



**DFS PORTION of FCC 47 CFR PART 15 SUBPART E
DFS PORTION of INDUSTRY CANADA RSS-247 ISSUE 1**

CERTIFICATION TEST REPORT

FOR

CEL-FI DUO SMART CELLULAR SIGNAL BOOSTER

MODEL NUMBER: D32-2/4CU

FCC ID: YETD24CU

REPORT NUMBER: 11440089-E1V2

ISSUE DATE: OCTOBER 27, 2016

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NVLAP LAB CODE 200065-0

Revision History

| Rev. | Issue Date | Revisions | Revised By |
|------|------------|---------------------------|--------------|
| V1 | 09/29/16 | Initial Issue | Conan Cheung |
| V2 | 10/27/16 | Updated Antenna Parameter | Conan Cheung |

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: NEXIVITY, INC.
12230 WORLD TRADE DRIVE, SUITE 250
SAN DIEGO, CA., 92128, U.S.A.

EUT DESCRIPTION: CEL-FI DUO SMART CELLULAR SIGNAL BOOSTER

MODEL: D32-2/4CU

SERIAL NUMBER: 192428015602

DATE TESTED: SEPTEMBER 13 and 29, 2016

| APPLICABLE STANDARDS | |
|---|--------------|
| STANDARD | TEST RESULTS |
| DFS Portion of CFR 47 Part 15 Subpart E | Pass |
| INDUSTRY CANADA RSS-247 Issue 1 | 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
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Tested By:



DOUG ANDERSON
EMC ENGINEER
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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, ANSI C63.10-2013, RSS-247 Issue 1.

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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

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

INDUSTRY CANADA

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

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

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

FCC

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

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

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

Table 2: Applicability of DFS requirements during normal operation

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

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

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

| | |
|---|----------------------|
| Maximum Transmit Power | Value (see notes) |
| E.I.R.P. \geq 200 mill watt | -64 dBm |
| E.I.R.P. $<$ 200 mill watt and power spectral density $<$ 10 dBm/MHz | -62 dBm |
| E.I.R.P. $<$ 200 mill watt that do not meet power spectral density requirement | -64 dBm |
| <p>Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna</p> <p>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.</p> <p>Note 3: E.I.R.P. is based on the highest antenna gain. For MIMO devices refer to KDB publication 662911 D01.</p> | |

Table 4: DFS Response requirement values

| | |
|--|---|
| Parameter | Value |
| <i>Non-occupancy period</i> | 30 minutes |
| <i>Channel Availability Check Time</i> | 60 seconds |
| <i>Channel Move Time</i> | 10 seconds (See Note 1) |
| <i>Channel Closing Transmission Time</i> | 200 milliseconds + approx. 60 milliseconds over remaining 10 second period. (See Notes 1 and 2) |
| <i>U-NII Detection Bandwidth</i> | Minimum 100% of the U- NII 99% transmission power bandwidth. (See Note 3) |
| <p>Note 1: <i>Channel Move Time</i> and the <i>Channel Closing Transmission Time</i> should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.</p> <p>Note 2: The <i>Channel Closing Transmission Time</i> is comprised of 200 milliseconds starting at the beginning of the <i>Channel Move Time</i> plus any additional intermittent control signals required to facilitate a <i>Channel</i> 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.</p> <p>Note 3: During the <i>U-NII Detection Bandwidth</i> detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.</p> | |

Table 5 – Short Pulse Radar Test Waveforms

| Radar Type | Pulse Width (usec) | PRI (usec) | Pulses | Minimum Percentage of Successful Detection | Minimum Trials |
|---|--------------------|---|---|--|----------------|
| 0 | 1 | 1428 | 18 | See Note 1 | See Note 1 |
| 1 | 1 | Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in table 5a | Roundup: $\{(1/360) \times (19 \times 10^6 \text{ PRI}_{\text{usec}})\}$ | 60% | 30 |
| | | Test B: 15 unique PRI values randomly selected within the range of 518-3066 usec. With a minimum increment of 1 usec, excluding PRI values selected in Test A | | | |
| 2 | 1-5 | 150-230 | 23-29 | 60% | 30 |
| 3 | 6-10 | 200-500 | 16-18 | 60% | 30 |
| 4 | 11-20 | 200-500 | 12-16 | 60% | 30 |
| Aggregate (Radar Types 1-4) | | | | 80% | 120 |
| Note 1: Short Pulse Radar Type 0 should be used for the <i>Detection Bandwidth</i> test, <i>Channel Move Time</i> , and <i>Channel Closing Time</i> tests. | | | | | |

Table 6 – Long Pulse Radar Test Signal

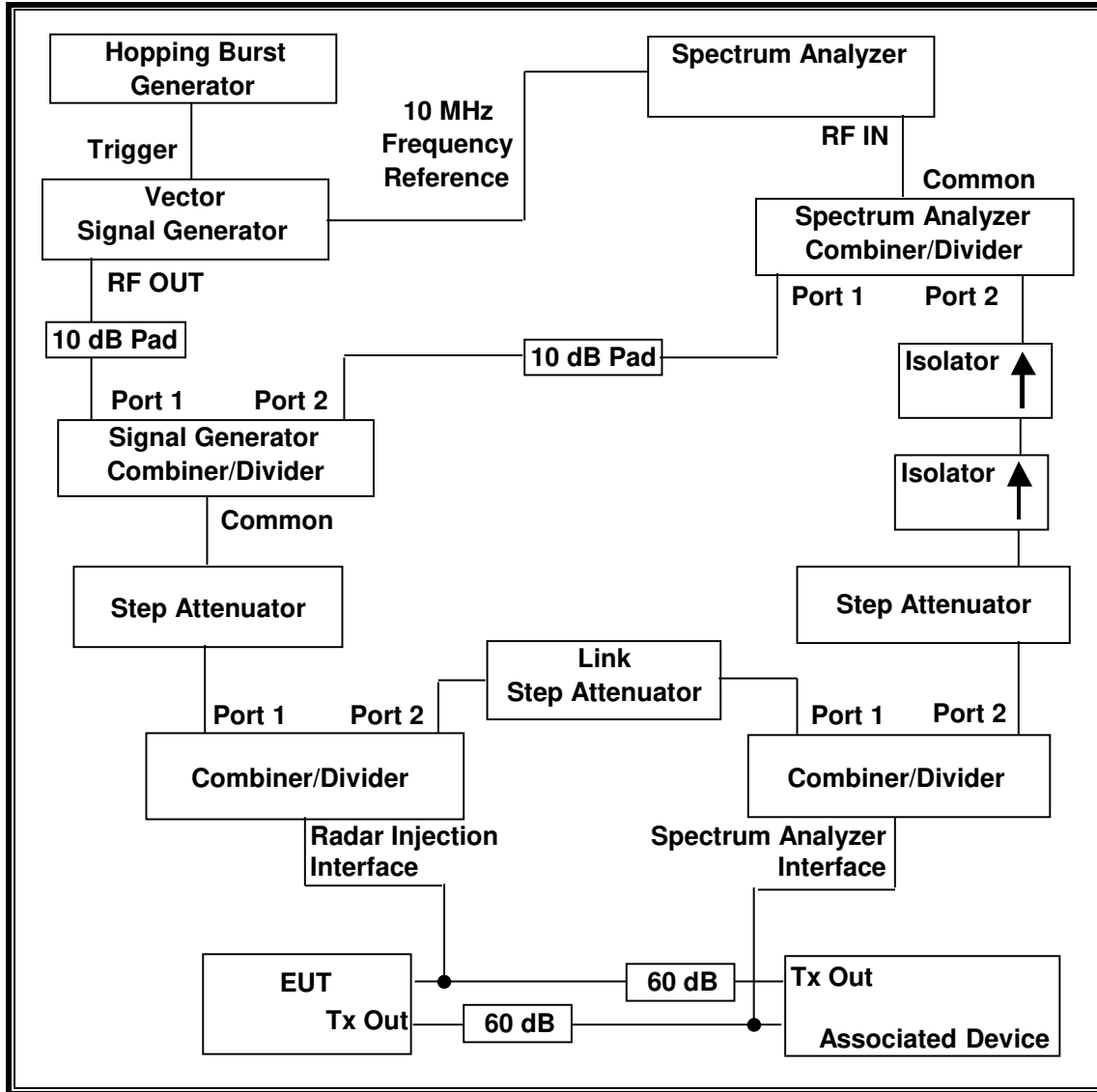
| Radar Waveform Type | Pulse Width (μsec) | Chirp Width (MHz) | PRI (μsec) | Pulses per Burst | Number of Bursts | Minimum Percentage of Successful Detection | Minimum Trials |
|---------------------|--------------------|-------------------|------------|------------------|------------------|--|----------------|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

Table 7 – Frequency Hopping Radar Test Signal

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

5.1.2. TEST AND MEASUREMENT SYSTEM

CONDUCTED METHOD SYSTEM BLOCK DIAGRAM



SYSTEM OVERVIEW

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

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

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

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

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

SYSTEM CALIBRATION

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

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

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

ADJUSTMENT OF DISPLAYED TRAFFIC LEVEL

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

TEST AND MEASUREMENT EQUIPMENT

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

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

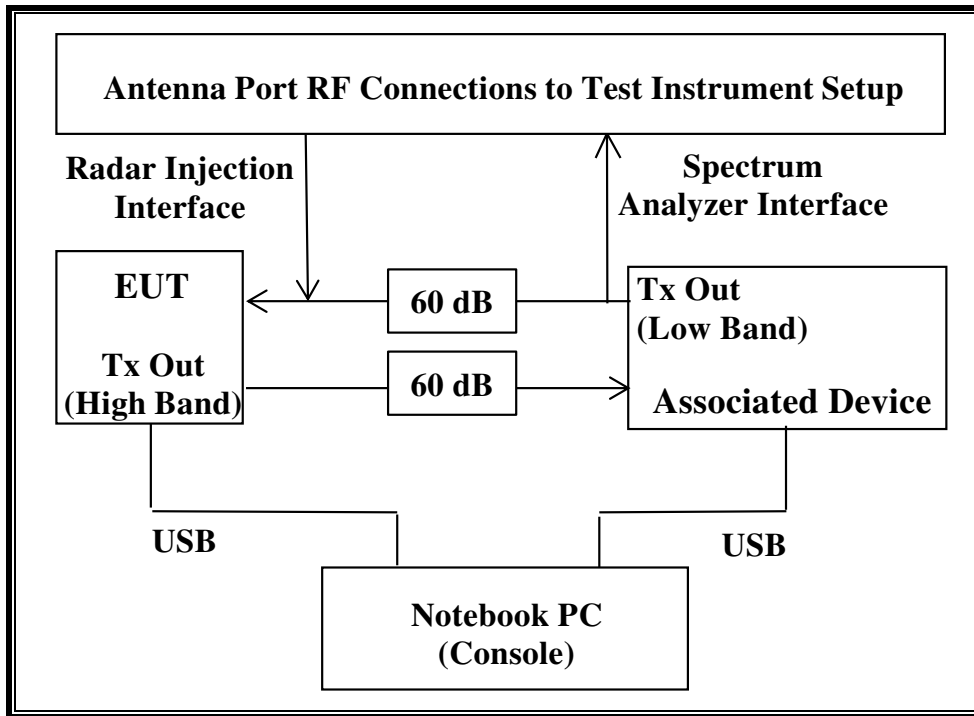
5.1.3. TEST AND MEASUREMENT SOFTWARE

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

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

5.1.4. SETUP OF EUT

CONDUCTED METHOD EUT TEST SETUP



SUPPORT EQUIPMENT

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) | Hon-Kwang | HK-AX-120A250-US | E70023138 | DoC |
| Cel-Fi DUO Smart Cellular Signal Booster (Associated Device) | Nextivity | D32-2/4NU | 9.05432E+11 | YETD24NU |
| AC Adapter (Associated Device) | Hon-Kwang | HK-AB-120A250-US | E50006725 | DoC |
| Notebook PC (Console) | Dell | PP18L | 7F7CDF1 | DoC |
| AC Adapter (Notebook PC) | Lite On Technology | PA-1900-02D | CN-09T215-71615-4CB-7655 | DoC |

5.1.5. DESCRIPTION OF EUT

For FCC, the EUT operates over the 5250-5350 MHz and 5470-5725 MHz ranges, excluding the 5600-5650 MHz range. However, the EUT only transmits over the 5470-5725 MHz range. The EUT also support other non-DFS frequency bands, and those bands are listed in the RF reports.

The EUT is a Master Device.

The highest power level within these bands is less than 23 dBm EIRP in the 5470-5725 MHz band per EMC report (dated April 22, 2014) of the original grant.

The highest gain antenna assembly utilized with the EUT has a gain of 2 dBi in the 5250-5350 MHz band and 2 dBi in the 5470-5725 MHz band. The lowest gain antenna assembly utilized with the EUT has a gain of 2 dBi in the 5250-5350 MHz band and 2 dBi in the 5470-5725 MHz band.

The EUT was tested with a client declared minimum gain of 2 dBi in the 5250-5350 MHz band and 2 dBi the 5470-5725 MHz band.

The rated output power of the Master unit is < 23dBm (EIRP). Therefore the required interference threshold level is -62 dBm. After correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is $-62 + 2 + 1 = -59$ dBm.

The calibrated conducted DFS Detection Threshold level is set to -60 dBm. The tested level is lower than the required level hence it provides a margin to the limit.

During normal operation after a successful CAC has been performed the EUT uses one transmitter chain in the 5470-5725 MHz band and one receive chain in the 5250-5350 MHz band, each connected to a 50-ohm coaxial antenna port. All antenna ports are connected to the test system via a power divider to perform conducted tests.

The secondary Master device associated with the EUT during these tests has radar detection capability.

The EUT is a proprietary frame-based system. EUT system traffic was tested while running at a channel loading rate of 100%.

TPC is not required since the maximum EIRP is less than 500 mW (27 dBm).

The EUT utilizes a proprietary frame-based architecture. Two nominal channel bandwidths are implemented: 30 MHz and 40 MHz.

The software installed in the EUT is revision 5.1.130.

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 Nextivity Access Point, FCC ID: YETD24CU. The minimum antenna gain for the Master Device is 2 dBi.

The rated output power of the Master unit is $< 23\text{dBm}$ (EIRP). Therefore the required interference threshold level is -62 dBm . After correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is $-62 + 2 + 1 = -59\text{ dBm}$.

