



TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: Sonata NP30

FCC ID: YKBNP30001

IC Certification Number: 9095A-NP3001

To: FCC Part 15.247: 2011 Subpart C, Industry Canada RSS-210 Issue 8 December 2010 & RSS-Gen Issue 3 December 2010

Test Report Serial No.:
RFI-RPT-RP77396JD24A

Version 3.0 Supersedes All Previous Versions

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

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Date of Issue:	19 January 2012

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1. Customer Information

Company Name:	Audio Partnership PLC
Address:	Gallery Court Hankey Place London SE1 4BB United Kingdom

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.247
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart C (Intentional Radiators) - Section 15.247
Specification Reference:	47CFR15.107 and 47CFR15.109
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart B (Unintentional Radiators) - Sections 15.107 and 15.109
Specification Reference:	47CFR15.207 and 47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: 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 Apparatus
Specification Reference:	RSS-210 Issue 8 December 2010
Specification Title:	Licence-exempt Radio Apparatus (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:	04 November 2010 to 08 December 2011

2.2. Summary of Test Results

FCC Reference (47CFR)	IC Reference	Measurement	Result
Part 15.107(a)	RSS-Gen 7.2.4	Receiver/Idle Mode AC Conducted Emissions	✓
Part 15.109	RSS-Gen 4.10/6.1	Receiver/Idle Mode Radiated Spurious Emissions	✓
Part 15.207	RSS-Gen 7.2.4	Transmitter AC Conducted Emissions	✓
Part 15.247(a)(2)	RSS-Gen 4.6.2 RSS-210 A8.2(a)	Transmitter 6 dB Bandwidth	✓
Part 15.247(e)	RSS-210 A8.2(b)	Transmitter Power Spectral Density	✓
Part 15.247(b)(3)	RSS-Gen 4.8 RSS-210 A8.4(4)	Transmitter Maximum Peak Output Power	✓
Part 15.247(d)/15.209(a)	RSS-Gen 4.9 RSS-210 A8.5	Transmitter Radiated Emissions	✓
Part 15.247(d)/15.209(a)	RSS-Gen 4.9 RSS-210 A8.5	Transmitter Band Edge Radiated Emissions	✓
Key to Results			
	= Complied		= Did not comply

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:	Cambridge Audio
Model Name or Number:	Sonata NP30
Serial Number(s):	00064cf8
Hardware Version Number:	Main PCB is REV 3
Software Version Number:	V1.0
FCC ID:	YKBNP30001
IC Certification Number:	9095A-NP3001

3.2. Description of EUT

The equipment under test was a Network Player containing a Wi-Fi transceiver.

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:	Digital Transmission System (IEEE 802.11b/g/n)				
Type of Unit:	Transceiver				
Modulation:	Barker/CCK/DBPSK/DQPSK, QPSK, 16QAM, 64QAM				
Data Rate:	1, 2, 5.5, 11, 6, 6.5, 9, 12, 18, 24, 26, 36, 39, 48, 52, 54, 58.5, 65, 7.2, 13, 13.5, 15, 14.4, 19.5, 21.7, 26, 27, 28.9, 30, 39, 40.5, 43.3, 45, 52, 54, 57.8, 58.5, 60, 65, 72.2, 81, 90, 108, 120, 121.5, 135, 150 Mbps				
Power Supply Requirement(s):	Nominal	120 VAC 60 Hz			
Maximum Conducted Output Power:	12.9 dBm				
Antenna Gain	3 dB				
Channel Spacing:	20 MHz				
Transmit Frequency Range:	2412 MHz to 2462 MHz				
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)		
	Bottom	1	2412		
	Middle	6	2437		
	Top	11	2462		
Receive Frequency Range:	2412 MHz to 2462 MHz				
Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)		
	Bottom	1	2412		
	Middle	6	2437		
	Top	11	2462		
Channel Spacing:	40 MHz				
Transmit Frequency Range:	2422 MHz to 2452 MHz				
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)		
	Bottom	3	2422		
	Middle	6	2437		
	Top	9	2452		
Receive Frequency Range:	2422 MHz to 2452 MHz				
Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)		
	Bottom	3	2422		
	Middle	6	2437		
	Top	9	2452		

3.5. Support Equipment

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

Description:	Router
Brand Name:	D-Link green
Model Name or Number:	DGS-1005D
Serial Number:	DR8SB92000451

Description:	USB to USB data cable
Brand Name:	Not Marked or Stated
Model Name or Number:	Not Marked or Stated
Serial Number:	Not Marked or Stated

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

- Constantly transmitting on bottom, middle and top channels.
- Idle mode.

4.2. Configuration and Peripherals

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

- Controlled using a bespoke application on the EUT, by pressing a sequence of buttons on the front panel display this placed the unit into a test mode. The application was used to enable continuous transmission, receive mode and to select the test channels, data rates and modulation schemes as required.
- Receive/Idle tests: The 802.11 mode was active but not transmitting.
- Transmitter radiated spurious emissions pre-scans were performed using the 11 Mbps configuration as it was previously measured and found to produce the highest EIRP.
- Conducted measurements were performed with the antenna removed and the measurement equipment connected to the reverse SMA RF connector.
- Radiated measurements were performed with the right angled antenna fitted.
- Radiated emissions and AC conducted emissions tests were performed with all unused ports terminated.

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. Receiver/Idle Mode AC Conducted Spurious Emissions

Test Summary:

Test Engineer:	Andrew Edwards	Test Date:	22 September 2011
Test Sample Serial No:	00064cf8		

FCC Reference:	Part 15.107(a)
Test Method Used:	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	31

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.195	Live	43.4	63.8	20.4	Complied
4.610	Live	34.6	56.0	21.4	Complied
5.010	Live	37.4	60.0	22.6	Complied
5.411	Live	39.7	60.0	20.3	Complied
5.811	Live	39.3	60.0	20.7	Complied
6.414	Live	37.7	60.0	22.3	Complied

Results: Live / Average

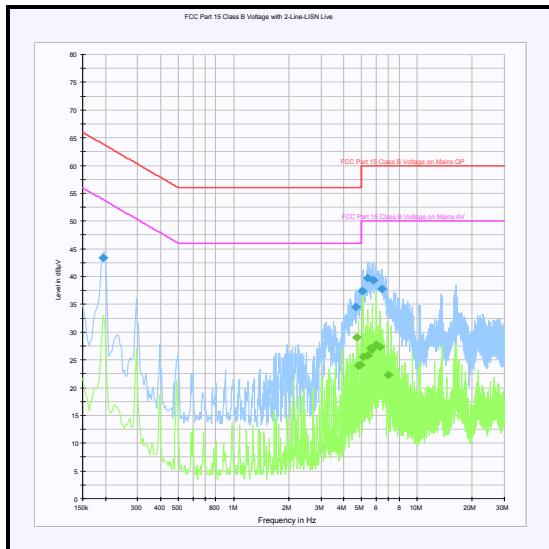
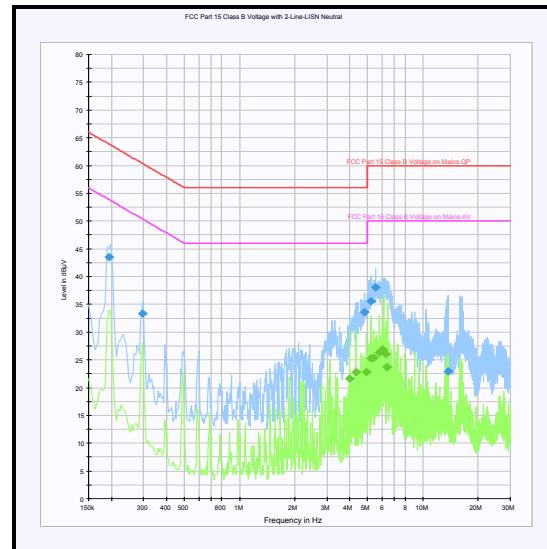
Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
4.700	Live	29.0	46.0	17.0	Complied
4.794	Live	24.0	46.0	22.0	Complied
4.893	Live	24.1	46.0	21.9	Complied
5.096	Live	25.6	50.0	24.4	Complied
5.375	Live	25.8	50.0	24.2	Complied
5.573	Live	27.1	50.0	22.9	Complied
5.681	Live	26.8	50.0	23.2	Complied
5.969	Live	27.8	50.0	22.2	Complied
6.261	Live	27.4	50.0	22.6	Complied
6.945	Live	22.3	50.0	27.7	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions (continued)**Results: Neutral / Quasi Peak**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.195	Neutral	43.5	63.8	20.3	Complied
0.294	Neutral	33.4	60.4	27.0	Complied
4.808	Neutral	33.6	56.0	22.4	Complied
5.208	Neutral	35.6	60.0	24.4	Complied
5.510	Neutral	38.1	60.0	21.9	Complied
13.799	Neutral	22.9	60.0	37.1	Complied

Results: Neutral / Average

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
4.007	Neutral	21.6	46.0	24.4	Complied
4.308	Neutral	22.8	46.0	23.2	Complied
4.889	Neutral	22.8	46.0	23.2	Complied
5.186	Neutral	25.2	50.0	24.8	Complied
5.379	Neutral	25.4	50.0	24.6	Complied
5.771	Neutral	26.3	50.0	23.7	Complied
5.969	Neutral	26.8	50.0	23.2	Complied
6.063	Neutral	26.8	50.0	23.2	Complied
6.257	Neutral	26.1	50.0	23.9	Complied
6.374	Neutral	23.8	50.0	26.2	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions (continued)**Live****Neutral**

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

5.2.2. Receiver/Idle Mode Radiated Spurious Emissions**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	30 December 2010
Test Sample Serial No:	00064cf8		

FCC Reference:	Part 15.109
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:

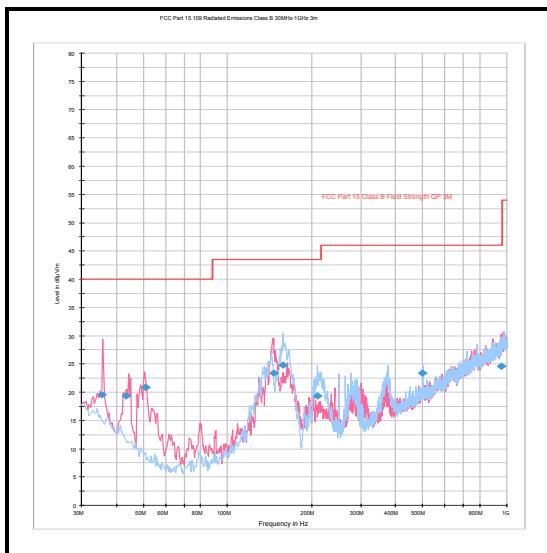
Temperature (°C):	23
Relative Humidity (%):	22

Results: Quasi Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
35.609	Vertical	19.6	40.0	20.4	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:	Andrew Edwards	Test Date:	04 November 2010
Test Sample Serial No:	00064cf8		

FCC Part:	Part 15.109
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
Frequency Range:	1 GHz to 12.5 GHz

Environmental Conditions:

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

Results: Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
12175.350	Vertical	49.6	74.0	24.4	Complied

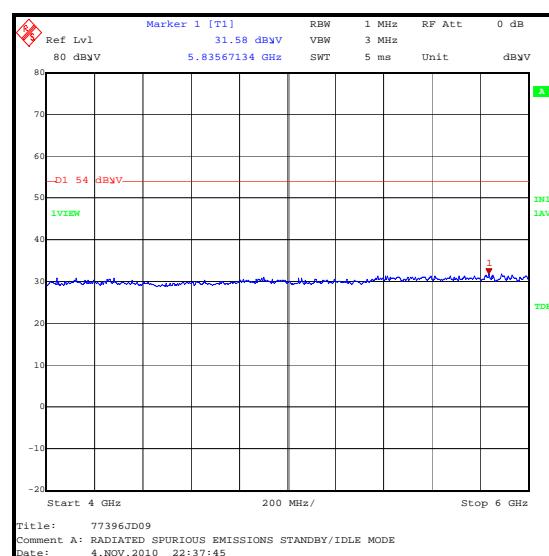
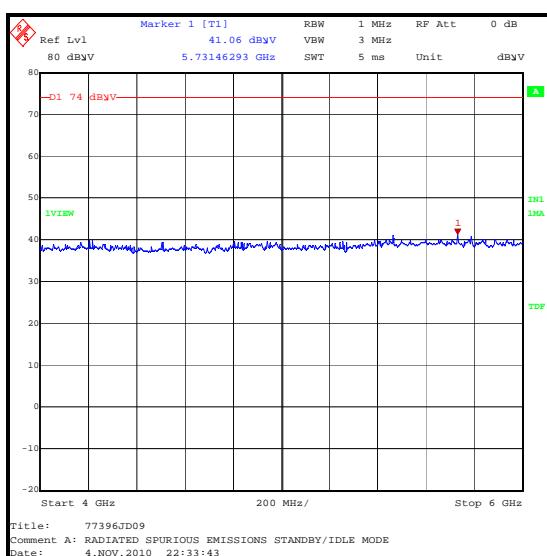
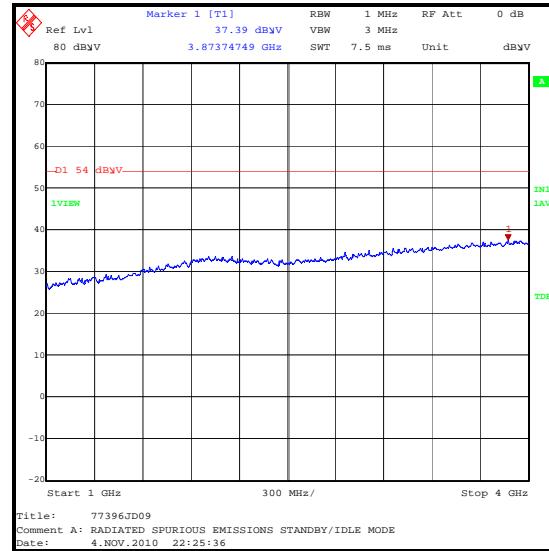
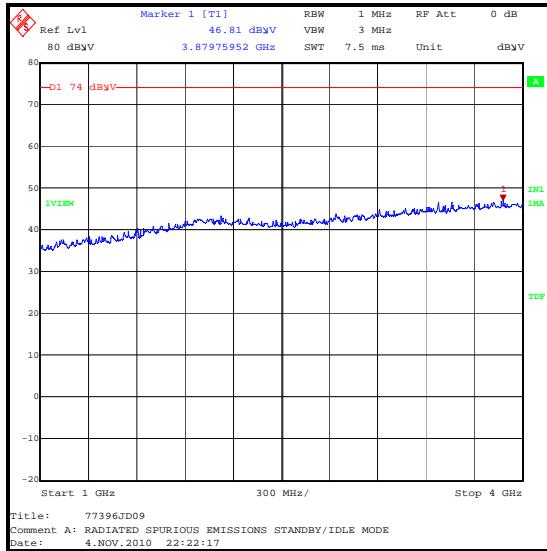
Results: Average

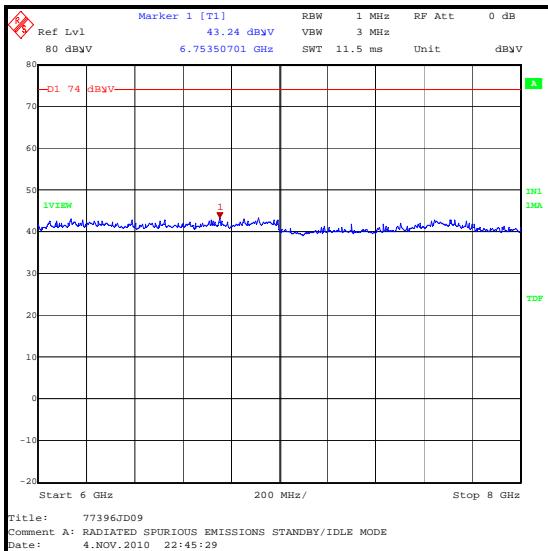
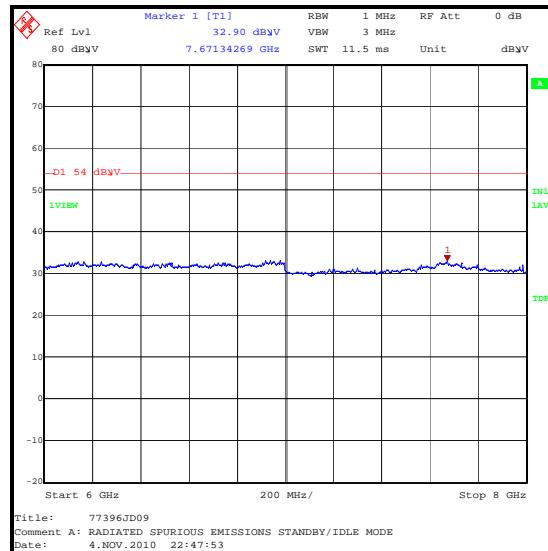
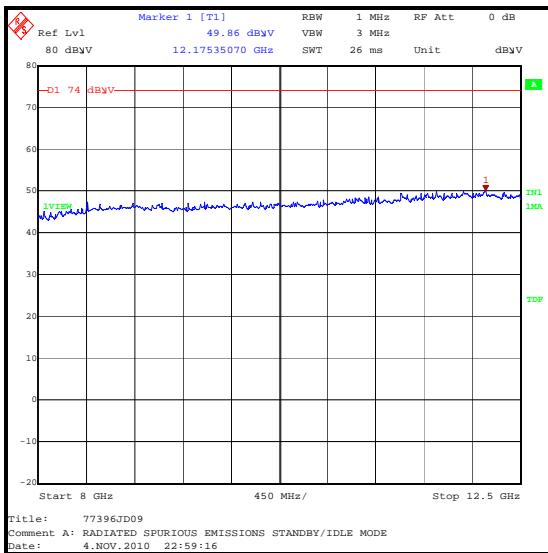
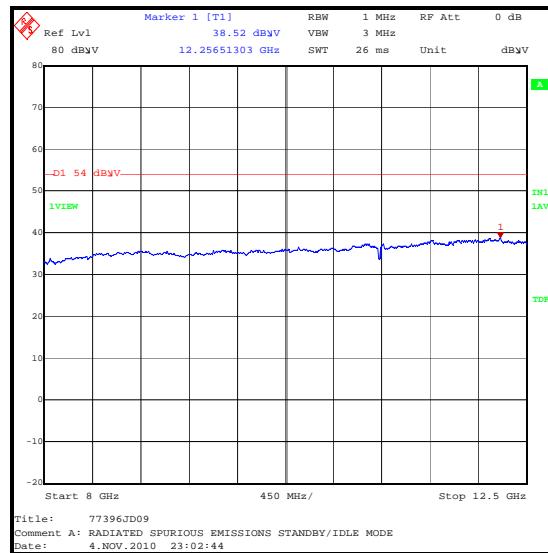
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
12256.130	Vertical	38.5	54.0	15.5	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. 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.
3. 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.

Receiver/Idle Mode Radiated Spurious Emissions (continued)



Receiver/Idle Mode Radiated Spurious Emissions (continued)**Peak Detector****Average Detector****Peak Detector****Average Detector**

5.2.3. Transmitter AC Conducted Spurious Emissions**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	22 September 2011
Test Sample Serial No:	00064cf8		

FCC Reference:	Part 15.207
Test Method Used:	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	30

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
4.704	Live	35.9	56.0	20.1	Complied
4.803	Live	35.4	56.0	20.6	Complied
4.911	Live	35.5	56.0	20.5	Complied
5.006	Live	37.6	60.0	22.4	Complied
5.402	Live	39.3	60.0	20.7	Complied
5.505	Live	39.8	60.0	20.2	Complied
5.712	Live	39.1	60.0	20.9	Complied
5.780	Live	40.3	60.0	19.7	Complied
5.910	Live	37.3	60.0	22.7	Complied
6.081	Live	39.9	60.0	20.1	Complied

Results: Live / Average

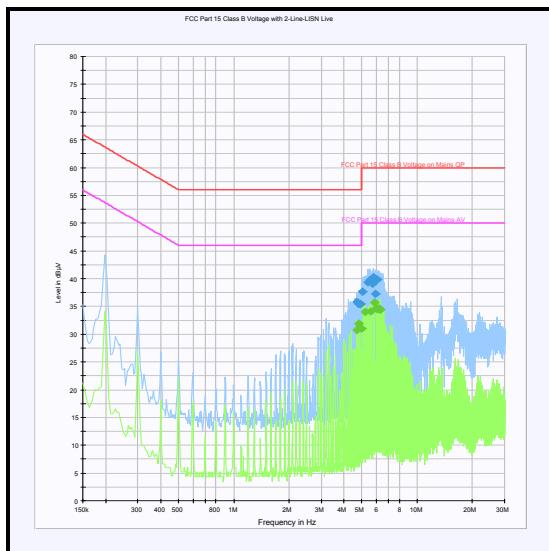
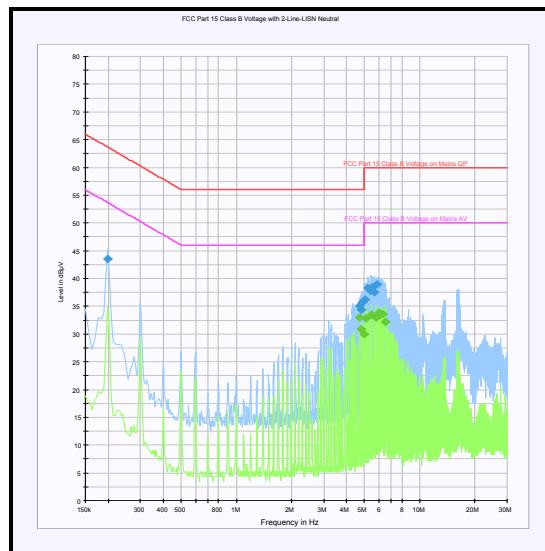
Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
4.682	Live	30.8	46.0	15.2	Complied
4.781	Live	31.9	46.0	14.1	Complied
4.983	Live	31.0	46.0	15.0	Complied
5.181	Live	34.0	50.0	16.0	Complied
5.582	Live	34.2	50.0	15.8	Complied
5.879	Live	35.6	50.0	14.4	Complied
5.978	Live	34.7	50.0	15.3	Complied
6.077	Live	34.5	50.0	15.5	Complied
6.180	Live	34.6	50.0	15.4	Complied
6.279	Live	34.4	50.0	15.6	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions (continued)**Results: Neutral / Quasi Peak**

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.200	Neutral	43.5	63.6	20.1	Complied
4.686	Neutral	35.0	56.0	21.0	Complied
4.803	Neutral	34.4	56.0	21.6	Complied
4.876	Neutral	35.7	56.0	20.3	Complied
5.006	Neutral	36.3	60.0	23.7	Complied
5.181	Neutral	38.3	60.0	21.7	Complied
5.411	Neutral	37.8	60.0	22.2	Complied
5.505	Neutral	38.5	60.0	21.5	Complied
5.681	Neutral	37.5	60.0	22.5	Complied
5.883	Neutral	39.0	60.0	21.0	Complied

Results: Neutral / Average

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
4.682	Neutral	33.0	46.0	13.0	Complied
4.781	Neutral	30.9	46.0	15.1	Complied
4.983	Neutral	30.0	46.0	16.0	Complied
5.082	Neutral	32.8	50.0	17.2	Complied
5.478	Neutral	33.5	50.0	16.5	Complied
5.780	Neutral	32.9	50.0	17.1	Complied
5.978	Neutral	33.9	50.0	16.1	Complied
6.077	Neutral	33.4	50.0	16.6	Complied
6.275	Neutral	33.6	50.0	16.4	Complied
6.477	Neutral	32.1	50.0	17.9	Complied

Transmitter AC Conducted Spurious Emissions (continued)**Live****Neutral**

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

5.2.4. Transmitter 6 dB Bandwidth**Test Summary:**

Test Engineer:	Andrew Edwards	Test Dates:	22 September 2011 & 13 October 2011
Test Sample Serial No:	00064cf8		

FCC Reference:	Part 15.247(a)(2)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.1

Environmental Conditions:

Temperature (°C):	25 to 27
Relative Humidity (%):	24 to 28

Results: 802.11b / 1 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	12.325	≥0.5	11.825	Complied
Middle	12.325	≥0.5	11.825	Complied
Top	12.325	≥0.5	11.825	Complied

Results: 802.11b / 2 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	12.826	≥0.5	12.326	Complied
Middle	12.625	≥0.5	12.125	Complied
Top	12.325	≥0.5	11.825	Complied

Results: 802.11b / 5.5 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	11.924	≥0.5	11.424	Complied
Middle	11.924	≥0.5	11.424	Complied
Top	11.924	≥0.5	11.424	Complied

Results: 802.11b / 11 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	12.425	≥0.5	11.925	Complied
Middle	12.525	≥0.5	12.025	Complied
Top	12.225	≥0.5	11.725	Complied

Transmitter 6 dB Bandwidth (continued)**Results: 802.11g / 6 Mbps**

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.633	≥0.5	16.133	Complied
Middle	16.633	≥0.5	16.133	Complied
Top	16.533	≥0.5	16.033	Complied

Results: 802.11g / 9 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.633	≥0.5	16.133	Complied
Middle	16.533	≥0.5	16.033	Complied
Top	16.533	≥0.5	16.033	Complied

Results: 802.11g / 12 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.533	≥0.5	16.033	Complied
Middle	16.633	≥0.5	16.133	Complied
Top	16.633	≥0.5	16.133	Complied

Results: 802.11g / 18 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.533	≥0.5	16.033	Complied
Middle	16.633	≥0.5	16.133	Complied
Top	16.633	≥0.5	16.133	Complied

Results: 802.11g / 24 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.533	≥0.5	16.033	Complied
Middle	16.633	≥0.5	16.133	Complied
Top	16.533	≥0.5	16.033	Complied

Results: 802.11g / 36 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.533	≥0.5	16.033	Complied
Middle	16.633	≥0.5	16.133	Complied
Top	16.633	≥0.5	16.133	Complied

Transmitter 6 dB Bandwidth (continued)**Results: 802.11g / 48 Mbps**

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.533	≥0.5	16.033	Complied
Middle	16.533	≥0.5	16.033	Complied
Top	16.633	≥0.5	16.133	Complied

Results: 802.11g / 54 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.733	≥0.5	16.233	Complied
Middle	16.733	≥0.5	16.233	Complied
Top	16.833	≥0.5	16.333	Complied

Results: 802.11n / 20 MHz / 6.5 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.735	≥0.5	17.235	Complied
Middle	17.635	≥0.5	17.135	Complied
Top	17.836	≥0.5	17.336	Complied

Results: 802.11n / 20 MHz / 13 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.635	≥0.5	17.135	Complied
Middle	17.535	≥0.5	17.035	Complied
Top	17.736	≥0.5	17.236	Complied

Results: 802.11n / 20 MHz / 19.5 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.836	≥0.5	17.336	Complied
Middle	17.836	≥0.5	17.336	Complied
Top	17.736	≥0.5	17.236	Complied

Results: 802.11n / 20 MHz / 26 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.836	≥0.5	17.336	Complied
Middle	17.936	≥0.5	17.436	Complied
Top	17.836	≥0.5	17.336	Complied

Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 39 Mbps**

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.836	≥0.5	17.336	Complied
Middle	17.836	≥0.5	17.336	Complied
Top	17.836	≥0.5	17.336	Complied

Results: 802.11n / 20 MHz / 52 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.836	≥0.5	17.336	Complied
Middle	17.836	≥0.5	17.336	Complied
Top	17.736	≥0.5	17.236	Complied

Results: 802.11n / 20 MHz / 58.5 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.836	≥0.5	17.336	Complied
Middle	17.836	≥0.5	17.336	Complied
Top	17.736	≥0.5	17.236	Complied

Results: 802.11n / 20 MHz / 65 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.836	≥0.5	17.336	Complied
Middle	17.936	≥0.5	17.436	Complied
Top	17.936	≥0.5	17.436	Complied

Results: 802.11n / 20 MHz / 7.2 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.435	≥0.5	16.935	Complied
Middle	17.535	≥0.5	17.035	Complied
Top	17.435	≥0.5	16.935	Complied

Results: 802.11n / 20 MHz / 14.4 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.635	≥0.5	17.135	Complied
Middle	17.435	≥0.5	16.935	Complied
Top	17.736	≥0.5	17.236	Complied

Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 21.7 Mbps**

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.535	≥0.5	17.035	Complied
Middle	17.435	≥0.5	16.935	Complied
Top	17.736	≥0.5	17.236	Complied

Results: 802.11n / 20 MHz / 28.9 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.435	≥0.5	16.935	Complied
Middle	17.836	≥0.5	17.336	Complied
Top	17.836	≥0.5	17.336	Complied

Results: 802.11n / 20 MHz / 43.4 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.735	≥0.5	17.235	Complied
Middle	17.836	≥0.5	17.336	Complied
Top	17.736	≥0.5	17.236	Complied

Results: 802.11n / 20 MHz / 57.8 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.635	≥0.5	17.135	Complied
Middle	17.836	≥0.5	17.336	Complied
Top	17.736	≥0.5	17.236	Complied

Results: 802.11n / 20 MHz / 65 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.836	≥0.5	17.336	Complied
Middle	17.936	≥0.5	17.436	Complied
Top	17.936	≥0.5	17.436	Complied

Results: 802.11n / 20 MHz / 72.2 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	17.836	≥0.5	17.336	Complied
Middle	17.635	≥0.5	17.135	Complied
Top	17.635	≥0.5	17.135	Complied

Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 13.5 Mbps**

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.242	≥0.5	35.742	Complied
Middle	36.473	≥0.5	36.973	Complied
Top	36.473	≥0.5	36.973	Complied

Results: 802.11n / 40 MHz / 27 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.242	≥0.5	35.742	Complied
Middle	36.273	≥0.5	35.773	Complied
Top	36.303	≥0.5	35.803	Complied

Results: 802.11n / 40 MHz / 40.5 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.673	≥0.5	36.173	Complied
Middle	36.473	≥0.5	35.973	Complied
Top	36.273	≥0.5	35.773	Complied

Results: 802.11n / 40 MHz / 54 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.273	≥0.5	35.773	Complied
Middle	36.473	≥0.5	35.973	Complied
Top	36.673	≥0.5	36.173	Complied

Results: 802.11n / 40 MHz / 81 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.273	≥0.5	35.773	Complied
Middle	36.303	≥0.5	35.803	Complied
Top	36.273	≥0.5	35.773	Complied

Results: 802.11n / 40 MHz / 108 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.273	≥0.5	35.773	Complied
Middle	36.273	≥0.5	35.773	Complied
Top	36.473	≥0.5	35.973	Complied

Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 121 Mbps**

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.072	≥0.5	35.572	Complied
Middle	36.072	≥0.5	35.572	Complied
Top	36.473	≥0.5	35.973	Complied

Results: 802.11n / 40 MHz / 135 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.473	≥0.5	35.973	Complied
Middle	36.072	≥0.5	35.572	Complied
Top	36.673	≥0.5	36.173	Complied

Results: 802.11n / 40 MHz / 15 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.072	≥0.5	35.572	Complied
Middle	36.102	≥0.5	35.602	Complied
Top	36.072	≥0.5	36.572	Complied

Results: 802.11n / 40 MHz / 30 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.072	≥0.5	35.572	Complied
Middle	36.102	≥0.5	35.602	Complied
Top	36.273	≥0.5	35.773	Complied

Results: 802.11n / 40 MHz / 45 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.072	≥0.5	35.572	Complied
Middle	36.102	≥0.5	35.602	Complied
Top	36.473	≥0.5	35.973	Complied

Results: 802.11n / 40 MHz / 60 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.473	≥0.5	35.973	Complied
Middle	36.473	≥0.5	35.973	Complied
Top	36.473	≥0.5	35.973	Complied

Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 90 Mbps**

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.473	≥0.5	35.973	Complied
Middle	36.473	≥0.5	35.973	Complied
Top	36.473	≥0.5	35.973	Complied

Results: 802.11n / 40 MHz / 120 Mbps

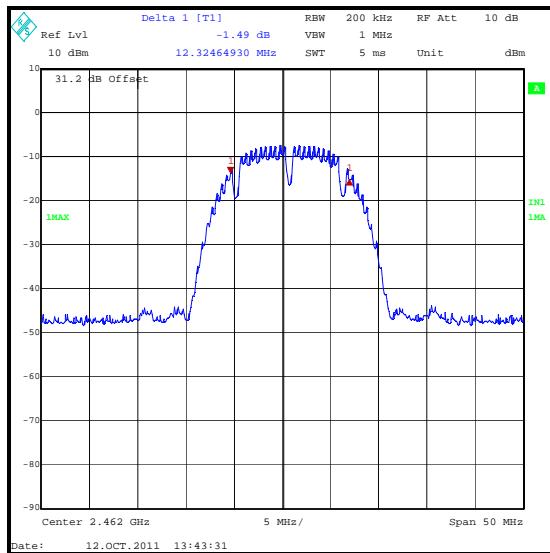
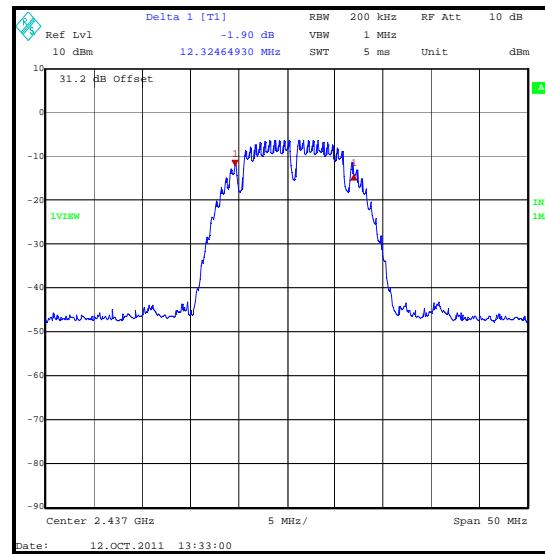
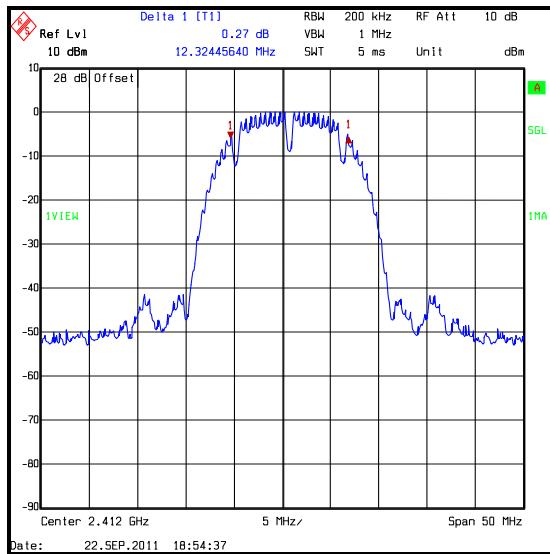
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.473	≥0.5	35.973	Complied
Middle	36.503	≥0.5	36.003	Complied
Top	36.273	≥0.5	35.773	Complied

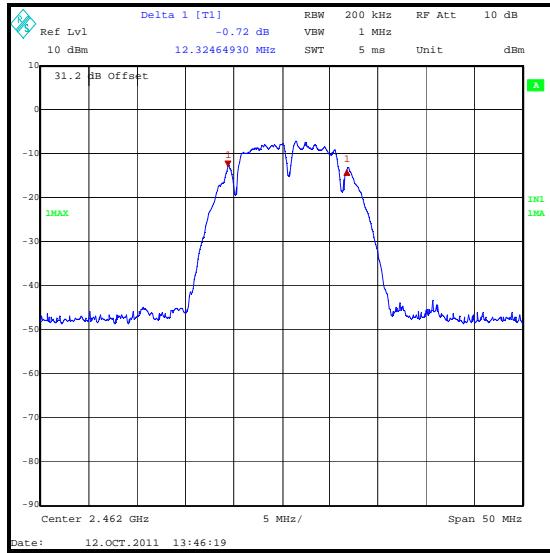
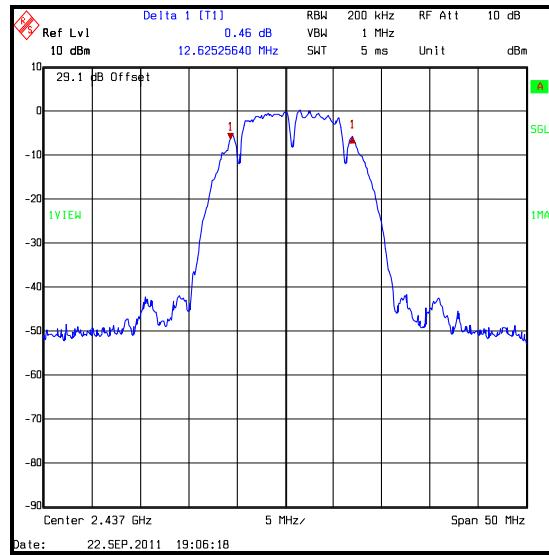
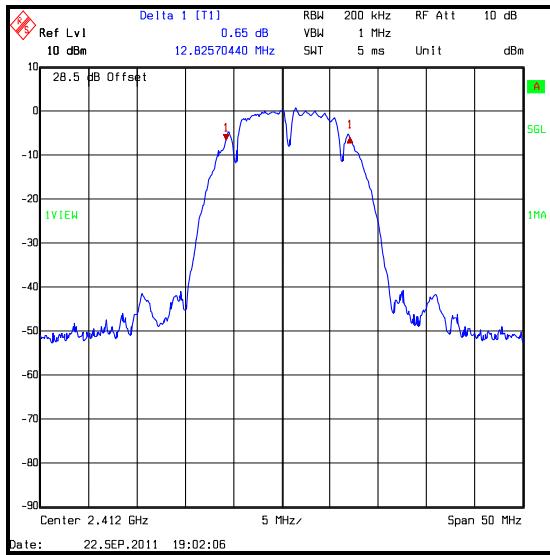
Results: 802.11n / 40 MHz / 135 Mbps

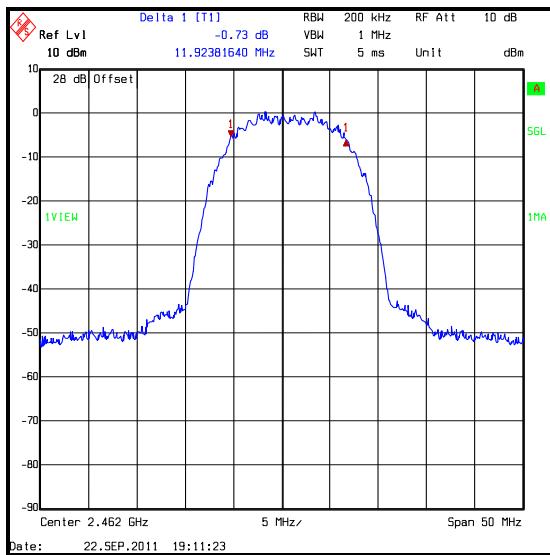
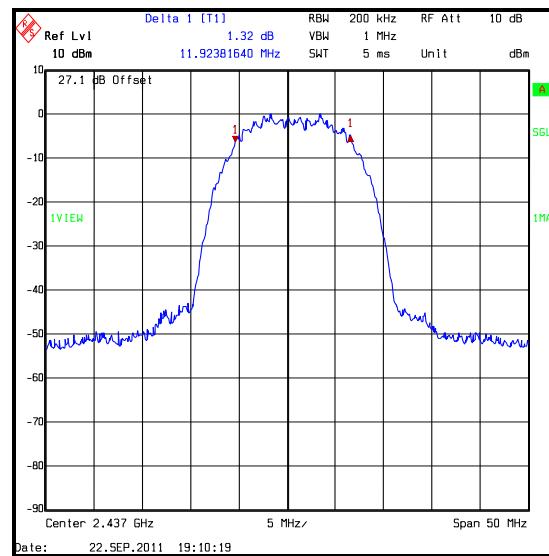
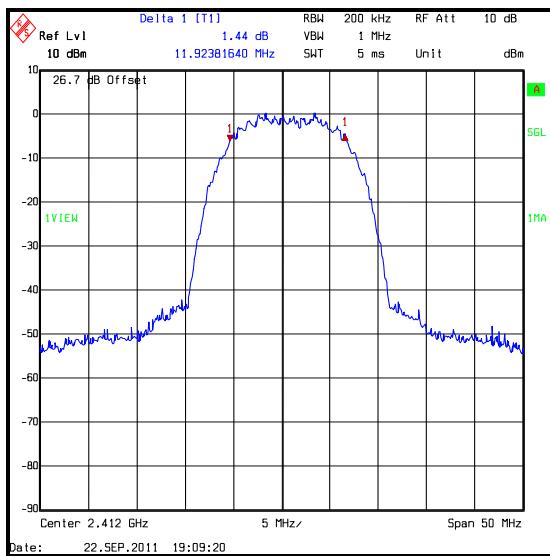
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.473	≥0.5	35.973	Complied
Middle	36.503	≥0.5	36.003	Complied
Top	36.333	≥0.5	35.833	Complied

Results: 802.11n / 40 MHz / 150 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	36.333	≥0.5	35.833	Complied
Middle	36.473	≥0.5	35.973	Complied
Top	36.473	≥0.5	35.973	Complied

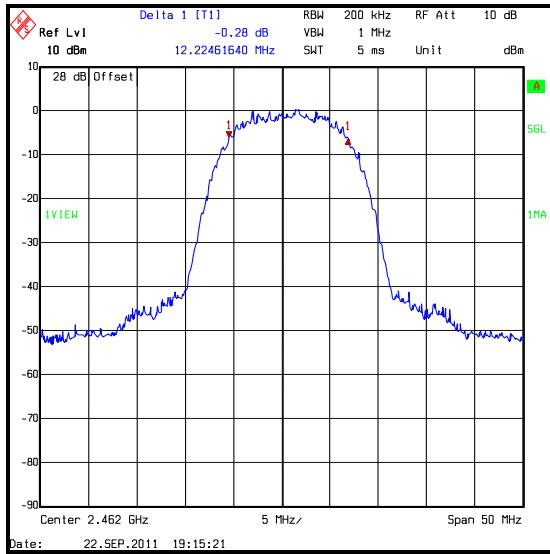
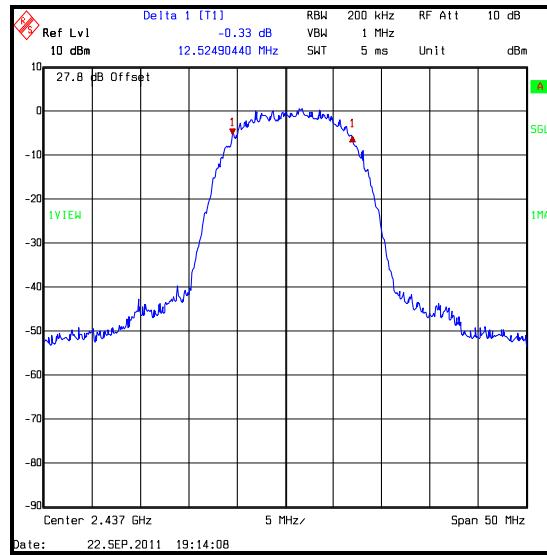
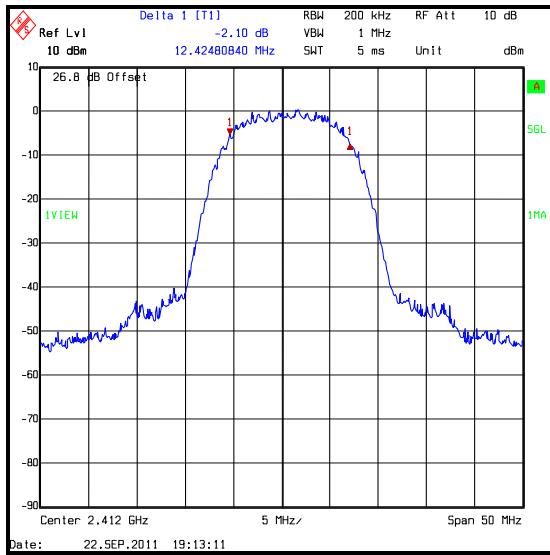
Transmitter 6 dB Bandwidth (continued)**Results: 802.11b / 1 Mbps**

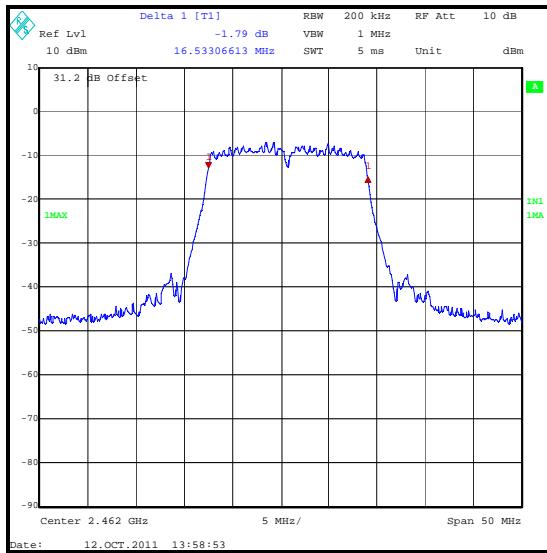
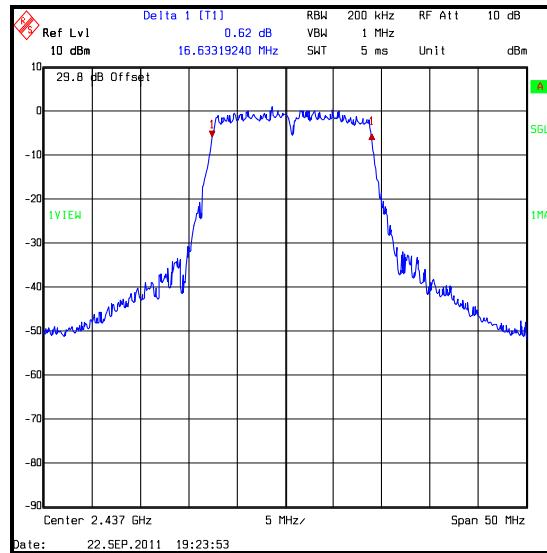
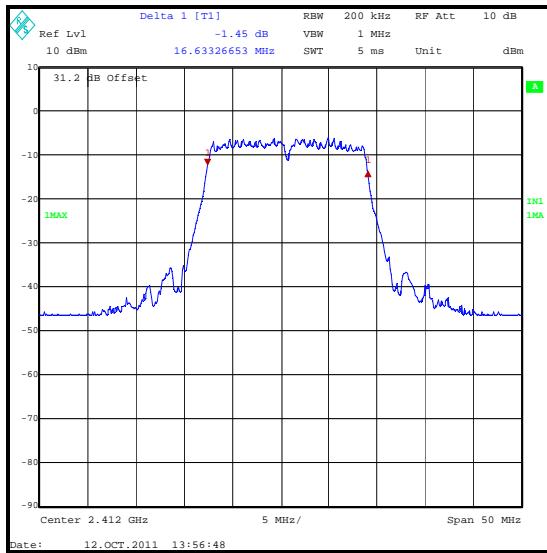
Transmitter 6 dB Bandwidth (continued)**Results: 802.11b / 2 Mbps**

