Report On

FCC DFS Testing of the
Sharp Quad-band LTE(B1 /B3/ B19/ B21), and Tri-band WCDMA(FDD I/ VI /XIX) Dual mode hand held Mini Phablet with Bluetooth, ANT+, W-LAN, NFC and GPS
In accordance with FCC CFR 47 Part 15E

COMMERCIAL-IN-CONFIDENCE

FCC ID: APYHRO00216

Document 75928438 Report 04 Issue 1 January 2015

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REPORT ON

FCC DFS Testing of the
Sharp Quad-band LTE(B1 /B3/ B19/ B21), and Tri-band WCDMA(FDD I/ VI /XIX) Dual mode hand held Mini Phablet with Bluetooth, ANT+, W-LAN, NFC and GPS
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Document 75928438 Report 04 Issue 1

January 2015

PREPARED FOR

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DATED 13 January 2015

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 15E and FCC 06-96. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

J Hurley

Product Service

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Product Service

SECTION 1

REPORT SUMMARY

FCC DFS Testing of the
Sharp Quad-band LTE(B1 /B3/ B19/ B21), and Tri-band WCDMA(FDD I/ VI /XIX) Dual mode hand held Mini Phablet with Bluetooth, ANT+, W-LAN, NFC and GPS
In accordance with FCC CFR 47 Part 15E

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1.1 INTRODUCTION

The information contained in this report is intended to show the verification of FCC DFS Testing of the Sharp Quad-band LTE(B1 /B3/ B19/ B21), and Tri-band WCDMA(FDD I/ VI /XIX) Dual mode hand held Mini Phablet with Bluetooth, ANT+, W-LAN, NFC and GPS to the requirements of FCC CFR 47 Part 15E.

Objective	To perform FCC DFS Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Sharp Corporation
Serial Number(s)	IMEI 004401115303485
Hardware Version	PP1
Software Version	AB070
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15E (2013)
Incoming Release Date	Application Form 19 November 2014
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	10377 02 December 2014
Start of Test	29 November 2014
Finish of Test	5 December 2014
Name of Engineer(s)	J Hurley
Related Document(s)	FCC KDB 905462 D02 UNII DFS Compliance Procedures New Rules v01r01 FCC KDB 905462 D03 Client without DFS New Rules v01r01 ETSI TR 100 028: 2001

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1.2 TEST REQUIREMENTS

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 bandwidths modes	Master Device or Client with Radar Detection	Client Without 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.		

Product Service

1.3 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 15E and FCC 06-96 is shown below.

Section	Spec Clause	Test Description	Result	Comments/Base Standard
802.11(a)				
2.1	NA	Calibration of Test Setup	Pass	
2.2	15.407 (h)(2)(iii)	In-Service Monitoring	Pass	
802.11(ac) 80 MHz BW				
2.1	NA	Calibration of Test Setup	Pass	
2.2	15.407 (h)(2)(iii)	In-Service Monitoring	Pass	
802.11(n) 40 MHz BW				
2.1	NA	Calibration of Test Setup	Pass	
2.2	15.407 (h)(2)(iii)	In-Service Monitoring	Pass	

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1.4 APPLICATION FORM

EQUIPMENT DESCRIPTION	
Model Name/Number	See APYHRO00216 Model Description form
Part Number	CA283
Hardware Version	Please refer to handset
Software Version	Please refer to handset
FCC ID	APYHRO00216
Technical Description (Please provide a brief description of the intended use of the equipment)	Quad-band LTE(B1/B3/B19/B21), Tri-band WCDMA(FDD-I/VI/XIX), Dual mode Mini Tablet with BT, ANT+, WLAN, NFC and GPS

TYPE OF EQUIPMENT	
☐	Master
☐	Client with Radar Detection
☒	Client without Radar Detection
☐	Wi-Fi Direct Support

TRANSMITTER TECHNICAL CHARACTERISTICS	
FREQUENCY CHARACTERISTICS	
☒	5.150 GHz to 5.250 GHz
☒	5.250 GHz to 5.350 GHz
☒	5.470 GHz to 5.725 GHz
☐	5.725 GHz to 5.825 GHz
☐	EUT operates in the frequency band 5600 – 5650 MHz?
☐	Off Channel CAC Implemented Off Channel CAC within 5600 – 5650 MHz band hours, (1 – 24) Off Channel CAC outside 5600 – 5650 MHz band minutes, (6 – 240)
Note: DFS is not required in the ranges 5.15 – 5.25 GHz and 5.725 – 5.825 GHz	

TRANSMITTER RF POWER CHARACTERISTICS	
Maximum rated transmitter output power as stated by manufacturer (if applicable)	
Conducted Power	12.5 dBm
Maximum Antenna Gain	0 dBi
EIRP	12.5 dBm
Minimum rated transmitter output power as stated by manufacturer (if applicable)	
Conducted Power	dBm
Maximum Antenna Gain	dBi
EIRP	dBm
Is TPC supported?	☐ Yes ☐ No
If Yes, provide a description of operation.	
N/A - less than 500mW	

POWER SOURCE			
☐ AC mains supply		State voltage	
AC supply frequency	(Hz)	VAC	
☒ DC supply			
Nominal voltage	4.0		

SYSTEM ARCHITECTURE			
☒	Frame Based		
☐	IP Based		
☐	Other	If other please state	
☒	802.11(a)	Receiver Bandwidth:	20 MHz
☒	802.11(n) – 20 MHz	Receiver Bandwidth:	20/ 40 MHz
☒	802.11(n) – 40 MHz	Receiver Bandwidth:	20/ 40 MHz
☒	802.11(ac) – 20 MHz	Receiver Bandwidth:	20/ 40/ 80 MHz
☒	802.11(ac) – 40 MHz	Receiver Bandwidth:	20/ 40/ 80 MHz
☒	802.11(ac) – 80 MHz	Receiver Bandwidth:	20/ 40/ 80 MHz

DECLARATION			
No parameter or information relating to the detected radar waveforms is available or accessible to the end user.			
☒	True	☐	False

MISCELLANEOUS	
Power-on cycle time*	N/A
* Time from switching on the UUT to the point at which Channel Availability Check (CAC) commences	

UNIFORM SPREADING
Describe how the meter provides, on aggregate, uniform channel loading of the spectrum across all channels.
N/A

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ANTENNA OPTIONS	
Antenna 1	
Antenna Description:	Integral BT / WLAN strip line antenna
Antenna Model:	QANTWA349AFZZ
Antenna Maximum Gain:	0 dBi
Antenna Frequency Range:	Dual band: 2400MHz -2500MHz, 5100MHz- 5750MHz
Antenna 2	
Antenna Description:	
Antenna Model:	
Antenna Maximum Gain:	
Antenna Frequency Range:	
Antenna 3	
Antenna Description:	
Antenna Model:	
Antenna Maximum Gain:	
Antenna Frequency Range:	
Antenna 4	
Antenna Description:	
Antenna Model:	
Antenna Maximum Gain:	
Antenna Frequency Range:	
Antenna 5	
Antenna Description:	
Antenna Model:	
Antenna Maximum Gain:	
Antenna Frequency Range:	

I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature: N. Arai Name: Nobumasa Arai

Position held: Manager Date: 19th November, 2014

Product Service

1.5 PRODUCT INFORMATION

1.5.1 Technical Description

The Equipment Under Test (EUT) was a Sharp Quad-band LTE(B1 /B3/ B19/ B21), and Tri-band WCDMA(FDD I/ VI /XIX) Dual mode hand held Mini Phablet with Bluetooth, ANT+, W-LAN, NFC and GPS. A full technical description can be found in the manufacturer's documentation.

