |
| 4019 | 16.2 | 305 | 14 | 5310 | Yes |
| 4020 | 17.7 | 273 | 13 | 5310 | No |
| 4021 | 13.7 | 406 | 12 | 5310 | Yes |
| 4022 | 15.6 | 269 | 12 | 5310 | Yes |
| 4023 | 16.9 | 415 | 13 | 5310 | Yes |
| 4024 | 19.3 | 290 | 16 | 5310 | Yes |
| 4025 | 11.9 | 449 | 15 | 5310 | Yes |
| 4026 | 19.6 | 337 | 13 | 5310 | No |
| 4027 | 12.7 | 273 | 12 | 5310 | Yes |
| 4028 | 11.7 | 425 | 13 | 5310 | Yes |
| 4029 | 14.9 | 374 | 15 | 5310 | Yes |
| 4030 | 14.5 | 421 | 16 | 5310 | Yes |

**TYPE 5 DETECTION PROBABILITY**

| Data Sheet for FCC Long Pulse Radar Type 5 | | |
|---|---|---|
| Trial | Frequency (MHz) | Successful Detection (Yes/No) |
| 1 | 5310 | No |
| 2 | 5310 | Yes |
| 3 | 5310 | Yes |
| 4 | 5310 | No |
| 5 | 5310 | Yes |
| 6 | 5310 | Yes |
| 7 | 5310 | Yes |
| 8 | 5310 | Yes |
| 9 | 5310 | Yes |
| 10 | 5310 | Yes |
| 11 | 5298 | Yes |
| 12 | 5298 | Yes |
| 13 | 5300 | Yes |
| 14 | 5298 | Yes |
| 15 | 5296 | Yes |
| 16 | 5298 | Yes |
| 17 | 5300 | Yes |
| 18 | 5299 | Yes |
| 19 | 5298 | Yes |
| 20 | 5300 | Yes |
| 21 | 5323 | No |
| 22 | 5322 | Yes |
| 23 | 5322 | Yes |
| 24 | 5320 | Yes |
| 25 | 5322 | Yes |
| 26 | 5322 | Yes |
| 27 | 5324 | Yes |
| 28 | 5321 | Yes |
| 29 | 5324 | Yes |
| 30 | 5323 | Yes |

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

**TYPE 6 DETECTION PROBABILITY**

| Data Sheet for FCC Hopping Radar Type 6 | | | | |
|---|---|---|---|---|
| 1 us Pulse Width, 333 us PRI, 9 Pulses per Burst, 1 Burst per Hop | | | | |
| NTIA August 2005 Hopping Sequence | | | | |
| Trial | Starting Index Within Sequence | Signal Generator Frequency (MHz) | Hops within Detection BW | Successful Detection (Yes/No) |
| 1 | 374 | 5290 | 10 | Yes |
| 2 | 849 | 5291 | 13 | Yes |
| 3 | 1324 | 5292 | 7 | Yes |
| 4 | 1799 | 5293 | 11 | Yes |
| 5 | 2274 | 5294 | 5 | Yes |
| 6 | 2749 | 5295 | 6 | Yes |
| 7 | 3224 | 5296 | 7 | Yes |
| 8 | 3699 | 5297 | 11 | Yes |
| 9 | 4174 | 5298 | 4 | Yes |
| 10 | 4649 | 5299 | 8 | Yes |
| 11 | 5124 | 5300 | 8 | Yes |
| 12 | 5599 | 5301 | 14 | Yes |
| 13 | 6074 | 5302 | 9 | Yes |
| 14 | 6549 | 5303 | 7 | Yes |
| 15 | 7024 | 5304 | 9 | Yes |
| 16 | 7499 | 5305 | 9 | Yes |
| 17 | 7974 | 5306 | 7 | Yes |
| 18 | 8449 | 5307 | 6 | Yes |
| 19 | 8924 | 5308 | 8 | Yes |
| 20 | 9399 | 5309 | 13 | Yes |
| 21 | 9874 | 5310 | 12 | Yes |
| 22 | 10349 | 5311 | 11 | Yes |
| 23 | 10824 | 5312 | 7 | Yes |
| 24 | 11299 | 5313 | 3 | Yes |
| 25 | 11774 | 5314 | 8 | Yes |
| 26 | 12249 | 5315 | 6 | Yes |
| 27 | 12724 | 5316 | 6 | Yes |
| 28 | 13199 | 5317 | 7 | Yes |
| 29 | 13674 | 5318 | 4 | Yes |
| 30 | 14149 | 5319 | 5 | Yes |
| 31 | 14624 | 5320 | 4 | Yes |
| 32 | 15099 | 5321 | 5 | Yes |
| 33 | 15574 | 5322 | 7 | Yes |
| 34 | 16049 | 5323 | 9 | Yes |
| 35 | 16524 | 5324 | 11 | Yes |
| 36 | 16999 | 5325 | 10 | Yes |
| 37 | 17474 | 5326 | 8 | Yes |
| 38 | 17949 | 5327 | 7 | Yes |
| 39 | 18424 | 5328 | 8 | Yes |
| 40 | 18899 | 5329 | 7 | Yes |
| 41 | 19374 | 5330 | 7 | Yes |

# 5.4. LOW BAND RESULTS FOR 80 MHz BANDWIDTH

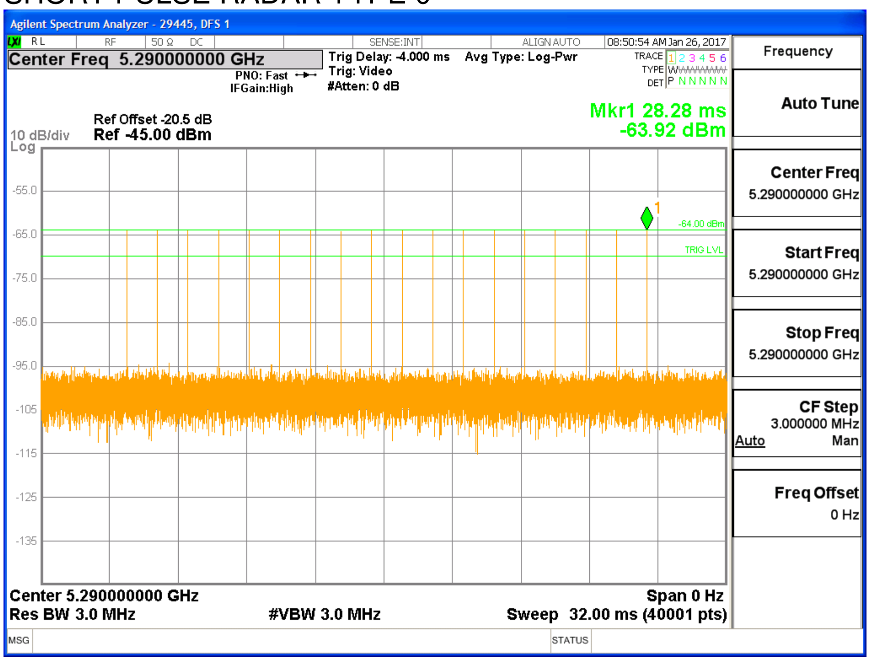
## 5.4.1. TEST CHANNEL

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

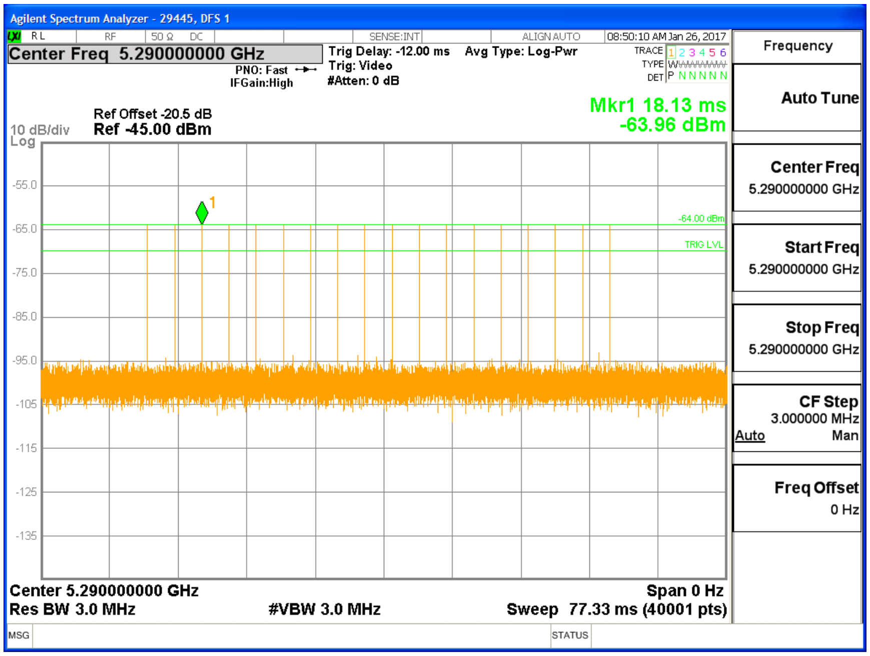
## 5.4.2. RADAR WAVEFORMS AND TRAFFIC

**RADAR WAVEFORMS**

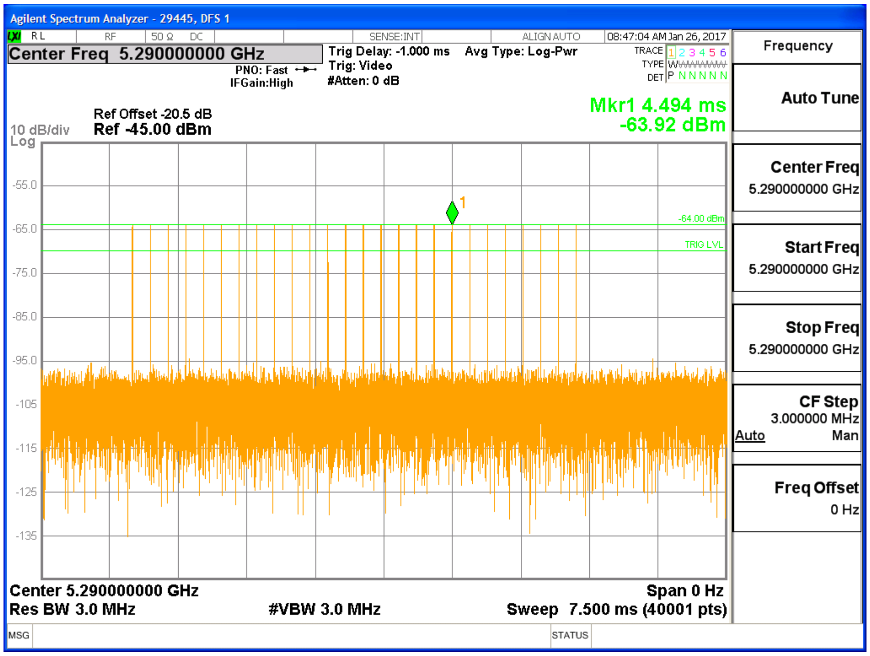
SHORT PULSE RADAR TYPE 0



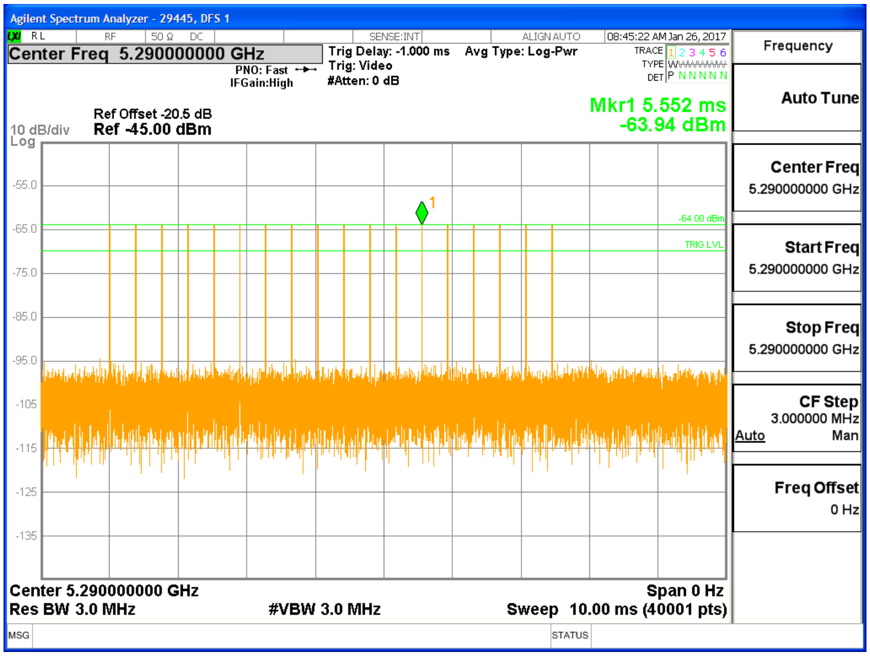
SAMPLE OF RADAR TYPE 1



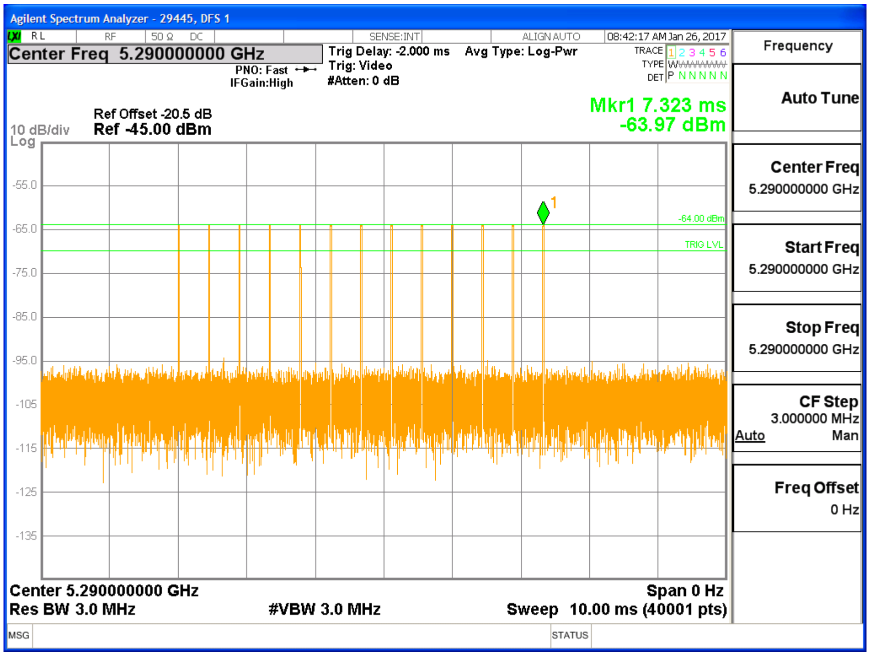
SAMPLE OF RADAR TYPE 2



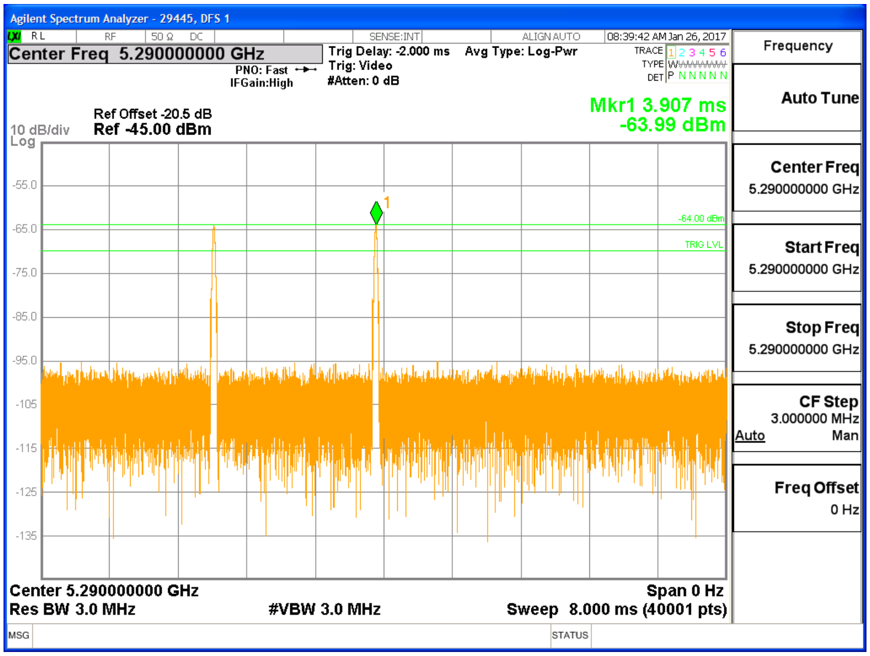
SAMPLE OF RADAR TYPE 3



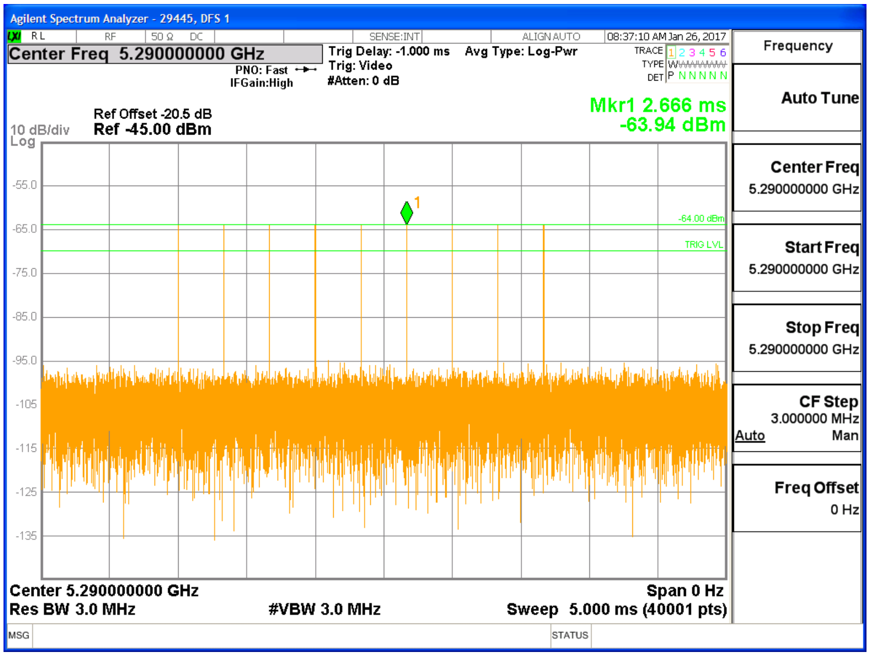
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

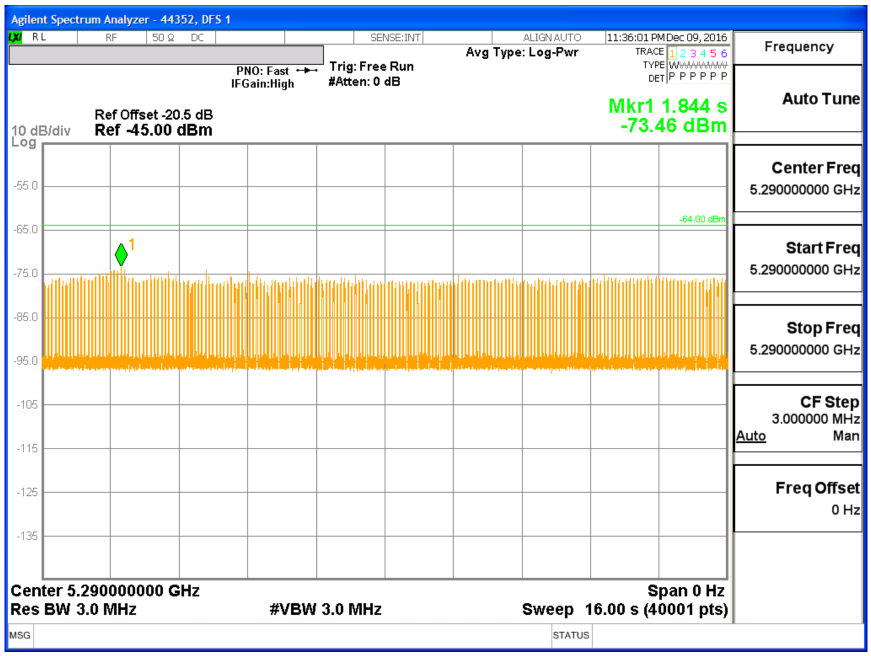


SINGLE BURST OF RADAR TYPE 6

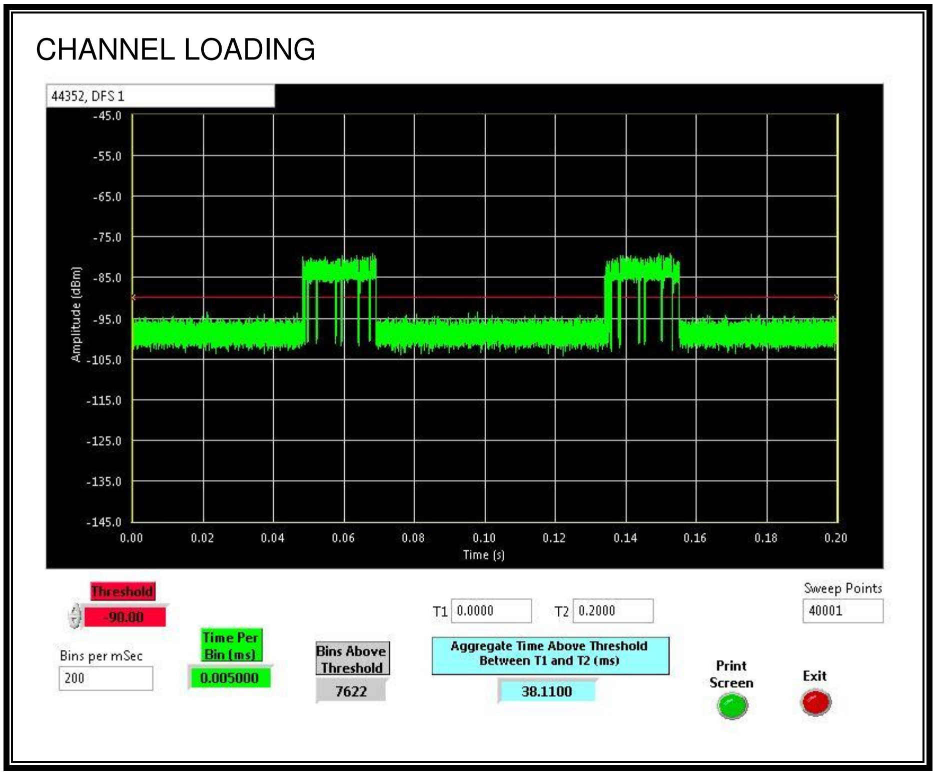


**TRAFFIC**

TRAFFIC



**CHANNEL LOADING**




The level of traffic loading on the channel by the EUT is 19.055%

### 5.4.3. OVERLAPPING CHANNEL TESTS

**RESULTS**

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

### 5.4.4. MOVE AND CLOSING TIME

**REPORTING NOTES**

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

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

The aggregate channel closing transmission time is calculated as follows:

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

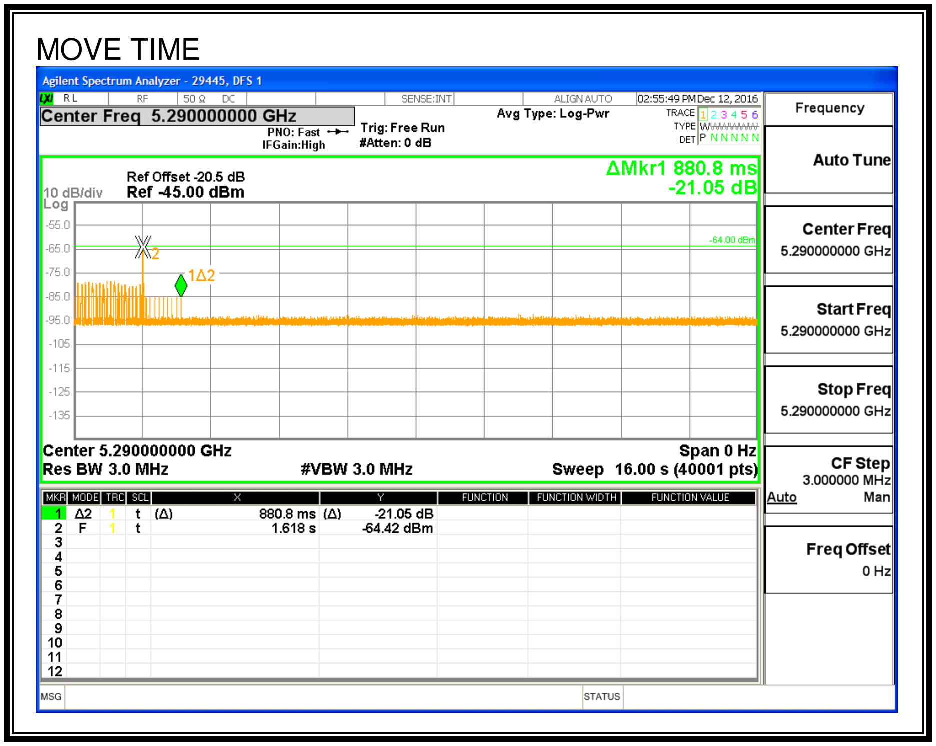
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

**RESULTS**

| Channel Move Time (sec) | Limit (sec) |
|---|---|
| 0.8808 | 10 |

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

## MOVE TIME

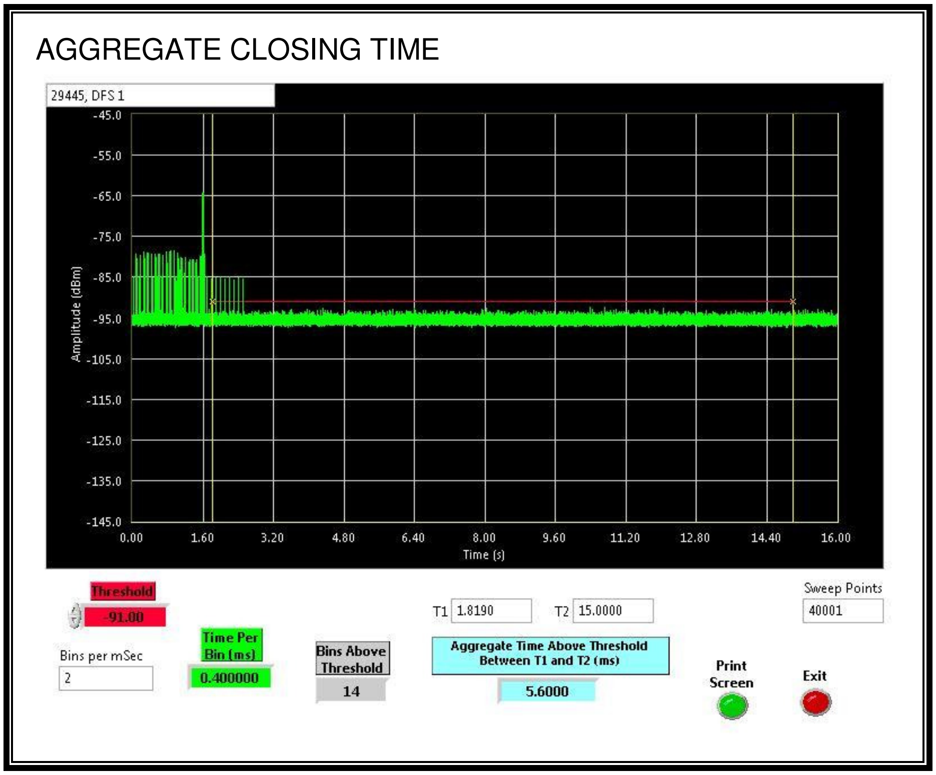

MOVE TIME
Agilent Spectrum Analyzer - 29445, DFS 1
Center Freq 5.290000000 GHz
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
02:55:49 PM Dec 12, 2016
Ref Offset -20.5 dB
10 dB/div Ref -45.00 dBm
ΔMkr1 880.8 ms
-21.05 dB
Center 5.290000000 GHz
Span 0 Hz
Res BW 3.0 MHz
#VBW 3.0 MHz
Sweep 16.00 s (40001 pts)
1 Δ2 1 t (Δ) 880.8 ms (Δ) -21.05 dB
2 F 1 t 1.618 s -64.42 dBm
Frequency
Auto Tune
Center Freq 5.290000000 GHz
Start Freq 5.290000000 GHz
Stop Freq 5.290000000 GHz
CF Step 3.000000 MHz
Auto Man
Freq Offset 0 Hz

## CHANNEL CLOSING TIME

CLOSING TIME

**AGGREGATE CHANNEL CLOSING TRANSMISSION TIME**

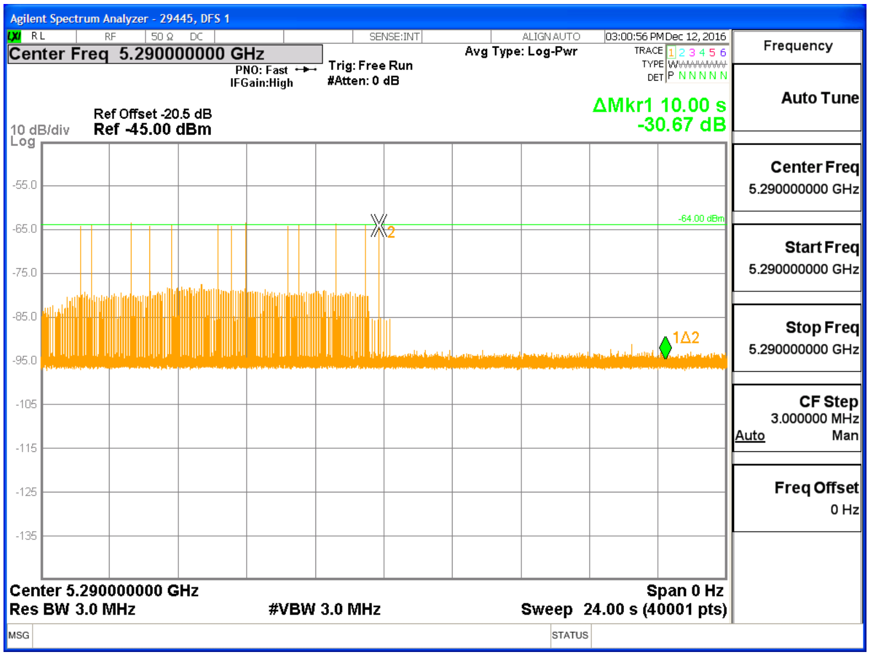
Only intermittent transmissions are observed during the aggregate monitoring period.



## LONG PULSE CHANNEL MOVE TIME

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

MOVE TIME FOR LONG PULSE RADAR

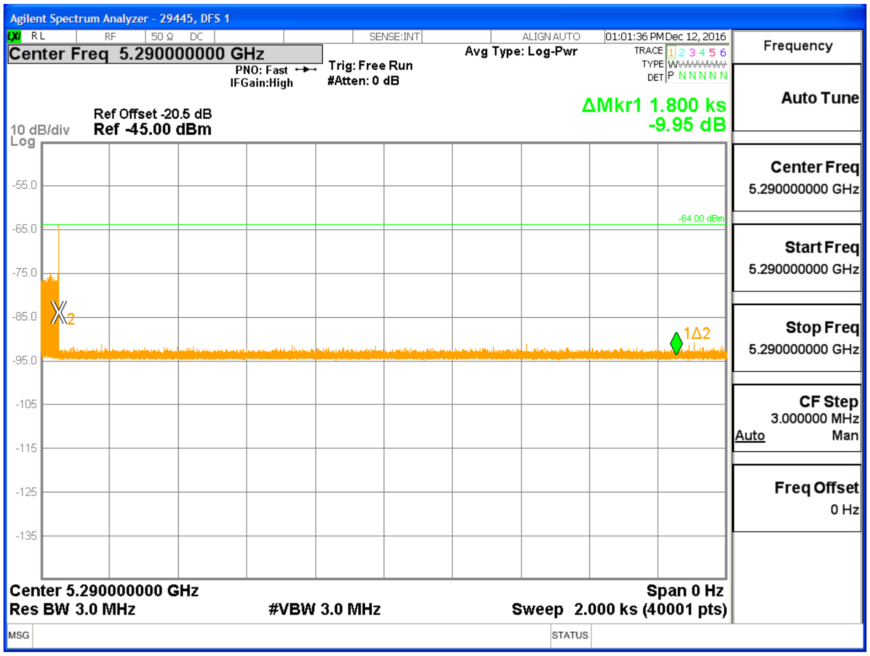


### 5.4.1. NON-OCCUPANCY PERIOD

**RESULTS**

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

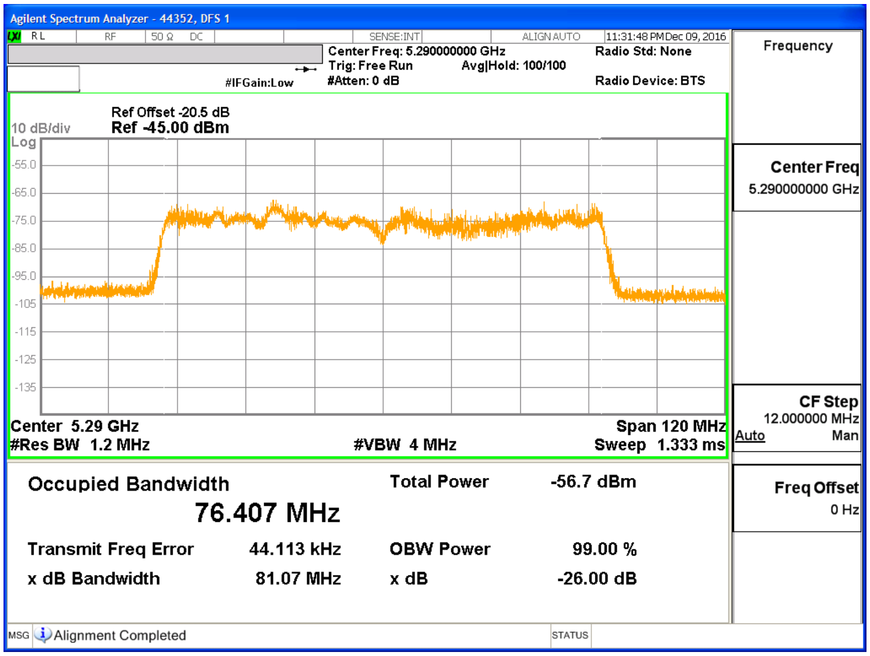
NON-OCCUPANCY PERIOD



### 5.4.2. DETECTION BANDWIDTH

**REFERENCE PLOT OF 99% POWER BANDWIDTH**

99% BANDWIDTH




**RESULTS**

| FL (MHz) | FH (MHz) | Detection Bandwidth (MHz) | 99% Power Bandwidth (MHz) | Ratio of Detection BW to 99% Power BW (%) | Minimum Limit (%) |
|---|---|---|---|---|---|
| 5251 | 5329 | 78 | 76.407 | 102.1 | 100 |

**DETECTION BANDWIDTH PROBABILITY**

DETECTION BANDWIDTH PROBABILITY RESULTS

| Detection Bandwidth Test Results | | 44352 | | DFS 1 |
|---|---|---|---|---|
| FCC Type 0 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst | | | | |
| Frequency (MHz) | Number of Trials | Number Detected | Detection (%) | Mark |
| 5250 | 1 | 0 | 0 | |
| 5251 | 10 | 10 | 100 | FL |
| 5252 | 10 | 10 | 100 | |
| 5253 | 10 | 10 | 100 | |
| 5254 | 10 | 10 | 100 | |
| 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 | |
| 5326 | 10 | 10 | 100 | |
| 5327 | 10 | 10 | 100 | |
| 5328 | 10 | 10 | 100 | |
| 5329 | 10 | 10 | 100 | FH |
| 5330 | 1 | 0 | 0 | |

### 5.4.3. IN-SERVICE MONITORING

**RESULTS**

FCC Radar Test Summary

| Signal Type | Number of Trials | Detection (%) | Limit (%) | Pass/Fail | Detection Bandwidth FL | Detection Bandwidth FH | OBW | Test Location | Employee Number | In-Service Monitoring Version |
|---|---|---|---|---|---|---|---|---|---|---|
| FCC Short Pulse Type 1 | 30 | 96.67 | 60 | Pass | 5251 | 5329 | 76.41 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 2 | 30 | 83.33 | 60 | Pass | 5251 | 5329 | 76.41 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 3 | 30 | 80.00 | 60 | Pass | 5251 | 5329 | 76.41 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 4 | 30 | 70.00 | 60 | Pass | 5251 | 5329 | 76.41 | DFS 1 | 29445 | Version 3.0 |
| Aggregate | | 82.50 | 80 | Pass | | | | | | |
| FCC Long Pulse Type 5 | 30 | 93.33 | 80 | Pass | 5251 | 5329 | 76.41 | DFS 1 | 29445 | Version 3.0 |
| FCC Hopping Type 6 | 79 | 100.00 | 70 | Pass | 5251 | 5329 | 76.41 | DFS 1 | 29445 | Version 3.0 |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**TYPE 1 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 1 | | | | | | |
|---|---|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Test (A/B) | Frequency (MHz) | Successful Detection (Yes/No) |
| 1001 | 1 | 3066 | 18 | A | 5290 | No |
| 1002 | 1 | 578 | 92 | A | 5290 | Yes |
| 1003 | 1 | 598 | 89 | A | 5290 | Yes |
| 1004 | 1 | 718 | 74 | A | 5290 | Yes |
| 1005 | 1 | 678 | 78 | A | 5290 | Yes |
| 1006 | 1 | 818 | 65 | A | 5290 | Yes |
| 1007 | 1 | 778 | 68 | A | 5290 | Yes |
| 1008 | 1 | 838 | 63 | A | 5290 | Yes |
| 1009 | 1 | 698 | 76 | A | 5290 | Yes |
| 1010 | 1 | 518 | 102 | A | 5290 | Yes |
| 1011 | 1 | 658 | 81 | A | 5290 | Yes |
| 1012 | 1 | 798 | 67 | A | 5290 | Yes |
| 1013 | 1 | 898 | 59 | A | 5290 | Yes |
| 1014 | 1 | 618 | 86 | A | 5290 | Yes |
| 1015 | 1 | 738 | 72 | A | 5290 | Yes |
| 1016 | 1 | 1638 | 33 | B | 5290 | Yes |
| 1017 | 1 | 2465 | 22 | B | 5290 | Yes |
| 1018 | 1 | 1226 | 44 | B | 5290 | Yes |
| 1019 | 1 | 2182 | 25 | B | 5290 | Yes |
| 1020 | 1 | 1073 | 50 | B | 5290 | Yes |
| 1021 | 1 | 964 | 55 | B | 5290 | Yes |
| 1022 | 1 | 2532 | 21 | B | 5290 | Yes |
| 1023 | 1 | 2553 | 21 | B | 5290 | Yes |
| 1024 | 1 | 1703 | 31 | B | 5290 | Yes |
| 1025 | 1 | 1291 | 41 | B | 5290 | Yes |
| 1026 | 1 | 2924 | 19 | B | 5290 | Yes |
| 1027 | 1 | 1138 | 47 | B | 5290 | Yes |
| 1028 | 1 | 2900 | 19 | B | 5290 | Yes |
| 1029 | 1 | 2597 | 21 | B | 5290 | Yes |
| 1030 | 1 | 747 | 71 | B | 5290 | Yes |

**TYPE 2 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 2 | | | | | |
|---|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Frequency (MHz) | Successful Detection (Yes/No) |
| 2001 | 3.8 | 194 | 26 | 5290 | Yes |
| 2002 | 2.8 | 188 | 26 | 5290 | Yes |
| 2003 | 1.1 | 154 | 24 | 5290 | Yes |
| 2004 | 2.2 | 195 | 24 | 5290 | Yes |
| 2005 | 3 | 208 | 23 | 5290 | No |
| 2006 | 2.4 | 172 | 27 | 5290 | Yes |
| 2007 | 3.3 | 189 | 26 | 5290 | Yes |
| 2008 | 2.9 | 157 | 27 | 5290 | Yes |
| 2009 | 2.2 | 222 | 27 | 5290 | Yes |
| 2010 | 4.2 | 156 | 28 | 5290 | Yes |
| 2011 | 3.6 | 182 | 25 | 5290 | Yes |
| 2012 | 3.6 | 163 | 26 | 5290 | No |
| 2013 | 1.4 | 155 | 27 | 5290 | No |
| 2014 | 3.8 | 178 | 29 | 5290 | Yes |
| 2015 | 1.7 | 217 | 23 | 5290 | Yes |
| 2016 | 4.3 | 206 | 29 | 5290 | Yes |
| 2017 | 4.7 | 168 | 24 | 5290 | No |
| 2018 | 1.5 | 162 | 23 | 5290 | Yes |
| 2019 | 3.9 | 209 | 29 | 5290 | Yes |
| 2020 | 3.1 | 169 | 29 | 5290 | Yes |
| 2021 | 1.7 | 182 | 28 | 5290 | Yes |
| 2022 | 1.1 | 227 | 24 | 5290 | Yes |
| 2023 | 2 | 164 | 28 | 5290 | Yes |
| 2024 | 3.8 | 213 | 25 | 5290 | Yes |
| 2025 | 5 | 196 | 28 | 5290 | Yes |
| 2026 | 2.9 | 211 | 26 | 5290 | Yes |
| 2027 | 2.3 | 199 | 23 | 5290 | Yes |
| 2028 | 4.5 | 218 | 24 | 5290 | Yes |
| 2029 | 4.2 | 210 | 25 | 5290 | No |
| 2030 | 2.5 | 195 | 27 | 5290 | Yes |


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**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 | 9.5 | 379 | 18 | 5290 | No |
| 3002 | 6.1 | 347 | 17 | 5290 | Yes |
| 3003 | 8.4 | 480 | 18 | 5290 | Yes |
| 3004 | 9.3 | 460 | 18 | 5290 | Yes |
| 3005 | 7.6 | 488 | 17 | 5290 | Yes |
| 3006 | 6.8 | 395 | 16 | 5290 | Yes |
| 3007 | 8.1 | 436 | 16 | 5290 | Yes |
| 3008 | 7.5 | 325 | 17 | 5290 | Yes |
| 3009 | 6.5 | 378 | 16 | 5290 | Yes |
| 3010 | 6.1 | 413 | 17 | 5290 | No |
| 3011 | 7.3 | 479 | 16 | 5290 | Yes |
| 3012 | 9.2 | 275 | 18 | 5290 | Yes |
| 3013 | 8.7 | 488 | 17 | 5290 | No |
| 3014 | 6.8 | 297 | 16 | 5290 | Yes |
| 3015 | 6.5 | 271 | 18 | 5290 | Yes |
| 3016 | 8.9 | 477 | 18 | 5290 | Yes |
| 3017 | 6.8 | 464 | 16 | 5290 | No |
| 3018 | 7.5 | 432 | 16 | 5290 | Yes |
| 3019 | 9.8 | 314 | 16 | 5290 | No |
| 3020 | 6.5 | 294 | 16 | 5290 | Yes |
| 3021 | 9 | 323 | 18 | 5290 | Yes |
| 3022 | 8.2 | 316 | 17 | 5290 | Yes |
| 3023 | 9 | 357 | 16 | 5290 | Yes |
| 3024 | 6.2 | 496 | 16 | 5290 | Yes |
| 3025 | 9.3 | 299 | 18 | 5290 | Yes |
| 3026 | 8.9 | 333 | 17 | 5290 | No |
| 3027 | 6 | 400 | 18 | 5290 | Yes |
| 3028 | 7.9 | 447 | 17 | 5290 | Yes |
| 3029 | 7.4 | 408 | 17 | 5290 | Yes |
| 3030 | 9.6 | 468 | 18 | 5290 | Yes |

**TYPE 4 DETECTION PROBABILITY**

Data Sheet for FCC Short Pulse Radar Type 4

| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Frequency (MHz) | Successful Detection (Yes/No) |
|---|---|---|---|---|---|
| 4001 | 18.3 | 443 | 13 | 5290 | Yes |
| 4002 | 14.5 | 398 | 12 | 5290 | No |
| 4003 | 19.1 | 385 | 16 | 5290 | Yes |
| 4004 | 11.5 | 352 | 15 | 5290 | No |
| 4005 | 16.6 | 485 | 16 | 5290 | Yes |
| 4006 | 18.5 | 348 | 13 | 5290 | Yes |
| 4007 | 14.9 | 494 | 15 | 5290 | Yes |
| 4008 | 13.1 | 370 | 12 | 5290 | Yes |
| 4009 | 14.8 | 277 | 16 | 5290 | No |
| 4010 | 13.4 | 417 | 14 | 5290 | No |
| 4011 | 15.5 | 470 | 14 | 5290 | Yes |
| 4012 | 14.6 | 254 | 12 | 5290 | No |
| 4013 | 13 | 320 | 14 | 5290 | Yes |
| 4014 | 12.5 | 368 | 15 | 5290 | Yes |
| 4015 | 11.3 | 329 | 13 | 5290 | No |
| 4016 | 16.2 | 389 | 14 | 5290 | Yes |
| 4017 | 15.5 | 363 | 12 | 5290 | Yes |
| 4018 | 16.5 | 318 | 16 | 5290 | Yes |
| 4019 | 16.2 | 305 | 14 | 5290 | Yes |
| 4020 | 17.7 | 273 | 13 | 5290 | Yes |
| 4021 | 13.7 | 406 | 12 | 5290 | No |
| 4022 | 15.6 | 269 | 12 | 5290 | No |
| 4023 | 16.9 | 415 | 13 | 5290 | Yes |
| 4024 | 19.3 | 290 | 16 | 5290 | Yes |
| 4025 | 11.9 | 449 | 15 | 5290 | No |
| 4026 | 19.6 | 337 | 13 | 5290 | Yes |
| 4027 | 12.7 | 273 | 12 | 5290 | Yes |
| 4028 | 11.7 | 425 | 13 | 5290 | Yes |
| 4029 | 14.9 | 374 | 15 | 5290 | Yes |
| 4030 | 14.5 | 421 | 16 | 5290 | Yes |