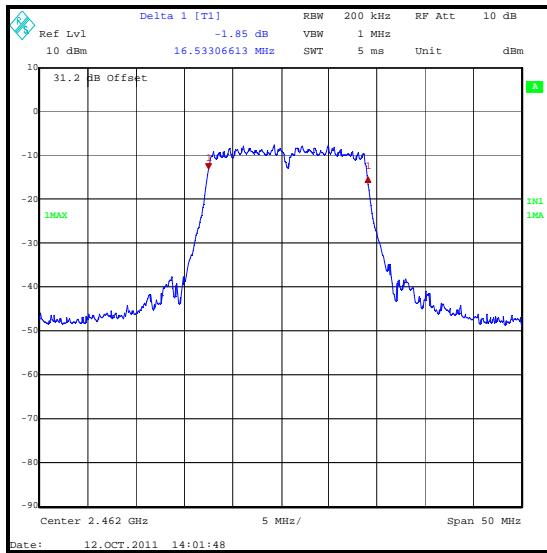
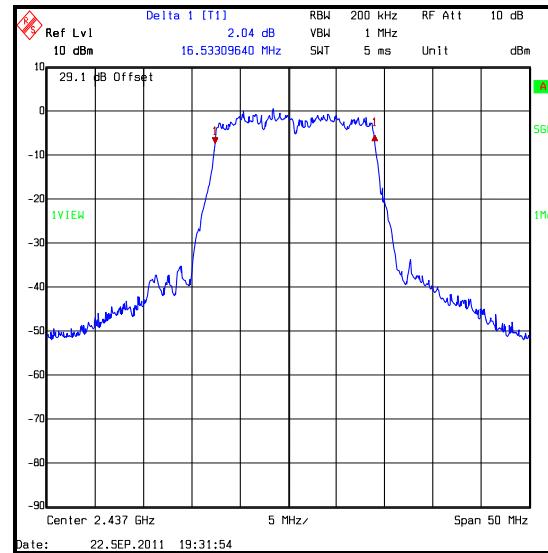
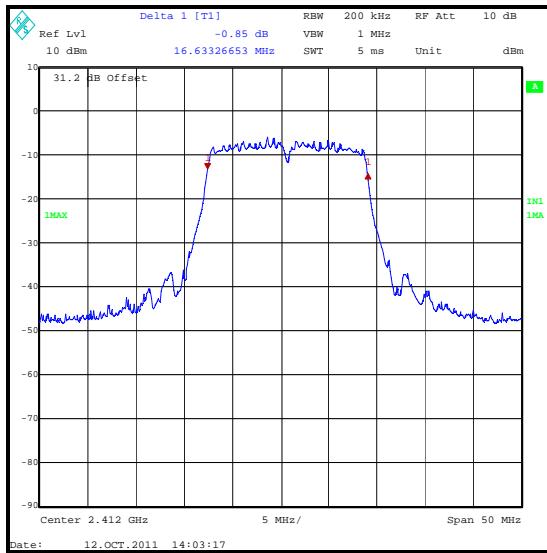
Transmitter 6 dB Bandwidth (continued)**Results: 802.11b / 5.5 Mbps**

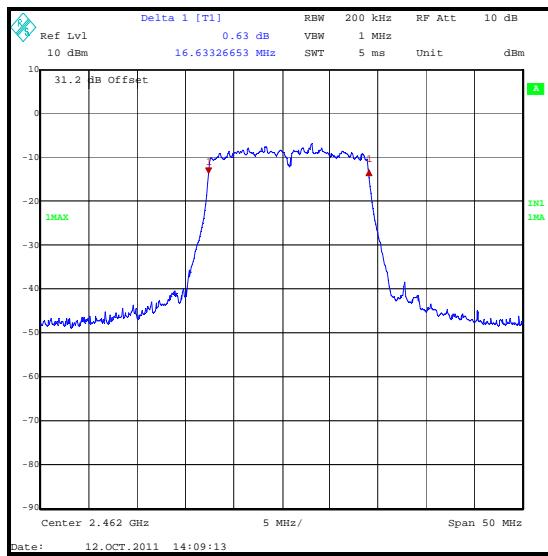
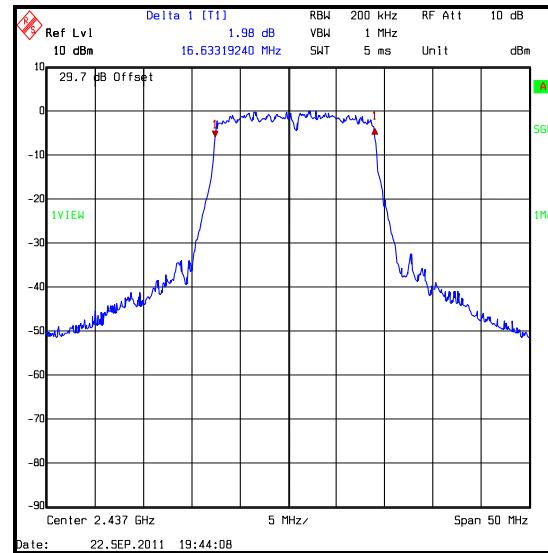
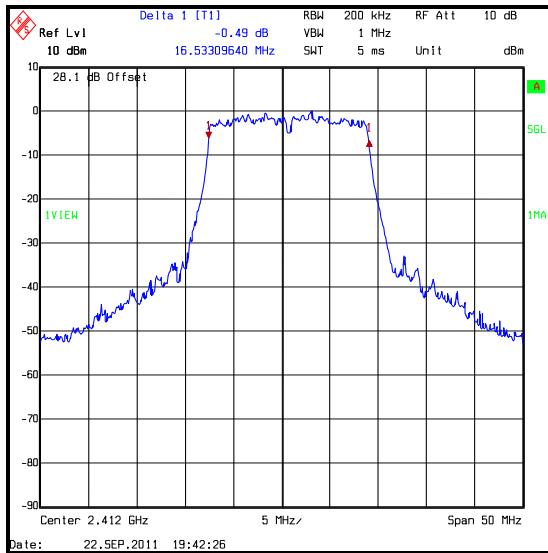
Transmitter 6 dB Bandwidth (continued)

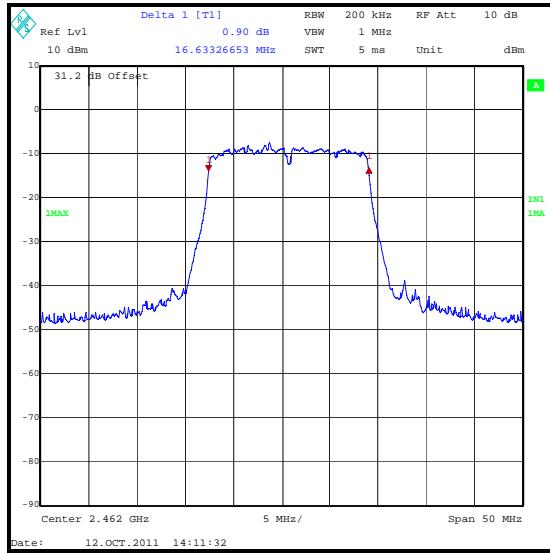
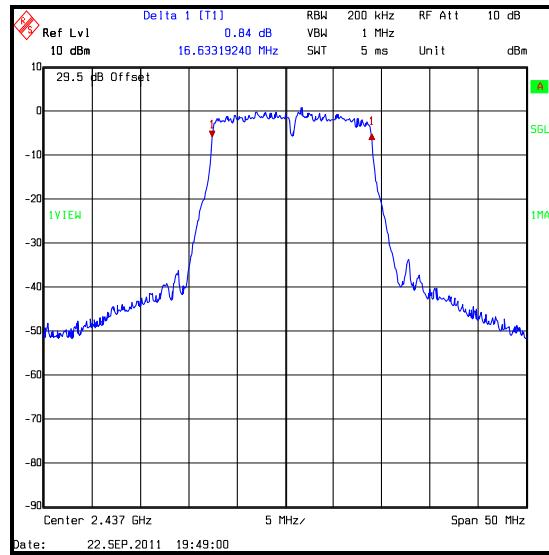
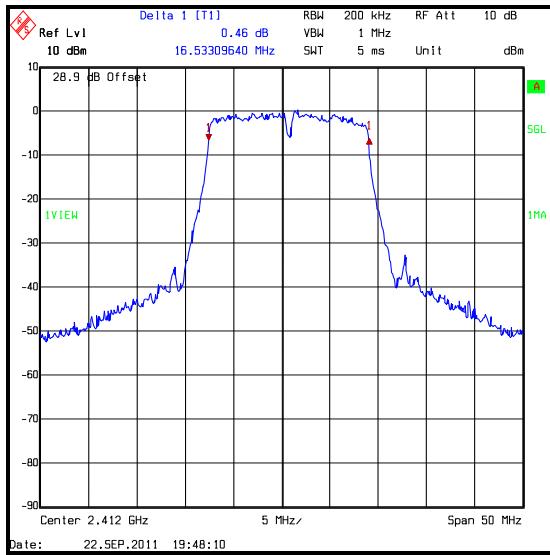
Results: 802.11b /11 Mbps

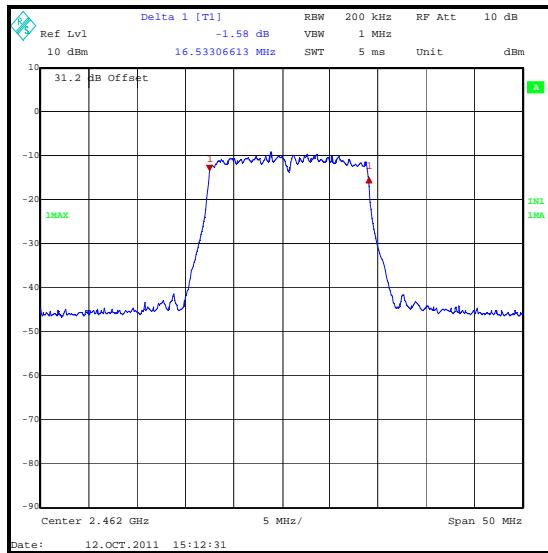
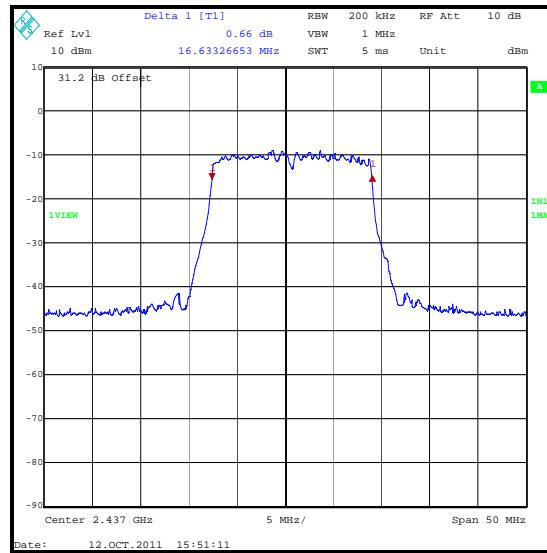
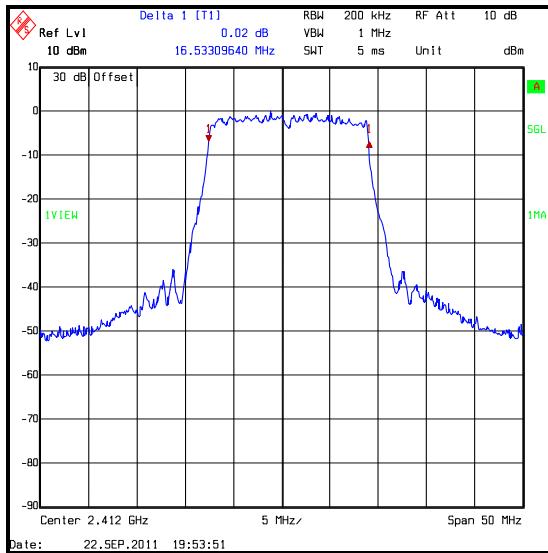


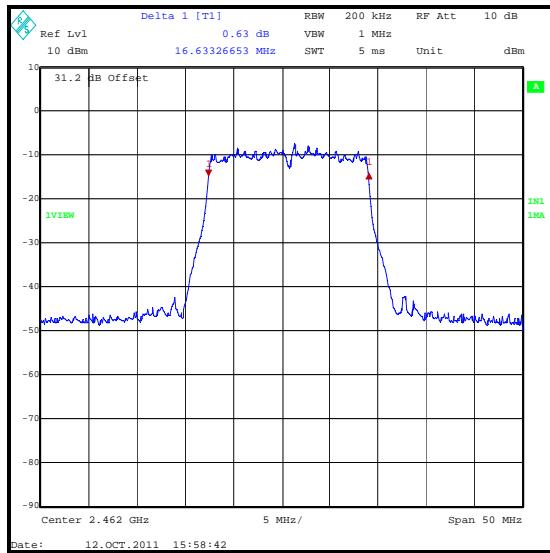
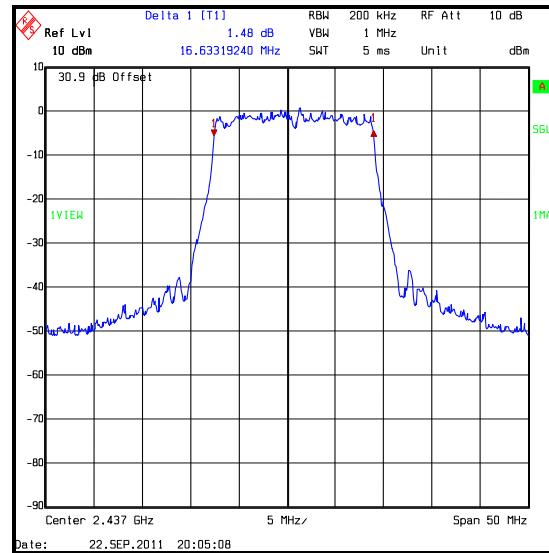
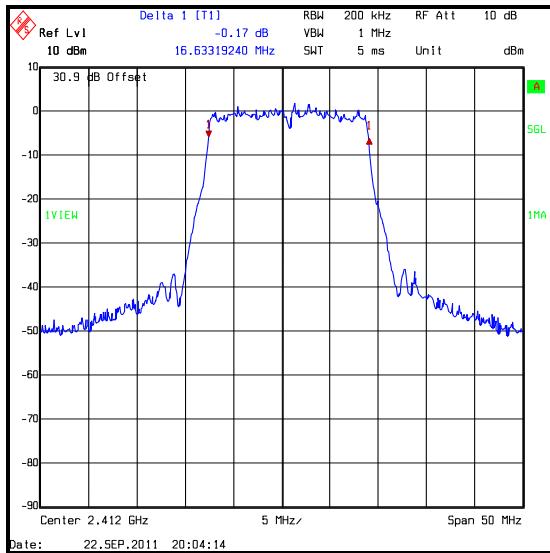
Transmitter 6 dB Bandwidth (continued)**Results: 802.11g / 6 Mbps**

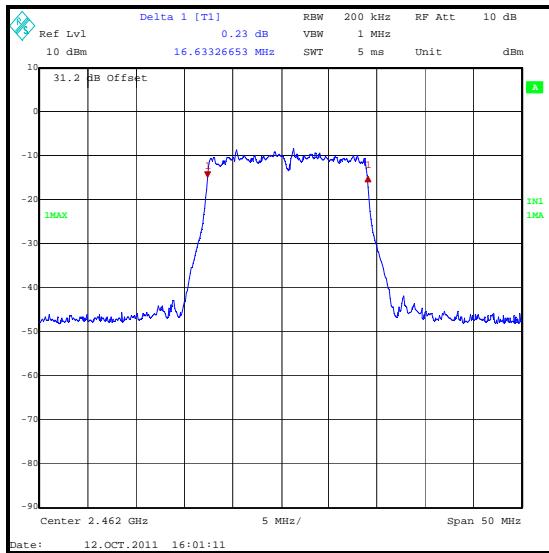
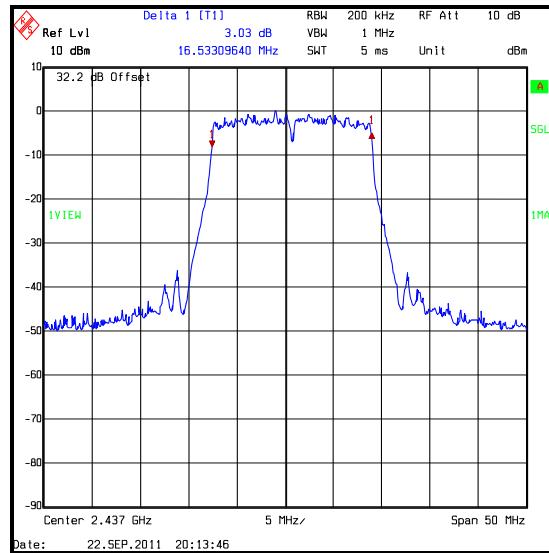
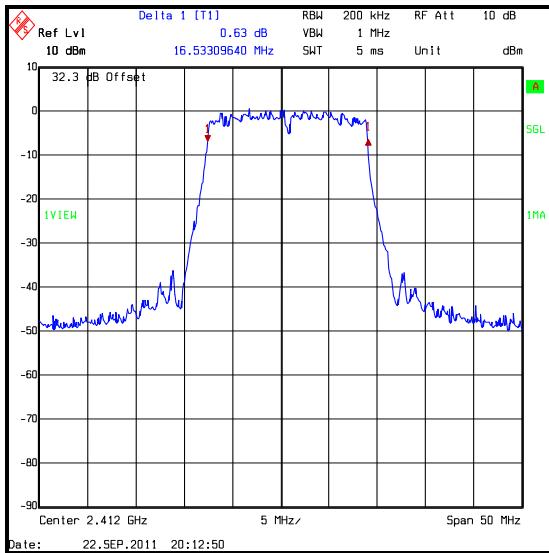
Transmitter 6 dB Bandwidth (continued)**Results: 802.11g / 9 Mbps**

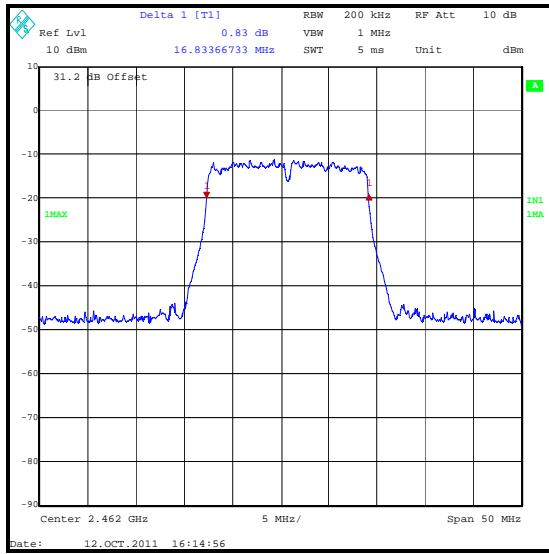
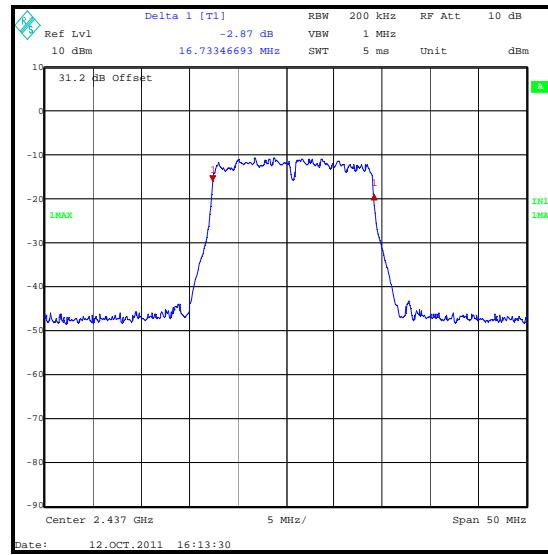
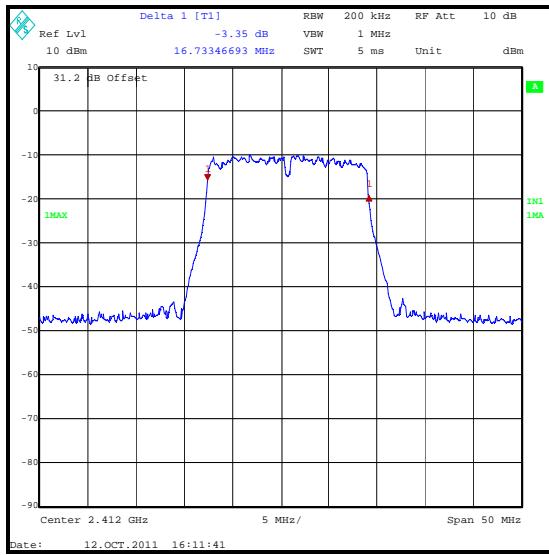
Transmitter 6 dB Bandwidth (continued)**Results: 802.11g / 12 Mbps**

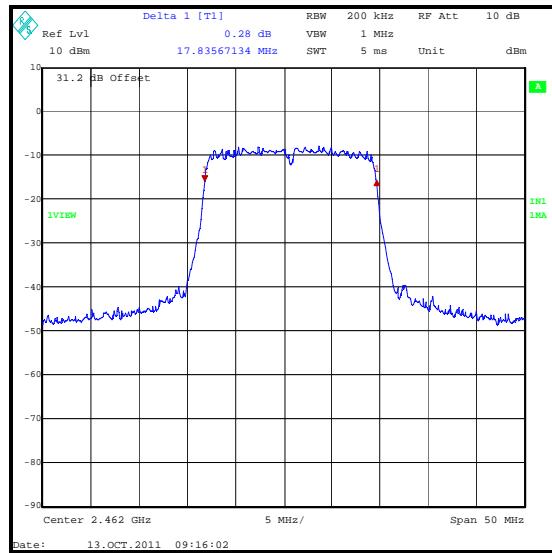
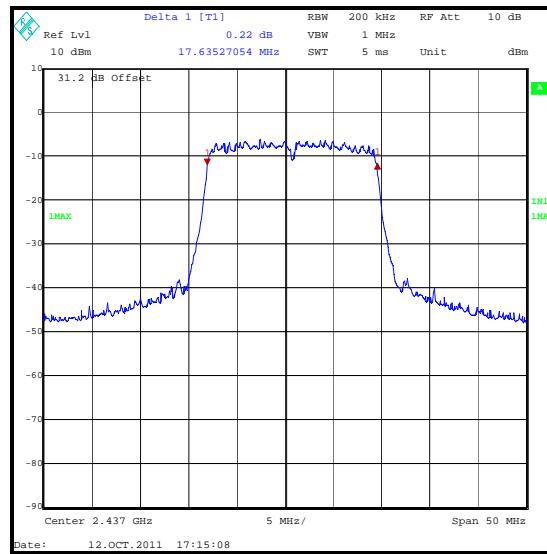
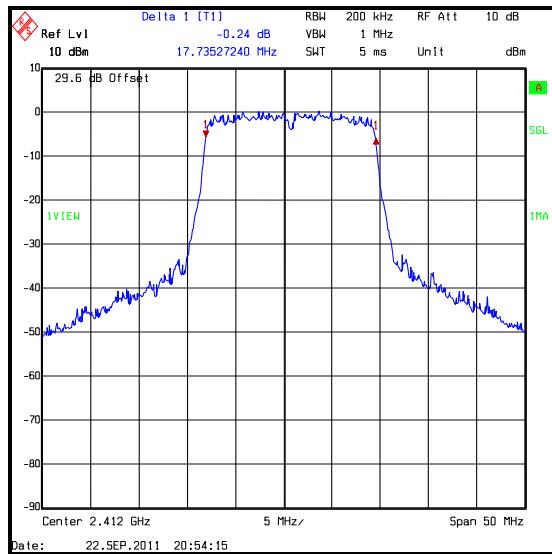
Transmitter 6 dB Bandwidth (continued)**Results: 802.11g / 18 Mbps**

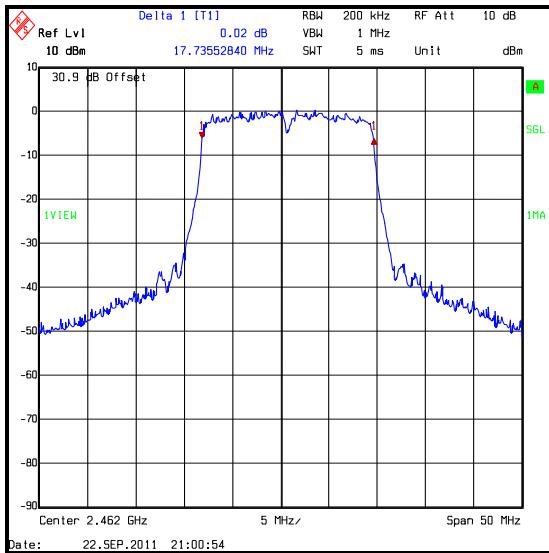
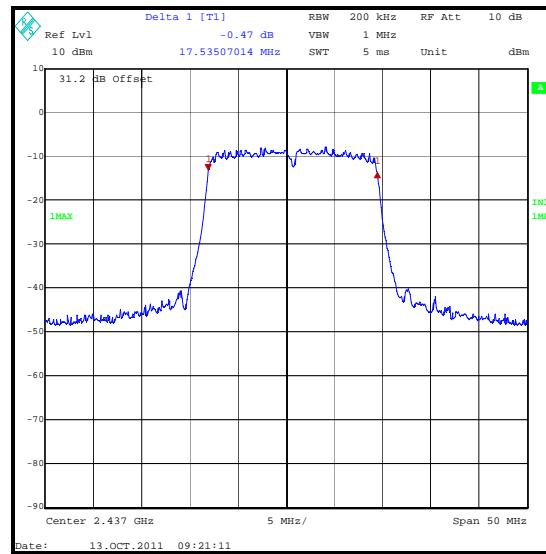
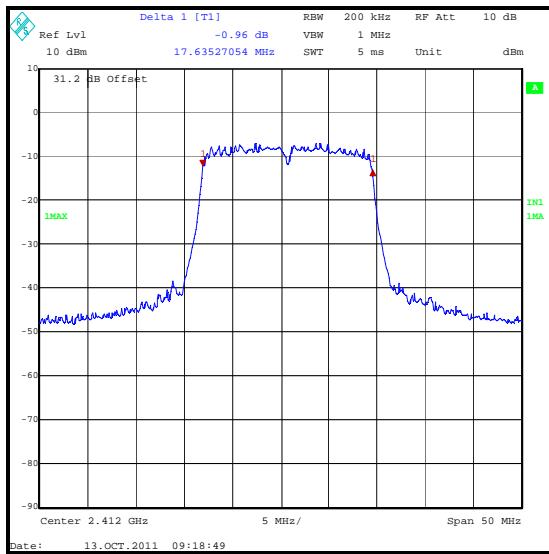
Transmitter 6 dB Bandwidth (continued)**Results: 802.11g / 24 Mbps**

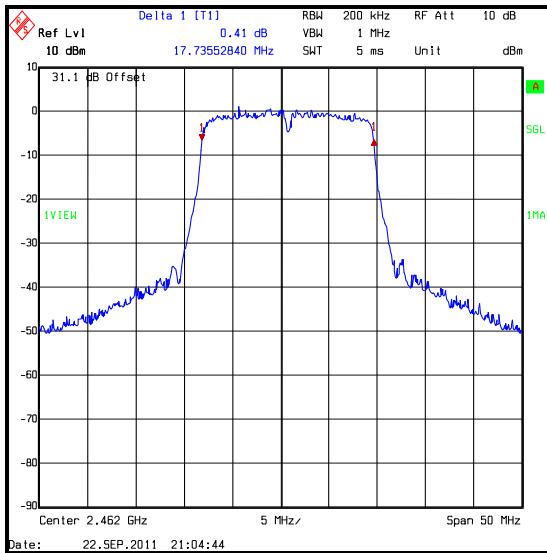
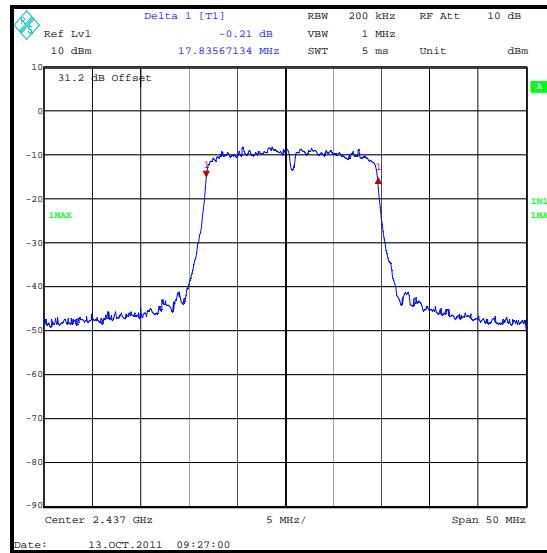
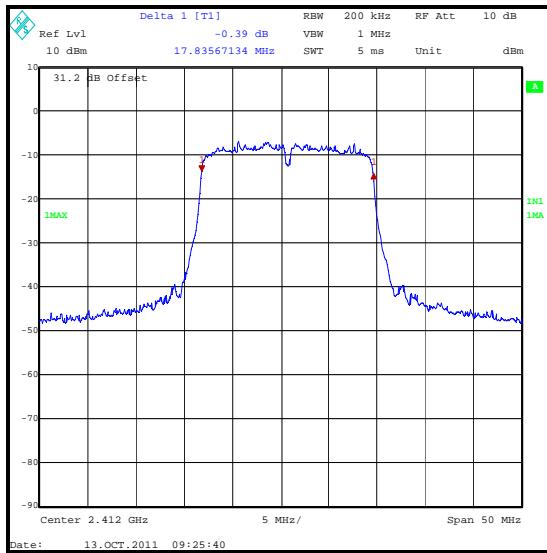
Transmitter 6 dB Bandwidth (continued)**Results: 802.11g / 36 Mbps**

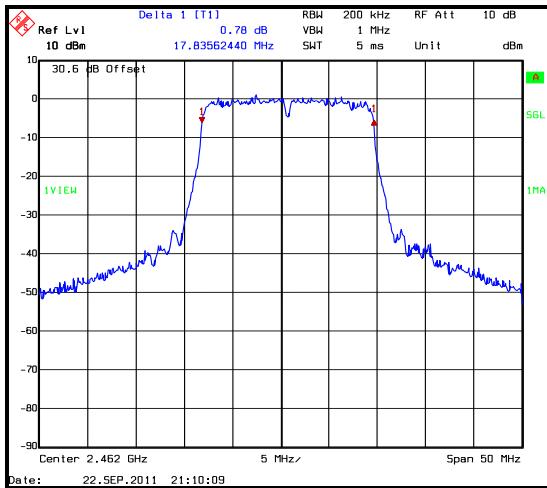
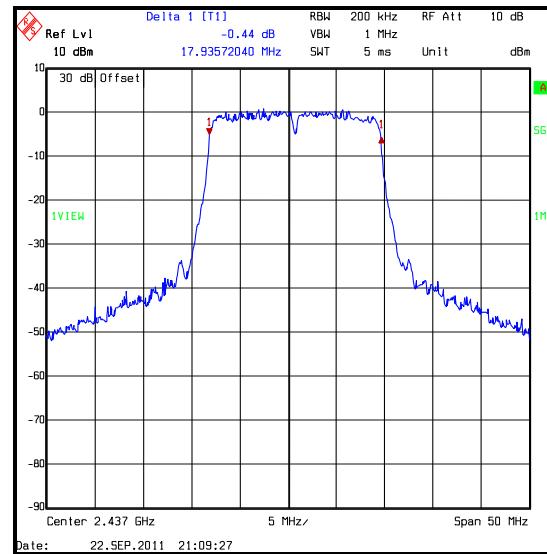
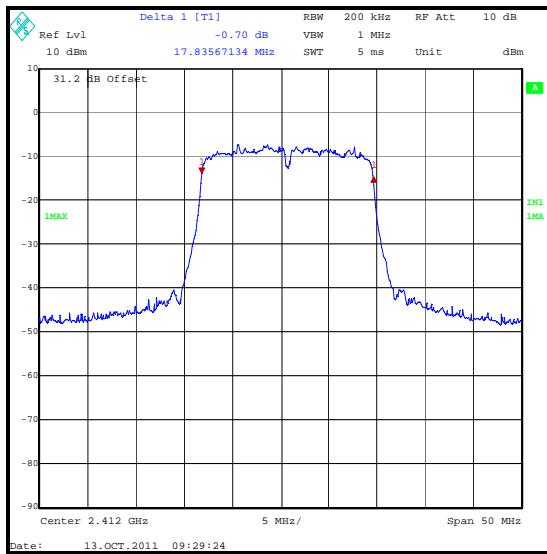
Transmitter 6 dB Bandwidth (continued)**Results: 802.11g / 48 Mbps**

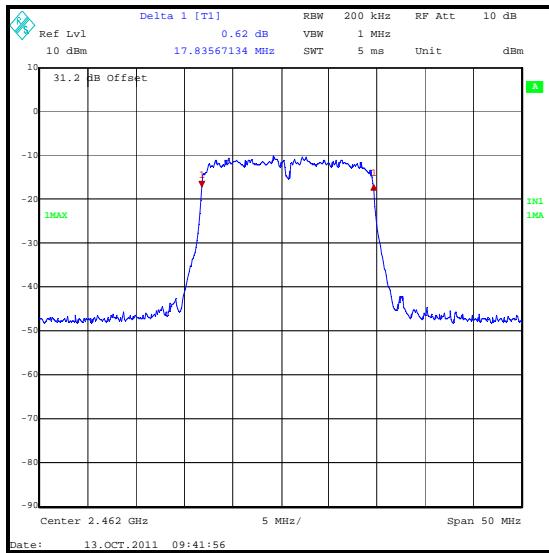
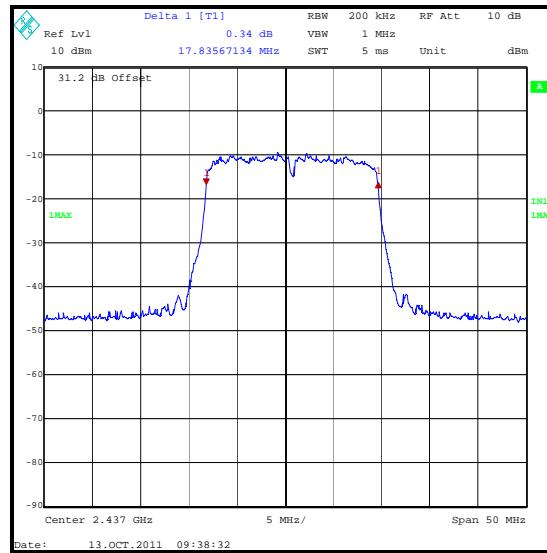
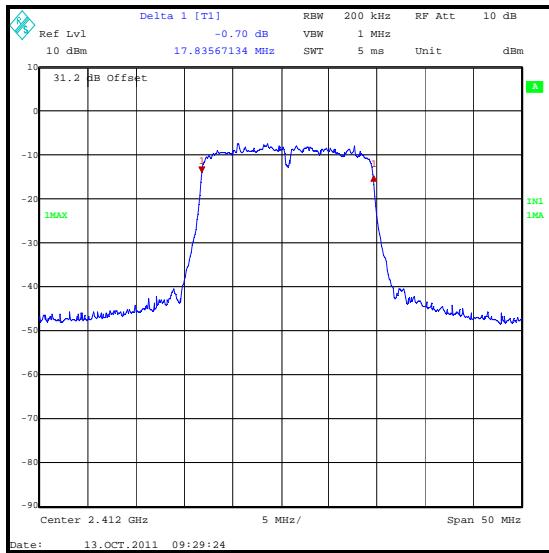
Transmitter 6 dB Bandwidth (continued)**Results: 802.11g / 54 Mbps**

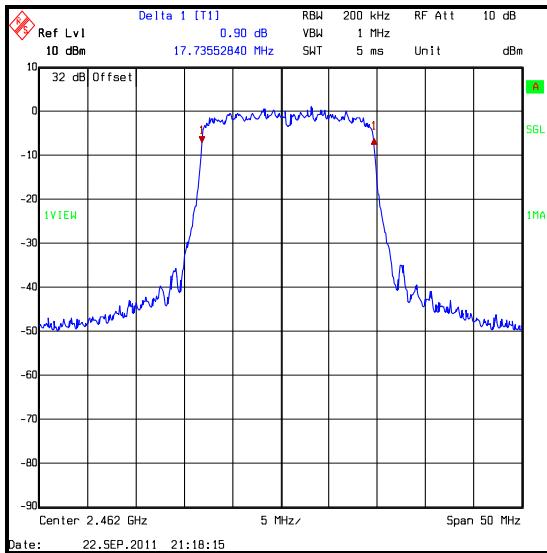
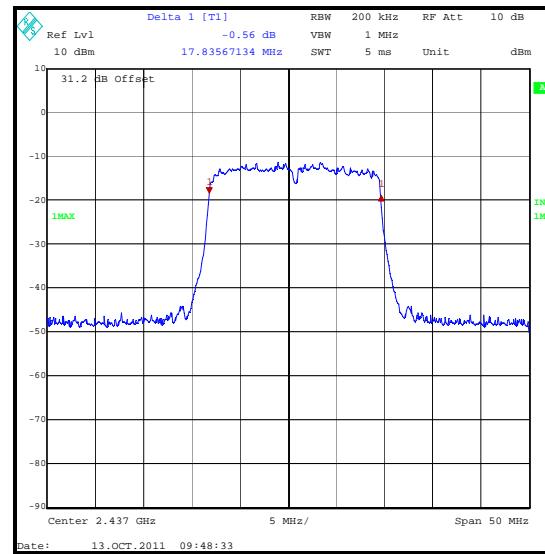
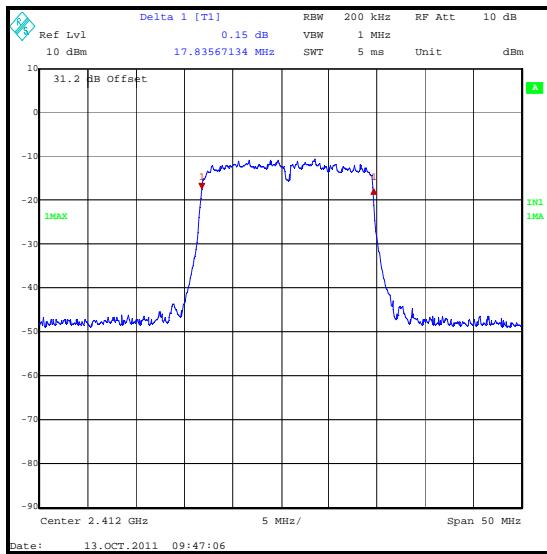
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 6.5 Mbps**

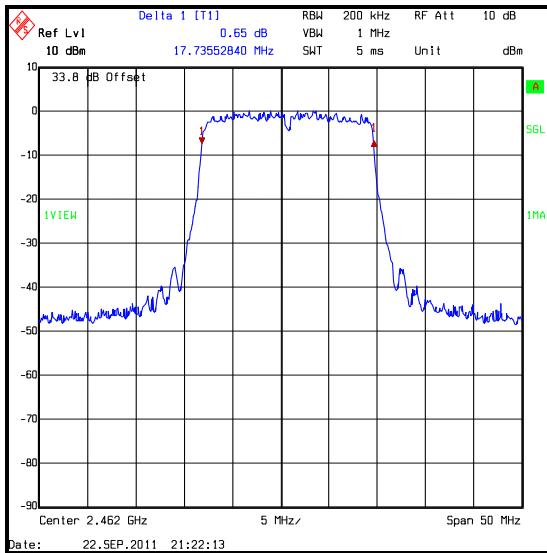
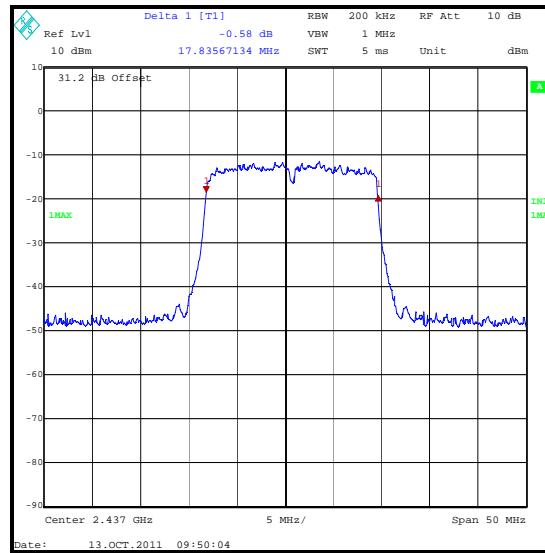
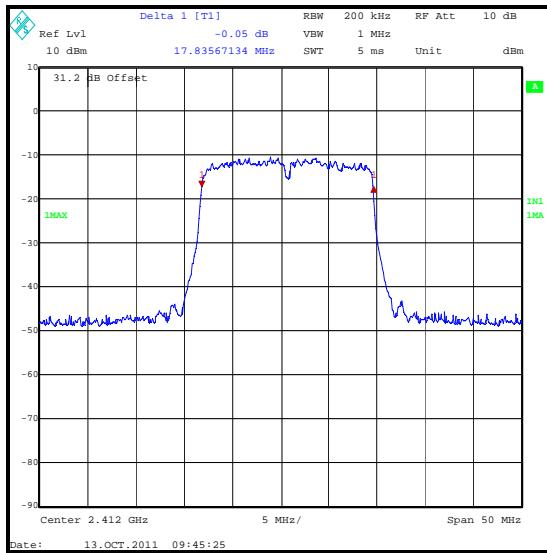
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 13 Mbps**

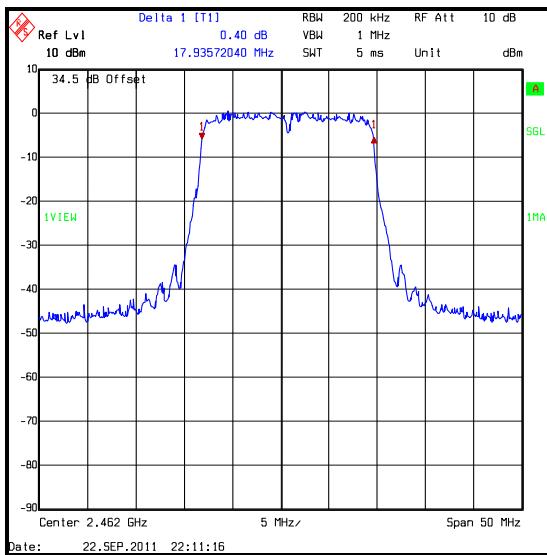
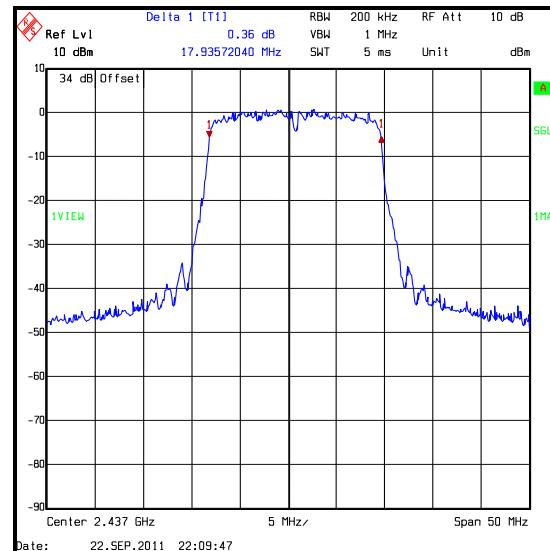
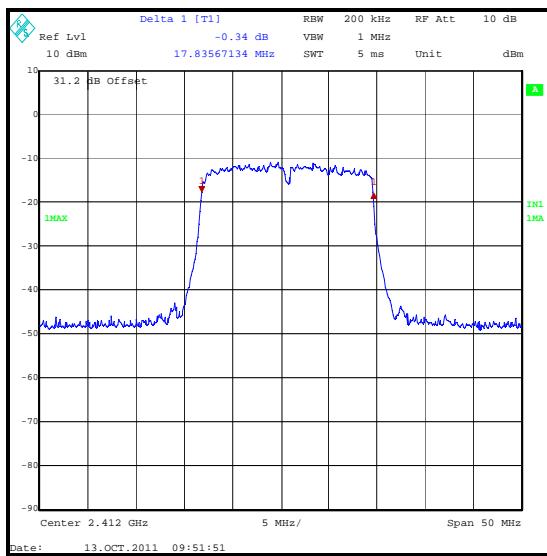
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 19.5 Mbps**

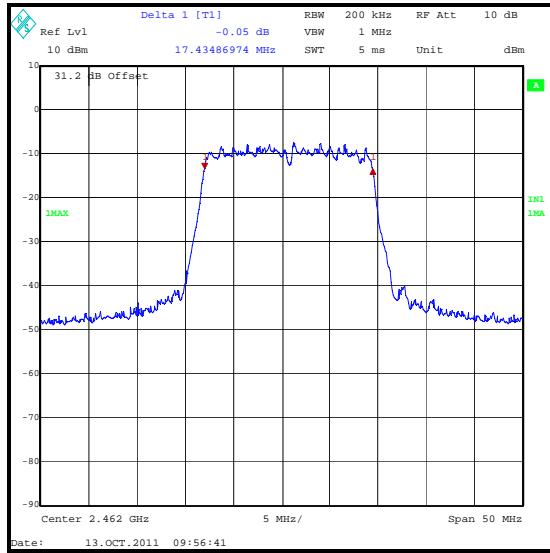
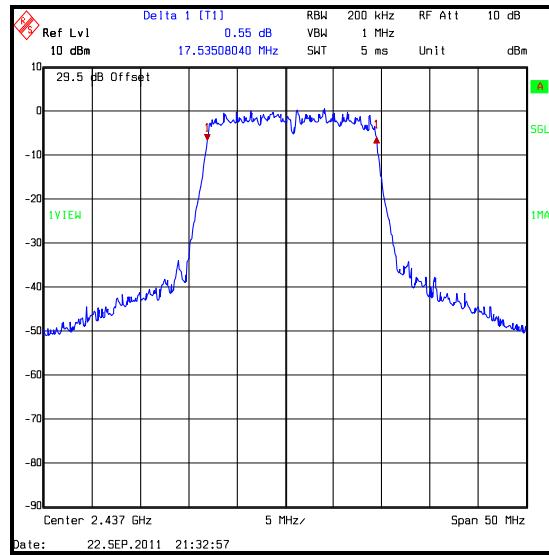
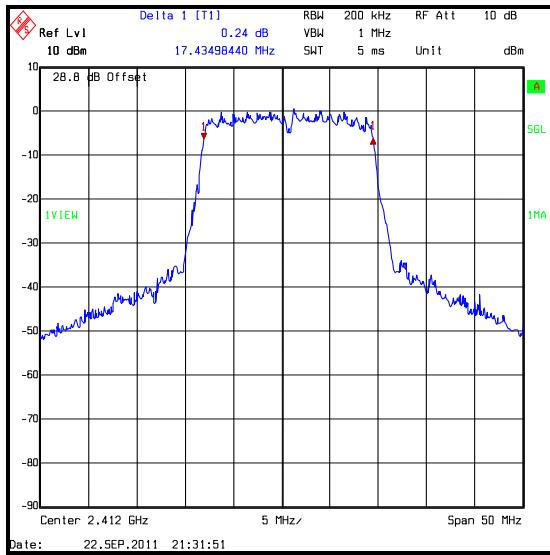
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 26 Mbps**

