



# TEST REPORT

**Test Report No. : UL-RPT-RP87285JD18A V2.0**

**Manufacturer** : Bang & Olufsen a/s  
**Model No.** : PlayMaker  
**FCC ID** : TTUPLAYMAKER  
**IC Certification No.** : 3775B-PLAYMAKER  
**Test Standard(s)** : FCC Parts 15.107(a), 15.109, 15.207, 15.209(a), 15.247(a)(2), 15.247(b)(3), 15.247(d) & 15.247(e), Industry Canada RSS-210 Issue 8 December 2010 A8.2(a), A8.2(b), A8.4(4) & A8.5, & RSS-Gen Issue 3 December 2010 4.6.1, 4.6.2, 4.8, 4.9, 4.10 & 7.2.4

1. This test report shall not be reproduced in full or partial, without the written approval of RFI Global Services Ltd trading as UL.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 2.0 supersedes all previous versions.

**Date of Issue:** 12 November 2012

**Checked by:**

Sarah Williams  
WiSE Laboratory Engineer

**Issued by :**

  
pp

John Newell  
Group Quality Manager, WiSE  
Basingstoke,  
UL Verification Services



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

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**1. Customer Information**












<b>Company Name:</b>	Bang & Olufsen a/s
<b>Address:</b>	Peter Bands Vej 15 7600 Struer Denmark

## 2. Summary of Testing

### 2.1. General Information

<b>Specification Reference:</b>	47CFR15.247
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2012: Part 15 Subpart C (Intentional Radiators) - Section 15.247
<b>Specification Reference:</b>	47CFR15.107 and 47CFR15.109
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2012: Part 15 Subpart B (Unintentional Radiators) - Sections 15.107 and 15.109
<b>Specification Reference:</b>	47CFR15.207 and 47CFR15.209
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2012: Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 15.209
<b>Specification Reference:</b>	RSS-Gen Issue 3 December 2010
<b>Specification Title:</b>	General Requirements and Information for the Certification of Radio Apparatus
<b>Specification Reference:</b>	RSS-210 Issue 8 December 2010
<b>Specification Title:</b>	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment.
<b>Site Registration:</b>	FCC: 209735; Industry Canada: 3245B-2
<b>Location of Testing:</b>	RFI Global Services Ltd trading as UL, Wade Road, Basingstoke, Hampshire, RG24 8AH.
<b>Test Dates:</b>	17 May 2012 to 23 October 2012

### 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	
N/A	RSS-Gen 4.6.1	Transmitter 99% Emission 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	
<b>Key to Results</b>			
 = Complied  = Did not comply			

### **2.3. Methods and Procedures**

<b>Reference:</b>	ANSI C63.4 (2009)
<b>Title:</b>	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
<b>Reference:</b>	ANSI C63.10 (2009)
<b>Title:</b>	American National Standard for Testing Unlicensed Wireless Devices
<b>Reference:</b>	KDB 558074 D01 v01 1/18/2012
<b>Title:</b>	Guidance for Performing Compliance Measurements on Digital Transmission System (DTS) devices operating Under §15.247
<b>Reference:</b>	KDB 558074 D01 v02 10/04/2012
<b>Title:</b>	Guidance for Performing Compliance Measurements on Digital Transmission System (DTS) devices operating Under §15.247

### **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)**

<b>Brand Name:</b>	Bang & Olufsen
<b>Model Name or Number:</b>	PlayMaker
<b>Serial Number:</b>	Rev 0
<b>Hardware Version Number:</b>	2161
<b>Software Version Number:</b>	22687549 ( <i>Radiated Sample #1</i> )
<b>FCC ID:</b>	TTUPLAYMAKER
<b>Industry Canada Certification Number:</b>	3775B-PLAYMAKER

<b>Brand Name:</b>	Bang & Olufsen
<b>Model Name or Number:</b>	PlayMaker
<b>Hardware Version</b>	Rev 0
<b>Software Version</b>	2161
<b>Serial Number:</b>	22687586 ( <i>Radiated Sample #2</i> )
<b>FCC ID:</b>	TTUPLAYMAKER
<b>Industry Canada Certification Number:</b>	3775B-PLAYMAKER

<b>Brand Name:</b>	Bang & Olufsen
<b>Model Name or Number:</b>	PlayMaker
<b>Hardware Version</b>	Rev 0
<b>Software Version</b>	2161
<b>Serial Number:</b>	22687533 ( <i>Conducted Sample</i> )
<b>FCC ID:</b>	TTUPLAYMAKER
<b>Industry Canada Certification Number:</b>	3775B-PLAYMAKER

#### **3.2. Description of EUT**

The equipment under test was a wireless music streaming device.

The EUT was powered by a 120 V / 60 Hz power supply.

#### **3.3. Modifications Incorporated in the EUT**

No modifications were applied to the EUT during testing.

**3.4. Additional Information Related to Testing**

<b>Technology Tested:</b>	Digital Transmission System (IEEE 802.11b/g)		
<b>Type of Unit:</b>	Transceiver		
<b>Modulation:</b>	CCK, BPSK, QPSK, 16QAM and 64QAM		
<b>Data Rates:</b>	1, 2, 5.5, 11, 6, 9, 12, 18, 24, 36, 48 and 54 Mbps		
<b>Power Supply Requirement(s):</b>	Nominal	120 VAC 60 Hz	
<b>Maximum Peak Output Power:</b>	21.9 dBm		
<b>Transmit Frequency Range:</b>	2412 MHz to 2462 MHz		
<b>Transmit Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	1	2412
	Middle	6	2437
	Top	11	2462
<b>Receive Frequency Range:</b>	2412 MHz to 2462 MHz		
<b>Receive Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	1	2412
	Middle	6	2437
	Top	11	2462



### **3.5. Support Equipment**

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

<b>Description:</b>	Laptop
<b>Brand Name:</b>	Dell
<b>Model Name or Number:</b>	D610
<b>Serial Number:</b>	RFI Asset No. PC379NT

<b>Description:</b>	Sound boards
<b>Brand Name:</b>	Not stated
<b>Model Name or Number:</b>	2011-11-01_GWA3700-6

<b>Description:</b>	Audio cable (phono to 3.5mm jack cable)
<b>Brand Name:</b>	Not stated
<b>Model Name or Number:</b>	Not stated

<b>Description:</b>	Ethernet cable
<b>Brand Name:</b>	Not stated
<b>Model Name or Number:</b>	Not stated

<b>Description:</b>	USB extension cable
<b>Brand Name:</b>	Not stated
<b>Model Name or Number:</b>	Not stated

## **4. Operation and Monitoring of the EUT during Testing**

### **4.1. Operating Modes**

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

- Receiver/Idle Mode.
- Continuously transmitting at maximum power on the bottom, middle and top channels as required using the supported data rates.

### **4.2. Configuration and Peripherals**

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

- Receive/Idle tests: The 802.11 mode was active but not transmitting.
- Transmitting in test mode with 100% duty cycle and controlled using a bespoke application on a laptop PC using HyperTerminal PC application. The application was used to enable continuous transmit mode and to select the test channels, data rates and modulation schemes as required. The Customer supplied instructions on how to configure the EUT for test purposes.
- The EUT was tested at power settings declared by the Customer as stated below:
  - 802.11b - 9
  - 802.11g - 1
- Transmitter spurious emissions were performed with the EUT transmitting with a data rate of 11 Mbps, as this was found to have the highest power level during pre-test checks and therefore deemed to be worst case.
- Transmitter spurious emissions at the band edge were tested with the highest data rate for each supported modulation type was tested.
- The conducted sample, with serial number 22687533 was used for Idle AC conducted emissions, 6 dB bandwidth, occupied bandwidth, maximum output power and power spectral density tests.
- The radiated sample with serial number 22687586 was used for Transmitter AC conducted emissions, Idle and Transmitter radiated emission < 1 GHz. It was also used for Band Edge emissions.
- The radiated sample with serial number 22687549 was used for all other tests.

## **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:**

<b>Test Engineer:</b>	Nick Steele	<b>Test Date:</b>	15 October 2012
<b>Test Sample Serial Number:</b>	22687533		

<b>FCC Reference:</b>	Part 15.107(a)
<b>Industry Canada Reference:</b>	RSS-Gen 7.2.4
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

**Environmental Conditions:**

<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	35

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

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.186	Live	47.0	64.2	17.2	Complied
0.326	Live	37.1	59.6	22.5	Complied
0.416	Live	30.8	57.5	26.7	Complied
0.749	Live	27.9	56.0	28.1	Complied
0.879	Live	28.5	56.0	27.5	Complied
0.938	Live	27.9	56.0	28.1	Complied
1.892	Live	31.6	56.0	24.4	Complied
1.968	Live	30.3	56.0	25.7	Complied

**Results: Live / Average**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.186	Live	32.9	54.2	21.3	Complied
0.326	Live	31.2	49.6	18.4	Complied
0.416	Live	26.1	47.5	21.4	Complied
0.880	Live	25.5	46.0	20.5	Complied
0.924	Live	23.2	46.0	22.8	Complied
1.761	Live	22.9	46.0	23.1	Complied
1.851	Live	22.3	46.0	23.7	Complied
1.901	Live	23.6	46.0	22.4	Complied
1.905	Live	23.5	46.0	22.5	Complied
1.946	Live	23.3	46.0	22.7	Complied

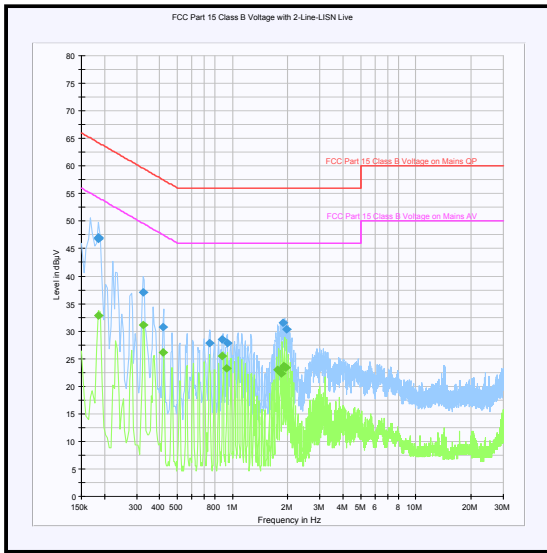
**Receiver/Idle Mode AC Conducted Spurious Emissions (continued)****Results: Neutral / Quasi Peak**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.186	Neutral	41.6	64.2	22.6	Complied
0.326	Neutral	34.7	59.6	24.9	Complied
0.375	Neutral	28.6	58.4	29.8	Complied
0.555	Neutral	25.0	56.0	31.0	Complied
0.753	Neutral	25.2	56.0	30.8	Complied
0.884	Neutral	27.4	56.0	28.6	Complied
1.064	Neutral	27.0	56.0	29.0	Complied
1.761	Neutral	32.5	56.0	23.5	Complied
1.887	Neutral	33.1	56.0	22.9	Complied

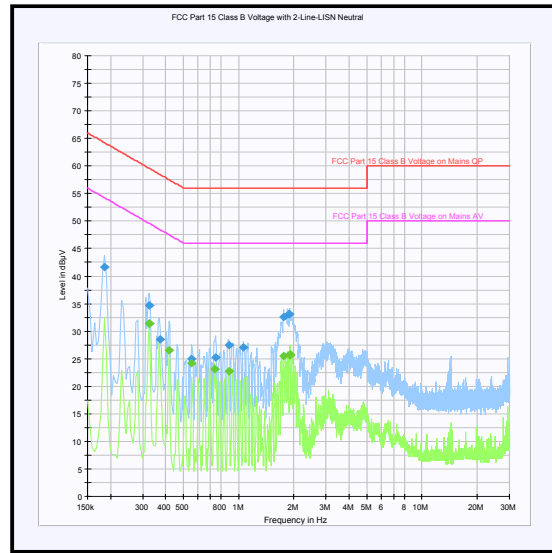
**Results: Neutral / Average**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.326	Neutral	31.4	49.6	18.2	Complied
0.416	Neutral	26.5	47.5	21.0	Complied
0.555	Neutral	24.2	46.0	21.8	Complied
0.744	Neutral	23.1	46.0	22.9	Complied
0.884	Neutral	22.7	46.0	23.3	Complied
1.761	Neutral	25.5	46.0	20.5	Complied
1.896	Neutral	25.8	46.0	20.2	Complied
1.901	Neutral	25.7	46.0	20.3	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:**

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	11 June 2012
<b>Test Sample Serial Number:</b>	22687586		

<b>FCC Reference:</b>	Part 15.109
<b>Industry Canada Reference:</b>	RSS-Gen 4.10/6.1
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
<b>Frequency Range:</b>	30 MHz to 1000 MHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	40

**Results: Quasi Peak**

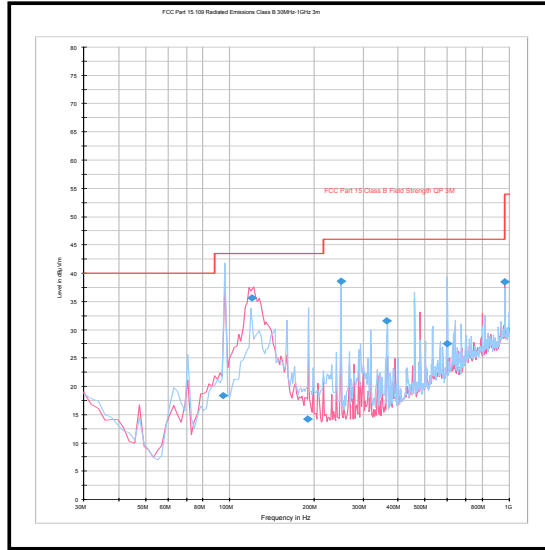
Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
94.317	Horizontal	18.4	43.5	25.1	Complied
119.992	Vertical	35.6	43.5	7.9	Complied
190.463	Horizontal	14.2	43.5	29.3	Complied
249.991	Horizontal	38.6	46.0	7.4	Complied
365.076	Horizontal	31.6	46.0	14.4	Complied
599.987	Horizontal	27.5	46.0	18.5	Complied
959.963	Vertical	38.5	46.0	7.5	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. 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:**

<b>Test Engineer:</b>	Nick Steele	<b>Test Date:</b>	17 May 2012
<b>Test Sample Serial No:</b>	22687549		

<b>FCC Reference:</b>	Part 15.109
<b>Industry Canada Reference:</b>	RSS-Gen 4.10/6.1
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
<b>Frequency Range:</b>	1 GHz to 12.5 GHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	22
<b>Relative Humidity (%):</b>	34

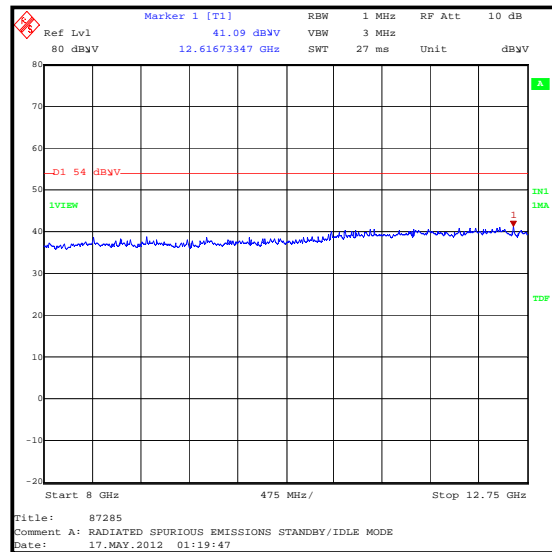
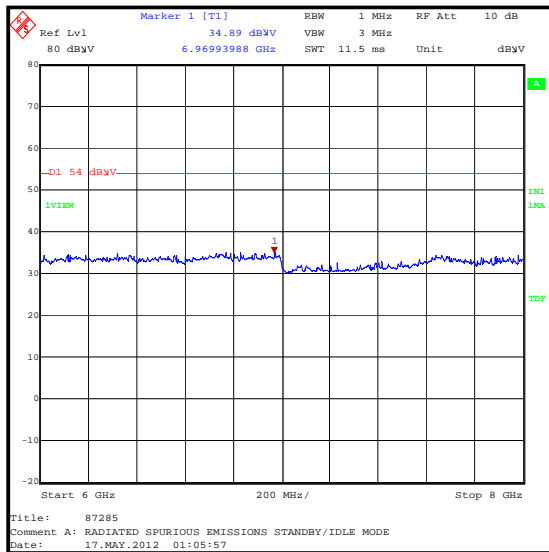
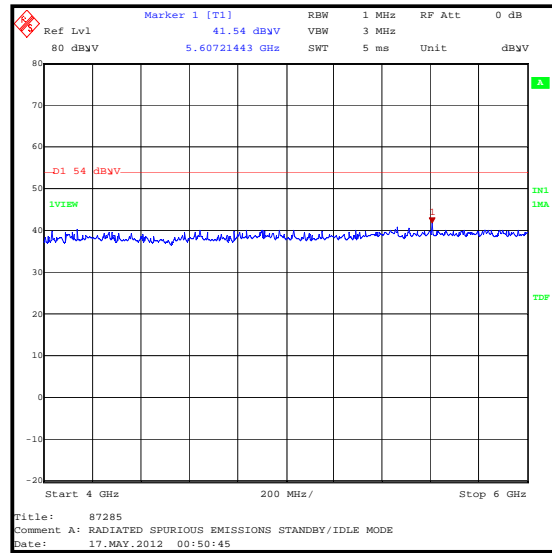
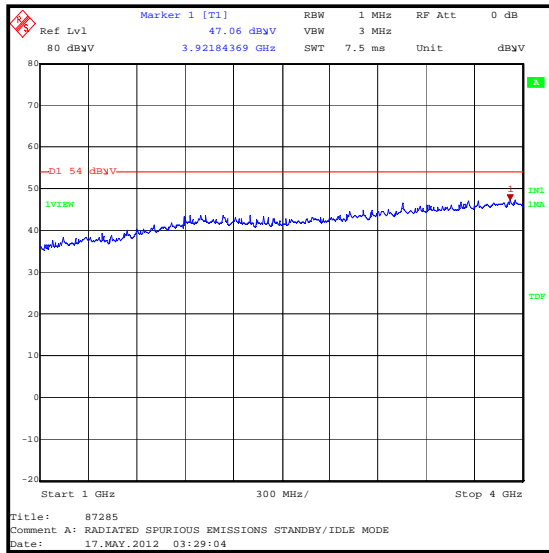
**Results:**

Frequency (MHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
3921.844	Vertical	47.1	54.0	6.9	Complied

**Note(s):**

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



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

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

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	23 October 2012
<b>Test Sample Serial Number:</b>	22687586		

<b>FCC Reference:</b>	Part 15.207
<b>Industry Canada Reference:</b>	RSS-Gen 7.2.4
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

**Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	38

**Results: Live / Quasi Peak**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.186	Live	42.0	64.2	22.2	Complied
0.231	Live	33.7	62.4	28.7	Complied
0.326	Live	36.5	59.6	23.1	Complied
0.371	Live	32.3	58.5	26.2	Complied
0.884	Live	30.5	56.0	25.5	Complied
1.721	Live	37.2	56.0	18.8	Complied

**Results: Live / Average**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.186	Live	28.4	54.2	25.8	Complied
0.326	Live	33.5	49.6	16.1	Complied
0.371	Live	29.8	48.5	18.7	Complied
0.695	Live	26.5	46.0	19.5	Complied
0.744	Live	28.6	46.0	17.4	Complied
1.581	Live	31.1	46.0	14.9	Complied
1.626	Live	31.5	46.0	14.5	Complied
1.766	Live	34.1	46.0	11.9	Complied

