# DFS Test Report

**Report No.:** RF160418C29B-1

**FCC ID:** GZ5NVG4XXQ

**Test Model:** NVG468MQ

**Series Model:** NVG448BQ, NVG443BQ

**Received Date:** Jun. 23, 2016

**Test Date:** Dec. 12 ~ Dec. 15, 2016

**Issued Date:** Dec. 16, 2016

**Applicant:** ARRIS Group, Inc.

**Address:** 2500 Walsh Ave. Santa Clara, CA 95051,United State

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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**Test Location:** No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

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## Release Control Record

| Issue No. | Description | Date Issued |
|---|---|---|
| RF160418C29B-1 | Original release | Dec. 16, 2016 |

## 1 Certificate of Conformity

**Product:** Ethernet and FTTH Gateway

**Brand:** ARRIS

**Test Model:** NVG468MQ

**Series Model:** NVG448BQ, NVG443BQ

**Sample Status:** Engineering Sample

**Applicant:** ARRIS Group, Inc.

**Test Date:** Dec. 12 ~ Dec. 15, 2016

**Standards:** FCC Part 15, Subpart E (Section 15.407)
KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :** _____ , **Date:** Dec. 16, 2016
Polly Chien / Specialist

**Approved by :** _____ , **Date:** Dec. 16, 2016
Ken Liu / Senior Manager

## 2 EUT Information

### 2.1 Operating Frequency Bands and Mode of EUT

Table 1: Operating Frequency Bands and Mode of EUT

| Operational Mode | Operating Frequency Range | |
|---|---|---|
| | 5250~5350MHz | 5470~5725MHz |
| Master | ✓ | ✓ |

### 2.2 EUT Software and Firmware Version

Table 2: The EUT Software/Firmware Version

| No. | Product | Test Model No. | Software/Firmware Version |
|---|---|---|---|
| 1 | Ethernet and FTTH Gateway | NVG468MQ (Refer to note) | 9.2.0h5d1 |

Note: All models are listed as below.

| Brand | Model | Difference | | | | | |
|---|---|---|---|---|---|---|---|
| | | Accessory | | | I/O port | | |
| | | Item | Brand | Model | Item | Number | Function |
| ARRIS | NVG468MQ | Switch Adapter Power cord: 1.8m non-shielded cable w/o ferrite core | Ktec | KSAS0361200250HU | MOCA 2.0 | 1 | For Local Area Network |
| | | | | | USB 3.0 | 1 | For Mass Storage |
| | | | | | LAN (RJ45) | 4 | For Local Area Network |
| | | Stand | FOXCONN | 447.00105.005 | WAN (RJ45) | 1 | For Wild Area Network |
| | | Ethernet Cable (2m non-shielded cable w/o ferrite core) | NIEN-YI | NYS1097 | VOIP (RJ14) | 1 | For Internet Voice Phone |
| | | | | | DC JACK | 1 | For Power Supply Input |
| | NVG448BQ | Switch Adapter Power cord: 1.8m non-shielded cable w/o ferrite core | Ktec | KSAS0361200250HU | VDSL (RJ14) | 1 | For Wideband/Internet connection |
| | | | | | USB 3.0 | 1 | For Mass Storage |
| | | | | | LAN (RJ45) | 4 | For Local Area Network |
| | | Stand | FOXCONN | 447.00105.005 | WAN (RJ45) | 1 | For Wild Area Network |
| | | Ethernet Cable (2m non-shielded cable w/o ferrite core) | NIEN-YI | NYS1097 | VOIP (RJ14) | 1 | For Internet Voice Phone |
| | | RJ14 Cable (4.5m non-shielded cable w/o ferrite core) | NIEN-YI | NYS1131 | DC JACK | 1 | For Power Supply Input |
| | NVG443BQ | Switch Adapter Power cord: 1.8m non-shielded cable w/o ferrite core | Ktec | KSAS0361200250HU | VDSL (RJ14) | 1 | For Wideband/Internet connection |
| | | | | | USB 3.0 | 1 | For Mass Storage |
| | | | | | LAN (RJ45) | 4 | For Local Area Network |
| | | Stand | FOXCONN | 447.00105.005 | WAN (RJ45) | 1 | For Wild Area Network |
| | | RJ14 Cable (4.5m non-shielded cable w/o ferrite core) | NIEN-YI | NYS1131 | DC JACK | 1 | For Power Supply Input |

* After the pretest, the model: NVG468MQ is found to be the worst case model and therefore all tests had been performed to this model.

## 2.3 Description of Available Antennas to the EUT

Table 3: Antenna List

| ANT No. | Antenna Type | Operation Frequency Range (MHz) | Gain (dBi) |
|---|---|---|---|
| 1. | PIFA | 5250-5725 | 3.97 |
| 2. | PIFA | 5250-5725 | 3.18 |
| 3. | PIFA | 5250-5725 | 4.56 |
| 4. | PIFA | 5250-5725 | 4.43 |

## 2.4 EUT Maximum Conducted Power

Table 4: The Measured Conducted Output Power

CDD Mode

802.11a

| Frequency Band (MHz) | Max. Power | | Min. Power | |
|---|---|---|---|---|
| | Output Power (dBm) | Output Power (mW) | Output Power (dBm) | Output Power (mW) |
| 5250~5350 | 20.41 | 110.022 | 14.41 | 27.606 |
| 5470~5725 | 20.41 | 109.907 | 14.41 | 27.606 |

802.11n HT20

| Frequency Band (MHz) | Max. Power | | Min. Power | |
|---|---|---|---|---|
| | Output Power (dBm) | Output Power (mW) | Output Power (dBm) | Output Power (mW) |
| 5250~5350 | 19.88 | 97.303 | 13.88 | 24.434 |
| 5470~5725 | 19.90 | 97.822 | 13.90 | 24.547 |

802.11n HT40

| Frequency Band (MHz) | Max. Power | | Min. Power | |
|---|---|---|---|---|
| | Output Power (dBm) | Output Power (mW) | Output Power (dBm) | Output Power (mW) |
| 5250~5350 | 23.77 | 237.960 | 17.77 | 59.841 |
| 5470~5725 | 23.75 | 236.868 | 17.75 | 59.566 |

802.11ac VHT80

| Frequency Band (MHz) | Max. Power | | Min. Power | |
|---|---|---|---|---|
| | Output Power (dBm) | Output Power (mW) | Output Power (dBm) | Output Power (mW) |
| 5250~5350 | 22.80 | 190.510 | 16.80 | 47.863 |
| 5470~5725 | 23.57 | 227.507 | 17.57 | 57.148 |

Beamfoming Mode

802.11n HT20

| Frequency Band (MHz) | Max. Power | | Min. Power | |
|---|---|---|---|---|
| | Output Power (dBm) | Output Power (mW) | Output Power (dBm) | Output Power (mW) |
| 5250~5350 | 19.88 | 97.303 | 13.88 | 24.434 |
| 5470~5725 | 19.90 | 97.822 | 13.90 | 24.547 |

802.11n HT40

| Frequency Band (MHz) | Max. Power | | Min. Power | |
|---|---|---|---|---|
| | Output Power (dBm) | Output Power (mW) | Output Power (dBm) | Output Power (mW) |
| 5250~5350 | 19.73 | 93.899 | 13.73 | 23.605 |
| 5470~5725 | 19.79 | 95.264 | 13.79 | 23.933 |

802.11ac VHT80

| Frequency Band (MHz) | Max. Power | | Min. Power | |
|---|---|---|---|---|
| | Output Power (dBm) | Output Power (mW) | Output Power (dBm) | Output Power (mW) |
| 5250~5350 | 19.91 | 97.930 | 13.91 | 24.604 |
| 5470~5725 | 19.92 | 98.169 | 13.92 | 24.660 |

## 2.5 EUT Maximum E.I.R.P. Power

Table 5: The EIRP Output Power List

CDD Mode

802.11a

| Frequency Band (MHz) | Max. Power | | Min. Power | |
|---|---|---|---|---|
| | Output Power (dBm) | Output Power (mW) | Output Power (dBm) | Output Power (mW) |
| 5250~5350 | 24.97 | 314.051 | 18.97 | 78.886 |
| 5470~5725 | 24.97 | 314.051 | 18.97 | 78.886 |

802.11n HT20

| Frequency Band (MHz) | Max. Power | | Min. Power | |
|---|---|---|---|---|
| | Output Power (dBm) | Output Power (mW) | Output Power (dBm) | Output Power (mW) |
| 5250~5350 | 24.44 | 277.971 | 18.44 | 69.823 |
| 5470~5725 | 24.46 | 279.254 | 18.46 | 70.146 |

802.11n HT40

| Frequency Band (MHz) | Max. Power | | Min. Power | |
|---|---|---|---|---|
| | Output Power (dBm) | Output Power (mW) | Output Power (dBm) | Output Power (mW) |
| 5250~5350 | 28.33 | 680.769 | 22.33 | 171.002 |
| 5470~5725 | 28.31 | 677.642 | 22.31 | 170.216 |

802.11ac VHT80

| Frequency Band (MHz) | Max. Power | | Min. Power | |
|---|---|---|---|---|
| | Output Power (dBm) | Output Power (mW) | Output Power (dBm) | Output Power (mW) |
| 5250~5350 | 27.36 | 544.503 | 21.36 | 136.773 |
| 5470~5725 | 28.13 | 650.130 | 22.13 | 163.305 |

Beamfoming Mode

802.11n HT20

| Frequency Band (MHz) | Max. Power | | Min. Power | |
|---|---|---|---|---|
| | Output Power (dBm) | Output Power (mW) | Output Power (dBm) | Output Power (mW) |
| 5250~5350 | 24.44 | 277.971 | 18.44 | 69.823 |
| 5470~5725 | 24.46 | 279.254 | 18.46 | 70.146 |

802.11n HT40

| Frequency Band (MHz) | Max. Power | | Min. Power | |
|---|---|---|---|---|
| | Output Power (dBm) | Output Power (mW) | Output Power (dBm) | Output Power (mW) |
| 5250~5350 | 24.29 | 268.534 | 18.29 | 67.453 |
| 5470~5725 | 24.35 | 272.270 | 18.35 | 68.391 |

802.11ac VHT80

| Frequency Band (MHz) | Max. Power | | Min. Power | |
|---|---|---|---|---|
| | Output Power (dBm) | Output Power (mW) | Output Power (dBm) | Output Power (mW) |
| 5250~5350 | 24.47 | 279.898 | 18.47 | 70.307 |
| 5470~5725 | 24.48 | 280.543 | 18.48 | 70.469 |

## 2.6 Transmit Power Control (TPC)

U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW.

Maximum EIRP of this device is 680.769mW which more than 500mW, therefore it's require TPC function.

The UUT can adjust a transmitter's output power based on the signal level present at the receiver.TPC is auto controlled by software

## 2.7 Statement of Manufacturer

Manufacturer statement confirming that information regarding the parameters of the detected Radar Waveforms is not available to the end user.

## 3 U-NII DFS Rule Requirements

### 3.1 Working Modes and Required Test Items

The manufacturer shall state whether the UUT is capable of operating as a Master and/or a Client. If the UUT is capable of operating in more than one operating mode then each operating mode shall be tested separately. See tables 6 and 7 for the applicability of DFS requirements for each of the operational modes.

Table 6: Applicability of DFS Requirements Prior To Use a Channel

| Requirement | Operational Mode | | |
|---|---|---|---|
| | Master | Client without radar detection | Client with radar detection |
| Non-Occupancy Period | ✓ | ✓ note | ✓ |
| DFS Detection Threshold | ✓ | Not required | ✓ |
| Channel Availability Check Time | ✓ | Not required | Not required |
| U-NII Detection Bandwidth | ✓ | Not required | ✓ |
| Note: Regarding KDB 905462 D03 Client Without DFS New Rules v01r01 section (b)(5/6), If the client moves with the master, the device is considered compliant if nothing appears in the client non-occupancy period test. For devices that shut down (rather than moving channels), no beacons should appear. An analyzer plot that contains a single 30-minute sweep on the original channel. | | | |

Table 7: Applicability of DFS Requirements during Normal Operation.

| Requirement | Operational Mode | |
|---|---|---|
| | Master or Client with radar detection | Client without radar detection |
| DFS Detection Threshold | ✓ | Not required |
| Channel Closing Transmission Time | ✓ | ✓ |
| Channel Move Time | ✓ | ✓ |
| U-NII Detection Bandwidth | ✓ | Not required |

| Additional requirements for devices with multiple bandwidth modes | Master or Client with radar detection | Client without radar detection |
|---|---|---|
| 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 each of the bonded 20 MHz channels and the channel center frequency. | | |

## 3.2 Test Limits and Radar Signal Parameters

**Detection Threshold Values**

Table 8: DFS Detection Thresholds for Master Devices And Client Devices With Radar Detection

| Maximum Transmit Power | Value<br>(See Notes 1, 2, and 3) |
|---|---|
| EIRP ≥ 200 milliwatt | -64 dBm |
| EIRP < 200 milliwatt and<br>power spectral density < 10 dBm/MHz | -62 dBm |
| EIRP < 200 milliwatt that do not meet the<br>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.
Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.

Table 9: DFS Response Requirement Values

| Parameter | Value |
|---|---|
| Non-occupancy period | Minimum 30 minutes |
| Channel Availability Check Time | 60 seconds |
| Channel Move Time | 10 seconds<br>See Note 1. |
| Channel Closing Transmission Time | 200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period.<br>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.