The calibrated conducted DFS Detection Threshold level is set to -60 dBm . The tested level is lower than the required level hence it provides a margin to the limit.

5.2. THEORY OF OPERATION

5.2.1. TECHNICAL DESCRIPTION

The Equipment Under Test (EUT) was a Nextivity Inc. Cel-Fi DUO Smart Cellular Signal Booster. The EUT is a signal booster for indoor residential, small business and small enterprise use. It consists of two units: the D32-2/4NU Network Unit (NU), and the D32-2/4CU Coverage Unit (CU). The NU and CU are shipped and sold as one unit. The NU is the primary Master device for the system and performs all CAC functions for both units. The CU does not perform a CAC and relies on the NU for authorization to commence transmissions. Both devices are programmed to only operate and connect to its factory-mated counterpart. The NU transmits and receives Cellular signals from the base station and operates similar to a cellular handset. The CU transmits and receives signals with the cellular handset and operates on frequencies similar to the cellular base station. The NU and CU are connected wirelessly over a full-duplex wireless link in the UNII band using a mixed OFDM and muxed cellular signal over a 30 or 40 MHz channel in each direction. The CU also includes Bluetooth LE connectivity.

5.2.2. CHANNEL MAPPING

During normal operation the NU and CU transmit signals on one UNII sub-band and receive signals on the other UNII sub-band. Therefore compliance to CAC, Channel Move/Closing Time, Occupied Bandwidth and Non-Occupancy tests are shown through indirect monitoring of the associated factory-mated counterpart device.

NETWORK UNIT

The NU is only capable of transmitting on the following frequencies and therefore the CU is only capable of receiving on the same frequencies during normal operation:

| Device | Bands (MHz) | TX Frequency (MHz) | Output Power (dBm) | DFS |
|--------|------------------------|--------------------|--------------------|--------------------------------------|
| NU | 5150-5250 [UNII 1] | | 21 | Support (not required by the FCC) |
| | | 5210 | | |
| | | 5220 | | |
| | | 5230 | | |
| | | 5240 | | |
| | 5250-5350 [UNII 2A] | 5250 | 21 | Yes |
| | | 5260 | | |
| | | 5270 | | |
| | | 5280 | | |
| | | 5290 | | |

COVERAGE UNIT

The CU is only capable of transmitting on the following frequencies and therefore the NU is only capable of receiving on the same frequencies during normal operation:

| | | | | |
|----|------------------------|------|----|--------------------------------------|
| CU | 5470-5725 [UNII 2C] | 5520 | 21 | Yes |
| | | 5530 | | |
| | | 5540 | | |
| | | 5550 | | |
| | | 5560 | | |
| | | 5570 | | |
| | | 5580 | | |
| | | 5590 | | |
| | | 5600 | | |
| | | 5610 | | |
| | | 5620 | | |
| | | 5630 | | |
| | | 5640 | | |
| | | 5650 | | |
| | | 5660 | | |
| | 5725-5850 [UNII 3] | | 21 | Support (not required by the FCC) |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | 5715 | | |
| | | 5725 | | |
| | | 5735 | | |
| | | 5745 | | |
| | | 5755 | | |
| | | 5765 | | |
| | | 5775 | | |
| | | 5785 | | |
| | | 5795 | | |
| | | 5805 | | |
| | | 5815 | | |
| | | 5825 | | |

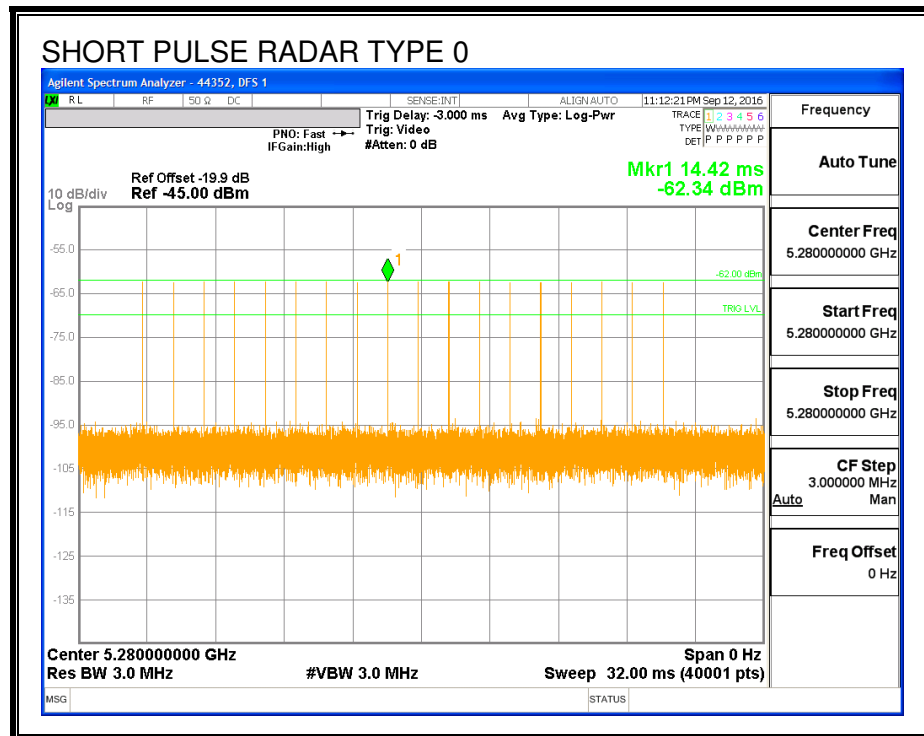
Note: Frequencies that overlap or reside within the 5600-5650 MHz TDWR weather band are not supported and shown in red.

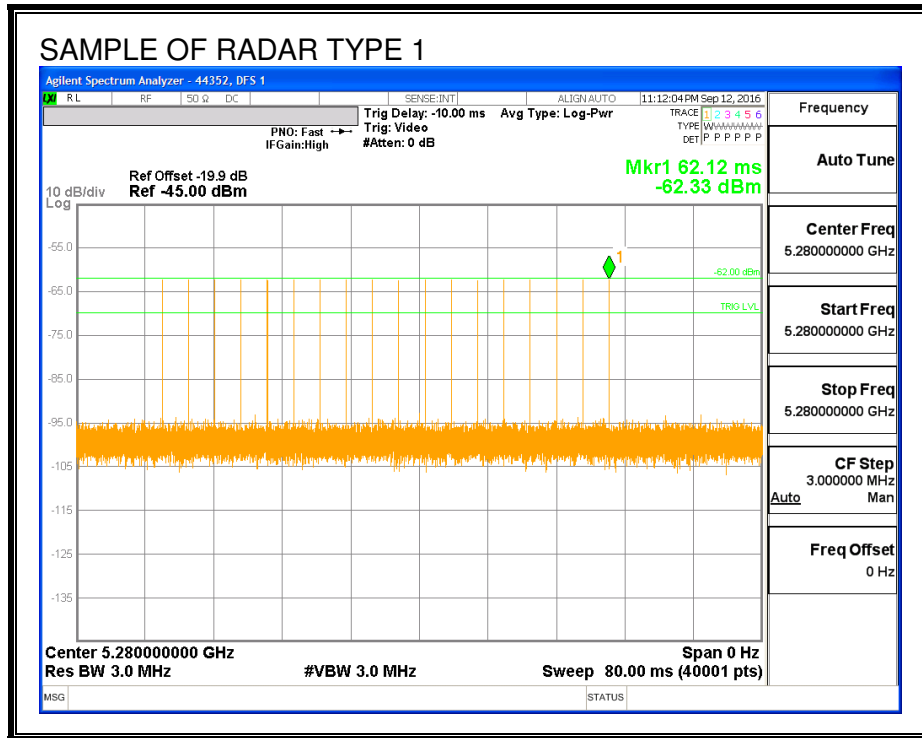
5.3. TEST CHANNEL

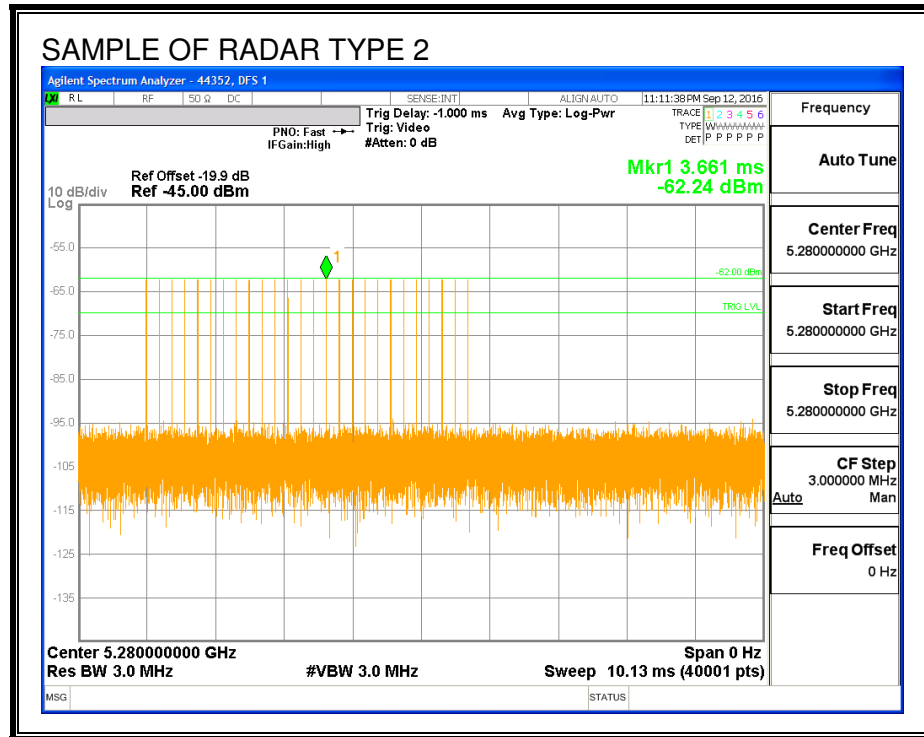
All tests were performed at a channel center frequency of 5280 MHz.