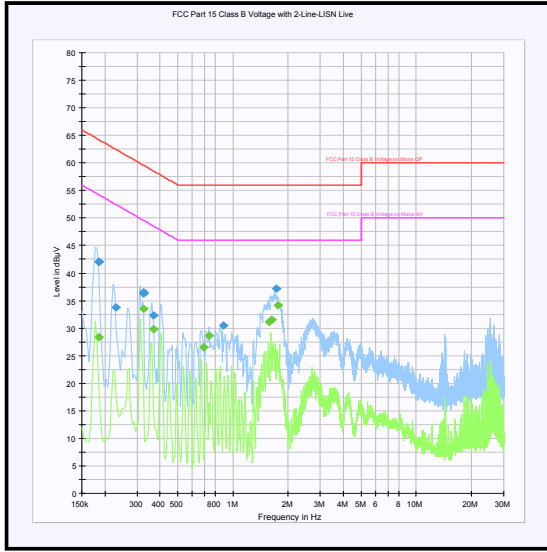
**Transmitter AC Conducted Spurious Emissions (continued)****Results: Neutral / Quasi Peak**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.186	Neutral	40.8	64.2	23.4	Complied
0.326	Neutral	36.9	59.6	22.7	Complied
0.416	Neutral	32.1	57.5	25.4	Complied
0.744	Neutral	32.8	56.0	23.2	Complied
1.064	Neutral	31.6	56.0	24.4	Complied
1.770	Neutral	35.7	56.0	20.3	Complied

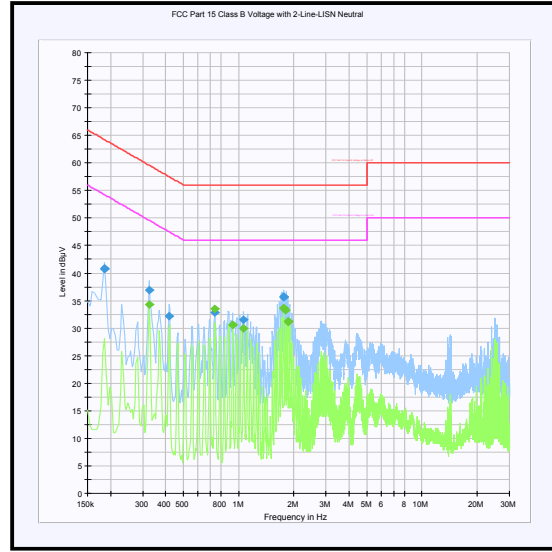
**Results: Neutral / Average**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.326	Neutral	34.3	49.6	15.3	Complied
0.744	Neutral	33.6	46.0	12.4	Complied
0.929	Neutral	30.6	46.0	15.4	Complied
1.068	Neutral	30.0	46.0	16.0	Complied
1.766	Neutral	33.6	46.0	12.4	Complied
1.811	Neutral	33.2	46.0	12.8	Complied
1.860	Neutral	31.3	46.0	14.7	Complied

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



**Live**



**Neutral**

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

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

<b>Test Engineers:</b>	Sandeep Bharat & Andrew Edwards	<b>Test Dates:</b>	11 October 2012 & 12 October 2012
<b>Test Sample Serial Number:</b>	22687533		

<b>FCC Reference:</b>	Part 15.247(a)(2)
<b>Industry Canada Reference:</b>	RSS-Gen 4.6.2, RSS-210 A8.2(a)
<b>Test Method Used:</b>	As detailed in FCC KDB 558074 D01 v02 Section 7.1 Option 1

**Environmental Conditions:**

<b>Temperature (°C):</b>	27
<b>Relative Humidity (%):</b>	35

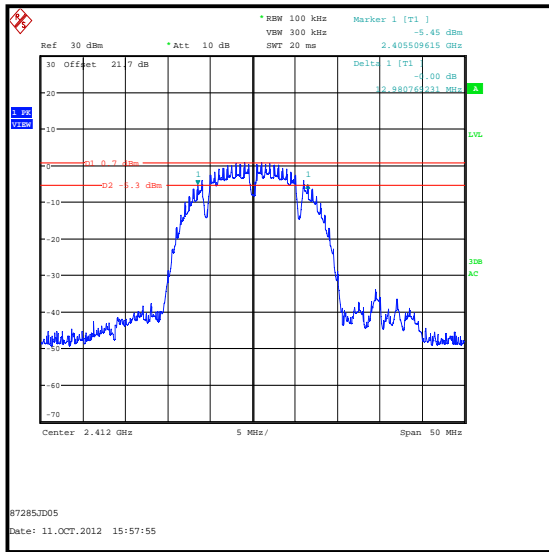
**Note(s):**

1. 6dB channel bandwidth measurements were performed using a spectrum analyser in accordance with KDB 558074 D01 v02 Section 7.1 Option 1, on all supported data rates.

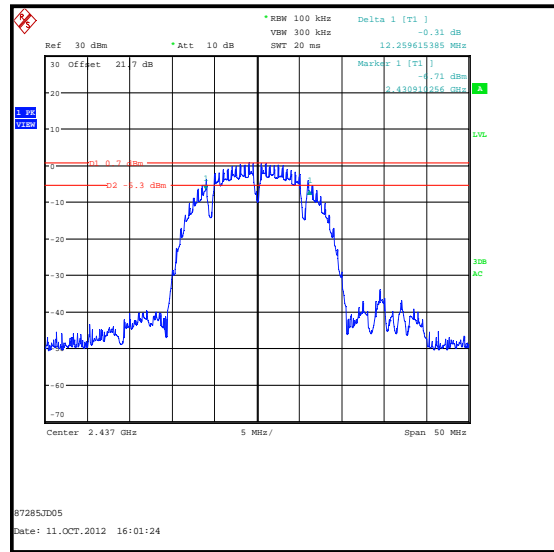
**Transmitter 6 dB Bandwidth (continued)**

**Results: 802.11b / 1 Mbps**

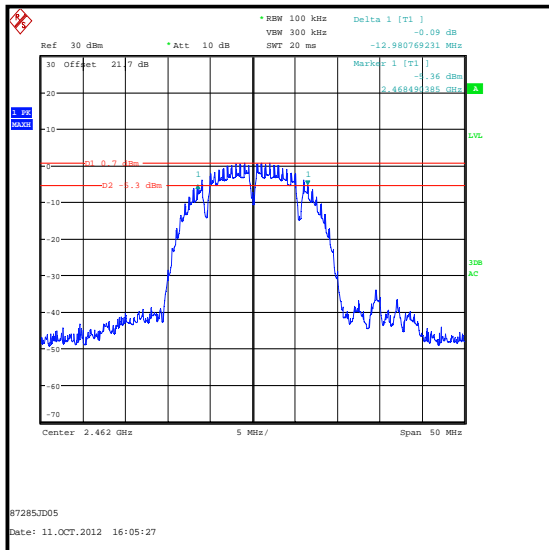
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	12.981	≥0.5	12.481	Complied
Middle	12.260	≥0.5	11.760	Complied
Top	12.981	≥0.5	12.481	Complied



**Bottom Channel**



**Middle Channel**



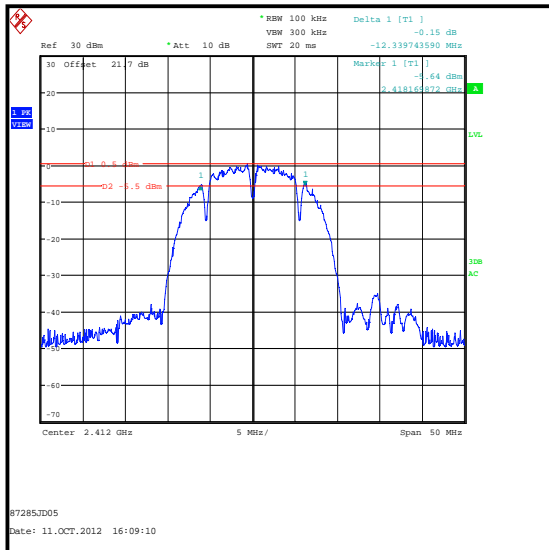
**Top Channel**



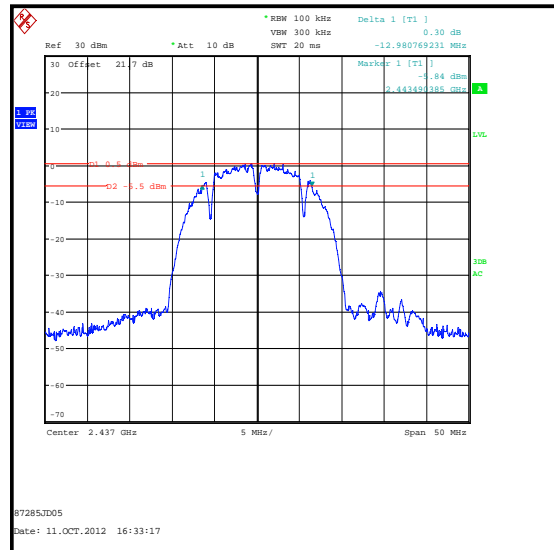
**Transmitter 6 dB Bandwidth (continued)**

**Results: 802.11b / 2 Mbps**

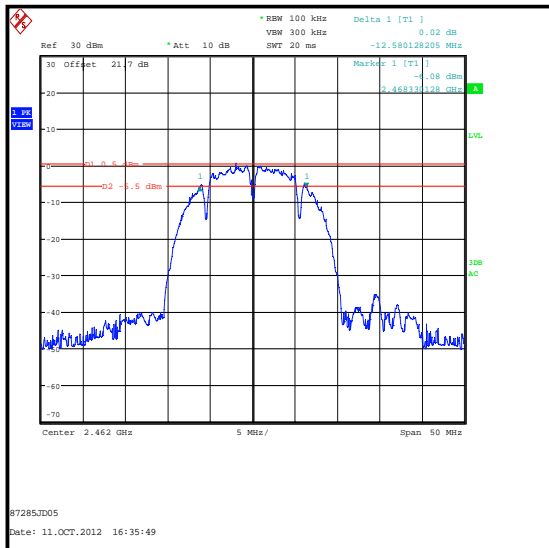
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	12.340	≥0.5	11.840	Complied
Middle	12.981	≥0.5	12.481	Complied
Top	12.580	≥0.5	12.080	Complied



**Bottom Channel**



**Middle Channel**

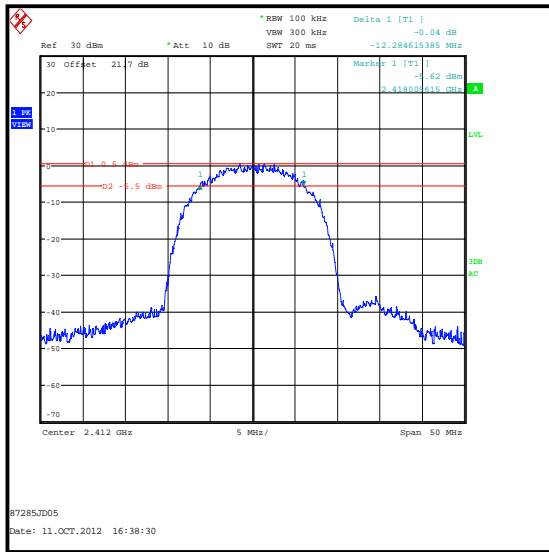


**Top Channel**

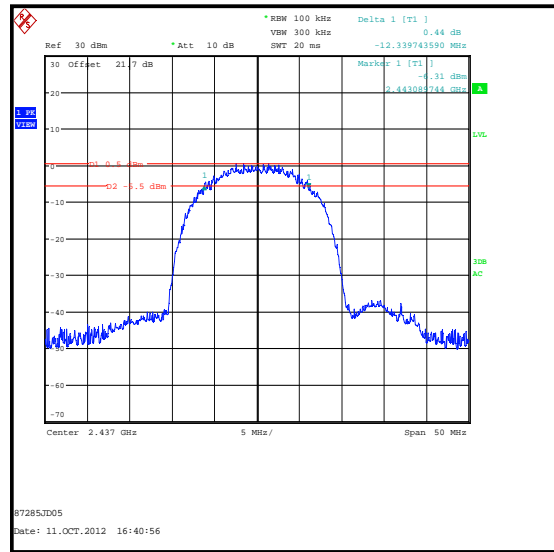
**Transmitter 6 dB Bandwidth (continued)**

**Results: 802.11b / 5.5 Mbps**

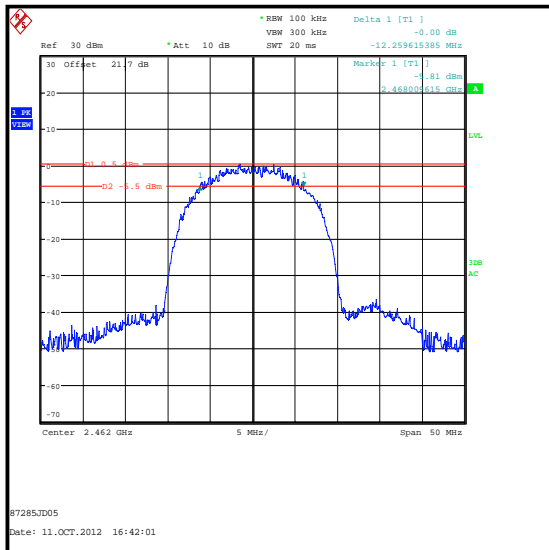
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	12.285	≥0.5	11.785	Complied
Middle	12.340	≥0.5	11.840	Complied
Top	12.260	≥0.5	11.760	Complied



**Bottom Channel**



**Middle Channel**

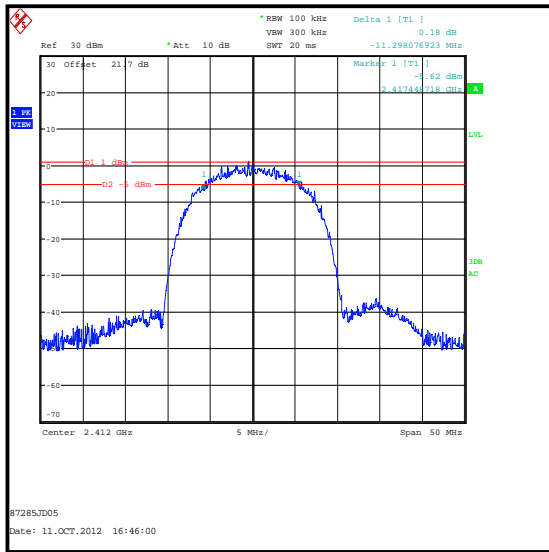


**Top Channel**

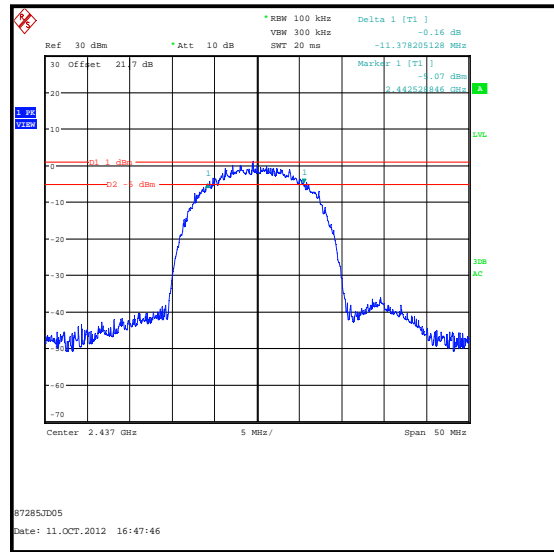
**Transmitter 6 dB Bandwidth (continued)**

**Results: 802.11b / 11 Mbps**

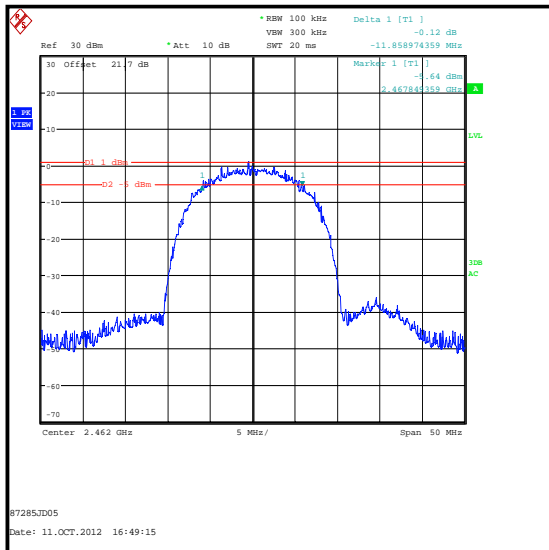
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	11.298	≥0.5	10.798	Complied
Middle	11.378	≥0.5	10.878	Complied
Top	11.859	≥0.5	11.359	Complied



**Bottom Channel**



**Middle Channel**

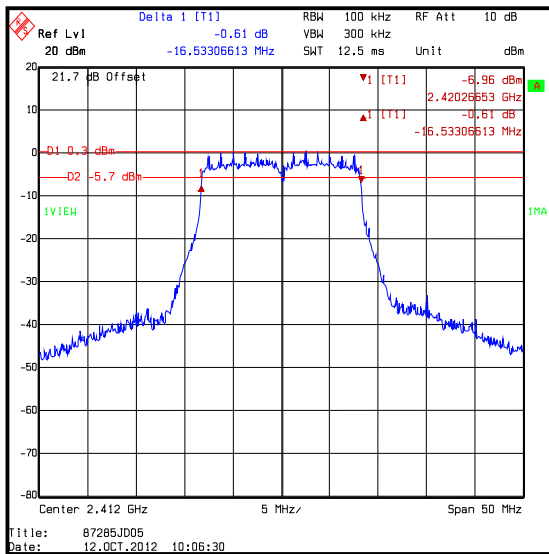


**Top Channel**

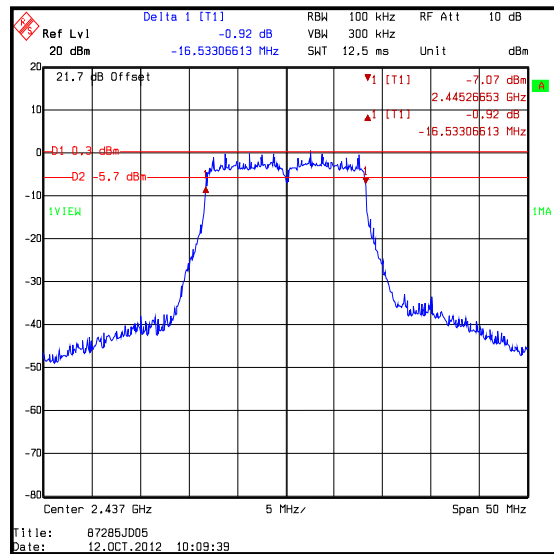
**Transmitter 6 dB Bandwidth (continued)**

**Results: 802.11g / 6 Mbps**

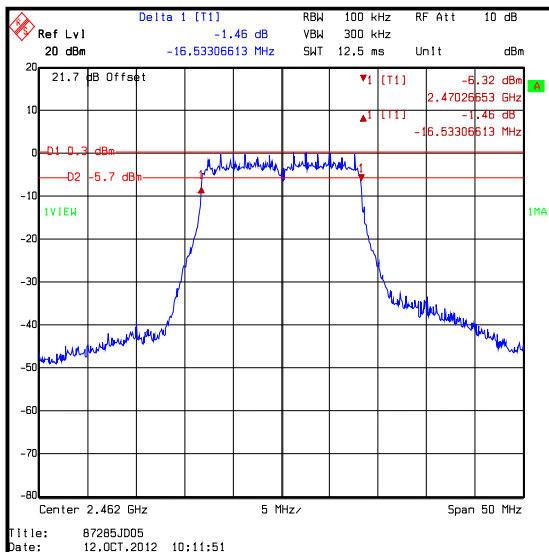
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.533	≥0.5	16.033	Complied
Middle	16.533	≥0.5	16.033	Complied
Top	16.533	≥0.5	16.033	Complied



