FCC TEST REPORT

For

South Surveying & Mapping Technology Co., Ltd.

GNSS RECEIVER

Test Model: INNO8

Additional Model No.: Please Refer to Page 6

Prepared for	:	South Surveying & Mapping Technology Co., Ltd.
Address	:	No.39, Sicheng Road, Tianhe District, Guangzhou
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China
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Date of receipt of test sample	:	May 24, 2024
Number of tested samples	:	2
Sample No.	:	A240511060-1, A240511060-2
Serial number	:	Prototype
Date of Test	:	May 24, 2024 ~ July 23, 2024
Date of Report	:	July 24, 2024

FCC TEST REPORT FCC CFR 47 PART 15 E (15.407)		
Report Reference No.	:	**LCSA05164163EF**
Date of Issue.....	:	July 24, 2024
Testing Laboratory Name.....	:	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address.....	:	101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China
Testing Location/ Procedure.....	:	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name.....	:	**South Surveying & Mapping Technology Co., Ltd.**
Address.....	:	No.39, Sicheng Road, Tianhe District, Guangzhou
Test Specification		
Standard.....	:	FCC CFR 47 PART 15E (15.407)
Test Report Form No.....	:	LCSEMC-1.0
TRF Originator.....	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF.....	:	Dated 2011-03

EUT Description.....	:	**GNSS RECEIVER**
Trade Mark.....	:	SOUTH, KOLIDA, SANDING, RUIDE, TIANYU
Test Model.....	:	INNO8
Ratings.....	:	Please Refer to Page 6
Result	:	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Diamond Lu/ Administrator	Cary Luo/ Technique principal	Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. :	LCSA05164163EF	July 24, 2024 Date of issue

EUT.....	: GNSS RECEIVER
Test Model.....	: INNO8
Applicant.....	**: South Surveying & Mapping Technology Co., Ltd.**
Address.....	: No.39, Sicheng Road, Tianhe District, Guangzhou
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: South Surveying & Mapping Technology Co., Ltd.**
Address.....	: No.39, Sicheng Road, Tianhe District, Guangzhou
Telephone.....	: /
Fax.....	: /
Factory.....	**: /**
Address.....	: /
Telephone.....	: /
Fax.....	: /

Test Result:	Positive

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Report Version	Issue Date	Revision Content	Revised By
000	July 24, 2024	Initial Issue	---

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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	: GNSS RECEIVER
Test Model	: INNO8
Additional Model No.	: ALPS1, ALPS2, ALPS3, ALPS4, ALPS5, ALPS6, INNO9, INNO6, INNO5, INNO3, INNO8 Pro, K60 Pro, K60, K2, KR1, KR2, KR3, T7, T7 Pro, T6, T6 Pro, T5, T5 Pro, RENO2S, RENO1 Pro, ROVA3, RAMA1, RAMA2, RAMA3, RAMA4, K50, K9S, T14, T15, RENO2, RENO3, ROVA2, Insight V3, V1
Model Declaration	: PCB board, structure and internal of these model(s) are the same, So no additional models were tested
Ratings	: For AC Adapter Input: 100-240V~, 50/60Hz, 1.4A MAX Adapter Output: PD3.0: 5V⎓3A/9V⎓3A/15V⎓3A/20V⎓2.25A PPS: 3.3-11.0V⎓3A QC: 5V⎓3A/9V⎓3A/12V⎓3A DC 7.4V by Rechargeable Li-ion Battery, 10000mAh
Hardware Version	: H0X0DY0N0210008063135G048C12
Software Version	: PurpleCowY_RTK-V20231019
Bluetooth	:
Frequency Range	: 2402MHz~2480MHz
Channel Number	: 79 channels for Bluetooth V4.2 (DSS) 40 channels for Bluetooth V4.2 (DTS)
Channel Spacing	: 1MHz for Bluetooth V4.2 (DSS) 2MHz for Bluetooth V4.2 (DTS)
Modulation Type	: GFSK, π/4-DQPSK, 8-DPSK for Bluetooth V4.2 (DSS) GFSK for Bluetooth V4.2 (DTS)
Bluetooth Version	: V4.2
Antenna Description	: Internal Antenna, 2.70dBi(Max.)
WIFI(2.4G Band)	:
Frequency Range	: 2412MHz~2462MHz
Channel Spacing	: 5MHz
Channel Number	: 11 Channels for 20MHz bandwidth (2412~2462MHz) 7 Channels for 40MHz bandwidth (2422~2452MHz)
Modulation Type	: IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: Internal Antenna, 2.70dBi(Max.)
WIFI(5.2G Band)	:
Frequency Range	: 5180MHz~5240MHz

Channel Number	: 4 Channels for 20MHz bandwidth(5180MHz~5240MHz) 2 channels for 40MHz bandwidth(5190MHz~5230MHz)
Modulation Type	: IEEE 802.11a/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: Internal Antenna, 8.07dBi(Max.)
WIFI(5.3G Band)	:
Frequency Range	: 5260MHz~5320MHz
Channel Number	: 4 Channels for 20MHz bandwidth(5260MHz~5320MHz) 2 channels for 40MHz bandwidth(5270MHz~5310MHz)
Modulation Type	: IEEE 802.11a/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: Internal Antenna, 6.95dBi(Max.)
WIFI(5.5G Band)	:
Frequency Range	: 5500MHz~5700MHz
Channel Number	: 11 Channels for 20MHz bandwidth(5500MHz~5700MHz) 5 Channels for 40MHz bandwidth(5510MHz~5670MHz)
Modulation Type	: IEEE 802.11a/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: Internal Antenna, 6.95dBi(Max.)
2G	:
Support Band	: ☒GSM 850 (U.S.-Band) ☒PCS 1900 (U.S.-Band)
Release Version	: R99
GPRS Class	: Class 12
EGPRS Class	: Class 12
Type Of Modulation	: GMSK for GSM/GPRS; GMSK/8PSK for EGPRS
Antenna Description	: Internal Antenna 0.63dBi (max.) For GSM 850 1.54dBi (max.) For PCS 1900
3G	:
Support Band	: ☒WCDMA Band V (U.S.-Band)
Release Version	: R9
Type Of Modulation	: QPSK,16QAM
Antenna Description	: Internal Antenna 0.63dBi (max.) For WCDMA Band V
LTE	:
Support Band	: ☒E-UTRA Band 5(U.S.-Band) ☒E-UTRA Band 7(U.S.-Band) ☒E-UTRA Band 41(U.S.-Band)
LTE Release Version	: R9
Type Of Modulation	: QPSK/16QAM
Antenna Description	: Internal Antenna

		0.63dBi (max.) For E-UTRA Band 5 1.78dBi (max.) For E-UTRA Band 7 2.55dBi (max.) For E-UTRA Band 41
Power Class	:	Class 3
NFC	:	
Frequency Range	:	13.56MHz
Modulation Type	:	ASK
Antenna Description	:	Internal Antenna, 0dBi(Max.)
PMR	:	
Operating Frequency	:	410MHz~470MHz
Channel Separation	:	12.5KHz
Modulation Type	:	GMSK
rated power	:	3W
Antenna Description	:	External Antenna, 2.14dBi(Max.)
Extreme temp. Tolerance	:	-30°C to +50°C
Extreme vol. Limits	:	6.7VDC to 8.4VDC (nominal: 7.4VDC)

1.2. Support equipment List

Manufacturer	Description	Model	Certificate
Diwen Enterprise Co., Ltd	SWITCHING POWER SUPPLY	S045SU2000225	FCC
TP-LINK TECHNOLOGIES CO., LTD.	Router	Archer AX50	FCCID: TE7AX50

Note: Auxiliary equipment(Router)is provided by the laboratory.

1.3. External I/O Cable

I/O Port Description	Quantity	Cable
UHF Antenna Port	1	N/A
Type-C USB Port	1	USB Cable: 0.8m, unshielded
SIM Card Slot	1	N/A

1.4. Description of Test Facility

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

Test Firm Registration Number: 254912.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

1.5. Statement of the Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

1.6. Measurement Uncertainty

No.	Item	Uncertainty
1	DFS Threshold (radiated)	±1.50dB
2	DFS Threshold (conducted)	±1.45dB
3	Temperature	±0.5°C
4	Humidity	±2%

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.7. Description of Test Modes

The EUT has been tested under operating condition.

Worst-Case data rates were utilized from preliminary testing of the Chipset, worst-case data rates used during the testing are as follows:

IEEE 802.11a Mode: 6 Mbps, OFDM.

IEEE 802.11n HT20 Mode: MCS0, OFDM.

IEEE 802.11n HT40 Mode: MCS0, OFDM.

1.8. Channel List and Frequency

U-NI-2A

Frequency Band	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
5260~5320MHz	52	5260	60	5300
	54	5270	62	5310
	56	5280	64	5320
	58	5290	/	/
For IEEE 802.11a/n HT20, Channel 52, 60 and 64 were tested. For IEEE 802.11n HT40, Channel 54 and 62 were tested.				

U-NI-2C

Frequency Band	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
5500~5700MHz	100	5500	118	5590
	102	5510	120	5600
	104	5520	122	5610
	106	5530	124	5620
	108	5540	126	5630
	110	5550	128	5640
	112	5560	132	5660
	114	5570	134	5670
	116	5580	136	5680
	--	--	140	5700
For IEEE 802.11a/n HT20, Channel 100, 116 and 140 were tested. For IEEE 802.11n HT40, Channel 102,110 and 134 were tested.				

1.9. Conduted Output Power and EIRP

Mode	Frequency Band (MHz)	Maximum Conducted Output Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)	Maximum EIRP (mW)
IEEE 802.11a	5260 – 5320	12.49	6.95	19.44	87.90
	5500 – 5700	12.97	6.95	19.92	98.17
IEEE 802.11n HT20	5260 – 5320	11.50	6.95	18.45	69.98
	5500 – 5700	11.97	6.95	18.92	77.98
IEEE 802.11n HT40	5270 – 5310	10.85	6.95	17.8	60.26
	5510 – 5670	11.31	6.95	18.26	66.99

Remark:
1. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW;

2. TEST METHODOLOGY

This report has been prepared to demonstrate compliance with the requirements for Dynamic Frequency Selection (DFS) as stated in FCC CFR 47 PART 15E(15.407). Testing was performed in accordance with the measurement procedure described in FCC KDB 905462 D02 v02 and KDB 905462 D03.

3. SYSTEM TEST CONFIGURATION

3.1. EUT Exercise Software

The system was configured for testing in a continuous transmits condition and change test channels by software provided by application.

3.2. Special Accessories

N/A

3.3. Block Diagram/Schematics

Please refer to the related document

3.4. Equipment Modifications

Shenzhen LCS Compliance Testing Laboratory Ltd. has not done any modification on the EUT.

3.5. Test Setup

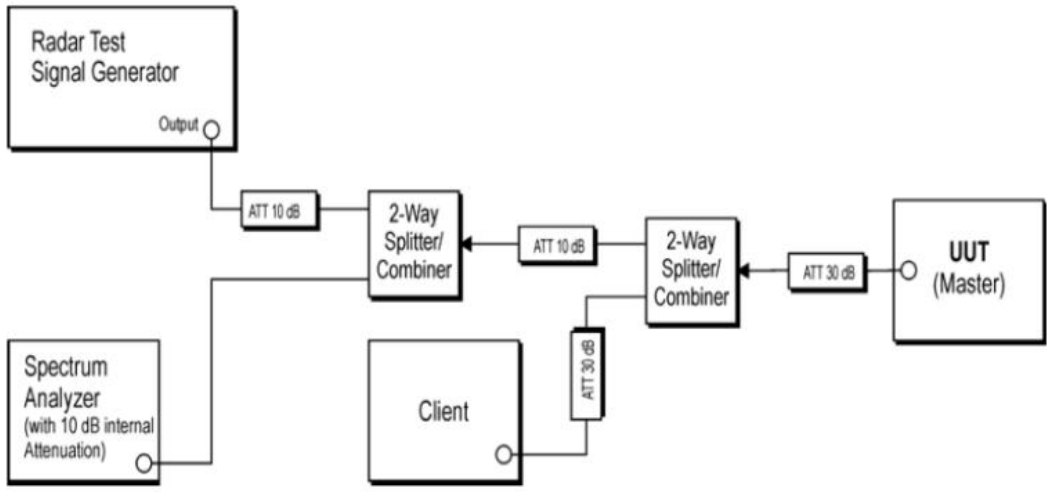


Figure 7-1. Test Setup

4. SUMMARY OF TEST RESULTS

Requirement	Results
Non-Occupancy Period	Pass
DFS Detection Threshold	Pass
Channel Availability Check Time	Pass
Channel Closing Transmission Time	Pass
Channel Move Time	Pass
U-NII Detection Bandwidth	Pass
Statistical Performance Check	Pass

Note: The EUT operating at DFS band as a master device with ad hoc and radar detection function.