**TYPE 5 DETECTION PROBABILITY**

Data Sheet for FCC Long Pulse Radar Type 5

| Trial | Frequency (MHz) | Successful Detection (Yes/No) |
|---|---|---|
| 1 | 5290 | Yes |
| 2 | 5290 | Yes |
| 3 | 5290 | Yes |
| 4 | 5290 | Yes |
| 5 | 5290 | Yes |
| 6 | 5290 | Yes |
| 7 | 5290 | Yes |
| 8 | 5290 | Yes |
| 9 | 5290 | Yes |
| 10 | 5290 | Yes |
| 11 | 5258 | Yes |
| 12 | 5258 | Yes |
| 13 | 5260 | Yes |
| 14 | 5258 | Yes |
| 15 | 5256 | Yes |
| 16 | 5258 | Yes |
| 17 | 5260 | Yes |
| 18 | 5259 | Yes |
| 19 | 5258 | Yes |
| 20 | 5260 | Yes |
| 21 | 5323 | Yes |
| 22 | 5322 | Yes |
| 23 | 5322 | Yes |
| 24 | 5320 | Yes |
| 25 | 5322 | No |
| 26 | 5322 | No |
| 27 | 5324 | Yes |
| 28 | 5321 | Yes |
| 29 | 5324 | Yes |
| 30 | 5323 | Yes |

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

**TYPE 6 DETECTION PROBABILITY**

| Data Sheet for FCC Hopping Radar Type 6 | | | | |
|---|---|---|---|---|
| 1 us Pulse Width, 333 us PRI, 9 Pulses per Burst, 1 Burst per Hop | | | | |
| NTIA August 2005 Hopping Sequence | | | | |
| Trial | Starting Index Within Sequence | Signal Generator Frequency (MHz) | Hops within Detection BW | Successful Detection (Yes/No) |
| 1 | 172 | 5251 | 17 | Yes |
| 2 | 647 | 5252 | 13 | Yes |
| 3 | 1122 | 5253 | 18 | Yes |
| 4 | 1597 | 5254 | 18 | Yes |
| 5 | 2072 | 5255 | 11 | Yes |
| 6 | 2547 | 5256 | 12 | Yes |
| 7 | 3022 | 5257 | 15 | Yes |
| 8 | 3497 | 5258 | 11 | Yes |
| 9 | 3972 | 5259 | 16 | Yes |
| 10 | 4447 | 5260 | 17 | Yes |
| 11 | 4922 | 5261 | 14 | Yes |
| 12 | 5397 | 5262 | 9 | Yes |
| 13 | 5872 | 5263 | 13 | Yes |
| 14 | 6347 | 5264 | 17 | Yes |
| 15 | 6822 | 5265 | 20 | Yes |
| 16 | 7297 | 5266 | 17 | Yes |
| 17 | 7772 | 5267 | 14 | Yes |
| 18 | 8247 | 5268 | 23 | Yes |
| 19 | 8722 | 5269 | 16 | Yes |
| 20 | 9197 | 5270 | 13 | Yes |
| 21 | 9672 | 5271 | 16 | Yes |
| 22 | 10147 | 5272 | 9 | Yes |
| 23 | 10622 | 5273 | 23 | Yes |
| 24 | 11097 | 5274 | 19 | Yes |
| 25 | 11572 | 5275 | 17 | Yes |
| 26 | 12047 | 5276 | 20 | Yes |
| 27 | 12522 | 5277 | 14 | Yes |
| 28 | 12997 | 5278 | 21 | Yes |
| 29 | 13472 | 5279 | 19 | Yes |
| 30 | 13947 | 5280 | 22 | Yes |
| 31 | 14422 | 5281 | 21 | Yes |
| 32 | 14897 | 5282 | 17 | Yes |
| 33 | 15372 | 5283 | 17 | Yes |
| 34 | 15847 | 5284 | 19 | Yes |
| 35 | 16322 | 5285 | 16 | Yes |
| 36 | 16797 | 5286 | 16 | Yes |
| 37 | 17272 | 5287 | 18 | Yes |
| 38 | 17747 | 5288 | 11 | Yes |
| 39 | 18222 | 5289 | 13 | Yes |

**TYPE 6 DETECTION PROBABILITY (CONTINUED)**

| | | | | |
|---|---|---|---|---|
| 40 | 18697 | 5290 | 20 | Yes |
| 41 | 19172 | 5291 | 11 | Yes |
| 42 | 19647 | 5292 | 18 | Yes |
| 43 | 20122 | 5293 | 17 | Yes |
| 44 | 20597 | 5294 | 19 | Yes |
| 45 | 21072 | 5295 | 22 | Yes |
| 46 | 21547 | 5296 | 16 | Yes |
| 47 | 22022 | 5297 | 18 | Yes |
| 48 | 22497 | 5298 | 16 | Yes |
| 49 | 22972 | 5299 | 18 | Yes |
| 50 | 23447 | 5300 | 15 | Yes |
| 51 | 23922 | 5301 | 21 | Yes |
| 52 | 24397 | 5302 | 15 | Yes |
| 53 | 24872 | 5303 | 22 | Yes |
| 54 | 25347 | 5304 | 12 | Yes |
| 55 | 25822 | 5305 | 8 | Yes |
| 56 | 26297 | 5306 | 12 | Yes |
| 57 | 26772 | 5307 | 15 | Yes |
| 58 | 27247 | 5308 | 15 | Yes |
| 59 | 27722 | 5309 | 15 | Yes |
| 60 | 28197 | 5310 | 20 | Yes |
| 61 | 28672 | 5311 | 14 | Yes |
| 62 | 29147 | 5312 | 19 | Yes |
| 63 | 29622 | 5313 | 10 | Yes |
| 64 | 30097 | 5314 | 17 | Yes |
| 65 | 30572 | 5315 | 13 | Yes |
| 66 | 31047 | 5316 | 22 | Yes |
| 67 | 31522 | 5317 | 14 | Yes |
| 68 | 31997 | 5318 | 15 | Yes |
| 69 | 32472 | 5319 | 16 | Yes |
| 70 | 32947 | 5320 | 17 | Yes |
| 71 | 33422 | 5321 | 21 | Yes |
| 72 | 33897 | 5322 | 13 | Yes |
| 73 | 34372 | 5323 | 14 | Yes |
| 74 | 34847 | 5324 | 17 | Yes |
| 75 | 35322 | 5325 | 21 | Yes |
| 76 | 35797 | 5326 | 20 | Yes |
| 77 | 36272 | 5327 | 13 | Yes |
| 78 | 36747 | 5328 | 9 | Yes |
| 79 | 37222 | 5329 | 23 | Yes |

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

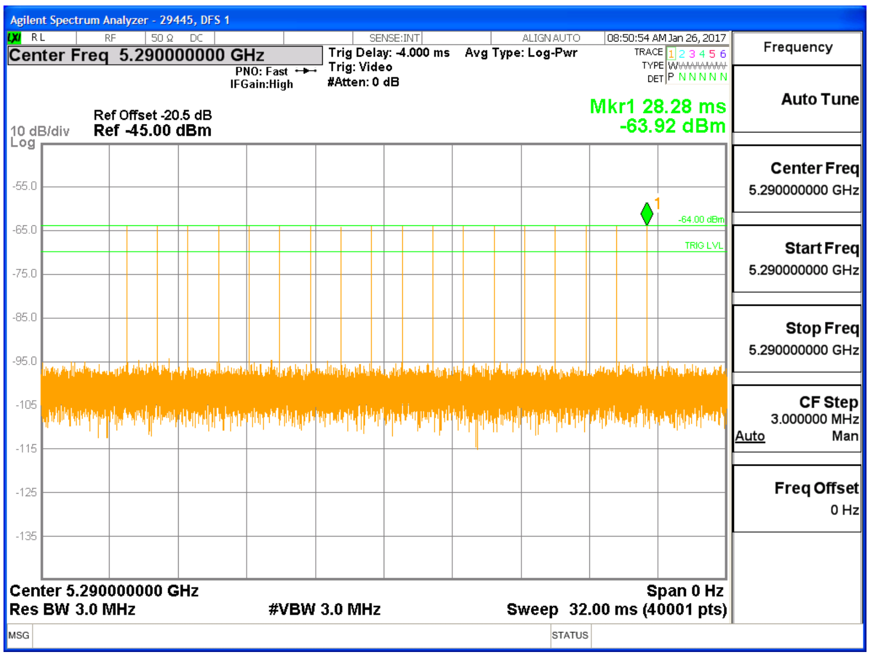
### 5.5.1. TEST CHANNEL

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

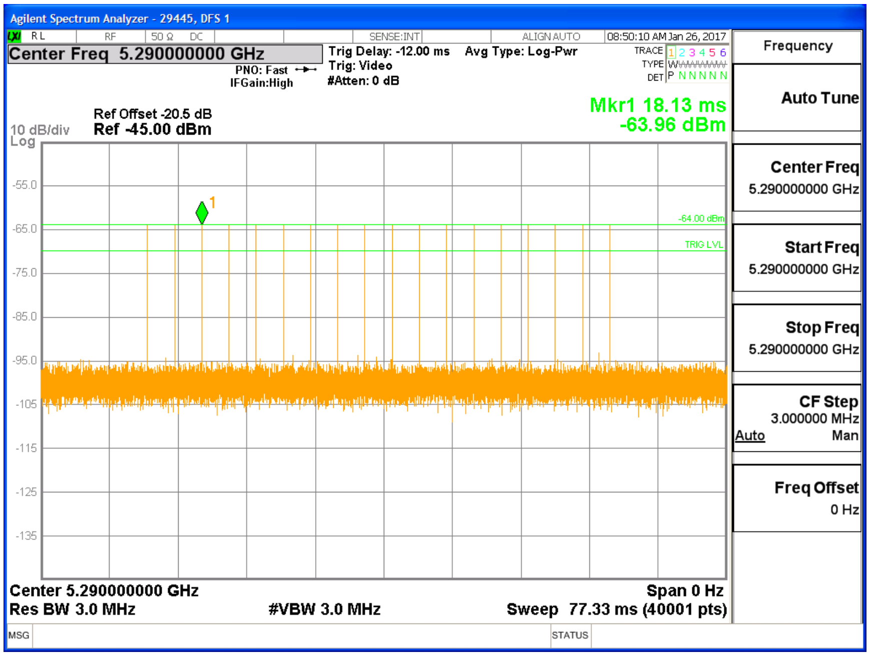
### 5.5.2. RADAR WAVEFORMS AND TRAFFIC

**RADAR WAVEFORMS**

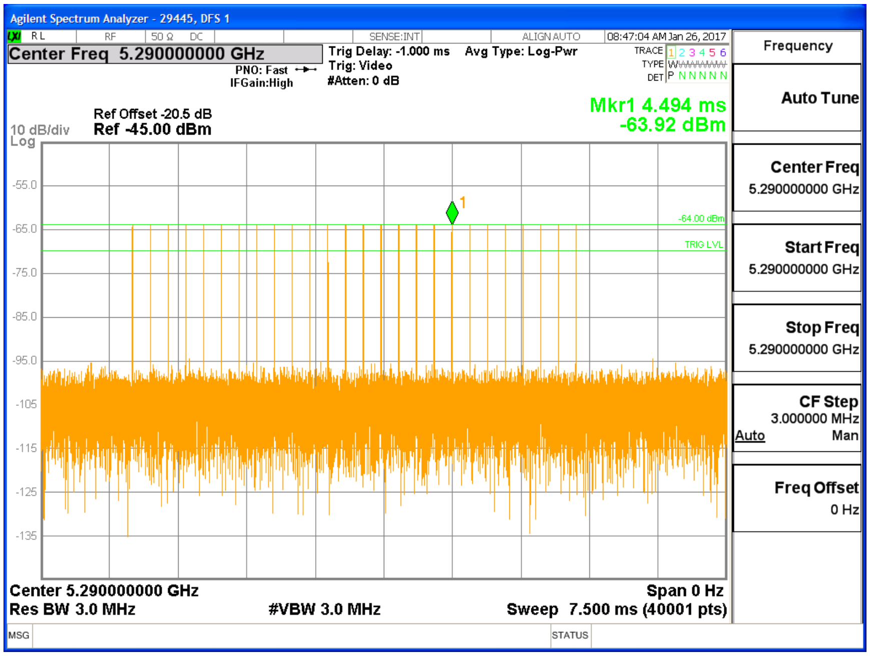
SHORT PULSE RADAR TYPE 0



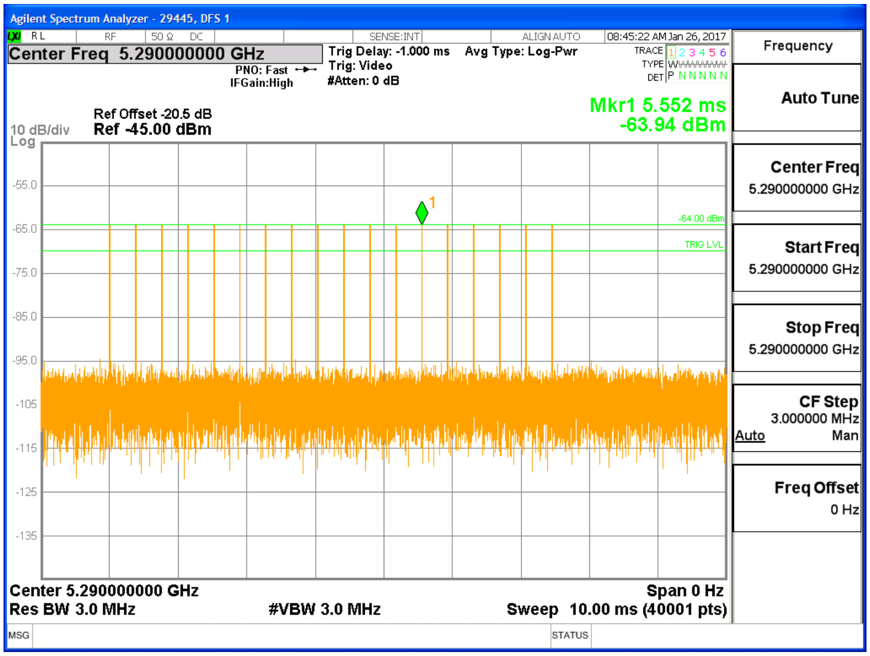
SAMPLE OF RADAR TYPE 1



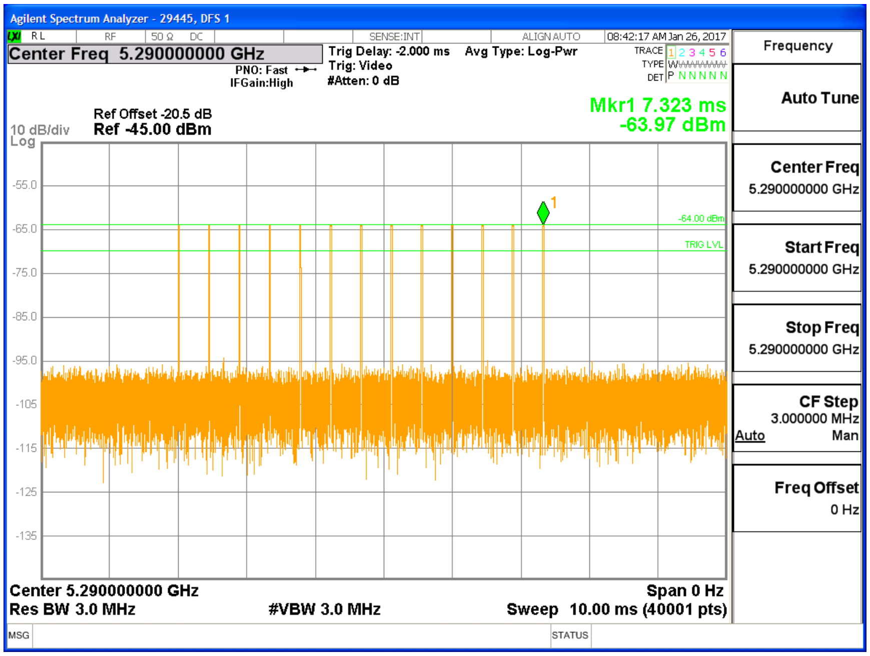
SAMPLE OF RADAR TYPE 2



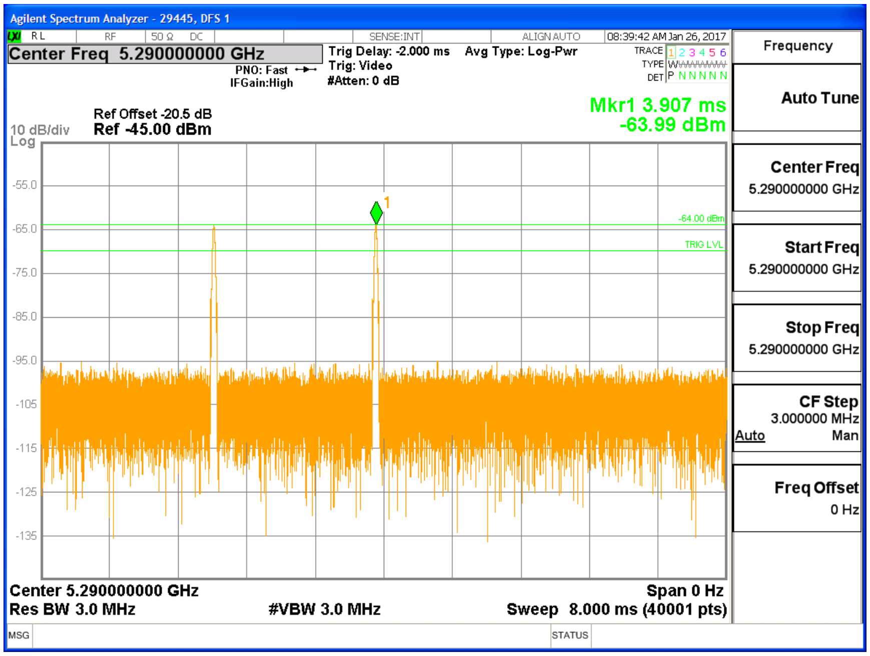
SAMPLE OF RADAR TYPE 3



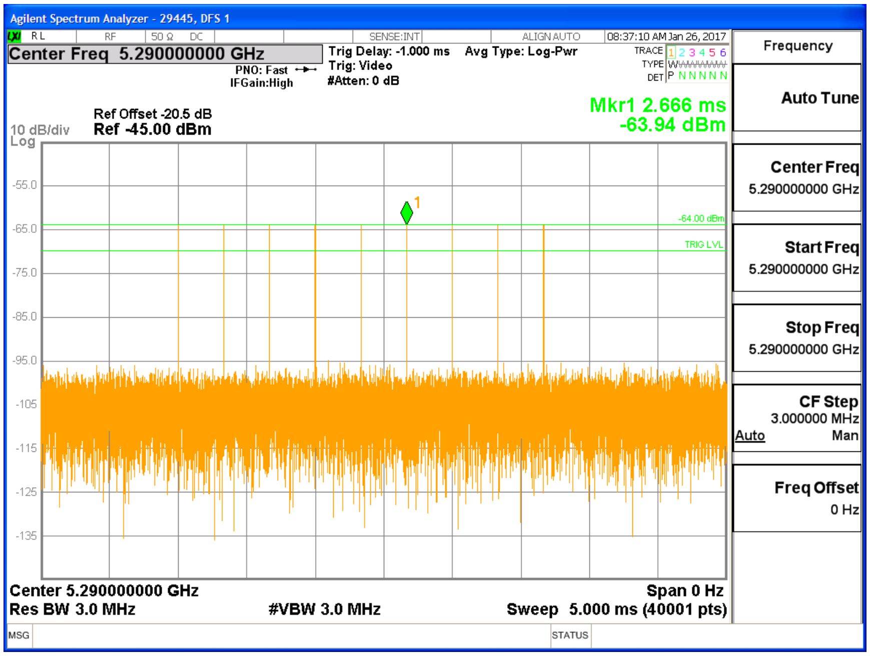
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

