FCC TEST REPORT

For

SCALA Digital Technology(Ningbo) Co., LTD

RK3399 R Player

Test Model: SMPR

Additional Model No.: Please refer to page 6

Prepared for	:	SCALA Digital Technology(Ningbo) Co., LTD
Address	:	No. 7 Hong Da Road, Hong Tang Industrial Zone A, Jiang Bei District, Ning Bo City, China
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample	:	November 15, 2019
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	November 15, 2019 ~ January 04, 2020
Date of Report	:	January 14, 2020

FCC TEST REPORT
FCC CFR 47 PART 15E (15.407)

Report Reference No. ..... :		**LCS191025032AEE**
Date of Issue..... :		January 14, 2020
Testing Laboratory Name ..... :		**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address..... :		1F., Xingyuan Industrial Park, Tongda Road, Bao'an Blvd., Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure..... :		Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name..... :		**SCALA Digital Technology(Ningbo) Co., LTD**
Address..... :		No. 7 Hong Da Road, Hong Tang Industrial Zone A, Jiang Bei District, Ning Bo City, China
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..... :		**RK3399 R Player**
Trade Mark..... :		STRATATACHE/SCALA
Test Model ..... :		SMPR
Ratings..... :		DC 12V⎓2A from adapter
Result ..... :		**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Jin Wang	Linda He	Gavin Liang
Jin Wang/ Administrators	Linda He/ Technique principal	Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : **LCS191025032AEE**	January 14, 2020 Date of issue

EUT.....	:	SMPR
Test Model.....	:	RK3399 R Player
Applicant.....	**:**	**SCALA Digital Technology(Ningbo) Co., LTD**
Address.....	:	No. 7 Hong Da Road, Hong Tang Industrial Zone A, Jiang Bei District, Ning Bo City, China
Telephone.....	:	/
Fax.....	:	/
Manufacturer.....	**:**	**SCALA Digital Technology(Ningbo) Co., LTD**
Address.....	:	No. 7 Hong Da Road, Hong Tang Industrial Zone A, Jiang Bei District, Ning Bo City, China
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

Revision	Issue Date	Revisions	Revised By
000	January 14, 2020	Initial Issue	Gavin Liang

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	RK3399 R Player
Test Model	:	SMPR
Additional Model No.	:	SMPR-RK3399-S, SMPR-RK3399-S-NL, SMPR-RK3399-S-CL, SMPR-RK3399-S-4G, SMPR-RK3399-S-4G-NL, SMPR-RK3399-S-4G-CL, SMPR-RK3399-S-POE, SMPR-RK3399-S-POE-NL, SMPR-RK3399-S-POE-CL, SMPR-RK3399-P, SMPR-RK3399-P-NL, SMPR-RK3399-P-CL, SMPR-RK3399-P-4G, SMPR-RK3399-P-4G-NL, SMPR-RK3399-P-4G-CL, SMPR-RK3399-P-POE, SMPR-RK3399-P-POE-NL, SMPR-RK3399-P-POE-CL, SMPR-RK3399-C264, SMPR-RK3399-C264-NL, SMPR-RK3399-C264-CL, SMPR-RK3399-C264-4G, SMPR-RK3399-C264-4G-NL, SMPR-RK3399-C264-4G-CL, SMPR-RK3399-C264-POE, SMPR-RK3399-C264-POE-NL, SMPR-RK3399-C264-POE-CL, SMPR-RK3399-C432，SMPR-RK3399-C432-NL, SMPR-RK3399-C432-CL, SMPR-RK3399-C432-4G, SMPR-RK3399-C432-4G-NL, SMPR-RK3399-C432-4G-CL, SMPR-RK3399-C432-POE, SMPR-RK3399-C432-POE-NL, SMPR-RK3399-C432-POE-CL, SMPR-RK3399-L, SMPR-RK3399-L-NL, SMPR-RK3399-L-CL, SMPR-RK3399-L-4G, SMPR-RK3399-L-4G-NL, SMPR-RK3399-L-4G-CL, SMPR-RK3399-L-POE, SMPR-RK3399-L-POE-NL, SMPR-RK3399-L-POE-CL
Model declaration	:	PCB board of these models are the same, just memory, trade mark and appearance are different. So no additional models were tested.
Power Supply	:	DC 12V⎓2A from adapter
Hardware Version	:	V1.X
Software Version	:	20190909.012310
Bluetooth		
Frequency Range	:	2402MHz-2480MHz
Bluetooth Version	:	V4.0
Bluetooth Channel Number	:	79 Channels for Bluetooth V4.0 (BDR/EDR) 40 channels for Bluetooth V4.0 (BT LE)
Bluetooth Channel Spacing	:	1MHz for Bluetooth V4.0 (BDR/EDR) 2MHz for Bluetooth V4.0 (BT LE)
Bluetooth Modulation Type	:	GFSK, π/4-DQPSK, 8-DPSK for Bluetooth V4.0 (BDR/EDR) GFSK for Bluetooth V4.0(BT LE)
Antenna Description	:	External Antenna, 2dBi

2.4G WLAN	
Frequency Range	: 2412MHz-2462MHz
Channel Number	: 11 Channels for 20MHz bandwidth(2412~2462MHz) 7 Channels for 40MHz bandwidth(2422~2452MHz)
Channel Spacing	: 5MHz
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	: External Antenna, 2dBi
5G WLAN	:
Frequency Range	: Band 1: 5180MHz ~ 5240MHz, Band 2A: 5260 MHz-5320 MHz
Channel Number	: 8 Channels for 802.11a, 802.11n(HT20), 802.11ac(VHT20) 4 Channels for 802.11n(HT40), 802.11ac(VHT40) 2 Channels for 802.11ac(VHT80)
Modulation Type	: IEEE 802.11a/n/ac: OFDM(64QAM, 16QAM, QPSK, BPSK)
Antenna Description	: External Antenna, 2dBi

1.2. Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	Certificate
SONY	TV	KDL-32W700B	2011083	SDOC
Shenzhen GEAO Technology Co.,Ltd.	ADAPTER	GEO241U-120200	1909-0000006	SDOC

1.3. External I/O Cable

I/O Port Description	Quantity	Cable
TV Port	1	N/A
Lan Port	1	N/A
HDMI Port	2	N/A
AVG Port	1	N/A
USB Port	1	0.8m, unshielded
Headset Port	1	N/A

1.4. Description of Test Facility

FCC Registration Number is 254912.
Industry Canada Registration Number is 9642A-1.
EMSD Registration Number is ARCB0108.
UL Registration Number is 100571-492.
TUV SUD Registration Number is SCN1081.
TUV RH Registration Number is UA 50296516-001.
NVLAP Accreditation Code is 600167-0.
FCC Designation Number is CN5024.
CAB identifier is CN0071.