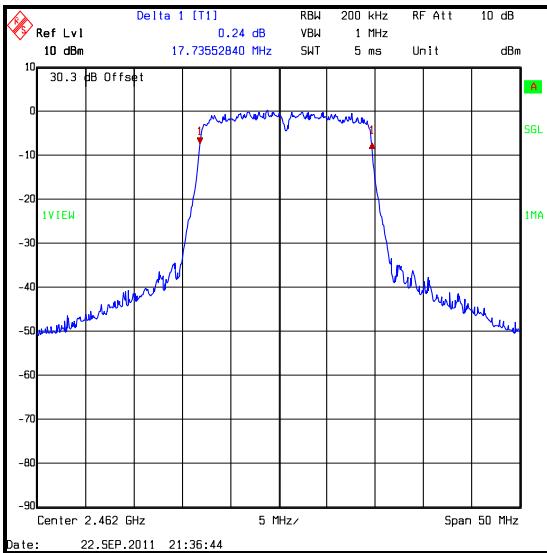
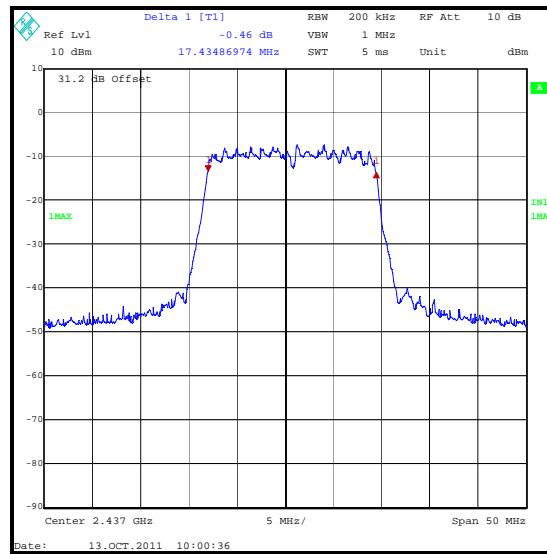
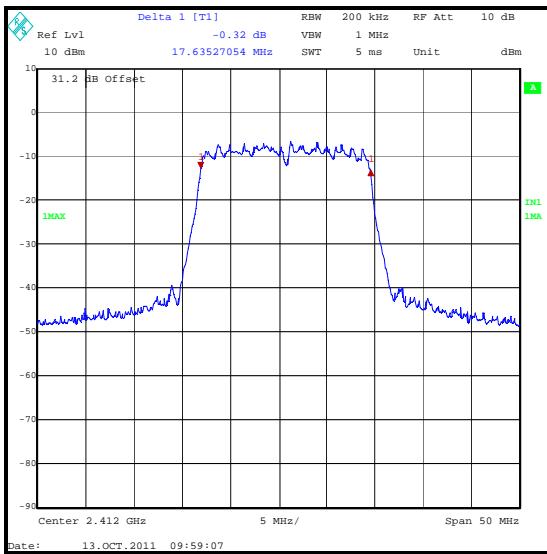
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 39 Mbps**

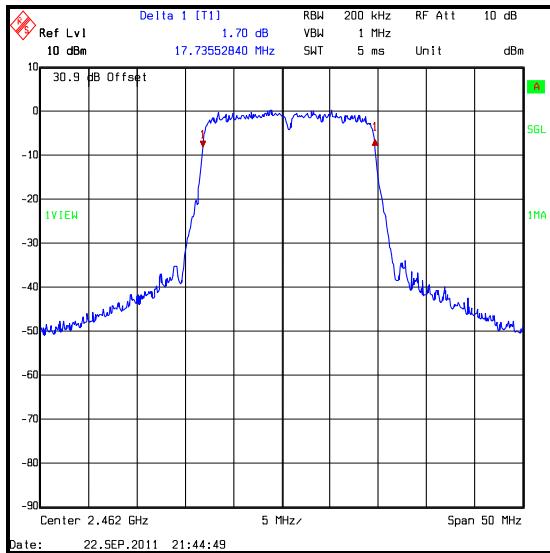
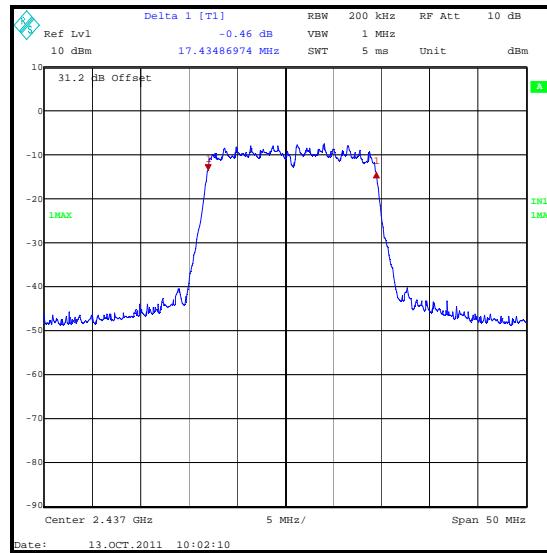
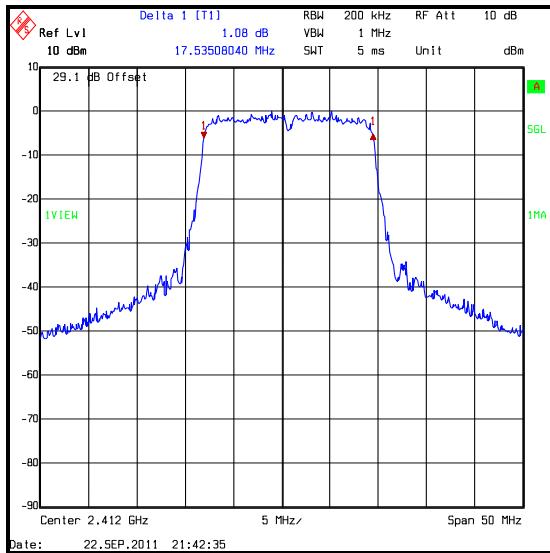
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 52 Mbps**

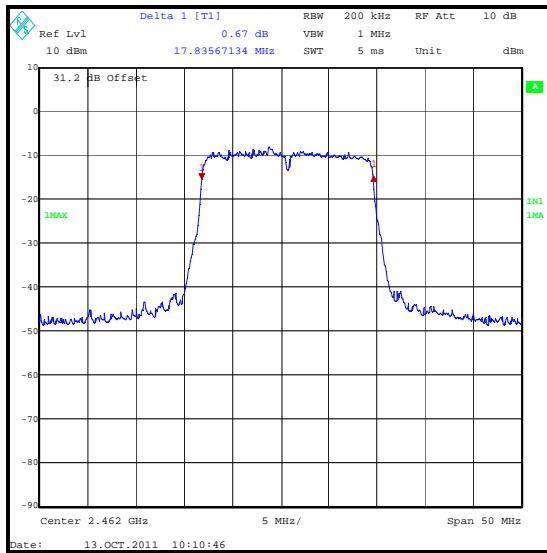
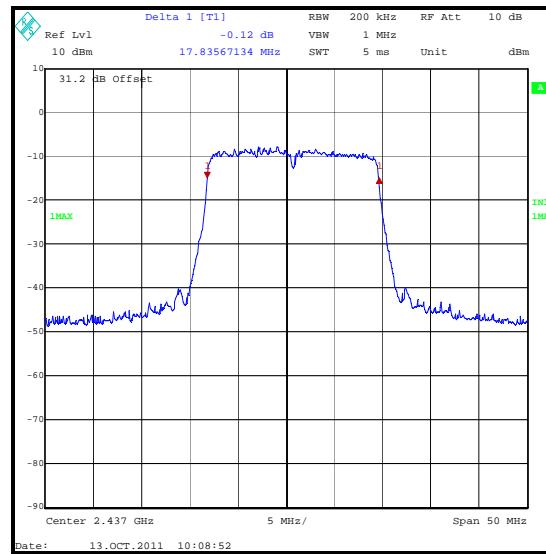
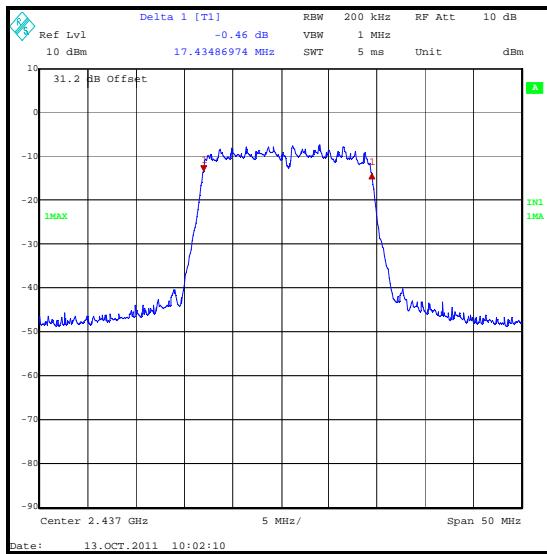
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 58.5 Mbps**

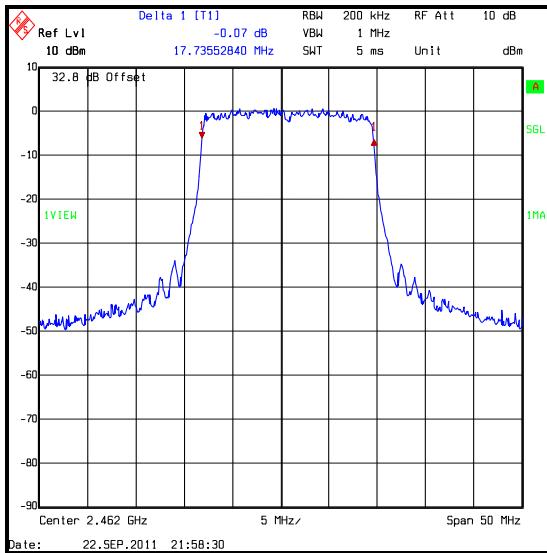
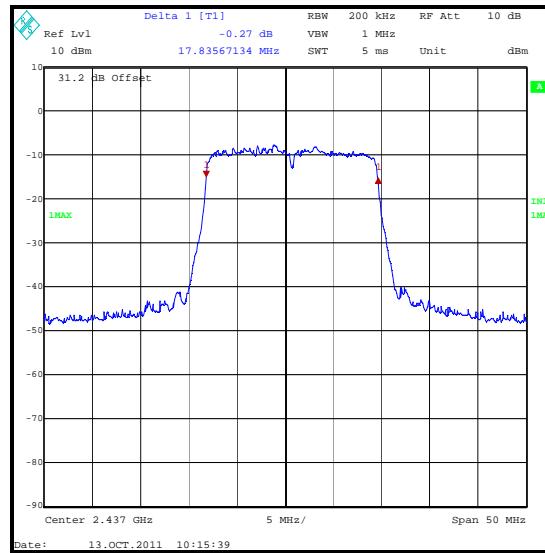
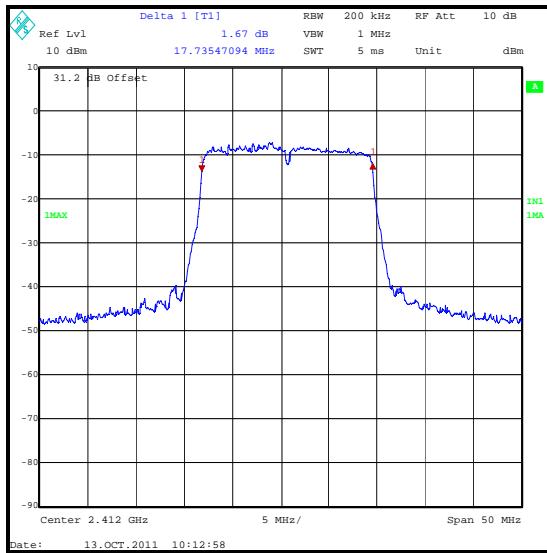
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 65 Mbps**

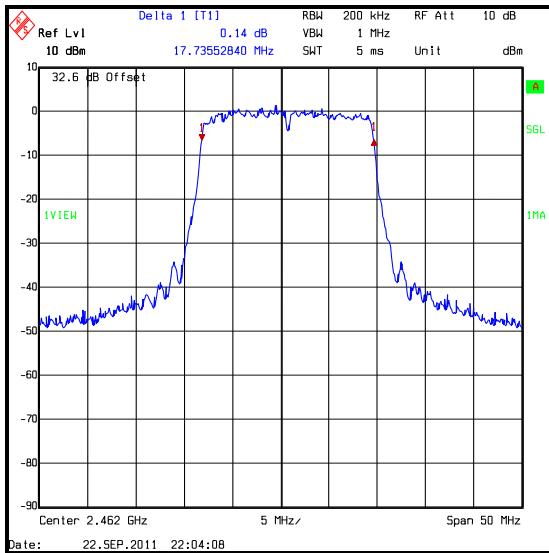
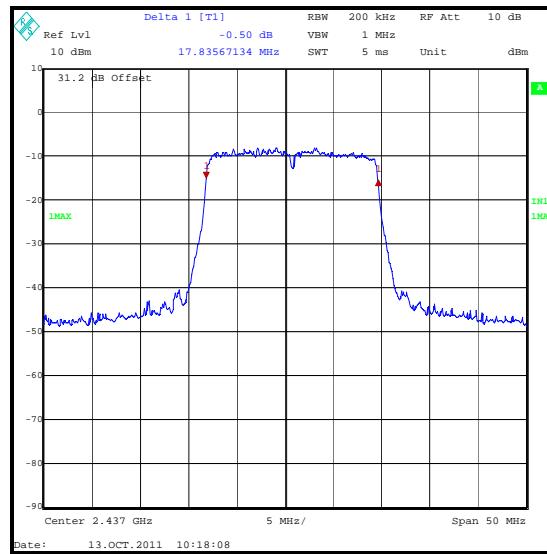
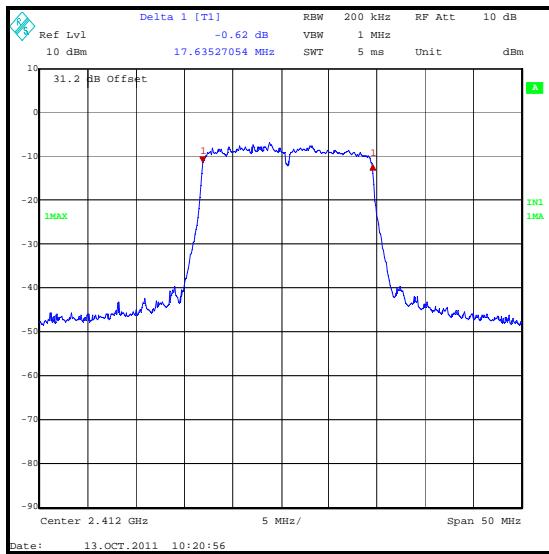
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 7.2 Mbps**

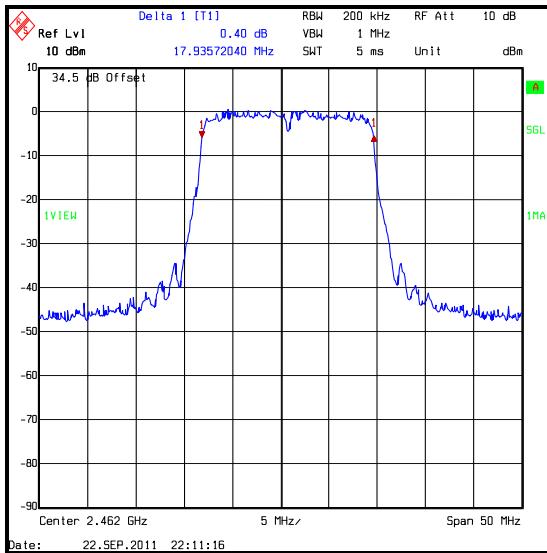
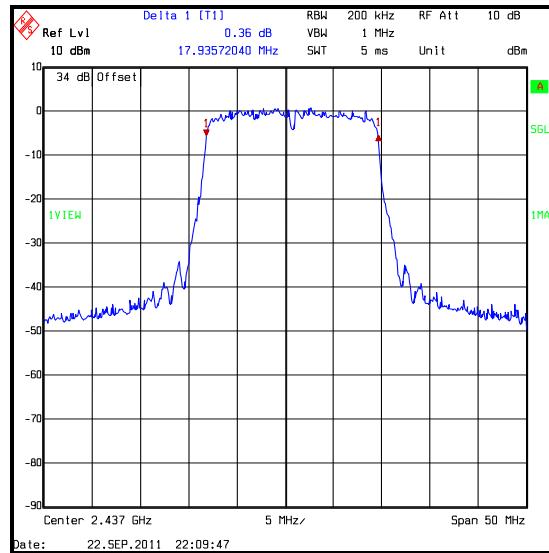
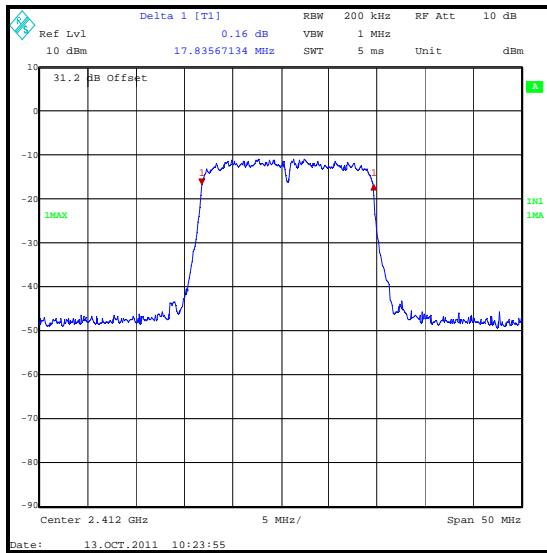
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 14.4 Mbps**

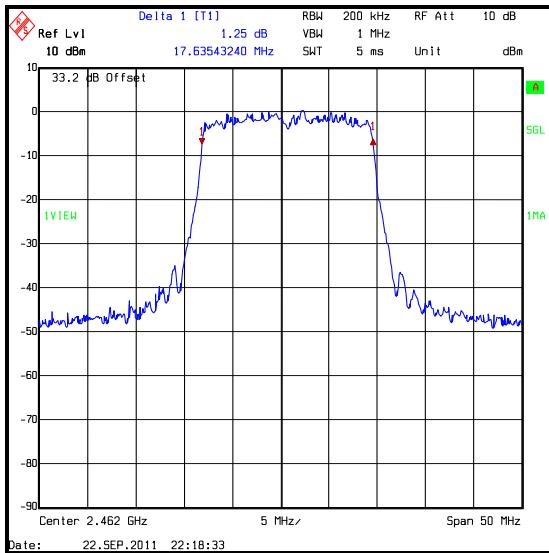
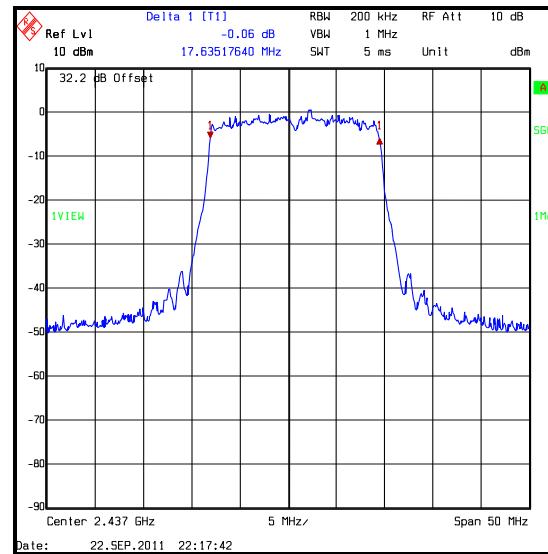
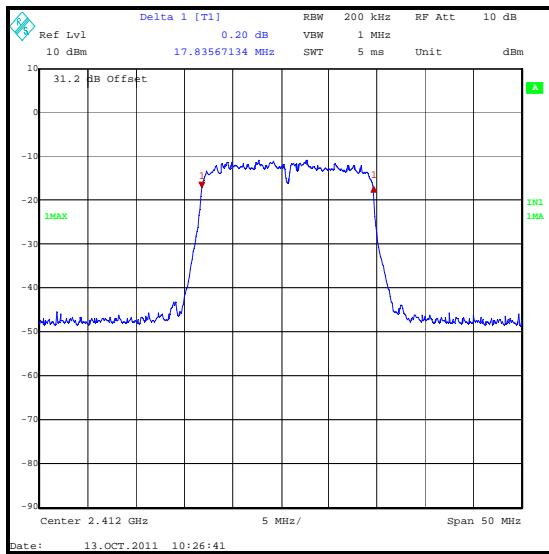
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 21.7 Mbps**

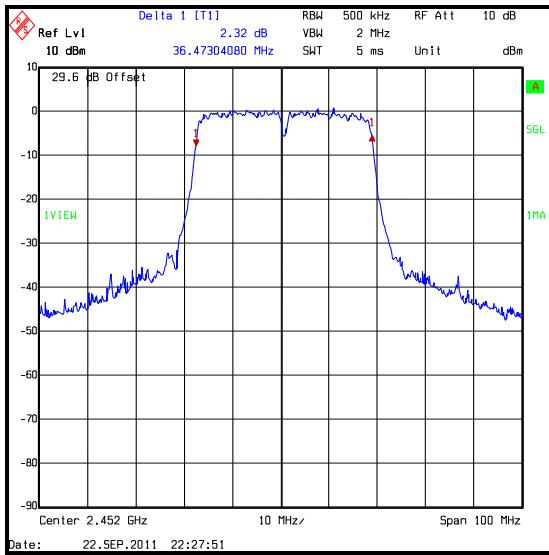
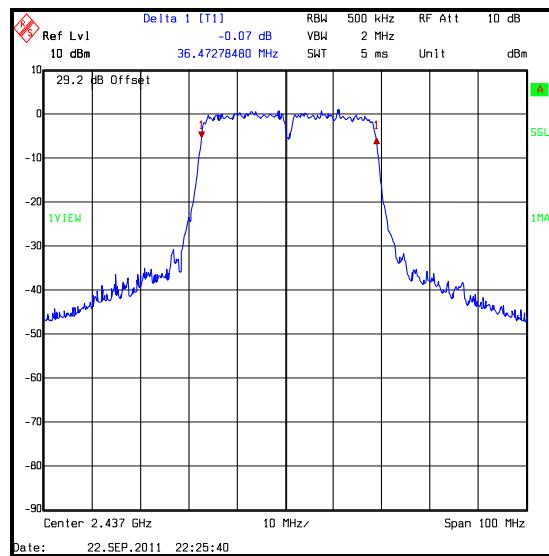
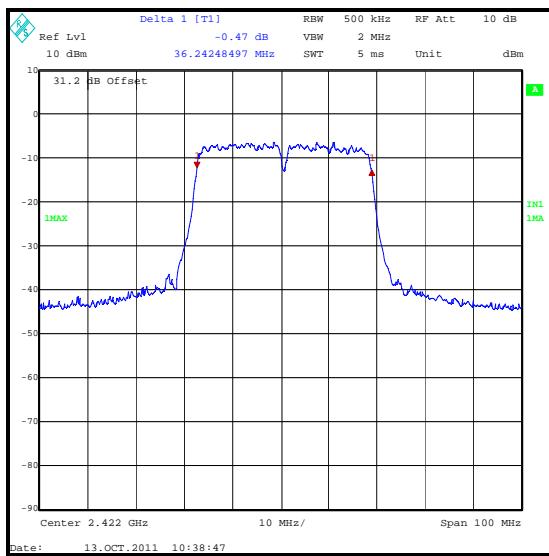
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 28.9 Mbps**

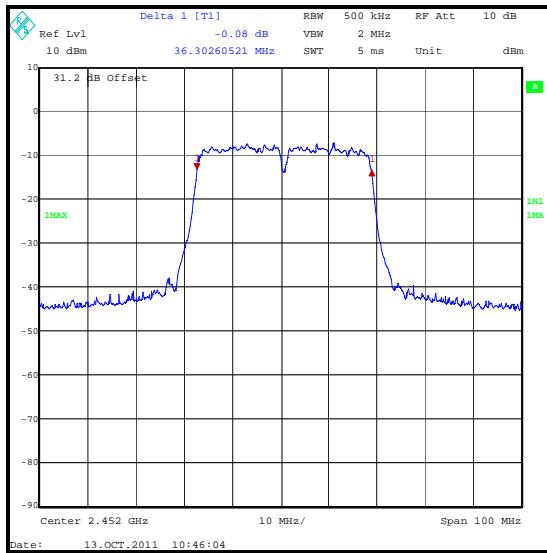
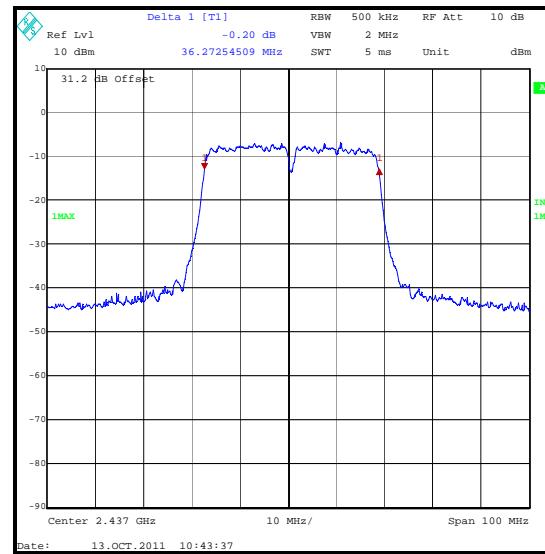
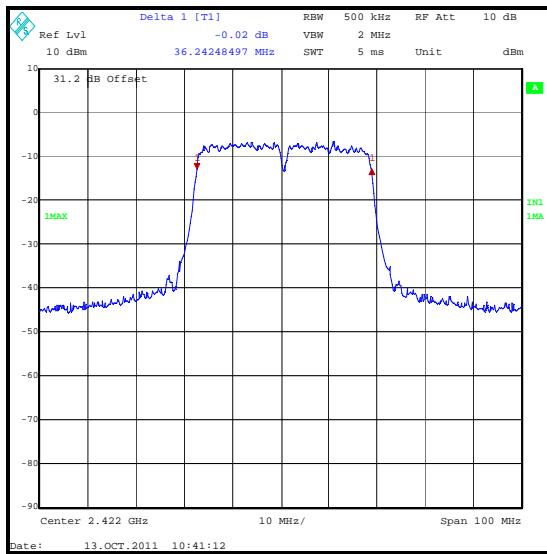
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 43.4 Mbps**

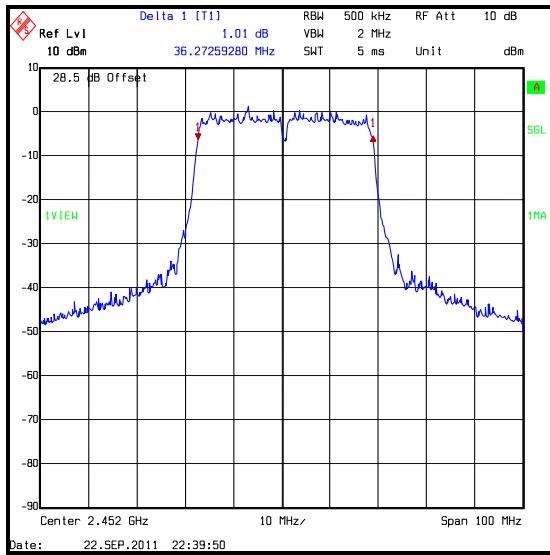
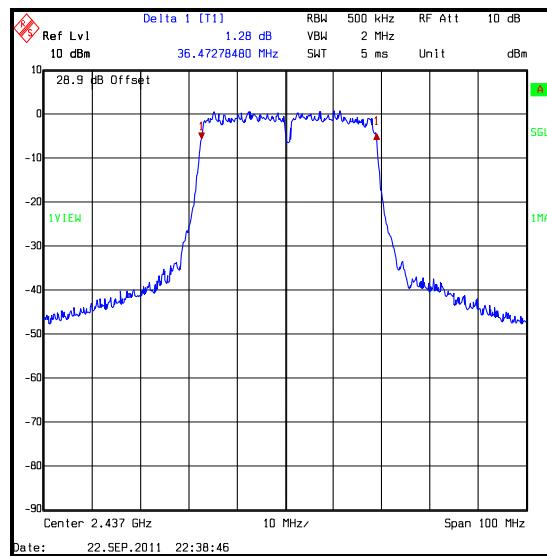
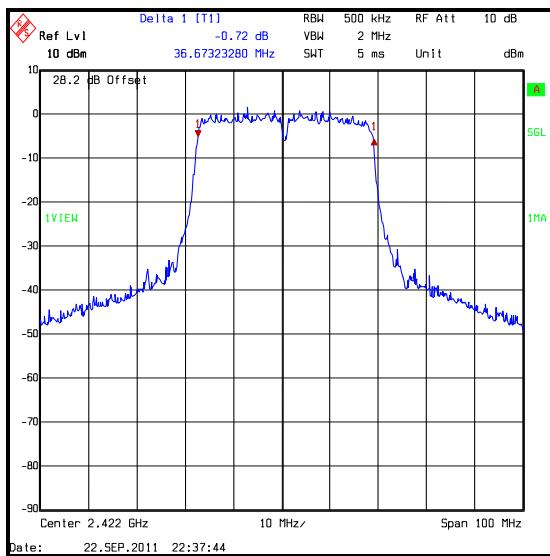
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 57.8 Mbps**

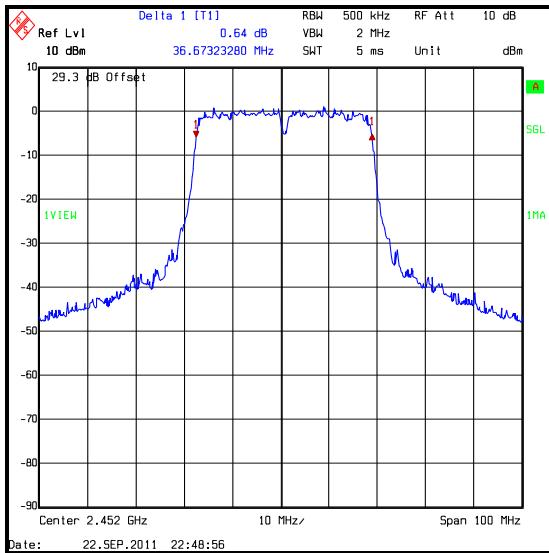
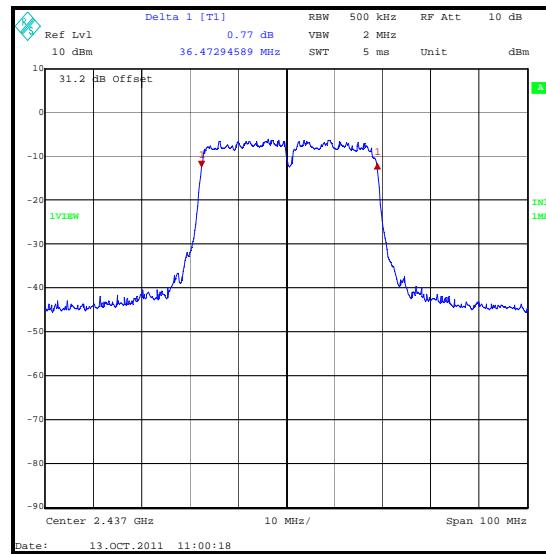
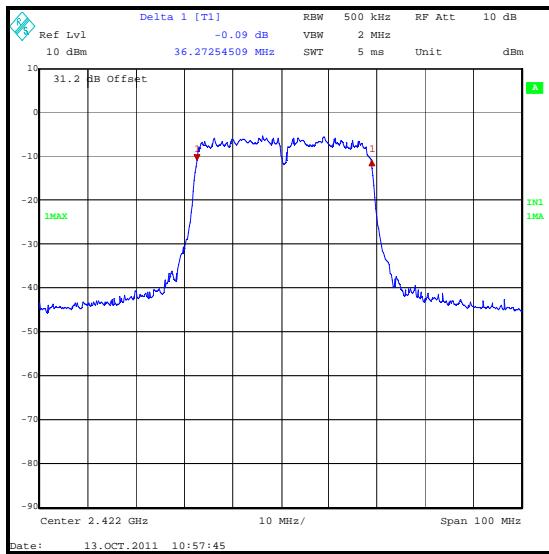
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 65 Mbps**

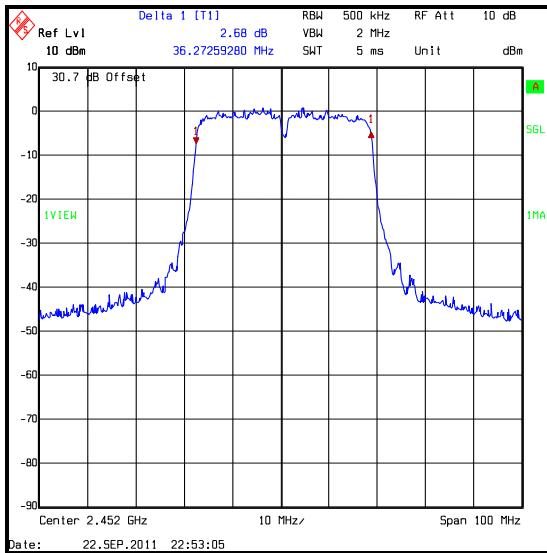
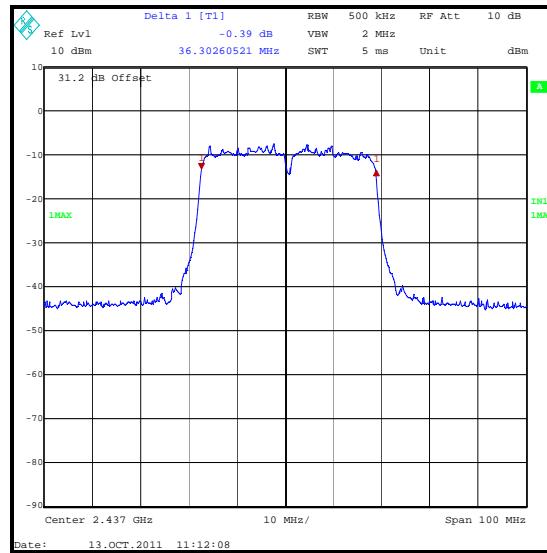
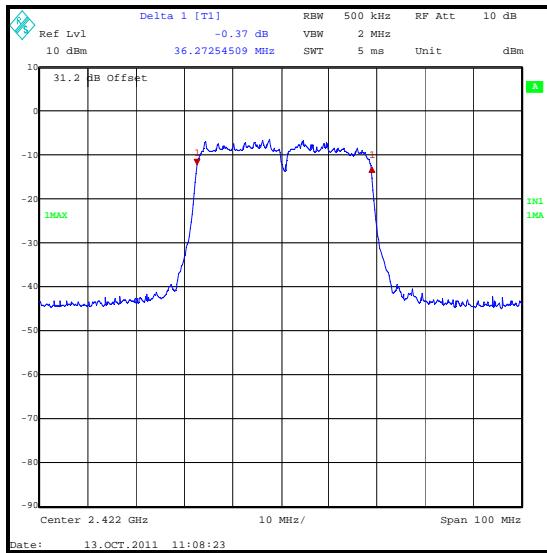
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 72.2 Mbps**

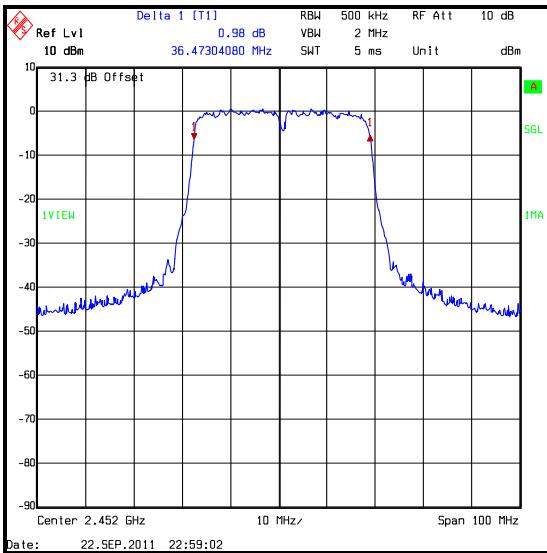
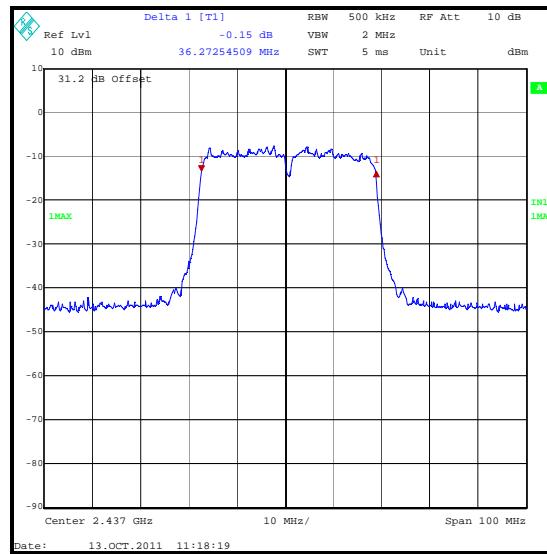
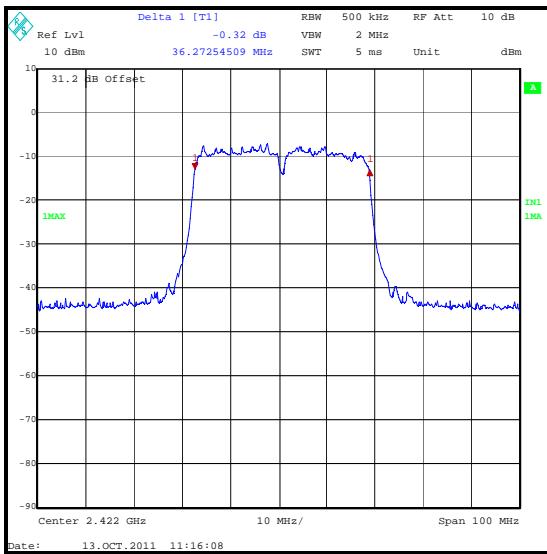
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 13.5 Mbps**

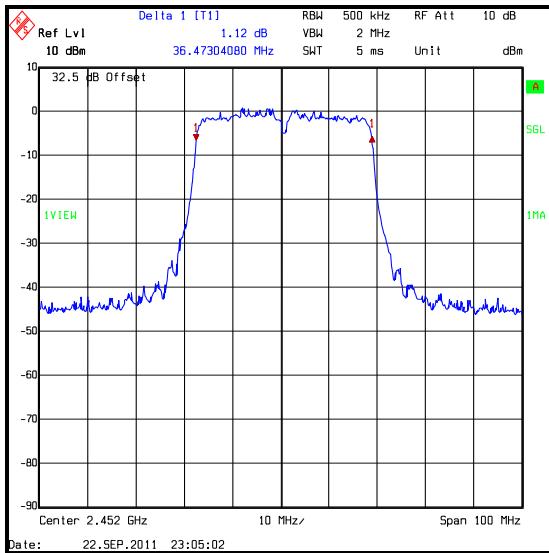
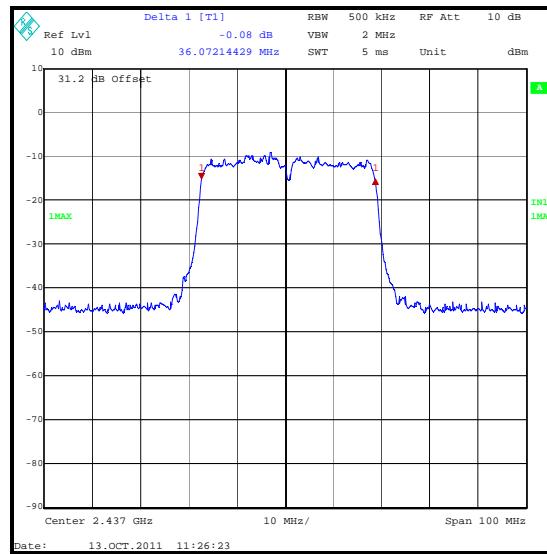
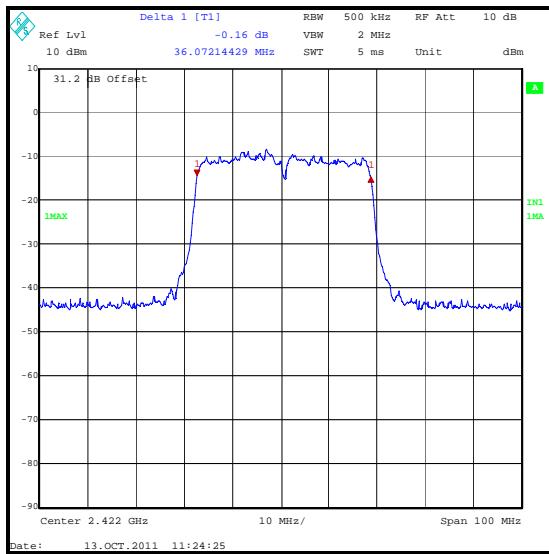
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 27 Mbps**

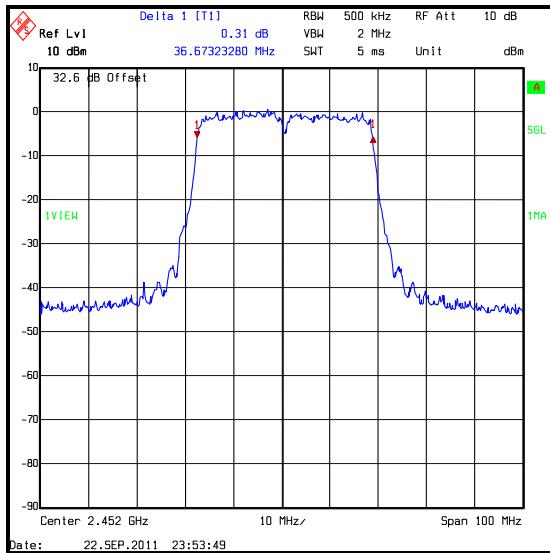
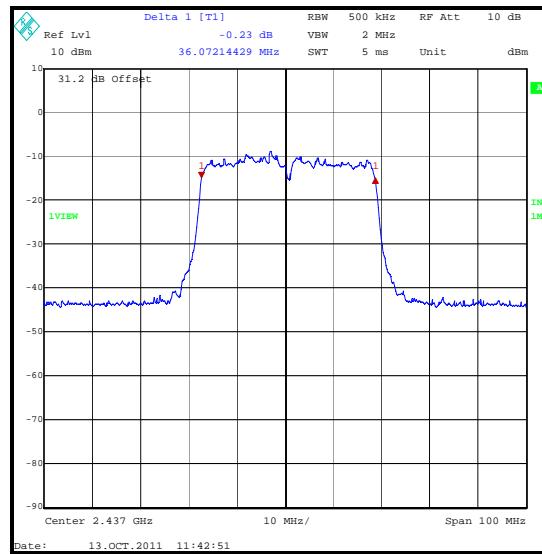
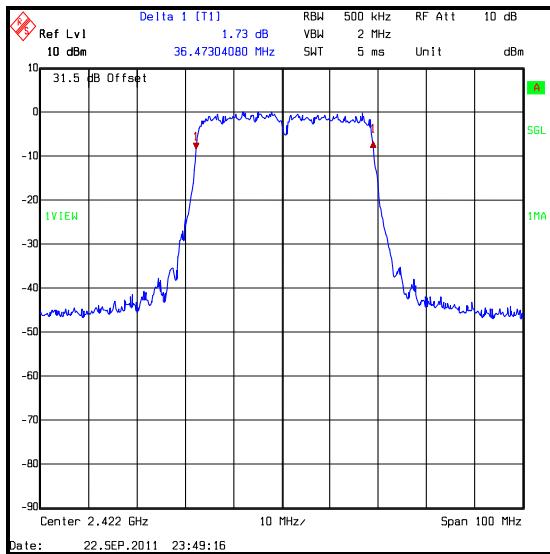
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 40.5 Mbps**

Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 54 Mbps**

Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 81 Mbps**

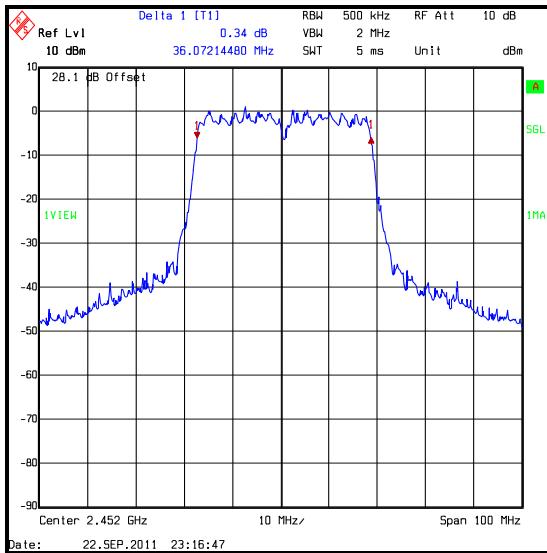
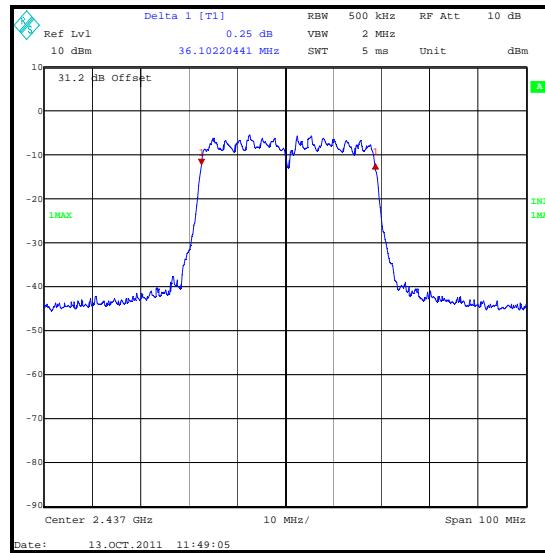
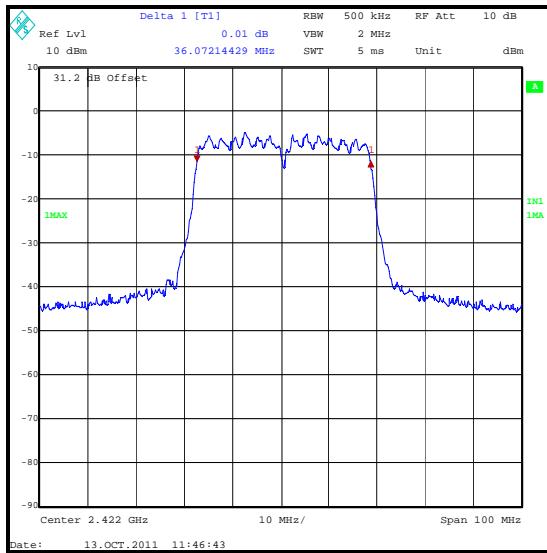
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 108 Mbps**