**Parameters of DFS Test Signals**

Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Table 10: Short Pulse Radar Test Waveforms

| Radar Type | Pulse Width (μsec) | PRI (μsec) | Number of Pulses | Minimum Percentage of Successful Detection | Minimum Number of 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<br>----------<br>Test B: 15 unique PRI values randomly selected within the range of 518-3066 μ sec, with a minimum increment of 1 μ sec, excluding PRI values selected in Test A | $\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{PRI_{\mu sec}}\right)\right\}$ | 60% | 30 |
| 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 11: Long Pulse Radar Test Waveform

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

Three subsets of trials will be performed with a minimum of ten trials per subset. The subset of trials differ in where the Long Pulse Type 5 Signal is tuned in frequency.

a) the Channel center frequency
b) tuned frequencies such that 90% of the Long Pulse Type 5 frequency modulation is within the low edge of the UUT Occupied Bandwidth
c) tuned frequencies such that 90% of the Long Pulse Type 5 frequency modulation is within the high edge of the UUT Occupied Bandwidth

It include 10 trails for every subset, the formula as below,

For subset case 1: the center frequency of the signal generator will remain fixed at the center of the UUT Channel.

For subset case 2: to retain 90% frequency overlap between the radar signal and the UUT Occupied Bandwidth, the center frequency of the signal generator will vary for each of the ten trials in subset case 2. The center frequency of the signal generator for each trial is calculated by:

$FL$+(0.4$*Chirp\ Width$ [$in\ MHz$])

For subset case 3: to retain 90% frequency overlap between the radar signal and the UUT Occupied Bandwidth, the center frequency of the signal generator will vary for each of the ten trials in subset case 3. The center frequency of the signal generator for each trial is calculated by:

$FH$−(0.4$*Chirp\ Width$ [$in\ MHz$])

Table 12: Frequency Hopping Radar Test Waveform

| Radar Type | Pulse Width (μsec) | PRI (μsec) | Pulses PER HOP | Hopping Rate (kHz) | Hopping Sequence Length (msec) | Minimum Percentage Of Successful Detection | Minimum Number Of Trials |
|---|---|---|---|---|---|---|---|
| 6 | 1 | 333 | 9 | 0.333 | 300 | 70% | 30 |

# 4 Test & Support Equipment List

## 4.1 Test Instruments

Table 13: Test Instruments List

| Description & Manufacturer | Model No. | Brand | Date Of Calibration | Due Date Of Calibration |
|---|---|---|---|---|
| R&S Spectrum analyzer | ESR | R&S | 2016/02/02 | 2017/02/01 |
| Signal generator | 8645A | Agilent | 2016/08/08 | 2017/08/07 |

## 4.2 Description of Support Units

Table 14: Support Unit Information.

| No. | Product | Brand | Model No. | FCC ID |
|---|---|---|---|---|
| 1 | Intel Dual Band Wireless | Intel | AC7265 | PD97265NG |

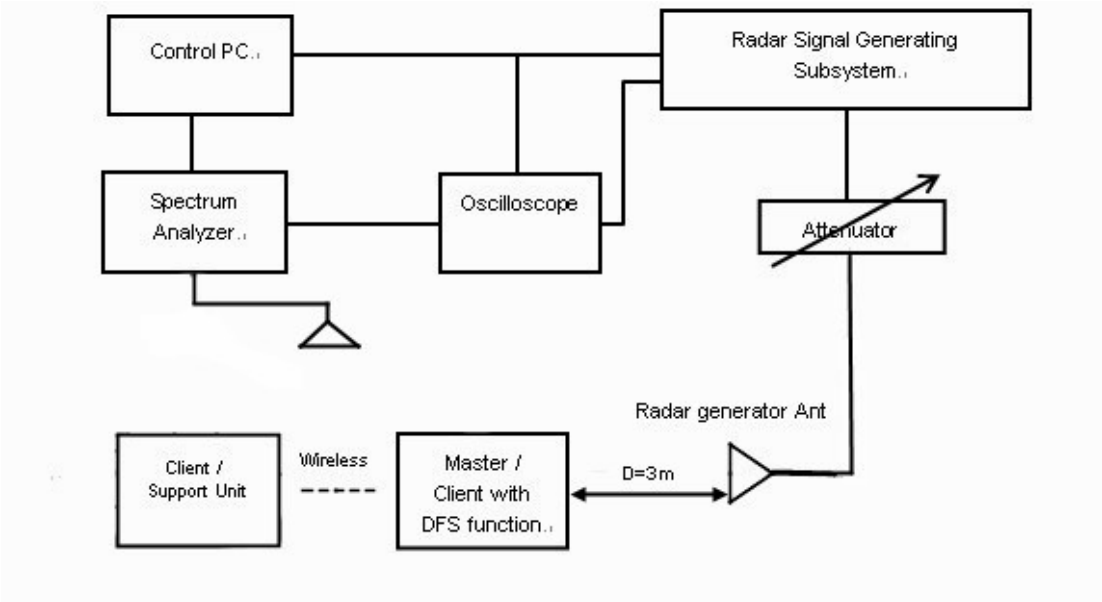
Note: This device was functioned as a ☐Master ☒Slave device during the DFS test.

# 5 Test Procedure

## 5.1 ADT DFS Measurement System

A complete ADT DFS Measurement System consists of two subsystems: (1) the Radar Signal Generating Subsystem and (2) the Traffic Monitoring Subsystem. The control PC is necessary for generating the Radar waveforms in Table 10, 11 and 12. The traffic monitoring subsystem is specified to the type of unit under test (UUT).

**Radiated Setup Configuration of ADT DFS Measurement System**




Note: The UUT main beam of the antenna is directly toward radar emitter during testing.

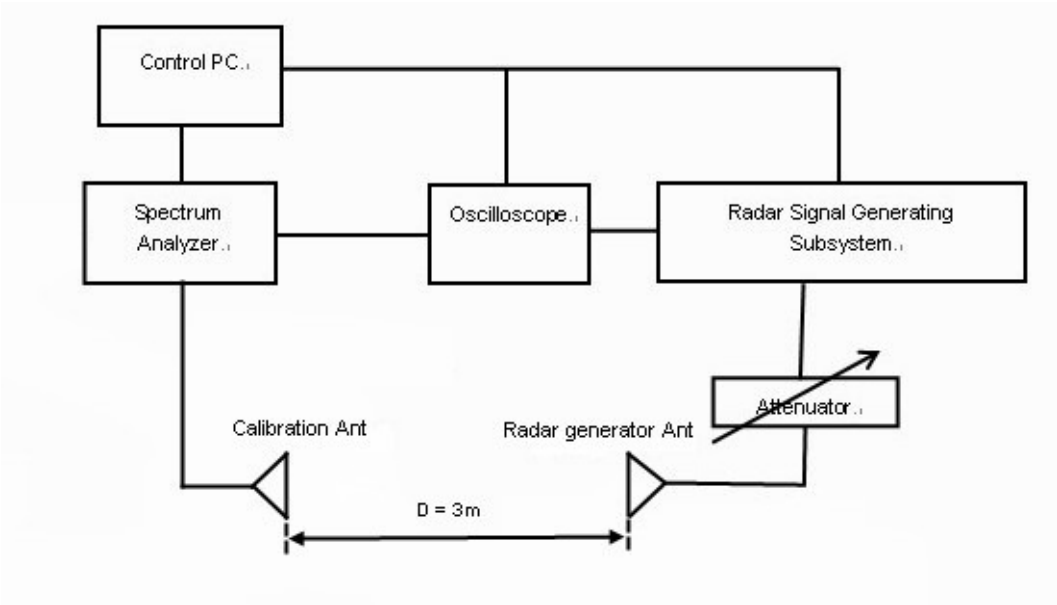
System testing will be performed with channel-loading using means appropriate to the data types that are used by the unlicensed device. The following requirements apply:

| | |
|---|---|
| | a) The data file must be of a type that is typical for the device (i.e., MPEG-2, MPEG-4, WAV, MP3, MP4, AVI, etc.) and must generally be transmitting in a streaming mode. |
| | b) Software to ping the client is permitted to simulate data transfer but must have random ping intervals. |
| V | c) Timing plots are required with calculations demonstrating a minimum channel loading of approximately 17% or greater. |
| | d) Unicast or Multicast protocols are preferable but other protocols may be used. The appropriate protocol used must be described in the test procedures. |

## 5.2 Calibration of DFS Detection Threshold Level

The measured channel is 5500MHz, 5510MHz and 5530MHz. The radar signal was the same as transmitted channels, and injected into the antenna of AP (master) or Client Device with Radar Detection, measured the channel closing transmission time and channel move time. The calibrated detection threshold level is set to -64dBm. The tested level is lower than required level hence it provides margin to the limit.

**Radiated Setup Configuration of Calibration of DFS Detection Threshold Level**

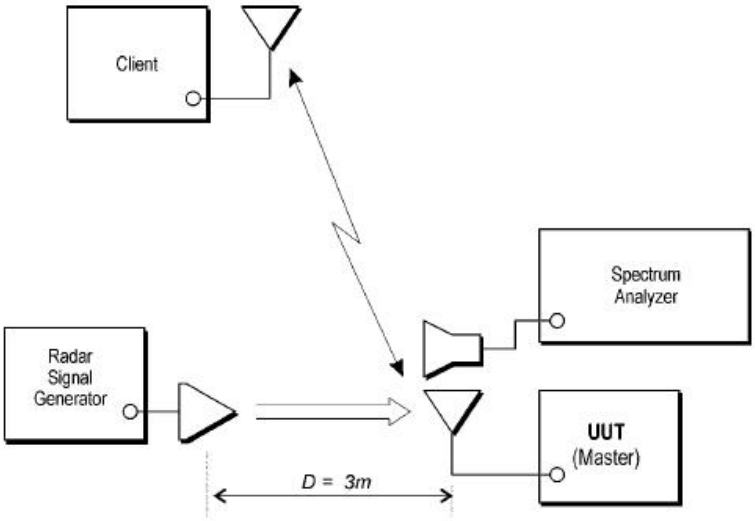



## 5.3 Deviation from Test Standard

No deviation.

## 5.4 Radiated Test Setup Configuration

### 5.4.1 Master Mode




The EUT is a U-NII Device operating in Master mode. The radar test signals are injected into the Master Device.

# 6 Test Results

## 6.1 Summary of Test Results

| Clause | Test Parameter | Remarks | Pass/Fail |
|---|---|---|---|
| 15.407 | DFS Detection Threshold | Applicable | Pass |
| 15.407 | U-NII Detection Bandwidth | Applicable | Pass |
| 15.407 | Channel Availability Check Time | Applicable | Pass |
| 15.407 | Channel Move Time | Applicable | Pass |
| 15.407 | Channel Closing Transmission Time | Applicable | Pass |
| 15.407 | Non- Occupancy Period | Applicable | Pass |
| 15.407 | Uniform Spreading | Applicable | Pass |

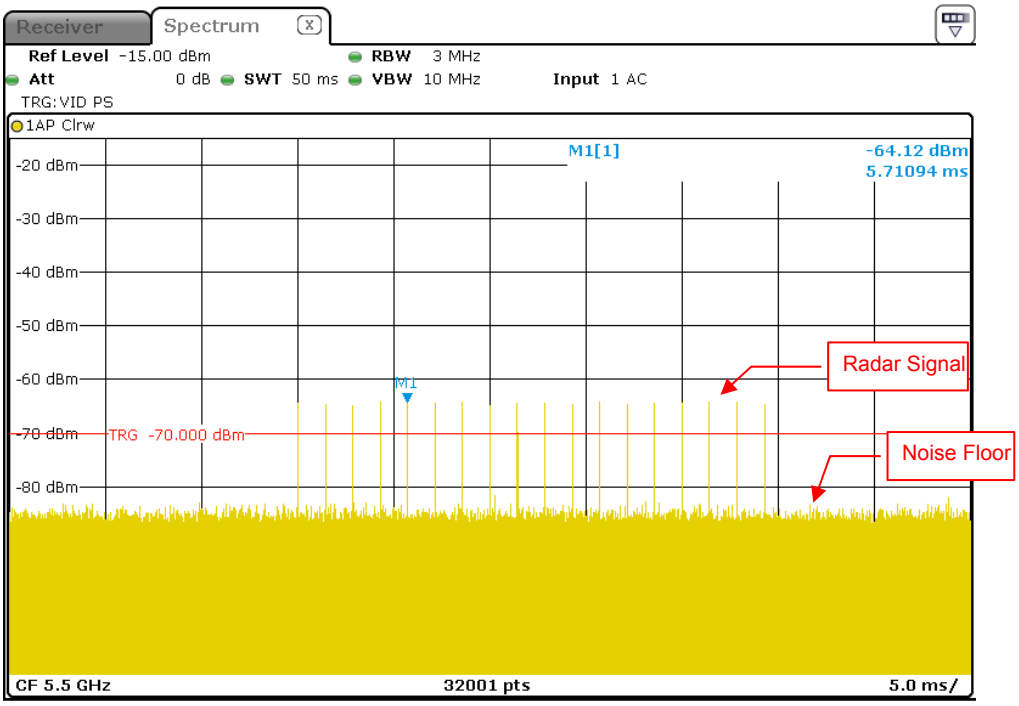
## 6.2 Test Results

### 6.2.1 Test Mode: Device Operating In Client without Radar Detection Mode.

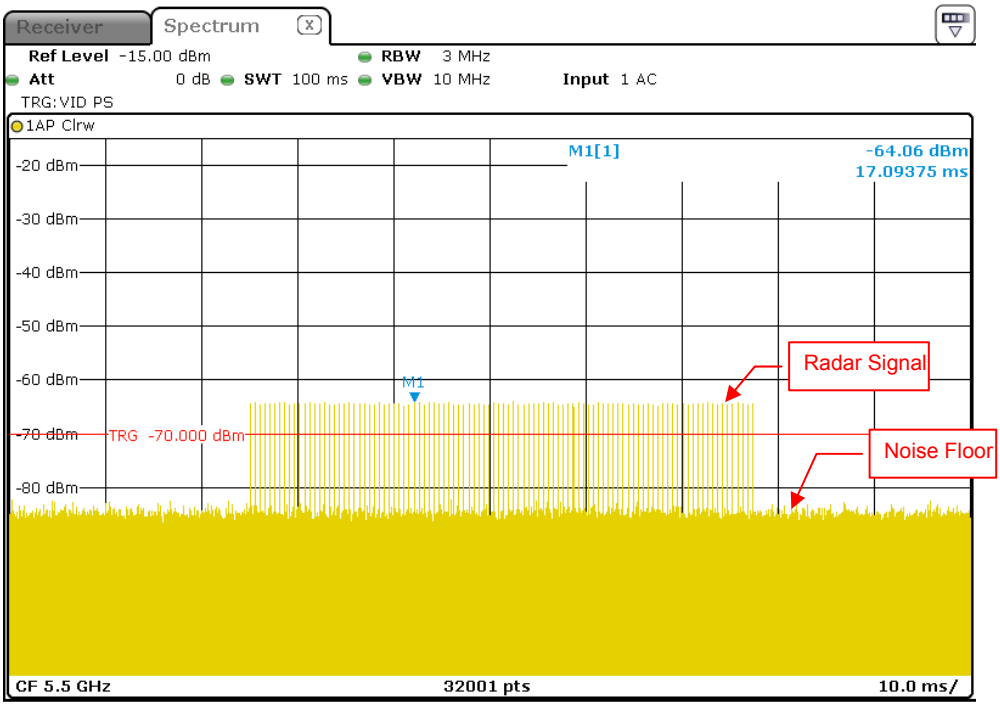
Master with injection at the Master. (Radar Test Waveforms are injected into the Master.)

