TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: F@st 3965CV Managed Home Router

FCC ID: VW3FAST3965CV

To: FCC Part 15.407(h)(2)

Test Report Serial No.:
RFI-RPT-RP89496JD02C

This Test Report Is Issued Under The Authority Of John Newell, Group Quality Manager: 	
Checked By:	Sarah Williams
Signature: 	
Date of Issue:	17 October 2012

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1. Customer Information

Company Name:	Sagemcom SAS
Address:	250 RTE De L`Empereur 92500 Rueil Malmaison France

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
Site Registration:	FCC: 209735
Test Dates:	21 September 2012 to 12 October 2012

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.407(h)(2)	U-NII Detection Bandwidth	✓
Part 15.407(h)(2)(ii)	Initial Channel Availability Check Time	✓
Part 15.407(h)(2)(ii)	Radar Burst at the Beginning of the Channel Availability Check Time	✓
Part 15.407(h)(2)(ii)	Radar Burst at the End of the Channel Availability Check Time	✓
Part 15.407(h)(2)(iii)	Channel Closing Transmission Time and Channel Move Time	✓
Part 15.407(h)(2)(iv)	Non-occupancy Period	✓
Part 15.407(h)(2)	Statistical Performance Check – Short Pulse Radar Types 1-4	✓
Part 15.407(h)(2)	Statistical Performance Check – Long Pulse Radar Type 5	✓
Part 15.407(h)(2)	Statistical Performance Check – Frequency Hopping Radar Type 6	✓
Key to Results ✓ = Complied ✗ = Did not comply		

Note(s):

1. The results of the testing of the non-DFS requirements of Part 15.407 are included in a separate report RFI-RPT-RP89496JD02A.
2. The requirements of DFS apply for the 5250-5350 MHz and 5470-5725 MHz bands.
3. The Manufacturer confirms that information regarding the parameters of the radar waveforms is not available to the end user.
4. Clause 8.3)18) of FCC 06-96 states tests are to be performed on the narrowest channel bandwidth (worst case). All tests were therefore performed at the 20 MHz bandwidth. Some tests were additionally performed at 40 MHz to ensure correct detection bandwidth, radar detection probability, and measurements of the channel move time since this could possibly be affected by the different data rate.

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

For the measurements contained within this test report, 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:	Sagemcom
Model Name or Number:	F@st 3965CV
Serial Number:	LK220202170
Hardware Version Number:	253509713
Software Version Number:	2.7
FCC ID:	VW3FAST3965CV

3.2. Description of EUT

The equipment under test was an IEEE 802.11a,b,g,n dual-band WLAN router operating in the 2.4 GHz and 5 GHz bands. The EUT has five internal antennas, two transmit/receive for 2.4 GHz band and three transmit/receive for 5 GHz band. The antennas are integral to the PCB and connected to the module via PCB tracks which incorporate a port on each track. When an RF cable is connected to the port the antenna is disconnected. For 802.11n operation the device uses MIMO – 2x2 for the 2.4 GHz band and 3x3 for the 5 GHz band. Depending on the 802.11 MCS, the device transmits 1, 2 or 3 spatial stream. The device uses spatial multiplexing and from an RF point of view the streams are correlated with unequal gain antennas.

3.3. Modifications Incorporated in the EUT

For test purposes a connection was made to the internal serial communications, so the internal status could be monitored or changed.

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)		
Type of Unit:	Transceiver		
Modulation:	OFDM		
Data Rates:	IEEE 802.11n: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65, 78, 104, 117, 130, 156, 175.5 & 195 Mbps (20 MHz Bandwidth) IEEE 802.11n: 13.5, 27, 40.5, 54, 81, 108, 121.5, 135, 162, 216, 243, 270, 324, 364.5 & 405 Mbps (40 MHz Bandwidth)		
Power Supply Requirement(s):	120 VAC 60 Hz via 12 V adaptor		
Transmit / Receive Frequency Range:	5150 to 5250 MHz 5250 to 5350 MHz 5470 to 5725 MHz (excluding 5600 – 5650 MHz) 5725 to 5850 MHz		
Transmit / Receive Channels Tested at 20 MHz Bandwidth setting:	**Test**	**Channel ID**	**Channel Centre Frequency (MHz)**
	Detection Probability, Detection Bandwidth, Channel Move & Non-Occupancy	64	5300
	Start Up CAC	100	5500
	Radar at Beginning and End of CAC	102	5520
Transmit / Receive Channels Tested at 40 MHz Bandwidth setting:	**Test**	**Channel ID**	**Channel Centre Frequency (MHz)**
	All applied tests	100	5510

3.5. Support Equipment

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

Description:	DFS enabled USB Wireless Dongle
Brand Name:	Atheros
Model Name or Number:	UB94-142-D1710
Serial Number:	AR5BUB-00094A(HT0302110)

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:

- As a Master device (the manufacturer declared the EUT does not operate in Client mode).
- The 3 MIMO ports were connected together via a splitter/combiner.
- The device was tested with a power level of '15.5 dBm'.
- The DFS detection threshold of -64 dBm was used throughout as the maximum transmit power >200 mW.
    - The customer declared the gain of the antennas used in the product to be +5.4 dBi for U-NII Bands 1 & 2, and +5.7 dBi for U-NII bands 3 & 4. Since the test is performed conducted this additional gain in signal would normally be present and so is added to the radar test level.
    - The radar level to be presented at the antenna ports was calculated as:
      -64 dBm +5.4 dBi antenna gain +1 dB to account for variations = -57.6 dBm radar level at antenna ports for U-NII band 2.
      -64 dBm +5.7 dBi antenna gain +1 dB to account for variations = -57.3 dBm radar level at antenna ports for U-NII band 3.

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 EUT internal serial port was used to configure the EUT and to report radar detection events using a debug option of its' internal software.
- 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. During test the file was transferred from one laptop via Ethernet to the master device, then via RF conducted link to the USB Client device which was connected to the MPEG decoding laptop.

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:**	26 September 2012
Test Sample Serial Number:	LK220202170		

FCC Part:	Part 15.407(h)(2)
Test Method Used:	FCC 06-96 Section 7.8.1

Environmental Conditions:

Temperature (°C):	29.7
Relative Humidity (%):	33

Results: 20 MHz

Measured using 99% channel bandwidth function of FSU analyser:

Bandwidth setting (MHz)	Measured 99% Bandwidth (MHz)
20	17.949

Tested at 1 MHz steps out from centre frequency of 5300 MHz, 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 (%)
+10/-10	10	100%
+11	0	<80%
-11	3	<80%

The detection bandwidth (20 MHz) is therefore larger than 80% of the 99% bandwidth (17.949 MHz).

Results: 40 MHz

Measured using 99% channel bandwidth function of FSU analyser:

Bandwidth setting (MHz)	Measured 99% Bandwidth (MHz)
40	37.500

Test at 1 MHz steps out from centre frequency of 5510 MHz, 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 (%)
+20/-20	10	100
+21	4	<80%
-21	1	<80%

The detection bandwidth (40 MHz) is therefore larger than 80% of the 99% bandwidth (37.500 MHz).

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. For each frequency step the minimum percentage of detection from table 4 is 60% for type 1 radars alone, but an aggregate of 80% for all radar types overall. Since the test is performed with type 1 radars only, the more stringent 80% aggregate limit was therefore used to define if the radar was detected at each frequency. 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:	LK220202170		

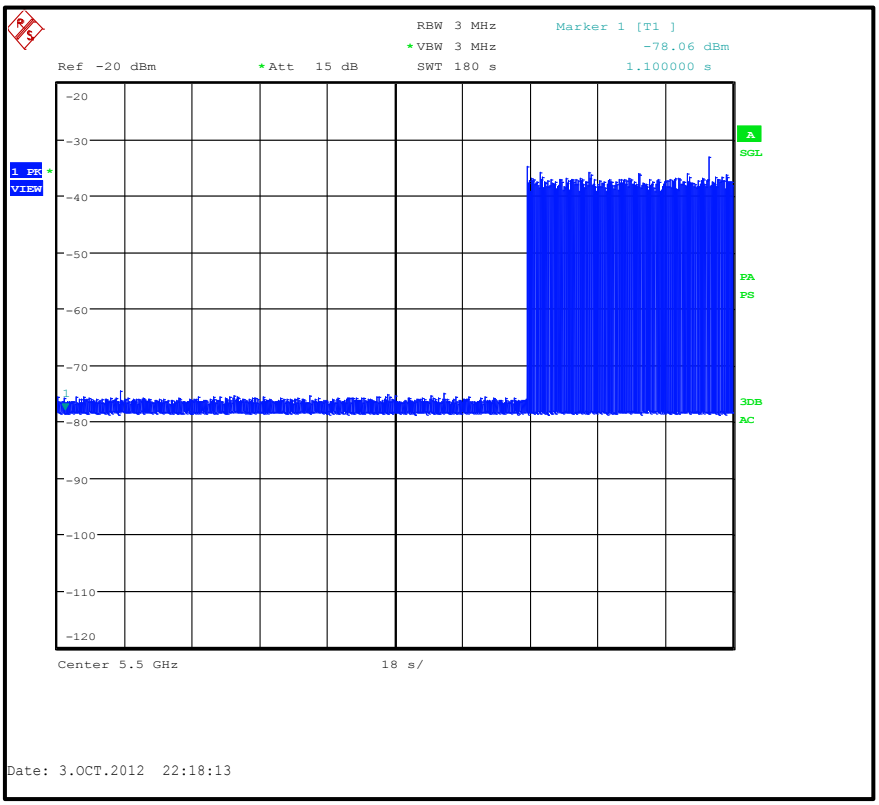
FCC Part:	Part 15.407(h)(2)(ii)
Test Method Used:	FCC 06-96 Section 7.8.2.1

Environmental Conditions:

Temperature (°C):	25.8
Relative Humidity (%):	34

Results: 20 MHz

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



Note(s):

1. The EUT was powered up at the same time the sweep was started. The EUT did not transmit any further data or beacons until approximately 124 seconds after this power up procedure.

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:**	12 October 2012
Test Sample Serial Number:	LK220202170		

FCC Part:	Part 15.407(h)(2)(ii)
Test Method Used:	FCC 06-96 Section 7.8.2.2

Environmental Conditions:

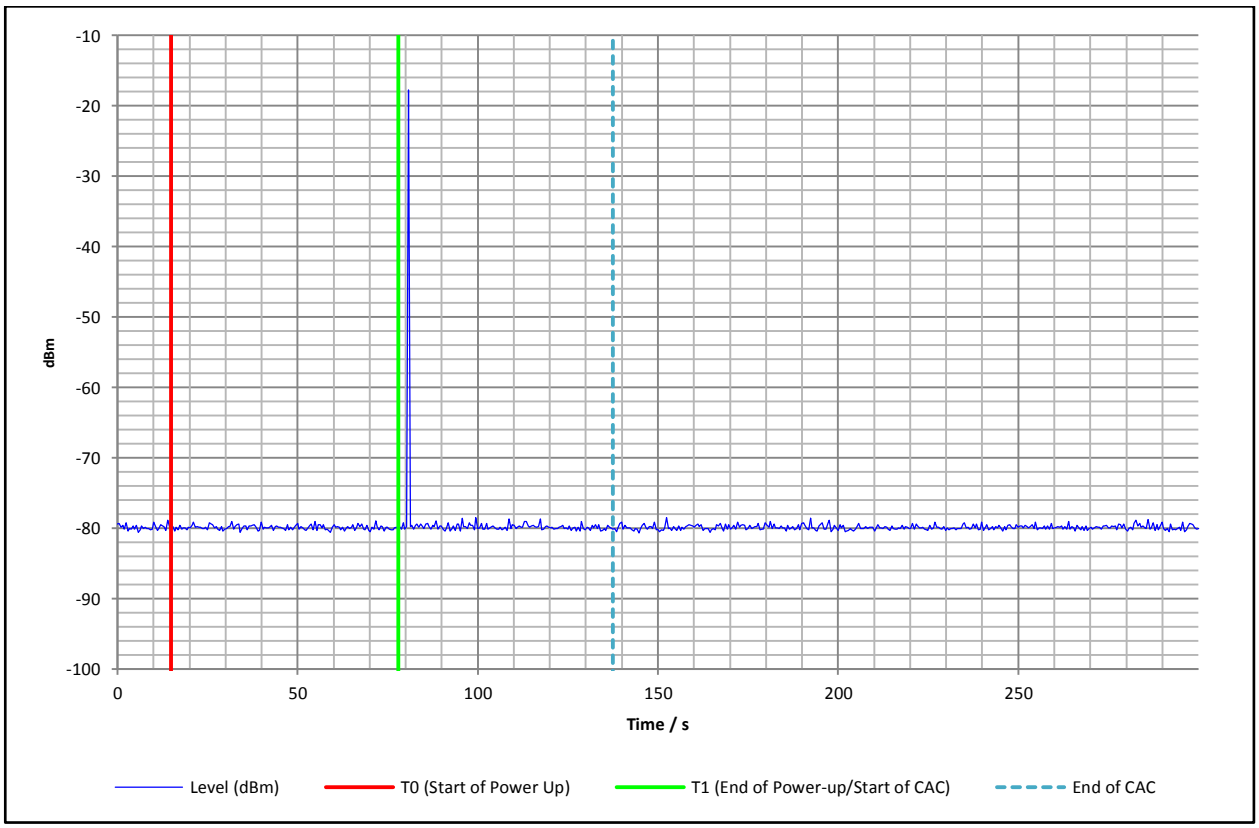
Temperature (°C):	28
Relative Humidity (%):	27

Note(s):

1. The trace was captured by a Rohde and Schwarz FSU set to the maximum sampling rate of 30001 data points. The trace data was then exported in ASCII format so it could be analysed within another application to the nearest 10 ms sample, which is not possible on the built-in display.

Results: 20 MHz

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



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:**	12 October 2012
Test Sample Serial Number:	LK220202170		

FCC Part:	Part 15.407(h)(2)(ii)
Test Method Used:	FCC 06-96 Section 7.8.2.3

Environmental Conditions:

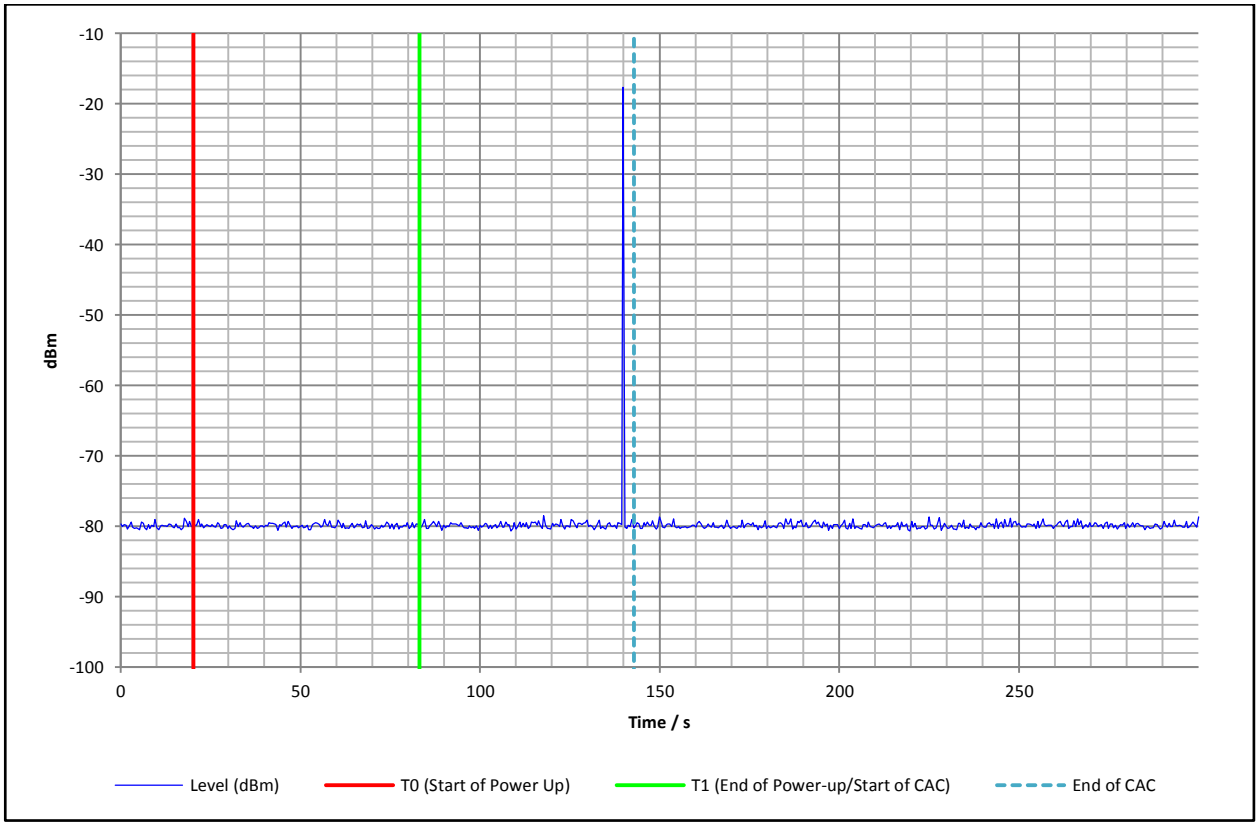
Temperature (°C):	28
Relative Humidity (%):	27

Note(s):

1. The trace was captured by a Rohde and Schwarz FSU set to the maximum sampling rate of 30001 data points. The trace data was then exported in ASCII format so it could be analysed within another application to the nearest 10 ms sample, which is not possible on the built-in display.