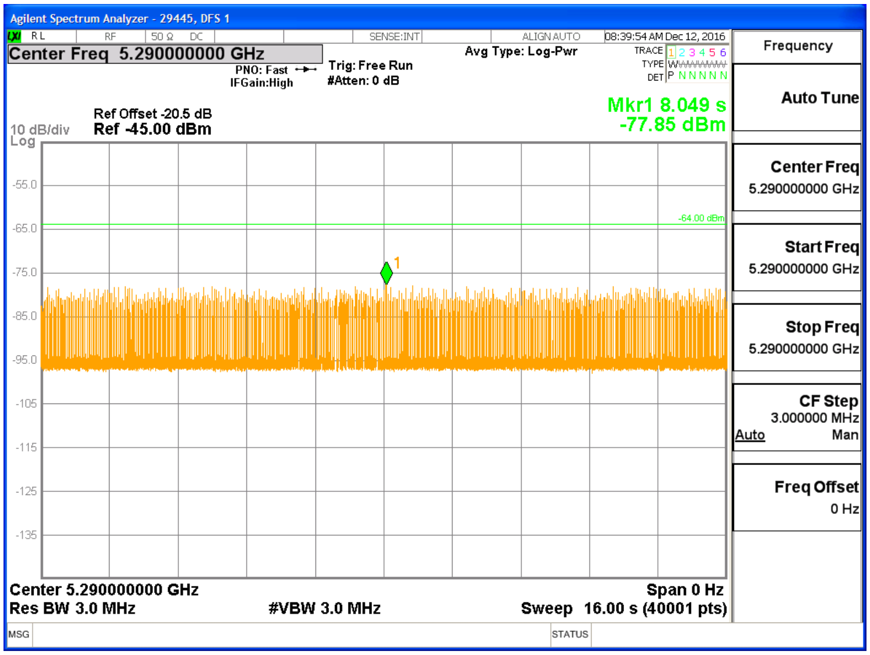


SINGLE BURST OF RADAR TYPE 6

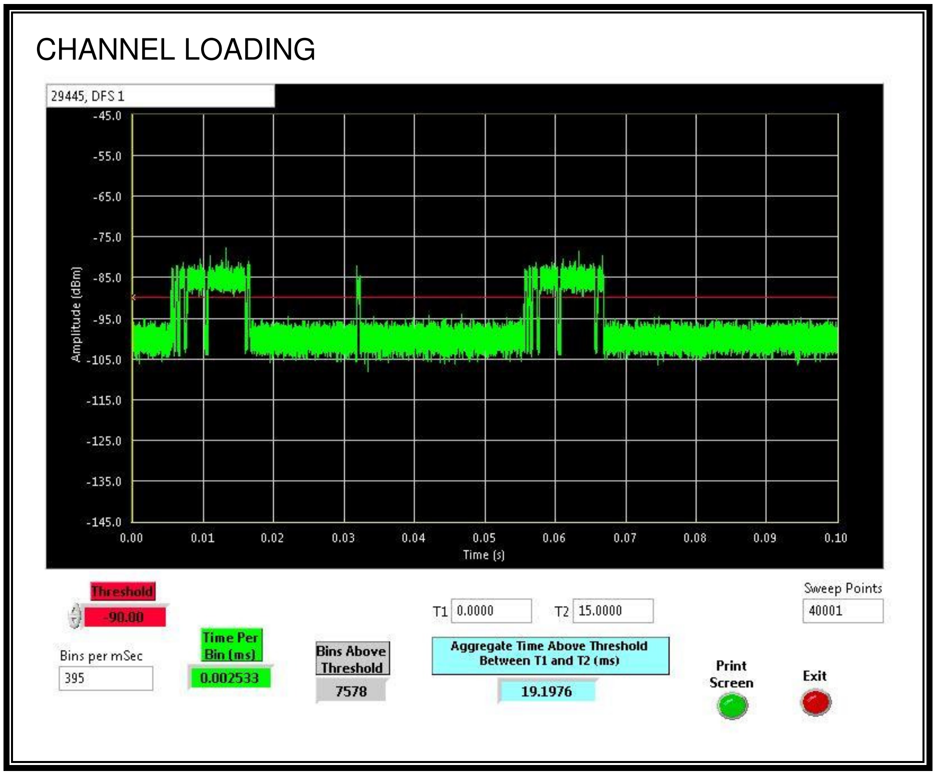


**TRAFFIC**

TRAFFIC



**CHANNEL LOADING**




The level of traffic loading on the channel by the EUT is 19.19%

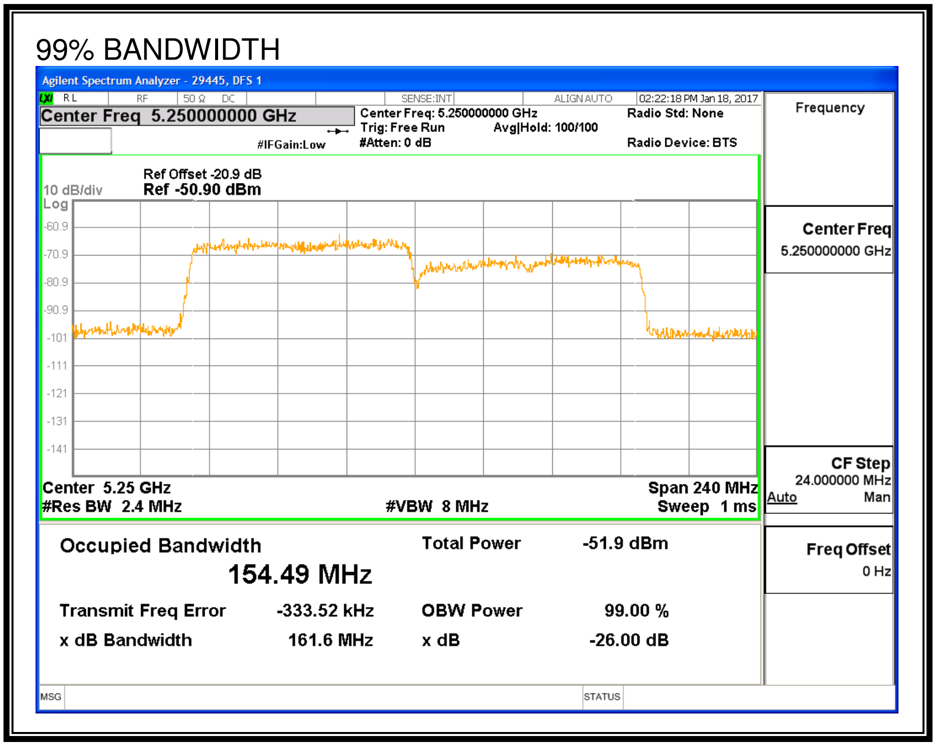
### 5.5.3. OVERLAPPING CHANNEL TESTS

**RESULTS**

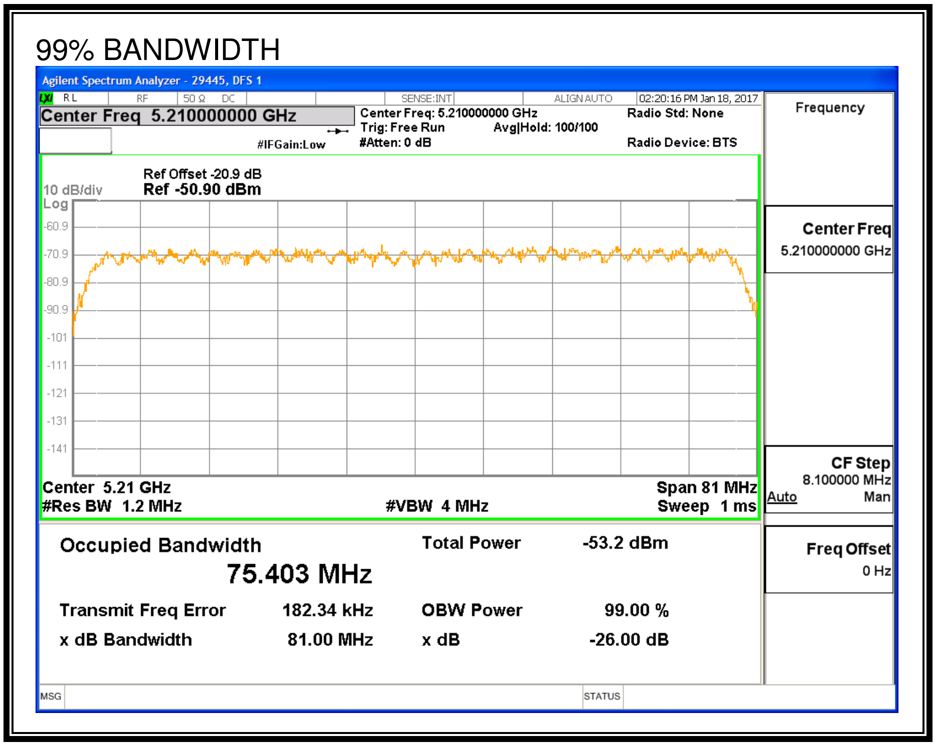
The channel spacing is not less than the channel bandwidth therefore the EUT does not have an overlapping channel plan.

## 5.5.4. DETECTION BANDWIDTH

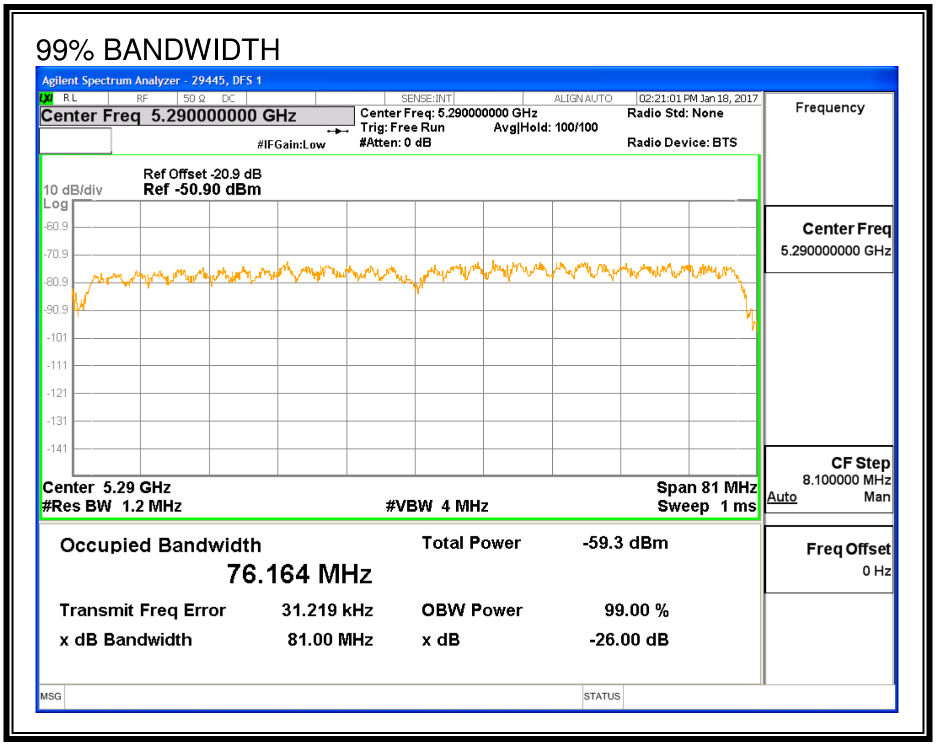
**REFERENCE PLOT OF 99% POWER BANDWIDTH (80 PLUS 80 MODE)**



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



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




## RESULTS

| FL (MHz) | FH (MHz) | Detection Bandwidth (MHz) | 99% Power Bandwidth (MHz) | Ratio of Detection BW to 99% Power BW (%) | Minimum Limit (%) |
|---|---|---|---|---|---|
| 5251 | 5328 | 77 | 76.164 | 101.1 | 100 |

**DETECTION BANDWIDTH PROBABILITY**

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results 29445 DFS 1

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

| Frequency (MHz) | Number of Trials | Number Detected | Detection (%) | Mark |
|---|---|---|---|---|
| 5251 | 10 | 10 | 100 | FL |
| 5252 | 10 | 10 | 100 | |
| 5253 | 10 | 10 | 100 | |
| 5254 | 10 | 10 | 100 | |
| 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 | |
| 5326 | 10 | 10 | 100 | |
| 5327 | 10 | 10 | 100 | |
| 5328 | 10 | 10 | 100 | FH |

### 5.5.5. IN-SERVICE MONITORING

**RESULTS**

FCC Radar Test Summary

| Signal Type | Number of Trials | Detection (%) | Limit (%) | Pass/Fail | Detection Bandwidth FL | Detection Bandwidth FH | OBW | Test Location | Employee Number | In-Service Monitoring Version |
|---|---|---|---|---|---|---|---|---|---|---|
| FCC Short Pulse Type 1 | 30 | 100.00 | 60 | Pass | 5251 | 5328 | 76.16 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 2 | 30 | 90.00 | 60 | Pass | 5251 | 5328 | 76.16 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 3 | 30 | 80.00 | 60 | Pass | 5251 | 5328 | 76.16 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 4 | 30 | 83.33 | 60 | Pass | 5251 | 5328 | 76.16 | DFS 1 | 29445 | Version 3.0 |
| Aggregate | | 88.33 | 80 | Pass | | | | | | |
| FCC Long Pulse Type 5 | 30 | 96.67 | 80 | Pass | 5251 | 5328 | 76.16 | DFS 1 | 29445 | Version 3.0 |
| FCC Hopping Type 6 | 78 | 97.44 | 70 | Pass | 5251 | 5328 | 76.16 | DFS 1 | 29445 | Version 3.0 |

**TYPE 1 DETECTION PROBABILITY**

Data Sheet for FCC Short Pulse Radar Type 1

| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Test (A/B) | Frequency (MHz) | Successful Detection (Yes/No) |
|---|---|---|---|---|---|---|
| 1001 | 1 | 3066 | 18 | A | 5290 | Yes |
| 1002 | 1 | 578 | 92 | A | 5290 | Yes |
| 1003 | 1 | 598 | 89 | A | 5290 | Yes |
| 1004 | 1 | 718 | 74 | A | 5290 | Yes |
| 1005 | 1 | 678 | 78 | A | 5290 | Yes |
| 1006 | 1 | 818 | 65 | A | 5290 | Yes |
| 1007 | 1 | 778 | 68 | A | 5290 | Yes |
| 1008 | 1 | 838 | 63 | A | 5290 | Yes |
| 1009 | 1 | 698 | 76 | A | 5290 | Yes |
| 1010 | 1 | 518 | 102 | A | 5290 | Yes |
| 1011 | 1 | 658 | 81 | A | 5290 | Yes |
| 1012 | 1 | 798 | 67 | A | 5290 | Yes |
| 1013 | 1 | 898 | 59 | A | 5290 | Yes |
| 1014 | 1 | 618 | 86 | A | 5290 | Yes |
| 1015 | 1 | 738 | 72 | A | 5290 | Yes |
| 1016 | 1 | 1638 | 33 | B | 5290 | Yes |
| 1017 | 1 | 2465 | 22 | B | 5290 | Yes |
| 1018 | 1 | 1226 | 44 | B | 5290 | Yes |
| 1019 | 1 | 2182 | 25 | B | 5290 | Yes |
| 1020 | 1 | 1073 | 50 | B | 5290 | Yes |
| 1021 | 1 | 964 | 55 | B | 5290 | Yes |
| 1022 | 1 | 2532 | 21 | B | 5290 | Yes |
| 1023 | 1 | 2553 | 21 | B | 5290 | Yes |
| 1024 | 1 | 1703 | 31 | B | 5290 | Yes |
| 1025 | 1 | 1291 | 41 | B | 5290 | Yes |
| 1026 | 1 | 2924 | 19 | B | 5290 | Yes |
| 1027 | 1 | 1138 | 47 | B | 5290 | Yes |
| 1028 | 1 | 2900 | 19 | B | 5290 | Yes |
| 1029 | 1 | 2597 | 21 | B | 5290 | Yes |
| 1030 | 1 | 747 | 71 | B | 5290 | Yes |

**TYPE 2 DETECTION PROBABILITY**

Data Sheet for FCC Short Pulse Radar Type 2

| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Frequency (MHz) | Successful Detection (Yes/No) |
|---|---|---|---|---|---|
| 2001 | 3.8 | 194 | 26 | 5290 | Yes |
| 2002 | 2.8 | 188 | 26 | 5290 | Yes |
| 2003 | 1.1 | 154 | 24 | 5290 | Yes |
| 2004 | 2.2 | 195 | 24 | 5290 | Yes |
| 2005 | 3 | 208 | 23 | 5290 | Yes |
| 2006 | 2.4 | 172 | 27 | 5290 | Yes |
| 2007 | 3.3 | 189 | 26 | 5290 | Yes |
| 2008 | 2.9 | 157 | 27 | 5290 | No |
| 2009 | 2.2 | 222 | 27 | 5290 | Yes |
| 2010 | 4.2 | 156 | 28 | 5290 | Yes |
| 2011 | 3.6 | 182 | 25 | 5290 | Yes |
| 2012 | 3.6 | 163 | 26 | 5290 | Yes |
| 2013 | 1.4 | 155 | 27 | 5290 | Yes |
| 2014 | 3.8 | 178 | 29 | 5290 | Yes |
| 2015 | 1.7 | 217 | 23 | 5290 | Yes |
| 2016 | 4.3 | 206 | 29 | 5290 | No |
| 2017 | 4.7 | 168 | 24 | 5290 | Yes |
| 2018 | 1.5 | 162 | 23 | 5290 | Yes |
| 2019 | 3.9 | 209 | 29 | 5290 | Yes |
| 2020 | 3.1 | 169 | 29 | 5290 | Yes |
| 2021 | 1.7 | 182 | 28 | 5290 | No |
| 2022 | 1.1 | 227 | 24 | 5290 | Yes |
| 2023 | 2 | 164 | 28 | 5290 | Yes |
| 2024 | 3.8 | 213 | 25 | 5290 | Yes |
| 2025 | 5 | 196 | 28 | 5290 | Yes |
| 2026 | 2.9 | 211 | 26 | 5290 | Yes |
| 2027 | 2.3 | 199 | 23 | 5290 | Yes |
| 2028 | 4.5 | 218 | 24 | 5290 | Yes |
| 2029 | 4.2 | 210 | 25 | 5290 | Yes |
| 2030 | 2.5 | 195 | 27 | 5290 | Yes |

**TYPE 3 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 3 | | | | | |
|---|---|---|---|---|---|
| **Waveform** | **Pulse Width (us)** | **PRI (us)** | **Pulses Per Burst** | **Frequency (MHz)** | **Successful Detection (Yes/No)** |
| 3001 | 9.5 | 379 | 18 | 5290 | Yes |
| 3002 | 6.1 | 347 | 17 | 5290 | Yes |
| 3003 | 8.4 | 480 | 18 | 5290 | Yes |
| 3004 | 9.3 | 460 | 18 | 5290 | No |
| 3005 | 7.6 | 488 | 17 | 5290 | Yes |
| 3006 | 6.8 | 395 | 16 | 5290 | Yes |
| 3007 | 8.1 | 436 | 16 | 5290 | Yes |
| 3008 | 7.5 | 325 | 17 | 5290 | Yes |
| 3009 | 6.5 | 378 | 16 | 5290 | No |
| 3010 | 6.1 | 413 | 17 | 5290 | Yes |
| 3011 | 7.3 | 479 | 16 | 5290 | Yes |
| 3012 | 9.2 | 275 | 18 | 5290 | Yes |
| 3013 | 8.7 | 488 | 17 | 5290 | No |
| 3014 | 6.8 | 297 | 16 | 5290 | Yes |
| 3015 | 6.5 | 271 | 18 | 5290 | Yes |
| 3016 | 8.9 | 477 | 18 | 5290 | Yes |
| 3017 | 6.8 | 464 | 16 | 5290 | Yes |
| 3018 | 7.5 | 432 | 16 | 5290 | Yes |
| 3019 | 9.8 | 314 | 16 | 5290 | Yes |
| 3020 | 6.5 | 294 | 16 | 5290 | Yes |
| 3021 | 9 | 323 | 18 | 5290 | Yes |
| 3022 | 8.2 | 316 | 17 | 5290 | Yes |
| 3023 | 9 | 357 | 16 | 5290 | Yes |
| 3024 | 6.2 | 496 | 16 | 5290 | Yes |
| 3025 | 9.3 | 299 | 18 | 5290 | No |
| 3026 | 8.9 | 333 | 17 | 5290 | Yes |
| 3027 | 6 | 400 | 18 | 5290 | Yes |
| 3028 | 7.9 | 447 | 17 | 5290 | No |
| 3029 | 7.4 | 408 | 17 | 5290 | No |
| 3030 | 9.6 | 468 | 18 | 5290 | Yes |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**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 | 18.3 | 443 | 13 | 5290 | Yes |
| 4002 | 14.5 | 398 | 12 | 5290 | No |
| 4003 | 19.1 | 385 | 16 | 5290 | Yes |
| 4004 | 11.5 | 352 | 15 | 5290 | Yes |
| 4005 | 16.6 | 485 | 16 | 5290 | Yes |
| 4006 | 18.5 | 348 | 13 | 5290 | Yes |
| 4007 | 14.9 | 494 | 15 | 5290 | Yes |
| 4008 | 13.1 | 370 | 12 | 5290 | Yes |
| 4009 | 14.8 | 277 | 16 | 5290 | Yes |
| 4010 | 13.4 | 417 | 14 | 5290 | No |
| 4011 | 15.5 | 470 | 14 | 5290 | Yes |
| 4012 | 14.6 | 254 | 12 | 5290 | Yes |
| 4013 | 13 | 320 | 14 | 5290 | Yes |
| 4014 | 12.5 | 368 | 15 | 5290 | Yes |
| 4015 | 11.3 | 329 | 13 | 5290 | No |
| 4016 | 16.2 | 389 | 14 | 5290 | Yes |
| 4017 | 15.5 | 363 | 12 | 5290 | Yes |
| 4018 | 16.5 | 318 | 16 | 5290 | Yes |
| 4019 | 16.2 | 305 | 14 | 5290 | Yes |
| 4020 | 17.7 | 273 | 13 | 5290 | No |
| 4021 | 13.7 | 406 | 12 | 5290 | Yes |
| 4022 | 15.6 | 269 | 12 | 5290 | Yes |
| 4023 | 16.9 | 415 | 13 | 5290 | Yes |
| 4024 | 19.3 | 290 | 16 | 5290 | Yes |
| 4025 | 11.9 | 449 | 15 | 5290 | Yes |
| 4026 | 19.6 | 337 | 13 | 5290 | Yes |
| 4027 | 12.7 | 273 | 12 | 5290 | Yes |
| 4028 | 11.7 | 425 | 13 | 5290 | Yes |
| 4029 | 14.9 | 374 | 15 | 5290 | No |
| 4030 | 14.5 | 421 | 16 | 5290 | Yes |


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**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 | 5258 | Yes |
| 12 | 5258 | Yes |
| 13 | 5261 | Yes |
| 14 | 5259 | Yes |
| 15 | 5256 | Yes |
| 16 | 5258 | Yes |
| 17 | 5260 | Yes |
| 18 | 5259 | Yes |
| 19 | 5258 | Yes |
| 20 | 5260 | Yes |
| 21 | 5323 | No |
| 22 | 5322 | Yes |
| 23 | 5322 | Yes |
| 24 | 5320 | Yes |
| 25 | 5322 | Yes |
| 26 | 5322 | Yes |
| 27 | 5324 | Yes |
| 28 | 5320 | Yes |
| 29 | 5324 | Yes |
| 30 | 5322 | Yes |

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


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**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 | 296 | 5251 | 18 | No |
| 2 | 771 | 5252 | 21 | No |
| 3 | 1246 | 5253 | 13 | Yes |
| 4 | 1721 | 5254 | 10 | Yes |
| 5 | 2196 | 5255 | 21 | Yes |
| 6 | 2671 | 5256 | 17 | Yes |
| 7 | 3146 | 5257 | 16 | Yes |
| 8 | 3621 | 5258 | 13 | Yes |
| 9 | 4096 | 5259 | 20 | Yes |
| 10 | 4571 | 5260 | 18 | Yes |
| 11 | 5046 | 5261 | 17 | Yes |
| 12 | 5521 | 5262 | 20 | Yes |
| 13 | 5996 | 5263 | 14 | Yes |
| 14 | 6471 | 5264 | 15 | Yes |
| 15 | 6946 | 5265 | 11 | Yes |
| 16 | 7421 | 5266 | 20 | Yes |
| 17 | 7896 | 5267 | 14 | Yes |
| 18 | 8371 | 5268 | 13 | Yes |
| 19 | 8846 | 5269 | 15 | Yes |
| 20 | 9321 | 5270 | 19 | Yes |
| 21 | 9796 | 5271 | 17 | Yes |
| 22 | 10271 | 5272 | 16 | Yes |
| 23 | 10746 | 5273 | 11 | Yes |
| 24 | 11221 | 5274 | 13 | Yes |
| 25 | 11696 | 5275 | 16 | Yes |
| 26 | 12171 | 5276 | 14 | Yes |
| 27 | 12646 | 5277 | 17 | Yes |
| 28 | 13121 | 5278 | 12 | Yes |
| 29 | 13596 | 5279 | 18 | Yes |
| 30 | 14071 | 5280 | 15 | Yes |
| 31 | 14546 | 5281 | 18 | Yes |
| 32 | 15021 | 5282 | 13 | Yes |
| 33 | 15496 | 5283 | 14 | Yes |
| 34 | 15971 | 5284 | 18 | Yes |
| 35 | 16446 | 5285 | 18 | Yes |
| 36 | 16921 | 5286 | 18 | Yes |
| 37 | 17396 | 5287 | 19 | Yes |
| 38 | 17871 | 5288 | 15 | Yes |
| 39 | 18346 | 5289 | 19 | Yes |

**TYPE 6 DETECTION PROBABILITY (CONTINUED)**

| | | | | |
|---|---|---|---|---|
| 40 | 18821 | 5290 | 18 | Yes |
| 41 | 19296 | 5291 | 14 | Yes |
| 42 | 19771 | 5292 | 12 | Yes |
| 43 | 20246 | 5293 | 18 | Yes |
| 44 | 20721 | 5294 | 16 | Yes |
| 45 | 21196 | 5295 | 12 | Yes |
| 46 | 21671 | 5296 | 12 | Yes |
| 47 | 22146 | 5297 | 13 | Yes |
| 48 | 22621 | 5298 | 19 | Yes |
| 49 | 23096 | 5299 | 17 | Yes |
| 50 | 23571 | 5300 | 16 | Yes |
| 51 | 24046 | 5301 | 13 | Yes |
| 52 | 24521 | 5302 | 19 | Yes |
| 53 | 24996 | 5303 | 25 | Yes |
| 54 | 25471 | 5304 | 19 | Yes |
| 55 | 25946 | 5305 | 24 | Yes |
| 56 | 26421 | 5306 | 20 | Yes |
| 57 | 26896 | 5307 | 13 | Yes |
| 58 | 27371 | 5308 | 12 | Yes |
| 59 | 27846 | 5309 | 19 | Yes |
| 60 | 28321 | 5310 | 19 | Yes |
| 61 | 28796 | 5311 | 11 | Yes |
| 62 | 29271 | 5312 | 13 | Yes |
| 63 | 29746 | 5313 | 19 | Yes |
| 64 | 30221 | 5314 | 17 | Yes |
| 65 | 30696 | 5315 | 13 | Yes |
| 66 | 31171 | 5316 | 19 | Yes |
| 67 | 31646 | 5317 | 16 | Yes |
| 68 | 32121 | 5318 | 16 | Yes |
| 69 | 32596 | 5319 | 15 | Yes |
| 70 | 33071 | 5320 | 20 | Yes |
| 71 | 33546 | 5321 | 16 | Yes |
| 72 | 34021 | 5322 | 17 | Yes |
| 73 | 34496 | 5323 | 16 | Yes |
| 74 | 34971 | 5324 | 12 | Yes |
| 75 | 35446 | 5325 | 13 | Yes |
| 76 | 35921 | 5326 | 15 | Yes |
| 77 | 36396 | 5327 | 18 | Yes |
| 78 | 36871 | 5328 | 19 | Yes |