**DFS Detection Threshold**

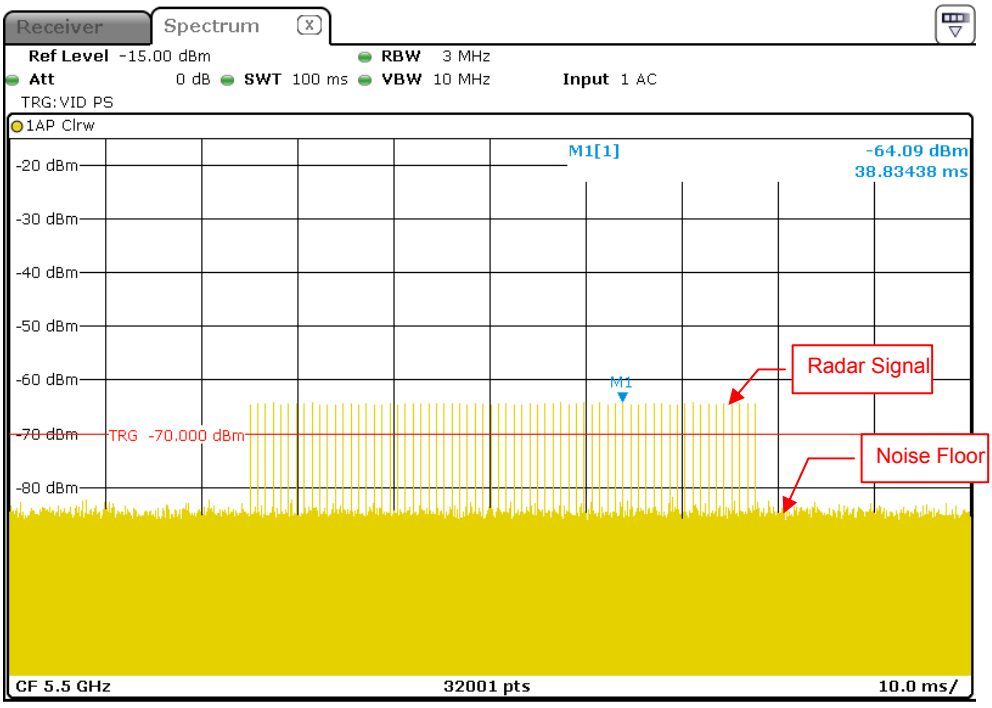
For a detection threshold level of -64dBm, the required signal strength at EUT antenna location is -64 dBm. The tested level is lower than required level hence it provides margin to the limit.



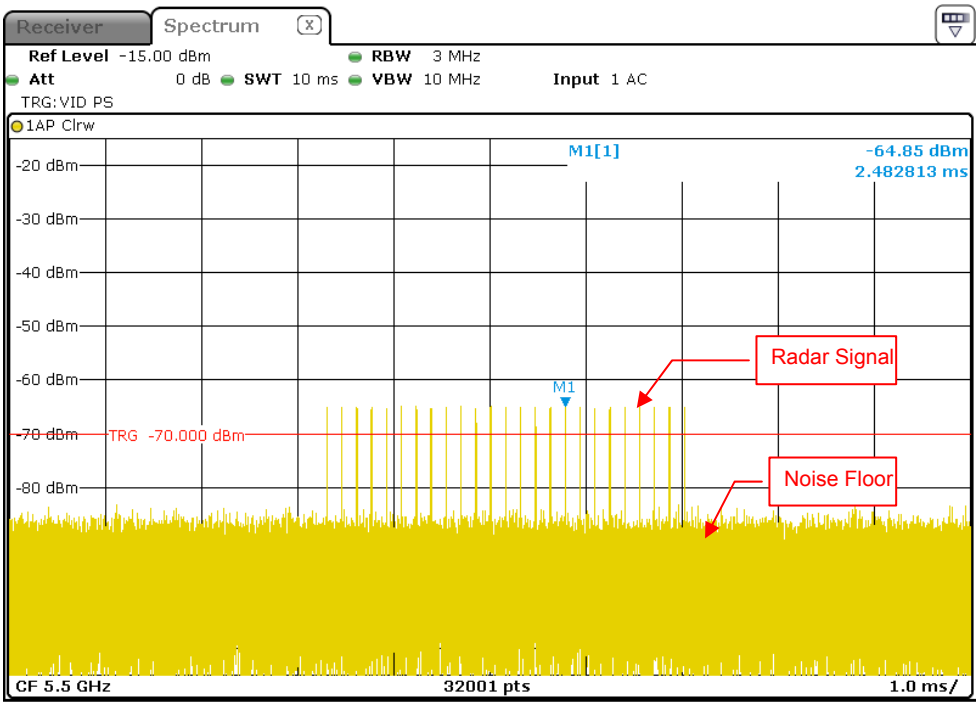

Radar Signal 0



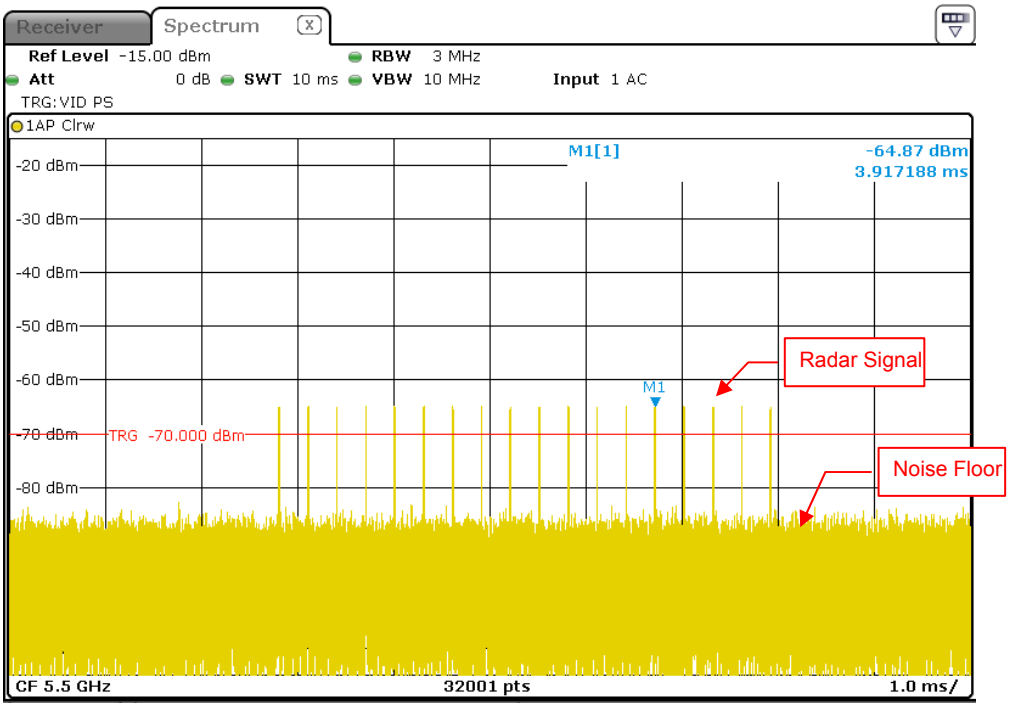

Radar Signal 1 (Test A)



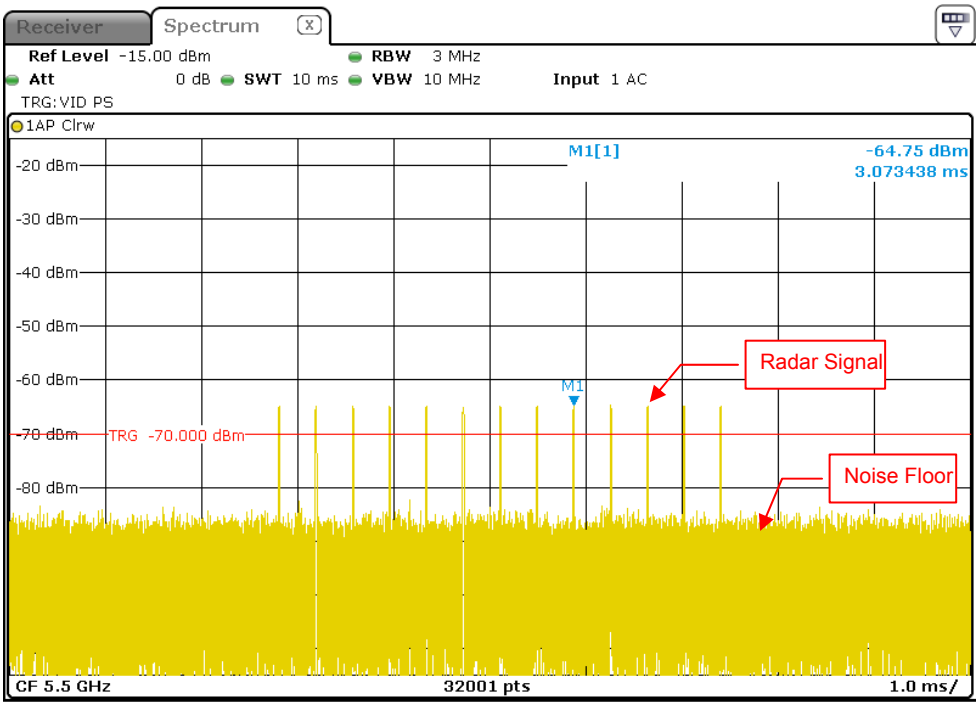

Radar Signal 1 (Test B)