Results: 20 MHz

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



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:**	27 September 2012
Test Sample Serial Number:	LK220202170		

FCC Part:	Part 15.407(h)(2)(iii)
Test Method Used:	FCC 06-96 Section 7.8.3

Environmental Conditions:

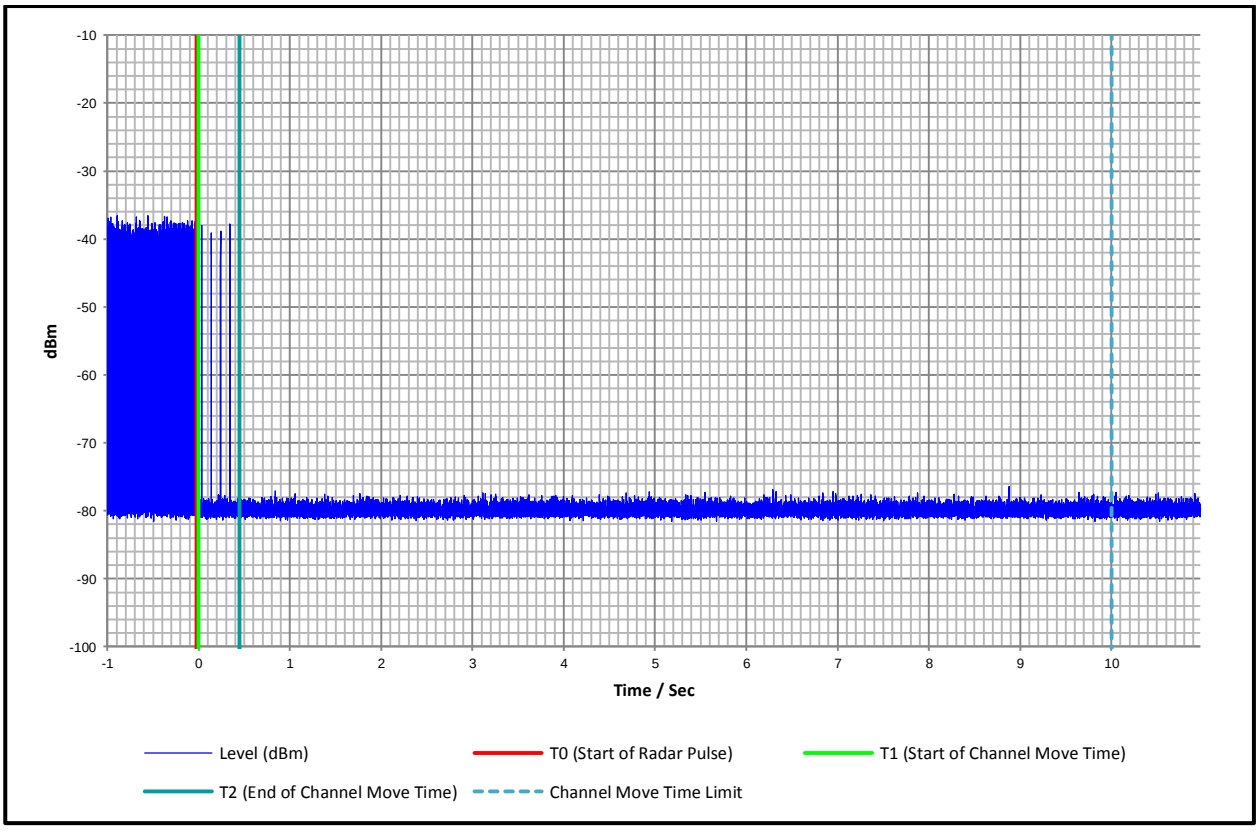
Temperature (°C):	30.1
Relative Humidity (%):	28

Note(s):

1. The trace was captured by a Rohde and Schwarz FSU set to the maximum sampling rate of 30001 data points. The trace data was then exported in ASCII format so it could be analysed within another application to the nearest 400 µs sample, which is not possible on the built-in display.
2. The EUT operated as a DFS Master device only.

Results: 20 MHz Master

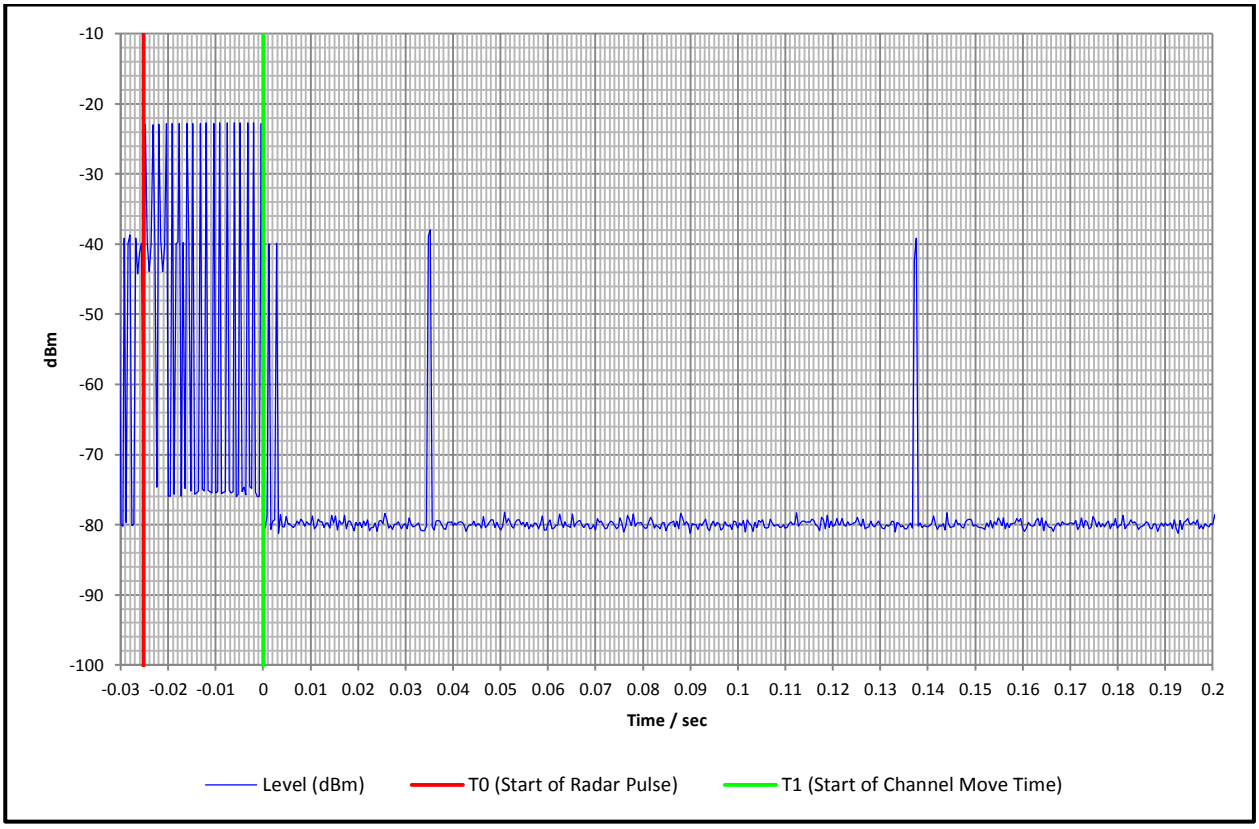
Radar burst type 1 was detected and channel move occurred.



Full 10 second plot

The channel move time was 445.2 ms
The channel closing transmission time was 3.6 ms, of which 1.2 ms was after the first 200 ms.

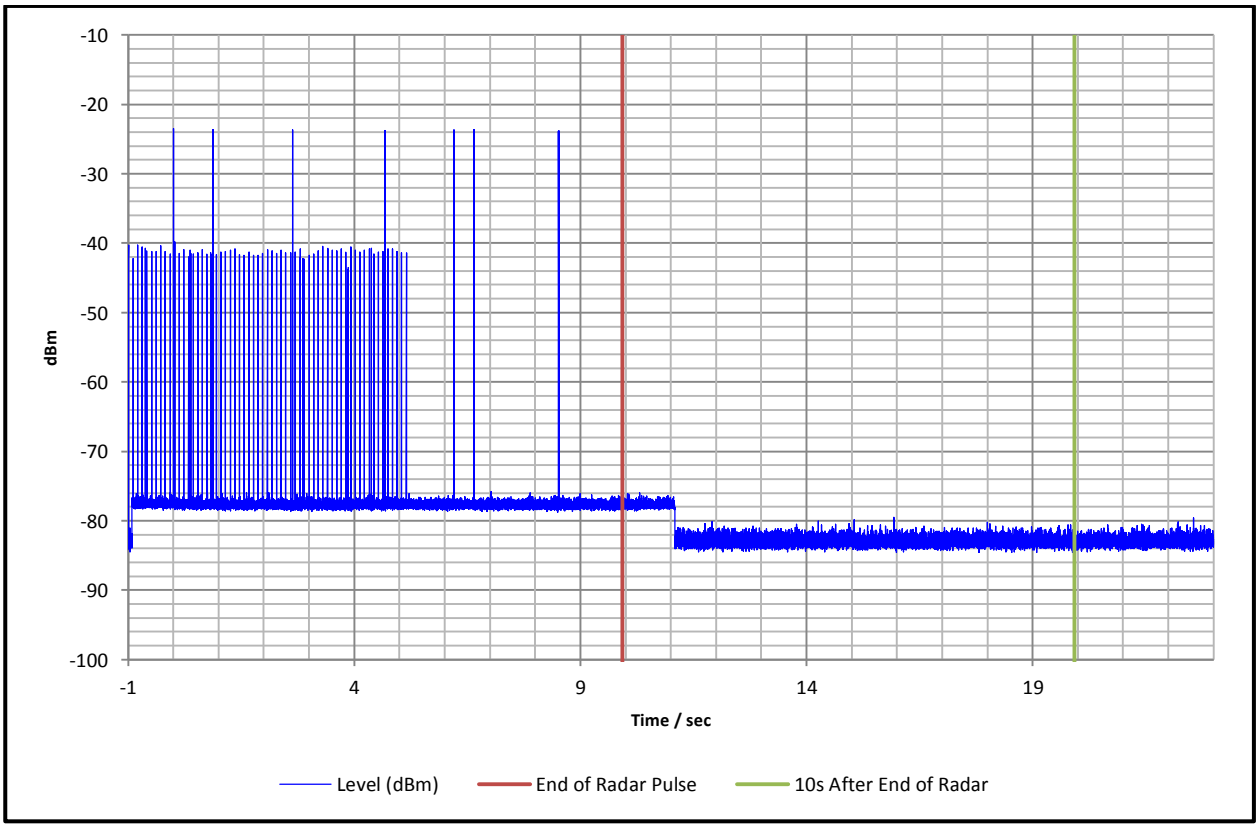
Channel Closing Transmission Time and Channel Move Time (continued)



Plot Showing Radar and <200ms Data Conformity

Results: 20 MHz Master

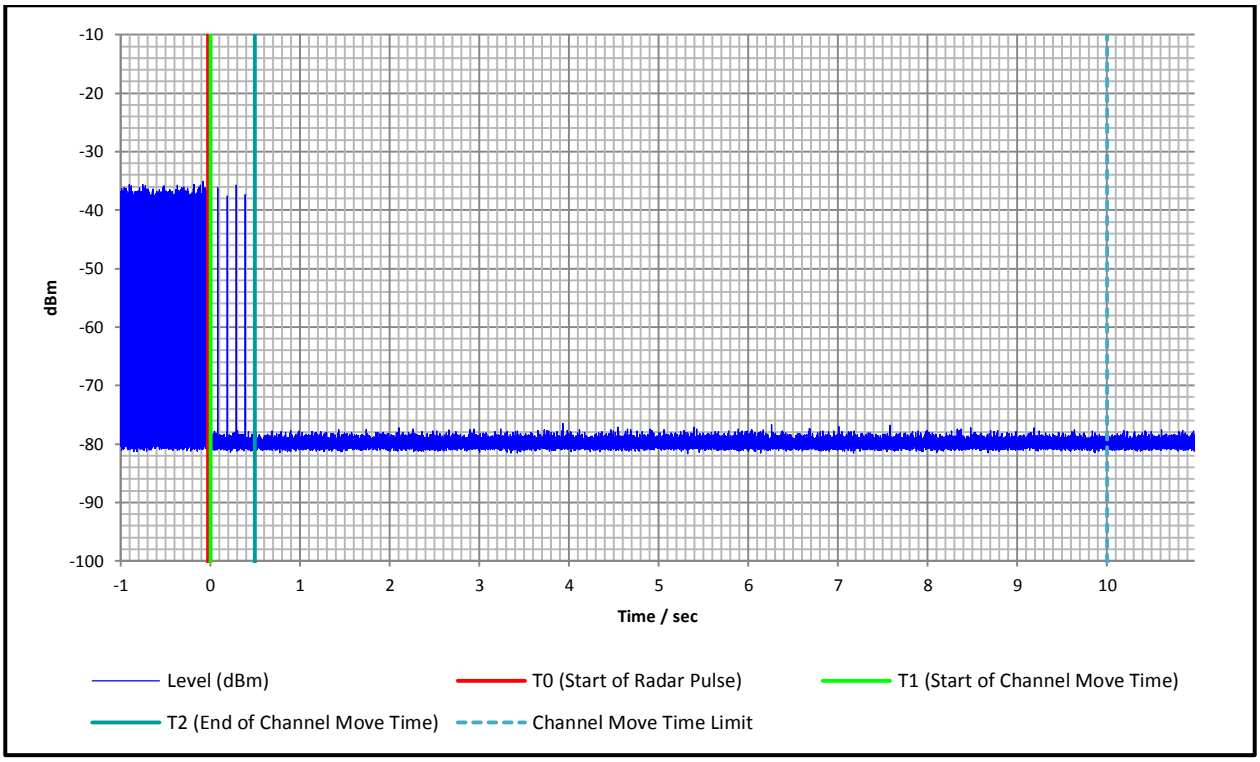
Radar burst type 5 was detected and channel move occurred.



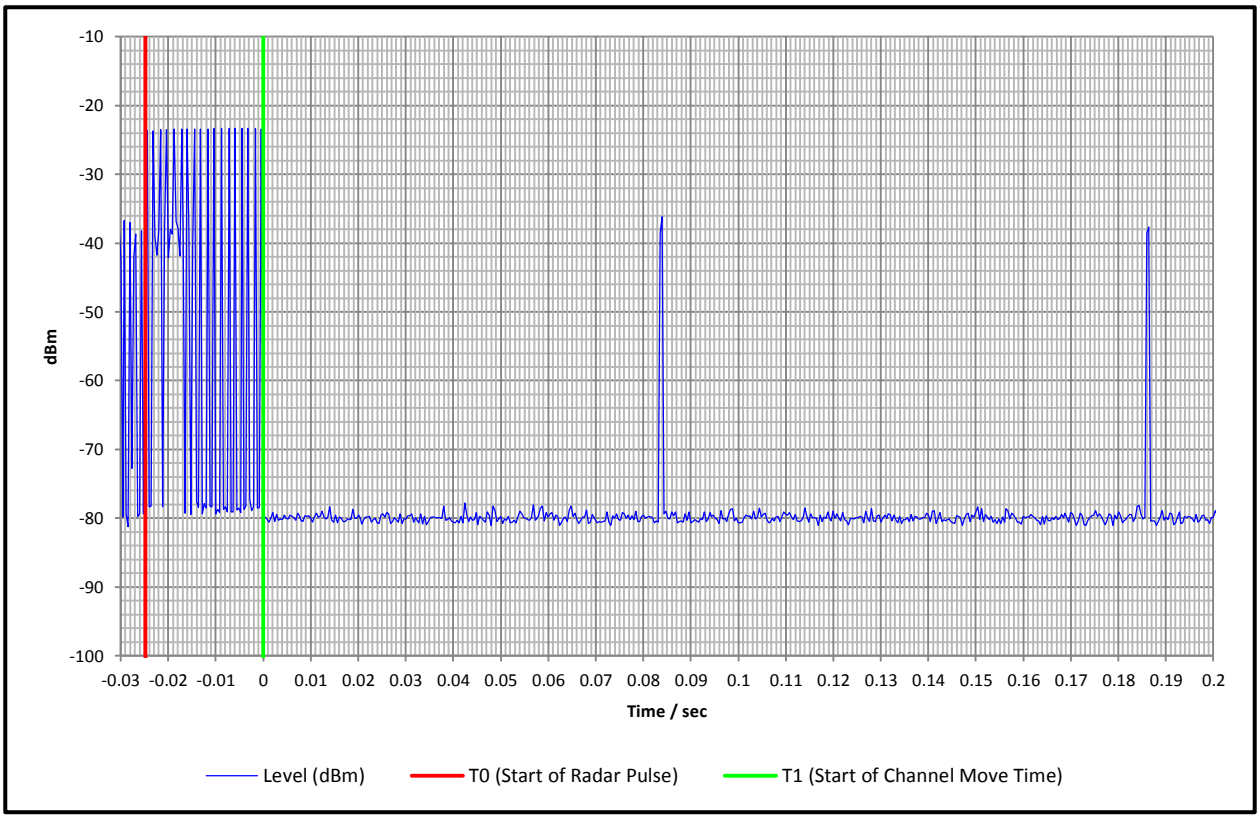
Channel Closing Transmission Time and Channel Move Time (continued)

Results: 40 MHz Master

Radar burst type 1 detected and channel move occurred.



