

TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: OWS451x

FCC ID: PVH0941

IC Certification Number: 5325A-0941

To: FCC Part 15.407: 2010 Subpart E, RSS-210 Issue 8 December
2010 and RSS-Gen Issue 3 December 2010

Test Report Serial No:
RFI-RPT-RP78718JD07D V1.0

This Test Report Is Issued Under The Authority
Of Chris Guy, Head of Global Approvals:



Checked By:

Nigel Davison

Signature:



Date of Issue:

17 May 2011

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1. Customer Information

Company Name:	connectBlue AB
Address:	Norra Vallgatan 64 3V Malmo Sweden SE-211 22

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.407
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart E (Unlicensed National Information Infrastructure Devices) - Section 15.407
Specification Reference:	47CFR15.109
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart B (Unintentional Radiators) - Sections 15.107 and 15.109
Specification Reference:	47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 15.209
Specification Reference:	RSS-GEN Issue 3 December 2010
Specification Title:	General Requirements and Information for the Certification of Radio communication Equipment
Specification Reference:	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
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	23 November 2010 to 12 May 2011

2.2. Summary of Test Results

Antenna: ProAnt Ex-IT-WLAN

FCC Reference (47CFR)	IC Reference	Measurement	Result
Part 15.109	RSS-Gen 4.10/6.1	Receiver/Idle Mode Radiated Spurious Emissions	
Part 15.407(a)(1)	–	Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band)	
–	RSS-Gen 4.8 / RSS-210 A9.2(1)	Transmitter Maximum Equivalent Isotropically Radiated Power (EIRP) (5.15-5.25 GHz band)	
Part 15.407(b)/15.209(a)	RSS-Gen 4.9 RSS-210 A9.2(1)	Transmitter Out of Band Radiated Emissions	
Part 15.407(b)/15.209(a)	RSS-Gen 4.9 RSS-210 A9.2(1)	Transmitter Band Edge Radiated Emissions	
Key to Results  = Complied  = Did not comply			

Antenna: ProAnt Inside EPA WLAN

FCC Reference (47CFR)	IC Reference	Measurement	Result
Part 15.109	RSS-Gen 4.10/6.1	Receiver/Idle Mode Radiated Spurious Emissions	
Part 15.407(a)(1)	–	Transmitter Maximum Conducted Output Power (5.15-5.25 GHz band)	
–	RSS-Gen 4.8 / RSS-210 A9.2(1)	Transmitter Maximum Equivalent Isotropically Radiated Power (EIRP) (5.15-5.25 GHz band)	
Part 15.407(b)/15.209(a)	RSS-Gen 4.9 RSS-210 A9.2(1)	Transmitter Out of Band Radiated Emissions	
Part 15.407(b)/15.209(a)	RSS-Gen 4.9 RSS-210 A9.2(1)	Transmitter Band Edge Radiated Emissions	
Key to Results  = Complied  = Did not comply			

Note: Where FCC clause references are made within this report also read the equivalent IC reference.

2.3. Methods and Procedures

Reference:	ANSI C63.4 (2009)
Title:	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
Reference:	ANSI C63.10 (2009)
Title:	American National Standard for Testing Unlicensed Wireless Devices

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:	connectBlue AB
Model Name or Number:	OWS451x
Serial Number:	Not stated
Hardware Version Number:	cB-0941-02
Software Version Number:	2.4_2.1.9_RPS / ows451_pcti_firmware_2.1.0_release.cbz
FCC ID::	PVH0941
IC Certification Number::	5325A-0941

3.2. Description of EUT

The equipment under test was a WLAN module with an external antenna port which provided a wireless communication link using IEEE802.11a/n WLAN.

- ProAnt Ex-IT-WLAN
- ProAnt Inside EPA WLAN

Note: This test report includes the test results for the above antennas. Please refer to RFI Test Report Serial Number RFI-RPT-RP78718JD03A and RFI-RPT-RP78718JD07C for additional antennas tested.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Technology Tested:	Unlicensed National Information Infrastructure Devices (U-NII)/License-exempt local area network (LE-LAN)		
Type of Unit:	Transceiver		
Channel Spacing:	20 MHz		
Modulation:	OFDM		
Data Rate:	802.11a: 6,9,12,18,24,36,48,54 Mbps 802.11n: 6.5,13,19.5,26,39,52,58.5,65 Mbps		
Maximum Conducted Peak Power Output:	9.4 dBm		
Power Supply Requirement(s):	Nominal	5.0 V	
Transmit & Receive Frequency Range:	5150 MHz to 5250 MHz		
Transmit & Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	36	5180
	Middle	40	5200
	Top	48	5240

3.5. Support Equipment

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

Description:	Dell
Brand Name:	Laptop
Model Name or Number:	Latitude D610

Description:	Connect Blue AB
Brand Name:	Development Board
Model Name or Number:	0068-01-002440

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating mode(s):

- Receiver/Idle mode.
- Continuously transmitting at maximum power on the bottom, centre and top channels as required using the highest and lowest data rates of each modulation scheme.

4.2. Configuration and Peripherals

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

- Controlled using a bespoke application on the laptop PC supplied by the client. The application was used to enable continuous transmission and idle mode (enabled but not transmitting) and to select the test channels, data rates and modulation schemes as required.
- Transmitter spurious emissions were performed with the EUT transmitting with the highest data rate ,65Mbps 802.11N, as this was found to have the highest power level and therefore deemed to be worst case.

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 - ProAnt Ex-IT-WLAN

5.2.1. Receiver/Idle Mode Radiated Spurious Emissions

Test Summary:

Test Engineer:	Nick Steele	Test Date:	23 November 2010
Test Sample Serial No:	ID:8		
Antenna:	ProAnt Ex-IT-WLAN		

FCC/IC Part:	15.109(a) and RSS-Gen 7.2.4
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range:	30 MHz to 1000 MHz

Environmental Conditions:

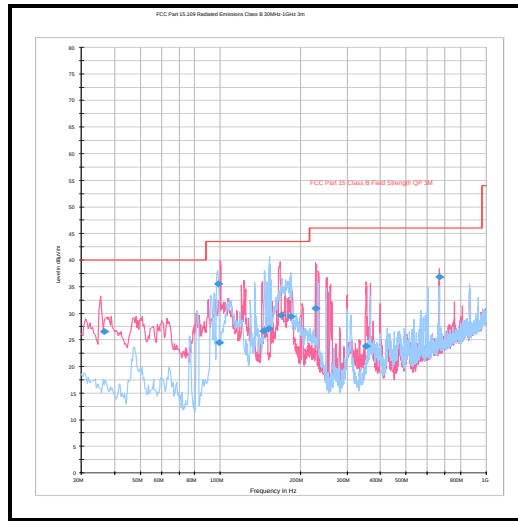
Temperature (°C):	24
Relative Humidity (%):	23

Results: Quasi Peak

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
36.622	Vertical	26.6	40	13.4	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Receiver/Idle Mode Radiated Spurious Emissions (continued)

Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Receiver/Idle Mode Radiated Spurious Emissions (continued)**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	23 November 2010
Test Sample Serial No:	ID:1		
Antenna:	ProAnt Ex-IT-WLAN		

FCC/IC Part:	15.109 and RSS-Gen 4.10/6.1
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
Frequency Range:	1 GHz to 30 GHz

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	25

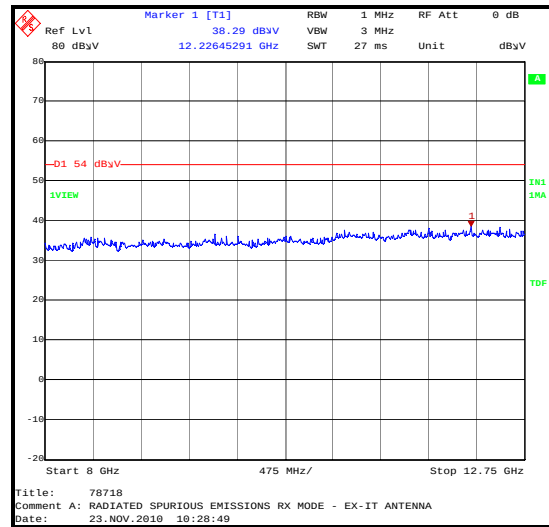
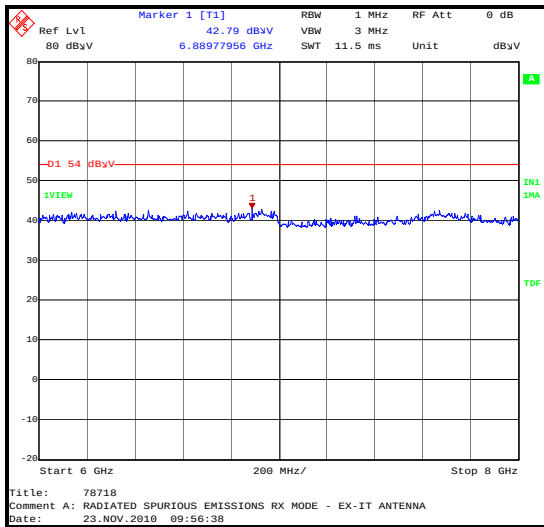
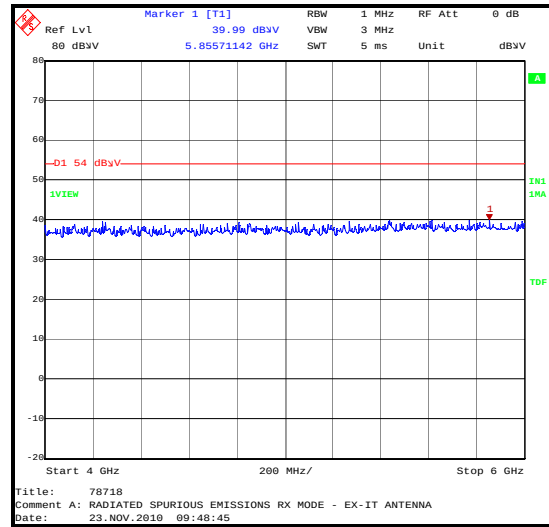
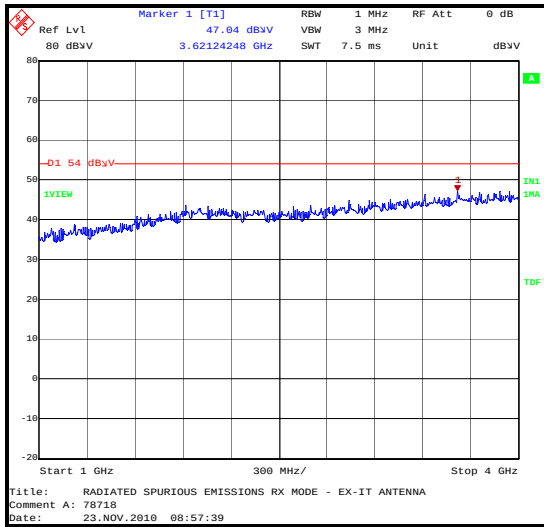
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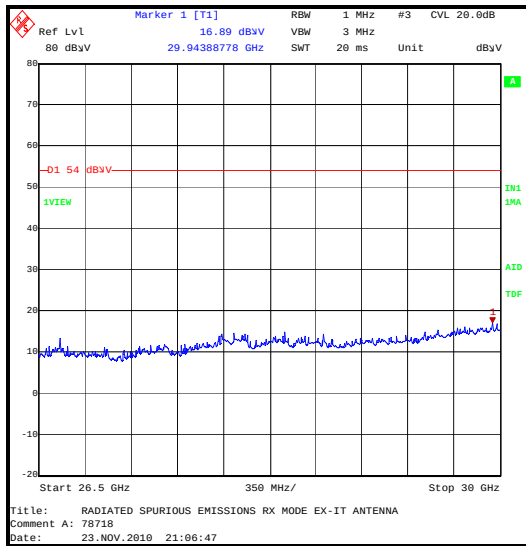
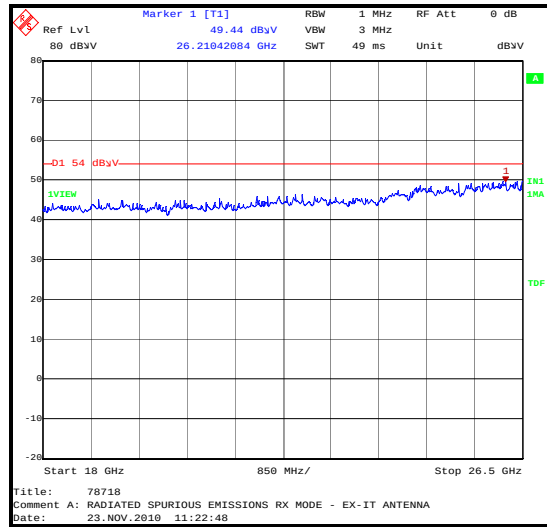
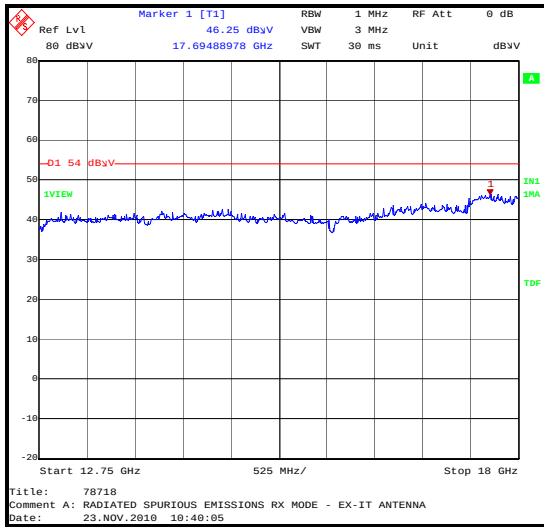
Frequency (GHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
26.210	Vertical	49.4	*54.0	4.6	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.
3. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

* The average limit was compared to the peak level as opposed to being compared to the peak limit because this is the more stringent limit.

Receiver/Idle Mode Radiated Spurious Emissions (continued)

Receiver/Idle Mode Radiated Spurious Emissions (continued)

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

5.2.2. Transmitter Maximum Peak Output Power**Test Summary:**

Test Engineer:	Nigel Davison	Test Date:	12 May 2011
Test Sample Serial No:	ID 3		

FCC Part:	FCC 15.407(a)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.3.1 Method 1

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	24

The limit was the lesser of 17dBm or $4\text{dBm} + 10 \times \text{Log}(B)$ where B is the emission bandwidth measure above.

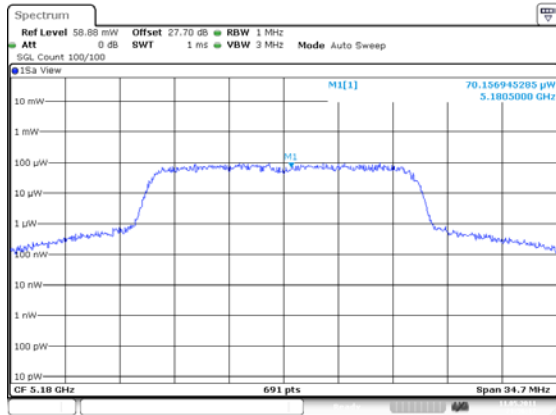
For the result of 5150 to 5250MHz, 17dBm was the lowest limit and thus was used as the limit shown in the results table below.

For 802.11N, limits for all bands were calculated based on the emissions bandwidth and the limit calculation within the FCC 15.407 as these were slightly lower than the fixed limits.

The gain of the proposed antenna is 3dBi.

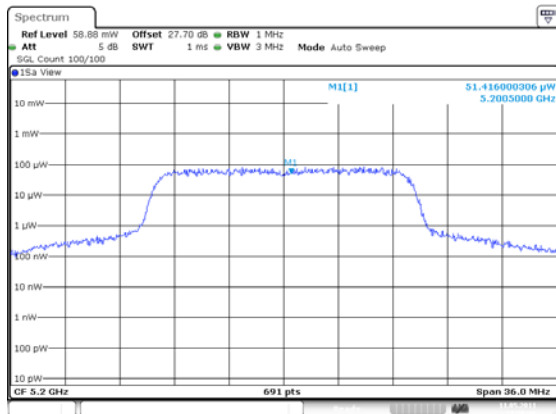
Transmitter Maximum Peak Output Power (continued)**Results - 802.11A 5150 to 5250MHz**

Channel	Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	BPSK	6	8.2	17	8.8	Complied
Middle	5200	BPSK	6	7.1	17	9.9	Complied
Top	5240	BPSK	6	7.5	17	9.5	Complied
Bottom	5180	BPSK	9	6.8	17	10.2	Complied
Middle	5200	BPSK	9	7.7	17	9.3	Complied
Top	5240	BPSK	9	8.5	17	8.5	Complied
Bottom	5180	QPSK	12	7.1	17	9.9	Complied
Middle	5200	QPSK	12	7.3	17	9.7	Complied
Top	5240	QPSK	12	8.0	17	9.0	Complied
Bottom	5180	QPSK	18	6.4	17	10.6	Complied
Middle	5200	QPSK	18	6.9	17	10.1	Complied
Top	5240	QPSK	18	7.5	17	9.5	Complied
Bottom	5180	16QAM	24	6.6	17	10.4	Complied
Middle	5200	16QAM	24	6.6	17	10.4	Complied
Top	5240	16QAM	24	7.4	17	9.6	Complied
Bottom	5180	16QAM	36	8.3	17	8.7	Complied
Middle	5200	16QAM	36	7.8	17	9.2	Complied
Top	5240	16QAM	36	8.3	17	8.7	Complied
Bottom	5180	64QAM	48	7.5	17	9.5	Complied
Middle	5200	64QAM	48	7.4	17	9.6	Complied
Top	5240	64QAM	48	8.9	17	8.1	Complied
Bottom	5180	64QAM	54	7.5	17	9.5	Complied
Middle	5200	64QAM	54	7.4	17	9.6	Complied
Top	5240	64QAM	54	7.7	17	9.3	Complied

Transmitter Maximum Peak Output Power (continued)**Results - 802.11A 5150 to 5250MHz**

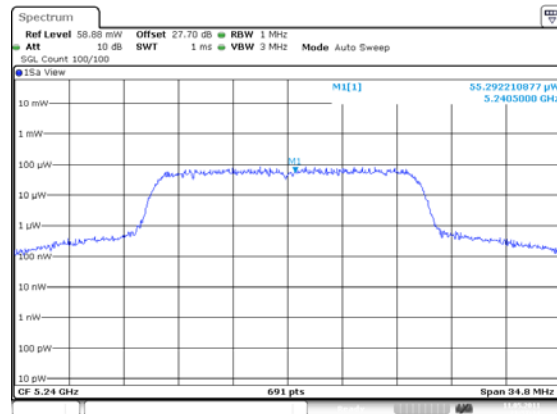
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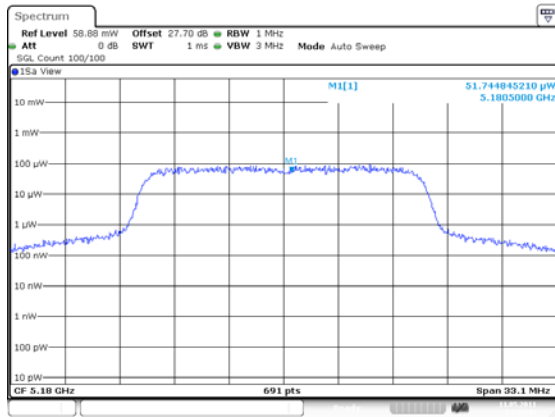
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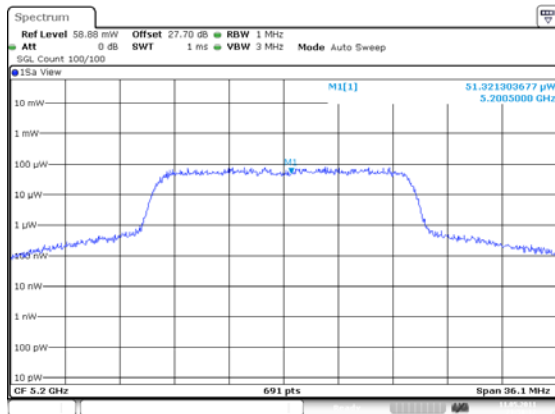
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Transmitter Maximum Peak Output Power (continued)

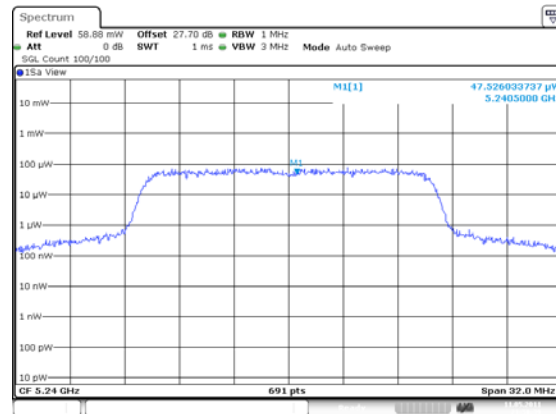
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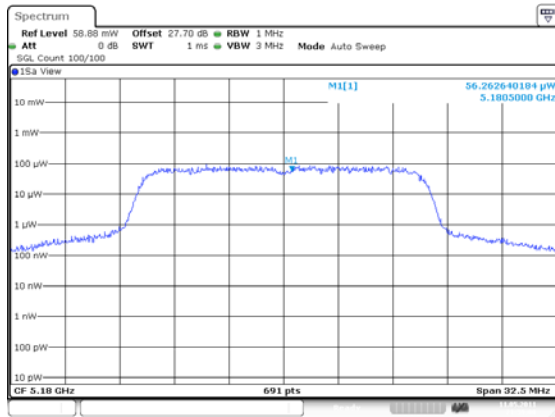
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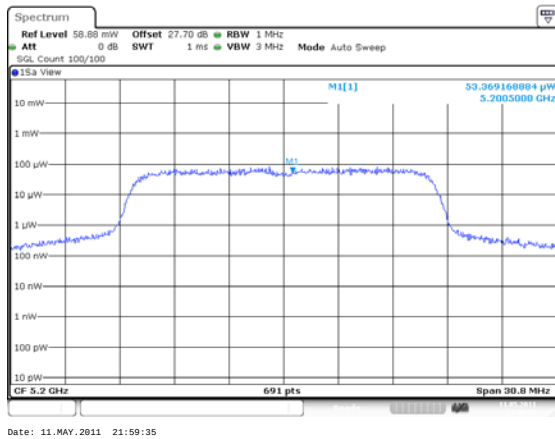


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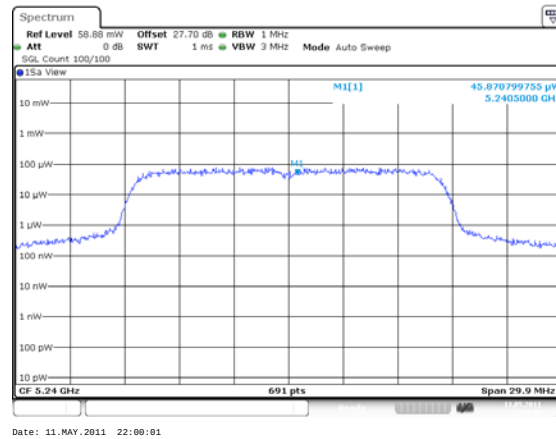
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Transmitter Maximum Peak Output Power (continued)

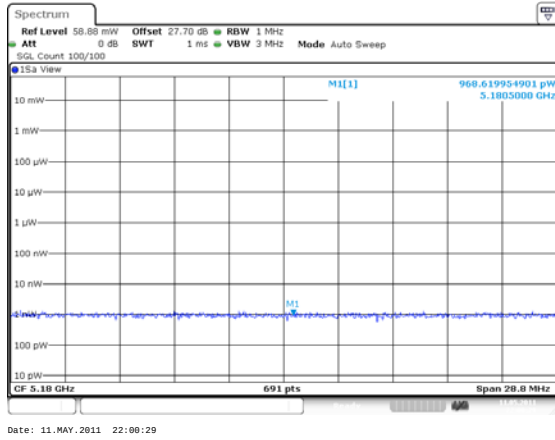
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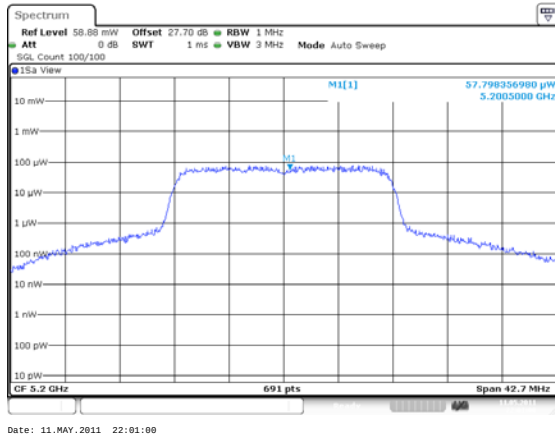
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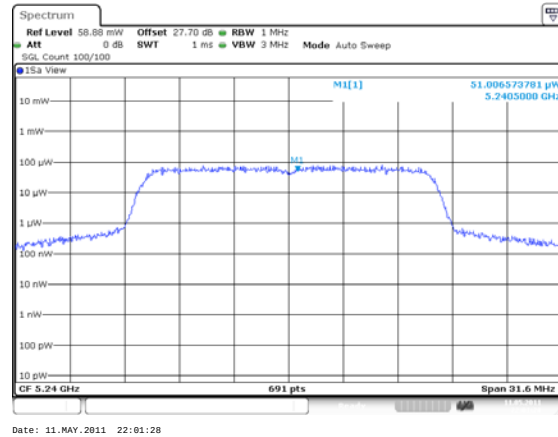
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Transmitter Maximum Peak Output Power (continued)

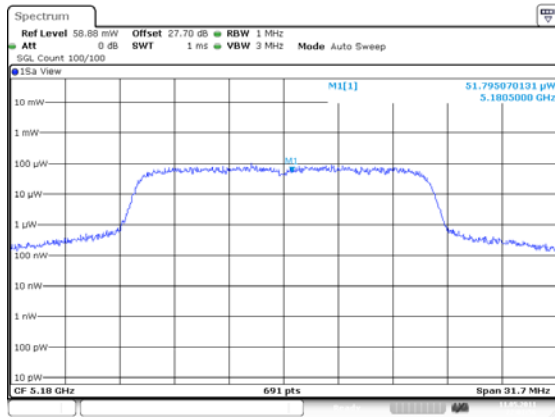
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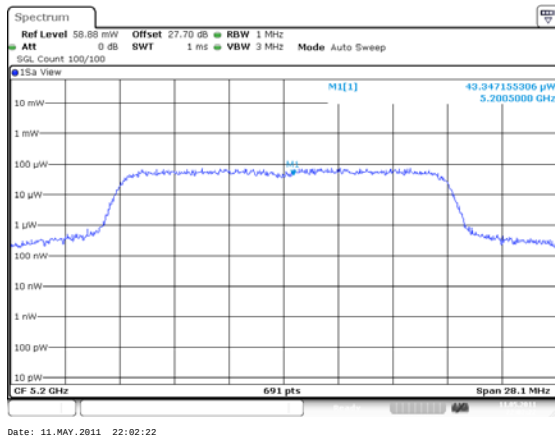
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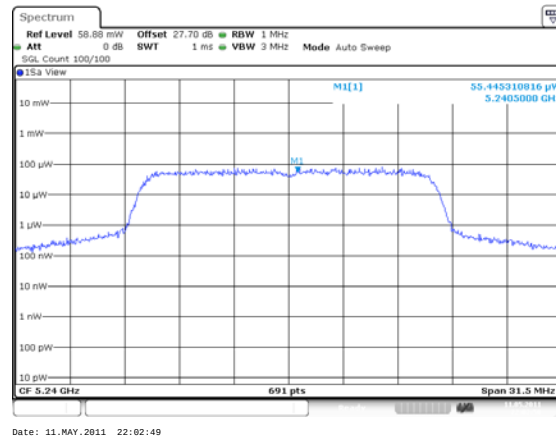
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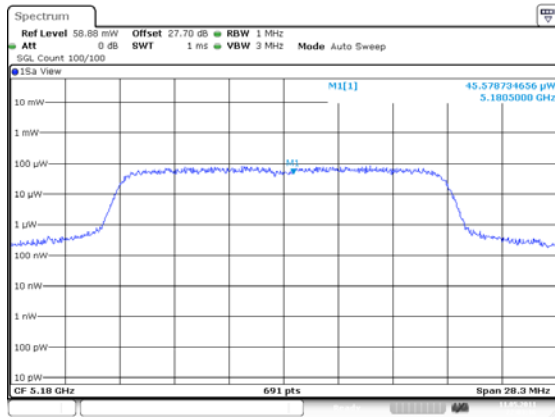
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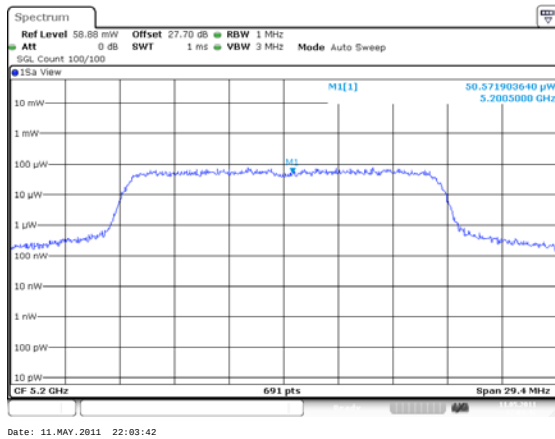
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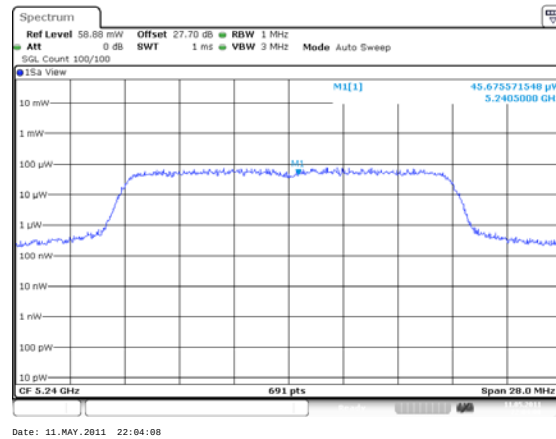
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Transmitter Maximum Peak Output Power (continued)

