




TEST REPORT

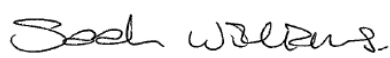
Test Report No. : UL-RPT-RP10011076JD01A

Manufacturer : Siemens AG
Model No. : SCALANCE W788-2 RJ45
FCC ID : LYHMPCIE1V1
IC Certification No. : 267AA-MPCIE1V1
Test Standard(s) : FCC Part 15.407(h)(2): Subpart E, RSS-210 A9.3 Issue 8 December 2010

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2. The results in this report apply only to the sample(s) tested.
3. The sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 1.0

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This laboratory is accredited by UKAS. The tests reported herein have been performed in accordance with its' terms of accreditation.

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1. Customer Information












Company Name:	Siemens AG
Address:	Östliche Rheinbrückenstr. 50 761687 Karlsruhe Germany

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.407
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): 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 May 2013 to 16 August 2013

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):

- Only DFS tests at the lowest EUT bandwidth (20 MHz) are required in accordance with clause 8.3(18) of FCC 06-96. Detection Bandwidth tests were performed on both 20 MHz and 40 MHz channels.
- The requirements of DFS apply for the 5250-5350 MHz and 5470-5725 MHz bands. The EUT transmits in the range 5150-5850 MHz.

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

There were no 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:	Siemens AG
Model Name or Number:	SCALANCE W788-2 RJ45
Serial Number(s):	1P 6GK5788-2FC00-0AA0
FCC ID:	LYHMPCIE1V1
Industry Canada Certification Number:	267AA-MPCIE1V1

3.2. Untested Variants

The customer has declared that the above SCALANCE W788-2 RJ45 used for testing is also a representative model for the following variants in terms of both hard ware & firmware.

They have declared that these variants only differ in terms of their hardware options (number of radio cards mounted, type of Ethernet /antenna connector, number of radio cards)

Type	Certification Name
SCALANCE W788-1 M12	RAPN-W1-M12-E3
SCALANCE W788-2 M12	RAPN-W2-M12-E3
SCALANCE W748-1 M12	RAPN-W1-M12-E3
SCALANCE W788-1 RJ45	RAPN-W1-RJ-E3
SCALANCE W788-2 RJ45	RAPN-W2-RJ-E3
SCALANCE W748-1 RJ45	RAPN-W1-RJ-E3
SCALANCE W788-2 M12 EEC	RAPN-W2-M12-E3

3.3. Description of EUT

The equipment under test was a Wi-Fi WLAN (IEEE 802.11a,n) / U-NII Access Point.

The EUT can be operated in either Master or Client mode depending on the firmware configuration. When operating in client mode the EUT does not support radar detection. It was tested in both modes.

3.4. Modifications Incorporated in the EUT

No modifications were made to the EUT during testing.

3.5. Additional Information Related to Testing

Technology Tested:	WLAN (IEEE 802.11a,n) / U-NII	
Type of Unit:	Access Point	
Data rates:	802.11a	6, 9, 12, 18, 24, 36 ,48 & 54 Mbps
	802.11n HT20	MCS0 to MCS23 (3 spatial stream)
	802.11n HT40	MCS0 to MCS23 (3 spatial stream)
Power Supply Requirement(s):	Nominal	12-24 VDC
Maximum Antenna Gains:	5 dBi	
Channel Spacing:	20 MHz	
Transmit Frequency Band:	5150 MHz to 5850 MHz (excluded 5600 MHz to 5650 MHz)	
Transmit Channels Tested:	Channel Number	Channel Frequency (MHz)
	100	5500

3.6. Support Equipment

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

Description:	Wireless Dual Band Router
Brand Name:	Netgear
Model Name or Number:	N600
FCC ID:	PY311100155
Serial Number:	2P021C7W00226

Description:	Test Laptop
Brand Name:	Dell
Model Name or Number:	Latitude D610
Serial Number:	CN-0C4708-48643-5CP-2346

Description:	Wireless Router (operating in client mode)
Brand Name:	Siemens
Model Name or Number:	W786-2
Serial Number:	6GK5786-2HC00-0AA0

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. The EUT transmitted at 54 Mbit/s data rate using 802.11a.
- The EUT was tested as a Client unit connected to a Netgear N600 DFS Master Access Point (FCC ID: PY311100155, IC: 4054A-11100155).
- The Master device set the channel bandwidth to either 20 MHz or 40 MHz. Only 20 MHz bandwidth testing was performed for most tests as this was worst-case as determined in FCC 06-96 clause 8.3(18). Additional 40 MHz bandwidth tests were performed for Detection Bandwidth, since this test relates to the current channel bandwidth.
- The EUT has three MIMO channels which normally connect to external antennas. The radar signal was applied to Port R1 A1 (Radio 1, Antenna 1) 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 20 dBm (100 mW). This was designed to simulate the use of an antenna with the minimum specified gain of +5 dBi.
- The time between EUT power up and first transmission was 86 s. Therefore the CAC was deemed to start 26 s after power up.
- The DFS detection threshold of -62 dBm was used throughout, as the maximum transmit power was <200 mW.
 - The customer declared the lowest gain of the antennas used in the product to be 5 dBi. Since the test is performed conducted, this additional gain which would normally be present in the signal is added to the radar test level.
 - The radar level to be presented at the antenna ports was calculated as:
-62 dBm +5 dBi antenna gain +1 dB to account for variations = -56.0 dBm radar level at external 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	-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.	

4.2. Configuration and Peripherals

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

- All measurements were made using a conducted link.
- A laptop PC was used to configure the EUT parameters during the testing using a standard web browser and via a terminal application. The laptop was connected to the EUT via Ethernet and serial connections to set EUT parameters.
- The EUT's serial 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.

In accordance with UKAS requirements all the measurement equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

5.2. Test Results

5.2.1. U-NII Detection Bandwidth

Test Summary:

Test Engineers:	Philip Harrison & Sandeep Bharat	Test Date:	08 May 2013
Test Sample Serial Number(s):	1P 6GK5788-2FC00-0AA0		

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):	24
Relative Humidity (%):	39

Results: 20 MHz

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

Bandwidth setting (MHz)	Measured 99% Bandwidth (MHz)
20	16.432

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.

Maximum Offsets from centre frequency as tested (MHz)	Detection attempts successful from 10 attempts at each frequency	Detection Rate (%)
±8	10	100

The detection bandwidth of 17 MHz is therefore larger than 80% of the 99% bandwidth of 16.432 MHz.

Results: 40 MHz

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

Bandwidth setting (MHz)	Measured 99% Bandwidth (MHz)
40	36.874

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 (%)
±18	10	100

The detection bandwidth of 37 MHz is therefore larger than 80% of the 99% bandwidth of 36.874 MHz.

Test Results (continued)**Limits:****Table 4: DFS Response Requirement Values**

Parameter	Value
<i>U-NII Detection Bandwidth</i>	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:	07 May 2013
Test Sample Serial Number(s):	1P 6GK5788-2FC00-0AA0		

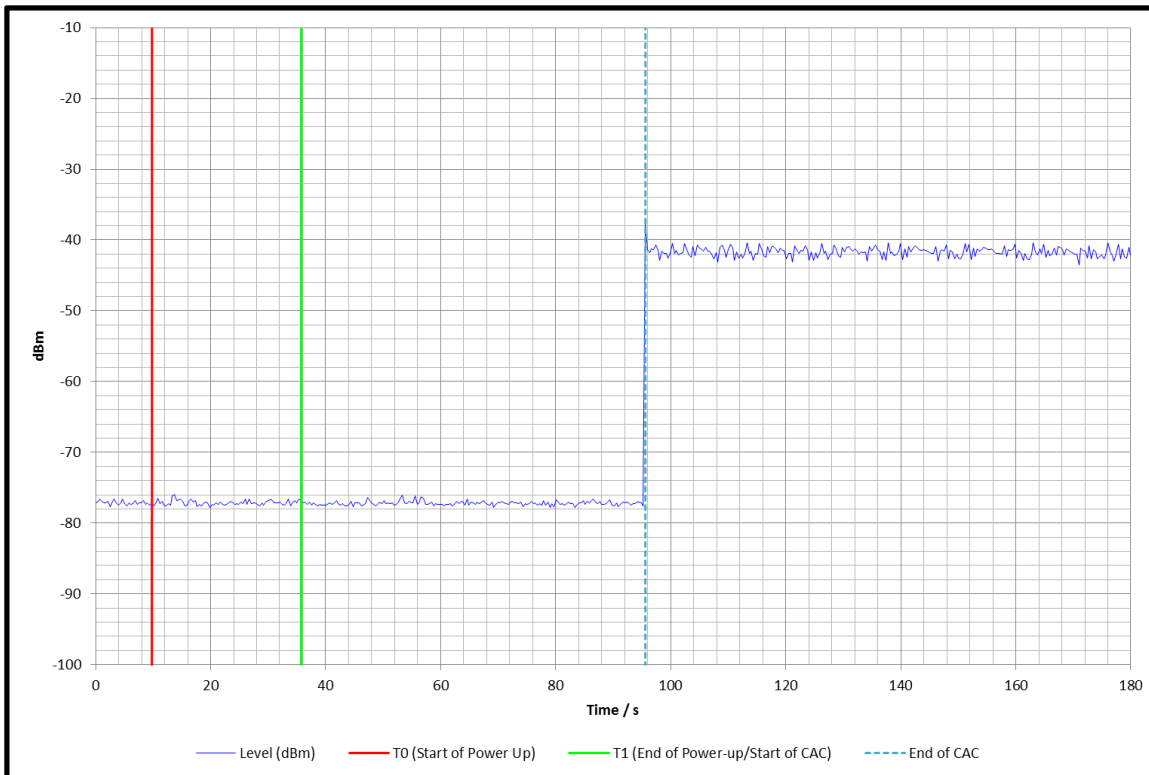
FCC Reference:	Part 15.407(h)(2)(ii)
Industry Canada Reference:	RSS-210 A9.3(b)(ii)
Test Method Used:	FCC 06-96 Section 7.8.2.1

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	33

Results: 20 MHz

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



The trace sweep was started 10 s before power on. Power up time is 26 seconds. CAC length is 60 seconds. Transmissions occurred at 96 seconds, 86 seconds after power on.

