# FCC DFS Test Report

| | | |
|---|---|---|
| **Equipment** | : | **Sophos Wireless Access Point AP55** |
| **Brand Name** | : | **Sophos** |
| **Model No.** | : | **AP 55** |
| **FCC ID** | : | **2ACTO-AP55** |
| **Standard** | : | **47 CFR FCC Part 15.407** |
| **Applicant** | : | **Sophos Ltd**<br>The Pentagon, Abingdon, OX14 3YP,<br>United Kingdom |
| **Manufacturer** | : | **Edimax Technology Co., Ltd.**<br>No.3, Wu-Chuan 3rd Road, Wu-Ku Industrial Park,<br>New Taipei City 24891, Taiwan R.O.C. |
| **Operate Mode** | : | **Master** |

**The product sample received on Dec. 27, 2014 and completely tested on Jan. 15, 2015. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in FCC 06-96 Appendix and shown compliance with the applicable technical standards.**

**The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.**

**Reviewed by:**

Vic Hsiao / Supervisor

Testing Laboratory
1190

# Table of Contents

**1 GENERAL DESCRIPTION ..... 5**

1.1 Information ..... 5
1.2 Support Equipment ..... 6
1.3 Testing Applied Standards ..... 6
1.4 Testing Location Information ..... 6
1.5 Measurement Uncertainty ..... 6

**2 TEST CONFIGURATION OF EUT ..... 7**

2.2 The Worst Case Measurement Configuration ..... 7

**3 DYNAMIC FREQUENCY SELECTION (DFS) TEST RESULT ..... 8**

3.1 General DFS Information ..... 8
3.2 Radar Test Waveform Calibration ..... 10
3.3 UNII Detection Bandwidth ..... 15
3.4 Channel Availability Check (CAC) ..... 20
3.5 In-service Monitoring ..... 23
3.6 Statistical Performance Check ..... 27

**4 TEST EQUIPMENT AND CALIBRATION DATA ..... 55**

**APPENDIX A. TEST PHOTOS ..... 1**

# Summary of Test Result

| Conformance Test Specifications (FCC 06-96 Appendix) | | | | | |
|---|---|---|---|---|---|
| **Report Clause** | **Ref. Std. Clause** | **Description** | **Measured** | **Limit** | **Result** |
| 3.3 | 7.8.1 | DFS: UNII Detection Bandwidth Measurement | VHT20: 17.62 MHz<br>VHT80: 75.75 MHz | 80% of the 99% BW | Complied |
| 3.4 | 7.8.2.1 | DFS: Initial Channel Availability Check Time | Power-on Cycle = 59.4125 sec<br>CAC = 60 sec | CAC ≥ 60 sec | Complied |
| 3.4 | 7.8.2.2 | DFS: Radar Burst at the Beginning of the Channel Availability Check Time | Detect Radar Signal | Detection Threshold:<br>-64 dBm | Complied |
| 3.4 | 7.8.2.3 | DFS: Radar Burst at the End of the Channel Availability Check Time | Detect Radar Signal | Detection Threshold:<br>-64 dBm | Complied |
| 3.5 | 7.8.3 | DFS: In-Service Monitoring for Channel Move Time (CMT) | CMT < 10sec | CMT ≤ 10sec | Complied |
| 3.5 | 7.8.3 | DFS: In-Service Monitoring for Channel Closing Transmission Time (CCTT) | CCTT < 60 ms | CCTT ≤ 60 ms starting at CMT 200ms | Complied |
| 3.5 | 7.8.3 | DFS: In-Service Monitoring for Non-Occupancy Period (NOP) | NOP > 30 min | NOP ≥ 30 min | Complied |
| 3.6 | 7.8.4 | DFS: Statistical Performance Check | All Pd > Table 5 - 7<br>(KDB 905462) | Table 5 - 7<br>(KDB 905462) | Complied |
| 3.1.4 | 5.8.1 | DFS: Uniform Spreading | Manufacturer attestation using a Gaussian random algorithm of the spectrum with uniform spreading | Uniform Spreading for DFS Band | Complied |
| 3.1.5 | 8.1 | User Access Restrictions | Manufacturer attestation NOT accessible to user | DFS controls | Complied |

# Revision History

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| FZ462324-01 | Rev. 01 | Initial issue of report | Oct. 7, 2014 |
| FZ462324-03 | Rev. 01 | Update information as below:<br>1. Change Equipment name.<br>2. Change model name.<br>3. Change the FCC ID.<br>4. Change Antenna number to two Antenna. | Feb. 06, 2015 |
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# 1 General Description

## 1.1 Information

### 1.1.1 RF General Information

| IEEE Std. 802.11 | Channel Bandwidth (MHz) |
|---|---|
| a / n (HT20) / ac (VHT20) | 20 |
| n (HT40) / ac (VHT40) | 40 |
| ac (VHT80) | 80 |
| 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.<br>802.11ac uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation. | |

### 1.1.2 Antenna Information

| Antenna Category | |
|---|---|
| ☒ | External antenna (antenna permanently attached) |
| | ☒ Temporary RF connector provided |
| | ☐ No temporary RF connector provided<br>Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path. |

| Antenna General Information | | | |
|---|---|---|---|
| No. | Ant. Cat. | Ant. Type | Gain (dBi) |
| 1 | External | Dipole | 2.58 |
| 2 | | | 2.58 |
| For radiated tests, the DFS test should be performed with lowest antenna gain (regardless of antenna type). | | | |

## 1.2 Support Equipment

| Support Equipment | | | | |
|---|---|---|---|---|
| **No.** | **Equipment** | **Brand Name** | **Model Name** | **FCC ID.** |
| 1 | USB Dongle | NETGEAR | A6200 | PY312200200 |
| 2 | NoteBook PC | Dell | E5510 | - |
| 3 | NoteBook PC | Dell | E5530 | - |
| 4 | Switch | 3COM | Gigabit Switch 5 | - |
| 5 | UTM | SOPHOS | UTM 110/120/100 | - |

## 1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC 06-96 Appendix
- FCC KDB 905462 D01 UNII DFS Compliance Procedures Old Rules v01
- FCC KDB 443999 Approval of DFS UNII Devices

## 1.4 Testing Location Information

| Testing Location | | | | | |
|---|---|---|---|---|---|
| ☒ | HWA YA | ADD : | No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. | | |
| | | TEL : | 886-3-327-3456 | FAX : | 886-3-327-0973 |
| **Test Condition** | | **Test Site No.** | | **Test Engineer** | **Test Environment** |
| DFS Site | | DF01-HY | | Ben | 25°C / 61.5% |

## 1.5 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

| Measurement Uncertainty | | |
|---|---|---|
| **Test Item** | **Uncertainty** | **Limit** |
| Radio frequency | ± 8.7 X $10^{-7}$ | N/A |
| RF output power, conducted | ±0.6 dB | N/A |
| All emissions, conducted | ±0.8 dB | N/A |
| All emissions, radiated | ±2.8 dB | N/A |
| Temperature | ±0.8 °C | N/A |
| Humidity | ±3 % | N/A |
| DC and low frequency voltages | ±3 % | N/A |
| Time | ±1.4 % | N/A |

# 2 Test Configuration of EUT

### 2.1.1 DFS and TPC Information

| The DFS Related Operating Mode(s) of the Equipment | | | |
|---|---|---|---|
| ☒ Master | | | |
| ☐ Slave with radar detection | | | |
| ☐ Slave without radar detection | | | |
| **Software / Firmware Version** | | 9.203-3 | |
| **Power-on Cycle. (Master)** | | 101.7 sec | |
| **Communication Mode** | | ☒ IP Based | ☐ Frame Based |
| **IEEE Std. 802.11** | **Frequency Range (MHz)** | **TPC (Transmit Power Control)** | **Active Scan** |
| a / n (HT20) / ac (VHT20) | ☒ 5250-5350 | Yes | Yes |
| n (HT40) / ac (VHT40) | ☒ 5470-5725 | Yes | Yes |
| ac (VHT80) | ☐ 5600-5650 | - | - |

## 2.2 The Worst Case Measurement Configuration

| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| **Tests Item** | Dynamic Frequency Selection (DFS) |
| **Test Condition** | Radiated measurement<br>The EUT shall be configured to operate at the highest transmitter output power setting. If more than one antenna assembly is intended for this power setting, the gain of the antenna assembly with the lowest gain shall be used. The DFS radar test signals have been aligned to the direction corresponding to the EUT's maximum antenna gain. |
| **Modulation Mode** | VHT20 / VHT80 |

# 3 Dynamic Frequency Selection (DFS) Test Result

## 3.1 General DFS Information

### 3.1.1 DFS Parameters

| Table D.1: DFS requirement values | |
|---|---|
| **Parameter** | **Value** |
| Non-occupancy period | Minimum 30 minutes |
| Channel Availability Check Time | 60 seconds |
| Channel Move Time | 10 seconds See Note 1. |
| Channel Closing Transmission Time | 200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second periods. See Notes 1 and 2. |
| U-NII Detection Bandwidth | Minimum 80% of the 99% power bandwidth See Note 3. |

Note 1: The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:
- For the Short pulse radar Test Signals this instant is the end of the *Burst*.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar *Burst* generated.
- For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.

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 *Channel* changes (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 1 is used and for each frequency step the minimum percentage of detection is 90%. Measurements are performed with no data traffic.

| Table D.2: Interference threshold values | |
|---|---|
| **Maximum Transmit Power** | **Value (see note)** |
| ≥ 200 milliwatt | -64 dBm |
| < 200 milliwatt | -62 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.

### 3.1.2 Applicability of DFS Requirements Prior to Use of a Channel

| Requirement | DFS 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 |
| *Uniform Spreading* | Yes | Not required | Not required |
| *U-NII Detection Bandwidth* | Yes | Not required | Yes |

### 3.1.3 Applicability of DFS Requirements during Normal Operation

| Requirement | DFS Operational mode | | |
|---|---|---|---|
| | Master | Client without radar detection | Client with radar detection |
| *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 |

### 3.1.4 Uniform Spreading

| Manufacturer Declare the Uniform Spreading | |
|---|---|
| ☒ | For the 5250-5350 MHz and 5470-5725 MHz bands, the Master device provides, on aggregate, uniform loading of the spectrum across all devices by selecting an operating channel among the available channels using a Gaussian random algorithm. |

### 3.1.5 User Access Restrictions

| User Access Restrictions | |
|---|---|
| ☒ | DFS controls (hardware or software) related to radar detection are NOT accessible to the user. Manufacturer statement confirming that information regarding the parameters of the detected Radar Waveforms is not available to the end user. |

### 3.1.6 Channel Loading/Data Streaming

| | | |
|---|---|---|
| ☒ | IP Based (Load Based) - stream the test file from the Master to the Client. | |
| | ☐ | The client device is link with the master device and plays the WAV audio file from master device to client device. Test file download in NTIA website (http://ntiacsd.ntia.doc.gov/dfs/) |
| | ☒ | The client device is link with the master device and plays the MPEG file (6 1/2 Magic Hours) from master device to client device. Test file download in NTIA website (http://ntiacsd.ntia.doc.gov/dfs/) |
| | ☐ | Alternative streaming e.g., FTP with about 17 to 20% loading and submit proposal to FCC. |
| ☐ | Frame Based - stream the test file from the Master to the Client. | |
| | ☐ | fixed talk/listen ratio, set the ratio to 45%/55% |

## 3.2 Radar Test Waveform Calibration

### 3.2.1 Short Pulse Radar Test Waveforms

| Radar Type | Pulse Width (µsec) | PRI (µsec) | Number of Pulses | Minimum Percentage of Successful Detection | Minimum Trials |
|---|---|---|---|---|---|
| 1 | 1 | 1428 | 18 | 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 |

A minimum of 30 unique waveforms are required for each of the short pulse radar types 2 through 4. For short pulse radar type 1, the same waveform is used a minimum of 30 times. If more than 30 waveforms are used for short pulse radar types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. The aggregate is the average of the percentage of successful detections of short pulse radar types 1-4.