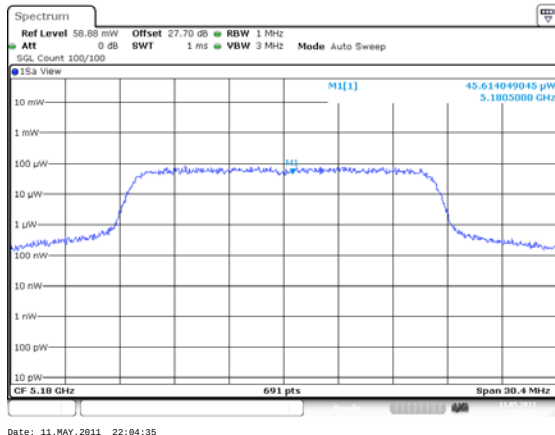
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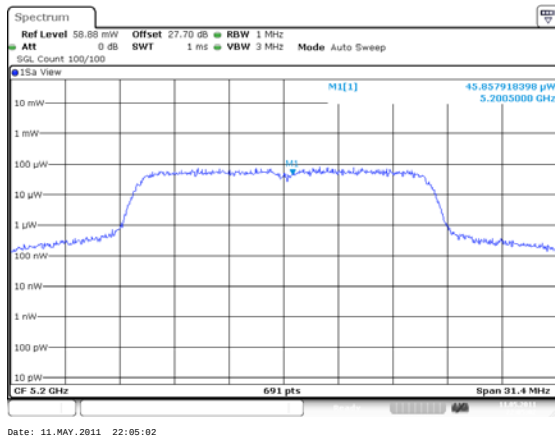
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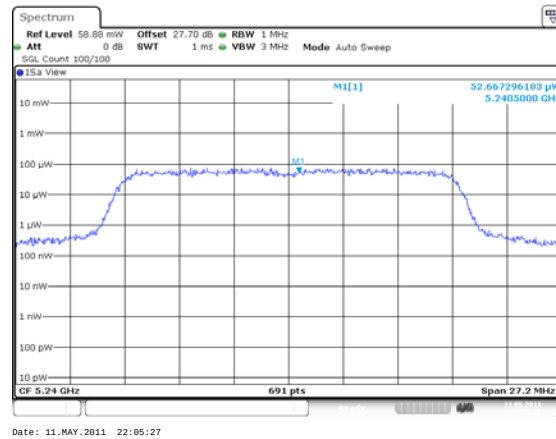
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Transmitter Maximum Peak Output Power (continued)

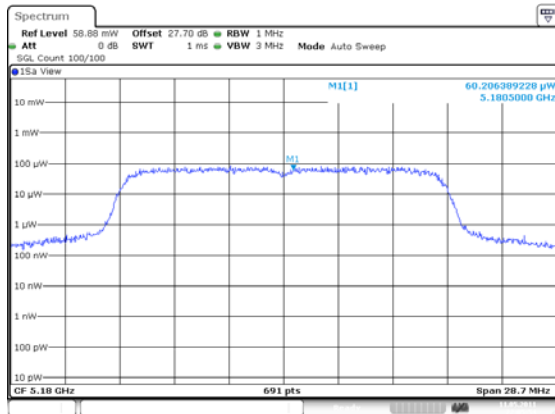
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Channel_Power_UNII_1_802_11A_48MBS_MiddleChannel

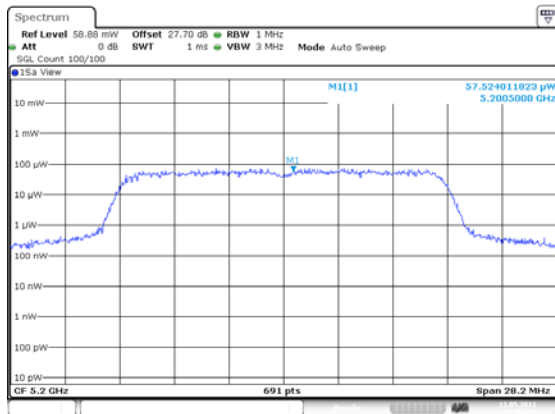


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Transmitter Maximum Peak Output Power (continued)

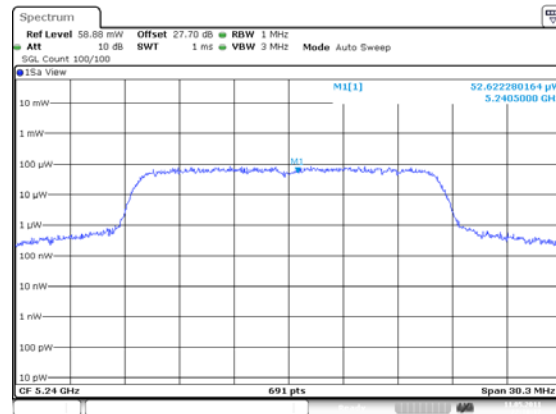
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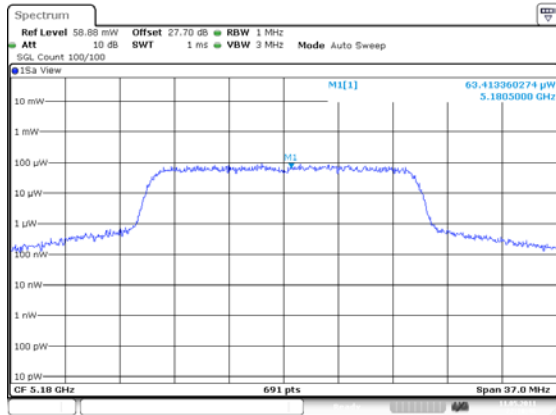


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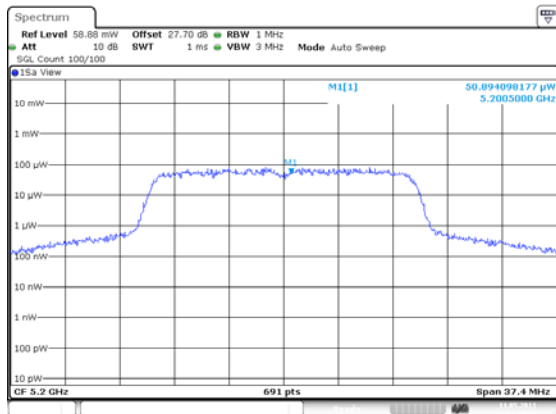
Channel_Power_UNII_1_802_11A_58MBS_TopChannel

Transmitter Maximum Output Power (continued)**Results - 802.11N 5150 to 5250MHz**

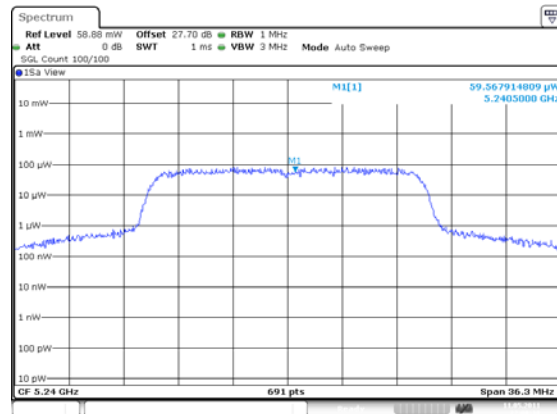
Channel	Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	BPSK	6.5	7.1	17	9.9	Complied
Middle	5200	BPSK	6.5	7.3	17	9.7	Complied
Top	5240	BPSK	6.5	8.2	17	8.8	Complied
Bottom	5180	QPSK	13	7.2	17	9.8	Complied
Middle	5200	QPSK	13	7.3	17	9.7	Complied
Top	5240	QPSK	13	8.2	17	8.8	Complied
Bottom	5180	QPSK	19.5	7.1	17	9.9	Complied
Middle	5200	QPSK	19.5	7.4	17	9.6	Complied
Top	5240	QPSK	19.5	8.0	17	9.0	Complied
Bottom	5180	16QAM	26	7.0	17	10.0	Complied
Middle	5200	16QAM	26	7.4	17	9.6	Complied
Top	5240	16QAM	26	7.8	17	9.2	Complied
Bottom	5180	64QAM	39	8.0	17	9.0	Complied
Middle	5200	64QAM	39	7.7	17	9.3	Complied
Top	5240	64QAM	39	8.2	17	8.8	Complied
Bottom	5180	64QAM	52	7.1	17	9.9	Complied
Middle	5200	64QAM	52	7.3	17	9.7	Complied
Top	5240	64QAM	52	8.6	17	8.4	Complied
Bottom	5180	64QAM	58	8.0	17	9.0	Complied
Middle	5200	64QAM	58	7.7	17	9.3	Complied
Top	5240	64QAM	58	8.4	17	8.6	Complied
Bottom	5180	64QAM	65	7.6	17	9.4	Complied
Middle	5200	64QAM	65	8.9	17	8.1	Complied
Top	5240	64QAM	65	9.4	17	7.6	Complied

Transmitter Maximum Peak Output Power (continued)**Results - 802.11N 5150 to 5250MHz**

Channel_Power_UNII_1_802_11N_6_5MBS_BottomChannel

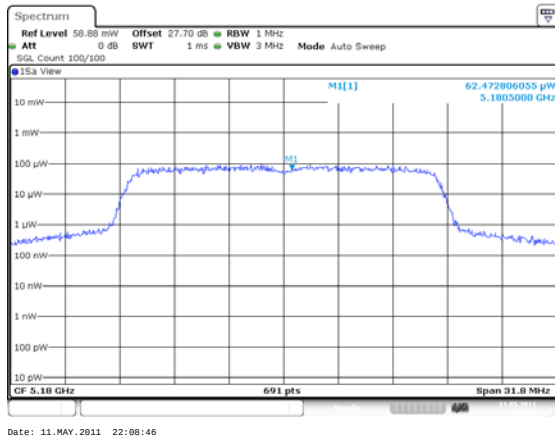


Channel_Power_UNII_1_802_11N_6_5MBS_MiddleChannel

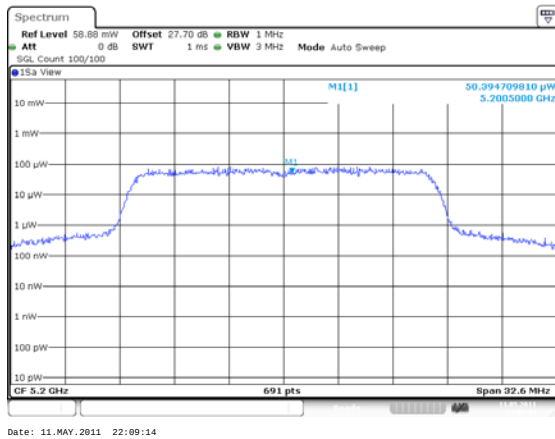


Channel_Power_UNII_1_802_11N_6_5MBS_TopChannel

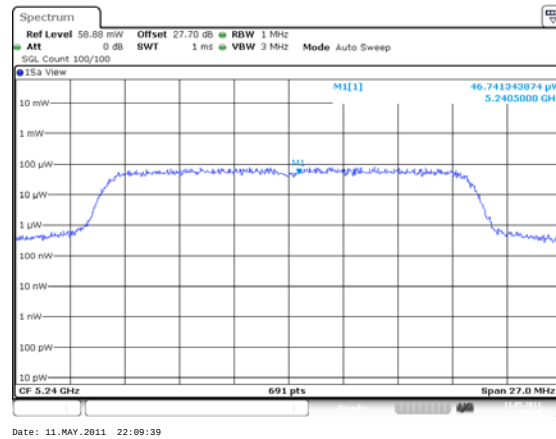
Transmitter Maximum Peak Output Power (continued)



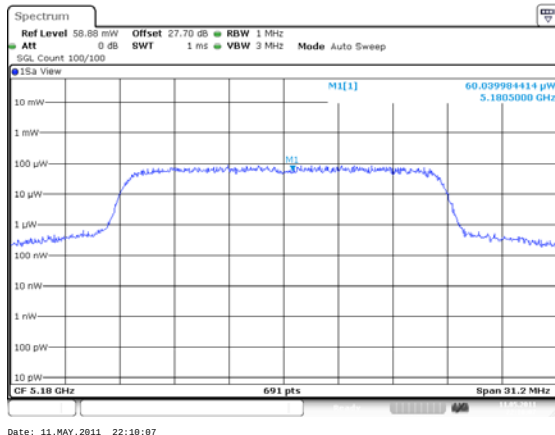
Channel_Power_UNII_1_802_11N_13MBS_BottomChannel



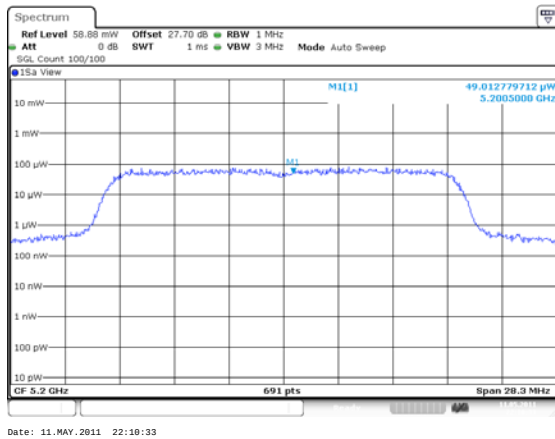
Channel_Power_UNII_1_802_11N_13MBS_MiddleChannel



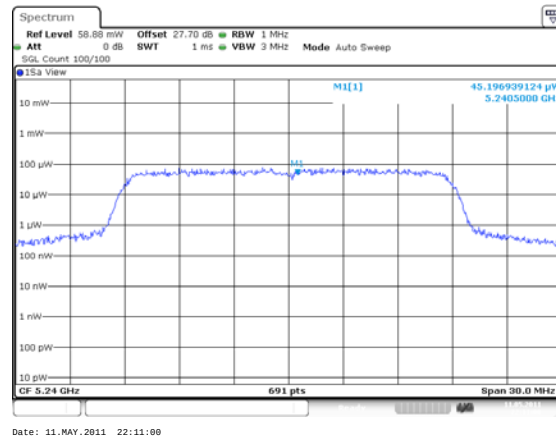
Channel_Power_UNII_1_802_11N_13MBS_TopChannel

Transmitter Maximum Peak Output Power (continued)

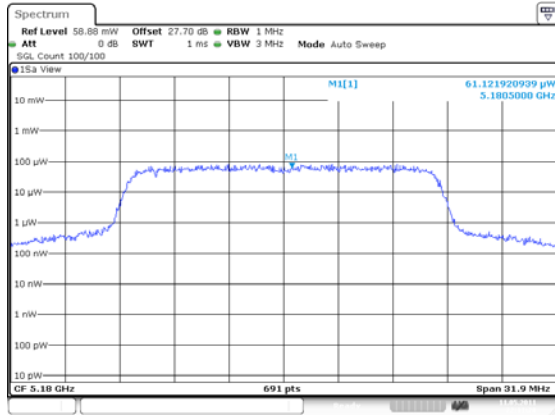
Channel_Power_UNII_1_802_11N_19_5MBS_BottomChannel



Channel_Power_UNII_1_802_11N_19_5MBS_MiddleChannel

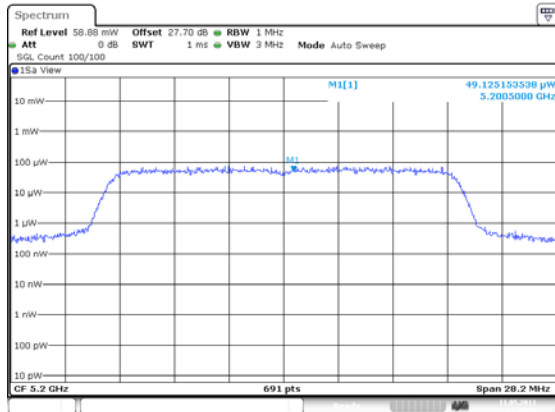


Channel_Power_UNII_1_802_11N_19_5MBS_TopChannel

Transmitter Maximum Peak Output Power (continued)

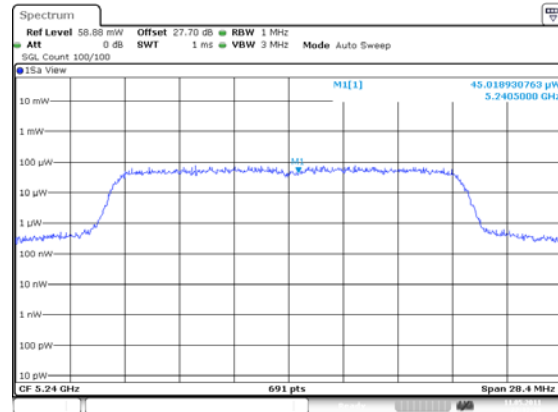
Date: 11.MAY.2011 22:11:28

Channel_Power_UNII_1_802_11N_26MBS_BottomChannel



Date: 11.MAY.2011 22:11:54

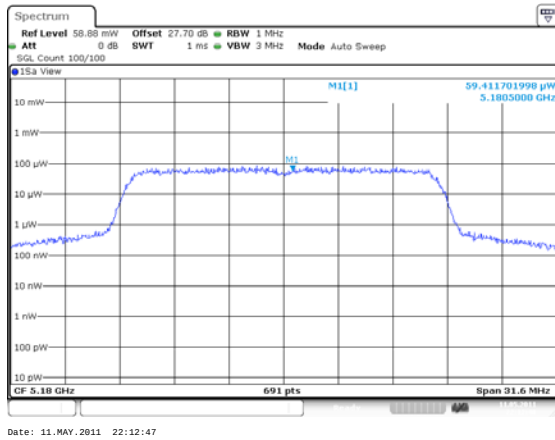
Channel_Power_UNII_1_802_11N_26MBS_MiddleChannel



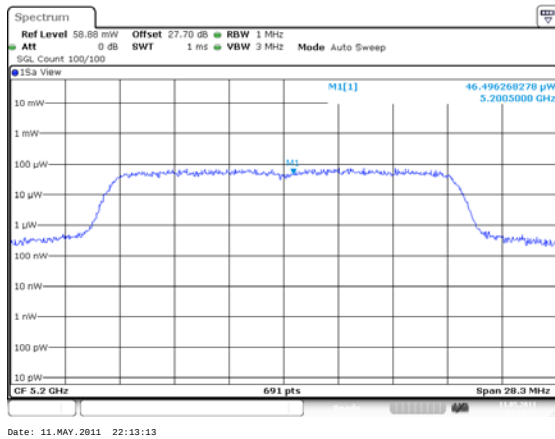
Date: 11.MAY.2011 22:12:28

Channel_Power_UNII_1_802_11N_26MBS_TopChannel

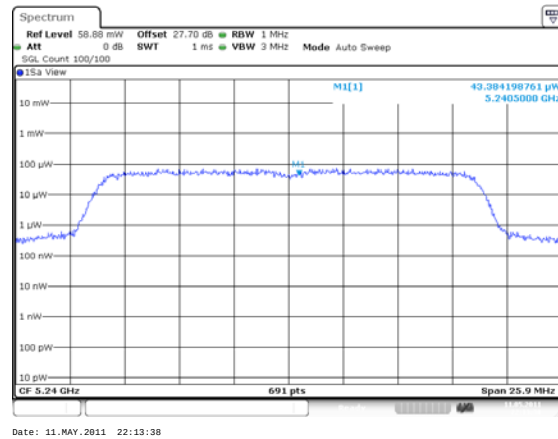
Transmitter Maximum Peak Output Power (continued)



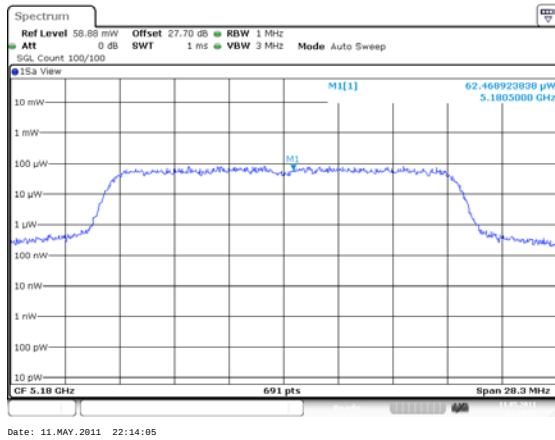
Channel_Power_UNII_1_802_11N_39MBS_BottomChannel



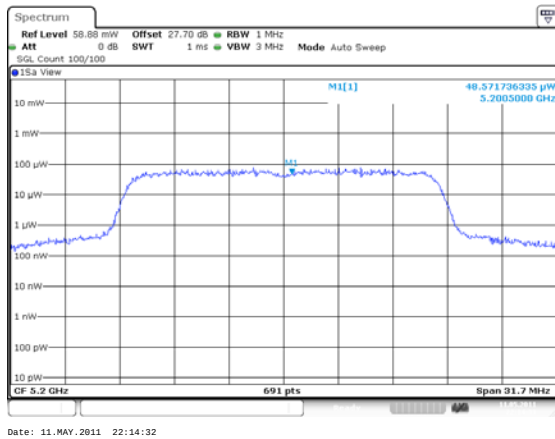
Channel_Power_UNII_1_802_11N_39MBS_MiddleChannel



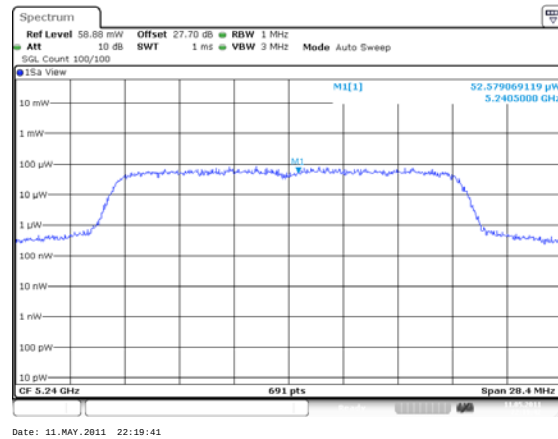
Channel_Power_UNII_1_802_11N_39MBS_TopChannel

Transmitter Maximum Peak Output Power (continued)

Channel_Power_UNII_1_802_11N_52MBS_BottomChannel

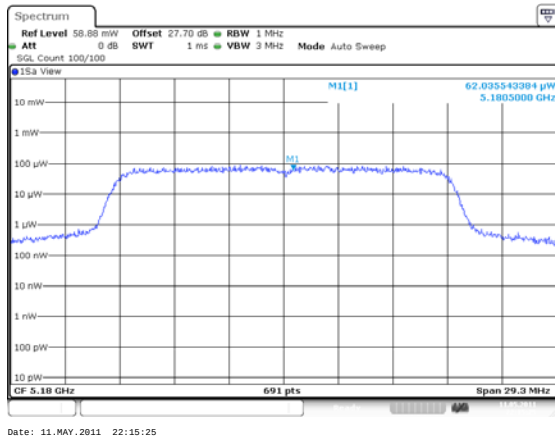


Channel_Power_UNII_1_802_11N_52MBS_MiddleChannel

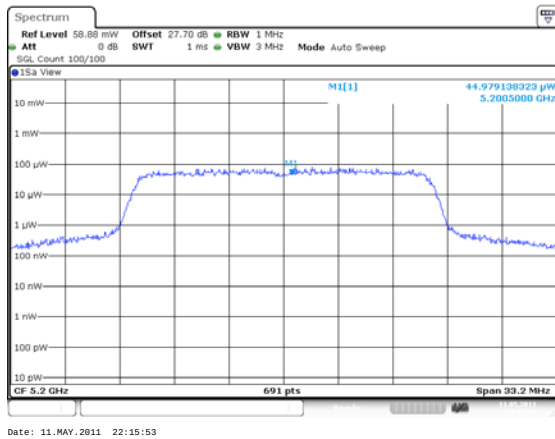


Channel_Power_UNII_1_802_11N_52MBS_TopChannel

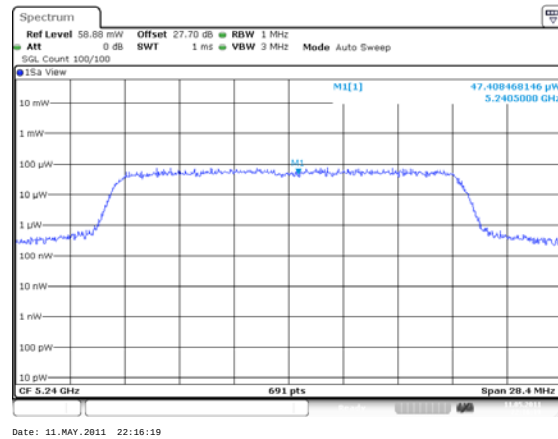
Transmitter Maximum Peak Output Power (continued)



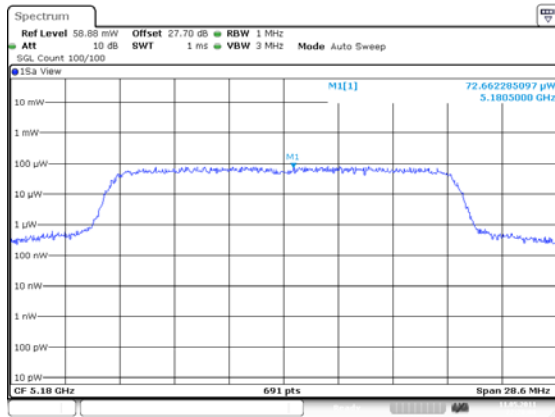
Channel_Power_UNII_1_802_11N_58_5MBS_BottomChannel



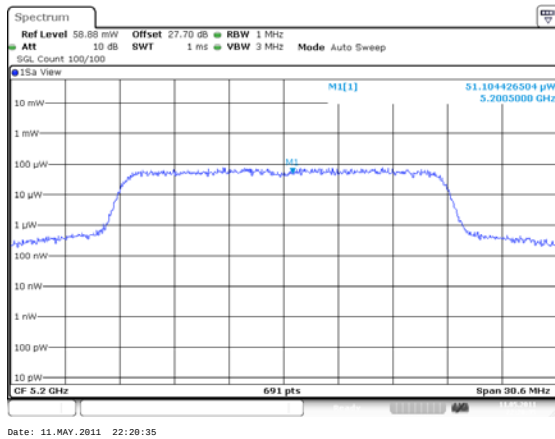
Channel_Power_UNII_1_802_11N_58_5MBS_MiddleChannel



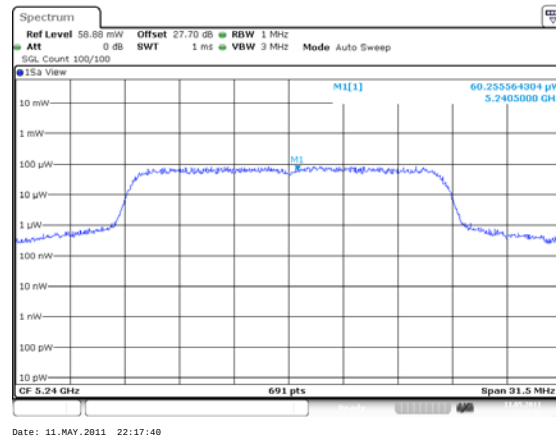
Channel_Power_UNII_1_802_11N_358_5MBS_TopChannel

Transmitter Maximum Peak Output Power (continued)

Channel_Power_UNII_1_802_11N_65MBS_BottomChannel



Channel_Power_UNII_1_802_11N_65MBS_MiddleChannel



Channel_Power_UNII_1_802_11N_65MBS_TopChannel

5.2.3. Transmitter Maximum Equivalent Isotropically Radiated Power (5.15-5.25 GHz band)**Test Summary:**

Test Engineer:	Nigel Davison	Test Date:	11 May 2011
Test Sample Serial No:	ID 3		

RSS Reference:	RSS-210 A9.2(1)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.3.1 Method 1

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	24

Results - 802.11A 5150 to 5250MHz

Channel	Mod Scheme	Data Rate	Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Fixed Limit (dBm)	Margin (dB)	Result
Bottom	BPSK	6	8.2	3	11.2	23.0	11.8	Complied
Middle	BPSK	6	7.1	3	10.1	23.0	12.9	Complied
Top	BPSK	6	7.5	3	10.5	23.0	12.5	Complied
Bottom	BPSK	9	6.8	3	9.8	23.0	13.2	Complied
Middle	BPSK	9	7.7	3	10.7	23.0	12.3	Complied
Top	BPSK	9	8.5	3	11.5	23.0	11.5	Complied
Bottom	QPSK	12	7.1	3	10.1	23.0	12.9	Complied
Middle	QPSK	12	7.3	3	10.3	23.0	12.7	Complied
Top	QPSK	12	8.0	3	11.0	23.0	12.0	Complied
Bottom	QPSK	18	6.4	3	9.4	23.0	13.6	Complied
Middle	QPSK	18	6.9	3	9.9	23.0	13.1	Complied
Top	QPSK	18	7.5	3	10.5	23.0	12.5	Complied
Bottom	16QAM	24	6.6	3	9.6	23.0	13.4	Complied
Middle	16QAM	24	6.6	3	9.6	23.0	13.4	Complied
Top	16QAM	24	7.4	3	10.4	23.0	12.6	Complied
Bottom	16QAM	36	8.3	3	11.3	23.0	11.7	Complied
Middle	16QAM	36	7.8	3	10.8	23.0	12.2	Complied
Top	16QAM	36	8.3	3	11.3	23.0	11.7	Complied
Bottom	64QAM	48	7.5	3	10.5	23.0	12.5	Complied
Middle	64QAM	48	7.4	3	10.4	23.0	12.6	Complied
Top	64QAM	48	8.9	3	11.9	23.0	11.1	Complied
Bottom	64QAM	54	7.5	3	10.5	23.0	12.5	Complied
Middle	64QAM	54	7.4	3	10.4	23.0	12.6	Complied

Channel	Mod Scheme	Data Rate	Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Fixed Limit (dBm)	Margin (dB)	Result
Top	64QAM	54	7.7	3	10.7	23.0	12.3	Complied

Note(s):

1. The limit is the lesser of 200 mW (23.0 dBm) or $10 \text{ dBm} + 10 \log B$, where B is the 99% emission bandwidth in MHz.
2. For the smallest 99% bandwidth of 19.0 MHz the limit equates to 22.8 dBm however as the pass margin is in excess of 10 dB for all test cases the fixed limit of 23.0 dBm is detailed in the above table for the sake of simplicity.

