TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: PMP450 AP - C054045A001A, 5.4 GHz Master

FCC ID: Z8H89FT0002

Industry Canada Certification Number: 109W-0002

To: FCC Part 15.407(h)(2): 2012 Subpart E, RSS-210 A9.3
Issue 8 December 2010

Test Report Serial No.:
RFI-RPT-RP90567JD01A

This Test Report Is Issued Under The Authority Of John Newell, Group Quality Manager:	
Checked By:	Sarah Williams
Signature:	
Date of Issue:	31 October 2012

This report is issued in Adobe Acrobat portable document format (PDF). It is only a valid copy of the report if it is being viewed in PDF format with the following security options not allowed: Changing the document, Selecting text and graphics, adding or changing notes and form fields.

RFI Global Services Ltd
Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire RG23 8BG
Telephone: +44 (0)1256 312000 Facsimile: +44 (0)1256 312001
Email: info@rfi-global.com Website: www.rfi-global.com

Registered in England and Wales. Company number: 2117901

This page has been left intentionally blank.

Table of Contents

1. Customer Information

Company Name:	Cambium Networks Ltd.
Address:	Unit B2/3, Linhay Business Park Eastern Road Ashburton Devon TQ13 7UP

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.407
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2012: Part 15 Subpart E (Unlicensed National Information Infrastructure Devices) - Section 15.407
Specification Reference:	Industry Canada RSS-210 Issue 8 December 2010
Specification Title:	Low-power Licence-exempt Radio communication Devices (All Frequency Bands): Category I Equipment.
Site Registration:	FCC: 209735; Industry Canada: 3245B-2
Test Dates:	01 October 2012 to 04 October 2012

2.2. Summary of Test Results

FCC Reference (47CFR)	IC Reference	Measurement	Result
Part 15.407(h)(2)	RSS-210 A9.3(a)	U-NII Detection Bandwidth	✓
Part 15.407(h)(2)(ii)	RSS-210 A9.3(b)(ii)	Initial Channel Availability Check Time	✓
Part 15.407(h)(2)(ii)	RSS-210 A9.3(b)(ii)	Radar Burst at the Beginning of the Channel Availability Check Time	✓
Part 15.407(h)(2)(ii)	RSS-210 A9.3(b)(ii)	Radar Burst at the End of the Channel Availability Check Time	✓
Part 15.407(h)(2)(iii)	RSS-210 A9.3(b)(iii)(iv)	Channel Closing Transmission Time and Channel Move Time	✓
Part 15.407(h)(2)(iv)	RSS-210 A9.3(b)(v)	Non-occupancy Period	✓
Part 15.407(h)(2)	RSS-210 A9.3(a)	Statistical Performance Check – Short Pulse Radar Types 1-4	✓
Part 15.407(h)(2)	RSS-210 A9.3(a)	Statistical Performance Check – Long Pulse Radar Type 5	✓
Part 15.407(h)(2)	RSS-210 A9.3(a)	Statistical Performance Check – Frequency Hopping Radar Type 6	✓

Key to Results

✓ = Complied ✗ = Did not comply

Note(s):

1. Only DFS tests at the lowest EUT bandwidth (10 MHz) are required in accordance with clause 8.3)18) of FCC 06-96. Some additional statistical performance checks and detection bandwidth tests were performed at the customer's request.
2. The requirements of DFS apply for the 5250-5350 MHz and 5470–5725 MHz bands. The EUT transmits in the range 5470–5875 MHz.
3. The Manufacturer confirms that information regarding the parameters of the radar waveforms is not available to the end user.

2.3. Methods and Procedures

Reference:	FCC 06-96
Title:	Compliance Measurement Procedures for Unlicensed-National Information Infrastructure Devices Operating in the 5250-5350 MHz and 5470-5725 MHz Bands Incorporating Dynamic Frequency Selection

2.4. Deviations from the Test Specification

The EUT operated as a frame based system. In accordance with Clause 7.7.2 of FCC 06-96 this should be set to a talk/listen ratio of 45%/55% for all tests except U-NII Detection Bandwidth. The manufacturer declared that this was not a typical usage scenario and hence a higher talk/listen ratio of 55%/45% was used. The higher transmit duty cycle of the EUT would therefore make it a more stringent test.

For the U-NII Detection Bandwidth test FCC 06-96 specifies a frame based system requirement of 0%/100% talk/listen ratio. It is not possible to set the EUT to this unless testing during an extended CAC. Therefore the EUT was set to the minimum talk/listen ratio of 10%/90% which would make it a more stringent test.

There were no other deviations from, additions to, or exclusions from the test specification identified above.

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Brand Name:	Cambium Networks
Model Name or Number:	PMP450AP – C054045A001A
Serial Number:	0A003EA004D1
Hardware Version Number:	84010120001 Issue C
Software Version Number:	Canopy 12.0 (W) 09/26/2012 12:58 AP-DES
FCC ID:	Z8H89FT0002
Industry Canada Certification Number:	109W-0002

3.2. Description of EUT

The equipment under test was a Point to MultiPoint (PMP) Access Point.

The EUT can be operated in either Master or Client mode depending on the firmware configuration. The testing covered in this report is with a Master configuration only.

3.3. Modifications Incorporated in the EUT

No modifications were made to the EUT during testing.

3.4. Additional Information Related to Testing

Technology Tested:	Unlicensed National Information Infrastructure Devices (U-NII) / License-exempt local area network (LE-LAN)	
Type of Unit:	Access Point	
Modulation:	OFDM	
Antenna Gain:	8 dBi	
Power Supply Requirement:	Nominal	24-30 VDC via 230 VAC 60 Hz adaptor
Transmit & Receive Frequency Range:	5470 MHz to 5725 MHz (excluded 5600 MHz to 5650 MHz)	
Channel Spacing:	10 MHz	
Transmit & Receive Channels Tested:	**Channel Frequency (MHz):**	5500
Channel Spacing:	20 MHz	
Transmit & Receive Channels Tested:	**Channel Frequency (MHz):**	5500

3.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	Subscriber Module
Brand Name:	Cambium Networks
Model Name or Number:	PMP450
Serial Number:	0A003EB03B73

Description:	AC/DC PSU
Brand Name:	Phihong
Model Name or Number:	PSA15R-295(MOT)
Serial Number:	P81000552A1

Description:	8 port Switch
Brand Name:	Netgear
Model Name or Number:	GS608
Serial Number:	1FK1785101419

Description:	5 port switch
Brand Name:	Netgear
Model Name or Number:	GS105
Serial Number:	2731023U006A9

Description:	Laptop Computer
Brand Name:	Lenovo
Model Name or Number:	G560
Serial Number:	CBL3805393

Description:	Laptop Computer
Brand Name:	Lenovo
Model Name or Number:	3000 G530
Serial Number:	EB17420700

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating modes, unless otherwise stated:

- The EUT was tested as a Master unit connected to a Client transmitting on full power using OFDM modulation as the manufacturer declared this as a representative modulation mode for DFS testing and further declared that the modulation mode used would not impact the results.
- The EUT has two identical receive channels which normally connect to vertically and horizontally polarised antennas, the radar signal was applied to one of the receive channels only at the levels defined in FCC 06-96.
- The EUT was operated on channel 5500 MHz.
- The device was tested with a power level of 6 dBm. This was designed to simulate the use of an antenna with the minimum specified gain of +8 dBi.
- The DFS detection threshold of -64 dBm was used throughout as the maximum transmit power >200 mW.
    - The customer declared the highest gain of the antennas used in the product to be 8 dBi. Since the test is performed conducted this additional gain in signal which would normally be present is added to the radar test level.
    - The radar level to be presented at the antenna ports was calculated as:
      -64 dBm +8 dBi antenna gain +1 dB to account for variations = -55.0 dBm radar level at antenna ports.

FCC 06-96 Table 3: 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
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.	

4.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

- All measurements were made using a conducted link. The antenna ports gave independent access to horizontal and vertical antenna connections.
- A laptop PC was used to configure the EUT parameters during the testing using a standard web browser and via Telnet. The laptop was connected to the EUT via Ethernet to set EUT parameters.
- The EUT's web interface was used to report radar detection events.
- When the system required channel loading, a MPEG video file that streamed full motion video at 30 frames per second was downloaded from http://ntiacsd.ntia.doc.gov/dfs/ and played between 2 laptops. The file was transferred from the master device to the client device during this testing.

5. Measurements, Examinations and Derived Results

5.1. General Comments

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section 6. Measurement Uncertainty* for details.

5.2. Test Results

5.2.1. U-NII Detection Bandwidth

Test Summary:

Test Engineer:	Philip Harrison	**Test Date:**	03 October 2012
Test Sample Serial Number:	0A003EA004D1		

FCC Reference:	Part 15.407(h)(2)
Industry Canada Reference:	RSS-210 A9.3(a)
Test Method Used:	FCC 06-96 Section 7.8.1

Environmental Conditions:

Temperature (°C):	27.1
Relative Humidity (%):	36

Results: 10 MHz

99% bandwidth using the measuring function of an ESU40 receiver:

Bandwidth setting (MHz)	Measured 99% Bandwidth (MHz)
10	9.056

The EUT was tested at 1 MHz steps out from centre frequency of 5500 MHz until the entire 99% bandwidth was covered in accordance with FCC 06-96. Due to the relatively narrow bandwidth, tests were also performed at 0.5 MHz steps at the top and bottom of the channel bandwidth to give more accurate results:

Maximum Offsets from centre frequency as tested (MHz)	Detection attempts successful from 10 attempts at each frequency	Detection Rate (%)
±4	10	100
±4.5	0	0
±5	0	0

The detection bandwidth of 8 MHz is therefore larger than 80% of the 99% bandwidth of 9.056 MHz.

Results: 20 MHz

99% bandwidth using the measuring function of an ESU40 receiver:

Bandwidth setting (MHz)	Measured 99% Bandwidth (MHz)
20	17.815

Test at 1 MHz steps out from centre frequency until entire 99% bandwidth is covered:

Maximum Offsets from centre frequency as tested (MHz)	Detection attempts successful from 10 attempts at each frequency	Detection Rate (%)
±9	10	100
±10	0	0

The detection bandwidth of 18 MHz is therefore larger than 80% of the 99% bandwidth of 17.815MHz.

Test Results (continued)

Limits:

Table 4: DFS Response Requirement Values

Parameter	Value
U-NII Detection Bandwidth	Minimum 80% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 3: During the U-NII Detection Bandwidth detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

5.2.2. Initial Channel Availability Check Time

Test Summary:

Test Engineer:	Philip Harrison	**Test Date:**	03 October 2012
Test Sample Serial Number:	0A003EA004D1		

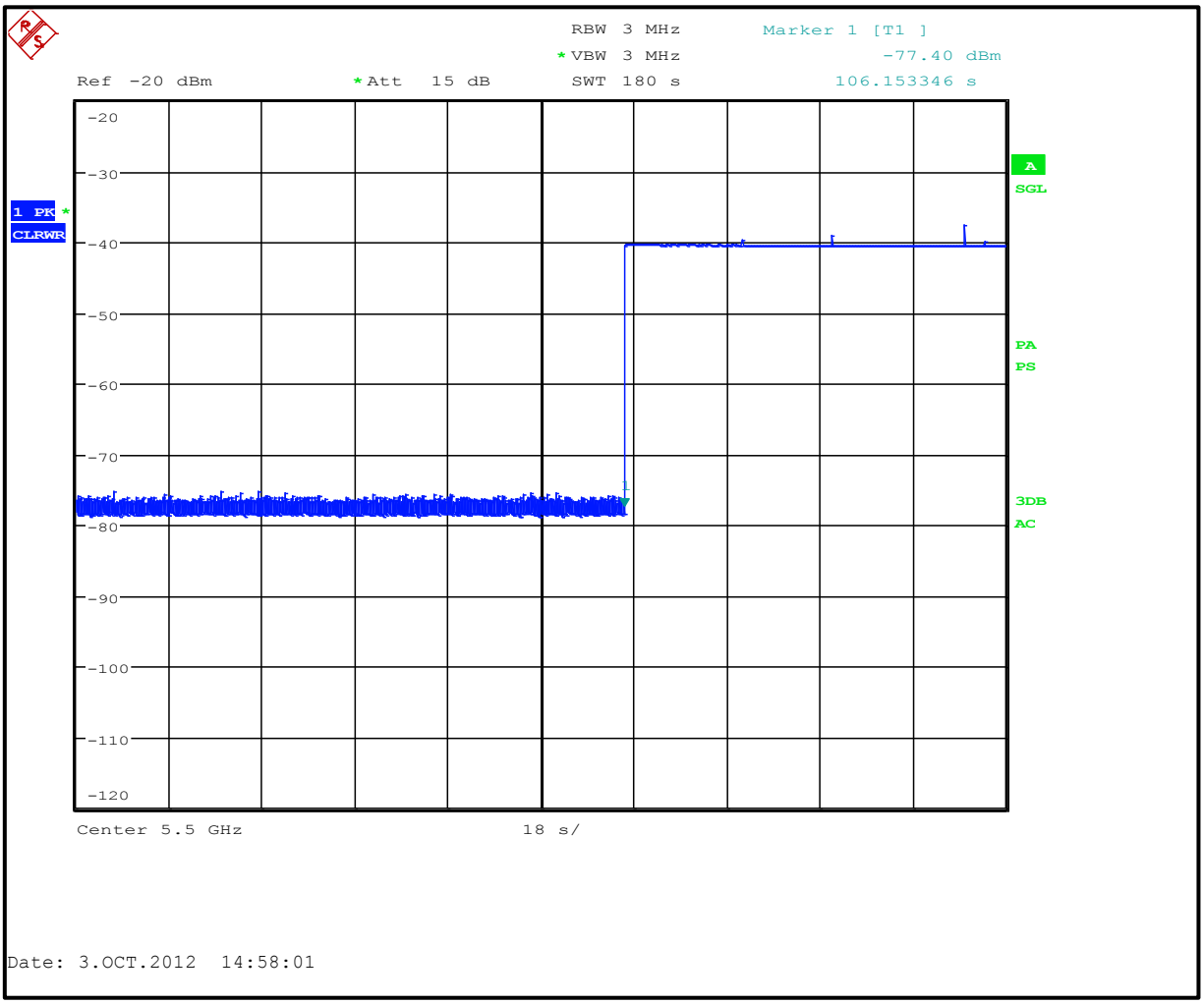
FCC Reference:	Part 15.407(h)(2)(ii)
Industry Canada Reference:	RSS-210 A9.3(b)(ii)
Test Method Used:	FCC 06-96 Section 7.8.2.1

Environmental Conditions:

Temperature (°C):	26.8
Relative Humidity (%):	31

Results: 10 MHz

No beacon or data transmission seen during channel availability check time.



The trace sweep was started at power on. Power up time is 46 s. CAC length is 60 s. Transmissions occurred at 106 s.