The EUT is a Client without Radar Detection device

The following shall be provided by the customer as part of the FCC filing:

- A complete User's Manual and/or Professional Installers Manual.
- A Statement of Conformity for the Client in Non-Associated mode is required. The Form 731 application must include a Cover Letter Attachment stating that the client software and associated drivers will not initiate any transmission on DFS frequencies without initiation by a master. This includes restriction on transmissions for beacons and support for ad-hoc peer-to- peer modes.
- A channel/frequency plan for the device showing the channels that have active scanning or passive scanning. Active scanning is where the device can transmit a probe (beacon) and passive scanning is where the device can listen only without probes.
- Software security description.

1.6 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. See individual test clauses.

The EUT was powered from a 4.0 V DC supply.

FCC Measurement Facility Registration Number
90987 Octagon House, Fareham Test Laboratory

1.7 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard were made during testing.

1.8 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.

1.9 DFS TEST SYSTEM

The DFS system consists of hardware and software. The Hardware uses a PXI chassis with PXI instruments populating the chassis. The instruments used are a Vector Signal Generator, a Digitiser, Frequency References and a Dual Core PC. The measurement and analysis software runs on the PC and controls the instruments within the mainframe via commands on the PXI bus. Various markers are contained within the generated waveforms. The markers are used to trigger the measurement system at the appropriate points. An external trigger is also provided at the SMB output on the Vector Signal Generator which is employed where a Spectrum Analyser is used in place of the Aeroflex Digitiser. These are described within the test procedure for the applicable test.

The Aeroflex DFS software generates the pulses in accordance with FCC KDB 905462 D02 UNII DFS Compliance Procedures New Rules v01r01.

Short Pulse Radar Test Waveform

The short pulse radar simulation is a conventional amplitude pulse with varying pulse widths, pulse rate intervals (PRI) and number of pulses. General characteristics for these types and number of repetitions required by the standard are as follows:

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	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\frac{19-10^6}{\text{PRI}_{\mu sec}}\right\}$	60%	30
		Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	-		
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.					

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

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

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SECTION 2

TEST DETAILS

FCC DFS Testing of the
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In accordance with FCC CFR 47 Part 15E

2.1 CALIBRATION OF TEST SETUP

2.1.1 Specification Reference

FCC CFR 47 Part 15E

2.1.2 Equipment Under Test and Modification State

S/N: IMEI 004401115303485 - Modification State 0

2.1.3 Date of Test

29 November 2014

2.1.4 Environmental Conditions

Ambient Temperature	22.4°C
Relative Humidity	42.1%

Product Service

2.1.5 Test Results

802.11(a)

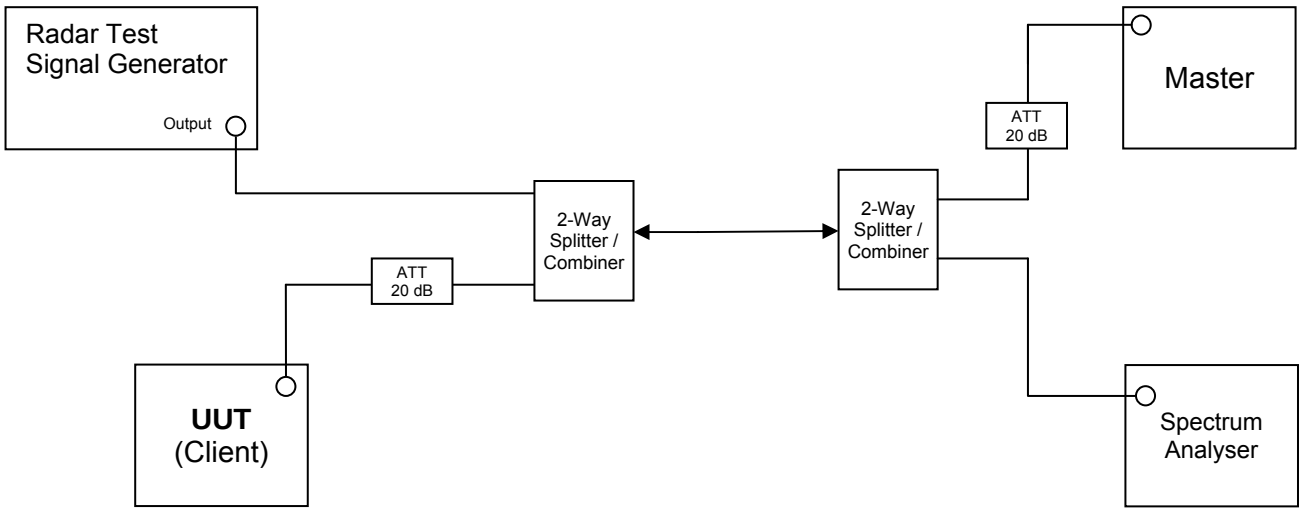
In this test equipment configuration, Radar signals are injected at the Master. The configuration ensures that the Radar pulses are received only by the Master device and not the Client. To calibrate the Radar pulses, the master was replaced by a Spectrum Analyser. The required Radar Waveform, (Type 0), was loaded into the Arbitrary Waveform Generator. The Spectrum Analyser was set to zero Span and the RBW and VBW set to 3MHz. The sweep time was set to display the entire burst and triggered on the Radar Burst. The output level of the Radar Signal Generator was adjusted to give the correct level as defined in the table below with the 1dB correction accounted for. Trace data showing the used Radar Pulses was recorded.

DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

Maximum Transmit Power	Value (See Notes 1 and 2)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.	

Test Equipment Setup

Setup for Client with injection at the Master



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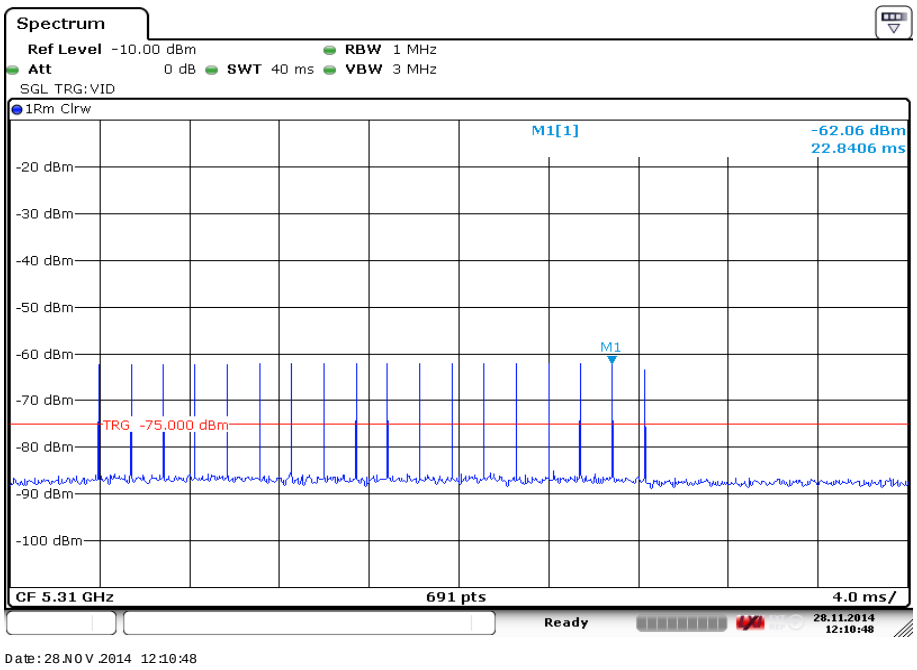
Radar Pulse Type 0