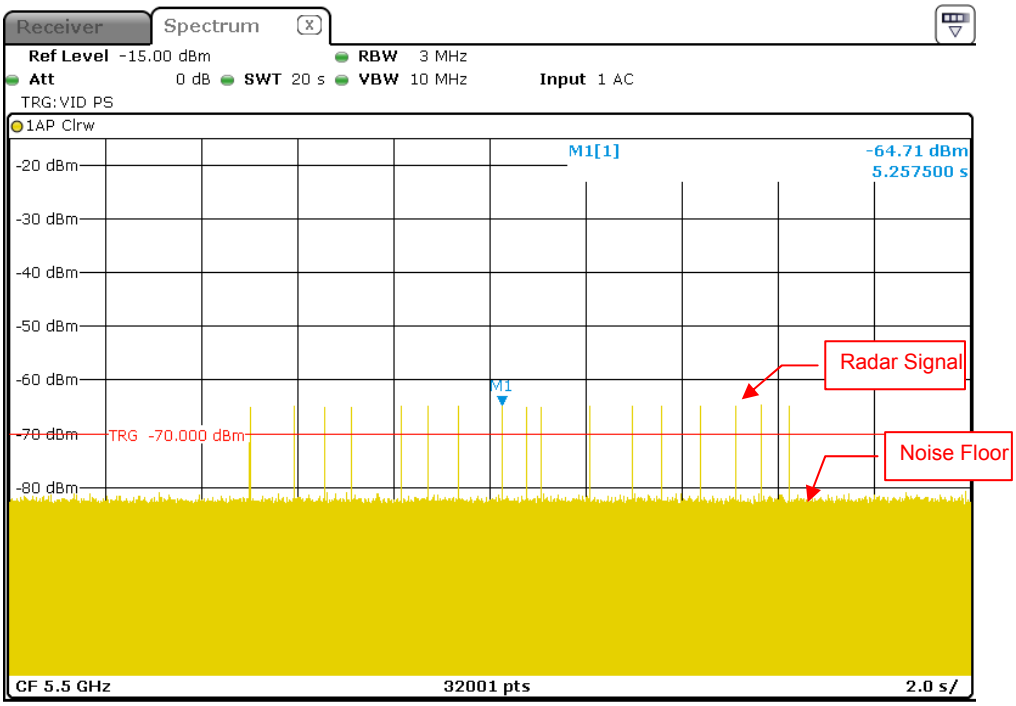

Radar Signal 2



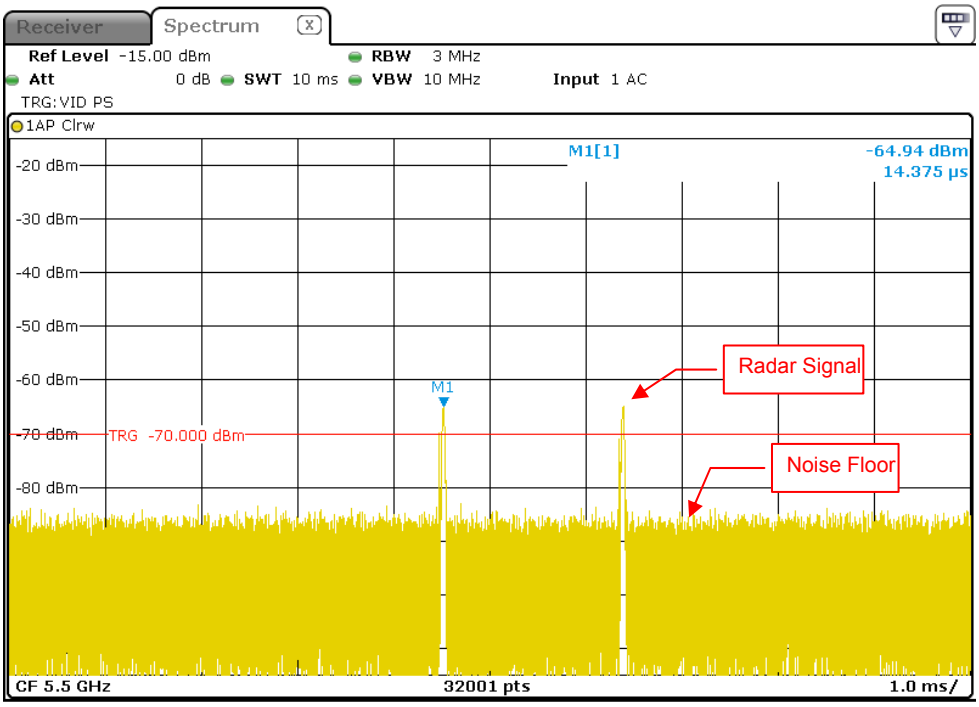

Radar Signal 3



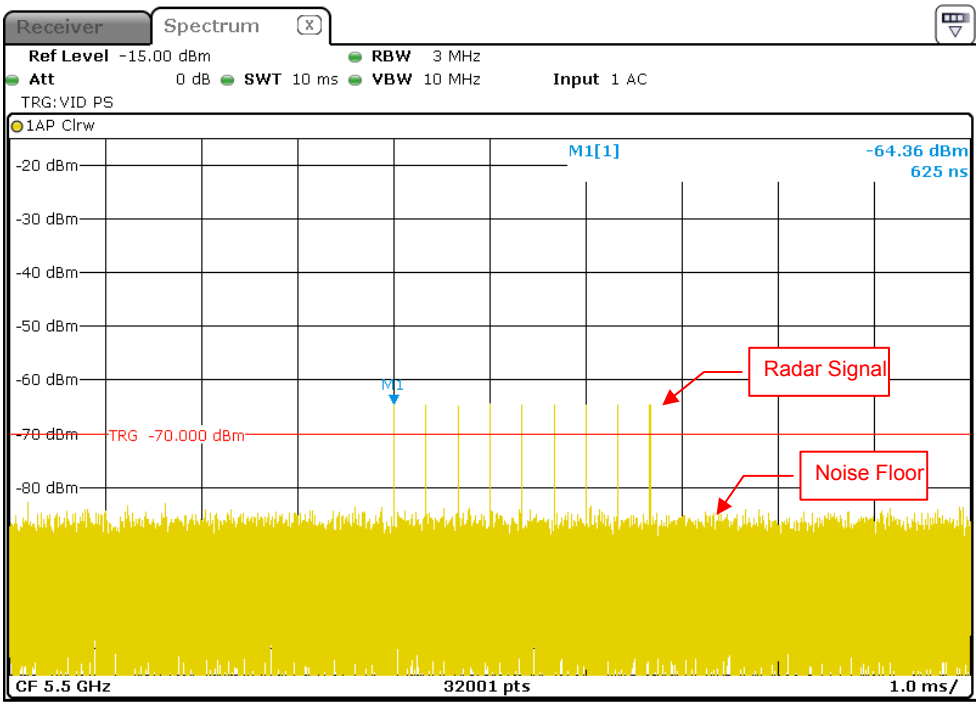

Radar Signal 4




Radar Signal 5



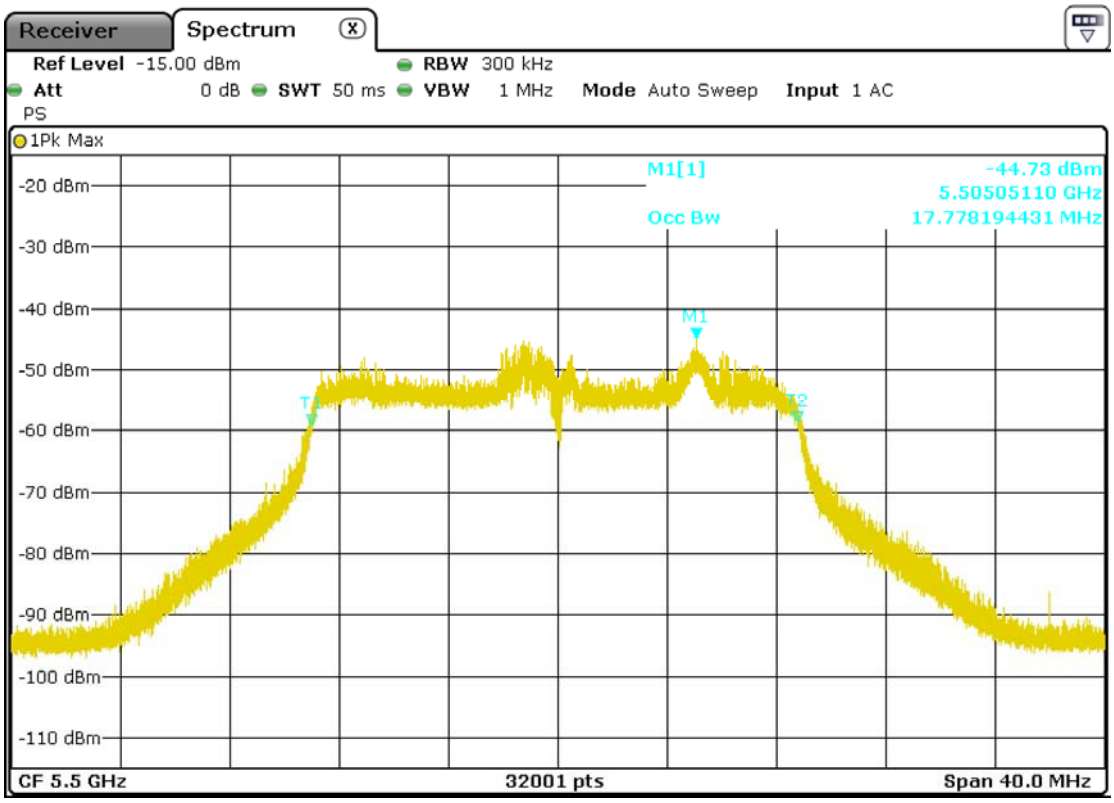

Single Burst of Radar Signal 5




Radar Signal 6

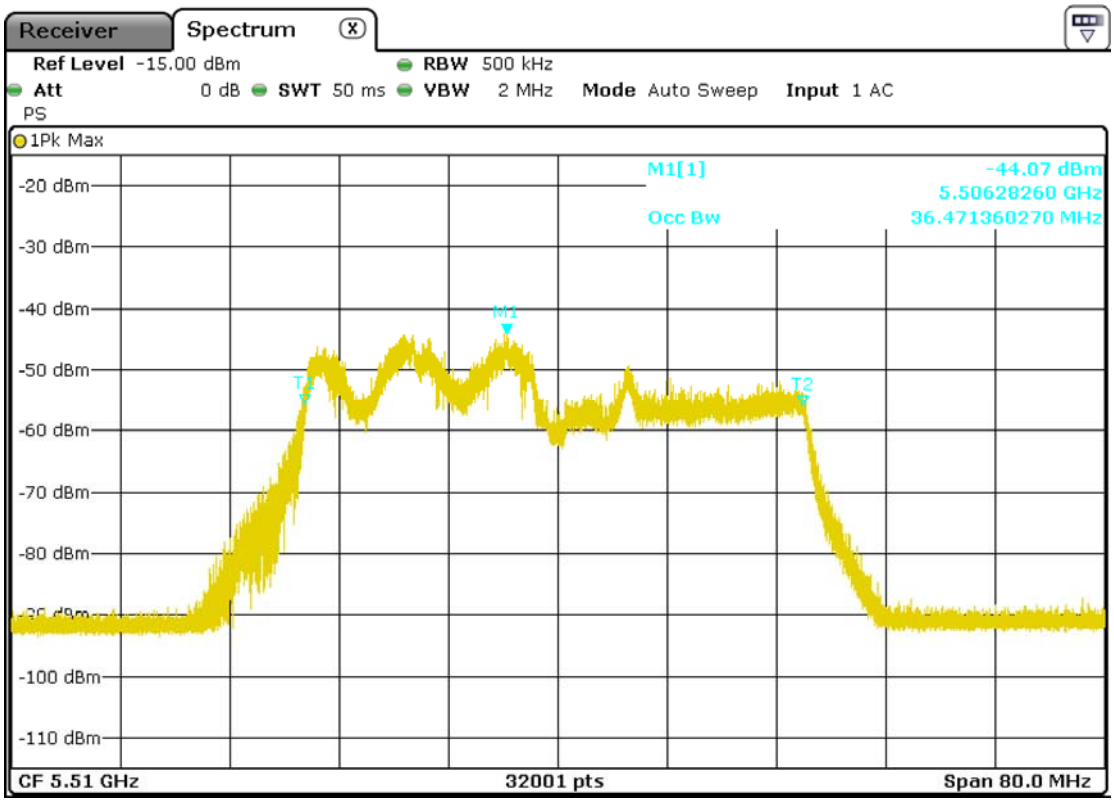
### 6.2.2 U-NII Detection Bandwidth

**802.11n HT20**



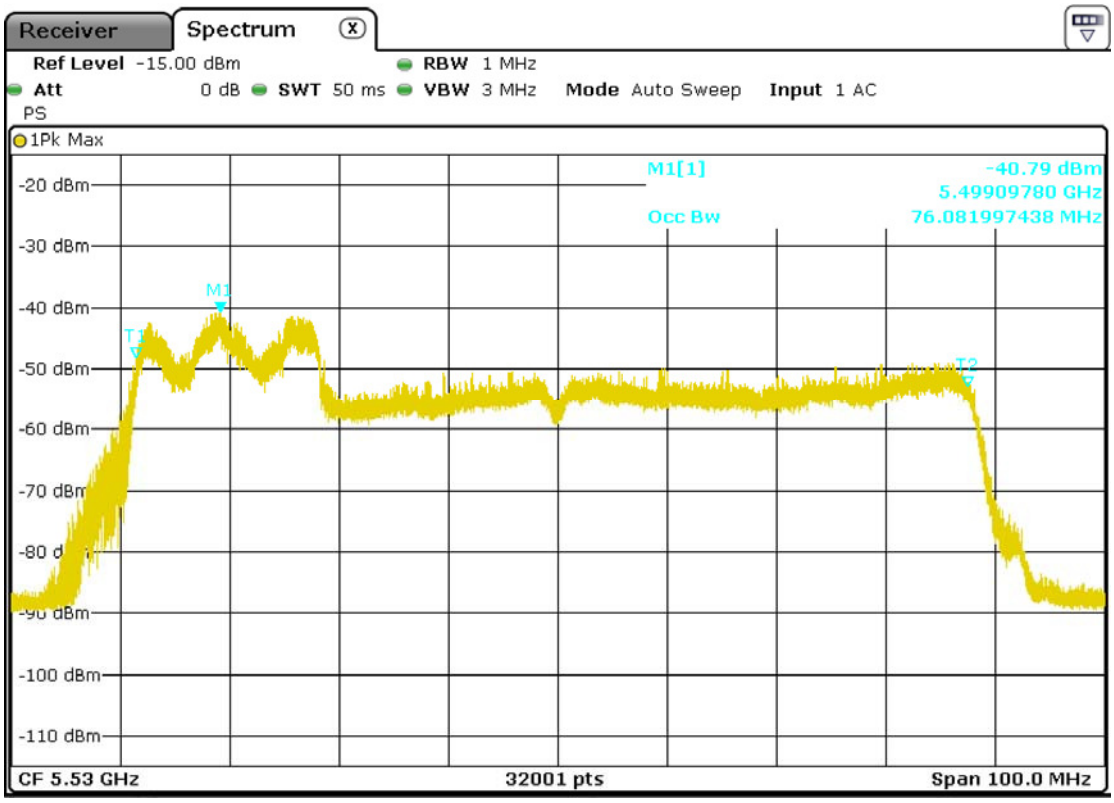

U-NII 99% Channel bandwidth

**802.11n HT40**




U-NII 99% Channel bandwidth

**802.11ac VHT80**




U-NII 99% Channel bandwidth

| Detection Bandwidth Test - IEEE 802.11n (HT20) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Radar Type 0<br>EUT Frequency: 5500MHz<br>EUT 99% Power bandwidth: 17.77MHz<br>Detection bandwidth limit (100% of EUT 99% Power bandwidth): 17.77MHz<br>Detection bandwidth (5510(FH) – 5490(FL)) : 20MHz<br>Test Result : PASS | | | | | | | | | | | |
| Radar Frequency (MHz) | Trial Number / Detection | | | | | | | | | | Detection Rate (%) |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 5489 | N | N | N | N | N | N | N | N | N | N | 0 |
| 5490(FL) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5491 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5492 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5493 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5494 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5495 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5496 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5497 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5498 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5499 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5500 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5501 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5502 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5503 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5504 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5505 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5506 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5507 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5508 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5509 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5510(FH) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5511 | N | N | N | N | N | N | N | N | N | N | 0 |

| Detection Bandwidth Test - IEEE 802.11n (HT40) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Radar Type 0<br>EUT Frequency: 5510MHz<br>EUT 99% Power bandwidth: 36.47MHz<br>Detection bandwidth limit (100% of EUT 99% Power bandwidth): 36.47MHz<br>Detection bandwidth (5530(FH) – 5490(FL)) : 40MHz<br>Test Result : PASS | | | | | | | | | | | |
| Radar Frequency (MHz) | Trial Number / Detection | | | | | | | | | | Detection Rate (%) |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 5489 | N | N | N | Y | N | N | N | N | N | N | 0 |
| 5490(FL) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5491 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5492 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5493 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5494 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5495 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5496 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5497 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5498 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5499 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5500 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5501 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5502 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5503 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5504 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5505 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5506 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5507 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5508 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5509 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5510 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5511 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5512 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5513 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5514 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5515 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5516 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5517 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5518 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5519 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5520 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5521 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5522 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5523 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5524 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5525 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5526 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5527 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5528 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5529 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5530(FH) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5531 | N | N | N | N | N | N | N | N | N | N | 0 |

| Detection Bandwidth Test - IEEE 802.11ac (VHT80) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Radar Type 0<br>EUT Frequency: 5530MHz<br>EUT 99% Power bandwidth: 76.08MHz<br>Detection bandwidth limit (100% of EUT 99% Power bandwidth): 76.08MHz<br>Detection bandwidth (5570(FH) – 5490(FL)) : 80MHz<br>Test Result : PASS | | | | | | | | | | | |
| Radar Frequency (MHz) | Trial Number / Detection | | | | | | | | | | Detection Rate (%) |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 5489 | N | N | N | N | N | N | N | N | N | N | 0 |
| 5490(FL) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5491 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5492 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5493 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5494 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5495 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5496 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5497 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5498 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5499 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5500 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5501 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5502 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5503 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5504 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5505 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5506 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5507 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5508 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5509 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5510 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5511 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5512 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5513 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5514 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5515 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5516 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5517 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5518 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5519 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5520 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5521 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5522 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5523 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5524 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5525 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5526 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5527 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5528 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5529 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5530 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5531 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5532 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5533 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5534 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |

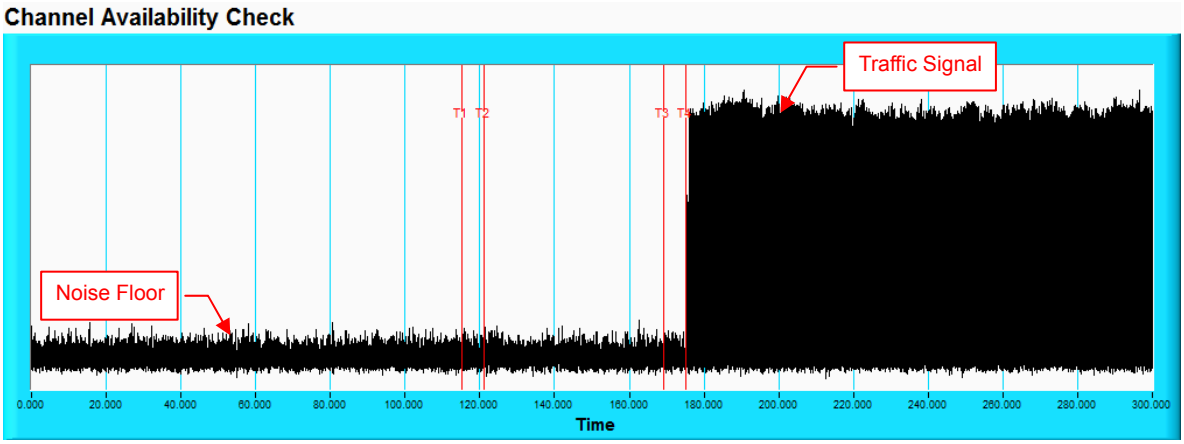
| Radar Frequency (MHz) | Trial Number / Detection | | | | | | | | | | Detection Rate (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 5535 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5536 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5537 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5538 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5539 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5540 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5541 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5542 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5543 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5544 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5545 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5546 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5547 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5548 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5549 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5550 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5551 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5552 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5553 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5554 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5555 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5556 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5557 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5558 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5559 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5560 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5561 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5562 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5563 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5564 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5565 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5566 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5567 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5568 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5569 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5570(FH) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 100 |
| 5571 | N | N | N | N | N | N | N | N | N | N | 0 |

### 6.1.1 Channel Availability Check Time

If the EUT successfully detected the radar burst, it should be observed as the EUT has no transmissions occurred until the EUT starts transmitting on another channel.

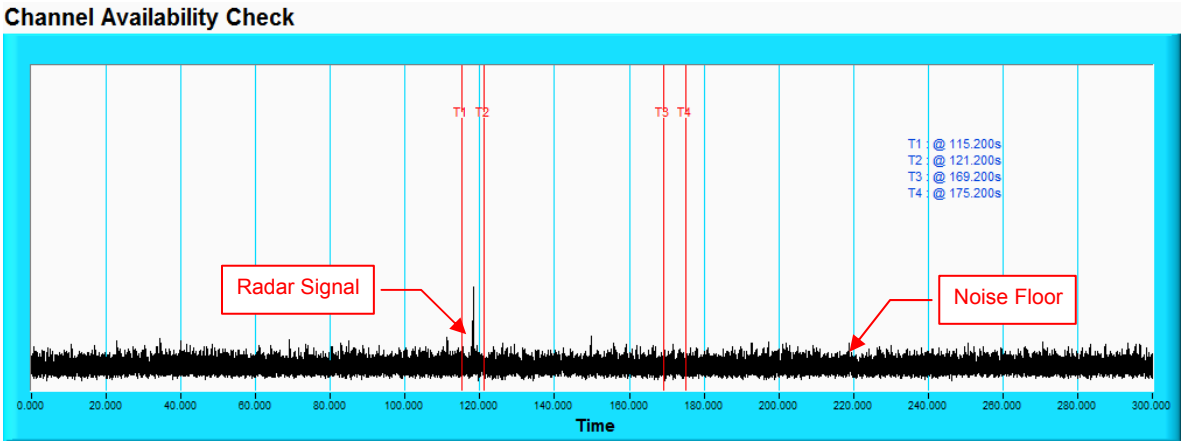
| Timing of Radar Signal | Observation | |
|---|---|---|
| | EUT | Spectrum Analyzer |
| Within 1 to 6 second | Detected | No transmissions |
| Within 54 to 60 second | Detected | No transmissions |

**Initial Channel Availability Check Time**



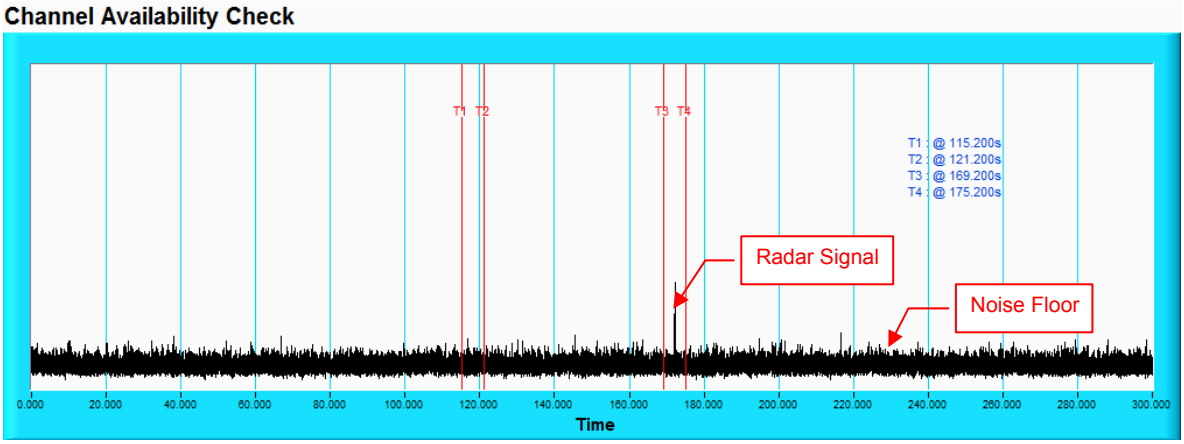

**NOTE:** T1 denotes the end of power-up time period is 115.2 second. T4 denotes the end of Channel Availability Check time is 175.2 second. Channel Availability Check time is equal to ( T4 – T1) 60 seconds.

**Radar Burst at the Beginning of the Channel Availability Check Time**




**NOTE:** T1 denotes the end of power up time period is 115.2 second. T2 denotes 121.2 second, the radar burst was commenced within a 6 second window starting from the end of power-up sequence. T4 denotes the 175.2 second.

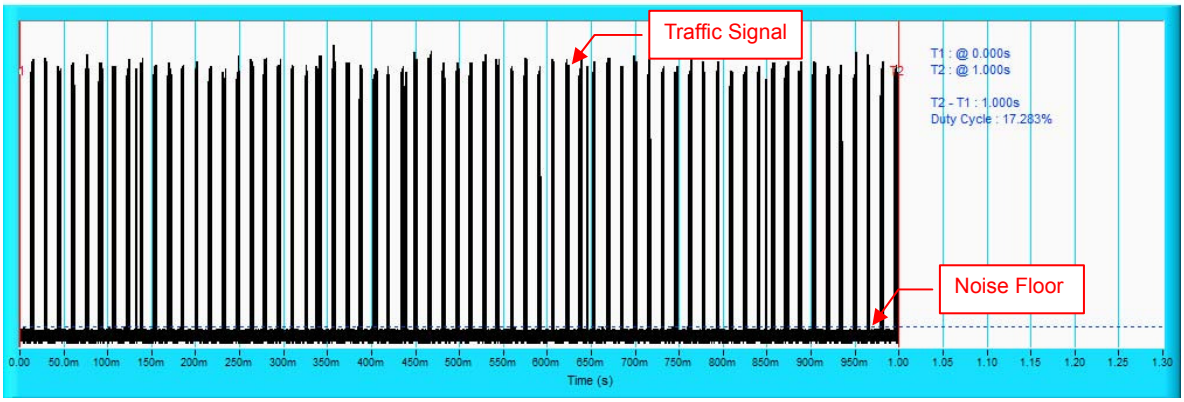
## Radar Burst at the End of the Channel Availability Check Time



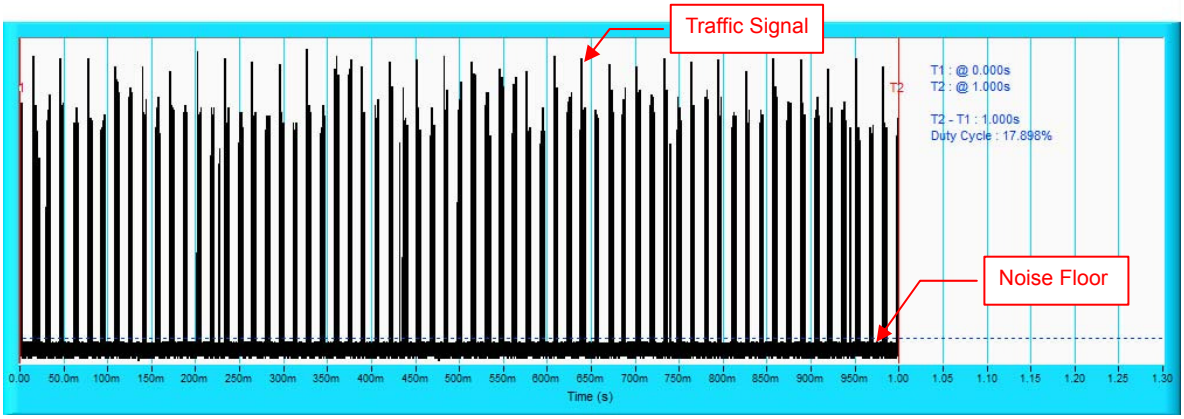

**NOTE:** T1 denotes the end of power up time period is 115.2 second. T3 denotes 169.2 second and radar burst was commenced within 54th second to 60th second window starting from the end of power-up sequence. T4 denotes the 175.2 second.

### 6.1.2 Channel Closing Transmission and Channel Move Time

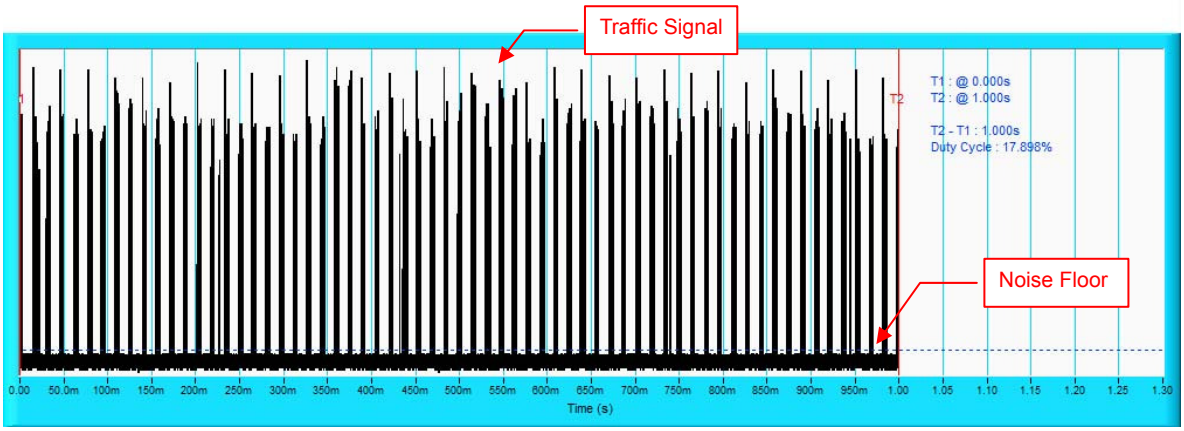
**Wireless Traffic Loading**
**IEEE 802.11n (HT20)**




**IEEE 802.11n (HT40)**




**IEEE 802.11ac VHT80**



**IEEE 802.11n (HT20)**

Table 1: Short Pulse Radar Test Waveforms.

| Radar Type | Pulse Width (μsec) | PRI (μsec) | Number of Pulses | Number of Trials (Times) | Percentage of Successful Detection (%) |
|---|---|---|---|---|---|
| 1 | 1 | Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a | $\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{PRI_{\mu sec}}\right)\right\}$ | 30 | 96.7 |
| | | Test B: 15 unique PRI values randomly selected within the range of 518-3066 $\mu$ sec, with a minimum increment of 1 $\mu$ sec, excluding PRI values selected in Test A | | | |
| 2 | 1-5 | 150-230 | 23-29 | 30 | 93.3 |
| 3 | 6-10 | 200-500 | 16-18 | 30 | 93.3 |
| 4 | 11-20 | 200-500 | 12-16 | 30 | 80.0 |
| Aggregate (Radar Types 1-4) | | | | 120 | 90.825 |

Table 2: Long Pulse Radar Test Waveform

| Radar Type | Pulse Width (μsec) | Chirp Width (MHz) | PRI (μsec) | Number of Pulses per Burst | Number of Bursts | Number of Trials(Times) | Percentage of Successful Detection (%) |
|---|---|---|---|---|---|---|---|
| 5 | 50-100 | 5-20 | 1000-2000 | 1-3 | 8-20 | 30 | 83.3 |

Table 3: Frequency Hopping Radar Test Waveform

| Radar Type | Pulse Width (μsec) | PRI (μsec) | Pulses per Hop | Hopping Rate (kHz) | Hopping Sequence Length (msec) | Number of Trials(Times) | Percentage of Successful Detection (%) |
|---|---|---|---|---|---|---|---|
| 6 | 1 | 333 | 9 | 0.333 | 300 | 30 | 100 |

The Detailed Radar pattern and Statistical Performance showed in Annex A.