Initial Channel Availability Check Time (continued)

Limits:

Parameter	Value
Channel Availability Check Time	60 seconds

5.2.3. Radar Burst at the Beginning of the Channel Availability Check Time

Test Summary:

Test Engineer:	Philip Harrison	**Test Date:**	03 October 2012
Test Sample Serial Number:	0A003EA004D1		

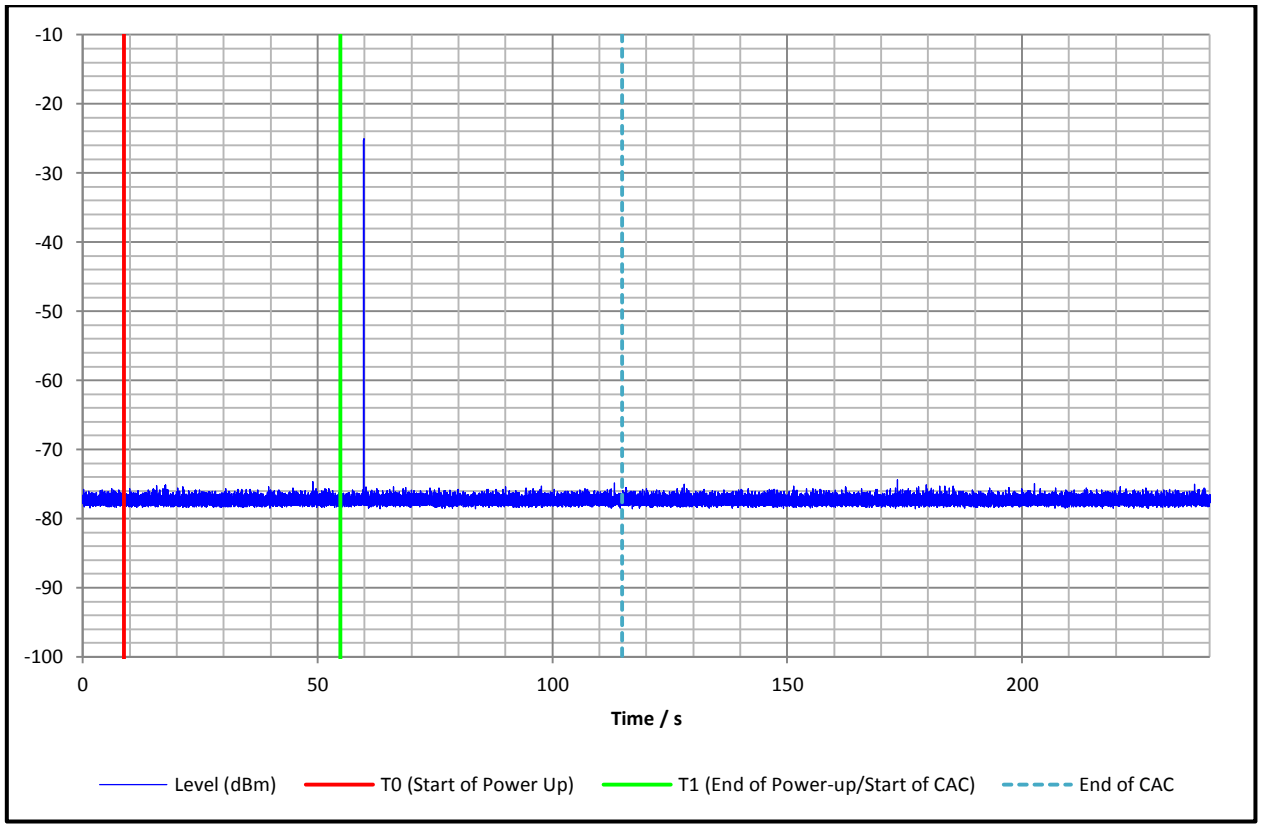
FCC Reference:	Part 15.407(h)(2)(ii)
Industry Canada Reference:	RSS-210 A9.3(b)(ii)
Test Method Used:	FCC 06-96 Section 7.8.2.2

Environmental Conditions:

Temperature (°C):	26.0
Relative Humidity (%):	35

Results: 10 MHz

Radar burst type 1 was detected and no beacon or data transmission seen.



Radar Pulse 5 s After the Beginning of CAC

Limits:

Parameter	Value
Channel Availability Check Time	60 seconds

5.2.4. Radar Burst at the End of the Channel Availability Check Time

Test Summary:

Test Engineer:	Philip Harrison	**Test Date:**	03 October 2012
Test Sample Serial Number:	0A003EA004D1		

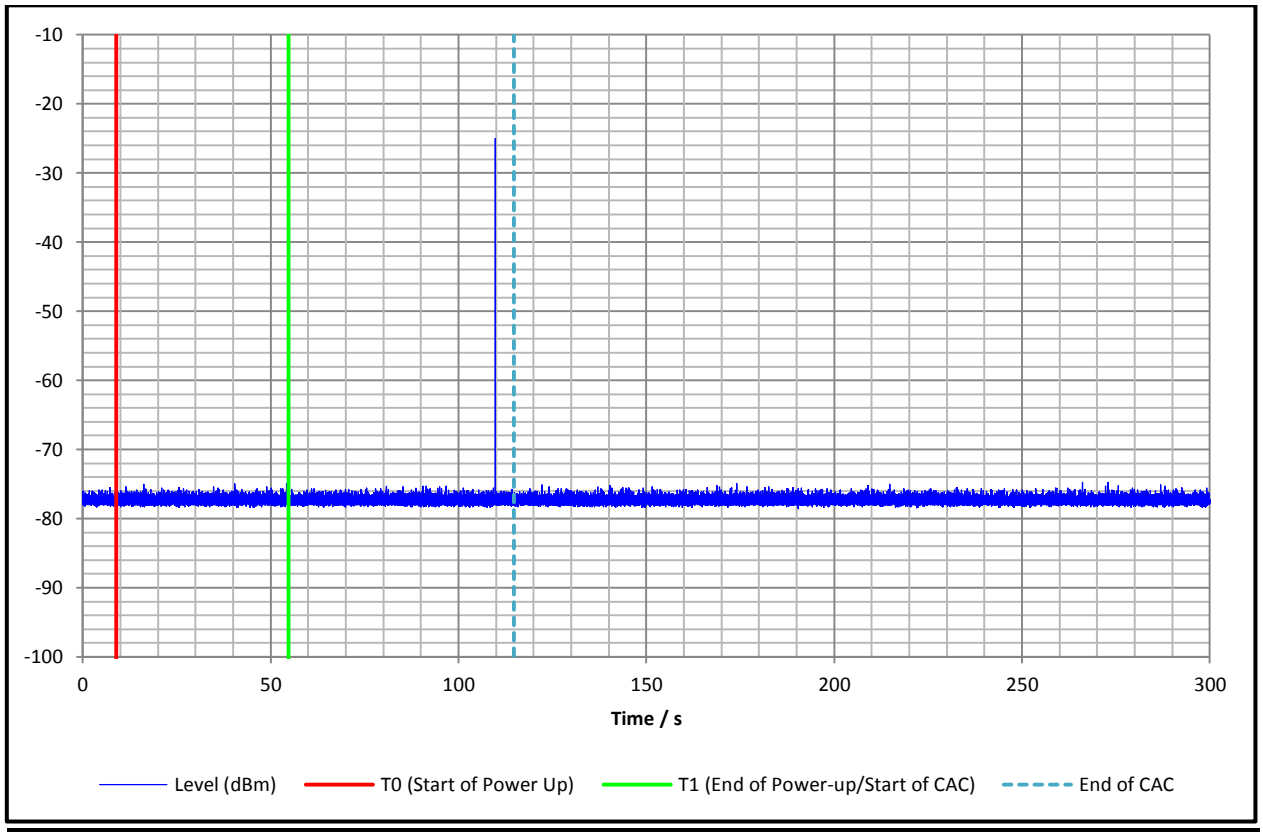
FCC Reference:	Part 15.407(h)(2)(ii)
Industry Canada Reference:	RSS-210 A9.3(b)(ii)
Test Method Used:	FCC 06-96 Section 7.8.2.3

Environmental Conditions:

Temperature (°C):	26.4
Relative Humidity (%):	35

Results: 10 MHz

Radar burst type 3 was detected and no beacon or data transmission seen.



Radar Pulse 5s Before End of CAC

Limits:

Parameter	Value
Channel Availability Check Time	60 seconds

5.2.5. Channel Closing Transmission Time and Channel Move Time

Test Summary:

Test Engineer:	Philip Harrison	**Test Date:**	03 October 2012
Test Sample Serial Number:	0A003EA004D1		

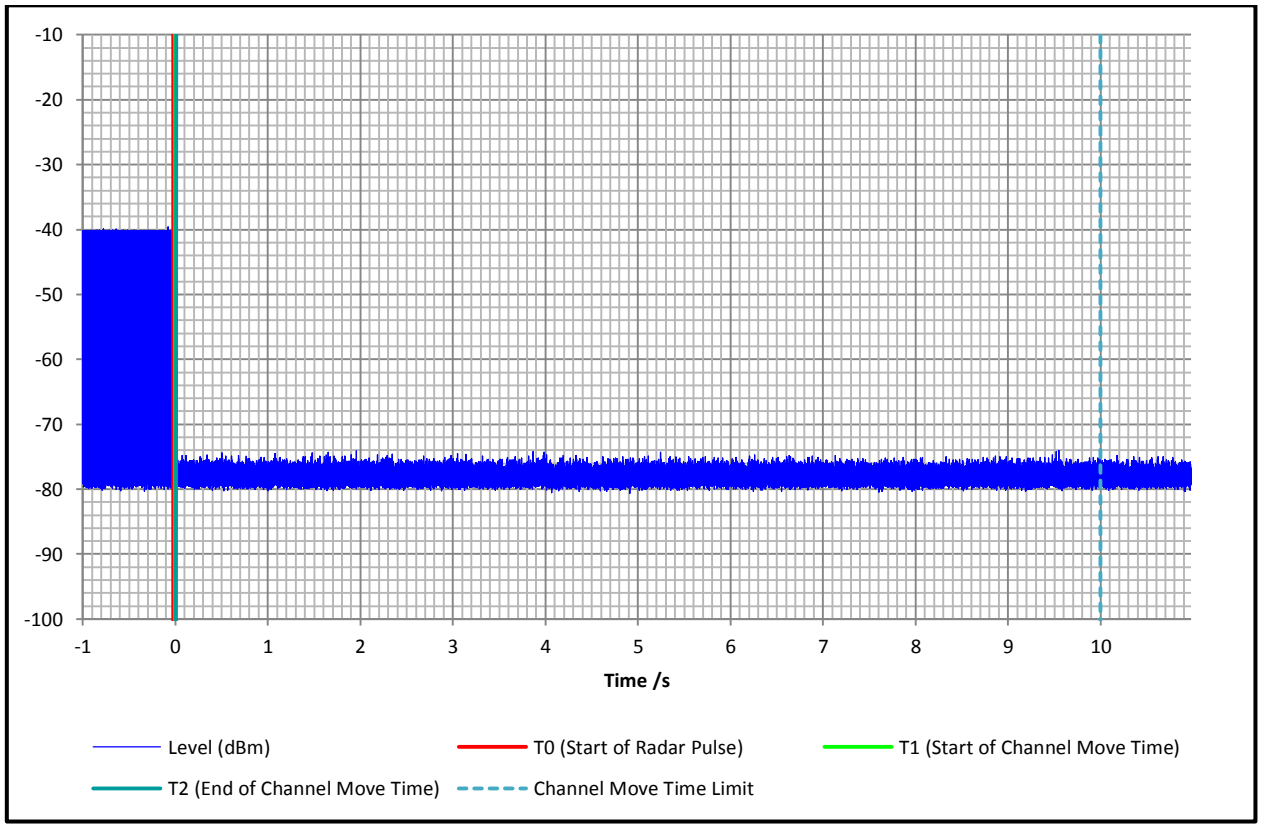
FCC Reference:	Part 15.407(h)(2)(iii)
Industry Canada Reference:	RSS-210 A9.3(b)(iii)(iv)
Test Method Used:	FCC 06-96 Section 7.8.3

Environmental Conditions:

Temperature (°C):	26.4
Relative Humidity (%):	35

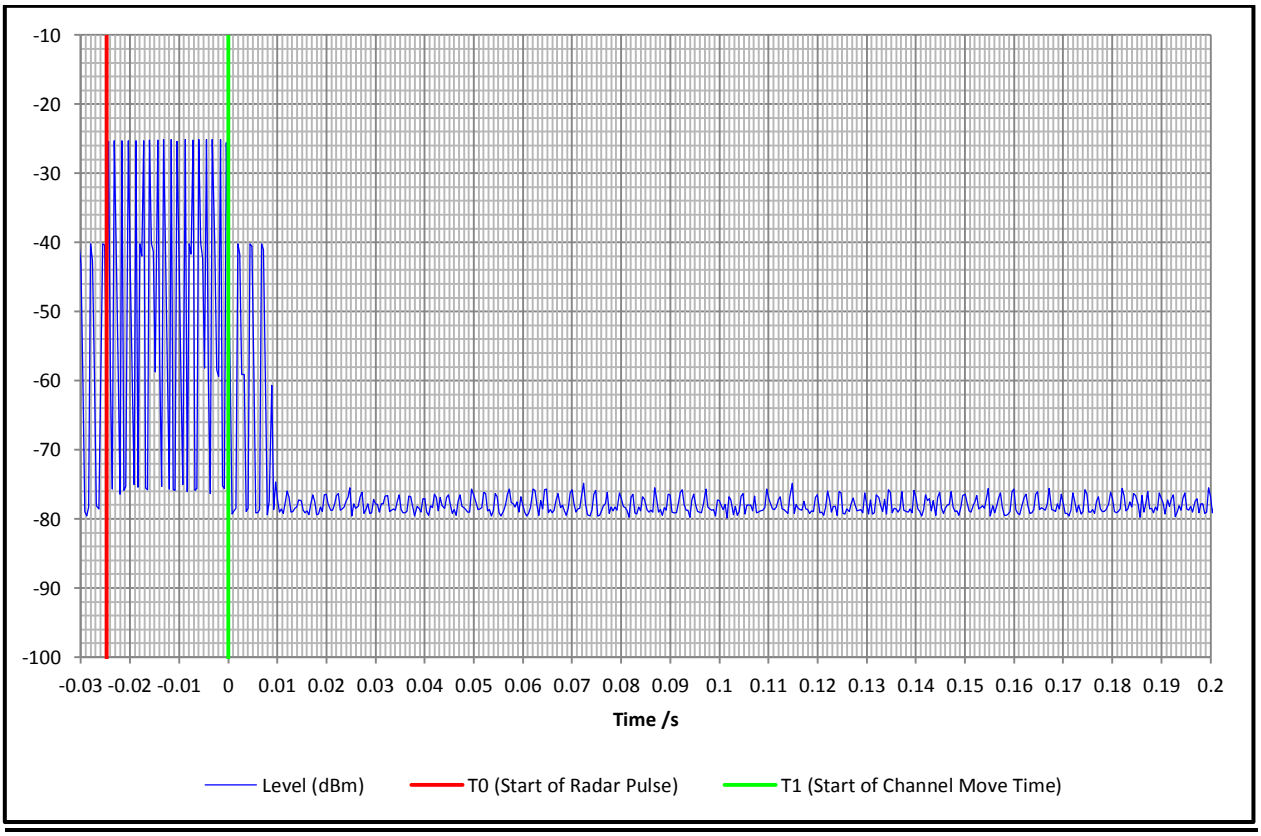
Results: 10 MHz Master

Radar burst type 1 was detected and channel move occurred.