Short Radar Pulse Characteristics

Radar Type	Pulse Width (µs)	PRI (µs)	Number Of Pulses
0	1	1428	18

Client without Radar Detection

Radar Type 0 Plot



Date: 28.NOV.2014 12:10:48

Channel Loading Plot

The channel loading was measured as 29.57 %

Limit

Channel loading must be > 17 %

802.11(ac) 80 MHz BW

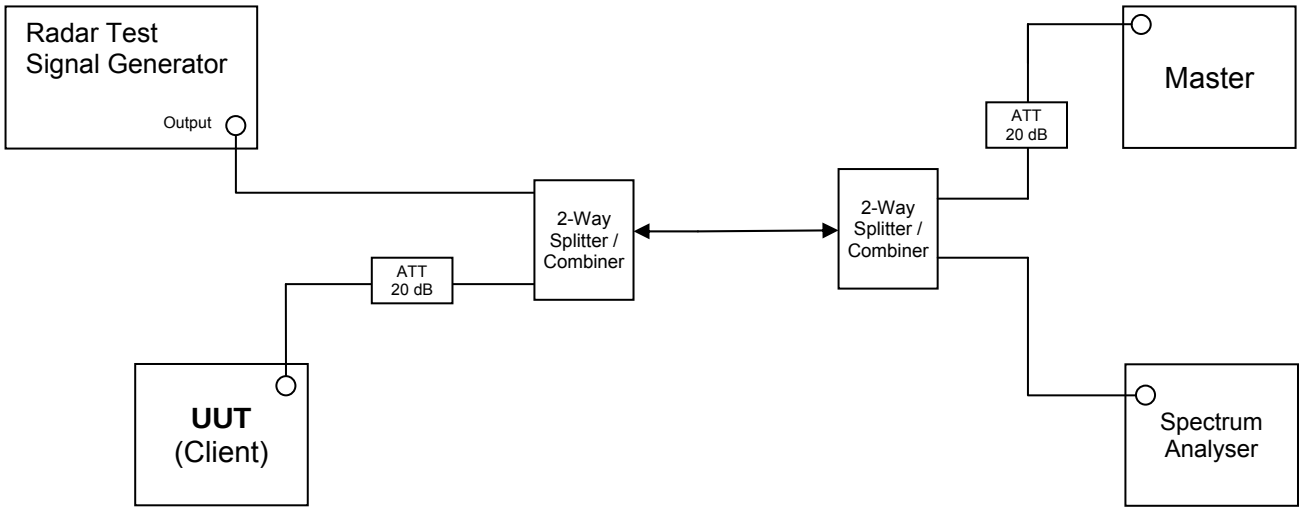
In this test equipment configuration, Radar signals are injected at the Master. The configuration ensures that the Radar pulses are received only by the Master device and not the Client. To calibrate the Radar pulses, the master was replaced by a Spectrum Analyser. The required Radar Waveform, (Type 0), was loaded into the Arbitrary Waveform Generator. The Spectrum Analyser was set to zero Span and the RBW and VBW set to 3MHz. The sweep time was set to display the entire burst and triggered on the Radar Burst. The output level of the Radar Signal Generator was adjusted to give the correct level as defined in the table below with the 1dB correction accounted for. Trace data showing the used Radar Pulses was recorded.

DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

Maximum Transmit Power	Value (See Notes 1 and 2)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.	