**IEEE 802.11n (HT40)**

Table 1: Short Pulse Radar Test Waveforms.

| Radar Type | Pulse Width (μsec) | PRI (μsec) | Number of Pulses | Number of Trials (Times) | Percentage of Successful Detection (%) |
|---|---|---|---|---|---|
| 1 | 1 | Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a | $\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{\text{PRI}_{\mu\text{sec}}}\right)\right\}$ | 30 | 93.3 |
| | | Test B: 15 unique PRI values randomly selected within the range of 518-3066 $\mu$ sec, with a minimum increment of 1 $\mu$ sec, excluding PRI values selected in Test A | | | |
| 2 | 1-5 | 150-230 | 23-29 | 30 | 86.7 |
| 3 | 6-10 | 200-500 | 16-18 | 30 | 90.0 |
| 4 | 11-20 | 200-500 | 12-16 | 30 | 93.3 |
| Aggregate (Radar Types 1-4) | | | | 120 | 90.825 |

Table 2: Long Pulse Radar Test Waveform

| Radar Type | Pulse Width (μsec) | Chirp Width (MHz) | PRI (μsec) | Number of Pulses per Burst | Number of Bursts | Number of Trials(Times) | Percentage of Successful Detection (%) |
|---|---|---|---|---|---|---|---|
| 5 | 50-100 | 5-20 | 1000-2000 | 1-3 | 8-20 | 30 | 86.7 |

Table 3: Frequency Hopping Radar Test Waveform

| Radar Type | Pulse Width (μsec) | PRI (μsec) | Pulses per Hop | Hopping Rate (kHz) | Hopping Sequence Length (msec) | Number of Trials(Times) | Percentage of Successful Detection (%) |
|---|---|---|---|---|---|---|---|
| 6 | 1 | 333 | 9 | 0.333 | 300 | 30 | 100 |

The Detailed Radar pattern and Statistical Performance showed in Annex A.

**IEEE 802.11ac (VHT80)**

Table 1: Short Pulse Radar Test Waveforms.

| Radar Type | Pulse Width (μsec) | PRI (μsec) | Number of Pulses | Number of Trials (Times) | Percentage of Successful Detection (%) |
|---|---|---|---|---|---|
| 1 | 1 | Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a | $\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{\text{PRI}_{\mu\text{sec}}}\right)\right\}$ | 30 | 96.7 |
| | | Test B: 15 unique PRI values randomly selected within the range of 518-3066 $\mu$ sec, with a minimum increment of 1 $\mu$ sec, excluding PRI values selected in Test A | | | |
| 2 | 1-5 | 150-230 | 23-29 | 30 | 96.7 |
| 3 | 6-10 | 200-500 | 16-18 | 30 | 100 |
| 4 | 11-20 | 200-500 | 12-16 | 30 | 90.0 |
| Aggregate (Radar Types 1-4) | | | | 120 | 95.85 |

Table 2: Long Pulse Radar Test Waveform

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

Table 3: Frequency Hopping Radar Test Waveform

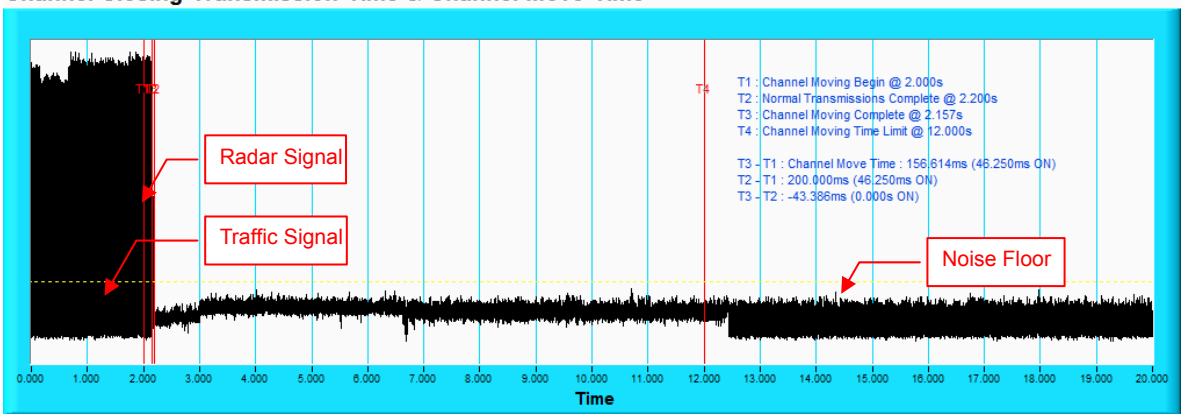
| Radar Type | Pulse Width (μsec) | PRI (μsec) | Pulses per Hop | Hopping Rate (kHz) | Hopping Sequence Length (msec) | Number of Trials(Times) | Percentage of Successful Detection (%) |
|---|---|---|---|---|---|---|---|
| 6 | 1 | 333 | 9 | 0.333 | 300 | 30 | 100 |

The Detailed Radar pattern and Statistical Performance showed in Annex A.

**Radar signal 0**

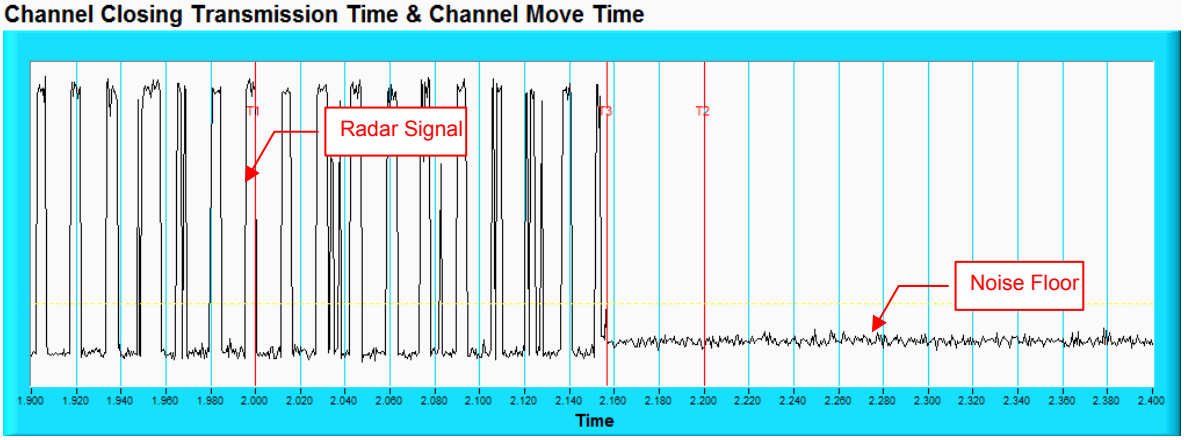
IEEE 802.11n (HT20)

**Channel Closing Transmission Time & Channel Move Time**



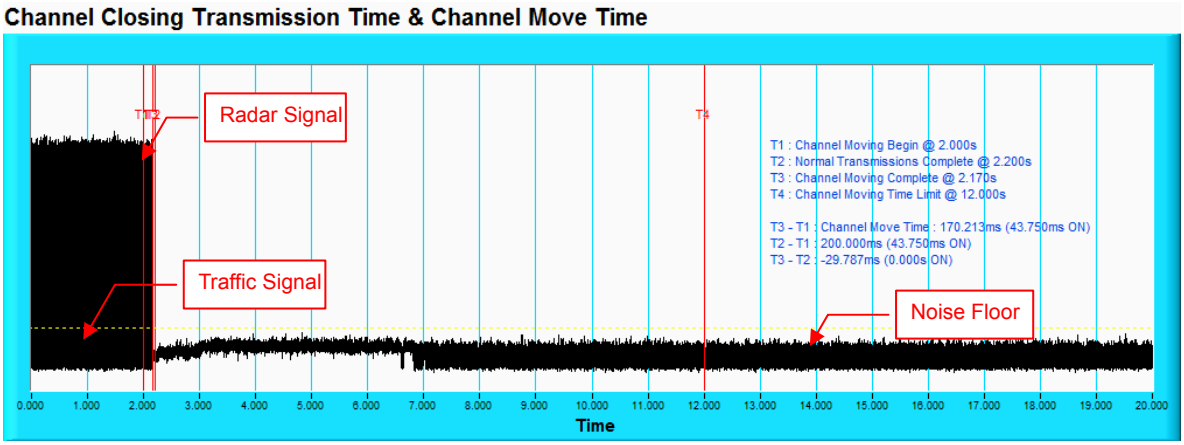

**NOTE:** T1 denotes the start of Channel Move Time upon the end of the last Radar burst. T2 denotes the data transmission time of 200ms from T1. T3 denotes the end of Channel Move Time. T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.

**Channel Closing Transmission Time & Channel Move Time**

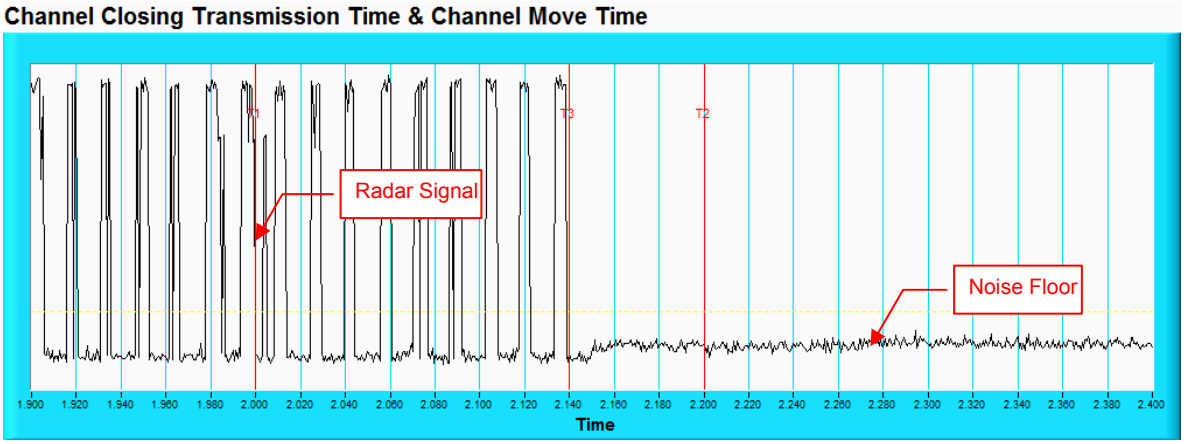



**NOTE:** Room-in of the first 500ms after radar signal applied.

**Radar signal 1**
IEEE 802.11n (HT20)

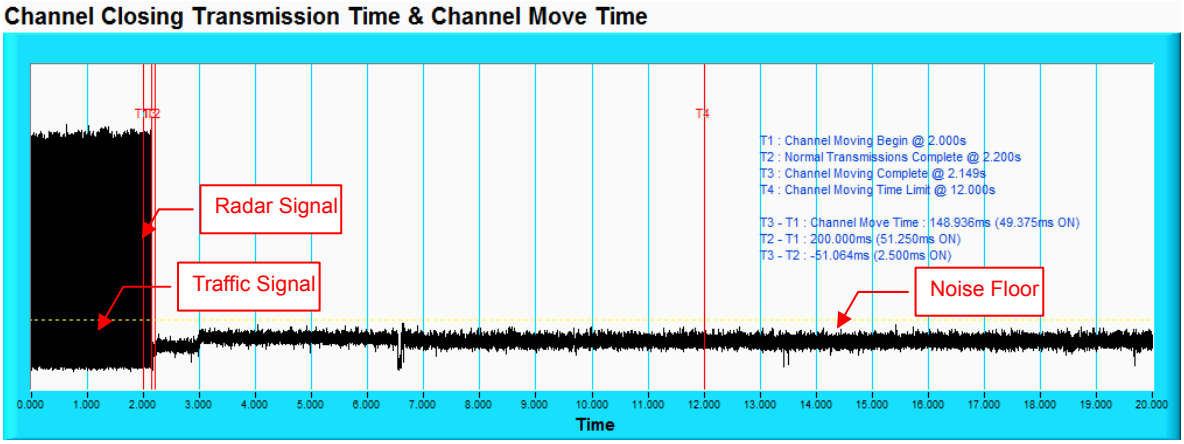



**NOTE:** T1 denotes the start of Channel Move Time upon the end of the last Radar burst. T2 denotes the data transmission time of 200ms from T1. T3 denotes the end of Channel Move Time. T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.