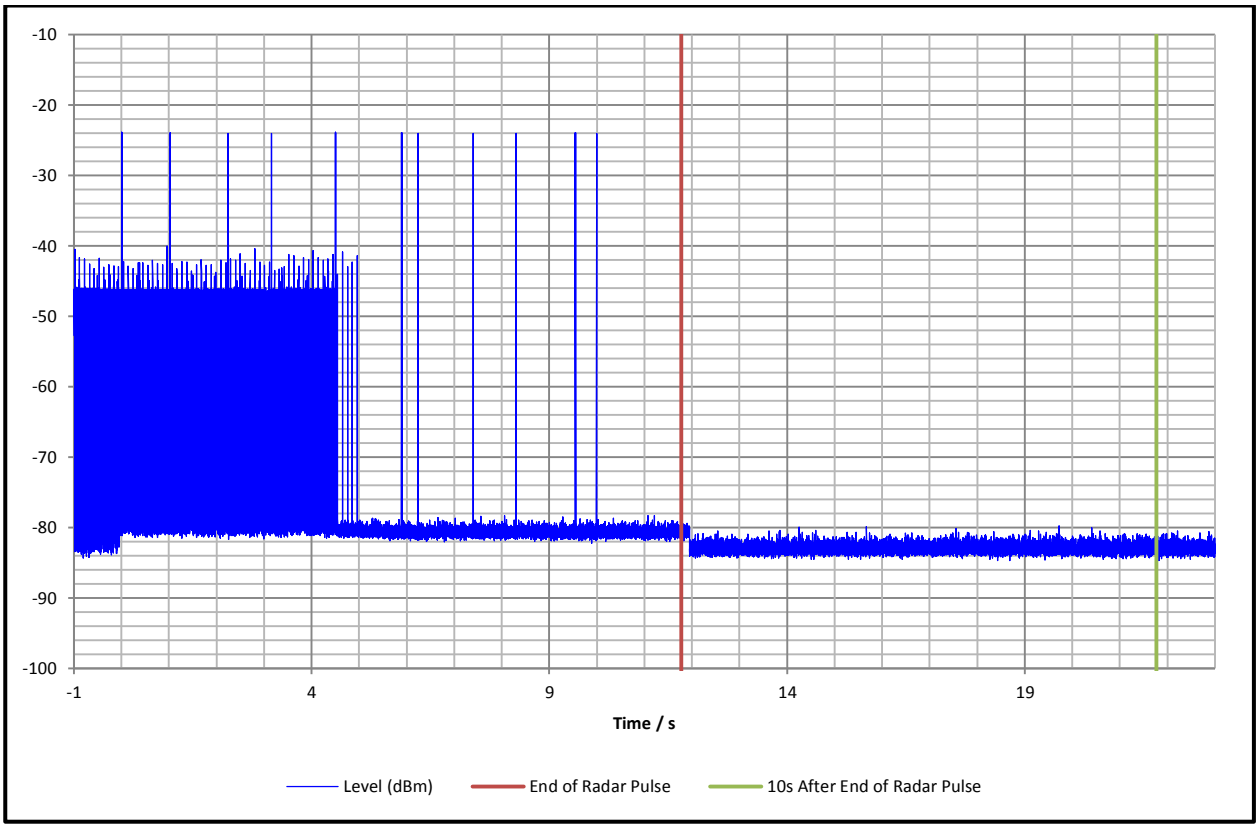
Full 10 sec Plot with Type 1 Radar



Plot Showing Type 1 Radar and <200 ms Data Conformity

Channel Closing Transmission Time and Channel Move Time (continued)

Radar burst type 5 detected and channel move occurred.



Channel Closing Transmission Time and Channel Move Time (continued)

Results: Beacon Analysis

20 MHz

The following samples found after the radar pulse were attributed to the EUT:

Time after Radar / s	Level / dBm
0.0012	-39.998
0.0028	-39.842
0.0348	-38.825
0.0352	-37.971
0.1372	-42.219
0.1376	-39.173
0.2400	-38.893
0.3424	-37.846
0.4448	-38.469

The sampling rate of the analyser gave an individual sample time of 400µs. The channel closing transmission time was therefore 3.6 ms, of which 1.2 ms was after the first 200 ms.

The last sample occurred at 0.4448 s, and therefore the channel move time was 445.2 ms.

40 MHz

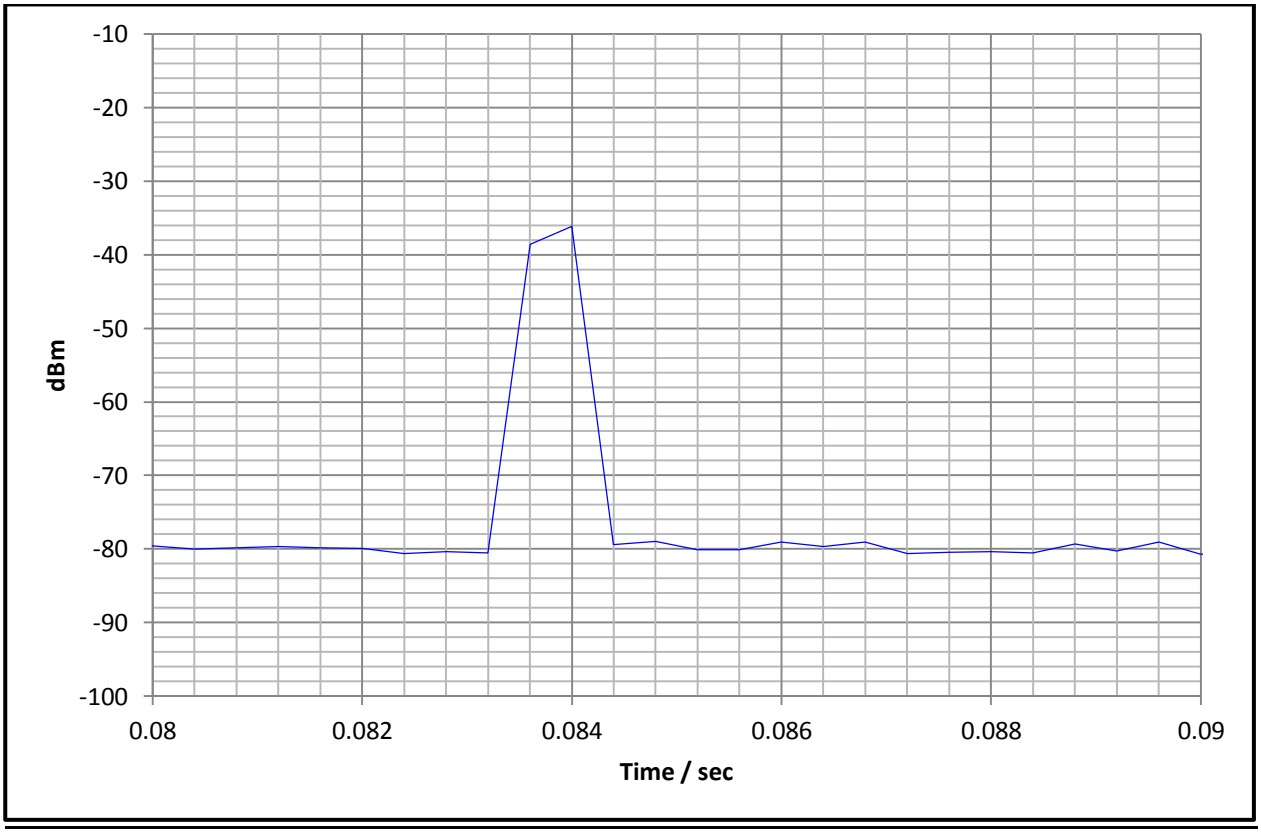
The following samples found after the radar pulse were attributed to the EUT:

Time after Radar / s	Level / dBm
0.0836	-38.579
0.0840	-36.196
0.1860	-38.589
0.1864	-37.630
0.2884	-37.130
0.2888	-35.717
0.3908	-37.351
0.3912	-37.762
0.4932	-37.836
0.4936	-36.388

The sampling rate of the analyser gave an individual sample time of 400µs. Therefore the channel closing transmission time was 4.0 ms, of which 2.4 ms was after the first 200 ms.

The last sample occurred at 0.4936 s, and therefore the channel move time was 494.0 ms.

Channel Closing Transmission Time and Channel Move Time (continued)



A 2-sample Beacon (800µs)

Note: although the plot shows the beacon as being 1200 µs wide at the bottom, the beacon signal only occurred during 2 samples so the straight line interpolation of the plot shows all signals in a worst-case light.

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:**	28 September 2012
Test Sample Serial Number:	LK220202170		

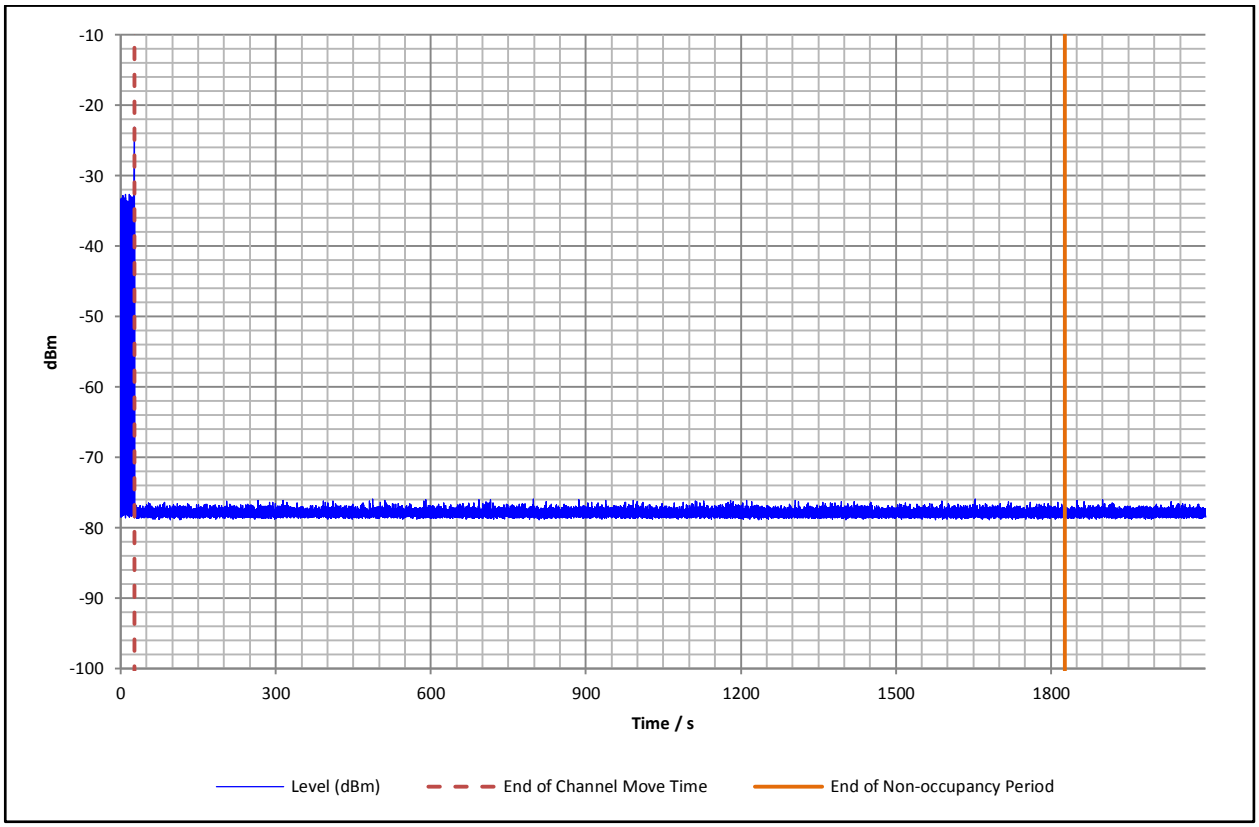
FCC Part:	Part 15.407(h)(iv)
Test Method Used:	FCC 06-96 Section 7.8.3

Environmental Conditions:

Temperature (°C):	30.1
Relative Humidity (%):	31

Results: 20 MHz

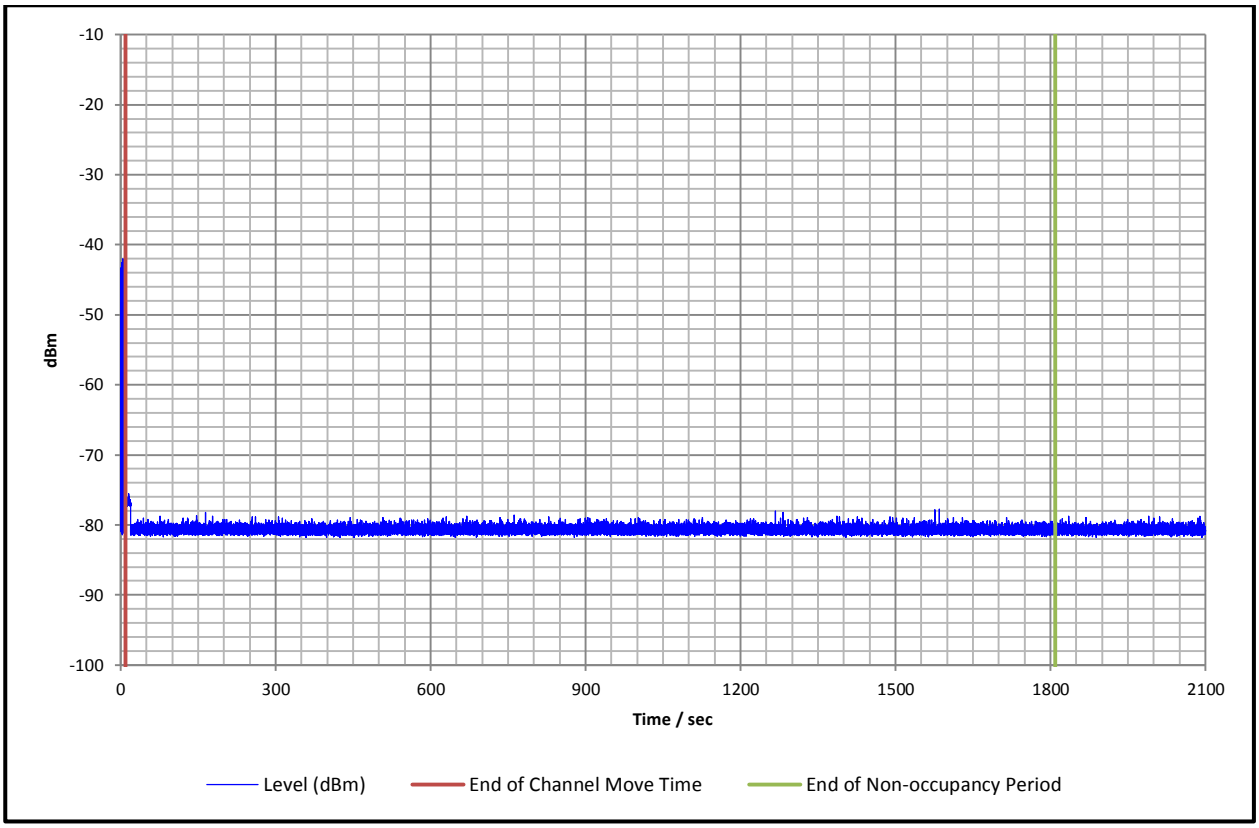
Radar burst type 1 detected and channel was vacated for >30 minutes.