Results - 802.11N 5150 to 5250MHz

Channel	Mod Scheme	Data Rate	Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Fixed Limit (dBm)	Margin (dB)	Result
Bottom	BPSK	6.5	7.1	3	10.1	23.0	12.9	Complied
Middle	BPSK	6.5	7.3	3	10.3	23.0	12.7	Complied
Top	BPSK	6.5	8.2	3	11.2	23.0	11.8	Complied
Bottom	QPSK	13	7.2	3	10.2	23.0	12.8	Complied
Middle	QPSK	13	7.3	3	10.3	23.0	12.7	Complied
Top	QPSK	13	8.2	3	11.2	23.0	11.8	Complied
Bottom	QPSK	19.5	7.1	3	10.1	23.0	12.9	Complied
Middle	QPSK	19.5	7.4	3	10.4	23.0	12.6	Complied
Top	QPSK	19.5	8.0	3	11.0	23.0	12.0	Complied
Bottom	16QAM	26	7.0	3	10.0	23.0	13.0	Complied
Middle	16QAM	26	7.4	3	10.4	23.0	12.6	Complied
Top	16QAM	26	7.8	3	10.8	23.0	12.2	Complied
Bottom	64QAM	39	8.0	3	11.0	23.0	12.0	Complied
Middle	64QAM	39	7.7	3	10.7	23.0	12.3	Complied
Top	64QAM	39	8.2	3	11.2	23.0	11.8	Complied
Bottom	64QAM	52	7.1	3	10.1	23.0	12.9	Complied
Middle	64QAM	52	7.3	3	10.3	23.0	12.7	Complied
Top	64QAM	52	8.6	3	11.6	23.0	11.4	Complied
Bottom	64QAM	58	8.0	3	11.0	23.0	12.0	Complied
Middle	64QAM	58	7.7	3	10.7	23.0	12.3	Complied
Top	64QAM	58	8.4	3	11.4	23.0	11.6	Complied
Bottom	64QAM	65	7.6	3	10.6	23.0	12.4	Complied
Middle	64QAM	65	8.9	3	11.9	23.0	11.1	Complied
Top	64QAM	65	9.4	3	12.4	23.0	10.6	Complied

Note(s):

1. The limit is the lesser of 200 mW (23.0 dBm) or 10 dBm + 10 log B, where B is the 99% emission bandwidth in MHz.
2. For the smallest 99% bandwidth of 19.0 MHz the limit equates to 22.8 dBm however as the pass margin is in excess of 10 dB for all test cases the fixed limit of 23.0 dBm is detailed in the above table for the sake of simplicity.

5.2.4. Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band)**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	23 November 2010
Test Sample Serial No:	ID 3		
Antenna:	ProAnt Ex-IT-WLAN		

FCC/IC Part:	15.407(b) / 15.209(a) and RSS-Gen 4.9 / RSS-210 A9.3
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	23

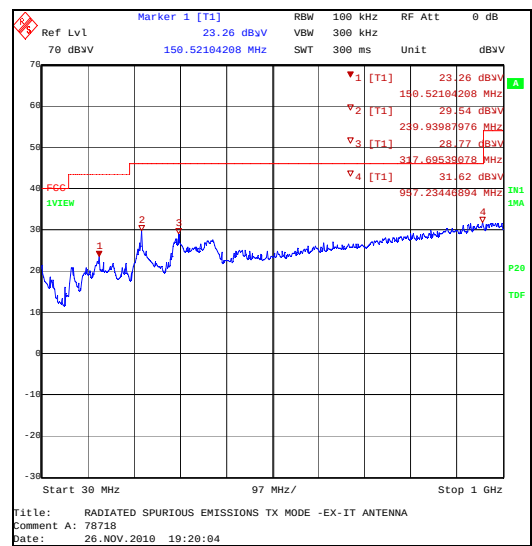
Results: Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
159.961	Horizontal	21.7	43.5	21.8	Complied
239.976	Vertical	27.4	46.0	18.6	Complied
319.981	Vertical	27.6	46.0	18.4	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss
2. The preliminary scans showed similar emission levels below 1 GHz, for each channel of operation. Therefore final radiated emissions measurements were performed with the EUT set to the top channel only.
3. All other emissions were at least 20 dB below the appropriate limit or below the noise floor of the measurement system.
4. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band) (continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band) (continued)**Test Summary:**

Test Engineer:	Nick Steele/Andrew Edwards	Test Date:	23 November 2010
Test Sample Serial No:	ID:1		
Antenna:	ProAnt Ex-IT-WLAN		

FCC/IC Part:	15.407(b)(1) & 15.209(a) and RSS-Gen 4.9 / RSS-210 A9.3
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
Frequency Range	1 GHz to 40 GHz

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	22

Results: Peak Bottom Channel

Frequency (GHz)	Antenna Polarity	Level (dBm)	Limit (dBm/MHz)	Margin (dB)	Result
10.360	Vertical	-50.7	-27	23.7	Complied

Results: Peak Middle Channel

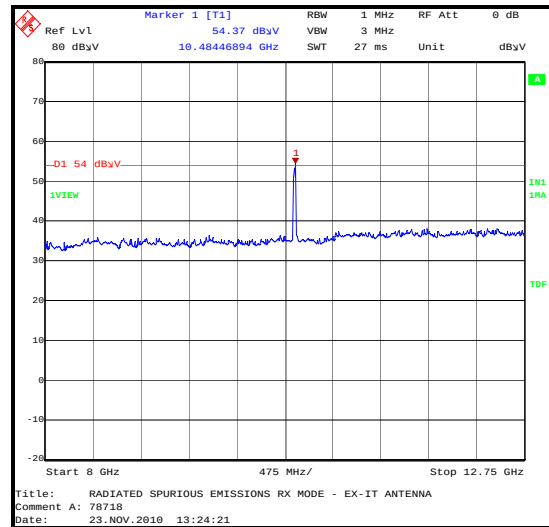
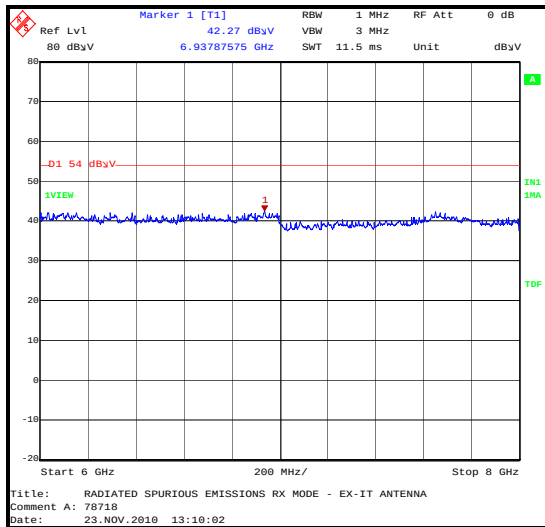
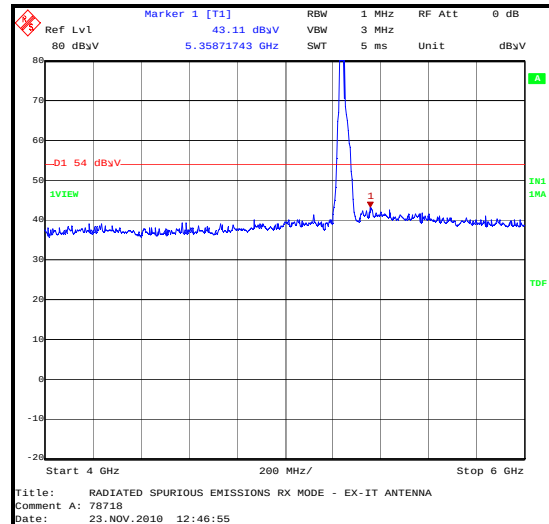
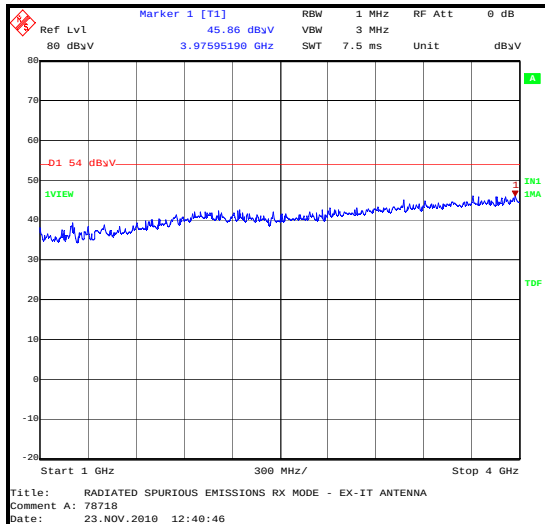
Frequency (GHz)	Antenna Polarity	Level (dBm)	Limit (dBm/MHz)	Margin (dB)	Result
10.400	Vertical	-51.7	-27	24.7	Complied

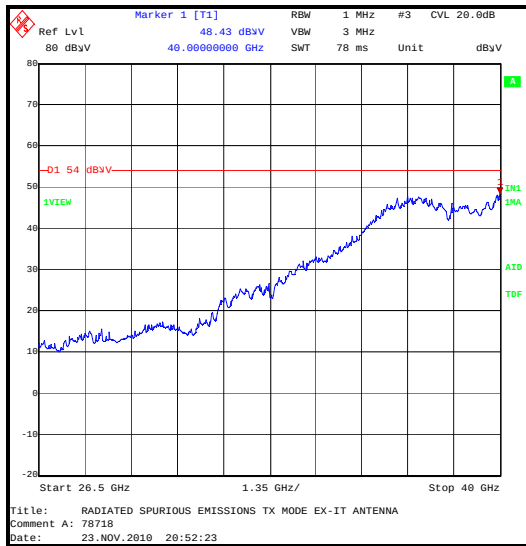
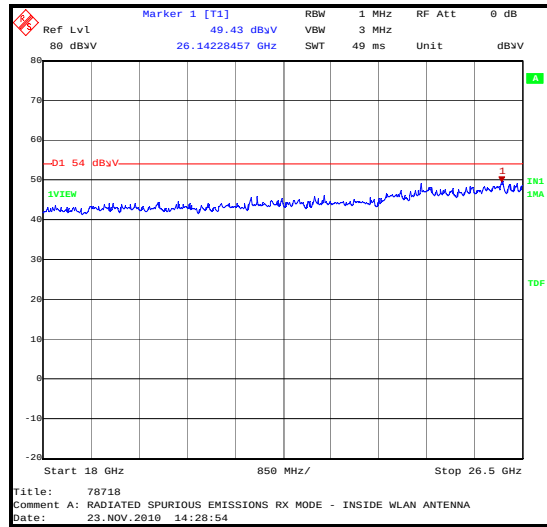
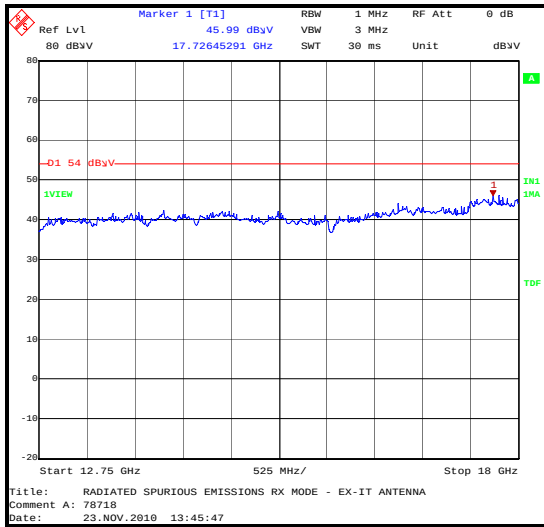
Results: Peak Top Channel

Frequency (GHz)	Antenna Polarity	Level (dBm)	Limit (dBm/MHz)	Margin (dB)	Result
10.482	Vertical	-53.6	-27	26.6	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. The spurious level in dBm was calculated using the following formula $PT=(E^2R^2)/30$ where P is the calculated power, E is the measured field strength and R is the test distance (3 meters)
3. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
4. The emission shown on the 4 GHz to 6 GHz plot is the EUT fundamental.
5. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band) (continued)

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band) (continued)

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

5.2.5. Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band)**Test Summary:**

Test Engineer:	David Lakeland	Test Date:	26 November 2010
Test Sample Serial No:	ID:8		
Antenna:	ProAnt Ex-IT-WLAN		

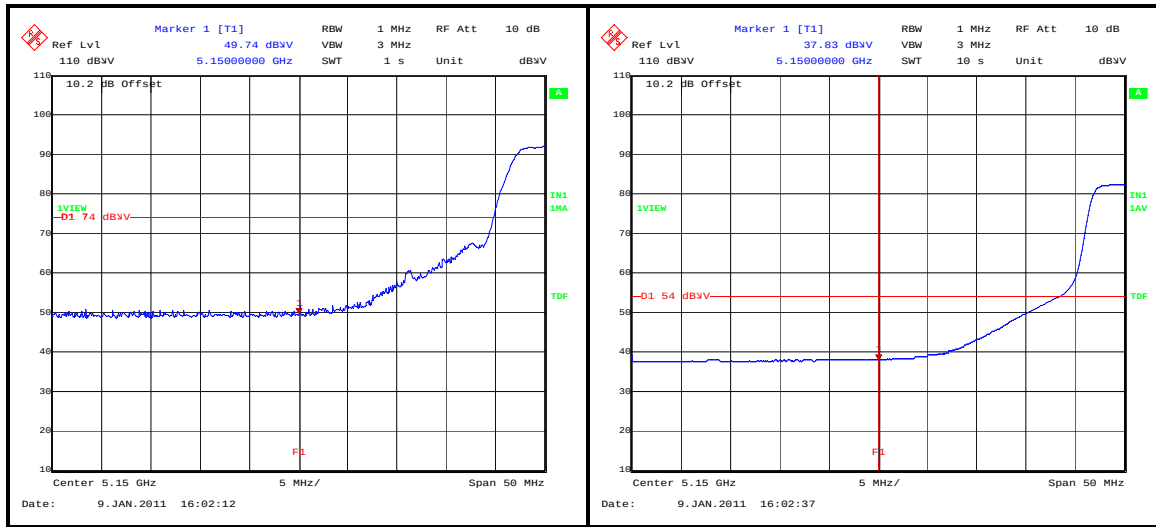
FCC/IC Part:	15.407(b)(1) & 15.209(a) and RSS-Gen 4.9 / RSS-210 A9.2(1)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.2 referencing FCC Part 15.407(b)(5)

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	34

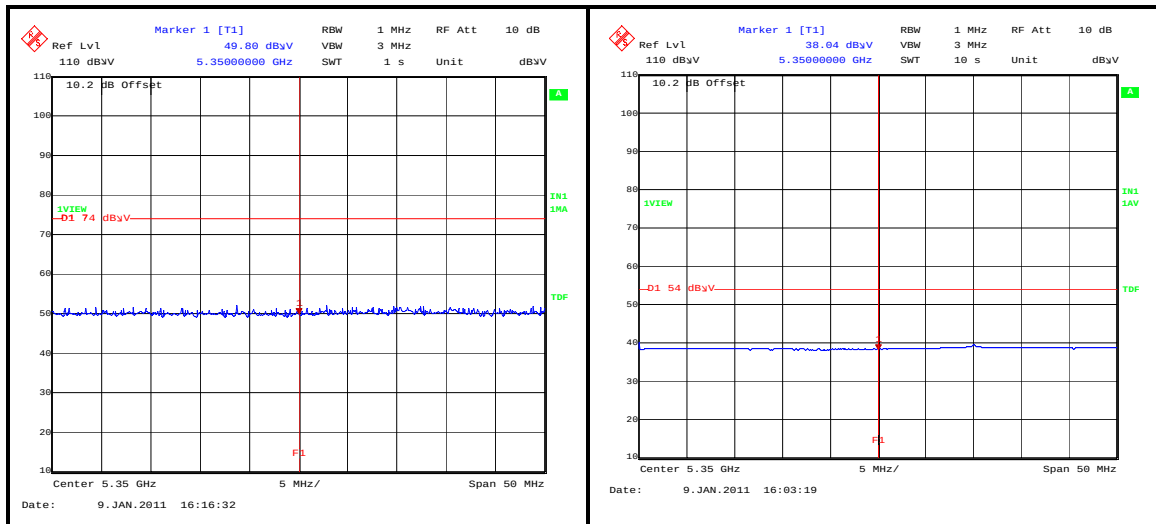
Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band**

Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Detector	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
5150	BPSK	6	Peak	49.7	74.0	24.3	Complied
5150	BPSK	6	Average	37.8	54.0	16.2	Complied
5350	BPSK	6	Peak	49.8	74.0	24.2	Complied
5350	BPSK	6	Average	38.0	54.0	16.0	Complied
5150	BPSK	9	Peak	49.6	74.0	24.4	Complied
5150	BPSK	9	Average	37.8	54.0	16.2	Complied
5350	BPSK	9	Peak	50.0	74.0	24.0	Complied
5350	BPSK	9	Average	38.5	54.0	15.5	Complied
5150	QPSK	12	Peak	48.9	74.0	25.1	Complied
5150	QPSK	12	Average	37.8	54.0	16.2	Complied
5350	QPSK	12	Peak	49.1	74.0	24.9	Complied
5350	QPSK	12	Average	38.0	54.0	16.0	Complied
5150	QPSK	18	Peak	49.2	74.0	24.8	Complied
5150	QPSK	18	Average	37.8	54.0	16.2	Complied
5350	QPSK	18	Peak	49.5	74.0	24.5	Complied
5350	QPSK	18	Average	38.5	54.0	15.5	Complied
5150	16QAM	24	Peak	49.1	74.0	24.9	Complied
5150	16QAM	24	Average	37.8	54.0	16.2	Complied
5350	16QAM	24	Peak	51.0	74.0	23.0	Complied
5350	16QAM	24	Average	38.5	54.0	15.5	Complied
5150	16QAM	36	Peak	48.8	74.0	25.2	Complied
5150	16QAM	36	Average	37.8	54.0	16.2	Complied
5350	16QAM	36	Peak	50.2	74.0	23.8	Complied
5350	16QAM	36	Average	38.0	54.0	16.0	Complied
5150	64QAM	48	Peak	49.3	74.0	24.7	Complied
5150	64QAM	48	Average	37.8	54.0	16.2	Complied
5350	64QAM	48	Peak	49.8	74.0	24.2	Complied
5350	64QAM	48	Average	38.0	54.0	16.0	Complied
5150	64QAM	54	Peak	49.1	74.0	24.9	Complied
5150	64QAM	54	Average	37.8	54.0	16.2	Complied
5350	64QAM	54	Peak	49.6	74.0	24.4	Complied
5350	64QAM	54	Average	38.0	54.0	16.0	Complied

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

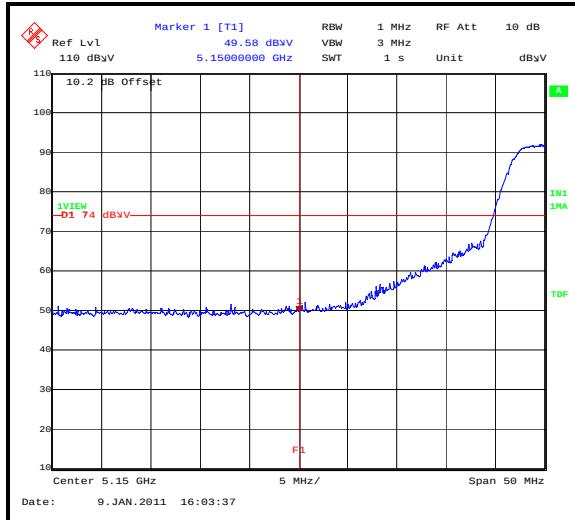
BandEdgePk_UNII_1_802_11A_6MBS_BottomChannel

BandEdgeAg_UNII_1_802_11A_6MBS_BottomChannel

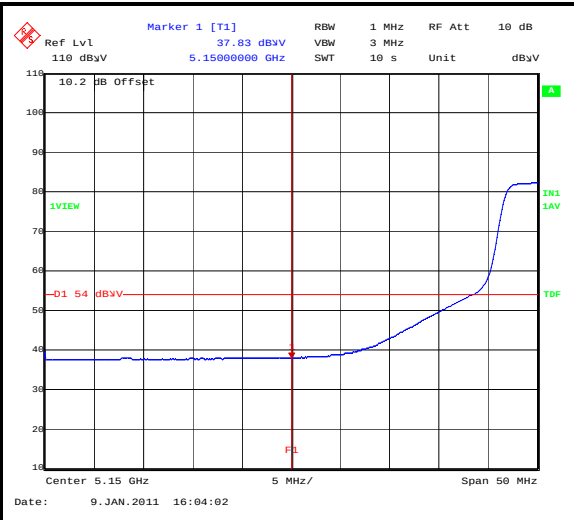


BandEdgePk_UNII_1_802_11A_6MBS_TopChannel

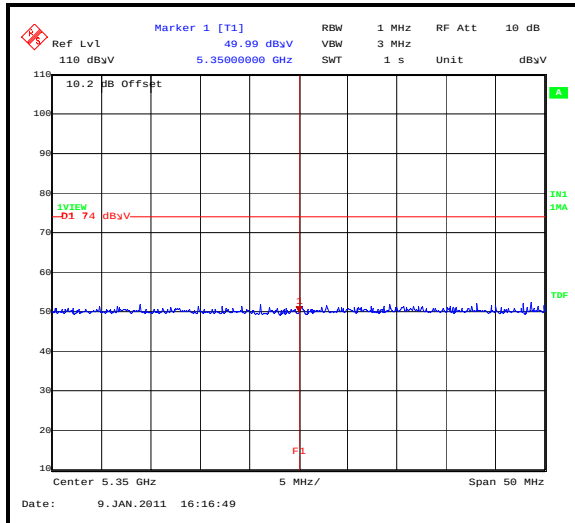
BandEdgeAg_UNII_1_802_11A_6MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

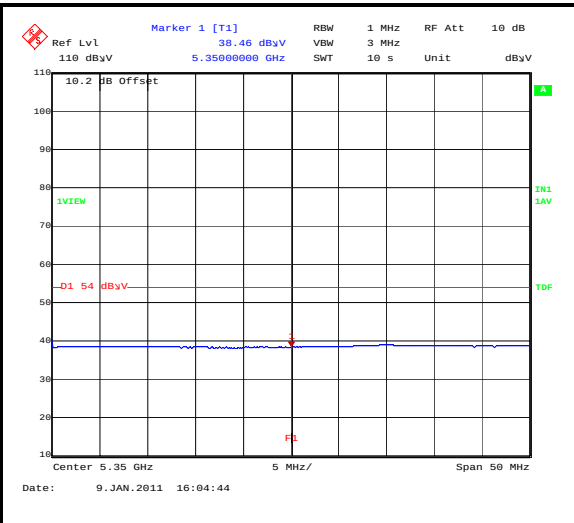
BandEdgePk_UNII_1_802_11A_9MBS_BottomChannel



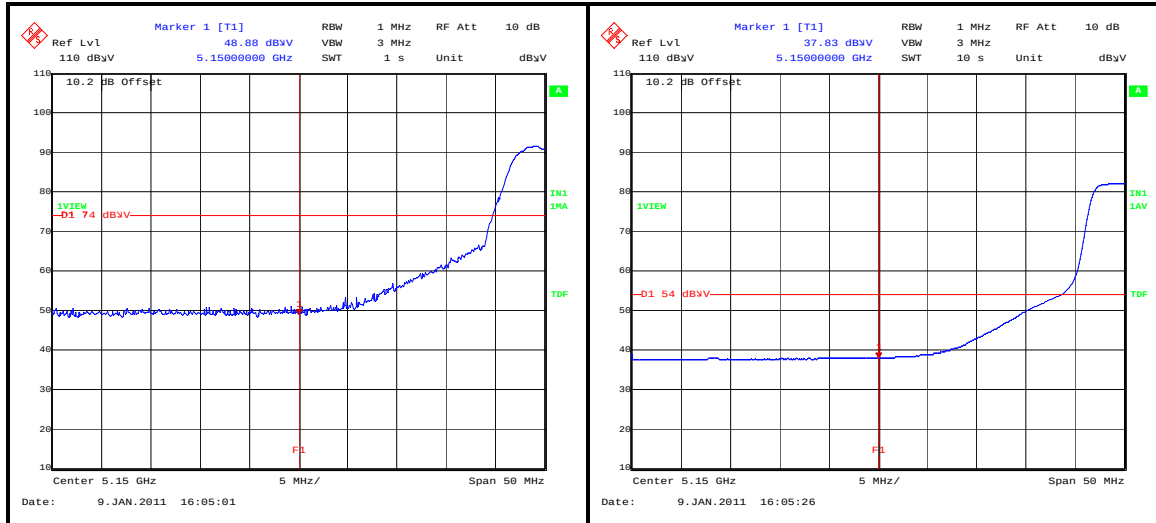
BandEdgeAv_UNII_1_802_11A_9MBS_BottomChannel



BandEdgePk_UNII_1_802_11A_9MBS_TopChannel

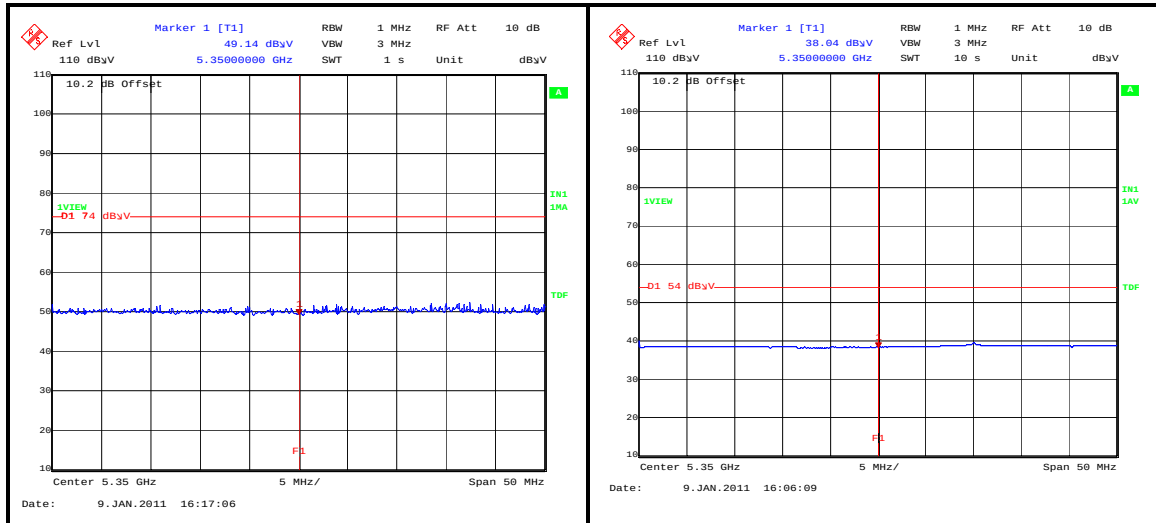


BandEdgeAg_UNII_1_802_11A_9MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

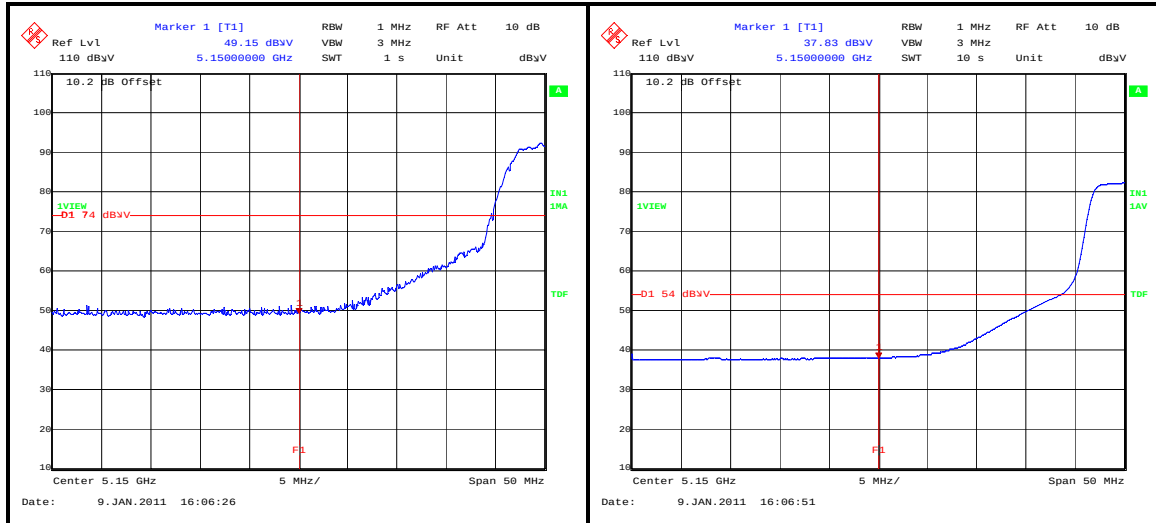
BandEdgePk_UNII_1_802_11A_12MBS_BottomChannel

BandEdgeAg_UNII_1_802_11A_12MBS_BottomChannel



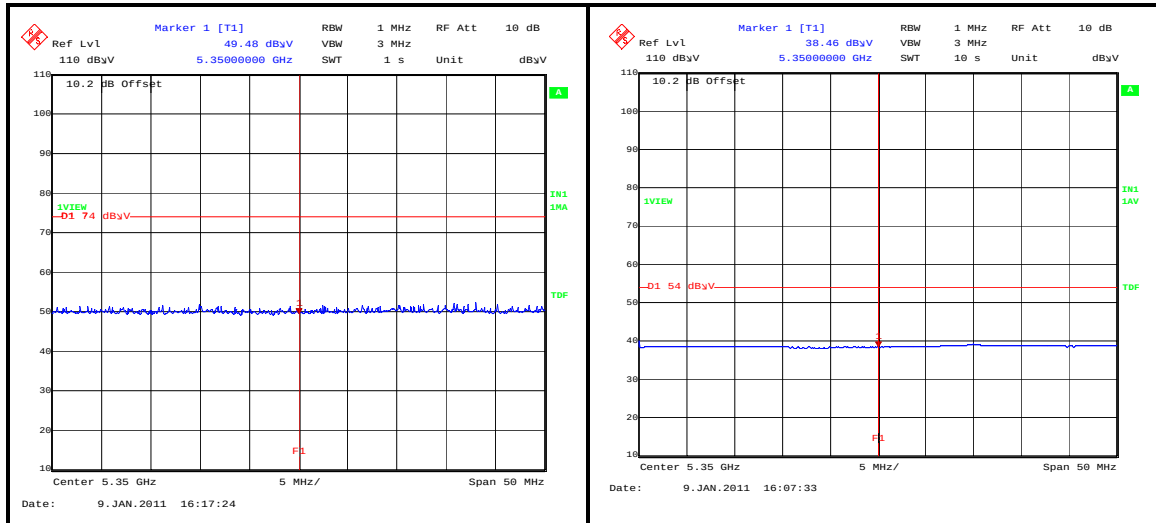
BandEdgePk_UNII_1_802_11A_12MBS_TopChannel

BandEdgeAg_UNII_1_802_11A_12MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