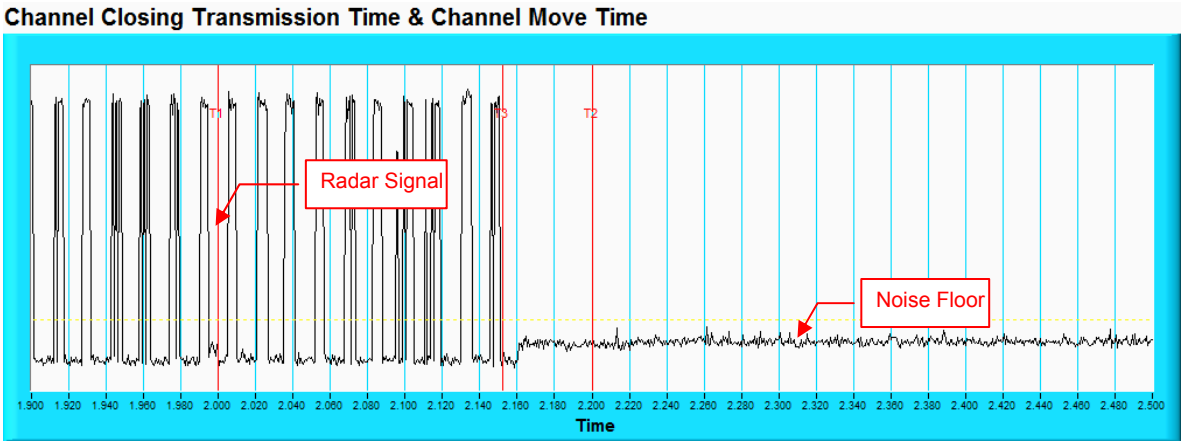



**NOTE:** Room-in of the first 500ms after radar signal applied.

**Radar signal 2**
IEEE 802.11n (HT20)




**NOTE:** T1 denotes the start of Channel Move Time upon the end of the last Radar burst. T2 denotes the data transmission time of 200ms from T1. T3 denotes the end of Channel Move Time. T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.

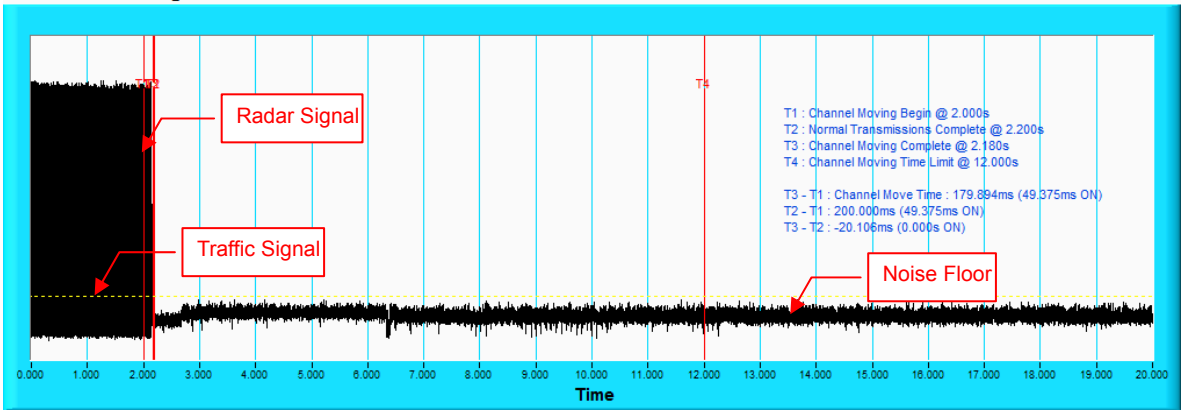



**NOTE:** Room-in of the first 500ms after radar signal applied.

**Radar signal 3**

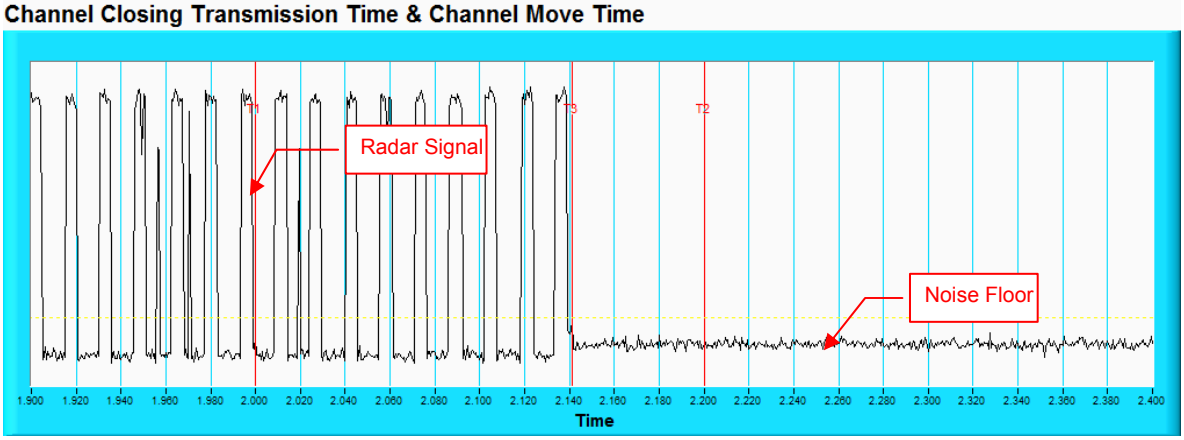
IEEE 802.11n (HT20)

**Channel Closing Transmission Time & Channel Move Time**



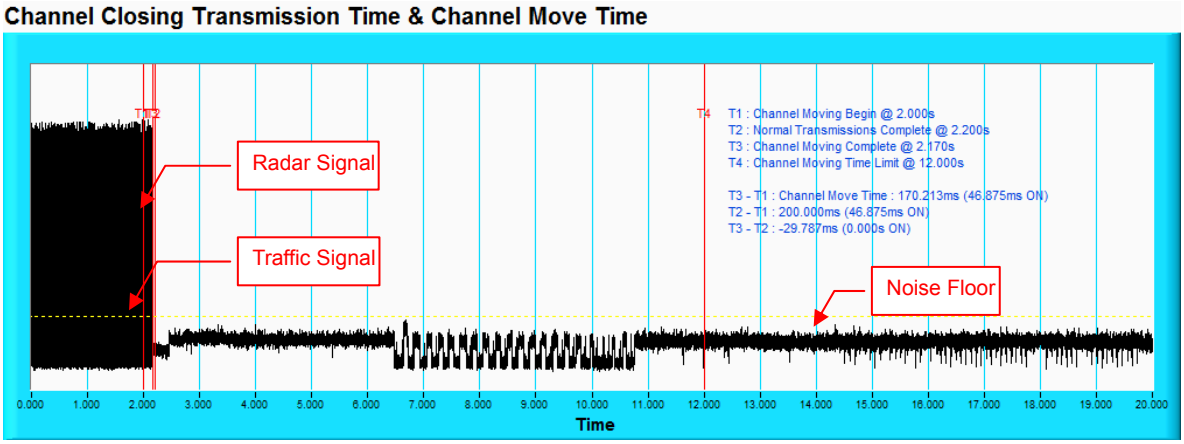

**NOTE:** T1 denotes the start of Channel Move Time upon the end of the last Radar burst. T2 denotes the data transmission time of 200ms from T1. T3 denotes the end of Channel Move Time. T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.

**Channel Closing Transmission Time & Channel Move Time**

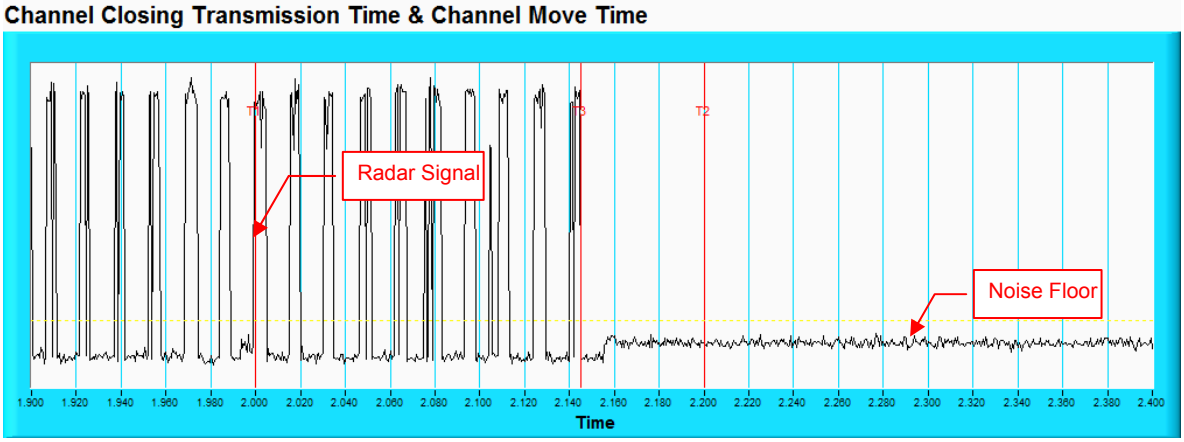



**NOTE:** Room-in of the first 500ms after radar signal applied.

**Radar signal 4**
IEEE 802.11n (HT20)




**NOTE:** T1 denotes the start of Channel Move Time upon the end of the last Radar burst. T2 denotes the data transmission time of 200ms from T1. T3 denotes the end of Channel Move Time. T4 denotes the 10 second from T1 to observe the aggregate duration of transmissions.




**NOTE:** Room-in of the first 500ms after radar signal applied.

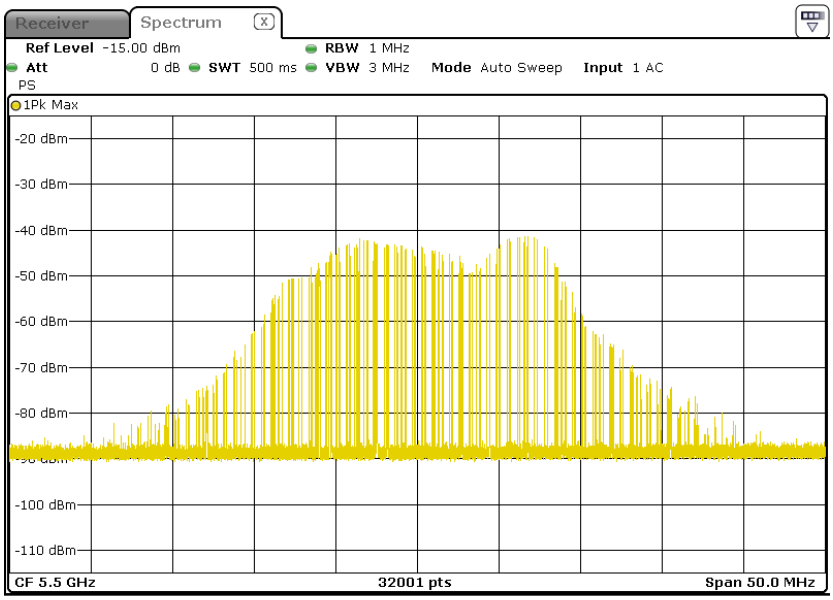
### 6.2.3 Non-Occupancy Period

**Associate test:**

During the 30 minutes observation time, UUT did not make any transmissions on a channel after a radar signal was detected on that channel by either the Channel Availability Check or the In-Service Monitoring.

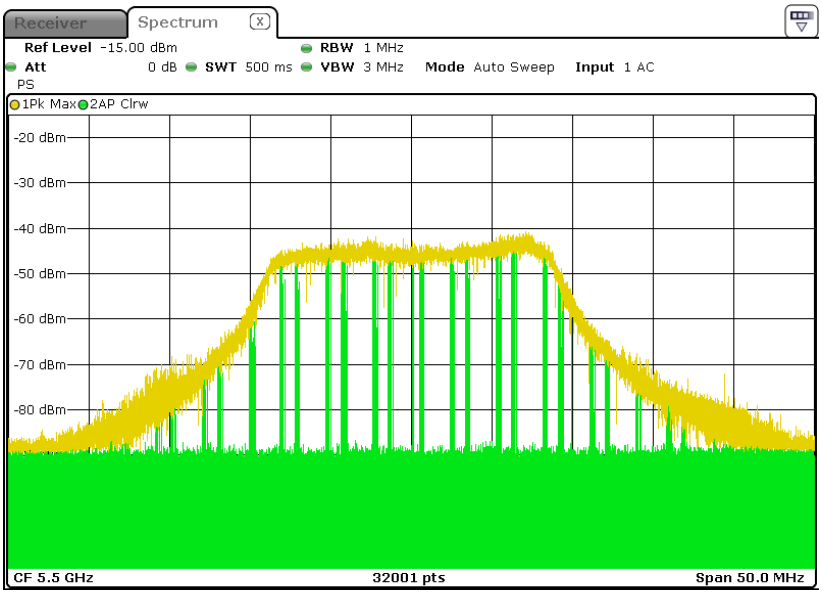
1) EUT (Client) links with master on 5500MHz.

