TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: REN-BP-AutOS

FCC ID: ZFWRENBPAUTOS

To: FCC Part 15.247: 2010 Subpart C

Test Report Serial No:
RFI-RPT-RP77334JD06A V3.0

Version 3.0 supersedes all previous versions

This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals: 	
Checked By:	Ian Watch
Signature: 	
Date of Issue:	15 September 2011

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1. Customer Information

Company Name:	Continental Automotive France S.A.S.
Address:	1, Rue de Clairefontaine – BP 65 78512 Rambouillet Cedex France

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.247
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) - Section 15.247
Specification Reference:	47CFR15.109
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart B (Unintentional Radiators) – Section 15.109
Specification Reference:	47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart C (Intentional Radiators) – Section 15.209
Site Registration:	FCC: 209735
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	02 March 2011 to 17 March 2011

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.109	Receiver/Idle Mode Radiated Spurious Emissions	✓
Part 15.247(a)(2)	Transmitter 6 dB Bandwidth	✓
Part 15.247(e)	Transmitter Power Spectral Density	✓
Part 15.247(b)(3)	Transmitter Maximum Peak Output Power	✓
Part 15.247(d)/15.209(a)	Transmitter Radiated Emissions	✓
Part 15.247(d)/15.209(a)	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:	REN-BP-AutOS
Model Name or Number:	C4
Serial Number:	Refer to individual results pages
Hardware Version Number:	C4
Software Version Number:	Not stated
FCC ID:	ZFWRENBPAUTOS

3.2. Description of EUT

The equipment under test was an automotive embedded PC for multimedia, wireless communication and navigation purposes. It incorporates the following technologies: 2G/EDGE/GPRS/3G/HSDPA/HSUPA; Bluetooth 2.1 (+ EDR); Wi-Fi b/g and GPS.

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		
Type of Unit:	Transceiver		
Modulation:	BPSK and 64QAM		
Data Rate:	802.11b (DSSS): 1, 2, 5.5, 11 Mbps 802.11g (OFDM): 6, 9, 12, 18, 24, 36, 48, 54 Mbps		
Power Supply Requirement(s):	Nominal	12 V	
Maximum Conducted Output Power:	11.6 dBm		
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

3.5. Support Equipment

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

Description:	Automotive Display Unit
Brand Name:	Johnson Control
Model Name or Number:	28091 CS70C
Serial Number:	NS00112177

Description:	USB Keyboard
Brand Name:	Dell
Model Name or Number:	SK-8115
Serial Number:	CN-0J4632-71616-5C0-02I5

Description:	USB Mouse
Brand Name:	Dell
Model Name or Number:	0X7636
Serial Number:	HCJ54795214

Description:	SD card
Brand Name:	Lbd
Model Name or Number:	265Mb
Serial Number:	None stated

Description:	12V vehicle battery
Brand Name:	Optima batteries
Model Name or Number:	8012-254
Serial Number:	812 254 0008882

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

- Continuously transmitting at maximum power on the bottom, centre and top channels as required using the data rates which exhibited the widest spectral bandwidths and highest power levels i.e.: 802.11b 11 Mbps – BPSK and 802.11g 54 Mbps - 64QAM.
- The measurement of 6 dB bandwidth was performed using the data rates in each mode which exhibited the narrowest spectral bandwidth.
- Band edge measurements were performed using the data rates in each mode which exhibited the widest spectral bandwidths and highest power levels.
- Idle Mode

4.2. Configuration and Peripherals

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

- The EUT as tested was operating on the Windows operating system to allow test software to be run which would exercise all of the technologies in the manner required by testing.
- The EUT was setup by connecting a mouse, keyboard and display to enable operation of test software. These, in addition to an SD card, were connected for the duration of testing in order to terminate all ports.
- EUT was powered by a standard 12V DC car battery.
- Transmitter spurious emissions were performed with the EUT transmitting in 802.11b 11 Mbps mode, as this was seen to have the highest power level and therefore deemed to be worst case.

5. Measurements, Examinations and Derived Results

5.1. General Comments

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section 6 for Measurement Uncertainties* for details.