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# 5.6. HIGH BAND RESULTS FOR 20 MHz BANDWIDTH

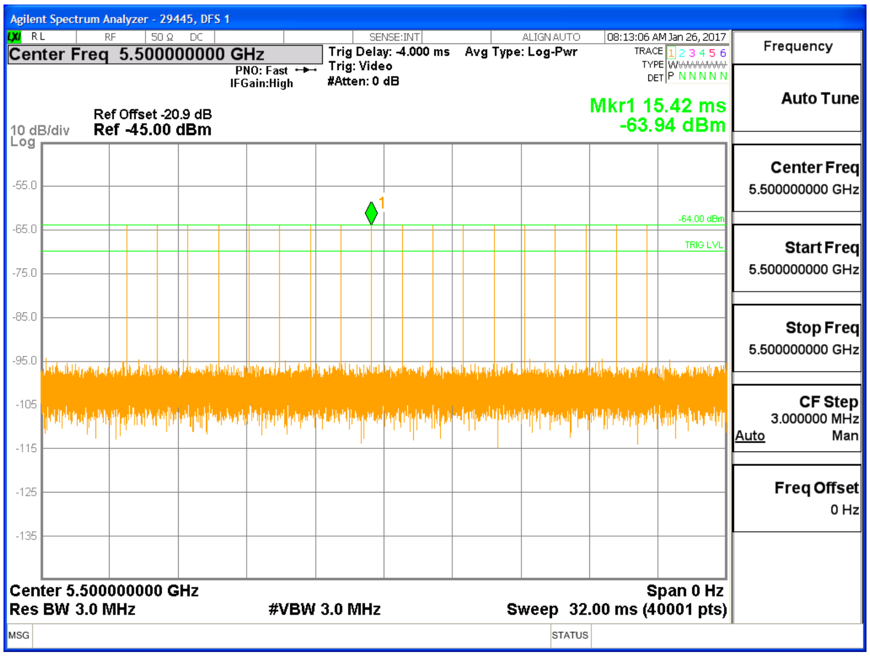
## 5.6.1. TEST CHANNEL

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

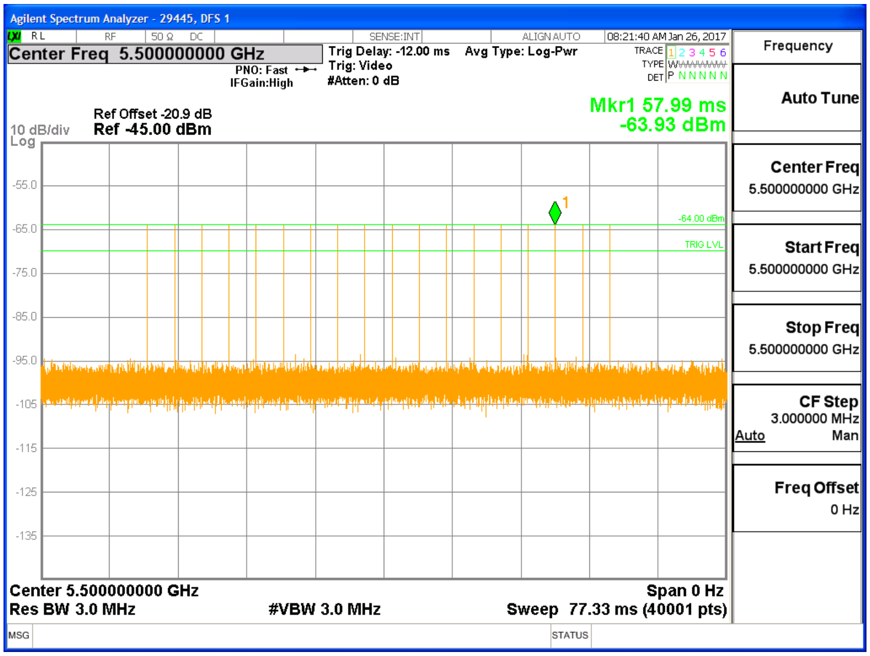
## 5.6.2. RADAR WAVEFORMS AND TRAFFIC

**RADAR WAVEFORMS**

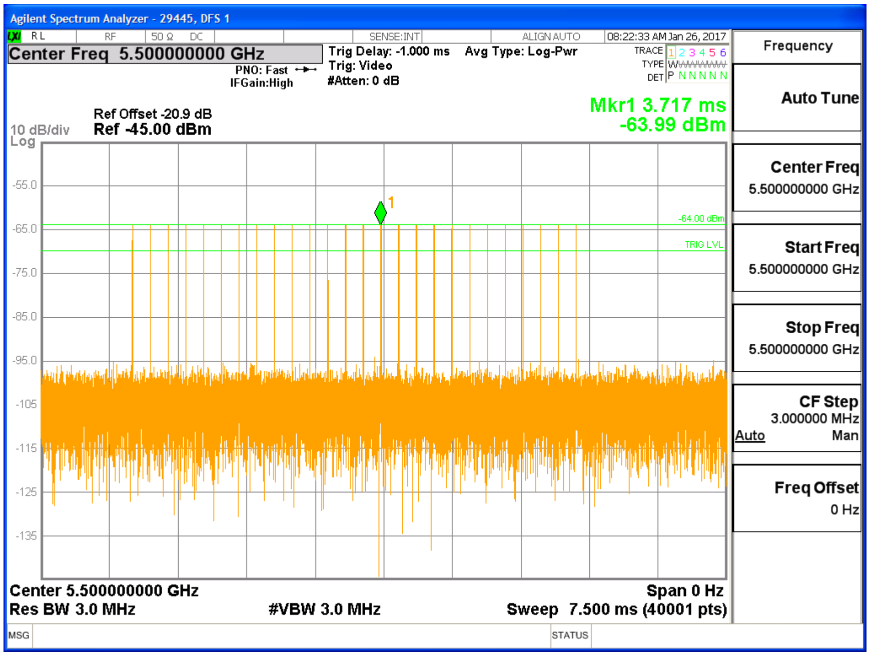
SHORT PULSE RADAR TYPE 0



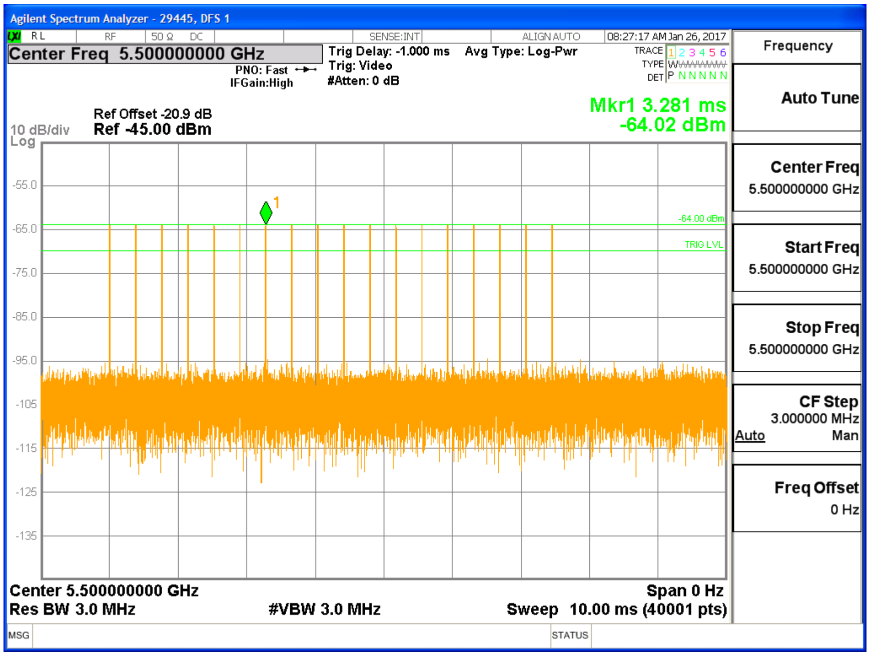
SAMPLE OF RADAR TYPE 1



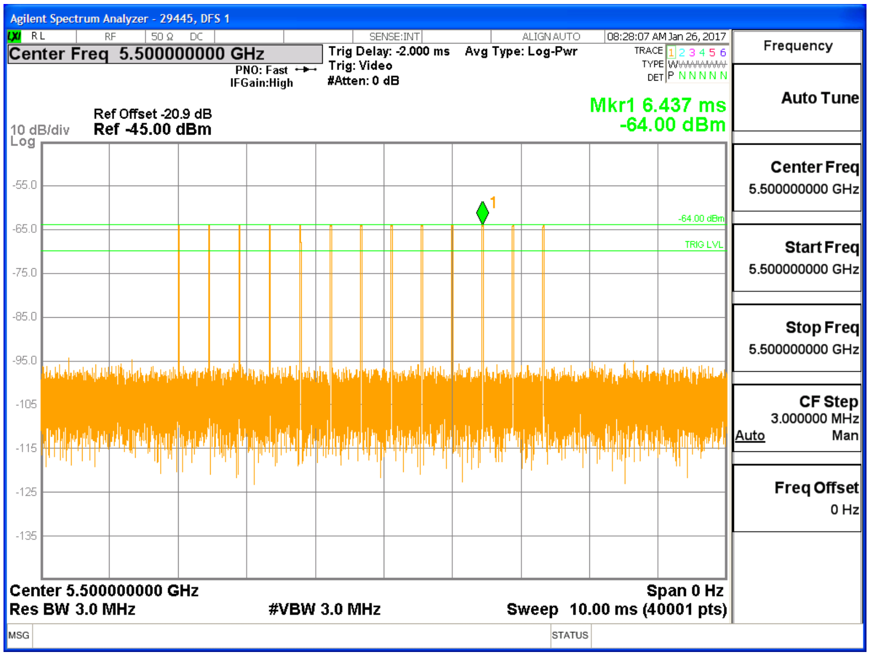
SAMPLE OF RADAR TYPE 2



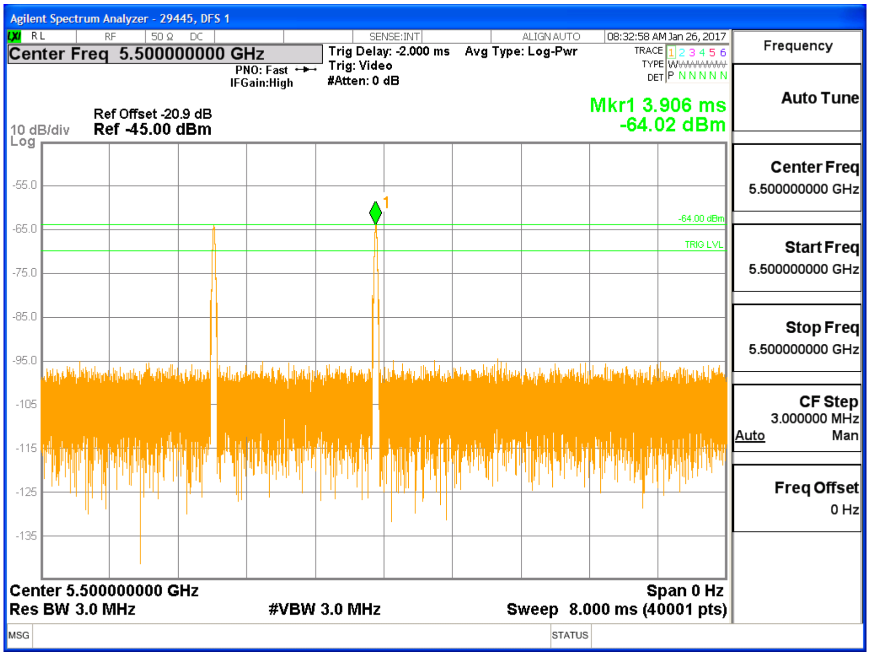
SAMPLE OF RADAR TYPE 3



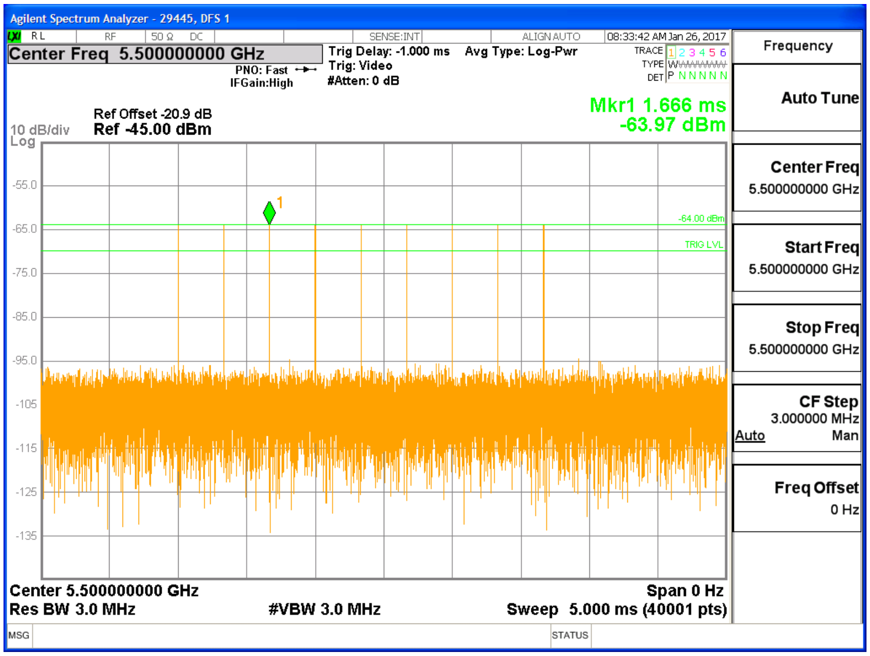
SAMPLE OF RADAR TYPE 4



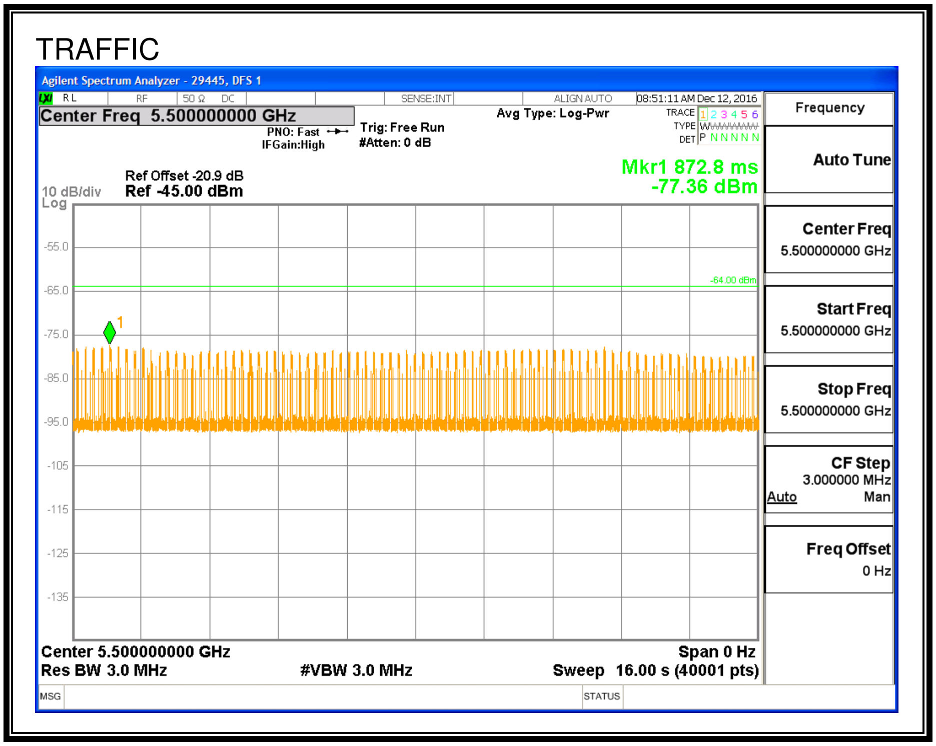
SAMPLE OF SINGLE BURST OF RADAR TYPE 5



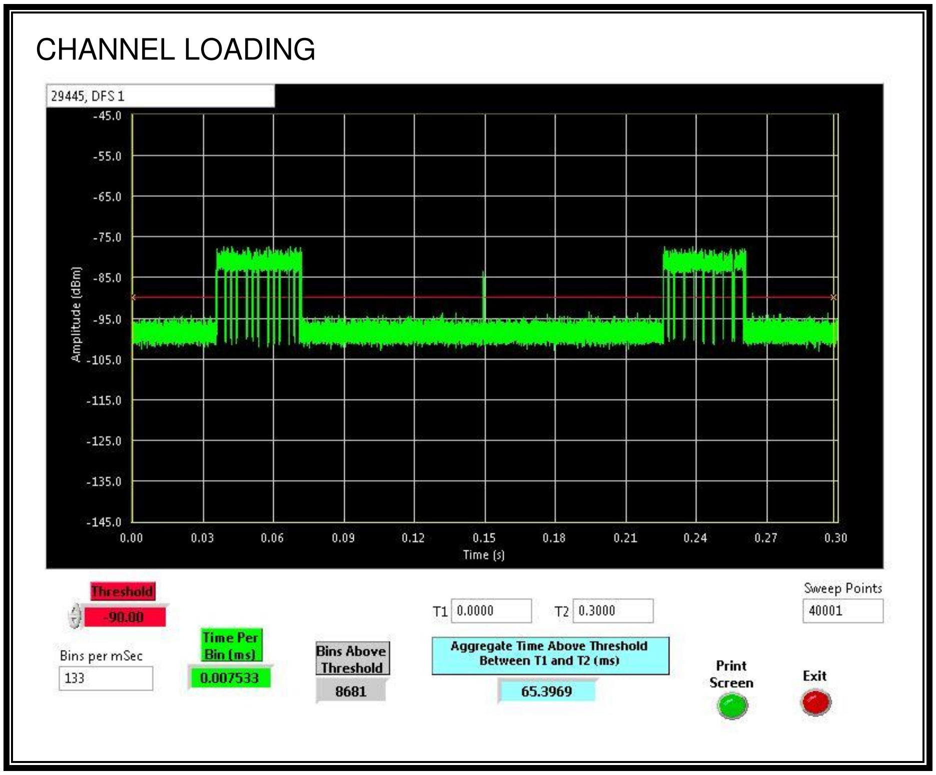
SINGLE BURST OF RADAR TYPE 6



## TRAFFIC


TRAFFIC
Agilent Spectrum Analyzer - 29445, DFS 1
Center Freq 5.500000000 GHz
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
08:51:11 AM Dec 12, 2016
Frequency
Auto Tune
Ref Offset -20.9 dB
Ref -45.00 dBm
10 dB/div
Log
Mkr1 872.8 ms
-77.36 dBm
-64.00 dBm
Center Freq
5.500000000 GHz
Start Freq
5.500000000 GHz
Stop Freq
5.500000000 GHz
CF Step
3.000000 MHz
Auto Man
Freq Offset
0 Hz
Center 5.500000000 GHz
Span 0 Hz
Res BW 3.0 MHz
#VBW 3.0 MHz
Sweep 16.00 s (40001 pts)

**CHANNEL LOADING**




The level of traffic loading on the channel by the EUT is 21.78%

### 5.6.3. OVERLAPPING CHANNEL TESTS

**RESULTS**

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

## 5.6.4. MOVE AND CLOSING TIME

**REPORTING NOTES**

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

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

The aggregate channel closing transmission time is calculated as follows:

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

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

**RESULTS**

| Channel Move Time (sec) | Limit (sec) |
|---|---|
| 0.8708 | 10 |

| Aggregate Channel Closing Transmission Time (msec) | Limit (msec) |
|---|---|
| 8.4 | 60 |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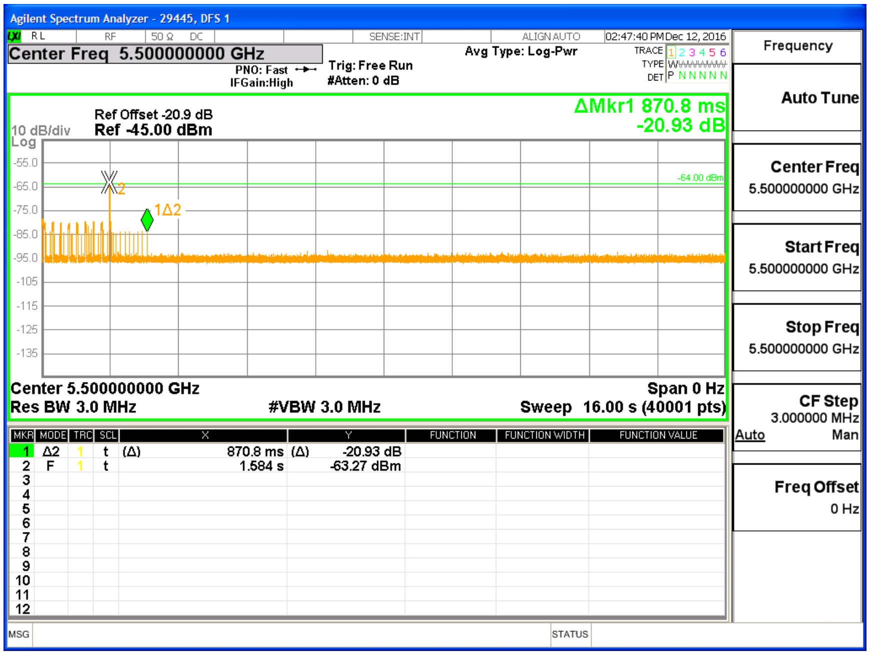
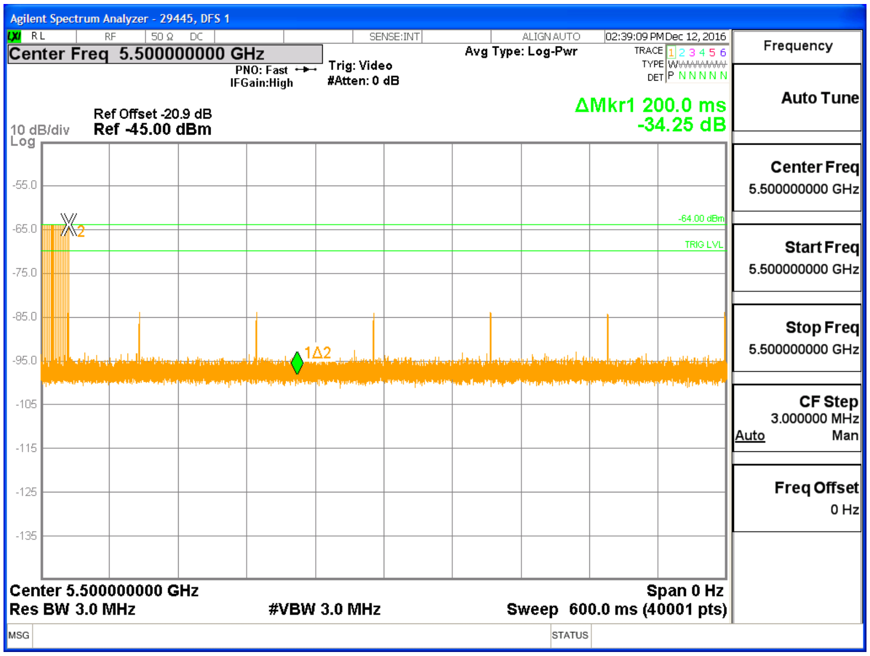
## MOVE TIME