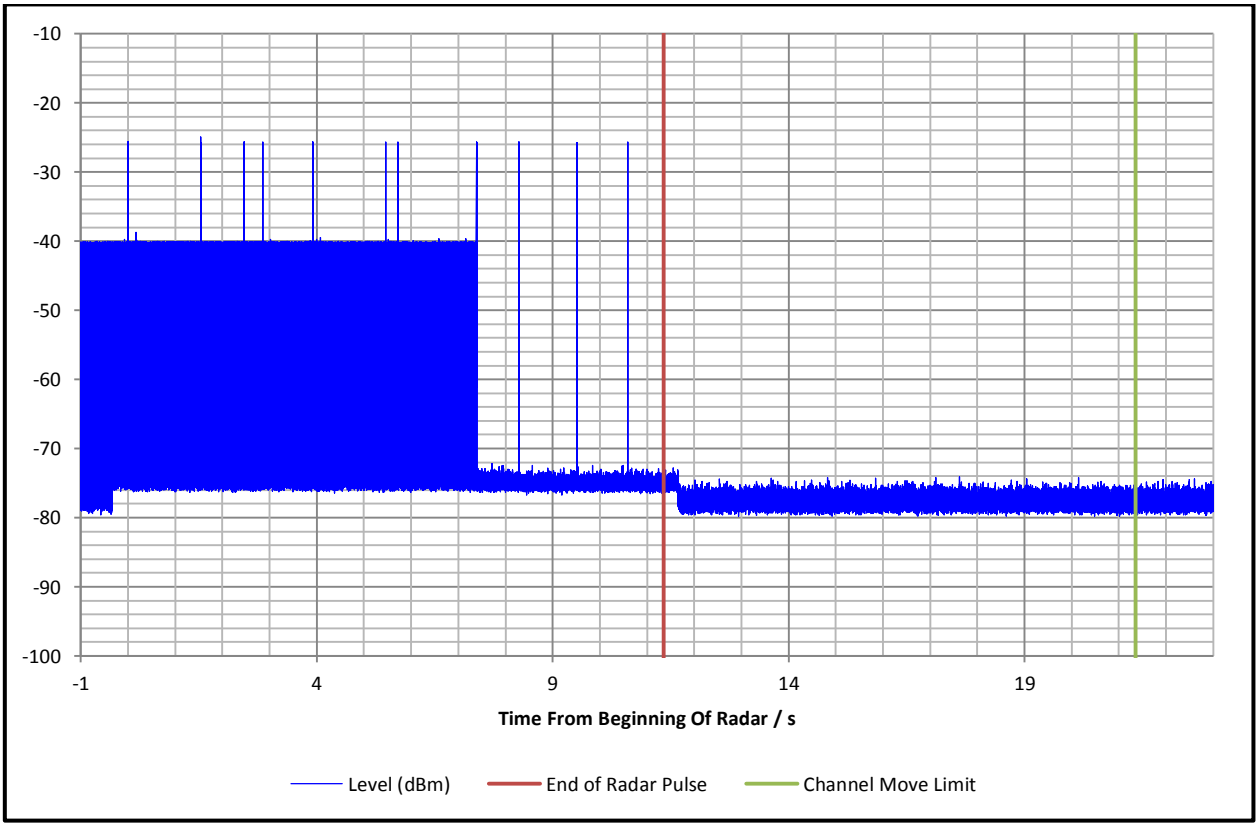
Plot Showing 10 sec Move Time Limit

Channel Closing Transmission Time and Channel Move Time (continued)



Plot Showing Radar Pulse and 200 ms Transmission

Radar burst type 5 was detected and channel move occurred.



Channel Closing Transmission Time and Channel Move Time (continued)

Results: Beacon Analysis

Only the following 3 pairs of samples were attributed to the DFS master after the end of the radar pulse.

Time After End of Radar (s)	Level (dBm)
0.002	-40.21651459
0.0024	-41.69108200
0.0044	-40.19760513
0.0048	-40.54059982
0.0068	-40.18664932
0.0072	-41.04057312

The maximum sampling rate of the test receiver used, meaning each sample had a duration of 400µs. Therefore the Channel Closing Transmission time was 2.4 ms, all of which happened within the first 200 ms of the end of the radar burst.

Channel Closing Transmission Time and Channel Move Time (continued)

Limits:

Table 4: DFS Response Requirement Values

Parameter	Value
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.

Note 1: The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:

- For the Short Pulse Radar Test Signals this instant is the end of the *Burst*.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar *Burst* generated.
- For the Long Pulse Radar Test Signal this instant is the end of the 12 second period defining the *Radar Waveform*.

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.

5.2.6. Non-occupancy Period

Test Summary:

Test Engineer:	Philip Harrison	**Test Date:**	03 October 2012
Test Sample Serial Number:	0A003EA004D1		

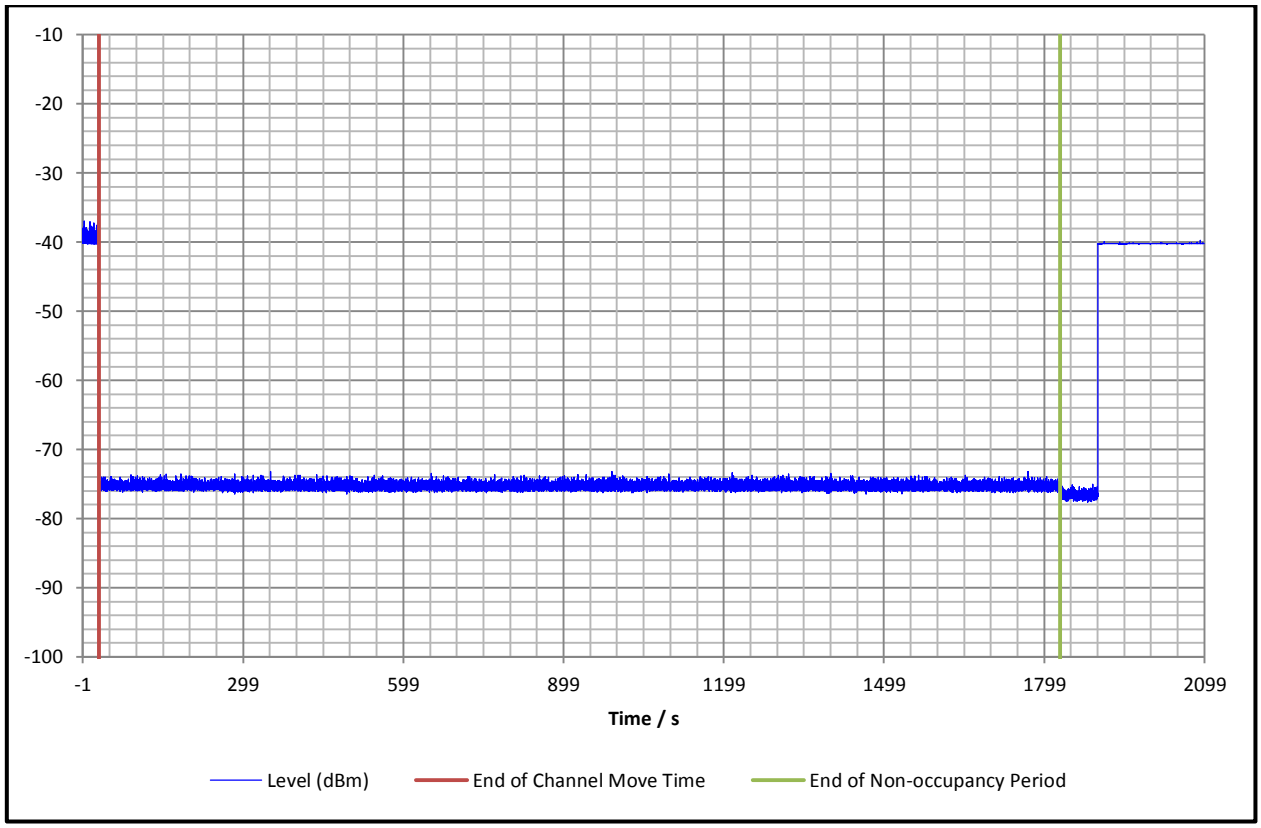
FCC Reference:	Part 15.407(h)(iv)
Industry Canada Reference:	RSS-210 A9.3(b)(v)
Test Method Used:	FCC 06-96 Section 7.8.3

Environmental Conditions:

Temperature (°C):	26.3
Relative Humidity (%):	34

Results: 10 MHz

Radar burst type 1 detected and channel was vacated for >30 minutes.



Limits:

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes

5.2.7. Statistical Performance Check – Short Pulse Radar Types 1 - 4

Test Summary:

Test Engineer:	Philip Harrison	**Test Date:**	01 October 2012
Test Sample Serial Number:	0A003EA004D1		

FCC Reference:	Part 15.407(h)(2)
Industry Canada Reference:	RSS-210 A9.3(a)
Test Method Used:	FCC 06-96 Section 7.8.4.1

Environmental Conditions:

Temperature (°C):	28.3
Relative Humidity (%):	38

Note(s):

1. FCC 06-96 Clause 8.3) 18) requests tests to be performed only on the narrowest operating bandwidth. Tests were additionally performed on the higher bandwidth at the customer's request.

Results: 10 MHz / Radar Type 1

Radar Type	Trial Number	Detected?	Trial Number	Detected?
1	1	Yes	16	Yes
	2	Yes	17	Yes
	3	Yes	18	Yes
	4	Yes	19	Yes
	5	Yes	20	Yes
	6	Yes	21	Yes
	7	Yes	22	Yes
	8	Yes	23	Yes
	9	Yes	24	Yes
	10	Yes	25	Yes
	11	Yes	26	Yes
	12	Yes	27	Yes
	13	Yes	28	Yes
	14	Yes	29	Yes
	15	Yes	30	Yes
	Detection level		100 %	

Statistical Performance Check – Short Pulse Radar Types 1 - 4 (continued)

Results: 10 MHz / Radar Type 2

Radar Type	Trial Number	Number Pulses per Burst	Pulse Width (µs)	PRI (µs)	Detected?
2	1	1	189	24	Yes
	2	1	203	27	Yes
	3	2	162	26	Yes
	4	2	181	27	Yes
	5	2	227	28	Yes
	6	3	199	29	Yes
	7	4	167	26	Yes
	8	5	189	28	Yes
	9	5	212	23	Yes
	10	5	219	26	Yes
	11	1	173	26	Yes
	12	1	194	26	Yes
	13	1	196	23	Yes
	14	1	202	26	Yes
	15	2	194	23	Yes
	16	3	172	29	Yes
	17	3	199	25	Yes
	18	5	172	25	Yes
	19	5	176	25	Yes
	20	5	202	25	Yes
	21	1	197	29	Yes
	22	1	211	23	Yes
	23	3	163	24	Yes
	24	3	177	29	Yes
	25	3	184	24	Yes
	26	3	215	27	Yes
	27	3	230	28	Yes
	28	4	159	26	Yes
	29	4	198	29	Yes
	30	5	159	23	Yes
	Detection Level			100 %	

Statistical Performance Check – Short Pulse Radar Types 1 - 4 (continued)

Results: 10 MHz / Radar Type 3

Radar Type	Trial Number	Number Pulses per Burst	Pulse Width (µs)	PRI (µs)	Detected?
3	1	6	221	16	Yes
	2	6	223	17	Yes
	3	6	231	18	Yes
	4	6	444	17	Yes
	5	7	251	16	Yes
	6	7	301	17	Yes
	7	7	423	18	Yes
	8	8	203	18	Yes
	9	9	423	16	Yes
	10	10	429	16	Yes
	11	10	323	17	Yes
	12	10	460	18	Yes
	13	7	214	17	Yes
	14	7	313	16	Yes
	15	7	414	18	Yes
	16	7	447	18	Yes
	17	8	458	16	Yes
	18	8	498	18	Yes
	19	9	403	18	Yes
	20	9	474	17	Yes
	21	10	306	16	Yes
	22	10	351	18	Yes
	23	6	282	17	Yes
	24	6	410	16	Yes
	25	6	424	17	Yes
	26	7	235	16	Yes
	27	7	260	16	Yes
	28	7	340	17	Yes
	29	8	359	18	Yes
	30	8	376	18	Yes
	Detection Level			100 %	

Statistical Performance Check – Short Pulse Radar Types 1 - 4 (continued)

Results: 10 MHz / Radar Type 4

Radar Type	Trial Number	Number Pulses per Burst	Pulse Width (µs)	PRI (µs)	Detected?
4	1	11	238	16	Yes
	2	11	264	15	Yes
	3	11	407	12	Yes
	4	13	208	12	Yes
	5	13	467	13	Yes
	6	14	218	16	Yes
	7	14	418	14	Yes
	8	16	486	14	Yes
	9	17	201	15	Yes
	10	17	395	12	Yes
	11	12	313	12	Yes
	12	15	444	14	Yes
	13	15	493	13	Yes
	14	16	286	13	Yes
	15	16	473	12	Yes
	16	17	405	15	Yes
	17	18	371	14	Yes
	18	18	456	15	Yes
	19	19	469	14	Yes
	20	20	484	12	Yes
	21	12	357	14	Yes
	22	13	496	12	Yes
	23	14	426	15	Yes
	24	16	259	16	Yes
	25	16	301	15	Yes
	26	16	336	15	Yes
	27	19	234	16	Yes
	28	19	303	13	Yes
	29	19	388	16	Yes
	30	20	417	15	Yes
	Detection Level			100 %	

Statistical Performance Check – Short Pulse Radar Types 1 - 4 (continued)

Results: 20 MHz / Radar Type 1

Radar Type	Trial Number	Detected?	Trial Number	Detected?
1	1	Yes	16	Yes
	2	Yes	17	Yes
	3	Yes	18	Yes
	4	Yes	19	Yes
	5	Yes	20	Yes
	6	Yes	21	Yes
	7	Yes	22	Yes
	8	Yes	23	Yes
	9	Yes	24	Yes
	10	Yes	25	Yes
	11	Yes	26	Yes
	12	Yes	27	Yes
	13	Yes	28	Yes
	14	Yes	29	Yes
	15	Yes	30	Yes
	Detection level		100 %	

Statistical Performance Check – Short Pulse Radar Types 1 - 4 (continued)

Results: 20 MHz / Radar Type 2

Radar Type	Trial Number	Number Pulses per Burst	Pulse Width (µs)	PRI (µs)	Detected?
2	1	1	178	24	Yes
	2	1	201	29	Yes
	3	1	215	23	Yes
	4	2	156	23	Yes
	5	2	159	24	Yes
	6	2	168	24	Yes
	7	3	168	24	Yes
	8	3	206	28	Yes
	9	4	152	28	Yes
	10	4	170	24	Yes
	11	1	162	25	Yes
	12	1	220	24	Yes
	13	1	222	26	Yes
	14	2	178	24	Yes
	15	2	190	28	Yes
	16	2	222	26	Yes
	17	4	154	25	Yes
	18	5	193	26	Yes
	19	5	213	24	Yes
	20	5	213	27	Yes
	21	1	218	29	Yes
	22	2	171	29	Yes
	23	2	174	24	Yes
	24	3	176	24	Yes
	25	3	201	25	Yes
	26	3	202	27	Yes
	27	4	154	26	Yes
	28	4	186	26	Yes
	29	5	163	29	Yes
	30	5	195	24	Yes
	Detection Level			100 %	

Statistical Performance Check – Short Pulse Radar Types 1 - 4 (continued)

Results: 20 MHz / Radar Type 3

Radar Type	Trial Number	Number Pulses per Burst	Pulse Width (µs)	PRI (µs)	Detected?
3	1	10	497	16	Yes
	2	6	203	18	Yes
	3	6	383	18	Yes
	4	7	274	17	Yes
	5	8	434	17	Yes
	6	9	238	18	Yes
	7	9	239	17	Yes
	8	9	277	16	Yes
	9	9	325	18	Yes
	10	9	433	17	Yes
	11	6	307	17	Yes
	12	6	370	16	Yes
	13	6	410	18	Yes
	14	6	458	17	Yes
	15	7	240	18	Yes
	16	8	233	17	Yes
	17	8	287	16	Yes
	18	8	306	18	Yes
	19	9	400	18	Yes
	20	9	444	16	Yes
	21	10	269	18	Yes
	22	10	326	18	Yes
	23	10	422	16	Yes
	24	7	379	17	Yes
	25	7	455	17	Yes
	26	8	225	18	Yes
	27	8	281	18	Yes
	28	8	386	17	Yes
	29	8	491	16	Yes
	30	9	265	16	Yes
	Detection Level			100 %	

Statistical Performance Check – Short Pulse Radar Types 1 - 4 (continued)

Results: 20 MHz / Radar Type 4

Radar Type	Trial Number	Number Pulses per Burst	Pulse Width (µs)	PRI (µs)	Detected?
4	1	11	465	16	Yes
	2	12	443	14	Yes
	3	15	235	14	Yes
	4	15	271	16	Yes
	5	16	278	15	Yes
	6	18	389	14	Yes
	7	18	456	13	Yes
	8	19	362	16	Yes
	9	19	381	14	Yes
	10	19	405	15	Yes
	11	12	324	15	Yes
	12	13	408	13	Yes
	13	14	297	16	Yes
	14	14	429	12	Yes
	15	15	288	15	Yes
	16	18	298	14	Yes
	17	18	302	12	Yes
	18	18	322	13	Yes
	19	19	328	13	Yes
	20	20	483	12	Yes
	21	14	308	13	Yes
	22	15	263	13	Yes
	23	15	331	13	Yes
	24	16	409	15	Yes
	25	17	299	15	Yes
	26	17	475	16	Yes
	27	17	497	16	Yes
	28	19	282	14	Yes
	29	20	278	12	Yes
	30	20	283	12	Yes
	Detection Level			100 %	

Statistical Performance Check – Short Pulse Radar Types 1 - 4 (continued)

Limits:

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
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

5.2.8. Statistical Performance Check – Long Pulse Radar Type 5

Test Summary:

Test Engineer:	Philip Harrison	**Test Date:**	01 October 2012
Test Sample Serial Number:	0A003EA004D1		

FCC Reference:	Part 15.407(h)(2)
Industry Canada Reference:	RSS-210 A9.3(a)
Test Method Used:	FCC 06-96 Section 7.8.4.2

Environmental Conditions:

Temperature (°C):	28.3
Relative Humidity (%):	38

Results: 10 MHz / Radar Type 5

Radar Type	Trial Number	Detected?	Trial Number	Detected?
5	1	Yes	16	Yes
	2	Yes	17	Yes
	3	Yes	18	Yes
	4	Yes	19	Yes
	5	Yes	20	Yes
	6	Yes	21	Yes
	7	Yes	22	Yes
	8	Yes	23	Yes
	9	Yes	24	Yes
	10	Yes	25	Yes
	11	Yes	26	Yes
	12	Yes	27	Yes
	13	Yes	28	Yes
	14	Yes	29	Yes
	15	Yes	30	Yes
	Detection level		100 %	

Statistical Performance Check – Long Pulse Radar Type 5 (continued)

Results: 20 MHz / Radar Type 5

Radar Type	Trial Number	Detected?	Trial Number	Detected?
5	1	Yes	16	Yes
	2	Yes	17	Yes
	3	Yes	18	Yes
	4	Yes	19	Yes
	5	Yes	20	Yes
	6	Yes	21	Yes
	7	Yes	22	Yes
	8	Yes	23	Yes
	9	Yes	24	Yes
	10	Yes	25	Yes
	11	Yes	26	Yes
	12	Yes	27	Yes
	13	Yes	28	Yes
	14	Yes	29	Yes
	15	Yes	30	Yes
	Detection level		100 %	

Notes:

Further details of all parameters on which the trials using Radar Type 5 were created and can be found in Appendix 5: Statistical Performance Check– Radar Type 5 Trial Records.