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:	07 May 2013
Test Sample Serial Number(s):	1P 6GK5788-2FC00-0AA0		

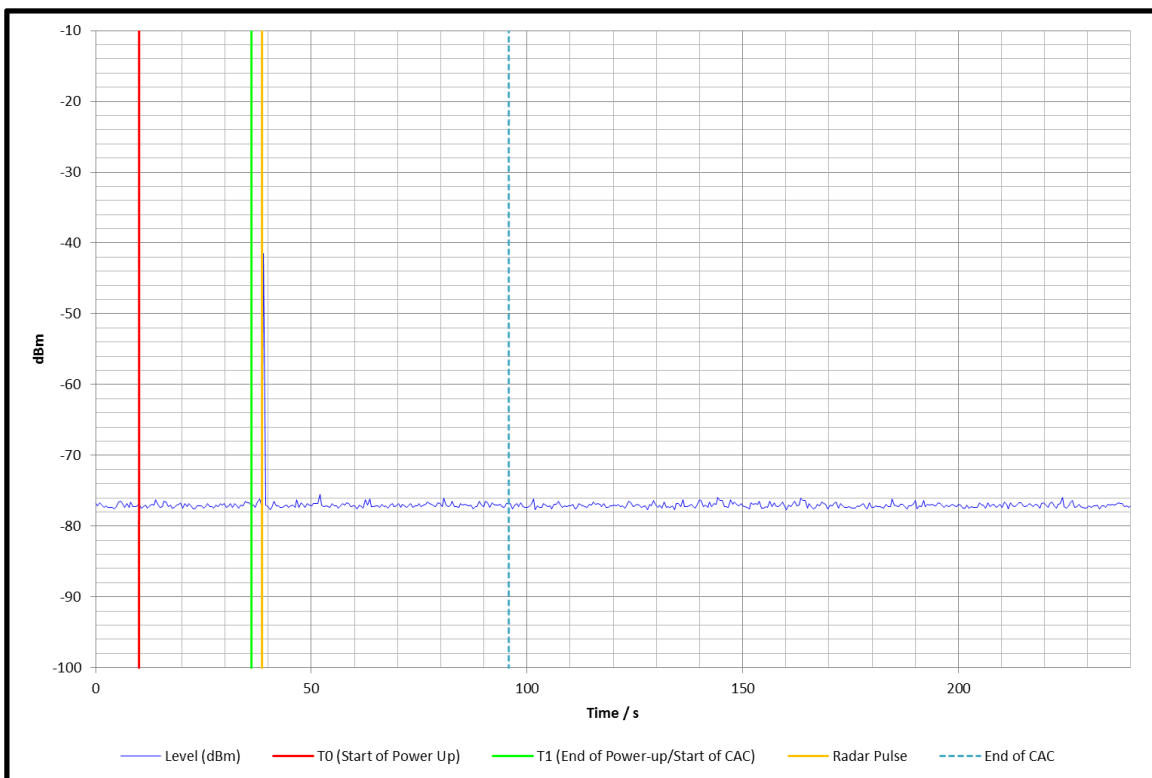
FCC Reference:	Part 15.407(h)(2)(ii)
Industry Canada Reference:	RSS-210 A9.3(b)(ii)
Test Method Used:	FCC 06-96 Section 7.8.2.2

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	33

Results: 20 MHz

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



Radar Pulse 3 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:	07 May 2013
Test Sample Serial Number(s):	1P 6GK5788-2FC00-0AA0		

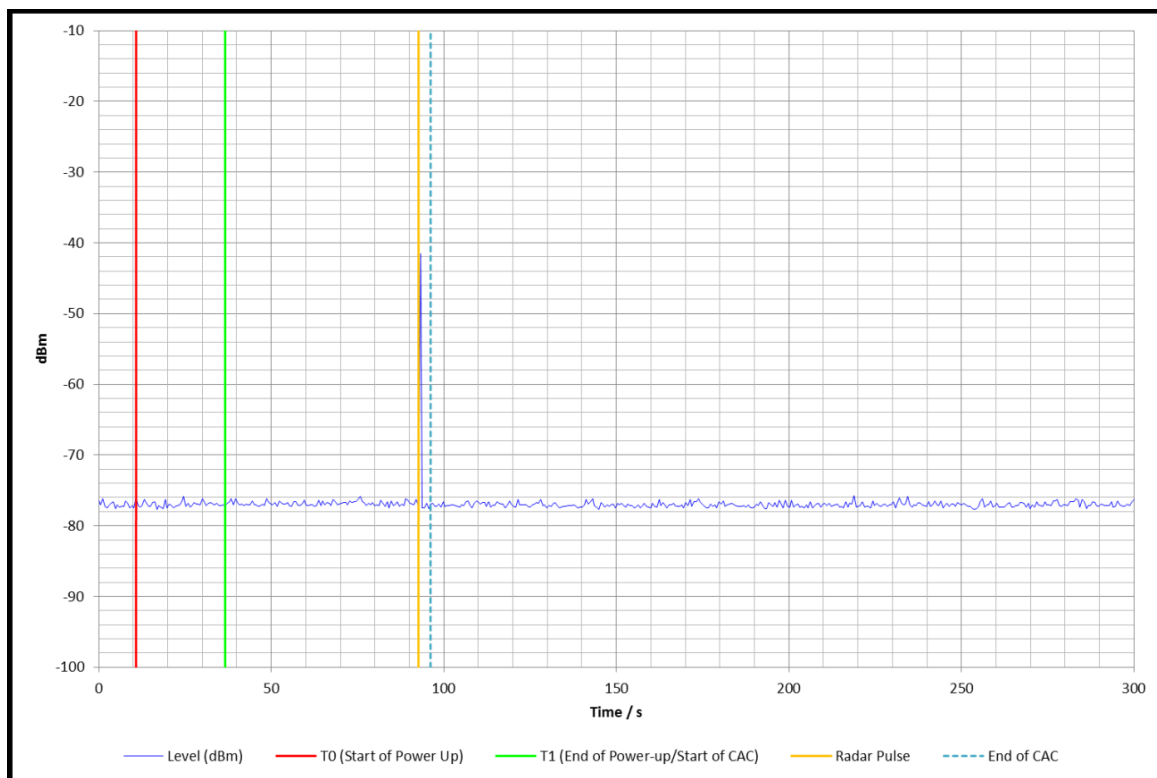
FCC Reference:	Part 15.407(h)(2)(ii)
Industry Canada Reference:	RSS-210 A9.3(b)(ii)
Test Method Used:	FCC 06-96 Section 7.8.2.3

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	33

Results: 20 MHz

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



Radar Pulse 3 s 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 Engineers:	Philip Harrison & Sandeep Bharat	Test Dates:	28 May 2013 to 16 August 2013
Test Sample Serial Number(s):	1P 6GK5788-2FC00-0AA0		

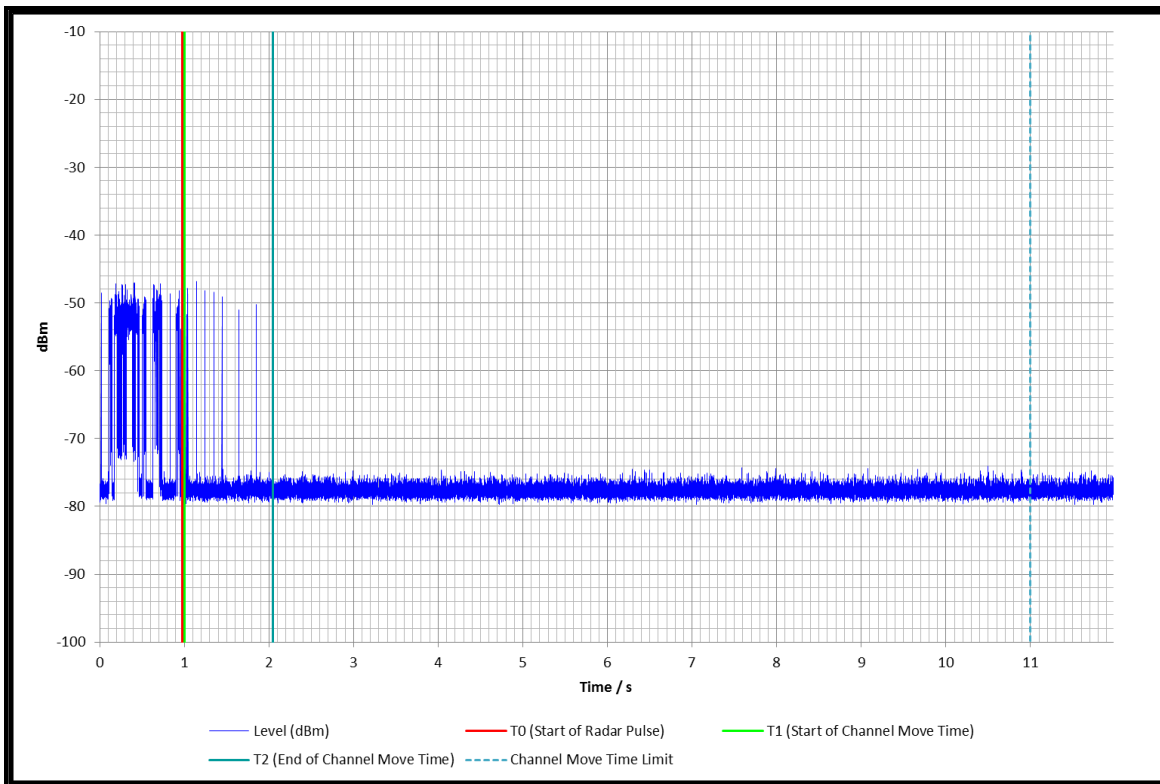
FCC Reference:	Part 15.407(h)(2)(iii)
Industry Canada Reference:	RSS-210 A9.3(b)(iii)(iv)
Test Method Used:	FCC 06-96 Section 7.8.3

Environmental Conditions:

Temperature (°C):	23 to 25
Relative Humidity (%):	33 to 42

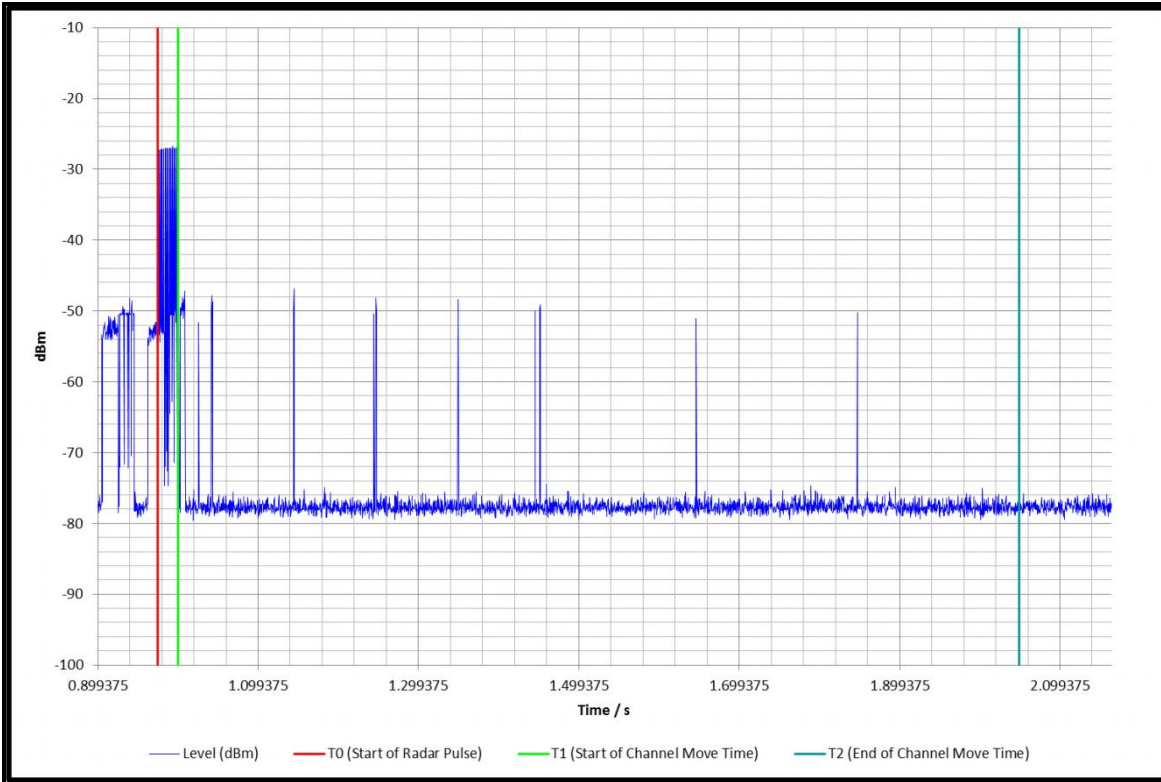
Results: 20 MHz Master

Radar burst type 1 was detected and channel move occurred.