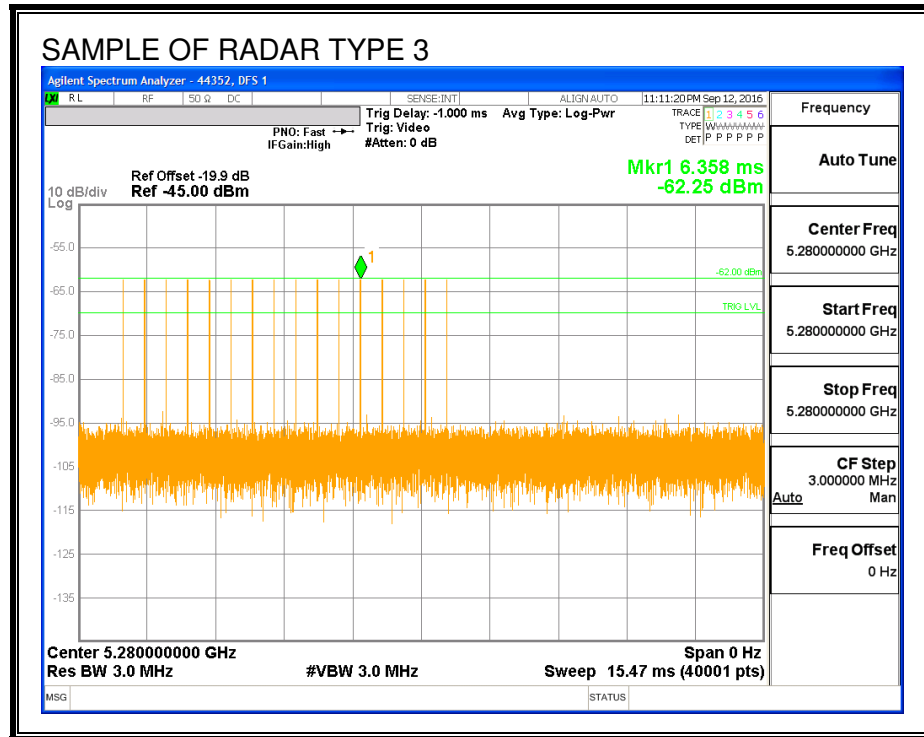
5.4. RADAR WAVEFORMS

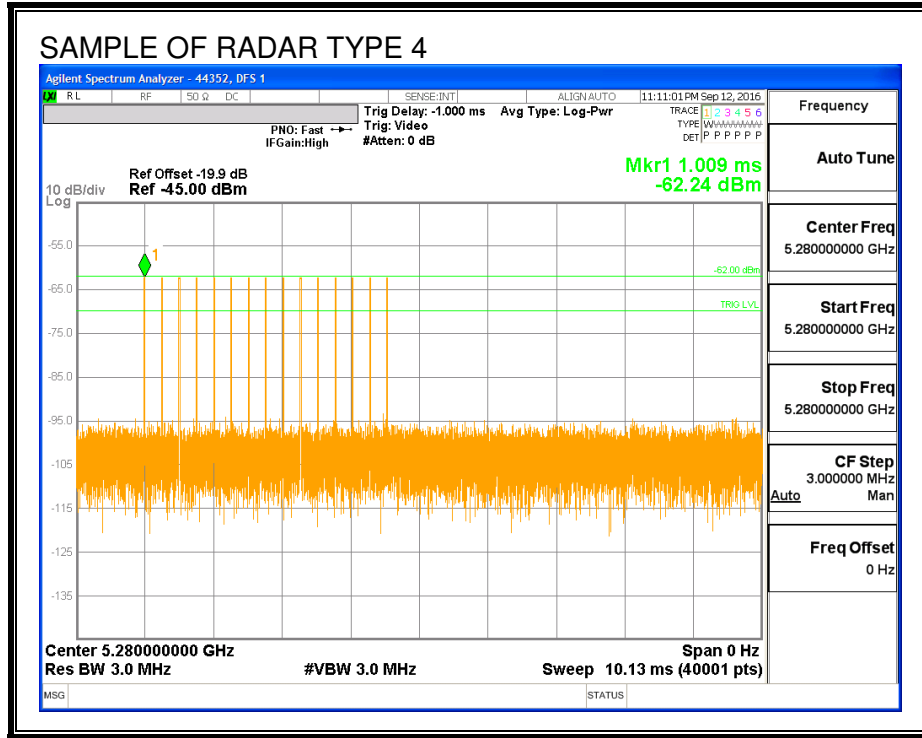
RADAR WAVEFORMS

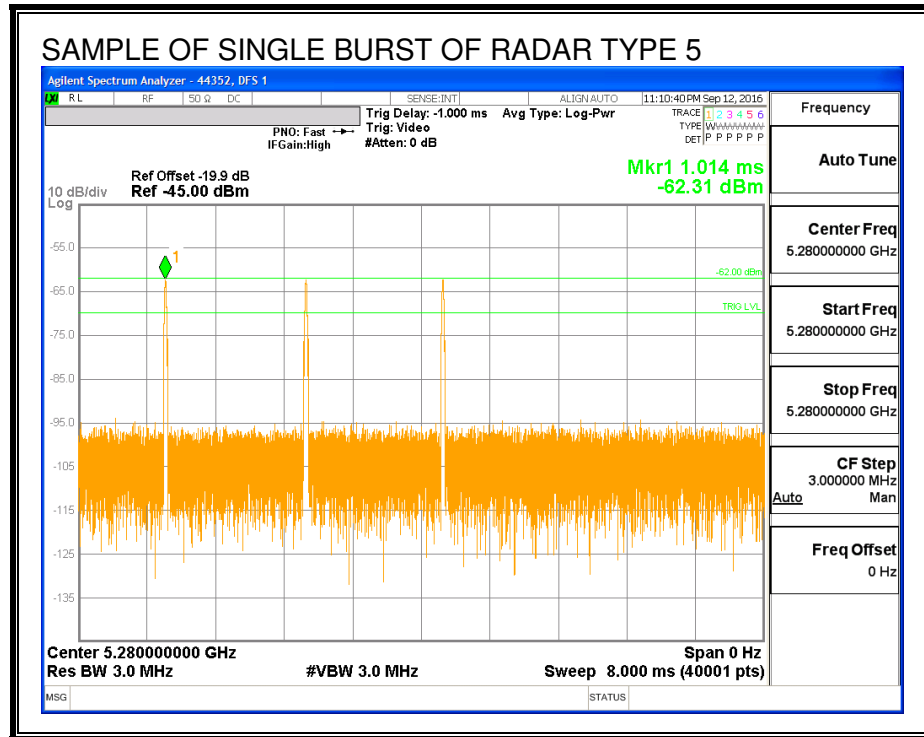


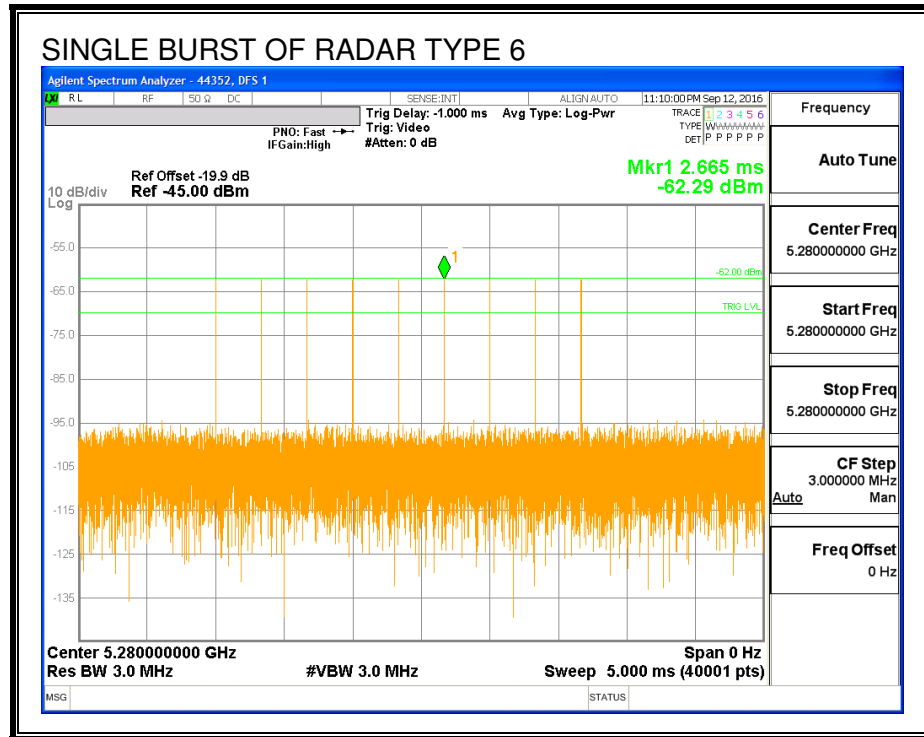








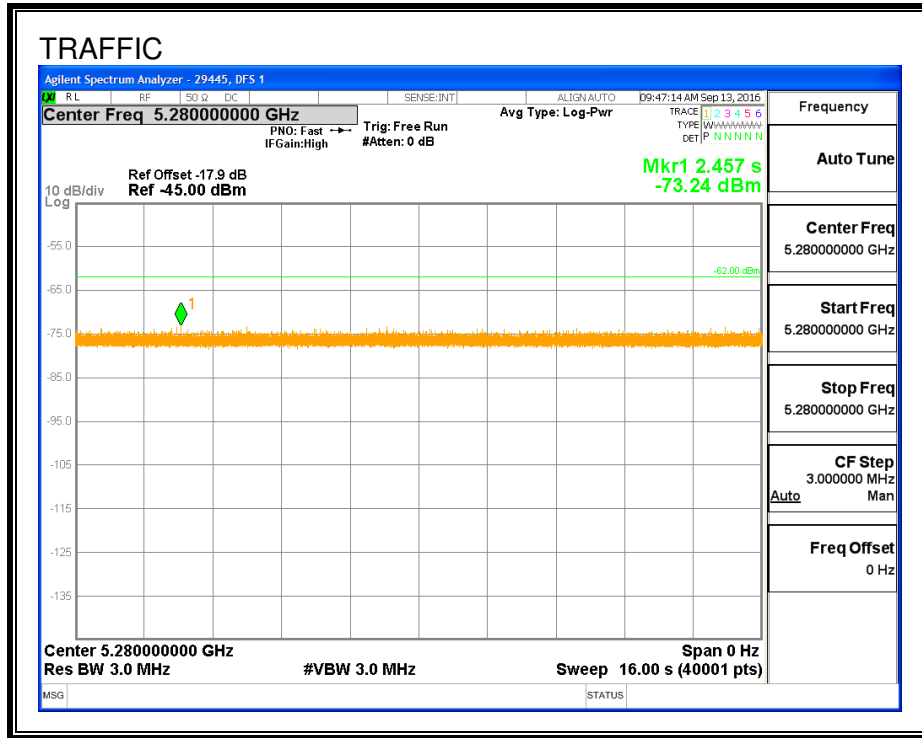




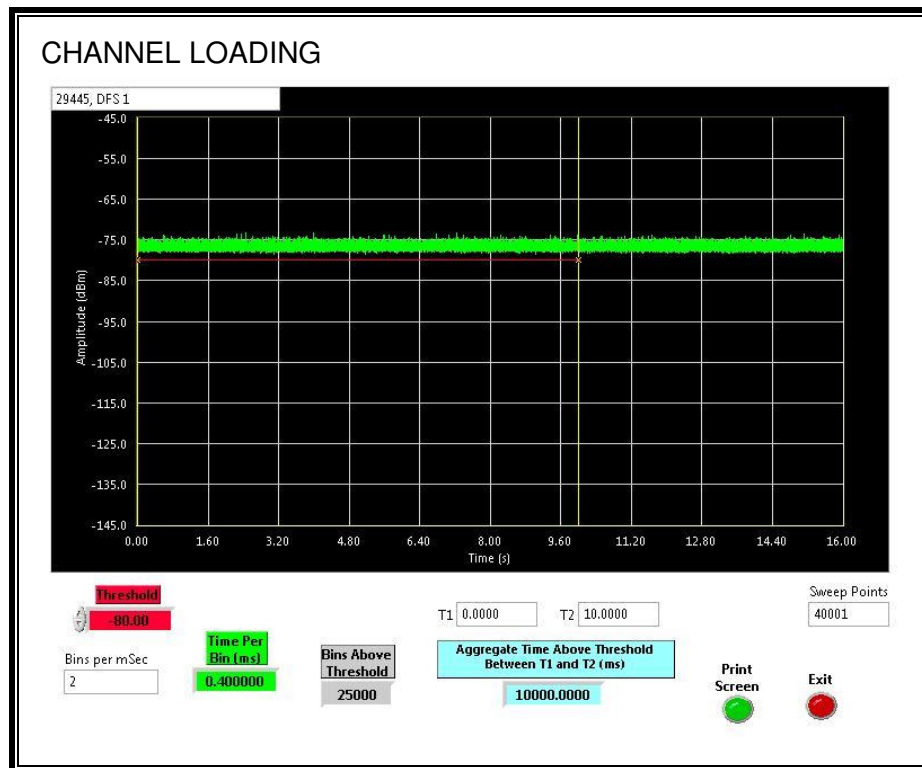
5.5. RESULTS FOR 30 MHz BANDWIDTH

5.5.1. TRAFFIC AND CHANNEL LOADING

TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 100%

5.5.2. CHANNEL AVAILABILITY CHECK TIME

PROCEDURE TO DETERMINE INITIAL POWER-UP CYCLE TIME

A link was established on channel then a software command was issued to the EUT to generate a CAC period on the channel. The time from the cessation of traffic to the re-initialization of traffic was measured as the time required for the EUT to complete the total cycle. The time to complete the initial processing period is 60 seconds less than this total time.

PROCEDURE FOR TIMING OF RADAR BURST

With a link established on channel, a software command was issued to the EUT to generate a CAC period on the channel. A radar signal was triggered within 0 to 6 seconds after the initial processing period, and transmissions on the channel were monitored on the spectrum analyzer.

The Non-Occupancy list was cleared. With a link established on channel, a software command was issued to the EUT to generate a CAC period on the channel. A radar signal was triggered within 54 to 60 seconds after the initial processing period, and transmissions on the channel were monitored on the spectrum analyzer.

Note: The Networking Unit (NU) is the primary Master device for the system and performs all CAC functions for both units. The Coverage Unit (CU) EUT does not perform a CAC and relies on the NU for authorization to commence transmissions

QUANTITATIVE RESULTS

No Radar Triggered

| Timing of S/W Command (sec) | Timing of Start of Traffic (sec) | Total Cycle Time (sec) | Processing Period Time (sec) |
|------------------------------------|---|-------------------------------|-------------------------------------|
| 30.93 | 100.9 | 70.0 | 10.0 |

Radar Near Beginning of CAC

| Timing of S/W Command (sec) | Timing of Radar Burst (sec) | Radar Relative to Command (sec) | Radar Relative to Start of CAC (sec) |
|------------------------------------|------------------------------------|--|---|
| 31.05 | 42.5 | 11.4 | 1.4 |

Radar Near End of CAC

| Timing of S/W Command (sec) | Timing of Radar Burst (sec) | Radar Relative to Command (sec) | Radar Relative to Start of CAC (sec) |
|------------------------------------|------------------------------------|--|---|
| 31.34 | 100.4 | 69.1 | 59.1 |

QUALITATIVE RESULTS

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

TIMING WITHOUT RADAR DURING CAC

Issue Software Command

Traffic ceases

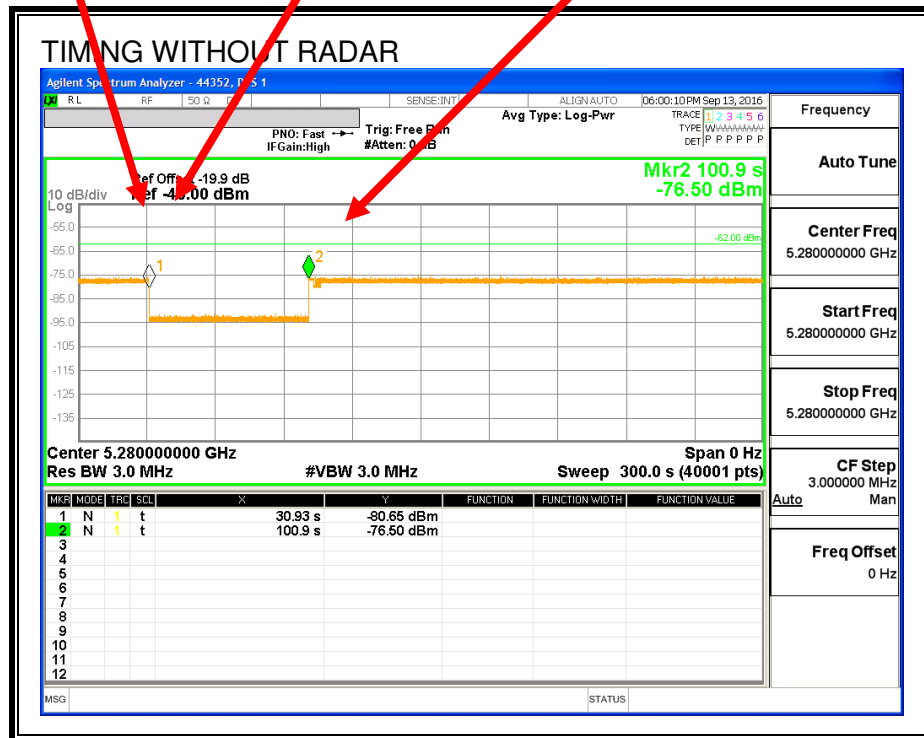
Begin Processing Period

End of Processing Period

Start of CAC

End of CAC

Traffic is Initiated



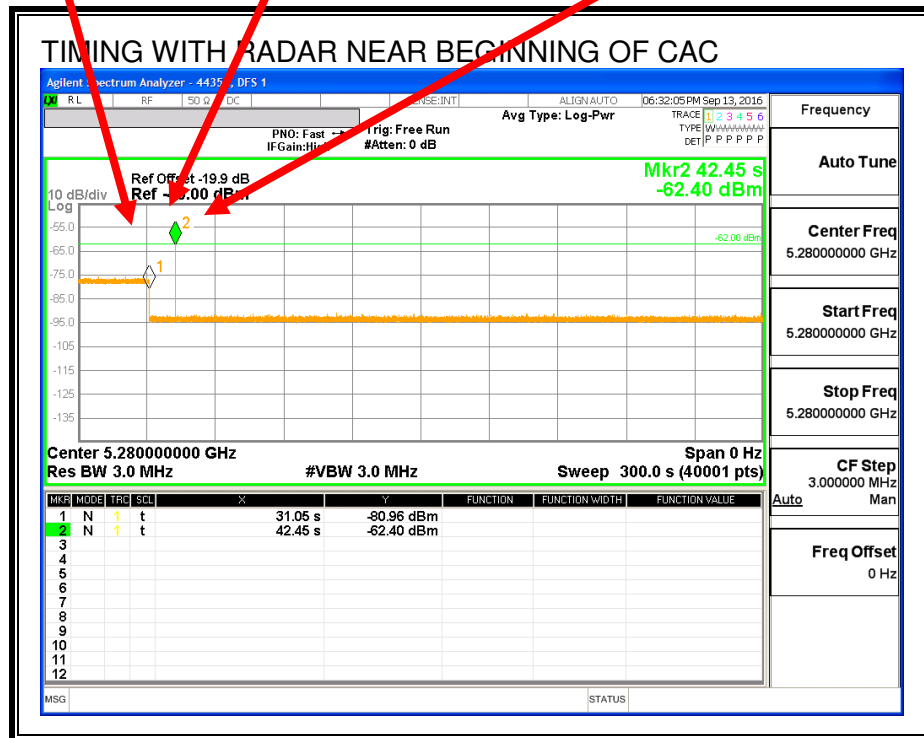
Transmissions begin on channel after completion of the initial processing period and CAC.