**Bottom Channel**



**Middle Channel**

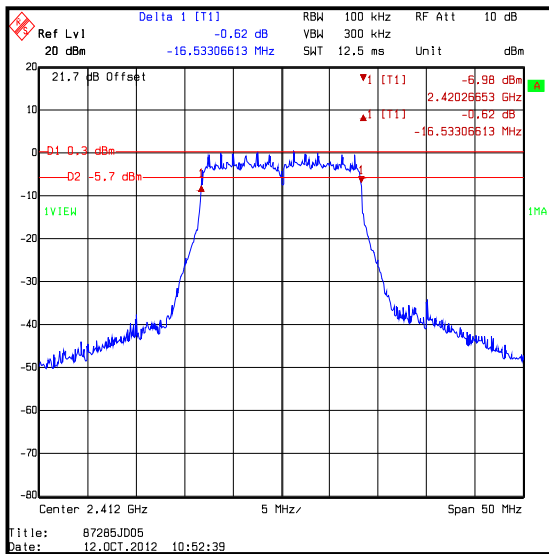


**Top Channel**

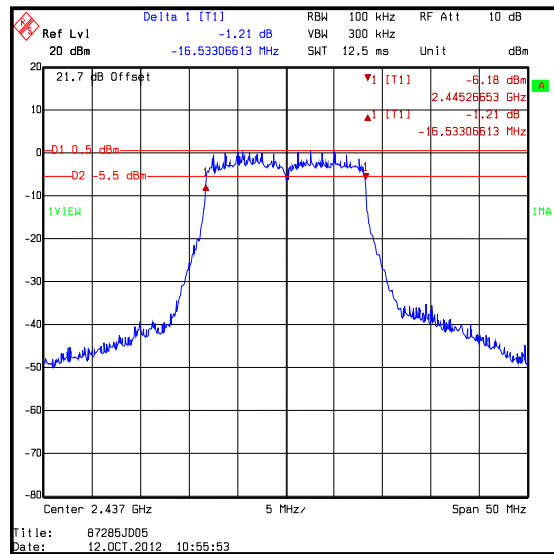
**Transmitter 6 dB Bandwidth (continued)**

**Results: 802.11g / 9 Mbps**

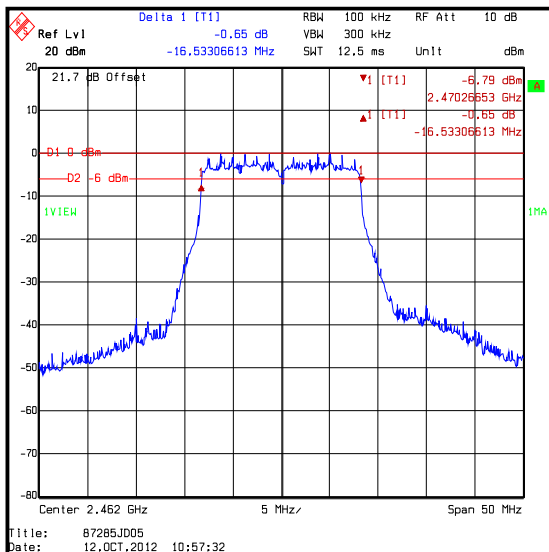
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.533	≥0.5	16.033	Complied
Middle	16.533	≥0.5	16.033	Complied
Top	16.533	≥0.5	16.033	Complied



**Bottom Channel**



**Middle Channel**

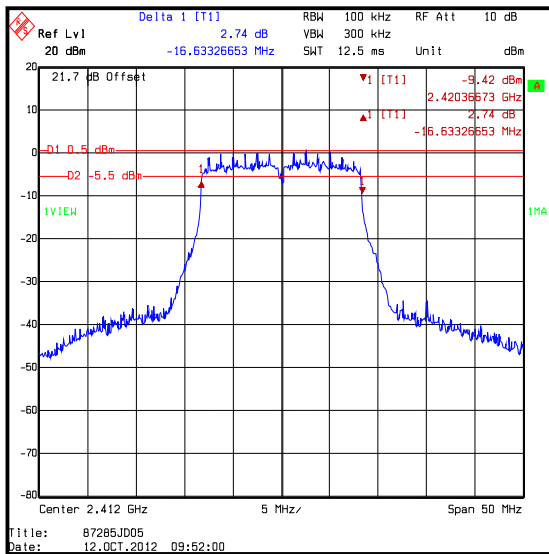


**Top Channel**

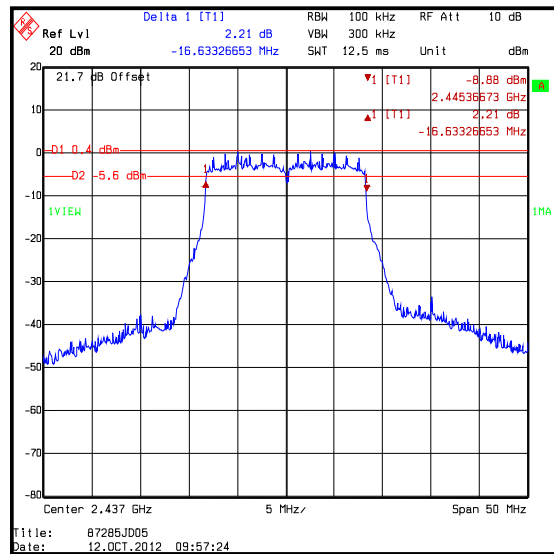
**Transmitter 6 dB Bandwidth (continued)**

**Results: 802.11g / 12 Mbps**

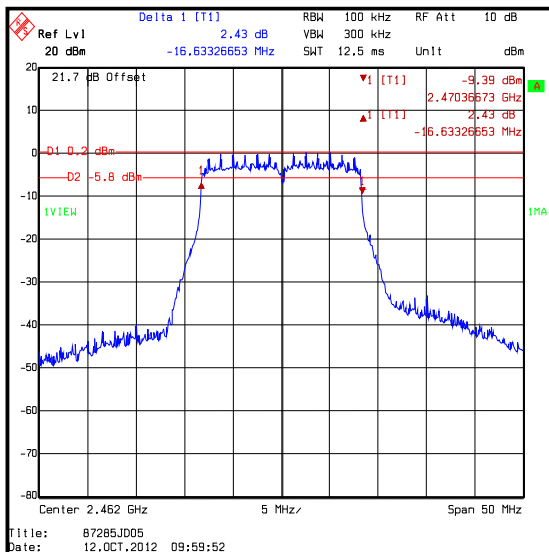
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.633	≥0.5	16.133	Complied
Middle	16.633	≥0.5	16.133	Complied
Top	16.633	≥0.5	16.133	Complied



**Bottom Channel**



**Middle Channel**

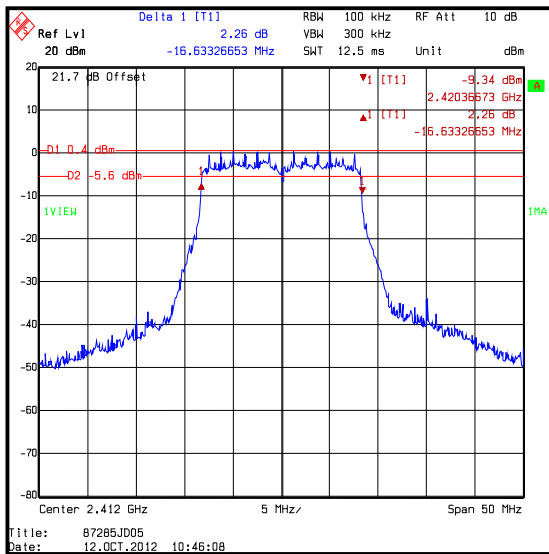


**Top Channel**

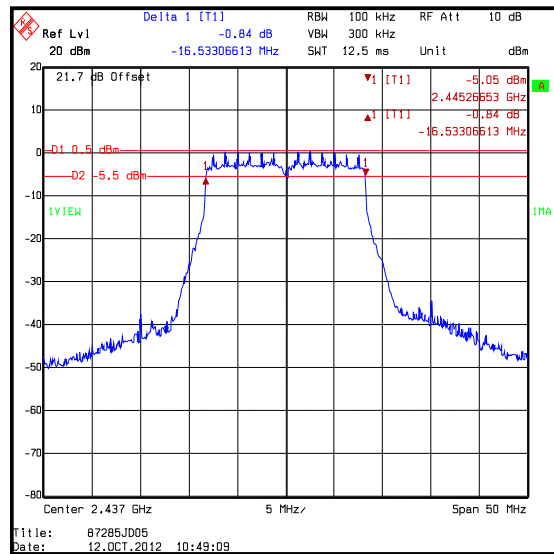
**Transmitter 6 dB Bandwidth (continued)**

**Results: 802.11g / 18 Mbps**

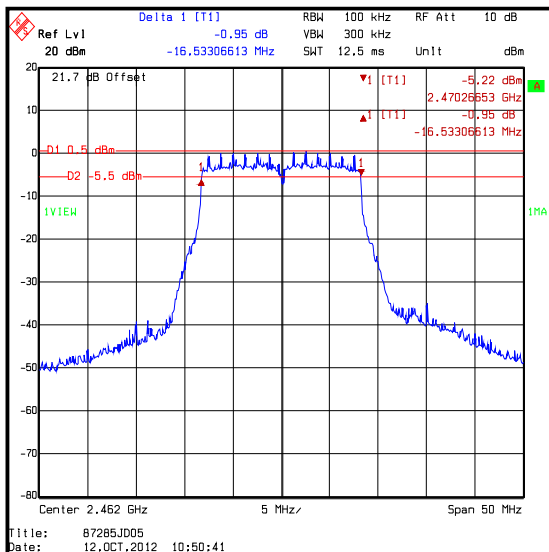
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.633	≥0.5	16.133	Complied
Middle	16.533	≥0.5	16.033	Complied
Top	16.533	≥0.5	16.033	Complied



**Bottom Channel**



**Middle Channel**

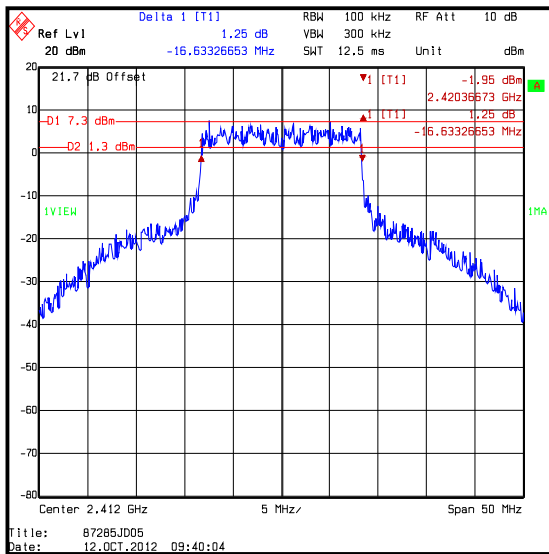


**Top Channel**

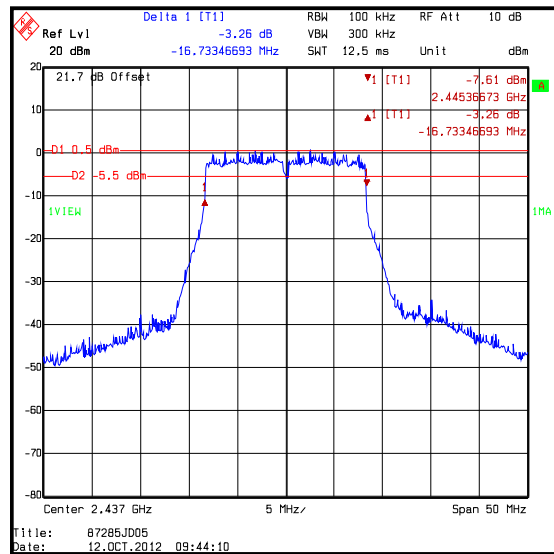
**Transmitter 6 dB Bandwidth (continued)**

**Results: 802.11g / 24 Mbps**

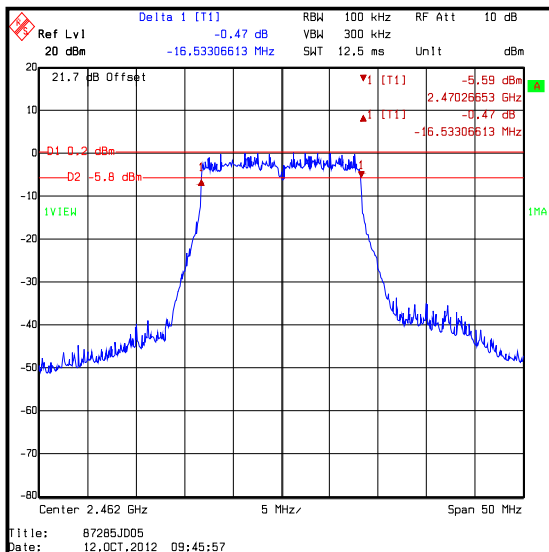
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.633	≥0.5	16.133	Complied
Middle	16.733	≥0.5	16.233	Complied
Top	16.533	≥0.5	16.033	Complied



**Bottom Channel**



**Middle Channel**



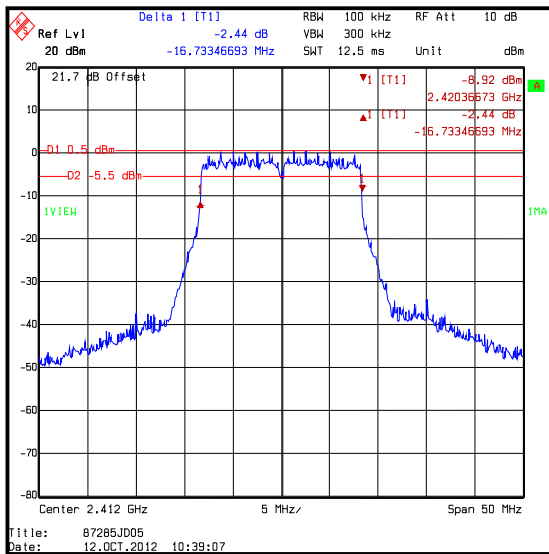
**Top Channel**



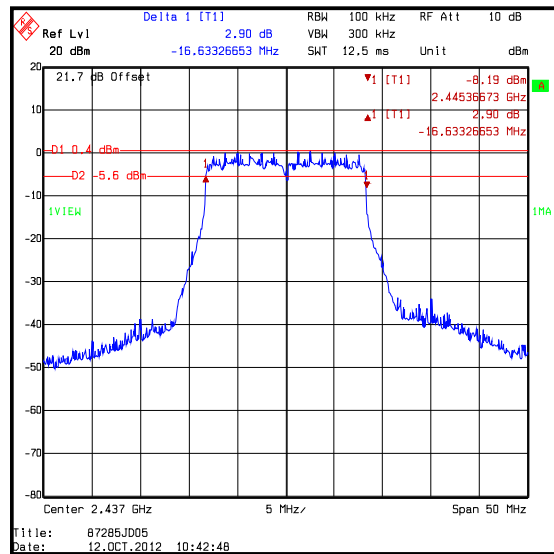
**Transmitter 6 dB Bandwidth (continued)**

**Results: 802.11g /36 Mbps**

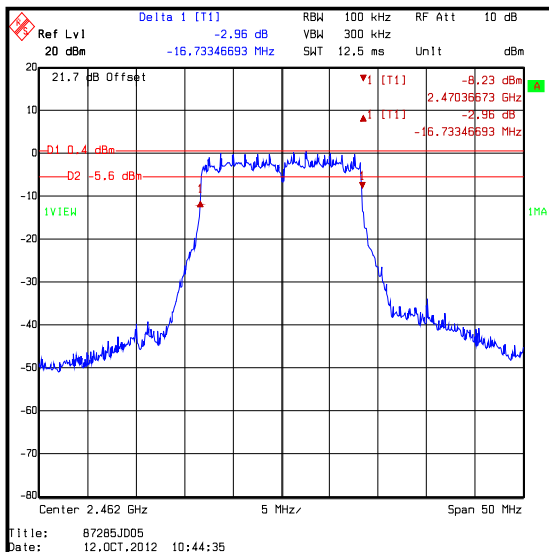
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.733	≥0.5	16.233	Complied
Middle	16.633	≥0.5	16.133	Complied
Top	16.733	≥0.5	16.233	Complied



**Bottom Channel**



**Middle Channel**

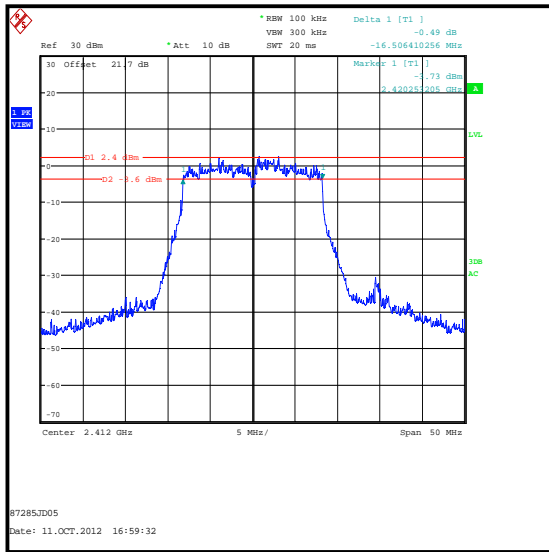


**Top Channel**

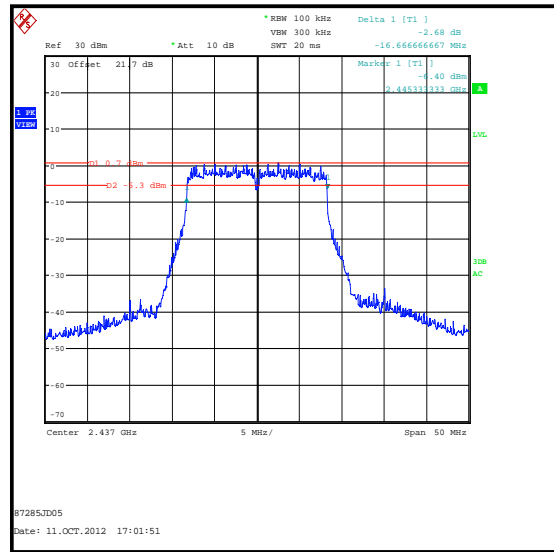
**Transmitter 6 dB Bandwidth (continued)**

**Results: 802.11g / 48 Mbps**

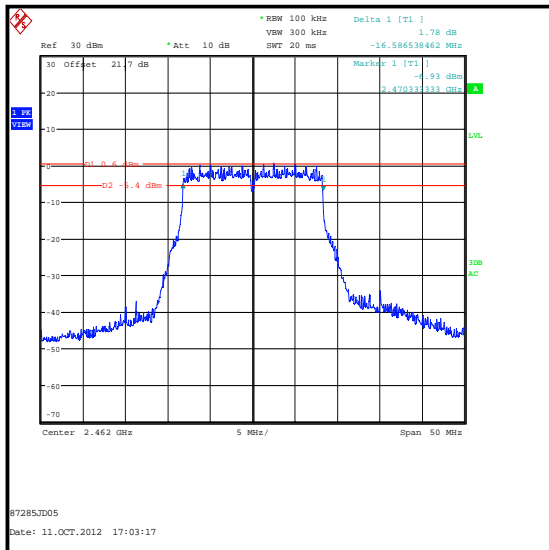
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.506	≥0.5	16.006	Complied
Middle	16.667	≥0.5	16.167	Complied
Top	16.587	≥0.5	16.087	Complied