5.2. Test Results

5.2.1. Receiver/Idle Mode Radiated Spurious Emissions

Test Summary:

Test Engineer:	Crawford Lindsay	**Test Date:**	02 March 2011
Test Sample Serial No:	BS0010430000039		

FCC 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):	25
Relative Humidity (%):	31

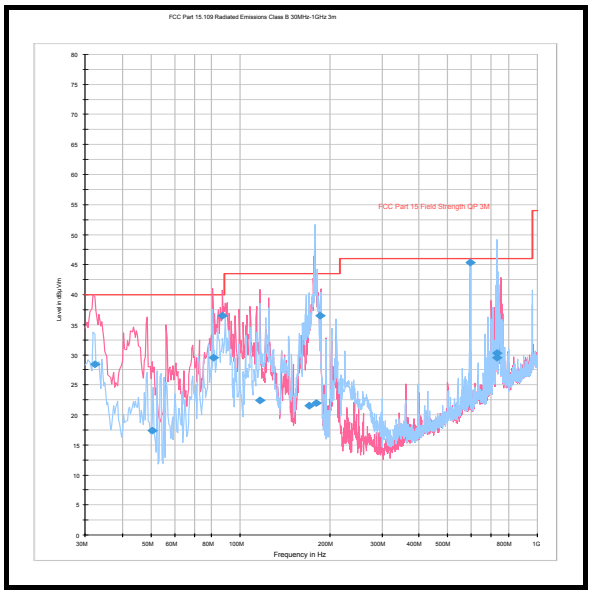
Results: Quasi Peak

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
32.437	Vertical	28.4	40.0	11.6	Complied
50.632	Vertical	17.3	40.0	22.7	Complied
81.243	Vertical	29.5	40.0	10.5	Complied
87.236	Vertical	36.5	40.0	3.5	Complied
116.497	Vertical	22.4	43.5	21.1	Complied
170.279	Horizontal	21.5	43.5	22.0	Complied
180.113	Horizontal	21.9	43.5	21.6	Complied
184.904	Vertical	36.5	43.5	7.0	Complied
592.466	Horizontal	45.4	46.0	0.6	Complied
732.887	Horizontal	30.2	46.0	15.8	Complied
732.937	Horizontal	29.5	46.0	16.5	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:

Test Engineer:	Andrew Edwards	**Test Date:**	08 March 2011
Test Sample Serial No:	BS0010430000058		

FCC 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):	23
Relative Humidity (%):	20

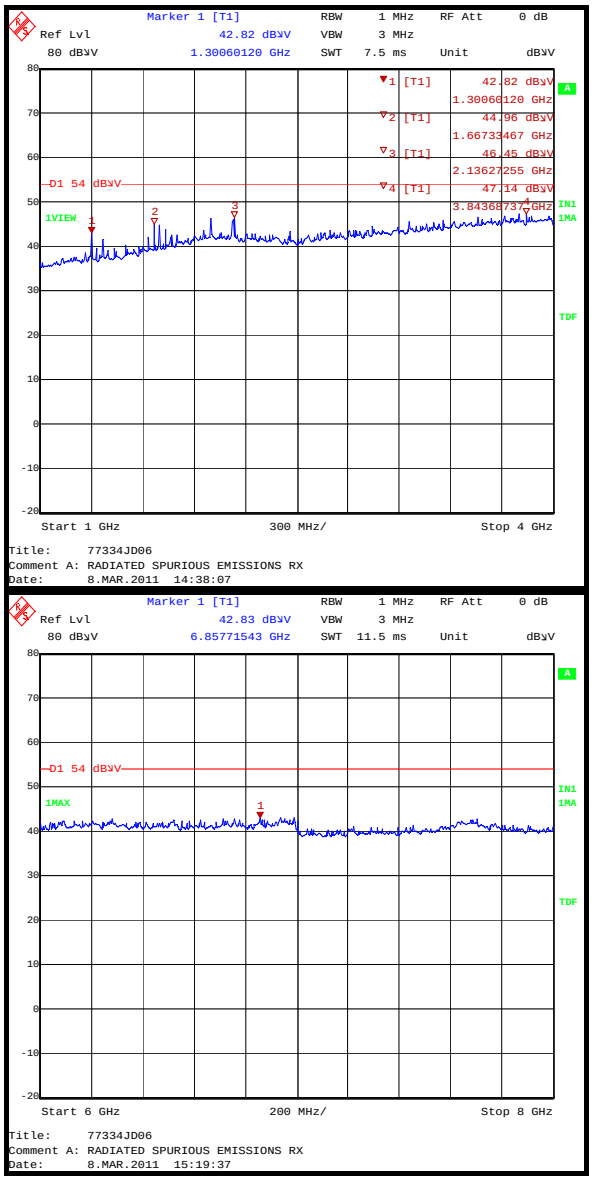
Results:

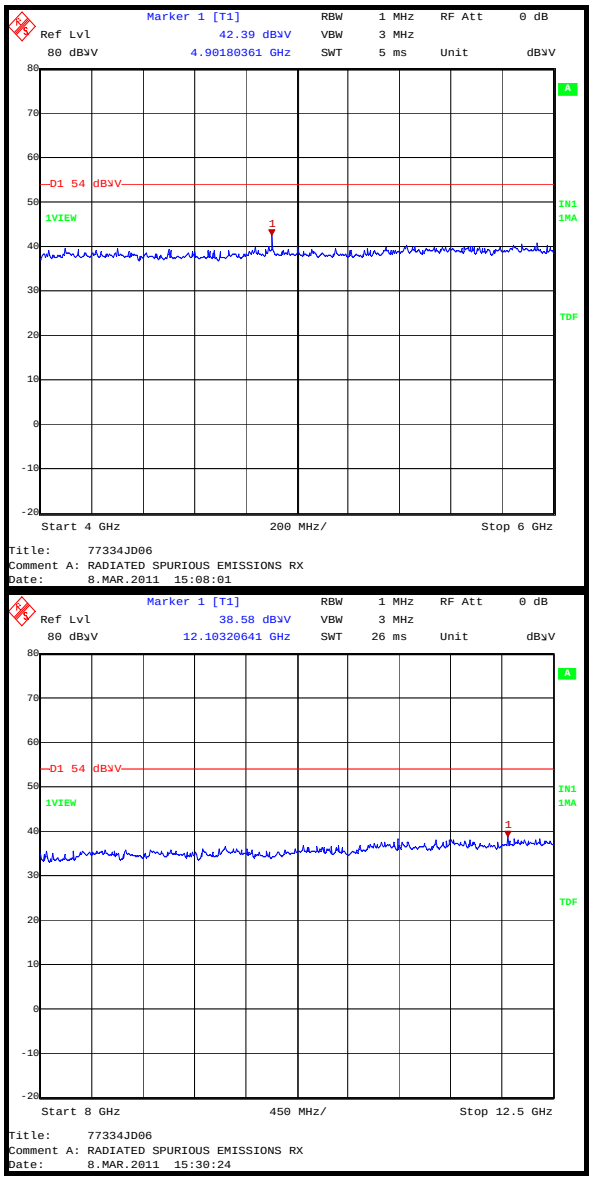
Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
1299.411	Vertical	41.5	54.0	12.5	Complied
1367.138	Vertical	41.1	54.0	12.9	Complied
1499.668	Vertical	40.5	54.0	13.5	Complied
1666.981	Vertical	45.3	54.0	8.7	Complied
1700.070	Vertical	47.0	54.0	7.0	Complied
1999.986	Vertical	46.5	54.0	7.5	Complied
4900.003	Vertical	42.9	54.0	11.1	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.

Receiver/Idle Mode Radiated Spurious Emissions (continued)





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

5.2.2. Transmitter 6 dB Bandwidth

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	15 March 2011
Test Sample Serial No:	BS0010430000029		

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

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	21

Results: 802.11b 1 Mbps

Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	10.220	≥0.5	9.720	Complied
Middle	10.120	≥0.5	9.620	Complied
Top	10.220	≥0.5	9.720	Complied