MOVE TIME



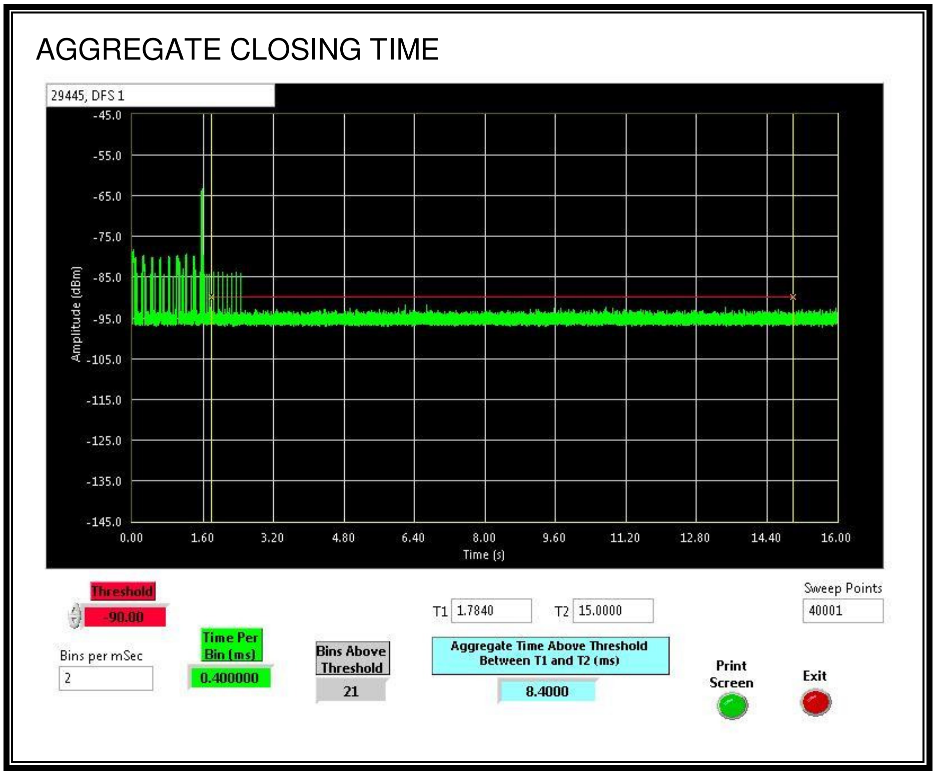
## CHANNEL CLOSING TIME

CLOSING TIME



**AGGREGATE CHANNEL CLOSING TRANSMISSION TIME**

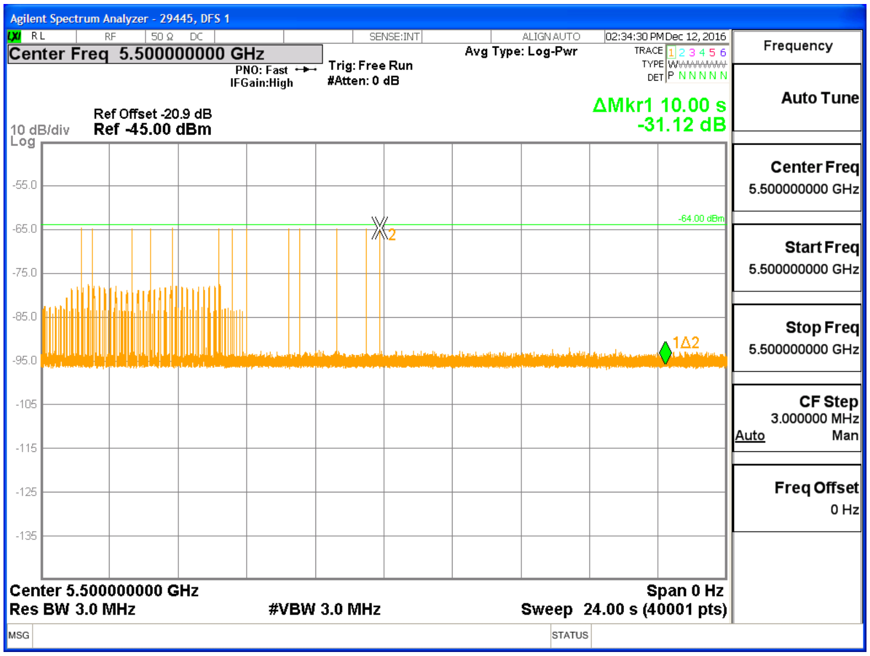
Only intermittent transmissions are observed during the aggregate monitoring period.



## LONG PULSE CHANNEL MOVE TIME

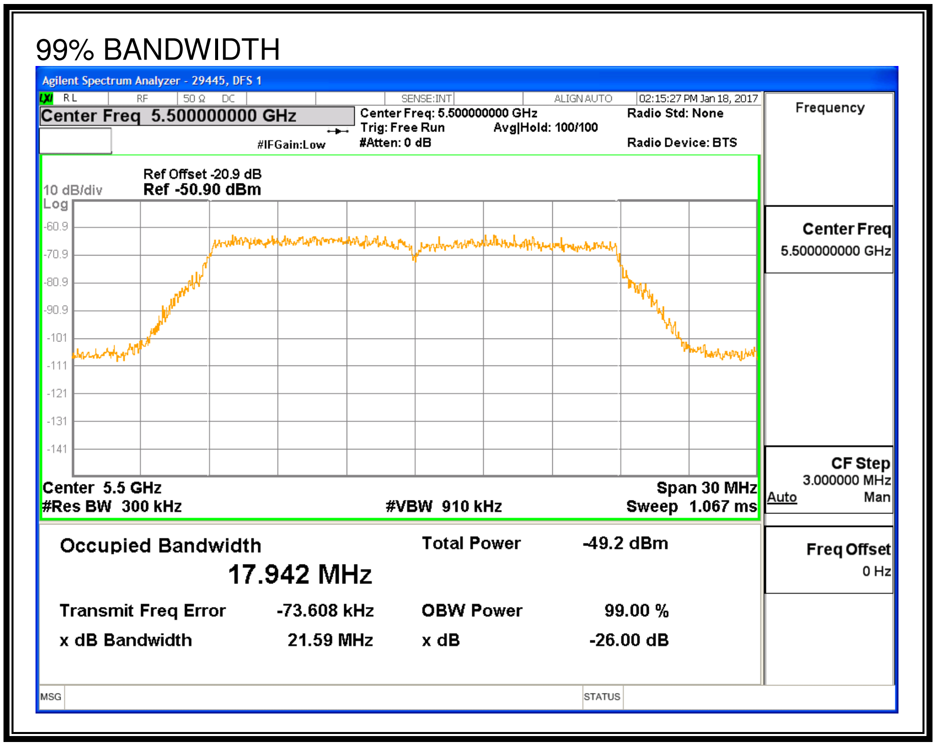
The traffic ceases prior to 10 seconds after the end of the radar waveform.

MOVE TIME FOR LONG PULSE RADAR



### 5.6.5. DETECTION BANDWIDTH

**REFERENCE PLOT OF 99% POWER BANDWIDTH**




**RESULTS**

| FL (MHz) | FH (MHz) | Detection Bandwidth (MHz) | 99% Power Bandwidth (MHz) | Ratio of Detection BW to 99% Power BW (%) | Minimum Limit (%) |
|---|---|---|---|---|---|
| 5490 | 5509 | 19 | 17.942 | 105.9 | 100 |

**DETECTION BANDWIDTH PROBABILITY**

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results 29445 DFS 1

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

| Frequency (MHz) | Number of Trials | Number Detected | Detection (%) | Mark |
|---|---|---|---|---|
| 5490 | 10 | 10 | 100 | FL |
| 5495 | 10 | 10 | 100 | |
| 5500 | 10 | 10 | 100 | |
| 5505 | 10 | 10 | 100 | |
| 5506 | 10 | 10 | 100 | |
| 5507 | 10 | 9 | 90 | |
| 5508 | 10 | 10 | 100 | |
| 5509 | 10 | 10 | 100 | FH |

### 5.6.6. IN-SERVICE MONITORING

**RESULTS**

FCC Radar Test Summary

| Signal Type | Number of Trials | Detection (%) | Limit (%) | Pass/Fail | Detection Bandwidth FL | Detection Bandwidth FH | OBW | Test Location | Employee Number | In-Service Monitoring Version |
|---|---|---|---|---|---|---|---|---|---|---|
| FCC Short Pulse Type 1 | 30 | 90.00 | 60 | Pass | 5490 | 5509 | 17.94 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 2 | 30 | 90.00 | 60 | Pass | 5490 | 5509 | 17.94 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 3 | 30 | 80.00 | 60 | Pass | 5490 | 5509 | 17.94 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 4 | 30 | 73.33 | 60 | Pass | 5490 | 5509 | 17.94 | DFS 1 | 29445 | Version 3.0 |
| Aggregate | | 83.33 | 80 | Pass | | | | | | |
| FCC Long Pulse Type 5 | 30 | 93.33 | 80 | Pass | 5490 | 5509 | 17.94 | DFS 1 | 29445 | Version 3.0 |
| FCC Hopping Type 6 | 40 | 95.00 | 70 | Pass | 5490 | 5509 | 17.94 | DFS 1 | 29445 | Version 3.0 |

**TYPE 1 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 1 | | | | | | |
|---|---|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Test (A/B) | Frequency (MHz) | Successful Detection (Yes/No) |
| 1001 | 1 | 3066 | 18 | A | 5500 | No |
| 1002 | 1 | 578 | 92 | A | 5500 | Yes |
| 1003 | 1 | 598 | 89 | A | 5500 | Yes |
| 1004 | 1 | 718 | 74 | A | 5500 | Yes |
| 1005 | 1 | 678 | 78 | A | 5500 | Yes |
| 1006 | 1 | 818 | 65 | A | 5500 | Yes |
| 1007 | 1 | 778 | 68 | A | 5500 | Yes |
| 1008 | 1 | 838 | 63 | A | 5500 | Yes |
| 1009 | 1 | 698 | 76 | A | 5500 | Yes |
| 1010 | 1 | 518 | 102 | A | 5500 | Yes |
| 1011 | 1 | 658 | 81 | A | 5500 | Yes |
| 1012 | 1 | 798 | 67 | A | 5500 | Yes |
| 1013 | 1 | 898 | 59 | A | 5500 | Yes |
| 1014 | 1 | 618 | 86 | A | 5500 | Yes |
| 1015 | 1 | 738 | 72 | A | 5500 | Yes |
| 1016 | 1 | 1638 | 33 | B | 5500 | Yes |
| 1017 | 1 | 2465 | 22 | B | 5500 | Yes |
| 1018 | 1 | 1226 | 44 | B | 5500 | Yes |
| 1019 | 1 | 2182 | 25 | B | 5500 | Yes |
| 1020 | 1 | 1073 | 50 | B | 5500 | Yes |
| 1021 | 1 | 964 | 55 | B | 5500 | Yes |
| 1022 | 1 | 2532 | 21 | B | 5500 | Yes |
| 1023 | 1 | 2553 | 21 | B | 5500 | Yes |
| 1024 | 1 | 1703 | 31 | B | 5500 | Yes |
| 1025 | 1 | 1291 | 41 | B | 5500 | Yes |
| 1026 | 1 | 2924 | 19 | B | 5500 | No |
| 1027 | 1 | 1138 | 47 | B | 5500 | Yes |
| 1028 | 1 | 2900 | 19 | B | 5500 | Yes |
| 1029 | 1 | 2597 | 21 | B | 5500 | No |
| 1030 | 1 | 747 | 71 | B | 5500 | Yes |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**TYPE 2 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 2 | | | | | |
|---|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Frequency (MHz) | Successful Detection (Yes/No) |
| 2001 | 3.8 | 194 | 26 | 5500 | No |
| 2002 | 2.8 | 188 | 26 | 5500 | Yes |
| 2003 | 1.1 | 154 | 24 | 5500 | Yes |
| 2004 | 2.2 | 195 | 24 | 5500 | Yes |
| 2005 | 3 | 208 | 23 | 5500 | Yes |
| 2006 | 2.4 | 172 | 27 | 5500 | Yes |
| 2007 | 3.3 | 189 | 26 | 5500 | Yes |
| 2008 | 2.9 | 157 | 27 | 5500 | Yes |
| 2009 | 2.2 | 222 | 27 | 5500 | Yes |
| 2010 | 4.2 | 156 | 28 | 5500 | Yes |
| 2011 | 3.6 | 182 | 25 | 5500 | Yes |
| 2012 | 3.6 | 163 | 26 | 5500 | Yes |
| 2013 | 1.4 | 155 | 27 | 5500 | Yes |
| 2014 | 3.8 | 178 | 29 | 5500 | Yes |
| 2015 | 1.7 | 217 | 23 | 5500 | Yes |
| 2016 | 4.3 | 206 | 29 | 5500 | Yes |
| 2017 | 4.7 | 168 | 24 | 5500 | Yes |
| 2018 | 1.5 | 162 | 23 | 5500 | Yes |
| 2019 | 3.9 | 209 | 29 | 5500 | Yes |
| 2020 | 3.1 | 169 | 29 | 5500 | Yes |
| 2021 | 1.7 | 182 | 28 | 5500 | Yes |
| 2022 | 1.1 | 227 | 24 | 5500 | Yes |
| 2023 | 2 | 164 | 28 | 5500 | Yes |
| 2024 | 3.8 | 213 | 25 | 5500 | No |
| 2025 | 5 | 196 | 28 | 5500 | Yes |
| 2026 | 2.9 | 211 | 26 | 5500 | Yes |
| 2027 | 2.3 | 199 | 23 | 5500 | Yes |
| 2028 | 4.5 | 218 | 24 | 5500 | No |
| 2029 | 4.2 | 210 | 25 | 5500 | Yes |
| 2030 | 2.5 | 195 | 27 | 5500 | Yes |

**TYPE 3 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 3 | | | | | |
|---|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Frequency (MHz) | Successful Detection (Yes/No) |
| 3001 | 9.5 | 379 | 18 | 5500 | Yes |
| 3002 | 6.1 | 347 | 17 | 5500 | Yes |
| 3003 | 8.4 | 480 | 18 | 5500 | Yes |
| 3004 | 9.3 | 460 | 18 | 5500 | Yes |
| 3005 | 7.6 | 488 | 17 | 5500 | No |
| 3006 | 6.8 | 395 | 16 | 5500 | Yes |
| 3007 | 8.1 | 436 | 16 | 5500 | Yes |
| 3008 | 7.5 | 325 | 17 | 5500 | Yes |
| 3009 | 6.5 | 378 | 16 | 5500 | Yes |
| 3010 | 6.1 | 413 | 17 | 5500 | Yes |
| 3011 | 7.3 | 479 | 16 | 5500 | Yes |
| 3012 | 9.2 | 275 | 18 | 5500 | No |
| 3013 | 8.7 | 488 | 17 | 5500 | No |
| 3014 | 6.8 | 297 | 16 | 5500 | Yes |
| 3015 | 6.5 | 271 | 18 | 5500 | Yes |
| 3016 | 8.9 | 477 | 18 | 5500 | Yes |
| 3017 | 6.8 | 464 | 16 | 5500 | Yes |
| 3018 | 7.5 | 432 | 16 | 5500 | Yes |
| 3019 | 9.8 | 314 | 16 | 5500 | Yes |
| 3020 | 6.5 | 294 | 16 | 5500 | Yes |
| 3021 | 9 | 323 | 18 | 5500 | Yes |
| 3022 | 8.2 | 316 | 17 | 5500 | Yes |
| 3023 | 9 | 357 | 16 | 5500 | Yes |
| 3024 | 6.2 | 496 | 16 | 5500 | No |
| 3025 | 9.3 | 299 | 18 | 5500 | Yes |
| 3026 | 8.9 | 333 | 17 | 5500 | No |
| 3027 | 6 | 400 | 18 | 5500 | No |
| 3028 | 7.9 | 447 | 17 | 5500 | Yes |
| 3029 | 7.4 | 408 | 17 | 5500 | Yes |
| 3030 | 9.6 | 468 | 18 | 5500 | 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 | 18.3 | 443 | 13 | 5500 | Yes |
| 4002 | 14.5 | 398 | 12 | 5500 | Yes |
| 4003 | 19.1 | 385 | 16 | 5500 | Yes |
| 4004 | 11.5 | 352 | 15 | 5500 | Yes |
| 4005 | 16.6 | 485 | 16 | 5500 | Yes |
| 4006 | 18.5 | 348 | 13 | 5500 | Yes |
| 4007 | 14.9 | 494 | 15 | 5500 | No |
| 4008 | 13.1 | 370 | 12 | 5500 | Yes |
| 4009 | 14.8 | 277 | 16 | 5500 | Yes |
| 4010 | 13.4 | 417 | 14 | 5500 | Yes |
| 4011 | 15.5 | 470 | 14 | 5500 | No |
| 4012 | 14.6 | 254 | 12 | 5500 | No |
| 4013 | 13 | 320 | 14 | 5500 | No |
| 4014 | 12.5 | 368 | 15 | 5500 | No |
| 4015 | 11.3 | 329 | 13 | 5500 | Yes |
| 4016 | 16.2 | 389 | 14 | 5500 | No |
| 4017 | 15.5 | 363 | 12 | 5500 | No |
| 4018 | 16.5 | 318 | 16 | 5500 | No |
| 4019 | 16.2 | 305 | 14 | 5500 | Yes |
| 4020 | 17.7 | 273 | 13 | 5500 | Yes |
| 4021 | 13.7 | 406 | 12 | 5500 | Yes |
| 4022 | 15.6 | 269 | 12 | 5500 | Yes |
| 4023 | 16.9 | 415 | 13 | 5500 | Yes |
| 4024 | 19.3 | 290 | 16 | 5500 | Yes |
| 4025 | 11.9 | 449 | 15 | 5500 | Yes |
| 4026 | 19.6 | 337 | 13 | 5500 | Yes |
| 4027 | 12.7 | 273 | 12 | 5500 | Yes |
| 4028 | 11.7 | 425 | 13 | 5500 | Yes |
| 4029 | 14.9 | 374 | 15 | 5500 | Yes |
| 4030 | 14.5 | 421 | 16 | 5500 | Yes |

**TYPE 5 DETECTION PROBABILITY**

| Data Sheet for FCC Long Pulse Radar Type 5 | | |
|---|---|---|
| Trial | Frequency (MHz) | Successful Detection (Yes/No) |
| 1 | 5500 | No |
| 2 | 5500 | Yes |
| 3 | 5500 | Yes |
| 4 | 5500 | Yes |
| 5 | 5500 | Yes |
| 6 | 5500 | Yes |
| 7 | 5500 | Yes |
| 8 | 5500 | Yes |
| 9 | 5500 | Yes |
| 10 | 5500 | Yes |
| 11 | 5497 | Yes |
| 12 | 5497 | Yes |
| 13 | 5500 | Yes |
| 14 | 5498 | Yes |
| 15 | 5495 | Yes |
| 16 | 5497 | Yes |
| 17 | 5499 | Yes |
| 18 | 5498 | Yes |
| 19 | 5497 | Yes |
| 20 | 5499 | Yes |
| 21 | 5504 | Yes |
| 22 | 5503 | Yes |
| 23 | 5503 | Yes |
| 24 | 5501 | Yes |
| 25 | 5503 | Yes |
| 26 | 5503 | Yes |
| 27 | 5505 | No |
| 28 | 5501 | Yes |
| 29 | 5505 | Yes |
| 30 | 5503 | Yes |

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


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**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 | 347 | 5490 | 2 | Yes |
| 2 | 822 | 5491 | 2 | Yes |
| 3 | 1297 | 5492 | 7 | Yes |
| 4 | 1772 | 5493 | 8 | Yes |
| 5 | 2247 | 5494 | 4 | Yes |
| 6 | 2722 | 5495 | 1 | Yes |
| 7 | 3197 | 5496 | 2 | Yes |
| 8 | 3672 | 5497 | 5 | Yes |
| 9 | 4147 | 5498 | 4 | Yes |
| 10 | 4622 | 5499 | 2 | Yes |
| 11 | 5097 | 5500 | 2 | Yes |
| 12 | 5572 | 5501 | 1 | Yes |
| 13 | 6047 | 5502 | 4 | Yes |
| 14 | 6522 | 5503 | 5 | Yes |
| 15 | 6997 | 5504 | 2 | Yes |
| 16 | 7472 | 5505 | 3 | Yes |
| 17 | 7947 | 5506 | 2 | Yes |
| 18 | 8422 | 5507 | 3 | Yes |
| 19 | 8897 | 5508 | 7 | Yes |
| 20 | 9372 | 5509 | 6 | Yes |
| 21 | 9847 | 5490 | 3 | Yes |
| 22 | 10322 | 5491 | 5 | Yes |
| 23 | 10797 | 5492 | 6 | Yes |
| 24 | 11272 | 5493 | 5 | Yes |
| 25 | 11747 | 5494 | 2 | Yes |
| 26 | 12222 | 5495 | 4 | Yes |
| 27 | 12697 | 5496 | 4 | Yes |
| 28 | 13172 | 5497 | 3 | Yes |
| 29 | 13647 | 5498 | 3 | Yes |
| 30 | 14122 | 5499 | 5 | Yes |
| 31 | 14597 | 5500 | 3 | Yes |
| 32 | 15072 | 5501 | 4 | Yes |
| 33 | 15547 | 5502 | 2 | Yes |
| 34 | 16022 | 5503 | 5 | Yes |
| 35 | 16497 | 5504 | 8 | Yes |
| 36 | 16972 | 5505 | 4 | Yes |
| 37 | 17447 | 5506 | 3 | Yes |
| 38 | 17922 | 5507 | 2 | No |
| 39 | 18397 | 5508 | 1 | No |
| 40 | 18872 | 5509 | 5 | Yes |


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# 5.7. HIGH BAND RESULTS FOR 40 MHz BANDWIDTH