5. DESCRIPTION OF DYNAMIC FREQUENCY SELECTION TEST

5.1. Requirements

Per FCC KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02 the following are the requirements for Master Devices:

(a) The Master Device will use DFS in order to detect Radar Waveforms with received signal strength above the DFS Detection Threshold in the 5250 ~ 5350 MHz and 5470 ~ 5725 MHz bands. DFS is not required in the 5150 ~ 5250 MHz or 5725 ~ 5825 MHz bands.

(b) Before initiating a network on a Channel, the Master Device will perform a Channel Availability Check for a specified time duration (Channel Availability Check Time) to ensure that there is no radar system operating on the Channel, using DFS described under subsection a) above.

(c) The Master Device initiates a U-NII network by transmitting control signals that will enable other U-NII devices to Associate with the Master Device.

(d) During normal operation, the Master Device will monitor the Channel (In-Service Monitoring) to ensure that there is no radar system operating on the Channel, using DFS described under a).

(e) If the Master Device has detected a Radar Waveform during In-Service Monitoring as described under d), the Operating Channel of the U-NII network is no longer an Available Channel. The Master Device will instruct all associated Client Device(s) to stop transmitting on this Channel within the Channel Move Time. The transmissions during the Channel Move Time will be limited to the Channel Closing Transmission Time.

(f) Once the Master Device has detected a Radar Waveform it will not utilize the Channel for the duration of the Non-Occupancy Period.

(g) If the Master Device delegates the In-Service Monitoring to a Client Device, then the combination will be tested to the requirements described under d) through f) above

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device 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.

5.2. RESPONSE REQUIREMENTS

Table 4: DFS Response 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 period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.

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

6. DFS DETECTION THRESHOLD VALUES

The DFS detection thresholds are defined for Master devices and Client Devices with In-service monitoring. These detection thresholds are listed in the following table.

Maximum Transmit Power	Value (See Notes 1 and 2)
EIRP≥ 200 milliwatt	-64 dBm
EIRP< 200 milliwatt and Power pectral < 10 dBm/MHz	-62 dBm
EIRP<200 milliwatt that do not meet the power spectral density requirement	-64 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.

Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Note 3: EIRP is based on the highest antenna. For MIMO devices refer to KDB Publication 662911 D01.

7. DFS TEST SIGNALS

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. 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 5 – 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	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot10^6}{\text{PRI}_{\mu\text{sec}}}\right)\right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 µsec, with a minimum increment of 1 µsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. 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. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.

Table 5a - Pulse Repetition Intervals Values for Test A

Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

Table 6 – 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

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse Radar Type waveforms. If more than 30 waveforms are used for the Long Pulse Radar Type waveforms, then each additional waveform must also be unique and not repeated from the previous waveforms.

Each waveform is defined as follows:

1) The transmission period for the Long Pulse Radar test signal is 12 seconds.

2) 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.

3) 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.

4) 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.

5) Each pulse has a linear frequency modulated chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a transmission period will have the same chirp width. 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.

6) 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 random time interval between the first and second pulses is chosen independently of the random time interval between the second and third pulses.

7) 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 randomly.

A representative example of a Long Pulse Radar Type waveform:

1) The total test waveform length is 12 seconds.

2) Eight (8) Bursts are randomly generated for the Burst Count.

3) Burst 1 has 2 randomly generated pulses.

4) The pulse width (for both pulses) is randomly selected to be 75 microseconds.

5) The PRI is randomly selected to be at 1213 microseconds.

6) Bursts 2 through 8 are generated using steps 3 – 5.

7) Each Burst is contained in even intervals of 1,500,000 microseconds. The starting location for Pulse 1, Burst 1 is randomly generated (1 to 1,500,000 minus the total Burst 1 length + 1 random PRI interval) at the 325,001 microsecond step. Bursts 2 through 8 randomly fall in successive 1,500,000 microsecond intervals (i.e. Burst 2 falls in the 1,500,001 – 3,000,000 microsecond range).

Table 7 – 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

For the Frequency Hopping Radar Type, the same Burst parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected from the hopping sequence defined by the following algorithm:

The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250 – 5724 MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

Manufacturer's Statement Regarding Uniform Channel Spreading

The end product implements an automatic channel selection feature at startup such that operation commences on channels distributed across the entire set of allowed 5GHz channels. This feature will ensure uniform spreading is achieved while avoiding non-allowed channels due to prior radar events.

TEST AND MEASUREMENT SYSTEM

System Overview

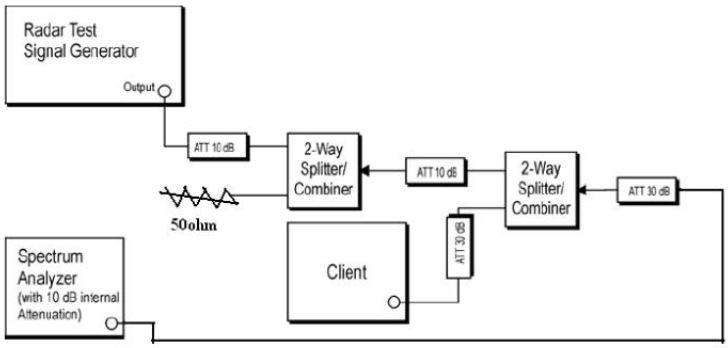
The measurement system is based on a conducted test method.
The short pulse and long pulse signal generating system utilizes the NTIA software and the same manufacturer / model Vector Signal Generator as the NTIA. The hopping signal generating system utilizes the simulated hopping method.
The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution. The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time. The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List, with the initial starting point randomized at run-time.

The signal monitoring equipment consists of a spectrum analyzer with the capacity to display 8192 bins on the horizontal axis. A time-domain resolution of 2 msec / bin is achievable with a 16 second sweep time, meeting the 10 second short pulse reporting criteria. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold. A time-domain resolution of 3 msec / bin is achievable with a 24 second sweep time, meeting the 22 second long pulse reporting criteria and allowing a minimum of 10 seconds after the end of the long pulse waveform.

Frequency Hopping Signal Generation

The hopping burst generator is a High Speed Digital I/O card plugged into the control computer. This card utilizes an independent hardware clock reference therefore the output pulse timing is unaffected by host computer operating system latency times.
The software selects the hopping sequence as a 100-length segment of the August 2005 NTIA hopping frequency list. This list contains 274 unique pseudorandom sequences. Each such sequence contains 475 frequencies ordered on a random without replacement basis. Each successive trial uses a contiguous 100-length segment from within each successive 475-length sequence in the list. The initial starting point within the list is randomized at run-time such that the first 100-length segment is entirely contained within the first 475-length sequence. The starting point of each successive trial is incremented by 475.
Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of FCC 06-96 APPENDIX. The frequency of the signal generator is incremented in 1 MHz steps from FL to FH for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

Conducted Method System Block Diagram



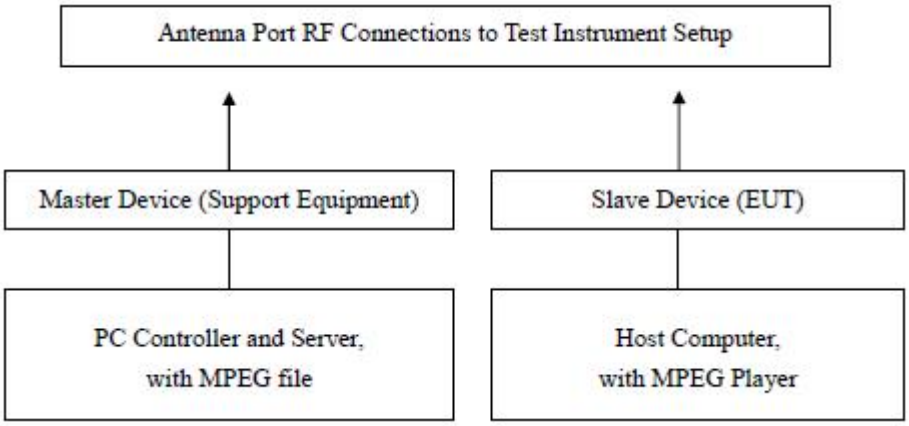
Measurement System Frequency Reference
Lock the signal generator and the spectrum analyzer to the same reference source as follows: Connect the 10 MHz OUT (SWITCHED) on the spectrum analyzer to the 10 MHz IN on the signal generator and set the spectrum analyzer 10 MHz Out to On.

Interference Detection Threshold Adjustment
Download the applicable radar waveforms to the signal generator. Select the radar waveform, trigger a burst manually and measure the amplitude on the spectrum analyzer. Readjust the amplitude of the signal generator as required so that the peak level of the waveform is at a displayed level equal to the required or desired

interference detection threshold. Separate signal generator amplitude settings are determined as required for each radar type.

Adjustment Of Displayed Traffic Level
Establish a link between the Master and Slave, adjusting the Link Step Attenuator as needed to provide a suitable received level at the Master and Slave devices. Stream the video test file to generate WLAN traffic. Confirm that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold. Confirm that the displayed traffic is from the Master Device. For Master Device testing confirm that the displayed traffic does not include Slave Device traffic. For Slave Device testing confirm that the displayed traffic does not include Master Device traffic.
If a different setting of the Master Step Attenuator is required to meet the above conditions, perform a new System Calibration for the new Master Step Attenuator setting.

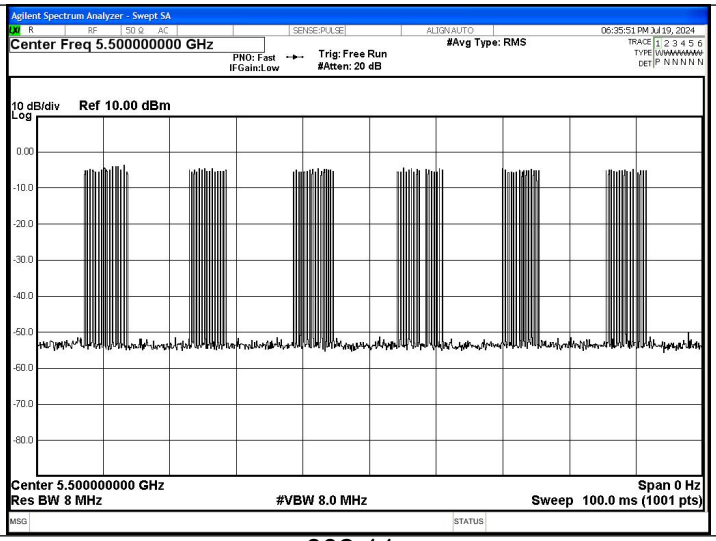
Test Setup



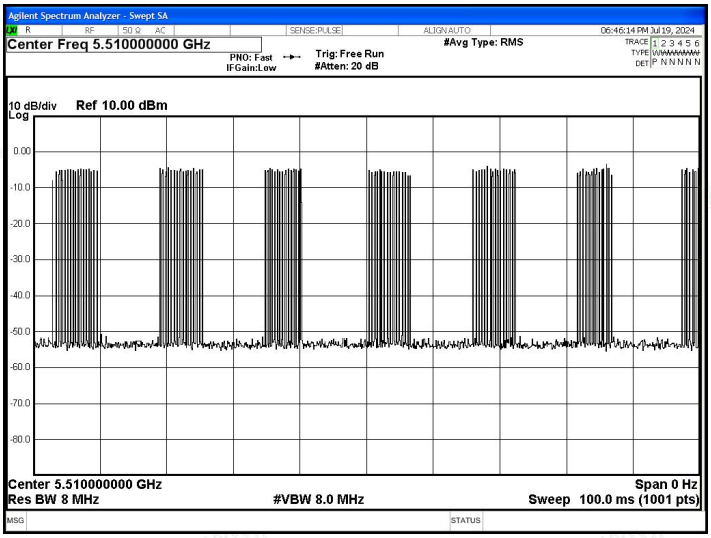
8. DFS CONFORMANCE TEST PROCEDURES

8.1 Channel Loading

Test Mode	Test Frequency	Packet Ratio	Requirement Ratio	Test resuelt
802.11a	5500	18.74%	≥17%	PASS
802.11n HT40	5510	18.23%	≥17%	PASS
Note: System testing was performed with the designated iperf test file. This file is used by IP and Frame based systems for loading the test channel during the In-service compliance testing of the U-NII device. Packet ratio = Time On / (Time On + Off Time).				