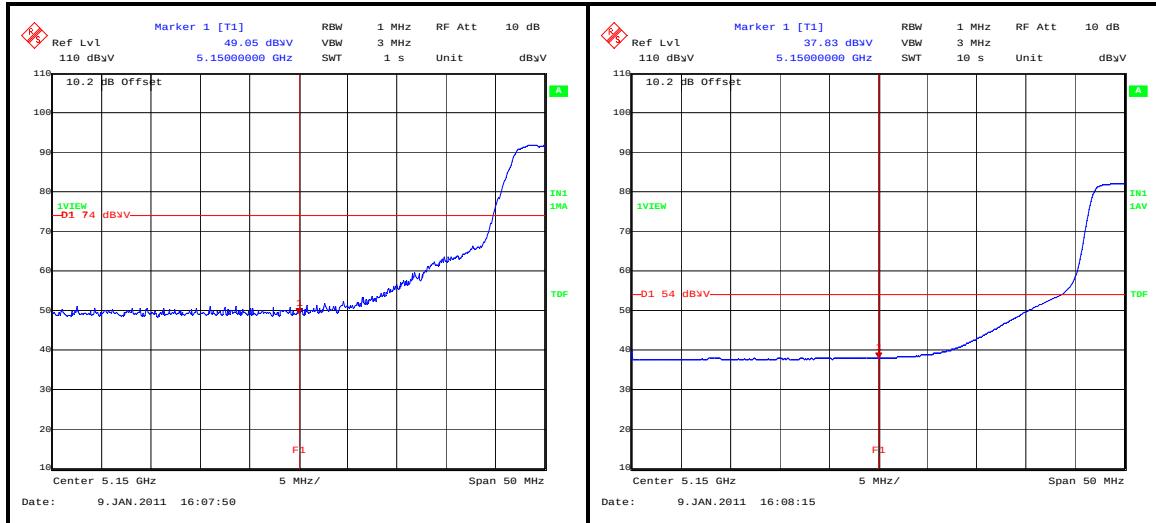
BandEdgePk_UNII_1_802_11A_18MBS_BottomChannel

BandEdgeAg_UNII_1_802_11A_18MBS_BottomChannel



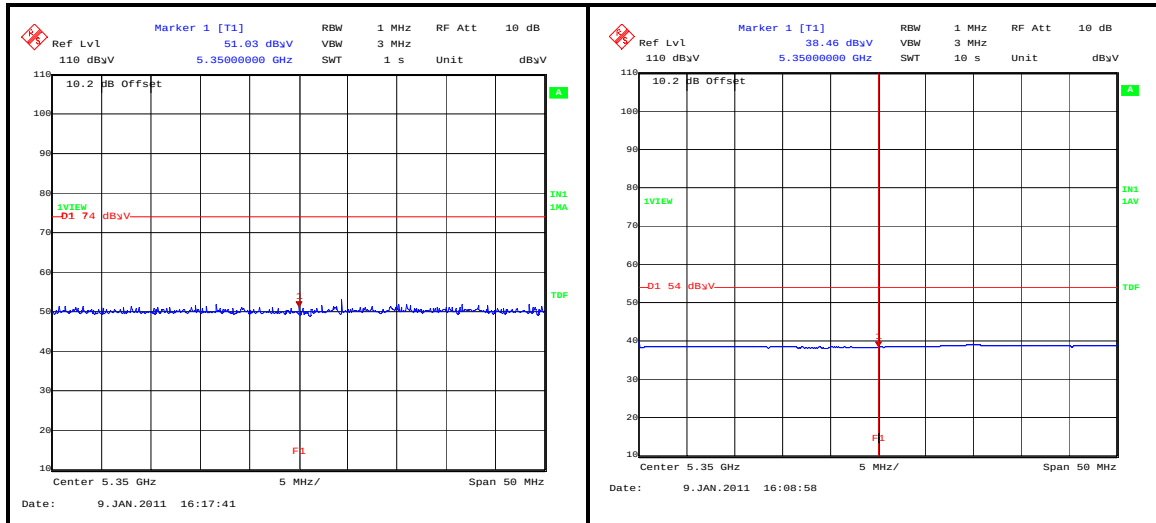
BandEdgePk_UNII_1_802_11A_18MBS_TopChannel

BandEdgeAg_UNII_1_802_11A_18MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

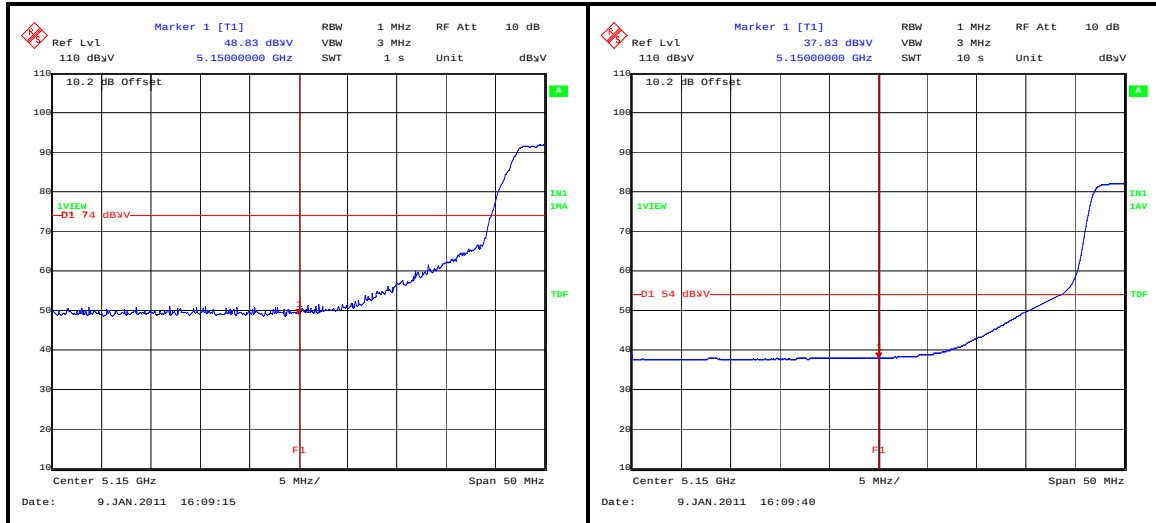
BandEdgePk_UNII_1_802_11A_24MBS_BottomChannel

BandEdgeAg_UNII_1_802_11A_24MBS_BottomChannel



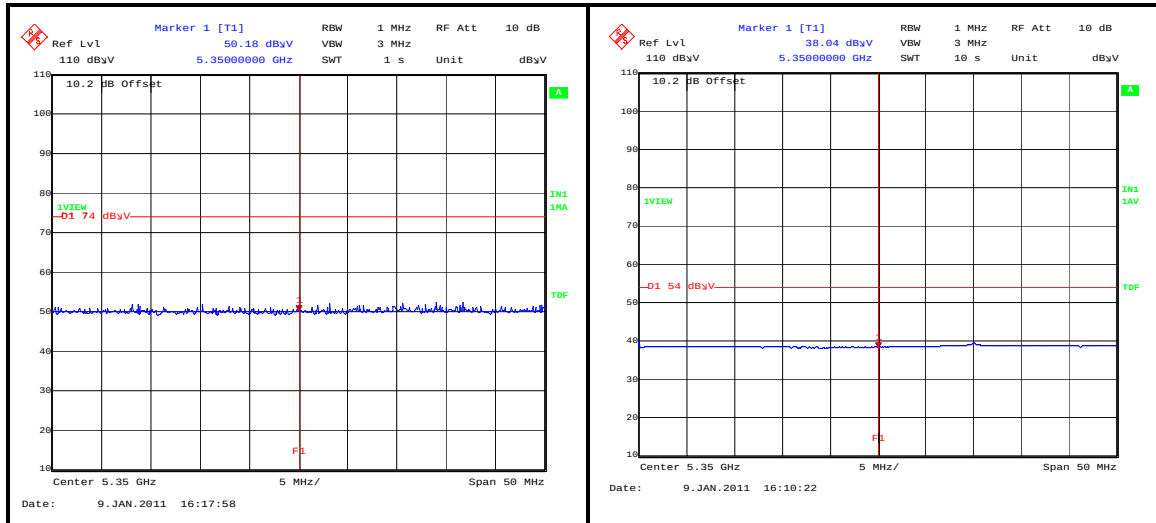
BandEdgePk_UNII_1_802_11A_24MBS_TopChannel

BandEdgeAg_UNII_1_802_11A_24MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

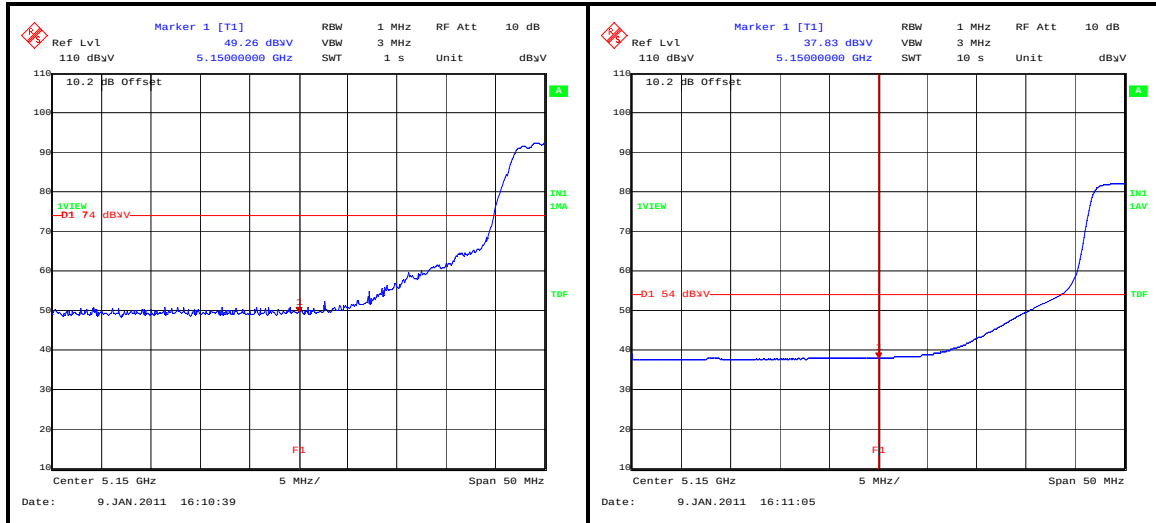
BandEdgePk_UNII_1_802_11A_36MBS_BottomChannel

BandEdgeAg_UNII_1_802_11A_36MBS_BottomChannel



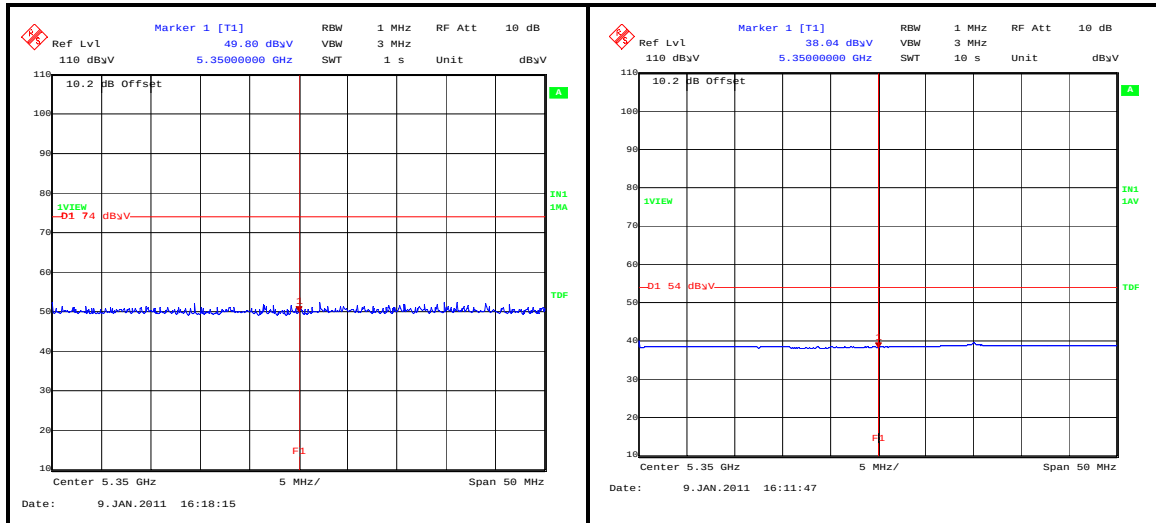
BandEdgePk_UNII_1_802_11A_36MBS_TopChannel

BandEdgeAg_UNII_1_802_11A_36MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

BandEdgePk_UNII_1_802_11A_48MBS_BottomChannel

BandEdgeAg_UNII_1_802_11A_48MBS_BottomChannel

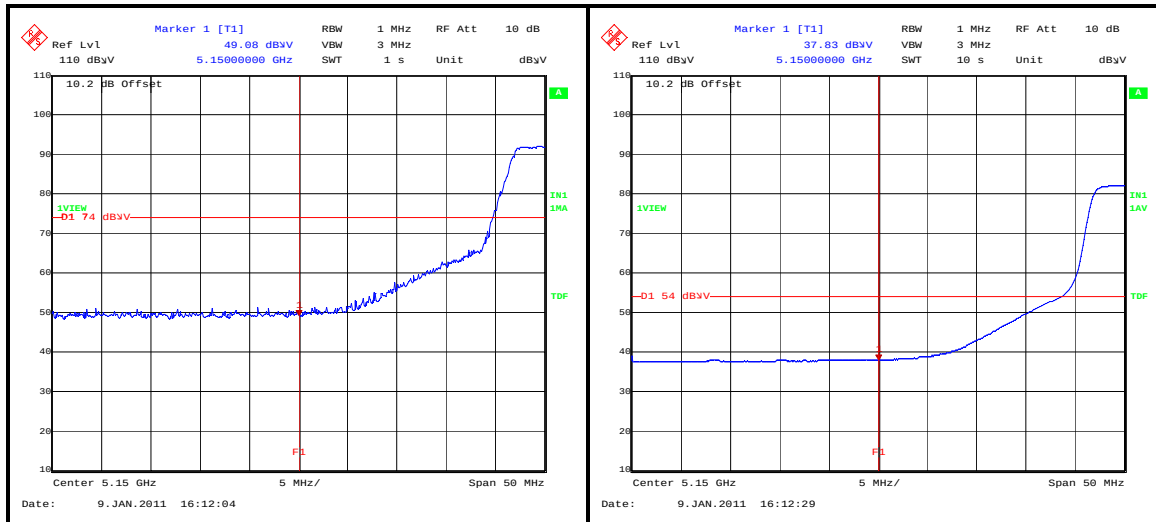


BandEdgePk_UNII_1_802_11A_48MBS_TopChannel

BandEdgeAg_UNII_1_802_11A_48MBS_TopChannel

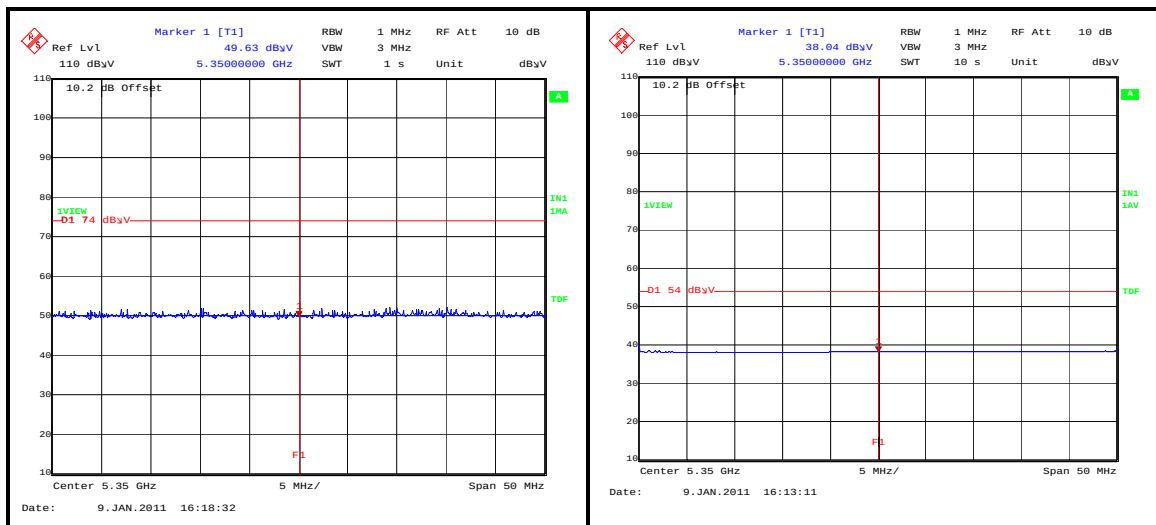
Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)

802.11a - 5.15-5.25 GHz band – Plots



BandEdgePk_UNII_1_802_11A_54MBS_BottomChannel

BandEdgeAg_UNII_1_802_11A_54MBS_BottomChannel

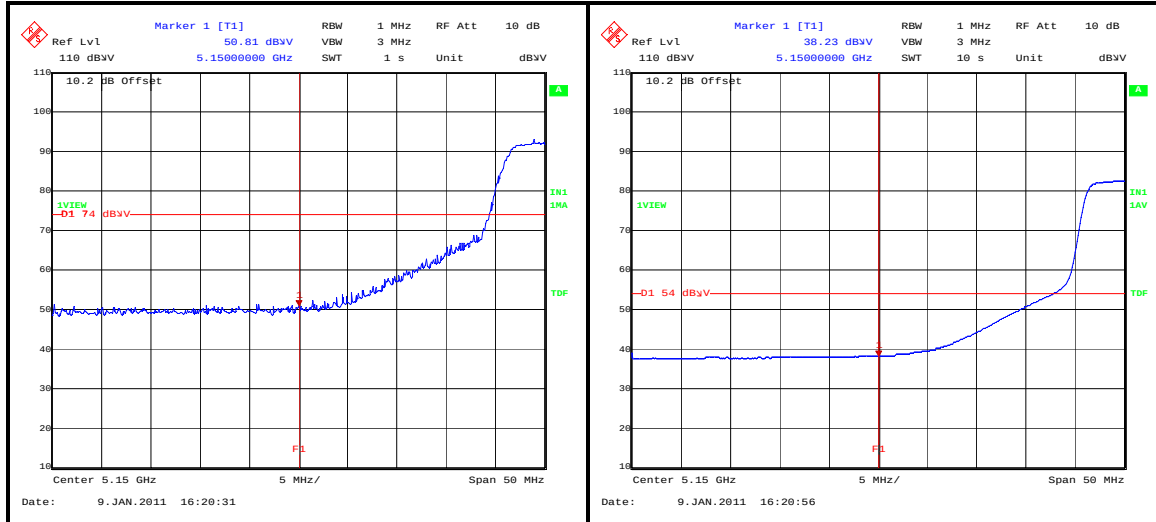


BandEdgePk_UNII_1_802_11A_54MBS_TopChannel

BandEdgeAg_UNII_1_802_11A_54MBS_TopChannel

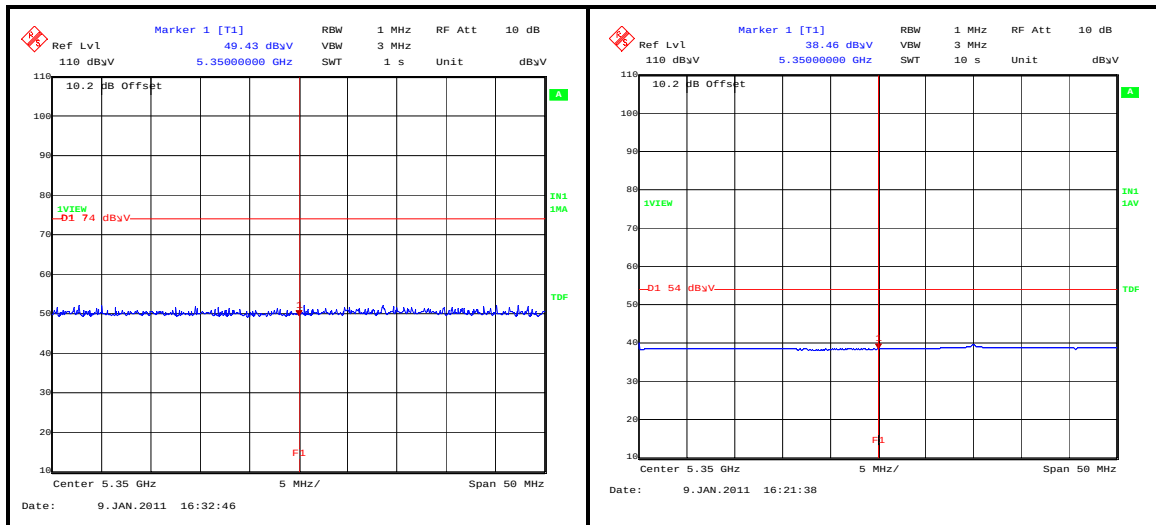
Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band**

Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Detector	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
5150	BPSK	6.5	Peak	50.8	74.0	23.2	Complied
5150	BPSK	6.5	Average	38.2	54.0	15.8	Complied
5350	BPSK	6.5	Peak	49.4	74.0	24.6	Complied
5350	BPSK	6.5	Average	38.5	54.0	15.5	Complied
5150	QPSK	13	Peak	49.7	74.0	24.3	Complied
5150	QPSK	13	Average	38.2	54.0	15.8	Complied
5350	QPSK	13	Peak	49.9	74.0	24.1	Complied
5350	QPSK	13	Average	38.5	54.0	15.5	Complied
5150	QPSK	19.5	Peak	49.7	74.0	24.3	Complied
5150	QPSK	19.5	Average	38.2	54.0	15.8	Complied
5350	QPSK	19.5	Peak	49.9	74.0	24.1	Complied
5350	QPSK	19.5	Average	38.5	54.0	15.5	Complied
5150	16QAM	26	Peak	49.7	74.0	24.3	Complied
5150	16QAM	26	Average	38.2	54.0	15.8	Complied
5350	16QAM	26	Peak	49.9	74.0	24.1	Complied
5350	16QAM	26	Average	38.5	54.0	15.5	Complied
5150	16QAM	39	Peak	50.1	74.0	23.9	Complied
5150	16QAM	39	Average	38.2	54.0	15.8	Complied
5350	16QAM	39	Peak	49.9	74.0	24.1	Complied
5350	16QAM	39	Average	38.5	54.0	15.5	Complied
5150	64QAM	52	Peak	50.1	74.0	23.9	Complied
5150	64QAM	52	Average	38.2	54.0	15.8	Complied
5350	64QAM	52	Peak	50.2	74.0	23.8	Complied
5350	64QAM	52	Average	38.5	54.0	15.5	Complied
5150	64QAM	58.5	Peak	50.0	74.0	24.0	Complied
5150	64QAM	58.5	Average	38.2	54.0	15.8	Complied
5350	64QAM	58.5	Peak	50.1	74.0	23.9	Complied
5350	64QAM	58.5	Average	38.5	54.0	15.5	Complied
5150	64QAM	65	Peak	49.3	74.0	24.7	Complied
5150	64QAM	65	Average	38.2	54.0	15.8	Complied
5350	64QAM	65	Peak	49.4	74.0	24.6	Complied
5350	64QAM	65	Average	38.5	54.0	15.5	Complied

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

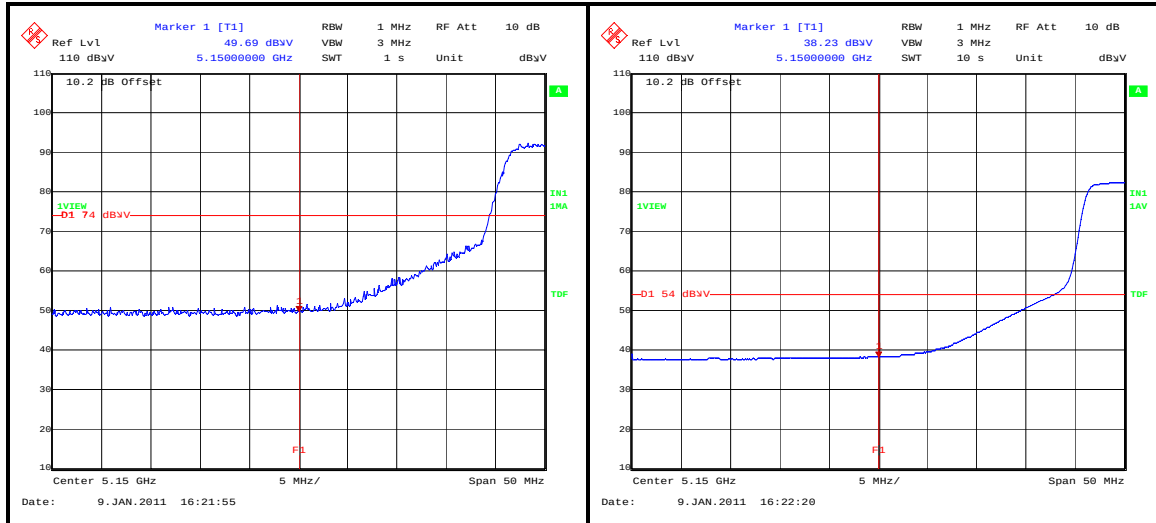
BandEdgePk_UNII_1_802_11N_6.5MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_6.5MBS_BottomChannel



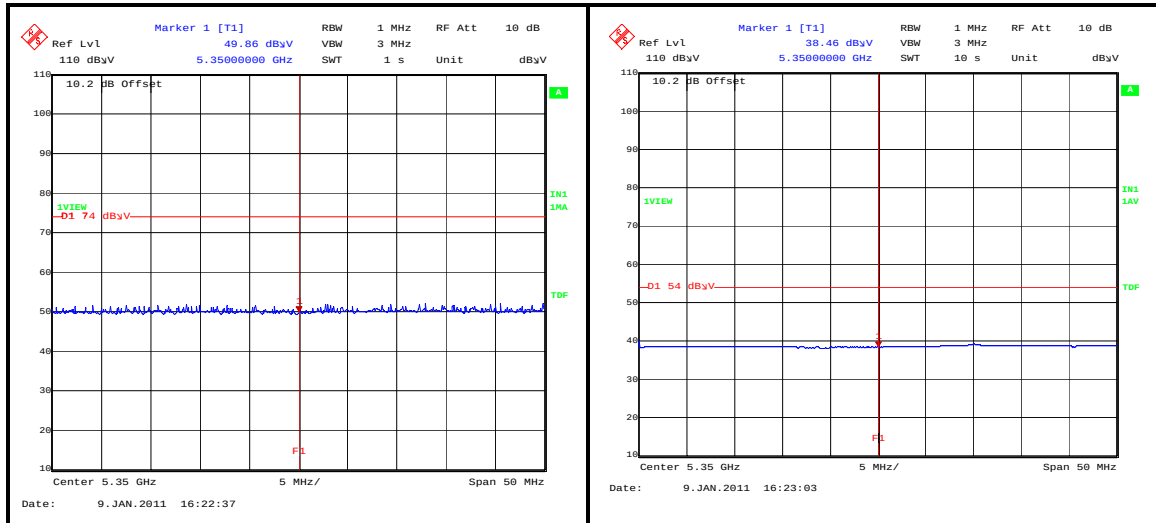
BandEdgePk_UNII_1_802_11N_6.5MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_6.5MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

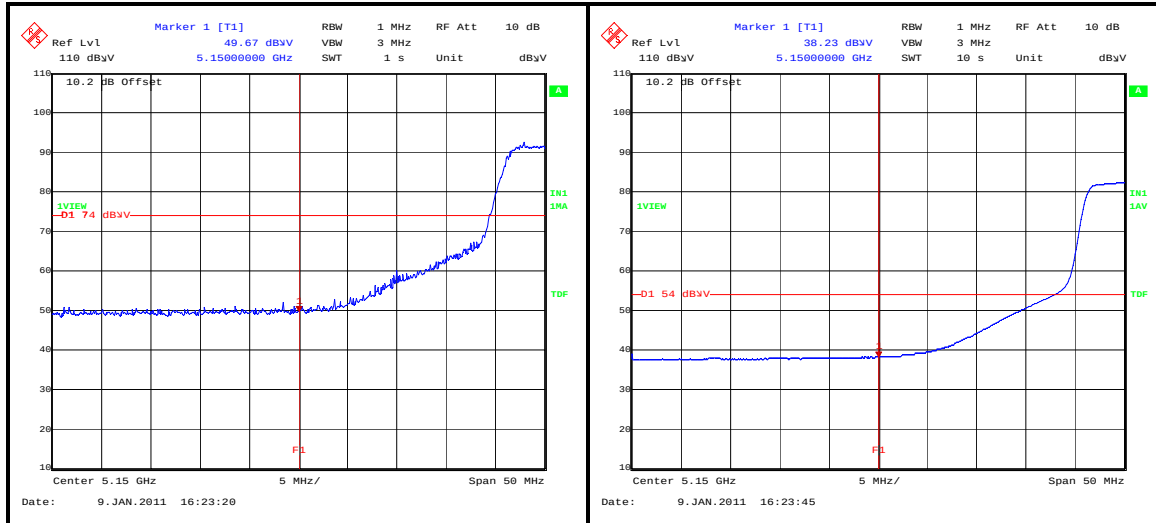
BandEdgePk_UNII_1_802_11N_13MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_13MBS_BottomChannel



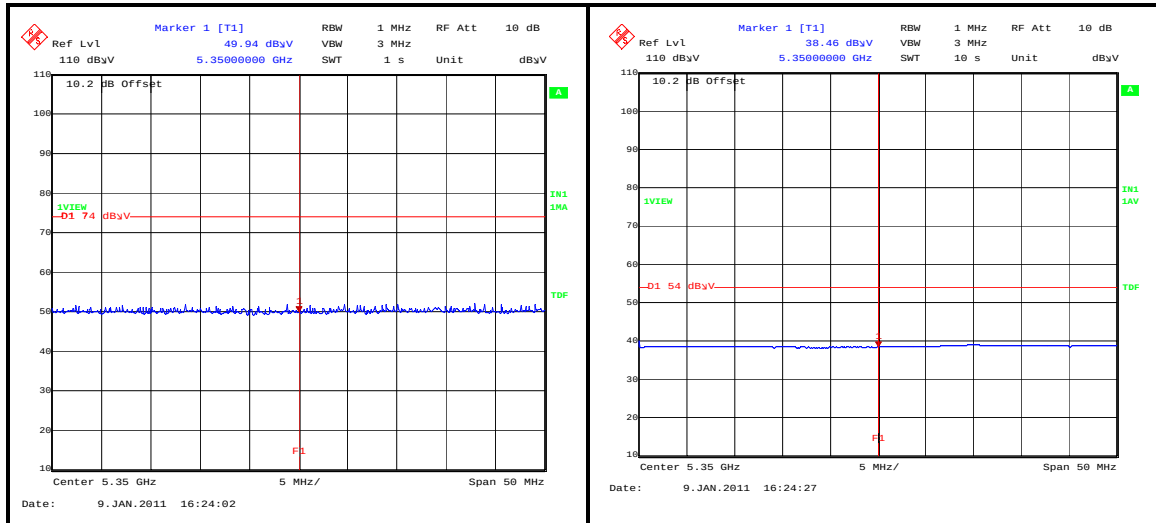
BandEdgePk_UNII_1_802_11N_13MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_13MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