**Bottom Channel**



**Middle Channel**

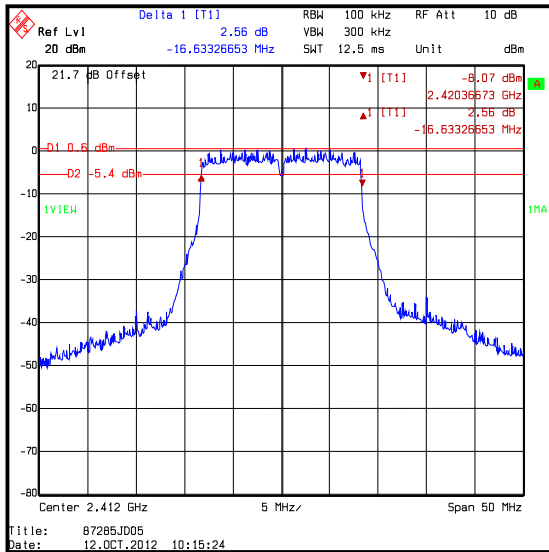


**Top Channel**

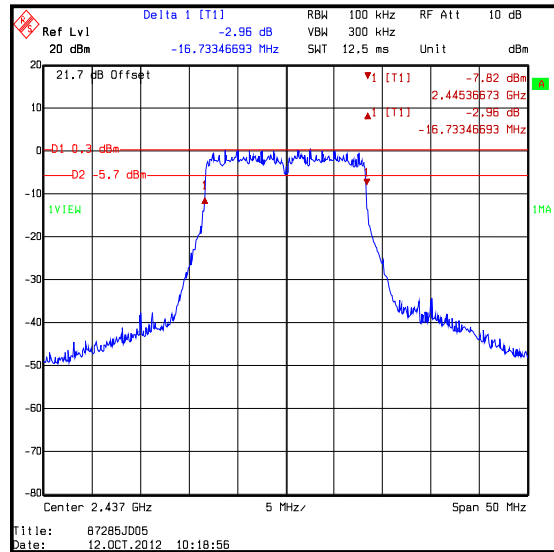
**Transmitter 6 dB Bandwidth (continued)**

**Results: 802.11g / 54 Mbps**

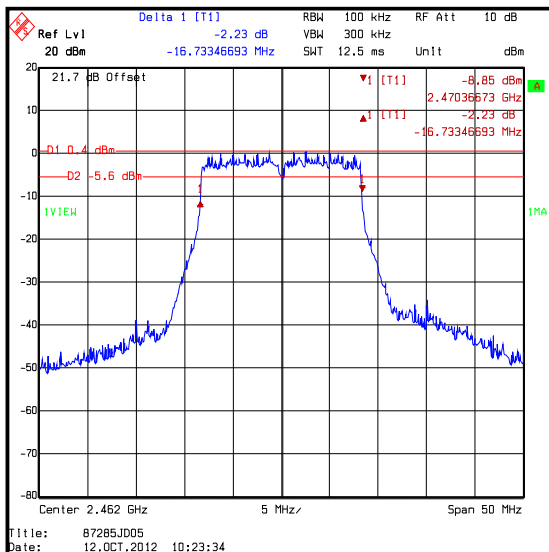
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.633	≥0.5	16.133	Complied
Middle	16.733	≥0.5	16.233	Complied
Top	16.733	≥0.5	16.233	Complied



**Bottom Channel**



**Middle Channel**



**Top Channel**

**5.2.5. Transmitter 99% Emission Bandwidth****Test Summary:**

<b>Test Engineers:</b>	Sandeep Bharat & Andrew Edwards	<b>Test Date:</b>	12 October 2012
<b>Test Sample Serial Number:</b>	22687533		

<b>FCC Reference:</b>	N/A
<b>Industry Canada Reference:</b>	RSS-Gen 4.6.1
<b>Test Method Used:</b>	Tested using the occupied bandwidth function of a spectrum analyzer

**Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	37

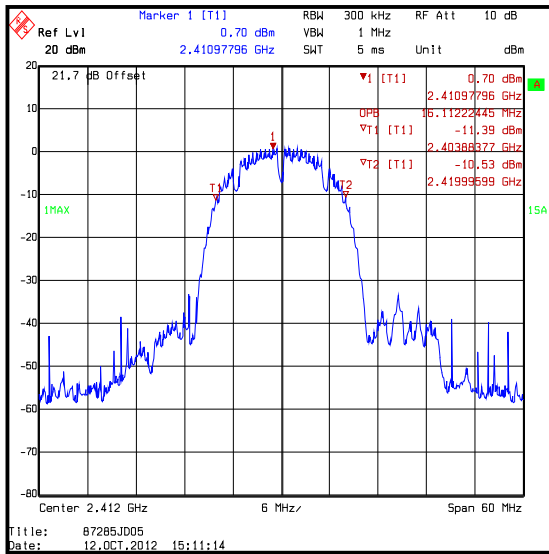
**Note(s):**

1. Occupied bandwidth (99% bandwidth) was measured using a spectrum analyser occupied bandwidth function with the spectrum analyser set to the appropriate bandwidth according to the channel width under test. Measurement bandwidths were set automatically by the spectrum analyser.

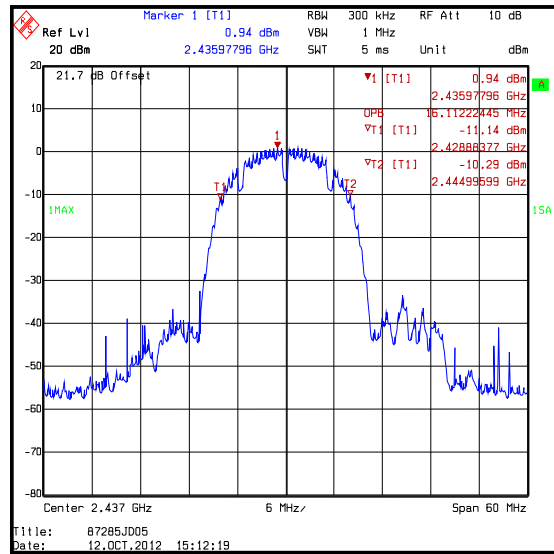
**Transmitter 99% Emission Bandwidth (continued)**

**Results: 802.11b / 1 Mbps**

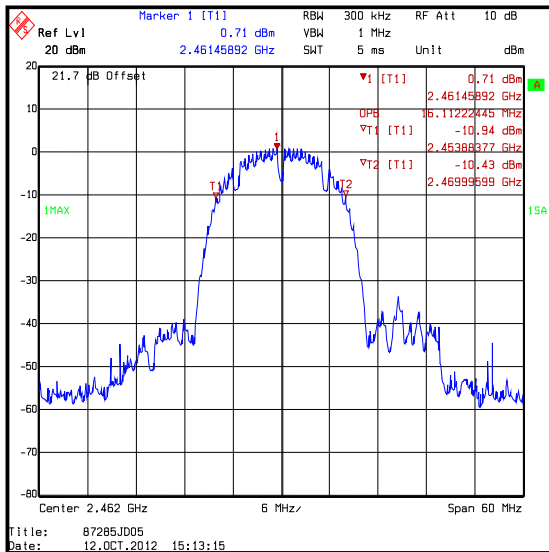
Channel	99 % Emission Bandwidth (MHz)
Bottom	16.112
Middle	16.112
Top	16.112



**Bottom Channel**



**Middle Channel**

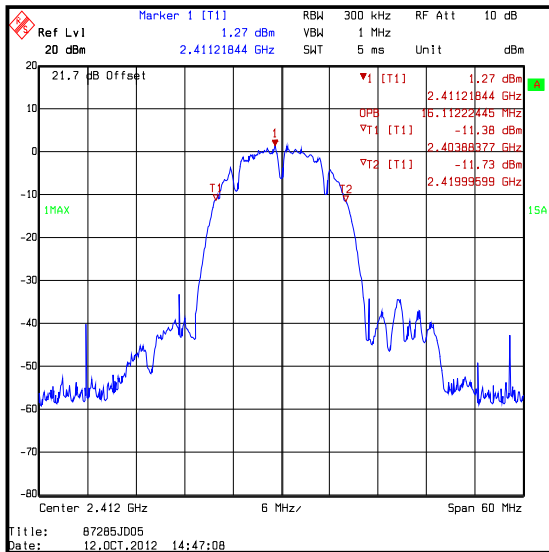


**Top Channel**

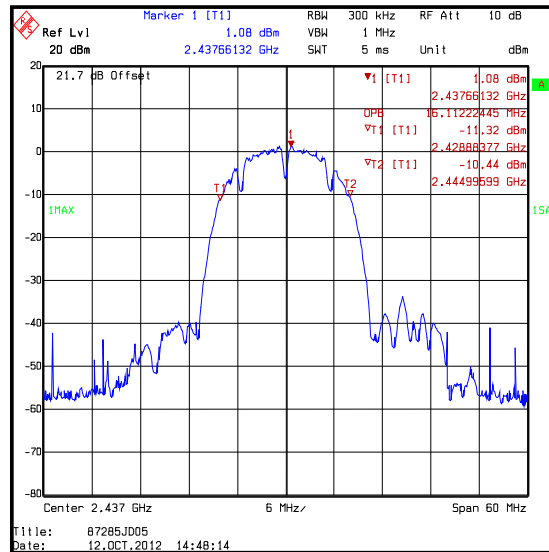
**Transmitter 99% Emission Bandwidth (continued)**

**Results: 802.11b / 2 Mbps**

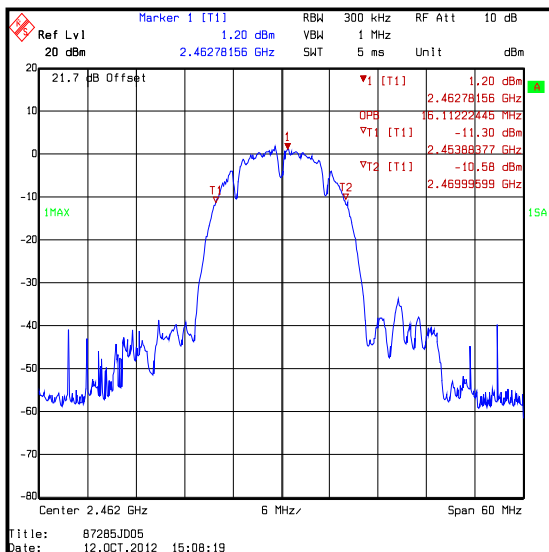
Channel	99 % Emission Bandwidth (MHz)
Bottom	16.112
Middle	16.112
Top	16.112



**Bottom Channel**



**Middle Channel**

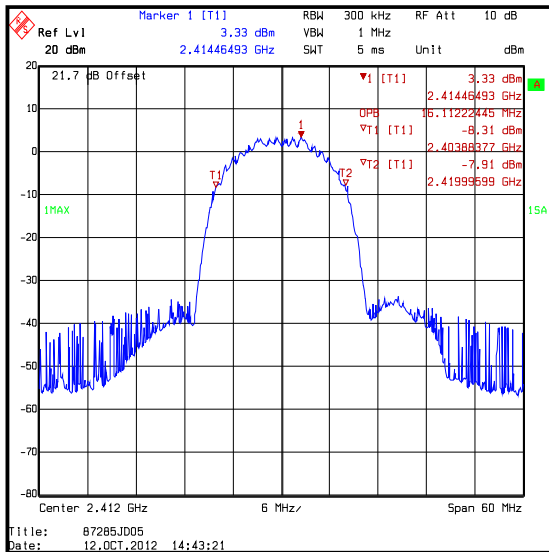


**Top Channel**

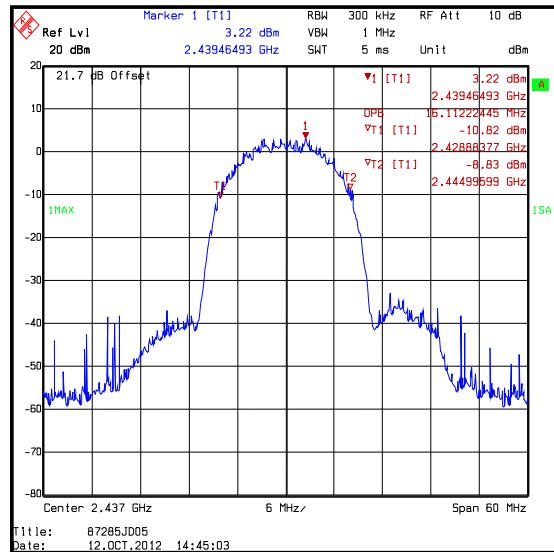
**Transmitter 99% Emission Bandwidth (continued)**

**Results: 802.11b / 5.5 Mbps**

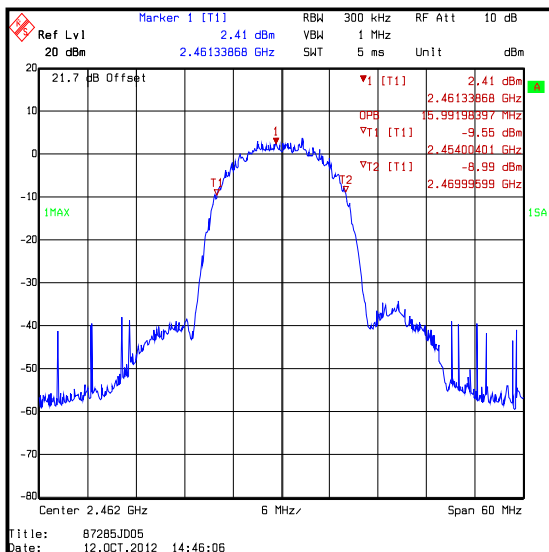
Channel	99 % Emission Bandwidth (MHz)
Bottom	16.112
Middle	16.112
Top	15.992



**Bottom Channel**



**Middle Channel**

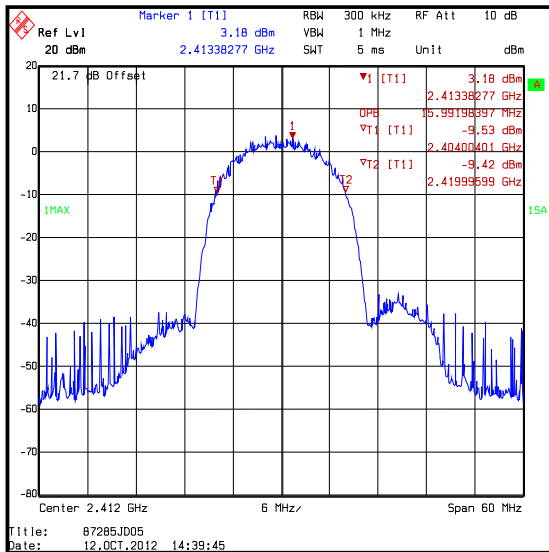


**Top Channel**

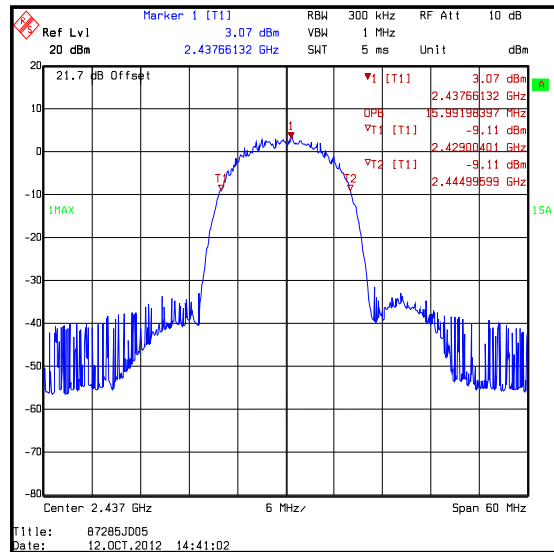
**Transmitter 99% Emission Bandwidth (continued)**

**Results: 802.11b / 11 Mbps**

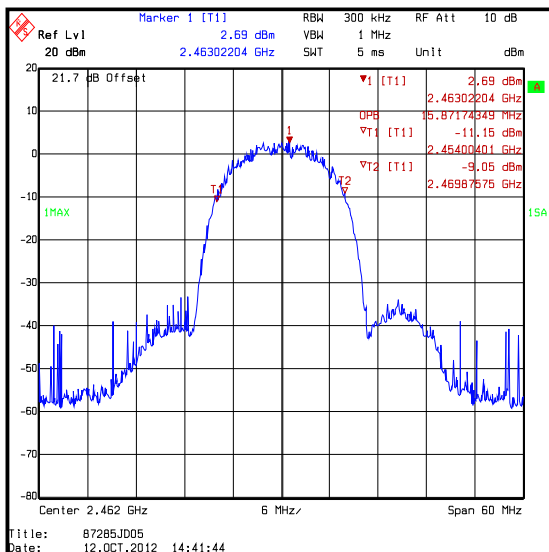
Channel	99 % Emission Bandwidth (MHz)
Bottom	15.992
Middle	15.992
Top	15.872



**Bottom Channel**



**Middle Channel**



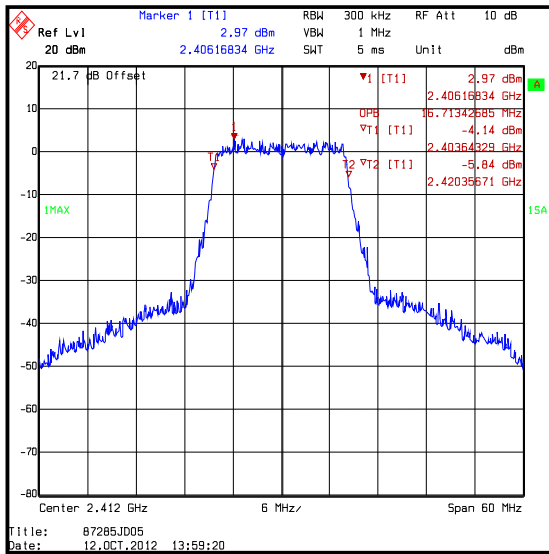
**Top Channel**



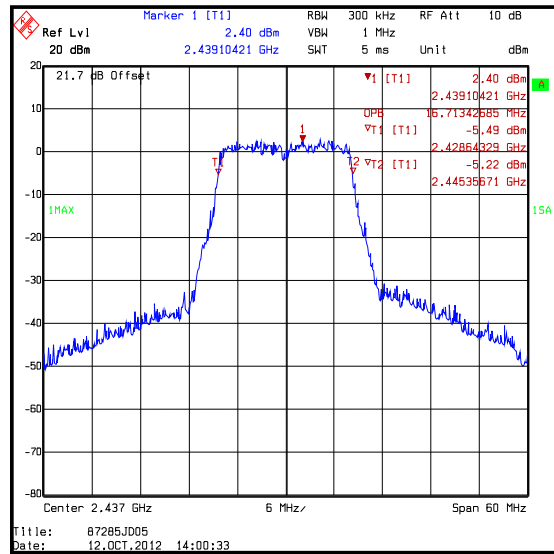
**Transmitter 99% Emission Bandwidth (continued)**

**Results: 802.11g / 6 Mbps**

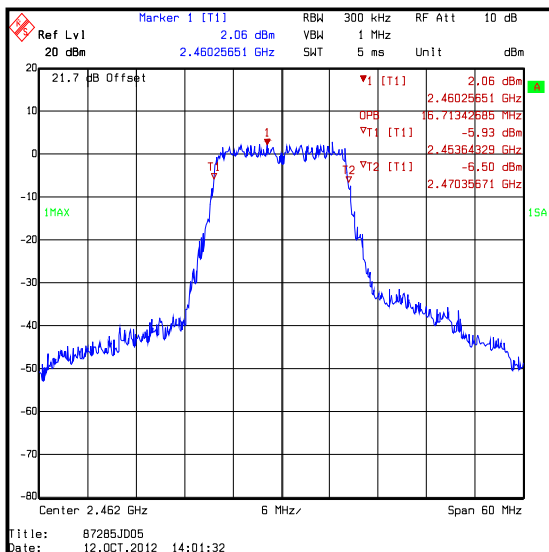
Channel	99 % Emission Bandwidth (MHz)
Bottom	16.713
Middle	16.713
Top	16.713