802.11a



802.11n HT40

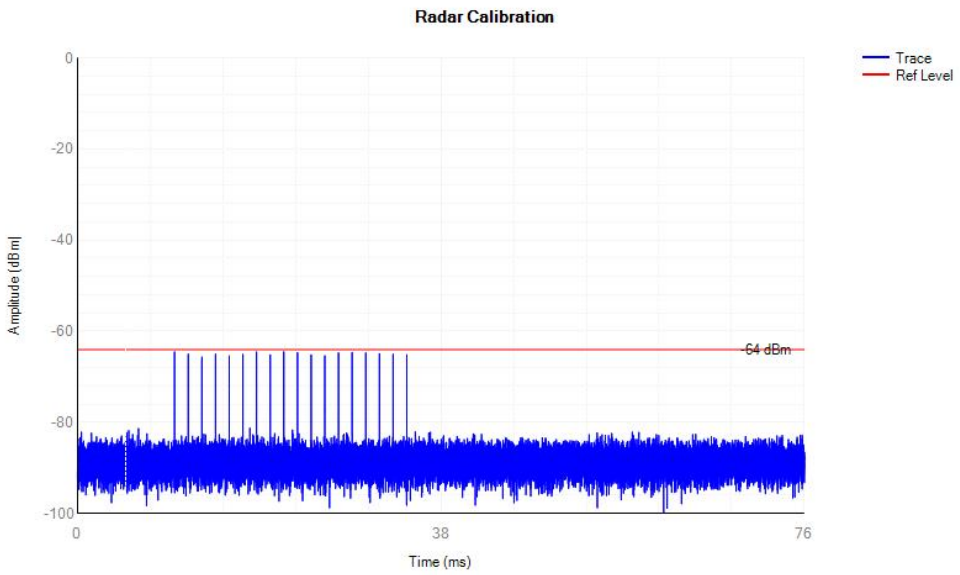
8.2 Radar Waveform Calibration Measurement

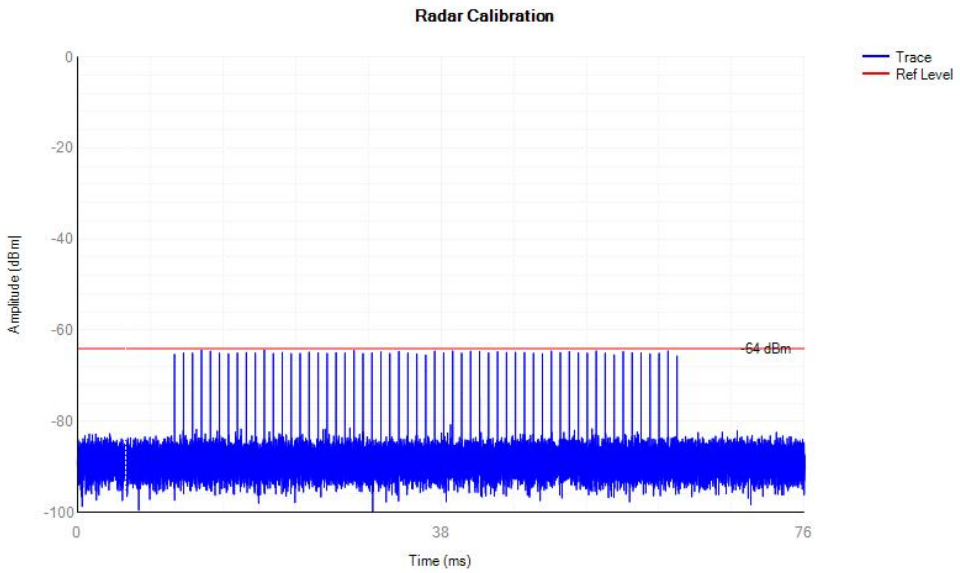
8.2.1 Calibration Procedure

The Interference Radar Detection Threshold Level is (-64dBm) + (0) [dBi]= -64 dBm that had been taken into account the output power range and antenna gain. The above equipment setup was used to calibrate the conducted Radar Waveform. A vector signal generator was utilized to establish the test signal level for each radar type. During this process there were replace 50ohm terminal form Master and Client device and no transmissions by either the Master or Client Device. The spectrum analyzer was switched to the zero span (Time Domain) at the frequency of the Radar Waveform generator. Peak detection was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to at least 3MHz. The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was (-64dBm) + (0) [dBi]= -64 dBm. Capture the spectrum analyzer plots on short pulse radar types, long pulse radar type and hopping radar waveform.