### 3.2.2 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 Trials |
|---|---|---|---|---|---|---|---|
| 5 | 50-100 | 5-20 | 1000-2000 | 1-3 | 8-20 | 80% | 30 |

Each waveform is defined as follows:

- The transmission period for the Long Pulse Radar test signal is 12 seconds.
- There are a total of 8 to 20 Bursts in the 12 second period, with the number of Bursts being randomly chosen. This number is Burst_Count.
- Each Burst consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each Burst within the 12 second sequence may have a different number of pulses.
- The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a Burst will have the same pulse width. Pulses in different Bursts may have different pulse widths.
- Each pulse has a linear FM chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a Burst will have the same chirp width. Pulses in different Bursts may have different chirp widths. The chirp is centered on the pulse. For example, with a radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.
- If more than one pulse is present in a Burst, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a Burst, the time between the first and second pulses is chosen independently of the time between the second and third pulses.
- The 12 second transmission period is divided into even intervals. The number of intervals is equal to Burst_Count. Each interval is of length (12,000,000 / Burst_Count) microseconds. Each interval contains one Burst. The start time for the Burst, relative to the beginning of the interval, is between 1 and [(12,000,000 / Burst_Count) – (Total Burst Length) + (One Random PRI Interval)] microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each Burst is chosen independently.

### 3.2.3 Frequency Hopping Radar Test Waveform

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

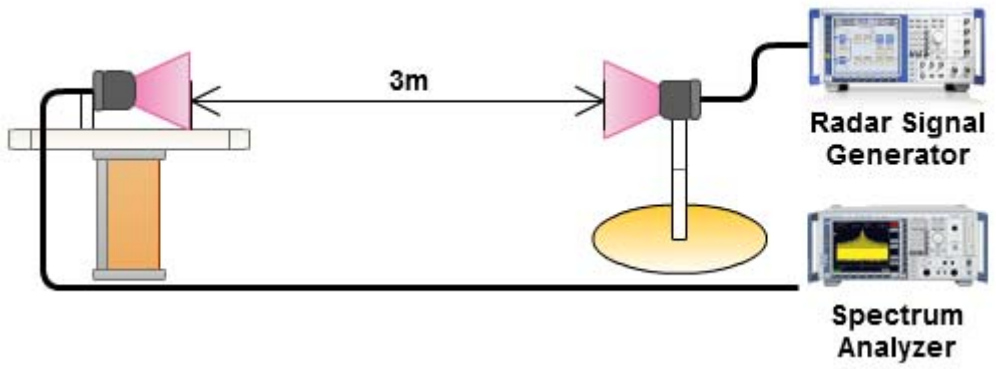
The FCC Type 6 waveform uses a static waveform with 100 bursts in the instruments ARB. In addition, the RF list mode is operated with a list containing 100 frequencies from a randomly generated list and it had be ensured that at least one of the random frequencies falls into the UNII Detection Bandwidth of the DUT. Each burst from the waveform file initiates a trigger pulse at the beginning that switches the RF list from one item to the next one.

### 3.2.4 DFS Threshold Level

| DFS Threshold Level | |
|---|---|
| DFS Threshold level: -64 dBm | ☐ at the antenna connector |
| | ☒ in front of the antenna |
| The Interference **Radar Detection Threshold Level** is -64 dBm. That had been taken into account the output power range and antenna gain. | |

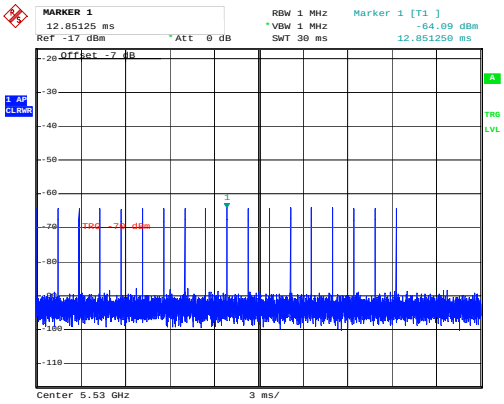
### 3.2.5 Calibration Setup

**Radiated Calibration Setup**



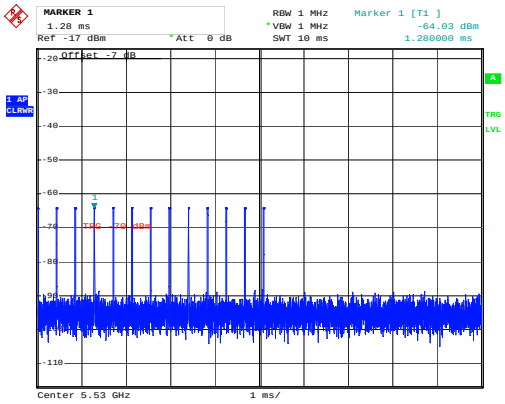
## Calibration Plots

### Radar #1 DFS detection threshold level




Date: 10.JAN.2015 15:58:43

### Radar #4 DFS detection threshold level

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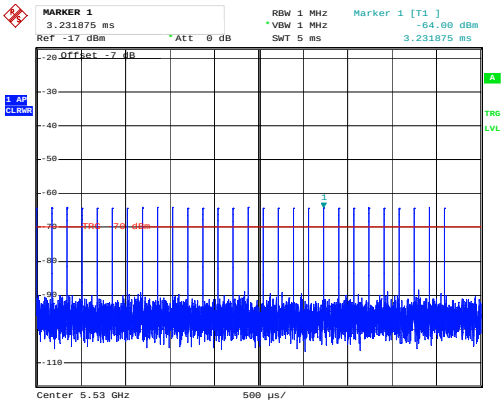
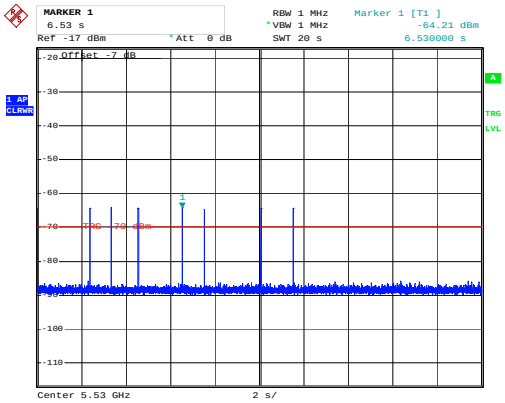
### Radar #2 DFS detection threshold level



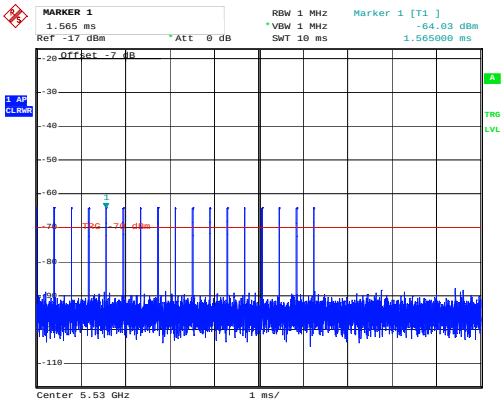

Date: 10.JAN.2015 16:02:50

### Radar #5 DFS detection threshold level



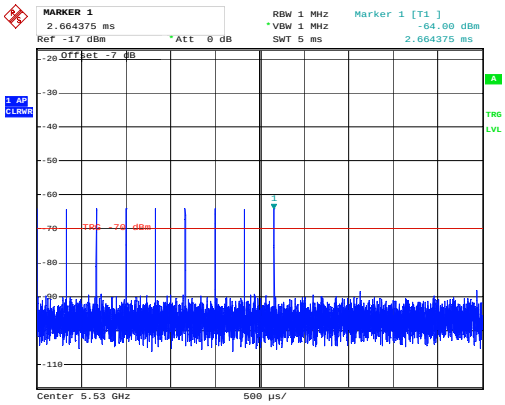

Date: 10.JAN.2015 16:55:31

### Radar #3 DFS detection threshold level




Date: 10.JAN.2015 16:05:38

### Radar #6 DFS detection threshold level

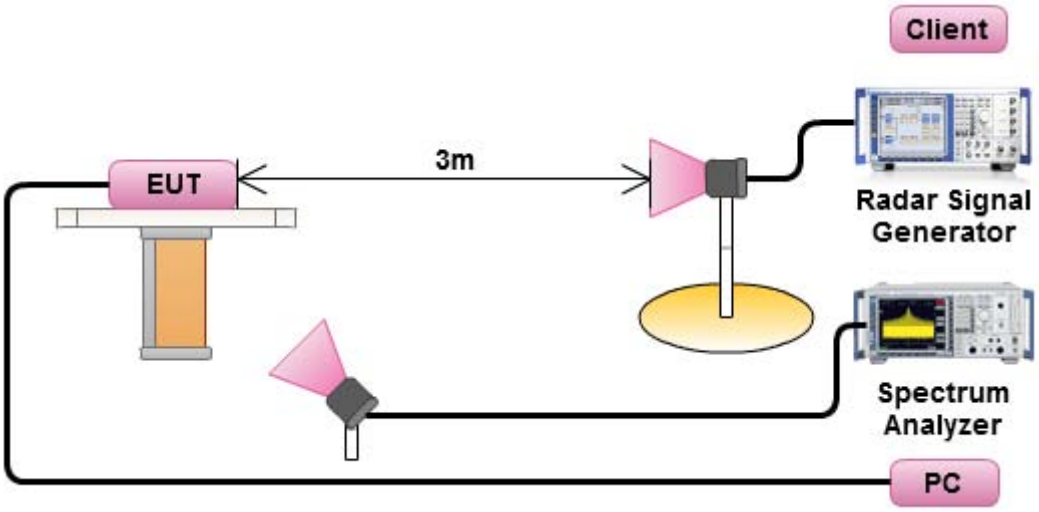



Date: 10.JAN.2015 17:21:14

### 3.2.6 Test Setup

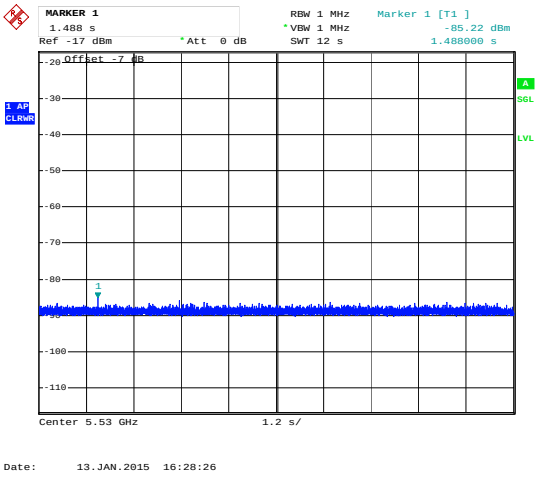
A spectrum analyzer is used as a monitor to verify that the EUT has vacated the Channel within the (Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the detection and Channel move.