Results: 802.11g 6 Mbps

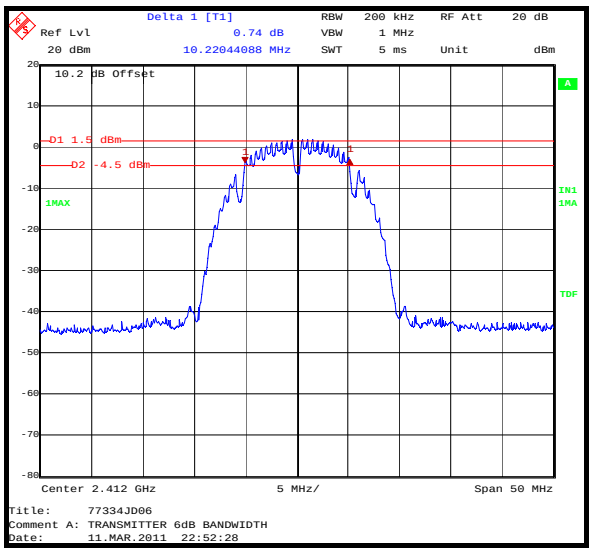
Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
Bottom	16.433	≥0.5	15.930	Complied
Middle	16.433	≥0.5	15.930	Complied
Top	16.533	≥0.5	16.030	Complied

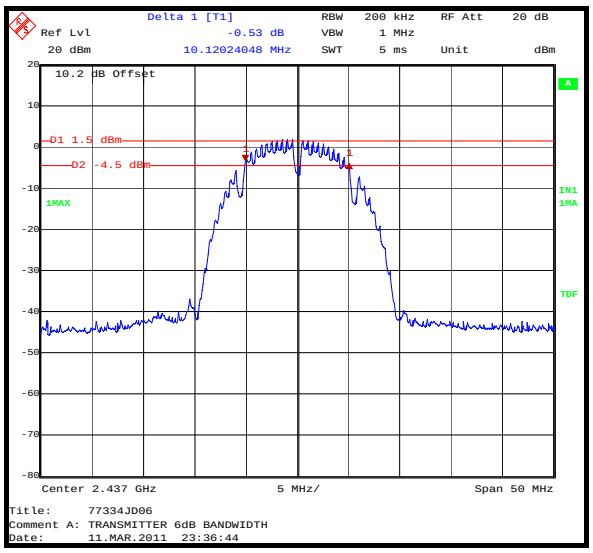
Note(s):

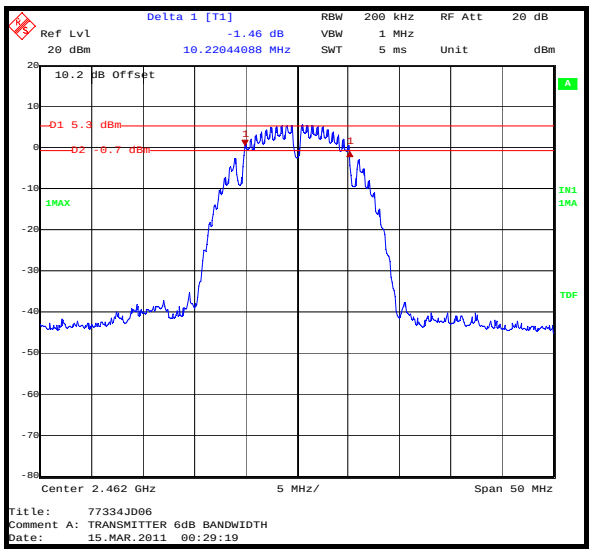
1. 6d B bandwidth measurements were performed on all data rates and the worst case (i.e. the narrowest) bandwidths in each mode are reported above.

Transmitter 6 dB Bandwidth (continued)