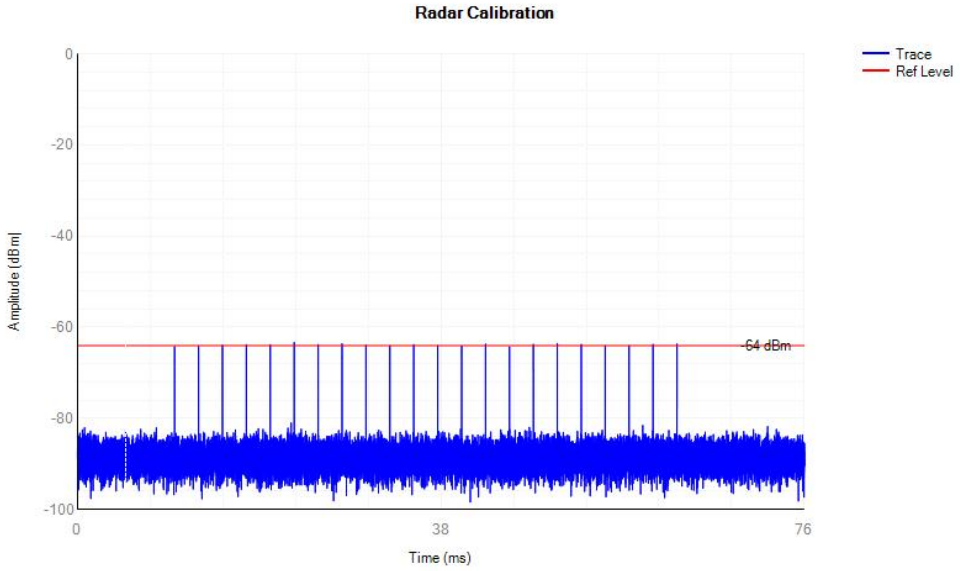
8.2.2 Calibration Results

Mode 802.11n HT40 mode - 5510MHz

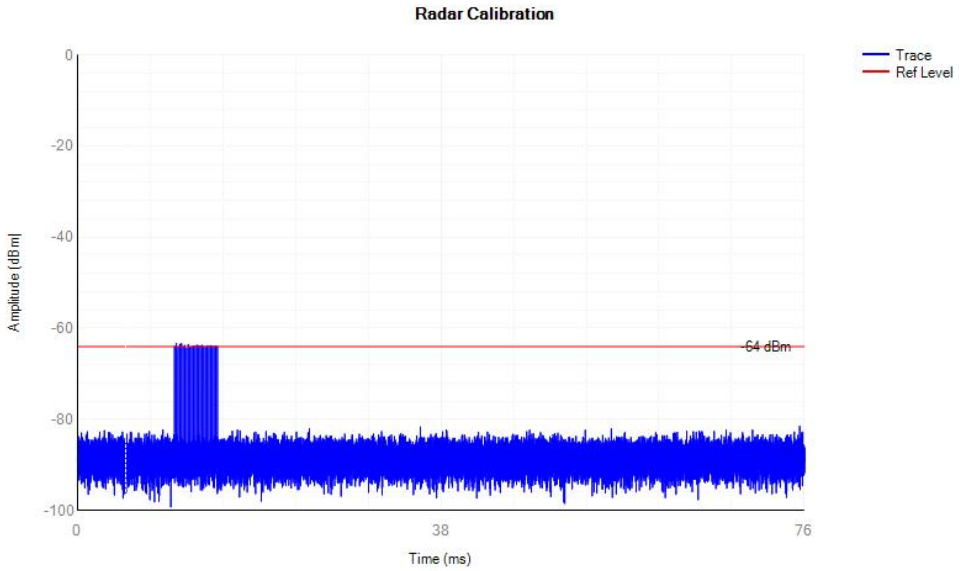
Radar #0

Radar #1A



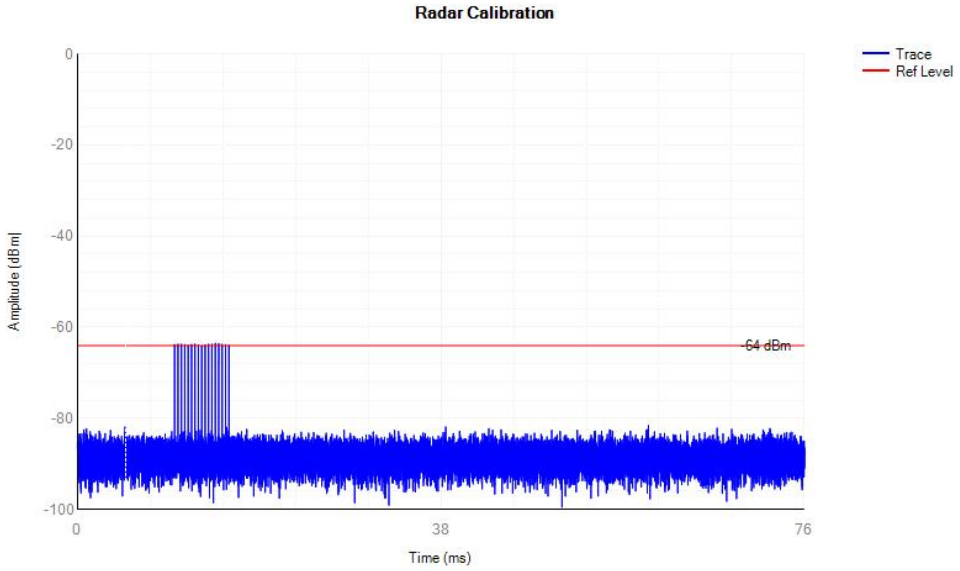
Radar #1B



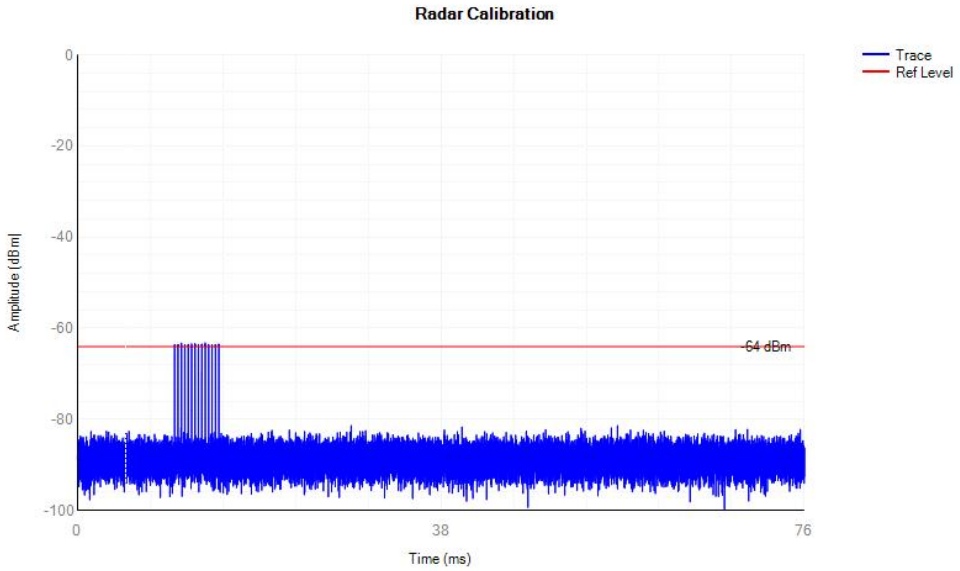
Radar #2



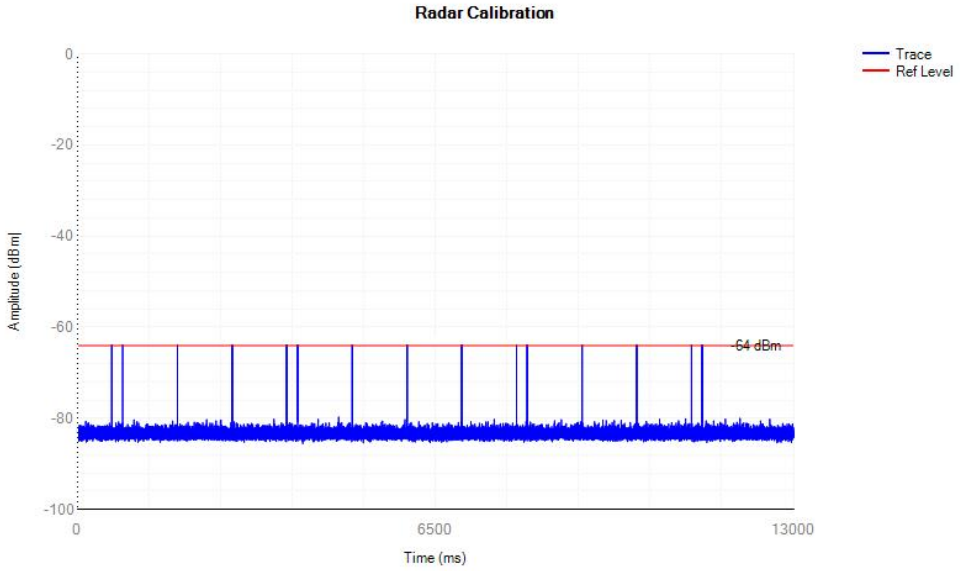
Radar #3



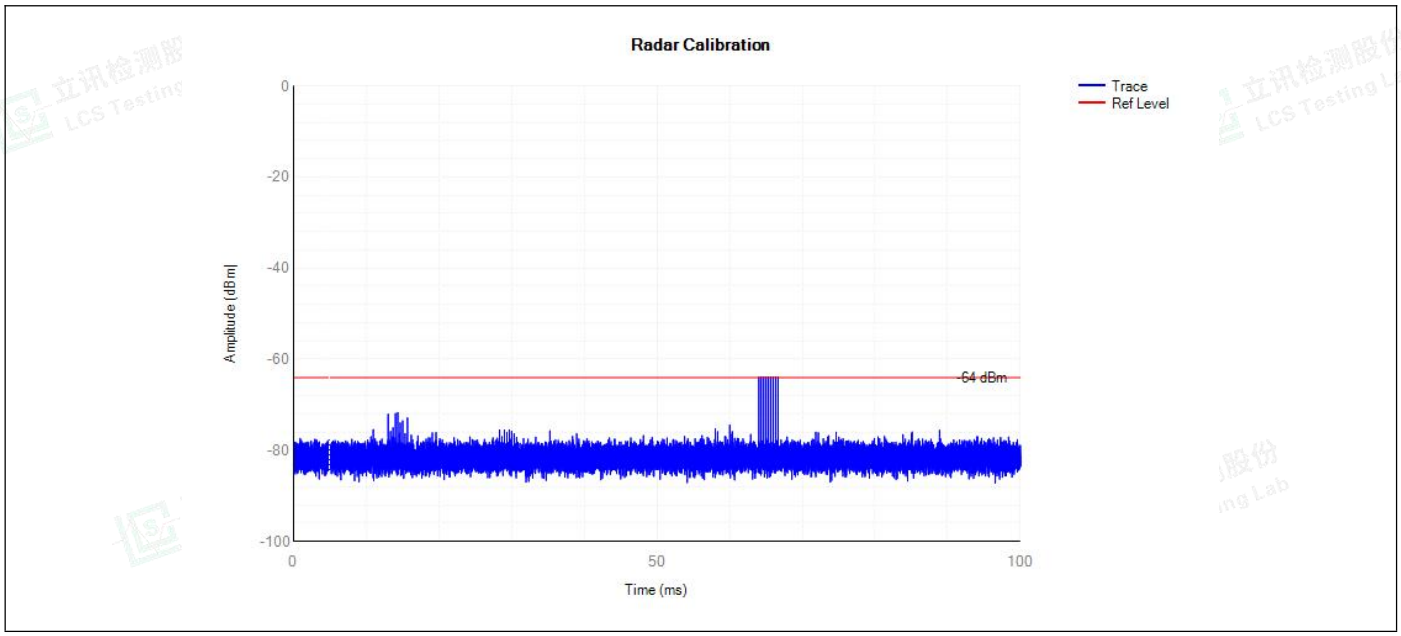
Radar #4



Radar #5



Radar #6


Radar Calibration
Trace
Ref Level
0
-20
-40
-60
-80
-100
Amplitude [dBm]
-64 dBm
0
50
100
Time (ms)

8.3 NII Detection Bandwidth Measurement

8.3.1 Test Limit

Minimum 100% of the NII 99% transmission power bandwidth. During the U-NII Detection Bandwidth detection test, each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

8.3.2 Test Procedure

1. Adjust the equipment to produce a single Burstof any one of the Short Pulse Radar Types 0 –4 in Table 5 at the center frequency of the UUT Operating Channelat the specified DFS Detection Threshold level found in Table 3.
2. The generating equipment is configured as shown in the Conducted Test Setup above Figure 7-1
3. The EUT is set up as a stand-alone device (no associated Client or Master, as appropriate) and no traffic. Frame based systems will be set to a talk/listen ratio reflecting the worst case (maximum) that is user configurable during this test.
4. Generate a single radar Burst, and note the response of the EUT. Repeat for a minimum of 10 trials. The EUT must detect the Radar Waveform using the specified U-NII Detection Bandwidth criterion shown in Table 3-5. In cases where the channel bandwidth may exceed past the DFS band edge on specific channels (i.e., 802.11ac or wideband frame based systems) select a channel that has the entire emission bandwidth within the DFS band. If this is not possible, test the detection BW to the DFS band edge.
5. Starting at the center frequency of the UUT operating Channel, increase the radar frequency in 5 MHz steps, repeating the above test sequence, until the detection rate falls below the U-NII Detection Bandwidth criterion specified in Table 3-3. Repeat this measurement in 1MHz steps at frequencies 5 MHz below where the detection rate begins to fall. Record the highest frequency (denote as FH) at which detection is greater than or equal to the U-NII Detection Bandwidth criterion. Recording the detection rate at frequencies above FH is not required to demonstrate compliance.
6. Starting at the center frequency of the EUT operating Channel, decrease the radar frequency in 1 MHz steps, repeating the above item 4 test sequence, until the detection rate falls below the U-NII Detection Bandwidth criterion. Record the lowest frequency (denote as FL) at which detection is greater than or equal to the U-NII Detection Bandwidth criterion. Recording the detection rate at frequencies below FL is not required to demonstrate compliance.
7. The U-NII Detection Bandwidth is calculated as follows: U-NII Detection Bandwidth = FH – FL
8. The U-NII Detection Bandwidth must be at least 100% of the EUT transmitter 99% power, otherwise, the EUT does not comply with DFS requirements

8.3.3 Test Result

Detection Bandwidth(802.11a mode-5500MHz)												
Radar Frequncy(MHz)	DFS Detection Trials(1=Detecton, 0=no Detection)											
	1	2	3	4	5	6	7	8	9	10	Detection Rate(%)	Limit(%)
5489	0	0	0	0	0	0	0	0	0	0	0	/
5490FL	1	1	1	1	1	1	1	1	1	1	100	90
5491	1	1	1	1	1	1	1	1	1	1	100	90
5492	1	1	1	1	1	1	1	1	1	1	100	90
5493	1	1	1	1	1	1	1	1	1	1	100	90
5495	1	1	1	1	1	1	1	1	1	1	100	90
5500	1	1	1	1	1	1	1	1	1	1	100	90
5505	1	1	1	1	1	1	1	1	1	1	100	90
5506	1	1	1	1	1	1	1	1	1	1	100	90
5507	1	1	1	1	1	1	1	1	1	1	100	90
5508	1	1	1	1	1	1	1	1	1	1	100	90
5509	1	1	1	1	1	1	1	1	1	1	100	90
5510FH	1	1	1	1	1	1	1	1	1	1	100	90
5511	0	0	0	0	0	0	0	0	0	0	0	/
Note 1: The 99% channel bandwidth is 16.79MHz. (See the 99% BW section of the RF report for further measurement details). Note 2: Detection Bandwidth = FH - FL = 5510MHz – 5490MHz = 20MHz Note 3: NII Detection Bandwidth Min. Limit (MHz): 16.79MHz x 100% = 16.79MHz.												

Detection Bandwidth(802.11n HT40 mode-5510MHz)												
Radar Frequncy(MHz)	DFS Detection Trials(1=Detecton, 0=no Detection)											
	1	2	3	4	5	6	7	8	9	10	Detection Rate(%)	Limit(%)
5489	0	0	0	0	0	0	0	0	0	0	0	/
5490FL	1	1	1	1	1	1	1	1	1	1	100	90
5491	1	1	1	1	1	1	1	1	1	1	100	90
5492	1	1	1	1	1	1	1	1	1	1	100	90
5493	1	1	1	1	1	1	1	1	1	1	100	90
5495	1	1	1	1	1	1	1	1	1	1	100	90
5500	1	1	1	1	1	1	1	1	1	1	100	90
5505	1	1	1	1	1	1	1	1	1	1	100	90
5510	1	1	1	1	1	1	1	1	1	1	100	90
5515	1	1	1	1	1	1	1	1	1	1	100	90
5520	1	1	1	1	1	1	1	1	1	1	100	90
5525	1	1	1	1	1	1	1	1	1	1	100	90

5526	1	1	1	1	1	1	1	1	1	1	100	90
5527	1	1	1	1	1	1	1	1	1	1	100	90
5528	1	1	1	1	1	1	1	1	1	1	100	90
5529	1	1	1	1	1	1	1	1	1	1	100	90
5530FH	1	1	1	1	1	1	1	1	1	1	100	90
5531	0	0	0	0	0	0	0	0	0	0	0	/

Note 1: The 99% channel bandwidth is 36.10MHz. (See the 99% BW section of the RF report for further measurement details).
Note 2: Detection Bandwidth = FH - FL = 5530MHz - 5490MHz = 40MHz.
Note 3: NII Detection Bandwidth Min. Limit (MHz): 36.10MHz x 100% = 36.10MHz.

8.4 Channel Availability Check Time Measurement

8.4.1 Limit and Test Procedure

Initial Channel Availability Check Time

The Initial Channel Availability Check Time tests that the UUT does not emit beacon, control, or data signals on the test Channel until the power-up sequence has been completed and the U-NII device checks for Radar Waveforms for one minute on the test Channel. This test does not use any Radar Waveforms and only needs to be performed one time.

a) The U-NII devices will be powered on and be instructed to operate on the appropriate U-NII Channel that must incorporate DFS functions. At the same time the UUT is powered on, the spectrum analyzer will be set to zero span mode with a 3 MHz RBW and 3 MHz VBW on the Channel occupied by the radar (Chr) with a 2.5 minute sweep time. The spectrum analyzer's sweep will be started at the same time power is applied to the U-NII device.

b) The UUT should not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle.

c) Confirm that the UUT initiates transmission on the channel This measurement can be used to determine the length of the power-on cycle if it is not supplied by the manufacturer. If the spectrum analyzer sweep is started at the same time the UUT is powered on and the UUT does not begin transmissions until it has completed the cycle, the power-on time can be determined by comparing the two times.

Radar Burst at the Beginning of the Channel Availability Check Time

The steps below define the procedure to verify successful radar detection on the test Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1 dB occurs at the beginning of the Channel Availability Check Time.

a) The Radar Waveform generator and UUT are connected using the applicable test setup described in the sections on configuration for Conducted Tests (Figure 7-1) and the power of the UUT is switched off.

b) The UUT is powered on at T_0. T_1 denotes the instant when the UUT has completed its power-up sequence (T_{power_up}). The Channel Availability Check Time commences on Chr at instant T_1 and will end no sooner than T_1 + $T_{ch\_avail\_check}$.

c) A single Burst of one of the Short Pulse Radar Types 0-4 will commence within a 6 second window starting at T_1. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.

d) Visual indication or measured results on the UUT of successful detection of the radar Burst will be recorded and reported. Observation of Ch_r for UUT emissions will continue for 2.5 minutes after the radar Burst has been generated.

e) Verify that during the 2.5 minute measurement window no UUT transmissions occurred on Ch_r. The Channel Availability Check results will be recorded.