**Master Radiated Measurement**

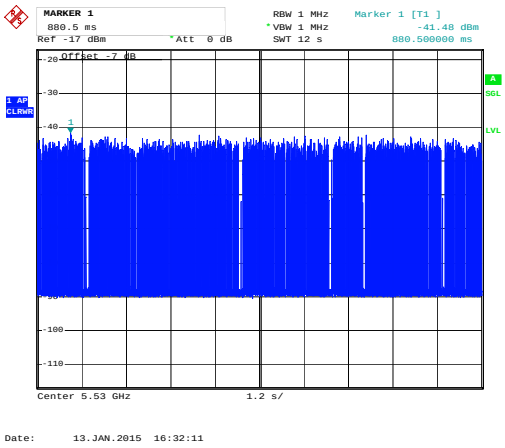


## Verification that when the EUT is “off” that the RF energy emitted Plots

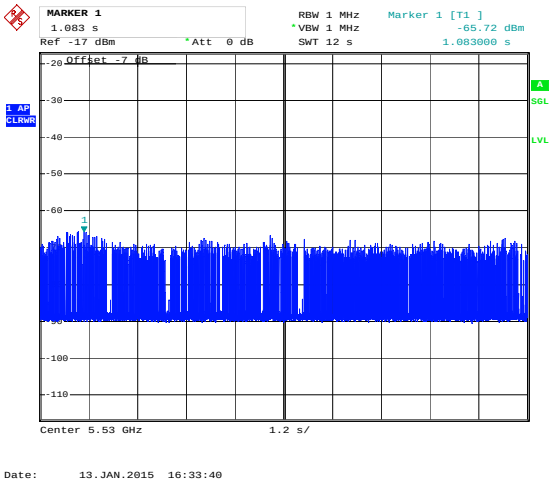
### Without Data Traffic Plot (Noise Plot)




### Master (EUT) Data Traffic Plot




### Client Data Traffic Plot



## 3.3 UNII Detection Bandwidth

### 3.3.1 UNII Detection Bandwidth Limit

| Channel Bandwidth (MHz) | 99% Power Bandwidth (MHz) | UNII Detection Bandwidth (MHz) |
|---|---|---|
| 20 | 17.62 | 14.096 |
| 80 | 75.75 | 60.6 |
| UNII Detection Bandwidth is minimum 80% of the 99% power bandwidth. A single radar Burst is generated for a minimum of 10 trials, and the response of the UUT is noted. The UUT must detect the Radar Waveform 90% or more of the time. | | |

### 3.3.2 Measuring Instruments

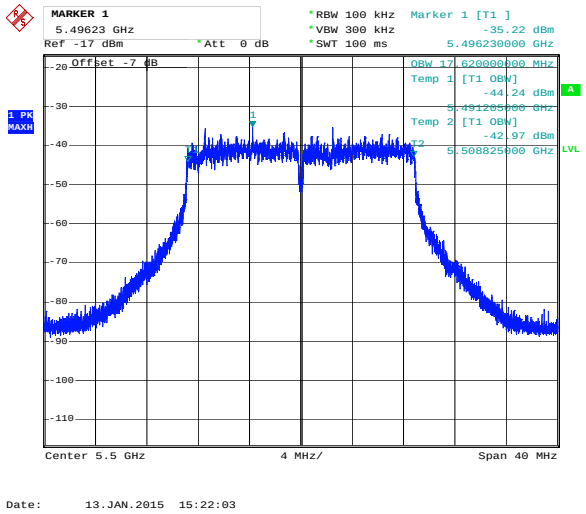
Refer a test equipment and calibration data table in this test report.

### 3.3.3 Test Procedures

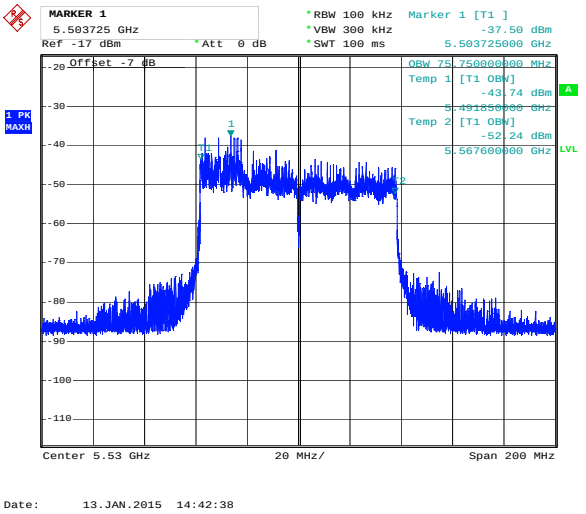
| Test Method |
|---|
| ☒ Refer as FCC 06-96 Appendix, clause 7.8.1 for UNII Detection Bandwidth test. During the U-NII Detection Bandwidth detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic. The EUT is set up as a standalone device (no associated Client and no traffic). The radar frequency is increased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The highest frequency at which detection is greater than or equal to 90% is denoted as $F_H$. The radar frequency is decreased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The lowest frequency at which detection is greater than or equal to 90% is denoted as $F_L$. UNII Detection Bandwidth = $F_H$ - $F_L$. |

**Emission Bandwidth Plots**

**VHT20**




**VHT80**



### 3.3.4 Test Result of UNII Detection Bandwidth

**Channel Bandwidth 20MHz**

| UNII Detection Bandwidth Result | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Radar Type | 1 | | | | | | | | | | | |
| Channel Bandwidth (MHz) | 20 | | | | | | | | | | | |
| Radar Freq. (MHz) | DFS Detection Trials (1=Detection, 0= No Detection) | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Detection Rate (%) | Detection Bandwidth (MHz) |
| 5490 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | 2 |
| 5491 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5492 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 90 | 17 |
| 5493 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5494 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5495 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5496 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5497 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 90 | |
| 5498 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5499 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5500 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5501 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5502 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 90 | |
| 5503 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5504 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5505 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5506 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5507 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5508 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 90 | |
| 5509 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | 2 |
| 5510 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| Limit (MHz) | | | | | | | | | | | | 14.096 |
| Result | | | | | | | | | | | | Complied |

**Channel Bandwidth 80MHz**

| UNII Detection Bandwidth Result | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Radar Type | 1 | | | | | | | | | | | |
| Channel Bandwidth (MHz) | 80 | | | | | | | | | | | |
| Radar Freq. (MHz) | DFS Detection Trials (1=Detection, 0= No Detection) | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Detection Rate (%) | Detection Bandwidth (MHz) |
| 5490 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | 1 |
| 5491 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | 78 |
| 5492 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 90 | |
| 5493 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 90 | |
| 5494 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5495 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5496 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5497 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5498 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5499 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5500 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5501 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5502 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 90 | |
| 5503 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5504 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5505 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5506 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5507 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5508 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5509 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 90 | |
| 5510 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 90 | |
| 5511 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5512 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5513 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5514 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5515 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5516 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5517 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5518 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5519 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5520 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5521 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5522 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5523 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5524 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5525 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5526 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5527 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5528 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |

| UNII Detection Bandwidth Result | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Radar Type | 1 | | | | | | | | | | | |
| Channel Bandwidth (MHz) | 80 | | | | | | | | | | | |
| Radar Freq. (MHz) | DFS Detection Trials (1=Detection, 0= No Detection) | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Detection Rate (%) | Detection Bandwidth (MHz) |
| 5529 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5530 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5531 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5532 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5533 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5534 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5535 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5536 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5537 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5538 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5539 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5540 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5541 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5542 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5543 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5544 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5545 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5546 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 90 | |
| 5547 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5548 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5549 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5550 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5551 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5552 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5553 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5554 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5555 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5556 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5557 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5558 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5559 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5560 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5561 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5562 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5563 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5564 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5565 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5566 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 90 | |
| 5567 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5568 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |

| UNII Detection Bandwidth Result | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Radar Type | 1 | | | | | | | | | | | |
| Channel Bandwidth (MHz) | 80 | | | | | | | | | | | |
| Radar Freq. (MHz) | DFS Detection Trials (1=Detection, 0= No Detection) | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Detection Rate (%) | Detection Bandwidth (MHz) |
| 5569 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | |
| 5570 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 100 | 1 |
| Limit (MHz) | | | | | | | | | | | | 60.6 |
| Result | | | | | | | | | | | | Complied |

## 3.4 Channel Availability Check (CAC)

### 3.4.1 Channel Availability Check Limit

| Channel Availability Check Limit | |
|---|---|
| ☒ | The EUT shall perform a Channel Availability Check to ensure that there is no radar operating on the channel. After power-up sequence, receive at least 1 minute (60 sec) on the intended operating frequency. |

### 3.4.2 Measuring Instruments

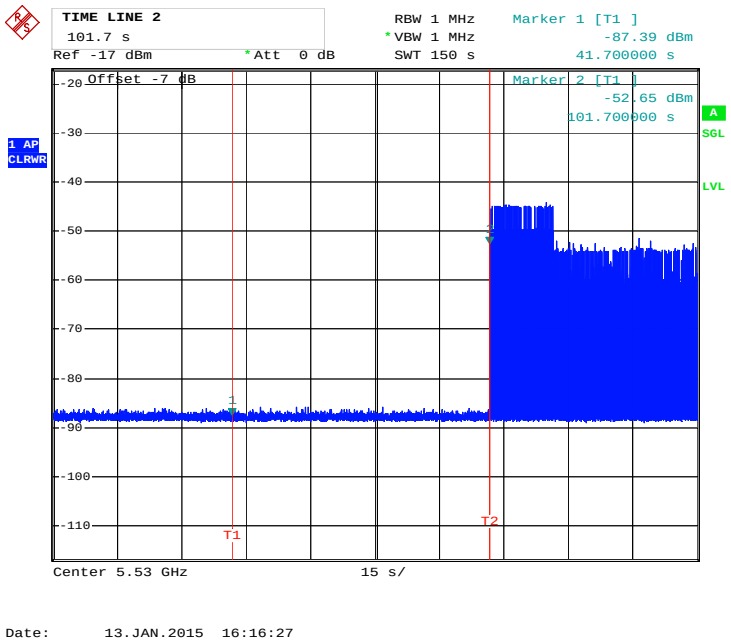
Refer a test equipment and calibration data table in this test report.

### 3.4.3 Test Procedures

| Test Method | |
|---|---|
| ☒ | Refer as FCC 06-96 Appendix, clause 7.8.2.1 for Initial Channel Availability Check Time. The EUT does not emit beacon, control, or data signals on the test Channel until the power-up sequence has been completed and the UNII device checks for Radar Waveforms for one minute on the test Channel. This test does not use any Radar Waveforms. |
| ☒ | Refer as FCC 06-96 Appendix, clause 7.8.2.2 for Radar Burst at the Beginning of the Channel Availability Check Time. To verify successful radar detection on the selected Channel during a period equal to the Beginning of the Channel Availability Check Time. |
| ☒ | Refer as FCC 06-96 Appendix, clause 7.8.2.3 for Radar Burst at the End of the Channel Availability Check Time. To verify successful radar detection on the selected Channel during a period equal to the End of the Channel Availability Check Time. |

### 3.4.4 Test Result of Channel Availability Check Time

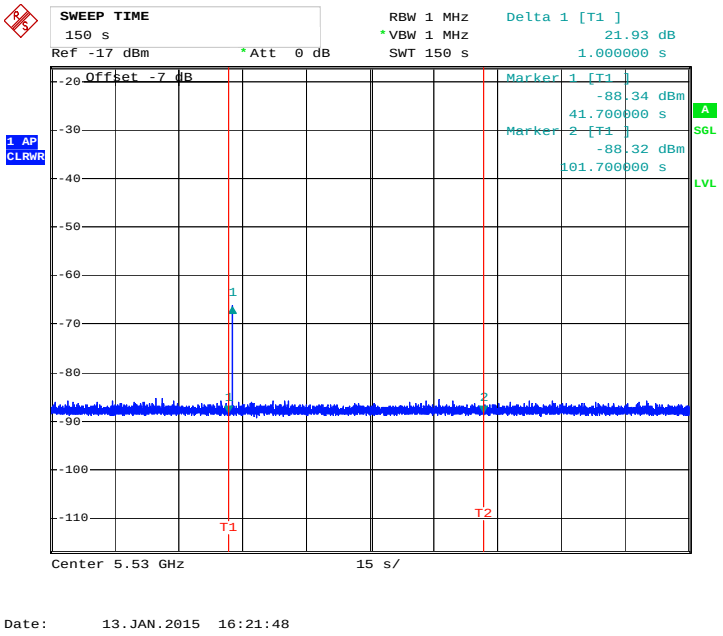
| Initial Channel Availability Check Time Result | | | | | |
|---|---|---|---|---|---|
| **Modulation Mode** | **Freq. (MHz)** | **Radar Test Signal** | **Power-on Cycle. (sec)** | **CAC Time (sec)** | **Observation Time (min)** |
| VHT80 | 5530 | N/A | **101.7** | 60 | 2.5 |
| **Result 150s Timing Plot** | | | **Complied** | | |




Note 1 : This test does not use any Radar Waveforms.
Note 2 : In the beginning, the EUT started in 80MHz.