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 802.11ac VHT20 Mode: MCS0
IEEE 802.11n HT20 Mode: MCS0, OFDM.
IEEE 802.11ac VHT40 Mode: MCS0, OFDM.
IEEE 802.11n HT40 Mode: MCS0, OFDM.
IEEE 802.11ac VHT80 Mode: MCS0, OFDM.

1.8. Channel List and Frequency

UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (N-NII)			
36	5180	52	5260
38	5190	54	5270
40	5200	56	5280
42	5210	58	5290
44	5220	60	5300
46	5230	62	5310
48	5240	64	5320

1.9. Directional Antenna Gain

The antenna for 5G WIFI is an external antenna, and the maximum antenna gain is 2dBi.

1.10. 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	9.30	2.0	11.30	13.49
IEEE 802.11n HT20	5260 – 5320	9.71	2.0	11.71	14.83
IEEE 802.11n HT40	5260 – 5320	9.32	2.0	11.32	13.55
IEEE 802.11ac VHT20	5260 – 5320	9.50	2.0	11.50	14.13
IEEE 802.11ac VHT40	5260 – 5320	9.12	2.0	11.12	12.94
IEEE 802.11ac VHT80	5260 – 5320	8.73	2.0	10.73	11.83

Remark:
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

3. SYSTEM TEST CONFIGURATION

3.1. Justification

1. Connect FCC approved Master AP to a network, via wired Ethernet, that allows connection to an FTP server.
2. Associate the EUT with the Master AP.
3. Launch the FTP application on the EUT.
4. Connect to the FTP server application to the FTP server hosting the file
5. Initiate an FTP download of the file from the host.
6. Monitor the channel loading during transfer.
7. Reduce the maximum allowed data rate for the Master AP, using the AP's GUI interface.
8. Repeat steps 4-6 until the channel loading is as close to 20 % as possible.
9. Record the data rate setting on the Master AP and the channel loading.
10. While the system is performing an FTP transfer using the settings form item 8 above, perform the Channel Closing Transmission Time and Channel Move Time Measurements as required by KDB905462 D02 v02 using a conducted test.

3.2. EUT Exercise Software

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

3.3. Special Accessories

No.	Equipment	Manufacturer	Model No.	Serial No.	Length	shielded/ unshielded	Notes
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3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

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

3.6. Test Setup

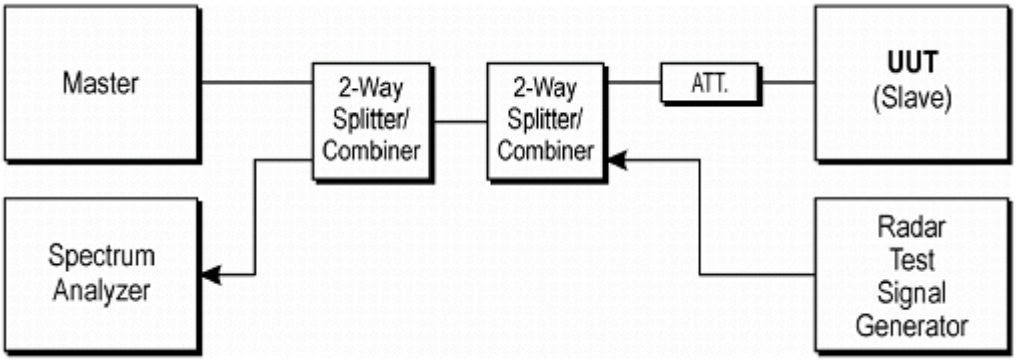


Figure 7-1. Test Setup

3.7. Procedure

The KDB905462 D02 v02 describes a conducted test setup. Each one channel selected between bands 2, band 3 is chosen for the testing.

1. The radar pulse generator is setup to provide a pulse at the frequency that the Master and Client are operating. A Type 0 radar pulse with a 1 μs pulse width and a 1428 μs PRI is used for the testing.
2. The vector signal generator is adjusted to provide the radar burst (18 pulses) at a level of approximately -62 dBm at the antenna of the Master device.
3. The Client Device (EUT) is set up per the diagram in Figure 3-1 and communications between the Master device and the Client is established.
4. The MPEG file specified by the FCC (”6½ Magic Hours”) is streamed from the “file computer” through the Master to the Slave Device and played in full motion video using Media Player Classic Ver.6.4.8.6 in order to properly load the network.
5. The spectrum analyzer is set to record about 15 sec window to any transmissions occurring up to and after 10 sec.
6. The system is again setup and the monitoring time is shortened in order to capture the Channel Closing Transmission Time. This time is measured to insure that the Client ceases transmission within 200 ms and the aggregate of emissions occurring after 200 ms up to 10 sec do not exceed 60 ms.

(Note: the channel may be different since the Master and Client have changed channels due to the detection of the initial radar pulse.)

7. After the initial radar burst the channel is monitored for 30 minutes to insure no transmissions or beacons occur. A second monitoring setup is used to verify that the Master and Client have both moved to different channels.