Limits:

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

5.2.9. Statistical Performance Check – Frequency Hopping Radar Type 6

Test Summary:

Test Engineer:	Philip Harrison	**Test Date:**	02 October 2012
Test Sample Serial Number:	0A003EA004D1		

FCC Reference:	Part 15.407(h)(2)
Industry Canada Reference:	RSS-210 A9.3(a)
Test Method Used:	FCC 06-96 Section 7.8.4.3

Environmental Conditions:

Temperature (°C):	28.0
Relative Humidity (%):	37

Results: 10 MHz / Radar Type 6

Radar Type	Trial Number	Detected?	Trial Number	Detected?
6	1	Yes	16	Yes
	2	Yes	17	Yes
	3	Yes	18	Yes
	4	Yes	19	Yes
	5	Yes	20	Yes
	6	Yes	21	Yes
	7	Yes	22	Yes
	8	Yes	23	Yes
	9	Yes	24	Yes
	10	Yes	25	Yes
	11	Yes	26	Yes
	12	Yes	27	Yes
	13	Yes	28	Yes
	14	Yes	29	Yes
	15	Yes	30	Yes
	Detection level		100 %	

Statistical Performance Check – Frequency Hopping Radar Type 6 (continued)

Results: 20 MHz / Radar Type 6

Radar Type	Trial Number	Detected?	Trial Number	Detected?
6	1	Yes	16	Yes
	2	Yes	17	Yes
	3	Yes	18	Yes
	4	Yes	19	Yes
	5	Yes	20	Yes
	6	Yes	21	Yes
	7	Yes	22	Yes
	8	Yes	23	Yes
	9	Yes	24	Yes
	10	Yes	25	Yes
	11	Yes	26	Yes
	12	Yes	27	Yes
	13	Yes	28	Yes
	14	Yes	29	Yes
	15	Yes	30	Yes
	Detection level		100 %	

Limits:

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

6. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Dynamic Frequency Selection (DFS) - Amplitude	5470 MHz to 5725 MHz	95%	0.3 dB
Dynamic Frequency Selection (DFS) - Time	5470 MHz to 5725 MHz	95%	4%

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

Appendix 1. Test Equipment Used

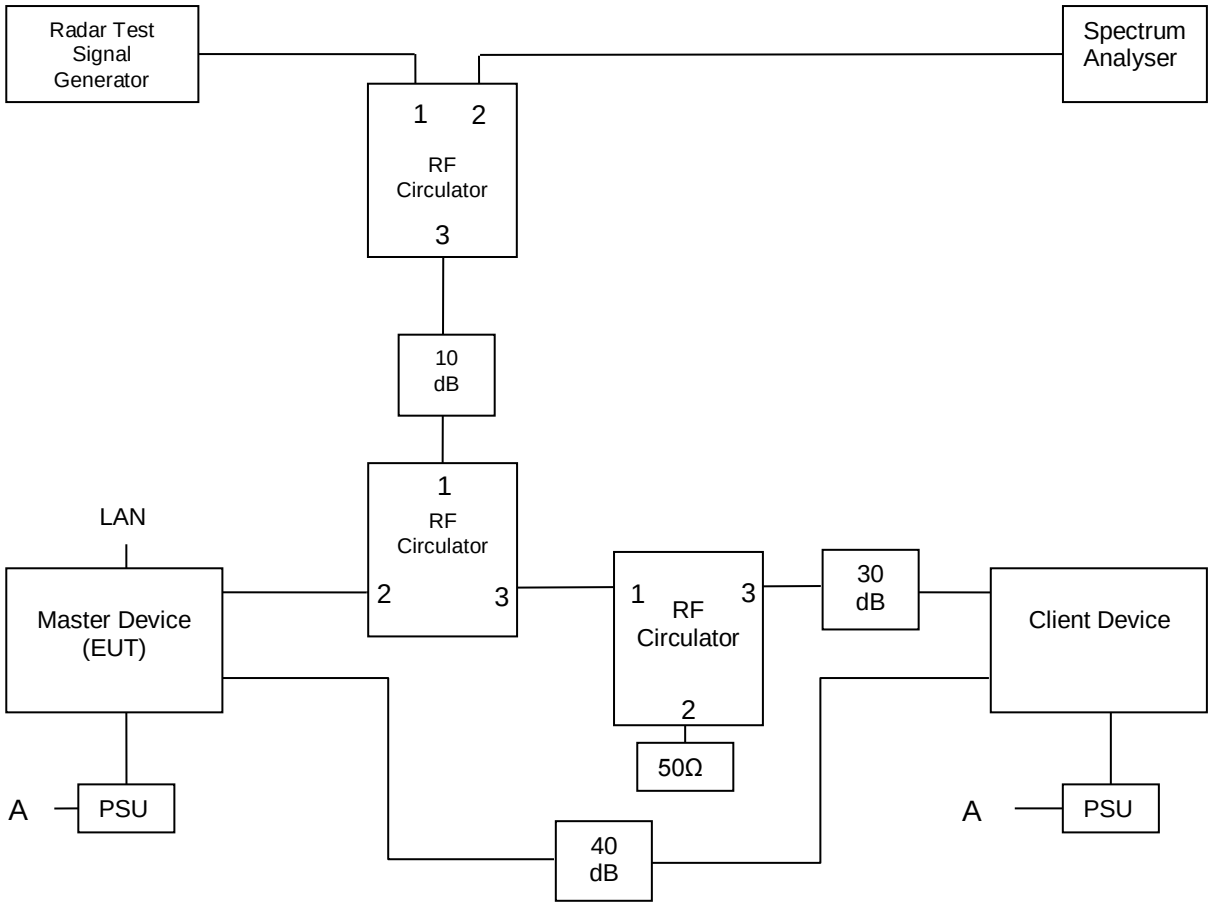
RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1631	DFS Test System	Aeroflex	PXI 3000	300110/291	Calibrated Before Use	-
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	13 Jan 2013	12
A248	Step Attenuator	Narda	743-60	01411	Calibrated Before Use	-
A030	Step Attenuator	Narda	445-69	01544	Calibrated Before Use	-
A163	Step Attenuator	Narda	743-80	01344	Calibrated Before Use	-
A2179	Coaxial Circulator 4-18GHz	Atlantec	ACC-20130-SF-SF-SF	120409230	Calibrated Before Use	-
A2182	Coaxial Circulator 4-18GHz	Atlantec	ACC-20130-SF-SF-SF	120409231	Calibrated Before Use	-
A2183	Coaxial Circulator 4-18GHz	Atlantec	ACC-20130-SF-SF-SF	120409232	Calibrated Before Use	-

NB In accordance with UKAS requirements all the measurement equipment is on a calibration schedule.

Appendix 2. Monitoring Methods Diagrams

All tests were performed as conducted measurements using the setups as shown below

Setup Diagram – EUT – Master, Radar Injection at Master



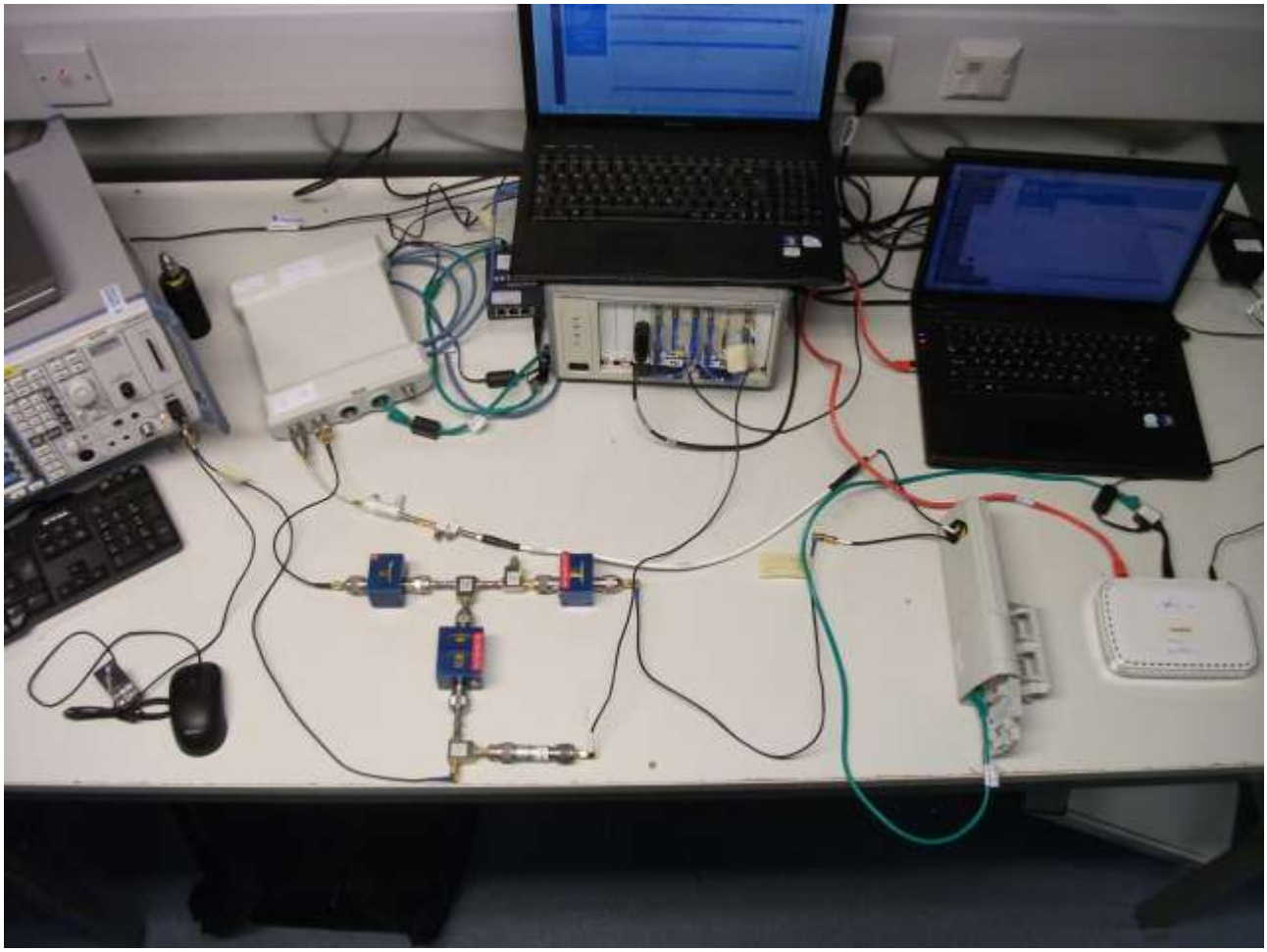
Note: The circulators have approximately 18 dB loss in the reverse direction.

Appendix 3. Radar Type 1-6 Calibration and Verification Data

All radars were generated and produced by an Aeroflex DFS test system. The radar pulse generation of this system has previously been verified by the FCC (see Appendix 4).

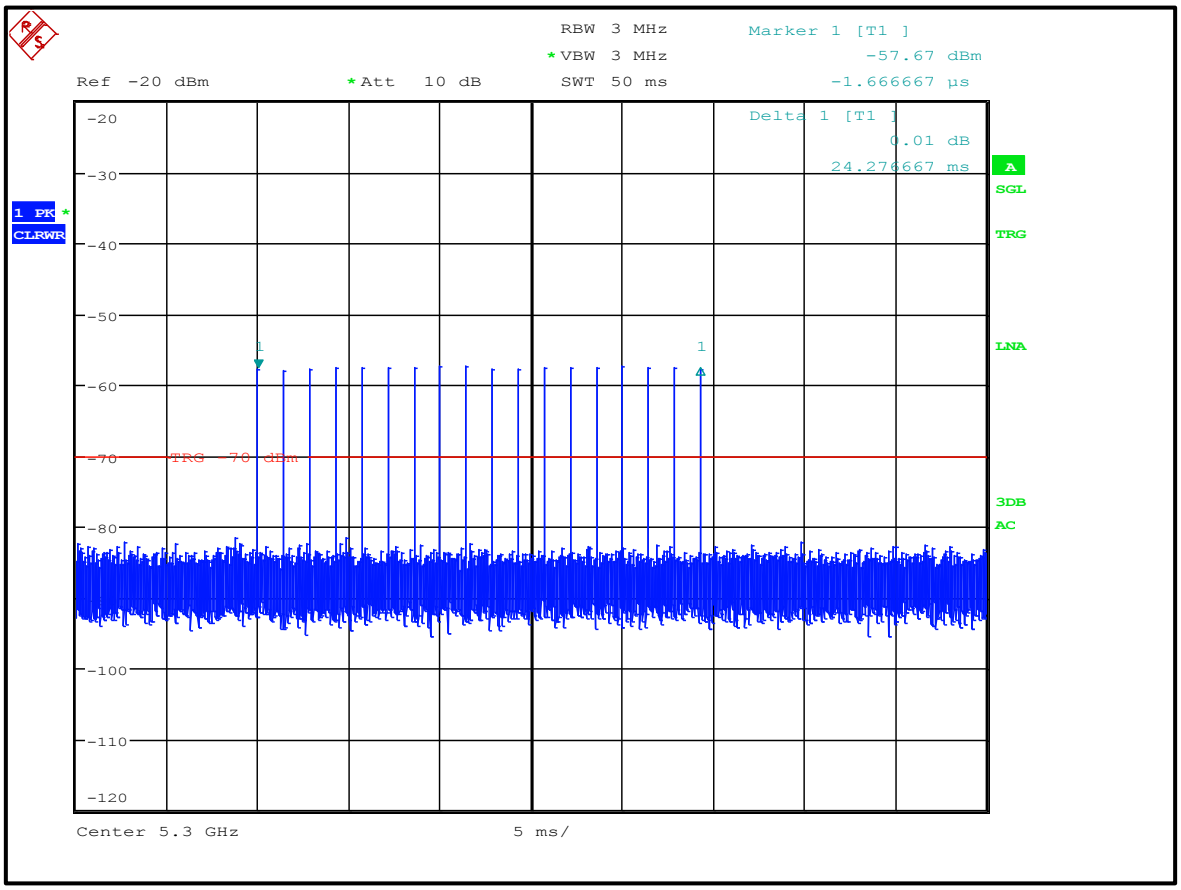
The radar amplitude was calibrated using the setup diagram above. The spectrum analyser was replaced by a 50Ω load. The EUT was replaced by a spectrum analyser. The radar pulses types 1-4 were then played back by the Aeroflex DFS test system. The amplitude was measured on the spectrum analyser using a 3 MHz RBW/VBW. The output level was adjusted to give the correct level into the EUT, as calculated in section 4.1, before the tests were performed. This level was used as the amplitude parameter for the DFS test system's generation of the pulse 5 & 6 waveforms. The generated pulse 5 & 6 waveforms were then also replayed and verified for amplitude.