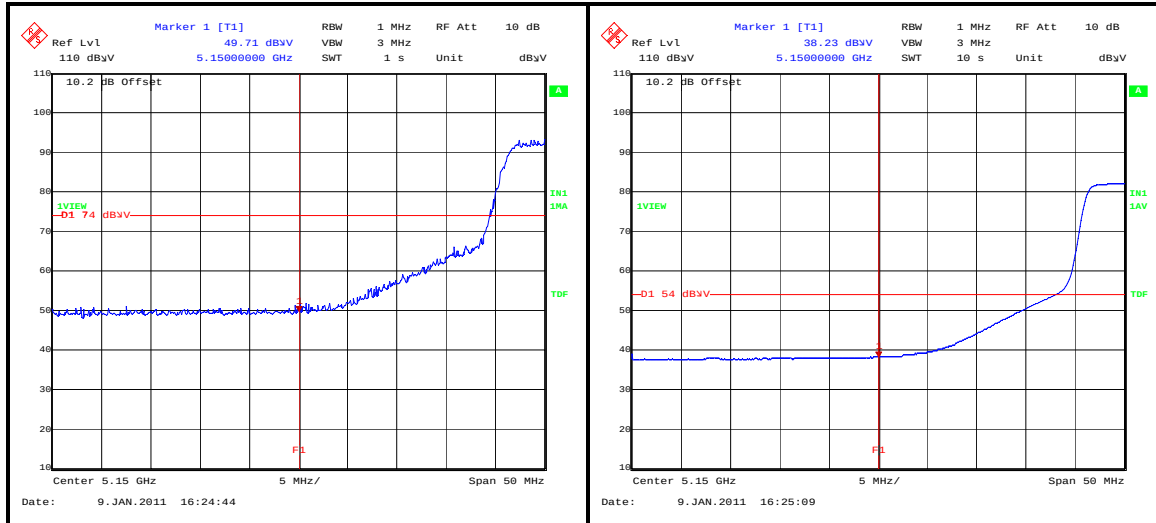
BandEdgePk_UNII_1_802_11N_19.5MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_19.5MBS_BottomChannel



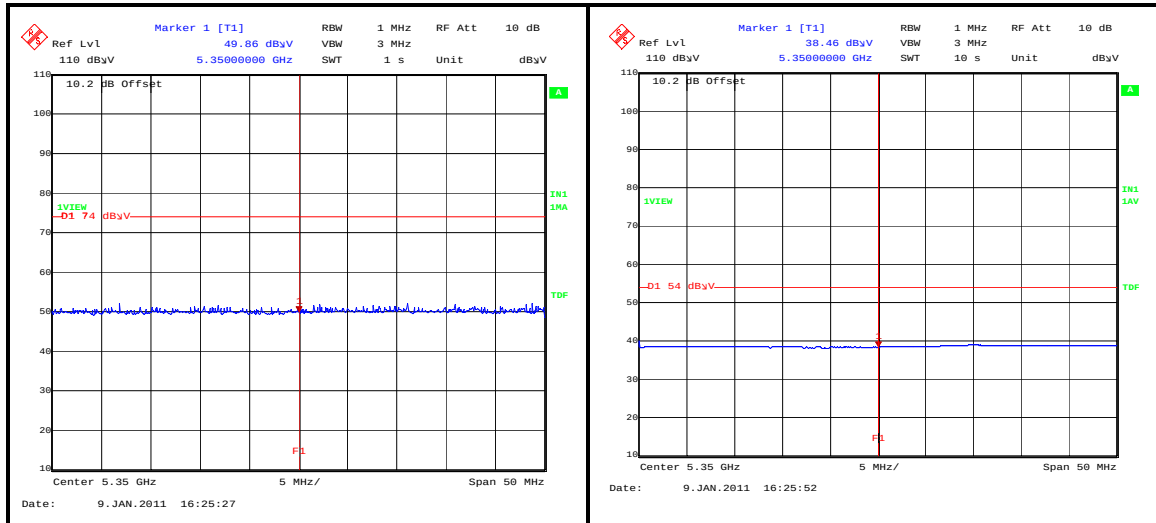
BandEdgePk_UNII_1_802_11N_19.5MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_19.5MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

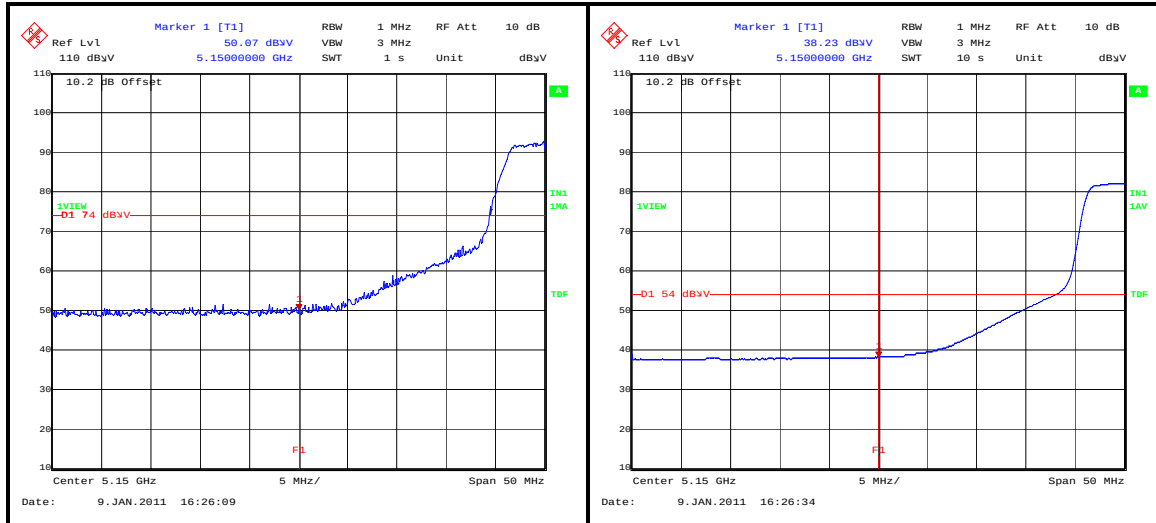
BandEdgePk_UNII_1_802_11N_26MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_26MBS_BottomChannel



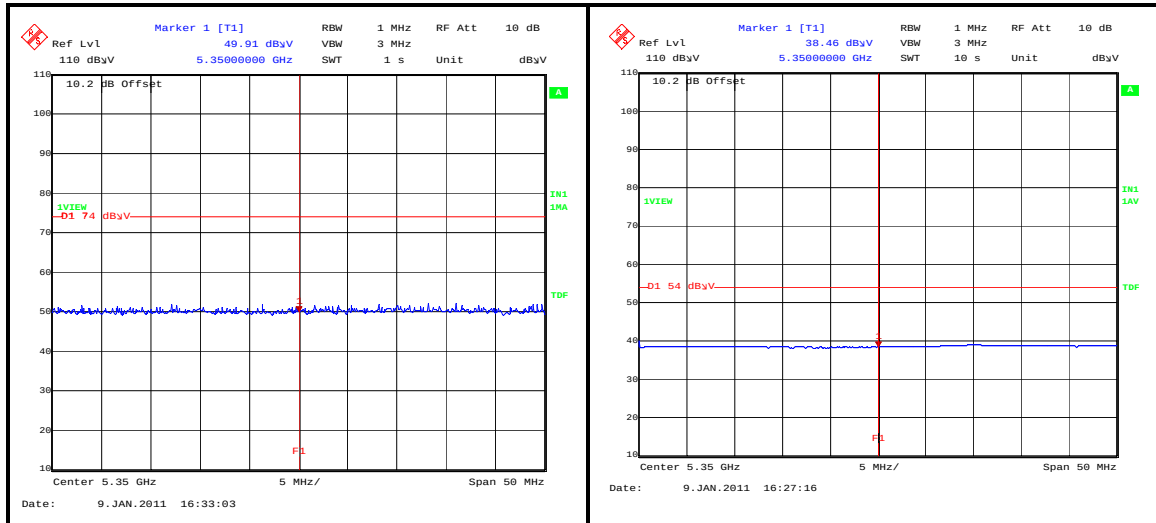
BandEdgePk_UNII_1_802_11N_26MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_26MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

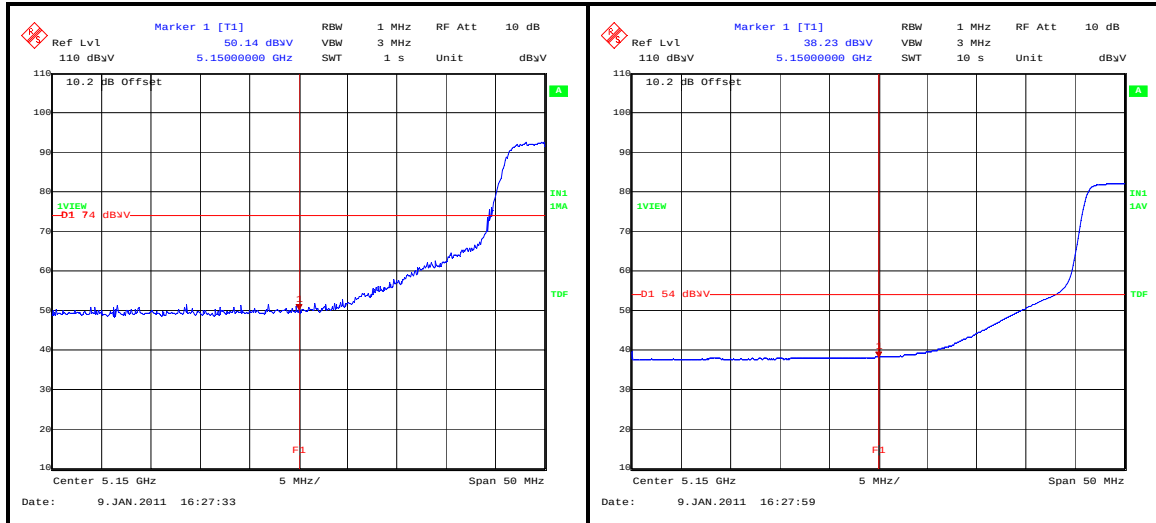
BandEdgePk_UNII_1_802_11N_39MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_39MBS_BottomChannel



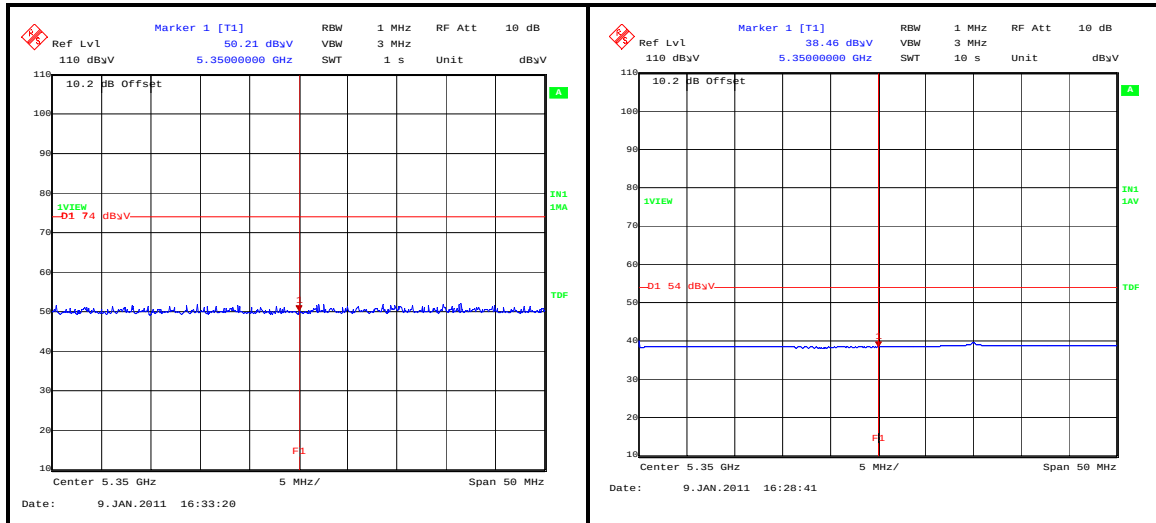
BandEdgePk_UNII_1_802_11N_39MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_39MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

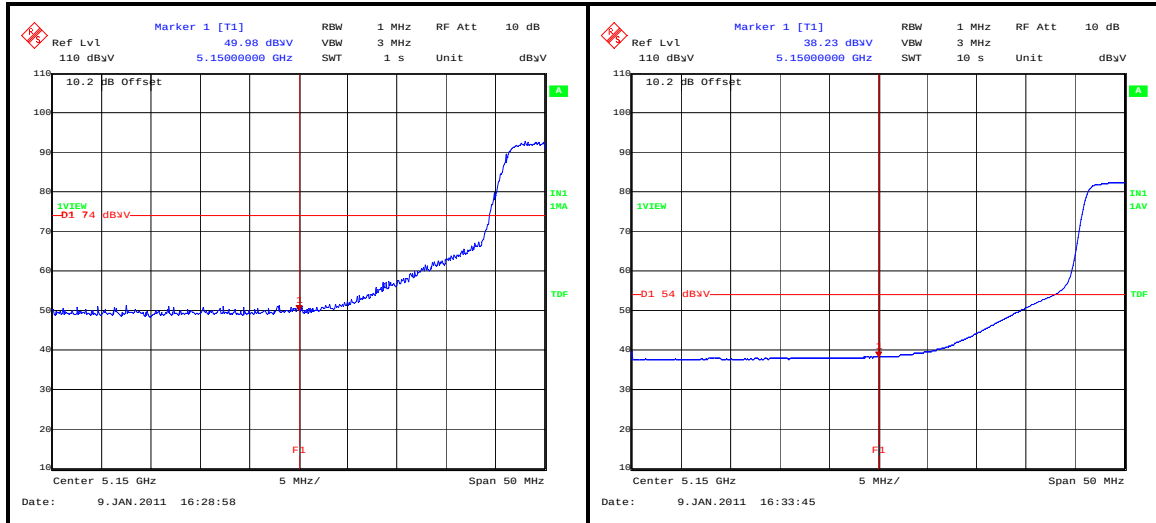
BandEdgePk_UNII_1_802_11N_52MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_52MBS_BottomChannel



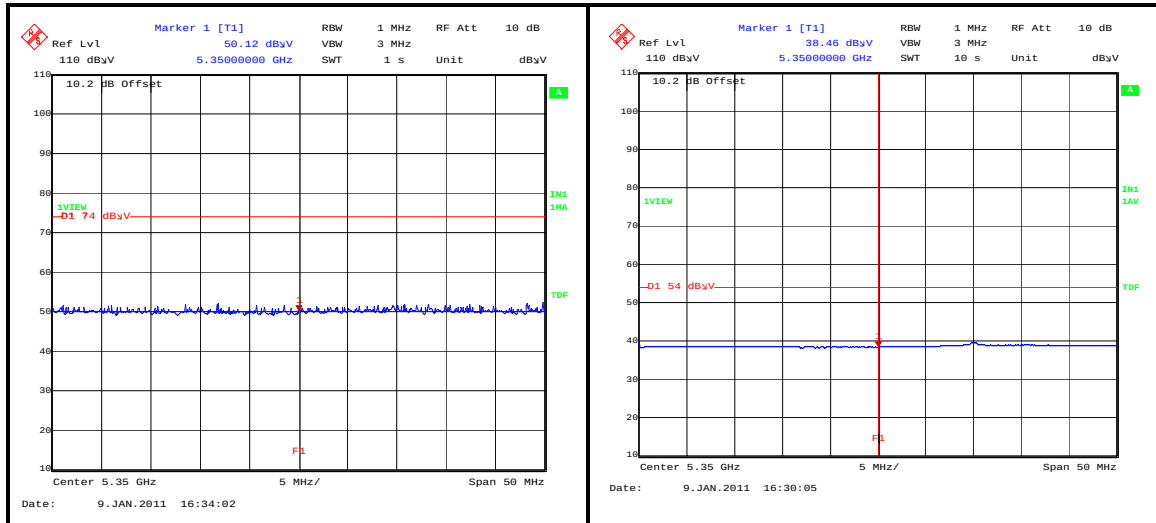
BandEdgePk_UNII_1_802_11N_52MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_52MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

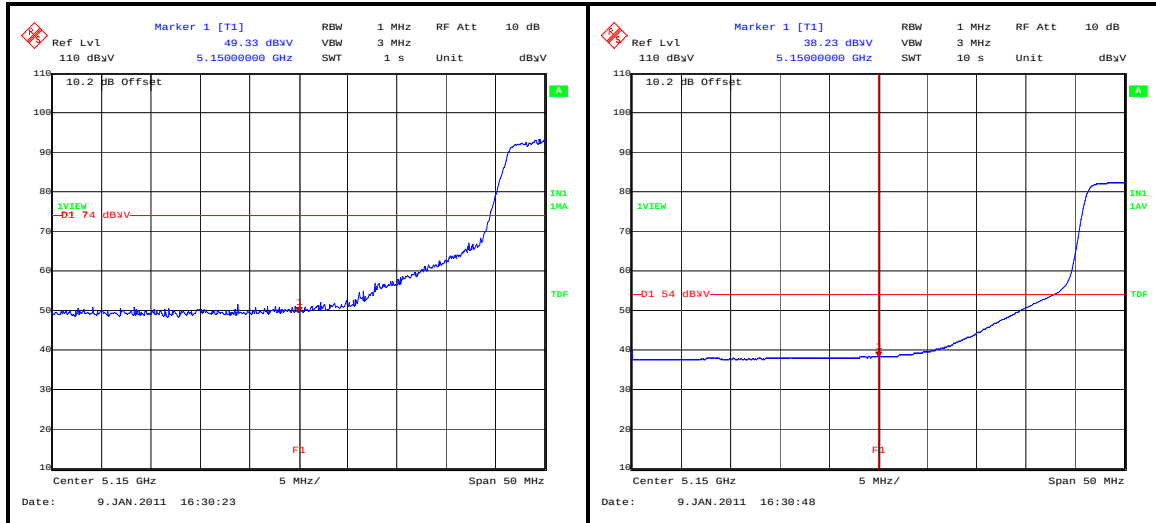
BandEdgePk_UNII_1_802_11N_58.5MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_58.5MBS_BottomChannel



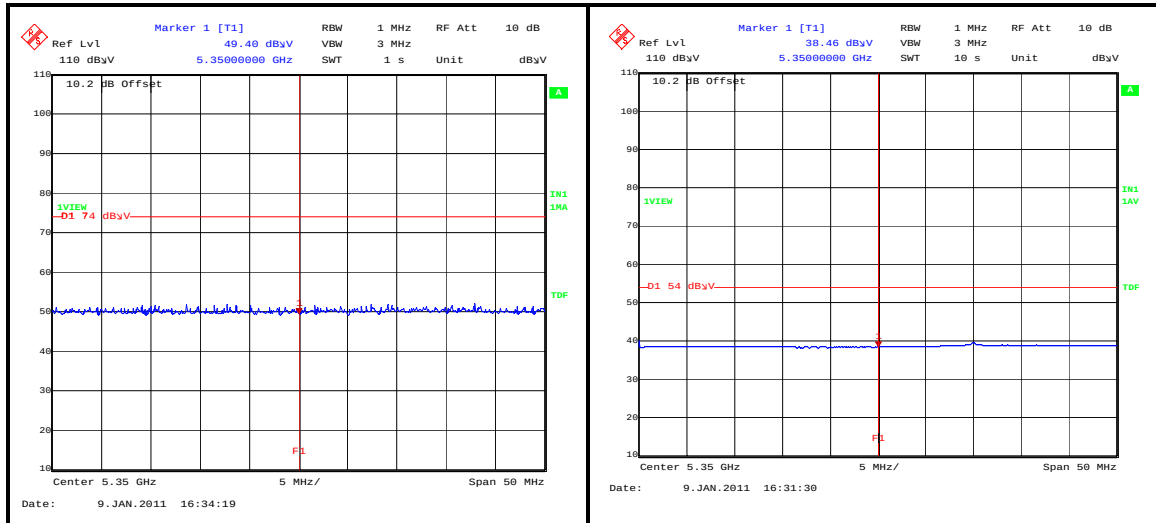
BandEdgePk_UNII_1_802_11N_58.5MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_58.5MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

BandEdgePk_UNII_1_802_11N_65MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_65MBS_BottomChannel



BandEdgePk_UNII_1_802_11N_65MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_65MBS_TopChannel

5.3. Test Results - ProAnt Inside EPA WLAN

5.3.1. Receiver/Idle Mode Radiated Spurious Emissions

Test Summary:

Test Engineer:	Nick Steele	Test Date:	23 November 2010
Test Sample Serial No:	ID1		
Antenna:	ProAnt Inside EPA WLAN		

FCC/IC Part:	15.109(a) and RSS-Gen 7.2.4
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range:	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	23

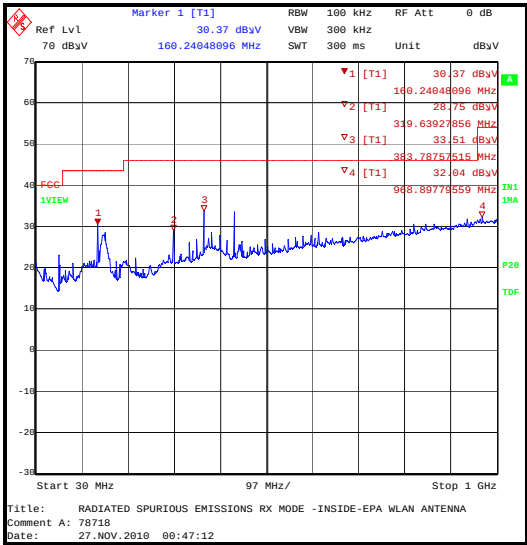
Results: Quasi Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
78.597	Vertical	22.4	40.0	17.6	Complied
159.967	Vertical	27.5	43.5	16.0	Complied
319.995	Horizontal	28.8	46.0	17.2	Complied
383.973	Horizontal	34.2	46.0	11.8	Complied
399.942	Horizontal	33.2	46.0	12.8	Complied
447.979	Horizontal	33.2	46.0	12.8	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Receiver/Idle Mode Radiated Spurious Emissions (continued)



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Receiver/Idle Mode Radiated Spurious Emissions (continued)**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	23 November 2010 & 25 November 2010
Test Sample Serial No:	ID:1		
Antenna:	ProAnt Inside EPA WLAN		

FCC/IC Part:	15.109 and RSS-Gen 4.10/6.1
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
Frequency Range:	1 GHz to 30 GHz

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	24

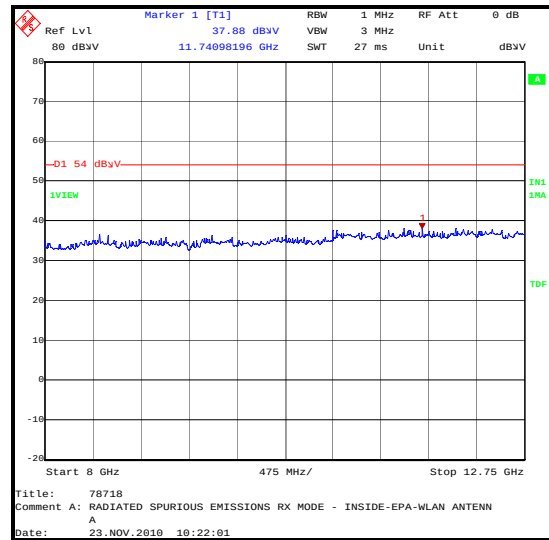
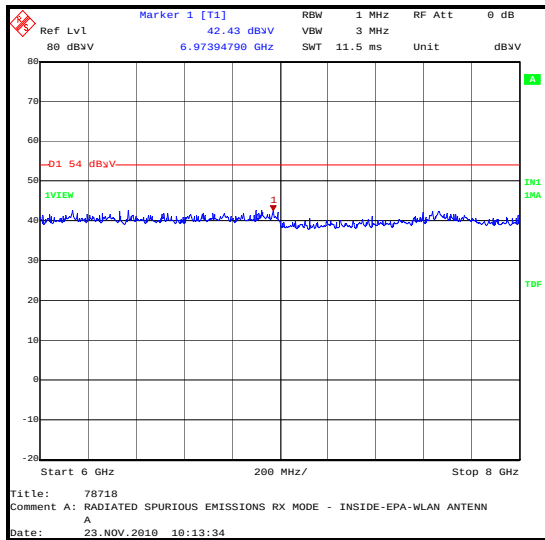
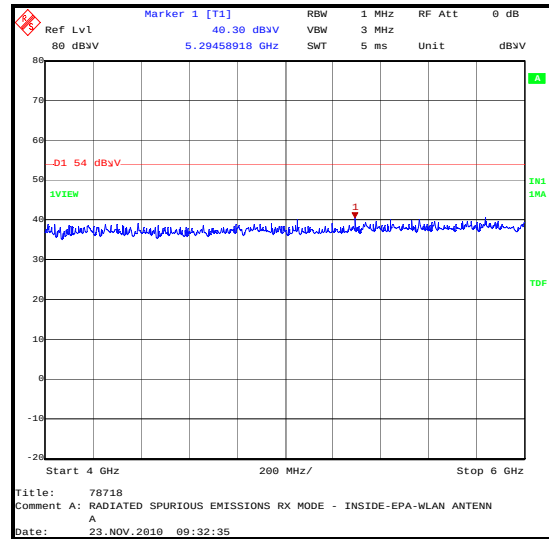
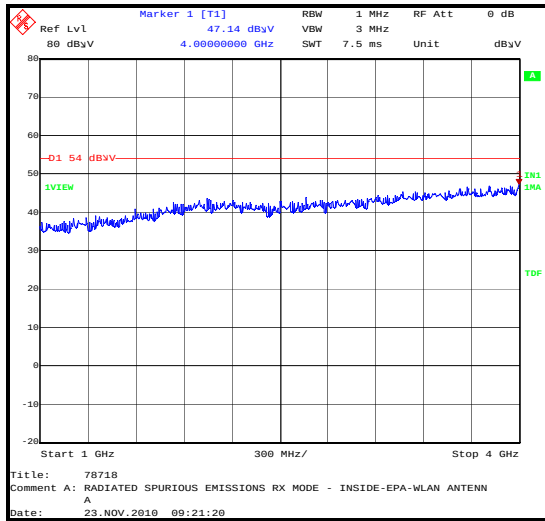
Results:

Frequency (GHz)	Antenna Polarity	Peak Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
26.159	Vertical	49.7	*54.0	5.3	Complied

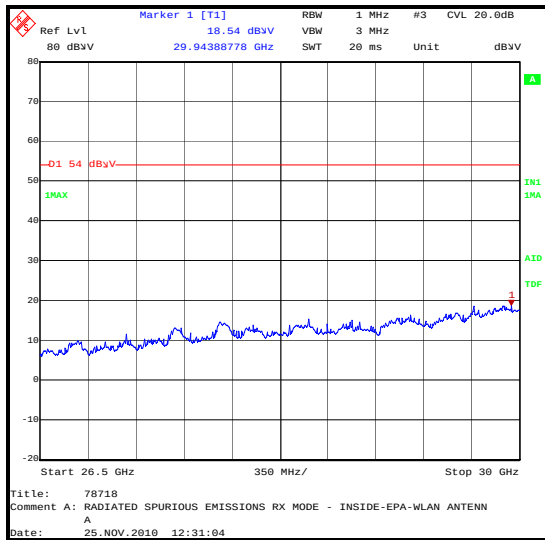
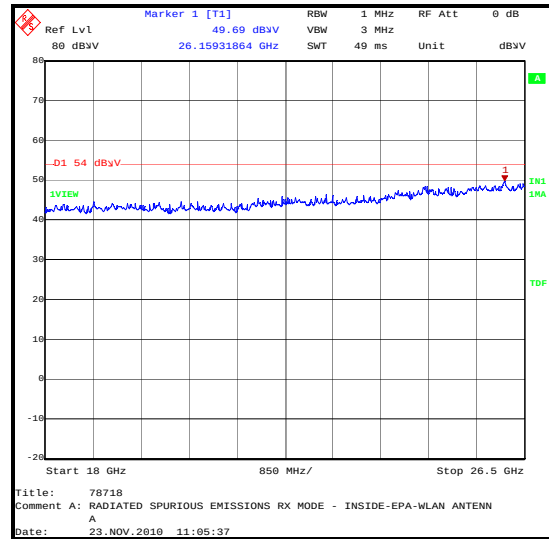
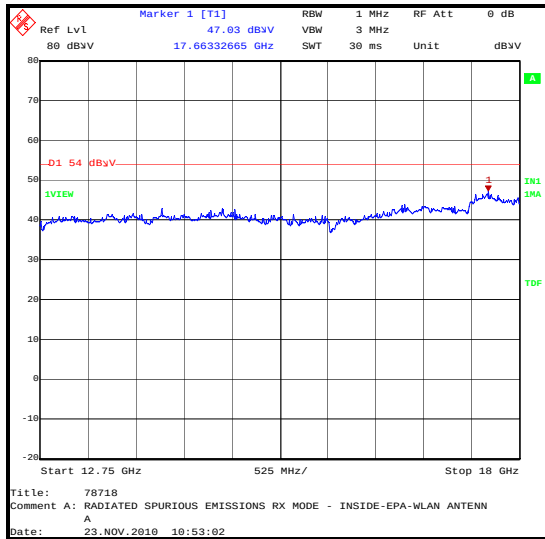
Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.
3. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

* The average limit was compared to the peak level as opposed to being compared to the peak limit because this is the more stringent limit.

Receiver/Idle Mode Radiated Spurious Emissions (continued)

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Receiver/Idle Mode Radiated Spurious Emissions (continued)

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

5.3.2. Transmitter Maximum Output Power**Test Summary:**

Test Engineer:	Nigel Davison	Test Date:	11 May 2011
Test Sample Serial No:	ID:3		
Antenna:	ProAnt Inside EPA WLAN		

FCC Part:	FCC 15.407(a)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.3.1 Method 1

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	24

The limit was the lesser of 17dBm or 4dBm + 10 x Log (B) where B is the emission bandwidth measure above.