4. SUMMARY OF TEST RESULTS

Applied Standard: FCC CFR 47 PART 15.407				
Requirement	Operational Mode			RESULTS
	Master	Client with radar detection	Client without radar detection	
Non-Occupancy Period	Required	Required	Not required	Not required
DFS Detection Threshold	Required	Not required	Not required	Not required
Channel Availability Check Time	Required	Not required	Not required	Not required
Channel Closing Transmission Time	Required	Required	Required	Pass
Channel Move Time	Required	Required	Required	Pass
U-NII Detection Bandwidth	Required	Not required	Not required	Not required

5. DESCRIPTION OF DYNAMIC FREQUENCY SELECTION TEST

5.1. Requirements

KDB905462 D02 v02 (04/08/2016) the following are the requirements for Client Devices:

1) A Client Device will not transmit before having received appropriate control signals from a Master Device.

2) A Client Device will stop all its transmissions whenever instructed by a Master Device to which it is associated and will meet the Channel Move Time and Channel Closing Transmission Time requirements.

The Client Device will not resume any transmissions until it has again received control signals from a Master Device.

3) If a Client Device is performing In-Service Monitoring and detects a Radar Waveform above the DFS Detection Threshold, it will inform the Master Device. This is equivalent to the Master Device detecting the Radar Waveform and d) through f) of section 5.1.1(KDB905462 D02 v02) apply.

4) Irrespective of Client Device or Master Device detection the Channel Move Time and Channel Closing Transmission Time requirements remain the same.

5.2. Limit

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.

Carlibration:

The EUT is slave equipment with a max gain is 2.0dBi;

For a detection threshold level of -62dBm and the master (Brand: Sanmsung), Model: S2LF812265, FCC ID: A3LWEA453E) antenna gain is 3.0 dBi, required detetion threshold is -59.00 dBm (=-62+3.0)

Maximum transmit power is less than 200 milliwatt in this report, so detection threshold level is -62dBm.

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.

7. DFS TEST SIGNALS

As the EUT is a Client Device with no Radar Detection only one type radar pulse is required for the testing. Radar Pulse type 0 was used in the evaluation of the Client device for the purpose of measuring the Channel Move Time and the Channel Closing Transmission Time.

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	Roundup $\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{PRI_{\mu sec}}\right)\right\}$	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 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.

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

Table 5a - Pulse Repetition Intervals Values for Test A

Pulse 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

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

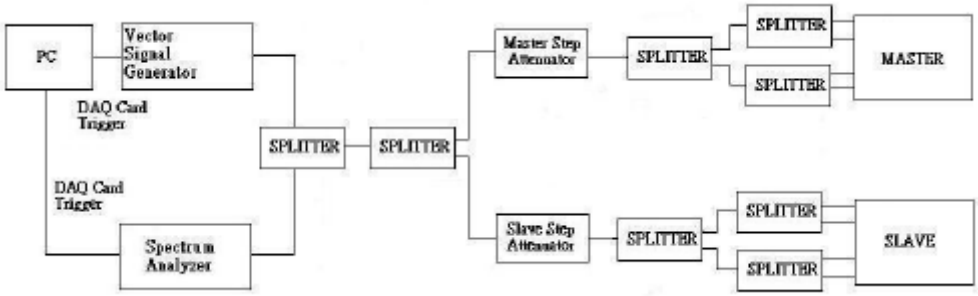
The measurement system is based on a conducted test method.
The short pulse and long pulse signal generating system utilizes the NTIA software and the same manufacturer / model Vector Signal Generator as the NTIA. The hopping signal generating system utilizes the simulated hopping method.
The software 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.

System Calibration
Connect the spectrum analyzer to the test system in place of the master device. Set the signal generator to CW mode. Adjust the amplitude of the signal generator to yield a measured level of –62 dBm on the spectrum analyzer.
Without changing any of the instrument settings, reconnect the spectrum analyzer to the Common port of the Spectrum Analyzer Combiner/Divider and connect a 50 ohm load to the Master Device port of the test system. Measure the amplitude and calculate the difference from –62 dBm. Adjust the Reference Level Offset of the spectrum analyzer to this difference. Confirm that the signal is displayed at –62 dBm. Readjust the RBW and VBW to 3 MHz, set the span to 10 MHz, and confirm that the signal is still displayed at –62 dBm.
The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –62 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.
Set the signal generator to produce a radar waveform, trigger a burst manually and measure the level 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.

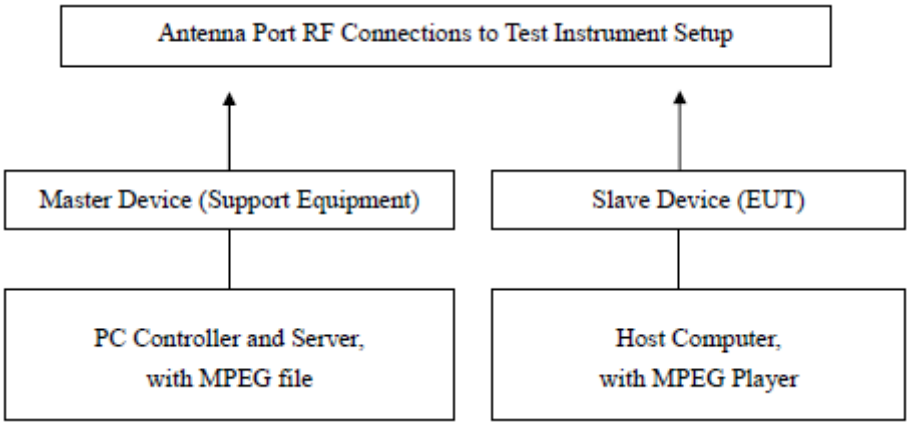
Interference Detection Threshold Adjustment
Download the applicable radar waveforms to the signal generator. Select the radar waveform, trigger a burst manually and measure the amplitude on the spectrum analyzer. Readjust the amplitude of the signal generator as required so that the peak level of the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