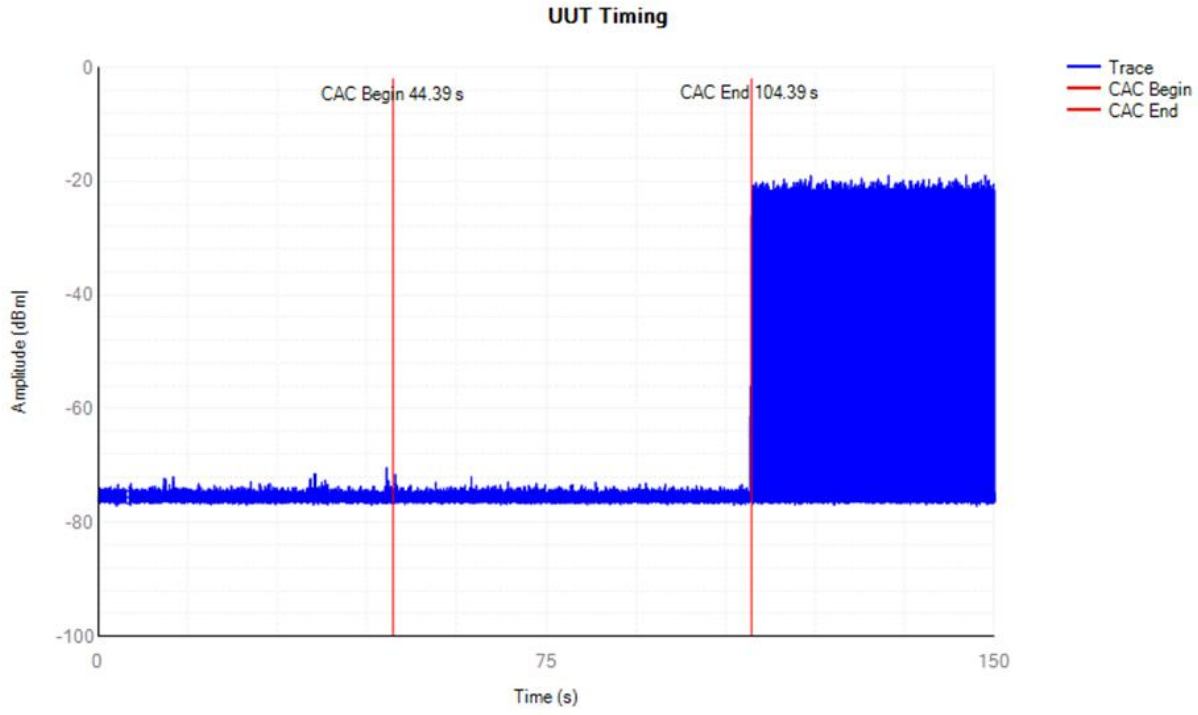
Radar Burst at the End of the Channel Availability Check Time

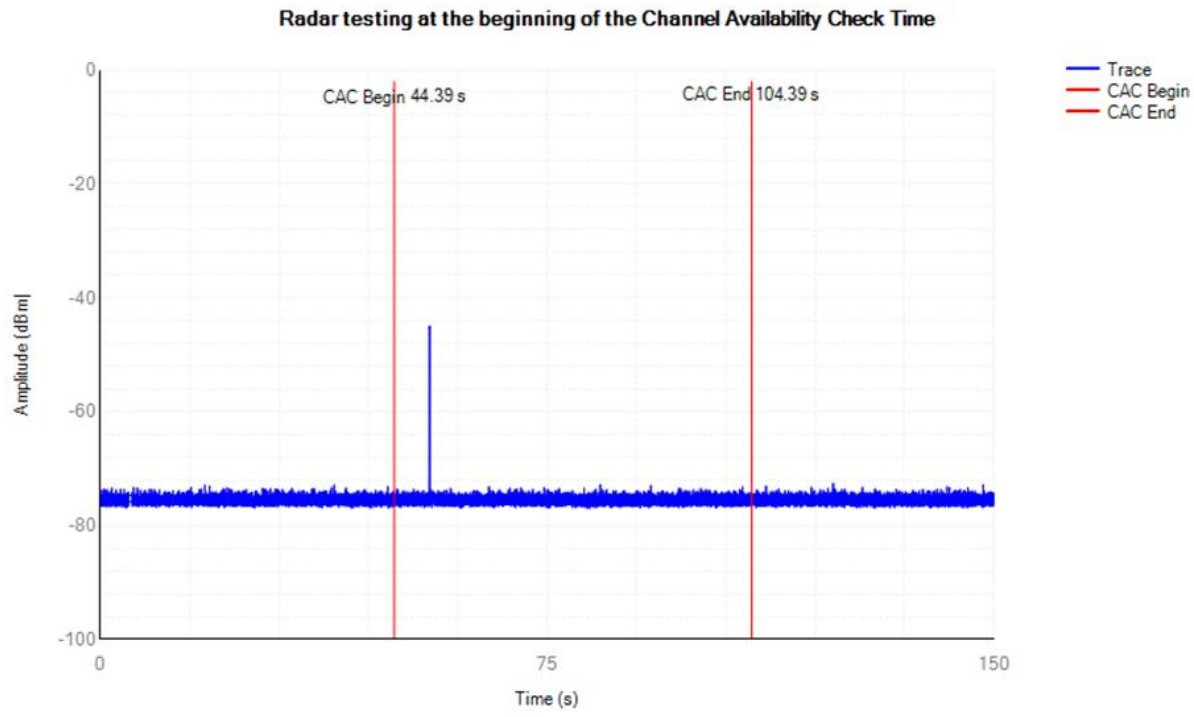
The steps below define the procedure to verify successful radar detection on the test Channel during a period equal to the Channel Availability Check Time and avoidance of operation on that Channel when a radar Burst with a level equal to the DFS Detection Threshold + 1dB occurs at the end of the Channel Availability Check Time.

a) The Radar Waveform generator and UUT are connected using the applicable test setup described in the sections for Conducted Tests (Figure 7-1) and the power of the UUT is switched off.
b) The UUT is powered on at T_0. T_1 denotes the instant when the UUT has completed its power-up sequence (T_{power_up}). The Channel Availability Check Time commences on Ch_r at instant T_1 and will end no sooner than T_1 + $T_{ch\_avail\_check}$.
c) A single Burst of one of the Short Pulse Radar Types 0-4 will commence within a 6 second window starting at T_1 + 54 seconds. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
d) Visual indication or measured results on the UUT of successful detection of the radar Burst will be recorded and reported. Observation of Ch_r for UUT emissions will continue for 2.5 minutes after the radar Burst has been generated.
e) Verify that during the 2.5 minute measurement window no UUT transmissions occurred on Ch_r. The Channel Availability Check results will be recorded.

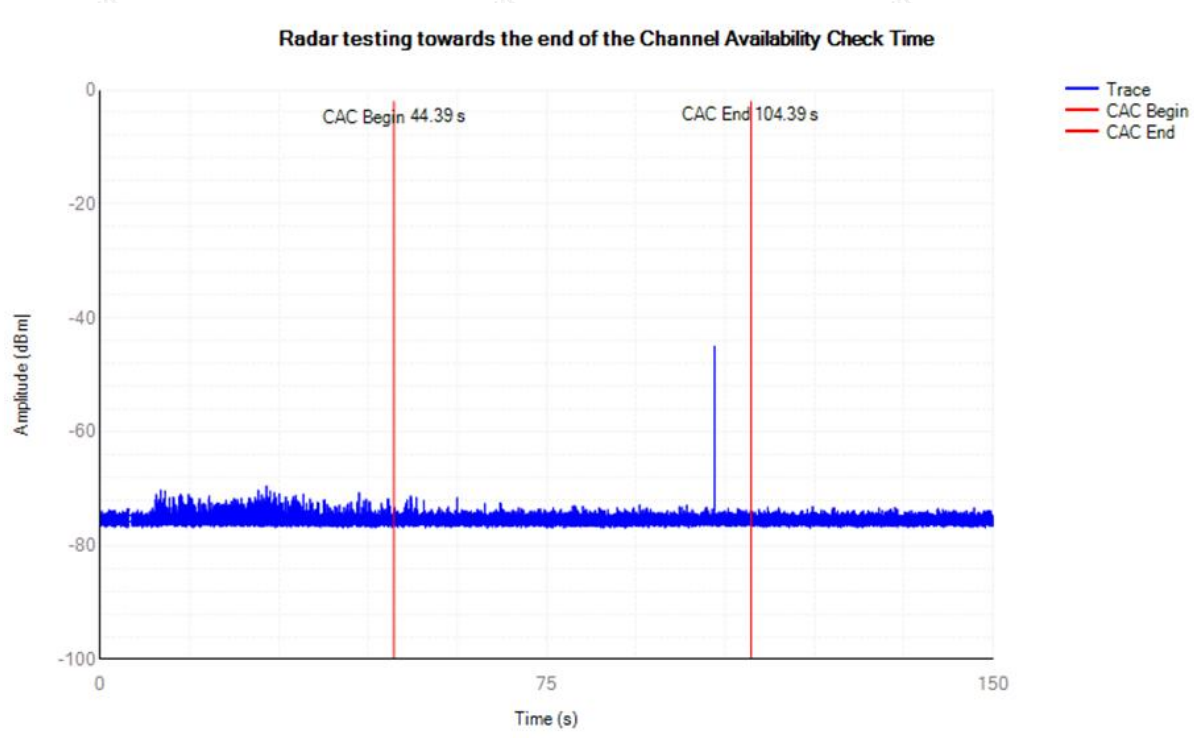
8.4.2 Test Result

Mode 802.11n HT40 mode - 5510MHz

Initial Channel Availability Check Time

Note: The EUT does not transmit any beacon or data transmissions until at least 1 minute after the completion of the power-on cycle (44.39sec). Initial beacons/data transmissions are indicated by marker 1 (104.39sec)
Beginning of the Channel Availability Check Time



End of the Channel Availability Check Time



8.5 In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period Measurement

8.5.1 Test Limit

The EUT has In-Service Monitoring function to continuously monitor the radar signals. If the radar is detected, must leave the channel (Shutdown). The Channel Move Time to cease all transmissions on the current channel upon detection of a Radar Waveform above the DFS Detection Threshold within 10 sec. The total duration of Channel Closing Transmission Time is 260ms, consisting of data signals and the aggregate of control signals, by a U-NII device during the Channel Move Time. The Non-Occupancy Period time is 30 minutes during which a Channel will not be utilized after a Radar Waveform is detected on that Channel.

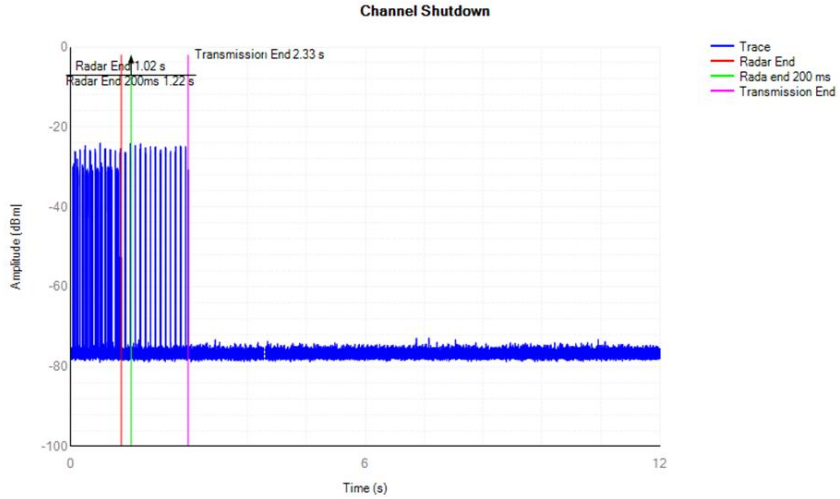
8.5.2 Test Procedure

1. The test should be performed with Radar Type 0. The measurement timing begins at the end of theRadar Type 0.
2. When the radar burst with a level equal to the DFS Detection Threshold + 1dB is generated on the Operating Channel of the U-NII device. A U-NII device operating as a Master Device will associate with the Client Device at Channel. Stream the MPEG test file from the Master Device to the Client Device on the selected Channel for the entire period of the test. At time T_0 the Radar Waveform generator sends a Burst of pulses for each of the radar types at Detection Threshold + 1dB.
3. Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel. Measure and record the transmissions from the EUT during the observation time (Channel Move Time).
4. Measurement of the aggregate duration of the Channel Closing Transmission Time method. With the spectrum analyzer set to zero span tuned to the center frequency of the EUT operating channel at the radar simulated frequency, peak detection, and max hold, the dwell time per bin is given by: Dwell (1.5ms) = S (12 sec) / B (8000); where Dwell is the dwell time per spectrum analyzer sampling bin, S is the sweep time and B is the number of spectrum analyzer sampling bins. An upper bound of the aggregate duration of the intermittent control signals of Channel Closing Transmission Time is calculated by: C = N X Dwell; where C is the Closing Time, N is the number of spectrum analyzer sampling bins showing a U-NII transmission and Dwell is the dwell time per bin.
5. Measure the EUT for more than 30 minutes following the channel close/move time to verify that the EUT does not resume any transmissions on this Channel.

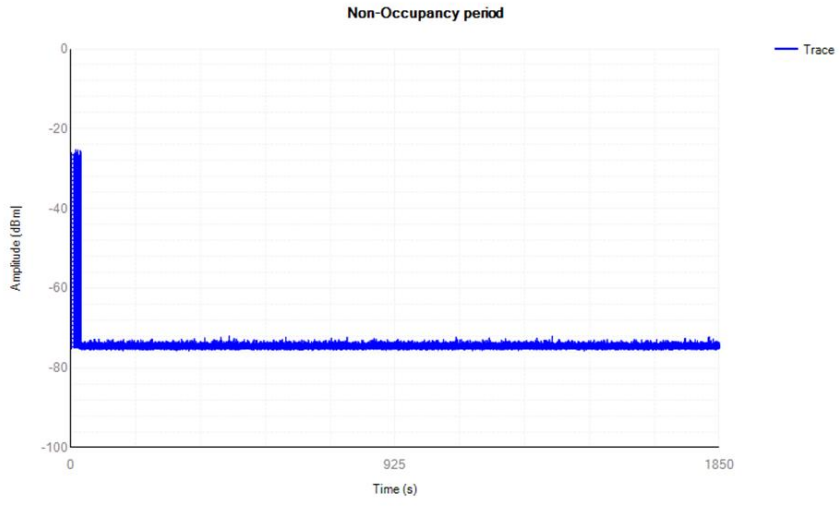
8.5.3 Test Result

Mode 802.11n HT40-5510MHz		
Parameter	Test Result	Limit
Channel Move Time (s)	1.3265	＜10
Channel Closing Transmission Time(ms)	0.026	＜260ms
CloseTransmissionTime after 200ms	0.0224	＜60ms
Non-Occupancy Period (min)	≥30min	≥30min

Channel Move Time and Channel Closing Transmission Time



Non-Occupancy Period



8.6 Statistical Performance Check

8.6.1 Test Limit

The minimum percentage of successful detection requirements found in below table when a radar burst with a level equal to the DFS Detection Threshold + 1dB is generated on the Operating Channel of the U-NII device (In- Service Monitoring).