For the result of 5150 to 5250MHz, 17dBm was the lowest limit and thus was used as the limit shown in the results table below.

For 802.11N, limits for all bands were calculated based on the emissions bandwidth and the limit calculation within the FCC 15.407 as these were slightly lower than the fixed limits.

The gain of the proposed antenna is 3dBi.

Transmitter Maximum Peak Output Power (continued)**Results - 802.11A 5150 to 5250MHz**

Channel	Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	BPSK	6	8.2	17	8.8	Complied
Middle	5200	BPSK	6	7.1	17	9.9	Complied
Top	5240	BPSK	6	7.5	17	9.5	Complied
Bottom	5180	BPSK	9	6.8	17	10.2	Complied
Middle	5200	BPSK	9	7.7	17	9.3	Complied
Top	5240	BPSK	9	8.5	17	8.5	Complied
Bottom	5180	QPSK	12	7.1	17	9.9	Complied
Middle	5200	QPSK	12	7.3	17	9.7	Complied
Top	5240	QPSK	12	8.0	17	9.0	Complied
Bottom	5180	QPSK	18	6.4	17	10.6	Complied
Middle	5200	QPSK	18	6.9	17	10.1	Complied
Top	5240	QPSK	18	7.5	17	9.5	Complied
Bottom	5180	16QAM	24	6.6	17	10.4	Complied
Middle	5200	16QAM	24	6.6	17	10.4	Complied
Top	5240	16QAM	24	7.4	17	9.6	Complied
Bottom	5180	16QAM	36	8.3	17	8.7	Complied
Middle	5200	16QAM	36	7.8	17	9.2	Complied
Top	5240	16QAM	36	8.3	17	8.7	Complied
Bottom	5180	64QAM	48	7.5	17	9.5	Complied
Middle	5200	64QAM	48	7.4	17	9.6	Complied
Top	5240	64QAM	48	8.9	17	8.1	Complied
Bottom	5180	64QAM	54	7.5	17	9.5	Complied
Middle	5200	64QAM	54	7.4	17	9.6	Complied
Top	5240	64QAM	54	7.7	17	9.3	Complied

Note: Plots for the results can be seen in section 5.2.2

Transmitter Maximum Output Power (continued)**Results - 802.11N 5150 to 5250MHz**

Channel	Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	5180	BPSK	6.5	7.1	17	9.9	Complied
Middle	5200	BPSK	6.5	7.3	17	9.7	Complied
Top	5240	BPSK	6.5	8.2	17	8.8	Complied
Bottom	5180	QPSK	13	7.2	17	9.8	Complied
Middle	5200	QPSK	13	7.3	17	9.7	Complied
Top	5240	QPSK	13	8.2	17	8.8	Complied
Bottom	5180	QPSK	19.5	7.1	17	9.9	Complied
Middle	5200	QPSK	19.5	7.4	17	9.6	Complied
Top	5240	QPSK	19.5	8.0	17	9.0	Complied
Bottom	5180	16QAM	26	7.0	17	10.0	Complied
Middle	5200	16QAM	26	7.4	17	9.6	Complied
Top	5240	16QAM	26	7.8	17	9.2	Complied
Bottom	5180	64QAM	39	8.0	17	9.0	Complied
Middle	5200	64QAM	39	7.7	17	9.3	Complied
Top	5240	64QAM	39	8.2	17	8.8	Complied
Bottom	5180	64QAM	52	7.1	17	9.9	Complied
Middle	5200	64QAM	52	7.3	17	9.7	Complied
Top	5240	64QAM	52	8.6	17	8.4	Complied
Bottom	5180	64QAM	58	8.0	17	9.0	Complied
Middle	5200	64QAM	58	7.7	17	9.3	Complied
Top	5240	64QAM	58	8.4	17	8.6	Complied
Bottom	5180	64QAM	65	7.6	17	9.4	Complied
Middle	5200	64QAM	65	8.9	17	8.1	Complied
Top	5240	64QAM	65	9.4	17	7.6	Complied

Note: Plots for the results can be seen in section 5.2.2

5.3.3. Transmitter Maximum Equivalent Isotropically Radiated Power (5.15-5.25 GHz band)**Test Summary:**

Test Engineer:	Nigel Davison	Test Date:	11 May 2011
Test Sample Serial No:	ID 3		

RSS Reference:	RSS-210 A9.2(1)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.3.1 Method 1

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	24

Results - 802.11A 5150 to 5250MHz

Channel	Mod Scheme	Data Rate	Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Fixed Limit (dBm)	Margin (dB)	Result
Bottom	BPSK	6	8.2	3	11.2	23.0	11.8	Complied
Middle	BPSK	6	7.1	3	10.1	23.0	12.9	Complied
Top	BPSK	6	7.5	3	10.5	23.0	12.5	Complied
Bottom	BPSK	9	6.8	3	9.8	23.0	13.2	Complied
Middle	BPSK	9	7.7	3	10.7	23.0	12.3	Complied
Top	BPSK	9	8.5	3	11.5	23.0	11.5	Complied
Bottom	QPSK	12	7.1	3	10.1	23.0	12.9	Complied
Middle	QPSK	12	7.3	3	10.3	23.0	12.7	Complied
Top	QPSK	12	8.0	3	11.0	23.0	12.0	Complied
Bottom	QPSK	18	6.4	3	9.4	23.0	13.6	Complied
Middle	QPSK	18	6.9	3	9.9	23.0	13.1	Complied
Top	QPSK	18	7.5	3	10.5	23.0	12.5	Complied
Bottom	16QAM	24	6.6	3	9.6	23.0	13.4	Complied
Middle	16QAM	24	6.6	3	9.6	23.0	13.4	Complied
Top	16QAM	24	7.4	3	10.4	23.0	12.6	Complied
Bottom	16QAM	36	8.3	3	11.3	23.0	11.7	Complied
Middle	16QAM	36	7.8	3	10.8	23.0	12.2	Complied
Top	16QAM	36	8.3	3	11.3	23.0	11.7	Complied
Bottom	64QAM	48	7.5	3	10.5	23.0	12.5	Complied
Middle	64QAM	48	7.4	3	10.4	23.0	12.6	Complied
Top	64QAM	48	8.9	3	11.9	23.0	11.1	Complied
Bottom	64QAM	54	7.5	3	10.5	23.0	12.5	Complied

Channel	Mod Scheme	Data Rate	Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Fixed Limit (dBm)	Margin (dB)	Result
Middle	64QAM	54	7.4	3	10.4	23.0	12.6	Complied
Top	64QAM	54	7.7	3	10.7	23.0	12.3	Complied

Note(s):

3. The limit is the lesser of 200 mW (23.0 dBm) or $10 \text{ dBm} + 10 \log B$, where B is the 99% emission bandwidth in MHz.
4. For the smallest 99% bandwidth of 19.0 MHz the limit equates to 22.8 dBm however as the pass margin is in excess of 10 dB for all test cases the fixed limit of 23.0 dBm is detailed in the above table for the sake of simplicity.

Results - 802.11N 5150 to 5250MHz

Channel	Mod Scheme	Data Rate	Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Fixed Limit (dBm)	Margin (dB)	Result
Bottom	BPSK	6.5	7.1	3	10.1	23.0	12.9	Complied
Middle	BPSK	6.5	7.3	3	10.3	23.0	12.7	Complied
Top	BPSK	6.5	8.2	3	11.2	23.0	11.8	Complied
Bottom	QPSK	13	7.2	3	10.2	23.0	12.8	Complied
Middle	QPSK	13	7.3	3	10.3	23.0	12.7	Complied
Top	QPSK	13	8.2	3	11.2	23.0	11.8	Complied
Bottom	QPSK	19.5	7.1	3	10.1	23.0	12.9	Complied
Middle	QPSK	19.5	7.4	3	10.4	23.0	12.6	Complied
Top	QPSK	19.5	8.0	3	11.0	23.0	12.0	Complied
Bottom	16QAM	26	7.0	3	10.0	23.0	13.0	Complied
Middle	16QAM	26	7.4	3	10.4	23.0	12.6	Complied
Top	16QAM	26	7.8	3	10.8	23.0	12.2	Complied
Bottom	64QAM	39	8.0	3	11.0	23.0	12.0	Complied
Middle	64QAM	39	7.7	3	10.7	23.0	12.3	Complied
Top	64QAM	39	8.2	3	11.2	23.0	11.8	Complied
Bottom	64QAM	52	7.1	3	10.1	23.0	12.9	Complied
Middle	64QAM	52	7.3	3	10.3	23.0	12.7	Complied
Top	64QAM	52	8.6	3	11.6	23.0	11.4	Complied
Bottom	64QAM	58	8.0	3	11.0	23.0	12.0	Complied
Middle	64QAM	58	7.7	3	10.7	23.0	12.3	Complied
Top	64QAM	58	8.4	3	11.4	23.0	11.6	Complied
Bottom	64QAM	65	7.6	3	10.6	23.0	12.4	Complied
Middle	64QAM	65	8.9	3	11.9	23.0	11.1	Complied
Top	64QAM	65	9.4	3	12.4	23.0	10.6	Complied

Note(s):

1. The limit is the lesser of 200 mW (23.0 dBm) or 10 dBm + 10 log B, where B is the 99% emission bandwidth in MHz.
2. For the smallest 99% bandwidth of 19.0 MHz the limit equates to 22.8 dBm however as the pass margin is in excess of 10 dB for all test cases the fixed limit of 23.0 dBm is detailed in the above table for the sake of simplicity.

5.3.4. Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band)**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	25 November 2010
Test Sample Serial No:	ID:1		
Antenna:	ProAnt Inside EPA WLAN		

FCC/IC Part:	15.407(b) / 15.209(a) and RSS-Gen 4.9 / RSS-210 A9.3
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
Frequency Range	30 MHz to 1000 MHz

Environmental Conditions:

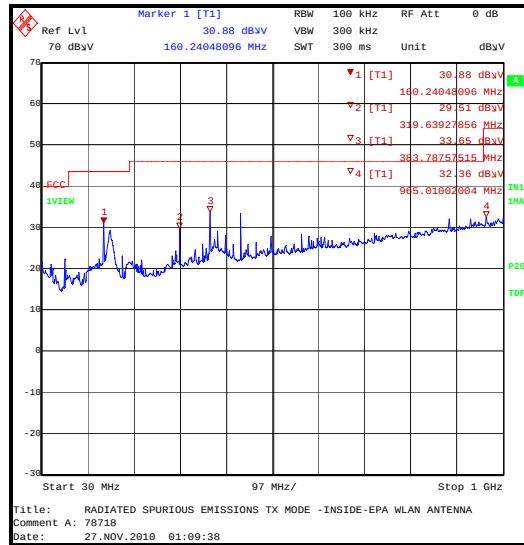
Temperature (°C):	23
Relative Humidity (%):	21

Results: Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
78.597	Vertical	22.4	40.0	17.6	Complied
159.967	Vertical	27.5	43.5	16.0	Complied
319.995	Horizontal	28.8	46.0	17.2	Complied
383.973	Horizontal	34.2	46.0	11.8	Complied
447.979	Horizontal	33.2	46.0	12.8	Complied
591.950	Horizontal	31.4	46.0	14.6	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss
2. The preliminary scans showed similar emission levels below 1 GHz, for each channel of operation. Therefore final radiated emissions measurements were performed with the EUT set to the top channel only.
3. All other emissions were at least 20 dB below the appropriate limit or below the noise floor of the measurement system.
4. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band) (continued)

Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band) (continued)**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	25 November 2010
Test Sample Serial No:	ID:1		
Antenna:	ProAnt Inside EPA WLAN		

FCC Part:	15.407(b)(1) & 15.209(a)
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
Frequency Range	1 GHz to 40 GHz

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	26

Results: Average Bottom Channel

Frequency (GHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
10.360	Vertical	-51	-27	24.0	Complied

Results: Average Middle Channel

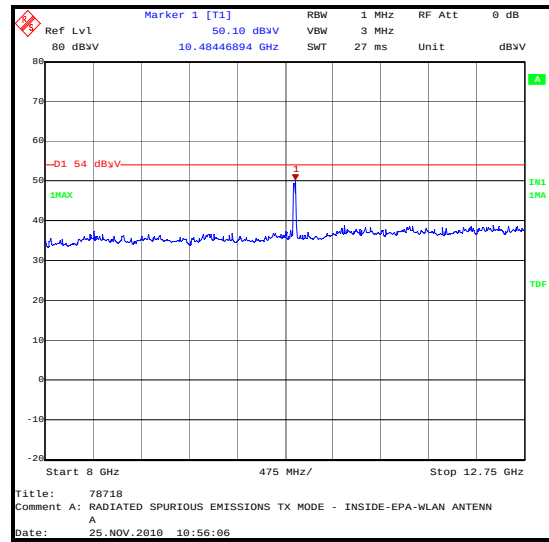
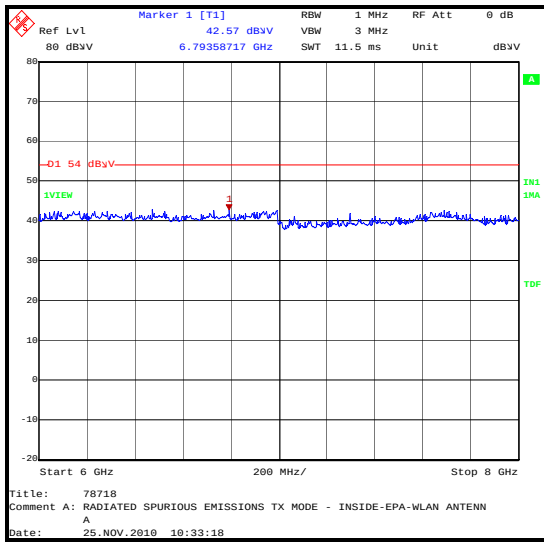
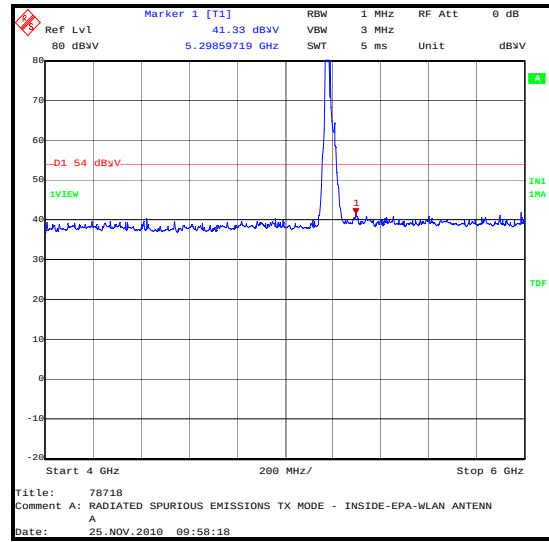
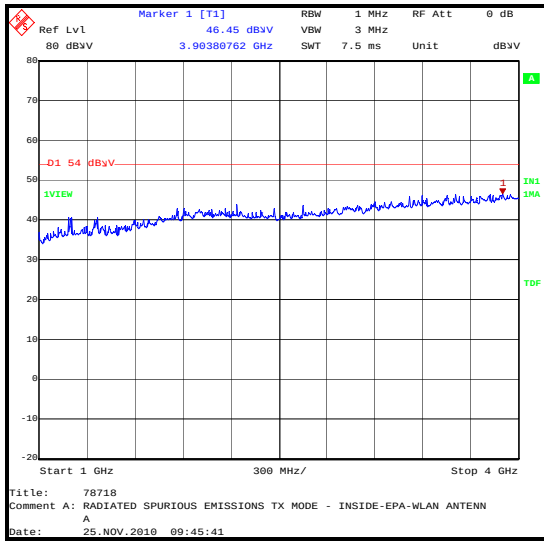
Frequency (GHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
10.400	Vertical	-51.4	-27	24.4	Complied

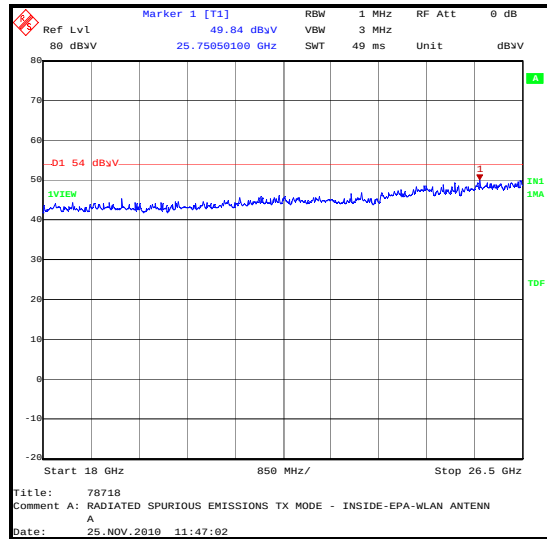
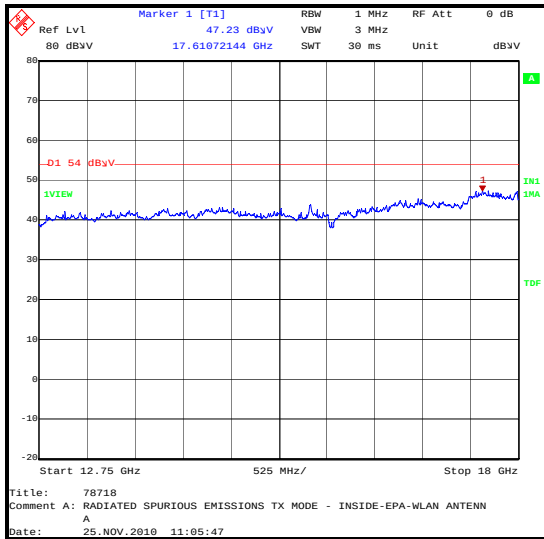
Results: Average Top Channel

Frequency (GHz)	Antenna Polarity	Level (dBm)	Limit (dBm)	Margin (dB)	Result
10.480	Vertical	-51.9	-27	24.9	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss
2. The spurious level in dBm was calculated using the following formula $PT=(E^2R^2)/30$ where P is the calculated power, E is the measured field strength and R is the test distance (3 meters)
3. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
4. The emission shown on the 4 GHz to 6 GHz plot is the EUT fundamental.
5. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band) (continued)

Transmitter Out of Band Radiated Emissions (5.15-5.25 GHz band) (continued)

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

5.3.5. Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band)**Test Summary:**

Test Engineer:	David Lakeland	Test Date:	09 January 2011
Test Sample Serial No:	ID:8		
Antenna:	ProAnt Inside EPA WLAN		

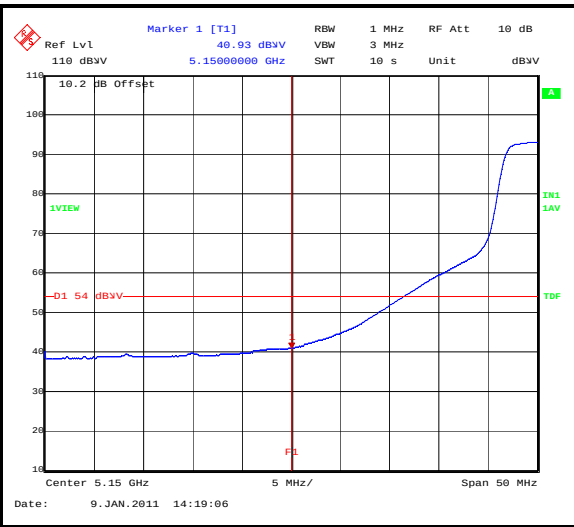
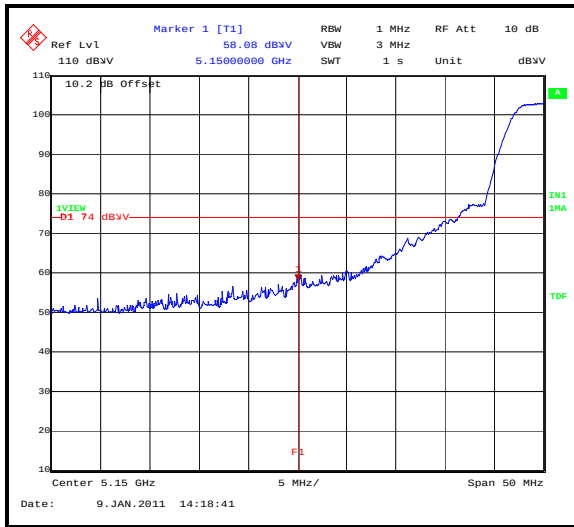
FCC/IC Part:	15.407(b)(1) & 15.209(a) and RSS-Gen 4.9 / RSS-210 A9.2(1)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.2 referencing FCC Part 15.407(b)(5)

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	34

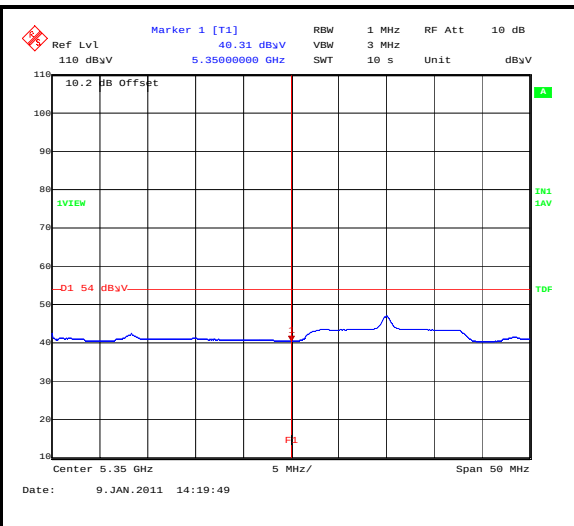
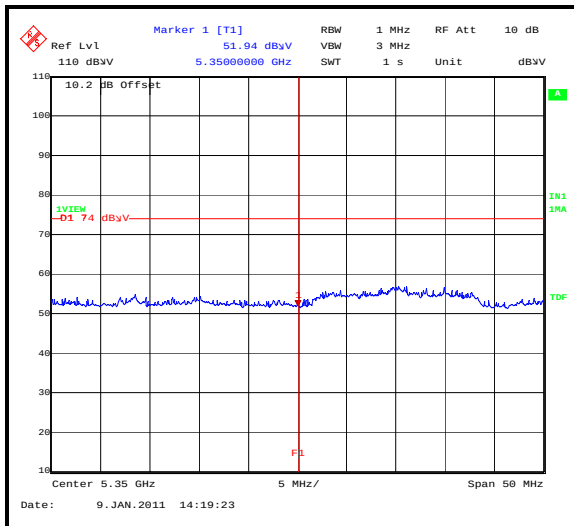
Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band**

Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Detector	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
5150	BPSK	6	Peak	58.1	74.0	15.9	Complied
5150	BPSK	6	Average	40.9	54.0	13.1	Complied
5350	BPSK	6	Peak	51.9	74.0	22.1	Complied
5350	BPSK	6	Average	40.3	54.0	13.7	Complied
5150	BPSK	9	Peak	54.0	74.0	20.0	Complied
5150	BPSK	9	Average	40.3	54.0	13.7	Complied
5350	BPSK	9	Peak	52.4	74.0	21.6	Complied
5350	BPSK	9	Average	40.3	54.0	13.7	Complied
5150	QPSK	12	Peak	53.0	74.0	21.0	Complied
5150	QPSK	12	Average	40.0	54.0	14.0	Complied
5350	QPSK	12	Peak	51.9	74.0	22.1	Complied
5350	QPSK	12	Average	40.3	54.0	13.7	Complied
5150	QPSK	18	Peak	53.3	74.0	20.7	Complied
5150	QPSK	18	Average	40.0	54.0	14.0	Complied
5350	QPSK	18	Peak	50.9	74.0	23.1	Complied
5350	QPSK	18	Average	40.0	54.0	14.0	Complied
5150	16QAM	24	Peak	53.1	74.0	20.9	Complied
5150	16QAM	24	Average	40.0	54.0	14.0	Complied
5350	16QAM	24	Peak	51.8	74.0	22.2	Complied
5350	16QAM	24	Average	40.0	54.0	14.0	Complied
5150	16QAM	36	Peak	54.6	74.0	19.4	Complied
5150	16QAM	36	Average	40.0	54.0	14.0	Complied
5350	16QAM	36	Peak	51.1	74.0	22.9	Complied
5350	16QAM	36	Average	40.0	54.0	14.0	Complied
5150	64QAM	48	Peak	53.9	74.0	20.1	Complied
5150	64QAM	48	Average	39.7	54.0	14.3	Complied
5350	64QAM	48	Peak	51.7	74.0	22.3	Complied
5350	64QAM	48	Average	40.0	54.0	14.0	Complied
5150	64QAM	54	Peak	53.9	74.0	20.1	Complied
5150	64QAM	54	Average	40.0	54.0	14.0	Complied
5350	64QAM	54	Peak	51.5	74.0	22.5	Complied
5350	64QAM	54	Average	40.3	54.0	13.7	Complied

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

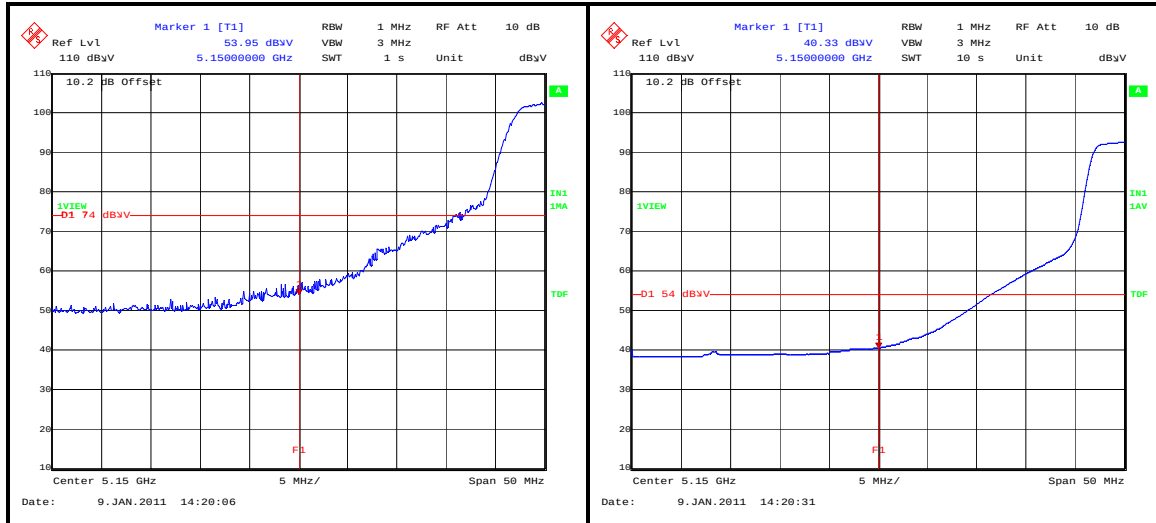
BandEdgePk_UNII_1_802_11A_6MBS_BottomChannel

BandEdgeAg_UNII_1_802_11A_6MBS_BottomChannel



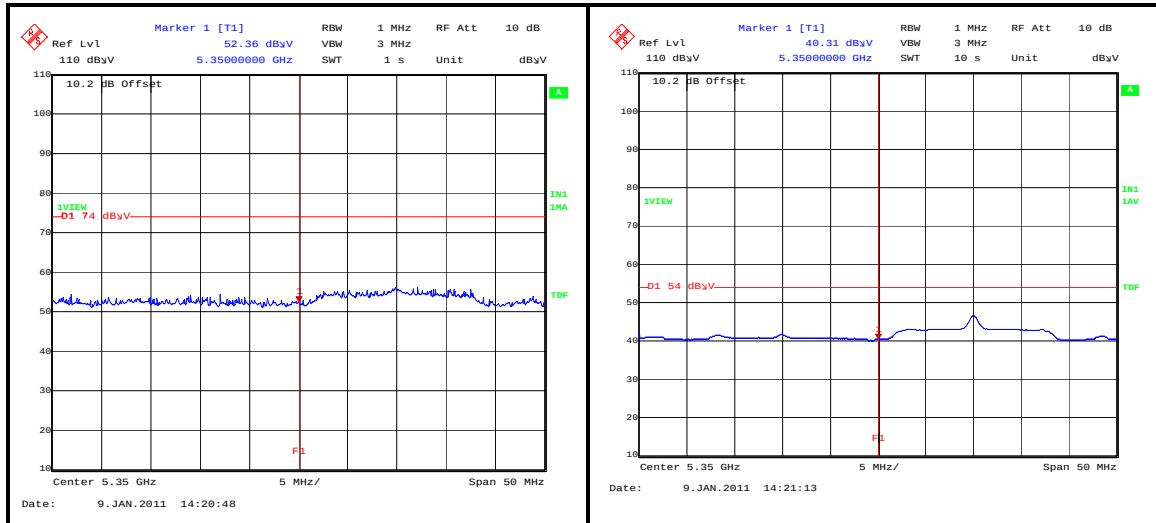
BandEdgePk_UNII_1_802_11A_6MBS_TopChannel

BandEdgeAg_UNII_1_802_11A_6MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

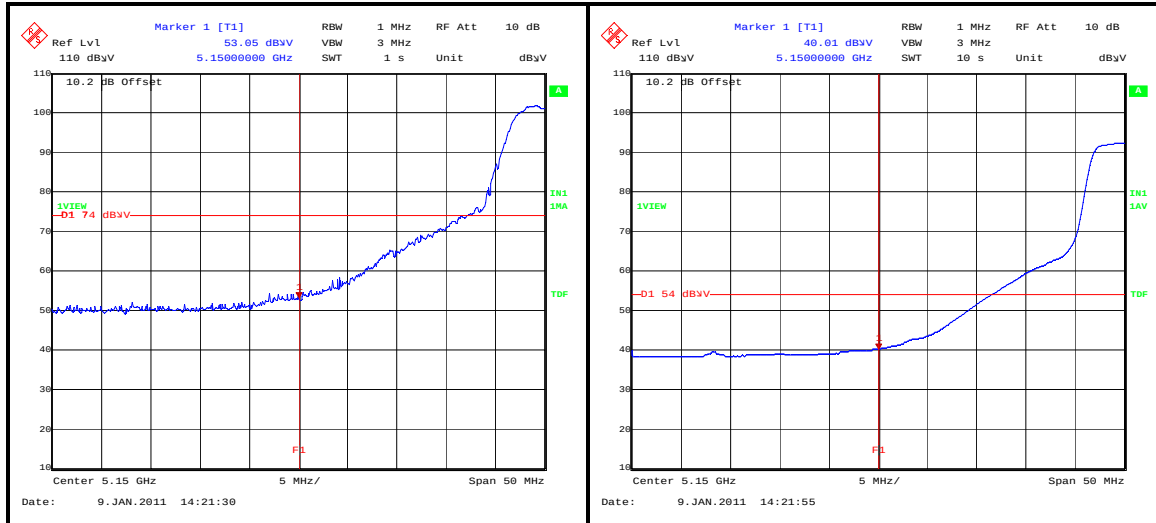
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BandEdgeAv_UNII_1_802_11A_9MBS_BottomChannel