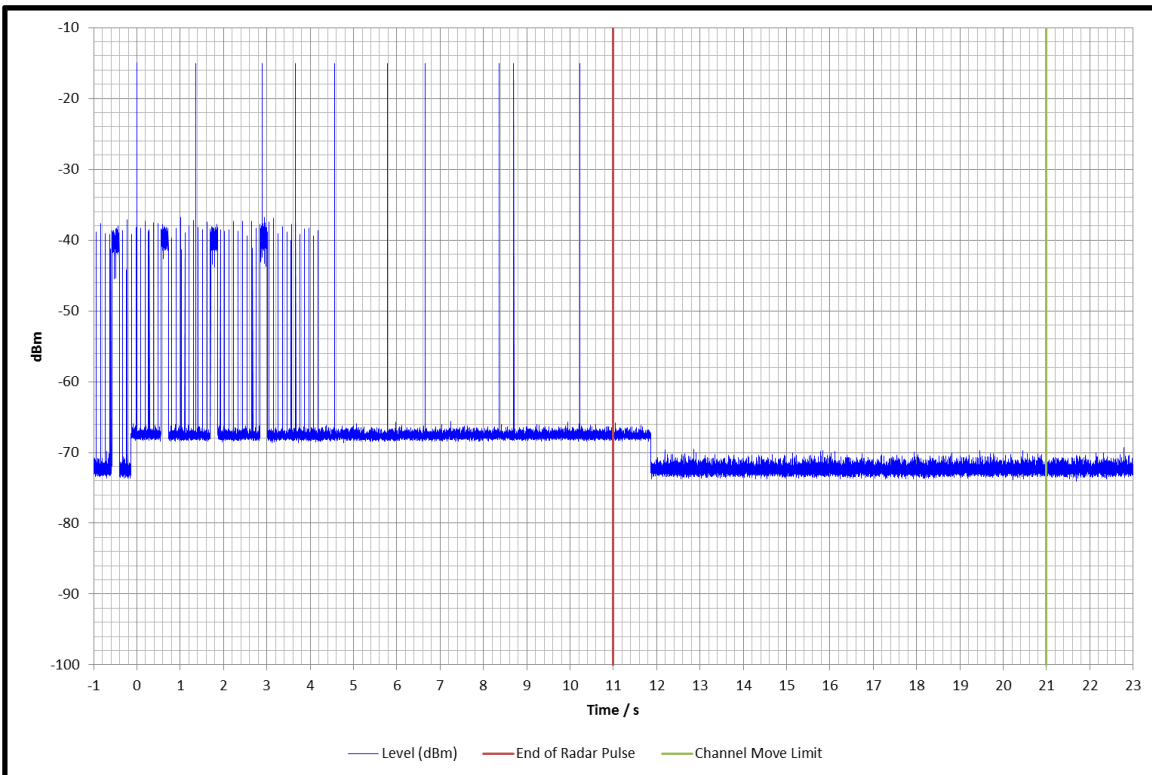
Plot Showing 10 sec Move Time Limit

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.

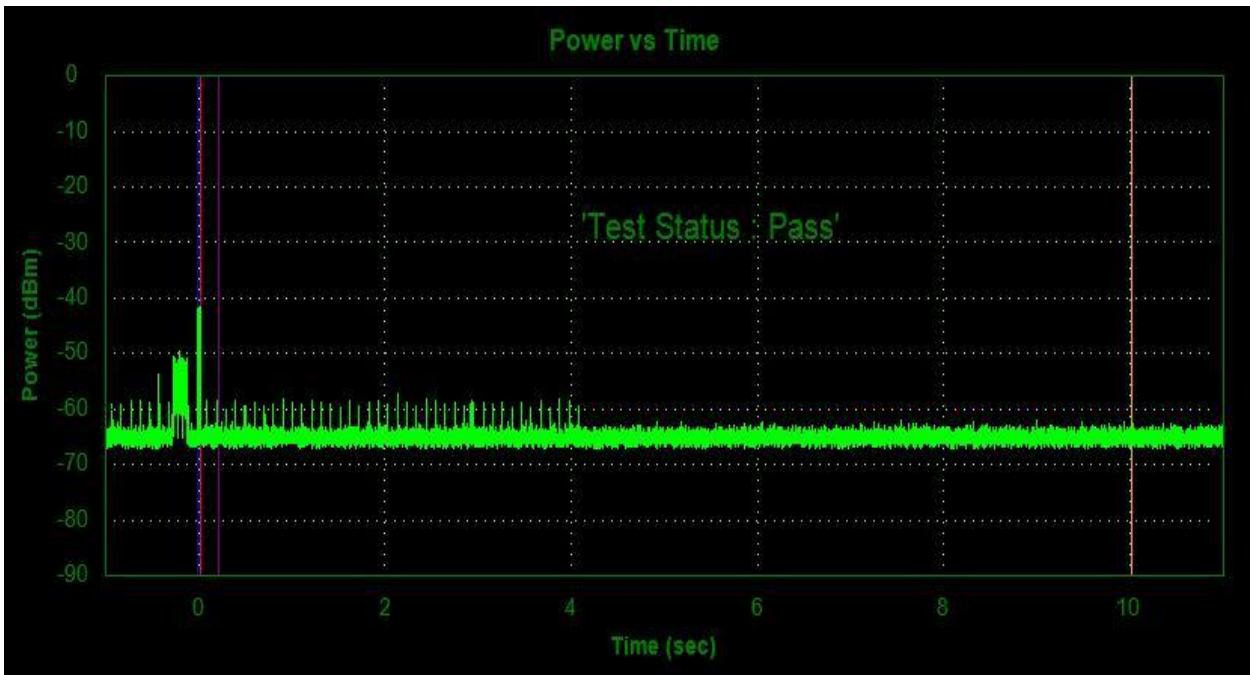


Plot Showing Type 5 Radar Pulses and Channel Shutdown

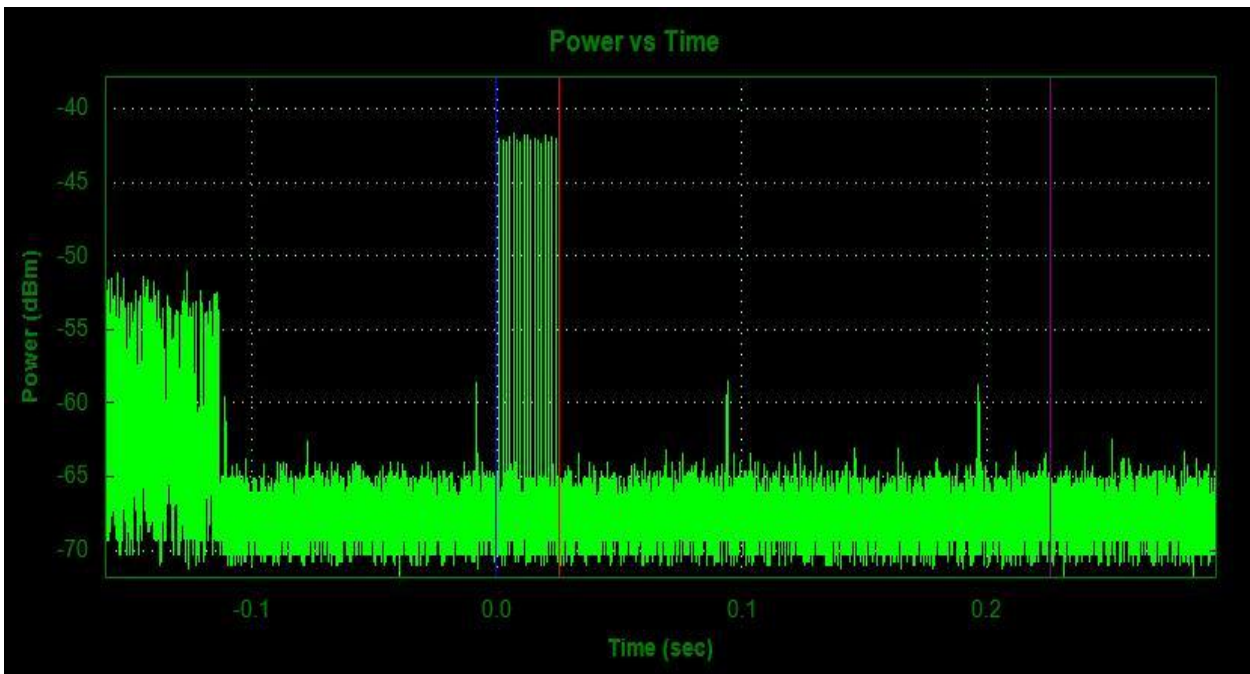
Channel Closing Transmission Time and Channel Move Time (continued)

Results: 20 MHz Client

Radar burst type 1 was detected and channel move occurred.



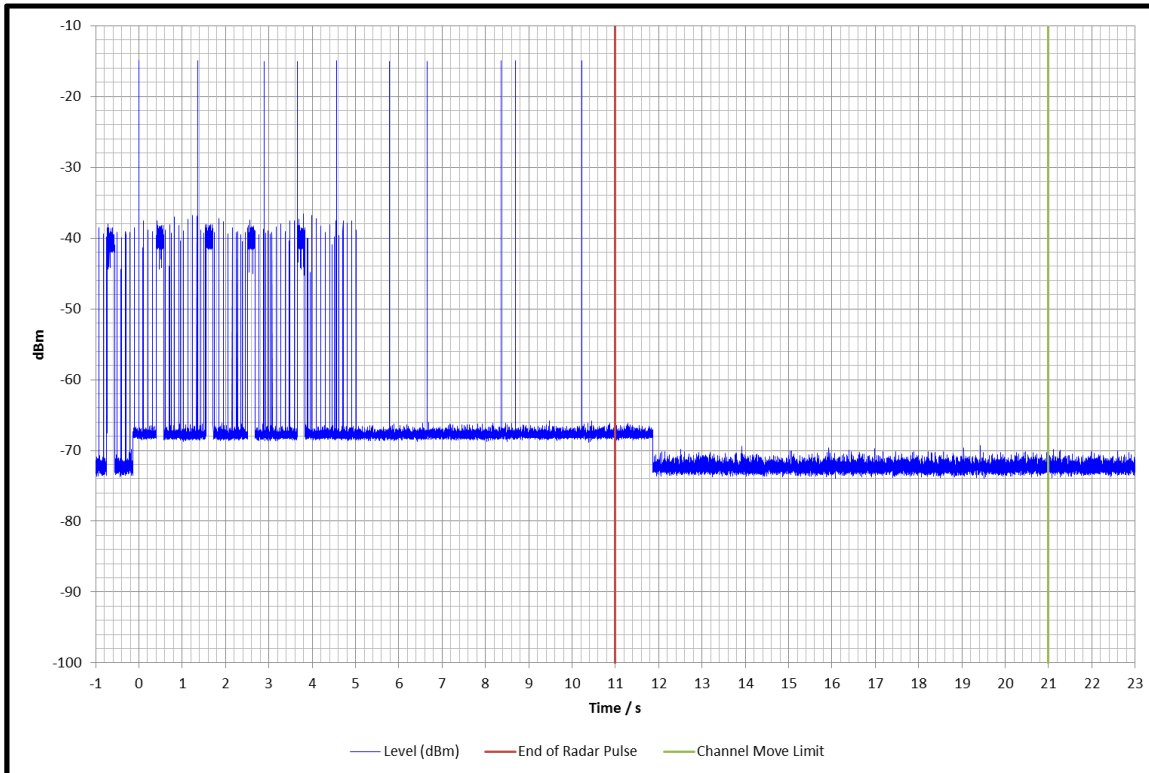
Plot Showing 10 sec Move Time Limit



Zoomed Plot Showing Radar Pulse and 200 ms Transmission

Channel Closing Transmission Time and Channel Move Time (continued)

Radar burst type 5 was detected and channel move occurred.