**Bottom Channel**



**Middle Channel**

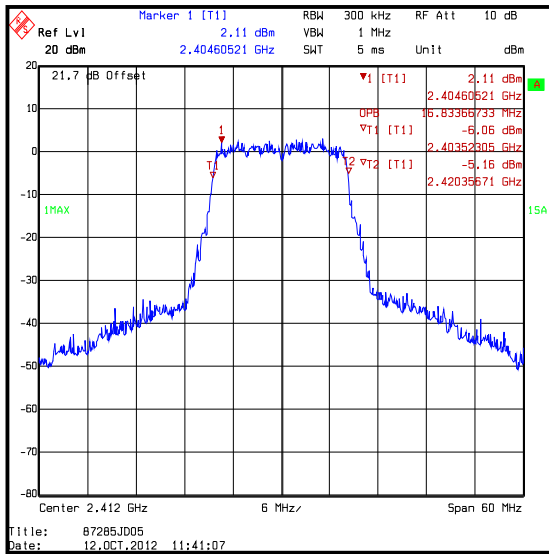


**Top Channel**

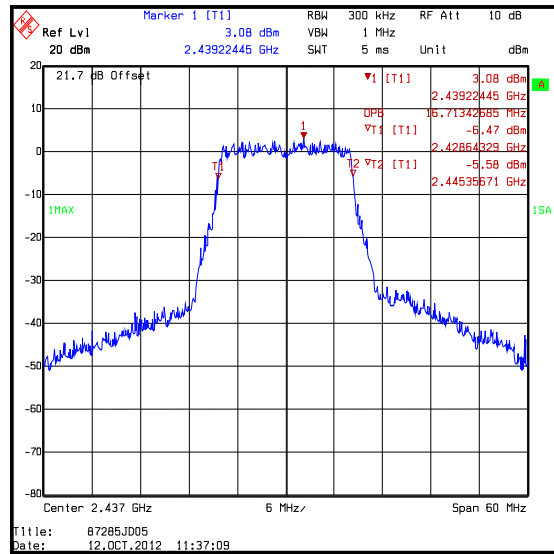
**Transmitter 99% Emission Bandwidth (continued)**

**Results: 802.11b / 9 Mbps**

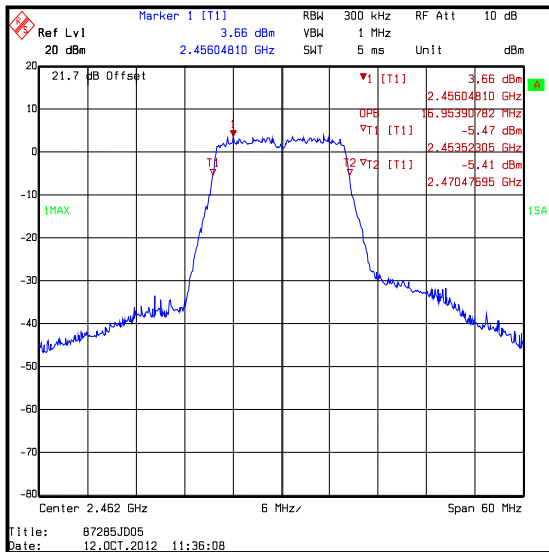
Channel	99 % Emission Bandwidth (MHz)
Bottom	16.834
Middle	16.713
Top	16.954



**Bottom Channel**



**Middle Channel**

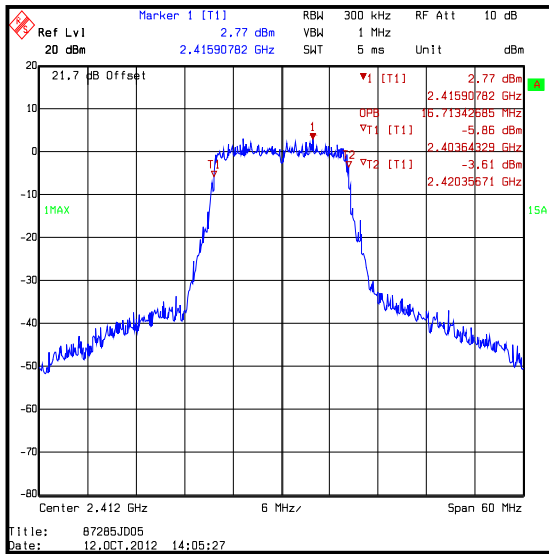


**Top Channel**

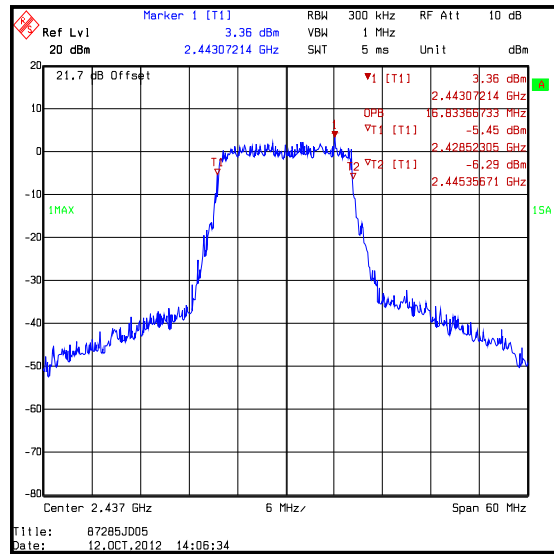
**Transmitter 99% Emission Bandwidth (continued)**

**Results: 802.11g / 12 Mbps**

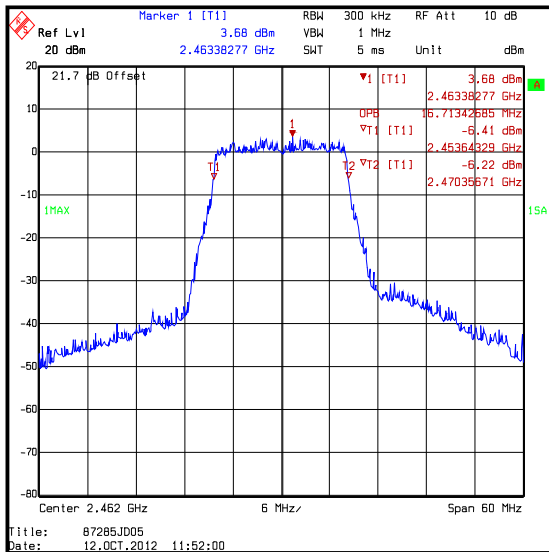
Channel	99 % Emission Bandwidth (MHz)
Bottom	16.713
Middle	16.834
Top	16.713



**Bottom Channel**



**Middle Channel**

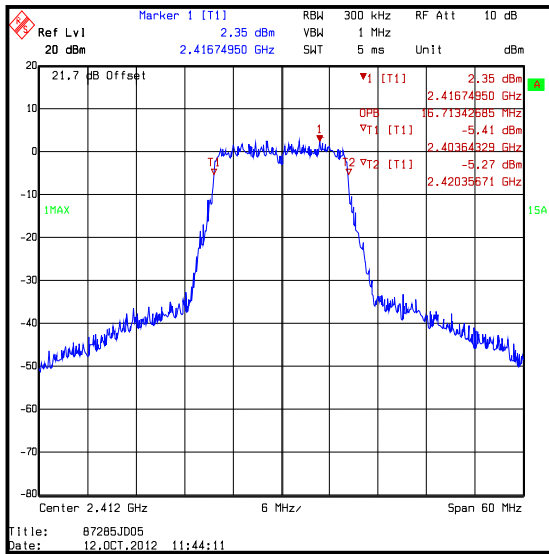


**Top Channel**

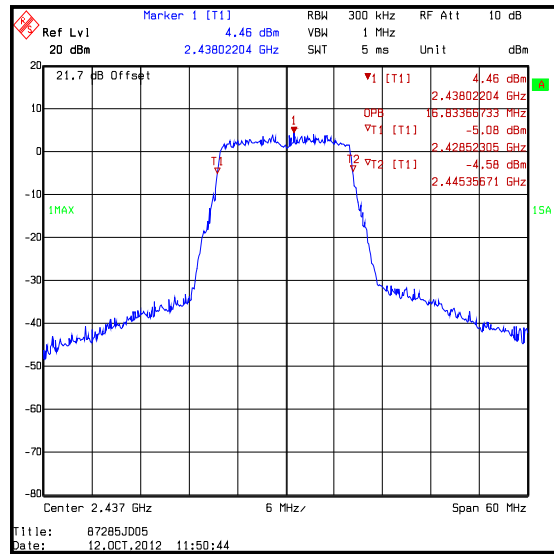
**Transmitter 99% Emission Bandwidth (continued)**

**Results: 802.11g / 18 Mbps**

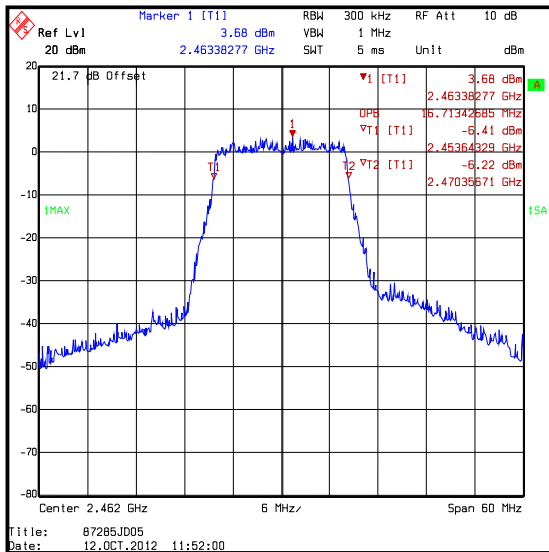
Channel	99 % Emission Bandwidth (MHz)
Bottom	16.713
Middle	16.834
Top	16.713



**Bottom Channel**



**Middle Channel**

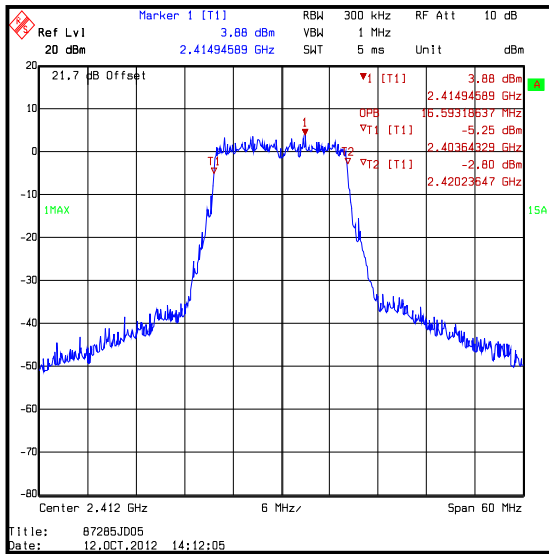


**Top Channel**

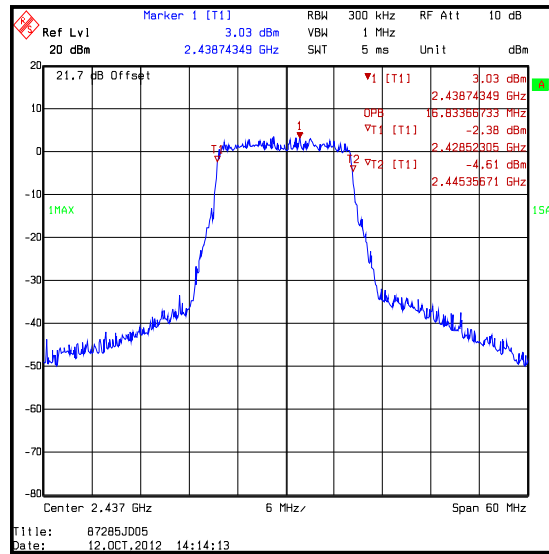
**Transmitter 99% Emission Bandwidth (continued)**

**Results: 802.11g / 24 Mbps**

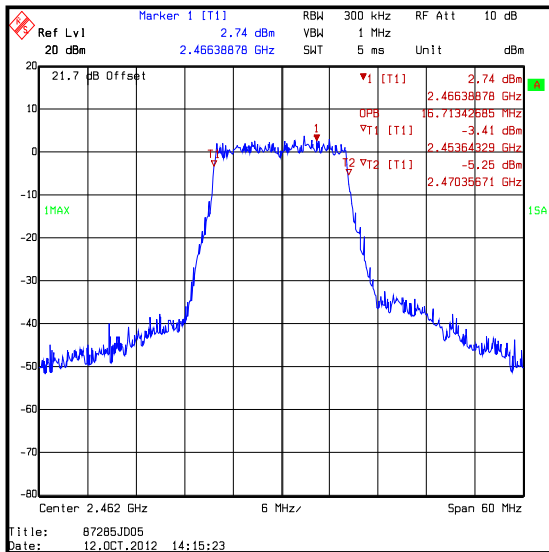
Channel	99 % Emission Bandwidth (MHz)
Bottom	16.593
Middle	16.834
Top	16.713



**Bottom Channel**



**Middle Channel**

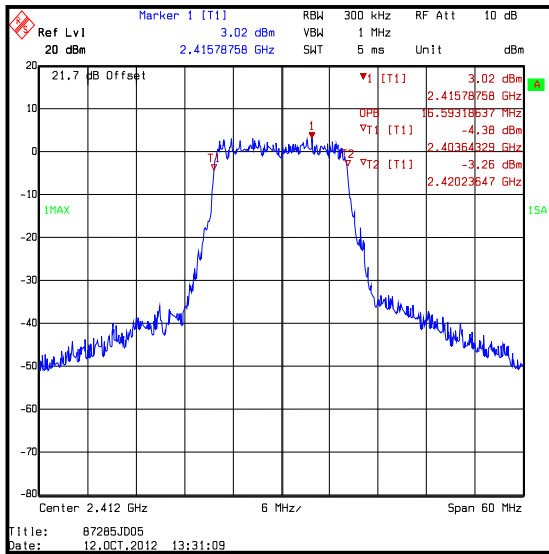


**Top Channel**

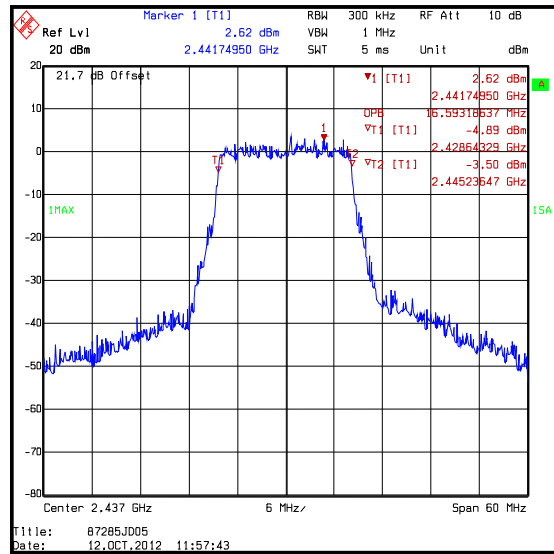
**Transmitter 99% Emission Bandwidth (continued)**

**Results: 802.11g / 36 Mbps**

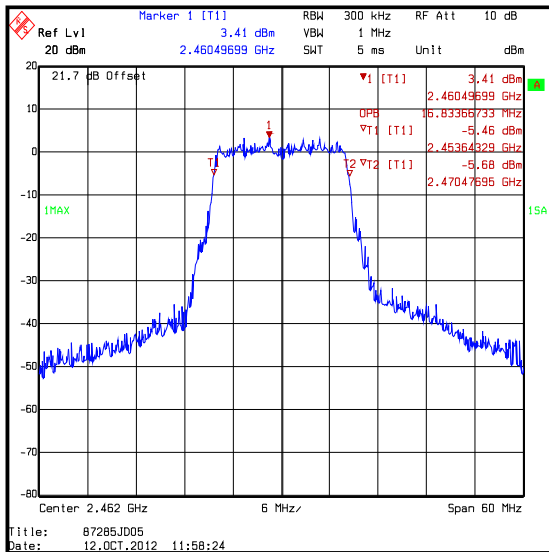
Channel	99 % Emission Bandwidth (MHz)
Bottom	16.593
Middle	16.593
Top	16.834



**Bottom Channel**



**Middle Channel**

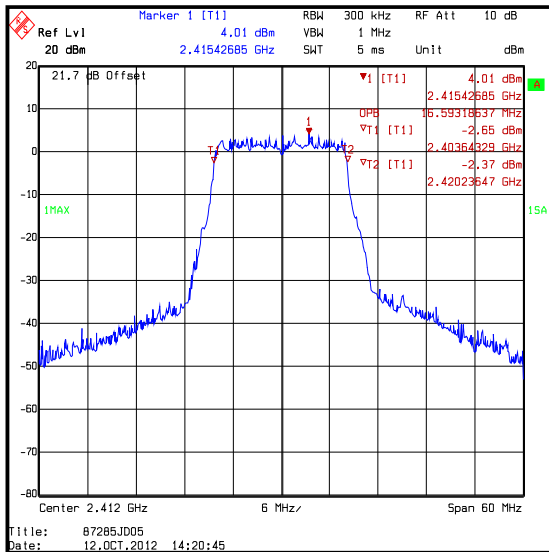


**Top Channel**

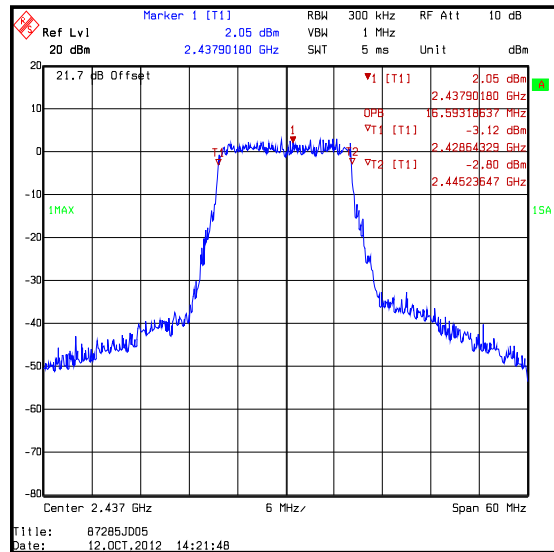
**Transmitter 99% Emission Bandwidth (continued)**

**Results: 802.11g / 48 Mbps**

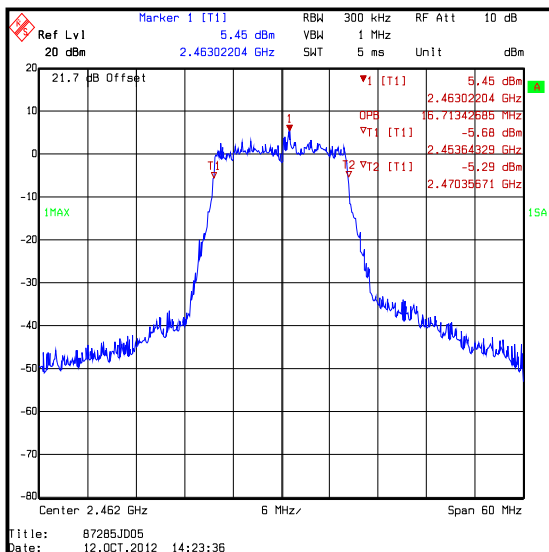
Channel	99 % Emission Bandwidth (MHz)
Bottom	16.593
Middle	16.593
Top	16.713