Setup Photographs

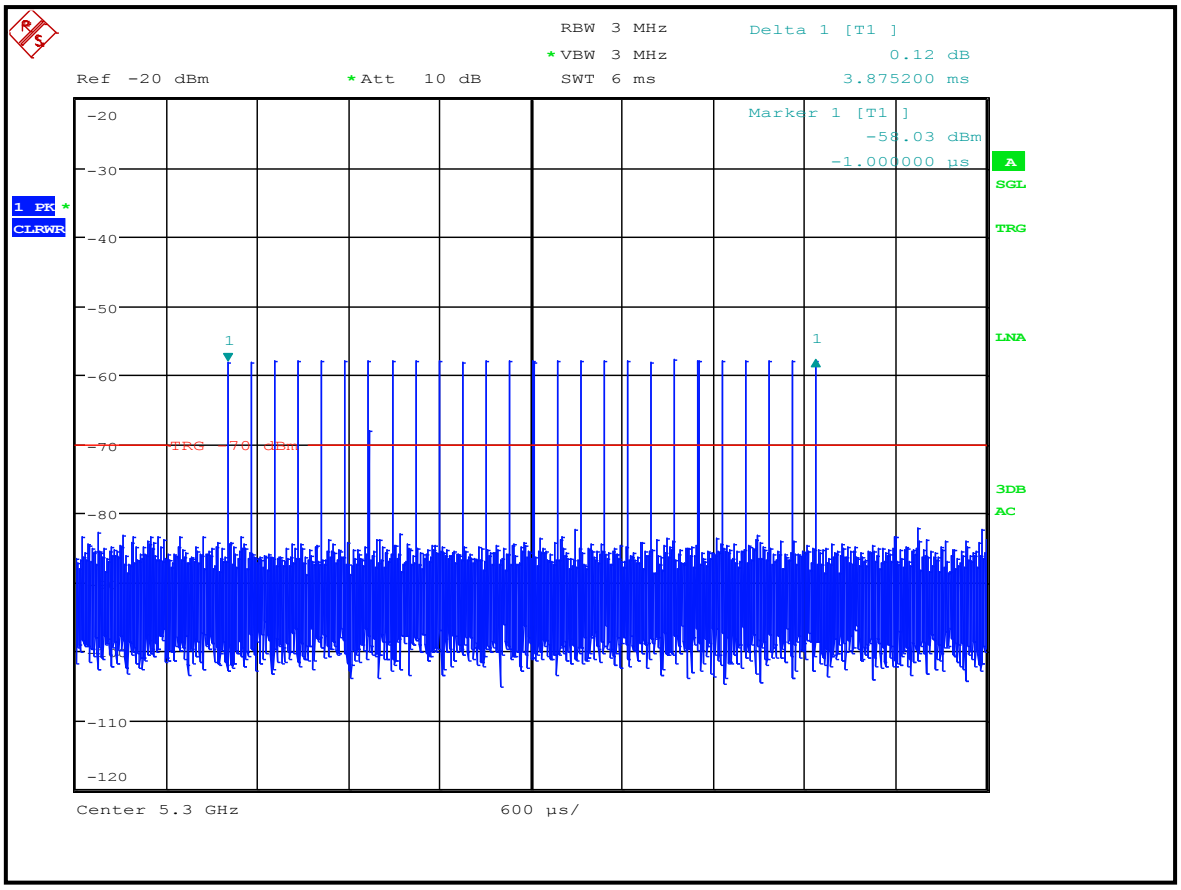


Radar Verification

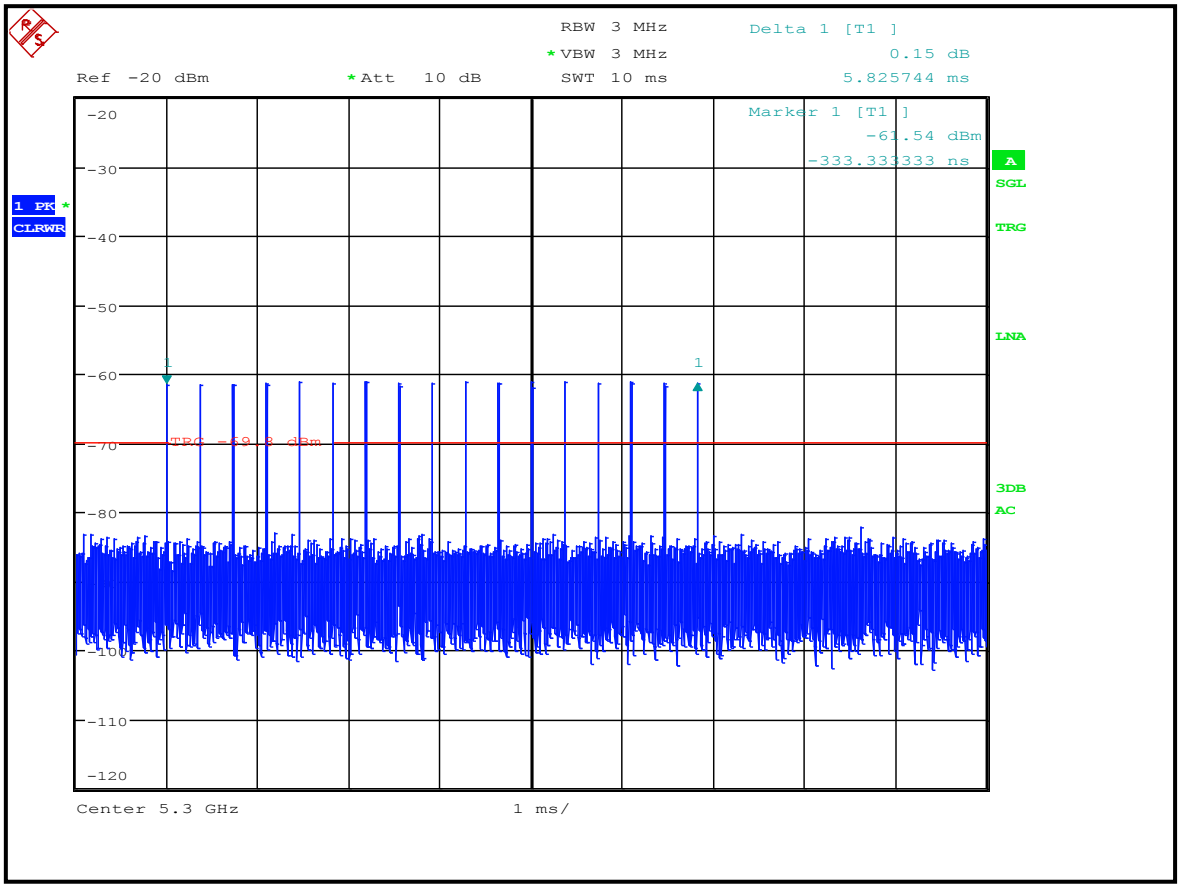
Below are sample plots of the radar waveforms, showing amplitude at one of the EUT receiver inputs.



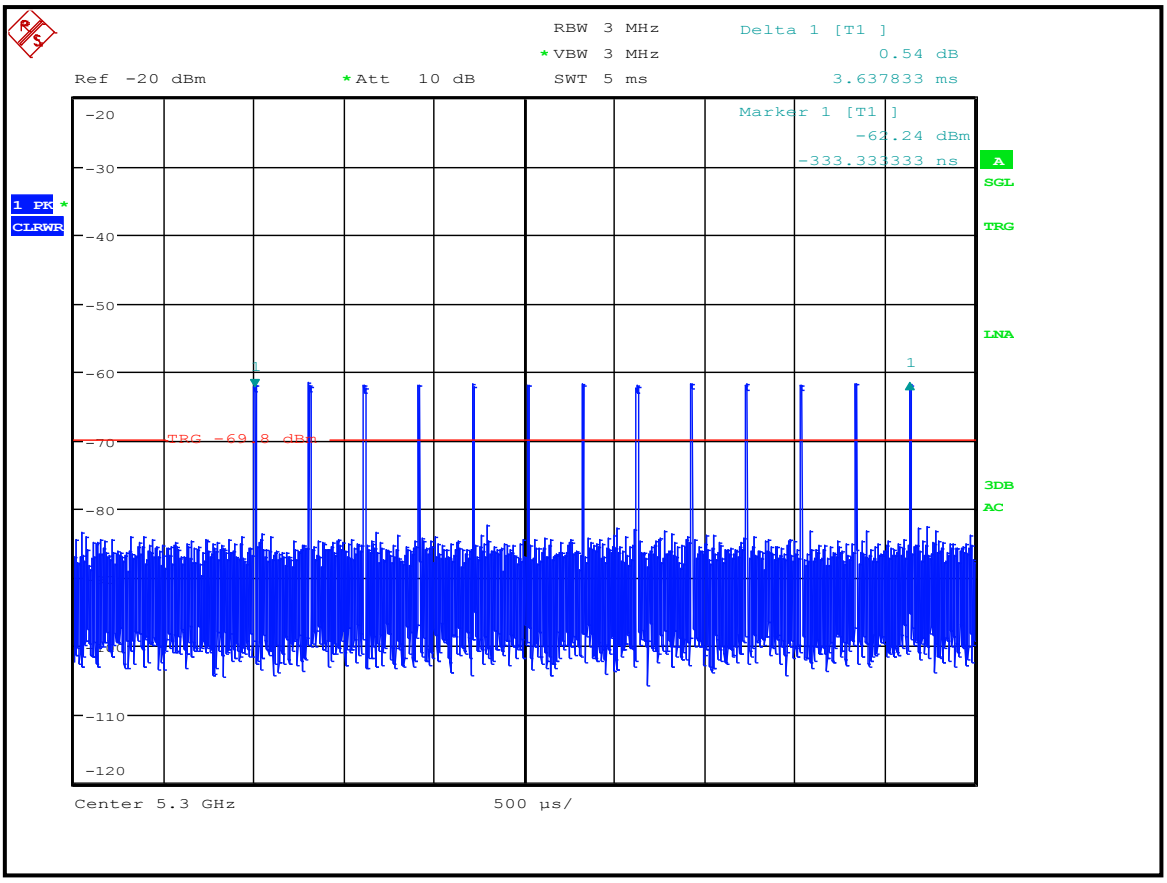
Radar Pulse 1



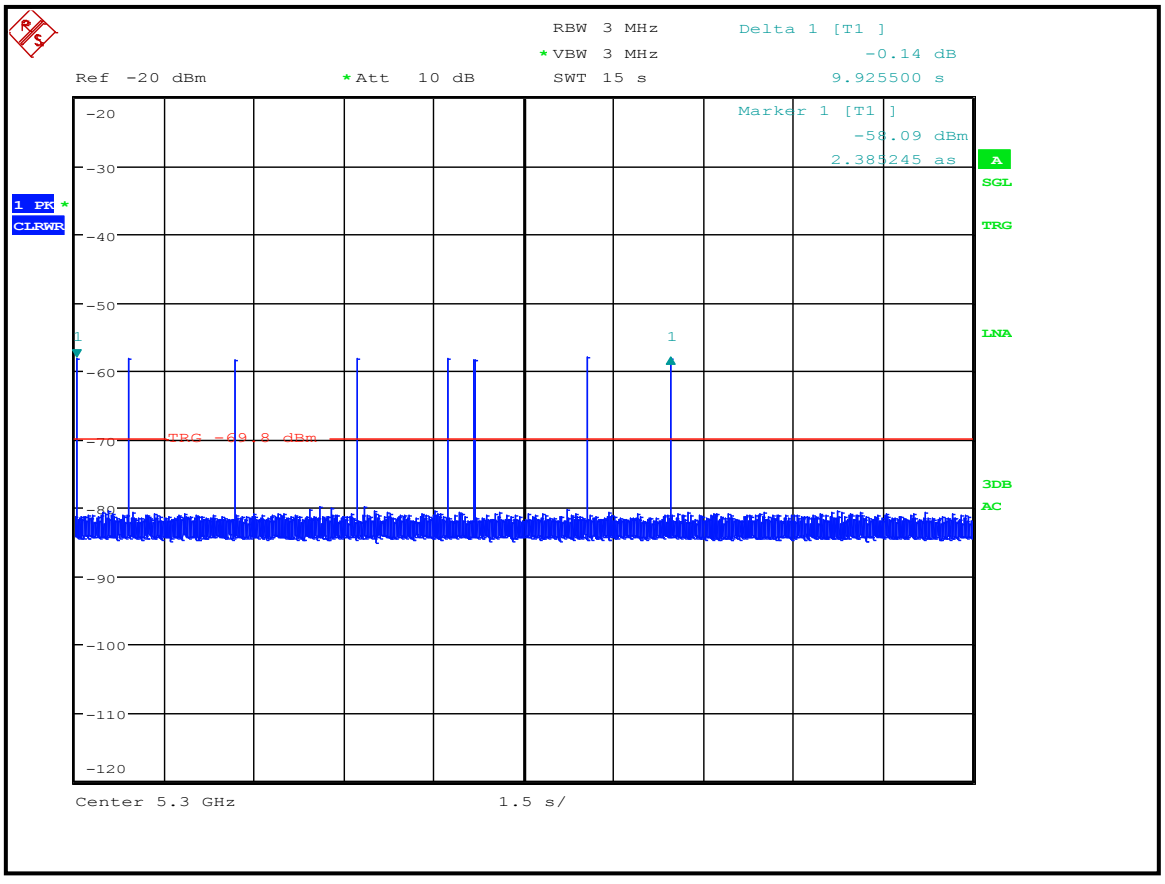
Radar Pulse 2



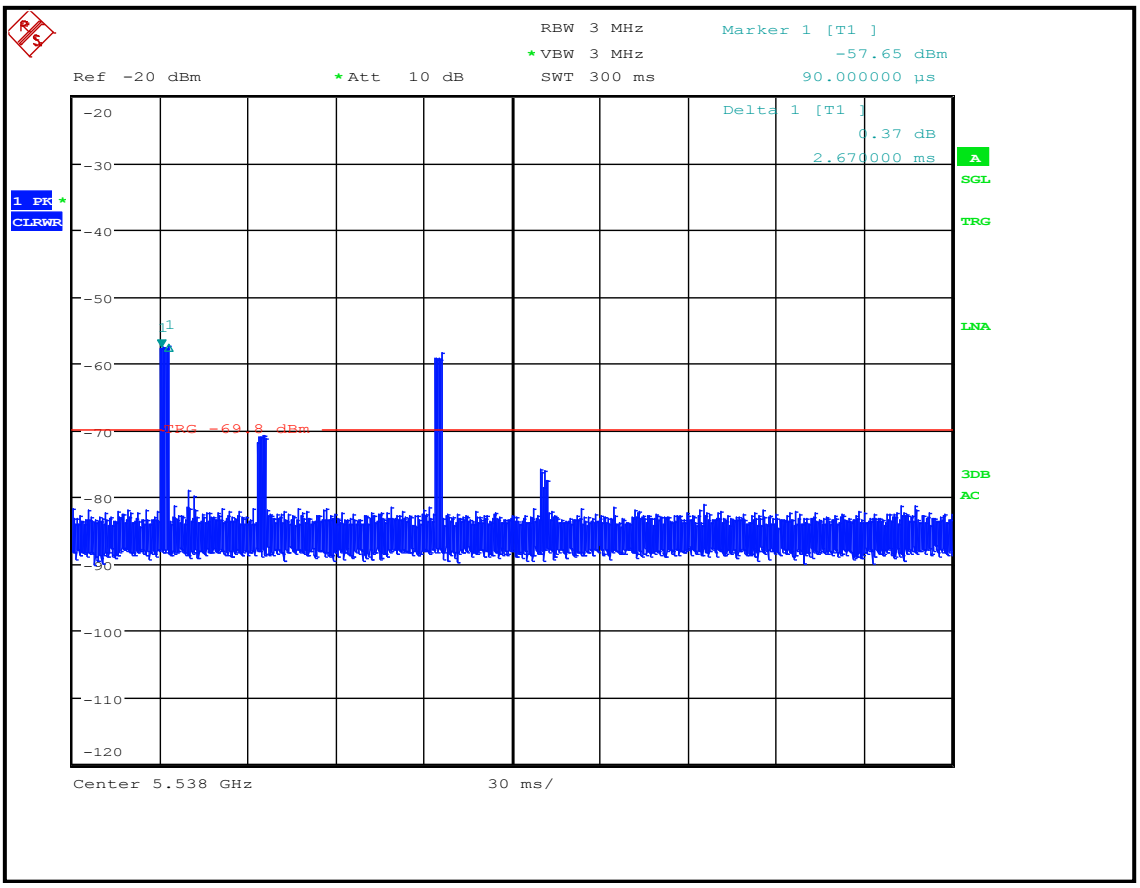
Radar Pulse 3



Radar Pulse 4



Long Radar Pulse 5



Hopping Radar Pulse 6 (Centre Frequency adjusted to first hop frequency)