Plot Showing Type 5 Radar Pulses and Channel Shutdown

Limits:

Table 4: DFS Response Requirement Values

Parameter	Value
<i>Channel Move Time</i>	10 seconds See Note 1.
<i>Channel Closing Transmission Time</i>	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 Engineers:	Philip Harrison & Sandeep Bharat	Test Dates:	28 May 2013 & 07 August 2013
Test Sample Serial Number(s):	1P 6GK5788-2FC00-0AA0		

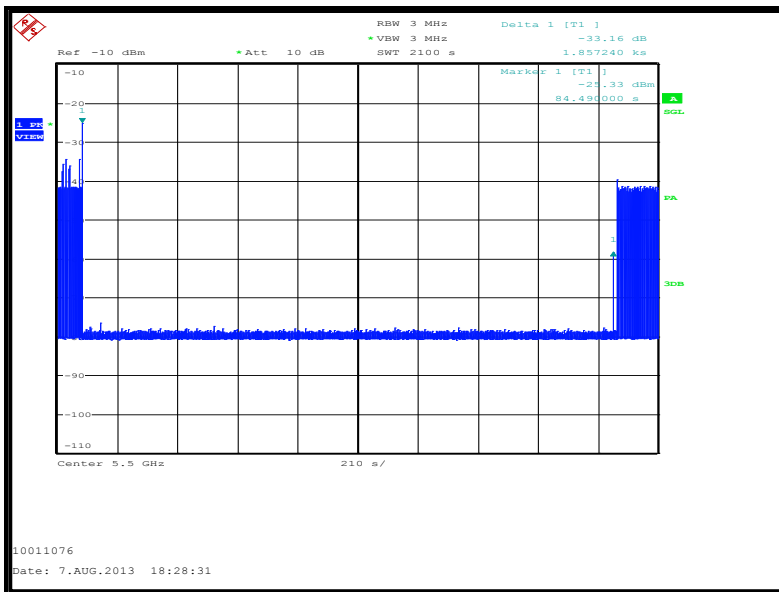
FCC Reference:	Part 15.407(h)(iv)
Industry Canada Reference:	RSS-210 A9.3(b)(v)
Test Method Used:	FCC 06-96 Section 7.8.3

Environmental Conditions:

Temperature (°C):	22 to 24
Relative Humidity (%):	32 to 45

Results: 20 MHz Master

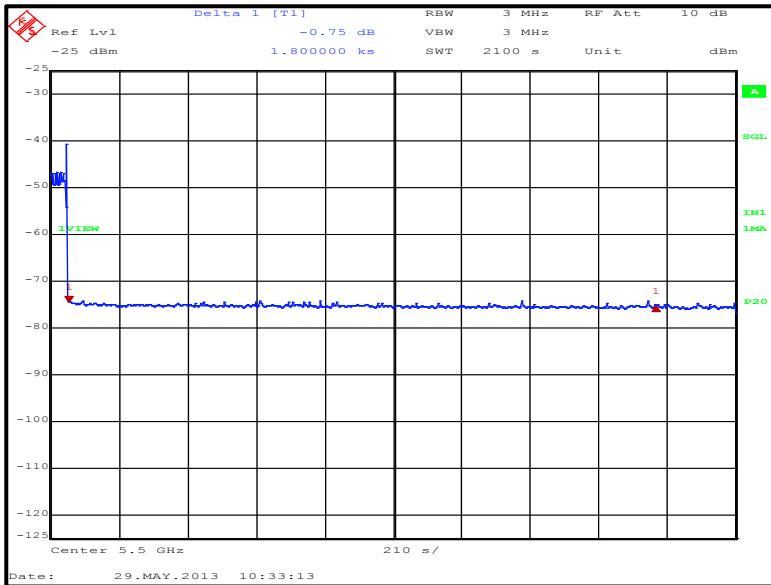
Radar burst type 1 detected and channel was vacated for >30 minutes.



Non-occupancy Period (continued)

Results: 20 MHz Client

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



Limits:

Table 4: DFS Response Requirement Values

Parameter	Value
<i>Non-occupancy period</i>	Minimum 30 minutes

5.2.7. Statistical Performance Check – Short Pulse Radar Types 1 - 4**Test Summary:**

Test Engineers:	Philip Harrison & Sandeep Bharat	Test Date:	01 May 2013
Test Sample Serial Number(s):	1P 6GK5788-2FC00-0AA0		

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):	23.6
Relative Humidity (%):	31.0

Note(s):

1. Non-detected radars marked with an asterisk indicate that the type of radar pulse was not detected the first time, but was detected with subsequent trials with the same radar parameters.

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 of Pulses per Burst	Pulse Width (μ s)	PRI (μ s)	Detected?
2	1	24	1.0	181	Yes
	2	25	1.1	202	Yes
	3	26	1.1	229	Yes
	4	25	1.2	178	No*
	5	24	1.3	197	Yes
	6	29	1.3	217	No*
	7	24	1.5	162	Yes
	8	24	1.5	219	Yes
	9	28	1.6	165	Yes
	10	24	1.6	174	Yes
	11	28	1.7	228	Yes
	12	27	2.0	190	Yes
	13	26	2.1	171	Yes
	14	29	2.3	162	Yes
	15	27	2.3	210	Yes
	16	26	2.4	204	Yes
	17	23	2.5	214	Yes
	18	28	2.5	223	Yes
	19	25	2.8	151	No*
	20	27	2.9	165	Yes
	21	29	2.9	183	Yes
	22	26	2.9	186	Yes
	23	23	2.9	212	Yes
	24	23	3.0	207	Yes
	25	28	3.2	164	Yes
	26	27	3.2	228	Yes
	27	29	3.6	159	Yes
	28	27	3.7	156	Yes
	29	28	3.7	183	Yes
	30	25	3.7	222	Yes
Detection Level				90%	

Statistical Performance Check – Short Pulse Radar Types 1 - 4 (continued)**Results: 20 MHz / Radar Type 3**

Radar Type	Trial Number	Number of Pulses per Burst	Pulse Width (µs)	PRI (µs)	Detected?
3	1	17	10.0	209	Yes
	2	17	10.0	239	Yes
	3	17	10.0	297	Yes
	4	17	6.0	229	Yes
	5	17	6.0	288	Yes
	6	16	6.0	384	Yes
	7	16	6.2	291	Yes
	8	18	6.3	444	Yes
	9	16	6.3	472	Yes
	10	18	6.5	444	Yes
	11	18	6.7	395	No*
	12	16	6.8	285	Yes
	13	18	6.8	326	Yes
	14	18	6.8	406	Yes
	15	16	7.0	368	Yes
	16	17	7.0	453	Yes
	17	16	7.0	468	Yes
	18	18	7.1	343	No*
	19	18	7.2	452	Yes
	20	17	7.3	287	Yes
	21	16	7.3	330	Yes
	22	18	7.4	369	Yes
	23	17	7.5	404	Yes
	24	16	7.5	434	Yes
	25	18	7.6	317	Yes
	26	17	7.6	485	Yes
	27	17	7.7	250	Yes
	28	18	7.9	235	Yes
	29	17	7.9	381	Yes
	30	17	8.1	237	Yes
Detection Level				93.3%	

Statistical Performance Check – Short Pulse Radar Types 1 - 4 (continued)**Results: 20 MHz / Radar Type 4**

Radar Type	Trial Number	Number of Pulses per Burst	Pulse Width (µs)	PRI (µs)	Detected?
4	1	15	11.1	211	Yes
	2	14	11.2	312	Yes
	3	13	11.2	375	Yes
	4	15	11.2	495	Yes
	5	14	11.4	461	Yes
	6	13	11.4	499	Yes
	7	13	11.5	469	Yes
	8	12	11.6	407	Yes
	9	15	11.7	356	Yes
	10	15	11.8	200	Yes
	11	14	11.8	324	Yes
	12	13	11.8	394	Yes
	13	15	12.1	281	Yes
	14	16	12.1	348	Yes
	15	16	12.2	299	Yes
	16	14	12.3	327	No*
	17	12	12.4	260	Yes
	18	16	12.4	272	Yes
	19	12	12.7	231	Yes
	20	14	12.9	480	Yes
	21	15	13.0	372	Yes
	22	15	13.3	320	Yes
	23	12	13.6	433	Yes
	24	12	13.7	251	Yes
	25	15	13.8	474	Yes
	26	14	13.8	480	Yes
	27	16	14	281	Yes
	28	12	14	435	Yes
	29	13	14.2	357	No*
	30	12	14.3	275	Yes
Detection Level				93.3%	

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 Engineers:	Philip Harrison & Sandeep Bharat	Test Date:	02 May 2013
Test Sample Serial Number(s):	1P 6GK5788-2FC00-0AA0		

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):	22
Relative Humidity (%):	32

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.

Statistical Performance Check – Long Pulse Radar Type 5 (continued)**Limits:****Table 6 – Long Pulse Radar Test Waveform**

Radar Type	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Number of Pulses per <i>Burst</i>	Number of <i>Bursts</i>	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 Engineers:	Philip Harrison & Sandeep Bharat	Test Date:	02 May 2013
Test Sample Serial Number(s):	1P 6GK5788-2FC00-0AA0		

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):	22
Relative Humidity (%):	32

Note(s):

1. Non-detected radars marked with an asterisk indicate that the type of radar pulse was not detected the first time, but was detected with subsequent trials with the same radar parameters.

Results: 20 MHz / Radar Type 6

Radar Type	Trial Number	Detected?	Trial Number	Detected?
6	1	Yes	16	No*
	2	Yes	17	Yes
	3	Yes	18	Yes
	4	Yes	19	Yes
	5	Yes	20	No*
	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			93.3 %	

Statistical Performance Check – Frequency Hopping Radar Type 6 (continued)**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	Confidence Level (%)	Calculated Uncertainty
Dynamic Frequency Selection (DFS) – Radar Amplitude	95%	± 2.17 dB
Dynamic Frequency Selection (DFS) – Radar During CAC Timing	95%	± 918 ms
Dynamic Frequency Selection (DFS) – Channel Shutdown Timing	95%	± 450 µs
Dynamic Frequency Selection (DFS) – Non-occupancy Timing	95%	± 79.25 ms

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.