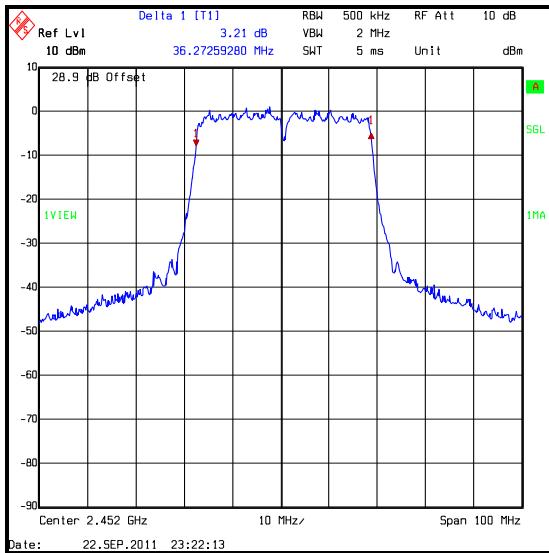
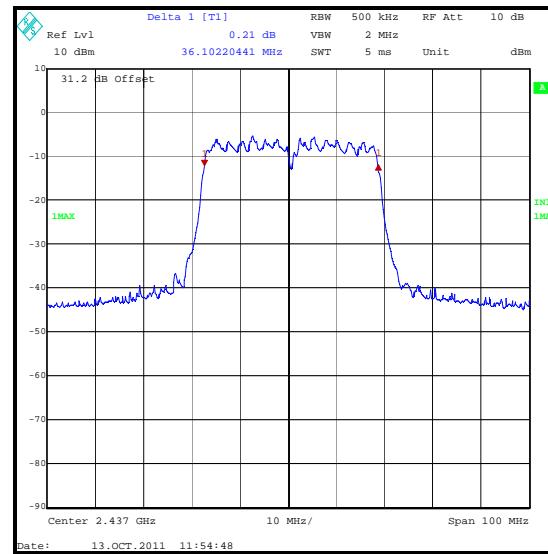
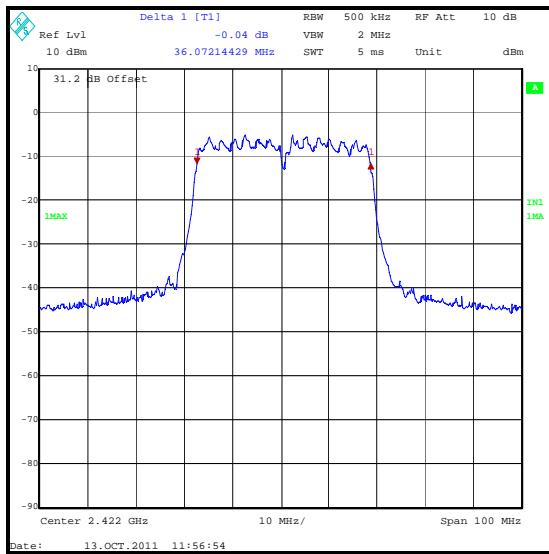
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 121 Mbps**

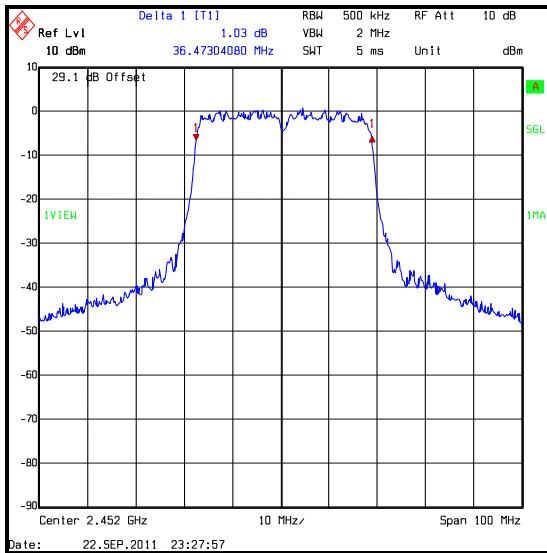
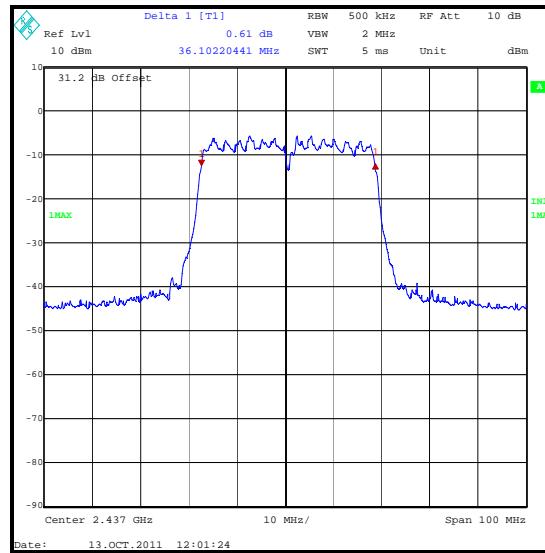
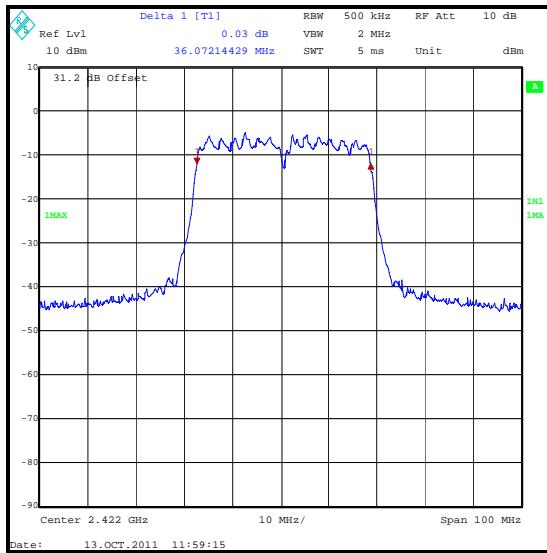
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 135 Mbps**

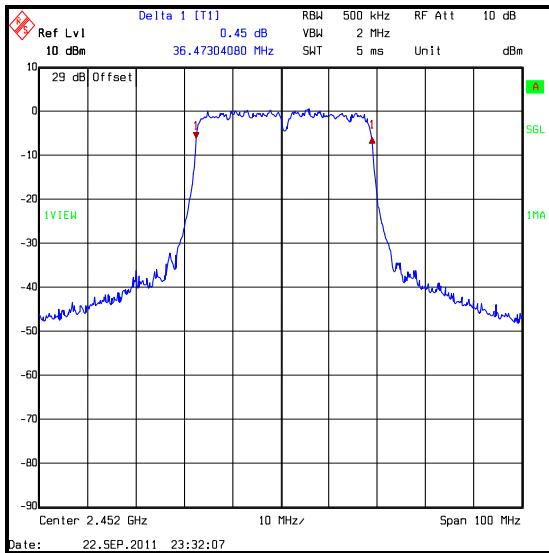
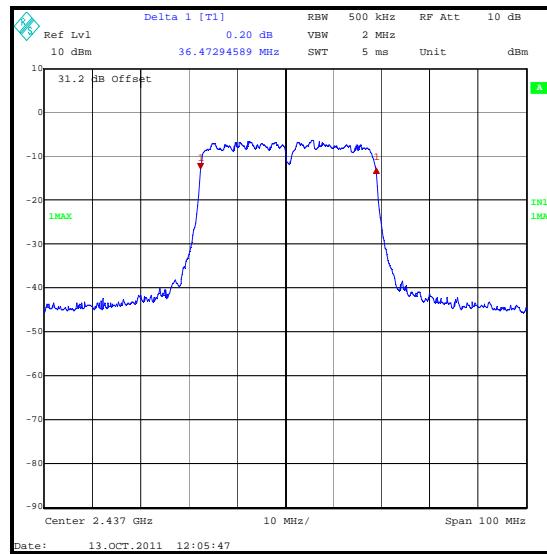
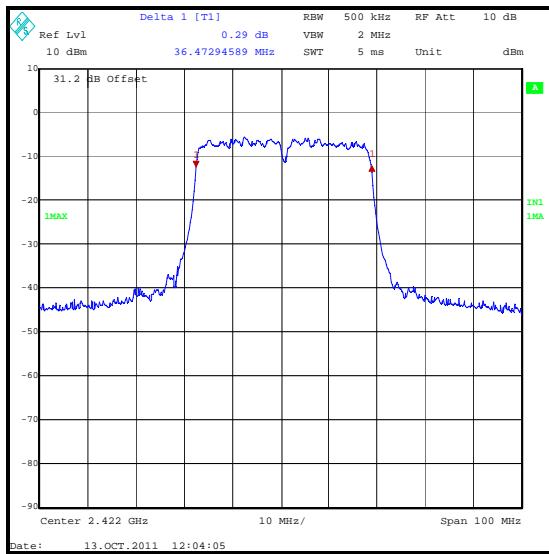
Transmitter 6 dB Bandwidth (continued)

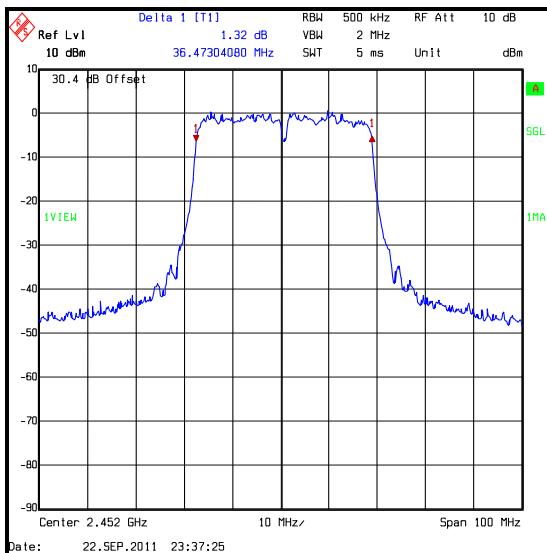
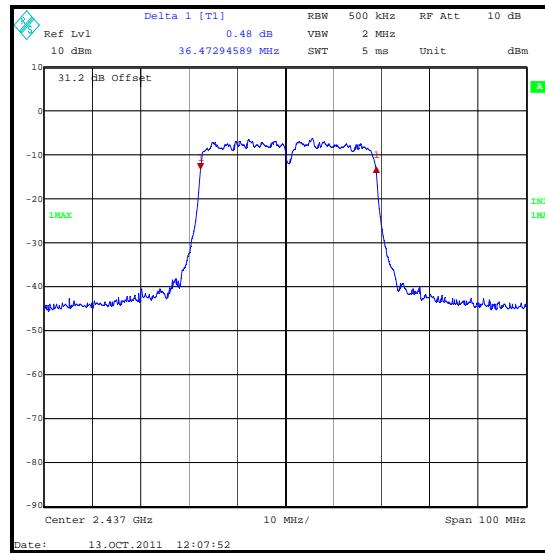
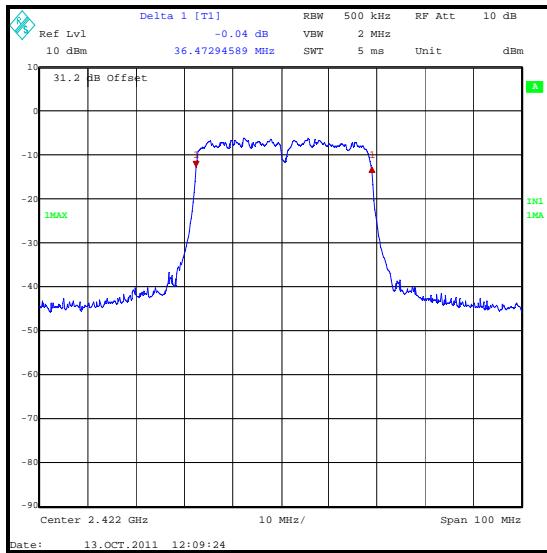
Results: 802.11n / 40 MHz / 15 Mbps

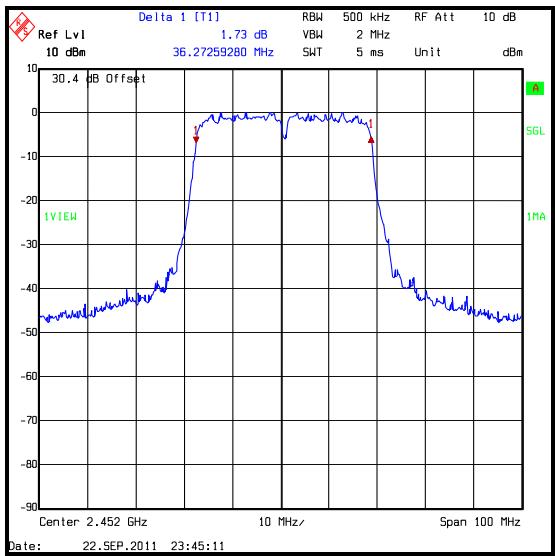
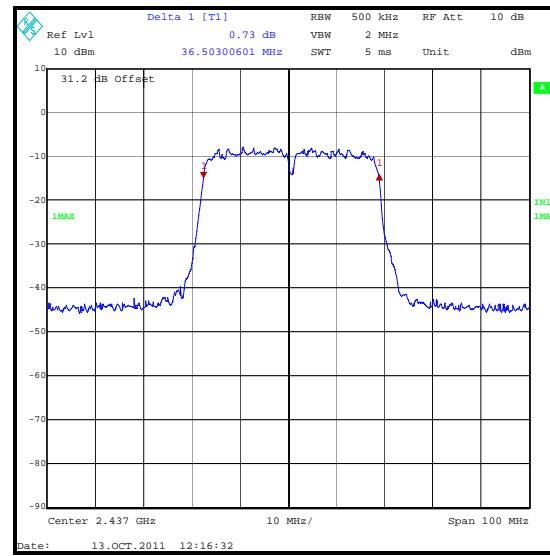
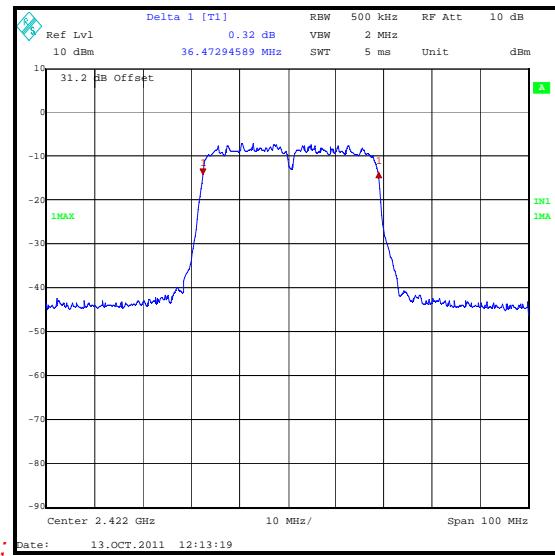


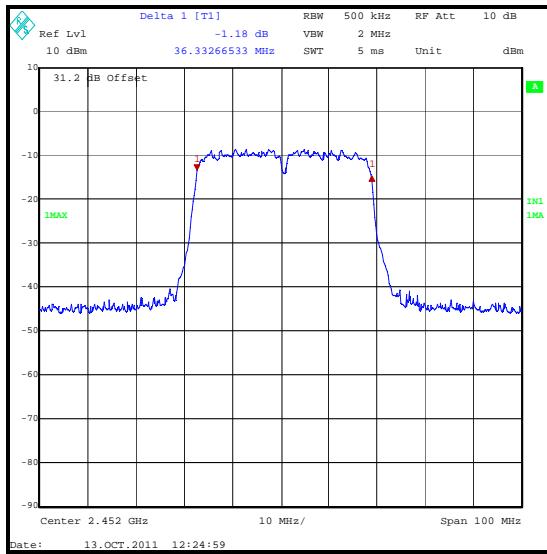
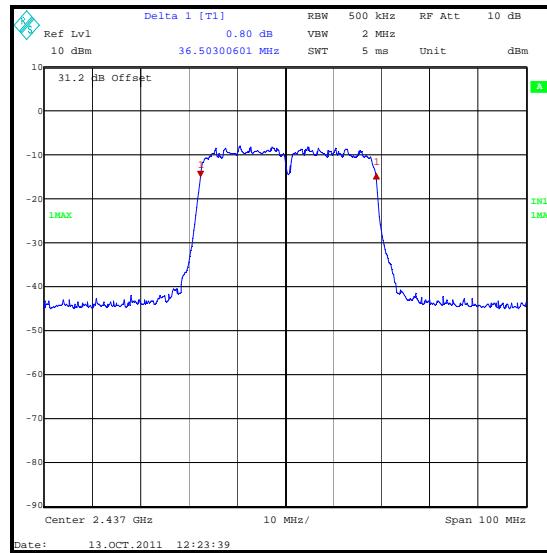
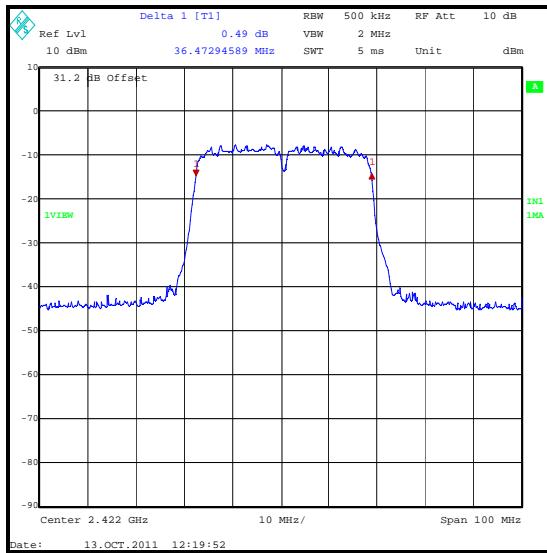
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 30 Mbps**

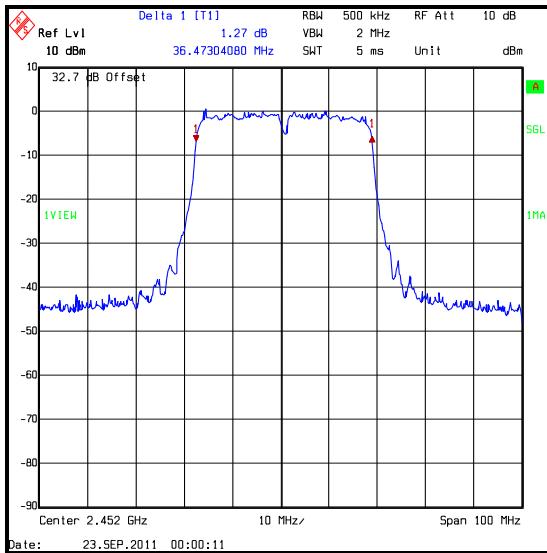
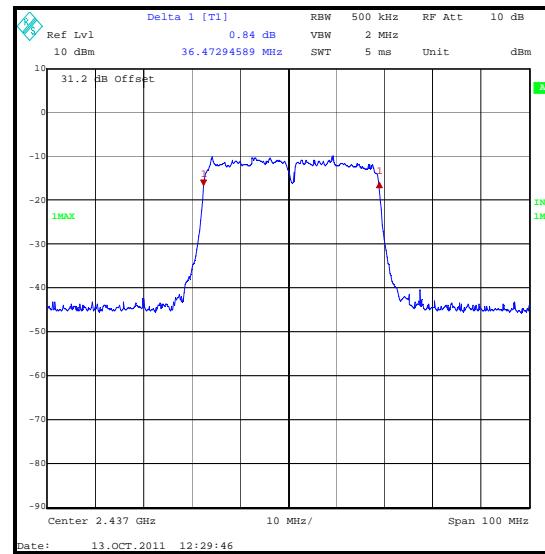
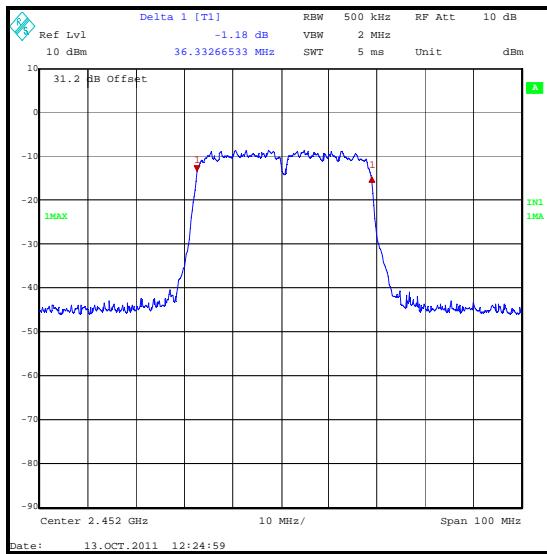
Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 45 Mbps**

Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 60 Mbps**

Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 90 Mbps**

Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 120 Mbps**

Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 135 Mbps**

Transmitter 6 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 150 Mbps**

5.2.5. Transmitter 20 dB Bandwidth**Test Summary:**

Test Engineer:	David Doyle	Test Dates:	07 December 2011 & 08 December 2011
Test Sample Serial No:	00064cf8		

FCC Reference:	Part 2.1049
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.1

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	28

Results: 802.11b / 1 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	17.435
Middle	17.485
Top	17.435

Results: 802.11b / 2 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	17.435
Middle	17.485
Top	17.435

Results: 802.11b / 5.5 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	17.034
Middle	17.335
Top	17.285

Results: 802.11b / 11 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	17.134
Middle	17.084
Top	17.134

Transmitter 20 dB Bandwidth (continued)**Results: 802.11g / 6 Mbps**

Channel	20 dB Bandwidth (MHz)
Bottom	18.838
Middle	18.988
Top	18.437

Results: 802.11g / 9 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.737
Middle	18.687
Top	18.537

Results: 802.11g / 12 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.537
Middle	18.387
Top	18.938

Results: 802.11g / 18 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.437
Middle	18.587
Top	18.537

Results: 802.11g / 24 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.838
Middle	18.788
Top	18.437

Results: 802.11g / 36 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.537
Middle	18.387
Top	18.737

Transmitter 20 dB Bandwidth (continued)**Results: 802.11g / 48 Mbps**

Channel	20 dB Bandwidth (MHz)
Bottom	18.838
Middle	18.587
Top	18.437

Results: 802.11g / 54 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.838
Middle	18.788
Top	18.437

Results: 802.11n / 20 MHz / 6.5 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.737
Middle	18.487
Top	18.838

Results: 802.11n / 20 MHz / 13 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.838
Middle	18.387
Top	18.737

Results: 802.11n / 20 MHz / 19.5 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.737
Middle	18.687
Top	18.537

Results: 802.11n / 20 MHz / 26 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.838
Middle	18.487
Top	18.437

Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 39 Mbps**

Channel	20 dB Bandwidth (MHz)
Bottom	18.537
Middle	18.487
Top	18.838

Results: 802.11n / 20 MHz / 52 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.437
Middle	18.587
Top	18.637

Results: 802.11n / 20 MHz / 58.5 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.537
Middle	18.587
Top	18.537

Results: 802.11n / 20 MHz / 65 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.537
Middle	18.888
Top	18.737

Results: 802.11n / 20 MHz / 7.2 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.838
Middle	18.637
Top	18.788

Results: 802.11n / 20 MHz / 14.4 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.838
Middle	18.888
Top	18.938

Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 21.7 Mbps**

Channel	20 dB Bandwidth (MHz)
Bottom	18.938
Middle	18.888
Top	18.437

Results: 802.11n / 20 MHz / 28.9 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.437
Middle	18.587
Top	18.938

Results: 802.11n / 20 MHz / 43.4 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.838
Middle	18.788
Top	18.737

Results: 802.11n / 20 MHz / 57.8 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.537
Middle	18.487
Top	18.537

Results: 802.11n / 20 MHz / 65 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.537
Middle	18.788
Top	18.737

Results: 802.11n / 20 MHz / 72.2 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	18.437
Middle	18.788
Top	18.938

Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 13.5 Mbps**

Channel	20 dB Bandwidth (MHz)
Bottom	39.699
Middle	39.729
Top	39.760

Results: 802.11n / 40 MHz / 27 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	38.878
Middle	38.908
Top	39.138

Results: 802.11n / 40 MHz / 40.5 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	39.078
Middle	39.108
Top	38.938

Results: 802.11n / 40 MHz / 54 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	39.279
Middle	39.309
Top	39.339

Results: 802.11n / 40 MHz / 81 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	38.878
Middle	38.908
Top	39.138

Results: 802.11n / 40 MHz / 108 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	39.279
Middle	39.309
Top	39.339

Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 121 Mbps**

Channel	20 dB Bandwidth (MHz)
Bottom	38.878
Middle	38.908
Top	38.737

Results: 802.11n / 40 MHz / 135 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	38.878
Middle	39.108
Top	39.138

Results: 802.11n / 40 MHz / 15 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	39.279
Middle	39.108
Top	39.339

Results: 802.11n / 40 MHz / 30 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	39.299
Middle	39.329
Top	39.138

Results: 802.11n / 40 MHz / 45 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	38.878
Middle	39.108
Top	39.339

Results: 802.11n / 40 MHz / 60 Mbps

Channel	20 dB Bandwidth (MHz)
Bottom	38.878
Middle	39.108
Top	38.938

Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 90 Mbps**

Channel	20 dB Bandwidth (MHz)
Bottom	38.878
Middle	38.707
Top	38.938

Results: 802.11n / 40 MHz / 120 Mbps

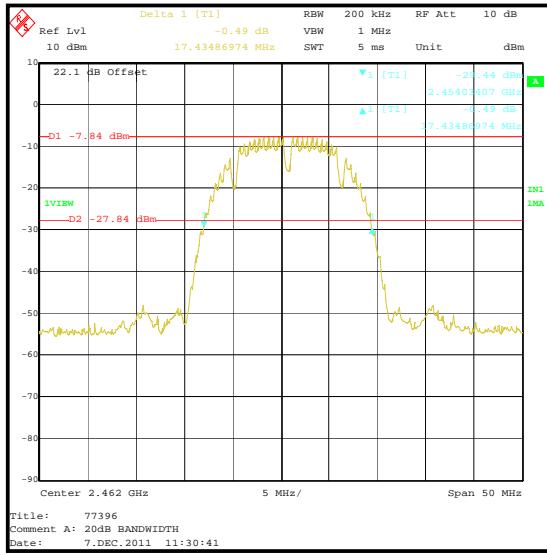
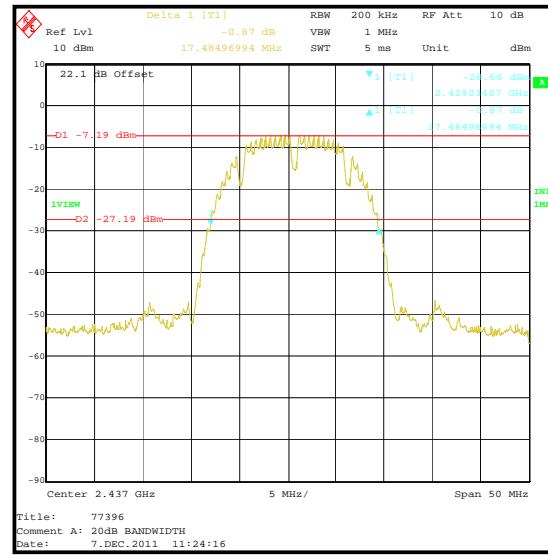
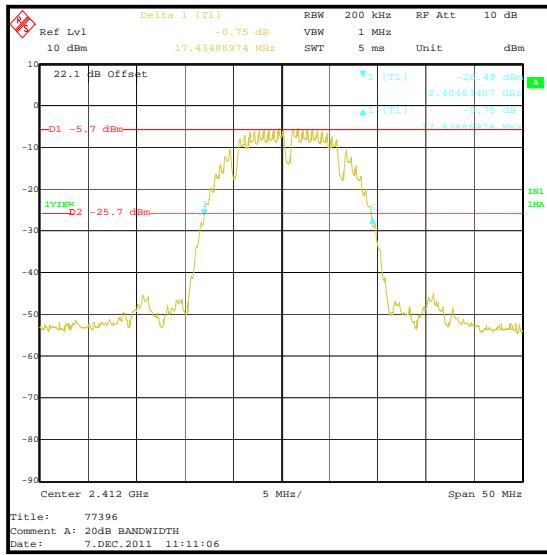
Channel	20 dB Bandwidth (MHz)
Bottom	39.279
Middle	39.509
Top	39.539

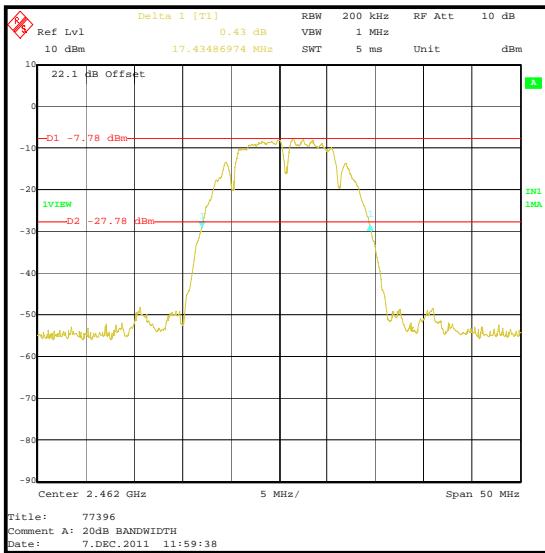
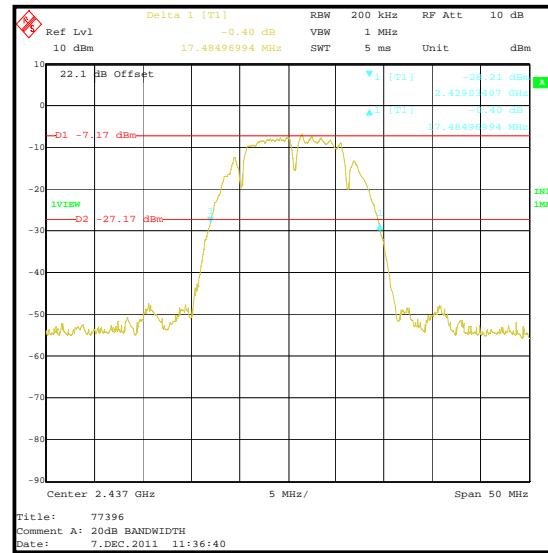
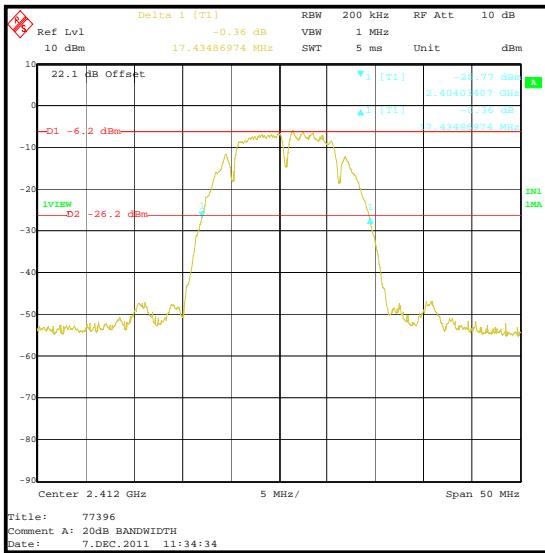
Results: 802.11n / 40 MHz / 135 Mbps

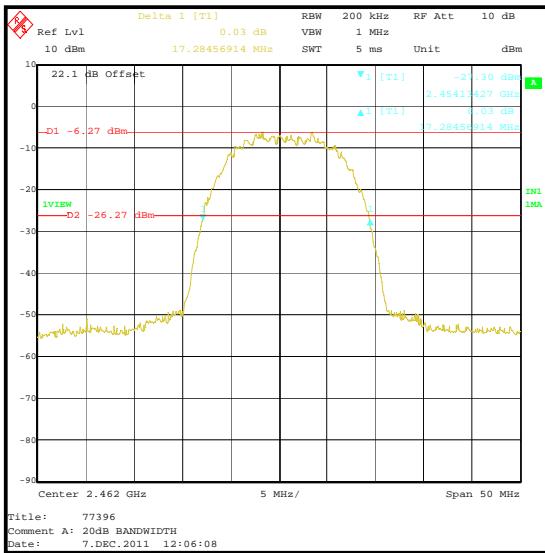
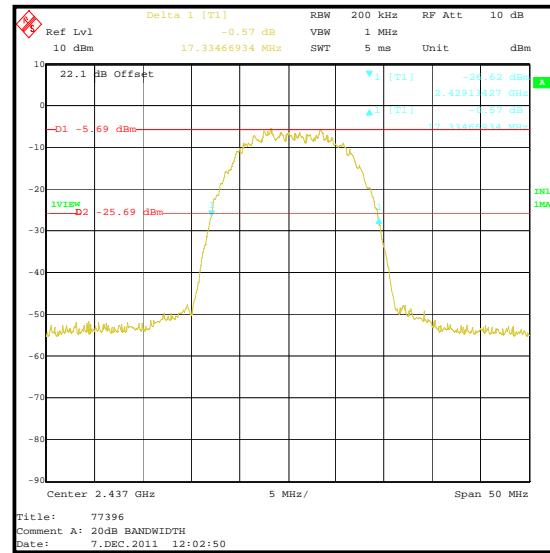
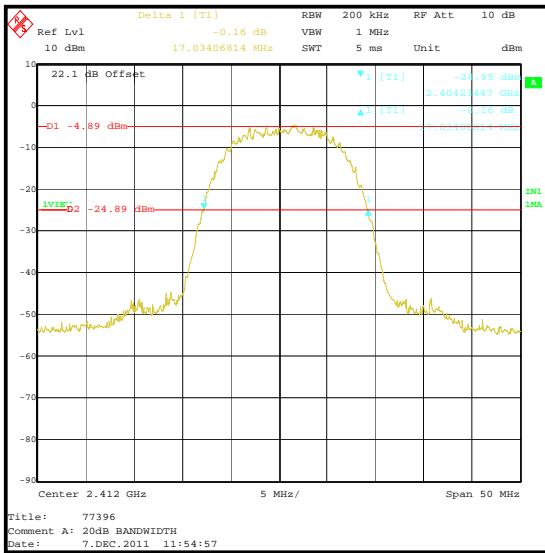
Channel	20 dB Bandwidth (MHz)
Bottom	39.479
Middle	39.509
Top	39.539

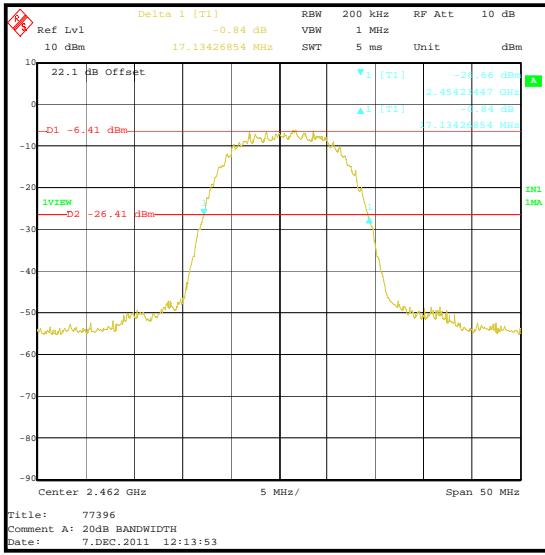
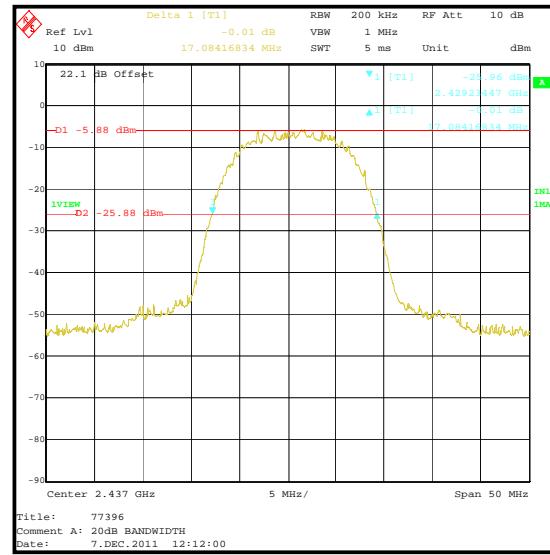
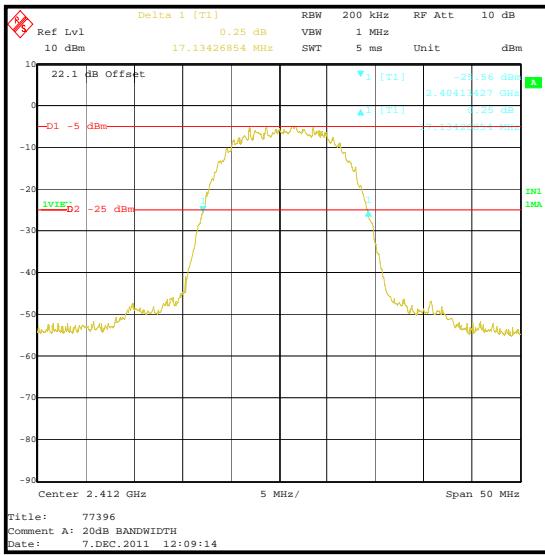
Results: 802.11n / 40 MHz / 150 Mbps

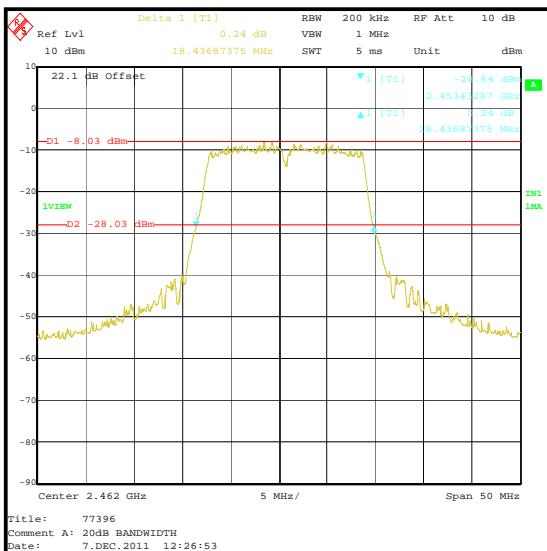
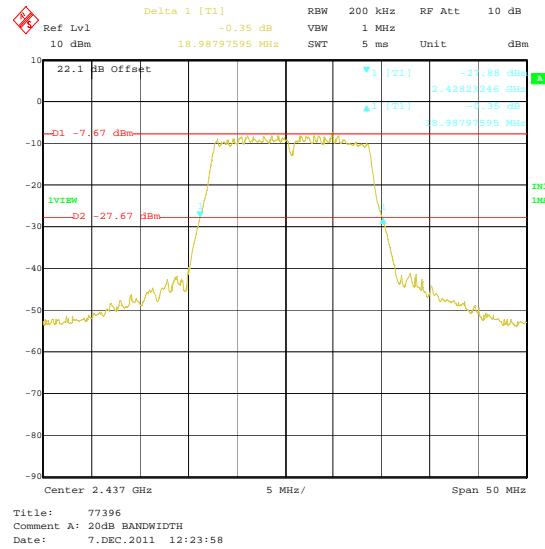
Channel	20 dB Bandwidth (MHz)
Bottom	39.078
Middle	38.908
Top	39.138

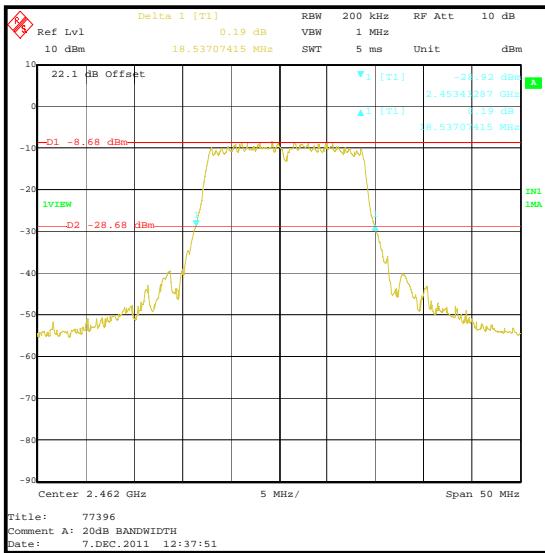
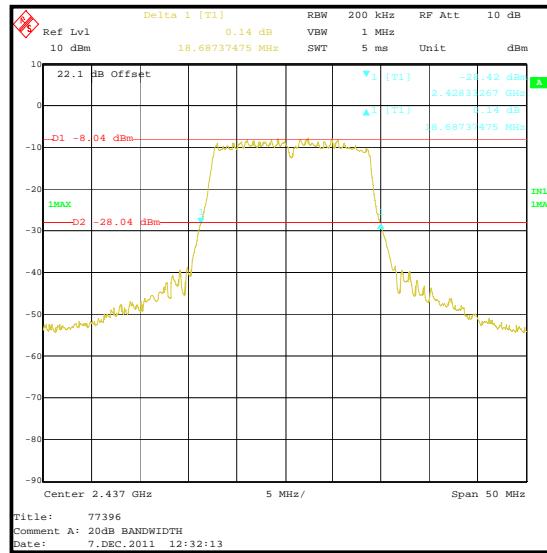
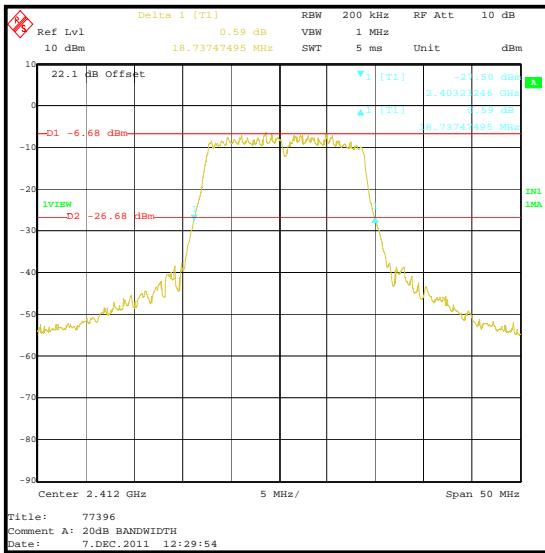
Transmitter 20 dB Bandwidth (continued)**Results: 802.11b / 1 Mbps**

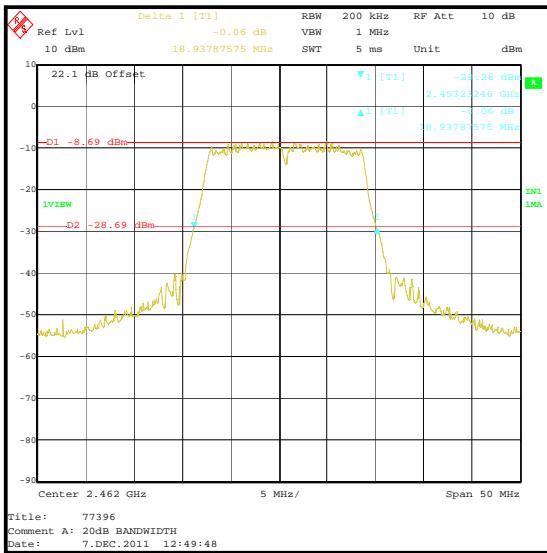
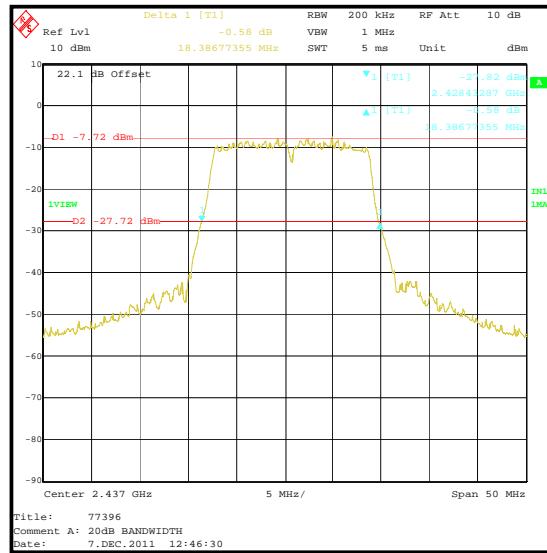
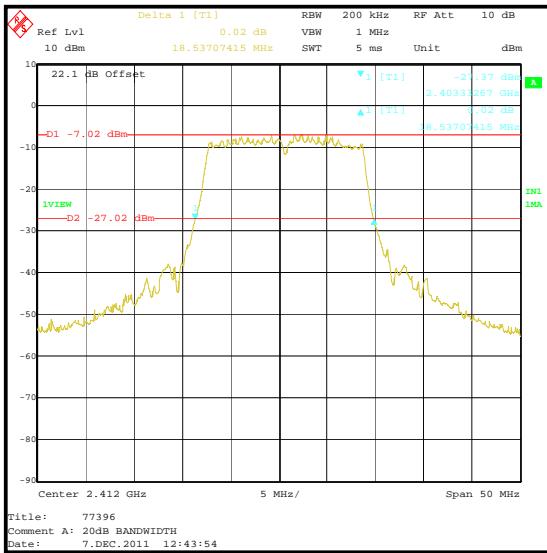
Transmitter 20 dB Bandwidth (continued)**Results: 802.11b / 2 Mbps**

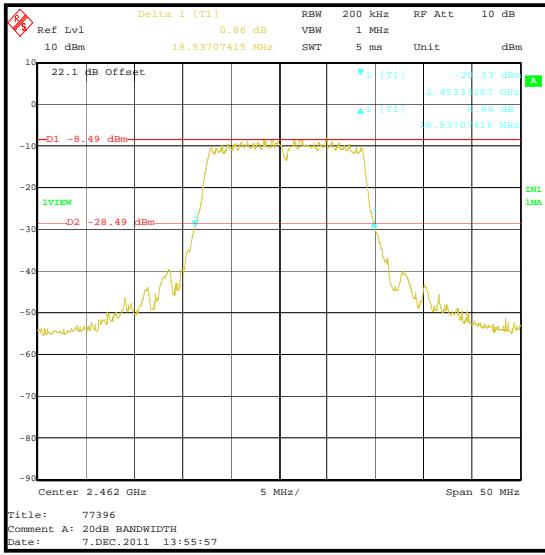
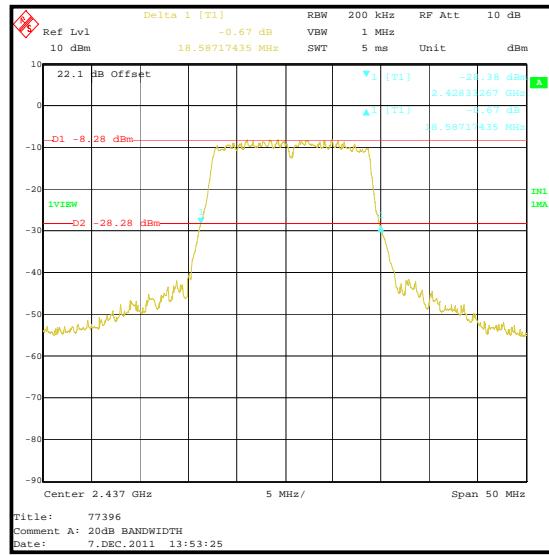
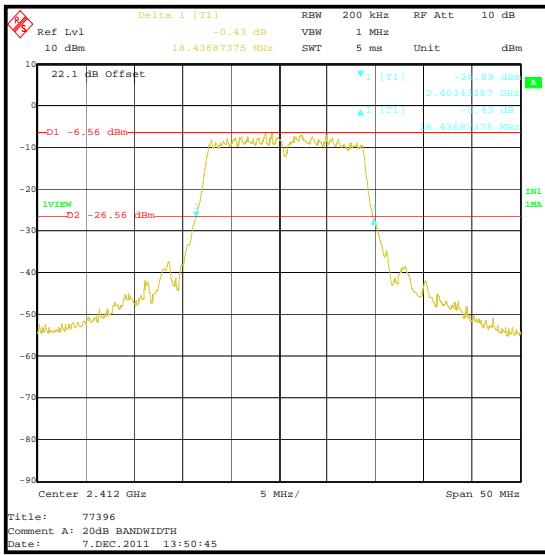
Transmitter 20 dB Bandwidth (continued)**Results: 802.11b / 5.5 Mbps**