Appendix 4. Test platform confirmation email

From: Andrew Leimer [mailto:Andrew.Leimer@fcc.gov]
Sent: Friday, September 23, 2011 4:24 PM
To: Chisham, Steve
Cc: Carey, Tim; Hack, Barry; Rashmi Doshi; Joe Dichoso
Subject: RE: Certification for Aeroflex DFS solution

Hello Steve,
The Aeroflex "DXI based DFS test solution" system used for DFS alternative radar signal generation has been approved by the FCC and NTIA.
This approval permits the system to be used by labs in the testing of DFS devices for equipment authorization Certification. It is recommended that applicants that use your system for testing include a statement in the Test Report or a Letter Exhibit stating that the system has FCC and NTIA approval. This E-mail is your record of this approval.
Note that the appropriate term for your system is Approved as the term Certification is reserved for devices gaining equipment authorization through the FCC or a TCB.

Regards,
Andy Leimer

FCC/OET/EACB

Appendix 5. Statistical Performance Check– Radar Type 5 Trial Records

10 MHz – Trial 1

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	66	14	1365	0	341929
2	2	100	7	1585	0	883499
3	3	56	12	1560	1132	801512
4	1	56	9	0	0	197404
5	3	55	10	1854	1907	252790
6	1	71	16	0	0	808159
7	1	80	6	0	0	65274
8	2	81	20	1068	0	724274
9	3	91	17	1282	1253	629374
10	3	87	9	1682	1710	858241
11	2	88	12	1035	0	937712
12	1	79	6	0	0	695221

10 MHz - Trial 2

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	73	10	0	0	1144639
2	2	89	19	1005	0	715839
3	1	55	15	0	0	891081
4	3	55	9	1870	1969	641139
5	2	51	12	1688	0	411691
6	1	67	14	0	0	904035
7	1	100	19	0	0	675022
8	1	74	8	0	0	618861

Statistical Performance Check– Radar Type 5 Trial Records (continued)

10 MHz - Trial 3

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	57	11	1517	0	747768
2	2	65	14	1887	0	249661
3	1	55	7	0	0	192285
4	1	63	17	0	0	654234
5	1	87	5	0	0	608911
6	3	63	12	1041	1544	141203
7	2	79	9	1437	0	41406
8	2	50	7	1626	0	185928
9	1	87	19	0	0	34269
10	3	65	18	1640	1236	114998
11	1	77	16	0	0	253078
12	2	62	19	1353	0	245049
13	1	84	7	0	0	668664
14	2	71	6	1680	0	211582
15	3	69	6	1997	1762	173075

10 MHz - Trial 4

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	56	15	1852	1915	382925
2	1	94	20	0	0	432056
3	3	84	9	1557	1537	21745
4	1	89	5	0	0	211392
5	2	82	11	1127	0	5595
6	3	97	6	1838	1945	184380
7	1	59	15	0	0	691221
8	1	94	11	0	0	128227
9	2	60	13	1716	0	202283
10	1	62	13	0	0	938783
11	1	71	5	0	0	658829

Statistical Performance Check– Radar Type 5 Trial Records (continued)

10 MHz - Trial 5

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	89	14	1309	0	652798
2	2	71	15	1814	0	28076
3	2	81	5	1245	0	791496
4	3	79	10	1899	1320	749193
5	1	50	8	0	0	137182
6	2	98	20	1028	0	57594
7	3	83	6	1160	1315	579565
8	1	88	14	0	0	720951
9	3	99	16	1854	1277	351725
10	3	91	19	1236	1500	373800
11	1	73	11	0	0	286649
12	3	99	17	1317	1339	365470
13	2	88	5	1281	0	531086
14	1	71	16	0	0	447169

10 MHz - Trial 6

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	63	20	1741	1244	155577
2	1	73	12	0	0	162650
3	1	50	9	0	0	459074
4	3	69	19	1590	1039	172441
5	2	96	14	1913	0	134981
6	2	53	6	1745	0	100401
7	2	59	19	1598	0	206608
8	1	70	17	0	0	220013
9	2	80	12	1931	0	418620
10	3	70	19	1303	1141	308490
11	2	50	19	1189	0	591178
12	3	62	11	1516	1756	204978
13	3	80	10	1667	1107	419845
14	1	87	12	0	0	16613
15	2	68	20	1569	0	218948
16	3	72	9	1447	1564	340248
17	3	91	5	1321	1427	31295
18	1	68	7	0	0	40988
19	3	77	12	1024	1307	122030

Statistical Performance Check– Radar Type 5 Trial Records (continued)

10 MHz - Trial 7

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	52	12	1298	0	51889
2	3	76	7	1987	1562	120584
3	3	73	18	1805	1818	502826
4	1	99	6	0	0	440902
5	1	67	16	0	0	585720
6	2	50	13	1041	0	121941
7	3	91	14	1433	1211	79235
8	3	99	5	1187	1418	803953
9	3	65	9	1273	1594	105103
10	2	100	12	1321	0	236044
11	1	59	16	0	0	435816
12	2	71	20	1851	0	244319
13	1	89	15	0	0	842904

10 MHz - Trial 8

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	67	14	1291	0	633652
2	1	54	13	0	0	340847
3	1	81	6	0	0	387847
4	3	60	10	1939	1699	666971
5	1	75	17	0	0	508367
6	1	82	14	0	0	810117
7	2	52	17	1535	0	260296
8	3	77	5	1750	1719	2542
9	1	52	7	0	0	571381
10	2	70	6	1292	0	573888
11	1	78	16	0	0	888040

Statistical Performance Check– Radar Type 5 Trial Records (continued)

10 MHz - Trial 9

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	70	10	0	0	351290
2	3	72	13	1738	1457	264356
3	1	78	6	0	0	473827
4	2	62	18	1938	0	108155
5	1	59	8	0	0	198494
6	2	90	16	1746	0	491385
7	3	97	13	1365	1599	395605
8	3	91	6	1648	1064	553489
9	2	59	15	1177	0	98476
10	2	97	10	1334	0	610093
11	2	56	6	1846	0	413828
12	2	67	7	1782	0	325801
13	2	82	13	1034	0	346552
14	1	61	6	0	0	373062
15	2	52	13	1724	0	550498
16	2	73	7	1275	0	222881
17	2	64	16	1579	0	429245

10 MHz - Trial 10

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	98	10	0	0	549985
2	2	94	7	1239	0	521137
3	1	60	16	0	0	625906
4	1	81	13	0	0	51056
5	1	53	18	0	0	703268
6	3	100	12	1612	1252	33405
7	1	50	20	0	0	389117
8	3	86	6	1627	1734	577387
9	1	95	19	0	0	280111
10	3	73	20	1024	1901	708216
11	2	94	20	1432	0	474582
12	3	86	20	1356	1698	457625
13	3	85	12	1598	1542	138402
14	2	85	18	1055	0	464951
15	2	88	13	1695	0	747097
16	1	54	15	0	0	612479

Statistical Performance Check– Radar Type 5 Trial Records (continued)

10 MHz - Trial 11

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	61	16	1817	0	563902
2	1	57	6	0	0	290350
3	3	67	14	1119	1199	29592
4	3	51	17	1287	1678	435064
5	2	92	9	1607	0	497745
6	1	97	13	0	0	316814
7	1	78	20	0	0	481334
8	1	90	20	0	0	322118
9	1	100	15	0	0	247706
10	2	83	20	1381	0	277585
11	2	84	19	1285	0	188319
12	1	80	13	0	0	27400
13	3	67	12	1107	1752	13917
14	2	60	20	1179	0	200793
15	3	91	17	1464	1484	64025
16	2	79	15	1419	0	8926
17	3	60	14	1838	1974	447098
18	1	81	14	0	0	233414
19	2	67	7	1281	0	588885
20	2	86	13	1132	0	96048

Statistical Performance Check– Radar Type 5 Trial Records (continued)

10 MHz - Trial 12

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	53	9	1139	0	141237
2	3	83	12	1570	1445	248781
3	1	62	5	0	0	488448
4	2	78	12	1946	0	107676
5	2	56	6	1465	0	313764
6	2	57	16	1130	0	50222
7	1	97	10	0	0	149501
8	1	96	5	0	0	374084
9	3	64	10	1694	1992	310762
10	3	97	13	1738	1207	233136
11	1	71	10	0	0	46972
12	2	55	15	1460	0	514799
13	3	87	19	1002	1491	256266
14	3	55	8	1508	1692	608201
15	3	74	11	1668	1598	411021
16	3	58	17	1371	1244	168204
17	3	78	20	1794	1771	229092
18	2	65	10	1192	0	558969
19	2	61	5	1172	0	488643

10 MHz - Trial 13

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	94	17	0	0	138767
2	3	96	15	1069	1753	148615
3	1	63	19	0	0	247522
4	2	87	10	1229	0	494061
5	2	65	20	1270	0	496055
6	1	85	6	0	0	188620
7	1	50	15	0	0	41548
8	2	57	6	1846	0	724583
9	1	99	11	0	0	457318
10	2	87	15	1790	0	232647
11	1	57	18	0	0	142115
12	2	67	5	1566	0	96206
13	1	58	19	0	0	555657
14	1	51	19	0	0	826204

Statistical Performance Check– Radar Type 5 Trial Records (continued)

10 MHz - Trial 14

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	50	12	0	0	572592
2	3	78	17	1833	1598	858437
3	2	65	7	1789	0	284925
4	3	84	8	1553	1662	933886
5	3	54	15	1183	1212	269972
6	3	66	5	1170	1915	733120
7	1	96	9	0	0	153645
8	3	90	10	1318	1660	683329
9	2	55	19	1867	0	479887
10	2	92	7	1670	0	80999
11	3	80	7	1507	1987	583835
12	2	62	7	1194	0	527765

10 MHz - Trial 15

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	71	12	1361	0	374104
2	3	52	15	1162	1171	49415
3	1	56	15	0	0	457432
4	2	92	15	1934	0	468298
5	1	81	8	0	0	213981
6	2	51	8	1111	0	333038
7	1	64	10	0	0	65020
8	2	89	10	1078	0	38719
9	1	59	17	0	0	590378
10	2	65	13	1552	0	39344
11	2	75	10	1174	0	72618
12	1	62	9	0	0	358276
13	1	80	20	0	0	294982
14	1	94	20	0	0	588122
15	1	93	15	0	0	345748
16	1	69	16	0	0	73272
17	3	68	19	1725	1714	232091
18	2	79	11	1658	0	565033
19	1	55	13	0	0	501313
20	2	54	9	1458	0	483990

Statistical Performance Check– Radar Type 5 Trial Records (continued)

10 MHz - Trial 16

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	56	9	0	0	425719
2	1	69	9	0	0	627039
3	3	55	5	1100	1657	685785
4	1	96	8	0	0	562433
5	2	70	7	1954	0	598965
6	1	74	15	0	0	685888
7	3	87	5	1923	1633	350098
8	3	73	18	1832	1980	198831
9	2	72	7	1020	0	676751
10	2	96	20	1335	0	639106
11	3	85	6	1669	1126	689818
12	1	86	17	0	0	238611
13	2	92	18	1779	0	385642
14	2	96	12	1724	0	128264
15	3	91	6	1418	1054	78888
16	1	65	10	0	0	446236

10 MHz - Trial 17

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	87	17	1179	1890	254917
2	1	56	10	0	0	522756
3	2	88	15	1917	0	419299
4	3	59	5	1897	1170	247409
5	2	66	8	1210	0	62652
6	3	64	5	1440	1890	533893
7	1	86	6	0	0	397141
8	1	99	14	0	0	270403
9	3	98	20	1737	1515	395444
10	1	63	19	0	0	121071
11	2	76	8	1688	0	569061
12	1	77	17	0	0	598562
13	1	60	8	0	0	182789
14	3	98	7	1311	1724	591040
15	1	80	11	0	0	342677
16	2	85	13	1411	0	25576
17	3	69	10	1263	1673	508695
18	1	77	10	0	0	517893
19	1	70	12	0	0	217381
20	2	90	17	1175	0	324597

Statistical Performance Check– Radar Type 5 Trial Records (continued)

10 MHz - Trial 18

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	75	19	1315	0	698955
2	1	83	7	0	0	647100
3	1	78	14	0	0	373261
4	1	56	7	0	0	364136
5	3	88	20	1608	1449	22910
6	1	83	9	0	0	25897
7	2	84	13	1604	0	307588
8	3	94	10	1804	1037	255265
9	3	61	11	1299	1277	367578
10	3	58	16	1040	1731	314929
11	1	52	5	0	0	474118
12	3	58	11	1134	1145	608475
13	2	99	16	1547	0	210045
14	3	99	15	1619	1765	505098
15	1	90	6	0	0	443220
16	3	87	16	1759	1765	146713
17	3	64	14	1110	1766	251276

10 MHz - Trial 19

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	79	11	1052	0	411414
2	1	53	19	0	0	1899
3	1	82	13	0	0	480802
4	1	51	17	0	0	166370
5	2	50	13	1036	0	295055
6	3	51	11	1443	1879	148116
7	1	55	20	0	0	118758
8	3	91	13	1199	1549	97159
9	1	63	16	0	0	269447
10	1	62	6	0	0	513819
11	3	50	12	1937	1635	571409
12	3	81	10	1685	1488	396581
13	1	100	12	0	0	57417
14	3	60	17	1316	1923	76317
15	2	61	10	1323	0	245745
16	3	80	17	1599	1852	413186
17	2	58	10	1459	0	395824
18	3	88	10	1358	1130	75556
19	2	66	14	1191	0	334228
20	2	67	14	1768	0	214359

10 MHz - Trial 20

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	68	5	1744	0	66491
2	2	93	5	1025	0	342023
3	1	79	8	0	0	582589
4	2	71	18	1127	0	285101
5	2	75	19	1833	0	725494
6	2	78	11	1211	0	644756
7	3	60	11	1540	1968	21507
8	1	52	15	0	0	357219
9	3	80	5	1871	1398	163207
10	3	85	20	1866	1566	609962
11	3	53	14	1769	1783	153831
12	1	60	9	0	0	346404
13	3	63	5	1398	1675	701693
14	2	72	17	1743	0	169061
15	2	75	12	1199	0	348764
16	2	62	18	1833	0	237964