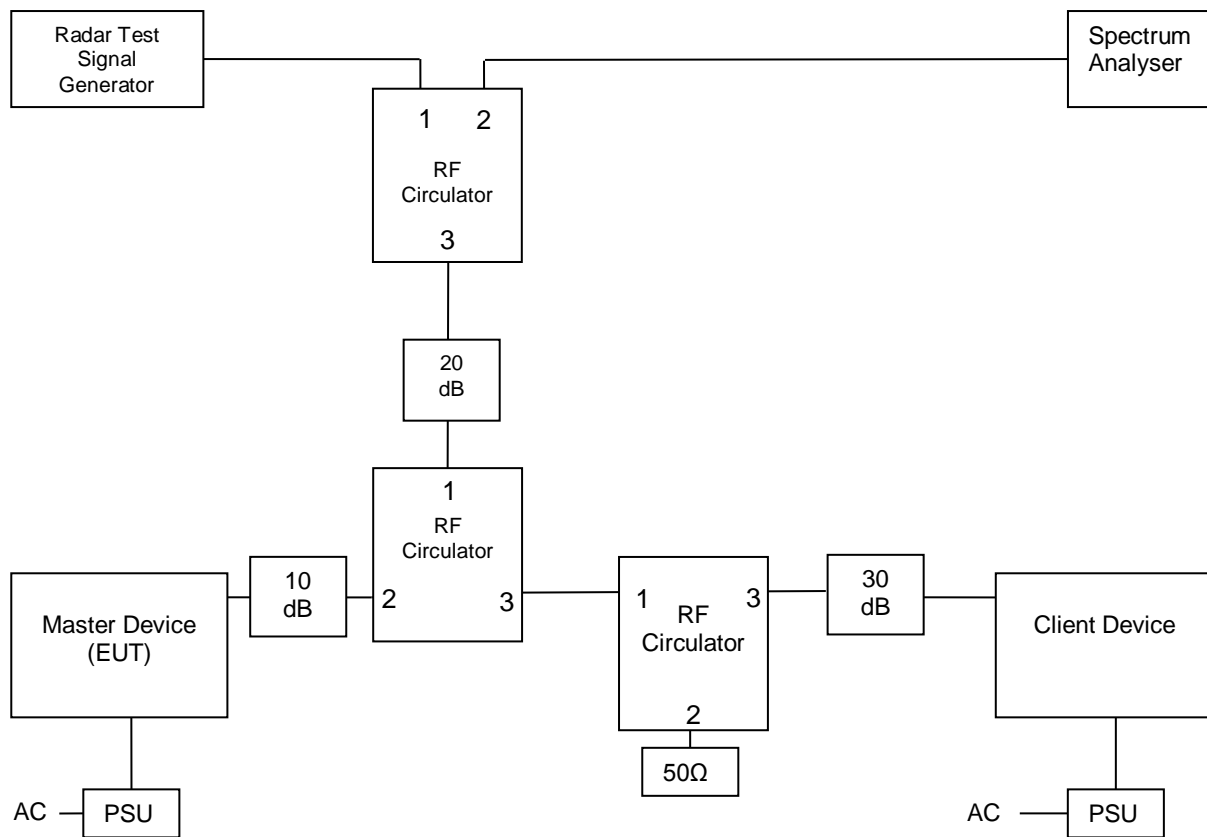
Appendix 1. Test Equipment Used

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1631	DFS Test System	Aeroflex	PXI 3000	300110/291	11 Jun 2015	24
L1076	Spectrum Analyser	Rohde & Schwarz	FSU 8	101349	29 May 2014	12
L1028	Signal Analyser	Rohde & Schwarz	FSV 30	100854	23 May 2014	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	Atlantec	ACC-20130-SF-SF-SF	120409230	Calibrated before use	-
A2182	Coaxial Circulator	Atlantec	ACC-20130-SF-SF-SF	120409231	Calibrated before use	-
A2183	Coaxial Circulator	Atlantec	ACC-20130-SF-SF-SF	120409232	Calibrated before use	-

Appendix 2. Monitoring Methods Diagrams

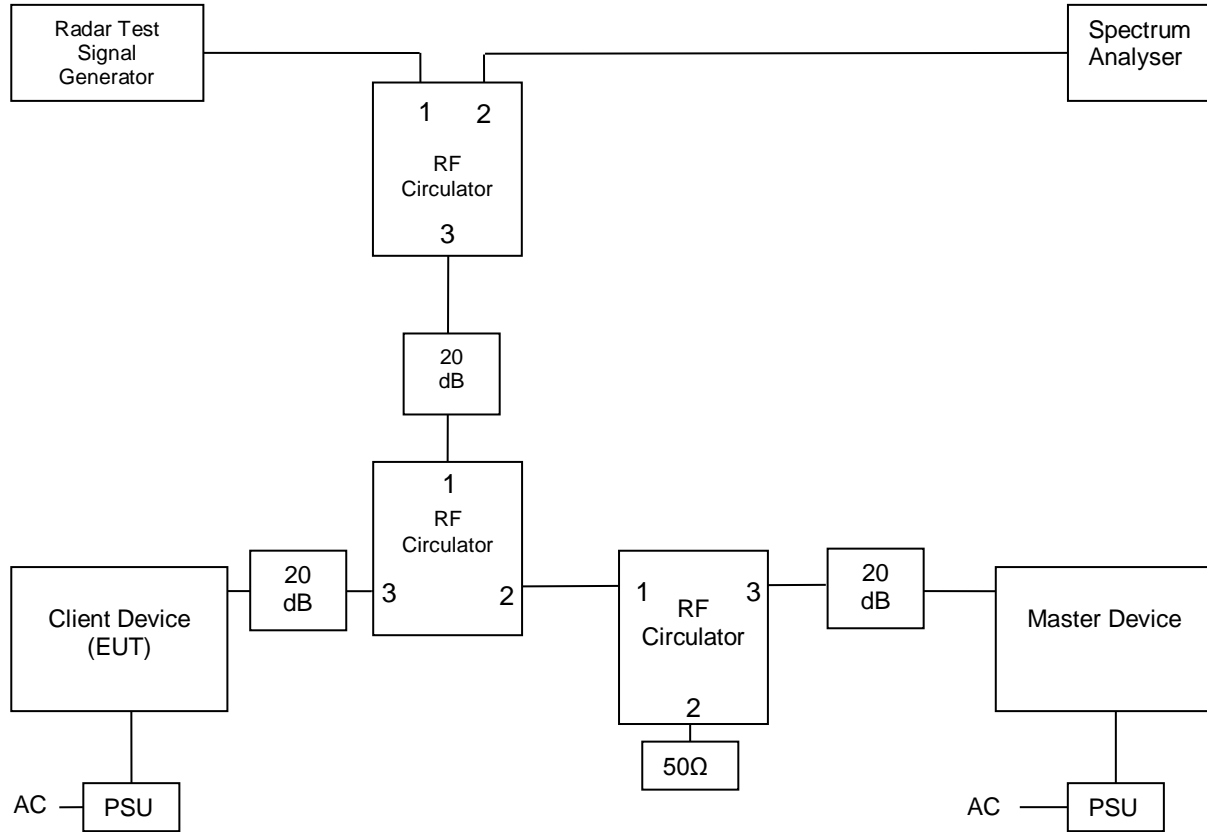
All tests were performed as conducted measurements using the setups as shown below

Setup Diagram – EUT – Master, Radar Injection at Master



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

Setup Diagram – EUT – Client, Radar Injection at Master



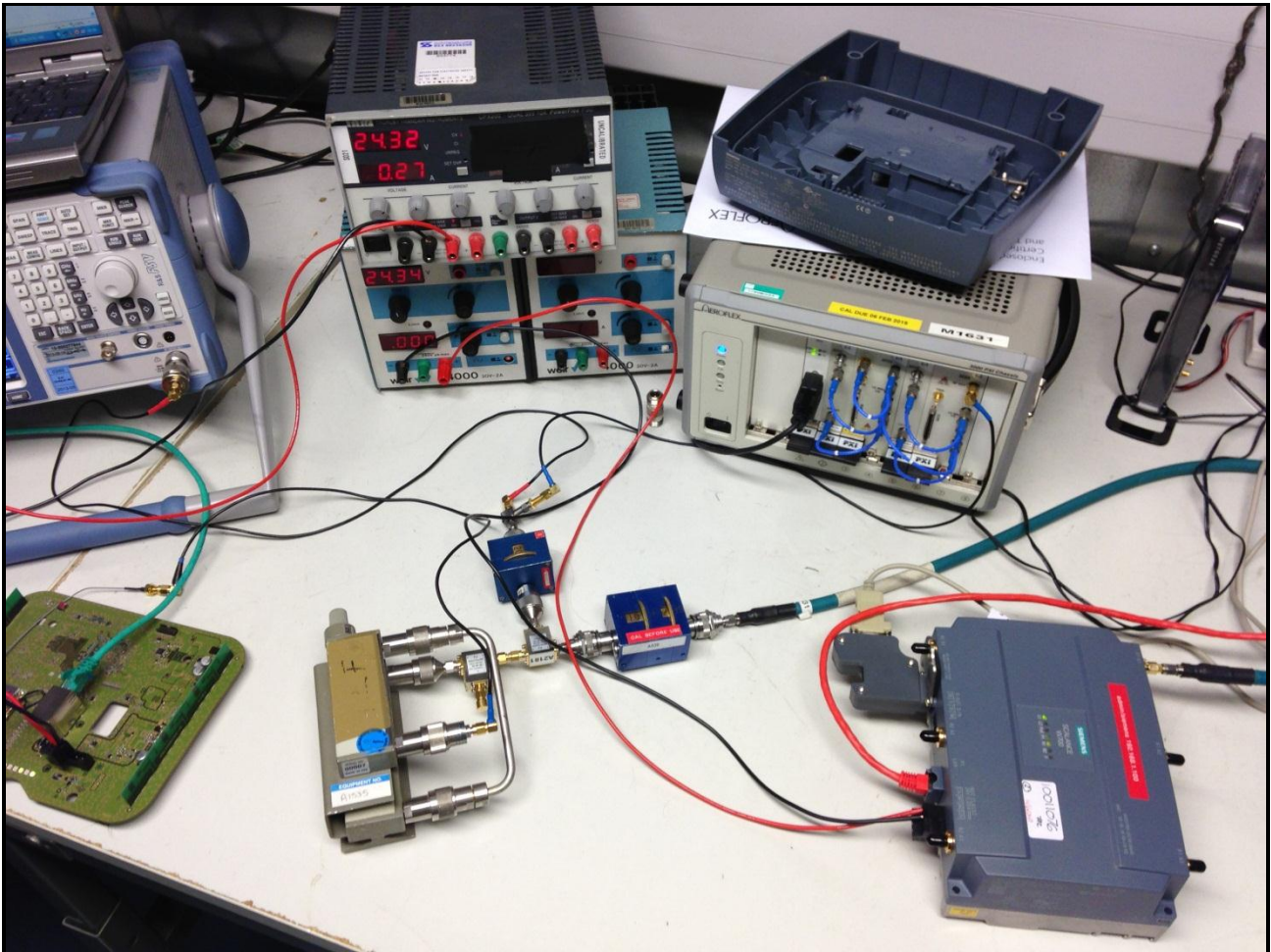
Note: The circulators have approximately 18 dB loss in the reverse direction.

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).