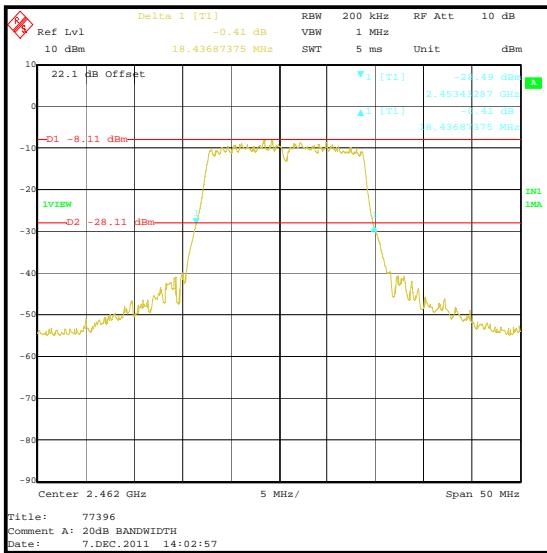
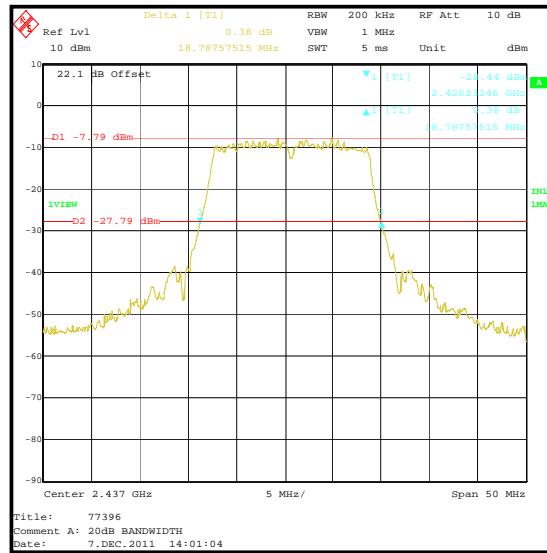
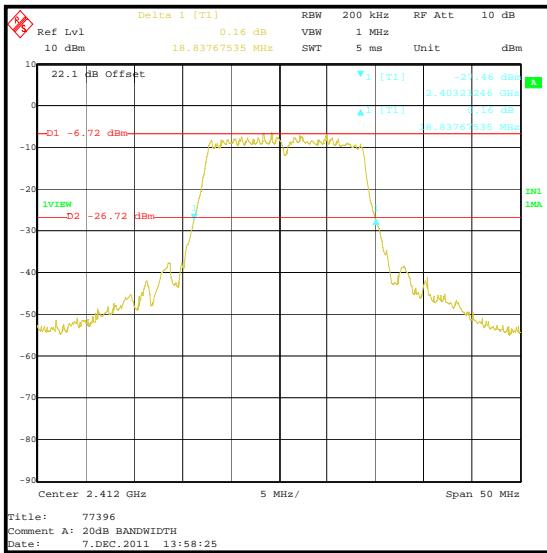
Transmitter 20 dB Bandwidth (continued)**Results: 802.11b / 11 Mbps**

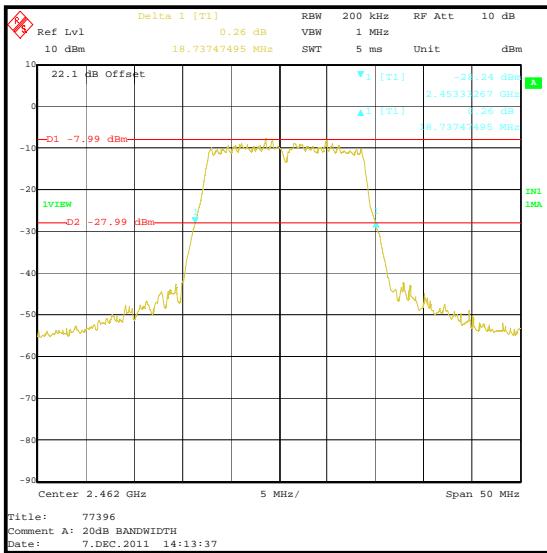
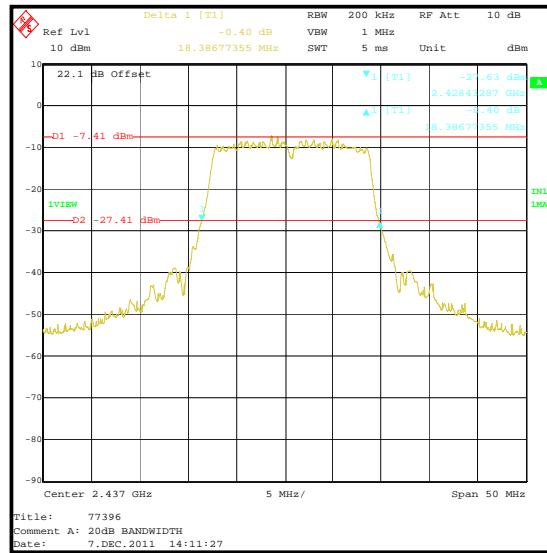
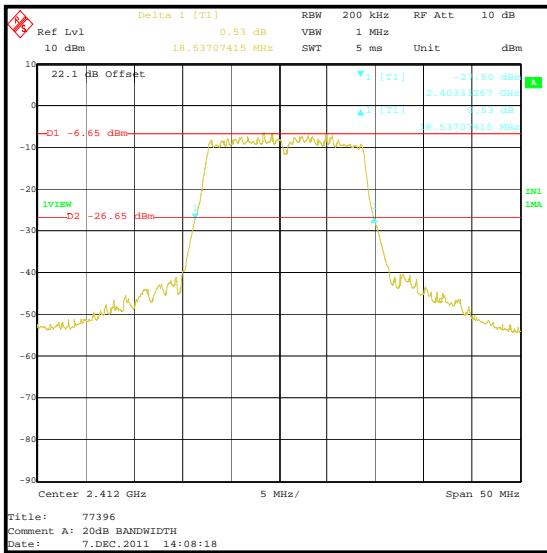
Transmitter 20 dB Bandwidth (continued)**Results: 802.11g / 6 Mbps**

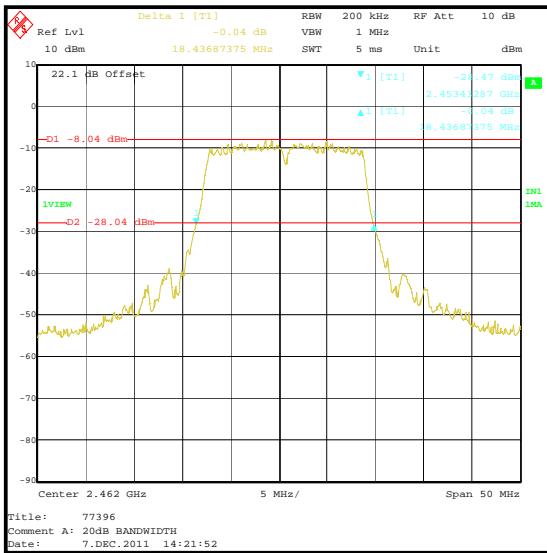
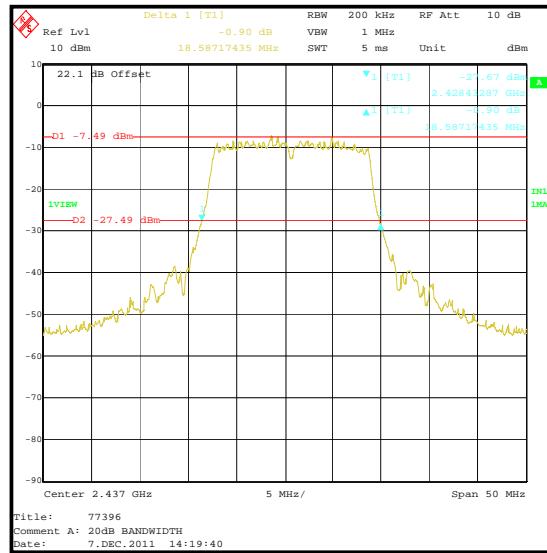
Transmitter 20 dB Bandwidth (continued)**Results: 802.11g / 9 Mbps**

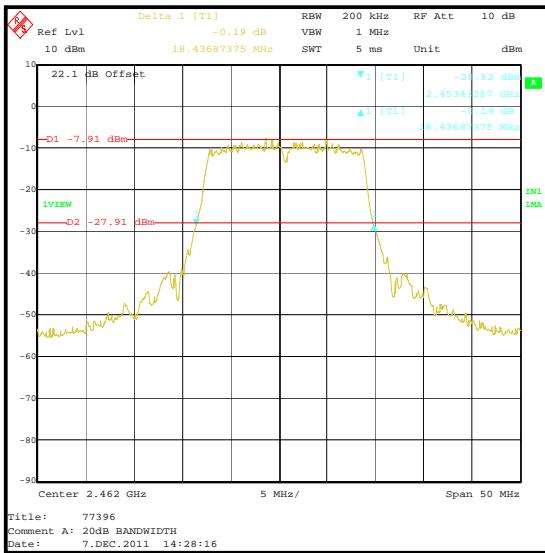
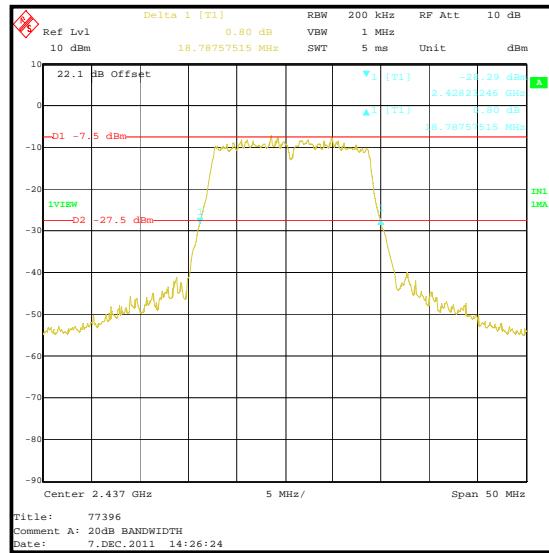
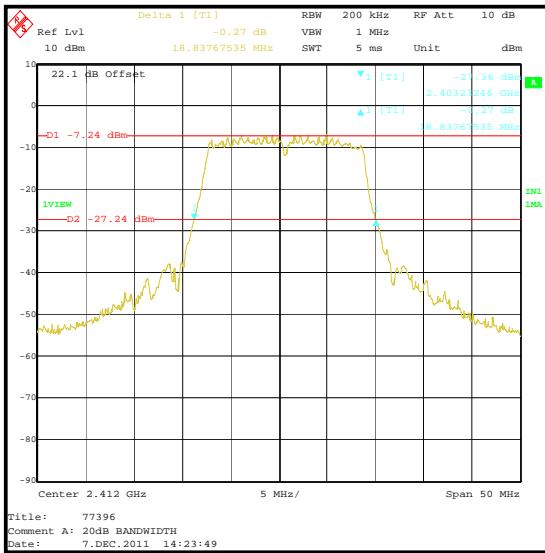
Transmitter 20 dB Bandwidth (continued)**Results: 802.11g / 12 Mbps**

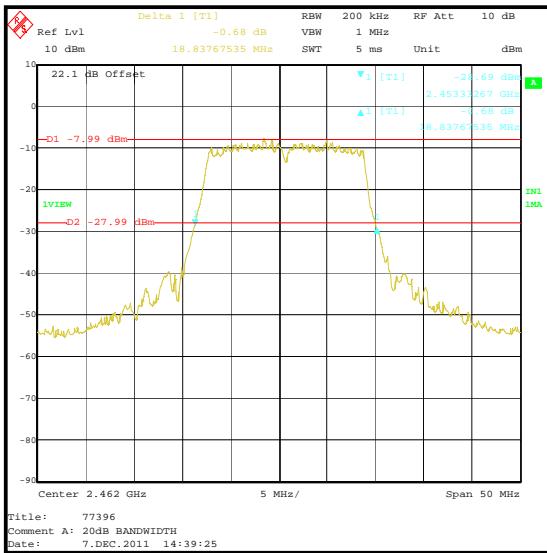
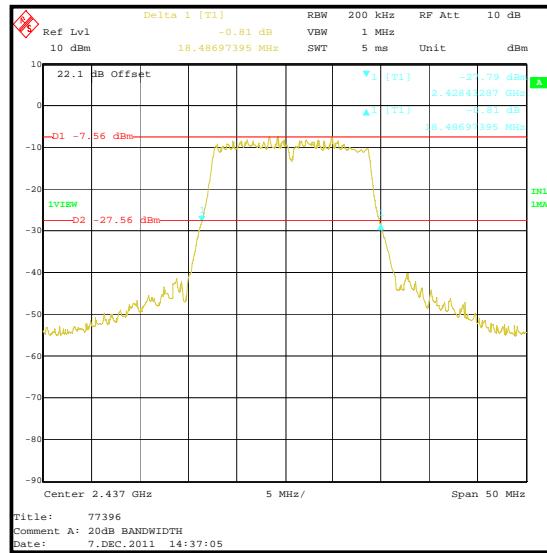
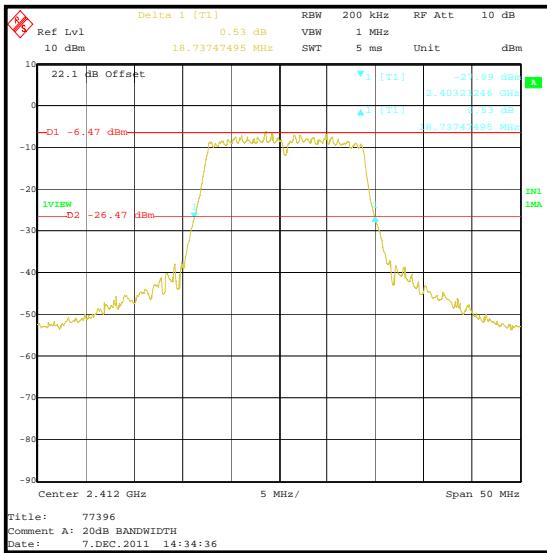
Transmitter 20 dB Bandwidth (continued)**Results: 802.11g / 18 Mbps**

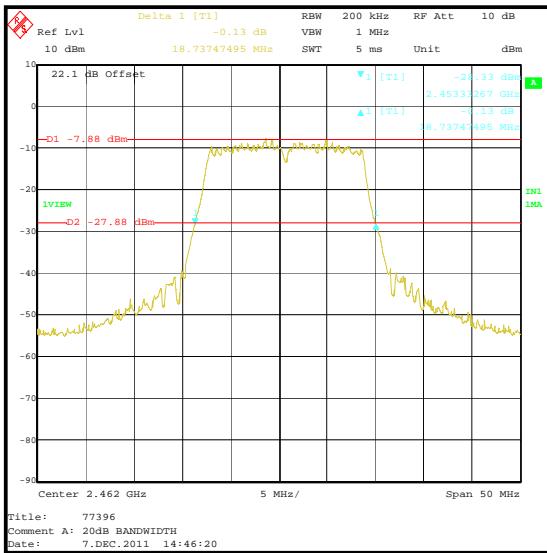
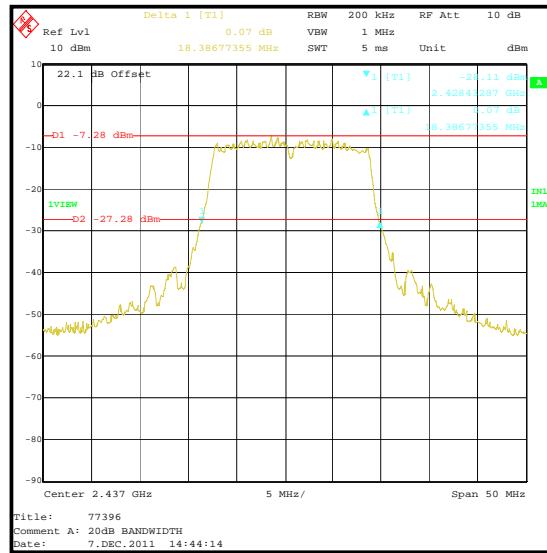
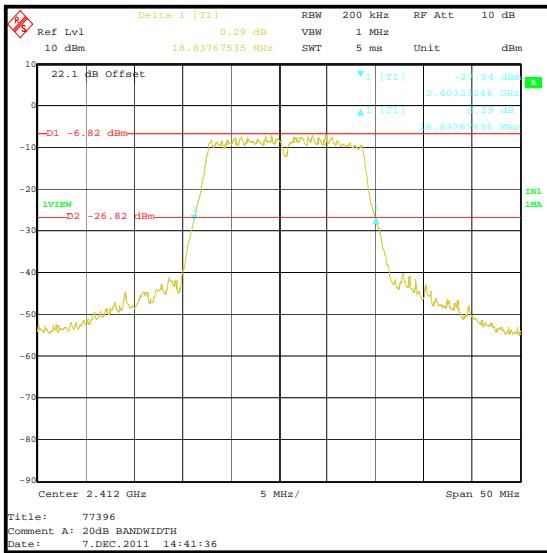
Transmitter 20 dB Bandwidth (continued)**Results: 802.11g / 24 Mbps**

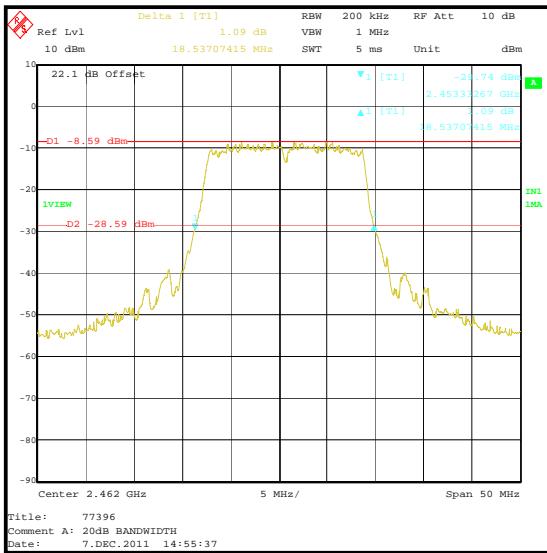
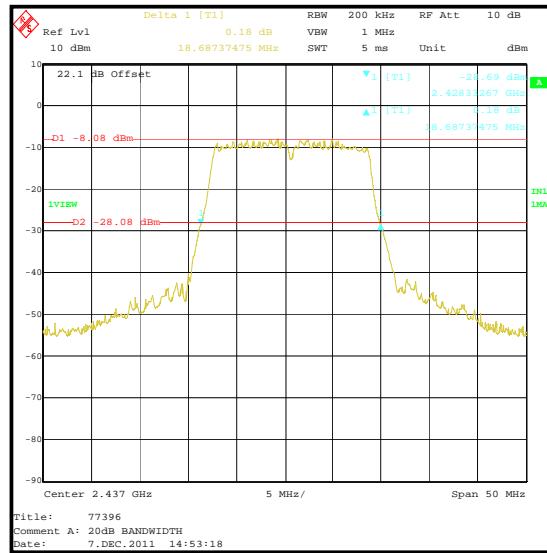
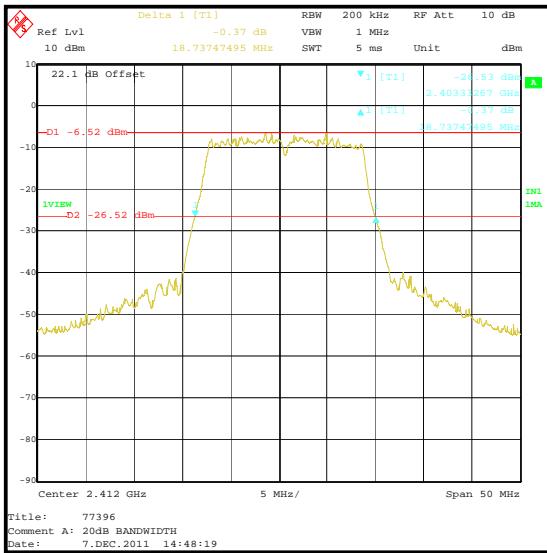
Transmitter 20 dB Bandwidth (continued)**Results: 802.11g / 36 Mbps**

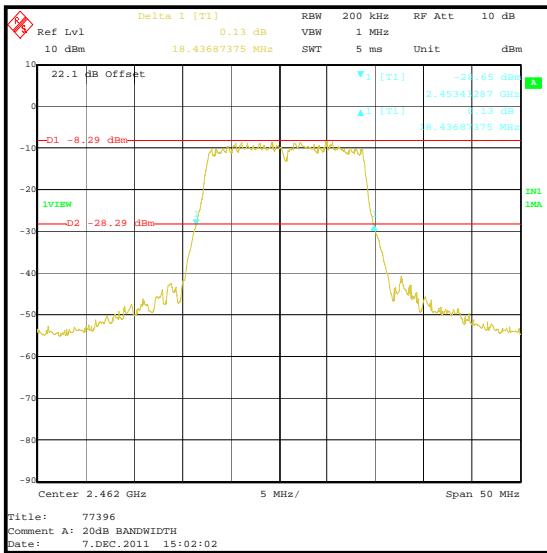
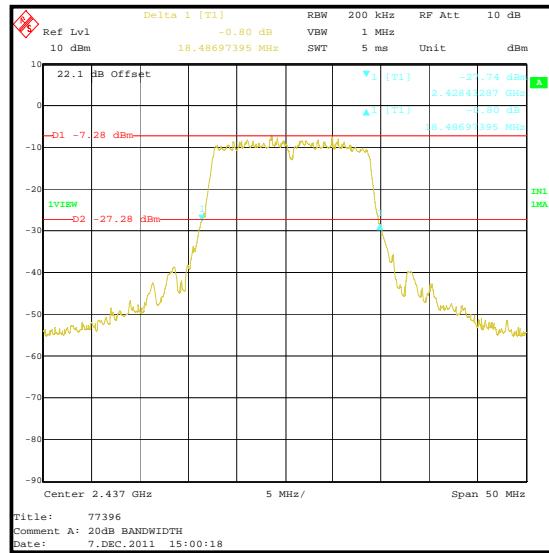
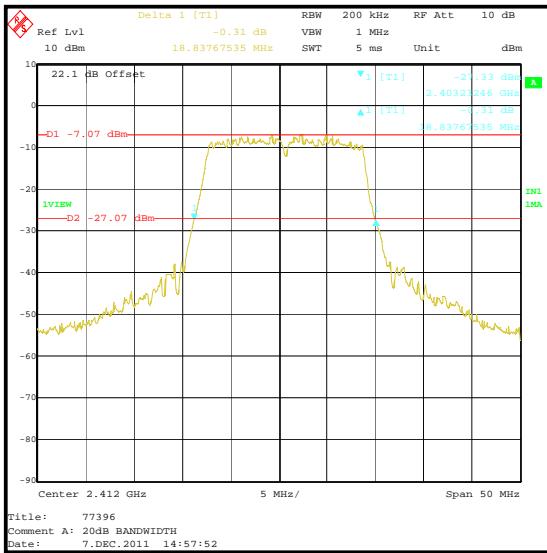
Transmitter 20 dB Bandwidth (continued)**Results: 802.11g / 48 Mbps**

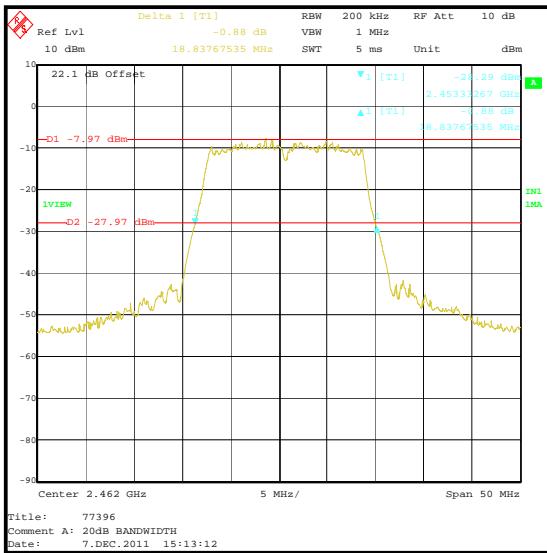
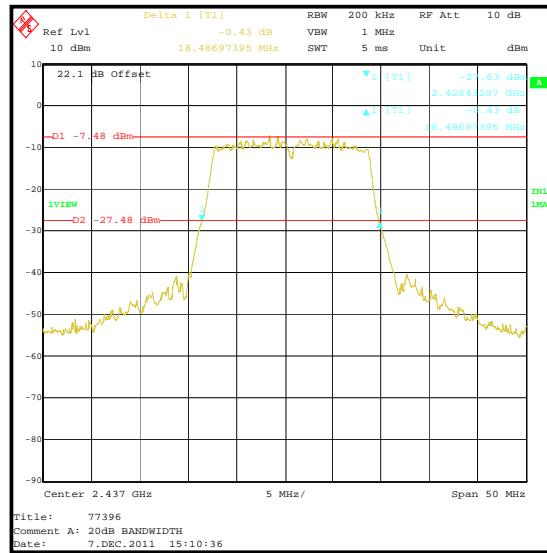
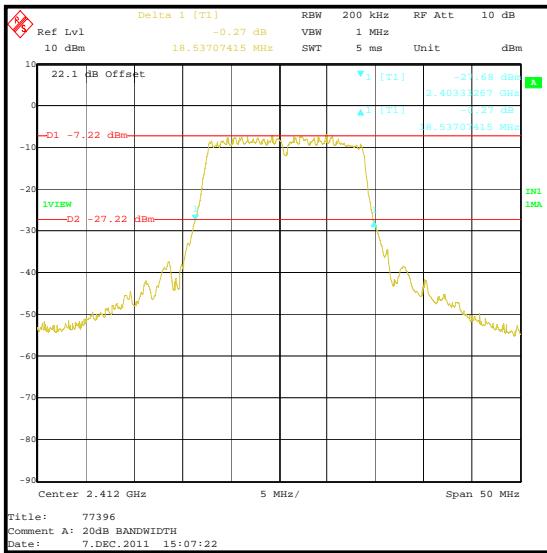
Transmitter 20 dB Bandwidth (continued)**Results: 802.11g / 54 Mbps**

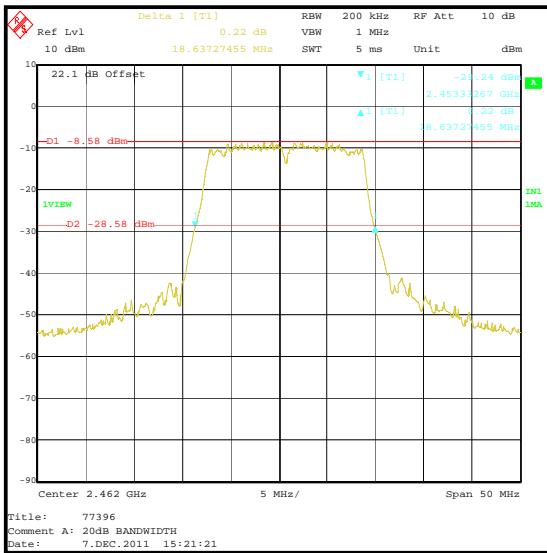
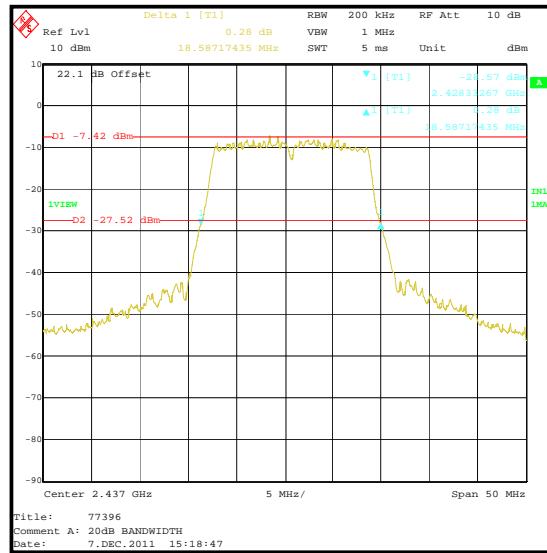
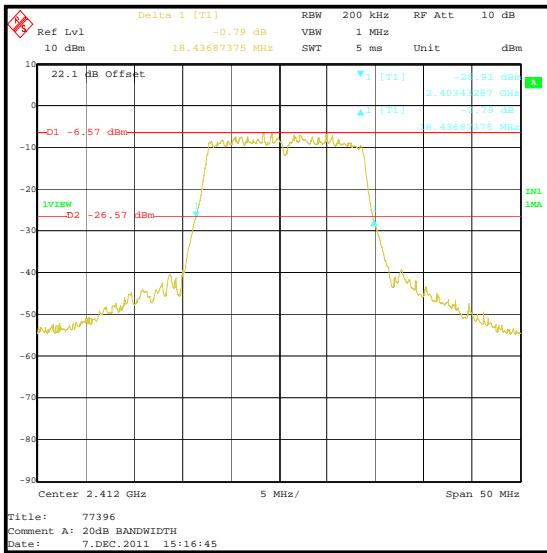
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 6.5 Mbps**

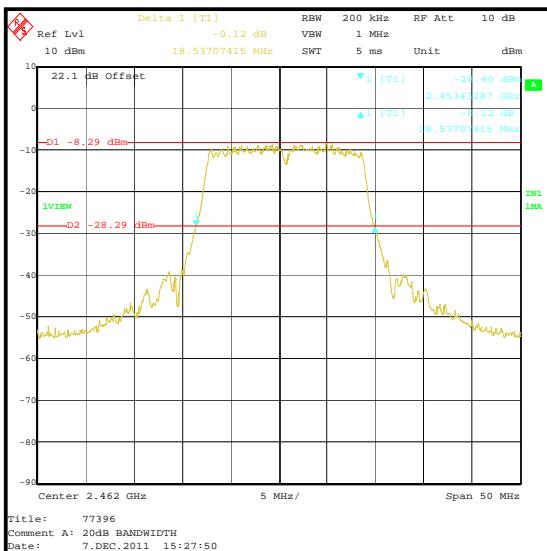
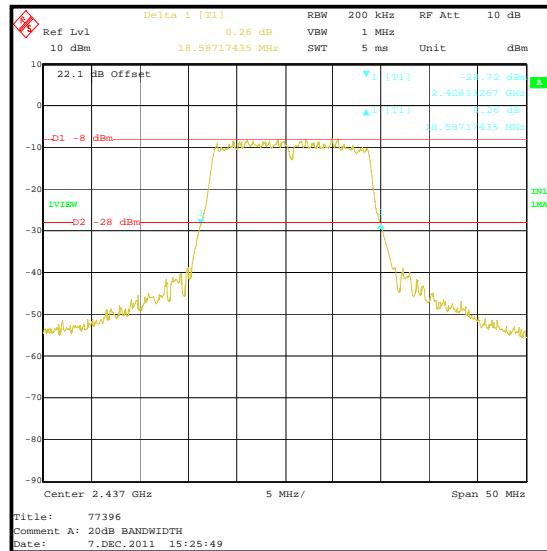
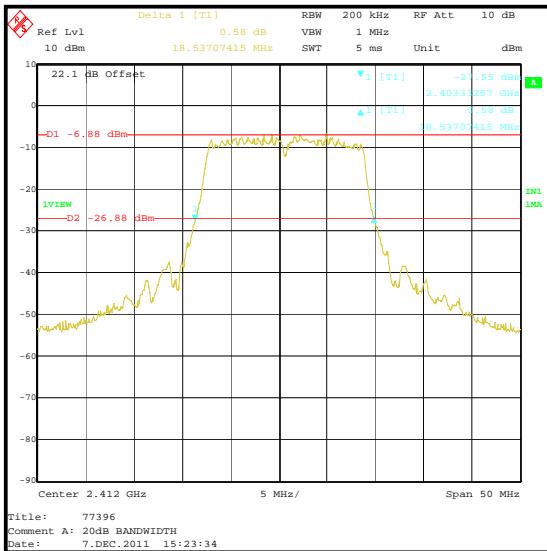
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 13 Mbps**

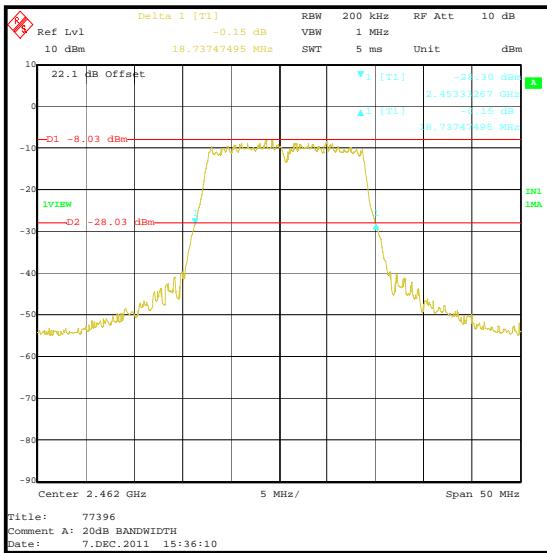
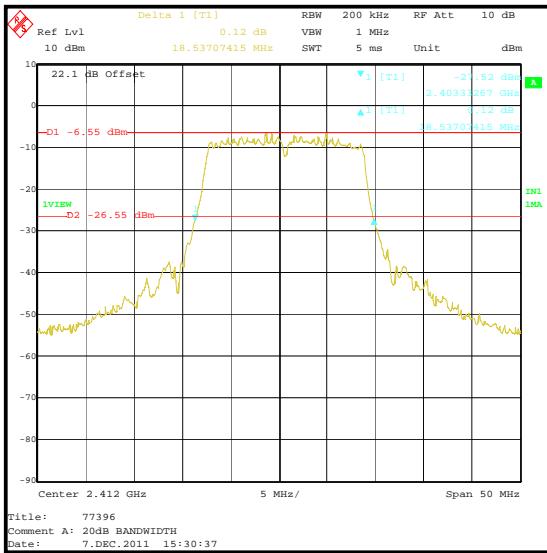
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 19.5 Mbps**

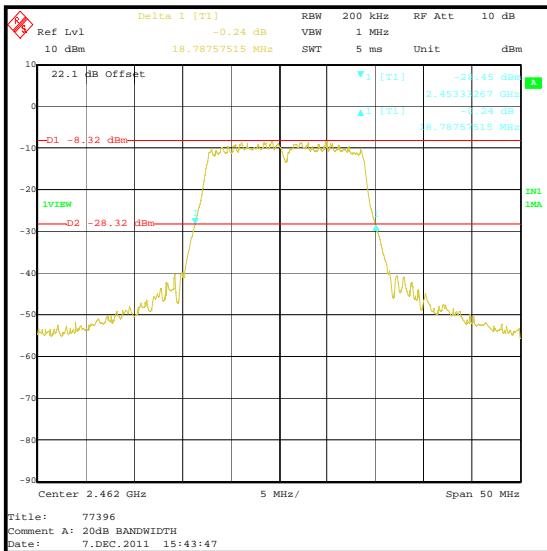
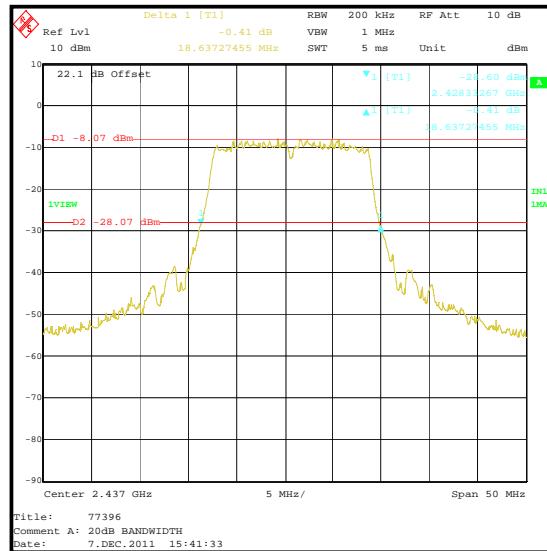
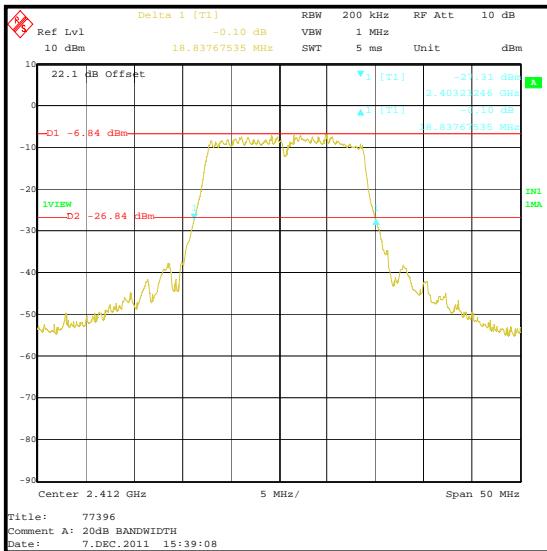
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 26 Mbps**

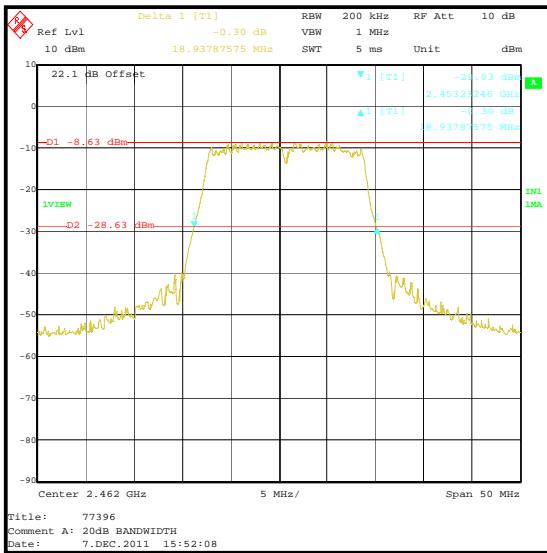
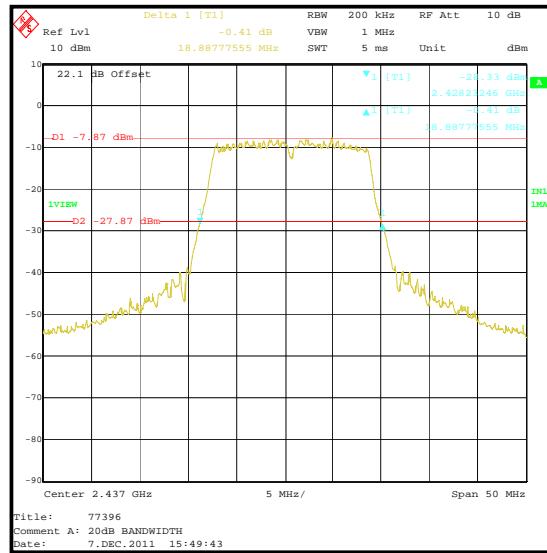
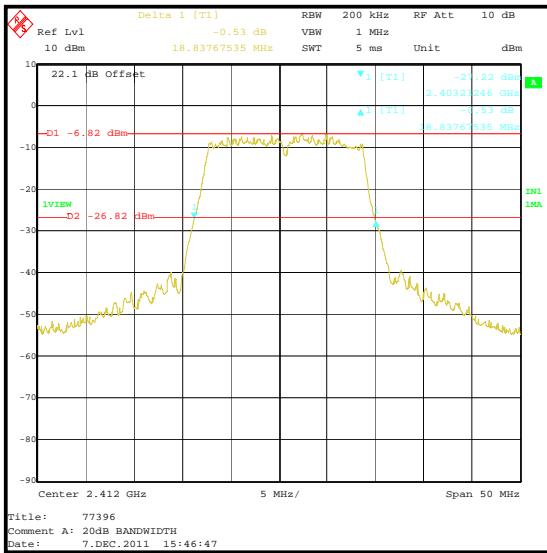
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 39 Mbps**

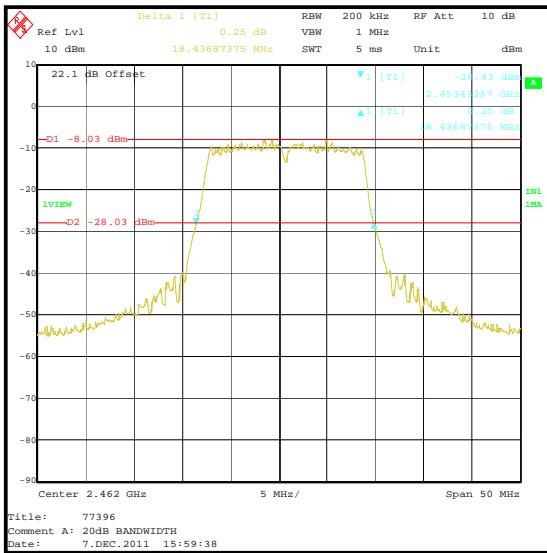
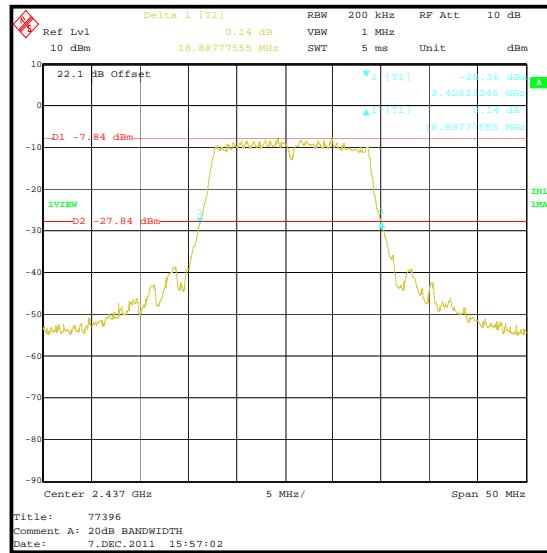
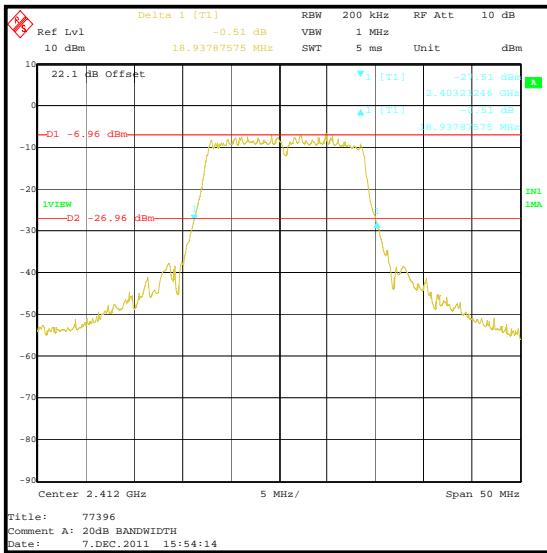
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 52 Mbps**

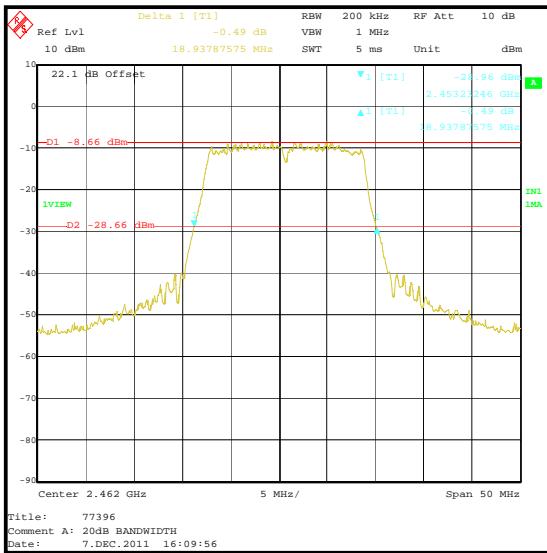
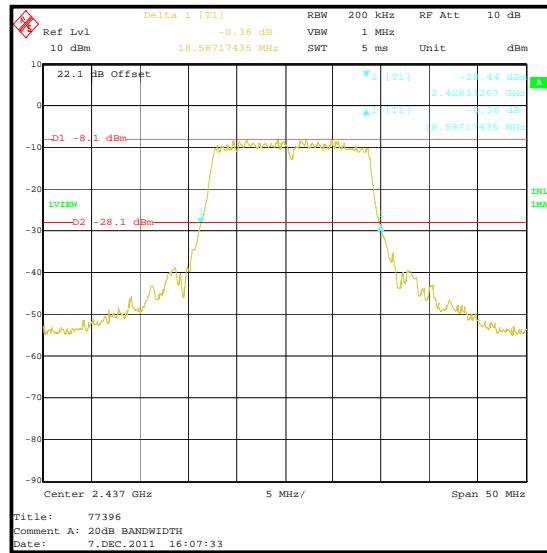
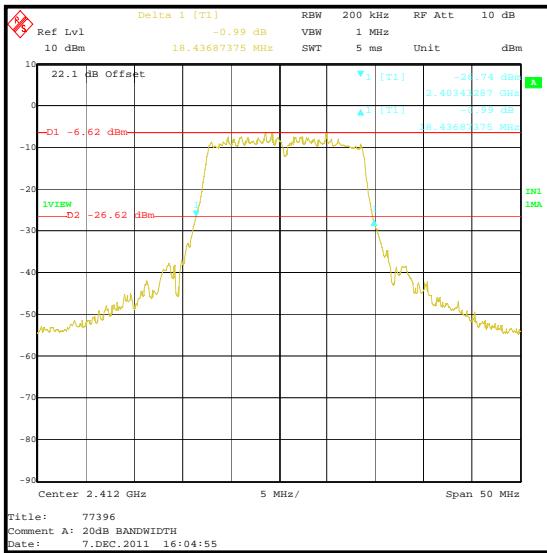
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 58.5 Mbps**

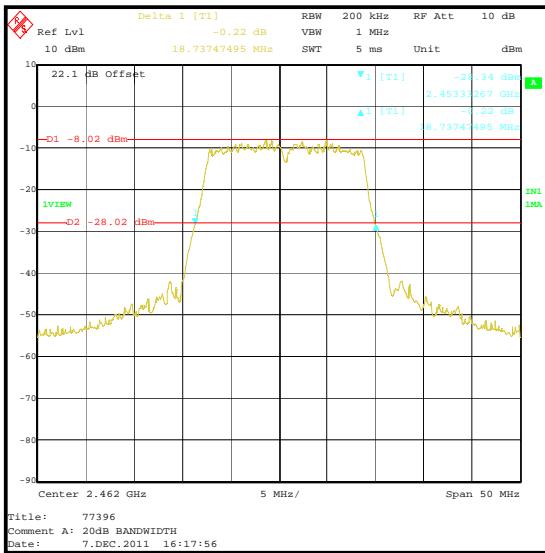
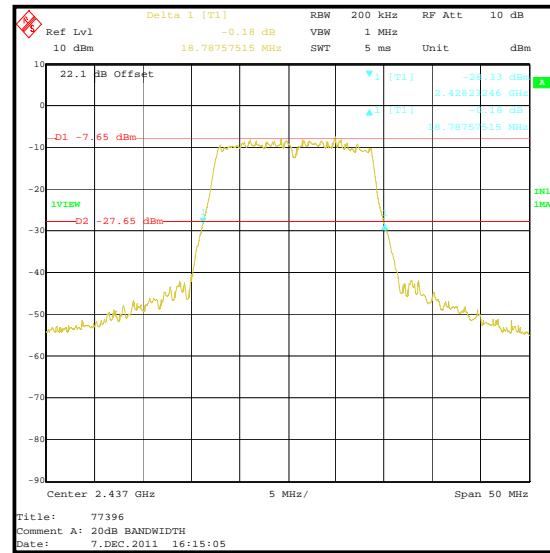
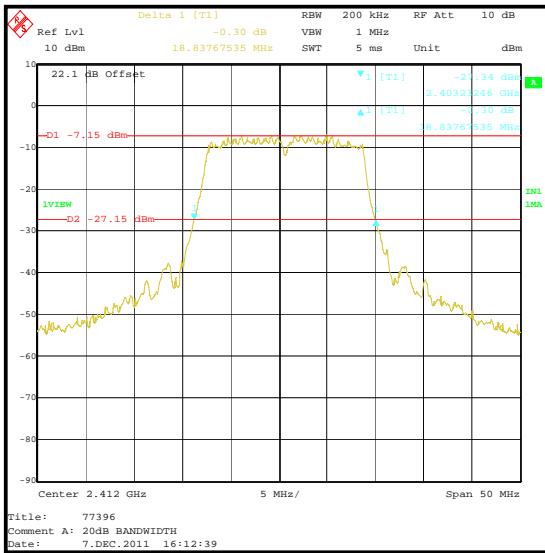
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 65 Mbps**