Non-occupancy Period (continued)

Results: 40 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 Dates:**	21 September 2012, 25 September 2012 & 27 September 2012
Test Sample Serial Number:	LK220202170		

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):	28.6 to 29.5
Relative Humidity (%):	31 to 33

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	155	26	Yes
	2	2	160	25	Yes
	3	2	180	26	Yes
	4	2	228	25	Yes
	5	3	155	23	Yes
	6	3	170	23	Yes
	7	3	186	29	Yes
	8	3	198	28	Yes
	9	4	198	28	Yes
	10	5	209	27	Yes
	11	1	158	26	Yes
	12	1	202	27	Yes
	13	1	224	26	Yes
	14	2	151	23	Yes
	15	2	225	25	Yes
	16	3	217	23	Yes
	17	4	184	25	Yes
	18	5	166	24	Yes
	19	5	196	26	Yes
	20	5	208	29	Yes
	21	1	205	24	Yes
	22	2	159	27	Yes
	23	2	165	29	Yes
	24	2	190	29	Yes
	25	2	195	26	Yes
	26	2	202	27	Yes
	27	3	200	23	Yes
	28	4	190	28	Yes
	29	5	186	25	Yes
	30	5	230	23	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	6	364	17	Yes
	2	6	369	18	Yes
	3	6	457	17	Yes
	4	7	241	17	Yes
	5	7	327	17	Yes
	6	8	344	16	Yes
	7	8	349	17	Yes
	8	9	489	17	Yes
	9	10	271	18	Yes
	10	10	442	18	Yes
	11	6	322	17	Yes
	12	6	325	16	Yes
	13	6	418	16	Yes
	14	6	426	18	Yes
	15	7	275	17	Yes
	16	7	365	17	Yes
	17	7	459	18	Yes
	18	9	309	17	Yes
	19	10	245	17	Yes
	20	10	278	16	Yes
	21	7	365	16	Yes
	22	8	293	18	Yes
	23	9	205	16	Yes
	24	9	226	16	Yes
	25	10	216	16	Yes
	26	10	233	16	Yes
	27	10	253	17	Yes
	28	10	475	18	Yes
	29	10	482	16	Yes
	30	10	494	18	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	12	303	13	Yes
	2	12	431	15	Yes
	3	16	307	13	Yes
	4	16	347	13	Yes
	5	17	323	12	Yes
	6	17	349	12	Yes
	7	17	374	14	Yes
	8	18	232	13	Yes
	9	19	380	16	Yes
	10	20	303	14	Yes
	11	11	222	16	Yes
	12	11	230	12	Yes
	13	12	237	13	Yes
	14	13	484	14	Yes
	15	14	434	13	Yes
	16	15	452	14	Yes
	17	16	335	14	Yes
	18	18	399	15	Yes
	19	18	406	16	Yes
	20	20	226	13	Yes
	21	11	338	14	Yes
	22	11	428	12	Yes
	23	11	462	15	Yes
	24	13	290	15	Yes
	25	13	437	12	Yes
	26	14	338	12	Yes
	27	15	255	16	Yes
	28	17	212	16	Yes
	29	17	489	13	Yes
	30	19	341	16	Yes
	Detection Level			100%	

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

Results: 40 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: 40 MHz / Radar Type 2

Radar Type	Trial Number	Number Pulses per Burst	Pulse Width (µs)	PRI (µs)	Detected?
2	1	1	186	27	Yes
	2	1	217	28	Yes
	3	2	164	23	Yes
	4	2	180	29	Yes
	5	3	163	27	Yes
	6	3	176	28	Yes
	7	4	164	23	Yes
	8	4	165	24	Yes
	9	5	192	28	Yes
	10	5	197	27	Yes
	11	1	212	24	Yes
	12	2	187	24	Yes
	13	2	201	27	Yes
	14	2	209	24	Yes
	15	3	204	29	Yes
	16	4	169	23	Yes
	17	4	182	25	Yes
	18	4	193	26	Yes
	19	4	220	23	Yes
	20	4	227	29	Yes
	21	1	162	27	Yes
	22	2	164	25	Yes
	23	2	198	27	Yes
	24	3	165	29	Yes
	25	3	209	24	Yes
	26	4	204	29	Yes
	27	4	205	26	Yes
	28	4	227	29	Yes
	29	5	213	29	Yes
	30	5	215	27	Yes
	Detection Level			100%	

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

Results: 40 MHz / Radar Type 3

Radar Type	Trial Number	Number Pulses per Burst	Pulse Width (µs)	PRI (µs)	Detected?
3	1	7	221	16	Yes
	2	7	334	16	Yes
	3	7	389	17	Yes
	4	8	359	18	Yes
	5	8	375	17	Yes
	6	8	469	18	Yes
	7	9	224	17	Yes
	8	9	234	17	Yes
	9	9	268	18	Yes
	10	10	288	17	Yes
	11	6	403	18	Yes
	12	6	413	18	Yes
	13	6	455	17	Yes
	14	8	409	16	Yes
	15	9	214	17	Yes
	16	9	235	17	Yes
	17	9	266	18	Yes
	18	9	499	17	Yes
	19	10	254	16	Yes
	20	10	308	17	Yes
	21	6	338	16	Yes
	22	6	395	17	Yes
	23	6	407	18	Yes
	24	7	347	16	Yes
	25	7	357	17	Yes
	26	7	469	18	Yes
	27	8	213	16	Yes
	28	9	368	16	Yes
	29	9	454	18	Yes
	30	10	318	18	Yes
	Detection Level			100%	

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

Results: 40 MHz / Radar Type 4

Radar Type	Trial Number	Number Pulses per Burst	Pulse Width (µs)	PRI (µs)	Detected?
4	1	12	245	16	Yes
	2	12	283	15	Yes
	3	12	456	12	Yes
	4	13	221	15	Yes
	5	14	473	16	Yes
	6	14	498	12	Yes
	7	18	321	12	Yes
	8	19	256	14	Yes
	9	20	232	12	Yes
	10	20	429	13	Yes
	11	13	212	12	Yes
	12	13	380	14	Yes
	13	13	431	12	Yes
	14	14	453	15	Yes
	15	14	495	13	Yes
	16	17	432	13	Yes
	17	17	489	15	Yes
	18	18	286	13	Yes
	19	18	298	16	Yes
	20	19	385	12	Yes
	21	11	257	13	Yes
	22	12	302	16	Yes
	23	14	295	16	Yes
	24	14	301	15	Yes
	25	14	476	14	Yes
	26	15	461	12	Yes
	27	18	209	12	Yes
	28	18	325	14	Yes
	29	19	337	12	Yes
	30	20	298	13	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:**	27 September 2012
Test Sample Serial Number:	LK220202170		

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):	29.5
Relative Humidity (%):	31

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%	

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

Results: 40 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%	

Note(s):

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:	LK220202170		

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):	26.2
Relative Humidity (%):	41

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%	

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

Results: 40 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	5250 MHz to 5725 MHz	95%	0.3 dB
Dynamic Frequency Selection (DFS) – Time	5250 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	-
L1076	Spectrum Analyser	Rohde & Schwarz	FSU8	101349	29 Sep 2012	12
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	13 Jan 2013	12
A2098	Power Splitter	Mini-Circuits	ZN4PD1-63-S+	S F210501205	Calibrated Before Use	-
A248	Variable 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	-

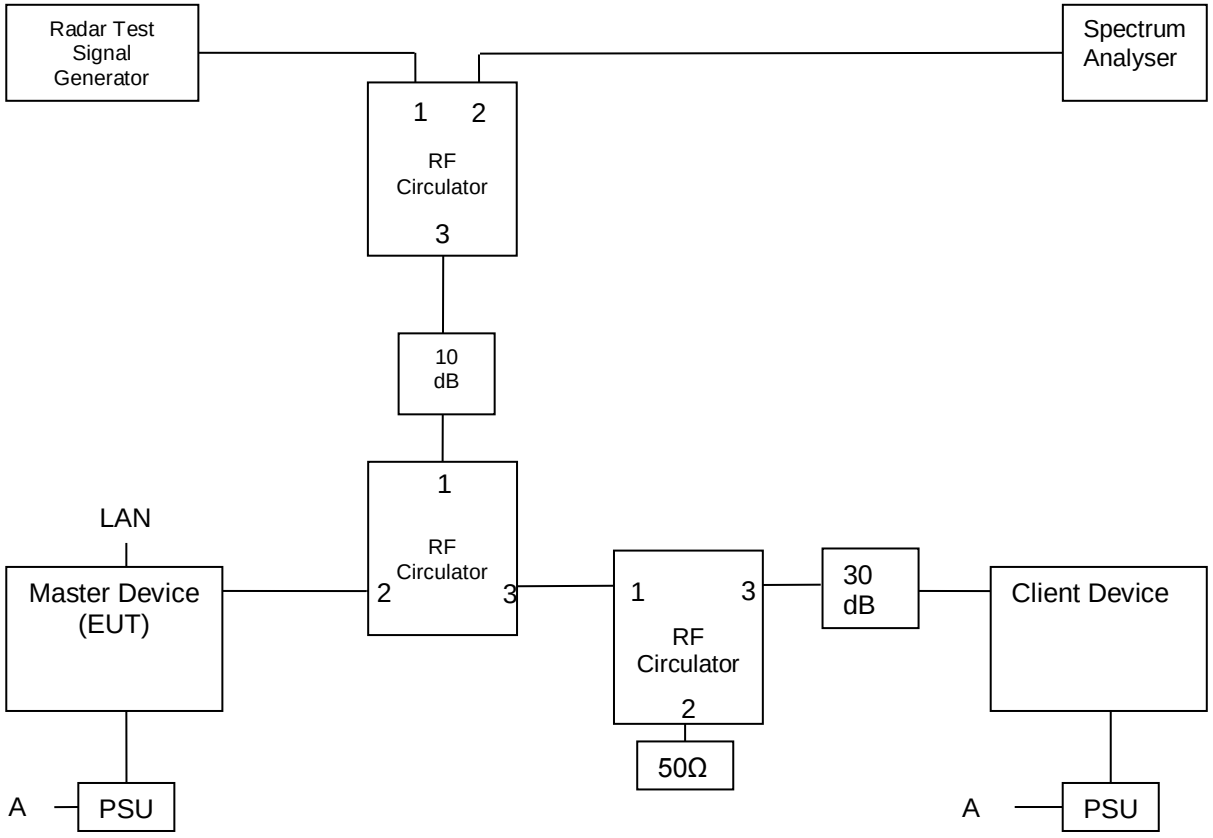
NB In accordance with UKAS requirements all the measurement equipment is on a calibration schedule.

All test equipment was within the previous or present calibration period on date of testing.

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



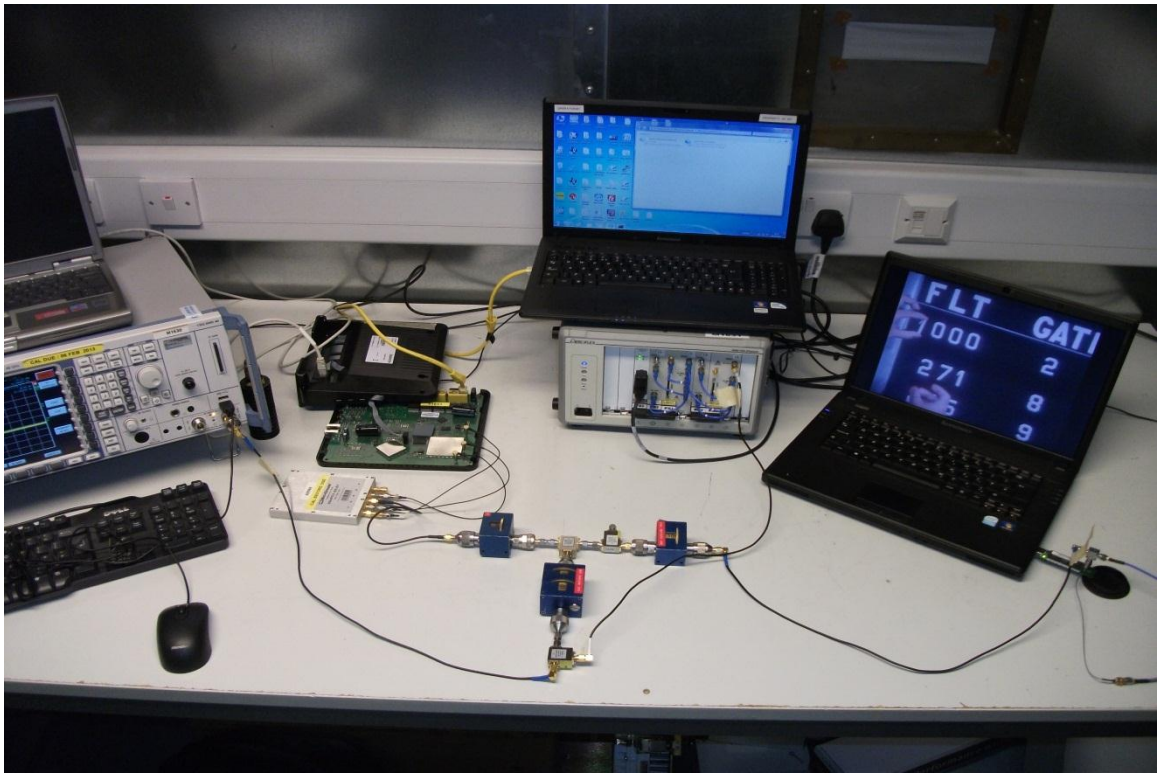
Note: The circulators have approximately 18 dB loss in the reverse direction.

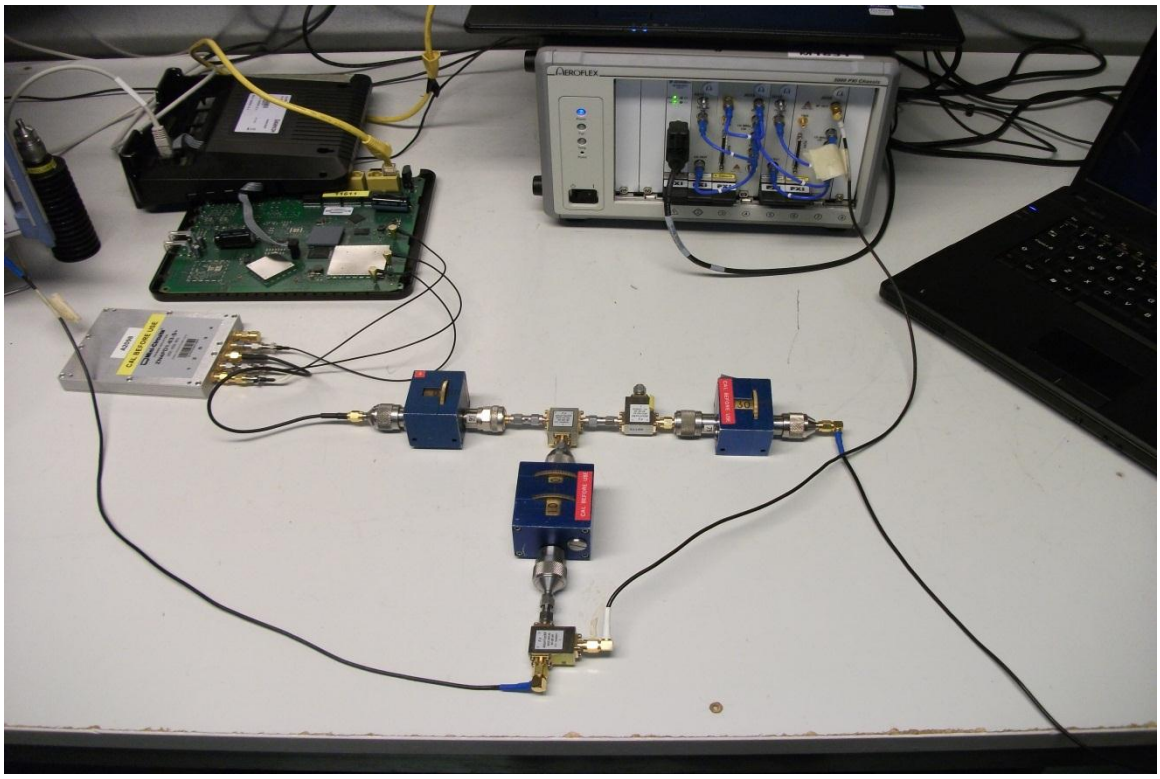
Appendix 3. Radar Type 1-6 Calibration and Verification Data

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).

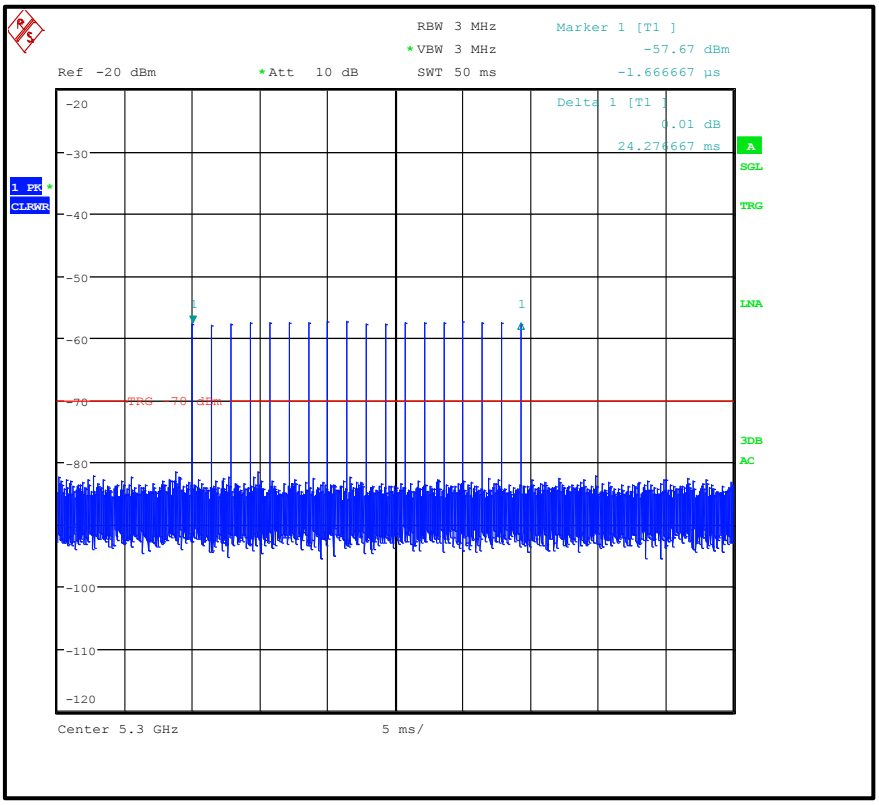
The radar amplitude was calibrated using the setup diagram above. The spectrum analyser was replaced by a 50Ω load. The EUT was replaced by a spectrum analyser. The radar pulses type 1-4 were then played back by the Aeroflex DFS test system. The amplitude was then measured on the spectrum analyser using a 3 MHz RBW/VBW. The output level was then adjusted to give the correct level into the EUT, as calculated in section 4.1, before the tests were performed. This level was then 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