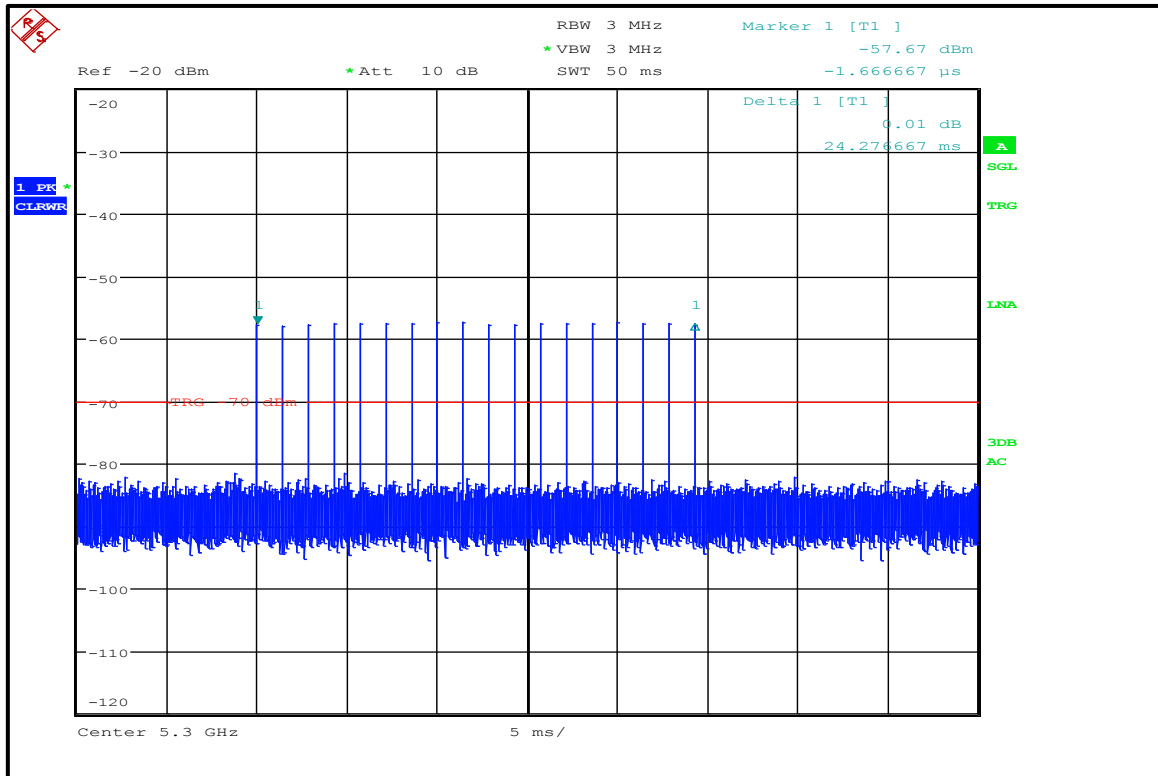
The radar amplitude was calibrated using the setup diagram above. The spectrum analyser was replaced by a 50Ω load. The EUT was replaced by a spectrum analyser. The radar pulses types 1-4 were then played back by the Aeroflex DFS test system. The amplitude was measured on the spectrum analyser using a 3 MHz RBW/VBW. The path loss was then put into the Aeroflex test system as an output level offset. The test system output level could then be set in the software to the correct level into the EUT, as calculated in section 4.1, before the tests were performed.

Setup Photographs

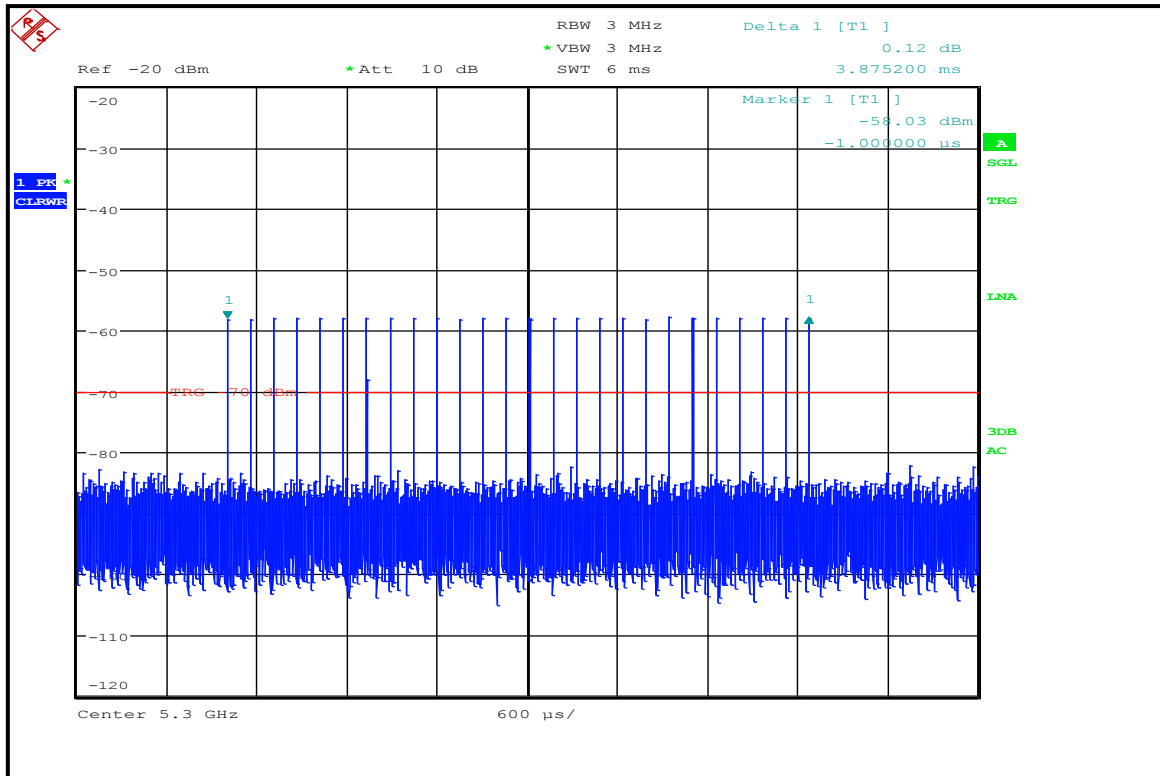


Radar Verification

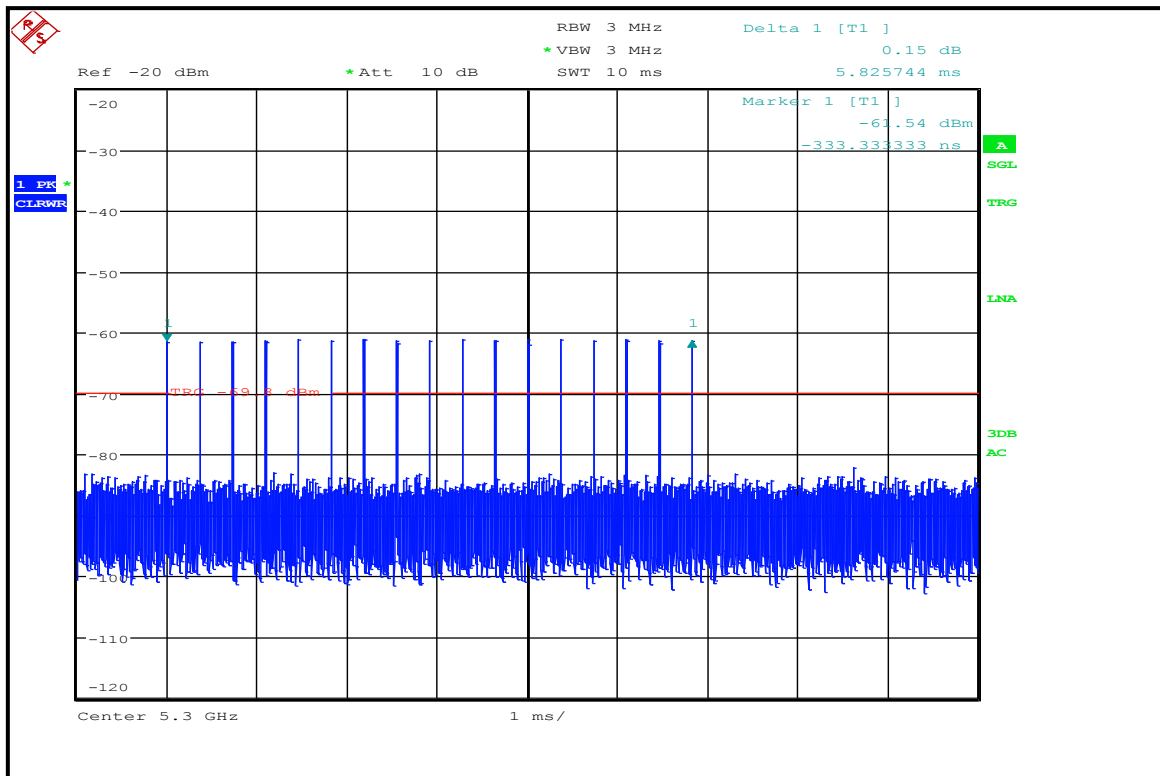
Below are sample plots of the radar waveforms showing timing properties. Once the path loss for the test network was found this was set in the DFS test system and the amplitude at the EUT receiver input could be adjusted as required.