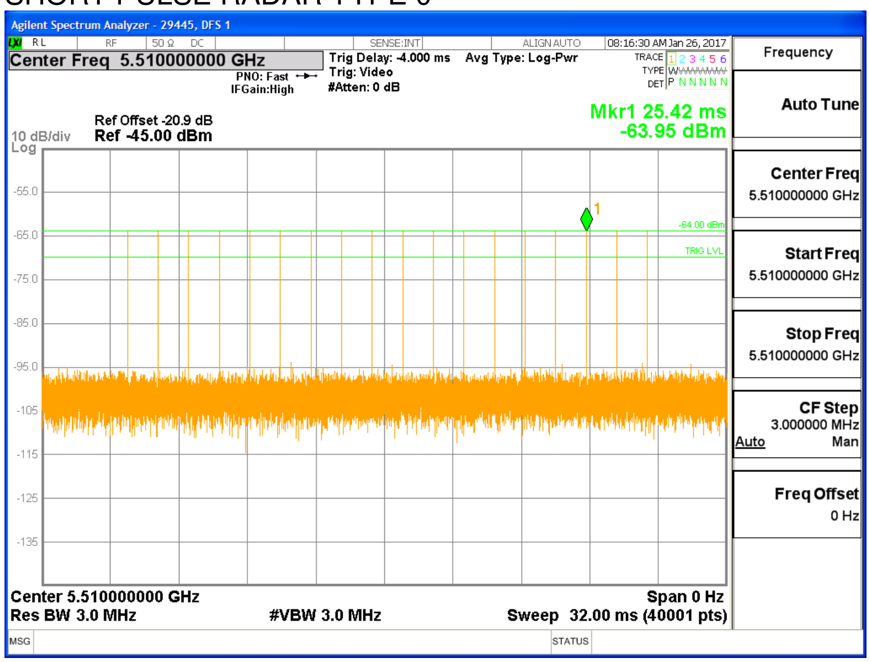
## 5.7.1. TEST CHANNEL

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

## 5.7.2. RADAR WAVEFORMS AND TRAFFIC

**RADAR WAVEFORMS**

SHORT PULSE RADAR TYPE 0





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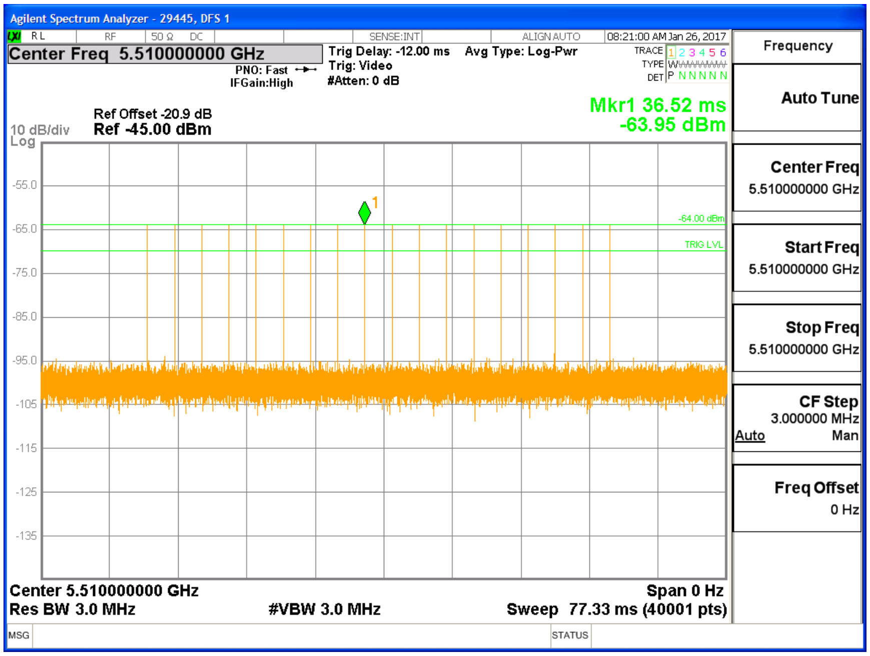
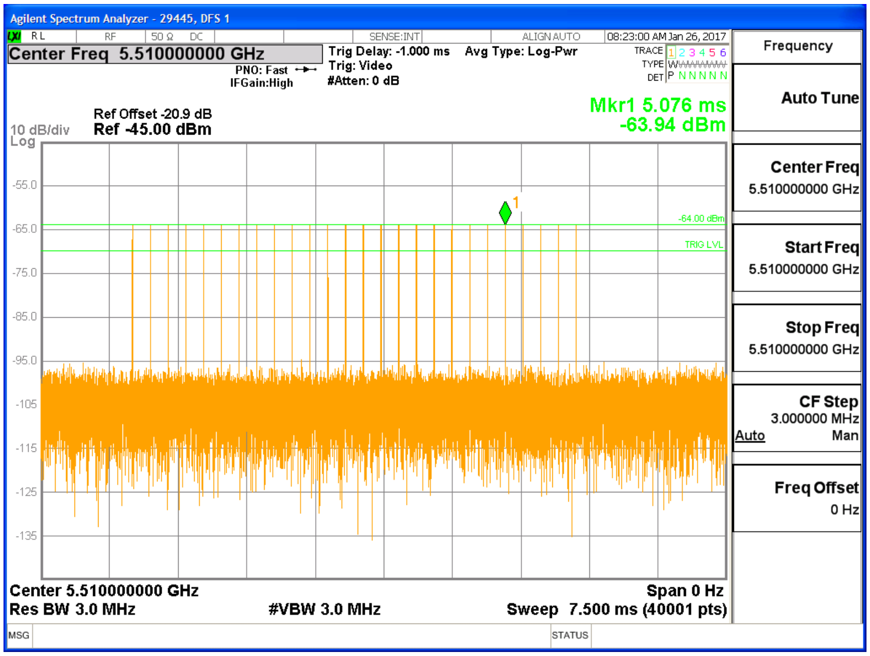
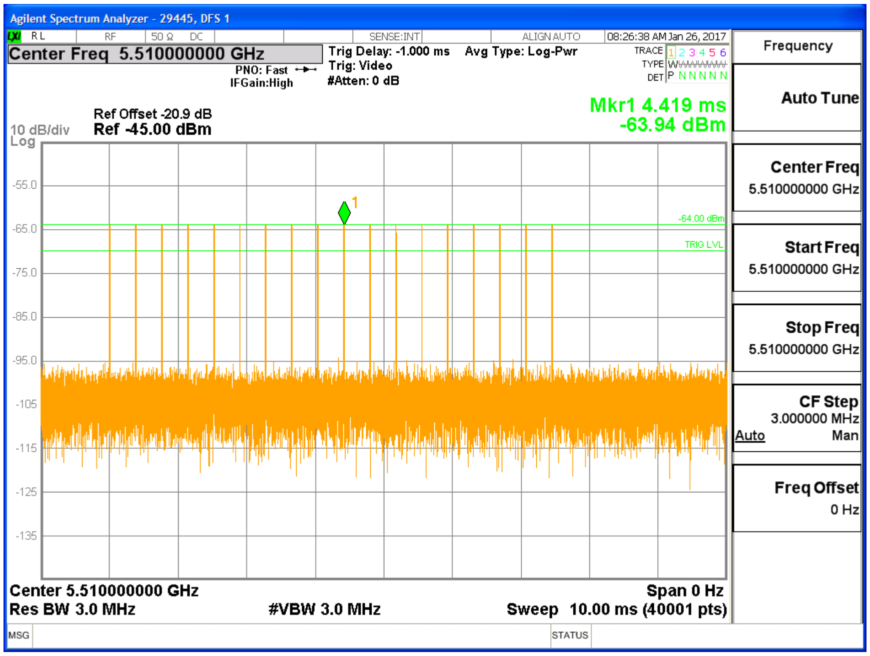
SAMPLE OF RADAR TYPE 1



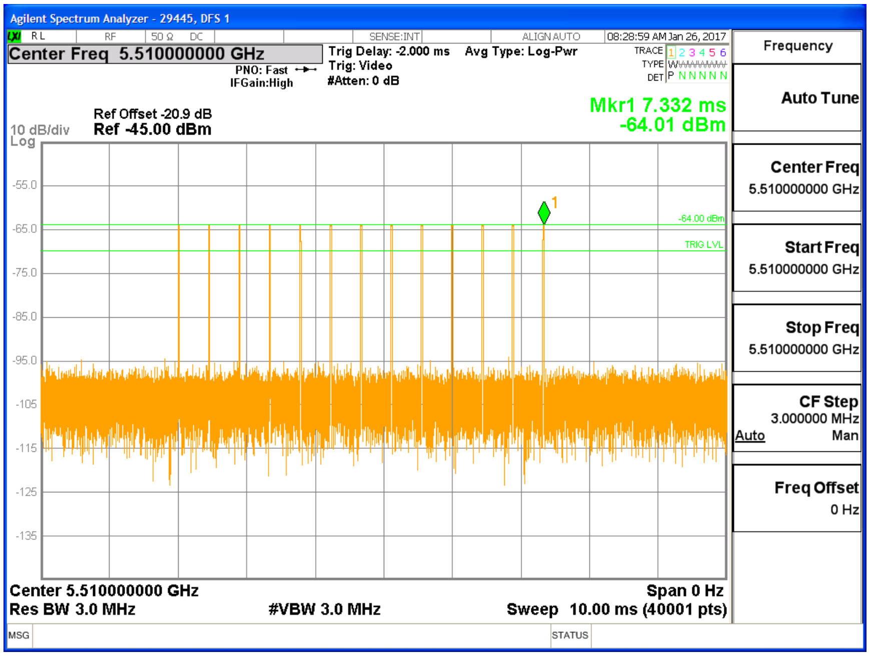
SAMPLE OF RADAR TYPE 2



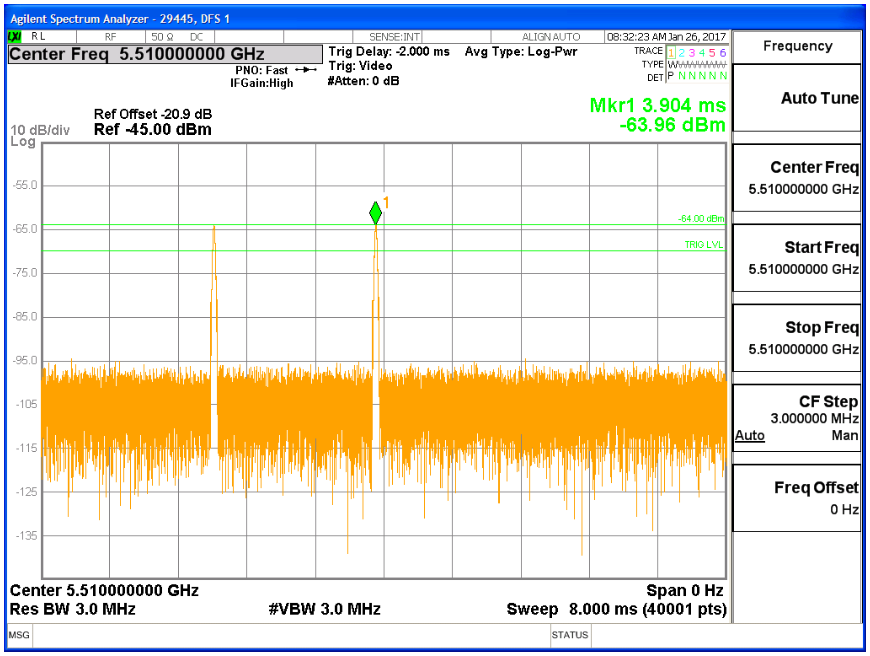
SAMPLE OF RADAR TYPE 3



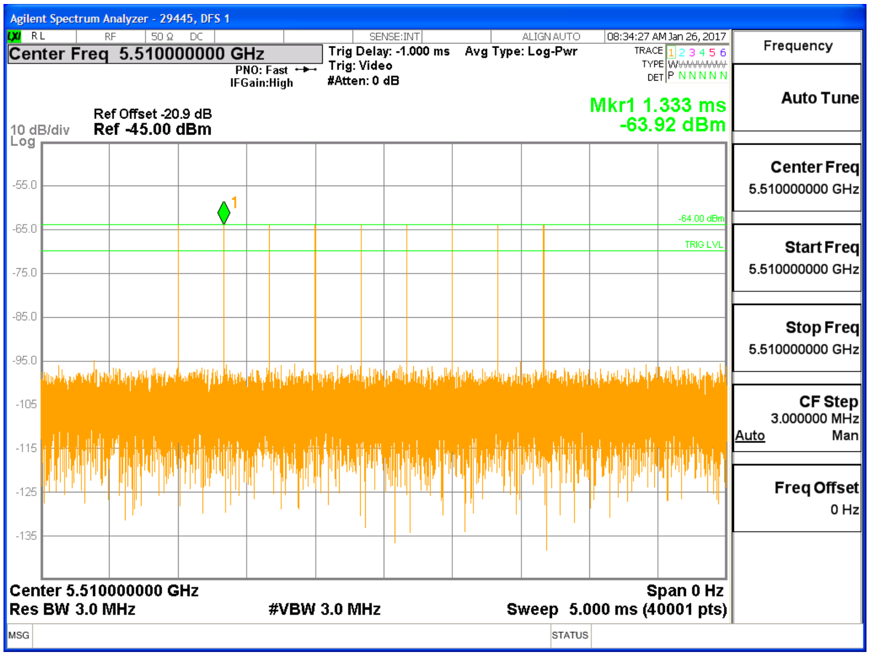
SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5

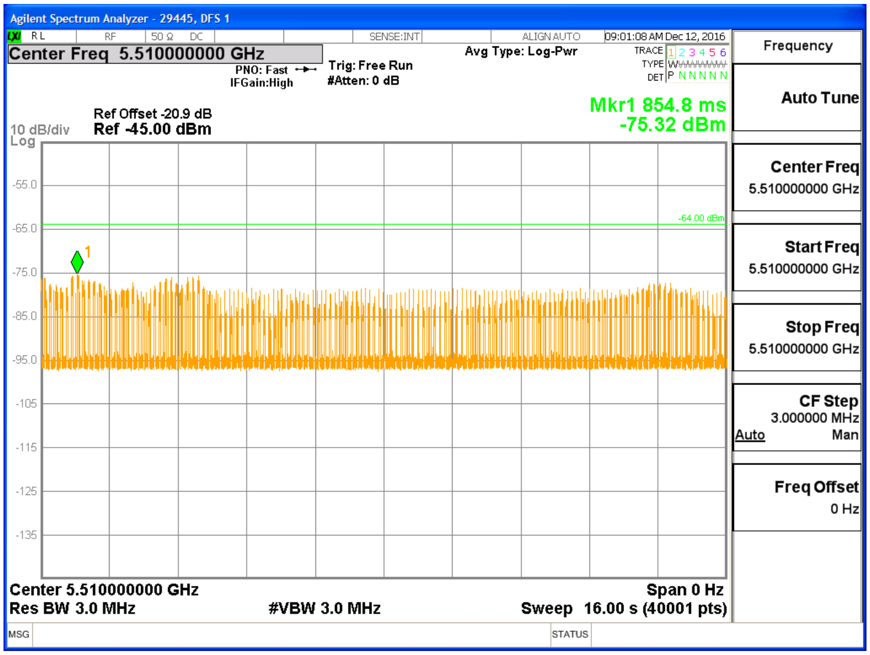


SINGLE BURST OF RADAR TYPE 6

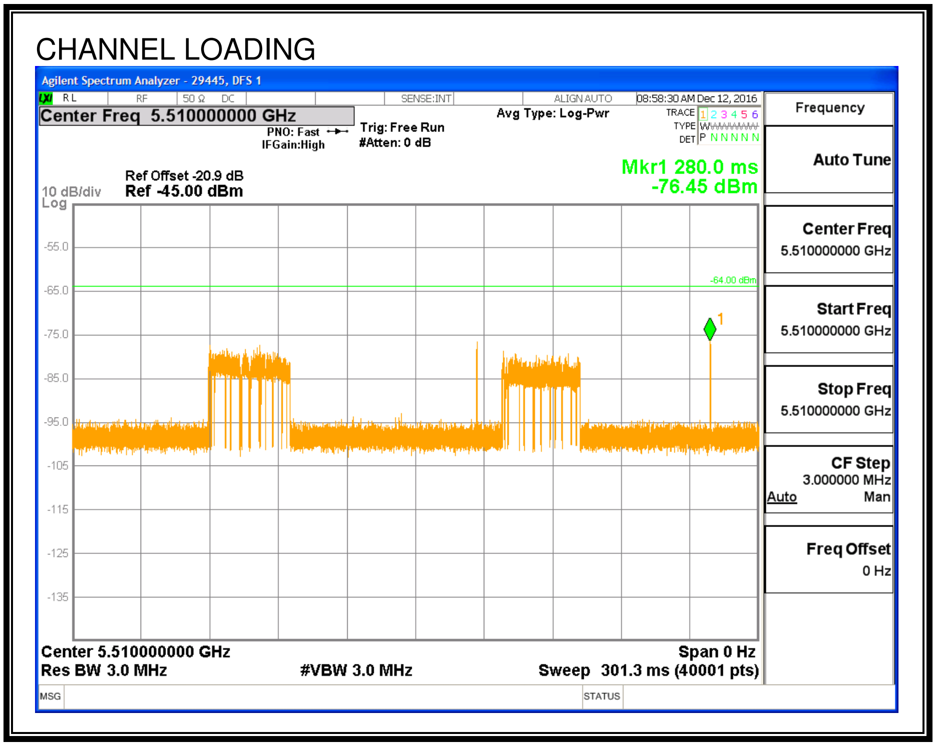


**TRAFFIC**

TRAFFIC



**CHANNEL LOADING**




The level of traffic loading on the channel by the EUT is 20.92%

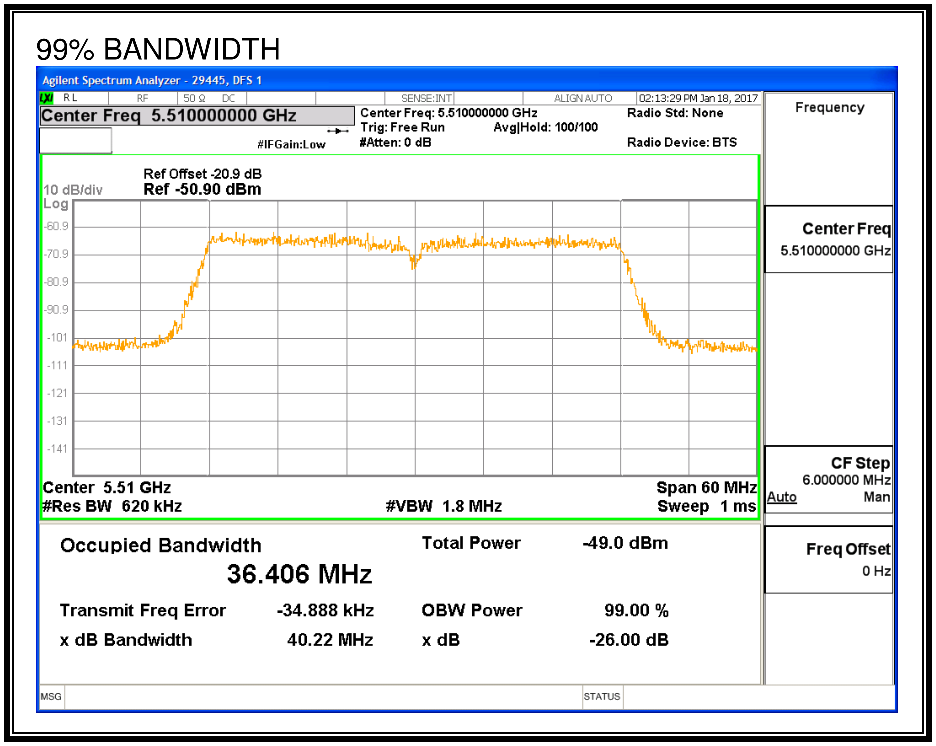
## 5.7.3. OVERLAPPING CHANNEL TESTS

**RESULTS**

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

### 5.7.4. DETECTION BANDWIDTH

**REFERENCE PLOT OF 99% POWER BANDWIDTH**




**RESULTS**

| FL (MHz) | FH (MHz) | Detection Bandwidth (MHz) | 99% Power Bandwidth (MHz) | Ratio of Detection BW to 99% Power BW (%) | Minimum Limit (%) |
|---|---|---|---|---|---|
| 5490 | 5529 | 39 | 36.406 | 107.1 | 100 |

## DETECTION BANDWIDTH PROBABILITY

DETECTION BANDWIDTH PROBABILITY RESULTS

Detection Bandwidth Test Results 29445 DFS 1

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

| Frequency (MHz) | Number of Trials | Number Detected | Detection (%) | Mark |
|---|---|---|---|---|
| 5490 | 10 | 10 | 100 | FL |
| 5495 | 10 | 10 | 100 | |
| 5500 | 10 | 10 | 100 | |
| 5505 | 10 | 10 | 100 | |
| 5510 | 10 | 10 | 100 | |
| 5515 | 10 | 10 | 100 | |
| 5520 | 10 | 10 | 100 | |
| 5525 | 10 | 10 | 100 | |
| 5526 | 10 | 10 | 100 | |
| 5527 | 10 | 10 | 100 | |
| 5528 | 10 | 10 | 100 | |
| 5529 | 10 | 10 | 100 | FH |

### 5.7.5. IN-SERVICE MONITORING

**RESULTS**

FCC Radar Test Summary

| Signal Type | Number of Trials | Detection (%) | Limit (%) | Pass/Fail | Detection Bandwidth FL | Detection Bandwidth FH | OBW | Test Location | Employee Number | In-Service Monitoring Version |
|---|---|---|---|---|---|---|---|---|---|---|
| FCC Short Pulse Type 1 | 30 | 100.00 | 60 | Pass | 5490 | 5529 | 36.41 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 2 | 30 | 73.33 | 60 | Pass | 5490 | 5529 | 36.41 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 3 | 30 | 73.33 | 60 | Pass | 5490 | 5529 | 36.41 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 4 | 30 | 76.67 | 60 | Pass | 5490 | 5529 | 36.41 | DFS 1 | 29445 | Version 3.0 |
| Aggregate | | 80.83 | 80 | Pass | | | | | | |
| FCC Long Pulse Type 5 | 30 | 93.33 | 80 | Pass | 5490 | 5529 | 36.41 | DFS 1 | 29445 | Version 3.0 |
| FCC Hopping Type 6 | 40 | 97.50 | 70 | Pass | 5490 | 5529 | 36.41 | DFS 1 | 29445 | Version 3.0 |

**TYPE 1 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 1 | | | | | | |
|---|---|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Test (A/B) | Frequency (MHz) | Successful Detection (Yes/No) |
| 1001 | 1 | 3066 | 18 | A | 5510 | Yes |
| 1002 | 1 | 578 | 92 | A | 5510 | Yes |
| 1003 | 1 | 598 | 89 | A | 5510 | Yes |
| 1004 | 1 | 718 | 74 | A | 5510 | Yes |
| 1005 | 1 | 678 | 78 | A | 5510 | Yes |
| 1006 | 1 | 818 | 65 | A | 5510 | Yes |
| 1007 | 1 | 778 | 68 | A | 5510 | Yes |
| 1008 | 1 | 838 | 63 | A | 5510 | Yes |
| 1009 | 1 | 698 | 76 | A | 5510 | Yes |
| 1010 | 1 | 518 | 102 | A | 5510 | Yes |
| 1011 | 1 | 658 | 81 | A | 5510 | Yes |
| 1012 | 1 | 798 | 67 | A | 5510 | Yes |
| 1013 | 1 | 898 | 59 | A | 5510 | Yes |
| 1014 | 1 | 618 | 86 | A | 5510 | Yes |
| 1015 | 1 | 738 | 72 | A | 5510 | Yes |
| 1016 | 1 | 1638 | 33 | B | 5510 | Yes |
| 1017 | 1 | 2465 | 22 | B | 5510 | Yes |
| 1018 | 1 | 1226 | 44 | B | 5510 | Yes |
| 1019 | 1 | 2182 | 25 | B | 5510 | Yes |
| 1020 | 1 | 1073 | 50 | B | 5510 | Yes |
| 1021 | 1 | 964 | 55 | B | 5510 | Yes |
| 1022 | 1 | 2532 | 21 | B | 5510 | Yes |
| 1023 | 1 | 2553 | 21 | B | 5510 | Yes |
| 1024 | 1 | 1703 | 31 | B | 5510 | Yes |
| 1025 | 1 | 1291 | 41 | B | 5510 | Yes |
| 1026 | 1 | 2924 | 19 | B | 5510 | Yes |
| 1027 | 1 | 1138 | 47 | B | 5510 | Yes |
| 1028 | 1 | 2900 | 19 | B | 5510 | Yes |
| 1029 | 1 | 2597 | 21 | B | 5510 | Yes |
| 1030 | 1 | 747 | 71 | B | 5510 | Yes |