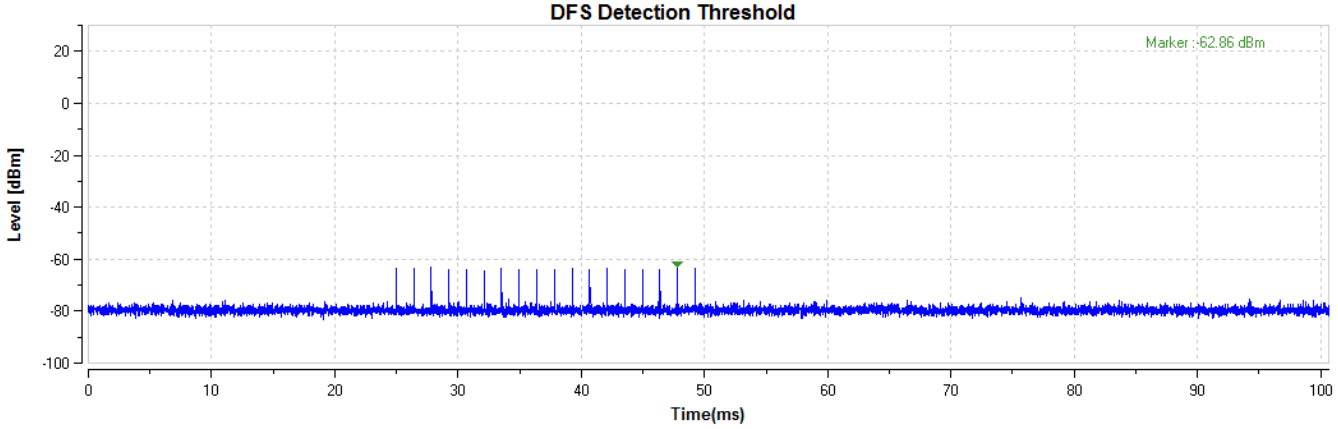
Test Setup



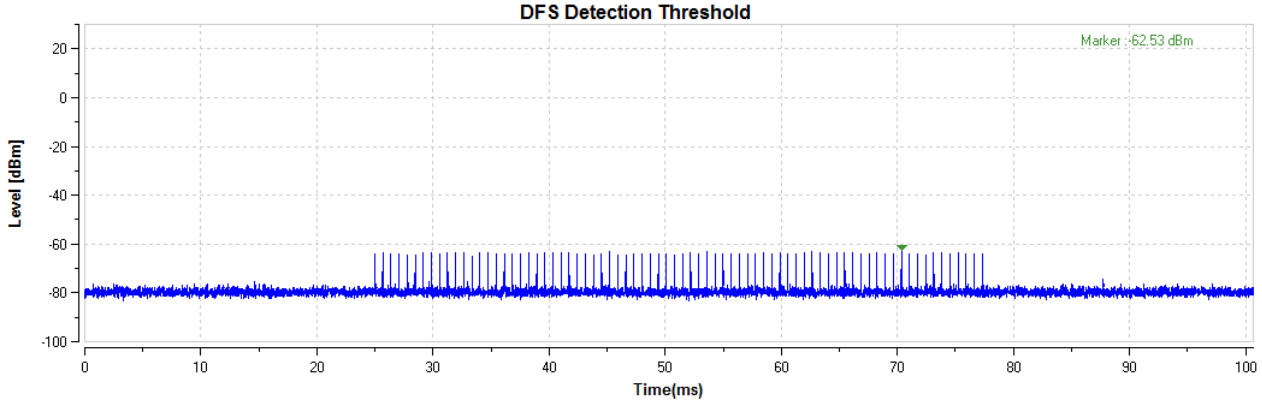
8. TEST RESULT

PLOTS OF RADAR WAVEFORMS

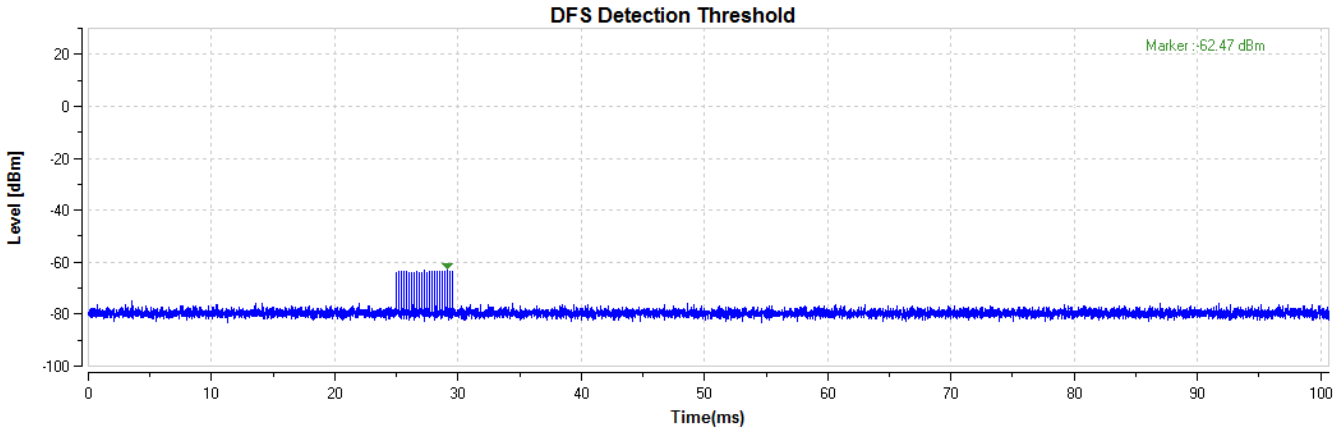
Radar Singal 0



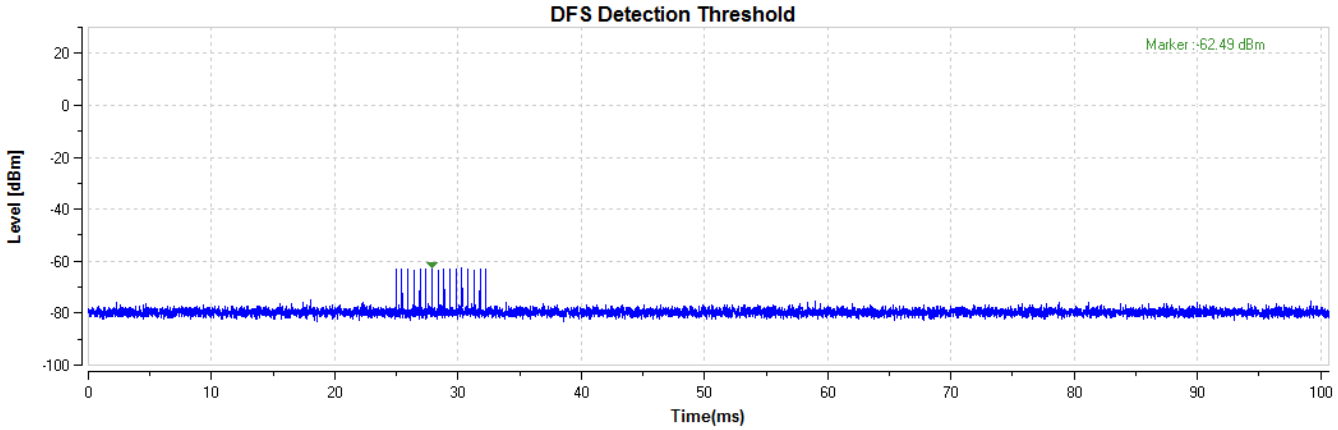
Radar Singal 1



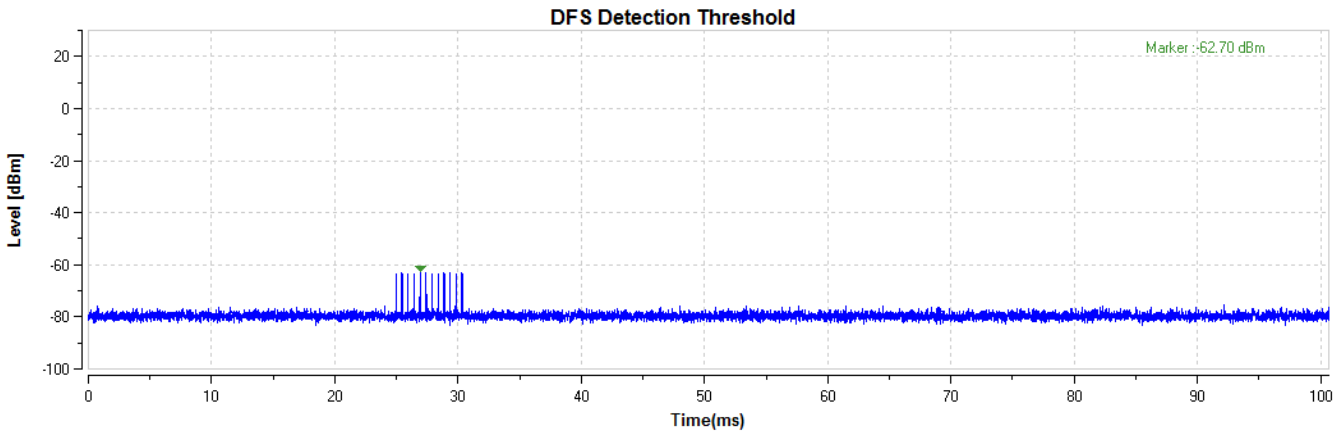
Radar Singal 2



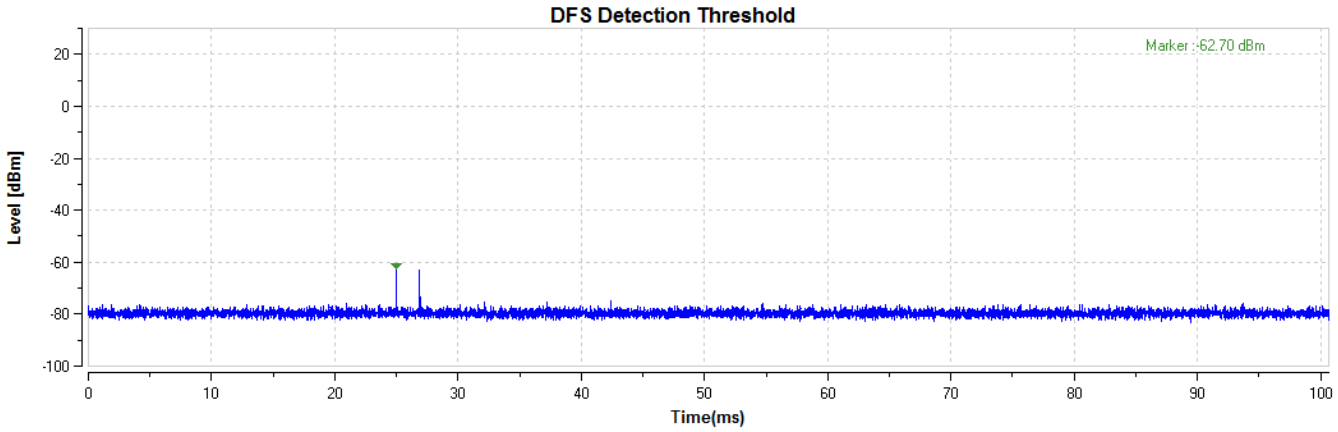
Radar Singal 3



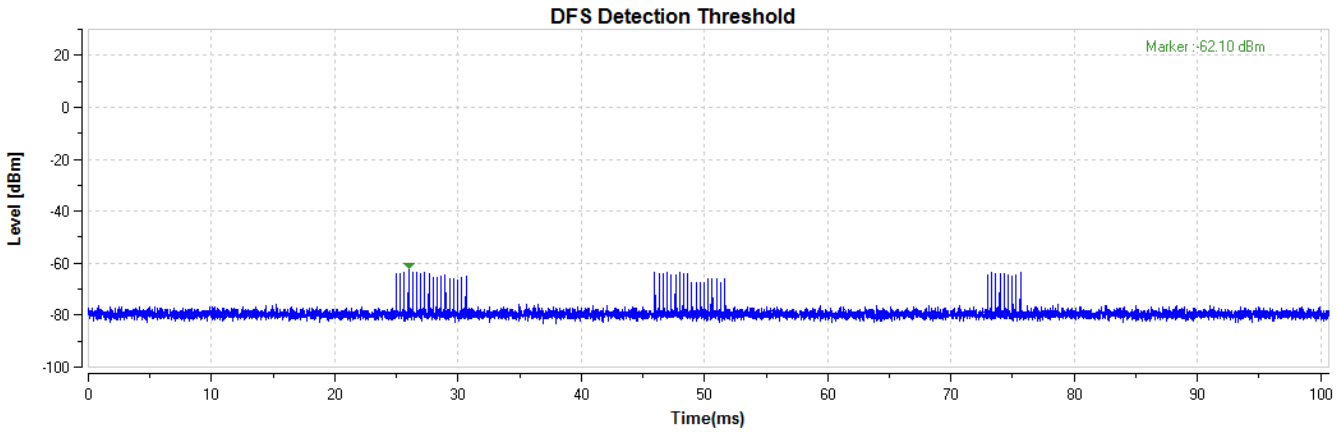
Radar Singal 4



Radar Singal 5



Radar Singal 6



Radar Singal 0

Trial ID	Radar Type	Pulse Width (us)	PRI (us)	Number of Pulses	Waveform Legth (us)
0	Type 0	1	1428	18	25704
1	Type 0	1	1428	18	25704
2	Type 0	1	1428	18	25704
3	Type 0	1	1428	18	25704
4	Type 0	1	1428	18	25704
5	Type 0	1	1428	18	25704
6	Type 0	1	1428	18	25704
7	Type 0	1	1428	18	25704
8	Type 0	1	1428	18	25704
9	Type 0	1	1428	18	25704
10	Type 0	1	1428	18	25704
11	Type 0	1	1428	18	25704
12	Type 0	1	1428	18	25704
13	Type 0	1	1428	18	25704
14	Type 0	1	1428	18	25704
15	Type 0	1	1428	18	25704
16	Type 0	1	1428	18	25704
17	Type 0	1	1428	18	25704
18	Type 0	1	1428	18	25704
19	Type 0	1	1428	18	25704
20	Type 0	1	1428	18	25704
21	Type 0	1	1428	18	25704