**Bottom Channel**



**Middle Channel**

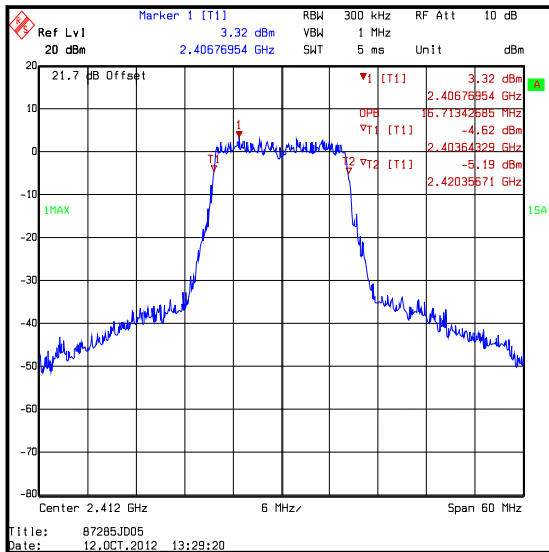


**Top Channel**

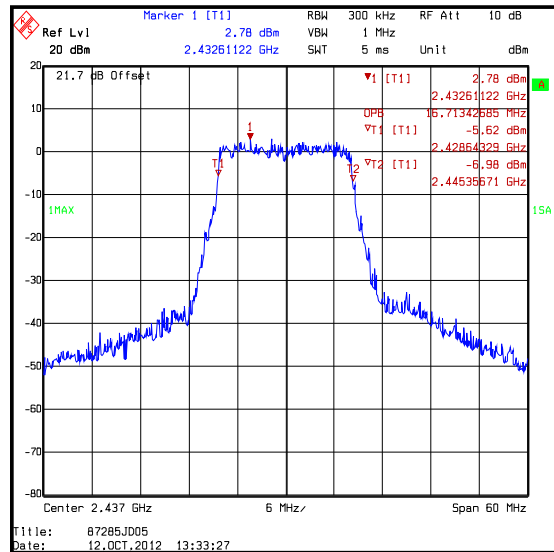
**Transmitter 99% Emission Bandwidth (continued)**

**Results: 802.11g / 54 Mbps**

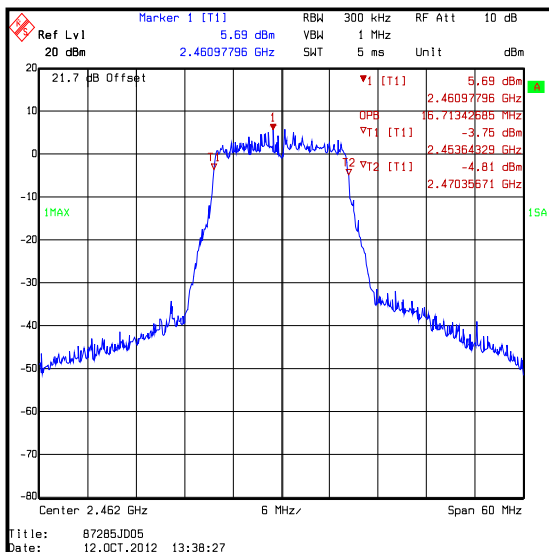
Channel	99 % Emission Bandwidth (MHz)
Bottom	16.713
Middle	16.713
Top	16.713



**Bottom Channel**



**Middle Channel**



**Top Channel**



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

<b>Test Engineers:</b>	Sandeep Bharat & Andrew Edwards	<b>Test Date:</b>	12 October 2012
<b>Test Sample Serial Number:</b>	22687533		

<b>FCC Reference:</b>	Part 15.247(e)
<b>Industry Canada Reference:</b>	RSS-210 A8.2(b)
<b>Test Method Used:</b>	As detailed in FCC KDB 558074 D01 v02 Section 9.1 Option 1

**Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	37

**Note(s):**

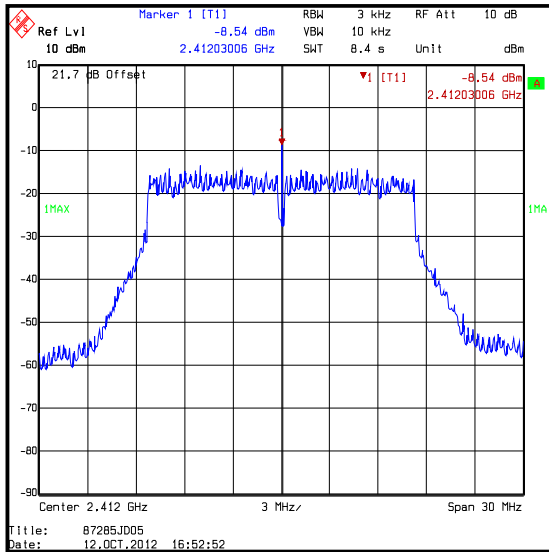
1. Preliminary tests were made on all supported data rates and modulation types to determine worst-case operation. The highest level of the worst-case mode was recorded in the table below.
2. Measurements were tested in accordance with in FCC KDB 558074 D01 v02 Section 9.1 Option 1.

**Results: 802.11g / 18 Mbps**

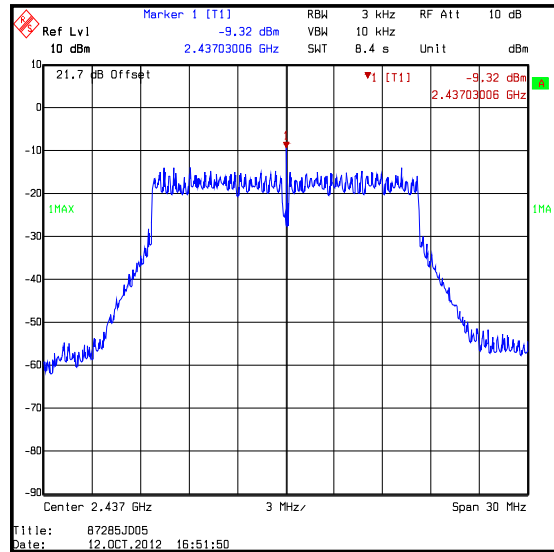
Channel	Output Power (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
Bottom	-8.5	8.0	16.5	Complied
Middle	-9.3	8.0	17.3	Complied
Top	-8.5	8.0	16.5	Complied

### Transmitter Power Spectral Density (continued)

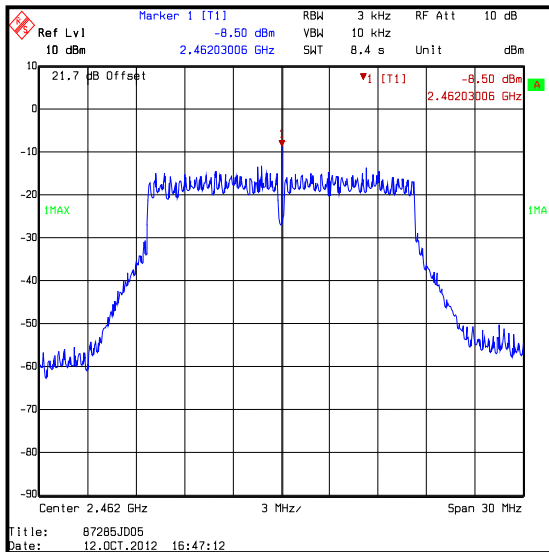
#### Results: 802.11g / 18 Mbps



Bottom Channel



Middle Channel



Top Channel

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

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	11 June 2012
<b>Test Sample Serial Number:</b>	22687533		

<b>FCC Reference:</b>	Part 15.247(b)(3)
<b>Industry Canada Reference:</b>	RSS-Gen 4.8, RSS-210 A8.4(4)
<b>Test Method Used:</b>	As detailed in KDB 558074 D01 v01 Section 5.2.1.2

**Environmental Conditions:**

<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	45

**Note(s):**

1. Conducted power measurements in all bands were performed using a spectrum analyser in accordance with FCC KDB 558074 D01 v01 Section 5.2.1.2. Measurement Procedure PK2.
2. Each supported modulation type was tested at the highest data rate.

**Results: 802.11b / 1 Mbps****Conducted Peak Limit Comparison**

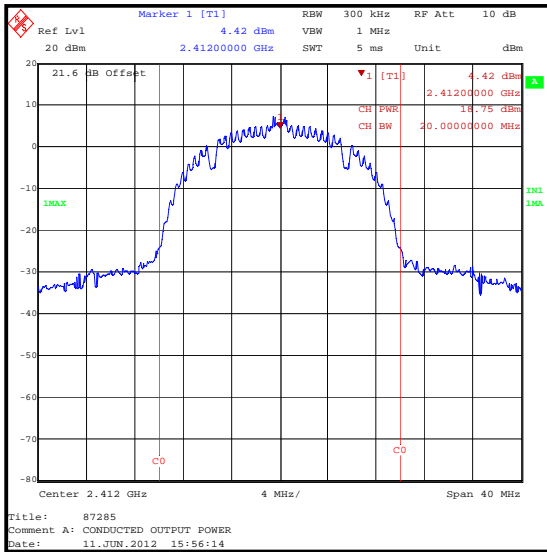
Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	18.8	30.0	11.2	Complied
Middle	18.7	30.0	11.3	Complied
Top	18.5	30.0	11.5	Complied

**De Facto EIRP Limit Comparison**

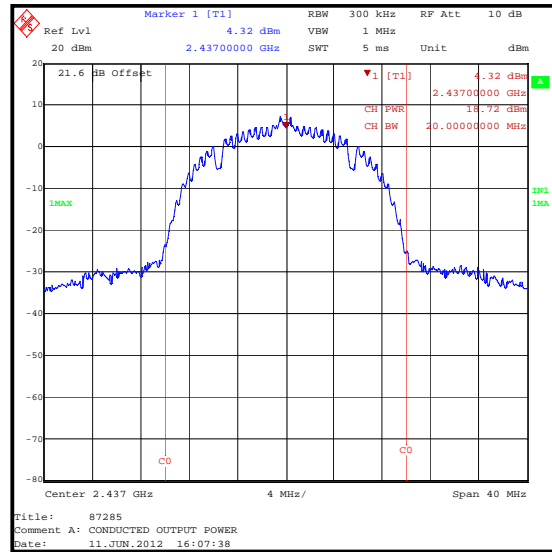
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	18.8	2.0	20.8	36.0	15.2	Complied
Middle	18.7	2.0	20.7	36.0	15.3	Complied
Top	18.5	2.0	20.5	36.0	15.5	Complied

### Transmitter Maximum Peak Output Power (continued)

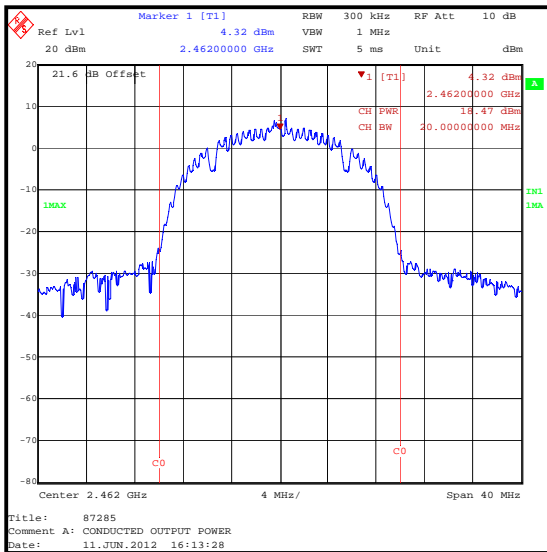
#### Results: 802.11b / 1 Mbps



Bottom Channel



Middle Channel



Top Channel

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

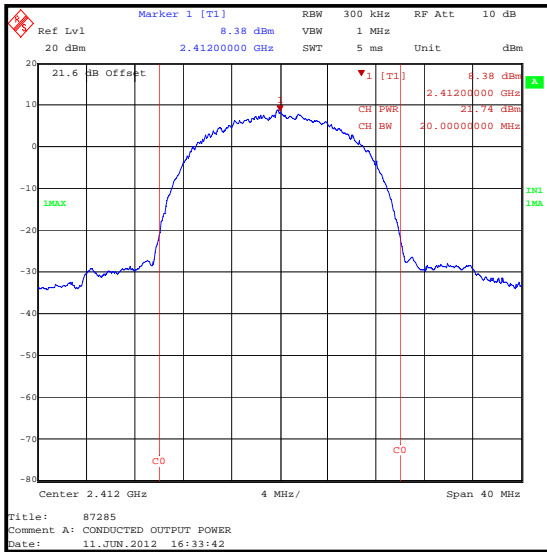
Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	21.7	30.0	8.3	Complied
Middle	21.6	30.0	8.4	Complied
Top	21.7	30.0	8.3	Complied

**De Facto EIRP Limit Comparison**

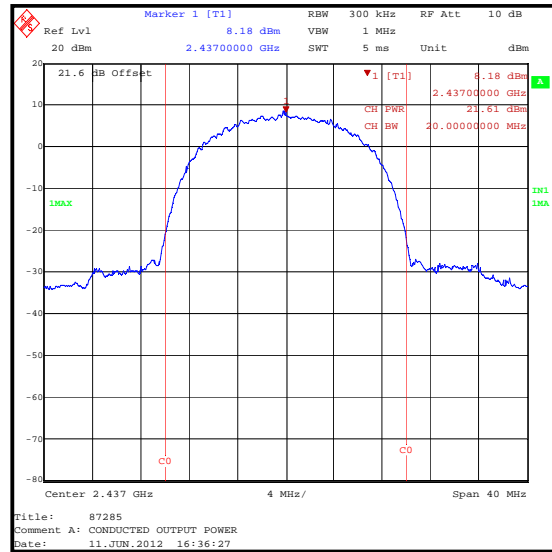
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	21.7	2.0	23.7	36.0	12.3	Complied
Middle	21.6	2.0	23.6	36.0	12.4	Complied
Top	21.7	2.0	23.7	36.0	12.3	Complied

### Transmitter Maximum Peak Output Power (continued)

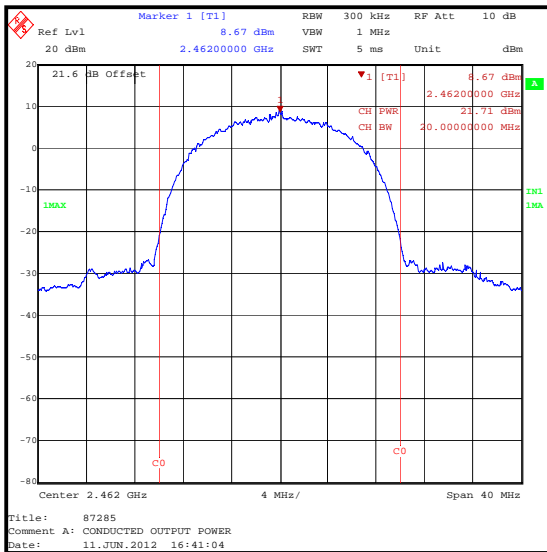
#### Results: 802.11b / 11 Mbps



Bottom Channel



Middle Channel



Top Channel

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

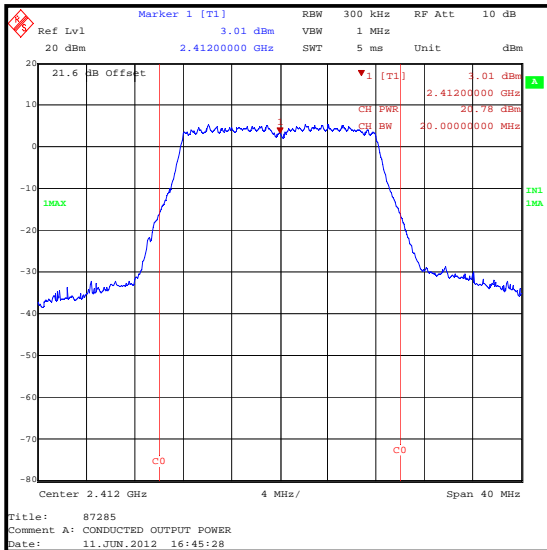
Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	20.8	30.0	9.2	Complied
Middle	20.7	30.0	9.3	Complied
Top	20.9	30.0	9.1	Complied

**De Facto EIRP Limit Comparison**

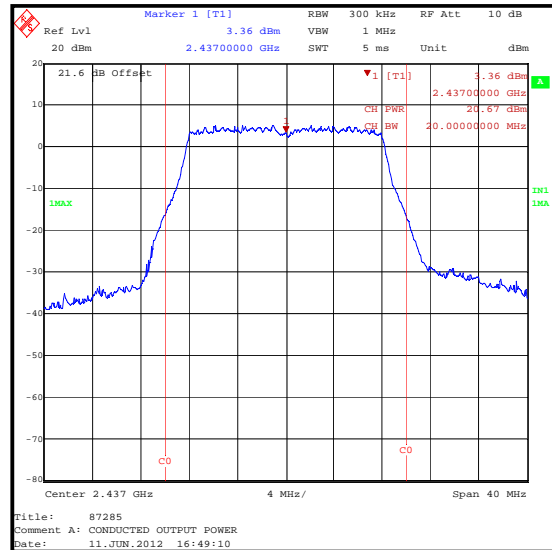
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	20.8	2.0	22.8	36.0	13.2	Complied
Middle	20.7	2.0	22.7	36.0	13.3	Complied
Top	20.9	2.0	22.9	36.0	13.1	Complied

### Transmitter Maximum Peak Output Power (continued)

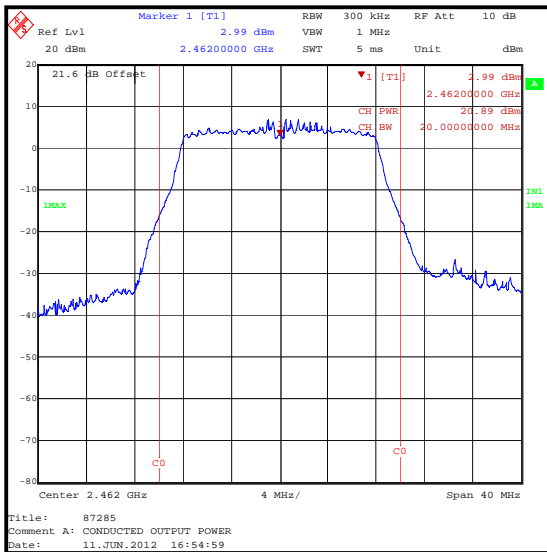
#### Results: 802.11g / 9 Mbps



Bottom Channel



Middle Channel



Top Channel



**Transmitter Maximum Peak Output Power (continued)****Results: 802.11g / 18 Mbps****Conducted Peak Limit Comparison**

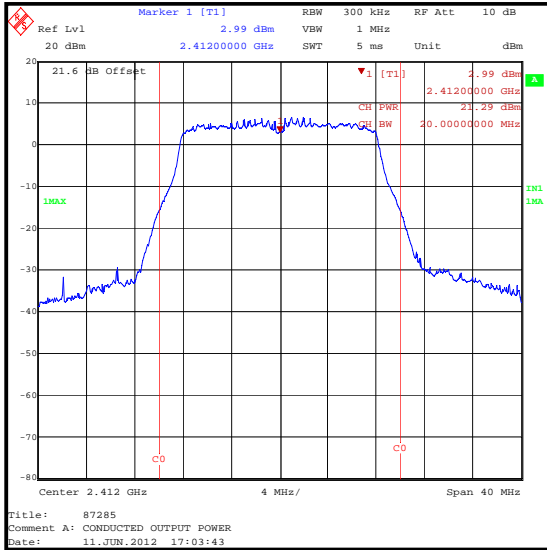
Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	21.3	30.0	8.7	Complied
Middle	21.1	30.0	8.9	Complied
Top	21.2	30.0	8.8	Complied

**De Facto EIRP Limit Comparison**

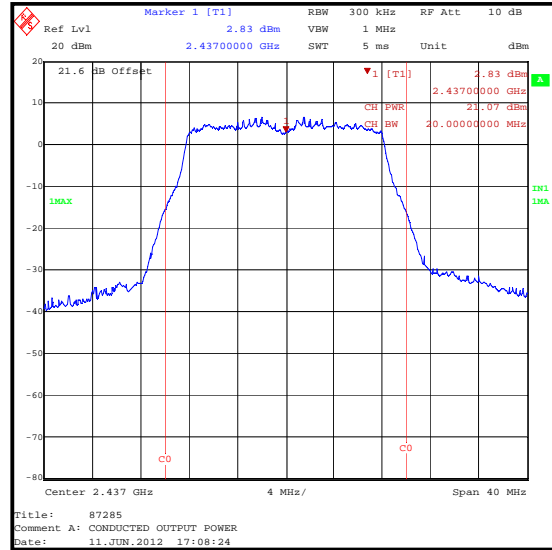
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	21.3	2.0	23.3	36.0	12.7	Complied
Middle	21.1	2.0	23.1	36.0	12.9	Complied
Top	21.2	2.0	23.2	36.0	12.8	Complied