TIMING WITH RADAR NEAR BEGINNING OF CAC

Issue Software Command
Traffic ceases
Begin Processing Period

End of Processing Period
Start of CAC

Radar Signal Applied



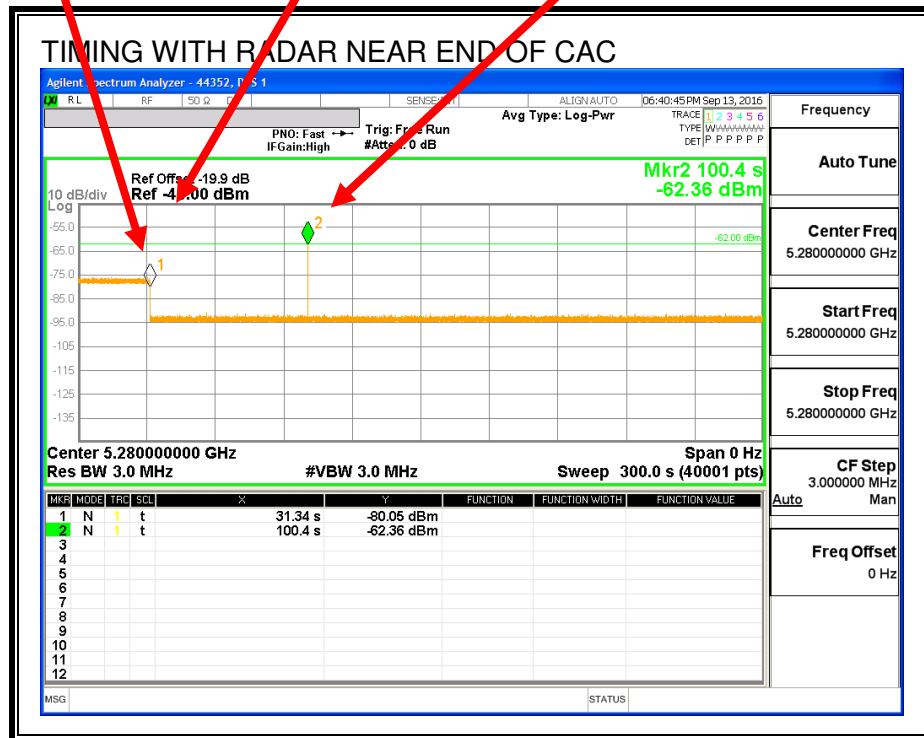
No EUT transmissions were observed after the radar signal.

TIMING WITH RADAR NEAR END OF CAC

Issue Software Command
Traffic ceases
Begin Processing Period

End of Processing Period
Start of CAC

Radar Signal Applied



No EUT transmissions were observed after the radar signal.

5.5.3. OVERLAPPING CHANNEL TESTS

RESULTS

Per Manufacture's Declaration:

To eliminate the possibility of overlapping channels, the EUT software automatically restricts access to a block of 30 MHz on either side of the center of the operating channel when radar is detected.

5.5.4. MOVE AND CLOSING TIME

REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

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

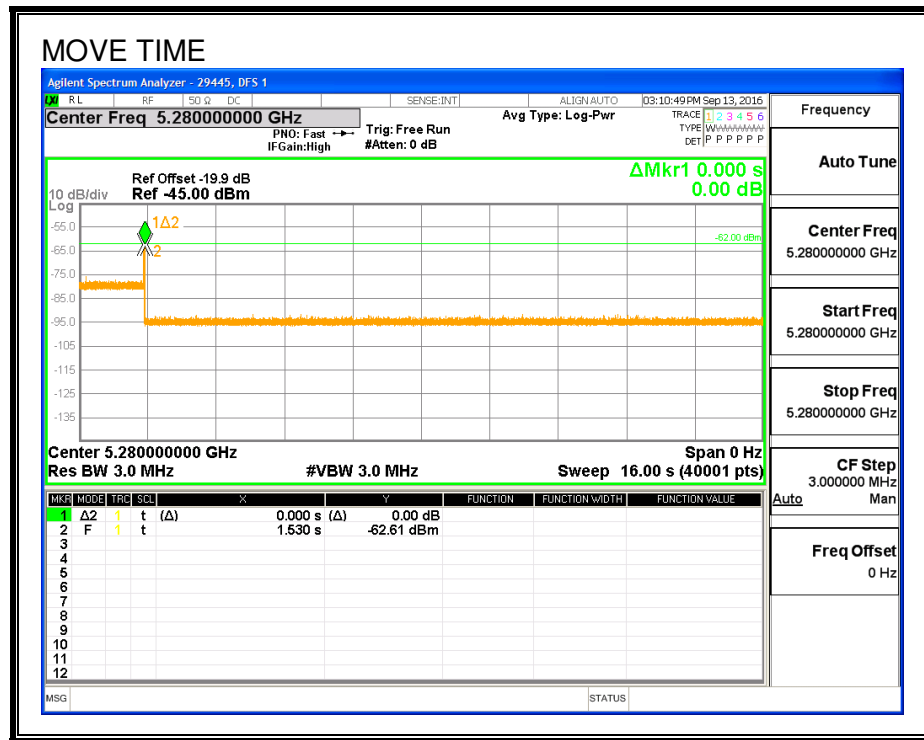
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

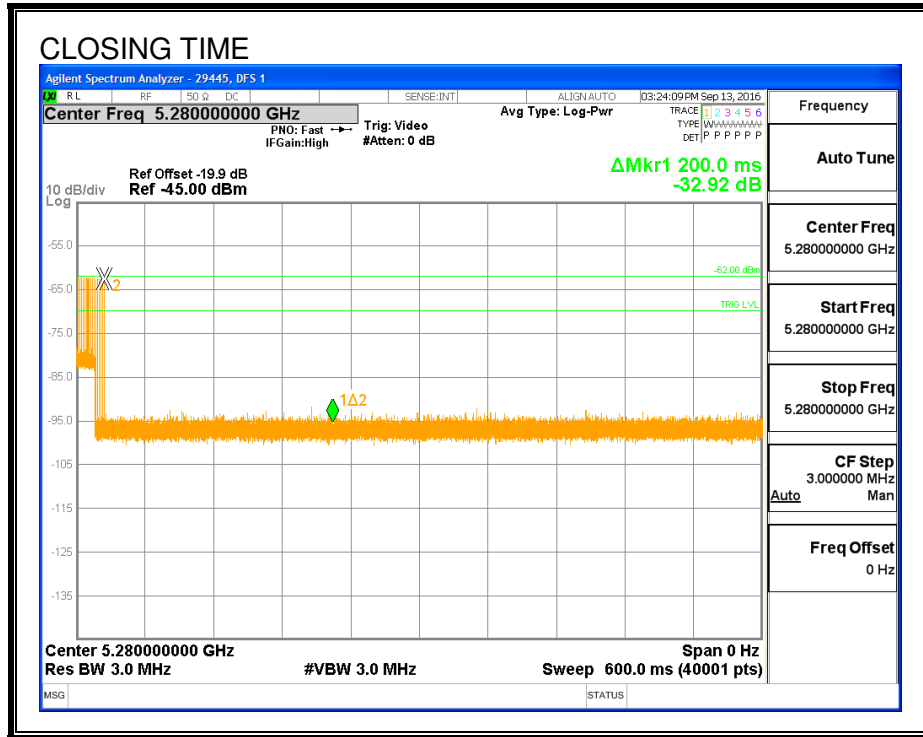
| Channel Move Time (sec) | Limit (sec) |
|----------------------------|----------------|
| 0.000 | 10 |

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

MOVE TIME

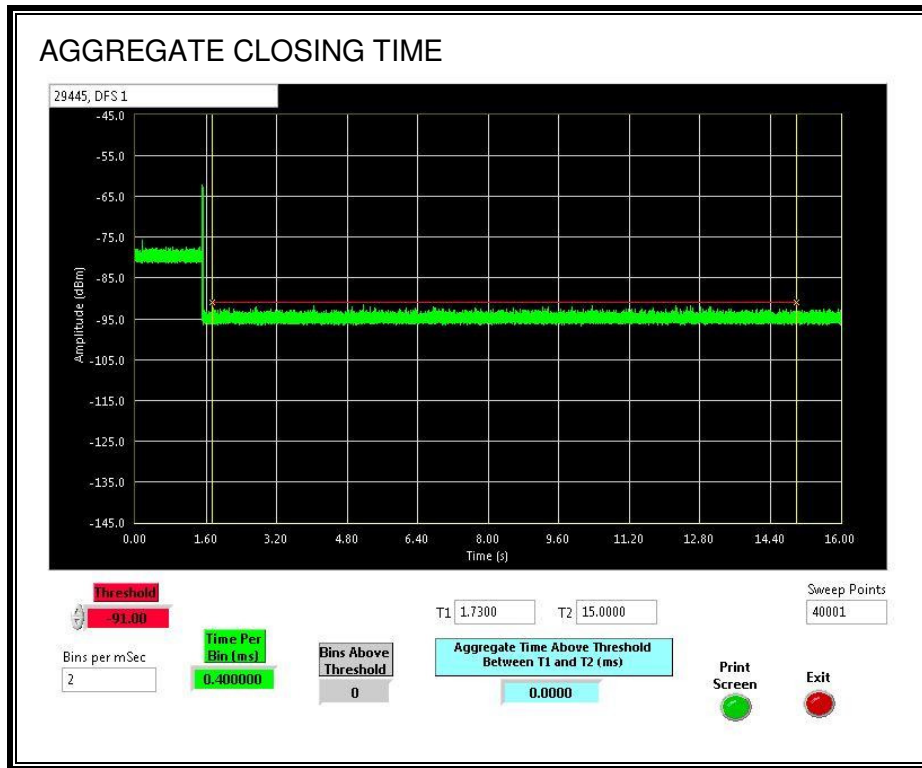


CHANNEL CLOSING TIME



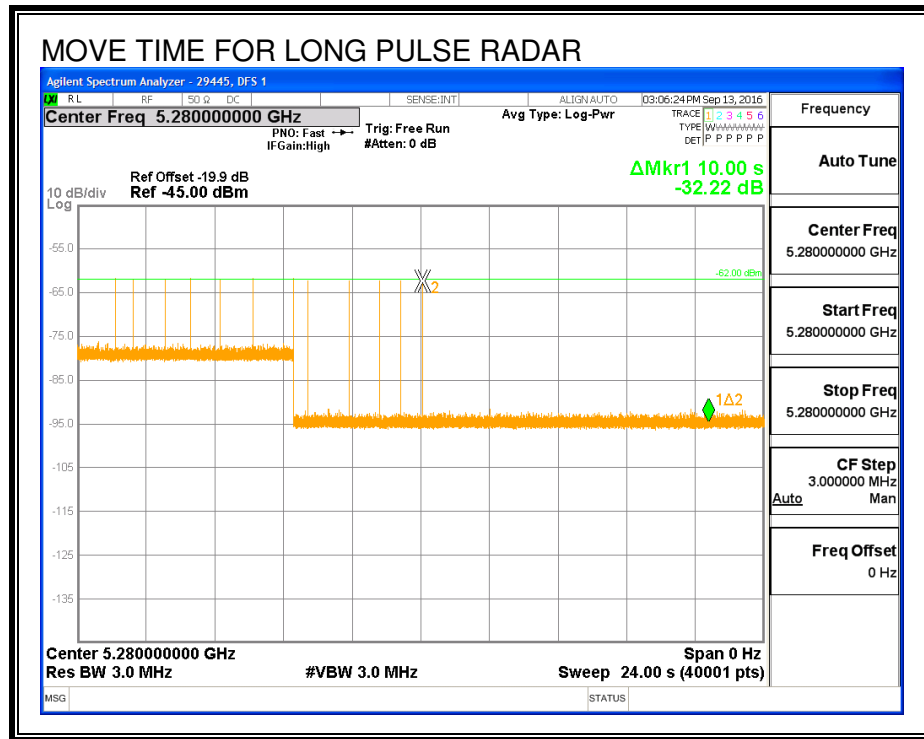
AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