22	Type 0	1	1428	18	25704
23	Type 0	1	1428	18	25704
24	Type 0	1	1428	18	25704
25	Type 0	1	1428	18	25704
26	Type 0	1	1428	18	25704
27	Type 0	1	1428	18	25704
28	Type 0	1	1428	18	25704
29	Type 0	1	1428	18	25704

Radar Singal 1

Trial ID	Radar Type	Pulse Width (us)	PRI (us)	Number of Pulses	Waveform Legth (us)	Pulse Repection Frequency (Pulses Per Second)	Pulse Repection Interval (Microseconds)
0	Type A	1	938	57	53466	1066.1	938
1	Type A	1	698	76	53048	1432.7	698
2	Type A	1	618	86	53148	1618.1	618
3	Type A	1	538	99	53262	1858.7	538
4	Type A	1	878	61	53558	1139	878
5	Type A	1	3066	18	55188	326.2	326.2
6	Type A	1	638	83	52954	1567.4	1567.4
7	Type A	1	918	58	53244	1089.3	1089.3
8	Type A	1	838	63	52794	1193.3	1193.3
9	Type A	1	858	62	53196	1165.6	1165.6
10	Type A	1	798	67	53466	1253.1	1253.1
11	Type A	1	718	74	53132	1392.8	1392.8
12	Type A	1	578	92	53176	1730.1	1730.1
13	Type A	1	598	89	53222	1672.2	1672.2
14	Type A	1	558	95	53010	1792.1	1792.1
15	Type B	1	2536	21	53256		
16	Type B	1	966	55	53130		
17	Type B	1	827	64	52928		
18	Type B	1	2501	22	55022		
19	Type B	1	2595	21	54495		
20	Type B	1	1114	48	53472		