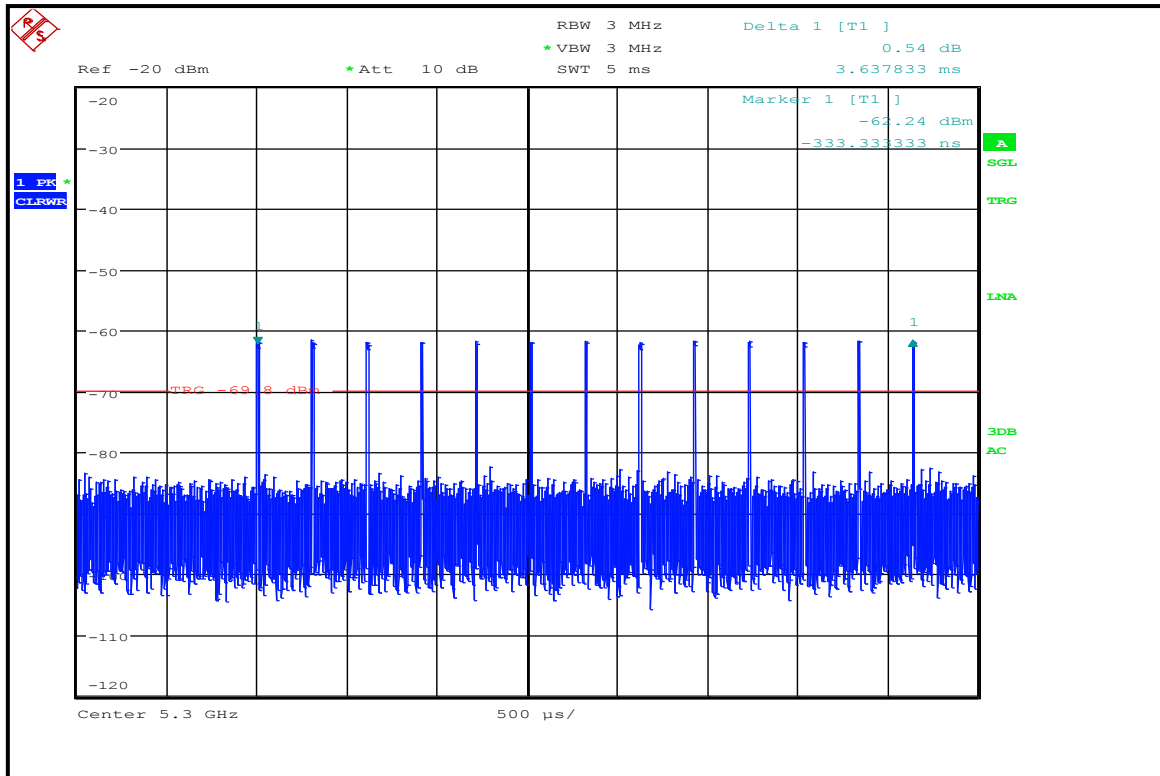
Radar Pulse 1



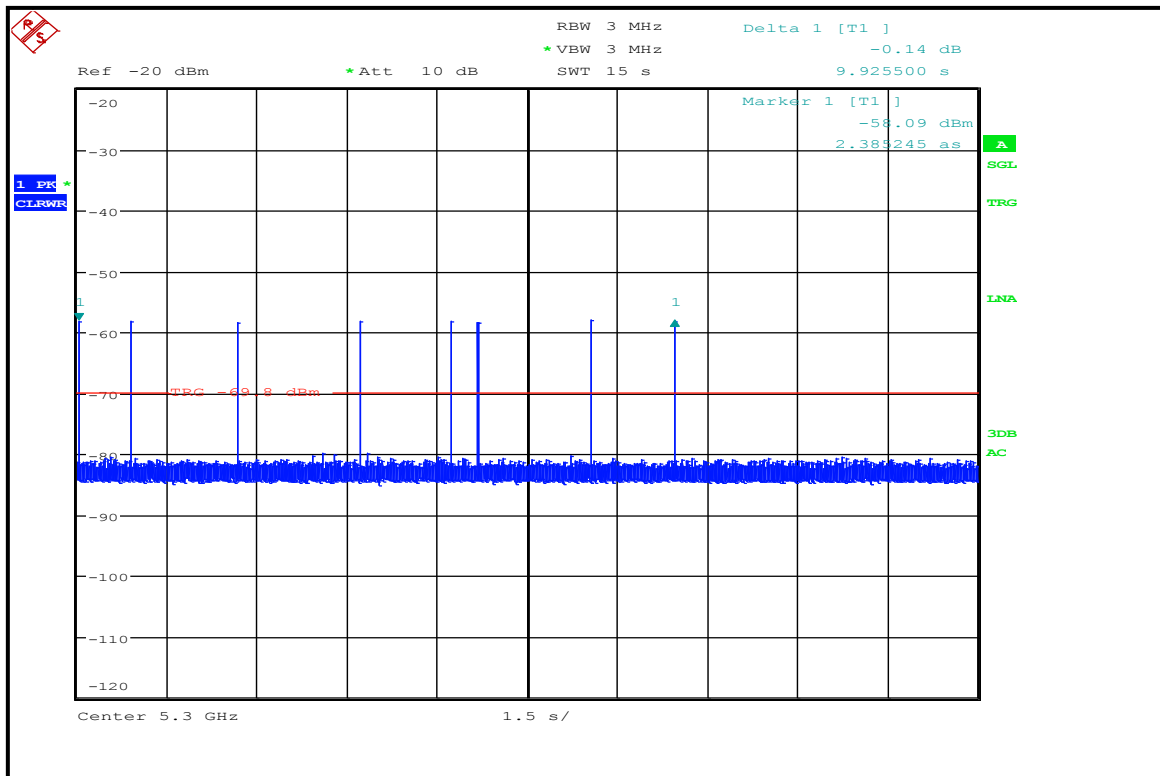
Radar Pulse 2



Radar Pulse 3



Radar Pulse 4



Long Radar Pulse 5

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

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	3	96	19	2000	1768	139439
2	2	97	11	1115	-	413869
3	3	54	14	1439	1011	847097
4	2	67	18	1069	-	530466
5	2	50	8	1548	-	336591
6	1	83	10	-	-	469521
7	3	75	18	1644	1080	246121
8	2	89	7	1452	-	866008
9	1	62	18	-	-	112711
10	1	70	15	-	-	553987
11	3	52	11	1655	1208	217953

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	3	89	8	1820	1235	313002
2	1	84	12	-	-	290204
3	1	98	10	-	-	856498
4	2	87	7	1390	-	298714
5	1	70	7	-	-	127525
6	2	96	14	1145	-	449999
7	2	77	18	1647	-	482906
8	3	65	15	1548	1367	235642
9	2	55	13	1358	-	912171
10	3	72	9	1723	1589	346131
11	1	63	19	-	-	950802

Statistical Performance Check– Radar Type 5 Trial Records (continued)**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	83	15	1909	1654	89448
2	2	65	20	1414	-	365906
3	2	77	12	1709	-	116762
4	3	58	17	1216	1849	513501
5	1	88	12	-	-	188318
6	2	92	5	1311	-	369777
7	3	79	20	1577	1984	540985
8	2	78	10	1480	-	155863
9	2	71	8	1926	-	462752
10	1	94	7	-	-	275033
11	1	58	15	-	-	12009
12	3	69	20	1439	1355	452473
13	3	62	15	1827	1868	591847
14	2	95	16	1324	-	206557
15	2	70	16	1602	-	250818
16	3	77	13	1563	1171	593144
17	3	94	12	1546	1917	579547
18	2	80	19	1019	-	131139
19	2	84	5	1791	-	375364

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	3	56	10	1154	1810	107362
2	2	89	19	1417	-	520666
3	2	70	19	1792	-	547229
4	3	66	17	1332	1322	26451
5	3	62	7	1401	1308	401069
6	3	53	14	1608	1260	202659
7	2	72	18	1789	-	118313
8	3	50	17	1998	1506	134958
9	1	76	7	-	-	415912
10	1	91	15	-	-	36807
11	1	50	20	-	-	445652
12	1	51	11	-	-	799550

Statistical Performance Check– Radar Type 5 Trial Records (continued)**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	1	93	18	-	-	1218042
2	1	59	10	-	-	477059
3	3	53	8	1987	1318	720876
4	1	59	6	-	-	67777
5	3	59	20	1661	1258	1216611
6	2	100	8	1605	-	1316346
7	3	88	16	1968	1935	1027309
8	1	85	8	-	-	1077432
9	1	90	5	-	-	484861

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	2	52	20	1473	-	652894
2	1	50	20	-	-	375939
3	2	54	10	1596	-	636295
4	2	63	5	1728	-	259936
5	1	66	12	-	-	12821
6	2	89	19	1490	-	620150
7	1	77	11	-	-	655098
8	1	76	11	-	-	367249
9	1	86	15	-	-	508526
10	3	89	7	1351	1842	299199
11	2	89	19	1538	-	228217
12	1	85	10	-	-	291433
13	3	51	13	1704	1040	546876
14	1	87	20	-	-	159516
15	1	52	6	-	-	335150
16	3	61	9	1050	1649	249313
17	2	65	15	1542	-	241697

Statistical Performance Check– Radar Type 5 Trial Records (continued)**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	50	16	1221	1327	238590
2	3	55	11	1488	1488	10778
3	2	98	13	1043	-	189881
4	1	84	11	-	-	478910
5	1	52	10	-	-	32447
6	1	52	20	-	-	875701
7	3	68	5	1361	1701	71346
8	1	51	17	-	-	899228
9	3	54	20	1043	1334	730607
10	1	71	16	-	-	808495
11	2	56	13	1866	-	965273
12	3	70	20	1387	1188	312038

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	62	16	1122	1468	778204
2	3	94	11	1012	1424	270425
3	3	65	13	1266	1723	700467
4	3	80	10	1164	1382	676086
5	3	57	11	1840	1674	227067
6	2	79	14	1727	-	101292
7	3	65	8	1265	1631	569078
8	3	70	12	1698	1316	136590
9	3	67	7	1221	1802	523036
10	3	94	18	1857	1181	357123

Statistical Performance Check– Radar Type 5 Trial Records (continued)**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	3	90	7	1849	1692	516351
2	1	63	15	-	-	217139
3	2	74	19	1091	-	295537
4	1	78	13	-	-	358594
5	2	100	19	1239	-	187511
6	3	50	14	1734	1907	640087
7	2	75	9	1417	-	437210
8	1	60	15	-	-	391705
9	3	67	15	1068	1855	377506
10	2	59	14	1914	-	408946
11	2	83	14	1575	-	502068
12	3	77	19	1058	1690	81612
13	2	68	16	1939	-	640604
14	1	74	12	-	-	186834
15	3	94	20	1595	1245	248877
16	3	69	16	1415	1812	17713
17	3	66	9	1707	1911	488654

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	2	80	10	1618	-	609483
2	3	88	9	1324	1917	440377
3	1	85	6	-	-	457881
4	2	88	16	1001	-	232714
5	2	58	7	1149	-	453437
6	3	54	17	1038	1467	162538
7	3	76	17	1832	1658	463838
8	1	55	17	-	-	348700
9	1	75	12	-	-	72011
10	1	55	19	-	-	121086
11	3	76	5	1909	1366	242636
12	2	72	7	1974	-	695098
13	3	100	8	1857	1686	440251
14	2	97	9	1991	-	653959
15	2	79	8	1837	-	197462
16	2	85	5	1395	-	543303
17	1	80	9	-	-	666108

Statistical Performance Check– Radar Type 5 Trial Records (continued)**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	1	57	11	-	-	422038
2	1	74	9	-	-	143585
3	1	75	18	-	-	769969
4	3	74	14	1184	1609	216635
5	3	51	11	1705	1530	77683
6	3	88	7	1579	1216	618673
7	2	97	19	1472	-	642091
8	2	74	20	1775	-	538885
9	1	73	6	-	-	391943
10	2	50	19	1573	-	962665

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	71	12	1913	-	620695
2	2	81	10	1533	-	374648
3	2	86	19	1575	-	95967
4	3	87	9	1940	1081	556193
5	3	70	10	1827	1974	471228
6	1	81	17	-	-	665267
7	2	89	15	1937	-	778091
8	2	50	16	1149	-	715158
9	1	70	9	-	-	83093
10	2	78	13	1206	-	425600
11	1	80	15	-	-	577764
12	3	96	5	1139	1085	641705
13	3	71	16	1734	1638	625052
14	3	64	15	1145	1468	580639
15	2	90	7	1584	-	208331

Statistical Performance Check– Radar Type 5 Trial Records (continued)**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	66	11	-	-	72023
2	3	54	13	1226	1928	70446
3	3	51	20	1299	1915	1183213
4	2	74	10	1674	-	889573
5	1	78	9	-	-	1200125
6	1	53	13	-	-	1319364
7	3	77	9	1651	1908	1178669
8	3	69	16	1416	1654	298483
9	2	93	19	1535	-	815721

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	91	16	-	-	522691
2	3	61	14	1432	1934	924848
3	1	57	19	-	-	33320
4	3	62	6	1516	1434	448528
5	1	71	7	-	-	598975
6	2	53	16	1450	-	308259
7	2	84	16	1287	-	1058742
8	3	88	9	1408	1834	105918
9	1	74	20	-	-	1176044
10	1	79	12	-	-	751219