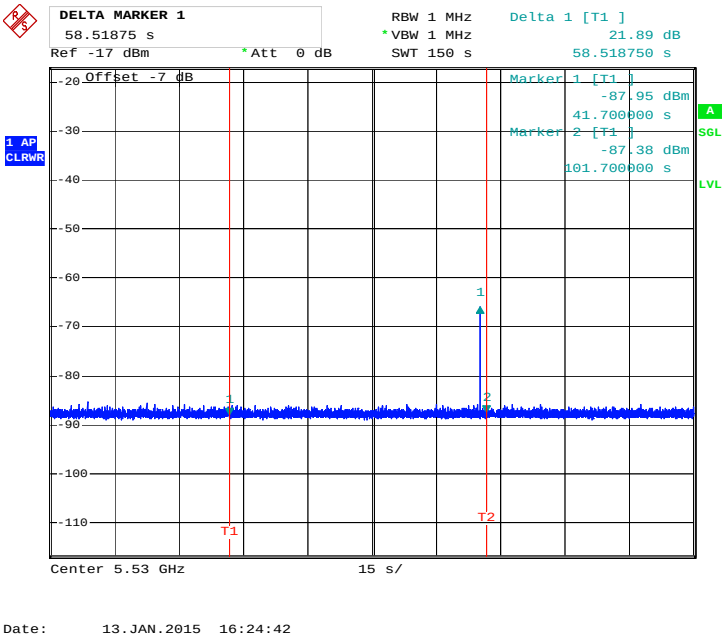
| Channel Availability Check Time Result | | | | | |
|---|---|---|---|---|---|
| **Modulation Mode** | **Freq. (MHz)** | **Radar Type Signal** | **Beginning CAC of Timing of radar burst (sec)** | **End CAC of Timing of radar burst (sec)** | **DFS Triggered (Yes/No)** |
| VHT80 | 5530 | 1 | 6 | 54 | Yes |
| **Result** | | | **Complied** | | |

**Beginning CAC of 150s Timing Plot**




Date: 13.JAN.2015 16:21:48

**End CAC of 150s Timing Plot**




Date: 13.JAN.2015 16:24:42

## 3.5 In-service Monitoring

### 3.5.1 In-service Monitoring Limit

| In-service Monitoring Limit | |
|---|---|
| Channel Move Time | 10 sec |
| Channel Closing Transmission Time | 200 ms + an aggregate of 60 ms over remaining 10 sec periods. |
| Non-occupancy period | Minimum 30 minutes |

### 3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

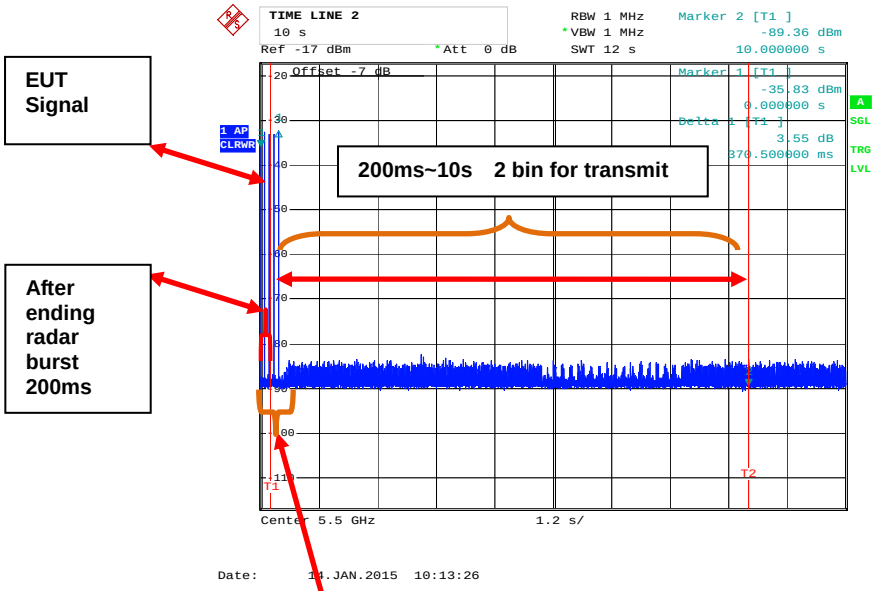
### 3.5.3 Test Procedures

| | Test Method |
|---|---|
| ☒ | Refer as FCC 06-96 Appendix, clause 7.8.3 verified during In-Service Monitoring; Channel Closing Transmission Time, Channel Move Time. Client Device will associate with the EUT. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the EUT during the observation time (Channel Move Time). Compare the Channel Move Time and Channel Closing Transmission Time limits. |
| ☒ | Refer as FCC 06-96 Appendix, clause 8.3 verified during In-Service Monitoring; Channel Closing Transmission Time, Channel Move Time. One 10 sec plot needs to be reported for the Short Pulse Radar Types 1-4 and one for the Long Pulse Radar Type in a 22 sec plot. And zoom-in a 600 ms plot verified channel closing time for the aggregate transmission time starting from 200ms after the end of the radar signal to the completion of the channel move. |
| ☒ | Refer as FCC 06-96 Appendix, clause 7.8.3 verified during In-Service Monitoring; Non-Occupancy Period. Client Device will associate with the EUT. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the EUT during the observation time (Non-Occupancy Period). Compare the Non-Occupancy Period limits. |

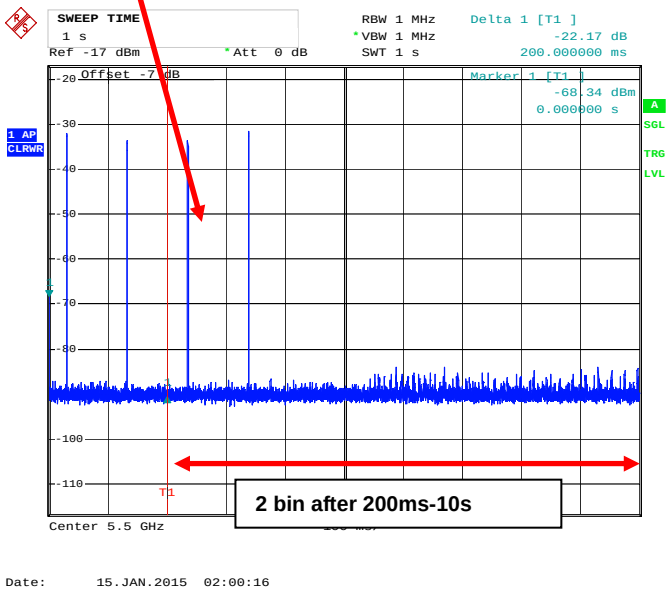
### 3.5.4 Test Result of In-service Monitoring

| Channel Closing Transmission Time and Channel Move Time Result | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation Mode | Freq. (MHz) | Radar Type | Channel Closing Transmission Time | | | | Channel Move Time | |
| | | | Tx Time in 0-0.2s | Tx Limit in 0-0.2s | Tx Time in 0.2s-10s | Tx Limit in 0.2s-10s | Movie Time in 0s-10s | Limit |
| VHT20 | 5500 | 1 | < 200ms | 200ms | 3ms | 60ms | 370.5 ms | 10 s |
| Total 8001 sample bin in 0-12s | | | transmission time bins: 2 [200ms~10s] | | | | | |

**12 sec Timing Plot**

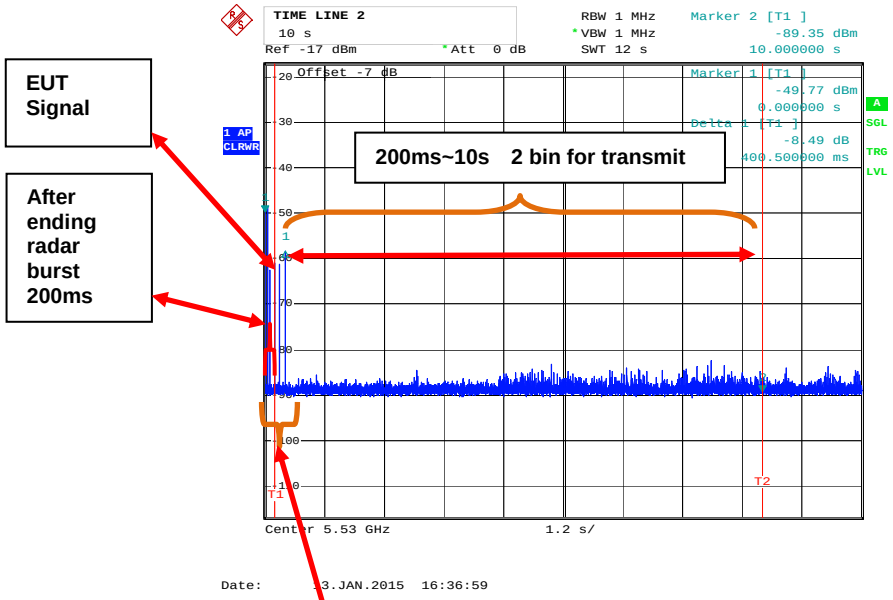



**Zoom-in 1s Timing Plot**

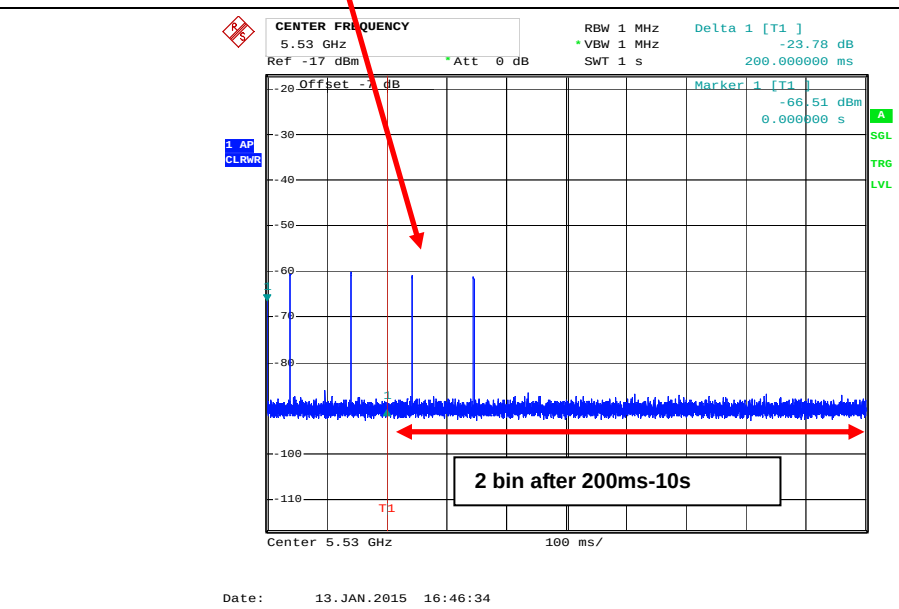


| Channel Closing Transmission Time and Channel Move Time Result | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation Mode | Freq. (MHz) | Radar Type | Channel Closing Transmission Time | | | | Channel Move Time | |
| | | | Tx Time in 0-0.2s | Tx Limit in 0-0.2s | Tx Time in 0.2s-10s | Tx Limit in 0.2s-10s | Movie Time in 0s-10s | Limit |
| VHT80 | 5530 | 1 | < 200ms | 200ms | 3ms | 60ms | 400.5 ms | 10s |
| Total 8001 sample bin in 0-12s | | | transmission time bins: 2 [200ms~10s] | | | | | |

**12 sec Timing Plot**

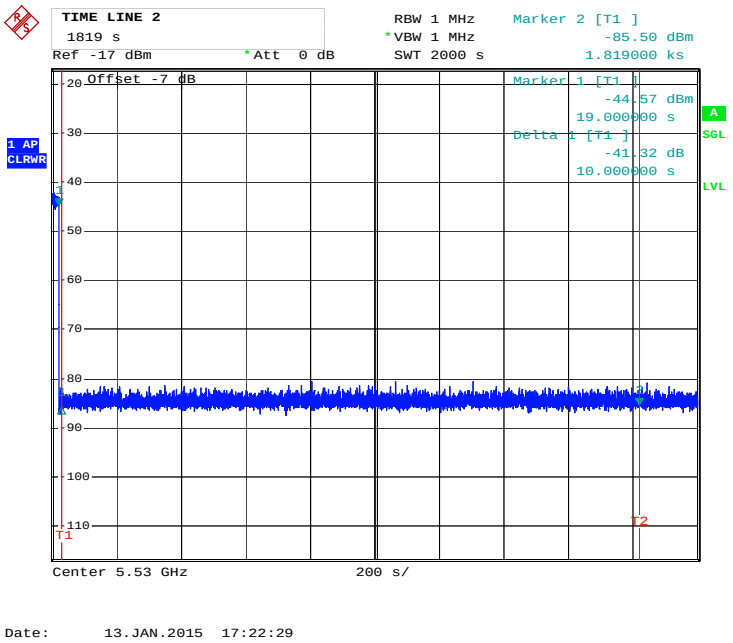



**Zoom-in 1s Timing Plot**



| Non-Occupancy Period Result | | | | |
|---|---|---|---|---|
| Modulation Mode | Freq. (MHz) | Non-Occupancy Period | | |
| | | Measured | Limit | Result |
| VHT80 | 5530 | >30min | 30min | Complied |