Radar Type	Minimum Number of Trails	Detection Probability
1	30(15 of test A and 15 of test B)	Pd ≥ 60%
2	30	Pd ≥ 60%
3	30	Pd ≥ 60%
4	30	Pd ≥ 60%
Aggregate (Radar Types 1-4)	120	Pd ≥ 80%
5	30	Pd ≥ 80%
6	30	Pd ≥ 70%
Note: The percentage of successful detection is calculated by: (Total Waveform Detections / Total Waveform Trails) * 100 = 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: (Pd1 + Pd2 + Pd3 + Pd4) / 4.		

8.6.2 Test Procedure

1. Stream the channel loading test file from the Master Device to the Client Device on the test Channel for the entire period of the test.
2. At time T_0 the Radar Waveform generator sends the individual waveform for each of the Radar Types 1-6, at levels equal to the DFS Detection Threshold + 1dB, on the Operating Channel.
3. Observe the transmissions of the EUT at the end of the Burst on the Operating Channel for duration greater than 10 seconds for Short Pulse Radar Types 0 to ensure detection occurs.
4. Observe the transmissions of the EUT 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.
5. The device can utilize a test mode to demonstrate when detection occurs to prevent the need to reset the device between trial runs.
6. The Minimum number of trails, minimum percentage of successful detection and the average minimum percentage of successful detection are found in below table

8.6.3 Test Result

Note: All the modes have been tested and recorded worst mode in the report.

Mode 802.11n HT40 mode - 5510MHz

Trial #	Radar Type 1		Radar Type 2		Radar Type 3		Radar Type 4	
	Radar Frequency (MHz)	1=Detection 0=no Detectiont	Radar Frequency (MHz)	1=Detection 0=no Detectiont	Radar Frequency (MHz)	1=Detection 0=no Detectiont	Radar Frequency (MHz)	1=Detection 0=no Detectiont
0	5498	1	5488	0	5490	1	5491	1
1	5493	0	5489	1	5493	0	5493	1
2	5496	1	5490	1	5492	1	5492	1
3	5500	1	5491	1	5496	1	5490	1
4	5499	1	5492	1	5497	1	5496	0
5	5492	1	5493	1	5498	1	5495	1
6	5510	1	5500	1	5501	0	5498	1
7	5501	1	5502	1	5500	1	5497	1
8	5506	1	5503	0	5503	1	5499	1
9	5503	1	5506	1	5504	1	5500	1
10	5512	1	5507	1	5506	1	5501	1
11	5516	1	5510	1	5509	1	5503	1
12	5517	1	5516	1	5508	1	5506	1
13	5524	1	5518	1	5510	1	5504	1
14	5532	1	5519	1	5514	1	5508	1
15	5524	1	5520	1	5519	1	5502	1
16	5508	1	5522	1	5517	1	5509	1
17	5507	1	5523	1	5511	1	5507	1
18	5504	1	5526	1	5512	1	5510	1
19	5517	1	5527	1	5513	1	5511	1
20	5522	1	5530	1	5522	1	5512	1
21	5521	1	5531	1	5526	0	5518	1
22	5536	1	5532	1	5527	1	5519	1
23	5522	1	5534	1	5528	1	5517	1
24	5529	0	5535	1	5523	1	5520	1
25	5533	1	5536	1	5524	1	5522	1
26	5534	0	5537	1	5529	1	5536	1
27	5539	0	5538	1	5530	0	5537	0
28	5536	0	5539	1	5534	1	5539	0
29	5530	1	5540	0	5536	0	5546	0
Probability:	83.3		90.0		83.3		86.7	
Aggregate:	85.83							

Radar Type 1 - Radar Waveform

Trial List

	Trial Id	Radar Type	Pulse Width (us)	PRI (us)	Number of Pulses	Waveform Length (us)
Download	0	Type 1	1.0	938.0	57	53466.0
Download	1	Type 1	1.0	698.0	76	53048.0
Download	2	Type 1	1.0	618.0	86	53148.0
Download	3	Type 1	1.0	538.0	99	53262.0
Download	4	Type 1	1.0	878.0	61	53558.0
Download	5	Type 1	1.0	3066.0	18	55188.0
Download	6	Type 1	1.0	638.0	83	52954.0
Download	7	Type 1	1.0	918.0	58	53244.0
Download	8	Type 1	1.0	838.0	63	52794.0
Download	9	Type 1	1.0	858.0	62	53196.0
Download	10	Type 1	1.0	798.0	67	53466.0
Download	11	Type 1	1.0	718.0	74	53132.0
Download	12	Type 1	1.0	578.0	92	53176.0
Download	13	Type 1	1.0	598.0	89	53222.0
Download	14	Type 1	1.0	558.0	95	53010.0
Download	15	Type 1	1.0	2536.0	21	53256.0
Download	16	Type 1	1.0	966.0	55	53130.0
Download	17	Type 1	1.0	827.0	64	52928.0
Download	18	Type 1	1.0	2501.0	22	55022.0
Download	19	Type 1	1.0	2595.0	21	54495.0
Download	20	Type 1	1.0	1114.0	48	53472.0
Download	21	Type 1	1.0	1302.0	41	53382.0
Download	22	Type 1	1.0	3045.0	18	54810.0
Download	23	Type 1	1.0	1624.0	33	53592.0
Download	24	Type 1	1.0	2878.0	19	54682.0
Download	25	Type 1	1.0	1027.0	52	53404.0
Download	26	Type 1	1.0	2485.0	22	54670.0
Download	27	Type 1	1.0	1600.0	33	52800.0
Download	28	Type 1	1.0	1172.0	46	53912.0
Download	29	Type 1	1.0	1177.0	45	52965.0

Radar Type 2 - Radar Waveform

Trial List

	Trial Id	Radar Type	Pulse Width (us)	PRI (us)	Number of Pulses	Waveform Length (us)
Download	0	Type 2	3.2	179.0	26	4654.0
Download	1	Type 2	1.1	207.0	23	4761.0
Download	2	Type 2	2.1	230.0	24	5520.0
Download	3	Type 2	4.8	200.0	29	5800.0
Download	4	Type 2	3.9	214.0	28	5992.0
Download	5	Type 2	2.9	222.0	26	5772.0
Download	6	Type 2	3.2	204.0	26	5304.0
Download	7	Type 2	2.5	192.0	25	4800.0
Download	8	Type 2	3.1	164.0	26	4264.0
Download	9	Type 2	1.2	156.0	23	3588.0
Download	10	Type 2	3.9	210.0	27	5670.0
Download	11	Type 2	4.6	201.0	29	5829.0
Download	12	Type 2	3.2	162.0	26	4212.0
Download	13	Type 2	2.2	197.0	25	4925.0
Download	14	Type 2	4.5	163.0	29	4727.0
Download	15	Type 2	3.0	203.0	26	5278.0
Download	16	Type 2	5.0	168.0	29	4872.0
Download	17	Type 2	2.4	217.0	25	5425.0
Download	18	Type 2	2.9	191.0	26	4966.0
Download	19	Type 2	2.3	166.0	25	4150.0
Download	20	Type 2	3.7	150.0	27	4050.0
Download	21	Type 2	2.2	176.0	25	4400.0
Download	22	Type 2	4.9	195.0	29	5655.0
Download	23	Type 2	2.9	202.0	26	5252.0
Download	24	Type 2	2.5	178.0	25	4450.0
Download	25	Type 2	1.1	206.0	23	4738.0
Download	26	Type 2	3.8	155.0	27	4185.0
Download	27	Type 2	4.7	157.0	29	4553.0
Download	28	Type 2	2.4	224.0	25	5600.0
Download	29	Type 2	4.2	159.0	28	4452.0

Radar Type 3 - Radar Waveform

Trial List

	Trial Id	Radar Type	Pulse Width (us)	PRI (us)	Number of Pulses	Waveform Length (us)
Download	0	Type 3	8.2	355.0	17	6035.0
Download	1	Type 3	6.1	487.0	16	7792.0
Download	2	Type 3	7.1	344.0	16	5504.0
Download	3	Type 3	9.8	288.0	18	5184.0
Download	4	Type 3	8.9	230.0	18	4140.0
Download	5	Type 3	7.9	432.0	17	7344.0
Download	6	Type 3	8.2	207.0	17	3519.0
Download	7	Type 3	7.5	443.0	17	7531.0
Download	8	Type 3	8.1	439.0	17	7463.0
Download	9	Type 3	6.2	223.0	16	3568.0
Download	10	Type 3	8.9	208.0	18	3744.0
Download	11	Type 3	9.6	463.0	18	8334.0
Download	12	Type 3	8.2	441.0	17	7497.0
Download	13	Type 3	7.2	323.0	16	5168.0
Download	14	Type 3	9.5	297.0	18	5346.0
Download	15	Type 3	8.0	412.0	17	7004.0
Download	16	Type 3	10.0	324.0	18	5832.0
Download	17	Type 3	7.4	271.0	17	4607.0
Download	18	Type 3	7.9	349.0	17	5933.0
Download	19	Type 3	7.3	409.0	16	6544.0
Download	20	Type 3	8.7	373.0	18	6714.0
Download	21	Type 3	7.2	254.0	16	4064.0
Download	22	Type 3	9.9	274.0	18	4932.0
Download	23	Type 3	7.9	278.0	17	4726.0
Download	24	Type 3	7.5	317.0	17	5389.0
Download	25	Type 3	6.1	260.0	16	4160.0
Download	26	Type 3	8.8	211.0	18	3798.0
Download	27	Type 3	9.7	272.0	18	4896.0
Download	28	Type 3	7.4	264.0	17	4488.0
Download	29	Type 3	9.2	284.0	18	5112.0

Radar Type 4 - Radar Waveform

Trial List

	Trial Id	Radar Type	Pulse Width (us)	PRI (us)	Number of Pulses	Waveform Length (us)
Download	0	Type 4	16.0	355.0	14	4970.0
Download	1	Type 4	11.3	487.0	12	5844.0
Download	2	Type 4	13.5	344.0	13	4472.0
Download	3	Type 4	19.4	288.0	16	4608.0
Download	4	Type 4	17.5	230.0	15	3450.0
Download	5	Type 4	15.3	432.0	14	6048.0
Download	6	Type 4	15.9	207.0	14	2898.0
Download	7	Type 4	14.3	443.0	13	5759.0
Download	8	Type 4	15.8	439.0	14	6146.0
Download	9	Type 4	11.5	223.0	12	2676.0
Download	10	Type 4	17.4	208.0	15	3120.0
Download	11	Type 4	19.0	463.0	16	7408.0
Download	12	Type 4	16.0	441.0	14	6174.0
Download	13	Type 4	13.8	323.0	13	4199.0
Download	14	Type 4	18.9	297.0	16	4752.0
Download	15	Type 4	15.5	412.0	14	5768.0
Download	16	Type 4	19.9	324.0	16	5184.0
Download	17	Type 4	14.1	271.0	13	3523.0
Download	18	Type 4	15.2	349.0	14	4886.0
Download	19	Type 4	13.8	409.0	13	5317.0
Download	20	Type 4	17.1	373.0	15	5595.0
Download	21	Type 4	13.8	254.0	13	3302.0
Download	22	Type 4	19.8	274.0	16	4384.0
Download	23	Type 4	15.3	278.0	14	3892.0
Download	24	Type 4	14.5	317.0	13	4121.0
Download	25	Type 4	11.3	260.0	12	3120.0
Download	26	Type 4	17.3	211.0	15	3165.0
Download	27	Type 4	19.2	272.0	16	4352.0
Download	28	Type 4	14.2	264.0	13	3432.0
Download	29	Type 4	18.2	284.0	15	4260.0

Radar Type 5

Trail #	Radar Frequency (MHz)	1=Detection 0=No Detection	Trail #	Radar Frequency (MHz)	1=Detection 0=No Detection
0	5500	1	15	5503.23	1
1	5500	0	16	5505.5	1
2	5500	1	17	5505.5	1
3	5500	0	18	5502.23	1
4	5500	1	19	5501.5	0
5	5500	1	20	5496.5	1
6	5500	1	21	5498.9	1
7	5500	1	22	5494.5	1
8	5500	1	23	5497.7	1
9	5500	1	24	5498.1	1
10	5503.9	1	25	5500.5	1
11	5505.1	1	26	5496.1	0
12	5502.7	1	27	5494.9	1
13	5501.5	1	28	5498.5	1
14	5504.7	0	29	5495.7	1
Detection Percentage (%)		**83.3**			