Results: 802.11b 1 Mbps

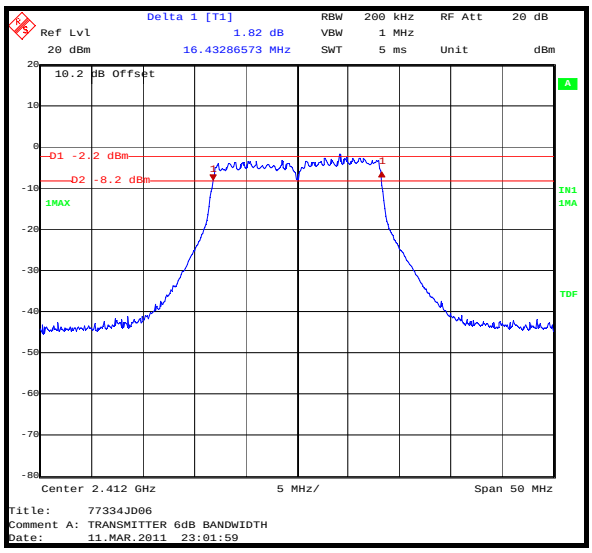


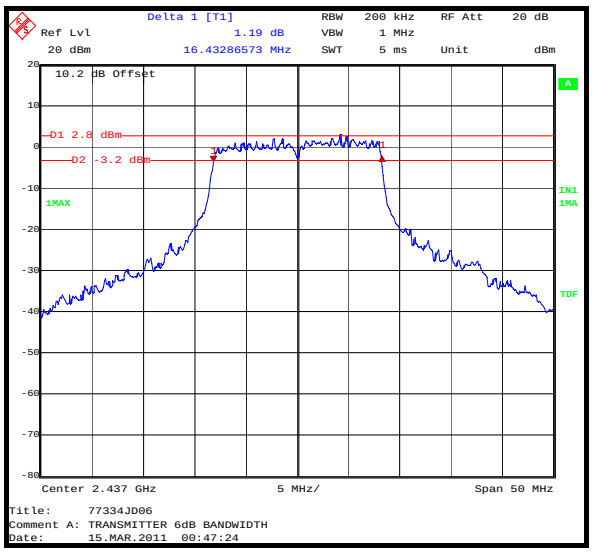


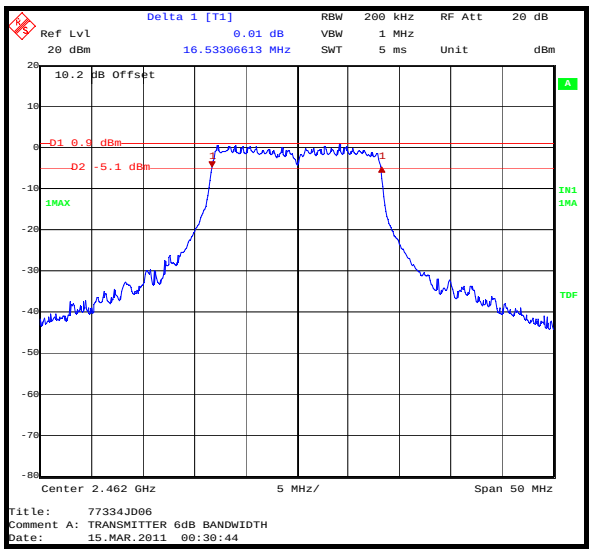


Transmitter 6 dB Bandwidth (continued)

Results: 802.11g 6 Mbps







5.2.3. Transmitter Power Spectral Density

Test Summary:

Test Engineer:	Crawford Lindsay	**Test Date:**	17 March 2011
Test Sample Serial No:	BS0010430000029		

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

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	31

Results: 802.11b 11 Mbps

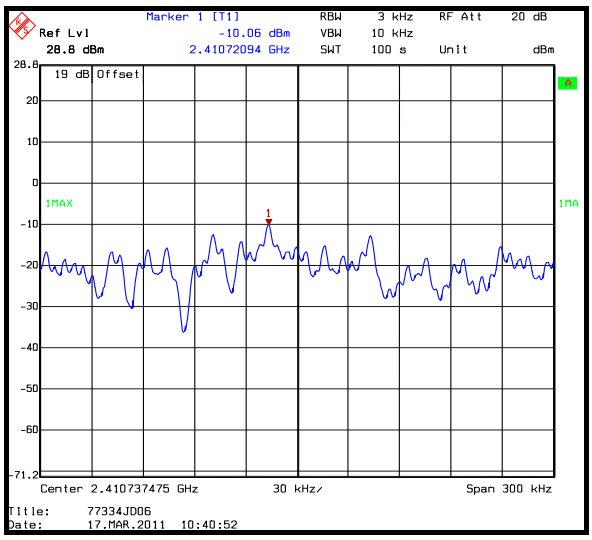
Channel	Output Power (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
Bottom	-10.1	8.0	18.1	Complied
Middle	-9.9	8.0	17.9	Complied
Top	-9.7	8.0	17.7	Complied