**2000 sec Timing Plot**



## 3.6 Statistical Performance Check

### 3.6.1 Statistical Performance Check Limit

| Radar Type | Minimum Percentage of Successful Detection (Pd) | Minimum Trials |
|---|---|---|
| 1 | 60% | 30 |
| 2 | 60% | 30 |
| 3 | 60% | 30 |
| 4 | 60% | 30 |
| Aggregate (Radar Types 1-4) | 80% | 120 |
| 5 | 80% | 30 |
| 6 | 70% | 30 |

The percentage of successful detection is calculated by:

$$\frac{TotalWaveformDetections}{TotalWaveformTrails} \times 100 = \text{Probability of Detection Radar Waveform}$$

In addition an aggregate minimum percentage of successful detection across all Short Pulse Radar Types 1-4 is required and is calculated as follows:

$$\frac{Pd1 + Pd2 + Pd3 + Pd4}{4}$$

### 3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

### 3.6.3 Test Procedures

| Test Method |
|---|
| ☒ Refer as FCC 06-96 Appendix, clause 7.8.4 for Statistical Performance Check test. Stream the MPEG test file from the Master Device to the Client Device on the test Channel for the entire period of the test. Observe the transmissions of the UUT at the end of the Burst on the Operating Channel for duration greater than 10 seconds for Short Pulse Radar Types 1-4 and 6 to ensure detection occurs. Then Observe the transmissions of the UUT at the end of the Burst on the Operating Channel for duration greater than 22 seconds for Long Pulse Radar Type 5 to ensure detection occurs. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trial runs. |

### 3.6.4

| Statistical Performance Check Result – VHT20 | | | | | |
|---|---|---|---|---|---|
| **Radar Signal (#)** | **Test Trail #** | **Detect Trail #** | **Pd (%)** | **Limit Pd (%)** | **Result** |
| **1** | 30 | 30 | 100 | 60 | Complied |
| **2** | 30 | 25 | 83 | 60 | Complied |
| **3** | 30 | 29 | 97 | 60 | Complied |
| **4** | 30 | 30 | 100 | 60 | Complied |
| **Aggregate 1 - 4** | 120 | 114 | 95 | 80 | Complied |
| **5** | 30 | 30 | 100 | 80 | Complied |
| **6** | 30 | 30 | 100 | 70 | Complied |

| Statistical Performance Check Result – VHT80 | | | | | |
|---|---|---|---|---|---|
| **Radar Signal (#)** | **Test Trail #** | **Detect Trail #** | **Pd (%)** | **Limit Pd (%)** | **Result** |
| **1** | 30 | 30 | 100 | 60 | Complied |
| **2** | 30 | 25 | 83 | 60 | Complied |
| **3** | 30 | 30 | 100 | 60 | Complied |
| **4** | 30 | 30 | 100 | 60 | Complied |
| **Aggregate 1 - 4** | 120 | 115 | 95.83 | 80 | Complied |
| **5** | 30 | 30 | 100 | 80 | Complied |
| **6** | 30 | 30 | 100 | 70 | Complied |

### 3.6.5 Detection Data Sheet for Radar Types 1, 5, and 6

| Radar Type | 1 | | 5 | | 6 | |
|---|---|---|---|---|---|---|
| Trail # | VHT20*1 | VHT80*1 | VHT20*1 | VHT80*1 | VHT20*1 | VHT80*1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | 1 | 1 | 1 | 1 | 1 | 1 |
| 6 | 1 | 1 | 1 | 1 | 1 | 1 |
| 7 | 1 | 1 | 1 | 1 | 1 | 1 |
| 8 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | 1 | 1 | 1 | 1 | 1 | 1 |
| 10 | 1 | 1 | 1 | 1 | 1 | 1 |
| 11 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | 1 | 1 | 1 | 1 | 1 | 1 |
| 13 | 1 | 1 | 1 | 1 | 1 | 1 |
| 14 | 1 | 1 | 1 | 1 | 1 | 1 |
| 15 | 1 | 1 | 1 | 1 | 1 | 1 |
| 16 | 1 | 1 | 1 | 1 | 1 | 1 |
| 17 | 1 | 1 | 1 | 1 | 1 | 1 |
| 18 | 1 | 1 | 1 | 1 | 1 | 1 |
| 19 | 1 | 1 | 1 | 1 | 1 | 1 |
| 20 | 1 | 1 | 1 | 1 | 1 | 1 |
| 21 | 1 | 1 | 1 | 1 | 1 | 1 |
| 22 | 1 | 1 | 1 | 1 | 1 | 1 |
| 23 | 1 | 1 | 1 | 1 | 1 | 1 |
| 24 | 1 | 1 | 1 | 1 | 1 | 1 |
| 25 | 1 | 1 | 1 | 1 | 1 | 1 |
| 26 | 1 | 1 | 1 | 1 | 1 | 1 |
| 27 | 1 | 1 | 1 | 1 | 1 | 1 |
| 28 | 1 | 1 | 1 | 1 | 1 | 1 |
| 29 | 1 | 1 | 1 | 1 | 1 | 1 |
| 30 | 1 | 1 | 1 | 1 | 1 | 1 |
| Pd (%) | 100 | 100 | 100 | 100 | 100 | 100 |
| Note 1: 1=Detection ;0=No Detection | | | | | | |

### 3.6.6 Data Sheet for Radar Type 2

| Radar Type | 2 | | | | |
|---|---|---|---|---|---|
| **Trail #** | **Pulse Width (us)** | **PRI (us)** | **Pulses / Burst** | **VHT20*1** | **VHT80*1** |
| 1 | 3.6 | 170 | 28 | 1 | 1 |
| 2 | 4.7 | 179 | 27 | 1 | 1 |
| 3 | 4.3 | 213 | 29 | 1 | 1 |
| 4 | 2.1 | 200 | 27 | 1 | 0 |
| 5 | 4.5 | 189 | 27 | 0 | 1 |
| 6 | 2.3 | 230 | 28 | 1 | 1 |
| 7 | 2.1 | 155 | 23 | 1 | 1 |
| 8 | 4.2 | 168 | 26 | 1 | 1 |
| 9 | 1.9 | 158 | 24 | 0 | 1 |
| 10 | 2 | 221 | 23 | 1 | 1 |
| 11 | 4 | 228 | 28 | 0 | 1 |
| 12 | 2.1 | 189 | 27 | 1 | 1 |
| 13 | 2 | 228 | 27 | 0 | 1 |
| 14 | 4.9 | 210 | 27 | 1 | 1 |
| 15 | 3.8 | 180 | 27 | 1 | 1 |
| 16 | 1.9 | 190 | 25 | 1 | 1 |
| 17 | 2.9 | 223 | 26 | 1 | 0 |
| 18 | 1.7 | 169 | 26 | 1 | 0 |
| 19 | 1.7 | 207 | 25 | 1 | 1 |
| 20 | 1.7 | 175 | 28 | 1 | 1 |
| 21 | 1.1 | 152 | 29 | 0 | 1 |
| 22 | 1.6 | 168 | 27 | 1 | 1 |
| 23 | 1.8 | 177 | 25 | 1 | 1 |
| 24 | 2.8 | 198 | 27 | 1 | 1 |
| 25 | 4 | 151 | 27 | 1 | 1 |
| 26 | 3 | 155 | 28 | 1 | 1 |
| 27 | 1.4 | 188 | 24 | 1 | 0 |
| 28 | 2 | 178 | 25 | 1 | 1 |
| 29 | 3.3 | 173 | 25 | 1 | 0 |
| 30 | 2.8 | 208 | 28 | 1 | 1 |
| Detection Percentage (%) | | | | 83 | 83 |
| Note 1: 1=Detection ;0=No Detection | | | | | |

### 3.6.7 Data Sheet for Radar Type 3

| Radar Type | 3 | | | | |
|---|---|---|---|---|---|
| **Trail #** | **Pulse Width (us)** | **PRI (us)** | **Pulses / Burst** | **VHT20*1** | **VHT80*1** |
| 1 | 6.4 | 390 | 17 | 1 | 1 |
| 2 | 9.1 | 410 | 17 | 1 | 1 |
| 3 | 9.4 | 490 | 17 | 0 | 1 |
| 4 | 7.6 | 395 | 17 | 1 | 1 |
| 5 | 7.9 | 201 | 17 | 1 | 1 |
| 6 | 9.1 | 227 | 16 | 1 | 1 |
| 7 | 7.8 | 477 | 16 | 1 | 1 |
| 8 | 7.2 | 497 | 16 | 1 | 1 |
| 9 | 7.9 | 491 | 16 | 1 | 1 |
| 10 | 8.5 | 304 | 16 | 1 | 1 |
| 11 | 10 | 443 | 17 | 1 | 1 |
| 12 | 8.1 | 264 | 18 | 1 | 1 |
| 13 | 7.7 | 461 | 17 | 1 | 1 |
| 14 | 6.1 | 242 | 17 | 1 | 1 |
| 15 | 7.8 | 331 | 18 | 1 | 1 |
| 16 | 7.8 | 481 | 17 | 1 | 1 |
| 17 | 6.6 | 325 | 18 | 1 | 1 |
| 18 | 6.6 | 239 | 17 | 1 | 1 |
| 19 | 6 | 258 | 17 | 1 | 1 |
| 20 | 6.8 | 464 | 18 | 1 | 1 |
| 21 | 9.1 | 288 | 17 | 1 | 1 |
| 22 | 6.1 | 375 | 17 | 1 | 1 |
| 23 | 8.8 | 377 | 17 | 1 | 1 |
| 24 | 9.5 | 293 | 17 | 1 | 1 |
| 25 | 9.1 | 437 | 18 | 1 | 1 |
| 26 | 6.7 | 290 | 17 | 1 | 1 |
| 27 | 7.2 | 481 | 16 | 1 | 1 |
| 28 | 9.4 | 315 | 18 | 1 | 1 |
| 29 | 6.9 | 356 | 17 | 1 | 1 |
| 30 | 9.6 | 385 | 16 | 1 | 1 |
| Detection Percentage (%) | | | | 97 | 100 |
| Note 1: 1=Detection ;0=No Detection | | | | | |