21	Type B	1	1302	41	53382		
22	Type B	1	3045	18	54810		
23	Type B	1	1624	33	53592		
24	Type B	1	2878	19	54682		
25	Type B	1	1027	52	53404		
26	Type B	1	2485	22	54670		
27	Type B	1	1600	33	52800		
28	Type B	1	1172	46	53912		
29	Type B	1	1177	45	52965		

Radar Singal 2

Trial ID	Radar Type	Pulse Width (us)	PRI (us)	Number of Pulses	Waveform Legth (us)
0	Type 2	3.2	179	26	4654
1	Type 2	1.1	207	23	4761
2	Type 2	2.1	230	24	5520
3	Type 2	4.8	200	29	5800
4	Type 2	3.9	214	28	5992
5	Type 2	2.9	222	26	5772
6	Type 2	3.2	204	26	5304
7	Type 2	2.5	192	25	4800
8	Type 2	3.1	164	26	4264
9	Type 2	1.2	156	23	3588
10	Type 2	3.9	210	27	5670
11	Type 2	4.6	201	29	5829
12	Type 2	3.2	162	26	4212
13	Type 2	2.2	197	25	4925
14	Type 2	4.5	163	29	4727
15	Type 2	3	203	26	5278
16	Type 2	5	168	29	4872
17	Type 2	2.4	217	25	5425
18	Type 2	2.9	191	26	4966
19	Type 2	2.3	166	25	4150
20	Type 2	3.7	150	27	4050
21	Type 2	2.2	176	25	4400
22	Type 2	4.9	195	29	5655
23	Type 2	2.9	202	26	5252
24	Type 2	2.5	178	25	4450
25	Type 2	1.1	206	23	4738
26	Type 2	3.8	155	27	4185
27	Type 2	4.8	157	29	4553
28	Type 2	2.4	224	25	5600
29	Type 2	4.2	159	28	4452