**Transmitter Maximum Peak Output Power (continued)**

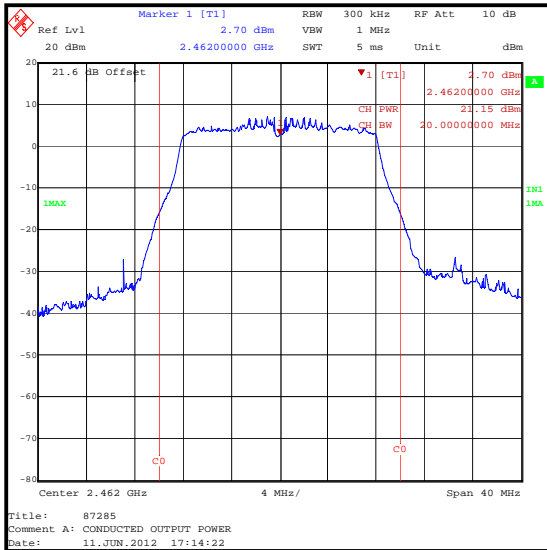
**Results: 802.11g / 18 Mbps**



**Bottom Channel**



**Middle Channel**



**Top Channel**

**Transmitter Maximum Peak Output Power (continued)****Results: 802.11g / 36 Mbps****Conducted Peak Limit Comparison**

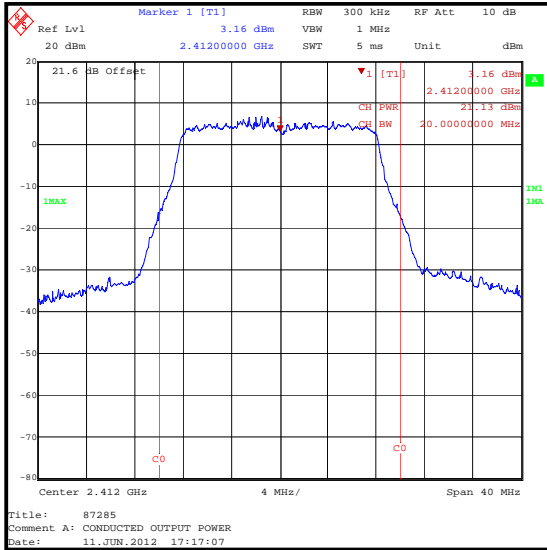
Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	21.1	30.0	8.9	Complied
Middle	21.4	30.0	8.6	Complied
Top	21.2	30.0	8.8	Complied

**De Facto EIRP Limit Comparison**

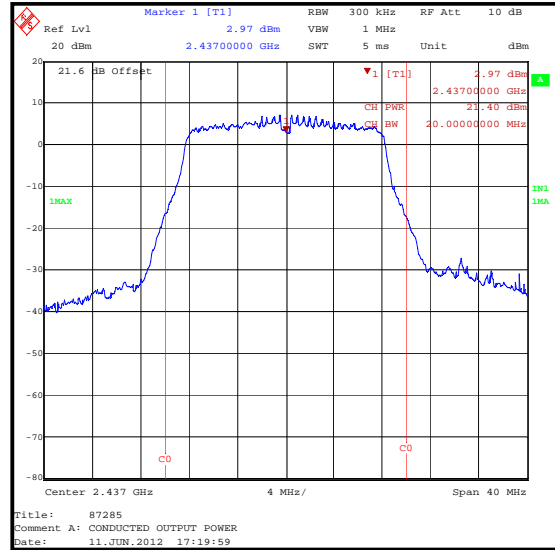
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	21.1	2.0	23.1	36.0	12.9	Complied
Middle	21.4	2.0	23.4	36.0	12.6	Complied
Top	21.2	2.0	23.2	36.0	12.8	Complied

### Transmitter Maximum Peak Output Power (continued)

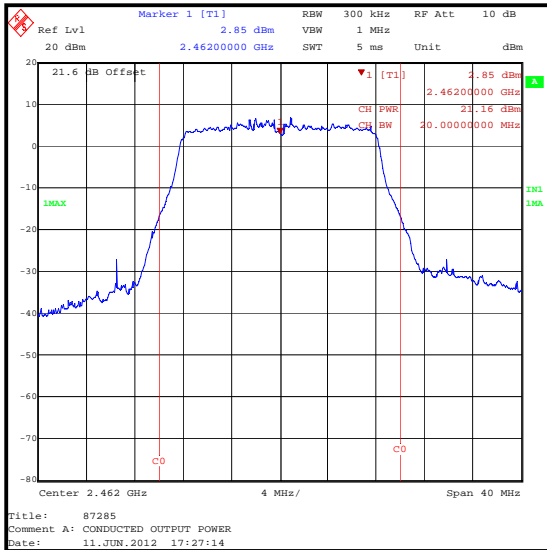
#### Results: 802.11g / 36 Mbps



Bottom Channel



Middle Channel



Top Channel

**Transmitter Maximum Peak Output Power (continued)****Results: 802.11g / 54 Mbps****Conducted Peak Limit Comparison**

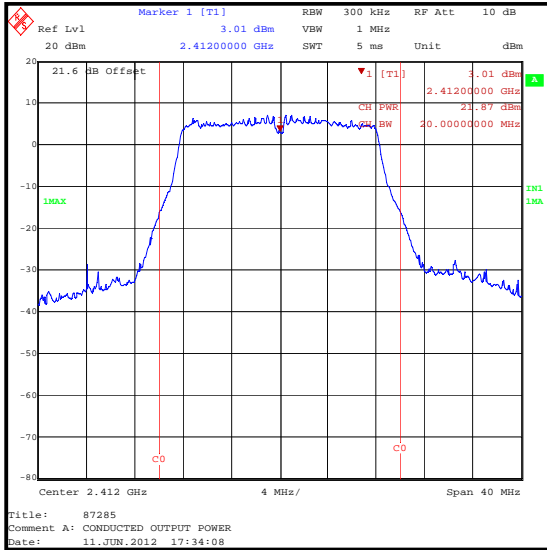
Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	21.9	30.0	8.1	Complied
Middle	21.6	30.0	8.4	Complied
Top	21.3	30.0	8.7	Complied

**De Facto EIRP Limit Comparison**

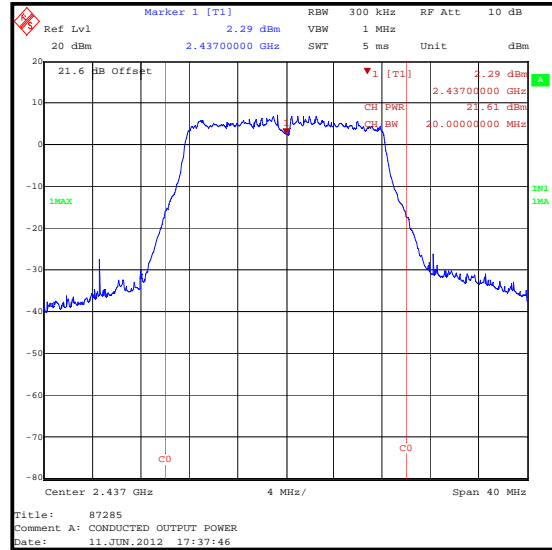
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	21.9	2.0	23.9	36.0	12.1	Complied
Middle	21.6	2.0	23.6	36.0	12.4	Complied
Top	21.3	2.0	23.3	36.0	12.7	Complied

### Transmitter Maximum Peak Output Power (continued)

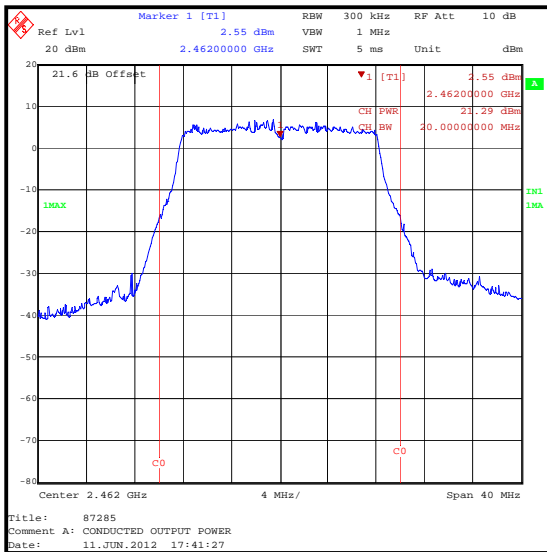
#### Results: 802.11g / 54 Mbps



Bottom Channel



Middle Channel



Top Channel

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

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	11 June 2012
<b>Test Sample Serial Number:</b>	22687586		

<b>FCC Reference:</b>	Parts 15.247(d) & 15.209(a)
<b>Industry Canada Reference:</b>	RSS-Gen 4.9, RSS-210 A8.5
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Sections 6.3 and 6.5 referencing ANSI C63.4
<b>Frequency Range</b>	30 MHz to 1000 MHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	40

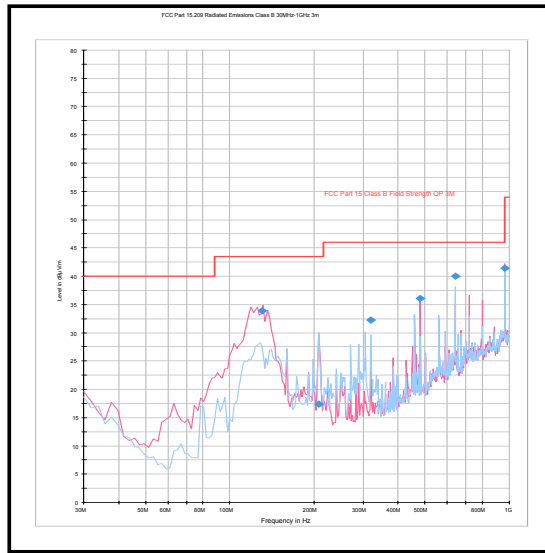
**Results: Top Channel**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
130.818	Vertical	33.9	43.5	9.6	Complied

**Note(s):**

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

**Transmitter 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:**

<b>Test Engineer:</b>	Nick Steele	<b>Test Date:</b>	17 May 2012
<b>Test Sample Serial Number:</b>	22687549		

<b>FCC Reference:</b>	Parts 15.247(d) & 15.209(a)
<b>Industry Canada Reference:</b>	RSS-Gen 4.9, RSS-210 A8.5
<b>Test Method Used:</b>	As detailed in ANSI C63.10 Sections 6.3 and 6.6 referencing ANSI C63.4
<b>Frequency Range</b>	1 GHz to 25 GHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	22
<b>Relative Humidity (%):</b>	34

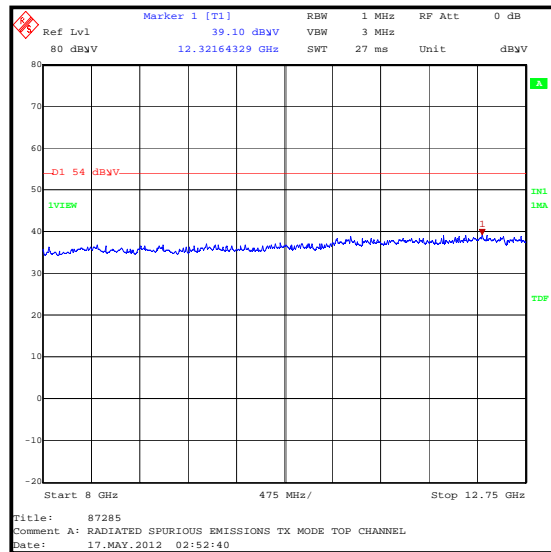
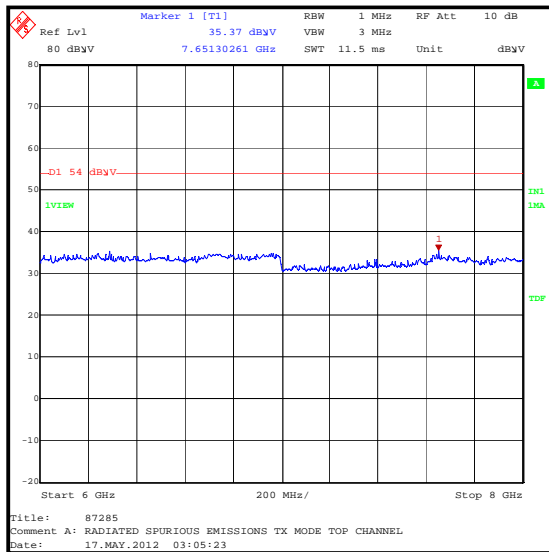
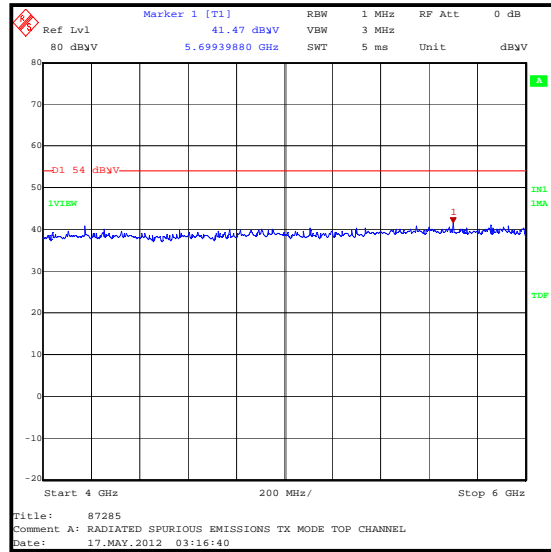
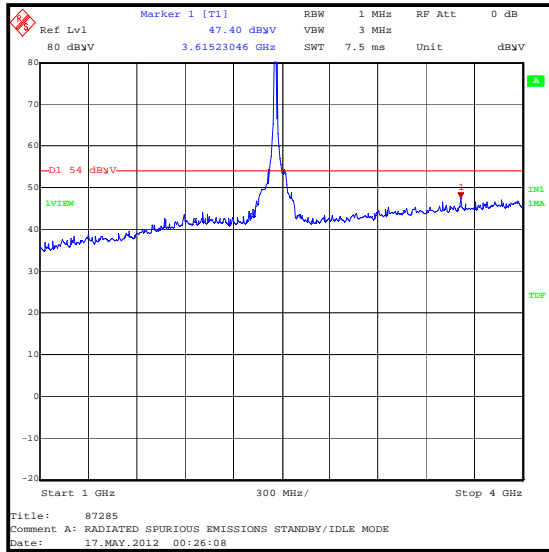
**Results:**

<b>Frequency (MHz)</b>	<b>Antenna Polarity</b>	<b>Peak Level (dB<math>\mu</math>V/m)</b>	<b>Average Limit (dB<math>\mu</math>V/m)</b>	<b>Margin (dB)</b>	<b>Result</b>
24817.635	Vertical	49.5	54.0	4.5	Complied

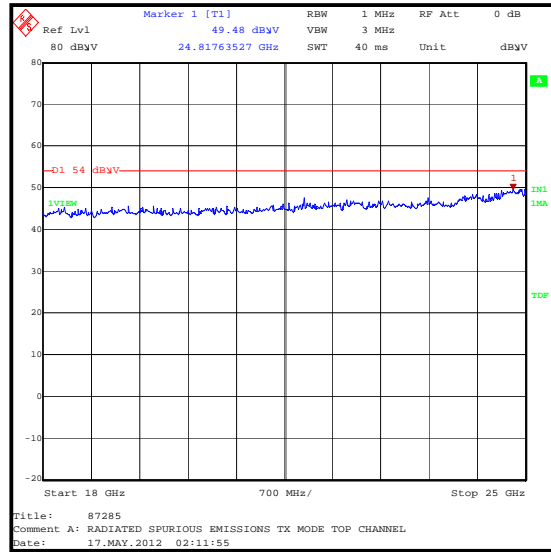
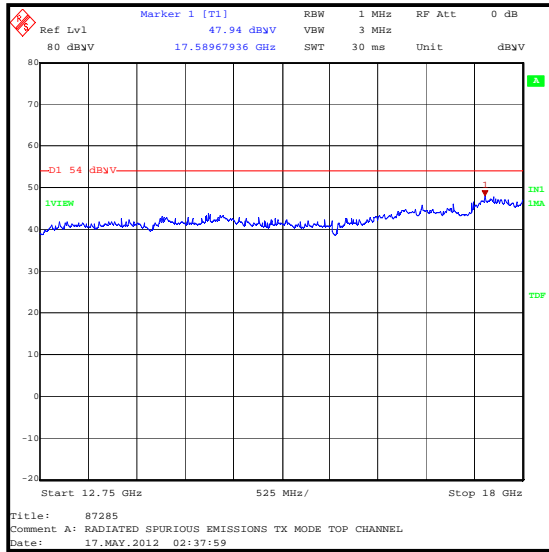
**Note(s):**

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.
3. 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)



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

<b>Test Engineer:</b>	David Doyle	<b>Test Dates:</b>	08 June 2012 & 12 June 2012
<b>Test Sample Serial Number:</b>	22687586		

<b>FCC Reference:</b>	Parts 15.247(d) & 15.209(a)
<b>Industry Canada Reference:</b>	RSS-Gen 4.9, RSS-210 A8.5
<b>Test Method Used:</b>	FCC KDB 558074 D01 Section 5.4 ANSI C63.10 Sections 6.3 and 6.6

**Environmental Conditions:**

<b>Temperature (°C):</b>	22 to 23
<b>Relative Humidity (%):</b>	44 to 47

**Results: 802.11b / 1 Mbps / Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2400	59.1	77.9*	18.8	Complied
2483.5	61.2	74.0	12.8	Complied

**Results: 802.11b / 1 Mbps / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	49.4	54.0	4.6	Complied

**Results: 802.11b / 11 Mbps / Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2400	59.1	78.5*	19.4	Complied
2483.5	70.9	74.0	3.1	Complied

**Results: 802.11b / 11 Mbps / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	49.6	54.0	4.4	Complied

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

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2400	64.2	79.7*	15.5	Complied
2483.5	69.6	74.0	4.4	Complied

**Results: 802.11g / 9 Mbps / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	52.0	54.0	2.0	Complied

**Results: 802.11g / 18 Mbps / Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2400	58.0	77.3*	19.3	Complied
2483.5	65.7	74.0	8.3	Complied

**Results: 802.11g / 18 Mbps / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	52.7	54.0	1.3	Complied

**Results: 802.11g / 36 Mbps / Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2400	56.9	78.0*	21.1	Complied
2483.5	65.5	74.0	8.5	Complied

**Results: 802.11g / 36 Mbps / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	50.8	54.0	3.2	Complied

**Transmitter Band Edge Radiated Emissions (continued)****Results: 802.11g / 54 Mbps / Peak**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2400	61.6	79.8*	18.2	Complied
2483.5	69.8	74.0	4.2	Complied

**Results: 802.11g / 54 Mbps / Average**

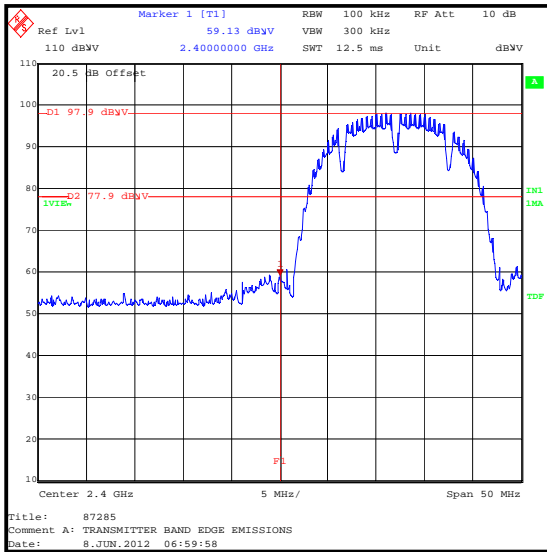
Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	50.7	54.0	3.3	Complied

**Note(s):**

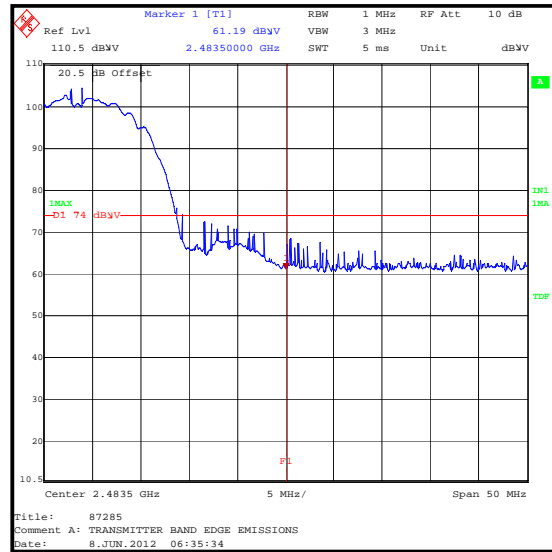
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. \* -20 dBc limit.
3. The highest data rate for each supported modulation type was tested.