### 3.6.8 Data Sheet for Radar Type 4

| Radar Type | 4 | | | | |
|---|---|---|---|---|---|
| **Trail #** | **Pulse Width (us)** | **PRI (us)** | **Pulses / Burst** | **VHT20*1** | **VHT80*1** |
| 1 | 18.2 | 424 | 13 | 1 | 1 |
| 2 | 17 | 283 | 15 | 1 | 1 |
| 3 | 11.4 | 386 | 12 | 1 | 1 |
| 4 | 14.2 | 471 | 13 | 1 | 1 |
| 5 | 13.9 | 399 | 15 | 1 | 1 |
| 6 | 18.7 | 252 | 14 | 1 | 1 |
| 7 | 11.4 | 370 | 12 | 1 | 1 |
| 8 | 17.5 | 283 | 15 | 1 | 1 |
| 9 | 14.1 | 391 | 16 | 1 | 1 |
| 10 | 16.4 | 229 | 15 | 1 | 1 |
| 11 | 15.8 | 327 | 14 | 1 | 1 |
| 12 | 18.8 | 317 | 15 | 1 | 1 |
| 13 | 17.7 | 433 | 13 | 1 | 1 |
| 14 | 16.3 | 312 | 15 | 1 | 1 |
| 15 | 15 | 486 | 16 | 1 | 1 |
| 16 | 16.9 | 393 | 14 | 1 | 1 |
| 17 | 19.3 | 354 | 12 | 1 | 1 |
| 18 | 15.2 | 353 | 13 | 1 | 1 |
| 19 | 14 | 478 | 13 | 1 | 1 |
| 20 | 16 | 408 | 16 | 1 | 1 |
| 21 | 16.4 | 317 | 12 | 1 | 1 |
| 22 | 19.2 | 464 | 14 | 1 | 1 |
| 23 | 16.2 | 301 | 12 | 1 | 1 |
| 24 | 11.1 | 226 | 14 | 1 | 1 |
| 25 | 14 | 315 | 16 | 1 | 1 |
| 26 | 15.7 | 293 | 12 | 1 | 1 |
| 27 | 19.3 | 398 | 14 | 1 | 1 |
| 28 | 15.7 | 324 | 15 | 1 | 1 |
| 29 | 15.4 | 394 | 13 | 1 | 1 |
| 30 | 15.5 | 376 | 13 | 1 | 1 |
| Detection Percentage (%) | | | | 100 | 100 |
| Note 1: 1=Detection ;0=No Detection | | | | | |