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	89	10	-	-	109954
2	1	56	17	-	-	711949
3	1	91	15	-	-	548643
4	1	58	12	-	-	103321
5	2	94	5	1132	-	216167
6	3	84	15	1346	1311	634505
7	2	59	8	1026	-	638201
8	1	58	6	-	-	751547
9	1	83	5	-	-	833772
10	1	54	5	-	-	639133
11	1	79	19	-	-	328259

Statistical Performance Check– Radar Type 5 Trial Records (continued)**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	3	94	16	1429	1494	67739
2	1	54	15	-	-	647139
3	3	77	9	1471	1989	678524
4	1	71	20	-	-	78319
5	3	89	16	1817	1287	847633
6	1	97	6	-	-	416324
7	3	69	9	1980	1296	305472
8	1	57	14	-	-	79560
9	3	80	15	1894	1122	195135
10	3	81	5	1791	1146	145374
11	3	60	16	1103	1149	772608
12	1	75	20	-	-	226602
13	1	60	20	-	-	465286
14	1	66	7	-	-	540217

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	3	91	18	1208	1190	128641
2	3	85	5	1150	1479	757509
3	1	67	14	-	-	361456
4	1	64	8	-	-	179085
5	2	50	6	1116	-	529637
6	2	72	19	1580	-	834000
7	2	72	11	1302	-	215609
8	2	54	5	1507	-	815579
9	1	60	6	-	-	300753
10	2	69	16	1857	-	346237
11	1	59	5	-	-	843065
12	2	54	19	1730	-	646283
13	2	80	16	1940	-	97233
14	1	81	5	-	-	400955

Statistical Performance Check– Radar Type 5 Trial Records (continued)**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	1	62	10	-	-	42816
2	3	62	19	1192	1932	442425
3	2	62	19	1578	-	295466
4	2	90	12	1465	-	596898
5	1	68	14	-	-	200851
6	2	96	8	1371	-	57760
7	3	86	12	1910	1709	458711
8	1	90	6	-	-	157264
9	3	76	19	1948	1988	81879
10	2	86	7	1445	-	391860
11	1	56	14	-	-	282131
12	3	86	14	1997	1660	519170
13	1	76	6	-	-	559804
14	1	57	10	-	-	102837
15	3	66	15	1685	1226	429743
16	2	66	11	1631	-	118075
17	1	59	6	-	-	555536
18	2	86	14	1903	-	262826
19	3	52	13	1794	1450	233378
20	3	100	17	1014	1972	589145

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	3	63	5	1000	1720	809310
2	2	77	19	1748	-	8083
3	1	66	9	-	-	503649
4	2	92	11	1336	-	404189
5	2	65	16	1439	-	1255026
6	1	88	11	-	-	67896
7	2	61	19	1288	-	1005469
8	2	72	9	1222	-	41354
9	2	67	16	1672	-	607667

Statistical Performance Check– Radar Type 5 Trial Records (continued)**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	2	91	13	1922	-	145969
2	3	98	15	1393	1743	241560
3	2	80	5	1657	-	568409
4	1	75	9	-	-	346639
5	1	93	14	-	-	594484
6	3	60	14	1347	1696	637235
7	2	82	9	1597	-	335488
8	1	62	12	-	-	554134
9	3	64	8	1895	1011	7540
10	3	85	7	1374	1785	214851
11	1	70	19	-	-	480927
12	2	61	14	1988	-	10243
13	1	80	20	-	-	288410
14	1	86	8	-	-	663817
15	2	70	14	1519	-	442670
16	2	62	19	1956	-	371331
17	3	50	13	1449	1973	603857
18	2	72	8	1347	-	582159

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	1	82	13	-	-	515216
2	3	84	8	1462	1926	180558
3	3	86	14	1977	1179	505553
4	2	99	16	1804	-	398102
5	3	87	20	1515	1715	393648
6	1	90	15	-	-	301038
7	3	56	15	1374	1969	4209
8	3	87	13	1700	1493	397890
9	2	66	17	1839	-	627298
10	3	92	18	1281	1651	44675
11	1	67	19	-	-	336623
12	1	99	5	-	-	90097
13	2	63	17	1805	-	369797
14	3	80	8	1798	1709	140665
15	1	55	7	-	-	26636
16	1	83	16	-	-	553567
17	2	67	20	1781	-	122918
18	1	52	10	-	-	15948
19	1	74	13	-	-	486711

Statistical Performance Check– Radar Type 5 Trial Records (continued)**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	2	92	10	1782	-	437341
2	1	94	11	-	-	445208
3	1	58	5	-	-	440324
4	3	57	9	1767	1870	493500
5	1	71	17	-	-	601252
6	2	81	14	1538	-	531271
7	2	57	10	1159	-	387994
8	2	77	9	1680	-	304941
9	1	76	5	-	-	203066
10	3	97	14	1137	1722	70863
11	1	86	9	-	-	517262
12	3	84	6	1759	1126	744521
13	1	98	15	-	-	209219
14	3	68	16	1006	1604	753553

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	3	81	11	1719	1060	76197
2	1	99	17	-	-	808615
3	2	93	12	1414	-	791270
4	3	86	8	1777	1550	725712
5	1	91	8	-	-	193412
6	3	89	11	1454	1221	559920
7	2	92	15	1372	-	84987
8	3	95	19	1594	1896	721124
9	2	100	16	1094	-	195994
10	3	98	13	1989	1817	760225
11	1	82	15	-	-	755755
12	1	75	8	-	-	291208
13	3	76	13	1267	1945	7112

Statistical Performance Check– Radar Type 5 Trial Records (continued)**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	1	89	20	-	-	557258
2	1	59	15	-	-	3218
3	3	91	13	1115	1638	622084
4	2	97	8	1792	-	469526
5	2	51	16	1273	-	441810
6	2	85	9	1130	-	176211
7	3	87	16	1086	1422	523397
8	1	77	7	-	-	358588
9	2	84	14	1819	-	4414
10	3	70	14	1378	1301	386110
11	1	74	8	-	-	333573
12	3	66	12	1305	1460	385231
13	3	76	16	1024	1084	502868
14	1	60	7	-	-	182098
15	2	54	9	1062	-	551416
16	2	96	9	1945	-	652535
17	1	95	18	-	-	455367
18	2	62	13	1586	-	442425

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	3	62	16	1958	1739	132554
2	3	90	19	1963	1365	305544
3	1	51	8	-	-	201452
4	1	58	15	-	-	297531
5	2	61	10	1478	-	389385
6	1	85	5	-	-	457798
7	3	62	12	1550	1679	491341
8	1	69	9	-	-	277171
9	3	76	6	1344	1983	526258
10	3	84	17	1492	1255	24843
11	1	96	10	-	-	49068
12	2	94	8	1502	-	627840
13	2	92	9	1090	-	609280
14	3	91	13	1453	1042	722965

Statistical Performance Check– Radar Type 5 Trial Records (continued)**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	3	100	18	1303	1882	225235
2	3	85	10	1894	1565	166517
3	3	96	13	1232	1621	62169
4	1	58	17	-	-	353645
5	1	85	18	-	-	152202
6	1	85	20	-	-	72215
7	2	72	11	1102	-	286852
8	3	75	17	1589	1504	210204
9	3	70	14	1263	1982	171459
10	3	70	14	1930	1348	462470
11	3	56	9	1787	1126	271067
12	2	55	7	1728	-	127855
13	2	55	18	1701	-	263271
14	2	87	18	1515	-	456376
15	3	99	8	1646	1433	517734
16	3	74	9	1384	1191	596677
17	3	87	20	1216	1129	220576
18	1	99	11	-	-	110358
19	1	59	5	-	-	89216
20	1	79	10	-	-	469953

Statistical Performance Check– Radar Type 5 Trial Records (continued)**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	1	92	5	-	-	565706
2	1	53	7	-	-	462161
3	2	83	15	1871	-	228965
4	1	77	12	-	-	88753
5	3	61	12	1367	1568	367644
6	2	82	19	1003	-	415778
7	1	88	11	-	-	83667
8	2	77	7	1165	-	440559
9	3	91	7	1989	1676	472854
10	1	89	10	-	-	494477
11	1	74	16	-	-	651747
12	3	56	9	1472	1494	185576
13	2	60	9	1069	-	343377
14	2	92	9	1503	-	236573
15	3	95	11	1778	1244	608929
16	1	75	16	-	-	569297
17	1	80	10	-	-	100520
18	3	57	14	1779	1525	660919

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	1	82	19	-	-	18031
2	3	78	6	1473	1267	1058240
3	1	63	20	-	-	1130065
4	1	54	19	-	-	879946
5	3	52	17	1781	1640	29133
6	1	95	6	-	-	275050
7	2	92	5	1757	-	606954
8	1	87	9	-	-	595127
9	3	78	10	1005	1020	508311
10	3	62	10	1367	1209	682434

Statistical Performance Check– Radar Type 5 Trial Records (continued)**20 MHz – Trial 29**

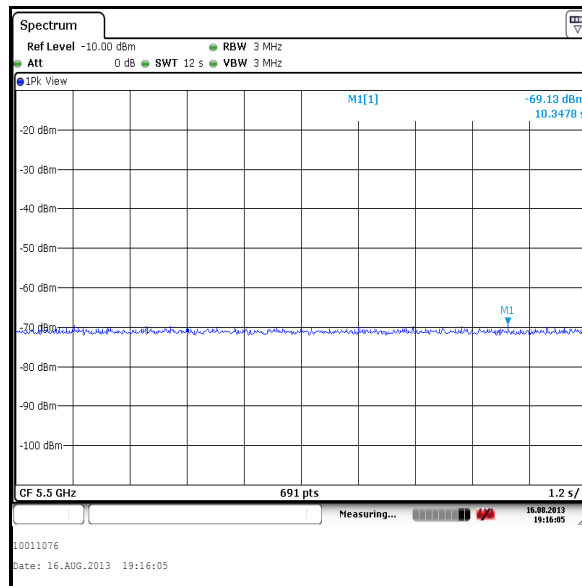
Burst Segment	Number of Pulses	Pulse Width (usec)	Chirp Width (MHz)	Pulse 1-to-2 Spacing (usec)	Pulse 2-to-3 Spacing (usec)	Starting Location Within Interval (usec)
1	2	52	14	1948	-	608708
2	1	100	18	-	-	1446839
3	3	72	18	1108	1433	1248381
4	1	88	18	-	-	321161
5	1	80	7	-	-	251426
6	2	52	17	1356	-	1004477
7	3	86	13	1902	1659	457470
8	1	50	7	-	-	838278

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	2	63	15	1799	-	543413
2	3	58	19	1991	1136	688214
3	2	78	20	1558	-	326116
4	2	94	5	1905	-	436201
5	3	66	6	1245	1276	379129
6	1	90	8	-	-	585358
7	1	60	6	-	-	549211
8	3	99	10	1396	1647	619559
9	3	68	13	1806	1146	679020
10	3	55	18	1712	1126	105264
11	2	55	13	1940	-	393198
12	2	75	11	1976	-	77818
13	3	65	19	1372	1471	152373
14	3	75	6	1483	1372	16149
15	3	79	17	1270	1098	217845
16	2	54	20	1533	-	495195

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