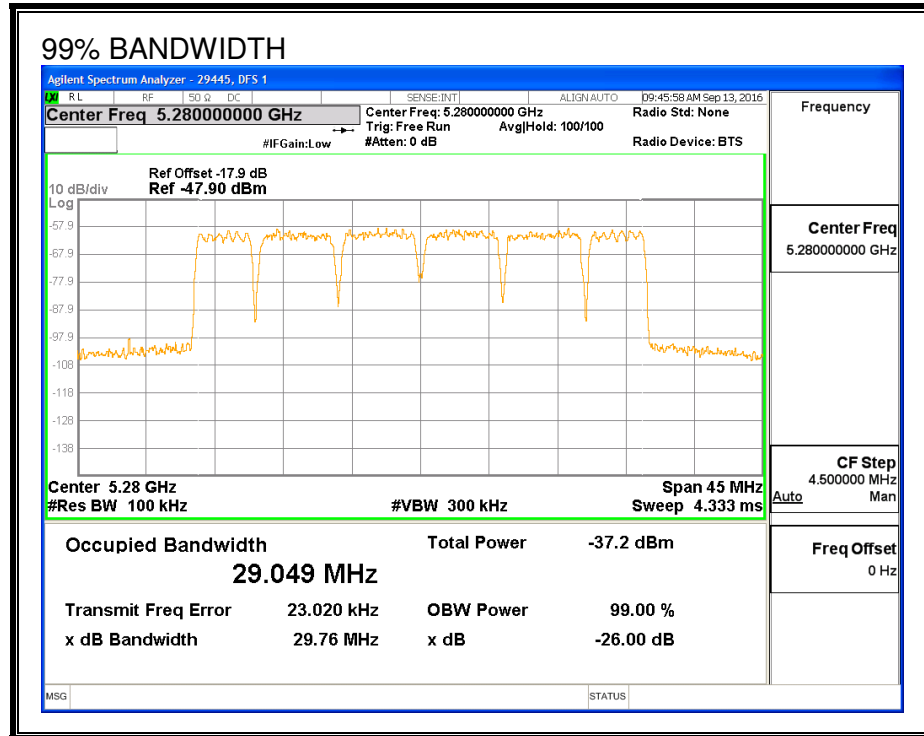
LONG PULSE CHANNEL MOVE TIME

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



5.5.5. DETECTION BANDWIDTH

REFERENCE PLOT OF 99% POWER BANDWIDTH



RESULTS

| FL | FH | Detection Bandwidth | 99% Power Bandwidth | Ratio of Detection BW to 99% Power BW | Minimum Limit |
|-------|-------|---------------------|---------------------|---------------------------------------|---------------|
| (MHz) | (MHz) | (MHz) | (MHz) | (%) | (%) |
| 5265 | 5295 | 30 | 29.049 | 103.3 | 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 |
| 5265 | 10 | 10 | 100 | FL |
| 5270 | 10 | 10 | 100 | |
| 5275 | 10 | 10 | 100 | |
| 5280 | 10 | 10 | 100 | |
| 5285 | 10 | 10 | 100 | |
| 5290 | 10 | 10 | 100 | |
| 5295 | 10 | 10 | 100 | FH |

5.5.6. IN-SERVICE MONITORING

RESULTS

| FCC Radar Test Summary | | | | | | | | | | | | |
|------------------------|------------------|---------------|-----------|-----------|---------------------|------|---------------|------|-------|---------------|-----------------|-------------------------------|
| Signal Type | Number of Trials | Detection (%) | Limit (%) | Pass/Fail | Detection Bandwidth | | 80% of Det BW | | OBW | Test Location | Employee Number | In-Service Monitoring Version |
| | | | | | FL | FH | FL5 | FH5 | | | | |
| FCC Short Pulse Type 1 | 30 | 100.00 | 60 | Pass | 5295 | 5265 | | | 29.05 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 2 | 30 | 100.00 | 60 | Pass | 5295 | 5265 | | | 29.05 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 3 | 30 | 96.67 | 60 | Pass | 5295 | 5265 | | | 29.05 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 4 | 30 | 80.00 | 60 | Pass | 5295 | 5265 | | | 29.05 | DFS 1 | 29445 | Version 3.0 |
| Aggregate | | 94.17 | 80 | Pass | | | | | | | | |
| FCC Long Pulse Type 5 | 30 | 86.67 | 80 | Pass | 5295 | 5265 | 5292 | 5268 | 29.05 | DFS 1 | 29445 | Version 3.0 |
| FCC Hopping Type 6 | 31 | 100.00 | 70 | Pass | 5265 | 5295 | | | | 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 | 5280 | Yes |
| 1002 | 1 | 718 | 74 | A | 5280 | Yes |
| 1003 | 1 | 818 | 65 | A | 5280 | Yes |
| 1004 | 1 | 518 | 102 | A | 5280 | Yes |
| 1005 | 1 | 638 | 83 | A | 5280 | Yes |
| 1006 | 1 | 618 | 86 | A | 5280 | Yes |
| 1007 | 1 | 758 | 70 | A | 5280 | Yes |
| 1008 | 1 | 698 | 76 | A | 5280 | Yes |
| 1009 | 1 | 538 | 99 | A | 5280 | Yes |
| 1010 | 1 | 778 | 68 | A | 5280 | Yes |
| 1011 | 1 | 878 | 61 | A | 5280 | Yes |
| 1012 | 1 | 838 | 63 | A | 5280 | Yes |
| 1013 | 1 | 678 | 78 | A | 5280 | Yes |
| 1014 | 1 | 558 | 95 | A | 5280 | Yes |
| 1015 | 1 | 738 | 72 | A | 5280 | Yes |
| 1016 | 1 | 706 | 75 | B | 5280 | Yes |
| 1017 | 1 | 597 | 89 | B | 5280 | Yes |
| 1018 | 1 | 2165 | 25 | B | 5280 | Yes |
| 1019 | 1 | 2186 | 25 | B | 5280 | Yes |
| 1020 | 1 | 1335 | 40 | B | 5280 | Yes |
| 1021 | 1 | 2839 | 19 | B | 5280 | Yes |
| 1022 | 1 | 923 | 58 | B | 5280 | Yes |
| 1023 | 1 | 2556 | 21 | B | 5280 | Yes |
| 1024 | 1 | 771 | 69 | B | 5280 | Yes |
| 1025 | 1 | 2533 | 21 | B | 5280 | Yes |
| 1026 | 1 | 2230 | 24 | B | 5280 | Yes |
| 1027 | 1 | 1733 | 31 | B | 5280 | Yes |
| 1028 | 1 | 1559 | 34 | B | 5280 | Yes |
| 1029 | 1 | 2386 | 23 | B | 5280 | Yes |
| 1030 | 1 | 2342 | 23 | B | 5280 | 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 | 2.9 | 190 | 26 | 5280 | Yes |
| 2002 | 1.3 | 156 | 24 | 5280 | Yes |
| 2003 | 4.5 | 197 | 24 | 5280 | Yes |
| 2004 | 3.1 | 210 | 23 | 5280 | Yes |
| 2005 | 4.7 | 217 | 24 | 5280 | Yes |
| 2006 | 1.5 | 154 | 27 | 5280 | Yes |
| 2007 | 3.3 | 203 | 24 | 5280 | Yes |
| 2008 | 4.5 | 186 | 27 | 5280 | Yes |
| 2009 | 2.3 | 201 | 25 | 5280 | Yes |
| 2010 | 1.8 | 189 | 29 | 5280 | Yes |
| 2011 | 4 | 208 | 23 | 5280 | Yes |
| 2012 | 3.7 | 200 | 24 | 5280 | Yes |
| 2013 | 2 | 185 | 26 | 5280 | Yes |
| 2014 | 4 | 181 | 27 | 5280 | Yes |
| 2015 | 4.7 | 171 | 26 | 5280 | Yes |
| 2016 | 2.9 | 214 | 28 | 5280 | Yes |
| 2017 | 3.7 | 208 | 27 | 5280 | Yes |
| 2018 | 2.1 | 217 | 26 | 5280 | Yes |
| 2019 | 1.3 | 214 | 26 | 5280 | Yes |
| 2020 | 4 | 228 | 25 | 5280 | Yes |
| 2021 | 3.4 | 192 | 28 | 5280 | Yes |
| 2022 | 2.4 | 209 | 25 | 5280 | Yes |
| 2023 | 2 | 220 | 29 | 5280 | Yes |
| 2024 | 3.2 | 160 | 25 | 5280 | Yes |
| 2025 | 1.1 | 176 | 23 | 5280 | Yes |
| 2026 | 4.6 | 163 | 26 | 5280 | Yes |
| 2027 | 2.7 | 183 | 25 | 5280 | Yes |
| 2028 | 2.4 | 174 | 29 | 5280 | Yes |
| 2029 | 4.8 | 160 | 24 | 5280 | Yes |
| 2030 | 2.7 | 156 | 25 | 5280 | Yes |

TYPE 3 DETECTION PROBABILITY

| Data Sheet for FCC Short Pulse Radar Type 3 | | | | | |
|---|---------------------|-------------|------------------|--------------------|----------------------------------|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Frequency (MHz) | Successful Detection (Yes/No) |
| 3001 | 8 | 487 | 16 | 5280 | No |
| 3002 | 5.7 | 369 | 17 | 5280 | Yes |
| 3003 | 6.8 | 350 | 17 | 5280 | Yes |
| 3004 | 9.9 | 378 | 16 | 5280 | Yes |
| 3005 | 8.9 | 371 | 17 | 5280 | Yes |
| 3006 | 9.8 | 412 | 17 | 5280 | Yes |
| 3007 | 6.3 | 301 | 17 | 5280 | Yes |
| 3008 | 5.2 | 354 | 18 | 5280 | Yes |
| 3009 | 9.7 | 389 | 17 | 5280 | Yes |
| 3010 | 6.1 | 455 | 16 | 5280 | Yes |
| 3011 | 8.6 | 251 | 18 | 5280 | Yes |
| 3012 | 7.9 | 464 | 18 | 5280 | Yes |
| 3013 | 5.5 | 273 | 18 | 5280 | Yes |
| 3014 | 5.1 | 498 | 17 | 5280 | Yes |
| 3015 | 8.1 | 453 | 17 | 5280 | Yes |
| 3016 | 5.6 | 440 | 16 | 5280 | Yes |
| 3017 | 6.4 | 408 | 18 | 5280 | Yes |
| 3018 | 9.2 | 290 | 16 | 5280 | Yes |
| 3019 | 5.2 | 404 | 17 | 5280 | Yes |
| 3020 | 8.3 | 299 | 18 | 5280 | Yes |
| 3021 | 7.3 | 425 | 17 | 5280 | Yes |
| 3022 | 8.2 | 333 | 16 | 5280 | Yes |
| 3023 | 7.4 | 472 | 18 | 5280 | Yes |
| 3024 | 8.6 | 275 | 17 | 5280 | Yes |
| 3025 | 8.1 | 309 | 18 | 5280 | Yes |
| 3026 | 9.9 | 258 | 16 | 5280 | Yes |
| 3027 | 9.7 | 305 | 17 | 5280 | Yes |
| 3028 | 9 | 267 | 16 | 5280 | Yes |
| 3029 | 6.6 | 327 | 16 | 5280 | Yes |
| 3030 | 6.2 | 301 | 18 | 5280 | Yes |

TYPE 4 DETECTION PROBABILITY

| Data Sheet for FCC Short Pulse Radar Type 4 | | | | | |
|---|---------------------|-------------|------------------|--------------------|----------------------------------|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Frequency (MHz) | Successful Detection (Yes/No) |
| 4001 | 13.6 | 256 | 15 | 5280 | Yes |
| 4002 | 13.3 | 494 | 13 | 5280 | Yes |
| 4003 | 15 | 462 | 12 | 5280 | No |
| 4004 | 10.5 | 344 | 16 | 5280 | Yes |
| 4005 | 12.6 | 458 | 15 | 5280 | Yes |
| 4006 | 14 | 352 | 12 | 5280 | Yes |
| 4007 | 16.7 | 479 | 14 | 5280 | Yes |
| 4008 | 18.6 | 387 | 14 | 5280 | No |
| 4009 | 17 | 275 | 16 | 5280 | Yes |
| 4010 | 19.4 | 462 | 16 | 5280 | Yes |
| 4011 | 18.4 | 363 | 14 | 5280 | Yes |
| 4012 | 16.6 | 430 | 16 | 5280 | Yes |
| 4013 | 16.1 | 477 | 12 | 5280 | No |
| 4014 | 14.8 | 438 | 15 | 5280 | Yes |
| 4015 | 10 | 498 | 16 | 5280 | Yes |
| 4016 | 19.4 | 472 | 14 | 5280 | Yes |
| 4017 | 10.4 | 428 | 13 | 5280 | Yes |
| 4018 | 10.1 | 297 | 14 | 5280 | Yes |
| 4019 | 11.8 | 265 | 16 | 5280 | Yes |
| 4020 | 17.4 | 264 | 14 | 5280 | Yes |
| 4021 | 19.5 | 378 | 14 | 5280 | Yes |
| 4022 | 10.8 | 273 | 15 | 5280 | Yes |
| 4023 | 13.5 | 400 | 13 | 5280 | Yes |
| 4024 | 15.4 | 307 | 12 | 5280 | No |
| 4025 | 13.8 | 329 | 15 | 5280 | Yes |
| 4026 | 16.3 | 383 | 14 | 5280 | Yes |
| 4027 | 15.2 | 284 | 12 | 5280 | Yes |
| 4028 | 13.4 | 483 | 15 | 5280 | No |
| 4029 | 12.9 | 397 | 16 | 5280 | No |
| 4030 | 11.6 | 359 | 13 | 5280 | Yes |

TYPE 5 DETECTION PROBABILITY

| Data Sheet for FCC Long Pulse Radar Type 5 | | |
|--|-----------------|-------------------------------|
| Trial | Frequency (MHz) | Successful Detection (Yes/No) |
| 1 | 5280 | Yes |
| 2 | 5280 | Yes |
| 3 | 5280 | Yes |
| 4 | 5280 | Yes |
| 5 | 5280 | Yes |
| 6 | 5280 | Yes |
| 7 | 5280 | Yes |
| 8 | 5280 | Yes |
| 9 | 5280 | Yes |
| 10 | 5280 | Yes |
| 11 | 5268 | No |
| 12 | 5269 | No |
| 13 | 5271 | Yes |
| 14 | 5272 | Yes |
| 15 | 5270 | Yes |
| 16 | 5268 | No |
| 17 | 5269 | Yes |
| 18 | 5273 | Yes |
| 19 | 5269 | Yes |
| 20 | 5271 | Yes |
| 21 | 5288 | Yes |
| 22 | 5289 | Yes |
| 23 | 5286 | Yes |
| 24 | 5291 | Yes |
| 25 | 5292 | No |
| 26 | 5291 | Yes |
| 27 | 5289 | Yes |
| 28 | 5292 | Yes |
| 29 | 5286 | Yes |
| 30 | 5287 | Yes |