Waveform of EUT links up with Master



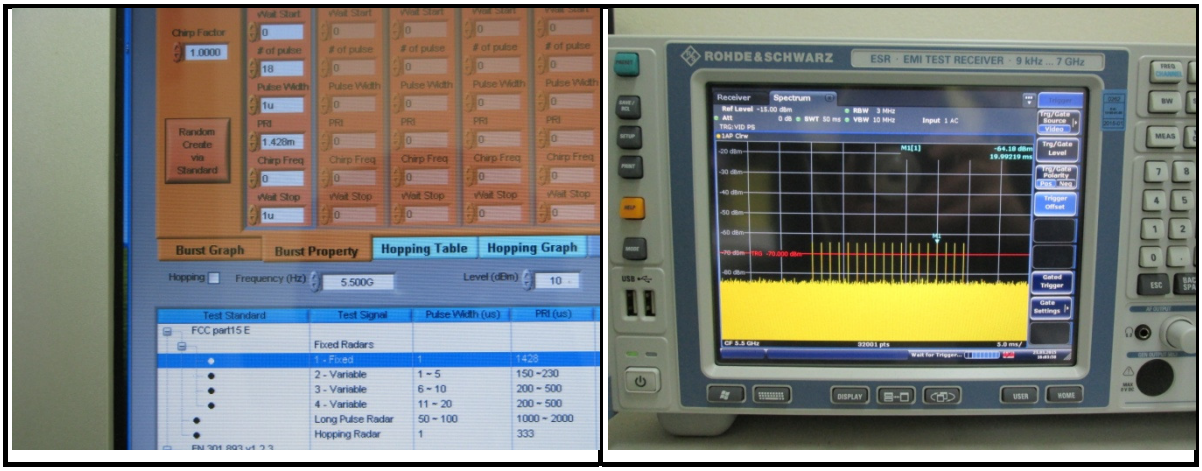

2) Client plays specified files via master.

Waveform of transmission

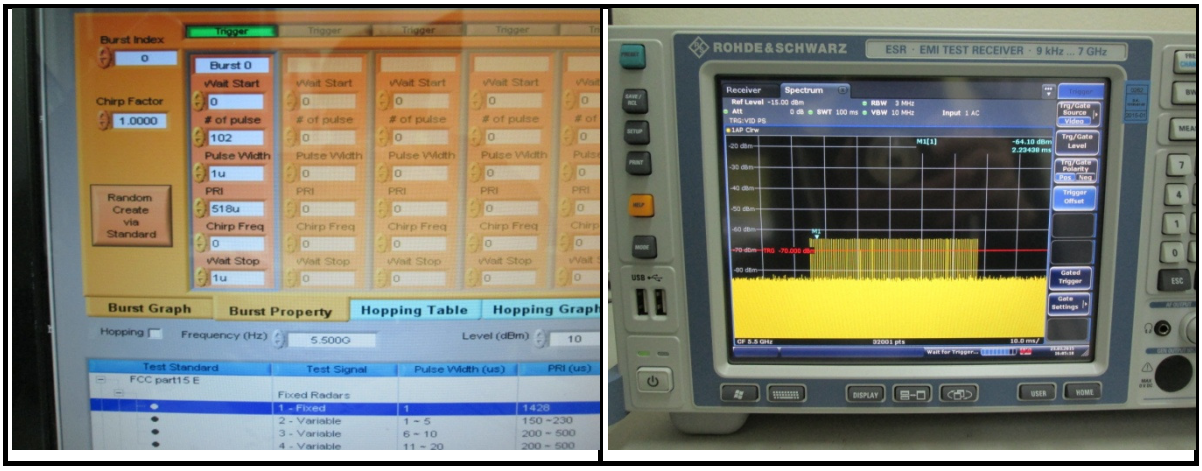


3) Radar signal is applied to the Master device and WiFi traffic signal stop immediately.

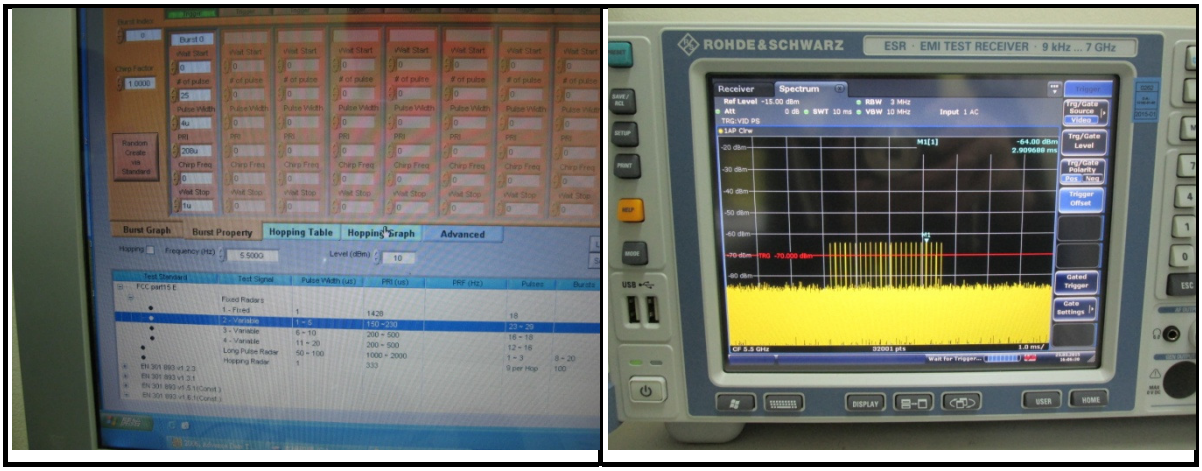
**Radar 0**



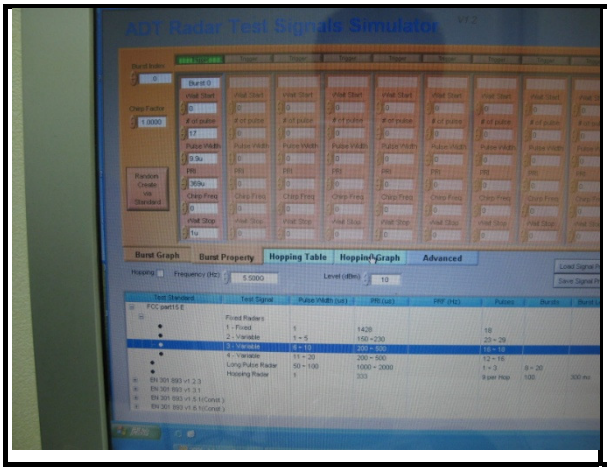

**Radar 1**

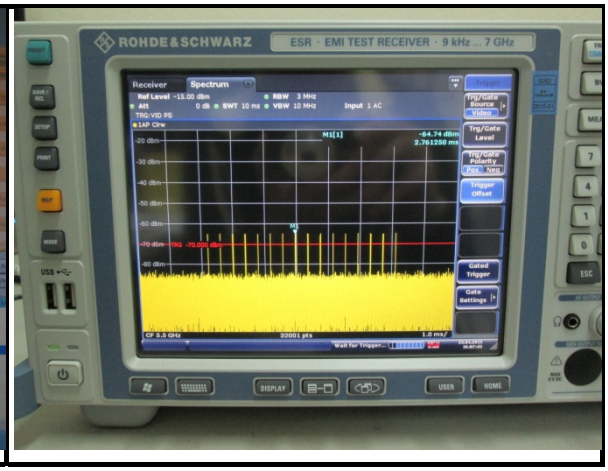



**Radar 2**

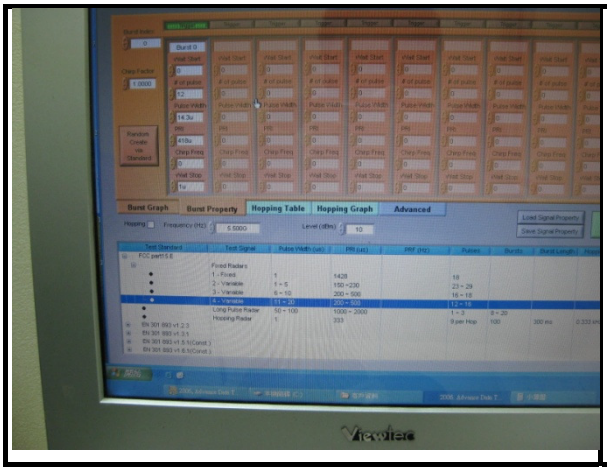


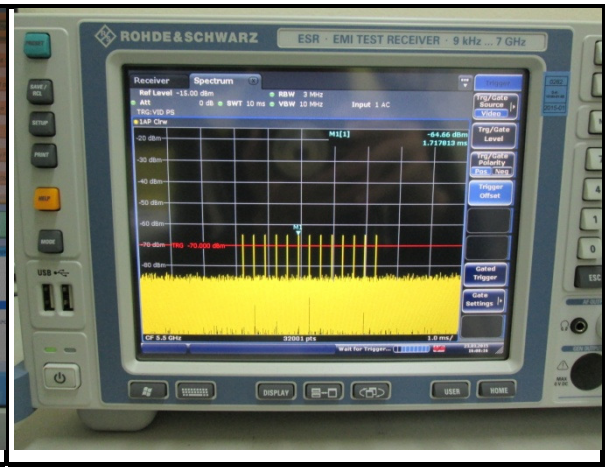
**Radar 3**



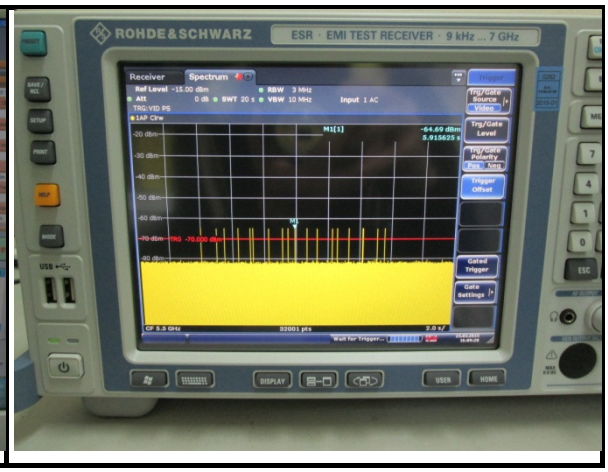




**Radar 4**

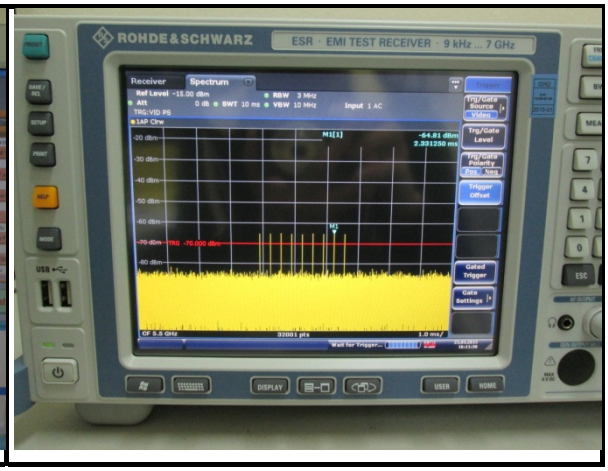



**Radar 5**



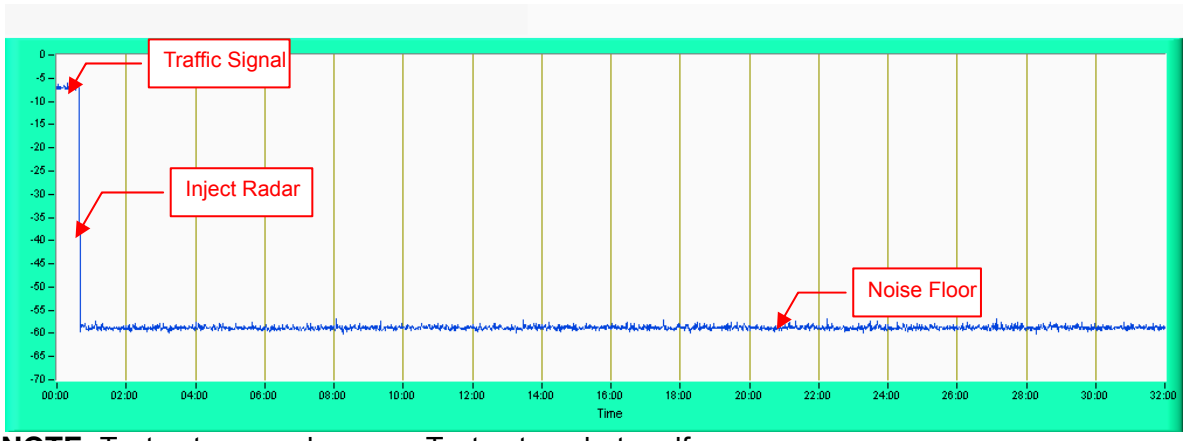
**Radar 6**




4) 5500MHz has been monitored in 30 minutes period. In this period, no any transmission occurs.

Plot of 30minutes period

**802.11n HT20**




**NOTE:** Test setup are shown on Test setup photo.pdf

### 6.2.4 Uniform Spreading

The intention of the uniform spreading is to provide, on aggregate, a uniform loading of the spectrum. The EUT randomly select next output channel without any bias or fixed pattern, so that all channels in DFS bands (5250 to 5350MHz and 5470 to 5725 MHz) will be used equally.

### 6.2.5 Transmit power control (TPC)

| TPC | E.I.R.P | FCC 15.407(h)(1) |
|---|---|---|
| √ | > 500mW | The TPC mechanism is required for system with an E.I.R.P. of above 500mW |
| | < 500mW | The TPC mechanism is not required for system with an E.I.R.P. of less 500mW |

## 7 Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:


**Linko EMC/RF Lab**
Tel: 886-2-26052180
Fax: 886-2-26051924

**Hsin Chu EMC/RF/Telecom Lab**
Tel: 886-3-6668565
Fax: 886-3-6668323

**Hwa Ya EMC/RF/Safety Lab**
Tel: 886-3-3183232
Fax: 886-3-3270892

**Email:** service.adt@tw.bureauveritas.com
**Web Site:** www.bureauveritas-adt.com


The address and road map of all our labs can be found in our web site also.

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