**TYPE 2 DETECTION PROBABILITY**

| Data Sheet for FCC Short Pulse Radar Type 2 | | | | | |
|---|---|---|---|---|---|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Frequency (MHz) | Successful Detection (Yes/No) |
| 2001 | 3.8 | 194 | 26 | 5510 | Yes |
| 2002 | 2.8 | 188 | 26 | 5510 | No |
| 2003 | 1.1 | 154 | 24 | 5510 | Yes |
| 2004 | 2.2 | 195 | 24 | 5510 | Yes |
| 2005 | 3 | 208 | 23 | 5510 | Yes |
| 2006 | 2.4 | 172 | 27 | 5510 | No |
| 2007 | 3.3 | 189 | 26 | 5510 | No |
| 2008 | 2.9 | 157 | 27 | 5510 | Yes |
| 2009 | 2.2 | 222 | 27 | 5510 | Yes |
| 2010 | 4.2 | 156 | 28 | 5510 | Yes |
| 2011 | 3.6 | 182 | 25 | 5510 | No |
| 2012 | 3.6 | 163 | 26 | 5510 | Yes |
| 2013 | 1.4 | 155 | 27 | 5510 | Yes |
| 2014 | 3.8 | 178 | 29 | 5510 | Yes |
| 2015 | 1.7 | 217 | 23 | 5510 | No |
| 2016 | 4.3 | 206 | 29 | 5510 | No |
| 2017 | 4.7 | 168 | 24 | 5510 | Yes |
| 2018 | 1.5 | 162 | 23 | 5510 | Yes |
| 2019 | 3.9 | 209 | 29 | 5510 | No |
| 2020 | 3.1 | 169 | 29 | 5510 | Yes |
| 2021 | 1.7 | 182 | 28 | 5510 | Yes |
| 2022 | 1.1 | 227 | 24 | 5510 | Yes |
| 2023 | 2 | 164 | 28 | 5510 | Yes |
| 2024 | 3.8 | 213 | 25 | 5510 | Yes |
| 2025 | 5 | 196 | 28 | 5510 | Yes |
| 2026 | 2.9 | 211 | 26 | 5510 | Yes |
| 2027 | 2.3 | 199 | 23 | 5510 | Yes |
| 2028 | 4.5 | 218 | 24 | 5510 | Yes |
| 2029 | 4.2 | 210 | 25 | 5510 | No |
| 2030 | 2.5 | 195 | 27 | 5510 | 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 | 9.5 | 379 | 18 | 5510 | Yes |
| 3002 | 6.1 | 347 | 17 | 5510 | Yes |
| 3003 | 8.4 | 480 | 18 | 5510 | Yes |
| 3004 | 9.3 | 460 | 18 | 5510 | Yes |
| 3005 | 7.6 | 488 | 17 | 5510 | Yes |
| 3006 | 6.8 | 395 | 16 | 5510 | Yes |
| 3007 | 8.1 | 436 | 16 | 5510 | Yes |
| 3008 | 7.5 | 325 | 17 | 5510 | No |
| 3009 | 6.5 | 378 | 16 | 5510 | Yes |
| 3010 | 6.1 | 413 | 17 | 5510 | No |
| 3011 | 7.3 | 479 | 16 | 5510 | No |
| 3012 | 9.2 | 275 | 18 | 5510 | Yes |
| 3013 | 8.7 | 488 | 17 | 5510 | Yes |
| 3014 | 6.8 | 297 | 16 | 5510 | Yes |
| 3015 | 6.5 | 271 | 18 | 5510 | Yes |
| 3016 | 8.9 | 477 | 18 | 5510 | Yes |
| 3017 | 6.8 | 464 | 16 | 5510 | No |
| 3018 | 7.5 | 432 | 16 | 5510 | Yes |
| 3019 | 9.8 | 314 | 16 | 5510 | No |
| 3020 | 6.5 | 294 | 16 | 5510 | Yes |
| 3021 | 9 | 323 | 18 | 5510 | Yes |
| 3022 | 8.2 | 316 | 17 | 5510 | Yes |
| 3023 | 9 | 357 | 16 | 5510 | No |
| 3024 | 6.2 | 496 | 16 | 5510 | No |
| 3025 | 9.3 | 299 | 18 | 5510 | Yes |
| 3026 | 8.9 | 333 | 17 | 5510 | Yes |
| 3027 | 6 | 400 | 18 | 5510 | Yes |
| 3028 | 7.9 | 447 | 17 | 5510 | No |
| 3029 | 7.4 | 408 | 17 | 5510 | Yes |
| 3030 | 9.6 | 468 | 18 | 5510 | 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 | 18.3 | 443 | 13 | 5510 | No |
| 4002 | 14.5 | 398 | 12 | 5510 | Yes |
| 4003 | 19.1 | 385 | 16 | 5510 | Yes |
| 4004 | 11.5 | 352 | 15 | 5510 | Yes |
| 4005 | 16.6 | 485 | 16 | 5510 | Yes |
| 4006 | 18.5 | 348 | 13 | 5510 | Yes |
| 4007 | 14.9 | 494 | 15 | 5510 | Yes |
| 4008 | 13.1 | 370 | 12 | 5510 | Yes |
| 4009 | 14.8 | 277 | 16 | 5510 | Yes |
| 4010 | 13.4 | 417 | 14 | 5510 | No |
| 4011 | 15.5 | 470 | 14 | 5510 | Yes |
| 4012 | 14.6 | 254 | 12 | 5510 | No |
| 4013 | 13 | 320 | 14 | 5510 | Yes |
| 4014 | 12.5 | 368 | 15 | 5510 | Yes |
| 4015 | 11.3 | 329 | 13 | 5510 | Yes |
| 4016 | 16.2 | 389 | 14 | 5510 | Yes |
| 4017 | 15.5 | 363 | 12 | 5510 | Yes |
| 4018 | 16.5 | 318 | 16 | 5510 | Yes |
| 4019 | 16.2 | 305 | 14 | 5510 | Yes |
| 4020 | 17.7 | 273 | 13 | 5510 | Yes |
| 4021 | 13.7 | 406 | 12 | 5510 | No |
| 4022 | 15.6 | 269 | 12 | 5510 | No |
| 4023 | 16.9 | 415 | 13 | 5510 | No |
| 4024 | 19.3 | 290 | 16 | 5510 | Yes |
| 4025 | 11.9 | 449 | 15 | 5510 | Yes |
| 4026 | 19.6 | 337 | 13 | 5510 | Yes |
| 4027 | 12.7 | 273 | 12 | 5510 | Yes |
| 4028 | 11.7 | 425 | 13 | 5510 | Yes |
| 4029 | 14.9 | 374 | 15 | 5510 | Yes |
| 4030 | 14.5 | 421 | 16 | 5510 | No |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**TYPE 5 DETECTION PROBABILITY**

Data Sheet for FCC Long Pulse Radar Type 5

| Trial | Frequency (MHz) | Successful Detection (Yes/No) |
|---|---|---|
| 1 | 5510 | Yes |
| 2 | 5510 | Yes |
| 3 | 5510 | Yes |
| 4 | 5510 | Yes |
| 5 | 5510 | Yes |
| 6 | 5510 | Yes |
| 7 | 5510 | Yes |
| 8 | 5510 | Yes |
| 9 | 5510 | Yes |
| 10 | 5510 | Yes |
| 11 | 5498 | Yes |
| 12 | 5498 | Yes |
| 13 | 5500 | Yes |
| 14 | 5498 | Yes |
| 15 | 5496 | Yes |
| 16 | 5498 | Yes |
| 17 | 5500 | Yes |
| 18 | 5499 | Yes |
| 19 | 5498 | Yes |
| 20 | 5500 | Yes |
| 21 | 5523 | No |
| 22 | 5522 | Yes |
| 23 | 5522 | Yes |
| 24 | 5520 | Yes |
| 25 | 5522 | Yes |
| 26 | 5522 | Yes |
| 27 | 5524 | Yes |
| 28 | 5521 | Yes |
| 29 | 5524 | Yes |
| 30 | 5523 | No |

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

**TYPE 6 DETECTION PROBABILITY**

| Data Sheet for FCC Hopping Radar Type 6 | | | | |
|---|---|---|---|---|
| 1 us Pulse Width, 333 us PRI, 9 Pulses per Burst, 1 Burst per Hop | | | | |
| NTIA August 2005 Hopping Sequence | | | | |
| Trial | Starting Index Within Sequence | Signal Generator Frequency (MHz) | Hops within Detection BW | Successful Detection (Yes/No) |
| 1 | 160 | 5490 | 5 | Yes |
| 2 | 635 | 5491 | 12 | Yes |
| 3 | 1110 | 5492 | 9 | Yes |
| 4 | 1585 | 5493 | 6 | Yes |
| 5 | 2060 | 5494 | 8 | Yes |
| 6 | 2535 | 5495 | 7 | Yes |
| 7 | 3010 | 5496 | 7 | Yes |
| 8 | 3485 | 5497 | 7 | Yes |
| 9 | 3960 | 5498 | 7 | Yes |
| 10 | 4435 | 5499 | 11 | Yes |
| 11 | 4910 | 5500 | 11 | Yes |
| 12 | 5385 | 5501 | 11 | Yes |
| 13 | 5860 | 5502 | 9 | Yes |
| 14 | 6335 | 5503 | 5 | Yes |
| 15 | 6810 | 5504 | 7 | Yes |
| 16 | 7285 | 5505 | 10 | Yes |
| 17 | 7760 | 5506 | 10 | Yes |
| 18 | 8235 | 5507 | 9 | Yes |
| 19 | 8710 | 5508 | 8 | Yes |
| 20 | 9185 | 5509 | 9 | Yes |
| 21 | 9660 | 5510 | 8 | Yes |
| 22 | 10135 | 5511 | 6 | Yes |
| 23 | 10610 | 5512 | 5 | Yes |
| 24 | 11085 | 5513 | 9 | Yes |
| 25 | 11560 | 5514 | 9 | Yes |
| 26 | 12035 | 5515 | 7 | Yes |
| 27 | 12510 | 5516 | 8 | Yes |
| 28 | 12985 | 5517 | 12 | Yes |
| 29 | 13460 | 5518 | 9 | Yes |
| 30 | 13935 | 5519 | 3 | No |
| 31 | 14410 | 5520 | 11 | Yes |
| 32 | 14885 | 5521 | 12 | Yes |
| 33 | 15360 | 5522 | 10 | Yes |
| 34 | 15835 | 5523 | 6 | Yes |
| 35 | 16310 | 5524 | 5 | Yes |
| 36 | 16785 | 5525 | 6 | Yes |
| 37 | 17260 | 5526 | 6 | Yes |
| 38 | 17735 | 5527 | 9 | Yes |
| 39 | 18210 | 5528 | 12 | Yes |
| 40 | 18685 | 5529 | 10 | Yes |

# 5.8. HIGH BAND RESULTS FOR 80 MHz BANDWIDTH

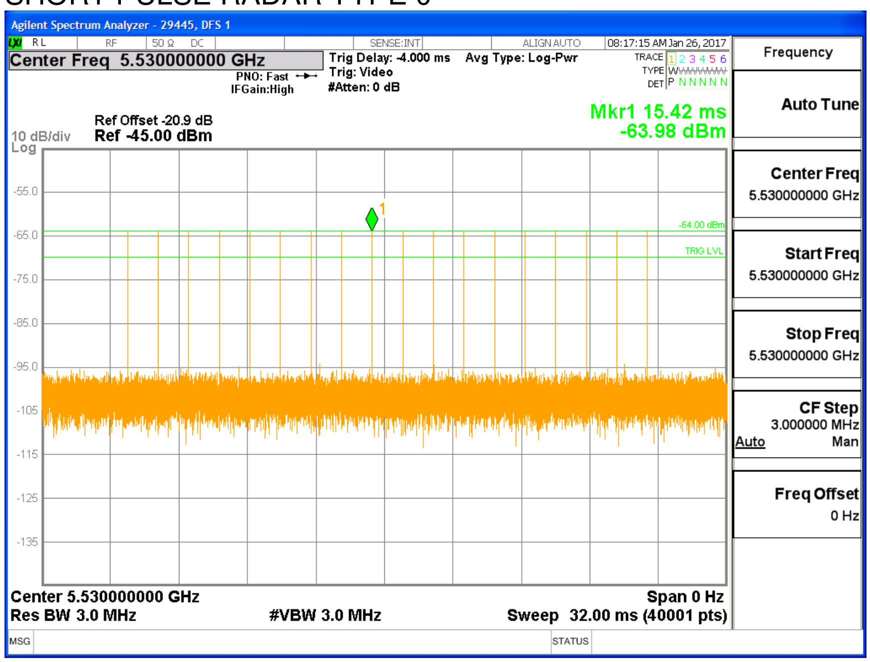
## 5.8.1. TEST CHANNEL

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

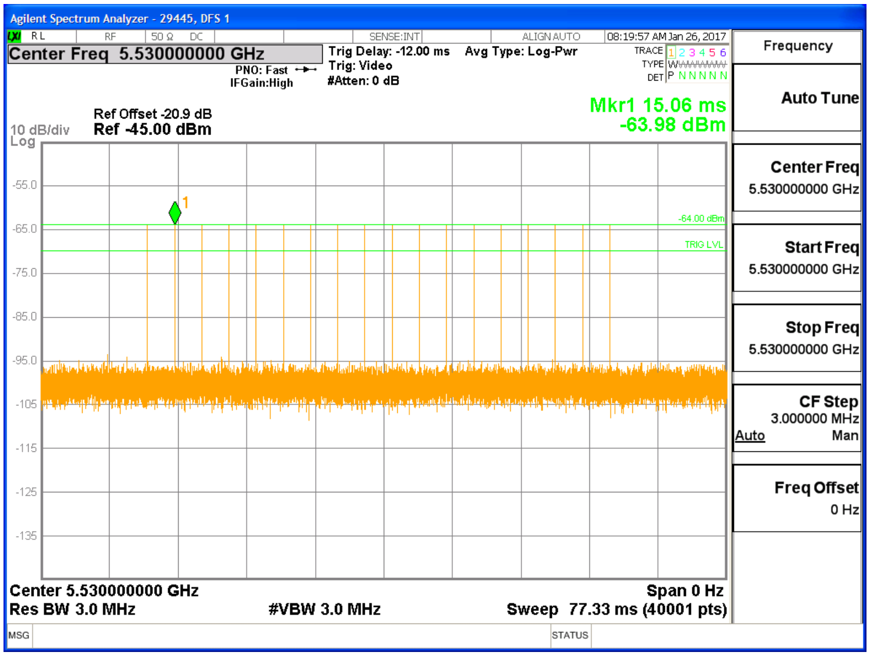
## 5.8.2. RADAR WAVEFORMS AND TRAFFIC

**RADAR WAVEFORMS**

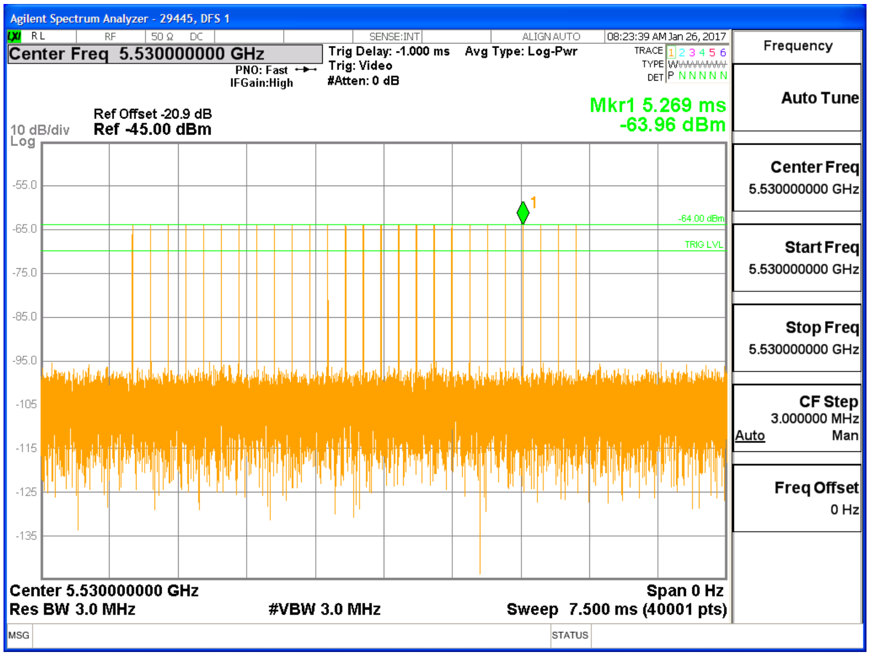
SHORT PULSE RADAR TYPE 0



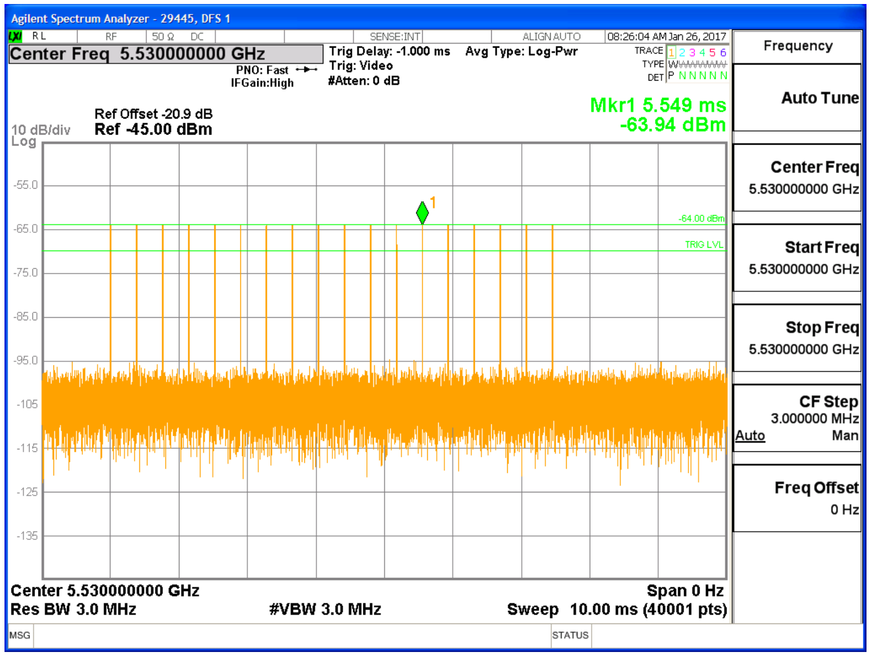
SAMPLE OF RADAR TYPE 1



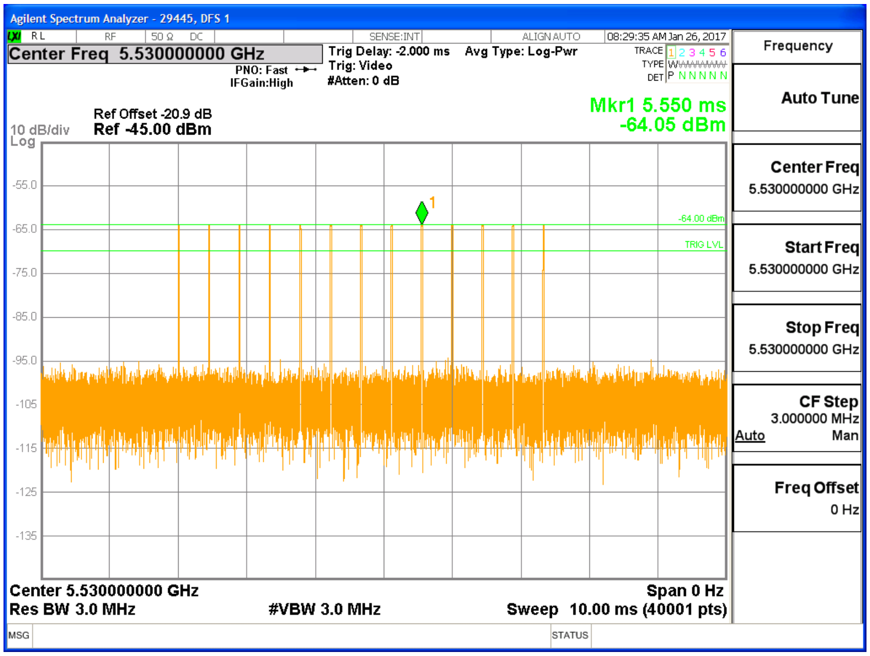
SAMPLE OF RADAR TYPE 2



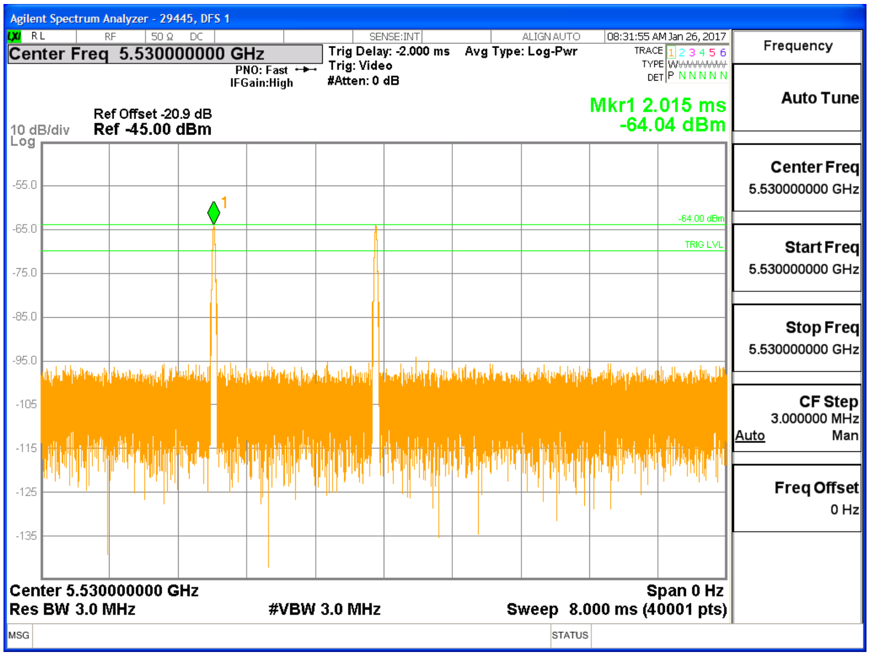
SAMPLE OF RADAR TYPE 3



SAMPLE OF RADAR TYPE 4



SAMPLE OF SINGLE BURST OF RADAR TYPE 5



SINGLE BURST OF RADAR TYPE 6