Radar Singal 3

Trial ID	Radar Type	Pulse Width (us)	PRI (us)	Number of Pulses	Waveform Legth (us)
0	Type 3	8.2	355	17	6035
1	Type 3	6.1	487	16	7792
2	Type 3	7.1	344	16	5504
3	Type 3	9.8	288	18	5184
4	Type 3	8.9	230	18	4140
5	Type 3	7.9	432	17	7344
6	Type 3	8.2	207	17	3519
7	Type 3	7.5	443	17	7531
8	Type 3	8.1	439	17	7463
9	Type 3	6.2	223	16	3568
10	Type 3	8.9	208	18	3744
11	Type 3	9.6	463	18	8334
12	Type 3	8.2	441	17	7497
13	Type 3	7.2	323	16	5168
14	Type 3	9.5	297	18	5346
15	Type 3	8	412	17	7004
16	Type 3	10	324	18	5832
17	Type 3	7.4	271	17	4607
18	Type 3	7.9	349	17	5933
19	Type 3	7.3	409	16	6544
20	Type 3	8.7	373	18	6714
21	Type 3	7.2	254	16	4064
22	Type 3	9.9	274	18	5932
23	Type 3	7.9	278	17	4726
24	Type 3	7.5	317	17	5389
25	Type 3	6.1	260	16	4160
26	Type 3	8.8	211	18	3798
27	Type 3	9.7	272	18	4896
28	Type 3	7.4	264	17	4488
29	Type 3	9.2	284	18	5112

Radar Singal 4

Trial ID	Radar Type	Pulse Width (us)	PRI (us)	Number of Pulses	Waveform Legth (us)
0	Type 4	16	355	14	4970
1	Type 4	11.3	487	12	5844
2	Type 4	13.5	344	13	4472
3	Type 4	19.4	288	16	4608
4	Type 4	17.5	230	15	3450
5	Type 4	15.3	432	14	6048
6	Type 4	15.9	207	14	2898
7	Type 4	14.3	443	13	5759
8	Type 4	15.8	439	14	6145
9	Type 4	11.5	223	112	2676
10	Type 4	17.4	208	15	3120
11	Type 4	19	463	16	7408
12	Type 4	16	441	14	6174
13	Type 4	13.8	323	13	4199
14	Type 4	18.9	297	16	4752
15	Type 4	15.5	412	14	5768
16	Type 4	19.9	324	16	5184
17	Type 4	14.1	271	13	3523
18	Type 4	15.2	349	14	4886
19	Type 4	13.8	409	31	5317
20	Type 4	17.1	373	151	5595
21	Type 4	13.8	254	13	3302
22	Type 4	19.8	274	16	4384
23	Type 4	15.3	278	14	3892
24	Type 4	14.5	317	13	4121
25	Type 4	11.3	260	12	3120
26	Type 4	17.3	211	15	3165
27	Type 4	19.2	272	16	4352
28	Type 4	14.2	264	13	3432
29	Type 4	18.2	284	15	4260

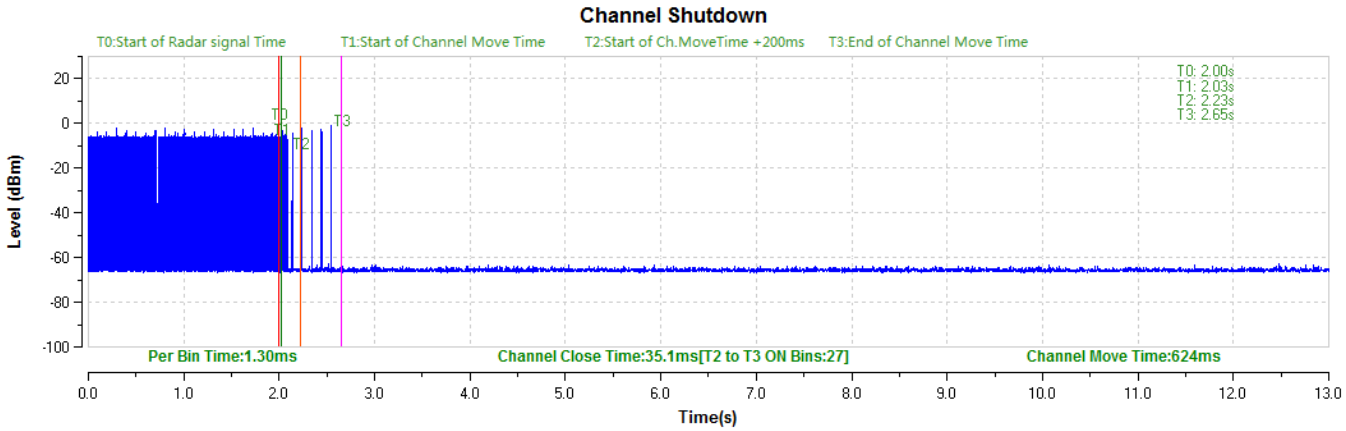
Radar Singal 6

Trial ID	Radar Type	Pulse Width (us)	PRI (us)	Number of Pulses	Waveform Legth (us)	Pulse Repection Frequency (Pulses Per Second)	Pulse Repection Interval (Microseconds)
0	Type 6	1	333.3	9	0.3333	3000	17
1	Type 6	1	333.3	9	0.3333	3000	13
2	Type 6	1	333.3	9	0.3333	3000	14
3	Type 6	1	333.3	9	0.3333	3000	19
4	Type 6	1	333.3	9	0.3333	3000	11
5	Type 6	1	333.3	9	0.3333	3000	13
6	Type 6	1	333.3	9	0.3333	3000	13
7	Type 6	1	333.3	9	0.3333	3000	17
8	Type 6	1	333.3	9	0.3333	3000	15
9	Type 6	1	333.3	9	0.3333	3000	17
10	Type 6	1	333.3	9	0.3333	3000	16
11	Type 6	1	333.3	9	0.3333	3000	23
12	Type 6	1	333.3	9	0.3333	3000	22
13	Type 6	1	333.3	9	0.3333	3000	16
14	Type 6	1	333.3	9	0.3333	3000	15
15	Type 6	1	333.3	9	0.3333	3000	21
16	Type 6	1	333.3	9	0.3333	3000	14
17	Type 6	1	333.3	9	0.3333	3000	22
18	Type 6	1	333.3	9	0.3333	3000	12
19	Type 6	1	333.3	9	0.3333	3000	17
20	Type 6	1	333.3	9	0.3333	3000	20
21	Type 6	1	333.3	9	0.3333	3000	18
22	Type 6	1	333.3	9	0.3333	3000	23
23	Type 6	1	333.3	9	0.3333	3000	14
24	Type 6	1	333.3	9	0.3333	3000	13
25	Type 6	1	333.3	9	0.3333	3000	16
26	Type 6	1	333.3	9	0.3333	3000	15
27	Type 6	1	333.3	9	0.3333	3000	19
28	Type 6	1	333.3	9	0.3333	3000	18
29	Type 6	1	333.3	9	0.3333	3000	15