### 3.6.9 Parameter Data Sheet for Radar Type 5

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 1 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 1 | 62.3 | 8 | | | 346 |
| 2 | 2 | 51.2 | 15 | 1745 | | 2705 |
| 3 | 3 | 93.6 | 5 | 957 | 1634 | 3674 |
| 4 | 3 | 68.2 | 12 | 1668 | 1573 | 4884 |
| 5 | 3 | 83.1 | 8 | 1188 | 1888 | 6876 |
| 6 | 1 | 56.7 | 18 | | | 7876 |
| 7 | 2 | 60.6 | 18 | 1874 | | 10409 |
| 8 | 3 | 75.5 | 13 | 1263 | 1683 | 11878 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 2 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 1 | 99.6 | 13 | | | 217 |
| 2 | 2 | 54.8 | 15 | 1727 | | 2315.333 |
| 3 | 3 | 91.1 | 15 | 1120 | 1826 | 3607.666 |
| 4 | 2 | 76.2 | 7 | 1638 | | 4476.999 |
| 5 | 1 | 88.9 | 13 | | | 5592.332 |
| 6 | 1 | 83 | 9 | | | 7558.665 |
| 7 | 1 | 83.9 | 12 | | | 8319.998 |
| 8 | 2 | 55.9 | 15 | 1613 | | 9778.331 |
| 9 | 1 | 96.1 | 13 | | | 11445.664 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 3 | |
| Burst | Number of Pulses | Pulse Width (μsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (μsec) | Pulse 2-to-3 Spacing (μsec) | Start Time (msec) |
| 1 | 2 | 82 | 6 | 1246 | | 1017 |
| 2 | 1 | 93.2 | 13 | | | 1960 |
| 3 | 2 | 61.3 | 13 | 1175 | | 2727 |
| 4 | 1 | 52.8 | 8 | | | 4424 |
| 5 | 3 | 70.6 | 19 | 929 | 1076 | 4915 |
| 6 | 1 | 80.3 | 17 | | | 6325 |
| 7 | 1 | 83.2 | 15 | | | 7879 |
| 8 | 2 | 94 | 9 | 1805 | | 9288 |
| 9 | 2 | 67 | 8 | 1486 | | 10449 |
| 10 | 1 | 56.4 | 20 | | | 11613 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 4 | |
| Burst | Number of Pulses | Pulse Width (μsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (μsec) | Pulse 2-to-3 Spacing (μsec) | Start Time (msec) |
| 1 | 3 | 90.5 | 8 | 1149 | 1612 | 35 |
| 2 | 3 | 54.5 | 8 | 1094 | 1525 | 2104.909 |
| 3 | 1 | 57.1 | 18 | | | 3008.818 |
| 4 | 2 | 98.6 | 20 | 1292 | | 3355.727 |
| 5 | 2 | 62.9 | 12 | 1433 | | 5039.636 |
| 6 | 1 | 71.1 | 15 | | | 6162.545 |
| 7 | 1 | 96.7 | 5 | | | 7256.454 |
| 8 | 1 | 64.3 | 5 | | | 8120.363 |
| 9 | 3 | 61.2 | 8 | 1075 | 1524 | 9171.272 |
| 10 | 2 | 79.2 | 13 | 1877 | | 10615.181 |
| 11 | 2 | 79.3 | 20 | 1313 | | 11197.09 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 5 | |
| Burst | Number of Pulses | Pulse Width (μsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (μsec) | Pulse 2-to-3 Spacing (μsec) | Start Time (msec) |
| 1 | 1 | 89.5 | 13 | | | 20 |
| 2 | 3 | 71.8 | 11 | 1446 | 1549 | 1117 |
| 3 | 3 | 53.7 | 15 | 1100 | 1517 | 2485 |
| 4 | 2 | 99.3 | 11 | 1571 | | 3334 |
| 5 | 3 | 56.8 | 6 | 1594 | 1280 | 4468 |
| 6 | 1 | 97.4 | 11 | | | 5213 |
| 7 | 2 | 67.6 | 13 | 1831 | | 6014 |
| 8 | 3 | 77.1 | 8 | 1683 | 1337 | 7267 |
| 9 | 1 | 98.5 | 17 | | | 8544 |
| 10 | 3 | 58.3 | 13 | 1924 | 1829 | 9159 |
| 11 | 1 | 98.4 | 14 | | | 10380 |
| 12 | 1 | 79.3 | 11 | | | 11257 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 6 | |
| Burst | Number of Pulses | Pulse Width (μsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (μsec) | Pulse 2-to-3 Spacing (μsec) | Start Time (msec) |
| 1 | 2 | 53.8 | 14 | 1631 | | 768 |
| 2 | 1 | 90 | 17 | | | 1453.077 |
| 3 | 3 | 87.2 | 18 | 1115 | 1297 | 2003.154 |
| 4 | 2 | 82 | 11 | 1728 | | 3661.231 |
| 5 | 3 | 69.8 | 7 | 1641 | 1779 | 3888.308 |
| 6 | 2 | 63.1 | 20 | 1836 | | 4946.385 |
| 7 | 1 | 59.8 | 6 | | | 6033.462 |
| 8 | 3 | 78.5 | 19 | 941 | 1921 | 7007.539 |
| 9 | 1 | 85.7 | 6 | | | 7603.616 |
| 10 | 3 | 67.7 | 9 | 1834 | 1450 | 8841.693 |
| 11 | 2 | 84.5 | 15 | 1376 | | 9512.77 |
| 12 | 2 | 99.3 | 13 | 1570 | | 10639.847 |
| 13 | 2 | 80.2 | 8 | 1088 | | 11143.924 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 7 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 3 | 80.8 | 10 | 1061 | 1124 | 389 |
| 2 | 2 | 81 | 9 | 1479 | | 1091.143 |
| 3 | 2 | 87.6 | 17 | 1247 | | 2291.286 |
| 4 | 2 | 94.7 | 18 | 1041 | | 3143.429 |
| 5 | 2 | 78 | 18 | 1267 | | 3741.572 |
| 6 | 1 | 95.5 | 14 | | | 4337.715 |
| 7 | 2 | 97.6 | 15 | 1215 | | 5199.858 |
| 8 | 3 | 88 | 9 | 1349 | 1598 | 6171.001 |
| 9 | 2 | 69.7 | 17 | 1711 | | 7626.144 |
| 10 | 2 | 96.5 | 17 | 1431 | | 7882.287 |
| 11 | 2 | 96.9 | 6 | 1871 | | 8695.43 |
| 12 | 3 | 66.4 | 10 | 1824 | 1468 | 10194.573 |
| 13 | 1 | 78.8 | 10 | | | 10822.716 |
| 14 | 3 | 87.6 | 6 | 1080 | 1159 | 11856.859 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 8 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 2 | 71.8 | 14 | 1432 | | 573 |
| 2 | 2 | 65.9 | 19 | 1762 | | 1114 |
| 3 | 2 | 74.7 | 6 | 1754 | | 1977 |
| 4 | 3 | 81.7 | 5 | 1133 | 974 | 2616 |
| 5 | 3 | 57.8 | 14 | 1176 | 1712 | 3329 |
| 6 | 1 | 80.6 | 6 | | | 4341 |
| 7 | 3 | 99.3 | 17 | 1268 | 1876 | 4965 |
| 8 | 1 | 79.8 | 12 | | | 6218 |
| 9 | 3 | 83 | 11 | 990 | 1738 | 6989 |
| 10 | 3 | 71.5 | 11 | 1473 | 1255 | 7206 |
| 11 | 1 | 77.4 | 11 | | | 8127 |
| 12 | 2 | 84.8 | 12 | 1390 | | 9315 |
| 13 | 2 | 64.6 | 12 | 1653 | | 9748 |
| 14 | 2 | 92.9 | 12 | 1881 | | 10919 |
| 15 | 1 | 71.3 | 6 | | | 11501 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 9 | |
| Burst | Number of Pulses | Pulse Width (μsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (μsec) | Pulse 2-to-3 Spacing (μsec) | Start Time (msec) |
| 1 | 2 | 55.4 | 9 | 1318 | | 383 |
| 2 | 2 | 80.8 | 18 | 1710 | | 1284 |
| 3 | 1 | 88.8 | 9 | | | 1995 |
| 4 | 2 | 78 | 12 | 1818 | | 2342 |
| 5 | 1 | 78.5 | 12 | | | 3108 |
| 6 | 2 | 55 | 13 | 1219 | | 3873 |
| 7 | 2 | 75.9 | 20 | 1004 | | 4623 |
| 8 | 2 | 70.9 | 7 | 1820 | | 5796 |
| 9 | 2 | 71.7 | 18 | 1559 | | 6476 |
| 10 | 2 | 73.9 | 19 | 1232 | | 6985 |
| 11 | 1 | 59.2 | 20 | | | 7924 |
| 12 | 1 | 55.7 | 9 | | | 8641 |
| 13 | 3 | 60.9 | 12 | 1144 | 1370 | 9198 |
| 14 | 2 | 60.8 | 14 | 990 | | 9766 |
| 15 | 3 | 60.6 | 19 | 1526 | 1326 | 11195 |
| 16 | 2 | 89 | 5 | 1029 | | 11381 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 10 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 2 | 72.1 | 14 | 1119 | | 488 |
| 2 | 3 | 81.4 | 13 | 1142 | 961 | 1156.882 |
| 3 | 3 | 92.9 | 18 | 991 | 1147 | 1976.764 |
| 4 | 3 | 81.3 | 18 | 1793 | 1369 | 2402.646 |
| 5 | 3 | 76.4 | 20 | 1005 | 1793 | 2902.528 |
| 6 | 1 | 61.6 | 18 | | | 4032.41 |
| 7 | 1 | 66.6 | 19 | | | 4416.292 |
| 8 | 1 | 53.7 | 12 | | | 5357.174 |
| 9 | 2 | 58 | 8 | 1477 | | 5754.056 |
| 10 | 2 | 64 | 18 | 1791 | | 6493.938 |
| 11 | 2 | 80.3 | 12 | 1304 | | 7574.82 |
| 12 | 3 | 77.3 | 5 | 1039 | 1668 | 8136.702 |
| 13 | 2 | 97.6 | 11 | 1593 | | 8633.584 |
| 14 | 1 | 73 | 6 | | | 9323.466 |
| 15 | 3 | 65.1 | 8 | 1097 | 1927 | 9984.348 |
| 16 | 2 | 59.5 | 13 | 1569 | | 10770.23 |
| 17 | 1 | 88.2 | 19 | | | 11947.112 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 11 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 2 | 56.1 | 12 | 1219 | | 273 |
| 2 | 1 | 83.3 | 7 | | | 964.666 |
| 3 | 3 | 79.6 | 17 | 1218 | 1897 | 1492.333 |
| 4 | 2 | 95.8 | 7 | 1672 | | 2480 |
| 5 | 2 | 79.6 | 8 | 920 | | 3053.667 |
| 6 | 2 | 88.9 | 11 | 1779 | | 3338.334 |
| 7 | 2 | 81.4 | 8 | 1645 | | 4201.001 |
| 8 | 2 | 92 | 6 | 1454 | | 4746.668 |
| 9 | 3 | 96 | 13 | 1518 | 1121 | 5525.335 |
| 10 | 2 | 65.6 | 11 | 1798 | | 6349.002 |
| 11 | 2 | 98.7 | 5 | 1360 | | 7082.669 |
| 12 | 2 | 52.9 | 15 | 1140 | | 7985.336 |
| 13 | 2 | 76.5 | 8 | 1032 | | 8092.003 |
| 14 | 3 | 73.8 | 18 | 1719 | 1383 | 9168.67 |
| 15 | 3 | 83.7 | 10 | 1270 | 1216 | 9676.337 |
| 16 | 2 | 89.6 | 10 | 1141 | | 10108.004 |
| 17 | 2 | 67.2 | 20 | 1455 | | 10938.671 |
| 18 | 3 | 55.7 | 14 | 1444 | 1475 | 11899.338 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 12 | |
| Burst | Number of Pulses | Pulse Width (μsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (μsec) | Pulse 2-to-3 Spacing (μsec) | Start Time (msec) |
| 1 | 2 | 70.6 | 15 | 1040 | | 575 |
| 2 | 2 | 72.9 | 13 | 1460 | | 809.579 |
| 3 | 3 | 88.9 | 5 | 1250 | 1629 | 1454.158 |
| 4 | 3 | 60.3 | 20 | 1757 | 1822 | 2362.737 |
| 5 | 3 | 92.1 | 19 | 1845 | 1198 | 3002.316 |
| 6 | 1 | 73 | 5 | | | 3689.895 |
| 7 | 1 | 50.4 | 15 | | | 3858.474 |
| 8 | 1 | 66.4 | 10 | | | 4754.053 |
| 9 | 1 | 79.1 | 18 | | | 5489.632 |
| 10 | 1 | 71.6 | 20 | | | 6108.211 |
| 11 | 2 | 95.6 | 13 | 1229 | | 6813.79 |
| 12 | 1 | 74.4 | 9 | | | 7310.369 |
| 13 | 3 | 55.6 | 17 | 1263 | 1724 | 7701.948 |
| 14 | 2 | 78.3 | 13 | 1507 | | 8247.527 |
| 15 | 3 | 54.1 | 13 | 1325 | 1249 | 9034.106 |
| 16 | 2 | 67.1 | 18 | 1584 | | 9784.685 |
| 17 | 2 | 65.8 | 9 | 1195 | | 10348.264 |
| 18 | 2 | 50.1 | 12 | 1755 | | 10784.843 |
| 19 | 2 | 87.7 | 18 | 1359 | | 11548.422 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 13 | |
| Burst | Number of Pulses | Pulse Width (μsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (μsec) | Pulse 2-to-3 Spacing (μsec) | Start Time (msec) |
| 1 | 3 | 79.5 | 7 | 1808 | 1550 | 274 |
| 2 | 2 | 76.7 | 20 | 1632 | | 1173 |
| 3 | 3 | 85.9 | 12 | 1305 | 1496 | 1218 |
| 4 | 3 | 86.6 | 14 | 968 | 1172 | 1933 |
| 5 | 2 | 74.9 | 14 | 1348 | | 2448 |
| 6 | 3 | 82.2 | 20 | 1692 | 1310 | 3156 |
| 7 | 2 | 53.9 | 13 | 1342 | | 3645 |
| 8 | 3 | 62.7 | 15 | 1839 | 1651 | 4276 |
| 9 | 2 | 86.2 | 6 | 1165 | | 4891 |
| 10 | 1 | 63.1 | 11 | | | 5791 |
| 11 | 2 | 82.4 | 6 | 1416 | | 6107 |
| 12 | 1 | 95.8 | 18 | | | 6848 |
| 13 | 2 | 75.7 | 9 | 993 | | 7682 |
| 14 | 3 | 70.1 | 18 | 1563 | 1020 | 8154 |
| 15 | 3 | 85.8 | 13 | 1420 | 1084 | 8846 |
| 16 | 1 | 63.2 | 7 | | | 9265 |
| 17 | 1 | 75.1 | 11 | | | 9747 |
| 18 | 2 | 69.5 | 5 | 1802 | | 10456 |
| 19 | 1 | 51.8 | 19 | | | 11222 |
| 20 | 2 | 62.3 | 5 | 1449 | | 11704 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 14 | |
| Burst | Number of Pulses | Pulse Width (μsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (μsec) | Pulse 2-to-3 Spacing (μsec) | Start Time (msec) |
| 1 | 3 | 74.9 | 5 | 1314 | 1466 | 1289 |
| 2 | 2 | 83.9 | 19 | 1442 | | 2936 |
| 3 | 2 | 55.8 | 6 | 1147 | | 3240 |
| 4 | 2 | 59.4 | 6 | 1490 | | 5955 |
| 5 | 2 | 78.2 | 15 | 1665 | | 7312 |
| 6 | 2 | 57.3 | 15 | 1357 | | 7764 |
| 7 | 2 | 76.2 | 11 | 1651 | | 9255 |
| 8 | 3 | 59 | 7 | 1460 | 1109 | 11910 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 15 | |
| Burst | Number of Pulses | Pulse Width (μsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (μsec) | Pulse 2-to-3 Spacing (μsec) | Start Time (msec) |
| 1 | 3 | 77.7 | 19 | 1046 | 1568 | 17 |
| 2 | 2 | 98.2 | 20 | 1628 | | 2210.333 |
| 3 | 2 | 95.3 | 8 | 1540 | | 3732.666 |
| 4 | 2 | 78.8 | 15 | 1341 | | 4821.999 |
| 5 | 2 | 52.8 | 20 | 988 | | 6353.332 |
| 6 | 2 | 65.2 | 9 | 1480 | | 7268.665 |
| 7 | 2 | 99.5 | 10 | 1867 | | 8883.998 |
| 8 | 2 | 79.5 | 13 | 1148 | | 9675.331 |
| 9 | 3 | 50.6 | 13 | 1030 | 1525 | 11987.664 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 16 | |
| Burst | Number of Pulses | Pulse Width (μsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (μsec) | Pulse 2-to-3 Spacing (μsec) | Start Time (msec) |
| 1 | 2 | 97.5 | 11 | 1357 | | 764 |
| 2 | 2 | 91.8 | 13 | 1896 | | 1498 |
| 3 | 1 | 78.5 | 5 | | | 3517 |
| 4 | 1 | 60.1 | 11 | | | 4669 |
| 5 | 2 | 96.2 | 10 | 975 | | 5957 |
| 6 | 2 | 56.6 | 18 | 1626 | | 6701 |
| 7 | 1 | 77.1 | 20 | | | 7523 |
| 8 | 2 | 96.3 | 8 | 1682 | | 8707 |
| 9 | 2 | 52.2 | 13 | 1017 | | 9817 |
| 10 | 1 | 92.8 | 15 | | | 11116 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 17 | |
| Burst | Number of Pulses | Pulse Width (μsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (μsec) | Pulse 2-to-3 Spacing (μsec) | Start Time (msec) |
| 1 | 2 | 57.3 | 8 | 1220 | | 792 |
| 2 | 3 | 73.1 | 5 | 1717 | 1679 | 1935.909 |
| 3 | 2 | 54.1 | 14 | 967 | | 2293.818 |
| 4 | 2 | 98.8 | 19 | 1137 | | 3987.727 |
| 5 | 3 | 85.5 | 8 | 1068 | 960 | 4664.636 |
| 6 | 2 | 78.5 | 7 | 1387 | | 6281.545 |
| 7 | 2 | 77.9 | 12 | 1869 | | 7051.454 |
| 8 | 1 | 81.9 | 10 | | | 8185.363 |
| 9 | 1 | 50.4 | 9 | | | 9191.272 |
| 10 | 1 | 75.2 | 8 | | | 10608.181 |
| 11 | 2 | 92.7 | 7 | 1770 | | 11876.09 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 18 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 2 | 79.1 | 6 | 1042 | | 793 |
| 2 | 3 | 55.7 | 9 | 1327 | 1744 | 1159 |
| 3 | 1 | 95 | 20 | | | 2734 |
| 4 | 1 | 88.4 | 5 | | | 3523 |
| 5 | 1 | 92.3 | 15 | | | 4546 |
| 6 | 1 | 93.6 | 6 | | | 5208 |
| 7 | 2 | 95.1 | 12 | 1044 | | 6894 |
| 8 | 1 | 59.5 | 17 | | | 7666 |
| 9 | 2 | 98.7 | 17 | 1422 | | 8640 |
| 10 | 2 | 65.1 | 5 | 1104 | | 9320 |
| 11 | 1 | 60.2 | 5 | | | 10060 |
| 12 | 1 | 88.7 | 8 | | | 11823 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 19 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 1 | 53.9 | 10 | | | 226 |
| 2 | 2 | 82.6 | 13 | 992 | | 1777.077 |
| 3 | 1 | 87.7 | 8 | | | 2149.154 |
| 4 | 3 | 69 | 12 | 1696 | 1606 | 3297.231 |
| 5 | 1 | 68.6 | 12 | | | 3912.308 |
| 6 | 3 | 76.5 | 13 | 1333 | 1468 | 5004.385 |
| 7 | 2 | 95.8 | 17 | 1380 | | 5595.462 |
| 8 | 2 | 55.6 | 19 | 1147 | | 6795.539 |
| 9 | 2 | 78.6 | 14 | 1268 | | 7512.616 |
| 10 | 2 | 65.4 | 17 | 1231 | | 9220.693 |
| 11 | 2 | 76.6 | 18 | 1883 | | 9748.77 |
| 12 | 1 | 93.2 | 6 | | | 10749.847 |
| 13 | 2 | 50.2 | 13 | 1836 | | 11137.924 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 20 | |
| Burst | Number of Pulses | Pulse Width (μsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (μsec) | Pulse 2-to-3 Spacing (μsec) | Start Time (msec) |
| 1 | 1 | 60.9 | 13 | | | 142 |
| 2 | 2 | 81.7 | 15 | 1831 | | 1379.143 |
| 3 | 2 | 78.5 | 5 | 1396 | | 2504.286 |
| 4 | 2 | 98.2 | 6 | 1652 | | 2574.429 |
| 5 | 1 | 64.1 | 12 | | | 3842.572 |
| 6 | 3 | 53 | 18 | 1862 | 1902 | 4442.715 |
| 7 | 2 | 62.3 | 15 | 1490 | | 5390.858 |
| 8 | 2 | 87 | 11 | 1411 | | 6576.001 |
| 9 | 2 | 78.4 | 8 | 1090 | | 7594.144 |
| 10 | 2 | 87.2 | 7 | 967 | | 8057.287 |
| 11 | 3 | 71 | 13 | 1662 | 1841 | 8676.43 |
| 12 | 2 | 77.2 | 5 | 1557 | | 10029.573 |
| 13 | 1 | 94.4 | 15 | | | 10393.716 |
| 14 | 1 | 90.6 | 13 | | | 11648.859 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 21 | |
| Burst | Number of Pulses | Pulse Width (μsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (μsec) | Pulse 2-to-3 Spacing (μsec) | Start Time (msec) |
| 1 | 3 | 76.5 | 8 | 1870 | 1326 | 385 |
| 2 | 2 | 95.3 | 13 | 1162 | | 873 |
| 3 | 3 | 58.9 | 9 | 1586 | 1909 | 2342 |
| 4 | 2 | 73.1 | 13 | 1460 | | 2730 |
| 5 | 2 | 73.1 | 12 | 1488 | | 3225 |
| 6 | 2 | 75.1 | 5 | 1331 | | 4418 |
| 7 | 3 | 98.5 | 11 | 936 | 1532 | 5014 |
| 8 | 3 | 72.5 | 13 | 1110 | 1903 | 5987 |
| 9 | 3 | 67.4 | 12 | 1567 | 1513 | 6480 |
| 10 | 2 | 76.1 | 12 | 1005 | | 7477 |
| 11 | 2 | 94.3 | 17 | 1413 | | 8314 |
| 12 | 2 | 72.8 | 12 | 1778 | | 8866 |
| 13 | 2 | 90.9 | 14 | 1793 | | 9747 |
| 14 | 3 | 94.8 | 11 | 1012 | 1742 | 10841 |
| 15 | 3 | 95 | 12 | 912 | 1641 | 11809 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 22 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 1 | 96.7 | 9 | | | 308 |
| 2 | 2 | 78.3 | 13 | 1045 | | 777 |
| 3 | 1 | 56.5 | 12 | | | 1574 |
| 4 | 3 | 88.5 | 14 | 1119 | 1020 | 2879 |
| 5 | 2 | 62.4 | 9 | 1436 | | 3548 |
| 6 | 2 | 78.2 | 5 | 1147 | | 4091 |
| 7 | 3 | 76.8 | 14 | 1069 | 1575 | 4860 |
| 8 | 2 | 91.6 | 18 | 978 | | 5852 |
| 9 | 2 | 93.7 | 5 | 1130 | | 6623 |
| 10 | 2 | 97.4 | 8 | 1100 | | 7006 |
| 11 | 3 | 90.1 | 6 | 1629 | 1375 | 7608 |
| 12 | 2 | 79.9 | 18 | 1809 | | 8433 |
| 13 | 2 | 83 | 10 | 1370 | | 9477 |
| 14 | 2 | 89.1 | 13 | 1239 | | 10234 |
| 15 | 2 | 58.3 | 8 | 1321 | | 10776 |
| 16 | 1 | 85.2 | 13 | | | 11272 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 23 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 3 | 60 | 10 | 1097 | 1748 | 56 |
| 2 | 3 | 66.3 | 13 | 1391 | 1430 | 1126.882 |
| 3 | 2 | 88.5 | 15 | 1040 | | 1994.764 |
| 4 | 2 | 72.1 | 8 | 1526 | | 2278.646 |
| 5 | 1 | 72.3 | 8 | | | 3273.528 |
| 6 | 2 | 67.3 | 7 | 1022 | | 3577.41 |
| 7 | 2 | 56.1 | 12 | 1325 | | 4896.292 |
| 8 | 1 | 83.5 | 11 | | | 5636.174 |
| 9 | 3 | 99.4 | 13 | 1490 | 938 | 6052.056 |
| 10 | 1 | 54.2 | 12 | | | 6478.938 |
| 11 | 3 | 92.7 | 17 | 1251 | 1631 | 7423.82 |
| 12 | 3 | 95.1 | 17 | 1741 | 1162 | 7821.702 |
| 13 | 2 | 84 | 9 | 1597 | | 8637.584 |
| 14 | 1 | 68.5 | 18 | | | 9688.466 |
| 15 | 1 | 76.5 | 20 | | | 10067.348 |
| 16 | 3 | 86.6 | 11 | 1774 | 1875 | 11045.23 |
| 17 | 2 | 62.2 | 9 | 1563 | | 11786.112 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 24 | |
| Burst | Number of Pulses | Pulse Width (μsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (μsec) | Pulse 2-to-3 Spacing (μsec) | Start Time (msec) |
| 1 | 1 | 86.6 | 19 | | | 621 |
| 2 | 2 | 95.3 | 17 | 926 | | 794.666 |
| 3 | 1 | 76.2 | 12 | | | 1584.333 |
| 4 | 3 | 71.4 | 19 | 1287 | 1404 | 2269 |
| 5 | 3 | 51.7 | 12 | 1564 | 1339 | 3299.667 |
| 6 | 2 | 77 | 5 | 1899 | | 3948.334 |
| 7 | 1 | 87.5 | 12 | | | 4375.001 |
| 8 | 3 | 59 | 17 | 1327 | 1615 | 5276.668 |
| 9 | 2 | 78.3 | 15 | 1551 | | 5881.335 |
| 10 | 2 | 89.7 | 5 | 1718 | | 6456.002 |
| 11 | 2 | 92.1 | 7 | 1403 | | 6678.669 |
| 12 | 2 | 97.3 | 14 | 1338 | | 7929.336 |
| 13 | 3 | 80.3 | 20 | 1354 | 1563 | 8484.003 |
| 14 | 1 | 98.2 | 8 | | | 9094.67 |
| 15 | 3 | 94.4 | 13 | 1795 | 1829 | 9845.337 |
| 16 | 2 | 90.4 | 13 | 1105 | | 10342.004 |
| 17 | 2 | 73.6 | 19 | 1787 | | 10958.671 |
| 18 | 1 | 82.9 | 7 | | | 11951.338 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 25 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 1 | 90 | 18 | | | 173 |
| 2 | 1 | 65.3 | 19 | | | 876.579 |
| 3 | 2 | 82.6 | 10 | 1756 | | 1390.158 |
| 4 | 2 | 93.9 | 18 | 1557 | | 2181.737 |
| 5 | 2 | 50.5 | 13 | 1479 | | 2808.316 |
| 6 | 1 | 68 | 7 | | | 3333.895 |
| 7 | 3 | 88.4 | 11 | 1244 | 1076 | 4357.474 |
| 8 | 3 | 66.8 | 11 | 1288 | 1909 | 4869.053 |
| 9 | 2 | 88 | 12 | 1450 | | 5579.632 |
| 10 | 3 | 51.1 | 6 | 1797 | 1935 | 5879.211 |
| 11 | 2 | 93.8 | 13 | 1073 | | 6499.79 |
| 12 | 1 | 83.5 | 10 | | | 7453.369 |
| 13 | 2 | 96.9 | 12 | 1047 | | 7845.948 |
| 14 | 3 | 87.2 | 18 | 1521 | 1450 | 8453.527 |
| 15 | 2 | 60.1 | 8 | 1545 | | 9133.106 |
| 16 | 3 | 98 | 10 | 1842 | 1402 | 10027.685 |
| 17 | 3 | 57 | 19 | 1665 | 1732 | 10248.264 |
| 18 | 1 | 74.3 | 14 | | | 10767.843 |
| 19 | 2 | 57.8 | 10 | 1576 | | 11977.422 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 26 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 2 | 92.8 | 9 | 1222 | | 531 |
| 2 | 2 | 52.4 | 8 | 1547 | | 768 |
| 3 | 3 | 56.8 | 7 | 1158 | 1184 | 1393 |
| 4 | 1 | 91.2 | 7 | | | 2365 |
| 5 | 3 | 61.2 | 10 | 1558 | 1664 | 2787 |
| 6 | 3 | 62 | 7 | 1518 | 1656 | 3391 |
| 7 | 2 | 69 | 5 | 1531 | | 3927 |
| 8 | 2 | 67.3 | 18 | 1064 | | 4225 |
| 9 | 1 | 94.1 | 5 | | | 4878 |
| 10 | 2 | 76 | 17 | 1190 | | 5622 |
| 11 | 2 | 81.9 | 12 | 1815 | | 6096 |
| 12 | 2 | 57.9 | 8 | 1594 | | 6877 |
| 13 | 3 | 68.3 | 19 | 1427 | 1540 | 7241 |
| 14 | 2 | 53.3 | 7 | 1713 | | 7848 |
| 15 | 2 | 85.3 | 15 | 1136 | | 8448 |
| 16 | 1 | 65.3 | 20 | | | 9057 |
| 17 | 3 | 79.8 | 20 | 923 | 1259 | 9648 |
| 18 | 2 | 56.9 | 20 | 1357 | | 10683 |
| 19 | 2 | 93 | 9 | 1686 | | 10873 |
| 20 | 2 | 82.8 | 10 | 944 | | 11752 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 27 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 3 | 50.9 | 11 | 1106 | 1077 | 1293 |
| 2 | 2 | 77.8 | 18 | 1836 | | 2735 |
| 3 | 3 | 60.7 | 5 | 1069 | 1635 | 4092 |
| 4 | 2 | 77.2 | 13 | 1916 | | 5843 |
| 5 | 2 | 91.6 | 13 | 1465 | | 7466 |
| 6 | 2 | 56.8 | 17 | 1783 | | 7876 |
| 7 | 1 | 59.5 | 20 | | | 9131 |
| 8 | 1 | 66.5 | 12 | | | 11524 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 28 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 2 | 72 | 9 | 1092 | | 965 |
| 2 | 2 | 89.2 | 6 | 1550 | | 2559.333 |
| 3 | 1 | 81.2 | 12 | | | 2943.666 |
| 4 | 2 | 80.6 | 15 | 1616 | | 4457.999 |
| 5 | 2 | 62.8 | 10 | 1812 | | 6081.332 |
| 6 | 1 | 71 | 8 | | | 7100.665 |
| 7 | 2 | 69.3 | 6 | 1027 | | 9110.998 |
| 8 | 2 | 77.2 | 13 | 1076 | | 9971.331 |
| 9 | 2 | 65.4 | 5 | 1582 | | 10944.664 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 29 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 1 | 51.5 | 19 | | | 151 |
| 2 | 1 | 82.3 | 13 | | | 2271 |
| 3 | 3 | 78.3 | 8 | 1115 | 1740 | 3046 |
| 4 | 2 | 99 | 14 | 1101 | | 4309 |
| 5 | 3 | 98.8 | 7 | 1819 | 945 | 5356 |
| 6 | 2 | 80.9 | 19 | 922 | | 6567 |
| 7 | 2 | 64 | 12 | 953 | | 7781 |
| 8 | 1 | 79 | 20 | | | 9198 |
| 9 | 1 | 68 | 8 | | | 9712 |
| 10 | 2 | 50.4 | 13 | 1587 | | 10826 |