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

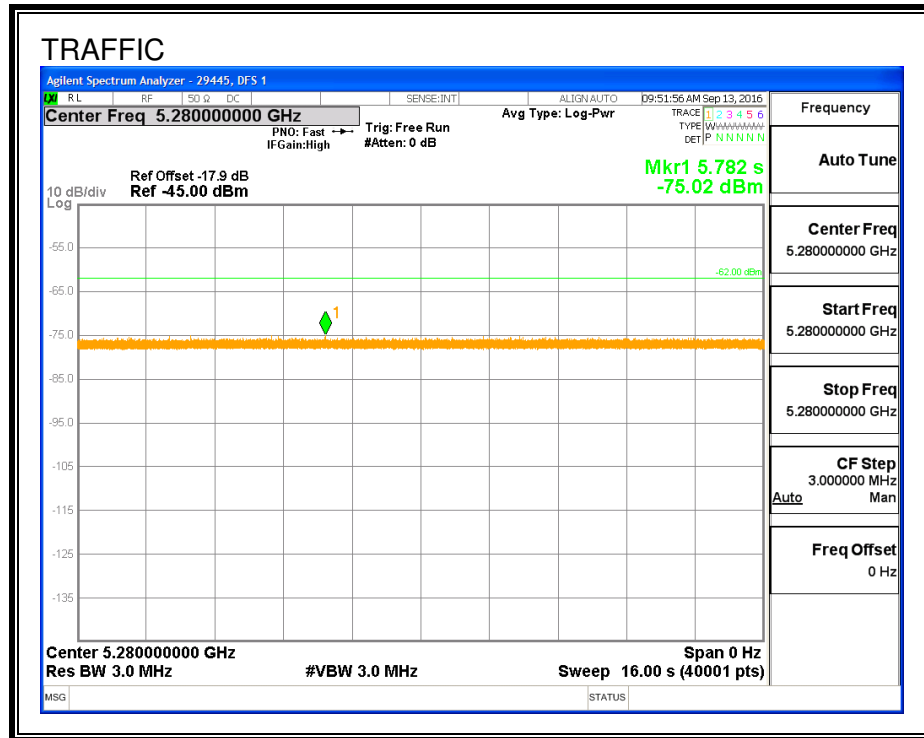
TYPE 6 DETECTION PROBABILITY

| 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 | 11 | 5265 | 4 | Yes |
| 2 | 486 | 5266 | 6 | Yes |
| 3 | 961 | 5267 | 7 | Yes |
| 4 | 1436 | 5268 | 5 | Yes |
| 5 | 1911 | 5269 | 9 | Yes |
| 6 | 2386 | 5270 | 4 | Yes |
| 7 | 2861 | 5271 | 8 | Yes |
| 8 | 3336 | 5272 | 8 | Yes |
| 9 | 3811 | 5273 | 3 | Yes |
| 10 | 4286 | 5274 | 10 | Yes |
| 11 | 4761 | 5275 | 8 | Yes |
| 12 | 5236 | 5276 | 11 | Yes |
| 13 | 5711 | 5277 | 8 | Yes |
| 14 | 6186 | 5278 | 6 | Yes |
| 15 | 6661 | 5279 | 6 | Yes |
| 16 | 7136 | 5280 | 6 | Yes |
| 17 | 7611 | 5281 | 7 | Yes |
| 18 | 8086 | 5282 | 10 | Yes |
| 19 | 8561 | 5283 | 7 | Yes |
| 20 | 9036 | 5284 | 2 | Yes |
| 21 | 9511 | 5285 | 6 | Yes |
| 22 | 9986 | 5286 | 8 | Yes |
| 23 | 10461 | 5287 | 7 | Yes |
| 24 | 10936 | 5288 | 4 | Yes |
| 25 | 11411 | 5289 | 3 | Yes |
| 26 | 11886 | 5290 | 8 | Yes |
| 27 | 12361 | 5291 | 5 | Yes |
| 28 | 12836 | 5292 | 8 | Yes |
| 29 | 13311 | 5293 | 4 | Yes |
| 30 | 13786 | 5294 | 4 | Yes |
| 31 | 14261 | 5295 | 7 | Yes |

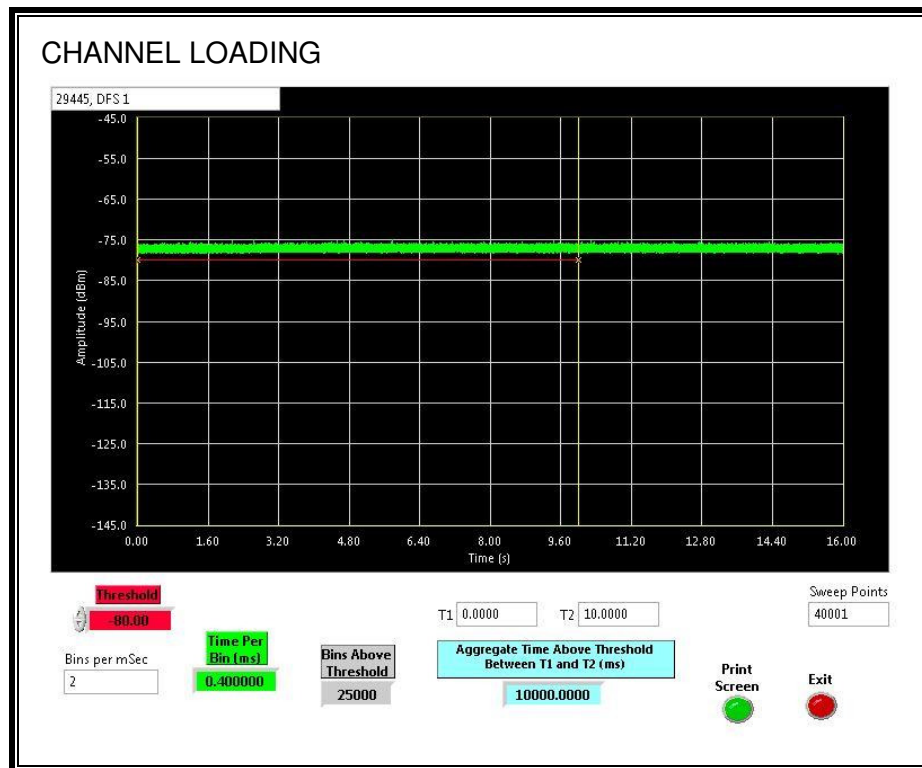
5.6. RESULTS FOR 40 MHZ BANDWIDTH

5.6.1. TRAFFIC AND CHANNEL LOADING

TRAFFIC



CHANNEL LOADING



The level of traffic loading on the channel by the EUT is 100%

5.6.2. CHANNEL AVAILABILITY CHECK TIME

PROCEDURE TO DETERMINE INITIAL POWER-UP CYCLE TIME

A link was established on channel then a software command was issued to the EUT to generate a CAC period on the channel. The time from the cessation of traffic to the re-initialization of traffic was measured as the time required for the EUT to complete the total cycle. The time to complete the initial processing period is 60 seconds less than this total time.

PROCEDURE FOR TIMING OF RADAR BURST

With a link established on channel, a software command was issued to the EUT to generate a CAC period on the channel. A radar signal was triggered within 0 to 6 seconds after the initial processing period, and transmissions on the channel were monitored on the spectrum analyzer.

The Non-Occupancy list was cleared. With a link established on channel, a software command was issued to the EUT to generate a CAC period on the channel. A radar signal was triggered within 54 to 60 seconds after the initial processing period, and transmissions on the channel were monitored on the spectrum analyzer.

Note: The Networking Unit (NU) is the primary Master device for the system and performs all CAC functions for both units. The Coverage Unit (CU) EUT does not perform a CAC and relies on the NU for authorization to commence transmissions.

QUANTITATIVE RESULTS

No Radar Triggered

| Timing of S/W Command (sec) | Timing of Start of Traffic (sec) | Total Cycle Time (sec) | Processing Period Time (sec) |
|------------------------------------|---|-------------------------------|-------------------------------------|
| 31.28 | 101.3 | 70.0 | 10.0 |

Radar Near Beginning of CAC

| Timing of S/W Command (sec) | Timing of Radar Burst (sec) | Radar Relative to Command (sec) | Radar Relative to Start of CAC (sec) |
|------------------------------------|------------------------------------|--|---|
| 31.28 | 42.4 | 11.1 | 1.1 |

Radar Near End of CAC

| Timing of S/W Command (sec) | Timing of Radar Burst (sec) | Radar Relative to Command (sec) | Radar Relative to Start of CAC (sec) |
|------------------------------------|------------------------------------|--|---|
| 30.84 | 100.4 | 69.6 | 59.5 |

QUALITATIVE RESULTS

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

TIMING WITHOUT RADAR DURING CAC

Issue Software Command

Traffic ceases

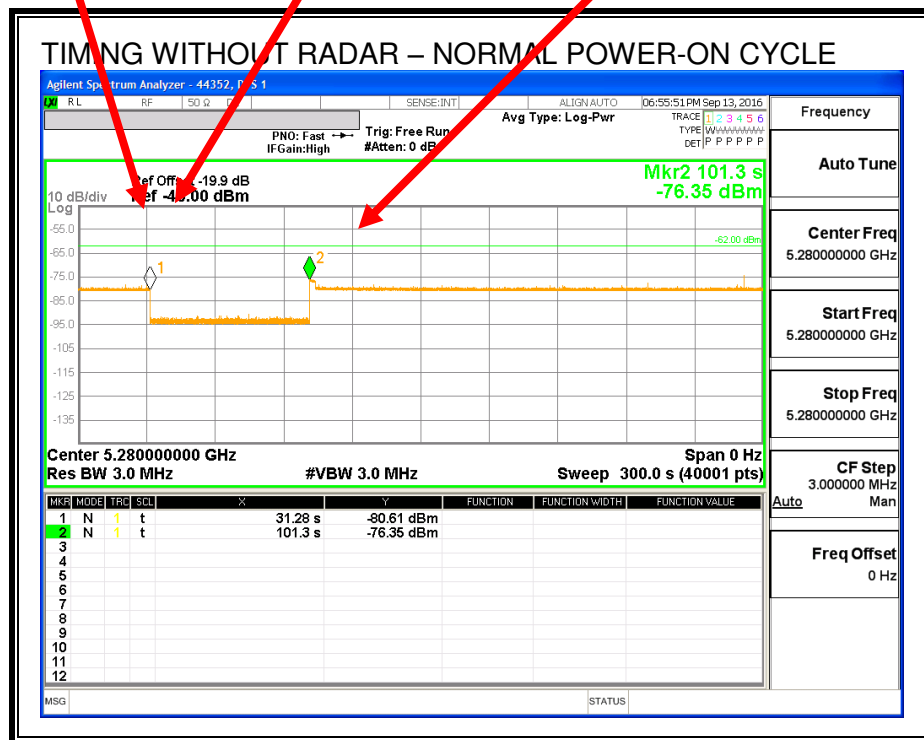
Begin Processing Period

End of Processing Period

Start of CAC

End of CAC

Traffic is Initiated



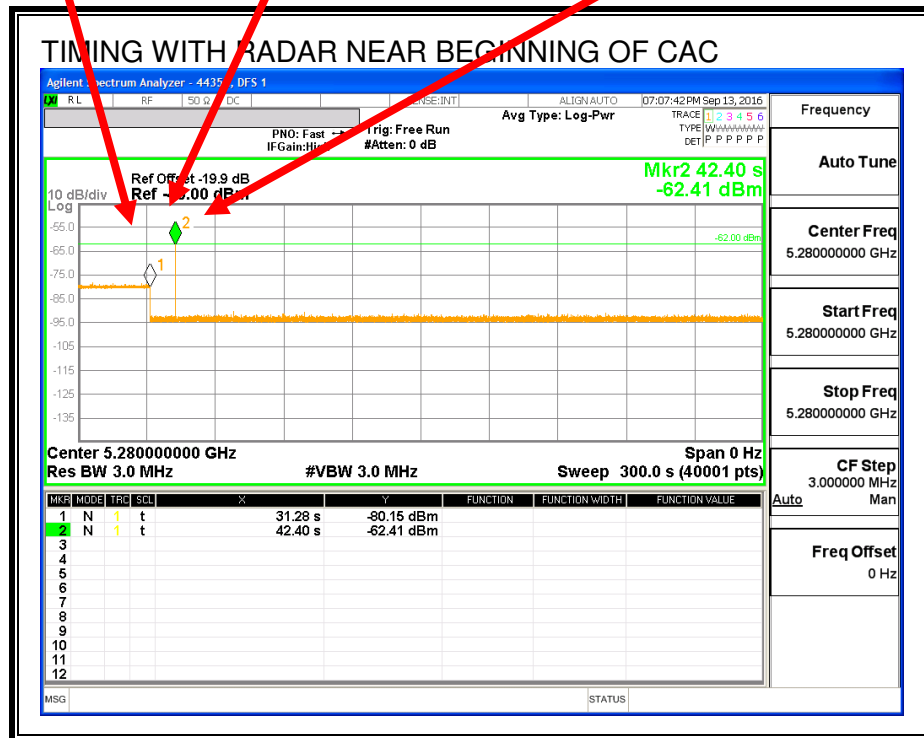
Transmissions begin on channel after completion of the initial power-up cycle and the CAC.

TIMING WITH RADAR NEAR BEGINNING OF CAC

Issue Software Command
Traffic ceases
Begin Processing Period

End of Processing Period
Start of CAC

Radar Signal Applied



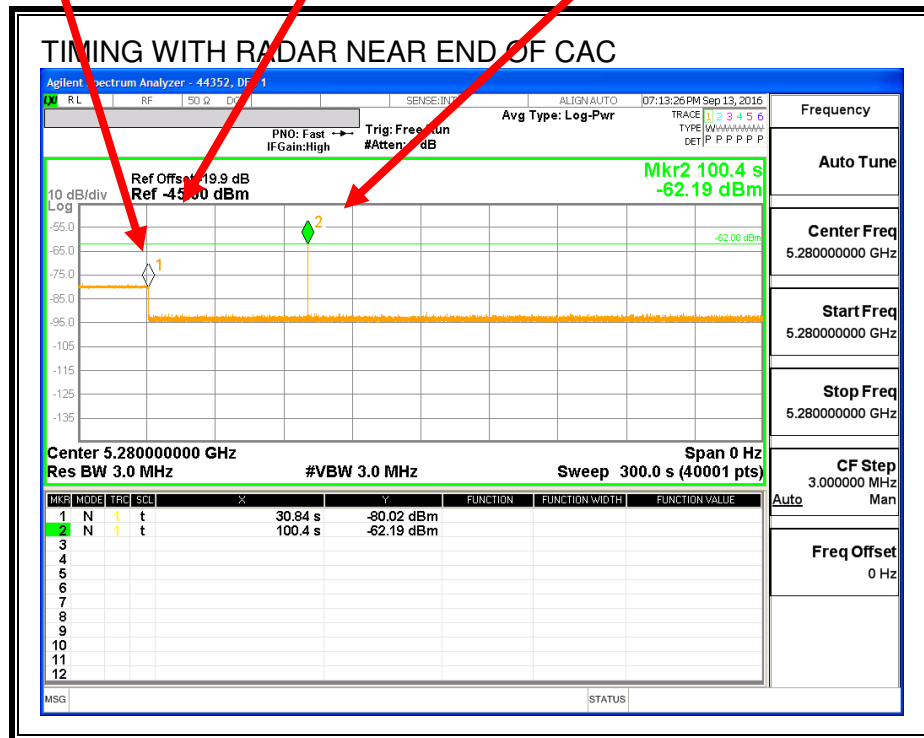
No EUT transmissions were observed after the radar signal.