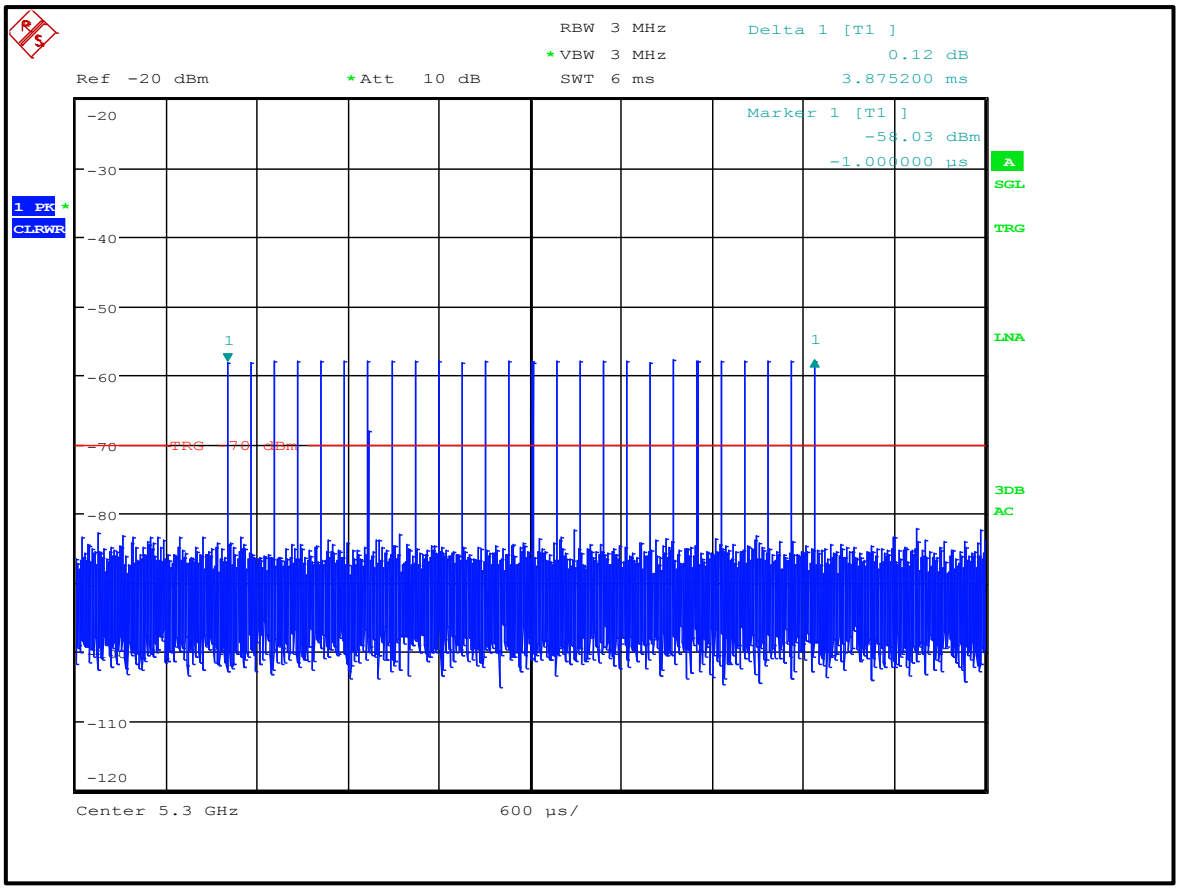




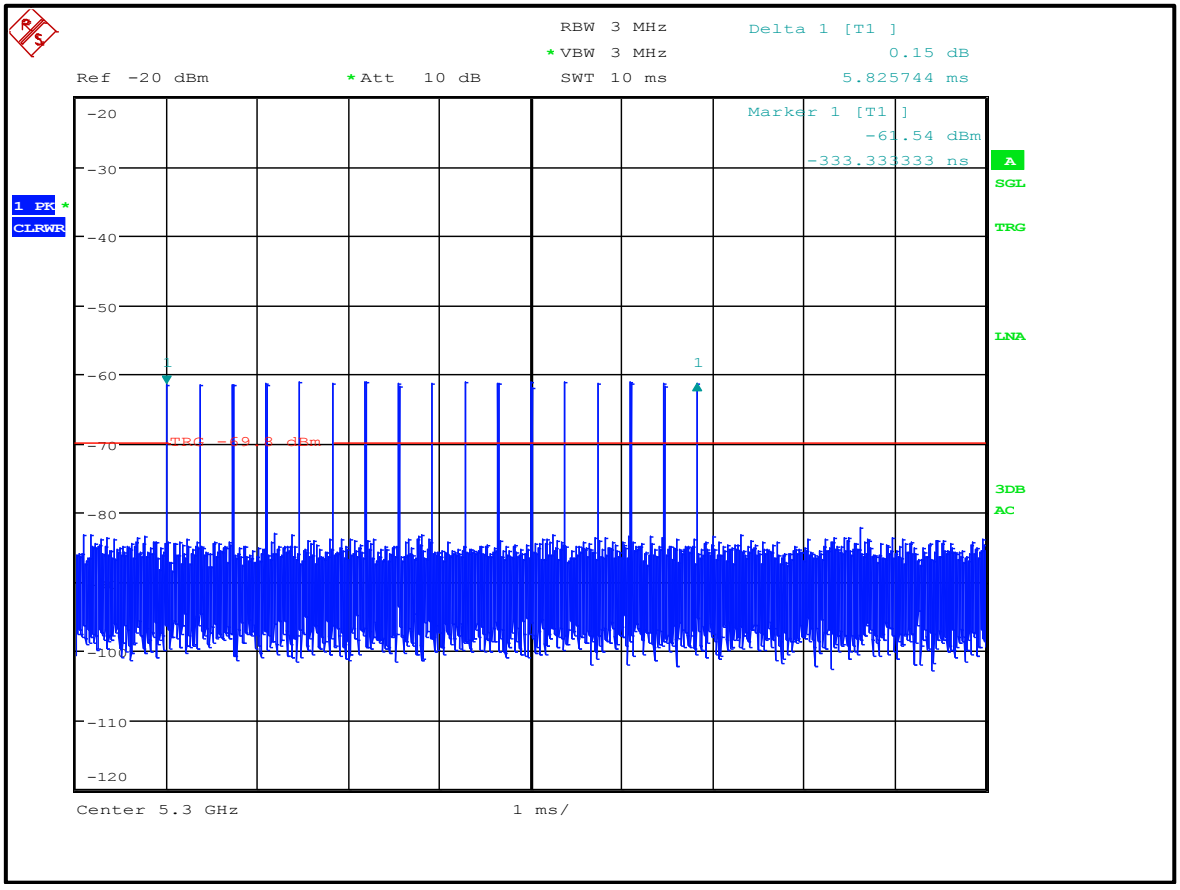
Below are sample plots of the radar waveforms, showing amplitude at one of the EUT receiver inputs.



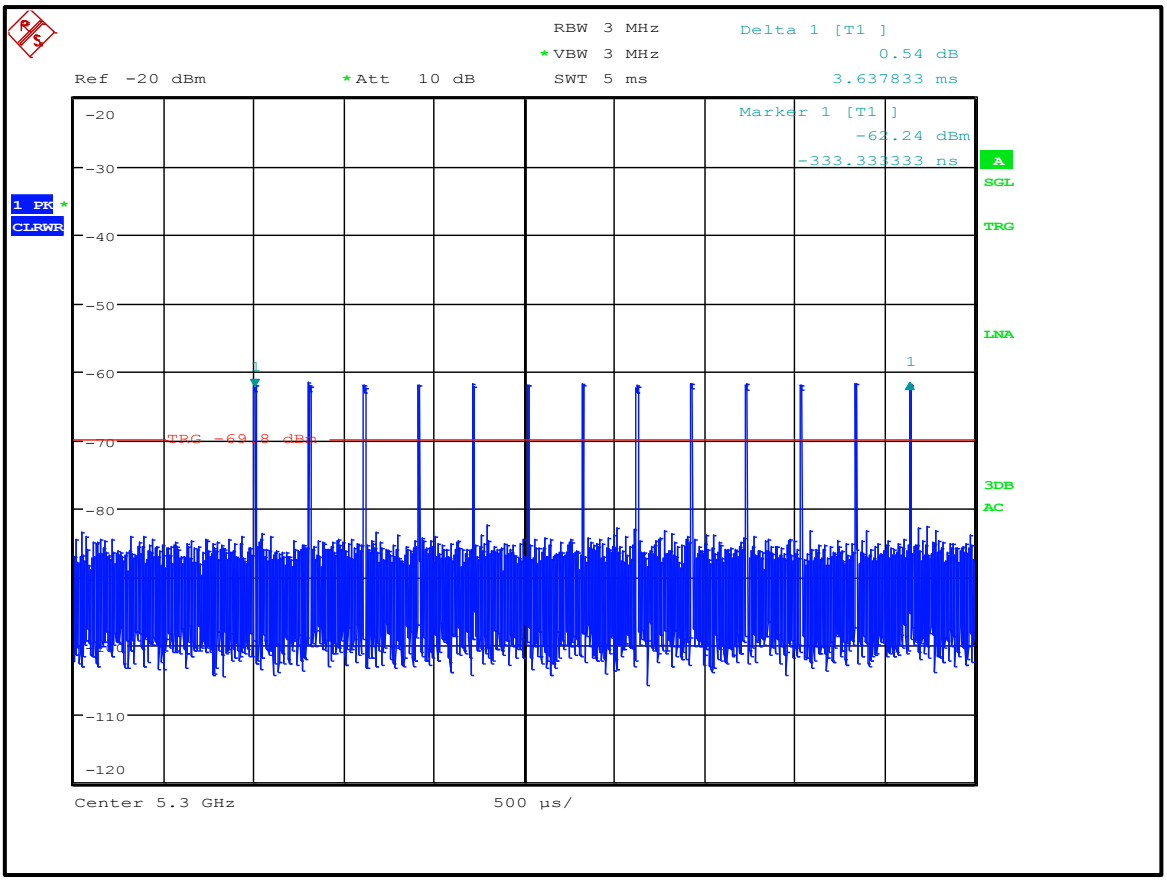
Radar Pulse 1



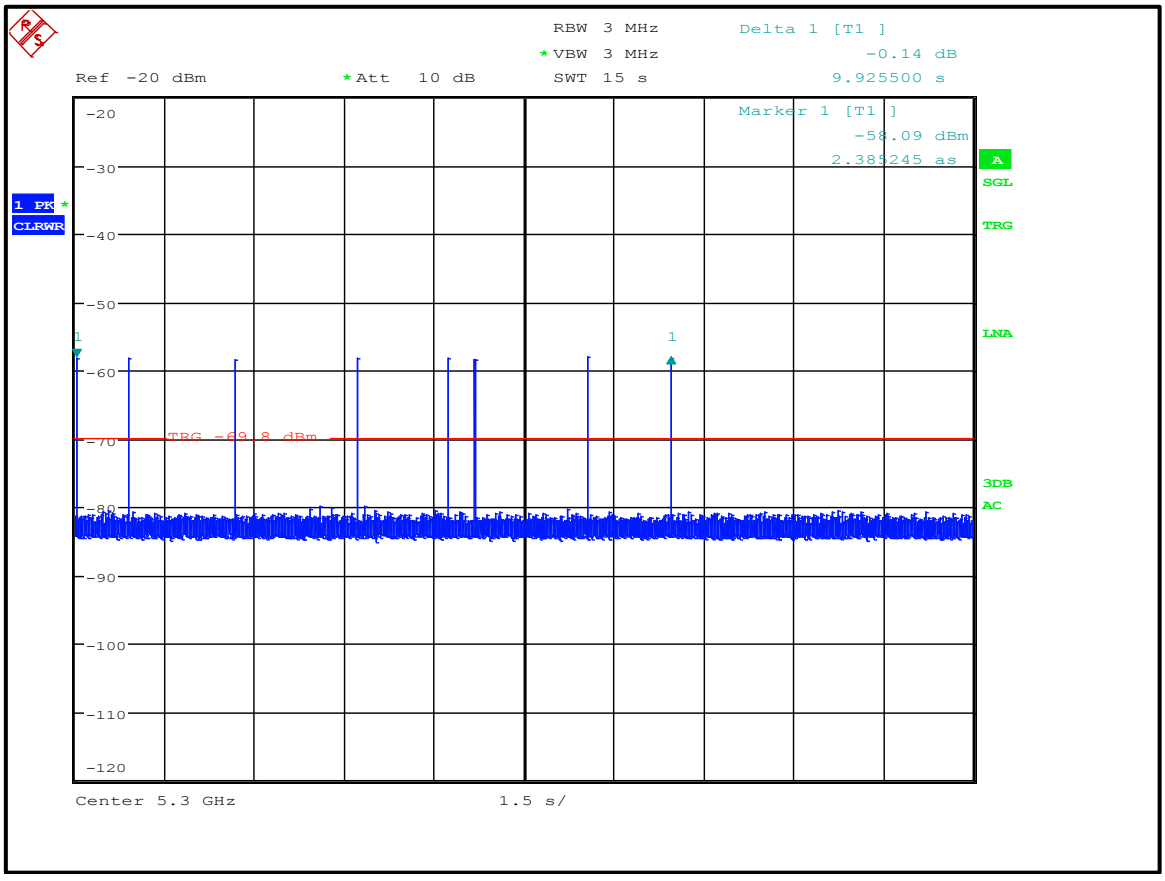
Radar Pulse 2



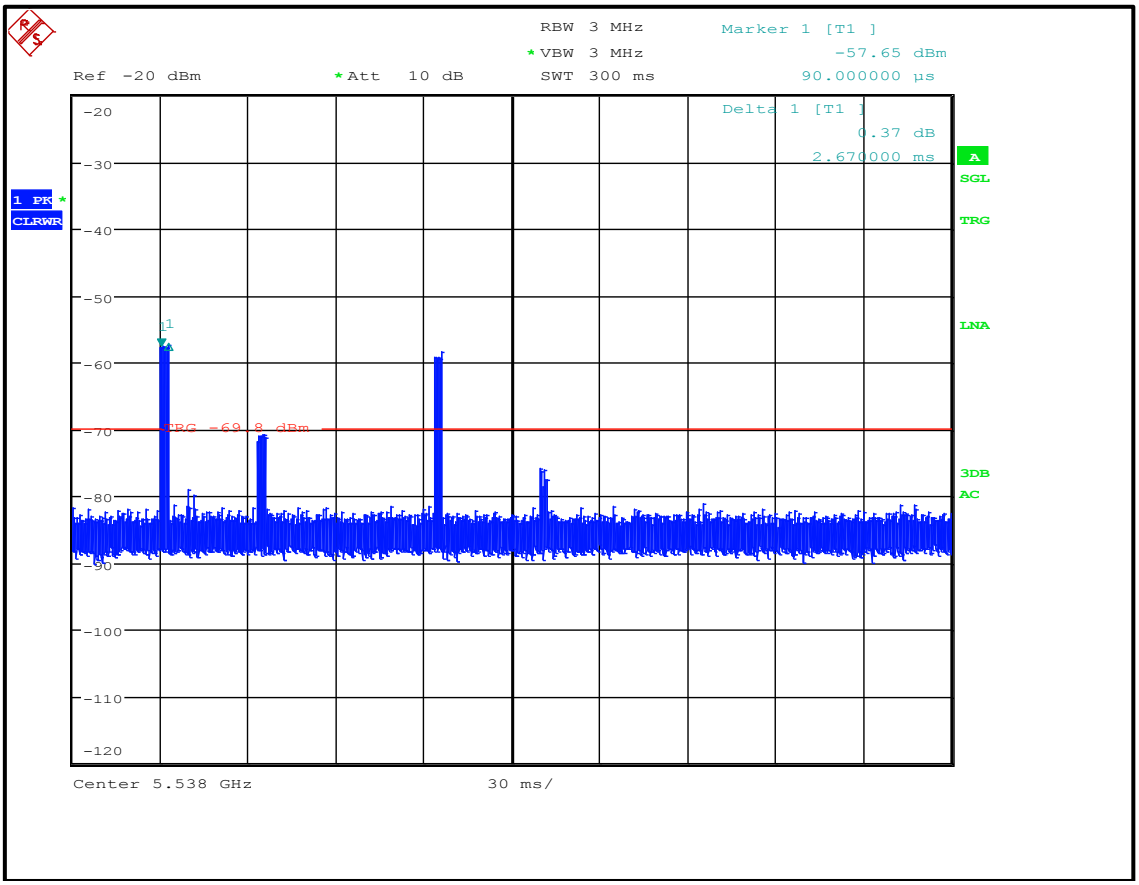
Radar Pulse 3



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

20 MHz – Trial 1

Number of Burst Segments = 8
Burst Segment Length = 1500000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2P2-to-3P3-to-End usec	usec	usec
1	1	59.0	18	914508	-	-	585433.0
2	3	96.0	16	289994	1634	1956	1206128.0
3	1	58.0	19	554468	-	-	945474.0
4	3	98.0	12	1093920	1114	1436	403236.0
5	2	94.0	14	1121557	1504	-	376751.0
6	3	56.0	13	55255	1453	1243	1441881.0
7	3	89.0	6	434366	1394	1466	1062507.0
8	1	66.0	12	339419	-	-	1160515.0

20 MHz – Trial 2

Number of Burst Segments = 8
Burst Segment Length = 1500000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2P2-to-3P3-to-End usec	usec	usec
1	3	96.0	5	980250	1246	1700	516516.0
2	2	81.0	11	1133499	1664	-	364675.0
3	2	53.0	9	613362	1099	-	885433.0
4	1	90.0	11	1285508	-	-	214402.0
5	1	59.0	8	649794	-	-	850147.0
6	2	83.0	9	1446226	1752	-	51856.0
7	3	51.0	18	125342	1903	1945	1370657.0
8	1	69.0	17	894317	-	-	605614.0