Test Equipment Setup

Setup for Client with injection at the Master



Product Service

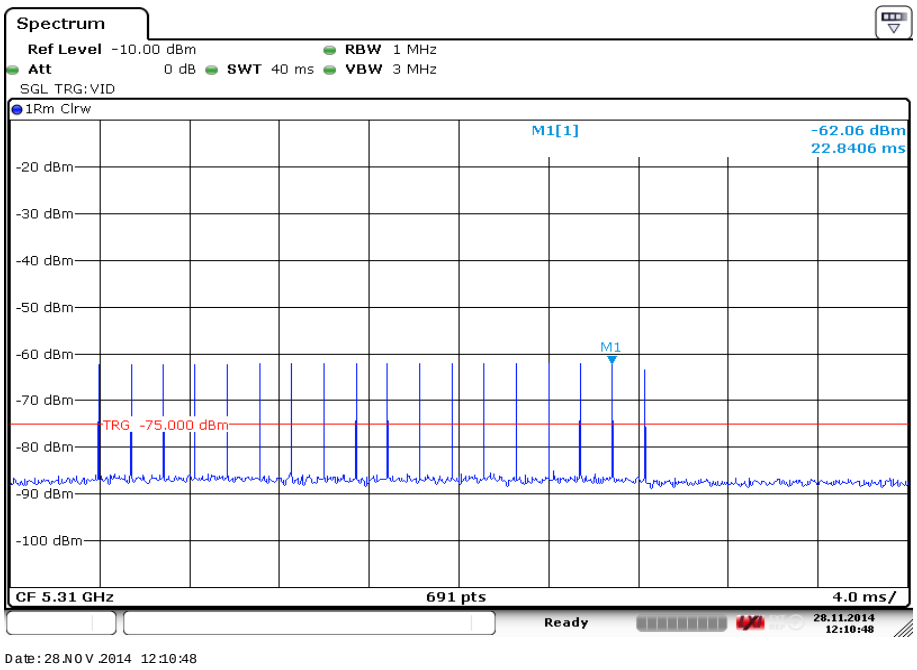
Radar Pulse Type 0

Short Radar Pulse Characteristics

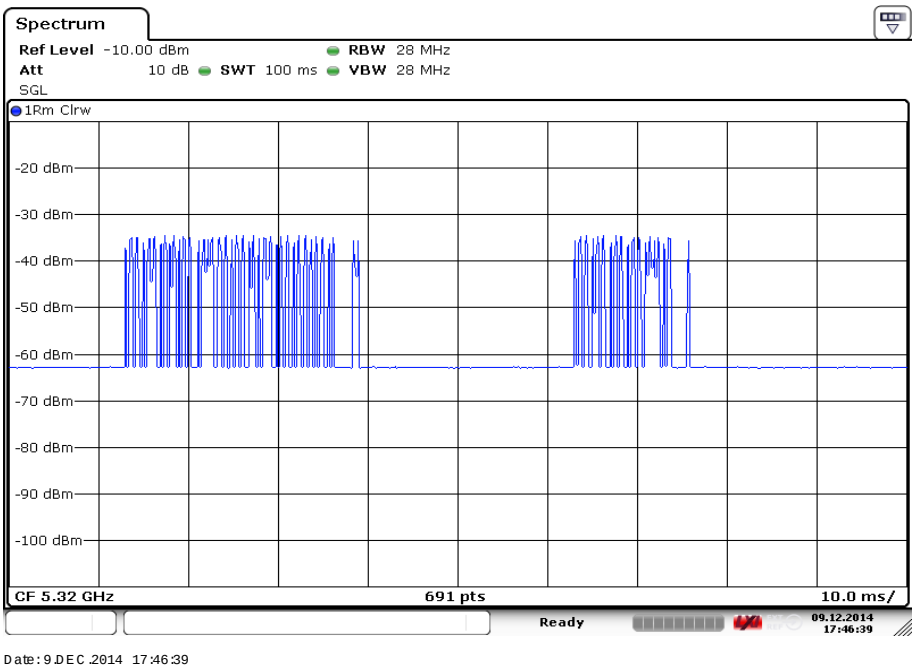
Radar Type	Pulse Width (µs)	PRI (µs)	Number Of Pulses
0	1	1428	18

Client without Radar Detection

Radar Type 0 Plot



Channel Loading Plot



The channel loading was measured as 27.54 %

Limit

Channel loading must be > 17 %

802.11(n) 40 MHz BW

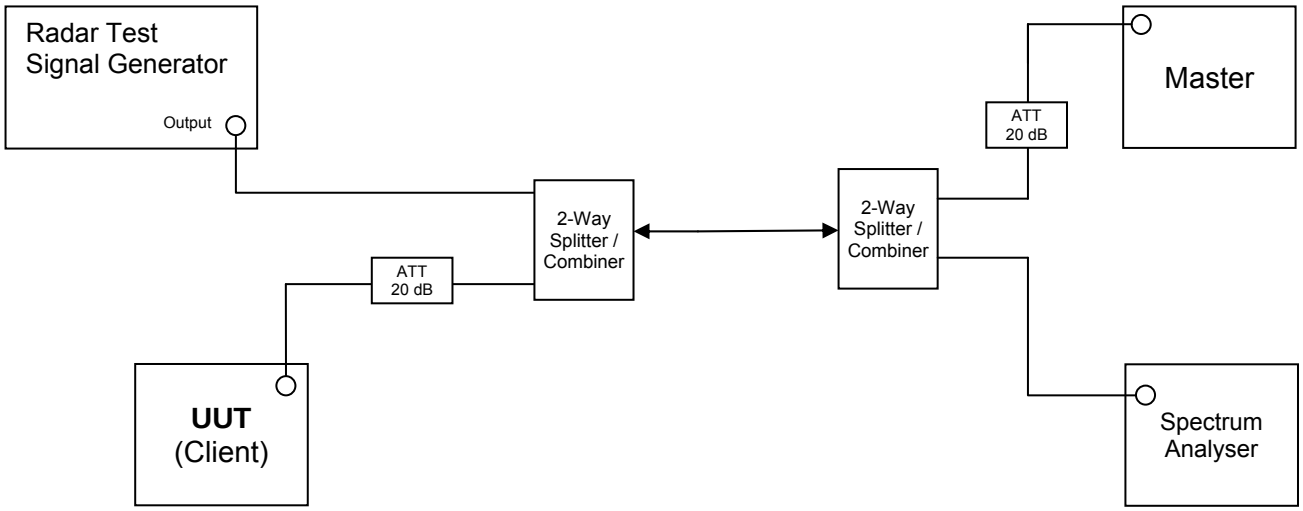
In this test equipment configuration, Radar signals are injected at the Master. The configuration ensures that the Radar pulses are received only by the Master device and not the Client. To calibrate the Radar pulses, the master was replaced by a Spectrum Analyser. The required Radar Waveform, (Type 0), was loaded into the Arbitrary Waveform Generator. The Spectrum Analyser was set to zero Span and the RBW and VBW set to 3MHz. The sweep time was set to display the entire burst and triggered on the Radar Burst. The output level of the Radar Signal Generator was adjusted to give the correct level as defined in the table below with the 1dB correction accounted for. Trace data showing the used Radar Pulses was recorded.

DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

Maximum Transmit Power	Value (See Notes 1 and 2)
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.	