TIMING WITH RADAR NEAR END OF CAC

Issue Software Command
Traffic ceases
Begin Processing Period

End of Processing Period
Start of CAC

Radar Signal Applied



No EUT transmissions were observed after the radar signal.

5.6.3. OVERLAPPING CHANNEL TESTS

RESULTS

Per Manufacture's Declaration:

To eliminate the possibility of overlapping channels, the EUT software automatically restricts access to a block of 30 MHz on either side of the center of the operating channel when radar is detected.

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)

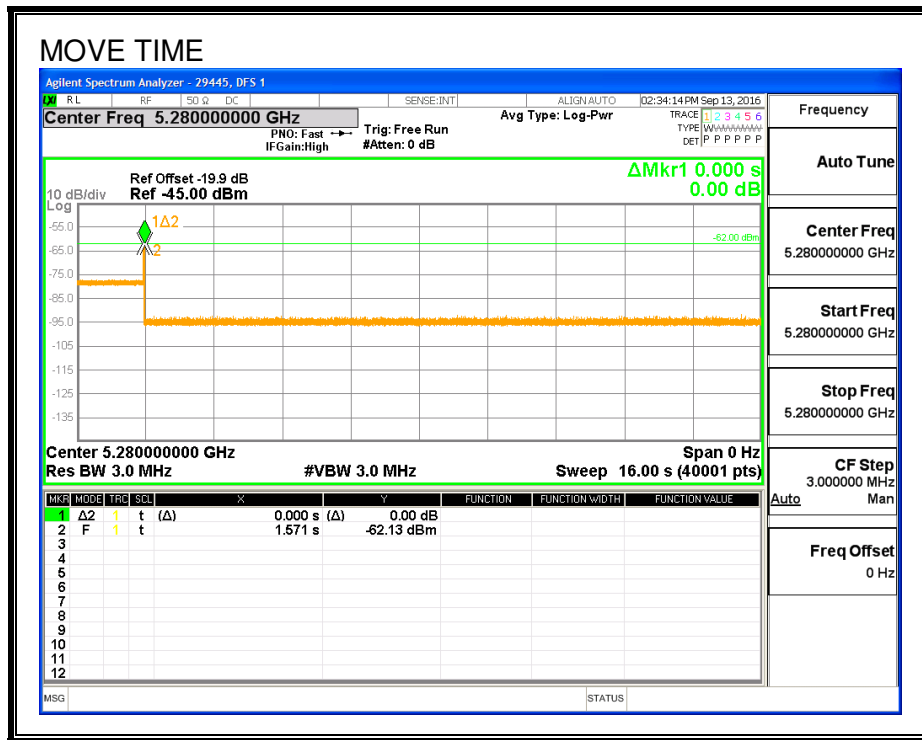
The observation period over which the aggregate time is calculated begins at (Reference Marker + 200 msec) and ends no earlier than (Reference Marker + 10 sec).

RESULTS

| Channel Move Time (sec) | Limit (sec) |
|----------------------------|----------------|
| 0.000 | 10 |

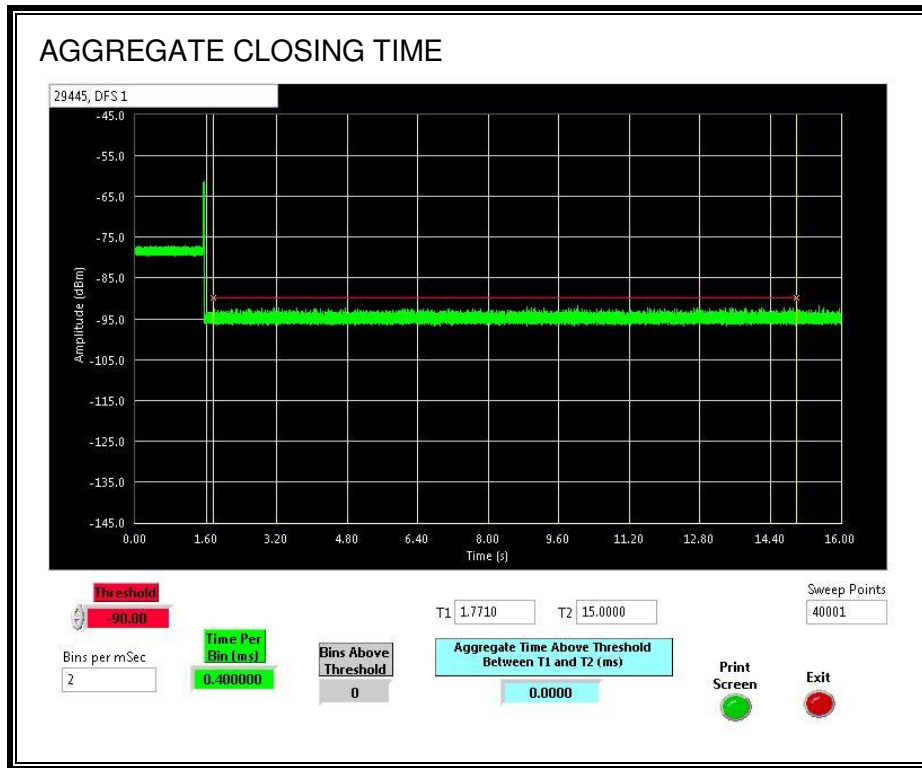
| Aggregate Channel Closing Transmission Time (msec) | Limit (msec) |
|---|-----------------|
| 0.0 | 60 |

MOVE TIME



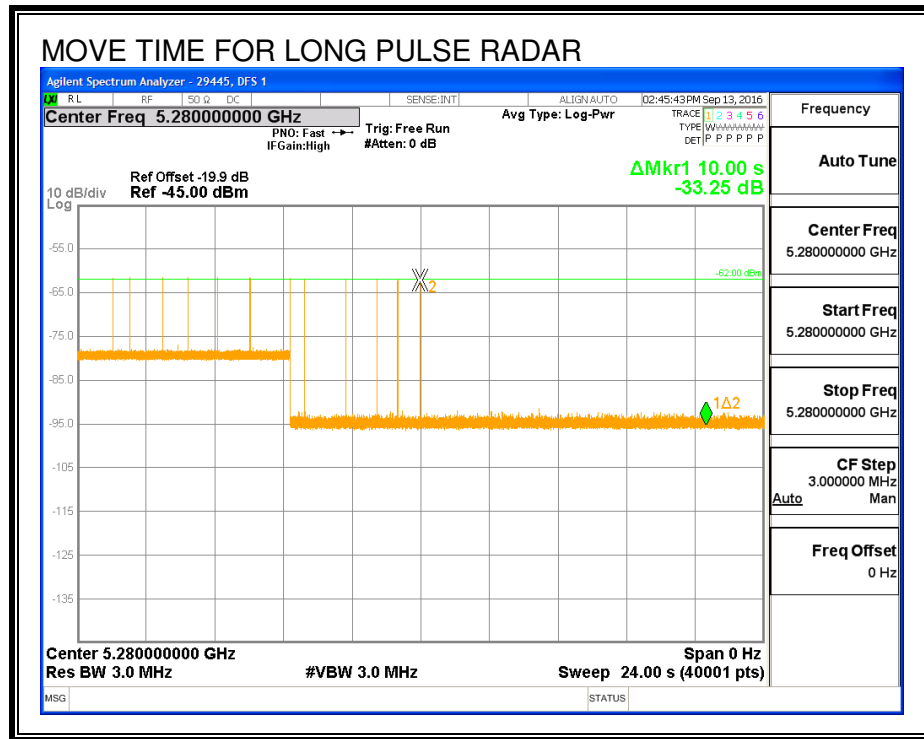
AGGREGATE CHANNEL CLOSING TRANSMISSION TIME

No transmissions are observed during the aggregate monitoring period.



LONG PULSE CHANNEL MOVE TIME

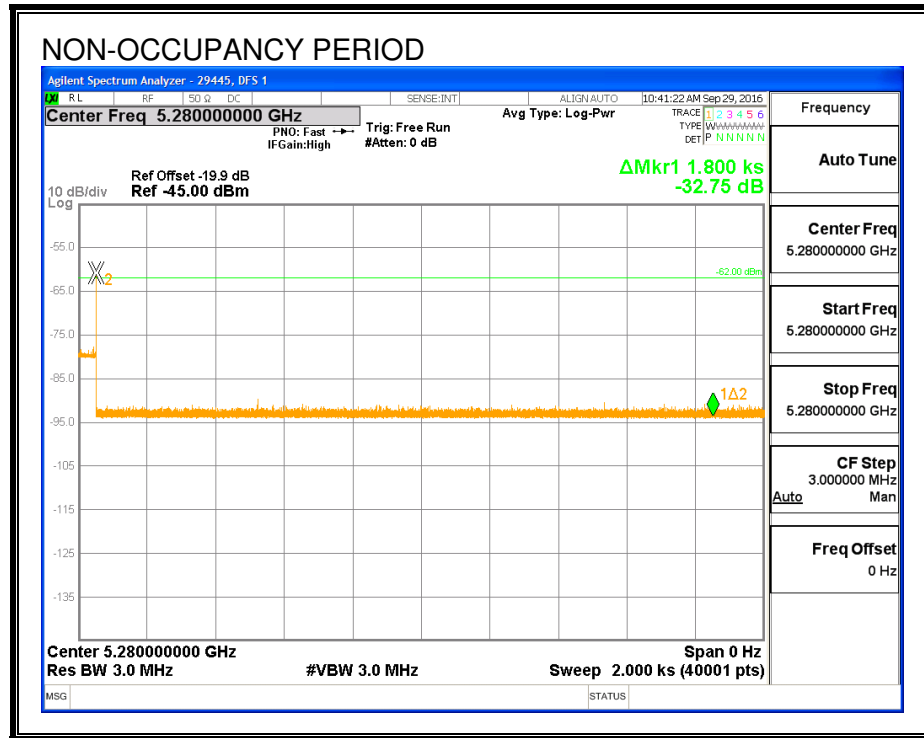
The traffic ceases prior to 10 seconds after the end of the radar waveform.



5.6.1. NON-OCCUPANCY PERIOD

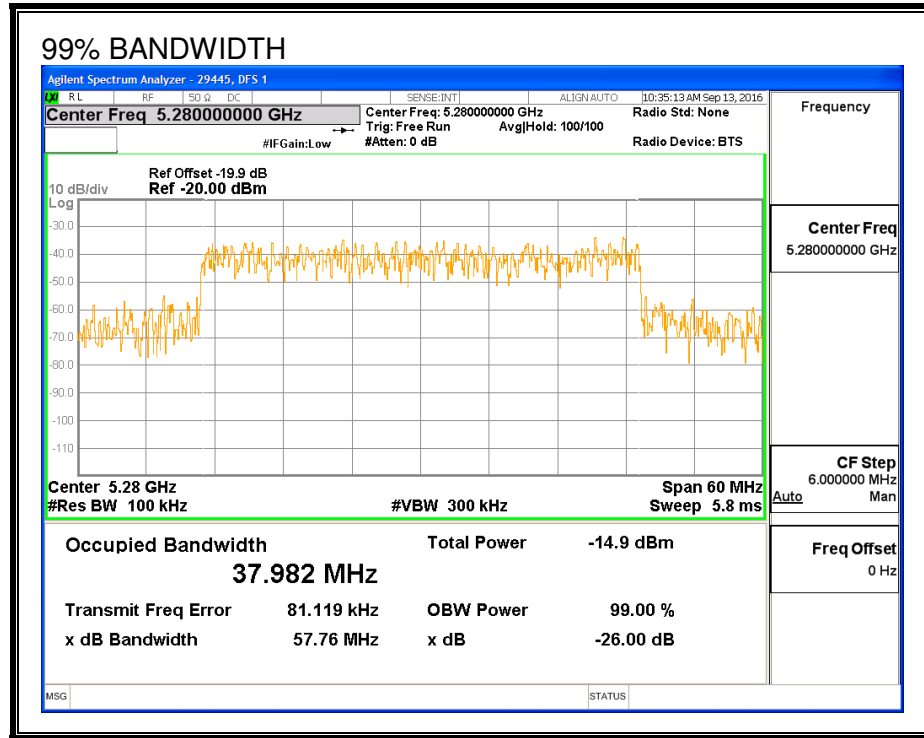
RESULTS

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



5.6.2. DETECTION BANDWIDTH

REFERENCE PLOT OF 99% POWER BANDWIDTH



RESULTS

| FL | FH | Detection Bandwidth | 99% Power Bandwidth | Ratio of Detection BW to 99% Power BW | Minimum Limit |
|-------|-------|---------------------|---------------------|---------------------------------------|---------------|
| (MHz) | (MHz) | (MHz) | (MHz) | (%) | (%) |
| 5261 | 5299 | 38 | 37.982 | 100.0 | 100 |

DETECTION BANDWIDTH PROBABILITY

| DETECTION BANDWIDTH PROBABILITY RESULTS | | | | |
|---|------------------|-----------------|---------------|------|
| Detection Bandwidth Test Results | | 29445 | DFS 1 | |
| FCC Type 0 Waveform: 1 us Pulse Width, 1428 us PRI, 18 Pulses per Burst | | | | |
| Frequency (MHz) | Number of Trials | Number Detected | Detection (%) | Mark |
| 5261 | 10 | 10 | 100 | FL |
| 5262 | 10 | 10 | 100 | |
| 5263 | 10 | 10 | 100 | |
| 5264 | 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 | |
| 5296 | 10 | 10 | 100 | |
| 5297 | 10 | 10 | 100 | |
| 5298 | 10 | 10 | 100 | |
| 5299 | 10 | 10 | 100 | FH |