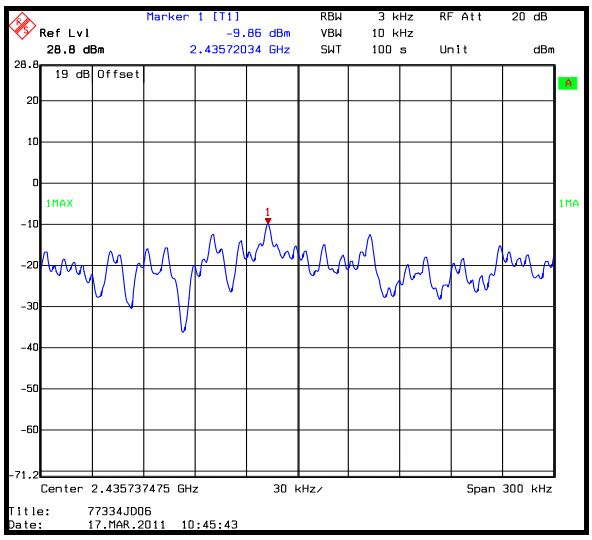
Results: 802.11g 54 Mbps

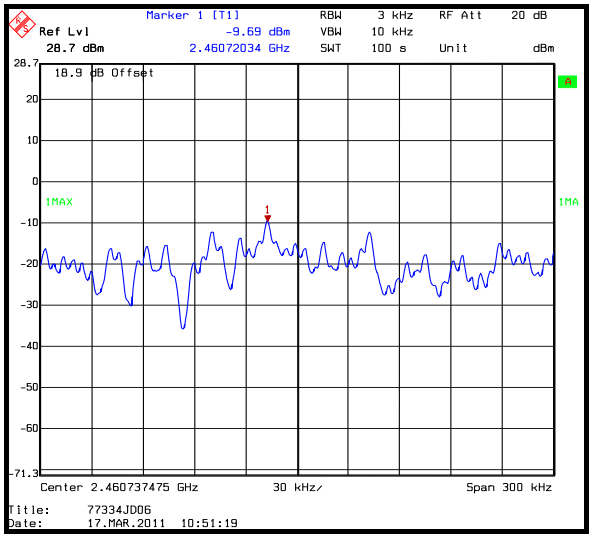
Channel	Output Power (dBm/3 kHz)	Limit (dBm/3 kHz)	Margin (dB)	Result
Bottom	-14.9	8.0	22.9	Complied
Middle	-16.9	8.0	24.9	Complied
Top	-15.4	8.0	23.4	Complied

Transmitter Power Spectral Density (continued)