| Statistical Performance Check Result | | | | | | |
|---|---|---|---|---|---|---|
| Radar Test Signal (#) | | 5 | | Trail # | 30 | |
| Burst | Number of Pulses | Pulse Width (µsec) | Chirp Width (MHz) | Pulse 1-to-2 Spacing (µsec) | Pulse 2-to-3 Spacing (µsec) | Start Time (msec) |
| 1 | 3 | 57.8 | 5 | 1324 | 1716 | 82 |
| 2 | 2 | 70.1 | 20 | 1733 | | 1677.909 |
| 3 | 2 | 95.2 | 13 | 1188 | | 2970.818 |
| 4 | 3 | 84.6 | 20 | 1042 | 1259 | 4293.727 |
| 5 | 3 | 96.5 | 7 | 1329 | 1596 | 4379.636 |
| 6 | 2 | 84.3 | 15 | 1606 | | 6162.545 |
| 7 | 3 | 53.5 | 19 | 1783 | 1458 | 7283.454 |
| 8 | 3 | 74.9 | 5 | 1599 | 1891 | 8102.363 |
| 9 | 3 | 53.8 | 7 | 1494 | 1467 | 8979.272 |
| 10 | 2 | 60.5 | 14 | 1319 | | 10282.181 |
| 11 | 1 | 73.3 | 10 | | | 11754.09 |

# 4 Test Equipment and Calibration Data

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|---|---|---|---|---|---|---|
| Spectrum Analyzer | R&S | FSP7 | 100645 | 9kHz ~ 7GHz | Nov. 10, 2014 | Radiation (DFS01-HY) |
| Vector Signal Generator | R&S | SMU200A | 102098 | 100kHz ~ 6GHz | Dec. 28, 2014 | Radiation (DFS01-HY) |
| Horn Antenna | COM-POWER | AH-118 | 711064 | 1GHz ~ 18GHz | Nov. 13, 2014 | Radiation (DFS01-HY) |
| Horn Antenna | COM-POWER | AH-118 | 10094 | 1GHz ~ 18GHz | Apr. 21, 2014 | Radiation (DFS01-HY) |
| RF Cable-3m | HUBER+SUHNER | SUCOFLEX_104 | 302338 | 1GHz ~ 26.5GHz | Dec. 01, 2014 | Radiation (DFS01-HY) |
| RF Cable-8m | HUBER+SUHNER | SUCOFLEX_104 | MY17172/4 | 0.05GHz ~ 26.5GHz | Dec. 01, 2014 | Radiation (DFS01-HY) |

Note: Calibration Interval of instruments listed above is one year.