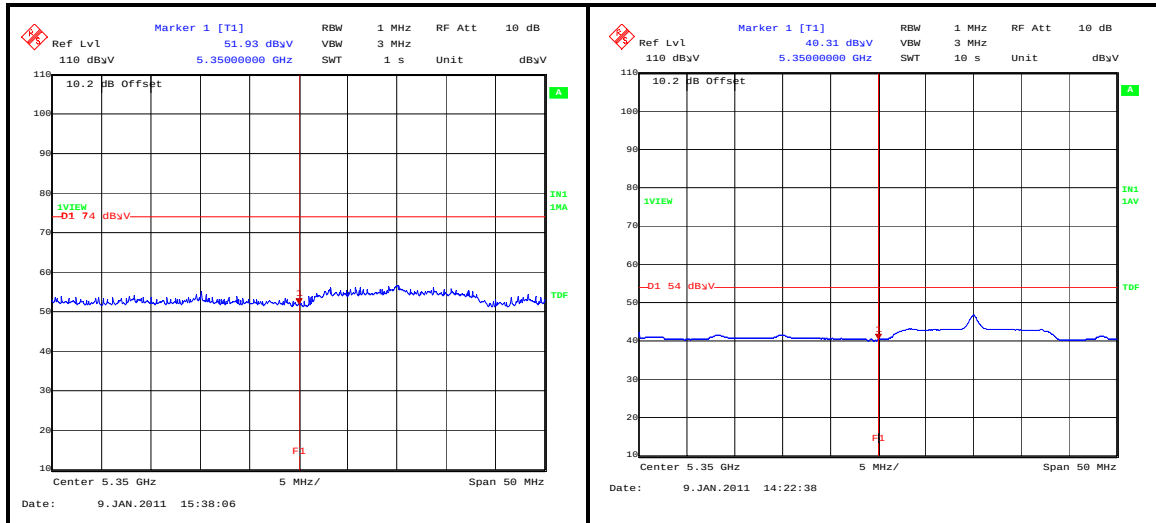
BandEdgePk_UNII_1_802_11A_9MBS_TopChannel

BandEdgeAg_UNII_1_802_11A_9MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

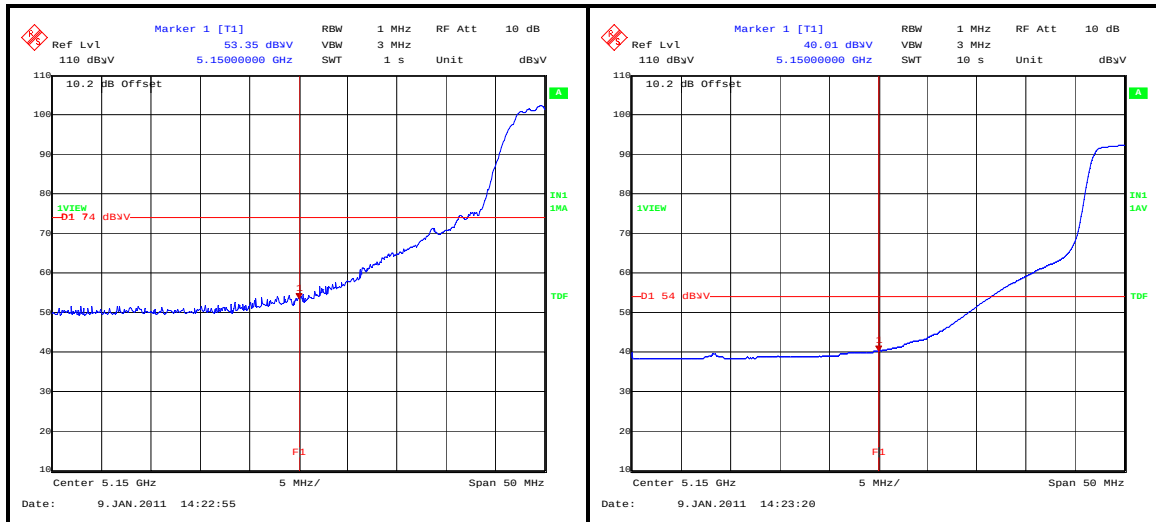
BandEdgePk_UNII_1_802_11A_12MBS_BottomChannel

BandEdgeAg_UNII_1_802_11A_12MBS_BottomChannel



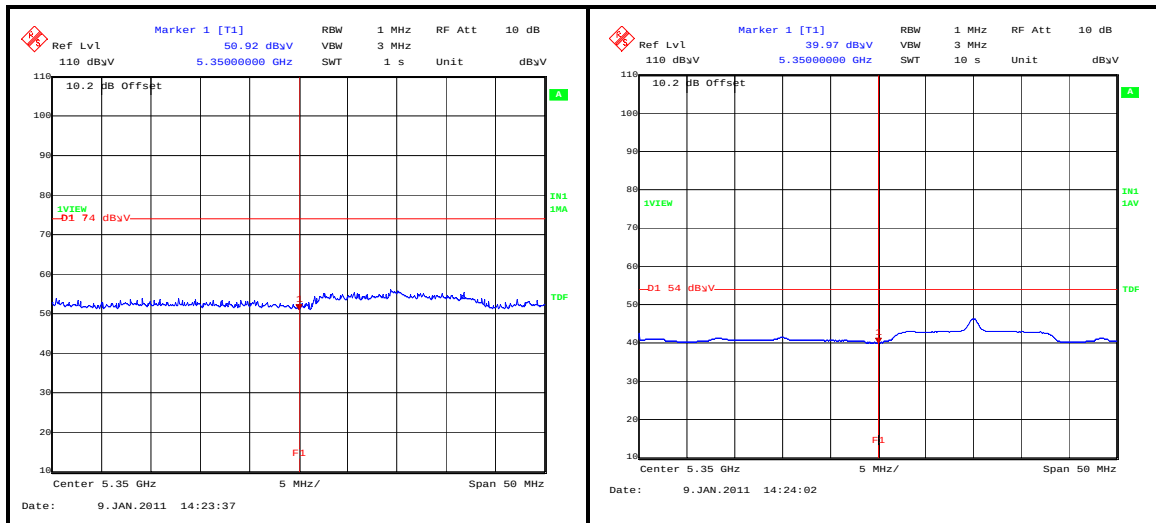
BandEdgePk_UNII_1_802_11A_12MBS_TopChannel

BandEdgeAg_UNII_1_802_11A_12MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

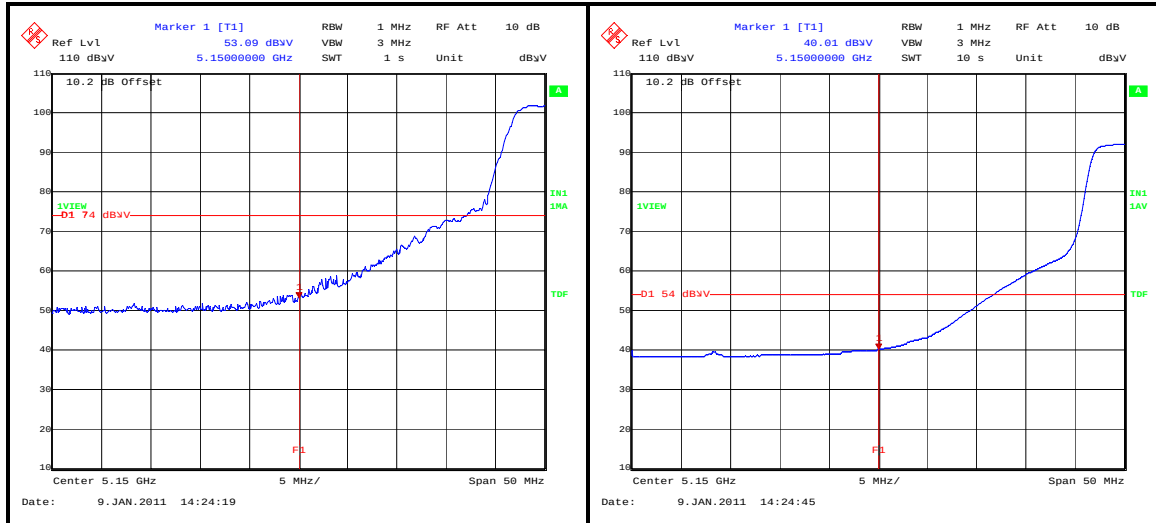
BandEdgePk_UNII_1_802_11A_18MBS_BottomChannel

BandEdgeAg_UNII_1_802_11A_18MBS_BottomChannel



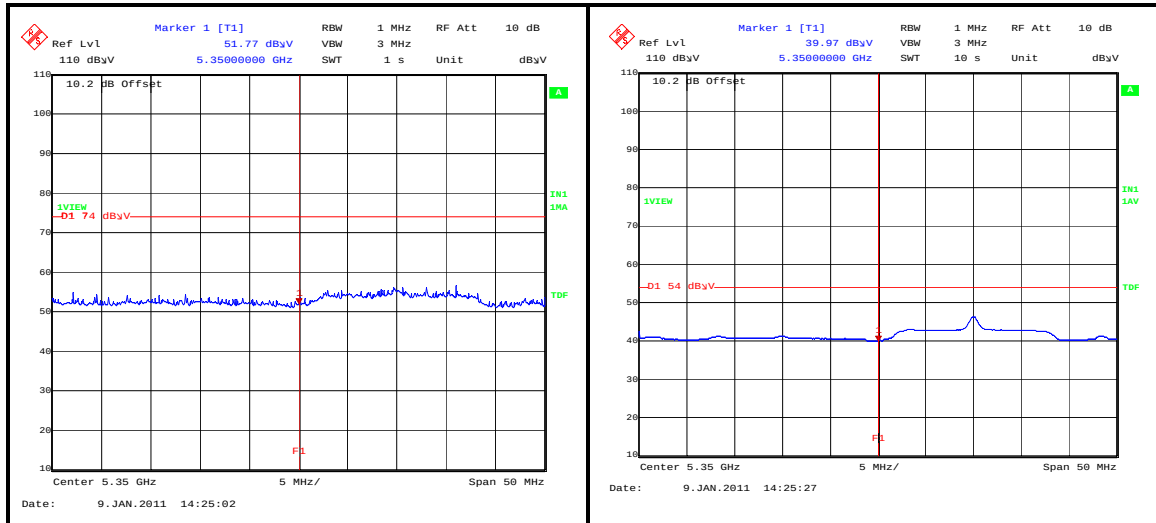
BandEdgePk_UNII_1_802_11A_18MBS_TopChannel

BandEdgeAg_UNII_1_802_11A_18MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

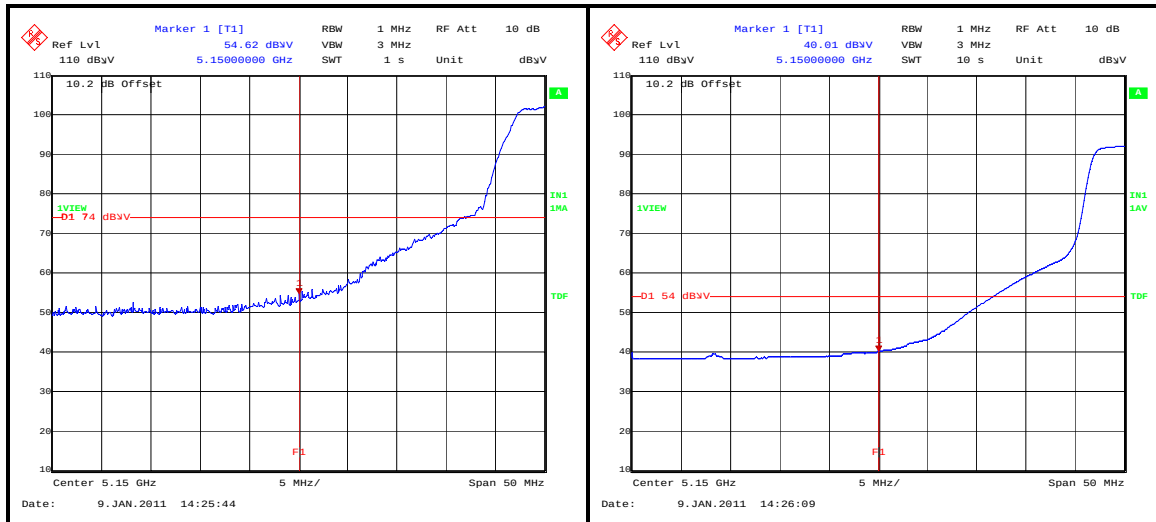
BandEdgePk_UNII_1_802_11A_24MBS_BottomChannel

BandEdgeAg_UNII_1_802_11A_24MBS_BottomChannel



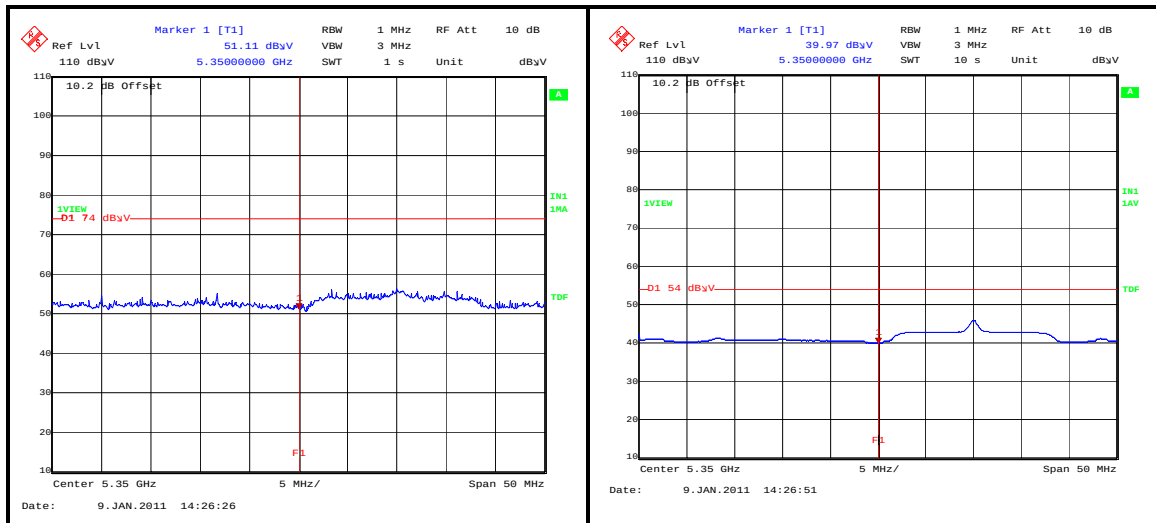
BandEdgePk_UNII_1_802_11A_24MBS_TopChannel

BandEdgeAg_UNII_1_802_11A_24MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

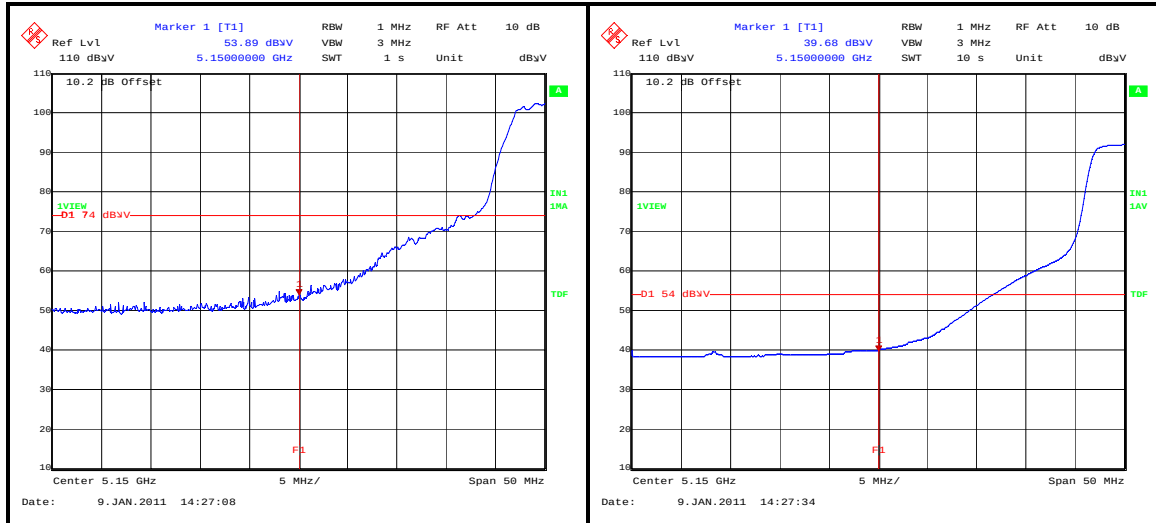
BandEdgePk_UNII_1_802_11A_36MBS_BottomChannel

BandEdgeAg_UNII_1_802_11A_36MBS_BottomChannel



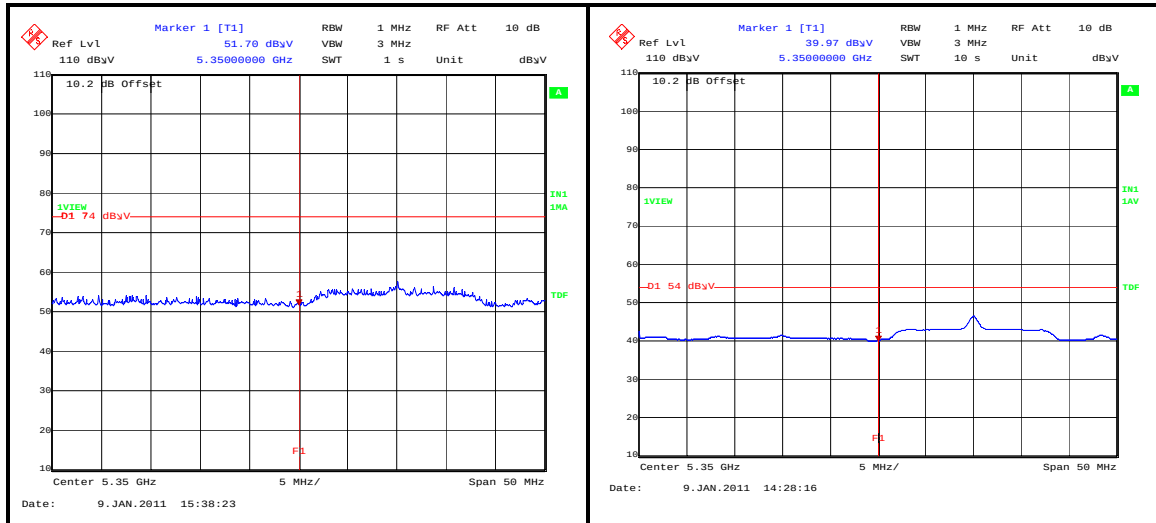
BandEdgePk_UNII_1_802_11A_36MBS_TopChannel

BandEdgeAg_UNII_1_802_11A_36MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

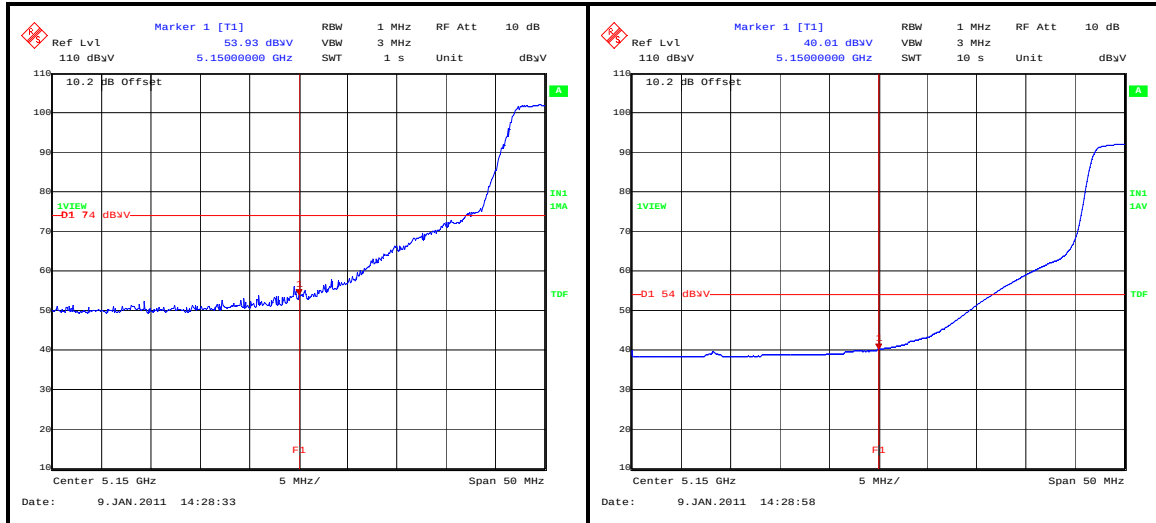
BandEdgePk_UNII_1_802_11A_48MBS_BottomChannel

BandEdgeAg_UNII_1_802_11A_48MBS_BottomChannel



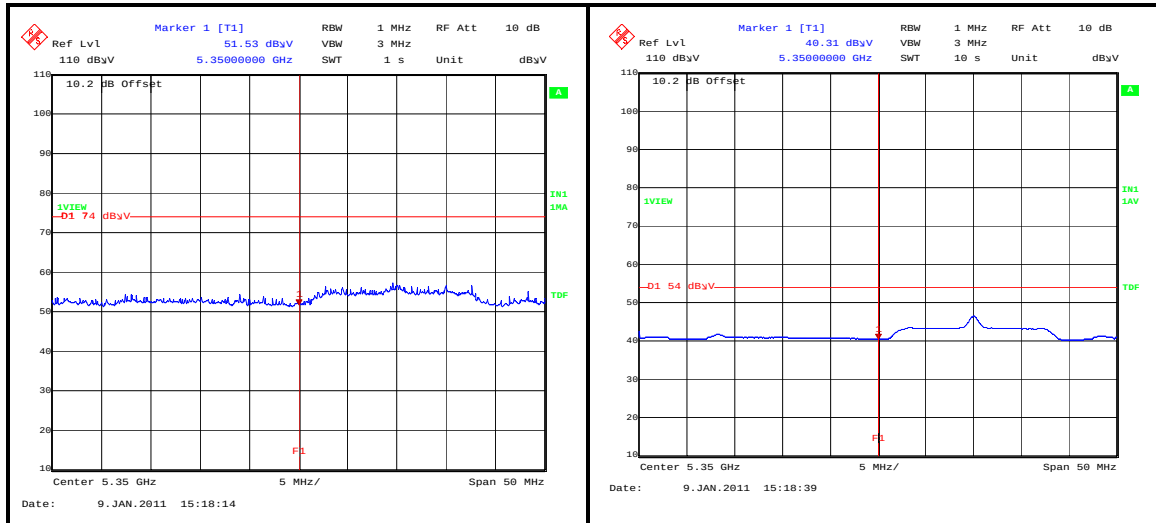
BandEdgePk_UNII_1_802_11A_48MBS_TopChannel

BandEdgeAg_UNII_1_802_11A_48MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11a - 5.15-5.25 GHz band – Plots**

BandEdgePk_UNII_1_802_11A_54MBS_BottomChannel

BandEdgeAg_UNII_1_802_11A_54MBS_BottomChannel

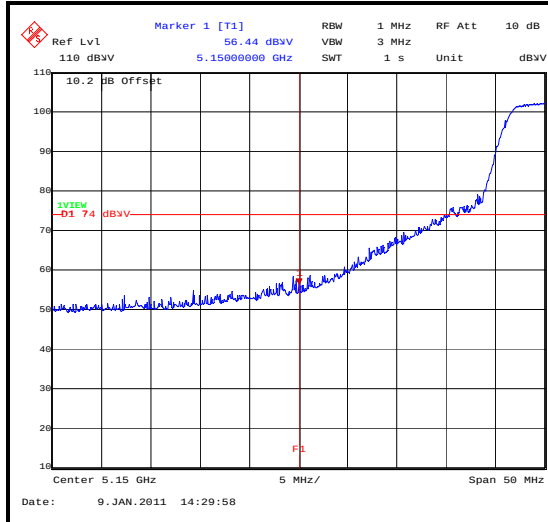


BandEdgePk_UNII_1_802_11A_54MBS_TopChannel

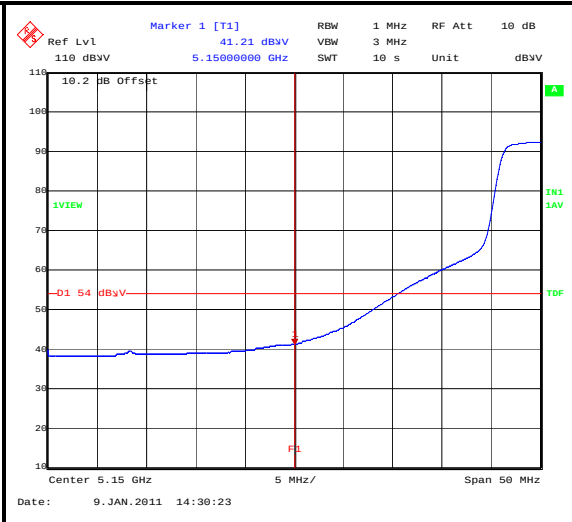
BandEdgeAg_UNII_1_802_11A_54MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band**

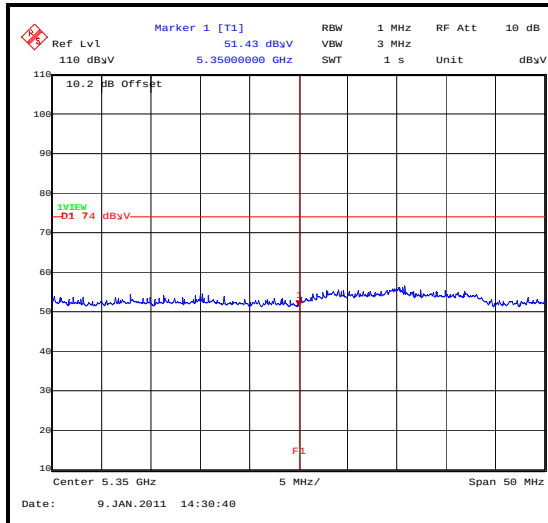
Frequency (MHz)	Modulation Scheme	Data Rate (Mbps)	Detector	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
5150	BPSK	6.5	Peak	56.4	74.0	17.6	Complied
5150	BPSK	6.5	Average	41.2	54.0	12.8	Complied
5350	BPSK	6.5	Peak	51.4	74.0	22.6	Complied
5350	BPSK	6.5	Average	40.3	54.0	13.7	Complied
5150	QPSK	13	Peak	53.8	74.0	20.2	Complied
5150	QPSK	13	Average	40.9	54.0	13.1	Complied
5350	QPSK	13	Peak	52.1	74.0	21.9	Complied
5350	QPSK	13	Average	40.3	54.0	13.7	Complied
5150	QPSK	19.5	Peak	54.9	74.0	19.1	Complied
5150	QPSK	19.5	Average	40.9	54.0	13.1	Complied
5350	QPSK	19.5	Peak	51.7	74.0	22.3	Complied
5350	QPSK	19.5	Average	40.3	54.0	13.7	Complied
5150	16QAM	26	Peak	54.0	74.0	20.0	Complied
5150	16QAM	26	Average	40.6	54.0	13.4	Complied
5350	16QAM	26	Peak	52.0	74.0	22.0	Complied
5350	16QAM	26	Average	40.3	54.0	13.7	Complied
5150	16QAM	39	Peak	54.4	74.0	19.6	Complied
5150	16QAM	39	Average	40.9	54.0	13.1	Complied
5350	16QAM	39	Peak	51.3	74.0	22.7	Complied
5350	16QAM	39	Average	40.3	54.0	13.7	Complied
5150	64QAM	52	Peak	54.8	74.0	19.2	Complied
5150	64QAM	52	Average	40.9	54.0	13.1	Complied
5350	64QAM	52	Peak	51.6	74.0	22.4	Complied
5350	64QAM	52	Average	40.3	54.0	13.7	Complied
5150	64QAM	58.5	Peak	55.9	74.0	18.1	Complied
5150	64QAM	58.5	Average	40.9	54.0	13.1	Complied
5350	64QAM	58.5	Peak	51.7	74.0	22.3	Complied
5350	64QAM	58.5	Average	40.3	54.0	13.7	Complied
5150	64QAM	65	Peak	54.1	74.0	19.9	Complied
5150	64QAM	65	Average	41.5	54.0	12.5	Complied
5350	64QAM	65	Peak	51.5	74.0	22.5	Complied
5350	64QAM	65	Average	40.3	54.0	13.7	Complied

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

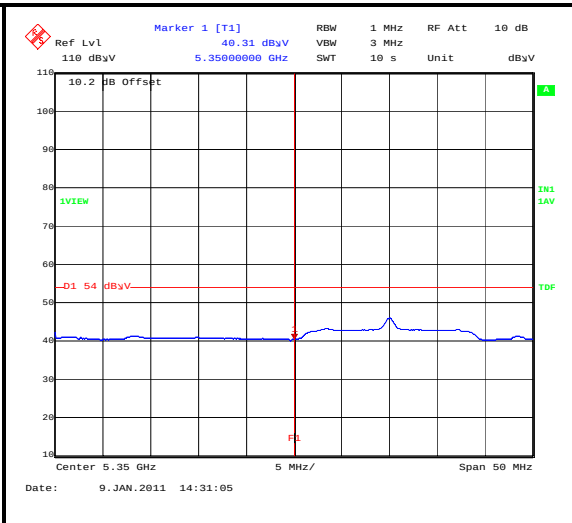
BandEdgePk_UNII_1_802_11N_6.5MBS_BottomChannel