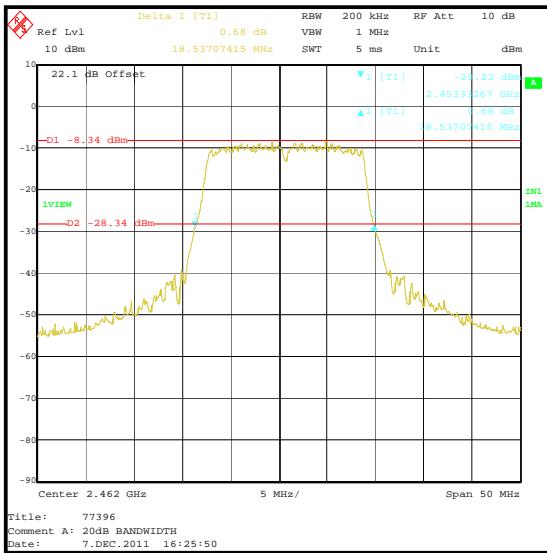
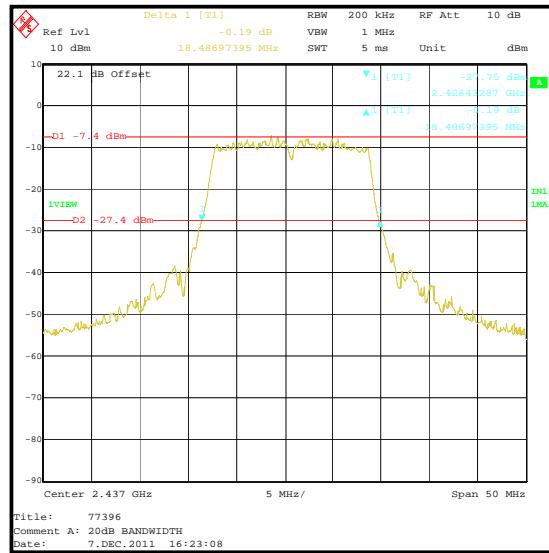
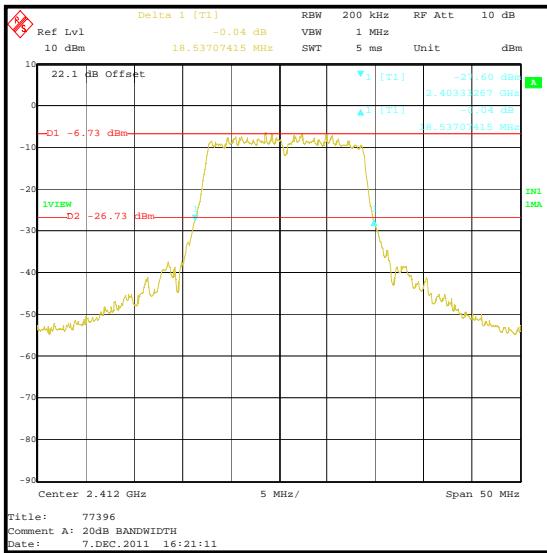
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 7.2 Mbps**

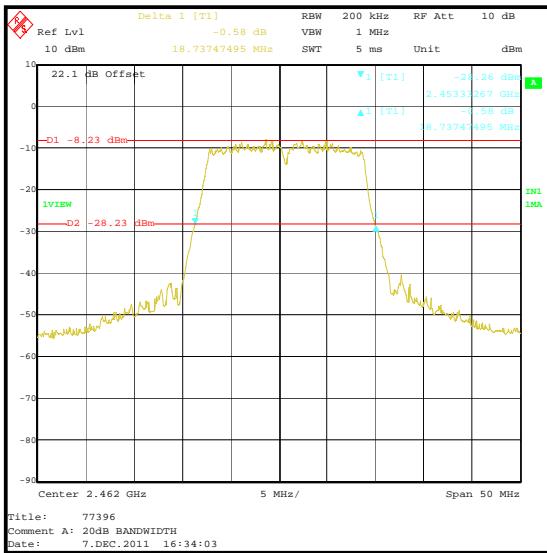
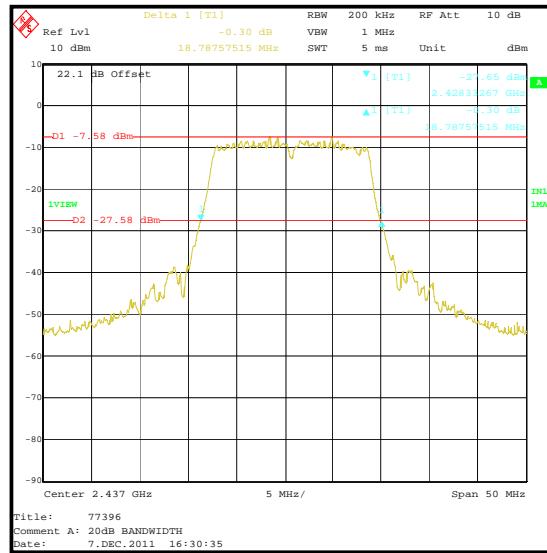
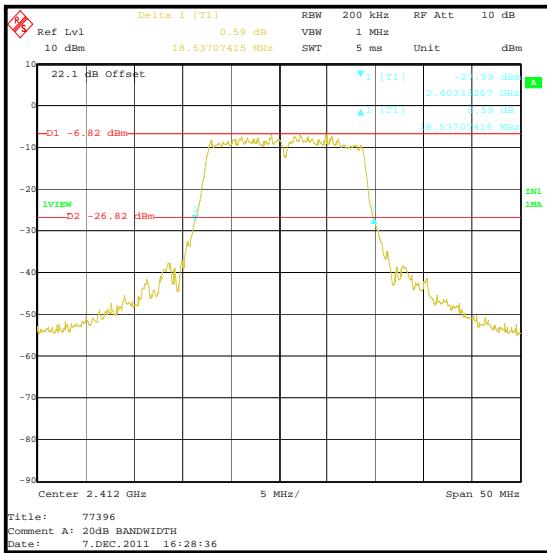
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 14.4 Mbps**

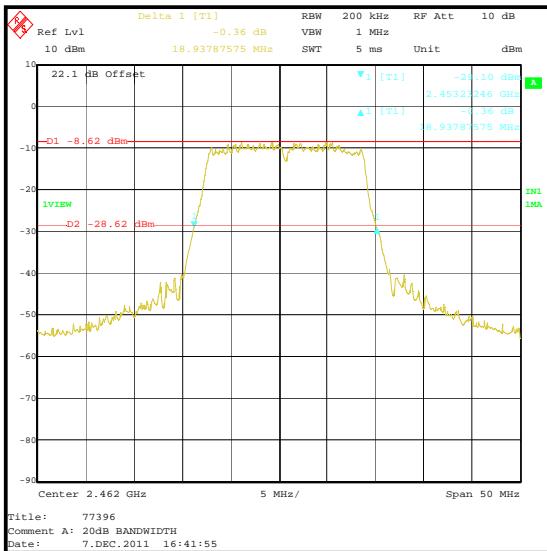
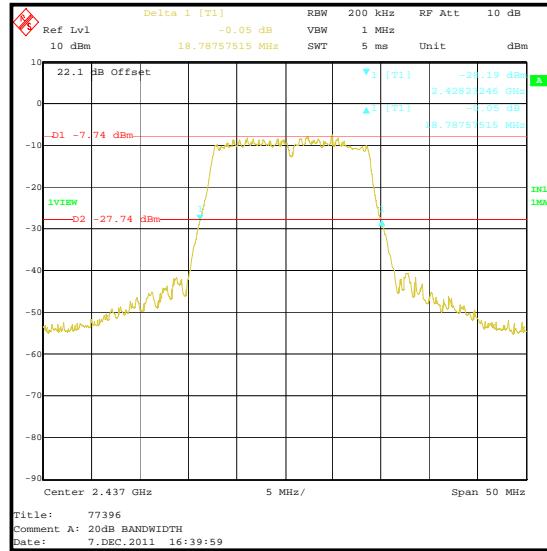
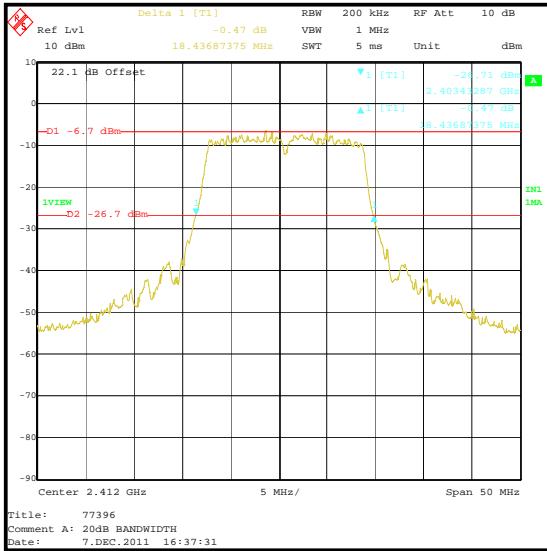
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 21.7 Mbps**

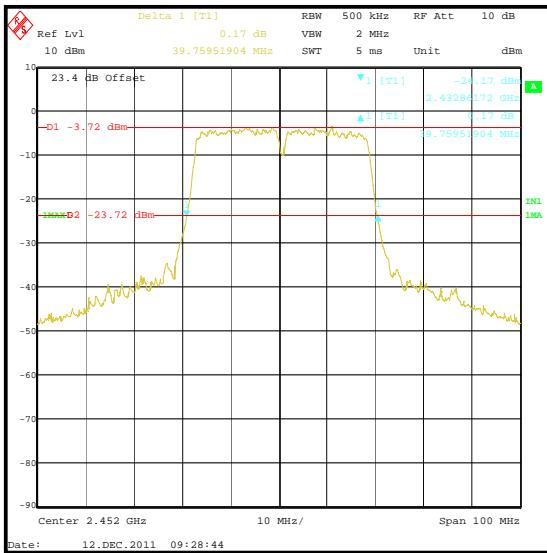
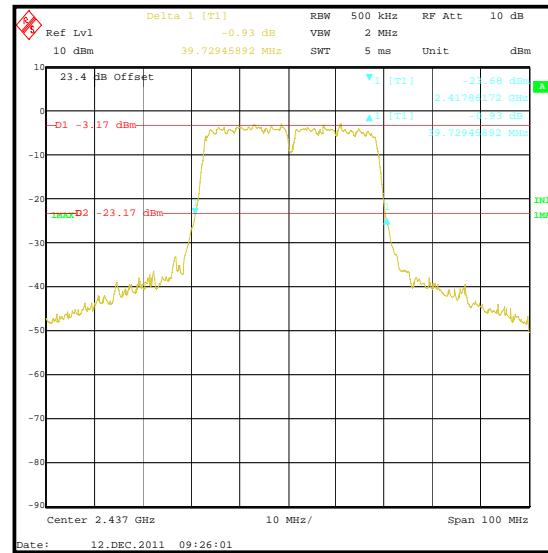
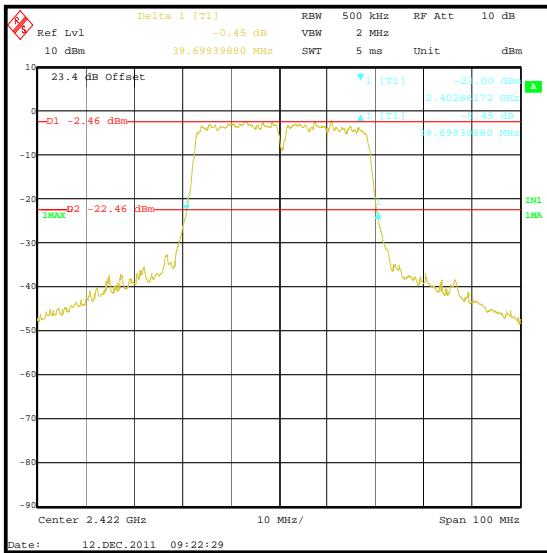
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 28.9 Mbps**

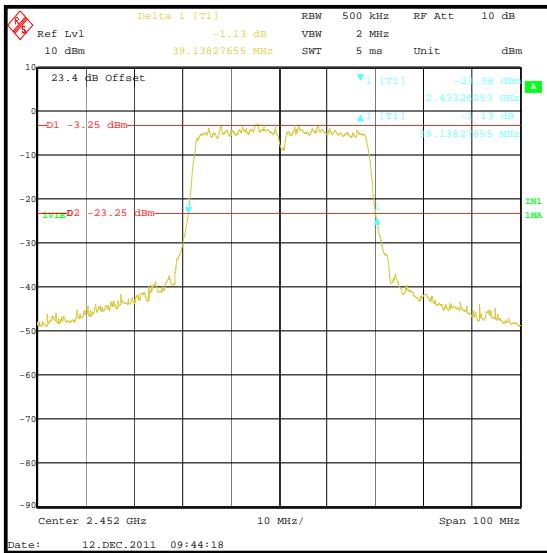
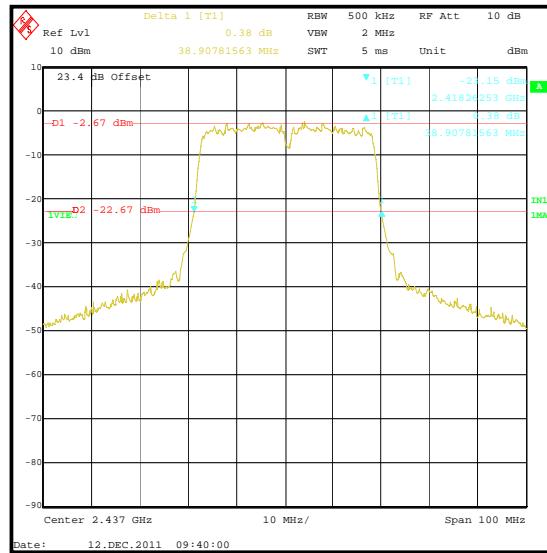
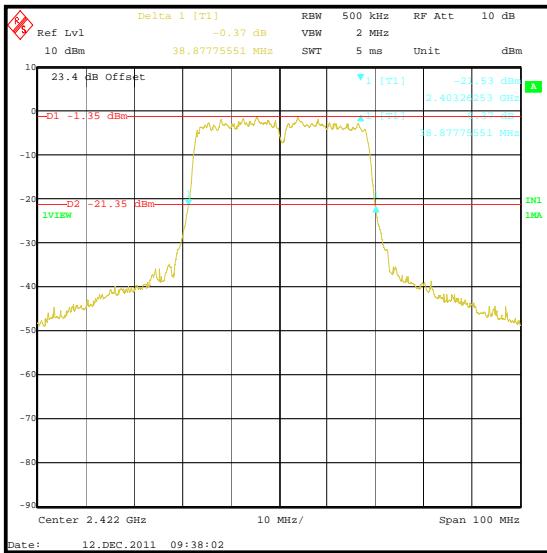
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 43.4 Mbps**

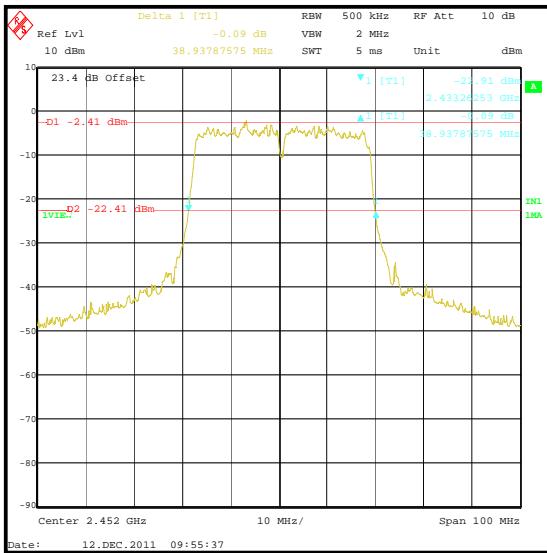
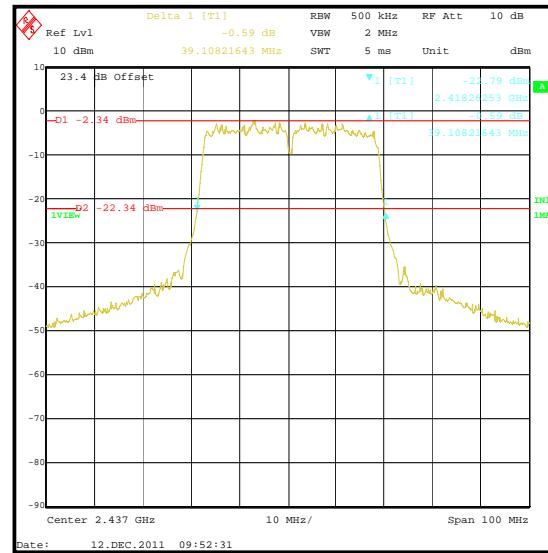
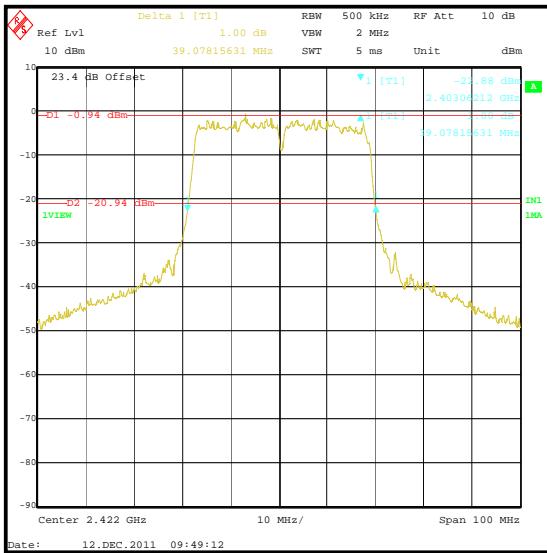
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 57.8 Mbps**

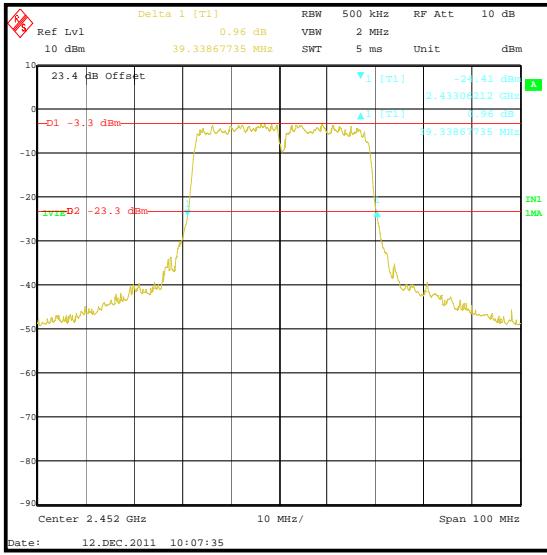
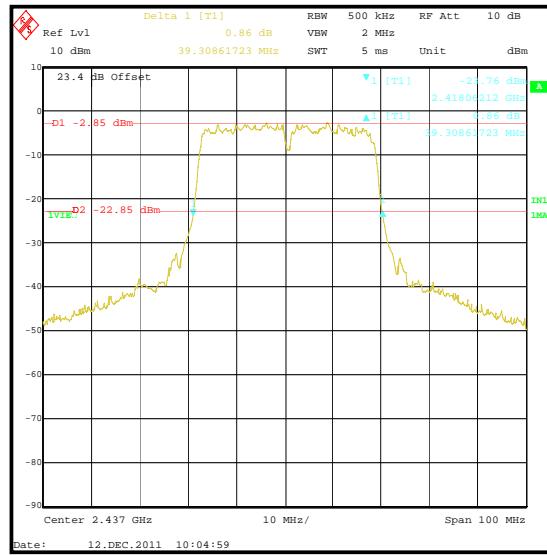
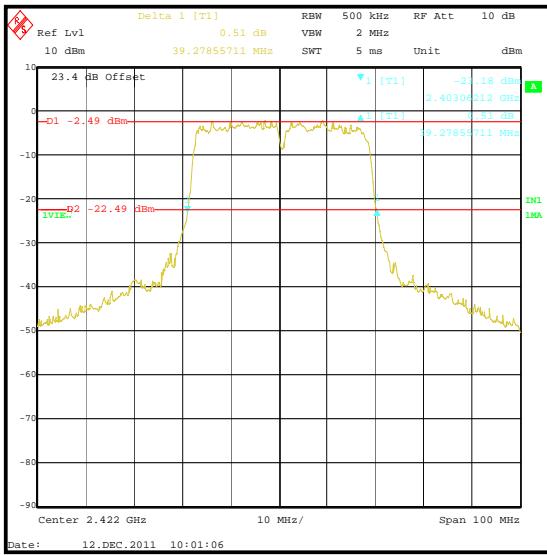
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 65 Mbps**

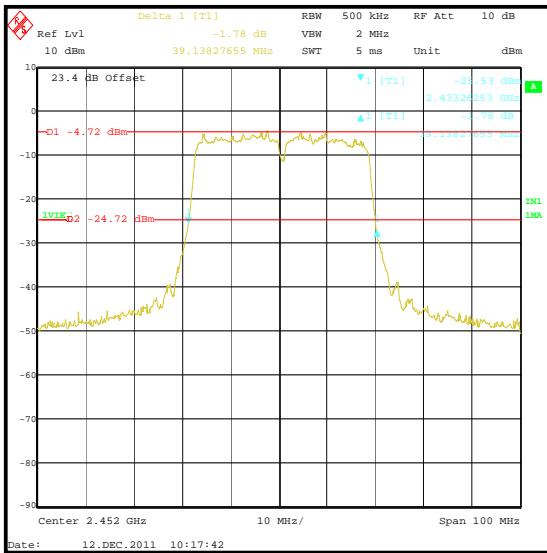
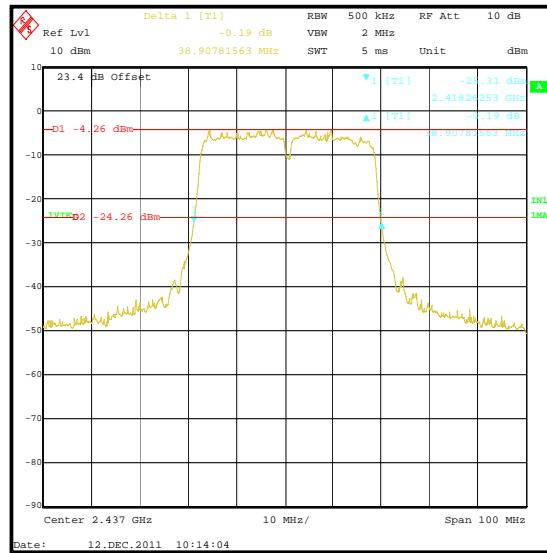
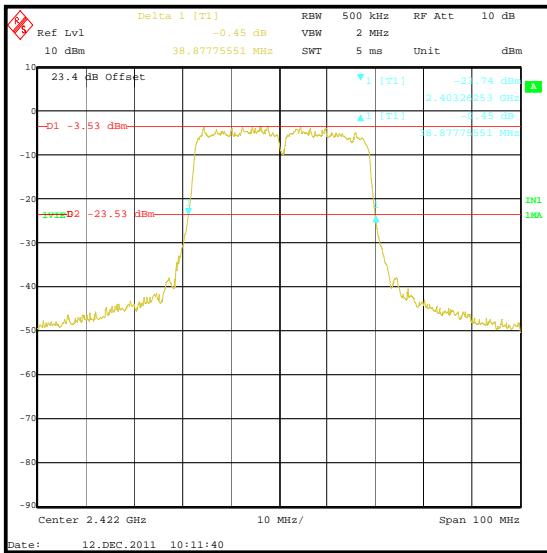
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 20 MHz / 72.2 Mbps**

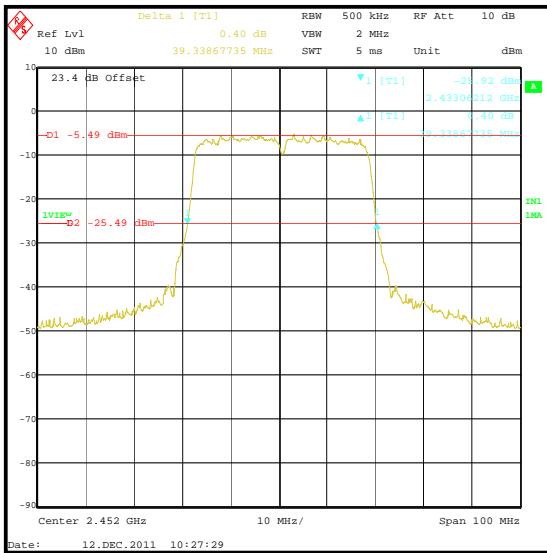
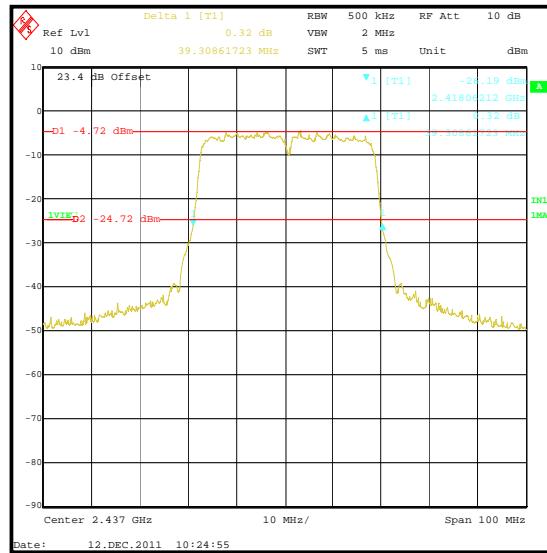
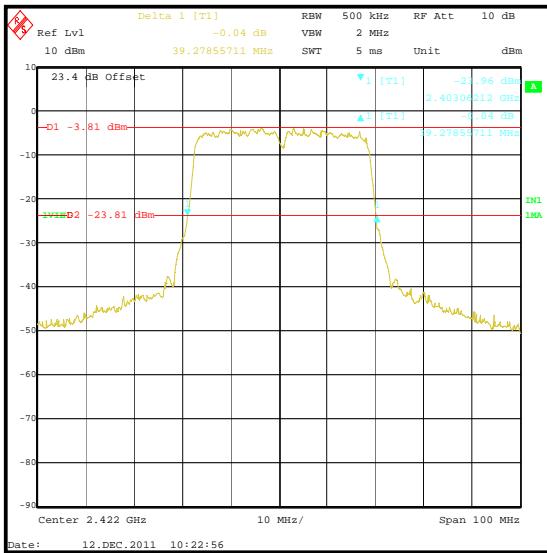
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 13.5 Mbps**

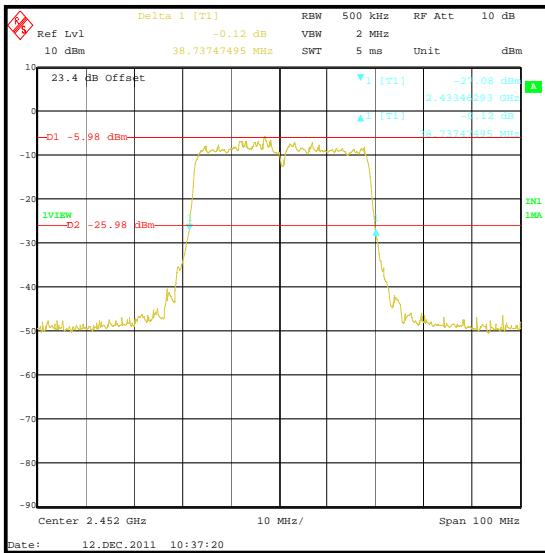
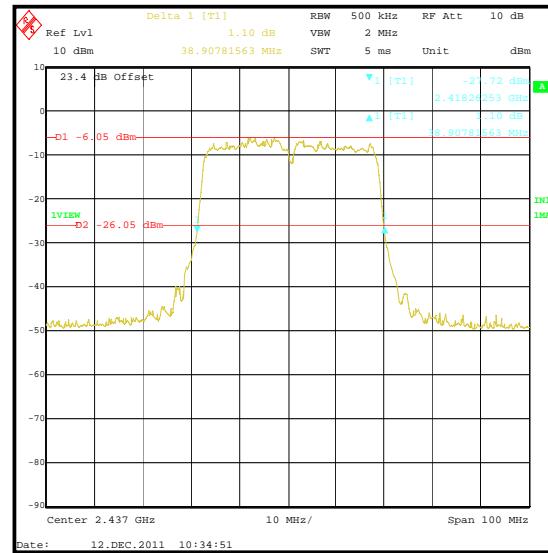
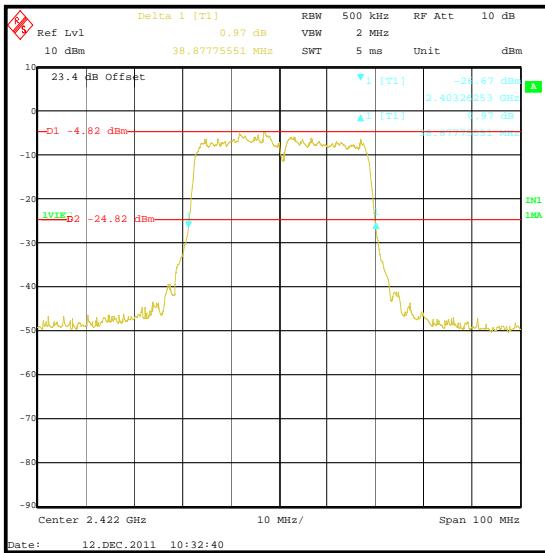
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 27 Mbps**

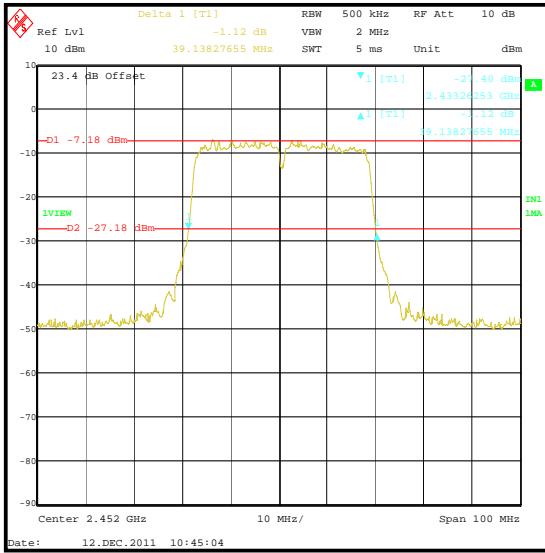
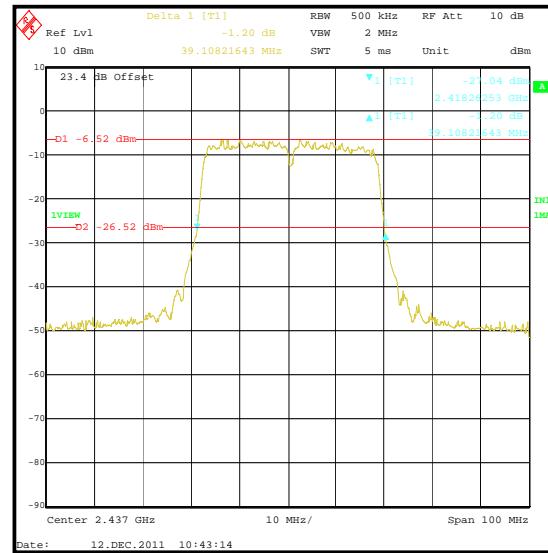
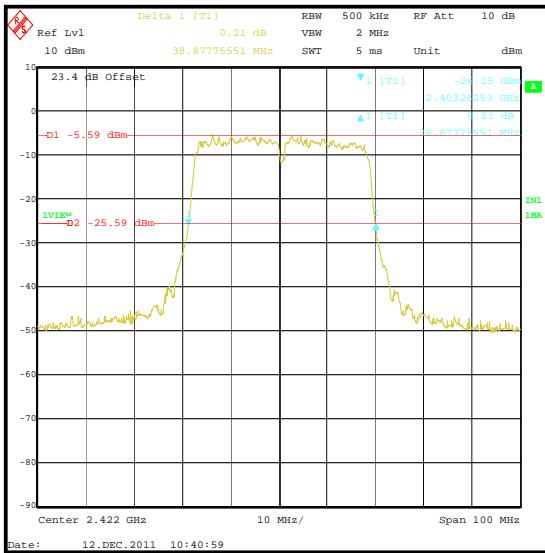
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 40.5 Mbps**

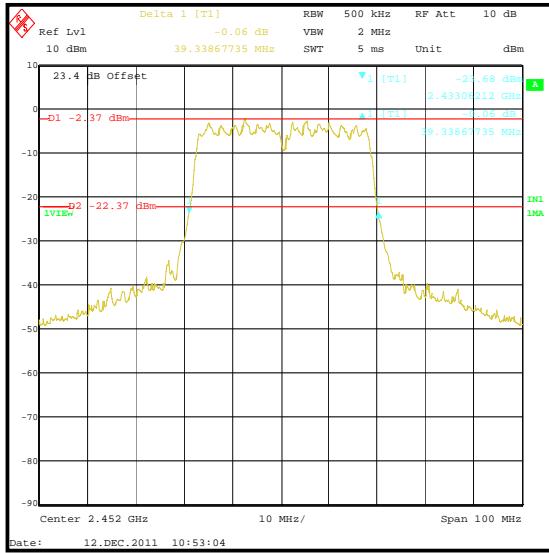
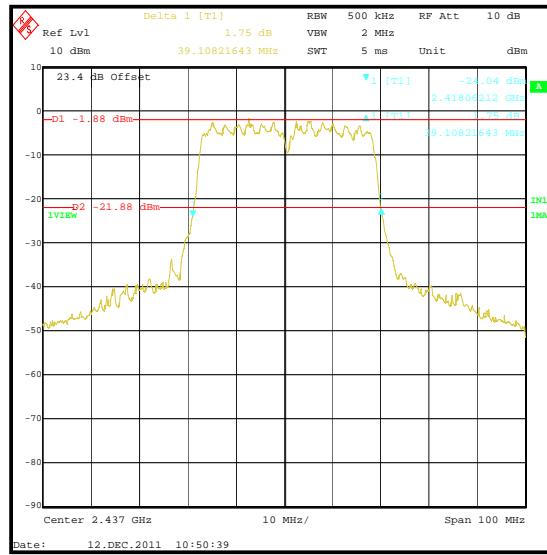
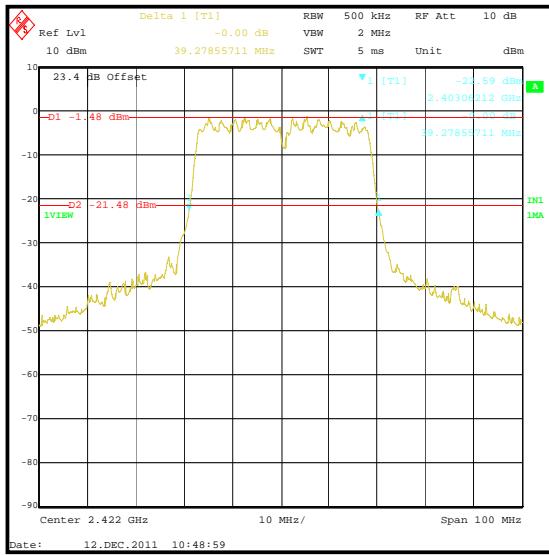
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 54 Mbps**

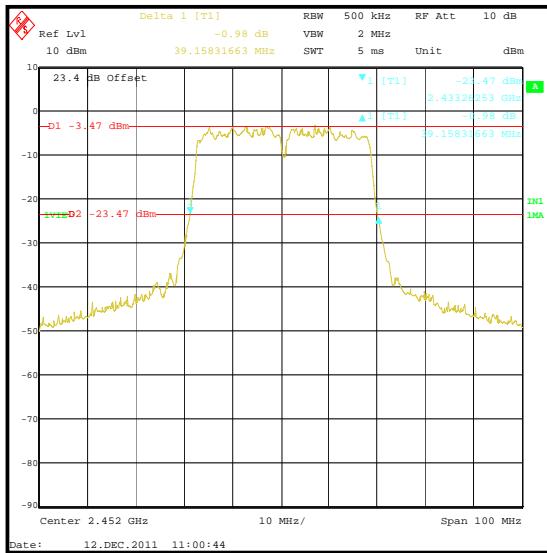
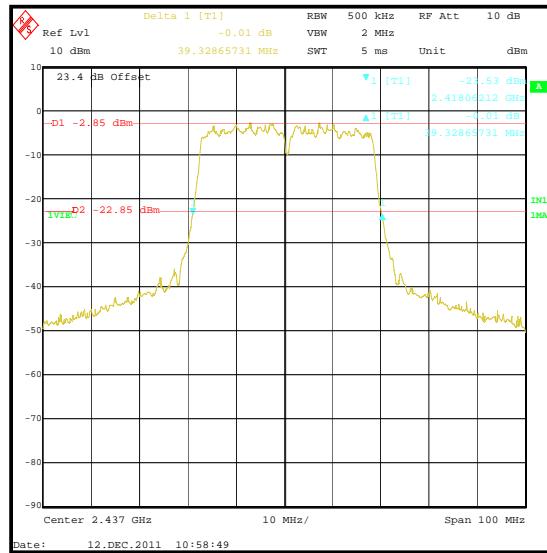
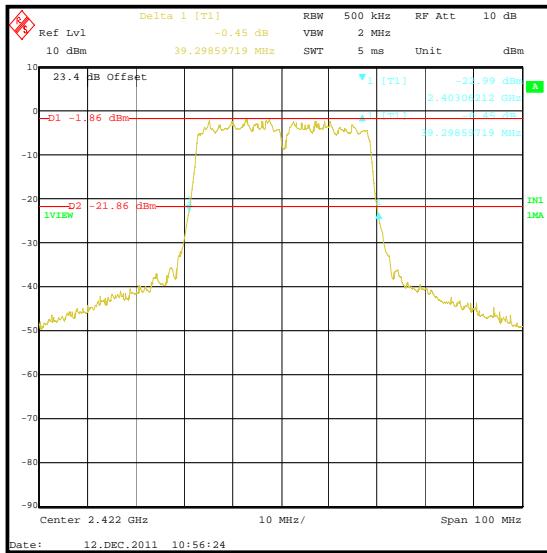
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 81 Mbps**

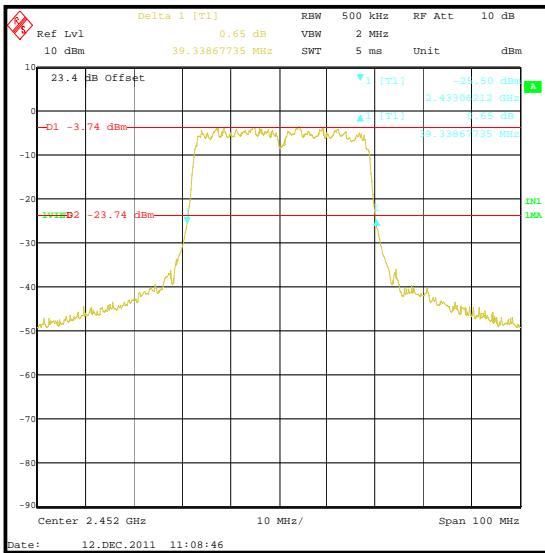
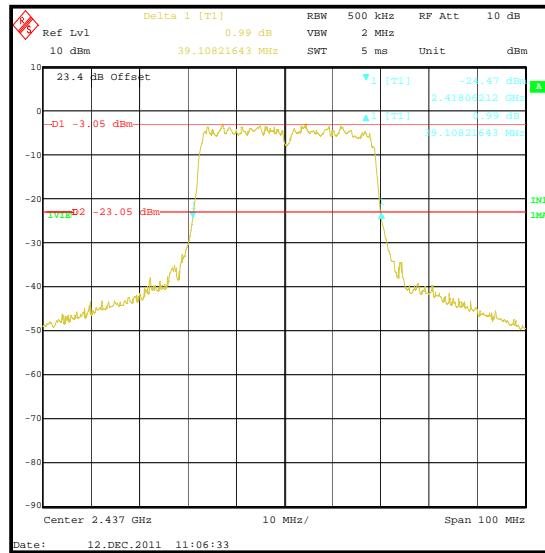
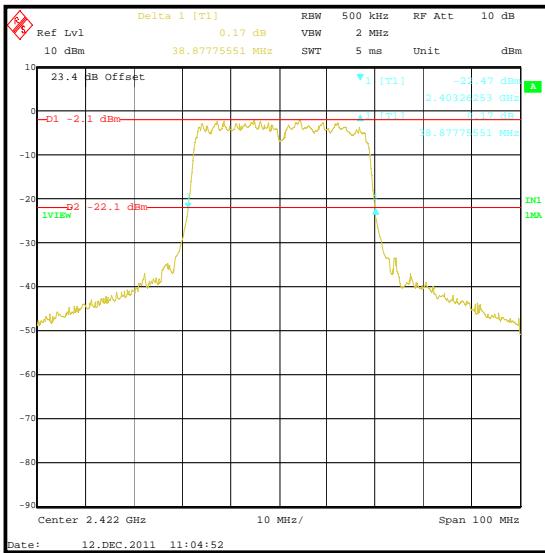
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 108 Mbps**

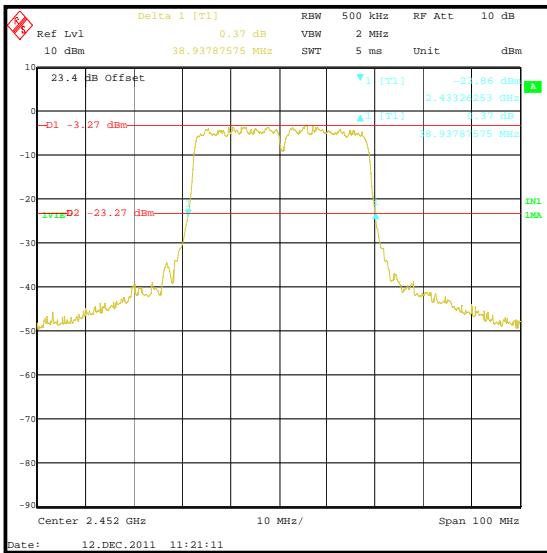
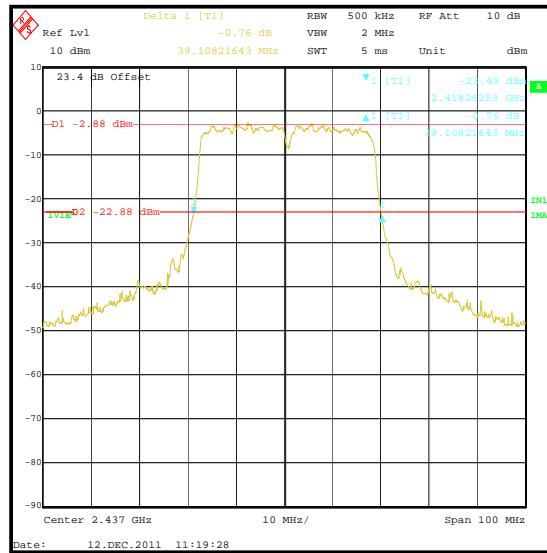
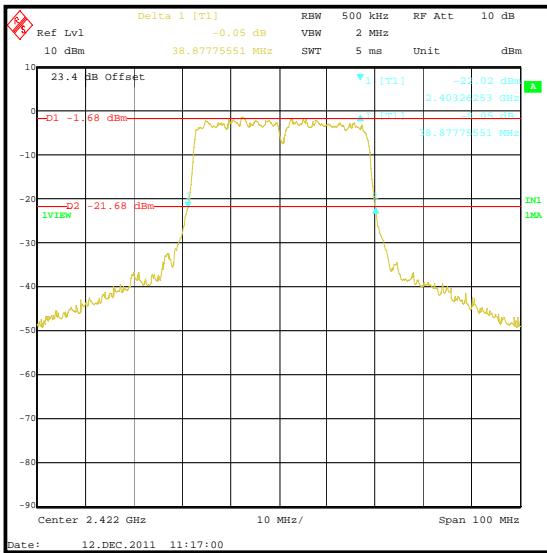
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 121 Mbps**

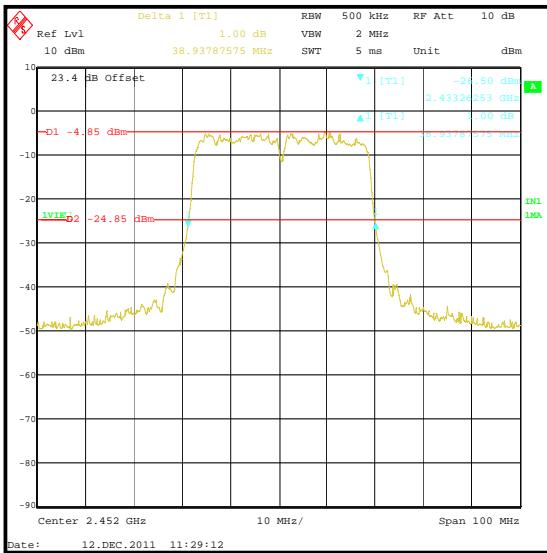
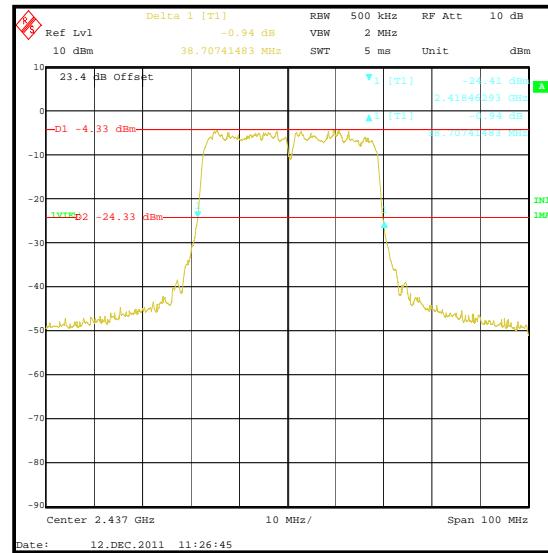
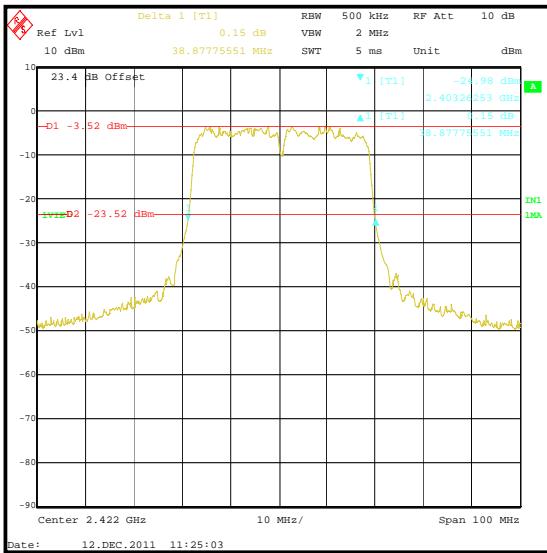
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 135 Mbps**