Radar Type 5 - Radar Waveform_#0

Trial List

	Trial Id	Radar Type	Number of Bursts	Burst Period (s)	Waveform Length (s)	Center Frequency (GHz)			
Download	0	Type 5	15	0.8000000	12.8000000	5.500000000			
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
		0	636185.0	77.8	13	2	1665.0	1477.0	–
		1	32674.0	51.9	13	1	1074.0	–	–
		2	226294.0	63.8	13	1	1584.0	–	–
		3	417976.0	96.6	13	3	1682.0	1786.0	1843.0
		4	611152.0	85.9	13	3	1795.0	1215.0	1729.0
		5	8789.0	73.7	13	2	1198.0	1549.0	–
		6	201917.0	77.2	13	2	1837.0	1819.0	–
		7	395530.0	68.4	13	2	1587.0	1114.0	–
		8	588564.0	76.7	13	2	2000.0	1155.0	–
		9	783794.0	53.2	13	1	1147.0	–	–
		10	177933.0	85.7	13	3	1433.0	1695.0	1394.0
		11	370624.0	94.3	13	3	1670.0	1426.0	1935.0
		12	564893.0	77.6	13	2	1294.0	1671.0	–
		13	759583.0	65.7	13	1	1512.0	–	–
		14	154262.0	93.5	13	3	1444.0	1130.0	1468.0

Radar Type 5 - Radar Waveform_#1

Download	1	Type 5	8	1.5000000	12.8000000	5.500000000			
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
		0	653020.0	75.0	5	2	1880.0	1527.0	–
		1	1015643.0	99.4	5	3	1401.0	1262.0	1257.0
		2	1379398.0	67.4	5	2	1531.0	1403.0	–
		3	245489.0	73.6	5	2	1449.0	1041.0	–
		4	609113.0	65.9	5	1	1432.0	–	–
		5	970852.0	83.8	5	3	1356.0	1292.0	1419.0
		6	1335913.0	65.5	5	1	1543.0	–	–
		7	200406.0	98.6	5	3	1548.0	1796.0	1728.0

Radar Type 5 - Radar Waveform_#2

Download	2	Type 5	11	1.0909091	12.8000000	5.500000000			
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)
		0	409565.0	73.8	9	2	1806.0	1538.0	–
		1	673692.0	69.5	9	2	1117.0	1649.0	–
		2	938562.0	51.9	9	1	1651.0	–	–
		3	113209.0	84.6	9	3	1976.0	1032.0	1271.0
		4	376726.0	95.4	9	3	1060.0	1903.0	1388.0
		5	641212.0	68.0	9	2	1368.0	1351.0	–
		6	903714.0	89.6	9	3	1338.0	1514.0	1573.0
		7	80863.0	81.9	9	2	1022.0	1689.0	–
		8	344067.0	88.3	9	3	1810.0	1330.0	1838.0
		9	609331.0	53.7	9	1	1597.0	–	–
		10	871542.0	91.3	9	3	1961.0	1106.0	1001.0

Radar Type 5 - Radar Waveform_#3

Download	3	Type 5	20	0.6000000	12.8000000	5.500000000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	26541.0	68.1	19	2	1339.0	1355.0	-	
		1	171821.0	58.7	19	1	1251.0	-	-	
		2	316229.0	75.3	19	2	1136.0	1640.0	-	
		3	461864.0	56.4	19	1	1753.0	-	-	
		4	8677.0	99.7	19	3	1196.0	1708.0	1159.0	
		5	153995.0	57.7	19	1	1013.0	-	-	
		6	299238.0	59.5	19	1	1072.0	-	-	
		7	443177.0	80.0	19	2	1482.0	1369.0	-	
		8	587671.0	82.0	19	2	1993.0	1197.0	-	
		9	135674.0	82.8	19	2	1883.0	1005.0	-	
		10	279928.0	88.0	19	3	1061.0	1928.0	1101.0	
		11	424279.0	93.2	19	3	1207.0	1907.0	1223.0	
		12	570132.0	70.4	19	2	1526.0	1360.0	-	
		13	117439.0	95.3	19	3	1171.0	1955.0	1775.0	
		14	262502.0	81.9	19	2	1690.0	1545.0	-	
		15	406573.0	98.5	19	3	1975.0	1169.0	1062.0	
		16	553328.0	65.0	19	1	1767.0	-	-	
		17	99799.0	85.4	19	3	1011.0	1637.0	1425.0	
		18	244095.0	91.6	19	3	1878.0	1445.0	1325.0	
		19	390012.0	67.3	19	2	1091.0	1218.0	-	

Radar Type 5 - Radar Waveform_#4

Download	4	Type 5	17	0.7058824	12.8000000	5.500000000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	629614.0	67.9	16	2	1320.0	1133.0	-	
		1	96856.0	62.3	16	1	1957.0	-	-	
		2	267719.0	53.3	16	1	1592.0	-	-	
		3	436784.0	90.0	16	3	1900.0	1153.0	1346.0	
		4	608289.0	77.1	16	2	1166.0	1646.0	-	
		5	75610.0	83.9	16	3	1278.0	1232.0	1459.0	
		6	245638.0	89.1	16	3	1240.0	1384.0	1939.0	
		7	416355.0	81.8	16	2	1833.0	1676.0	-	
		8	588736.0	50.3	16	1	1075.0	-	-	
		9	54571.0	87.1	16	3	1116.0	1996.0	1756.0	
		10	225175.0	71.3	16	2	1225.0	1815.0	-	
		11	394825.0	97.5	16	3	1884.0	1465.0	1132.0	
		12	565361.0	90.6	16	3	1561.0	1040.0	1354.0	
		13	33643.0	86.3	16	3	1596.0	1183.0	1792.0	
		14	203957.0	97.6	16	3	1365.0	1073.0	1361.0	
		15	373812.0	84.7	16	3	1021.0	1718.0	1854.0	
		16	544060.0	99.7	16	3	1150.0	1244.0	1988.0	

Radar Type 5 - Radar Waveform_#5

Download	5	Type 5	14	0.8571429	12.8000000	5.500000000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	15438.0	92.9	12	3	1085.0	1564.0	1407.0	
		1	222486.0	67.7	12	2	1744.0	1747.0	-	
		2	430731.0	65.8	12	1	1092.0	-	-	
		3	637784.0	56.3	12	1	1851.0	-	-	
		4	845342.0	53.7	12	1	1727.0	-	-	
		5	196720.0	83.5	12	3	1679.0	1930.0	1025.0	
		6	404955.0	65.8	12	1	1519.0	-	-	
		7	610711.0	85.9	12	3	1134.0	1034.0	1808.0	
		8	818057.0	76.3	12	2	1606.0	1926.0	-	
		9	171459.0	81.5	12	2	1891.0	1714.0	-	
		10	377969.0	89.4	12	3	1310.0	1594.0	1827.0	
		11	586875.0	63.4	12	1	1568.0	-	-	
		12	792834.0	69.6	12	2	1307.0	1925.0	-	
		13	146044.0	74.5	12	2	1264.0	1846.0	-	

Radar Type 5 - Radar Waveform_#6

Download	6	Type 5	15	0.8000000	12.8000000	5.500000000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	329022.0	96.6	13	3	1182.0	1609.0	1581.0	
		1	521718.0	96.7	13	3	1829.0	1799.0	1154.0	
		2	714222.0	86.5	13	3	1923.0	1396.0	1865.0	
		3	112450.0	73.3	13	2	1908.0	1318.0	-	
		4	306283.0	55.8	13	1	1688.0	-	-	
		5	500239.0	55.4	13	1	1145.0	-	-	
		6	690932.0	85.3	13	3	1336.0	1504.0	1820.0	
		7	88645.0	79.4	13	2	1344.0	1893.0	-	
		8	282508.0	65.7	13	1	1476.0	-	-	
		9	475842.0	68.6	13	2	1008.0	1028.0	-	
		10	667887.0	77.7	13	2	1972.0	1835.0	-	
		11	64845.0	79.6	13	2	1882.0	1331.0	-	
		12	257755.0	94.9	13	3	1830.0	1070.0	1349.0	
		13	452335.0	61.4	13	1	1451.0	-	-	
		14	643395.0	90.6	13	3	1233.0	1562.0	1887.0	

Radar Type 5 - Radar Waveform_#7

Download	7	Type 5	12	1.0000000	12.8000000	5.500000000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	51446.0	52.6	10	1	1210.0	-	-	
		1	292696.0	84.1	10	3	1314.0	1725.0	1529.0	
		2	533989.0	97.7	10	3	1139.0	1868.0	1805.0	
		3	775564.0	97.3	10	3	1341.0	1446.0	1755.0	
		4	21542.0	98.8	10	3	1544.0	1386.0	1302.0	
		5	263385.0	72.2	10	2	1771.0	1184.0	-	
		6	505581.0	67.6	10	2	1175.0	1027.0	-	
		7	747058.0	75.7	10	2	1026.0	1871.0	-	
		8	989976.0	60.9	10	1	1798.0	-	-	
		9	234024.0	64.2	10	1	1138.0	-	-	
		10	475207.0	78.8	10	2	1784.0	1604.0	-	
		11	715825.0	87.5	10	3	1511.0	1712.0	1683.0	

Radar Type 5 - Radar Waveform_#8

Download	8	Type 5	14	0.8571429	12.0000000	5.500000000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	823112.0	54.1	13	1	1415.0	-	-	
		1	174965.0	50.7	13	1	1221.0	-	-	
		2	382216.0	52.3	13	1	1974.0	-	-	
		3	587395.0	99.8	13	3	1558.0	1696.0	1949.0	
		4	796897.0	68.4	13	2	1014.0	1099.0	-	
		5	149042.0	80.8	13	2	1736.0	1505.0	-	
		6	356750.0	62.5	13	1	1778.0	-	-	
		7	563824.0	74.8	13	2	1149.0	1204.0	-	
		8	772314.0	50.8	13	1	1049.0	-	-	
		9	123796.0	54.0	13	1	1417.0	-	-	
		10	331215.0	63.0	13	1	1730.0	-	-	
		11	537402.0	91.8	13	3	1143.0	1270.0	1347.0	
		12	744805.0	79.3	13	2	1274.0	1992.0	-	
		13	98172.0	64.3	13	1	1937.0	-	-	

Radar Type 5 - Radar Waveform_#9

Download	9	Type 5	8	1.5000000	12.8000000	5.500000000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	535615.0	63.4	6	1	1043.0	-	-	
		1	898668.0	52.0	6	1	1863.0	-	-	
		2	1259235.0	97.2	6	3	1973.0	1605.0	1583.0	
		3	127106.0	78.7	6	2	1466.0	1743.0	-	
		4	490358.0	74.2	6	2	1280.0	1219.0	-	
		5	852409.0	88.7	6	3	1293.0	1934.0	1273.0	
		6	1217152.0	54.3	6	1	1991.0	-	-	
		7	82296.0	95.4	6	3	1580.0	1555.0	1791.0	

Radar Type 5 - Radar Waveform_#10

Download	10	Type 5	17	0.7058824	12.8000000	5.503900000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	209249.0	73.7	16	2	1208.0	1497.0	-	
		1	378386.0	97.4	16	3	1942.0	1754.0	1613.0	
		2	548411.0	91.7	16	3	1999.0	1702.0	1462.0	
		3	17733.0	66.2	16	1	1393.0	-	-	
		4	187952.0	70.8	16	2	1968.0	1821.0	-	
		5	359277.0	52.3	16	1	1740.0	-	-	
		6	528886.0	78.9	16	2	1308.0	1984.0	-	
		7	700166.0	70.9	16	2	1050.0	1358.0	-	
		8	167197.0	75.6	16	2	1437.0	1430.0	-	
		9	338262.0	59.1	16	1	1697.0	-	-	
		10	508324.0	77.0	16	2	1397.0	1304.0	-	
		11	678689.0	67.9	16	2	1803.0	1083.0	-	
		12	146031.0	81.2	16	2	1720.0	1932.0	-	
		13	316923.0	78.7	16	2	1247.0	1121.0	-	
		14	488056.0	63.3	16	1	1634.0	-	-	
		15	657326.0	68.9	16	2	1849.0	1423.0	-	
		16	125509.0	59.3	16	1	1093.0	-	-	