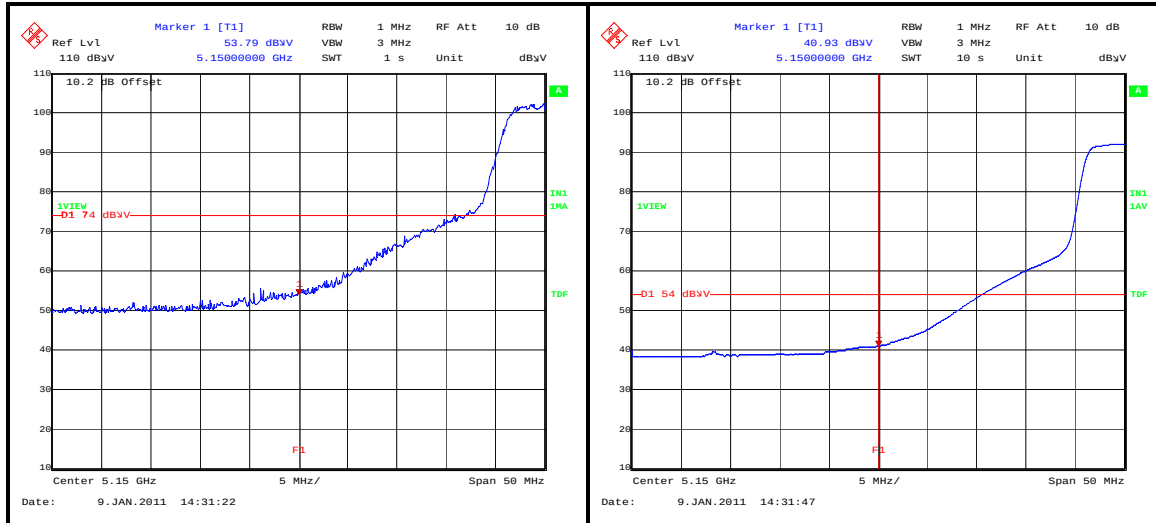
BandEdgeAg_UNII_1_802_11N_6.5MBS_BottomChannel



BandEdgePk_UNII_1_802_11N_6.5MBS_TopChannel

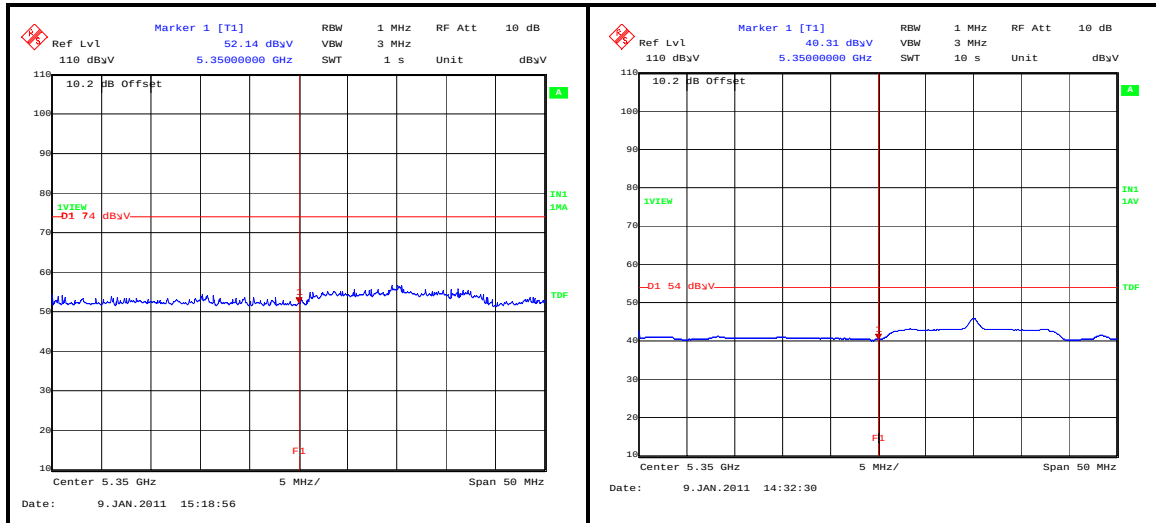


BandEdgeAg_UNII_1_802_11N_6.5MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

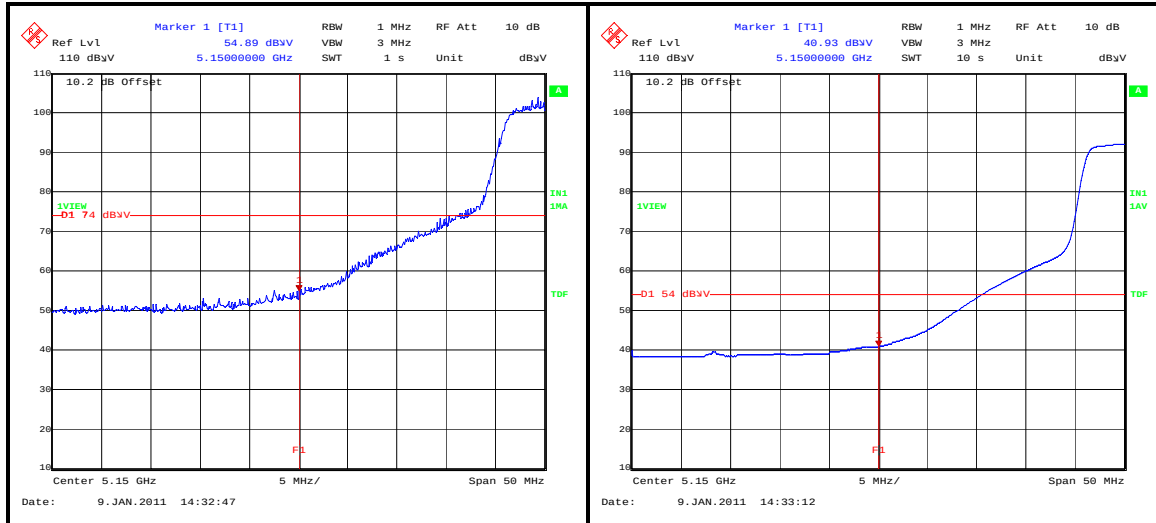
BandEdgePk_UNII_1_802_11N_13MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_13MBS_BottomChannel



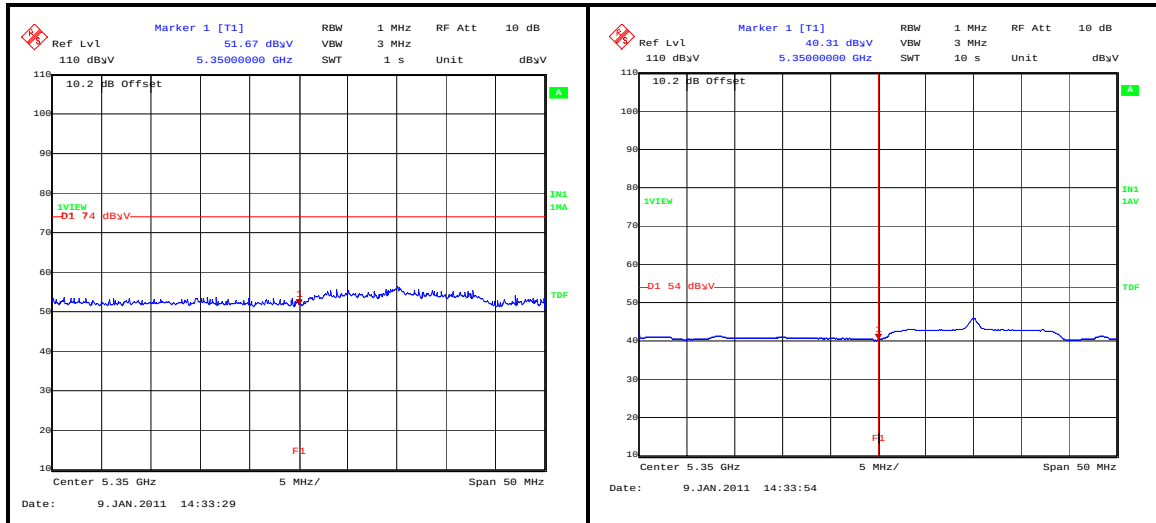
BandEdgePk_UNII_1_802_11N_13MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_13MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

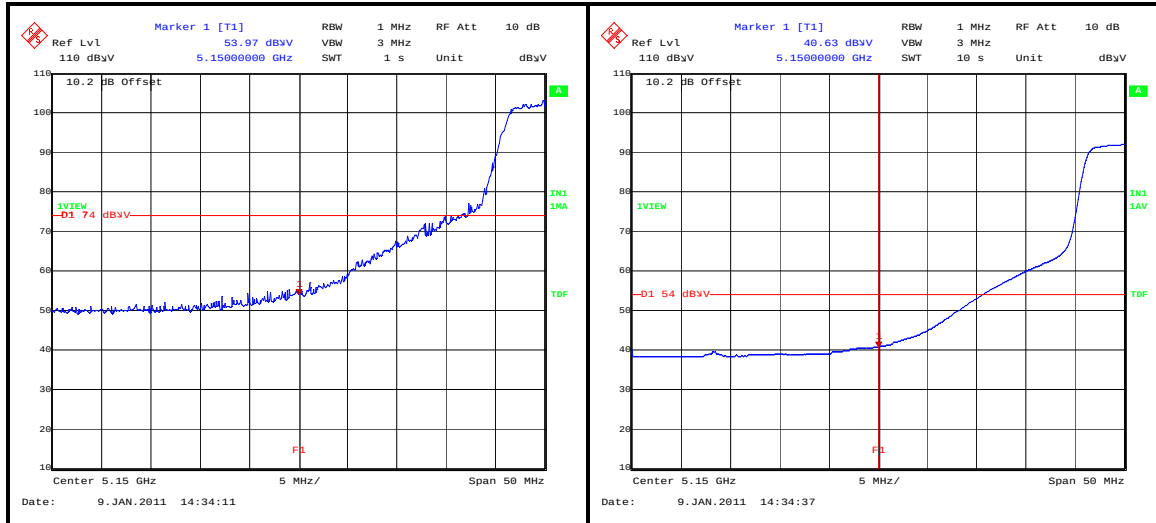
BandEdgePk_UNII_1_802_11N_19.5MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_19.5MBS_BottomChannel



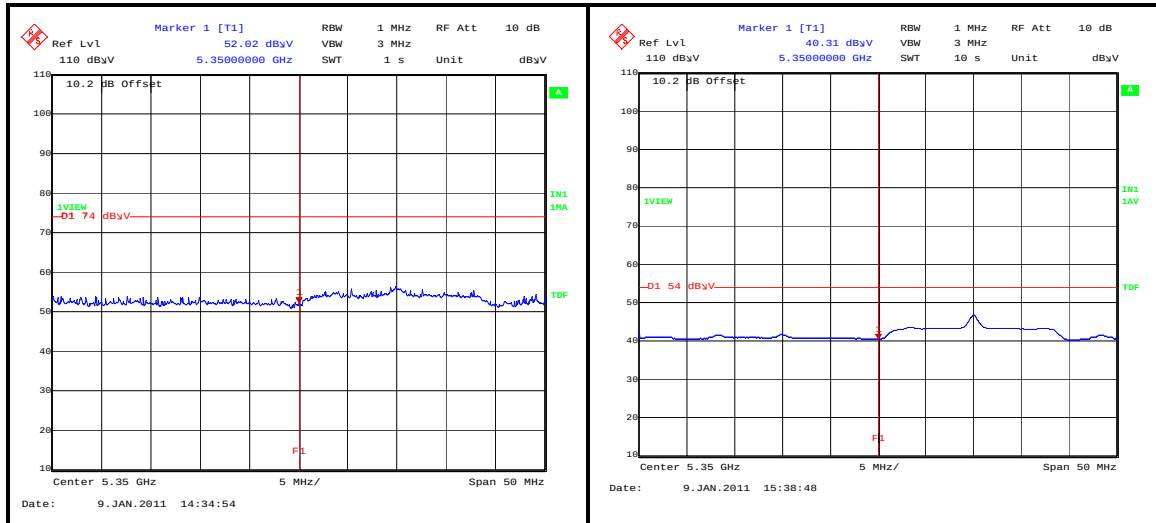
BandEdgePk_UNII_1_802_11N_19.5MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_19.5MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

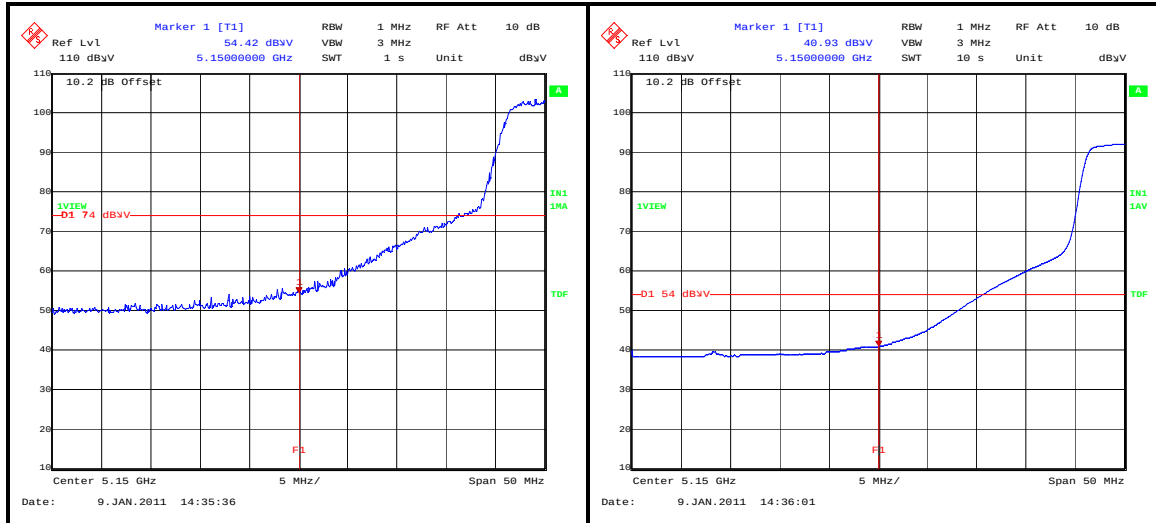
BandEdgePk_UNII_1_802_11N_26MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_26MBS_BottomChannel



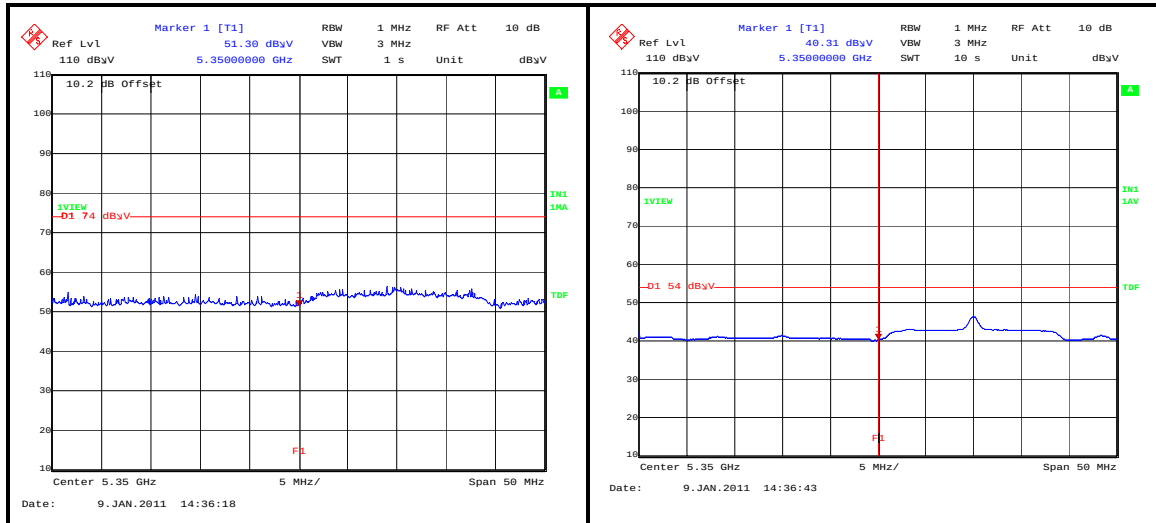
BandEdgePk_UNII_1_802_11N_26MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_26MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

BandEdgePk_UNII_1_802_11N_39MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_39MBS_BottomChannel

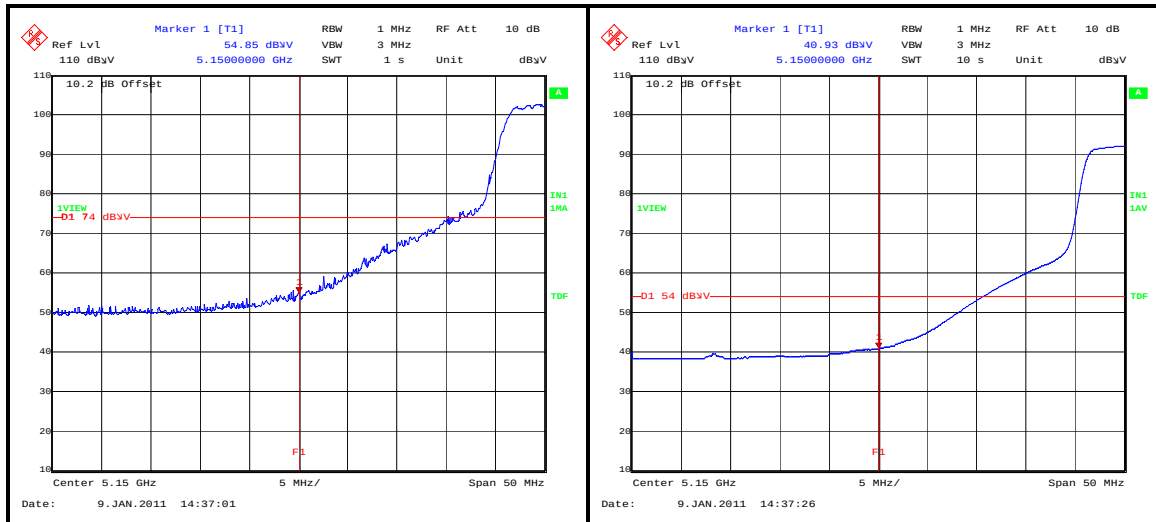


BandEdgePk_UNII_1_802_11N_39MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_39MBS_TopChannel

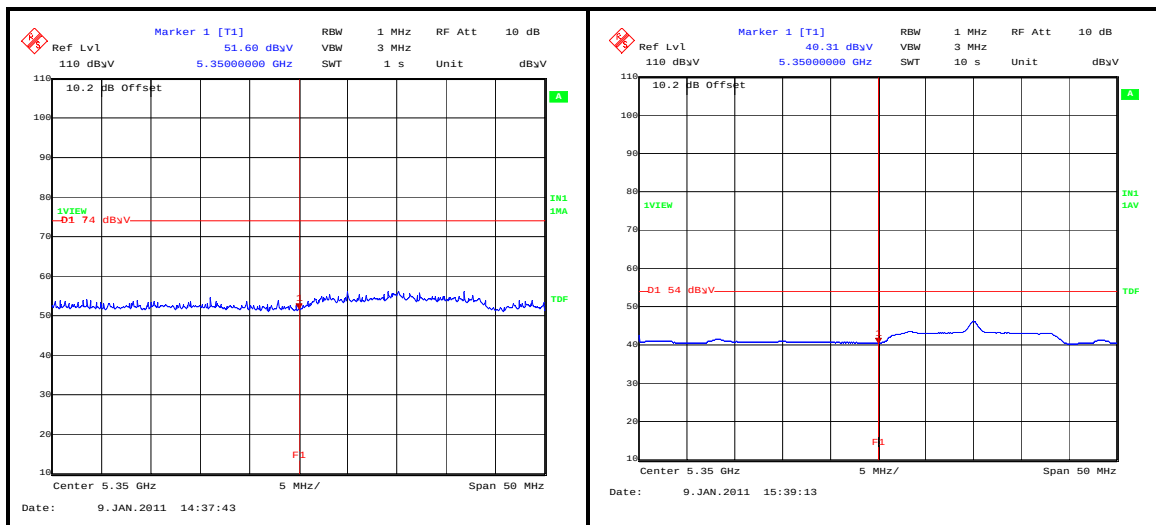
Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)

802.11n - 5.15-5.25 GHz band – Plots



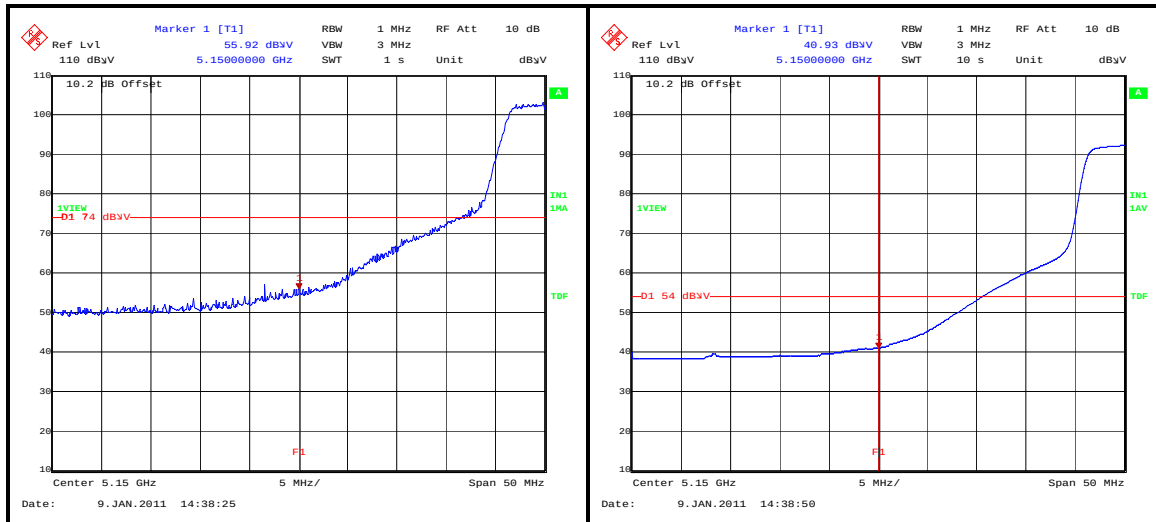
BandEdgePk_UNII_1_802_11N_52MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_52MBS_BottomChannel



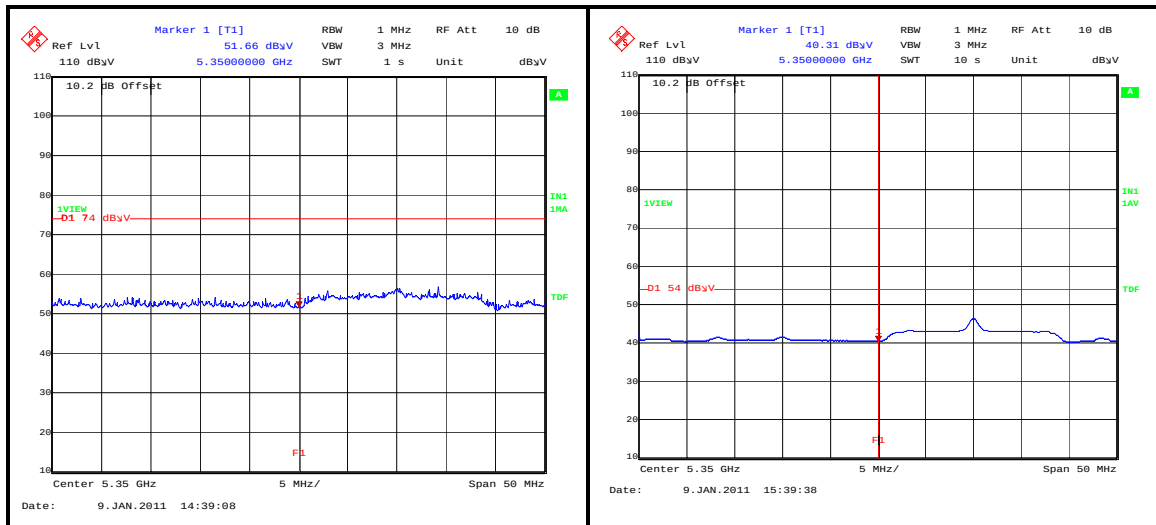
BandEdgePk_UNII_1_802_11N_52MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_52MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

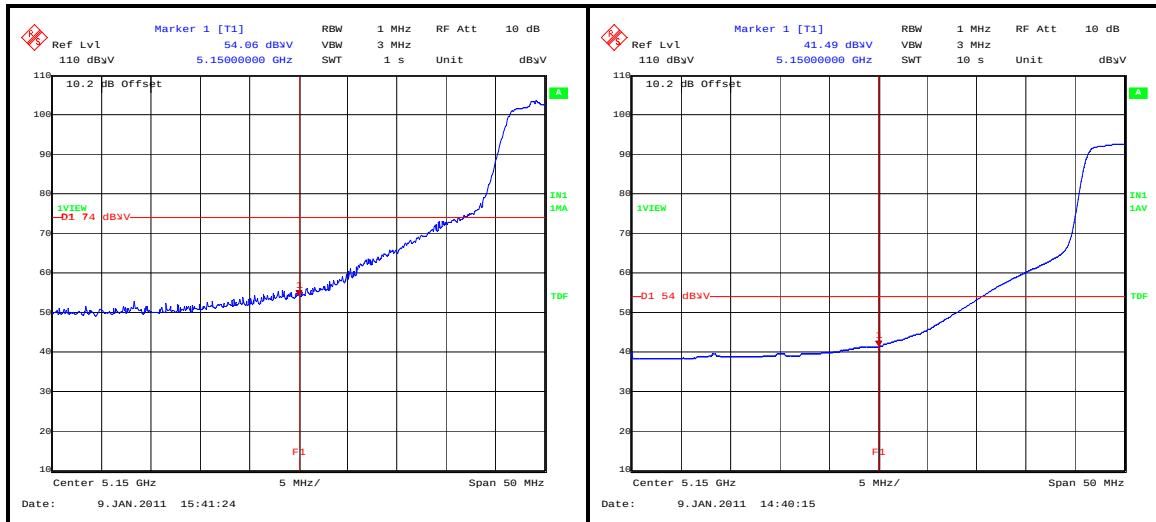
BandEdgePk_UNII_1_802_11N_58.5MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_58.5MBS_BottomChannel



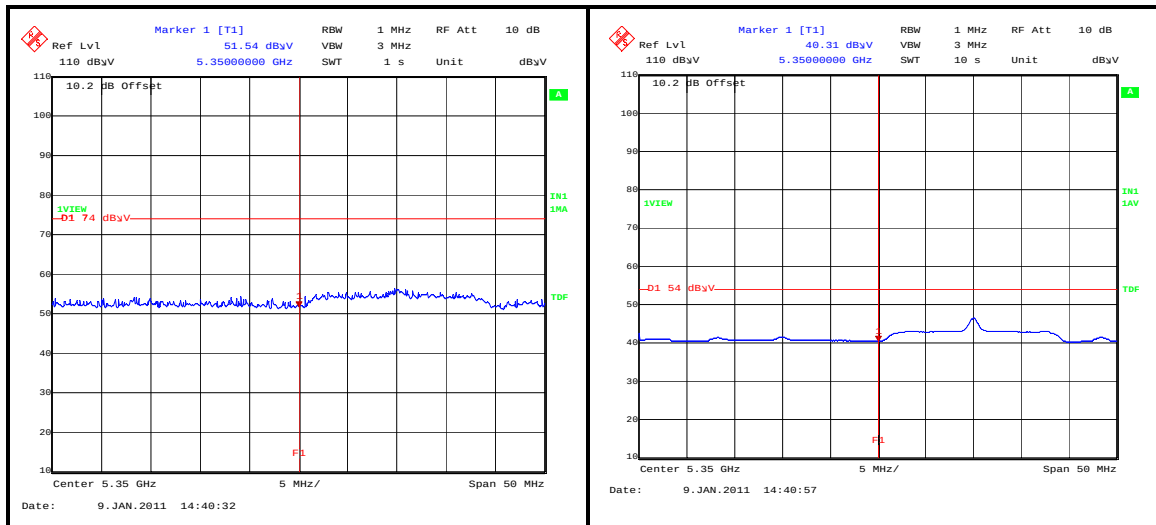
BandEdgePk_UNII_1_802_11N_58.5MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_58.5MBS_TopChannel

Transmitter Band Edge Radiated Emissions (5.15-5.25 GHz band) (continued)**802.11n - 5.15-5.25 GHz band – Plots**

BandEdgePk_UNII_1_802_11N_65MBS_BottomChannel

BandEdgeAg_UNII_1_802_11N_65MBS_BottomChannel



BandEdgePk_UNII_1_802_11N_65MBS_TopChannel

BandEdgeAg_UNII_1_802_11N_65MBS_TopChannel

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
Maximum Conducted Output Power	5.15 GHz to 5.825 GHz	95%	±0.27 dB
Radiated Spurious Emissions	30 MHz to 40 GHz	95%	±4.68 dB

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)
A1256	Power Supply Unit	Farnell	11E30/1B	000378	06 Jun 2011	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	06 Jun 2011	12
A1818	Antenna	EMCO	3115	00075692	05 Sep 2011	12
A1999	Attenuator	Huber + Suhner AG	6820.17.B	07101	18 March 2012	12
A203	Antenna	Flann Microwave Ltd	22240-20	343	11 May 2013	36
A253	Antenna	Flann Microwave	12240-20	128	05 Sep 2011	12
A254	Antenna	Flann Microwave	14240-20	139	05 Sep 2011	12
A255	Antenna	Flann Microwave	16240-20	519	05 Sep 2011	12
A256	Antenna	Flann Microwave	18240-20	400	05 Sep 2011	12
A288	Antenna	Chase	CBL6111A	1589	05 Sep 2011	12
A436	Antenna	Flann	20240-20	330	05 Sep 2011	12
A553	Antenna	Chase	CBL6111A	1593	16 Mar 2011	12
G0543	Amplifier	Sonoma Instrument Co.	310N	230801	30 Jun 2011	12
K0001	5m Semi-Anechoic Chamber	Rainford EMC	N/A	N/A	25 Apr 2011	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	05 Sep 2011	12
L1001	Test Receiver	ROHDE & SCHWARZ	ESU26	100239	28 Jan 2011	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESI26	100046K	22 Apr 2011	12
M1223	Environmental Chamber	Votsch	VT4002	58566072720010	Cal on use	N/A
M1249	Thermometer	Fluke	52II	88800049	05 Jul 2011	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	28 Jun 2011	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	05 July 2011	12
A1830	Pulse limiter	Rohde & Schwarz	ESH3-Z2	100668	05 March 2012	12

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1251	Digital Multimeter	Fluke	175	89170179	15 July 2012	12
M1081	DC power supply	Agilent Technologies	66311B	GB38440216	Cal on use	N/A

Asset Numbers A553, K0001, L1001 and M1124 was in calibration during testing

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