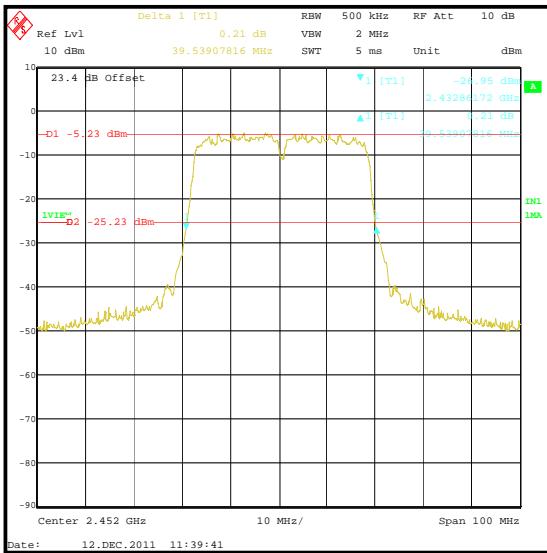
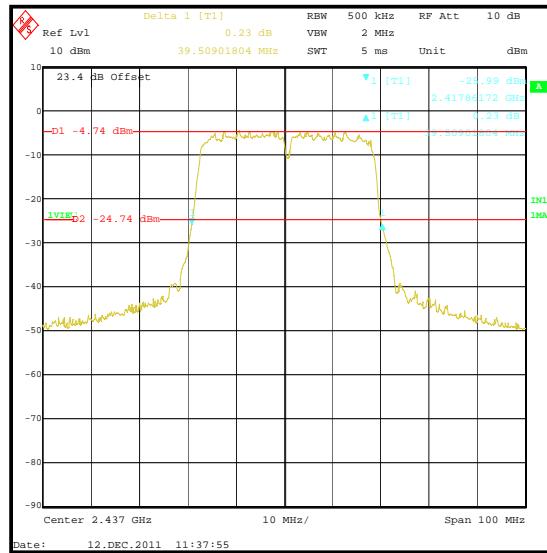
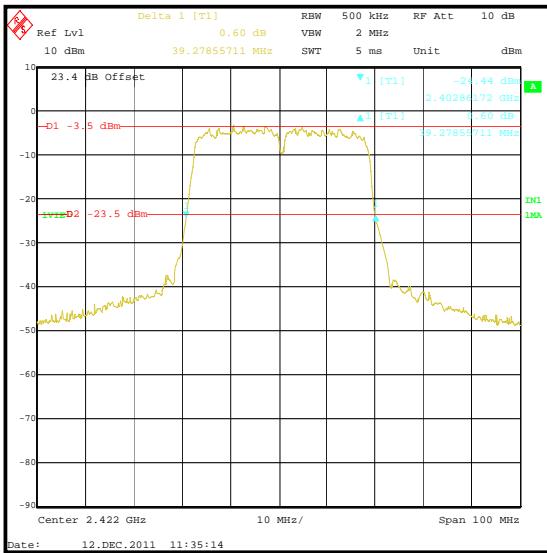
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 15 Mbps**

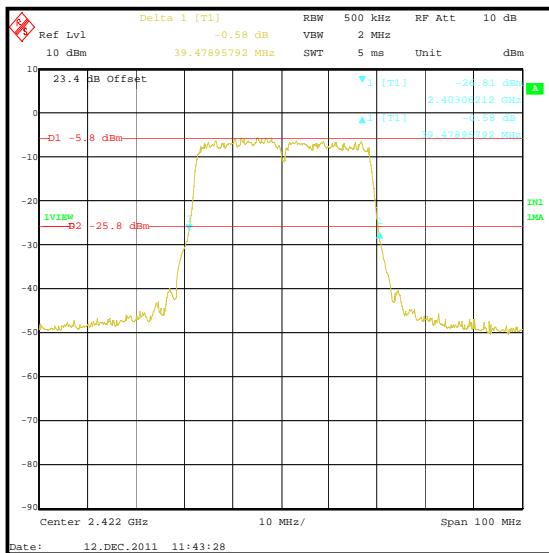
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 30 Mbps**

Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 45 Mbps**

Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 60 Mbps**

Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 90 Mbps**

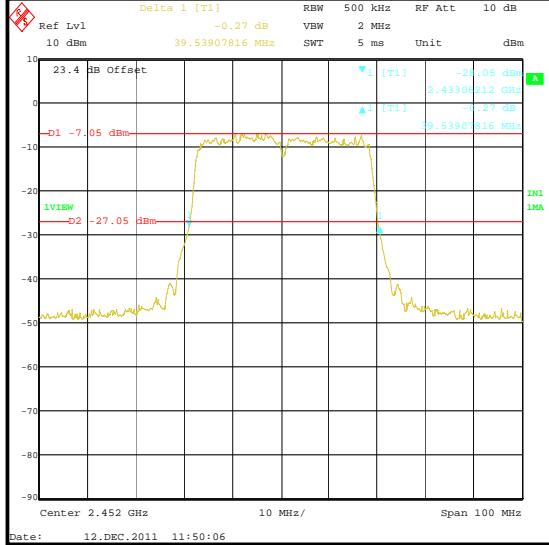
Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 120 Mbps**

Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 135 Mbps**

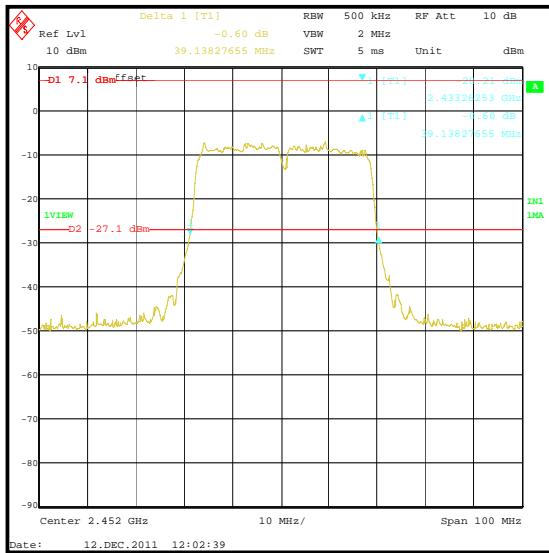
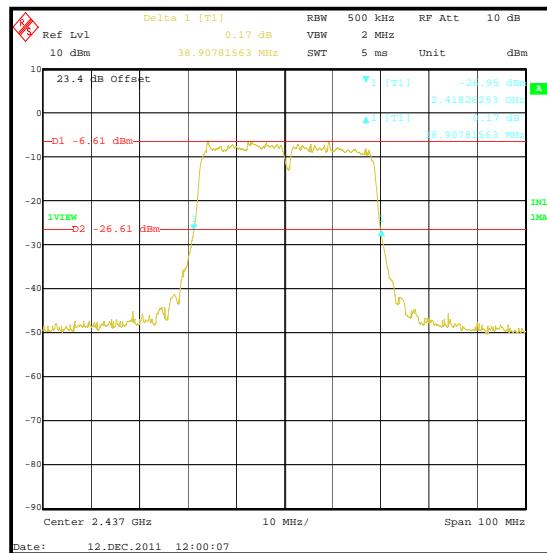
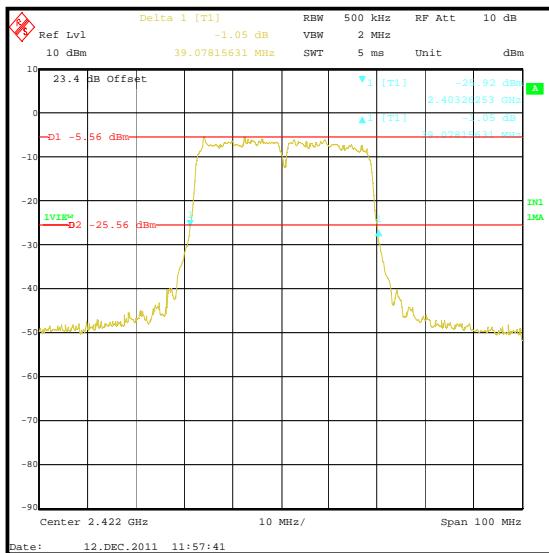
Date: 12.DEC.2011 11:43:28



Date: 12.DEC.2011 11:46:52



Date: 12.DEC.2011 11:50:06

Transmitter 20 dB Bandwidth (continued)**Results: 802.11n / 40 MHz / 150 Mbps**

Reference Line D1 should be at -7.1 dBm.

Reference Line D2 shows the correct final result.

5.2.6.Transmitter Power Spectral Density**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	22 September 2011
Test Sample Serial No:	00064cf8		

FCC Reference:	Part 15.247(e)
Test Method Used:	As detailed in ANSI C63.10 Section 6.11.2

Environmental Conditions:

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

Results: 802.11b / 2 Mbps

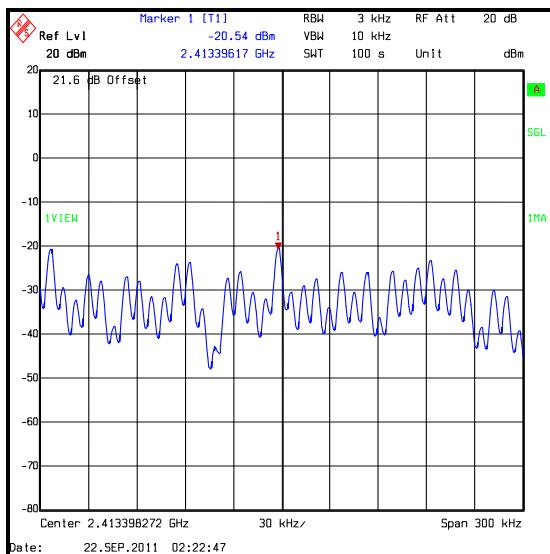
Channel	Output Power (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
Bottom	-20.5	8.0	28.5	Complied
Middle	-20.5	8.0	28.5	Complied
Top	-20.8	8.0	28.8	Complied

Note(s):

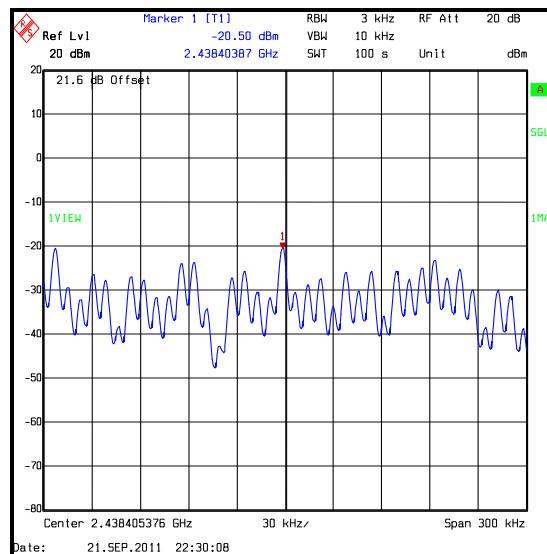
1. Preliminary tests were made on all supported data rates and modulation types to determine worst-case operation. The highest level of the worst-case mode was recorded in the table above.
2. A 20 dB attenuator and RF cable were used to connect the EUT to the spectrum analyser. The combined loss of the 20 dB attenuator and cable was 21.6 dB and this was entered on the spectrum analyser as an RF level offset.

Transmitter Power Spectral Density (continued)

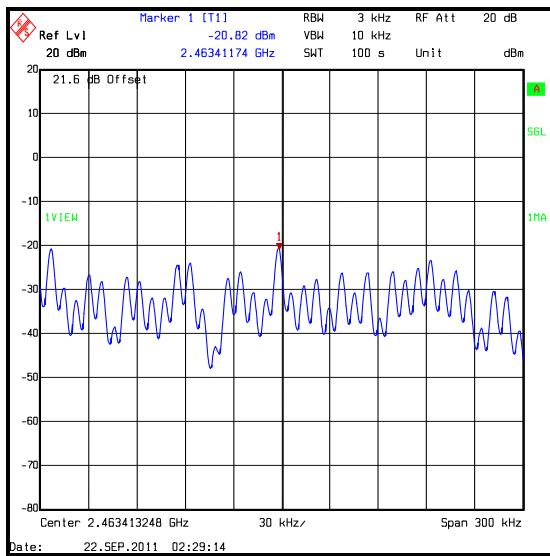
Results:



Bottom Channel



Middle Channel



Top Channel

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

Test Engineer:	David Doyle	Test Date:	08 December 2011
Test Sample Serial No:	00064cf8		

FCC Reference:	Part 15.247(b)(3)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.2

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	28

Results: 802.11b / 1 Mbps

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	9.7	30.0	20.3	Complied
Middle	8.5	30.0	21.5	Complied
Top	7.8	30.0	22.2	Complied

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	9.7	3.0	12.7	36.0	23.3	Complied
Middle	8.5	3.0	11.5	36.0	24.5	Complied
Top	7.8	3.0	10.8	36.0	25.2	Complied

Results: 802.11b / 11 Mbps

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	12.9	30.0	17.1	Complied
Middle	11.6	30.0	18.4	Complied
Top	10.8	30.0	19.2	Complied

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	12.9	3.0	15.9	36.0	20.1	Complied
Middle	11.6	3.0	14.6	36.0	21.4	Complied
Top	10.8	3.0	13.8	36.0	22.2	Complied

Transmitter Maximum Peak Output Power (continued)**Results: 802.11g / 9 Mbps**

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	12.4	30.0	17.6	Complied
Middle	11.3	30.0	18.7	Complied
Top	10.6	30.0	19.4	Complied

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	12.4	3.0	15.4	36.0	20.6	Complied
Middle	11.3	3.0	14.3	36.0	21.7	Complied
Top	10.6	3.0	13.6	36.0	22.4	Complied

Results: 802.11g / 48 Mbps

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	8.9	30.0	21.1	Complied
Middle	7.8	30.0	22.2	Complied
Top	6.9	30.0	23.1	Complied

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	8.9	3.0	11.9	36.0	24.1	Complied
Middle	7.8	3.0	10.8	36.0	25.2	Complied
Top	6.9	3.0	9.9	36.0	26.1	Complied

Transmitter Maximum Peak Output Power (continued)**Results: 802.11n / 20 MHz / 21.7 Mbps**

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	12.3	30.0	17.7	Complied
Middle	11.3	30.0	18.7	Complied
Top	10.5	30.0	19.5	Complied

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	12.3	3.0	15.3	36.0	20.7	Complied
Middle	11.3	3.0	14.3	36.0	21.7	Complied
Top	10.5	3.0	13.5	36.0	22.5	Complied

Results: 802.11n / 20 MHz / 72.2 Mbps

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	9.3	30.0	20.7	Complied
Middle	8.1	30.0	21.9	Complied
Top	7.3	30.0	22.7	Complied

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	9.3	3.0	12.3	36.0	23.7	Complied
Middle	8.1	3.0	11.1	36.0	24.9	Complied
Top	7.3	3.0	10.3	36.0	25.7	Complied

Transmitter Maximum Peak Output Power (continued)**Results: 802.11n / 40MHz / 15 Mbps**

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	12.2	30.0	17.8	Complied
Middle	11.5	30.0	18.5	Complied
Top	11.0	30.0	19.0	Complied

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	12.2	3.0	15.2	36.0	20.8	Complied
Middle	11.5	3.0	14.5	36.0	21.5	Complied
Top	11.0	3.0	14.0	36.0	22.0	Complied

Results: 802.11n / 40 MHz / 45 Mbps

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	12.5	30.0	17.5	Complied
Middle	11.6	30.0	18.4	Complied
Top	11.1	30.0	18.9	Complied

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	12.5	3.0	15.5	36.0	20.5	Complied
Middle	11.6	3.0	14.6	36.0	21.4	Complied
Top	11.1	3.0	14.1	36.0	21.9	Complied

Transmitter Maximum Peak Output Power (continued)**Results: 802.11n / 40 MHz / 90 Mbps**

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	10.9	30.0	19.1	Complied
Middle	10.1	30.0	19.9	Complied
Top	9.5	30.0	20.5	Complied

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	10.9	3.0	13.9	36.0	22.1	Complied
Middle	10.1	3.0	13.1	36.0	22.9	Complied
Top	9.5	3.0	12.5	36.0	23.5	Complied

Results: 802.11n / 40 MHz / 150 Mbps

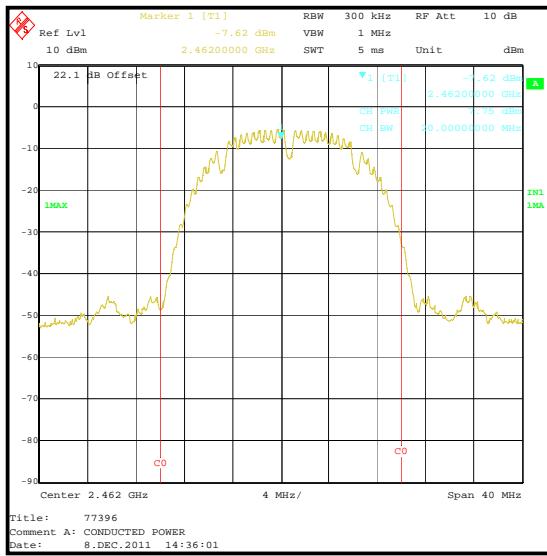
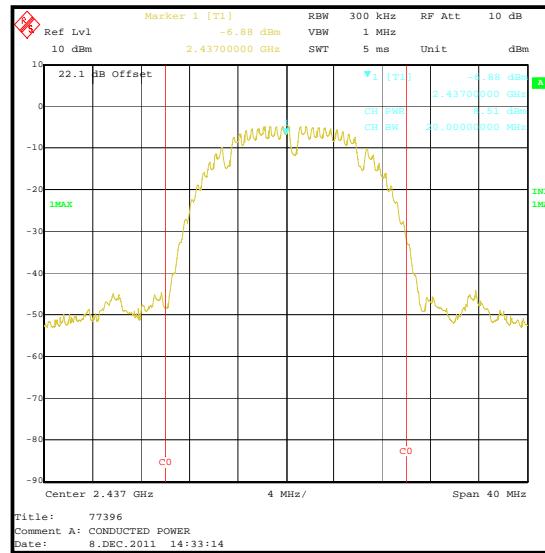
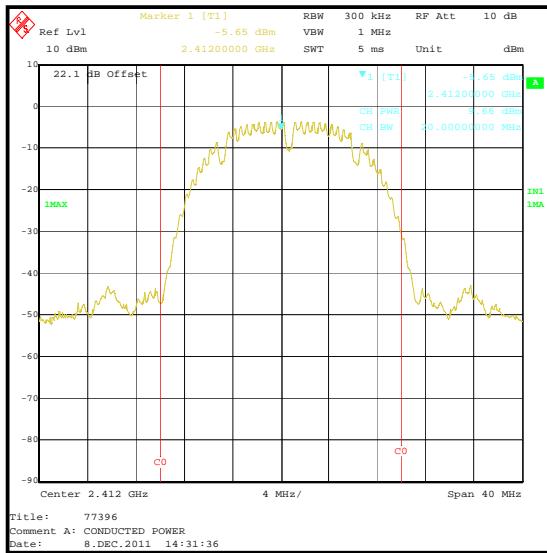
Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	8.8	30.0	21.2	Complied
Middle	8.0	30.0	22.0	Complied
Top	7.5	30.0	22.5	Complied

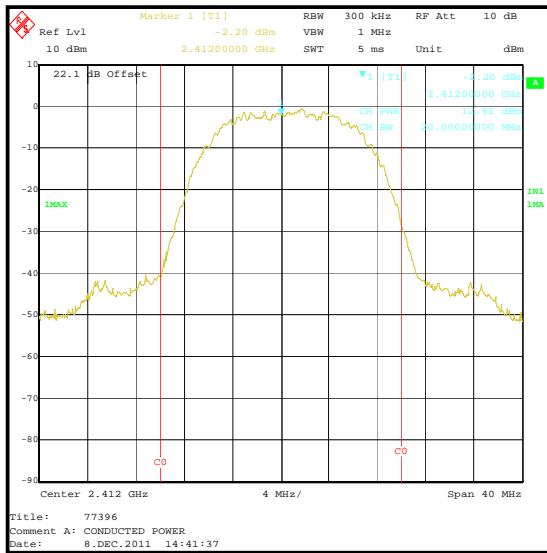
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	8.8	3.0	11.8	36.0	24.2	Complied
Middle	8.0	3.0	11.0	36.0	25.0	Complied
Top	7.5	3.0	10.5	36.0	25.5	Complied

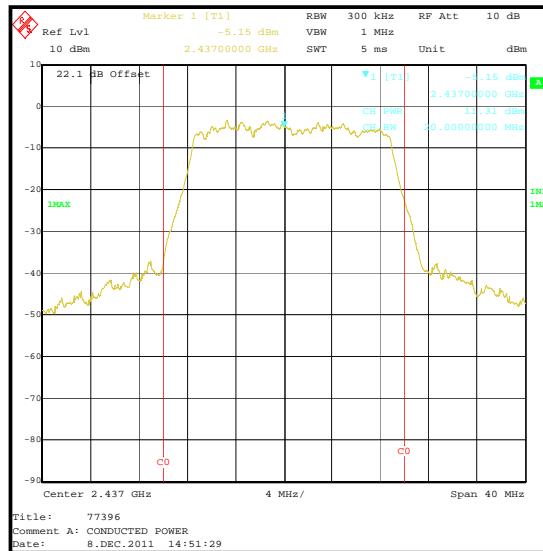
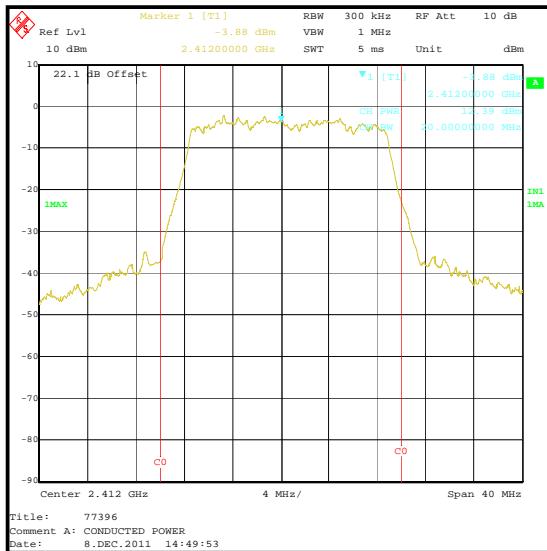
Note(s):

1. The highest data rate for each supported modulation type and channel width was tested.
2. Conducted power was measured using the channel power function of a spectrum analyser. Measurement bandwidths were set automatically by the spectrum analyser.
3. The declared antenna gain was added to the conducted power to obtain the EIRP:

$$\text{EIRP} = \text{Conducted Power} + \text{Antenna Gain (dBi)}$$

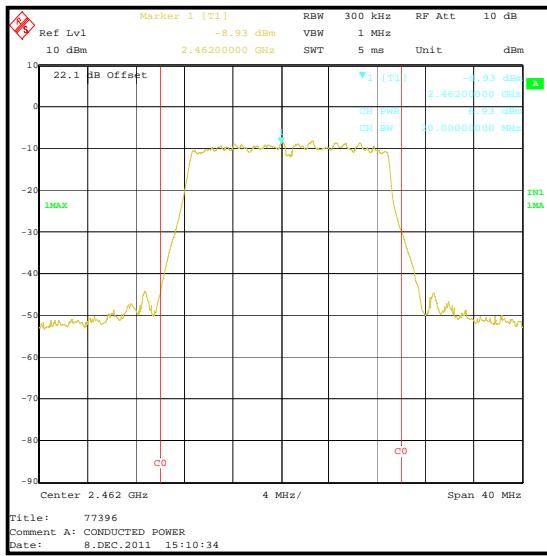
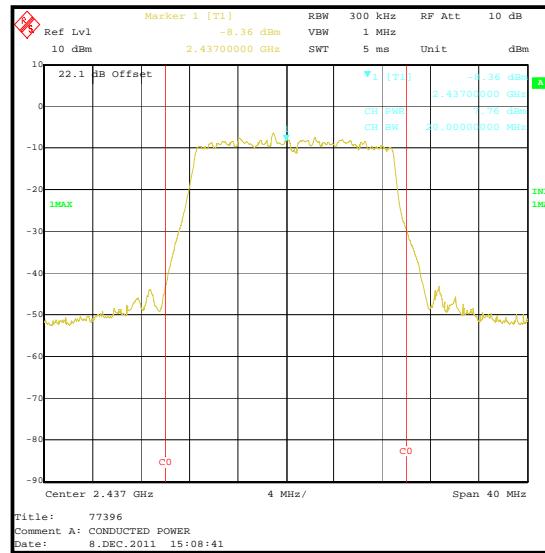
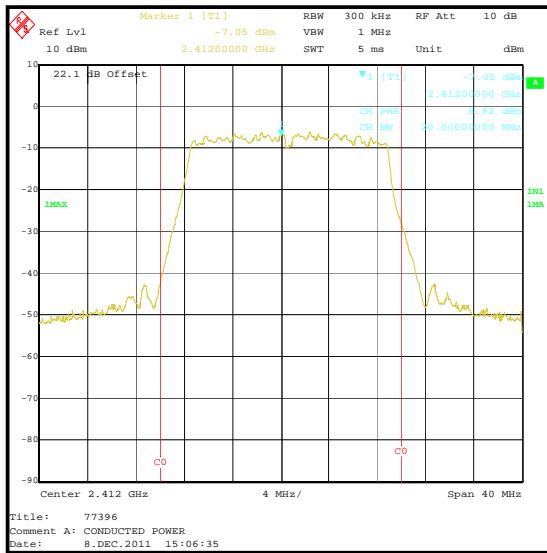
Transmitter Maximum Peak Output Power (continued)**Results: 802.11b / 1 Mbps**

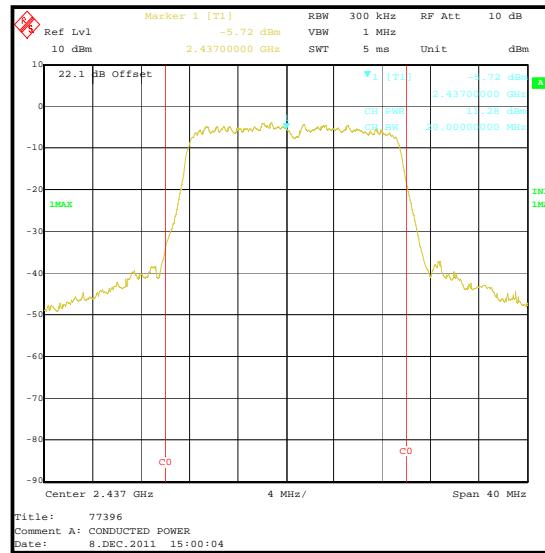
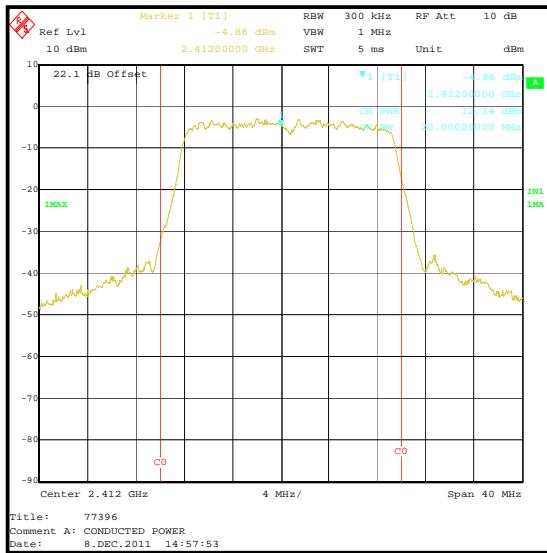
Transmitter Maximum Peak Output Power (continued)**Results: 802.11b / 11 Mbps**

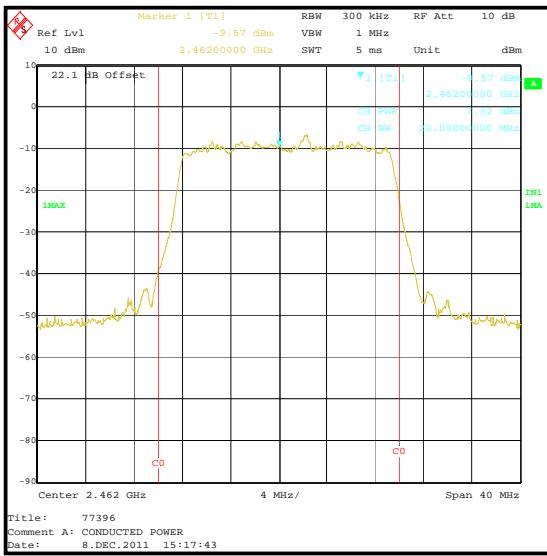
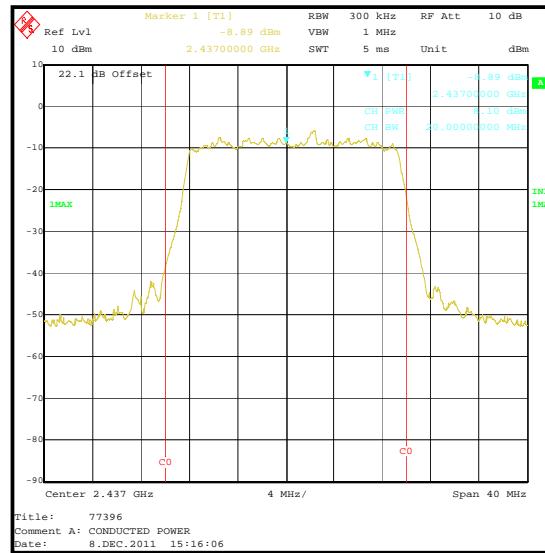
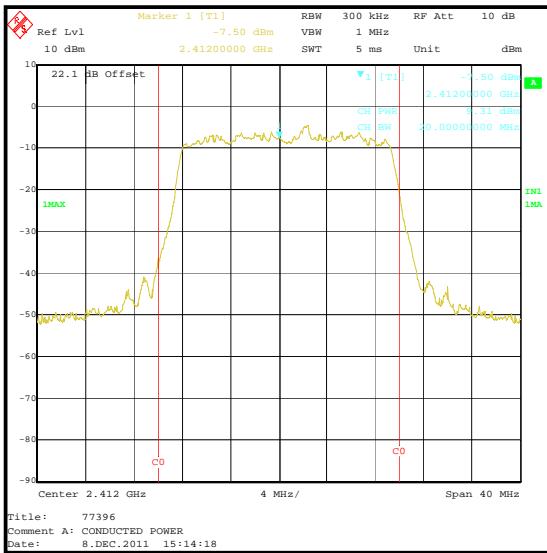
Transmitter Maximum Peak Output Power (continued)**Results: 802.11g / 9 Mbps**

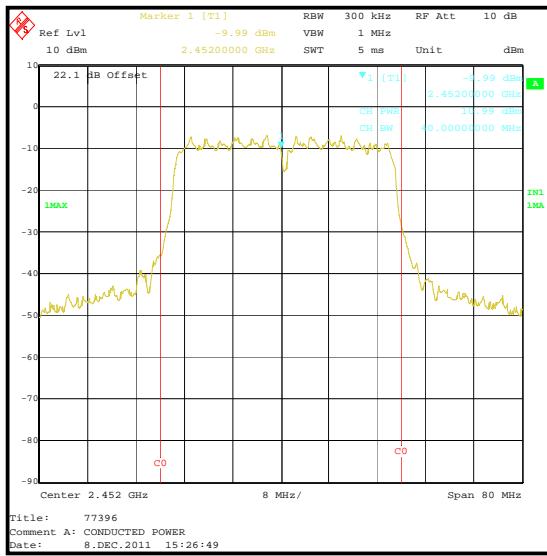
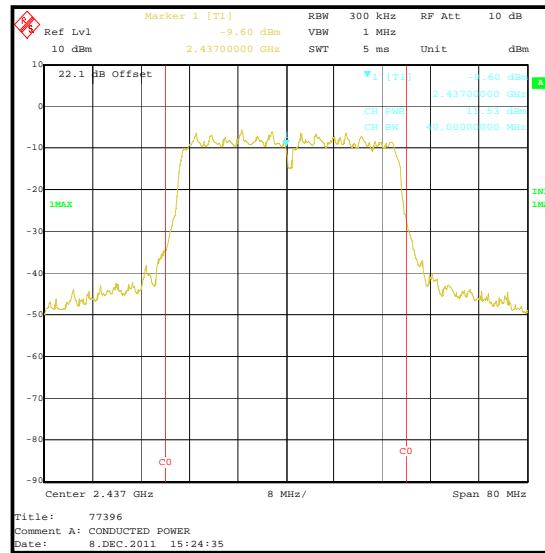
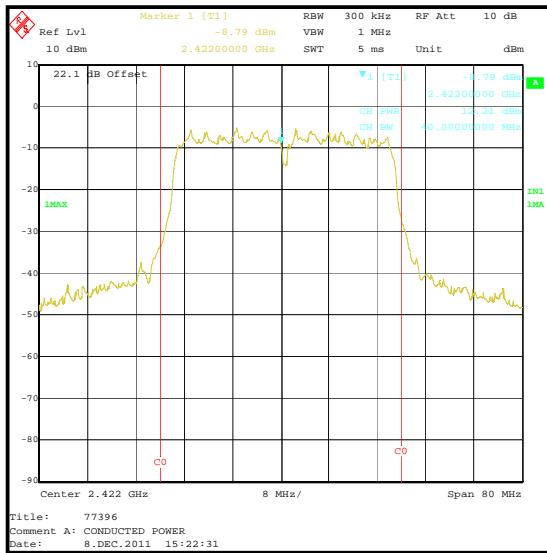
Transmitter Maximum Peak Output Power (continued)

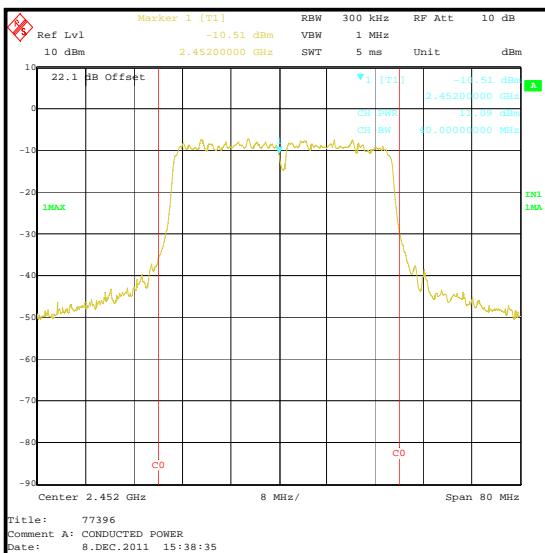
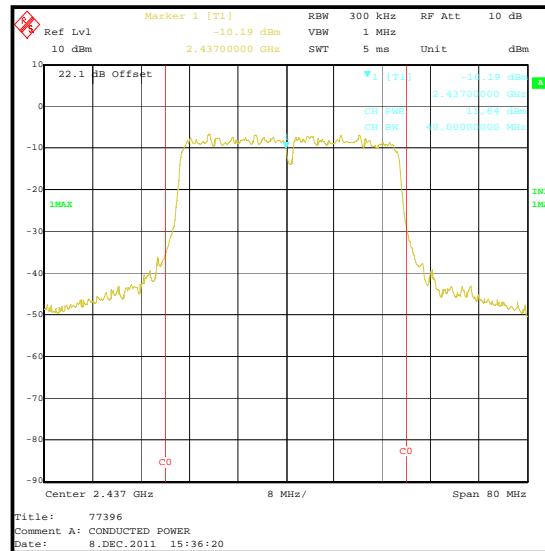
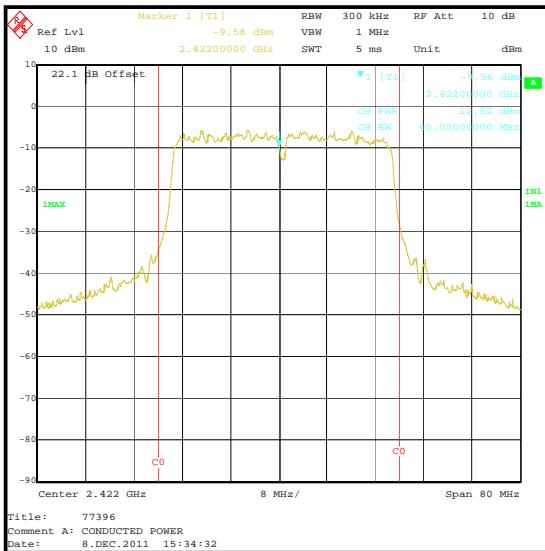
Results: 802.11g / 48 Mbps

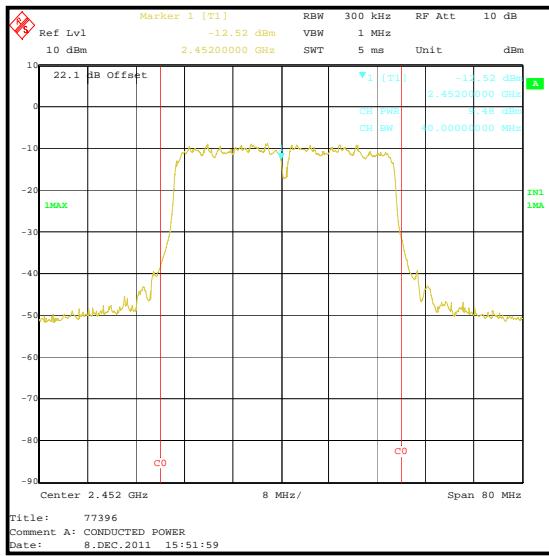
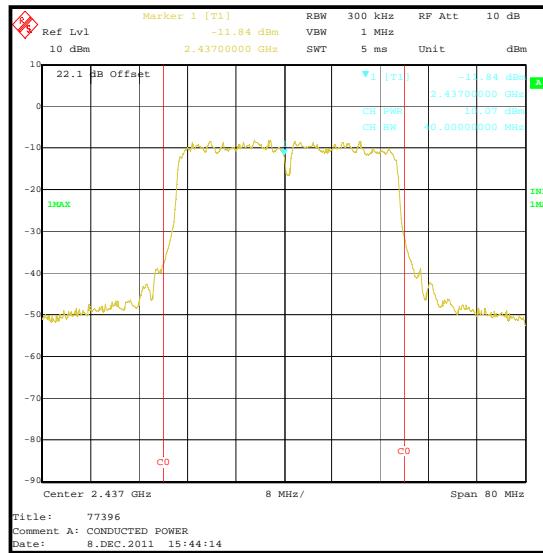
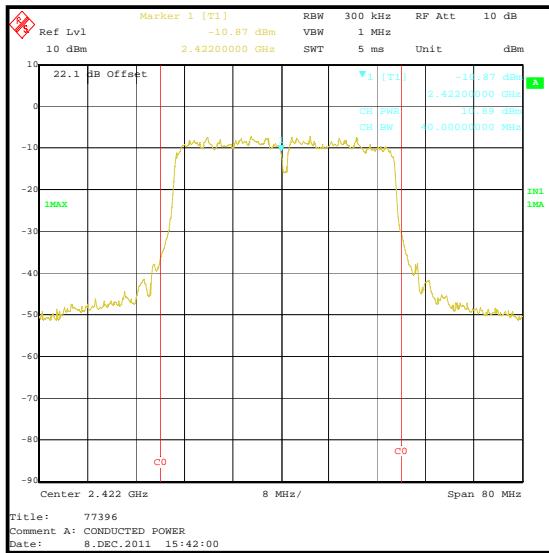


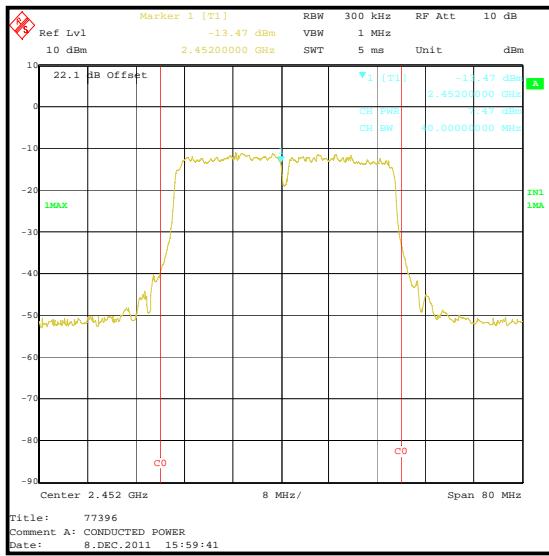
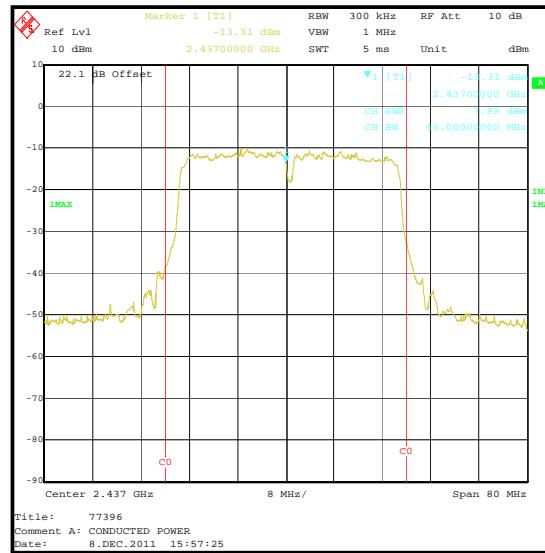
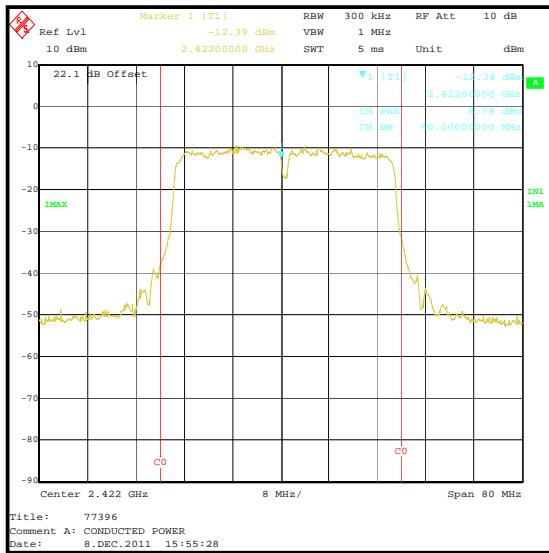
Transmitter Maximum Peak Output Power (continued)**Results: 802.11n / 21.7 Mbps**

Transmitter Maximum Peak Output Power (continued)**Results: 802.11n / 20 MHz / 72.2 Mbps**

Transmitter Maximum Peak Output Power (continued)**Results: 802.11n / 40 MHz / 15 Mbps**

Transmitter Maximum Peak Output Power (continued)**Results: 802.11n / 40 MHz / 45 Mbps**

Transmitter Maximum Peak Output Power (continued)**Results: 802.11n / 40 MHz / 90 Mbps**

Transmitter Maximum Peak Output Power (continued)**Results: 802.11n / 40 MHz / 150 Mbps**

5.2.8. Transmitter Radiated Emissions**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	04 November 2010
Test Sample Serial No:	00064cf8		

FCC Reference:	Part 15.247(d) / 15.209(a)
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:

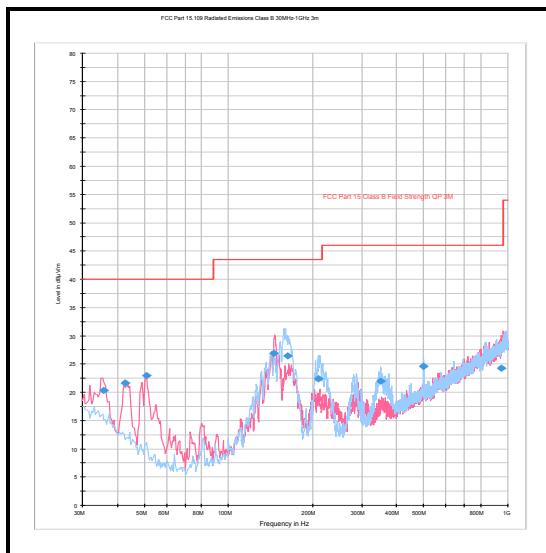
Temperature (°C):	27
Relative Humidity (%):	30

Results: 802.11n / 11 Mbps / 20 MHz Channel / Top Channel

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
35.724	Vertical	20.3	40.0	19.7	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 Radiated Emissions (continued)

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

Transmitter Radiated Emissions (continued)**Test Summary:**

Test Engineer:	Andrew Edwards	Test Dates:	04 November 2010 & 30 December 2010
Test Sample Serial No:	00064cf8		

FCC Reference:	15.247(d) & 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 25 GHz

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	28

Results: 802.11b / 11 Mbps / Peak Bottom Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4825.385	Vertical	53.9	74.0	20.1	Complied

Results: 802.11b / 11 Mbps / Average Bottom Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4825.385	Vertical	41.1	54.0	12.9	Complied

Results: 802.11b / 11 Mbps / Peak Middle Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4875.481	Vertical	54.3	74.0	19.7	Complied

Results: 802.11b / 11 Mbps / Average Middle Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4875.481	Vertical	39.8	54.0	14.2	Complied

Results: 802.11b / 11 Mbps / Peak Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4925.641	Vertical	52.6	74.0	21.4	Complied

Results: 802.11b / 11 Mbps / Average Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4925.641	Vertical	38.9	54.0	15.1	Complied

Transmitter Radiated Emissions (continued)**Results: 802.11g / 6 Mbps / Peak Bottom Channel**

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4827.885	Vertical	55.8	74.0	18.2	Complied

Results: 802.11g / 6 Mbps / Average Bottom Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4827.885	Vertical	40.3	54.0	13.7	Complied

Results: 802.11g / 6 Mbps / Peak Middle Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4876.121	Vertical	55.1	74.0	18.9	Complied

Results: 802.11g / 6 Mbps / Average Middle Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4876.121	Vertical	37.1	54.0	16.9	Complied

Results: 802.11g / 6 Mbps / Peak Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4921.554	Vertical	53.1	74.0	20.9	Complied

Results: 802.11g / 6 Mbps / Average Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4921.554	Vertical	38.2	54.0	15.8	Complied

Transmitter Radiated Emissions (continued)**Results: 802.11n / 21.7 Mbps / 20 MHz Channel / Peak Bottom Channel**

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4827.484	Vertical	54.3	74.0	19.7	Complied