### Transmitter Band Edge Radiated Emissions (continued)

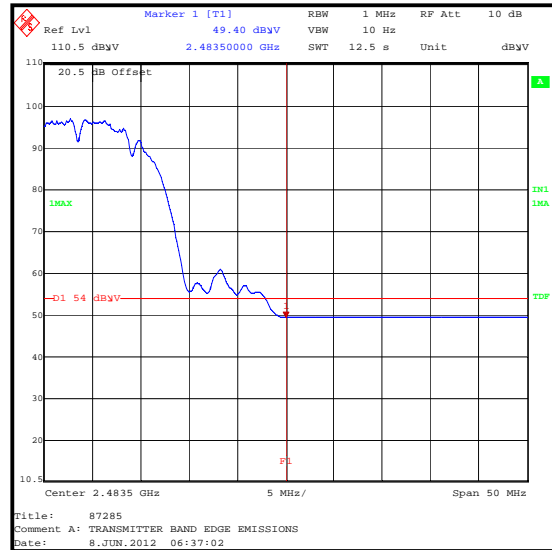
#### Results: 802.11b / 1 Mbps



Lower Band Edge Peak Measurement



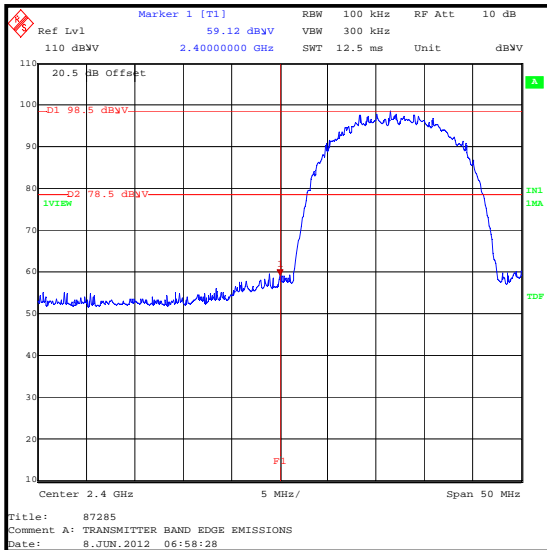
Upper Band Edge Peak Measurement



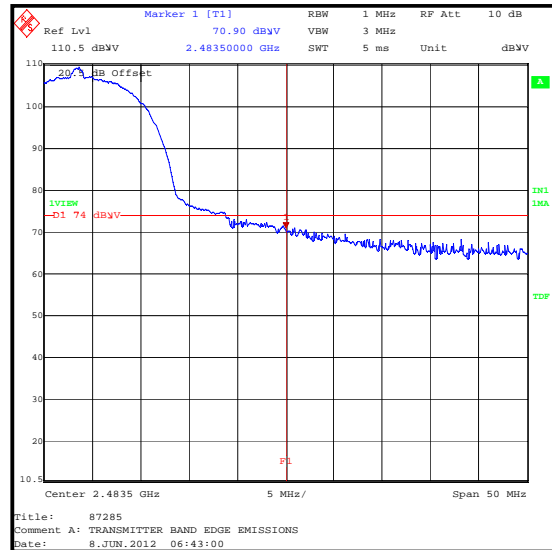
Upper Band Edge Average Measurement

### Transmitter Band Edge Radiated Emissions (continued)

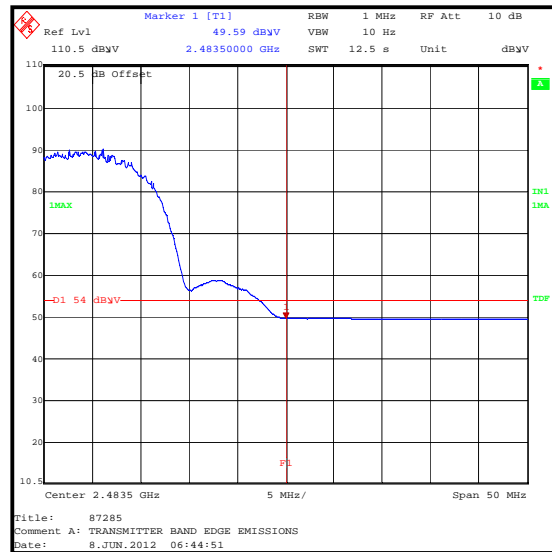
#### Results: 802.11b / 11 Mbps



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement

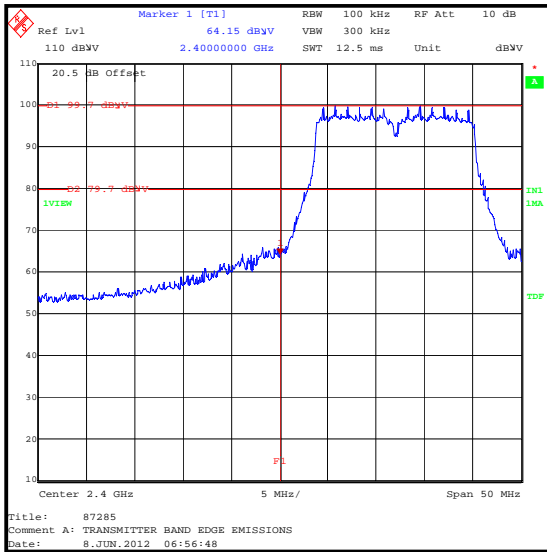


Upper Band Edge Average Measurement

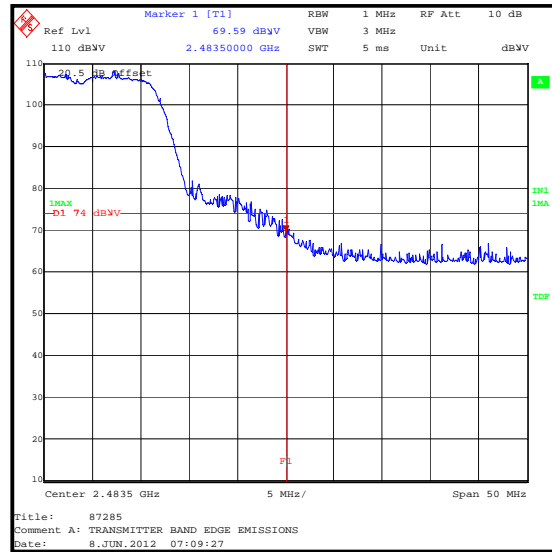


### Transmitter Band Edge Radiated Emissions (continued)

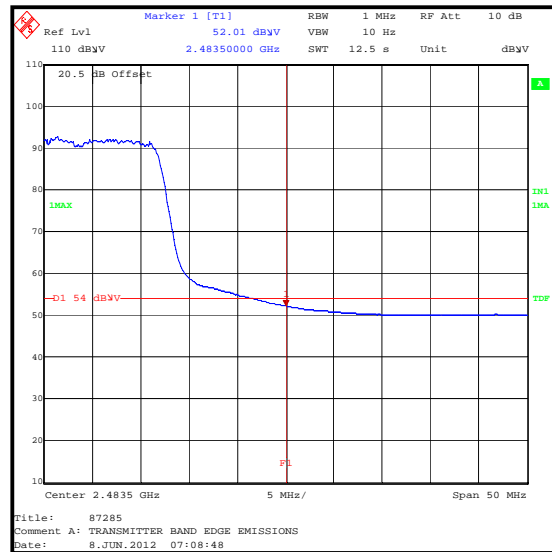
#### Results: 802.11g / 9 Mbps



Lower Band Edge Peak Measurement



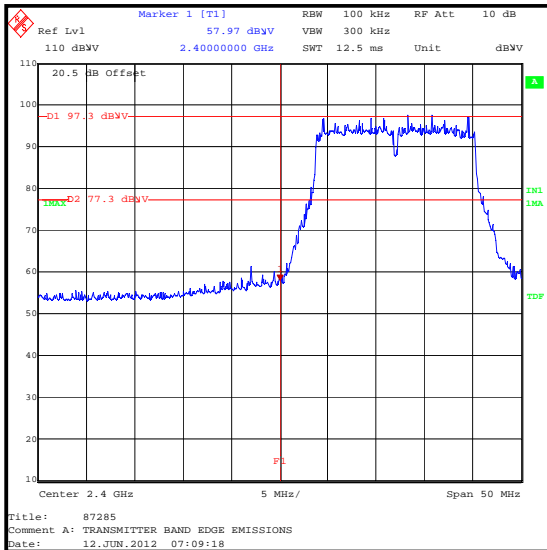
Upper Band Edge Peak Measurement



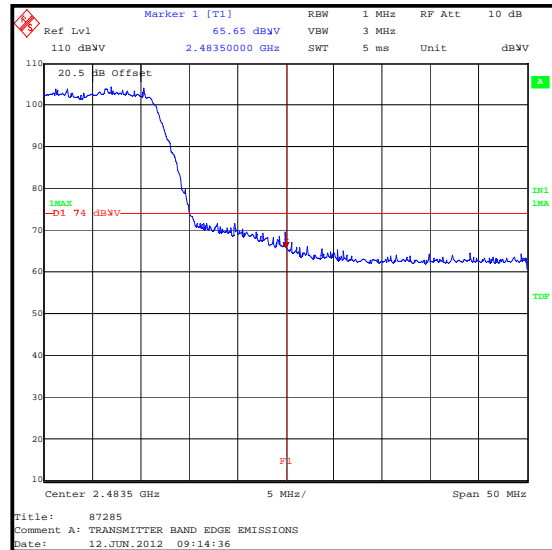
Upper Band Edge Average Measurement

### Transmitter Band Edge Radiated Emissions (continued)

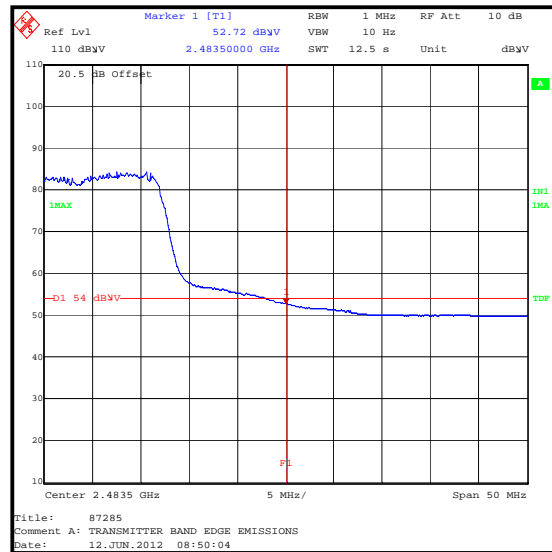
#### Results: 802.11g / 18 Mbps



Lower Band Edge Peak Measurement



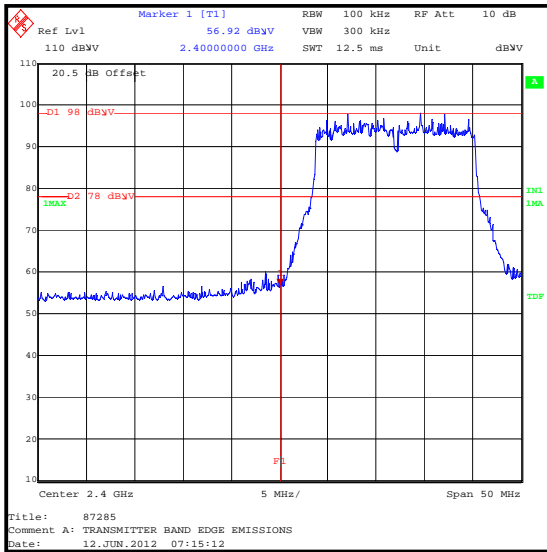
Upper Band Edge Peak Measurement



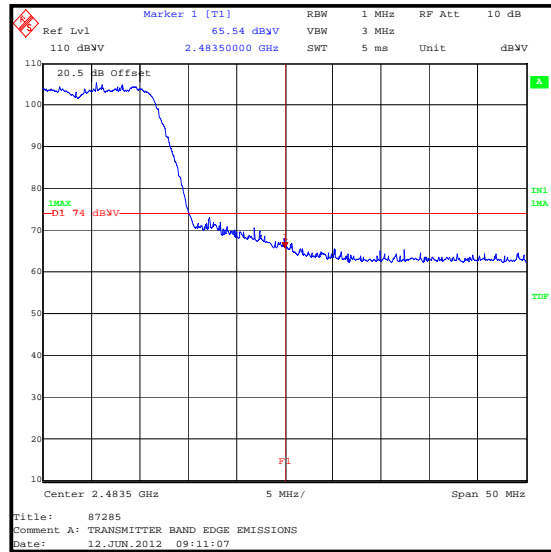
Upper Band Edge Average Measurement

### Transmitter Band Edge Radiated Emissions (continued)

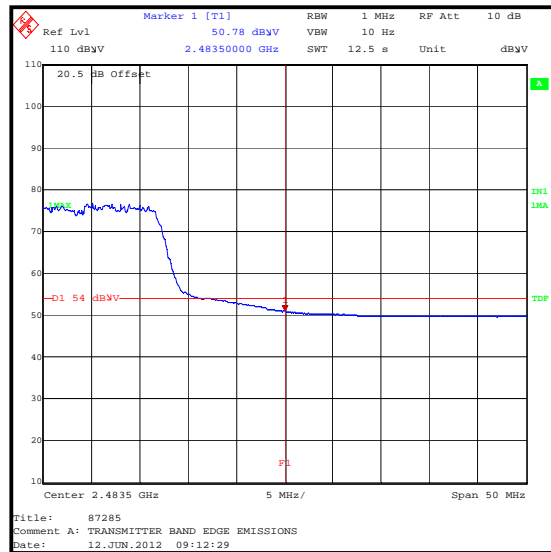
#### Results: 802.11g / 36 Mbps



Lower Band Edge Peak Measurement



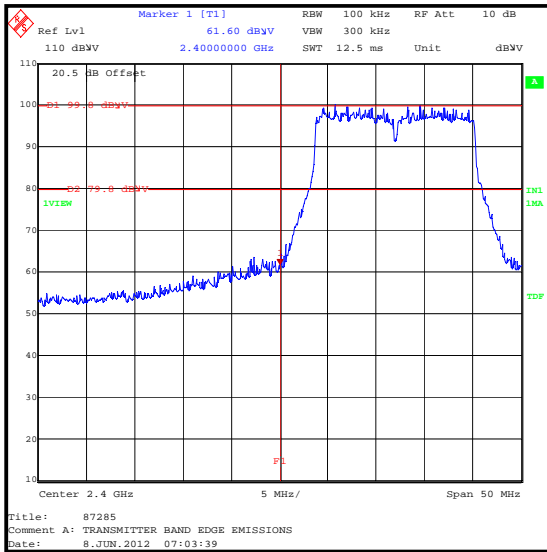
Upper Band Edge Peak Measurement



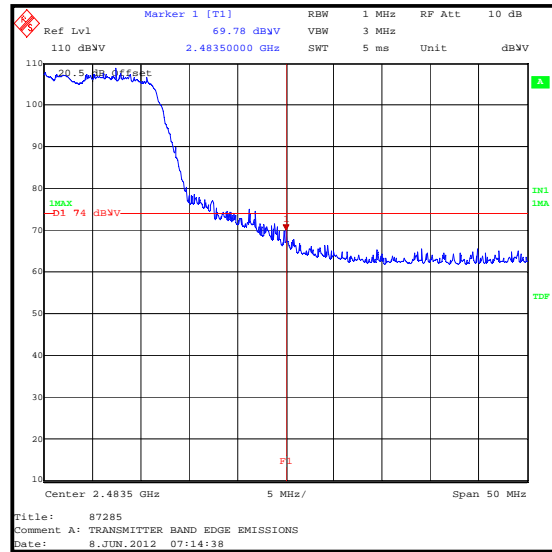
Upper Band Edge Average Measurement

### Transmitter Band Edge Radiated Emissions (continued)

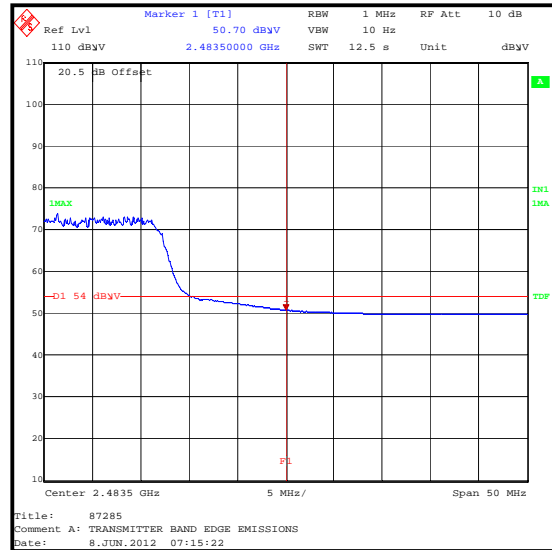
#### Results: 802.11g / 54 Mbps



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 measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

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

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

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

<b>Measurement Type</b>	<b>Range</b>	<b>Confidence Level (%)</b>	<b>Calculated Uncertainty</b>
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%	±0.28 dB
Spectral Power Density	2.4 GHz to 2.4835 GHz	95%	±0.28 dB
6 dB Bandwidth	2.4 GHz to 2.4835 GHz	95%	±0.92 ppm
99 % Emission 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**

<b>RFI No.</b>	<b>Instrument</b>	<b>Manufacturer</b>	<b>Type No.</b>	<b>Serial No.</b>	<b>Date Calibration Due</b>	<b>Cal. Interval (months)</b>
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	06 Jul 2013	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	09 Oct 2012	12
A1818	Antenna	EMCO	3115	00075692	09 Oct 2012	12
A1830	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100668	25 Feb 2013	12
A1834	Attenuator	Hewlett Packard	8491B	10444	29 Jan 2013	12
A2142	Attenuator	Atlan TecRF	AN18-20	081120-23	25 May 2013	12
A253	Antenna	Flann Microwave	12240-20	128	09 Oct 2012	12
A254	Antenna	Flann Microwave	14240-20	139	09 Oct 2012	12
A255	Antenna	Flann Microwave	16240-20	519	09 Oct 2012	12
A256	Antenna	Flann Microwave	18240-20	400	09 Oct 2012	12
A436	Antenna	Flann	20240-20	330	09 Oct 2012	12
A553	Antenna	Chase	CBL6111A	1593	15 Feb 2013	12
A649	LISN	Rohde & Schwarz	ESH3-Z5	825562/008	19 Feb 2013	12
G0543	Amplifier	Sonoma	310N	230801	02 Jan 2013	3
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	24 Oct 2013	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	09 Oct 2012	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB 26	100046K	14 Aug 2013	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	09 Aug 2013	12
M1267	Thermal Power Sensor	Rohde & Schwarz	NRV-Z52	100155	07 Jun 2013	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	03 Feb 2013	12
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	13 Jan 2013	12

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