Test Equipment Setup

Setup for Client with injection at the Master



Product Service

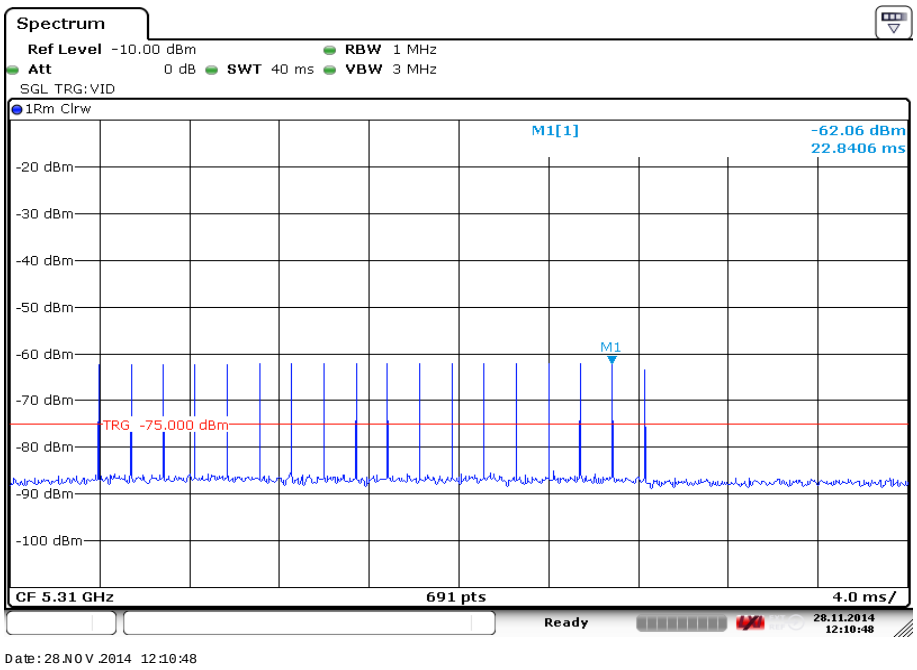
Radar Pulse Type 0

Short Radar Pulse Characteristics

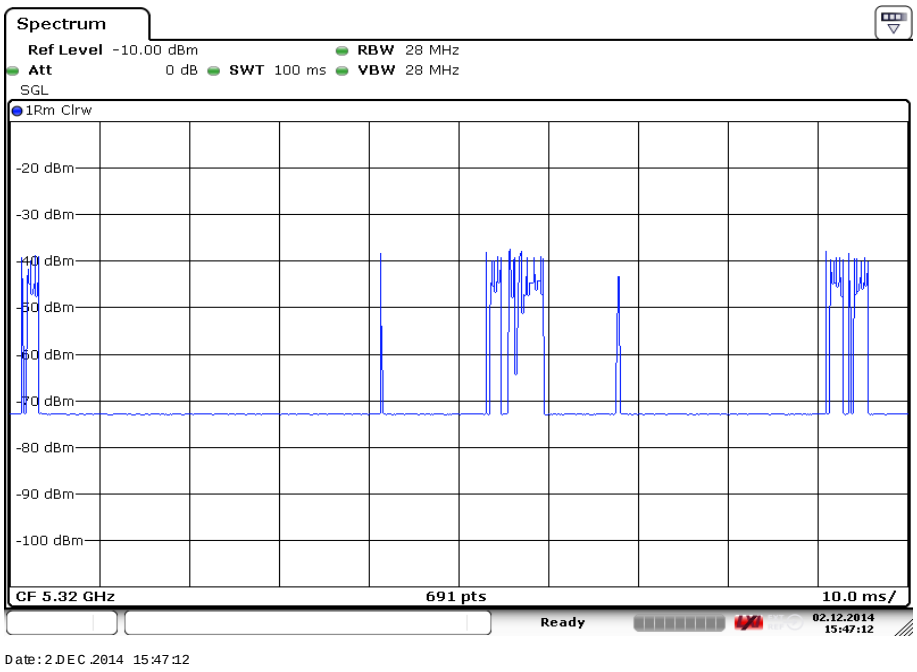
Radar Type	Pulse Width (µs)	PRI (µs)	Number Of Pulses
0	1	1428	18

Client without Radar Detection

Radar Type 0 Plot



Channel Loading Plot



The channel loading was measured as 20.14 %

Limit

Channel loading must be > 17 %

2.2 IN-SERVICE MONITORING

2.2.1 Specification Reference

FCC CFR 47 Part 15E, Clause 15.407 (h)(2)(iii)

2.2.2 Equipment Under Test and Modification State

S/N: IMEI 004401115303485 - Modification State 0

2.2.3 Date of Test

29 November 2014 & 5 December 214

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Procedure

Client without Radar Detection

The EUT was associated with the FCC Approved Master device FCC ID: UZ7MB82 and FCC ID: Q9DAPIN0224225. A computer was connected via an Ethernet cable to the Master device and the FCC defined audio/video file was streamed to the Client device using Windows Media Player.

Radar Pulse Type 0 was then transmitted and the Spectrum monitored. The transmissions from the UUT were observed for a period of 12 seconds after the final injected Radar Pulse. The Channel Move Time and the Channel Closing Time were measured and recorded.

Initially, the UUT was removed from the test setup and replaced with a Spectrum Analyser. A Type 0 Radar burst was sent from the signal generator and its level adjusted until the required level of -62 dBm was achieved. The Spectrum Analyser was then replaced with the UUT.

The UUT was configured to stream the FCC designated MPEG/Audio file using VLC Player version 12. Using the Aeroflex DFS Software, the Radar burst was injected to the Master. The test software triggered the capture mechanism of the PXI Digitiser and data was collected of the Radar burst, the Master and Client devices. The data was analysed with the Channel Move time being measured at the final point where transmissions ceased. It was checked that all transmissions stopped within the 10 second period defined from the point of the end of the final Radar pulse + 10 seconds. In addition, the aggregate on time during the first 200ms and the following 9.8 seconds of the Channel Move Time was computed by the Aeroflex DFS Software.

The markers on the trace data correspond to the following time periods:

Red - End Of Radar Burst, (T0)

Purple - End Of 200ms Period, (T0 + 200 ms)

Orange - End Of Channel Move Time, (T0 + 10 seconds)

Product Service

Additionally, the PXI digitiser was replaced with a Spectrum Analyser. The external trigger from the Aeroflex DFS test system was used to trigger a 30 minute sweep from the moment the radar burst sequence was injected. It was verified that no transmissions occurred on the test channel during this time period.

2.2.6 Environmental Conditions

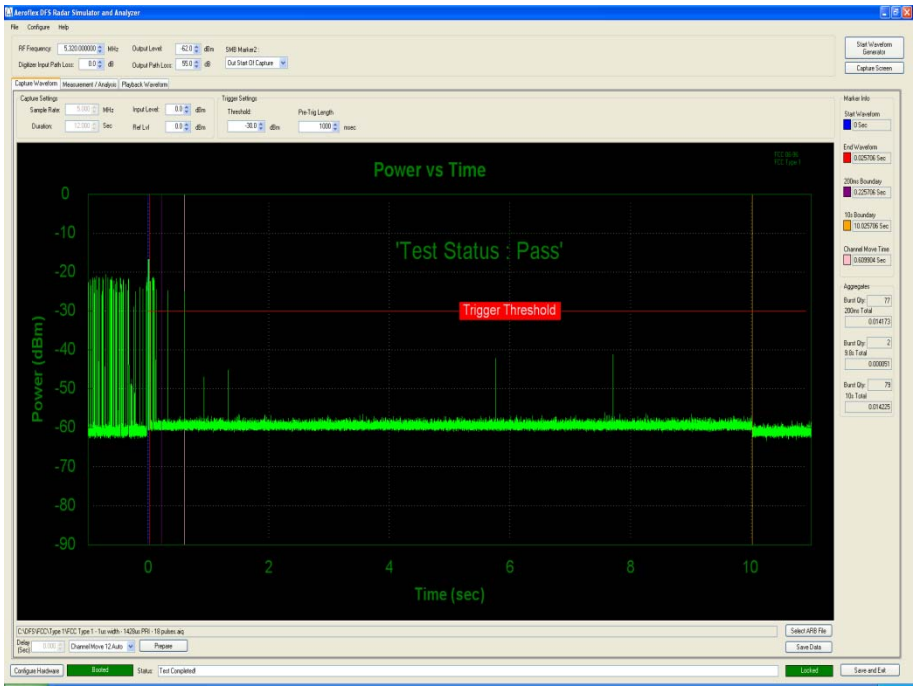
Ambient Temperature	22.4-22.5°C
Relative Humidity	32.6-42.1%

2.2.7 Test Results

802.11(a)