10 MHz - Trial 21

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	66	12	1657	1680	713384
2	1	62	7	0	0	246838
3	3	67	5	1184	1264	331461
4	3	64	16	1490	1515	564327
5	1	70	6	0	0	63978
6	3	99	20	1899	1030	548642
7	1	96	16	0	0	455262
8	3	84	19	1987	1888	409715
9	2	73	18	1202	0	83350
10	1	88	19	0	0	6832
11	2	82	9	1365	0	726074
12	3	95	13	1946	1140	676917
13	2	61	19	1564	0	507016
14	3	51	5	1650	1478	166631
15	2	82	5	1019	0	328670
16	3	66	11	1418	1005	59844

10 MHz - Trial 22

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	77	13	0	0	883344
2	2	66	14	1017	0	167315
3	1	90	8	0	0	14106
4	3	76	18	1687	1876	234675
5	1	97	5	0	0	190495
6	2	50	9	1323	0	750472
7	3	93	19	1977	1259	490203
8	3	88	15	1753	1949	121698
9	1	80	16	0	0	179929
10	3	94	16	1016	1285	547546

10 MHz - Trial 23

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	80	7	1931	1345	670552
2	3	73	14	1211	1787	548768
3	2	98	9	1218	0	223871
4	1	65	5	0	0	10484
5	2	82	9	1007	0	9277
6	1	65	10	0	0	603824
7	2	94	7	1417	0	555740
8	2	68	8	1588	0	581465
9	3	67	11	1682	1252	456250
10	3	54	14	1280	1455	957871
11	1	57	13	0	0	975092

10 MHz - Trial 24

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	60	13	1396	0	540463
2	2	77	13	1400	0	585636
3	3	98	13	1108	1798	334467
4	2	53	12	1529	0	214657
5	2	89	15	1774	0	94046
6	3	59	6	1993	1723	512768
7	3	53	14	1014	1996	204846
8	2	64	13	1870	0	371071
9	2	79	12	1153	0	147467
10	2	72	6	1934	0	328284
11	1	67	7	0	0	40975
12	1	96	7	0	0	391339
13	2	81	9	1429	0	503776
14	3	100	8	1226	1020	580806
15	2	56	10	1356	0	63740
16	2	53	9	1152	0	317801
17	3	81	9	1403	1250	36732
18	3	87	10	1034	1266	506956
19	1	97	17	0	0	112370
20	2	84	10	1798	0	33081

10 MHz - Trial 25

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	94	19	1433	0	582811
2	2	93	9	1306	0	605056
3	1	100	19	0	0	121007
4	1	98	16	0	0	407306
5	1	81	9	0	0	242085
6	1	55	19	0	0	538593
7	1	56	9	0	0	371358
8	2	95	19	1603	0	86837
9	1	75	20	0	0	636619
10	1	58	14	0	0	465246
11	3	51	15	1238	1926	538179
12	1	90	19	0	0	440090
13	2	88	13	1991	0	456969
14	1	85	8	0	0	569548
15	2	50	14	1570	0	126897
16	1	50	13	0	0	248211
17	3	98	18	1978	1543	380689
18	3	58	6	1875	1201	571013

10 MHz - Trial 26

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	82	10	1855	1745	400216
2	3	85	6	1377	1848	581157
3	3	99	18	1862	1509	189425
4	2	75	20	1737	0	137401
5	2	77	12	1990	0	233729
6	3	64	11	1529	1628	259785
7	2	69	10	1821	0	515123
8	3	55	5	1977	1293	388627
9	3	52	15	1760	1469	358519
10	2	56	8	1025	0	334326
11	2	69	19	1188	0	430269
12	1	89	16	0	0	360004
13	3	56	13	1953	1820	103748
14	3	69	16	1755	1599	415005
15	2	55	19	1828	0	356251
16	1	96	9	0	0	591414

10 MHz - Trial 27

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	50	14	0	0	388176
2	2	74	8	1662	0	695967
3	2	63	16	1332	0	861748
4	2	53	6	1339	0	571762
5	3	86	6	1718	1397	477618
6	2	62	13	1108	0	165693
7	2	93	15	1408	0	502349
8	1	89	15	0	0	661206
9	2	96	8	1923	0	469393
10	3	56	12	1763	1202	615192
11	2	81	6	1796	0	344155
12	1	96	15	0	0	437320

10 MHz - Trial 28

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	55	5	1286	0	705213
2	3	65	17	1742	1485	36138
3	2	84	14	1786	0	646121
4	2	65	16	1291	0	530729
5	2	51	20	1039	0	648702
6	3	64	11	1729	1631	188322
7	1	83	6	0	0	553516
8	2	58	5	1988	0	173240
9	1	95	15	0	0	687235
10	2	98	14	1161	0	274598
11	1	82	14	0	0	377322
12	2	69	7	1224	0	171557
13	3	88	13	1177	1219	135334
14	3	63	17	1322	1345	137747

10 MHz - Trial 29

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	89	14	0	0	578154
2	2	86	14	1893	0	85152
3	3	55	18	1218	1098	660427
4	2	71	7	1517	0	31361
5	1	98	13	0	0	559927
6	3	66	10	1636	1159	293922
7	3	67	6	1055	1299	623285
8	3	74	10	1210	1987	474879
9	3	85	6	1192	1292	393614
10	1	72	12	0	0	545340
11	1	52	19	0	0	199701
12	3	86	19	1757	1688	4930
13	3	55	13	1830	1437	312197
14	1	92	5	0	0	568857
15	2	64	20	1051	0	158521
16	2	58	15	1120	0	620087

10 MHz - Trial 30

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	83	10	1148	1218	657122
2	1	57	13	0	0	132810
3	3	97	18	1436	1067	740642
4	3	54	10	1209	1336	723372
5	3	72	9	1393	1168	921173
6	3	89	14	1744	1358	646347
7	2	75	8	1081	0	746150
8	1	94	19	0	0	648719
9	2	75	19	1509	0	28111
10	3	78	9	1960	1537	23300

20 MHz - Trial 1

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	53	20	1013	0	389496
2	3	92	20	1745	1774	510294
3	2	75	18	1641	0	485141
4	1	99	9	0	0	29706
5	1	97	6	0	0	430067
6	1	86	18	0	0	482256
7	1	74	19	0	0	411693
8	2	99	9	1400	0	151077
9	3	77	17	1367	1612	106358
10	1	99	5	0	0	585667
11	2	53	10	1157	0	664204
12	3	96	6	1093	1136	418564
13	2	80	14	1151	0	392960
14	2	78	5	1554	0	444158
15	1	69	15	0	0	400959
16	1	64	7	0	0	181636
17	2	98	9	1409	0	569572

20 MHz - Trial 2

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	52	12	0	0	585273
2	1	50	6	0	0	439370
3	3	63	11	1569	1760	642987
4	3	73	13	1227	1013	519236
5	2	98	18	1286	0	87606
6	1	84	10	0	0	440741
7	3	96	12	1841	1848	614990
8	2	86	13	1562	0	846524
9	3	82	9	1443	1267	148563
10	1	76	9	0	0	349681
11	2	68	19	1978	0	107237
12	1	68	11	0	0	258864
13	2	72	17	1890	0	632902

20 MHz - Trial 3

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	61	13	1070	1848	156884
2	3	55	13	1542	1243	854913
3	1	90	9	0	0	430662
4	1	83	19	0	0	945673
5	2	87	15	1995	0	449717
6	3	70	13	1912	1414	70561
7	2	99	14	1952	0	189150
8	3	67	9	1531	1547	379478
9	2	54	11	1465	0	577901
10	2	83	6	1535	0	714150
11	1	86	16	0	0	686393
12	1	53	12	0	0	146435

20 MHz - Trial 4

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	68	16	0	0	320517
2	1	62	8	0	0	806749
3	2	74	17	1801	0	125168
4	2	64	19	1571	0	428152
5	3	92	14	1677	1688	868542
6	2	75	20	1170	0	804898
7	3	87	16	1248	1569	281416
8	3	57	19	1565	1016	11321
9	1	83	20	0	0	16822
10	1	90	8	0	0	128059

20 MHz - Trial 5

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	93	13	1993	0	245376
2	3	74	14	1218	1933	455485
3	2	70	16	1553	0	693171
4	1	94	18	0	0	574957
5	1	69	17	0	0	872976
6	1	69	20	0	0	140006
7	2	97	13	1698	0	599740
8	2	96	7	1778	0	544934
9	3	55	20	1128	1524	180014
10	1	81	19	0	0	752302

20 MHz - Trial 6

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	71	20	0	0	722603
2	2	91	13	1162	0	195297
3	2	78	9	1859	0	145481
4	2	92	6	1318	0	258007
5	2	54	11	1115	0	897901
6	1	100	6	0	0	752028
7	3	82	19	1767	1027	633791
8	1	89	17	0	0	447489
9	2	67	19	1516	0	488767
10	3	79	20	1441	1816	16475
11	3	82	9	1134	1606	319007
12	3	80	8	1878	1315	890869
13	1	93	16	0	0	399805

20 MHz - Trial 7

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	73	13	1540	1129	34588
2	2	78	9	1306	0	421686
3	1	60	15	0	0	442388
4	2	100	14	1150	0	160418
5	2	72	5	1207	0	465251
6	3	65	17	1898	1218	403144
7	3	57	8	1976	1852	144099
8	2	67	20	1280	0	283609
9	1	95	20	0	0	135819
10	3	67	13	1699	1204	441127
11	3	58	12	1649	1217	551225
12	1	89	17	0	0	61432
13	2	76	12	1518	0	551348
14	2	68	12	1066	0	262090
15	2	56	10	1952	0	153579
16	2	58	5	1413	0	14290
17	2	96	10	1216	0	72984
18	2	53	17	1735	0	553223
19	1	91	14	0	0	237051
20	3	90	11	1305	1948	342647

20 MHz - Trial 8

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	67	13	1340	1400	218494
2	2	60	5	1862	0	339025
3	1	79	18	0	0	115114
4	3	57	18	1673	1644	724208
5	3	100	14	1600	1588	200368
6	2	75	7	1465	0	15409
7	2	91	19	1231	0	549856
8	2	53	5	1199	0	132433
9	2	98	6	1230	0	31490
10	2	80	10	1132	0	180857
11	2	65	20	1189	0	614907
12	1	82	19	0	0	498108
13	3	66	12	1142	1360	557491
14	3	55	18	1613	1786	390977
15	2	62	11	1717	0	386920
16	1	74	6	0	0	176736

20 MHz - Trial 9

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	99	8	0	0	818748
2	1	54	11	0	0	299705
3	3	75	6	1711	1922	657496
4	3	78	18	1442	1081	676126
5	3	98	15	1265	1708	367257
6	3	50	15	1346	1480	115866
7	2	71	16	1136	0	10553
8	1	84	16	0	0	521043
9	3	96	15	1811	1406	446074
10	2	61	17	1830	0	14725
11	2	81	12	1016	0	157257
12	3	65	12	1302	1439	398321
13	3	84	15	1531	1835	78178
14	1	82	17	0	0	396801

20 MHz - Trial 10

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	92	11	1077	1020	426610
2	3	73	18	1234	1053	815201
3	2	60	15	1443	0	278590
4	3	70	6	1090	1230	317298
5	3	55	7	1808	1936	642090
6	1	57	13	0	0	734275
7	3	56	7	1527	1685	451740
8	2	93	20	1634	0	765655
9	2	54	8	1559	0	654532
10	3	84	14	1916	1143	293487
11	1	65	11	0	0	589425
12	3	51	14	1110	1390	731758
13	3	85	16	1696	1768	757177
14	2	53	15	1703	0	448010

20 MHz - Trial 11

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	67	17	1150	1527	291814
2	2	71	20	1916	0	420421
3	3	92	14	1074	1278	587381
4	3	50	8	1278	1361	364166
5	2	83	5	1217	0	344027
6	3	65	5	1202	1747	10741
7	1	81	15	0	0	146312
8	1	59	18	0	0	558501
9	1	54	16	0	0	24379
10	2	68	8	1088	0	275398
11	1	65	5	0	0	427786
12	3	84	10	1318	1325	152172
13	3	58	15	1262	1147	455114
14	3	89	8	1210	1810	103935
15	1	68	14	0	0	611858

20 MHz - Trial 12

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	74	6	1526	0	1360246
2	1	98	18	0	0	1186626
3	2	68	7	1699	0	449959
4	2	55	8	1329	0	543055
5	3	73	13	1384	1543	1003009
6	3	99	10	1951	1353	28720
7	2	82	19	1454	0	6334
8	1	65	9	0	0	643418

20 MHz - Trial 13

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	61	10	0	0	1116111
2	1	50	17	0	0	1008190
3	1	98	8	0	0	576548
4	1	84	7	0	0	295936
5	1	78	6	0	0	124285
6	2	86	6	1092	0	1195153
7	1	61	8	0	0	1348499
8	2	68	19	1421	0	507240

20 MHz - Trial 14

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	65	14	0	0	434784
2	2	82	10	1062	0	170806
3	1	54	8	0	0	557406
4	2	68	8	1074	0	108160
5	3	75	11	1939	1903	365801
6	1	87	8	0	0	159383
7	3	89	11	1500	1802	558887
8	3	88	10	1141	1071	33265
9	3	100	17	1079	1346	490020
10	2	66	6	1933	0	99983
11	1	96	16	0	0	526620
12	3	92	19	1206	1010	169766
13	3	69	8	1416	1368	506746
14	2	65	12	1791	0	411376
15	2	57	12	1051	0	22982
16	3	87	18	1965	1196	291103
17	2	100	20	1853	0	1459
18	3	82	11	1688	1921	25086
19	1	75	17	0	0	626591

20 MHz - Trial 15

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	98	5	0	0	568367
2	3	71	15	1577	1245	346002
3	2	79	12	1718	0	352340
4	1	71	6	0	0	724235
5	2	59	15	1111	0	383019
6	1	73	19	0	0	100774
7	3	99	6	1973	1910	81526
8	1	98	19	0	0	580650
9	2	85	5	1124	0	685471
10	2	87	6	1274	0	170360
11	1	72	20	0	0	154422
12	1	91	10	0	0	737889
13	1	84	9	0	0	661030
14	1	67	13	0	0	50233
15	3	64	10	1597	1123	715561
16	3	82	18	1000	1642	207573

20 MHz - Trial 16

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	82	17	0	0	516033
2	2	94	15	1110	0	77462
3	1	64	9	0	0	150379
4	3	92	5	1115	1249	299622
5	3	50	7	1712	1482	764331
6	3	84	9	1379	1244	755699
7	1	87	6	0	0	645457
8	2	96	12	1824	0	711467
9	1	66	16	0	0	444995
10	2	77	13	1943	0	673795
11	2	99	6	1692	0	93956
12	2	66	7	1895	0	477103
13	3	72	19	1097	1976	391522
14	3	79	10	1598	1047	79865

20 MHz - Trial 17

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	57	19	0	0	351978
2	3	96	7	1104	1648	737737
3	3	65	9	1841	1509	541593
4	3	92	13	1843	1237	50139
5	1	79	5	0	0	773578
6	2	79	19	1528	0	754085
7	3	93	8	1138	1814	481751
8	1	58	11	0	0	718231
9	1	88	15	0	0	82832
10	1	54	11	0	0	352139
11	2	70	17	1604	0	155266
12	1	69	13	0	0	12420
13	3	79	6	1417	1200	792321
14	3	97	16	1548	1928	593086

20 MHz - Trial 18

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	78	20	1720	1029	261575
2	1	52	13	0	0	622065
3	2	93	20	1996	0	674185
4	2	61	18	1874	0	536124
5	1	84	6	0	0	481719
6	2	93	7	1966	0	538832
7	3	98	7	1483	1515	754920
8	2	57	7	1047	0	914020
9	3	81	14	1256	1088	97039
10	3	71	11	1222	1240	56964
11	3	82	7	1578	1488	176661
12	2	72	9	1184	0	631086
13	2	97	10	1297	0	23419