Results: 802.11b 11 Mbps

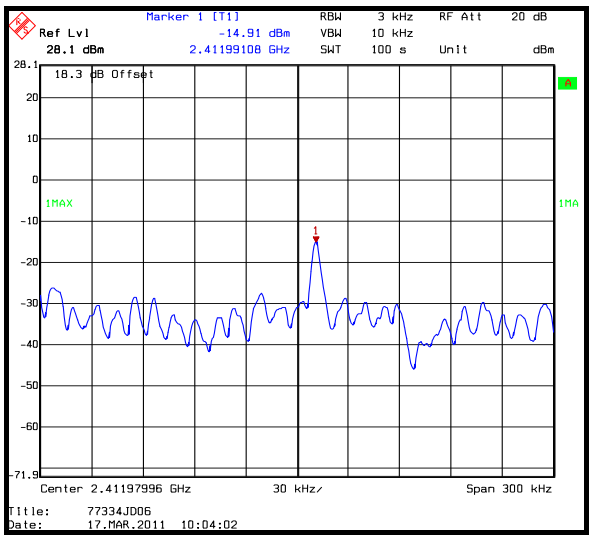


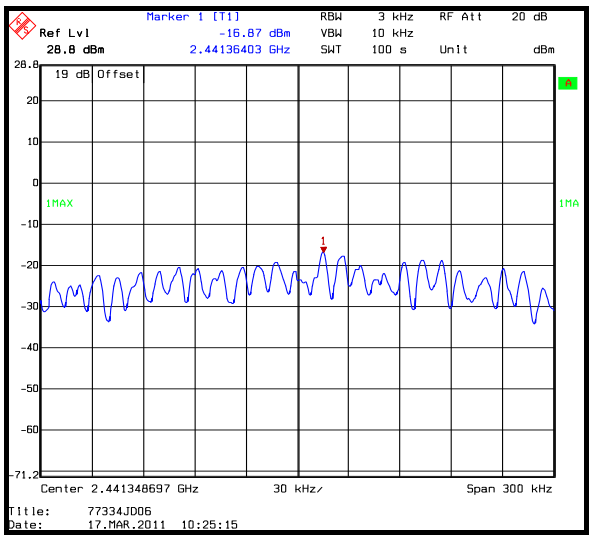


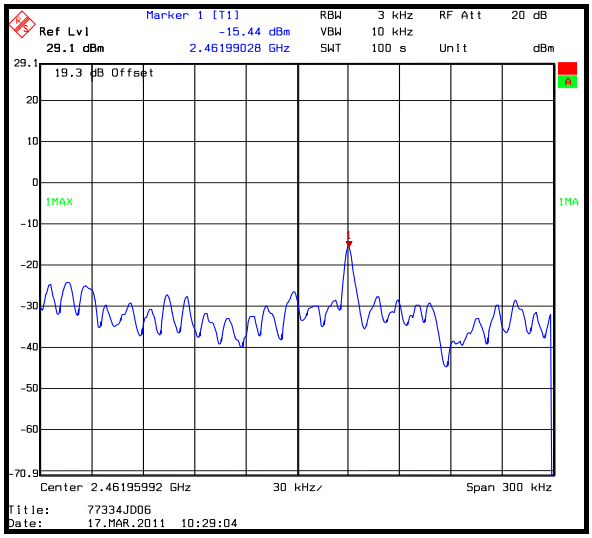


Transmitter Power Spectral Density (continued)

Results: 802.11g 54 Mbps







5.2.4. Transmitter Maximum Peak Conducted Output Power

Test Summary:

Test Engineer:	Crawford Lindsay	**Test Date:**	16 March 2011
Test Sample Serial No:	BS0010430000029		

FCC 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 (%):	30

Results 802.11b 11Mbps:

Conducted Limit Comparison

Channel	Conducted Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	11.4	30.0	18.6	Complied
Middle	11.4	30.0	18.6	Complied
Top	11.6	30.0	18.4	Complied

De Facto EIRP Limit Comparison

Channel	Conducted Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	11.4	7.5	18.9	36.0	17.1	Complied
Middle	11.4	7.5	18.9	36.0	17.1	Complied
Top	11.6	7.5	19.1	36.0	16.9	Complied

Transmitter Maximum Peak Output Power (continued)

Results 802.11g 54Mbps:

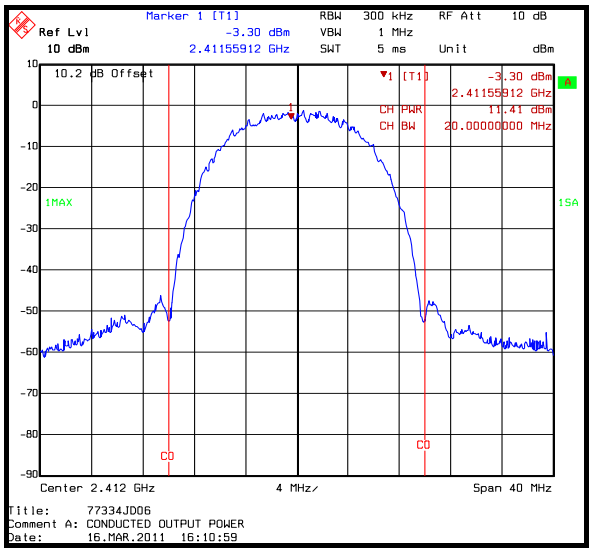
Conducted Limit Comparison

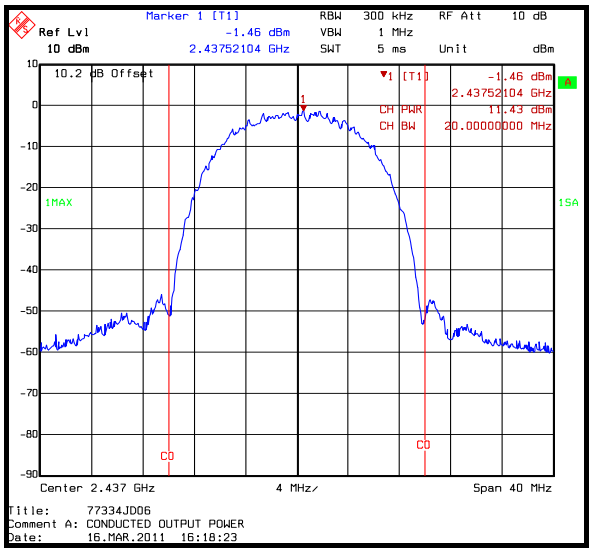
Channel	Conducted Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	8.2	30.0	21.8	Complied
Middle	7.8	30.0	22.2	Complied
Top	8.1	30.0	21.9	Complied