20 MHz – Trial 3

Number of Burst Segments = 10
Burst Segment Length = 1200000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	1	91.0	14	16872	-	-	1183037.0
2	3	50.0	7	1072873	1092	1255	124630.0
3	2	56.0	8	865905	1469	-	332514.0
4	2	59.0	5	182156	1761	-	1015965.0
5	1	82.0	5	658739	-	-	541179.0
6	2	88.0	17	613093	1795	-	584936.0
7	2	94.0	18	614592	1488	-	583732.0
8	2	99.0	12	1187579	1864	-	10359.0
9	3	90.0	16	1046371	1323	1517	150519.0
10	2	78.0	15	199890	1506	-	998448.0

20 MHz – Trial 4

Number of Burst Segments = 18
Burst Segment Length = 666666.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	55.0	18	304609	1514	-	360433.0
2	2	50.0	9	339055	1107	-	326404.0
3	2	51.0	20	303217	1435	-	361912.0
4	1	98.0	7	412571	-	-	253997.0
5	2	51.0	6	141025	1733	-	523806.0
6	3	94.0	14	107300	1769	1769	555546.0
7	3	97.0	12	347661	1421	1156	316137.0
8	2	90.0	8	293389	1054	-	372043.0
9	3	59.0	7	393236	1577	1694	269982.0
10	2	61.0	19	395994	1528	-	269022.0
11	1	97.0	9	647073	-	-	19496.0
12	1	68.0	20	476133	-	-	190465.0
13	3	52.0	9	645521	1039	1197	18753.0
14	3	90.0	14	574492	1471	1202	89231.0
15	1	56.0	9	475704	-	-	190906.0
16	1	61.0	10	425096	-	-	241509.0
17	2	54.0	10	94913	1770	-	569875.0
18	1	65.0	9	241989	-	-	424612.0

20 MHz – Trial 5

Number of Burst Segments = 12
Burst Segment Length = 1000000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	1	97.0	14	778568	-	-	221335.0
2	2	61.0	20	546006	1007	-	452865.0
3	3	68.0	20	392800	1539	1303	604154.0
4	2	58.0	20	380894	1058	-	617932.0
5	1	61.0	5	992682	-	-	7257.0
6	2	84.0	5	787001	1616	-	211215.0
7	2	63.0	20	752849	1883	-	245142.0
8	1	91.0	9	654283	-	-	345626.0
9	1	83.0	18	81176	-	-	918741.0
10	1	88.0	16	917240	-	-	82672.0
11	2	96.0	8	57853	1288	-	940667.0
12	2	76.0	10	501202	1910	-	496736.0

20 MHz – Trial 6

Number of Burst Segments = 18
Burst Segment Length = 666666.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	64.0	9	232606	1746	1230	430892.0
2	2	60.0	12	364508	1697	-	300341.0
3	2	64.0	9	627817	1685	-	37036.0
4	2	99.0	15	543761	1798	-	120909.0
5	3	64.0	5	566367	1141	1502	97464.0
6	3	97.0	6	100353	1937	1144	562941.0
7	2	57.0	5	583141	1721	-	81690.0
8	1	73.0	20	176355	-	-	490238.0
9	1	73.0	8	275746	-	-	390847.0
10	1	52.0	20	648841	-	-	17773.0
11	1	63.0	18	204411	-	-	462192.0
12	1	70.0	11	537076	-	-	129520.0
13	3	81.0	16	474570	1184	1324	189345.0
14	3	85.0	16	573803	1398	1823	89387.0
15	1	66.0	11	277809	-	-	388791.0
16	1	99.0	13	542206	-	-	124361.0
17	1	83.0	19	268735	-	-	397848.0
18	2	68.0	14	577124	1683	-	87723.0

20 MHz – Trial 7

Number of Burst Segments = 11
Burst Segment Length = 1090909.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	99.0	12	487169	1326	-	602216.0
2	1	64.0	19	591281	-	-	499564.0
3	2	75.0	19	489818	1220	-	599721.0
4	2	91.0	10	62127	1686	-	1026914.0
5	3	100.0	18	462162	1380	1339	625728.0
6	3	95.0	7	385722	1664	1644	701594.0
7	2	94.0	6	275540	1561	-	813620.0
8	1	65.0	11	268570	-	-	822274.0
9	3	91.0	5	1058191	1543	1660	29242.0
10	3	65.0	8	941247	1087	1037	147343.0
11	3	72.0	6	883496	1184	1787	204226.0

20 MHz – Trial 8

Number of Burst Segments = 16
Burst Segment Length = 750000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	57.0	13	442070	1673	1549	304537.0
2	2	70.0	5	384180	1525	-	364155.0
3	3	80.0	16	496510	1896	1860	249494.0
4	2	74.0	17	179170	1389	-	569293.0
5	1	83.0	12	179206	-	-	570711.0
6	1	51.0	17	582889	-	-	167060.0
7	3	73.0	18	115412	1341	1828	631200.0
8	1	71.0	20	647749	-	-	102180.0
9	2	95.0	8	510441	1622	-	237747.0
10	1	73.0	13	154657	-	-	595270.0
11	3	96.0	20	443208	1070	1255	304179.0
12	3	74.0	18	319710	1735	1588	426745.0
13	2	98.0	6	401143	1169	-	347492.0
14	3	93.0	13	599656	1846	1098	147121.0
15	1	71.0	18	130875	-	-	619054.0
16	3	52.0	11	378510	1557	1540	368237.0

20 MHz – Trial 9

Number of Burst Segments = 14
Burst Segment Length = 857142.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	51.0	6	182700	1134	-	673206.0
2	1	71.0	20	469512	-	-	387559.0
3	3	69.0	7	607032	1695	1100	247108.0
4	1	62.0	6	146136	-	-	710944.0
5	3	56.0	18	571332	1477	1226	282939.0
6	3	57.0	13	383302	1713	1419	470537.0
7	2	65.0	10	829491	1035	-	26486.0
8	2	87.0	17	57719	1853	-	797396.0
9	2	86.0	13	206041	1163	-	649766.0
10	2	63.0	15	576935	1464	-	278617.0
11	1	67.0	5	302204	-	-	554871.0
12	1	81.0	6	7067	-	-	849994.0
13	1	94.0	10	693143	-	-	163905.0
14	1	83.0	12	812394	-	-	44665.0

20 MHz – Trial 10

Number of Burst Segments = 17
Burst Segment Length = 705882.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	86.0	7	310893	1451	1229	392051.0
2	2	70.0	6	526672	1455	-	177615.0
3	2	98.0	14	478477	1022	-	226187.0
4	3	94.0	9	493440	1852	1096	209212.0
5	1	96.0	9	280004	-	-	425782.0
6	2	89.0	13	323069	1782	-	380853.0
7	3	66.0	8	584742	1818	1397	117727.0
8	3	76.0	20	529626	1682	1123	173223.0
9	2	66.0	16	166008	1738	-	538004.0
10	3	85.0	12	96953	1103	1792	605779.0
11	2	94.0	12	499379	1840	-	204475.0
12	1	76.0	9	537829	-	-	167977.0
13	1	82.0	16	363951	-	-	341849.0
14	3	55.0	11	428491	1611	1962	273653.0
15	1	74.0	5	74790	-	-	631018.0
16	2	60.0	5	325548	1663	-	378551.0
17	3	76.0	13	508875	1861	1923	192995.0

20 MHz – Trial 11

Number of Burst Segments = 12
Burst Segment Length = 1000000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	78.0	13	657910	1901	-	340033.0
2	3	78.0	8	514578	1830	1357	482001.0
3	1	53.0	11	279743	-	-	720204.0
4	3	95.0	16	61766	1744	1186	935019.0
5	1	93.0	12	605690	-	-	394217.0
6	1	57.0	15	24019	-	-	975924.0
7	1	65.0	5	177428	-	-	822507.0
8	2	95.0	19	874581	1036	-	124193.0
9	3	63.0	16	934638	1920	1069	62184.0
10	3	69.0	20	753692	1640	1906	242555.0
11	2	53.0	17	787549	1245	-	211100.0
12	2	96.0	5	149615	1970	-	848223.0

20 MHz – Trial 12

Number of Burst Segments = 18
Burst Segment Length = 666666.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	50.0	10	572867	1942	1184	90523.0
2	3	77.0	11	63735	1877	1671	599152.0
3	2	63.0	20	589456	1445	-	75639.0
4	2	76.0	17	645405	1665	-	19444.0
5	3	89.0	13	315282	1250	1140	348727.0
6	1	52.0	17	296827	-	-	369787.0
7	3	82.0	9	512431	1549	1435	151005.0
8	2	59.0	16	110458	1494	-	554596.0
9	3	83.0	5	643969	1557	1963	18928.0
10	1	93.0	8	427290	-	-	239283.0
11	2	92.0	9	93729	1456	-	571297.0
12	2	91.0	15	539983	1857	-	124644.0
13	1	59.0	7	481279	-	-	185328.0
14	2	96.0	11	397100	1887	-	267487.0
15	3	98.0	11	3043	1490	1317	660522.0
16	1	58.0	5	153494	-	-	513114.0
17	3	71.0	20	458793	1105	1572	204983.0
18	2	83.0	15	303538	1617	-	361345.0

20 MHz – Trial 13

Number of Burst Segments = 13
Burst Segment Length = 923076.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	1	91.0	17	247216	-	-	675769.0
2	1	67.0	19	741124	-	-	181885.0
3	1	61.0	16	491562	-	-	431453.0
4	3	84.0	19	120892	1923	1053	798956.0
5	2	56.0	15	267657	1364	-	653943.0
6	2	67.0	8	797539	1533	-	123870.0
7	2	54.0	11	642008	1673	-	279287.0
8	1	59.0	20	223222	-	-	699795.0
9	2	81.0	5	884206	1529	-	37179.0
10	1	84.0	13	325028	-	-	597964.0
11	3	54.0	10	711598	1778	1236	208302.0
12	2	58.0	20	493426	1499	-	428035.0
13	1	77.0	6	539975	-	-	383024.0

20 MHz – Trial 14

Number of Burst Segments = 18
Burst Segment Length = 666666.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	69.0	13	16264	1229	1778	647188.0
2	2	68.0	7	643780	1609	-	21141.0
3	1	90.0	16	620788	-	-	45788.0
4	3	50.0	12	117518	1882	1795	545321.0
5	1	89.0	10	249022	-	-	417555.0
6	3	58.0	19	393268	1850	1231	270143.0
7	2	91.0	19	143295	1708	-	521481.0
8	1	76.0	20	54684	-	-	611906.0
9	2	81.0	6	342721	1971	-	321812.0
10	3	73.0	16	276487	1092	1981	386887.0
11	1	51.0	17	435123	-	-	231492.0
12	3	66.0	10	466414	1603	1459	196992.0
13	3	92.0	7	572533	1802	1686	90369.0
14	1	91.0	9	441976	-	-	224599.0
15	2	72.0	5	84728	1272	-	580522.0
16	3	80.0	10	112187	1037	1219	551983.0
17	2	90.0	7	379188	1298	-	286000.0
18	3	76.0	19	623236	1316	1912	39974.0

20 MHz – Trial 15

Number of Burst Segments = 11
Burst Segment Length = 1090909.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	72.0	20	437573	1057	-	652135.0
2	1	91.0	12	457721	-	-	633097.0
3	3	54.0	13	736721	1933	1167	350926.0
4	1	72.0	13	421835	-	-	669002.0
5	2	64.0	17	155303	1449	-	934029.0
6	3	85.0	20	1012171	1327	1470	75686.0
7	1	74.0	10	979882	-	-	110953.0
8	1	59.0	6	1071748	-	-	19102.0
9	1	50.0	16	723951	-	-	366908.0
10	3	77.0	13	96392	1304	1624	991358.0
11	1	86.0	5	1011503	-	-	79320.0

20 MHz – Trial 16

Number of Burst Segments = 8
Burst Segment Length = 1500000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	56.0	14	462423	1292	1719	1034398.0
2	3	69.0	16	1087467	1743	1944	408639.0
3	3	85.0	12	174535	1960	1062	1322188.0
4	1	68.0	8	870837	-	-	629095.0
5	3	80.0	6	1122262	1095	1712	374691.0
6	2	89.0	14	220380	1424	-	1278018.0
7	2	56.0	16	793236	1631	-	705021.0
8	1	86.0	12	1031215	-	-	468699.0

20 MHz – Trial 17

Number of Burst Segments = 10
Burst Segment Length = 1200000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	1	76.0	11	857429	-	-	342495.0
2	2	92.0	14	147913	1803	-	1050100.0
3	1	81.0	7	403259	-	-	796660.0
4	2	60.0	19	278481	1178	-	920221.0
5	1	63.0	12	978402	-	-	221535.0
6	2	56.0	7	48537	1760	-	1149591.0
7	1	83.0	18	363643	-	-	836274.0
8	3	68.0	5	132374	1433	1655	1064334.0
9	2	57.0	8	966106	1464	-	232316.0
10	2	60.0	19	1038057	1709	-	160114.0

20 MHz – Trial 18

Number of Burst Segments = 19
Burst Segment Length = 631578.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	85.0	6	103198	1653	1400	525072.0
2	1	66.0	11	240179	-	-	391333.0
3	2	50.0	20	167668	1470	-	462340.0
4	2	90.0	17	160460	1897	-	469041.0
5	2	82.0	15	366548	1863	-	263003.0
6	3	88.0	18	396718	1612	1947	231037.0
7	1	77.0	13	81704	-	-	549797.0
8	1	67.0	7	278086	-	-	353425.0
9	1	90.0	8	430633	-	-	200855.0
10	1	74.0	16	112624	-	-	518880.0
11	3	70.0	12	311986	1649	1465	316268.0
12	2	68.0	10	418004	1140	-	212298.0
13	1	70.0	16	530911	-	-	100597.0
14	2	73.0	9	563383	1416	-	66633.0
15	1	60.0	16	26923	-	-	604595.0
16	1	57.0	13	285782	-	-	345739.0
17	3	79.0	5	69409	1728	1766	558438.0
18	2	78.0	16	187089	1957	-	442376.0
19	3	51.0	11	119135	1826	1720	508744.0

20 MHz – Trial 19

Number of Burst Segments = 11
Burst Segment Length = 1090909.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	70.0	8	141346	1073	-	948350.0
2	1	60.0	18	208818	-	-	882031.0
3	3	58.0	16	476707	1203	1372	611453.0
4	2	95.0	12	1019603	1900	-	69216.0
5	2	96.0	20	623708	1391	-	465618.0
6	1	91.0	17	35987	-	-	1054831.0
7	1	57.0	19	577211	-	-	513641.0
8	2	99.0	15	8406	1520	-	1080785.0
9	2	76.0	13	42050	1294	-	1047413.0
10	1	64.0	9	606480	-	-	484365.0
11	1	58.0	20	861886	-	-	228965.0

20 MHz – Trial 20

Number of Burst Segments = 10
Burst Segment Length = 1200000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	68.0	16	642040	1573	-	556251.0
2	2	65.0	13	303344	1462	-	895064.0
3	3	65.0	9	207360	1894	1256	989295.0
4	2	61.0	17	1070444	1779	-	127655.0
5	1	100.0	10	433895	-	-	766005.0
6	2	77.0	19	47256	1194	-	1151396.0
7	3	80.0	11	787937	1839	1675	408309.0
8	1	70.0	17	779284	-	-	420646.0
9	2	95.0	11	470780	1081	-	727949.0
10	3	95.0	12	9821	1179	1460	1187255.0

20 MHz – Trial 21

Number of Burst Segments = 9
Burst Segment Length = 1333333.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	97.0	14	281426	1686	-	1050027.0
2	3	76.0	19	166983	1254	1682	1163186.0
3	2	60.0	19	1193107	1889	-	138217.0
4	3	64.0	17	663191	1471	1075	667404.0
5	3	54.0	15	431202	1707	1179	899083.0
6	1	56.0	9	862520	-	-	470757.0
7	1	77.0	7	468150	-	-	865106.0
8	2	73.0	9	1041487	1019	-	290681.0
9	3	92.0	17	660599	1836	1258	669364.0

20 MHz – Trial 22

Number of Burst Segments = 10
Burst Segment Length = 1200000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	61.0	16	297966	1642	-	900270.0
2	1	74.0	15	849843	-	-	350083.0
3	3	70.0	10	9482	1054	1688	1187566.0
4	3	86.0	20	968821	1272	1615	228034.0
5	3	90.0	16	936652	1849	1681	259548.0
6	2	94.0	9	197184	1556	-	1001072.0
7	1	79.0	14	481086	-	-	718835.0
8	2	83.0	5	579307	1887	-	618640.0
9	3	61.0	15	29734	1007	1652	1167424.0
10	3	66.0	9	605770	1160	1478	591394.0

20 MHz – Trial 23

Number of Burst Segments = 8
Burst Segment Length = 1500000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	97.0	17	437781	1670	-	1060355.0
2	3	96.0	15	88089	1348	1042	1409233.0
3	3	57.0	17	936745	1230	1885	559969.0
4	1	55.0	18	276275	-	-	1223670.0
5	1	82.0	10	958207	-	-	541711.0
6	1	90.0	7	119949	-	-	1379961.0
7	2	90.0	17	118681	1772	-	1379367.0
8	3	67.0	17	880484	1732	1763	615820.0

20 MHz – Trial 24

Number of Burst Segments = 10
Burst Segment Length = 1200000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	66.0	17	236168	1666	-	962034.0
2	2	83.0	15	371328	1278	-	827228.0
3	2	71.0	18	667741	1599	-	530518.0
4	2	51.0	12	1046993	1783	-	151122.0
5	2	55.0	20	1102112	1762	-	96016.0
6	2	93.0	8	1167178	1786	-	30850.0
7	2	62.0	17	1011025	1614	-	187237.0
8	1	53.0	19	1163840	-	-	36107.0
9	1	68.0	10	1179033	-	-	20899.0
10	1	74.0	18	446134	-	-	753792.0