Channel Move Time & Channel Closing Transmission Time

IEEE 802.11a

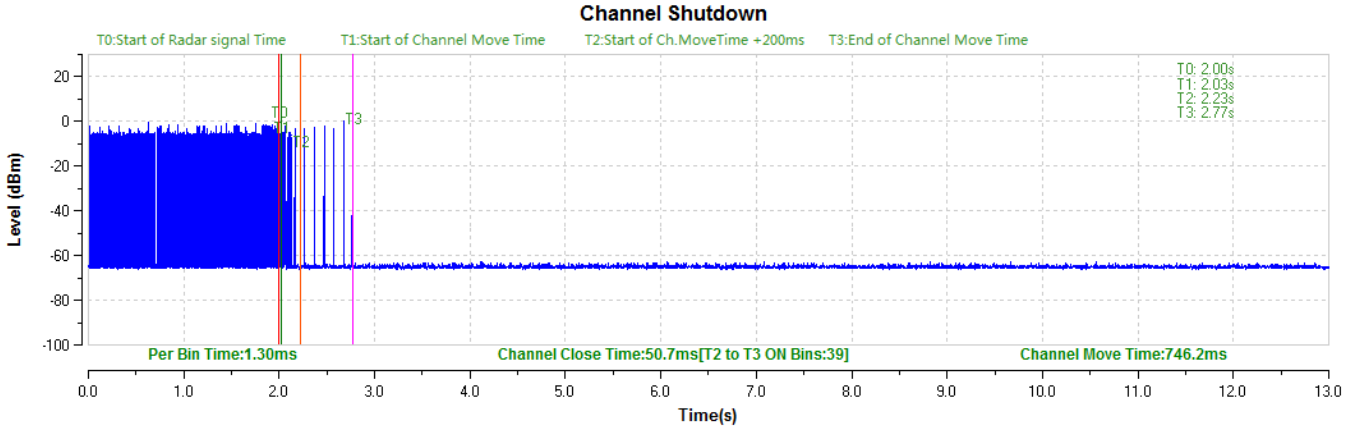
Channel 64 / 5320 MHz



Channel Move Time (s)	Limit (s)
0.42	10

IEEE 802.11n HT40

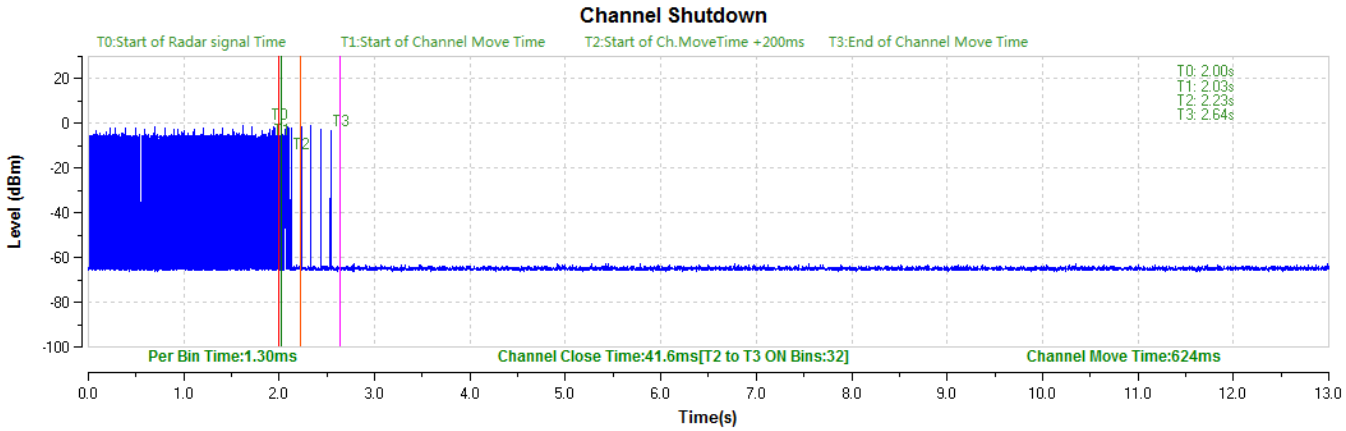
Channel 62 / 5310 MHz



Channel Move Time (s)	Limit (s)
0.54	10

IEEE 802.11ac VHT80

Channel 58 / 5290 MHz



Channel Move Time (s)	Limit (s)
0.41	10

9. LIST OF MEASURING EQUIPMENTS

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
SAMSUNG ELECTRONICS	WEA453e / Wireless AP (Master Device)	N/A	N/A	S2LF812265 (FCC ID:A3LWEA453E)
ADLINK	PXI/DFS Measurement System(S/G)	03/22/2019	12 months	302581/735
ADLINK	PXI/DFS Measurement System(S/A)	03/22/2019	12 months	303582/113
Agilent	N9020A / Signal Analyzer	06/08/2019	12 months	MY52090906
Hewlett Packard	11636B/Power Divider	02/21/2019	12 months	0531
Hewlett Packard	11667B / Power Splitter	06/07/2019	12 months	05001
Agilent	8493C / Attenuator(10 dB)	07/10/2019	12 months	07560
WEINSCHEL	2-3 / Attenuator(3 dB)	10/10/2019	12 months	BR0617
Weinschel	AF9003-69-31 / Step Attenuator	10/15/2019	12 months	5701
Cernex	CDPU5260404K / 4 Way Power Divider	03/07/2019	12 months	14695
Narda	4426-4 / 4 Way Power Divider	02/08/2019	12 months	11927

10. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separated files for Test Setup Photos of the EUT.

----------THE END OF REPORT----------