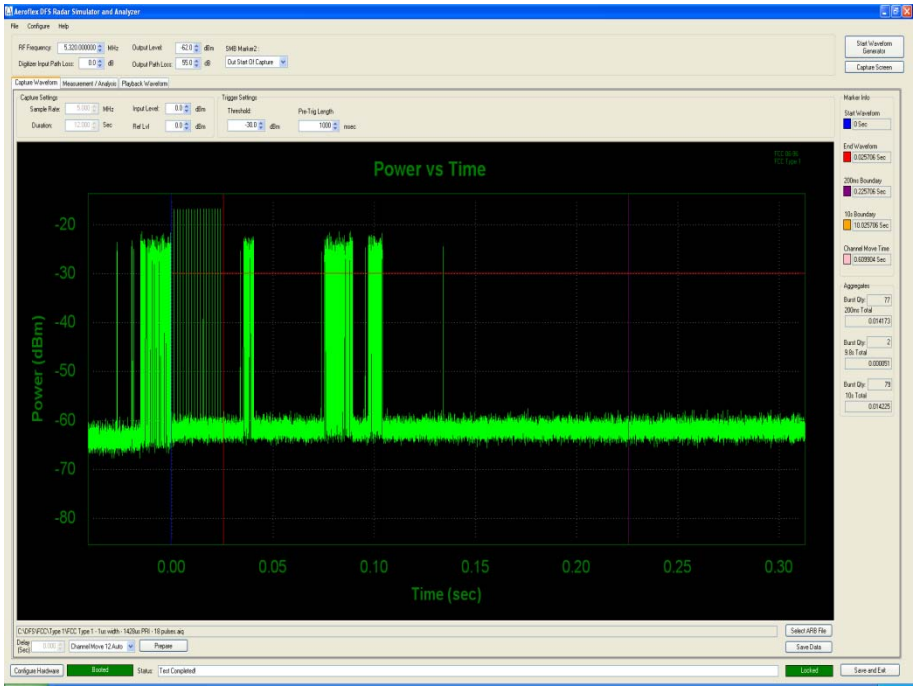
Channel Move Time	0.609904 seconds
Channel Closing Time (Aggregate Time During 200ms)	0.014173 ms
Channel Closing Time (Aggregate Time During +200ms to 10s)	0.000051 ms
Channel Closing Time (Aggregate Time During 10s)	0.014225 ms

Overall Power vs Time Display, showing channel closing and move time



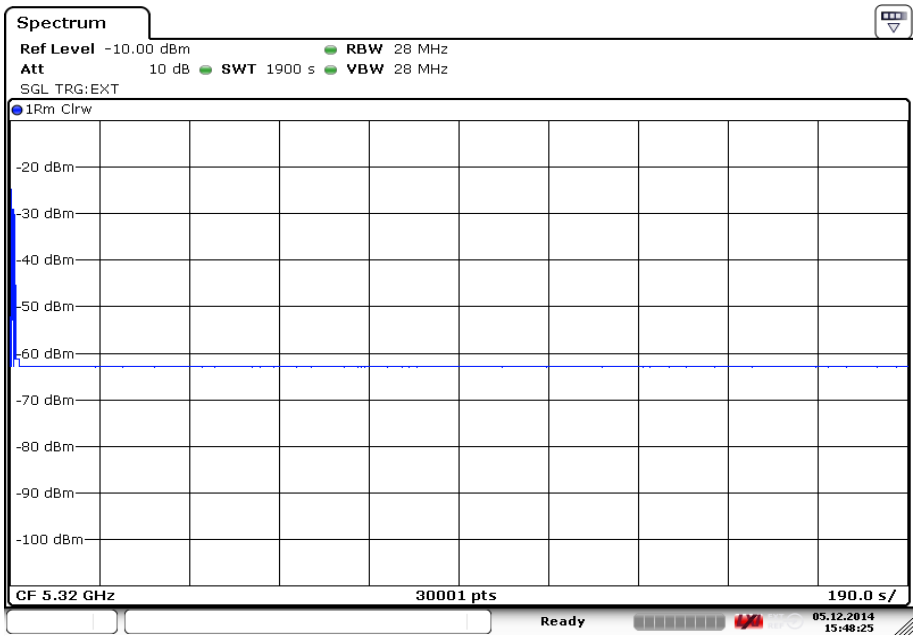
Product Service

Zoom of Radar Burst, Access Point and Client Signalling



Non-occupancy Period

The EUT did not resume transmissions during the non-occupancy period.



Date: 5.DEC.2014 15:48:25

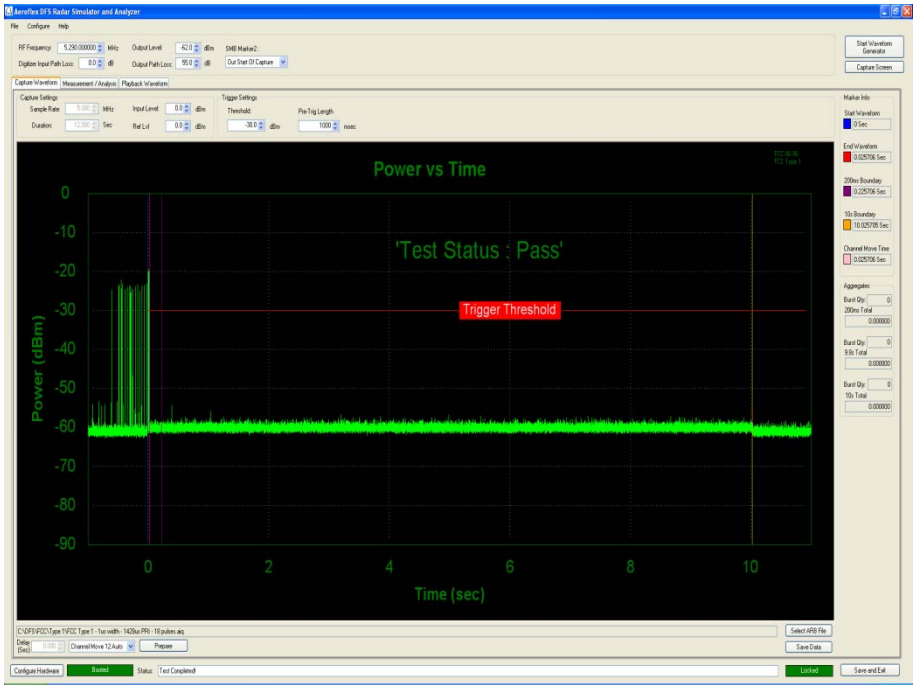
Limit Clause 15.407 (h)(2(iii) and FCC 06-96, Table 4

Channel Move Time	<10s
Channel Closing Time (Aggregate Time During 200ms)	<200ms
Channel Closing Time (Aggregate Time During +200ms to 10s)	<60ms

802.11(ac) 80 MHz BW

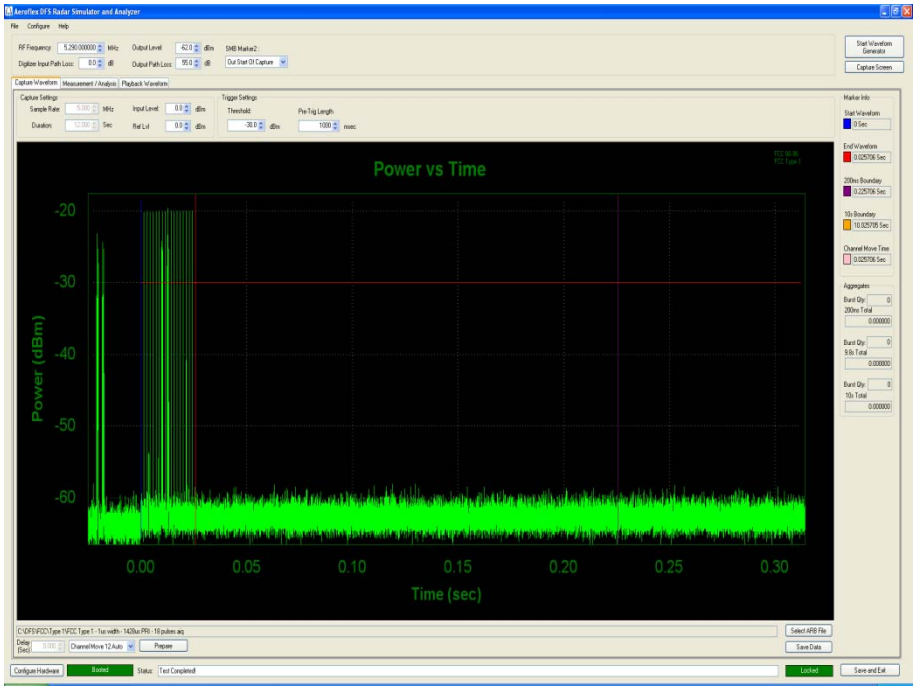
Channel Move Time	0.025706 seconds
Channel Closing Time (Aggregate Time During 200ms)	0.0 ms
Channel Closing Time (Aggregate Time During +200ms to 10s)	0.0 ms
Channel Closing Time (Aggregate Time During 10s)	0.0 ms