Results: 802.11n / 21.7 Mbps / 20 MHz Channel / Average Bottom Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4827.484	Vertical	38.5	54.0	15.5	Complied

Results: 802.11n / 21.7 Mbps / 20 MHz Channel / Peak Middle Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4877.965	Vertical	55.3	74.0	18.7	Complied

Results: 802.11n / 21.7 Mbps / 20 MHz Channel / Average Middle Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4877.965	Vertical	40.4	54.0	13.6	Complied

Results: 802.11n / 21.7 Mbps / 20 MHz Channel / Peak Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4927.724	Vertical	55.2	74.0	18.8	Complied

Results: 802.11n / 21.7 Mbps / 20 MHz Channel / Average Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4927.724	Vertical	39.6	54.0	14.4	Complied

Transmitter Radiated Emissions (continued)**Results: 802.11n / 54 Mbps / 40 MHz Channel / Peak Bottom Channel**

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4846.603	Vertical	54.9	74.0	19.1	Complied

Results: 802.11n / 54 Mbps / 40 MHz Channel / Average Bottom Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4846.603	Vertical	38.6	54.0	15.4	Complied

Results: 802.11n / 54 Mbps / 40 MHz Channel / Peak Middle Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4876.683	Vertical	54.3	74.0	19.7	Complied

Results: 802.11n / 54 Mbps / 40 MHz Channel / Average Middle Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4876.683	Vertical	39.3	54.0	14.7	Complied

Results: 802.11n / 54 Mbps / 40 MHz Channel / Peak Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4908.446	Vertical	53.2	74.0	20.8	Complied

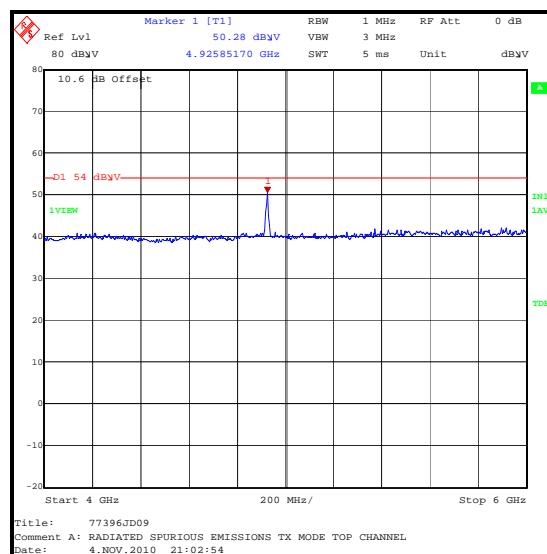
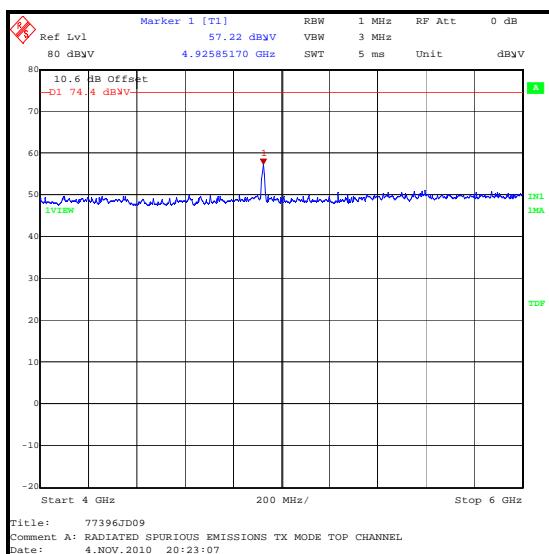
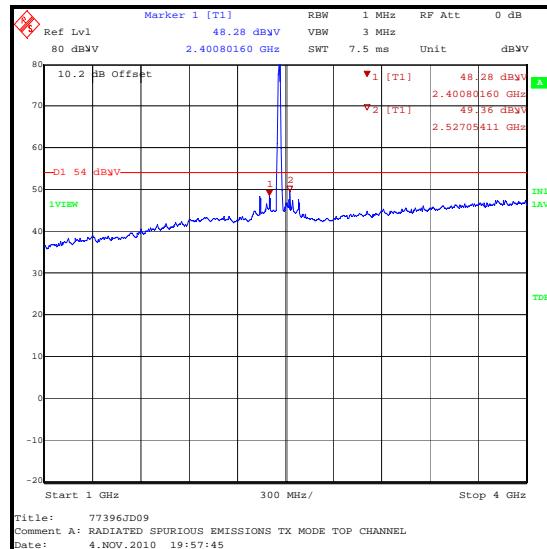
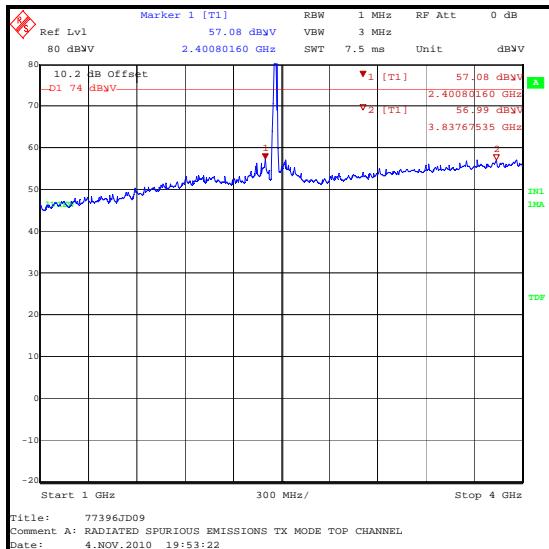
Results: 802.11n / 54 Mbps / 40 MHz Channel / Average Top Channel

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
4908.446	Vertical	38.3	54.0	15.7	Complied

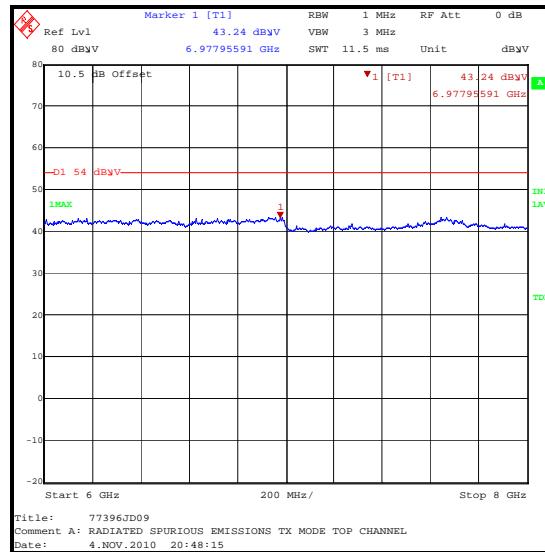
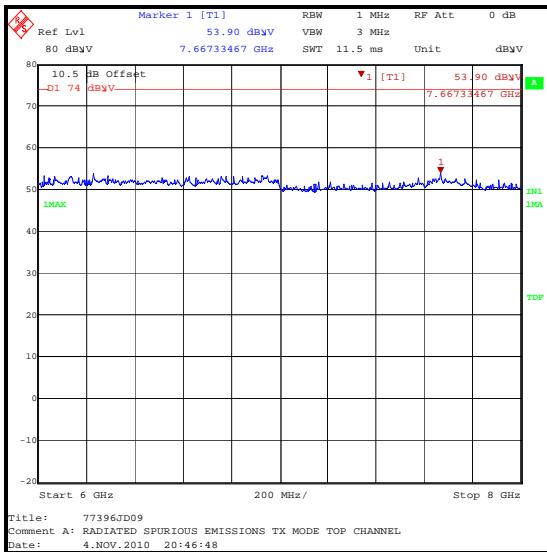
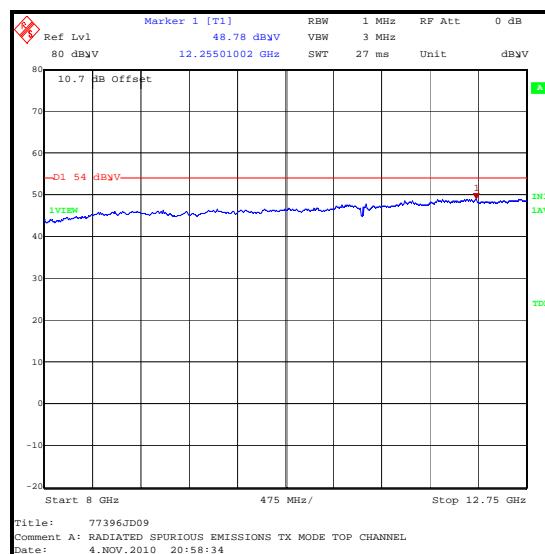
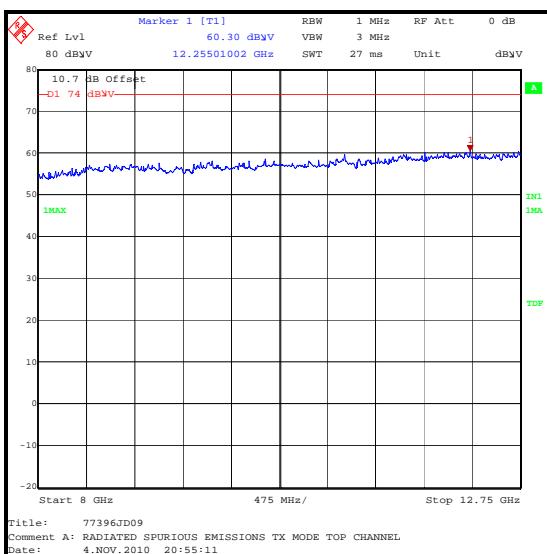
Note(s):

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. The emission shown at 2462 MHz on the 1 GHz to 4 GHz plot is the EUT fundamental.
4. 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.

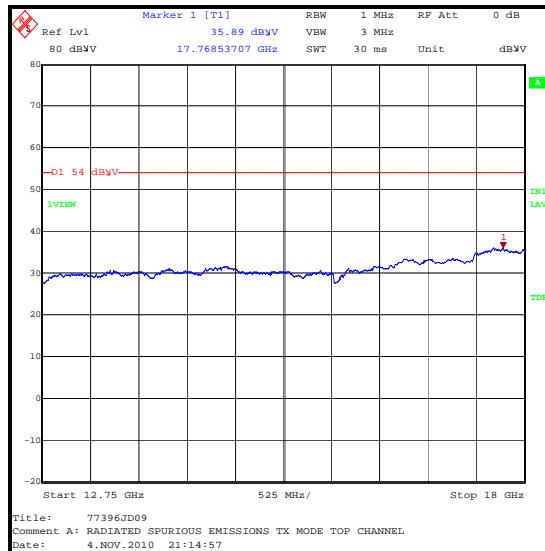
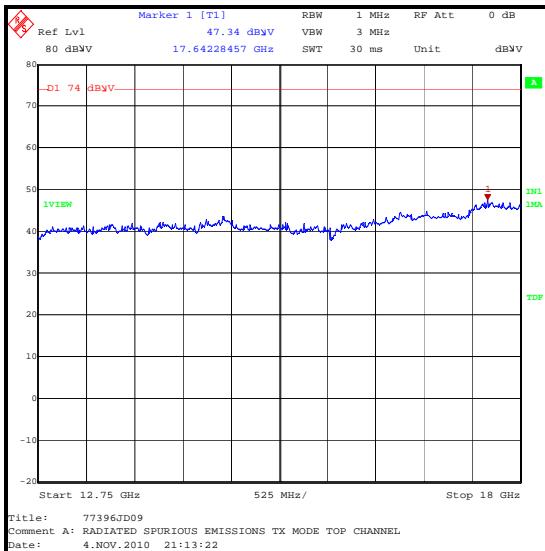
Transmitter Radiated Emissions (continued)



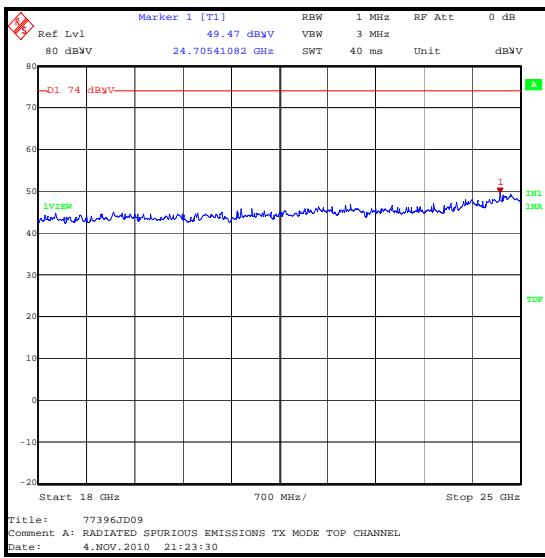
Transmitter Radiated Emissions (continued)

**Peak Detector****Average Detector****Peak Detector****Average Detector**

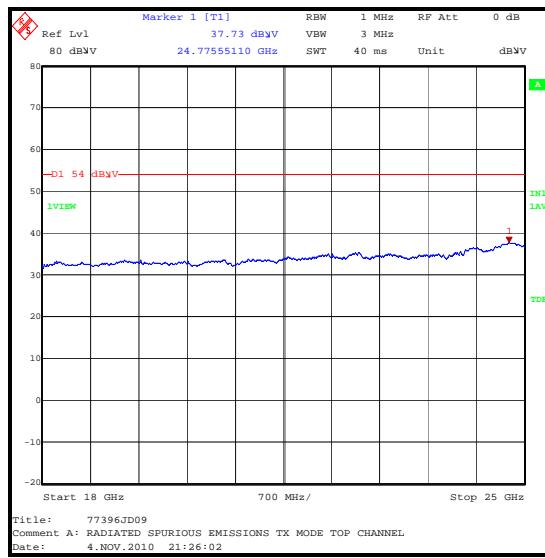
Transmitter Radiated Emissions (continued)



Peak Detector



Peak Detector



Average Detector

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

5.2.9. Transmitter Band Edge Radiated Emissions**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	12 December 2011
Test Sample Serial No:	00064cf8		

FCC Reference:	Part 15.247(d) / 15.209(a)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.2

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	23

Results: 802.11b / Peak / 1 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400	53.0	75.4*	22.4	Complied
2483.5	62.0	74.0	12.0	Complied

Results: 802.11b / Average / 1 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	48.4	54.0	5.6	Complied

Results: 802.11b / Peak / 11 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400	55.6	75.9*	20.3	Complied
2483.5	61.7	74.0	12.3	Complied

Results: 802.11b / Average / 11 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	48.4	54.0	5.6	Complied

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11g / Peak / 9 Mbps**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400	56.8	73.3*	16.5	Complied
2483.5	62.4	74.0	11.6	Complied

Results: 802.11g / Average / 9 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	48.5	54.0	5.5	Complied

Results: 802.11g / Peak / 48 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400	53.6	70.4*	16.8	Complied
2483.5	61.3	74.0	12.7	Complied

Results: 802.11g / Average / 48 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	48.0	54.0	6.0	Complied

Results: 802.11g / Peak / 21.7 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400	55.1	79.2*	24.1	Complied
2483.5	63.3	74.0	10.7	Complied

Results: 802.11g / Average / 21.7 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	49.0	54.0	5.0	Complied

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11n / Peak / 20 MHz / 72.2 Mbps**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400	52.2	69.5*	17.3	Complied
2483.5	61.6	74.0	12.4	Complied

Results: 802.11n / Average / 20MHz / 72.2 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	48.0	54.0	6.0	Complied

Results: 802.11n / Peak / 40 MHz / 15 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400	56.0	70.2*	14.2	Complied
2483.5	63.4	74.0	10.6	Complied

Results: 802.11n / Average / 40 MHz / 15 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	50.1	54.0	3.9	Complied

Results: 802.11n / Peak / 40 MHz / 45 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400	56.0	69.2*	13.2	Complied
2483.5	64.5	74.0	9.5	Complied

Results: 802.11n / Average / 40 MHz / 45 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	50.9	54.0	3.1	Complied

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11n / Peak / 40 MHz / 90 Mbps**

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400	54.3	69.1*	14.8	Complied
2483.5	62.6	74.0	11.4	Complied

Results: 802.11n / Average / 40 MHz / 90 Mbps

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	48.7	54.0	5.3	Complied

Results: 802.11n / Peak / 40 MHz / 150 Mbps

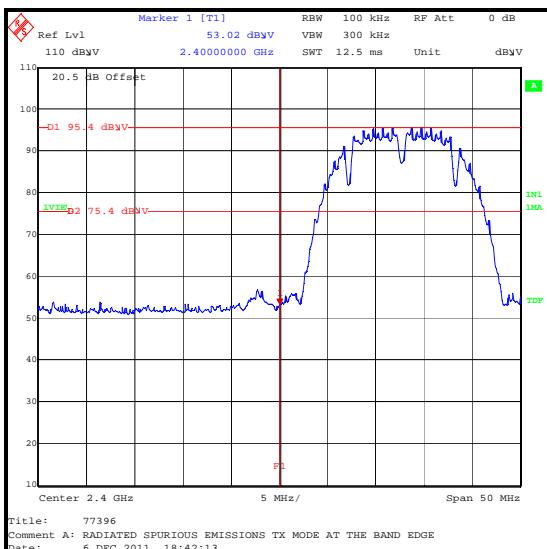
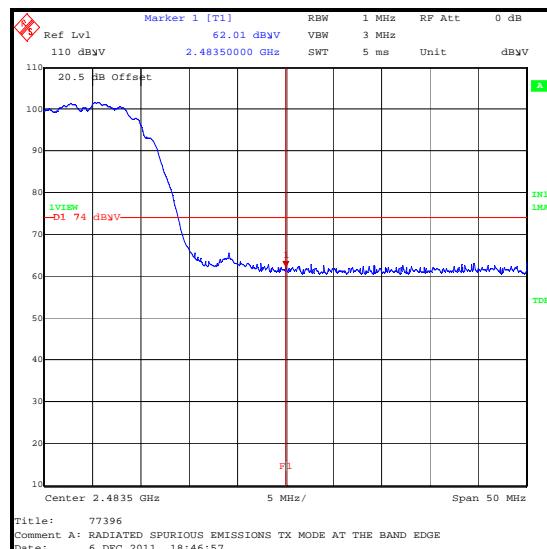
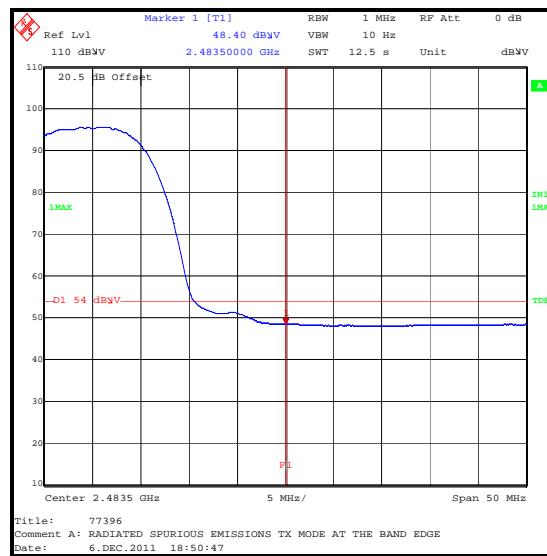
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400	52.9	66.9*	14.0	Complied
2483.5	60.9	74.0	13.1	Complied

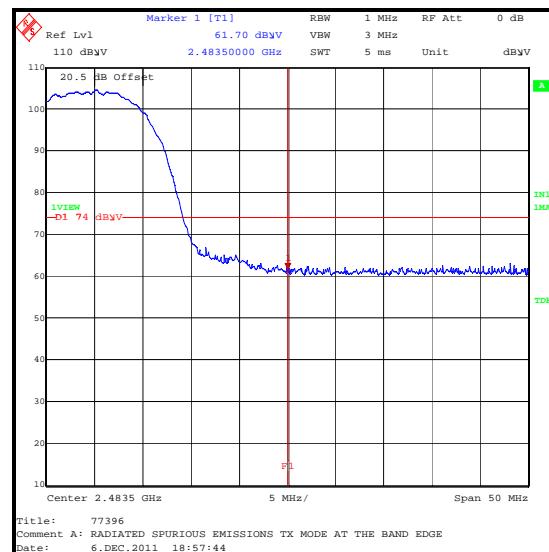
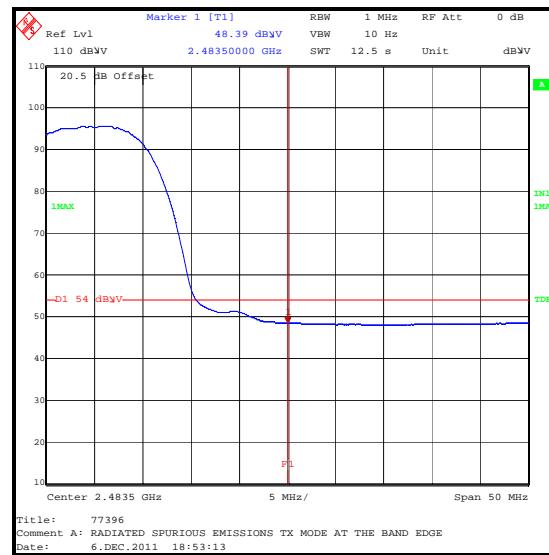
Results: 802.11n / Average / 40 MHz / 150 Mbps

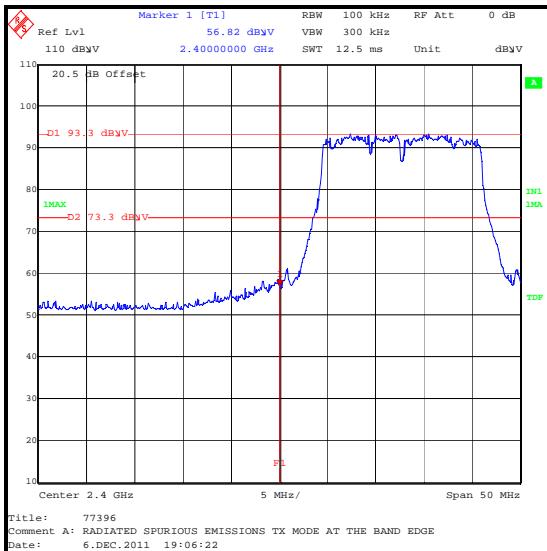
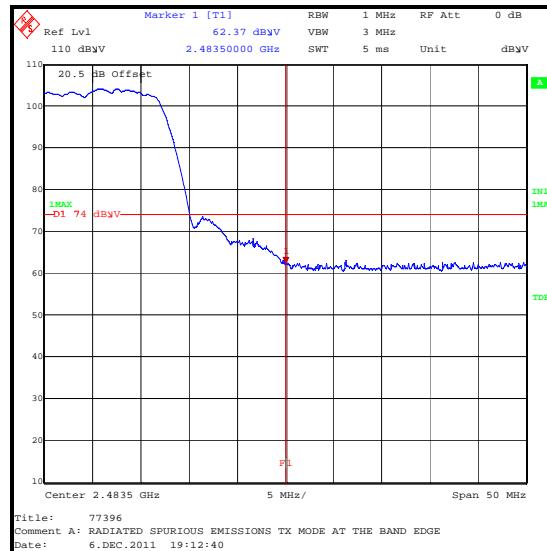
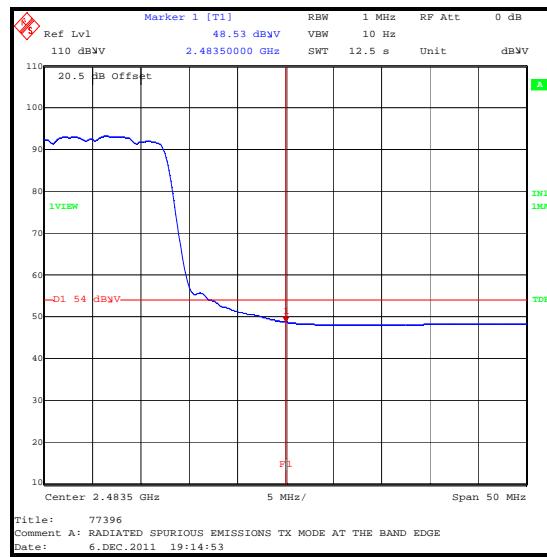
Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	48.2	54.0	5.8	Complied

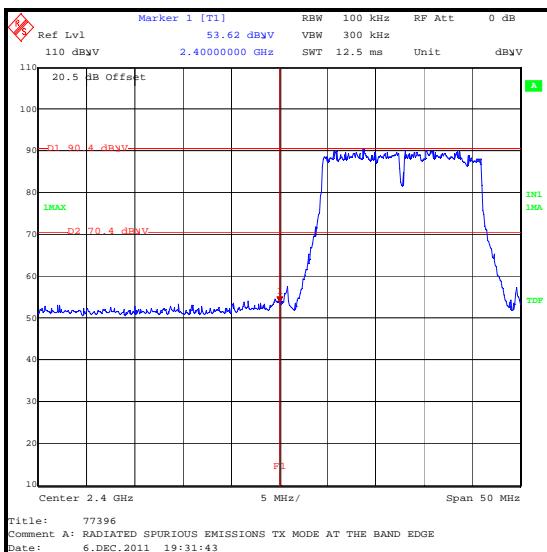
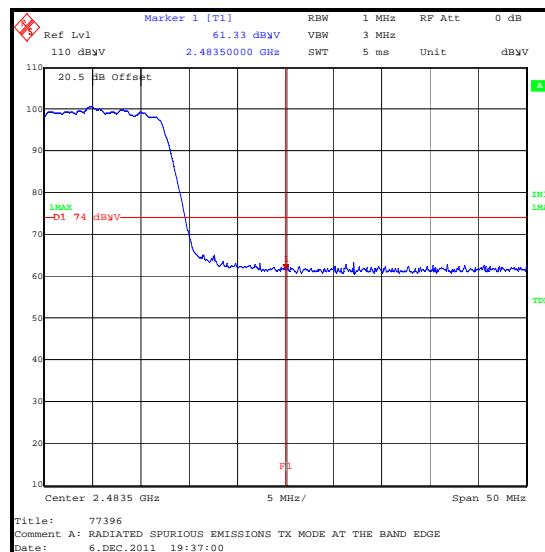
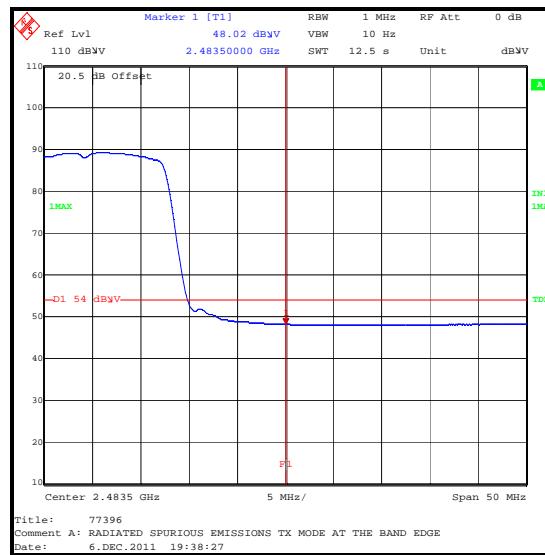
Note(s):

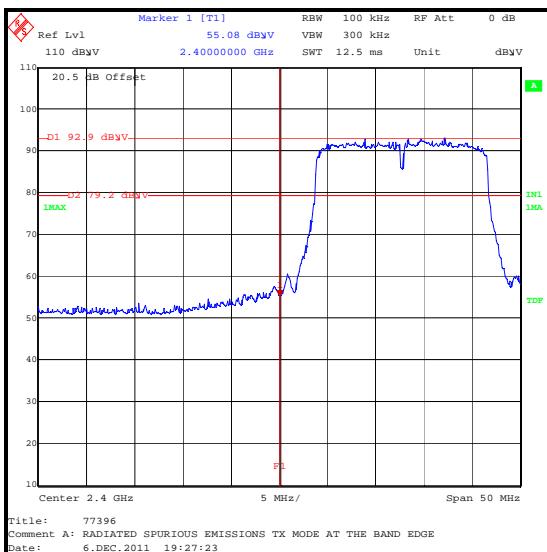
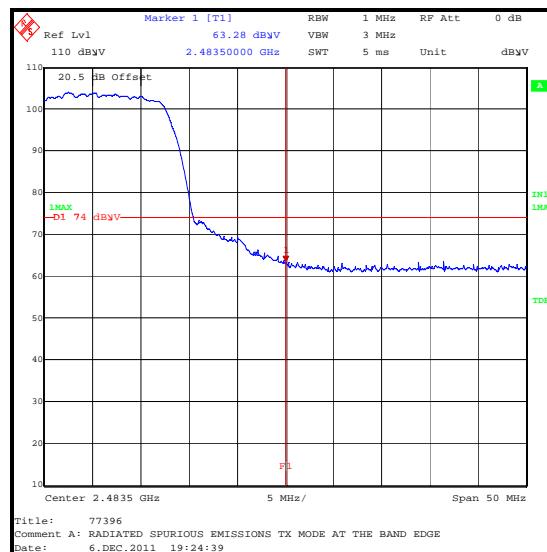
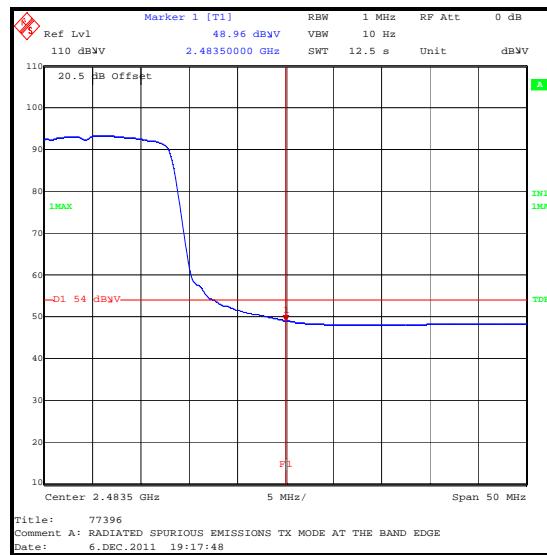
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. *-20 dBc limit.
3. The highest data rate for each supported modulation type and channel width was tested.

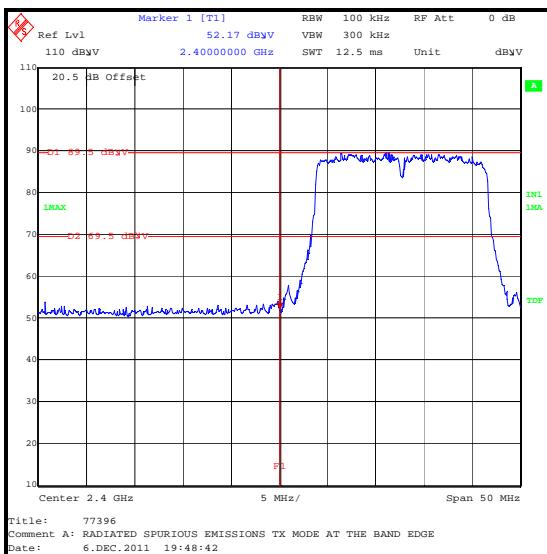
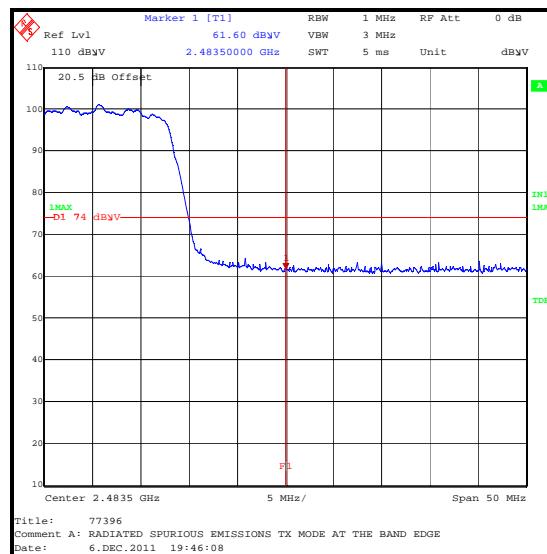
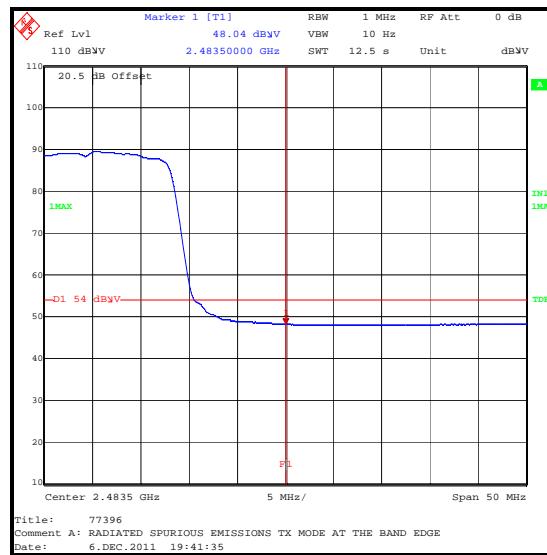
Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11b / 1 Mbps****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Upper Band Edge Average Measurement**

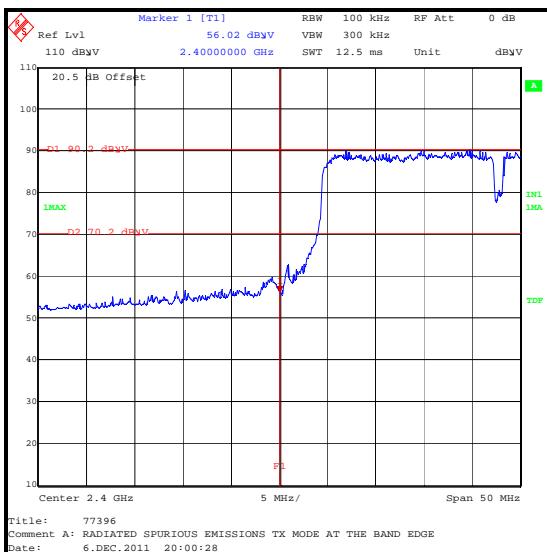
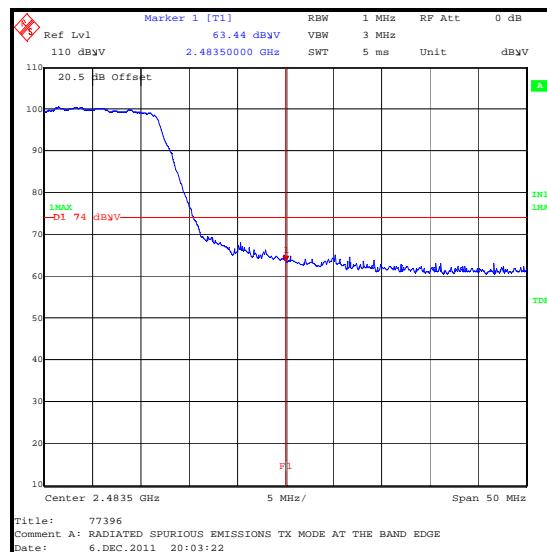
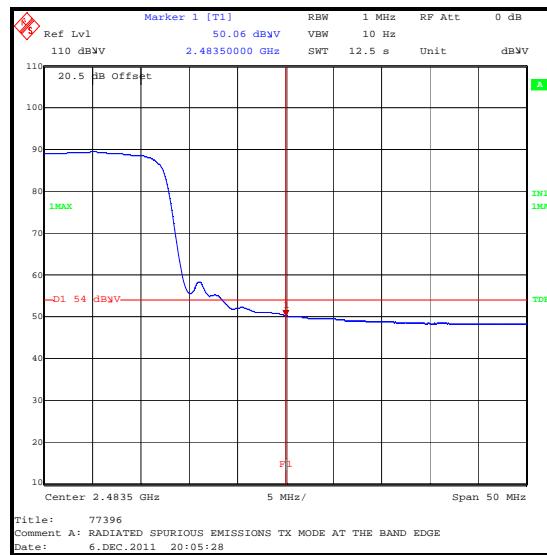
Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11b / 11 Mbps****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Upper Band Edge Average Measurement**

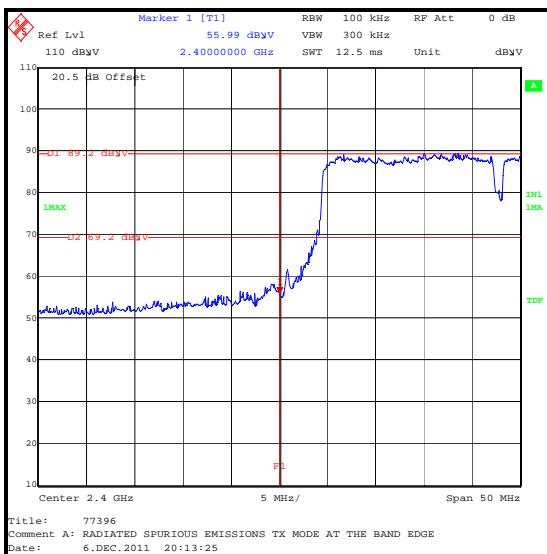
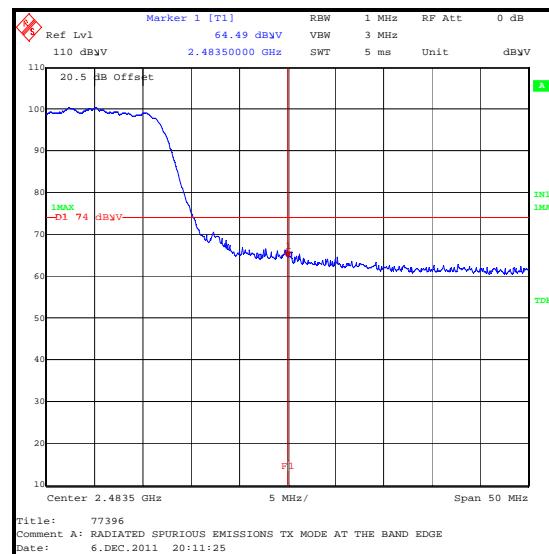
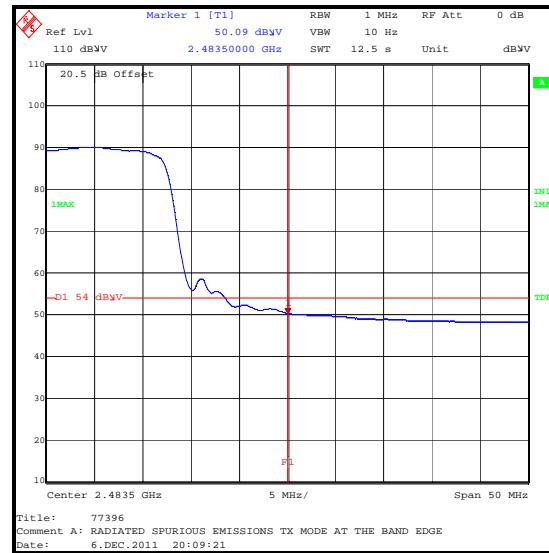
Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11g / 9 Mbps****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Upper Band Edge Average Measurement**

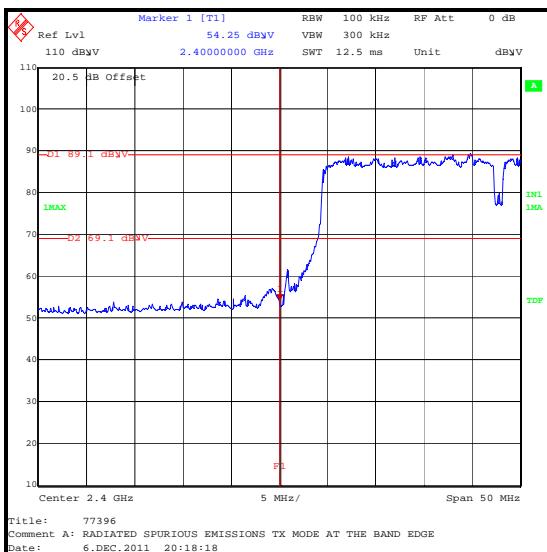
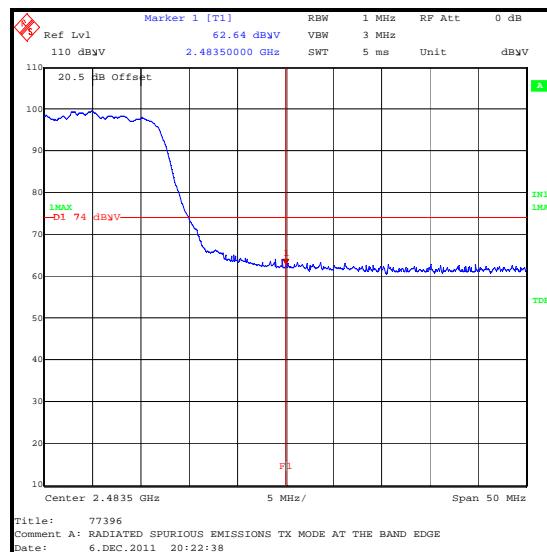
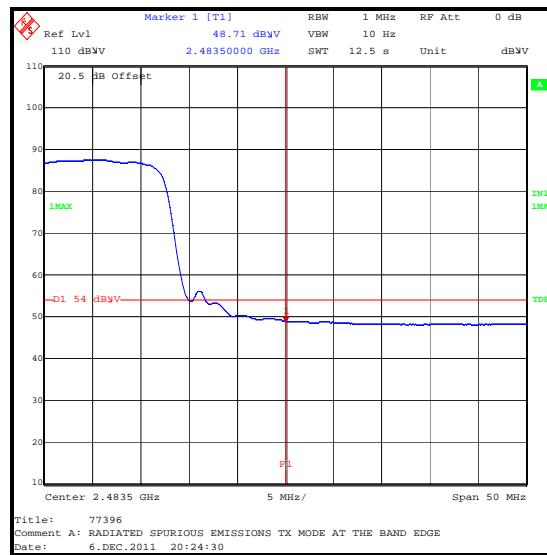
Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11g / 48 Mbps****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Upper Band Edge Average Measurement**

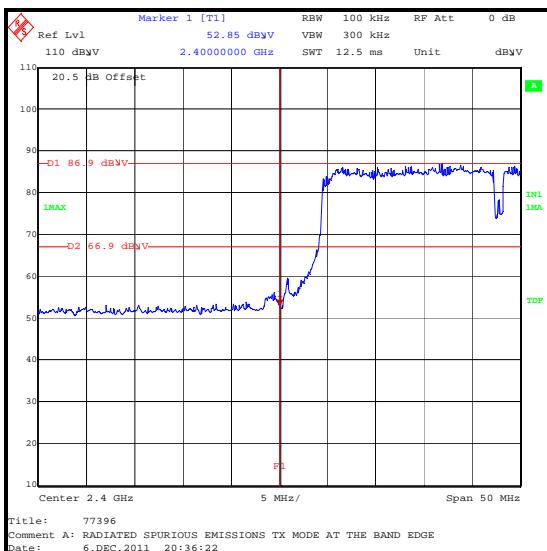
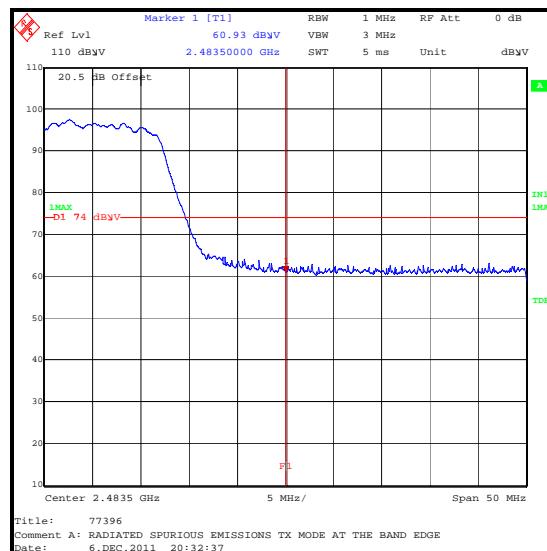
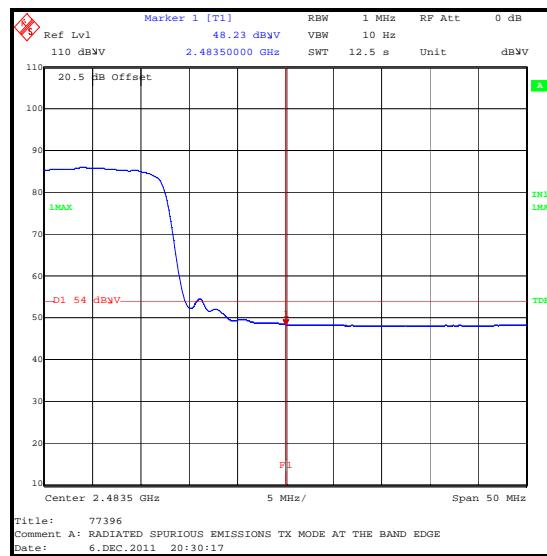
Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11n / 20 MHz / 21.7 Mbps****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Upper Band Edge Average Measurement**

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11n / 20 MHz / 72.2 Mbps****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Upper Band Edge Average Measurement**

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11n / 40 MHz / 15 Mbps****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Upper Band Edge Average Measurement**

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11n / 40 MHz / 45 Mbps****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Upper Band Edge Average Measurement**

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11n / 40 MHz / 90 Mbps****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Upper Band Edge Average Measurement**

Transmitter Band Edge Radiated Emissions (continued)**Results: 802.11n / 40 MHz / 150 Mbps****Lower Band Edge Peak Measurement****Upper Band Edge Peak Measurement****Upper Band Edge Average Measurement**

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 measured (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
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
Conducted Maximum Peak Output Power	2.4 GHz to 2.4835 GHz	95%	±0.27 dB
Spectral Power Density	2.4 GHz to 2.4835 GHz	95%	±2.94 dB
Occupied Bandwidth	2.4 GHz to 2.4835 GHz	95%	±0.92 ppm
Radiated Spurious Emissions	30 MHz to 26.5 GHz	95%	±2.94 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 (Month)
A1393	Attenuator	Huber & Suhner	757456	6820.17.B	08 Jul 2012	12
A1396	Attenuator	Huber & Suhner	757987	6810.17.B	08 Jul 2012	12
A239	Attenuator	Huber & Suhner		6806-17-B	22 Nov 2012	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	20 Jun 2012	12
A1818	Antenna	EMCO	3115	00075692	09 Oct 2012	12
A1830	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100668	05 Mar 2012	12
A1834	Attenuator	Hewlett Packard	8491B	10444	26 Jul 2012	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	29 Dec 2011	12
A1998	Attenuator	Huber & Suhner	6820.17.B	07101	09 Feb 2012	12
A253	Antenna	Flann	12240-20	128	09 Oct 2012	12
A254	Antenna	Flann	14240-20	139	09 Oct 2012	12
A255	Antenna	Flann	16240-20	519	09 Oct 2012	12
A256	Antenna	Flann	18240-20	400	09 Oct 2012	12
A436	Antenna	Flann	20240-20	330	09 Oct 2012	12
A553	Antenna	Chase	CBL6111A	1593	26 Mar 2012	12
A649	LISN	Rohde & Schwarz	ESH3-Z5	825562/008	05 Apr 2012	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	29 May 2012	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	09 Oct 2012	12
L1001	Test Receiver	Rohde & Schwarz	ESU26	100239	17 Mar 2012	12
L1041	Test Receiver	Rohde & Schwarz	ESIB26	10887490	27 Sep 2012	24
M1124	Spectrum Analyser	Rohde & Schwarz	ESI26	100046K	29 Jun 2012	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	13 Jul 2012	12

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