20 MHz – Trial 25

Number of Burst Segments = 14
Burst Segment Length = 857142.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	70.0	17	41992	1055	-	813955.0
2	2	93.0	5	99201	1187	-	756568.0
3	2	71.0	20	375789	1735	-	479476.0
4	3	65.0	11	761085	1367	1719	92776.0
5	2	91.0	11	110637	1102	-	745221.0
6	2	56.0	14	634371	1541	-	221118.0
7	3	72.0	9	598013	1269	1325	256319.0
8	2	78.0	16	467950	1275	-	387761.0
9	2	69.0	13	268980	1198	-	586826.0
10	3	78.0	15	262612	1527	1972	590797.0
11	3	92.0	10	680681	1613	1480	173092.0
12	1	97.0	10	6230	-	-	850815.0
13	3	66.0	16	106590	1930	1742	746682.0
14	3	60.0	14	382616	1602	1441	471303.0

20 MHz – Trial 26

Number of Burst Segments = 20
Burst Segment Length = 600000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	84.0	6	474350	1107	1582	122709.0
2	1	53.0	14	577557	-	-	22390.0
3	2	53.0	18	349954	1115	-	248825.0
4	2	94.0	15	573907	1968	-	23937.0
5	3	81.0	11	540920	1570	1120	56147.0
6	1	81.0	20	380631	-	-	219288.0
7	1	65.0	6	4357	-	-	595578.0
8	2	64.0	5	69814	1229	-	528829.0
9	3	62.0	12	203685	1874	1227	393028.0
10	1	55.0	8	486579	-	-	113366.0
11	3	95.0	5	54839	1894	1031	541951.0
12	1	53.0	7	255698	-	-	344249.0
13	3	83.0	13	214026	1608	1206	382911.0
14	3	100.0	8	502429	1850	1941	93480.0
15	1	67.0	14	33541	-	-	566392.0
16	1	99.0	17	86834	-	-	513067.0
17	2	70.0	14	241928	1462	-	356470.0
18	3	84.0	7	272391	1222	1665	324470.0
19	3	74.0	15	321581	1284	1652	275261.0
20	3	58.0	19	220774	1649	1769	375634.0

20 MHz – Trial 27

Number of Burst Segments = 9
Burst Segment Length = 1333333.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	72.0	14	1009383	1694	-	322112.0
2	3	88.0	15	778718	1856	1359	551136.0
3	3	74.0	19	673046	1190	1131	657744.0
4	3	61.0	16	284310	1574	1574	1045692.0
5	1	58.0	7	845197	-	-	488078.0
6	2	83.0	6	745999	1740	-	585428.0
7	2	94.0	19	628502	1439	-	703204.0
8	2	70.0	15	807016	1058	-	525119.0
9	1	80.0	20	439235	-	-	894018.0

20 MHz – Trial 28

Number of Burst Segments = 17
Burst Segment Length = 705882.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	87.0	14	545318	1697	1879	156727.0
2	2	65.0	10	652593	1111	-	52048.0
3	3	74.0	6	305643	1795	1194	397028.0
4	2	97.0	15	75236	1980	-	628472.0
5	1	82.0	11	155056	-	-	550744.0
6	3	51.0	9	416949	1886	1053	285841.0
7	1	99.0	14	618226	-	-	87557.0
8	3	73.0	18	316566	1917	1989	385191.0
9	2	94.0	8	152235	1365	-	552094.0
10	2	51.0	7	125991	1181	-	578608.0
11	1	60.0	7	95127	-	-	610695.0
12	2	79.0	5	530753	1613	-	173358.0
13	1	58.0	9	357506	-	-	348318.0
14	1	53.0	16	635688	-	-	70141.0
15	1	99.0	6	411034	-	-	294749.0
16	2	98.0	12	155787	1991	-	547908.0
17	2	52.0	19	245292	1894	-	458592.0

20 MHz – Trial 29

Number of Burst Segments = 10
Burst Segment Length = 1200000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	83.0	20	169116	1718	1817	1027100.0
2	1	96.0	11	769271	-	-	430633.0
3	2	85.0	13	1131315	1583	-	66932.0
4	2	81.0	13	1130088	1008	-	68742.0
5	3	57.0	16	508261	1451	1754	688363.0
6	2	80.0	10	883619	1408	-	314813.0
7	3	77.0	16	1003995	1887	1646	192241.0
8	1	76.0	12	721978	-	-	477946.0
9	2	58.0	7	310389	1323	-	888172.0
10	3	71.0	16	559713	1697	1764	636613.0

20 MHz – Trial 30

Number of Burst Segments = 11
Burst Segment Length = 1090909.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	84.0	6	208605	1511	1046	879495.0
2	1	93.0	6	787339	-	-	303477.0
3	1	70.0	17	503641	-	-	587198.0
4	3	70.0	8	668209	1071	1083	420336.0
5	1	90.0	8	872214	-	-	218605.0
6	3	55.0	16	504422	1360	1467	583495.0
7	2	85.0	16	448503	1633	-	640603.0
8	1	68.0	10	384524	-	-	706317.0
9	1	87.0	13	413720	-	-	677102.0
10	2	94.0	9	544986	1119	-	544616.0
11	1	51.0	13	299256	-	-	791602.0

40 MHz – Trial 1

Number of Burst Segments = 16
Burst Segment Length = 750000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	97.0	17	475717	1183	1651	271158.0
2	3	94.0	19	417964	1095	1056	329603.0
3	3	94.0	15	523587	1814	1591	222726.0
4	3	74.0	18	443310	1964	1894	302610.0
5	2	81.0	17	404793	1419	-	343626.0
6	3	83.0	7	139419	1929	1045	607358.0
7	3	96.0	11	25518	1013	1787	721394.0
8	1	75.0	14	609251	-	-	140674.0
9	2	62.0	11	144506	1253	-	604117.0
10	1	57.0	6	191744	-	-	558199.0
11	2	87.0	14	95231	1161	-	653434.0
12	3	68.0	17	318806	1092	1969	427929.0
13	2	98.0	18	612962	1891	-	134951.0
14	1	99.0	14	404473	-	-	345428.0
15	2	52.0	8	31157	1754	-	716985.0
16	2	79.0	20	574367	1528	-	173947.0

40 MHz – Trial 2

Number of Burst Segments = 18
Burst Segment Length = 666666.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	56.0	12	597818	1807	-	66929.0
2	1	91.0	20	411899	-	-	254676.0
3	2	82.0	17	429814	1098	-	235590.0
4	3	83.0	18	378142	1415	1168	285692.0
5	1	67.0	10	65796	-	-	600803.0
6	3	97.0	19	74739	1651	1517	588468.0
7	2	54.0	11	252184	1721	-	412653.0
8	2	97.0	10	143827	1618	-	521027.0
9	2	79.0	8	235074	1555	-	429879.0
10	3	78.0	17	249976	1944	1398	413114.0
11	2	94.0	11	201676	1347	-	463455.0
12	1	64.0	18	284245	-	-	382357.0
13	2	59.0	15	649423	1411	-	15714.0
14	3	50.0	19	662439	1400	1360	1317.0
15	2	52.0	16	251712	1127	-	413723.0
16	1	98.0	7	569233	-	-	97335.0
17	1	100.0	12	193217	-	-	473349.0
18	2	89.0	19	103596	1994	-	560898.0

40 MHz – Trial 3

Number of Burst Segments = 11
Burst Segment Length = 1090909.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	1	61.0	18	672042	-	-	418806.0
2	3	70.0	20	177070	1217	1409	911003.0
3	2	55.0	9	293381	1860	-	795558.0
4	1	100.0	10	309436	-	-	781373.0
5	3	75.0	13	193310	1175	1573	894626.0
6	1	64.0	11	849068	-	-	241777.0
7	1	59.0	8	335485	-	-	755365.0
8	3	83.0	19	1010774	1683	1884	76319.0
9	1	69.0	12	73474	-	-	1017366.0
10	3	81.0	12	1067576	1457	1507	20126.0
11	1	84.0	5	334720	-	-	756105.0

40 MHz – Trial 4

Number of Burst Segments = 15
Burst Segment Length = 800000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	72.0	10	596902	1939	-	201015.0
2	2	86.0	7	456964	1769	-	341095.0
3	1	97.0	14	401331	-	-	398572.0
4	2	95.0	9	478634	1842	-	319334.0
5	1	64.0	19	308800	-	-	491136.0
6	3	79.0	16	692394	1988	1259	104122.0
7	2	68.0	17	145133	1549	-	653182.0
8	2	53.0	19	707062	1055	-	91777.0
9	3	100.0	9	480965	1469	1050	316216.0
10	2	92.0	15	708316	1606	-	89894.0
11	3	79.0	12	6301	1943	1305	790214.0
12	1	79.0	15	762017	-	-	37904.0
13	3	71.0	16	69942	1369	1610	726866.0
14	3	74.0	10	468838	1870	1452	327618.0
15	3	56.0	16	471855	1003	1804	325170.0

40 MHz – Trial 5

Number of Burst Segments = 17
Burst Segment Length = 705882.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	87.0	16	250128	1785	-	453795.0
2	1	58.0	17	80566	-	-	625258.0
3	1	73.0	6	121109	-	-	584700.0
4	1	96.0	7	85197	-	-	620589.0
5	2	61.0	16	633711	1997	-	70052.0
6	1	67.0	9	42186	-	-	663629.0
7	1	95.0	8	126215	-	-	579572.0
8	3	53.0	8	111822	1685	1385	590831.0
9	2	72.0	9	607776	1374	-	96588.0
10	2	98.0	8	551616	1817	-	152253.0
11	3	90.0	15	325972	1282	1949	376409.0
12	2	90.0	8	512002	1551	-	192149.0
13	3	50.0	18	89147	1875	1104	613606.0
14	2	71.0	18	510619	1937	-	193184.0
15	1	80.0	12	305990	-	-	399812.0
16	1	88.0	16	264102	-	-	441692.0
17	1	87.0	18	367757	-	-	338038.0

40 MHz – Trial 6

Number of Burst Segments = 12
Burst Segment Length = 1000000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	99.0	15	55493	1648	1530	941032.0
2	2	63.0	11	82272	1882	-	915720.0
3	3	80.0	9	299375	1087	1069	698229.0
4	1	92.0	19	215830	-	-	784078.0
5	2	61.0	20	558282	1905	-	439691.0
6	3	81.0	19	950349	1598	1050	46760.0
7	3	87.0	6	296005	1453	1428	700853.0
8	2	95.0	11	458156	1029	-	540625.0
9	2	67.0	6	352774	1694	-	645398.0
10	2	50.0	9	601478	1826	-	396596.0
11	1	76.0	11	46716	-	-	953208.0
12	3	88.0	19	826545	1615	1159	170417.0

40 MHz – Trial 7

Number of Burst Segments = 16
Burst Segment Length = 750000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	62.0	11	260232	1638	-	488006.0
2	1	58.0	13	667098	-	-	82844.0
3	1	98.0	19	570025	-	-	179877.0
4	2	76.0	7	186910	1494	-	561444.0
5	1	87.0	6	708023	-	-	41890.0
6	2	93.0	5	69456	1012	-	679346.0
7	3	86.0	18	496328	1010	2000	250404.0
8	3	82.0	6	537282	1683	1283	209506.0
9	2	67.0	16	4922	1612	-	743332.0
10	1	74.0	6	432441	-	-	317485.0
11	1	64.0	19	477718	-	-	272218.0
12	1	78.0	15	400018	-	-	349904.0
13	2	59.0	12	468727	1769	-	279386.0
14	2	74.0	8	571698	1706	-	176448.0
15	1	97.0	18	116763	-	-	633140.0
16	1	53.0	20	232248	-	-	517699.0

40 MHz – Trial 8

Number of Burst Segments = 12
Burst Segment Length = 1000000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	1	84.0	11	612660	-	-	387256.0
2	3	74.0	17	236281	1126	1490	760881.0
3	1	89.0	19	438031	-	-	561880.0
4	2	76.0	18	745463	1632	-	252753.0
5	3	81.0	18	58370	1138	1774	938475.0
6	3	56.0	6	668705	1279	1054	328794.0
7	3	100.0	15	650658	1389	1360	346293.0
8	3	99.0	15	84816	1730	1288	911869.0
9	3	74.0	8	926604	1231	1780	70163.0
10	1	61.0	6	485164	-	-	514775.0
11	1	50.0	9	861440	-	-	138510.0
12	1	50.0	12	760725	-	-	239225.0

40 MHz – Trial 9

Number of Burst Segments = 13
Burst Segment Length = 923076.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	100.0	7	455576	1542	1523	464135.0
2	3	78.0	18	819833	1060	1648	100301.0
3	3	96.0	6	465936	1772	1488	453592.0
4	2	80.0	10	645918	1434	-	275564.0
5	2	52.0	16	567405	1347	-	354220.0
6	3	59.0	9	571875	1330	1809	347885.0
7	2	85.0	19	719731	1234	-	201941.0
8	1	82.0	10	84725	-	-	838269.0
9	2	79.0	11	768268	1230	-	153420.0
10	1	63.0	6	654185	-	-	268828.0
11	3	51.0	15	200625	1493	1621	719184.0
12	3	51.0	5	103263	1961	1989	815710.0
13	1	73.0	12	30620	-	-	892383.0

40 MHz – Trial 10

Number of Burst Segments = 19
Burst Segment Length = 631578.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	74.0	8	39748	1131	-	590551.0
2	1	93.0	5	285741	-	-	345744.0
3	1	89.0	11	146419	-	-	485070.0
4	3	83.0	7	289408	1137	1364	339420.0
5	1	59.0	10	157514	-	-	474005.0
6	2	60.0	12	337507	1403	-	292548.0
7	3	73.0	17	437238	1240	1358	191523.0
8	2	78.0	8	369112	1771	-	260539.0
9	2	51.0	20	167307	1923	-	462246.0
10	3	84.0	5	252222	1242	1998	375864.0
11	3	67.0	11	85876	1106	1089	543306.0
12	2	94.0	13	474806	1480	-	155104.0
13	1	86.0	9	300773	-	-	330719.0
14	2	95.0	8	95211	1514	-	534663.0
15	1	50.0	18	253570	-	-	377958.0
16	1	91.0	15	595674	-	-	35813.0
17	1	93.0	7	564894	-	-	66591.0
18	2	60.0	16	386895	1752	-	242811.0
19	2	80.0	12	471772	1781	-	157865.0

40 MHz – Trial 11

Number of Burst Segments = 11
Burst Segment Length = 1090909.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	1	96.0	13	366434	-	-	724379.0
2	3	94.0	12	473580	1274	1986	613787.0
3	1	68.0	8	826841	-	-	264000.0
4	3	100.0	9	808080	1502	1551	279476.0
5	3	72.0	7	271967	1927	1340	815459.0
6	2	72.0	12	907634	1802	-	181329.0
7	3	61.0	14	193806	1643	1976	893301.0
8	2	94.0	11	652617	1016	-	437088.0
9	1	54.0	8	269717	-	-	821138.0
10	3	63.0	19	896200	1104	1279	192137.0
11	1	80.0	14	707800	-	-	383029.0

40 MHz – Trial 12

Number of Burst Segments = 13
Burst Segment Length = 923076.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	1	80.0	11	464975	-	-	458021.0
2	3	94.0	12	710290	1961	1150	209393.0
3	1	92.0	18	319011	-	-	603973.0
4	2	95.0	19	564635	1199	-	357052.0
5	2	82.0	11	29829	1163	-	891920.0
6	1	58.0	6	582352	-	-	340666.0
7	3	90.0	16	705779	1561	1657	213809.0
8	1	95.0	10	635539	-	-	287442.0
9	2	56.0	6	893736	1316	-	27912.0
10	3	82.0	7	171717	1593	1893	747627.0
11	1	66.0	13	219354	-	-	703656.0
12	1	89.0	9	547535	-	-	375452.0
13	2	59.0	9	648325	1465	-	273168.0

40 MHz – Trial 13

Number of Burst Segments = 18
Burst Segment Length = 666666.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	81.0	17	427300	1959	1394	235770.0
2	3	99.0	19	313214	1350	1553	350252.0
3	1	69.0	6	308988	-	-	357609.0
4	3	64.0	15	228160	1410	1276	435628.0
5	2	60.0	16	470580	1194	-	194772.0
6	1	58.0	18	222818	-	-	443790.0
7	3	89.0	7	314639	1821	1576	348363.0
8	3	89.0	14	5587	1726	1307	657779.0
9	1	71.0	19	496899	-	-	169696.0
10	1	62.0	17	515695	-	-	150909.0
11	1	65.0	20	203128	-	-	463473.0
12	2	81.0	6	228047	1748	-	436709.0
13	3	88.0	13	302342	1761	1304	360995.0
14	1	78.0	20	146619	-	-	519969.0
15	1	86.0	8	561751	-	-	104829.0
16	3	78.0	18	363289	1980	1368	299795.0
17	2	64.0	16	551898	1604	-	113036.0
18	1	65.0	5	579248	-	-	87353.0

40 MHz – Trial 14

Number of Burst Segments = 12
Burst Segment Length = 1000000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	1	89.0	16	918072	-	-	81839.0
2	1	89.0	12	286501	-	-	713410.0
3	2	51.0	16	622390	1142	-	376366.0
4	1	58.0	8	646750	-	-	353192.0
5	2	64.0	6	852435	1335	-	146102.0
6	1	60.0	5	607583	-	-	392357.0
7	2	87.0	20	763034	1834	-	234958.0
8	2	98.0	8	212922	1484	-	785398.0
9	2	90.0	5	491853	1383	-	506584.0
10	3	77.0	13	273503	1025	1708	723533.0
11	3	68.0	5	853364	1969	1500	142963.0
12	2	87.0	10	798619	1044	-	200163.0