Overall Power vs Time Display, showing channel closing and move time



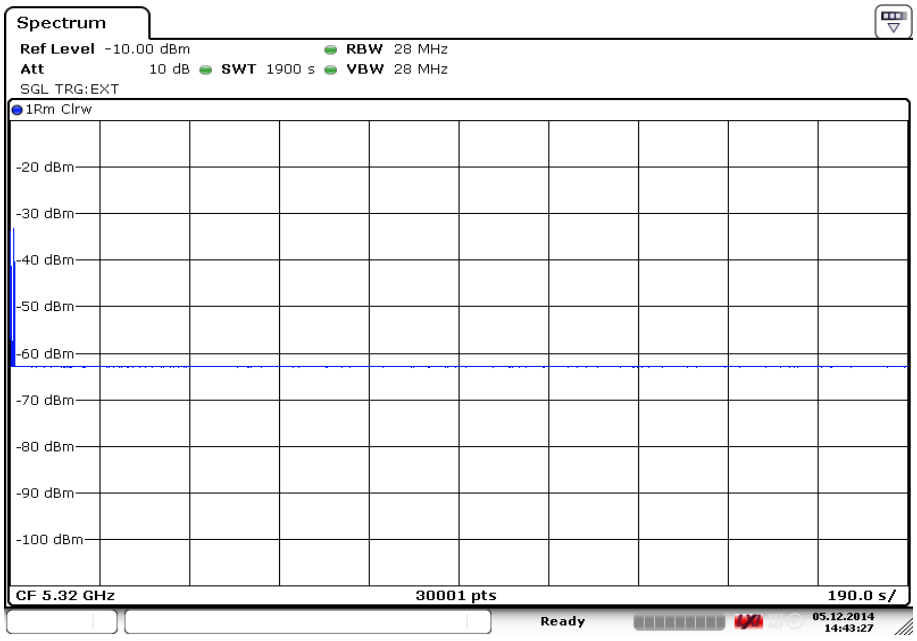
Product Service

Zoom of Radar Burst, Access Point and Client Signalling



Non-occupancy Period

The EUT did not resume transmissions during the non-occupancy period.



Date: 5.DEC.2014 14:43:28

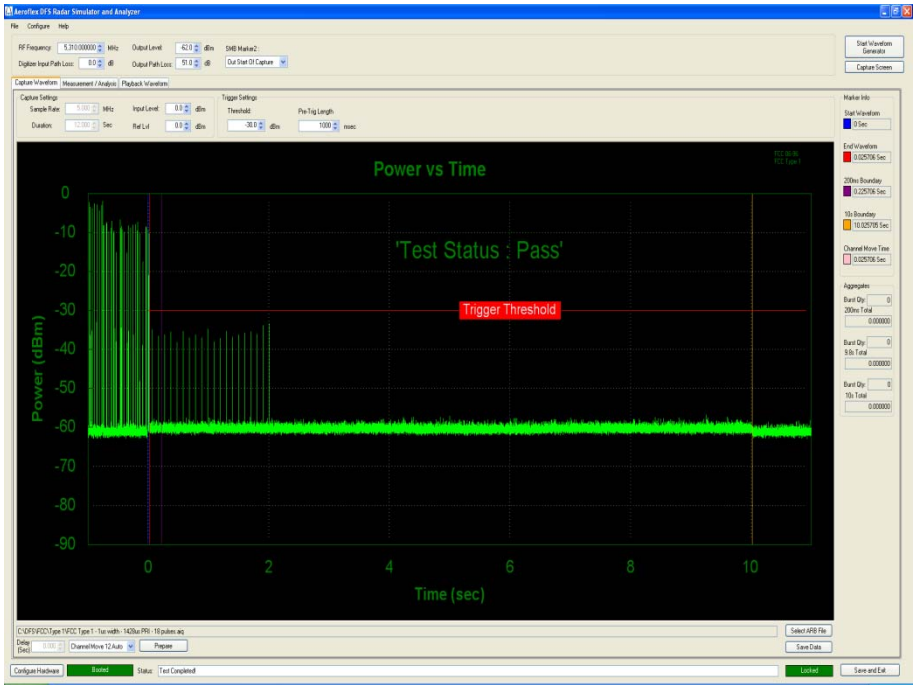
Limit Clause 15.407 (h)(2(iii) and FCC 06-96, Table 4

Channel Move Time	<10s
Channel Closing Time (Aggregate Time During 200ms)	<200ms
Channel Closing Time (Aggregate Time During +200ms to 10s)	<60ms

802.11(n) 40 MHz BW

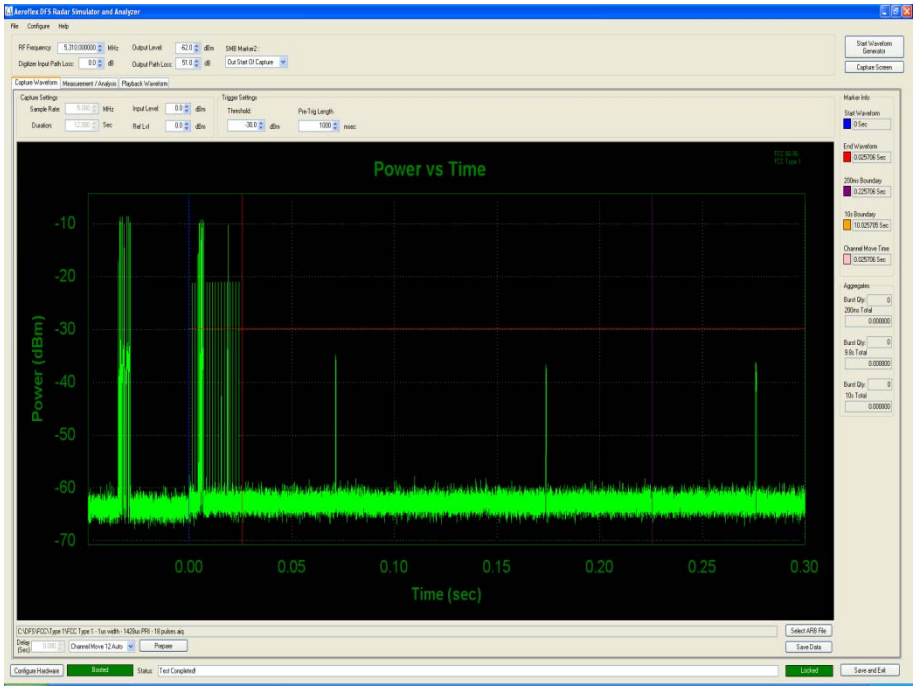
Channel Move Time	0.025706 seconds
Channel Closing Time (Aggregate Time During 200ms)	0.0 ms
Channel Closing Time (Aggregate Time During +200ms to 10s)	0.0 ms
Channel Closing Time (Aggregate Time During 10s)	0.0 ms