20 MHz - Trial 19

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	54	18	0	0	303300
2	3	50	13	1164	1218	826887
3	3	80	10	1246	1982	394952
4	2	55	18	1971	0	33788
5	2	89	8	1512	0	764759
6	1	83	18	0	0	309537
7	1	73	13	0	0	323352
8	1	100	18	0	0	676997
9	3	69	10	1491	1021	550806
10	1	53	7	0	0	639806
11	1	78	6	0	0	84854
12	2	73	20	1626	0	206525
13	1	93	16	0	0	2211
14	1	79	12	0	0	317318

20 MHz - Trial 20

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	53	5	1902	1653	35123
2	3	68	16	1246	1141	66126
3	3	64	11	1003	1187	289782
4	1	60	14	0	0	817766
5	2	88	14	1134	0	705840
6	3	76	19	1595	1825	762723
7	3	66	8	1381	1714	413189
8	2	79	17	1147	0	742414
9	2	98	10	1727	0	923534
10	1	66	20	0	0	720864
11	1	90	8	0	0	970935
12	2	66	17	1215	0	193522

20 MHz - Trial 21

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	63	11	1152	0	341939
2	3	72	14	1094	1151	336358
3	1	72	9	0	0	64928
4	2	76	6	1977	0	437859
5	3	88	11	1577	1366	990137
6	3	84	17	1573	1345	292421
7	1	93	17	0	0	967947
8	2	77	18	1038	0	17546
9	3	84	19	1719	1115	1205454

20 MHz - Trial 22

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	67	12	1434	1667	775951
2	1	96	14	0	0	211208
3	3	89	10	1665	1646	604063
4	1	82	17	0	0	461652
5	2	99	20	1577	0	86032
6	2	98	12	1308	0	292311
7	2	53	5	1136	0	703584
8	3	92	10	1984	1387	660500
9	1	77	19	0	0	647934
10	3	88	5	1832	1024	49033
11	1	95	17	0	0	422144
12	3	68	18	1225	1330	371919
13	1	93	8	0	0	610146
14	3	51	8	1468	1852	50994

20 MHz - Trial 23

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	76	13	1124	0	304656
2	2	51	6	1591	0	810802
3	3	68	18	1105	1047	705254
4	1	56	6	0	0	595581
5	1	59	7	0	0	52361
6	3	76	20	1513	1735	317637
7	2	72	15	1682	0	791271
8	3	96	20	1041	1211	129073
9	1	66	14	0	0	250829
10	2	97	18	1518	0	475678
11	1	58	15	0	0	1058572

20 MHz - Trial 24

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	71	16	1968	0	524118
2	2	50	5	1834	0	497077
3	1	80	6	0	0	788978
4	2	93	12	1195	0	891958
5	3	80	12	1123	1127	409202
6	1	90	15	0	0	293108
7	3	65	6	1596	1450	4455
8	3	79	10	1798	1181	790830
9	3	91	8	1419	1156	677166
10	3	78	6	1496	1614	789242
11	1	88	13	0	0	454047
12	1	70	14	0	0	144207
13	3	91	20	1570	1546	499971

20 MHz - Trial 25

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	85	14	0	0	480550
2	2	82	8	1244	0	414083
3	1	83	9	0	0	296587
4	3	97	17	1498	1296	270548
5	2	82	12	1039	0	421538
6	3	91	12	1330	1608	7893
7	2	76	19	1103	0	346614
8	3	94	18	1900	1695	347586
9	3	92	8	1322	1674	588693
10	2	87	16	1504	0	372787
11	1	69	12	0	0	361345
12	2	59	6	1097	0	283955
13	2	64	12	1394	0	623907
14	3	76	9	1274	1821	229190
15	1	94	20	0	0	221747
16	1	69	11	0	0	560655
17	3	65	8	1762	1080	221672
18	1	94	9	0	0	305983
19	2	80	6	1345	0	179121

20 MHz - Trial 26

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	1	90	16	0	0	1004049
2	3	66	9	1042	1044	863587
3	2	52	7	1887	0	910116
4	1	66	5	0	0	808300
5	2	71	10	1274	0	824773
6	1	78	17	0	0	986949
7	2	94	13	1625	0	538211
8	3	80	16	1091	1463	166033
9	2	93	16	1088	0	862283
10	1	99	6	0	0	181534
11	1	92	20	0	0	54220

20 MHz - Trial 27

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	73	6	1675	0	345370
2	3	82	13	1397	1807	559484
3	1	64	20	0	0	480591
4	2	73	12	1218	0	914140
5	1	83	20	0	0	1152022
6	1	78	10	0	0	378490
7	3	69	6	1255	1390	1189113
8	2	58	7	1199	0	740202
9	2	95	8	1335	0	628891
10	2	94	10	1774	0	37934

20 MHz - Trial 28

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	72	15	1533	0	636483
2	2	75	18	1496	0	803945
3	2	96	20	1365	0	269836
4	2	72	6	1777	0	820845
5	2	86	15	1638	0	946980
6	2	84	10	1975	0	580299
7	3	61	18	1943	1387	1139751
8	2	65	19	1004	0	960288
9	3	85	12	1145	1693	1171962
10	2	54	11	1441	0	334960

20 MHz - Trial 29

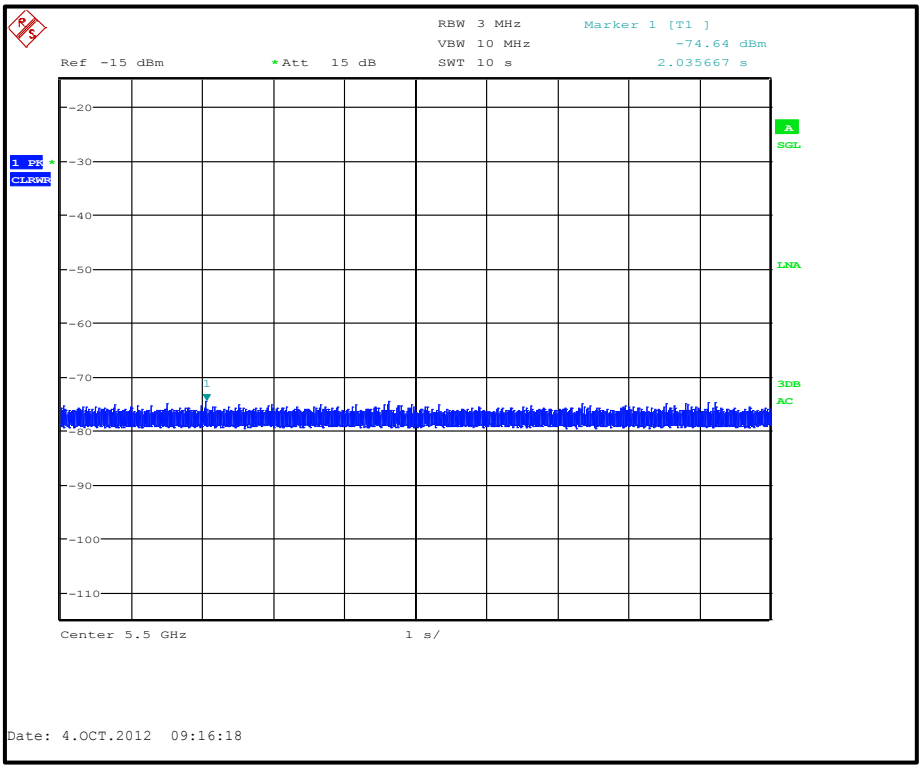
Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	64	18	1387	0	1369767
2	1	94	11	0	0	251645
3	2	80	17	1378	0	1065602
4	3	55	10	1522	1874	1221746
5	3	96	11	1225	1783	1271752
6	1	92	9	0	0	1204566
7	1	62	18	0	0	1032294
8	2	100	10	1085	0	1309798

20 MHz - Trial 30

Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	3	84	9	1467	1856	1463242
2	2	75	7	1746	0	1258164
3	2	74	20	1663	0	898815
4	1	56	10	0	0	1117942
5	2	74	8	1013	0	749839
6	3	92	8	1766	1172	1142410
7	3	97	14	1641	1387	249104
8	3	80	17	1844	1549	275905

Appendix 6. System Noise floor Reference Plots

As required by section 8.3.18(iii) of FCC 06-96, the following plots show the reference noise floor of the system used during measurement.



Noise floor of test system

Appendix 7. Radar Detection Probability with 75% Duty Cycle

The customer requested the same radars used in the main report were repeated with the EUT transmitting at 75%/25% talk/listen ratio for the 10 MHz bandwidth. As previously the details of the radars pulses can be seen either on the result page below or in Appendix 5: Statistical Performance Check– Radar Type 5 Trial Records.

Statistical Performance Check with 75% Duty Cycle – Short Pulse Radar Types 1 - 4

Test Summary:

Test Engineer:	Philip Harrison	**Test Date:**	04 October 2012
Test Sample Serial Number:	0A003EA004D1		

FCC Part:	Part 15.407(h)(2) & RSS-210 A9.3(a)
Test Method Used:	FCC 06-96 Section 7.8.4.1

Environmental Conditions:

Temperature (°C):	37.3
Relative Humidity (%):	34

The same Radars

Results: 10 MHz Radar / Type 1

Radar Type	Trial Number	Detected?	Trial Number	Detected?
1	1	Yes	16	Yes
	2	Yes	17	Yes
	3	Yes	18	Yes
	4	Yes	19	Yes
	5	Yes	20	Yes
	6	Yes	21	Yes
	7	Yes	22	Yes
	8	Yes	23	Yes
	9	Yes	24	Yes
	10	Yes	25	Yes
	11	Yes	26	Yes
	12	Yes	27	Yes
	13	Yes	28	Yes
	14	Yes	29	Yes
	15	Yes	30	Yes
	Detection level		100 %	

Statistical Performance Check with 75% Duty Cycle – Short Pulse Radar Types 1 - 4 (continued)

Results: 10 MHz / Radar Type 2

Radar Type	Trial Number	Number Pulses per Burst	Pulse Width (µs)	PRI (µs)	Detected?
2	1	1	189	24	Yes
	2	1	203	27	Yes
	3	2	162	26	Yes
	4	2	181	27	Yes
	5	2	227	28	Yes
	6	3	199	29	Yes
	7	4	167	26	Yes
	8	5	189	28	Yes
	9	5	212	23	Yes
	10	5	219	26	Yes
	11	1	173	26	Yes
	12	1	194	26	Yes
	13	1	196	23	Yes
	14	1	202	26	Yes
	15	2	194	23	Yes
	16	3	172	29	Yes
	17	3	199	25	Yes
	18	5	172	25	Yes
	19	5	176	25	Yes
	20	5	202	25	Yes
	21	1	197	29	Yes
	22	1	211	23	Yes
	23	3	163	24	Yes
	24	3	177	29	Yes
	25	3	184	24	Yes
	26	3	215	27	Yes
	27	3	230	28	Yes
	28	4	159	26	Yes
	29	4	198	29	Yes
	30	5	159	23	Yes
	Detection Level			100 %	

Statistical Performance Check with 75% Duty Cycle – Short Pulse Radar Types 1 - 4 (continued)

Results: 10 MHz / Radar Type 3

Radar Type	Trial Number	Number Pulses per Burst	Pulse Width (µs)	PRI (µs)	Detected?
3	1	6	221	16	Yes
	2	6	223	17	Yes
	3	6	231	18	Yes
	4	6	444	17	Yes
	5	7	251	16	Yes
	6	7	301	17	Yes
	7	7	423	18	Yes
	8	8	203	18	Yes
	9	9	423	16	Yes
	10	10	429	16	Yes
	11	10	323	17	Yes
	12	10	460	18	Yes
	13	7	214	17	Yes
	14	7	313	16	Yes
	15	7	414	18	Yes
	16	7	447	18	Yes
	17	8	458	16	Yes
	18	8	498	18	Yes
	19	9	403	18	Yes
	20	9	474	17	Yes
	21	10	306	16	Yes
	22	10	351	18	Yes
	23	6	282	17	Yes
	24	6	410	16	Yes
	25	6	424	17	Yes
	26	7	235	16	Yes
	27	7	260	16	Yes
	28	7	340	17	Yes
	29	8	359	18	Yes
	30	8	376	18	Yes
	Detection Level			100 %	

Statistical Performance Check with 75% Duty Cycle – Short Pulse Radar Types 1 - 4 (continued)

Results: 10 MHz / Radar Type 4

Radar Type	Trial Number	Number Pulses per Burst	Pulse Width (µs)	PRI (µs)	Detected?
4	1	11	238	16	Yes
	2	11	264	15	Yes
	3	11	407	12	Yes
	4	13	208	12	Yes
	5	13	467	13	Yes
	6	14	218	16	Yes
	7	14	418	14	Yes
	8	16	486	14	Yes
	9	17	201	15	Yes
	10	17	395	12	Yes
	11	12	313	12	No
	12	15	444	14	Yes
	13	15	493	13	No
	14	16	286	13	Yes
	15	16	473	12	Yes
	16	17	405	15	Yes
	17	18	371	14	Yes
	18	18	456	15	Yes
	19	19	469	14	Yes
	20	20	484	12	No
	21	12	357	14	Yes
	22	13	496	12	Yes
	23	14	426	15	Yes
	24	16	259	16	Yes
	25	16	301	15	Yes
	26	16	336	15	Yes
	27	19	234	16	Yes
	28	19	303	13	Yes
	29	19	388	16	Yes
	30	20	417	15	No
	Detection Level			86.7 %	

Statistical Performance Check with 75% Duty Cycle – Long Pulse Radar Type 5

Test Summary:

Test Engineer:	Philip Harrison	**Test Date:**	04 October 2012
Test Sample Serial Number:	0A003EA004D1		

FCC Part:	Part 15.407(h)(2) & RSS-210 A9.3(a)
Test Method Used:	FCC 06-96 Section 7.8.4.2

Environmental Conditions:

Temperature (°C):	37.3
Relative Humidity (%):	34

Results: 10 MHz / Radar Type 5

Radar Type	Trial Number	Detected?	Trial Number	Detected?
5	1	Yes	16	Yes
	2	Yes	17	Yes
	3	Yes	18	Yes
	4	Yes	19	Yes
	5	Yes	20	Yes
	6	Yes	21	Yes
	7	Yes	22	Yes
	8	Yes	23	Yes
	9	Yes	24	Yes
	10	Yes	25	Yes
	11	Yes	26	Yes
	12	Yes	27	Yes
	13	Yes	28	Yes
	14	Yes	29	Yes
	15	Yes	30	Yes
	Detection level		100 %	

Statistical Performance Check with 75% Duty Cycle – Frequency Hopping Radar Type 6

Test Summary:

Test Engineer:	Philip Harrison	**Test Date:**	02 October 2012
Test Sample Serial No:	0A003EA004D1		

FCC Part:	Part 15.407(h)(2) & RSS-210 A9.3(a)
Test Method Used:	FCC 06-96 Section 7.8.4.3

Environmental Conditions:

Temperature (°C):	27.3
Relative Humidity (%):	33

Results: 10 MHz / Radar Type 6

Radar Type	Trial Number	Detected?	Trial Number	Detected?
6	1	Yes	16	Yes
	2	Yes	17	Yes
	3	No	18	Yes
	4	Yes	19	Yes
	5	Yes	20	Yes
	6	Yes	21	Yes
	7	Yes	22	No
	8	Yes	23	Yes
	9	Yes	24	No
	10	Yes	25	Yes
	11	Yes	26	Yes
	12	Yes	27	Yes
	13	No	28	Yes
	14	Yes	29	Yes
	15	Yes	30	Yes
	Detection level		86.7 %	

Statistical Performance Check – Frequency Hopping Radar Type 6 (continued)

Results: 20 MHz / Radar Type 6

Radar Type	Trial Number	Detected?	Trial Number	Detected?
6	1	Yes	16	Yes
	2	Yes	17	Yes
	3	Yes	18	Yes
	4	Yes	19	Yes
	5	Yes	20	Yes
	6	Yes	21	Yes
	7	Yes	22	Yes
	8	Yes	23	Yes
	9	Yes	24	Yes
	10	Yes	25	Yes
	11	Yes	26	Yes
	12	Yes	27	Yes
	13	Yes	28	Yes
	14	Yes	29	Yes
	15	Yes	30	Yes
	Detection level		100 %	

Limits:

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