5.6.3. IN-SERVICE MONITORING

RESULTS

| FCC Radar Test Summary | | | | | | | | | | | | |
|------------------------|------------------|---------------|-----------|-----------|---------------------|------|---------------|------|-------|---------------|-----------------|-------------------------------|
| Signal Type | Number of Trials | Detection (%) | Limit (%) | Pass/Fail | Detection Bandwidth | | 80% of Det BW | | OBW | Test Location | Employee Number | In-Service Monitoring Version |
| | | | | | FL | FH | FL5 | FH5 | | | | |
| FCC Short Pulse Type 1 | 30 | 100.00 | 60 | Pass | 5261 | 5299 | | | 37.95 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 2 | 30 | 100.00 | 60 | Pass | 5261 | 5299 | | | 37.95 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 3 | 30 | 100.00 | 60 | Pass | 5261 | 5299 | | | 37.95 | DFS 1 | 29445 | Version 3.0 |
| FCC Short Pulse Type 4 | 30 | 93.33 | 60 | Pass | 5261 | 5299 | | | 37.95 | DFS 1 | 29445 | Version 3.0 |
| Aggregate | | 98.33 | 80 | Pass | | | | | | | | |
| FCC Long Pulse Type 5 | 30 | 86.67 | 80 | Pass | 5261 | 5299 | 5265 | 5295 | 37.95 | DFS 1 | 29445 | Version 3.0 |
| FCC Hopping Type 6 | 39 | 94.87 | 70 | Pass | 5261 | 5299 | | | | 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 | 5280 | Yes |
| 1002 | 1 | 718 | 74 | A | 5280 | Yes |
| 1003 | 1 | 818 | 65 | A | 5280 | Yes |
| 1004 | 1 | 518 | 102 | A | 5280 | Yes |
| 1005 | 1 | 638 | 83 | A | 5280 | Yes |
| 1006 | 1 | 618 | 86 | A | 5280 | Yes |
| 1007 | 1 | 758 | 70 | A | 5280 | Yes |
| 1008 | 1 | 698 | 76 | A | 5280 | Yes |
| 1009 | 1 | 538 | 99 | A | 5280 | Yes |
| 1010 | 1 | 778 | 68 | A | 5280 | Yes |
| 1011 | 1 | 878 | 61 | A | 5280 | Yes |
| 1012 | 1 | 838 | 63 | A | 5280 | Yes |
| 1013 | 1 | 678 | 78 | A | 5280 | Yes |
| 1014 | 1 | 558 | 95 | A | 5280 | Yes |
| 1015 | 1 | 738 | 72 | A | 5280 | Yes |
| 1016 | 1 | 706 | 75 | B | 5280 | Yes |
| 1017 | 1 | 597 | 89 | B | 5280 | Yes |
| 1018 | 1 | 2165 | 25 | B | 5280 | Yes |
| 1019 | 1 | 2186 | 25 | B | 5280 | Yes |
| 1020 | 1 | 1335 | 40 | B | 5280 | Yes |
| 1021 | 1 | 2839 | 19 | B | 5280 | Yes |
| 1022 | 1 | 923 | 58 | B | 5280 | Yes |
| 1023 | 1 | 2556 | 21 | B | 5280 | Yes |
| 1024 | 1 | 771 | 69 | B | 5280 | Yes |
| 1025 | 1 | 2533 | 21 | B | 5280 | Yes |
| 1026 | 1 | 2230 | 24 | B | 5280 | Yes |
| 1027 | 1 | 1733 | 31 | B | 5280 | Yes |
| 1028 | 1 | 1559 | 34 | B | 5280 | Yes |
| 1029 | 1 | 2386 | 23 | B | 5280 | Yes |
| 1030 | 1 | 2342 | 23 | B | 5280 | 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 | 2.9 | 190 | 26 | 5280 | Yes |
| 2002 | 1.3 | 156 | 24 | 5280 | Yes |
| 2003 | 4.5 | 197 | 24 | 5280 | Yes |
| 2004 | 3.1 | 210 | 23 | 5280 | Yes |
| 2005 | 4.7 | 217 | 24 | 5280 | Yes |
| 2006 | 1.5 | 154 | 27 | 5280 | Yes |
| 2007 | 3.3 | 203 | 24 | 5280 | Yes |
| 2008 | 4.5 | 186 | 27 | 5280 | Yes |
| 2009 | 2.3 | 201 | 25 | 5280 | Yes |
| 2010 | 1.8 | 189 | 29 | 5280 | Yes |
| 2011 | 4 | 208 | 23 | 5280 | Yes |
| 2012 | 3.7 | 200 | 24 | 5280 | Yes |
| 2013 | 2 | 185 | 26 | 5280 | Yes |
| 2014 | 4 | 181 | 27 | 5280 | Yes |
| 2015 | 4.7 | 171 | 26 | 5280 | Yes |
| 2016 | 2.9 | 214 | 28 | 5280 | Yes |
| 2017 | 3.7 | 208 | 27 | 5280 | Yes |
| 2018 | 2.1 | 217 | 26 | 5280 | Yes |
| 2019 | 1.3 | 214 | 26 | 5280 | Yes |
| 2020 | 4 | 228 | 25 | 5280 | Yes |
| 2021 | 3.4 | 192 | 28 | 5280 | Yes |
| 2022 | 2.4 | 209 | 25 | 5280 | Yes |
| 2023 | 2 | 220 | 29 | 5280 | Yes |
| 2024 | 3.2 | 160 | 25 | 5280 | Yes |
| 2025 | 1.1 | 176 | 23 | 5280 | Yes |
| 2026 | 4.6 | 163 | 26 | 5280 | Yes |
| 2027 | 2.7 | 183 | 25 | 5280 | Yes |
| 2028 | 2.4 | 174 | 29 | 5280 | Yes |
| 2029 | 4.8 | 160 | 24 | 5280 | Yes |
| 2030 | 2.7 | 156 | 25 | 5280 | Yes |

TYPE 3 DETECTION PROBABILITY

| Data Sheet for FCC Short Pulse Radar Type 3 | | | | | |
|---|---------------------|-------------|------------------|--------------------|----------------------------------|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Frequency (MHz) | Successful Detection (Yes/No) |
| 3001 | 8 | 487 | 16 | 5280 | Yes |
| 3002 | 5.7 | 369 | 17 | 5280 | Yes |
| 3003 | 6.8 | 350 | 17 | 5280 | Yes |
| 3004 | 9.9 | 378 | 16 | 5280 | Yes |
| 3005 | 8.9 | 371 | 17 | 5280 | Yes |
| 3006 | 9.8 | 412 | 17 | 5280 | Yes |
| 3007 | 6.3 | 301 | 17 | 5280 | Yes |
| 3008 | 5.2 | 354 | 18 | 5280 | Yes |
| 3009 | 9.7 | 389 | 17 | 5280 | Yes |
| 3010 | 6.1 | 455 | 16 | 5280 | Yes |
| 3011 | 8.6 | 251 | 18 | 5280 | Yes |
| 3012 | 7.9 | 464 | 18 | 5280 | Yes |
| 3013 | 5.5 | 273 | 18 | 5280 | Yes |
| 3014 | 5.1 | 498 | 17 | 5280 | Yes |
| 3015 | 8.1 | 453 | 17 | 5280 | Yes |
| 3016 | 5.6 | 440 | 16 | 5280 | Yes |
| 3017 | 6.4 | 408 | 18 | 5280 | Yes |
| 3018 | 9.2 | 290 | 16 | 5280 | Yes |
| 3019 | 5.2 | 404 | 17 | 5280 | Yes |
| 3020 | 8.3 | 299 | 18 | 5280 | Yes |
| 3021 | 7.3 | 425 | 17 | 5280 | Yes |
| 3022 | 8.2 | 333 | 16 | 5280 | Yes |
| 3023 | 7.4 | 472 | 18 | 5280 | Yes |
| 3024 | 8.6 | 275 | 17 | 5280 | Yes |
| 3025 | 8.1 | 309 | 18 | 5280 | Yes |
| 3026 | 9.9 | 258 | 16 | 5280 | Yes |
| 3027 | 9.7 | 305 | 17 | 5280 | Yes |
| 3028 | 9 | 267 | 16 | 5280 | Yes |
| 3029 | 6.6 | 327 | 16 | 5280 | Yes |
| 3030 | 6.2 | 301 | 18 | 5280 | Yes |

TYPE 4 DETECTION PROBABILITY

| Data Sheet for FCC Short Pulse Radar Type 4 | | | | | |
|---|---------------------|-------------|------------------|--------------------|----------------------------------|
| Waveform | Pulse Width (us) | PRI (us) | Pulses Per Burst | Frequency (MHz) | Successful Detection (Yes/No) |
| 4001 | 13.6 | 256 | 15 | 5280 | Yes |
| 4002 | 13.3 | 494 | 13 | 5280 | Yes |
| 4003 | 15 | 462 | 12 | 5280 | Yes |
| 4004 | 10.5 | 344 | 16 | 5280 | Yes |
| 4005 | 12.6 | 458 | 15 | 5280 | Yes |
| 4006 | 14 | 352 | 12 | 5280 | Yes |
| 4007 | 16.7 | 479 | 14 | 5280 | Yes |
| 4008 | 18.6 | 387 | 14 | 5280 | Yes |
| 4009 | 17 | 275 | 16 | 5280 | Yes |
| 4010 | 19.4 | 462 | 16 | 5280 | Yes |
| 4011 | 18.4 | 363 | 14 | 5280 | Yes |
| 4012 | 16.6 | 430 | 16 | 5280 | No |
| 4013 | 16.1 | 477 | 12 | 5280 | Yes |
| 4014 | 14.8 | 438 | 15 | 5280 | Yes |
| 4015 | 10 | 498 | 16 | 5280 | Yes |
| 4016 | 19.4 | 472 | 14 | 5280 | Yes |
| 4017 | 10.4 | 428 | 13 | 5280 | Yes |
| 4018 | 10.1 | 297 | 14 | 5280 | Yes |
| 4019 | 11.8 | 265 | 16 | 5280 | Yes |
| 4020 | 17.4 | 264 | 14 | 5280 | Yes |
| 4021 | 19.5 | 378 | 14 | 5280 | Yes |
| 4022 | 10.8 | 273 | 15 | 5280 | Yes |
| 4023 | 13.5 | 400 | 13 | 5280 | Yes |
| 4024 | 15.4 | 307 | 12 | 5280 | Yes |
| 4025 | 13.8 | 329 | 15 | 5280 | Yes |
| 4026 | 16.3 | 383 | 14 | 5280 | Yes |
| 4027 | 15.2 | 284 | 12 | 5280 | No |
| 4028 | 13.4 | 483 | 15 | 5280 | Yes |
| 4029 | 12.9 | 397 | 16 | 5280 | Yes |
| 4030 | 11.6 | 359 | 13 | 5280 | Yes |

TYPE 5 DETECTION PROBABILITY

| Data Sheet for FCC Long Pulse Radar Type 5 | | |
|--|-----------------|-------------------------------|
| Trial | Frequency (MHz) | Successful Detection (Yes/No) |
| 1 | 5280 | Yes |
| 2 | 5280 | Yes |
| 3 | 5280 | Yes |
| 4 | 5280 | Yes |
| 5 | 5280 | Yes |
| 6 | 5280 | Yes |
| 7 | 5280 | Yes |
| 8 | 5280 | Yes |
| 9 | 5280 | Yes |
| 10 | 5280 | Yes |
| 11 | 5264 | Yes |
| 12 | 5265 | No |
| 13 | 5266 | Yes |
| 14 | 5268 | Yes |
| 15 | 5265 | Yes |
| 16 | 5264 | No |
| 17 | 5265 | Yes |
| 18 | 5269 | Yes |
| 19 | 5264 | No |
| 20 | 5266 | Yes |
| 21 | 5292 | Yes |
| 22 | 5293 | Yes |
| 23 | 5291 | Yes |
| 24 | 5295 | Yes |
| 25 | 5297 | No |
| 26 | 5295 | Yes |
| 27 | 5294 | Yes |
| 28 | 5296 | Yes |
| 29 | 5291 | Yes |
| 30 | 5292 | 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 | 197 | 5261 | 11 | No |
| 2 | 672 | 5262 | 9 | Yes |
| 3 | 1147 | 5263 | 8 | Yes |
| 4 | 1622 | 5264 | 8 | Yes |
| 5 | 2097 | 5265 | 13 | Yes |
| 6 | 2572 | 5266 | 7 | Yes |
| 7 | 3047 | 5267 | 7 | Yes |
| 8 | 3522 | 5268 | 6 | Yes |
| 9 | 3997 | 5269 | 9 | Yes |
| 10 | 4472 | 5270 | 7 | Yes |
| 11 | 4947 | 5271 | 8 | Yes |
| 12 | 5422 | 5272 | 3 | Yes |
| 13 | 5897 | 5273 | 8 | Yes |
| 14 | 6372 | 5274 | 9 | Yes |
| 15 | 6847 | 5275 | 8 | Yes |
| 16 | 7322 | 5276 | 8 | Yes |
| 17 | 7797 | 5277 | 8 | Yes |
| 18 | 8272 | 5278 | 13 | Yes |
| 19 | 8747 | 5279 | 9 | Yes |
| 20 | 9222 | 5280 | 9 | Yes |
| 21 | 9697 | 5281 | 9 | Yes |
| 22 | 10172 | 5282 | 3 | Yes |
| 23 | 10647 | 5283 | 12 | Yes |
| 24 | 11122 | 5284 | 9 | Yes |
| 25 | 11597 | 5285 | 9 | Yes |
| 26 | 12072 | 5286 | 6 | Yes |
| 27 | 12547 | 5287 | 9 | Yes |
| 28 | 13022 | 5288 | 9 | Yes |
| 29 | 13497 | 5289 | 9 | Yes |
| 30 | 13972 | 5290 | 11 | Yes |
| 31 | 14447 | 5291 | 10 | Yes |
| 32 | 14922 | 5292 | 4 | Yes |
| 33 | 15397 | 5293 | 5 | Yes |
| 34 | 15872 | 5294 | 9 | Yes |
| 35 | 16347 | 5295 | 4 | Yes |
| 36 | 16822 | 5296 | 5 | Yes |
| 37 | 17297 | 5297 | 5 | Yes |
| 38 | 17772 | 5298 | 3 | Yes |
| 39 | 18247 | 5299 | 6 | No |

5.7. BRIDGE MODE RESULTS

Per KDB 905462, Section 5.1 (footnote 1):

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

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