Radar Type 5 - Radar Waveform_#11

Download	11	Type 5	19	0.6315789	12.8000000	5.505100000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	263736.0	98.9	19	3	1381.0	1680.0	1488.0	
		1	416459.0	82.3	19	2	1716.0	1855.0	-	
		2	567902.0	86.7	19	3	1211.0	1400.0	1919.0	
		3	92979.0	89.7	19	3	1861.0	1068.0	1282.0	
		4	245155.0	98.6	19	3	1507.0	1194.0	1461.0	
		5	397609.0	71.1	19	2	1921.0	1789.0	-	
		6	551431.0	55.9	19	1	1947.0	-	-	
		7	74413.0	67.9	19	2	1350.0	1372.0	-	
		8	226559.0	84.4	19	3	1203.0	1107.0	1443.0	
		9	380056.0	58.8	19	1	1715.0	-	-	
		10	533408.0	65.6	19	1	1017.0	-	-	
		11	55547.0	78.5	19	2	1911.0	1704.0	-	
		12	207876.0	82.3	19	2	1845.0	1686.0	-	
		13	359771.0	90.1	19	3	1938.0	1071.0	1266.0	
		14	511297.0	90.2	19	3	1989.0	1089.0	1950.0	
		15	36803.0	83.1	19	2	1943.0	1406.0	-	
		16	189652.0	58.8	19	1	1742.0	-	-	
		17	341809.0	77.0	19	2	1187.0	1657.0	-	
		18	495737.0	55.0	19	1	1012.0	-	-	

Radar Type 5 - Radar Waveform_#12

Download	12	Type 5	15	0.8000000	12.8000000	5.502700000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	22911.0	58.1	13	1	1929.0	-	-	
		1	216473.0	52.1	13	1	1910.0	-	-	
		2	410004.0	59.9	13	1	1971.0	-	-	
		3	603671.0	60.2	13	1	1812.0	-	-	
		4	794160.0	95.9	13	3	1399.0	1906.0	1608.0	
		5	192251.0	79.9	13	2	1626.0	1859.0	-	
		6	385590.0	78.5	13	2	1238.0	1917.0	-	
		7	579862.0	53.8	13	1	1763.0	-	-	
		8	773423.0	64.7	13	1	1800.0	-	-	
		9	168898.0	61.4	13	1	1390.0	-	-	
		10	361606.0	83.2	13	2	1692.0	1858.0	-	
		11	553866.0	84.7	13	3	1533.0	1677.0	1638.0	
		12	747241.0	88.7	13	3	1703.0	1528.0	1058.0	
		13	144710.0	78.3	13	2	1258.0	1951.0	-	
		14	337856.0	69.3	13	2	1731.0	1717.0	-	

Radar Type 5 - Radar Waveform_#13

Download	13	Type 5	12	1.0000000	12.0000000	5.501500000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	664275.0	75.3	10	2	1994.0	1612.0	-	
		1	907886.0	56.3	10	1	1456.0	-	-	
		2	151316.0	67.7	10	2	1617.0	1185.0	-	
		3	393746.0	55.6	10	1	1337.0	-	-	
		4	635093.0	75.2	10	2	1421.0	1267.0	-	
		5	876993.0	76.3	10	2	1359.0	1305.0	-	
		6	121278.0	85.7	10	3	1547.0	1362.0	1924.0	
		7	362696.0	98.4	10	3	1873.0	1550.0	1249.0	
		8	604342.0	86.4	10	3	1779.0	1439.0	1046.0	
		9	846453.0	93.6	10	3	1059.0	1031.0	1452.0	
		10	91871.0	63.3	10	1	1328.0	-	-	
		11	333050.0	92.4	10	3	1412.0	1673.0	1322.0	

Radar Type 5 - Radar Waveform_#14

Download	14	Type 5	19	0.6315789	12.8000000	5.504700000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	361323.0	93.3	18	3	1983.0	1912.0	1535.0	
		1	515261.0	69.1	18	2	1102.0	1794.0	-	
		2	39025.0	86.9	18	3	1044.0	1152.0	1148.0	
		3	190900.0	84.9	18	3	1894.0	1948.0	1118.0	
		4	343941.0	72.3	18	2	1094.0	1916.0	-	
		5	497624.0	51.7	18	1	1447.0	-	-	
		6	20319.0	58.3	18	1	1429.0	-	-	
		7	172999.0	60.8	18	1	1979.0	-	-	
		8	325872.0	57.1	18	1	1641.0	-	-	
		9	475841.0	88.9	18	3	1886.0	1964.0	1489.0	
		10	1489.0	72.0	18	2	1909.0	1297.0	-	
		11	153647.0	90.9	18	3	1261.0	1566.0	1370.0	
		12	307096.0	59.8	18	1	1552.0	-	-	
		13	458804.0	70.0	18	2	1759.0	1291.0	-	
		14	610798.0	67.2	18	2	1625.0	1881.0	-	
		15	134759.0	91.2	18	3	1382.0	1832.0	1661.0	
		16	288306.0	56.5	18	1	1483.0	-	-	
		17	441296.0	51.2	18	1	1237.0	-	-	
		18	592780.0	74.1	18	2	1471.0	1245.0	-	

Radar Type 5 - Radar Waveform_#15

Download	15	Type 5	14	0.8571429	12.8000000	5.502300000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	158286.0	76.9	12	2	1110.0	1140.0	-	
		1	366024.0	50.2	12	1	1316.0	-	-	
		2	573452.0	62.9	12	1	1520.0	-	-	
		3	780619.0	64.7	12	1	1902.0	-	-	
		4	132455.0	83.8	12	3	1410.0	1097.0	1621.0	
		5	340207.0	65.4	12	1	1944.0	-	-	
		6	548208.0	53.2	12	1	1024.0	-	-	
		7	755333.0	51.7	12	1	1603.0	-	-	
		8	107117.0	78.7	12	2	1804.0	1168.0	-	
		9	314500.0	72.4	12	2	1030.0	1343.0	-	
		10	522447.0	53.8	12	1	1327.0	-	-	
		11	728517.0	73.6	12	2	1524.0	1553.0	-	
		12	81611.0	66.7	12	2	1722.0	1122.0	-	
		13	288948.0	82.5	12	2	1404.0	1019.0	-	

Radar Type 5 - Radar Waveform_#16

Download	16	Type 5	20	0.6000000	12.8000000	5.505500000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	345766.0	87.6	20	3	1565.0	1055.0	1840.0	
		1	490019.0	85.2	20	3	1735.0	1541.0	1408.0	
		2	39073.0	84.8	20	3	1534.0	1889.0	1463.0	
		3	183923.0	77.9	20	2	1749.0	1460.0	-	
		4	328777.0	76.5	20	2	1518.0	1485.0	-	
		5	474728.0	60.9	20	1	1540.0	-	-	
		6	21394.0	83.0	20	2	1080.0	1010.0	-	
		7	165992.0	80.4	20	2	1824.0	1752.0	-	
		8	310973.0	67.5	20	2	1764.0	1181.0	-	
		9	456884.0	62.1	20	1	1495.0	-	-	
		10	3515.0	86.4	20	3	1773.0	1966.0	1263.0	
		11	147928.0	84.3	20	3	1593.0	1188.0	1788.0	
		12	293225.0	76.9	20	2	1226.0	1537.0	-	
		13	436922.0	95.8	20	3	1192.0	1298.0	1844.0	
		14	584015.0	55.2	20	1	1644.0	-	-	
		15	130832.0	59.0	20	1	1402.0	-	-	
		16	274684.0	94.5	20	3	1296.0	1700.0	1283.0	
		17	418579.0	91.9	20	3	1970.0	1978.0	1165.0	
		18	563464.0	85.2	20	3	1732.0	1551.0	1189.0	
		19	112787.0	69.5	20	2	1038.0	1224.0	-	

Radar Type 5 - Radar Waveform_#17

Download	17	Type 5	12	1.0000000	12.8000000	5.501500000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	429224.0	86.4	10	3	1259.0	1918.0	1455.0	
		1	670241.0	92.2	10	3	1598.0	1719.0	1895.0	
		2	912880.0	80.4	10	2	1816.0	1899.0	-	
		3	158603.0	54.3	10	1	1335.0	-	-	
		4	400824.0	53.1	10	1	1303.0	-	-	
		5	641915.0	69.4	10	2	1503.0	1546.0	-	
		6	883823.0	69.1	10	2	1279.0	1639.0	-	
		7	128373.0	100.0	10	3	1375.0	1438.0	1595.0	
		8	370379.0	79.6	10	2	1239.0	1705.0	-	
		9	611194.0	88.4	10	3	1374.0	1579.0	1623.0	
		10	855665.0	53.3	10	1	1016.0	-	-	
		11	98897.0	65.3	10	1	1709.0	-	-	

Radar Type 5 - Radar Waveform_#18

Download	18	Type 5	14	0.8571429	12.8000000	5.502300000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	292143.0	55.3	12	1	1920.0	-	-	
		1	499633.0	58.3	12	1	1797.0	-	-	
		2	706377.0	72.3	12	2	1610.0	1039.0	-	
		3	58989.0	84.8	12	3	1131.0	1761.0	1721.0	
		4	266161.0	82.5	12	2	1875.0	1431.0	-	
		5	474469.0	63.3	12	1	1095.0	-	-	
		6	680544.0	80.0	12	2	1119.0	1913.0	-	
		7	33519.0	90.3	12	3	1660.0	1853.0	1123.0	
		8	240319.0	91.1	12	3	1539.0	1783.0	1172.0	
		9	447400.0	96.6	12	3	1525.0	1036.0	1385.0	
		10	654516.0	82.7	12	2	1710.0	1990.0	-	
		11	8083.0	50.7	12	1	1234.0	-	-	
		12	215435.0	78.4	12	2	1047.0	1109.0	-	
		13	421325.0	99.5	12	3	1299.0	1965.0	1869.0	

Radar Type 5 - Radar Waveform_#19

Download	19	Type 5	12	1.0000000	12.8000000	5.501500000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	733725.0	88.6	10	3	1501.0	1067.0	1927.0	
		1	977882.0	57.4	10	1	1723.0	-	-	
		2	221197.0	96.6	10	3	1086.0	1658.0	1324.0	
		3	462915.0	69.7	10	2	1751.0	1945.0	-	
		4	705071.0	77.9	10	2	1642.0	1317.0	-	
		5	947923.0	62.0	10	1	1866.0	-	-	
		6	191373.0	88.4	10	3	1997.0	1077.0	1366.0	
		7	432561.0	97.3	10	3	1790.0	1896.0	1367.0	
		8	674004.0	96.2	10	3	1391.0	1787.0	1672.0	
		9	915842.0	95.4	10	3	1020.0	1892.0	1414.0	
		10	162176.0	54.8	10	1	1084.0	-	-	
		11	403553.0	80.4	10	2	1850.0	1436.0	-	

Radar Type 5 - Radar Waveform_#20

Download	20	Type 5	16	0.7500000	12.8000000	5.496500000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	483470.0	74.7	15	2	1619.0	1611.0	-	
		1	666072.0	57.1	15	1	1560.0	-	-	
		2	98810.0	91.9	15	3	1392.0	1475.0	1276.0	
		3	279914.0	83.1	15	2	1809.0	1772.0	-	
		4	462536.0	50.7	15	1	1003.0	-	-	
		5	642324.0	79.2	15	2	1574.0	1600.0	-	
		6	76831.0	58.7	15	1	1186.0	-	-	
		7	257785.0	71.0	15	2	1521.0	1567.0	-	
		8	438554.0	79.0	15	2	1777.0	1960.0	-	
		9	620397.0	68.5	15	2	1284.0	1428.0	-	
		10	54310.0	73.5	15	2	1904.0	1352.0	-	
		11	235506.0	70.5	15	2	1864.0	1115.0	-	
		12	417036.0	76.6	15	2	1045.0	1300.0	-	
		13	597974.0	81.2	15	2	1160.0	1675.0	-	
		14	32086.0	61.8	15	1	1277.0	-	-	
		15	212751.0	94.9	15	3	1450.0	1206.0	1860.0	

Radar Type 5 - Radar Waveform_#21

Download	21	Type 5	12	1.0000000	12.8000000	5.498900000				
		Burst ID	Burst Offset (us)	Pulse Width (us)	Chirp Width (MHz)	Number of Pulses per Burst	PRI-1 (us)	PRI-2 (us)	PRI-3 (us)	
		0	526149.0	78.5	9	2	1653.0	1698.0	-	
		1	767135.0	89.8	9	3	1174.0	1962.0	1167.0	
		2	12955.0	59.4	9	1	1982.0	-	-	
		3	254612.0	79.6	9	2	1633.0	1890.0	-	
		4	496588.0	76.0	9	2	1112.0	1811.0	-	
		5	739728.0	53.6	9	1	1144.0	-	-	
		6	980872.0	80.9	9	2	1220.0	1053.0	-	
		7	225249.0	61.6	9	1	1724.0	-	-	
		8	467279.0	53.4	9	1	1901.0	-	-	
		9	709720.0	59.9	9	1	1379.0	-	-	
		10	951847.0	60.4	9	1	1453.0	-	-	
		11	194839.0	91.4	9	3	1768.0	1726.0	1227.0	

Radar Type 5 - Radar Waveform_#22