Overall Power vs Time Display, showing channel closing and move time



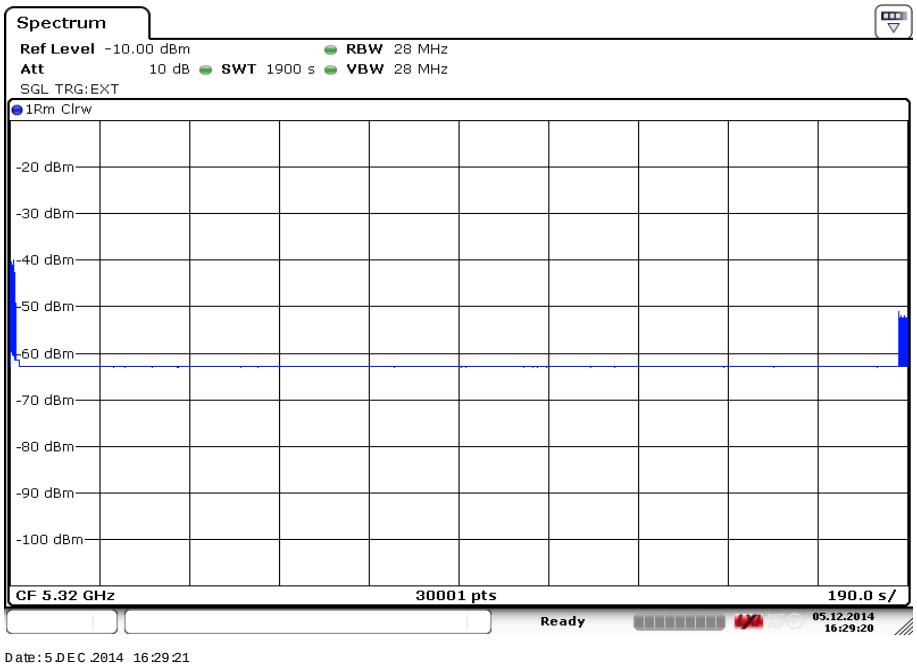
Product Service

Zoom of Radar Burst, Access Point and Client Signalling



Non-occupancy Period

The EUT did not resume transmissions during the non-occupancy period.



Date: 5.DEC.2014 16:29:21

Limit Clause 15.407 (h)(2(iii) and FCC 06-96, Table 4

Channel Move Time	<10s
Channel Closing Time (Aggregate Time During 200ms)	<200ms
Channel Closing Time (Aggregate Time During +200ms to 10s)	<60ms

Product Service

SECTION 3

TEST EQUIPMENT USED

Product Service

3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 - In-Service Monitoring					
Power Supply Unit	Hewlett Packard	6253A	441	-	O/P Mon
20dB/2W Attenuator	Narda	4772-20	462	-	TU
30dB Attenuator	Narda	4772-30	463	-	TU
Multimeter	Iso-tech	IDM101	2424	12	26-Sep-2015
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	9-Jan-2015
PXI RF Digitizer	Aeroflex	3025	4012	24	3-Oct-2015
PXI RF Synthesizer	Aeroflex	3010	4013	24	3-Oct-2015
PXI RF Synthesizer	Aeroflex	3010	4014	24	3-Oct-2015
PXI Digital RF Signal Generator	Aeroflex	3025	4015	24	3-Oct-2015
1800-6000 MHz Power Splitter	Mini-Circuits	ZN2PD-63-S+	4055	-	O/P Mon
1800-6000 MHz Power Splitter	Mini-Circuits	ZN2PD-63-S+	4056	-	O/P Mon
Timing Module	FIME	-	4431	-	TU
AP-220 Series Wireless Access Point	Aruba Networks	APIN0224	4448	-	TU
802.11(a,n) Access Point	Motorola	AP-650	4452	-	TU

TU – Traceability Unscheduled
O/P MON – Output Monitored with Calibrated Equipment

3.2 SUPPORT TEST EQUIPMENT

Instrument	Manufacturer	Type No.	Serial Number
Computer	Dell Inc.	DCSM	36DJp2J

Product Service

3.3 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	MU
In-Service Monitoring	Time: ± 0.47 % Power: ± 1.29 dB

Product Service

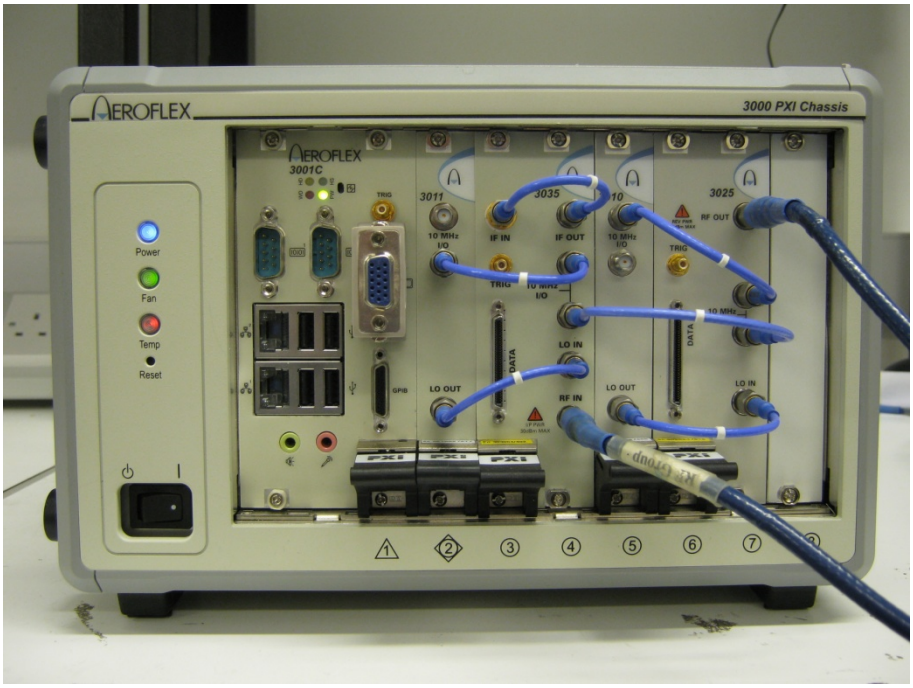
SECTION 4

PHOTOGRAPHS

4.1 TEST SET-UP PHOTOGRAPHS

See test set-up photographs exhibit “75928438 FCC Set Up Photos.pdf”.

4.2 DFS TEST EQUIPMENT



Test Set Up

Product Service

SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).