40 MHz – Trial 15

Number of Burst Segments = 8
Burst Segment Length = 1500000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	94.0	9	566534	1241	1774	930169.0
2	1	76.0	5	1308492	-	-	191432.0
3	2	57.0	16	972385	1400	-	526101.0
4	2	81.0	18	244690	1274	-	1253874.0
5	2	92.0	7	1234345	1331	-	264140.0
6	3	91.0	12	203719	1880	1752	1292376.0
7	3	98.0	15	448061	1539	1080	1049026.0
8	2	89.0	6	216317	1001	-	1282504.0

40 MHz – Trial 16

Number of Burst Segments = 15
Burst Segment Length = 800000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	1	87.0	17	731393	-	-	68520.0
2	2	77.0	20	166396	1337	-	632113.0
3	2	65.0	17	110004	1555	-	688311.0
4	3	64.0	17	328484	1812	1830	467682.0
5	3	98.0	17	118179	1157	1616	678754.0
6	3	73.0	7	136088	1697	1938	660058.0
7	1	70.0	18	160695	-	-	639235.0
8	1	68.0	19	164548	-	-	635384.0
9	3	76.0	7	28551	1164	1207	768850.0
10	2	94.0	14	429383	1604	-	368825.0
11	3	99.0	7	612551	1683	1922	183547.0
12	3	90.0	11	469272	1328	1744	327386.0
13	3	74.0	6	346758	1175	1968	449877.0
14	1	69.0	14	56227	-	-	743704.0
15	2	87.0	14	238157	1497	-	560172.0

40 MHz – Trial 17

Number of Burst Segments = 10
Burst Segment Length = 1200000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	1	94.0	18	972111	-	-	227795.0
2	2	76.0	14	83673	1787	-	1114388.0
3	1	61.0	8	842665	-	-	357274.0
4	3	70.0	14	257229	1793	1255	939513.0
5	3	84.0	9	361599	1026	1108	836015.0
6	2	78.0	18	999527	1091	-	199226.0
7	3	79.0	20	320502	1768	1159	876334.0
8	2	84.0	11	662826	1581	-	535425.0
9	3	62.0	11	664723	1647	1324	532120.0
10	3	69.0	20	874679	1659	1287	322168.0

40 MHz – Trial 18

Number of Burst Segments = 13
Burst Segment Length = 923076.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	100.0	20	675891	1309	-	245676.0
2	3	62.0	8	426095	1024	1137	494634.0
3	2	94.0	19	662853	1808	-	258227.0
4	3	54.0	16	476899	1998	1950	442067.0
5	3	90.0	8	471794	1404	1100	448508.0
6	3	99.0	20	175933	1826	1491	743529.0
7	3	66.0	7	749471	1315	1664	170428.0
8	1	57.0	19	648523	-	-	274496.0
9	1	53.0	11	169199	-	-	753824.0
10	3	51.0	6	563988	1841	1315	355779.0
11	1	86.0	11	223396	-	-	699594.0
12	2	55.0	7	141552	1413	-	780001.0
13	1	53.0	12	851018	-	-	72005.0

40 MHz – Trial 19

Number of Burst Segments = 20
Burst Segment Length = 600000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	1	74.0	14	593914	-	-	6012.0
2	3	73.0	5	204211	1854	1289	392427.0
3	1	77.0	15	528352	-	-	71571.0
4	3	100.0	17	228918	1611	1437	367734.0
5	1	95.0	16	441198	-	-	158707.0
6	2	79.0	18	35353	1379	-	563110.0
7	2	86.0	15	153703	1782	-	444343.0
8	1	71.0	16	344007	-	-	255922.0
9	3	89.0	15	568675	1771	1551	27736.0
10	3	99.0	9	535968	1778	1977	59980.0
11	2	86.0	11	449227	1299	-	149302.0
12	2	61.0	11	116654	1399	-	481825.0
13	3	89.0	9	251581	1173	1222	345757.0
14	2	64.0	6	336387	1017	-	262468.0
15	3	81.0	5	93771	1997	1438	502551.0
16	3	81.0	10	334278	1612	1250	262617.0
17	2	63.0	20	84043	1681	-	514150.0
18	2	93.0	16	535652	1657	-	62505.0
19	3	75.0	13	120548	1117	1520	476590.0
20	3	55.0	11	538400	1154	1901	58380.0

40 MHz – Trial 20

Number of Burst Segments = 15
Burst Segment Length = 800000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	72.0	20	212545	1705	-	585606.0
2	2	60.0	9	74498	1035	-	724347.0
3	2	77.0	17	490338	1585	-	307923.0
4	1	69.0	9	214053	-	-	585878.0
5	3	66.0	17	324372	1761	1793	471876.0
6	2	62.0	17	266893	1748	-	531235.0
7	1	100.0	17	153416	-	-	646484.0
8	1	77.0	12	232654	-	-	567269.0
9	3	79.0	8	290558	1512	1308	506385.0
10	2	94.0	12	276147	1618	-	522047.0
11	1	87.0	10	208065	-	-	591848.0
12	1	100.0	18	564050	-	-	235850.0
13	1	83.0	12	240214	-	-	559703.0
14	1	67.0	12	325879	-	-	474054.0
15	1	53.0	13	120933	-	-	679014.0

40 MHz – Trial 21

Number of Burst Segments = 12
Burst Segment Length = 1000000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	1	87.0	13	408316	-	-	591597.0
2	2	64.0	6	785250	1291	-	213331.0
3	2	76.0	19	260261	1784	-	737803.0
4	1	54.0	6	398239	-	-	601707.0
5	1	63.0	14	200646	-	-	799291.0
6	3	78.0	19	868231	1274	1392	128869.0
7	1	86.0	13	950884	-	-	49030.0
8	1	78.0	14	287512	-	-	712410.0
9	3	74.0	7	886776	1091	1028	110883.0
10	3	81.0	15	681686	1858	1632	314581.0
11	2	54.0	14	129262	1890	-	868740.0
12	3	86.0	19	178628	1478	1775	817861.0

40 MHz – Trial 22

Number of Burst Segments = 12
Burst Segment Length = 1000000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	80.0	18	506854	1247	-	491739.0
2	2	54.0	20	680676	1520	-	317696.0
3	2	55.0	9	901723	1245	-	96922.0
4	1	95.0	10	798246	-	-	201659.0
5	2	88.0	17	784510	1086	-	214228.0
6	3	53.0	5	70386	1750	1375	926330.0
7	3	67.0	9	238054	1873	1339	758533.0
8	1	81.0	16	897092	-	-	102827.0
9	2	74.0	19	665047	1700	-	333105.0
10	2	89.0	5	419059	1667	-	579096.0
11	3	99.0	19	812972	1744	1687	183300.0
12	3	72.0	6	717185	1755	1072	279772.0

40 MHz – Trial 23

Number of Burst Segments = 11
Burst Segment Length = 1090909.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	64.0	13	412186	1563	-	677032.0
2	2	66.0	7	957310	1158	-	132309.0
3	3	55.0	15	818994	1134	1413	269203.0
4	2	94.0	18	1004097	1995	-	84629.0
5	2	74.0	12	402446	1468	-	686847.0
6	3	89.0	9	24025	1929	1396	1063292.0
7	3	85.0	8	2095	1355	1229	1085975.0
8	1	53.0	9	678341	-	-	412515.0
9	2	89.0	12	193659	1623	-	895449.0
10	2	76.0	20	273051	1545	-	816161.0
11	3	72.0	7	867191	1529	1418	220555.0

40 MHz – Trial 24

Number of Burst Segments = 19
Burst Segment Length = 631578.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	83.0	18	134119	1695	-	495598.0
2	1	94.0	15	5628	-	-	625856.0
3	1	77.0	5	420006	-	-	211495.0
4	2	65.0	12	355819	1208	-	274421.0
5	2	53.0	20	305708	1566	-	324198.0
6	3	68.0	19	183708	1209	1733	444724.0
7	3	54.0	14	481598	1243	1446	147129.0
8	2	53.0	6	336343	1656	-	293473.0
9	3	63.0	11	481195	1378	1275	147541.0
10	2	95.0	9	213735	1043	-	416610.0
11	2	76.0	16	8362	1469	-	621595.0
12	3	68.0	15	248223	1980	1403	379768.0
13	1	89.0	11	462014	-	-	169475.0
14	1	99.0	8	410517	-	-	220962.0
15	2	61.0	13	13299	1351	-	616806.0
16	3	94.0	11	97312	1704	1742	530538.0
17	2	51.0	10	438772	1540	-	191164.0
18	2	66.0	11	528175	1195	-	102076.0
19	1	57.0	7	495721	-	-	135800.0

40 MHz – Trial 25

Number of Burst Segments = 15
Burst Segment Length = 800000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	95.0	17	705178	1354	1802	91381.0
2	3	62.0	8	610189	1499	1656	186470.0
3	3	81.0	18	783913	1465	1598	12781.0
4	2	75.0	12	703116	1204	-	95530.0
5	2	80.0	12	399240	1566	-	399034.0
6	2	51.0	17	503972	1147	-	294779.0
7	1	53.0	15	558511	-	-	241436.0
8	1	91.0	10	449399	-	-	350510.0
9	2	82.0	10	27474	1383	-	770979.0
10	3	85.0	17	677835	1220	1894	118796.0
11	1	86.0	5	619495	-	-	180419.0
12	3	74.0	17	49255	1792	1627	747104.0
13	1	64.0	12	44219	-	-	755717.0
14	3	64.0	15	222025	1327	1578	574878.0
15	1	89.0	9	152215	-	-	647696.0

40 MHz – Trial 26

Number of Burst Segments = 8
Burst Segment Length = 1500000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	53.0	11	498799	1525	-	999570.0
2	1	69.0	9	1384197	-	-	115734.0
3	1	93.0	19	1398185	-	-	101722.0
4	1	72.0	5	1070416	-	-	429512.0
5	2	78.0	6	1098476	1573	-	399795.0
6	1	77.0	16	1394942	-	-	104981.0
7	2	51.0	19	1262917	1963	-	235018.0
8	1	89.0	19	37782	-	-	1462129.0

40 MHz – Trial 27

Number of Burst Segments = 13
Burst Segment Length = 923076.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	73.0	17	600269	1137	-	321524.0
2	3	52.0	7	19351	1069	1769	900731.0
3	1	64.0	17	299883	-	-	623129.0
4	2	90.0	12	213209	1543	-	708144.0
5	3	73.0	17	233321	1862	1729	685945.0
6	3	90.0	5	518513	1860	1566	400867.0
7	2	91.0	13	65727	1571	-	855596.0
8	3	70.0	17	74540	1692	1388	845246.0
9	1	73.0	5	655290	-	-	267713.0
10	2	98.0	20	408444	1752	-	512684.0
11	3	54.0	10	513298	1332	1368	406916.0
12	1	82.0	7	29879	-	-	893115.0
13	3	70.0	13	300546	1226	1857	619237.0

40 MHz – Trial 28

Number of Burst Segments = 13
Burst Segment Length = 923076.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	3	55.0	8	397431	1883	1813	521784.0
2	1	89.0	14	614470	-	-	308517.0
3	3	82.0	17	66278	1059	1399	854094.0
4	3	99.0	13	249407	1315	1451	670606.0
5	3	54.0	17	83967	1088	1832	836027.0
6	1	73.0	14	371581	-	-	551422.0
7	2	68.0	19	145277	1250	-	776413.0
8	2	52.0	13	884294	1048	-	37630.0
9	3	70.0	9	456717	1349	1958	462842.0
10	1	85.0	8	444376	-	-	478615.0
11	3	99.0	12	453719	1811	1390	465859.0
12	1	62.0	19	382375	-	-	540639.0
13	3	97.0	11	65291	1555	1136	854803.0

40 MHz – Trial 29

Number of Burst Segments = 16
Burst Segment Length = 750000.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	1	78.0	18	719937	-	-	29985.0
2	3	70.0	17	10295	1092	1579	736824.0
3	3	78.0	10	665977	1169	1494	81126.0
4	1	65.0	10	181144	-	-	568791.0
5	2	50.0	14	674989	1979	-	72932.0
6	3	98.0	9	686312	1231	1084	61079.0
7	1	64.0	16	116624	-	-	633312.0
8	3	95.0	15	245763	1728	1396	500828.0
9	2	76.0	19	147191	1806	-	600851.0
10	2	58.0	20	490014	1963	-	257907.0
11	2	56.0	15	471045	1702	-	277141.0
12	3	73.0	6	57547	1552	1776	688906.0
13	2	99.0	7	708556	1688	-	39558.0
14	2	68.0	16	82711	1743	-	665410.0
15	1	68.0	20	306461	-	-	443471.0
16	1	80.0	8	604802	-	-	145118.0

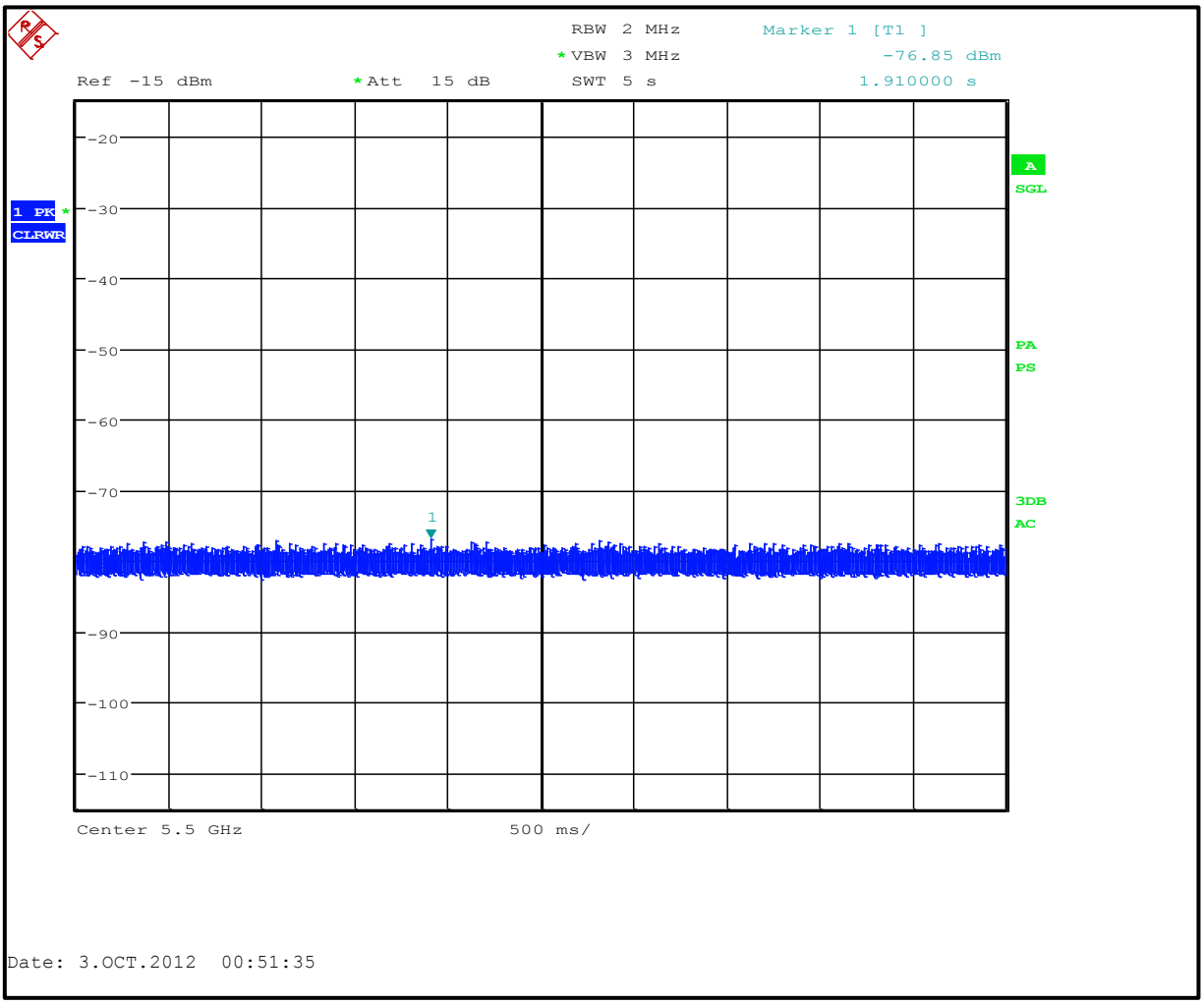
40 MHz – Trial 30

Number of Burst Segments = 11
Burst Segment Length = 1090909.0 usec

Burst Segment	Number of Pulses	Pulse Width (t2) usec	Chirp Width MHz	Start Loc usec	P1-to-2 usec	P2-to-3 usec	P3-to-End usec
1	2	61.0	15	120454	1172	-	969161.0
2	1	69.0	16	969999	-	-	120841.0
3	3	67.0	6	877158	1762	1828	209960.0
4	3	91.0	17	842309	1773	1870	244684.0
5	2	81.0	14	139955	1966	-	948826.0
6	1	52.0	5	877619	-	-	213238.0
7	3	84.0	10	654940	1940	1419	432358.0
8	3	76.0	10	568708	1396	1090	519487.0
9	1	64.0	17	1053049	-	-	37796.0
10	1	98.0	12	226009	-	-	864802.0
11	3	81.0	17	364151	1315	1316	723884.0

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 the Test System