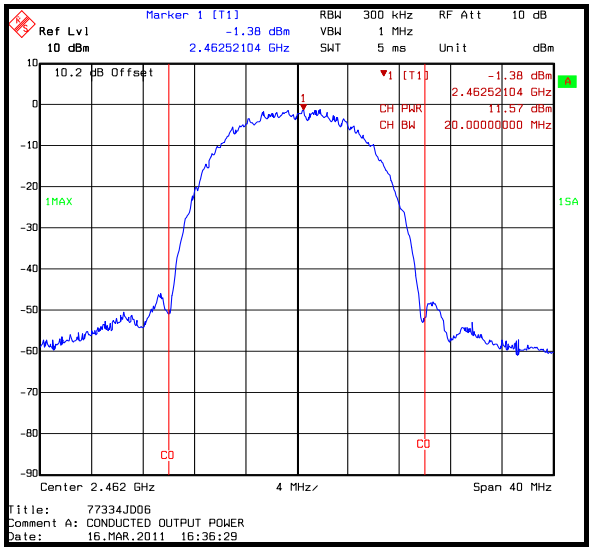
De Facto EIRP Limit Comparison

Channel	Conducted Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	8.2	7.5	15.7	36.0	20.3	Complied
Middle	7.8	7.5	15.3	36.0	20.7	Complied
Top	8.1	7.5	15.6	36.0	20.4	Complied

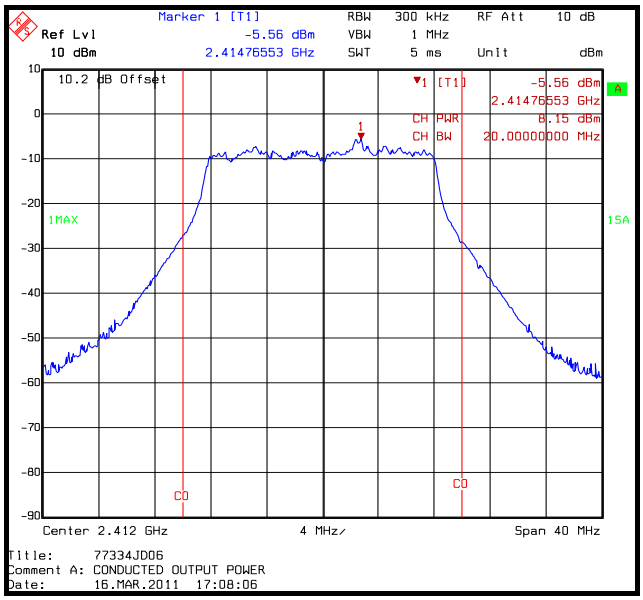
Transmitter Maximum Peak Output Power (continued) 802.11b 11 Mbps:

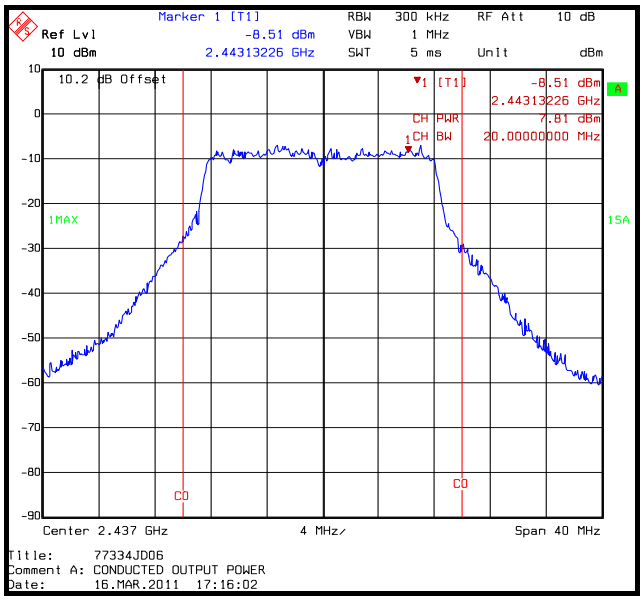


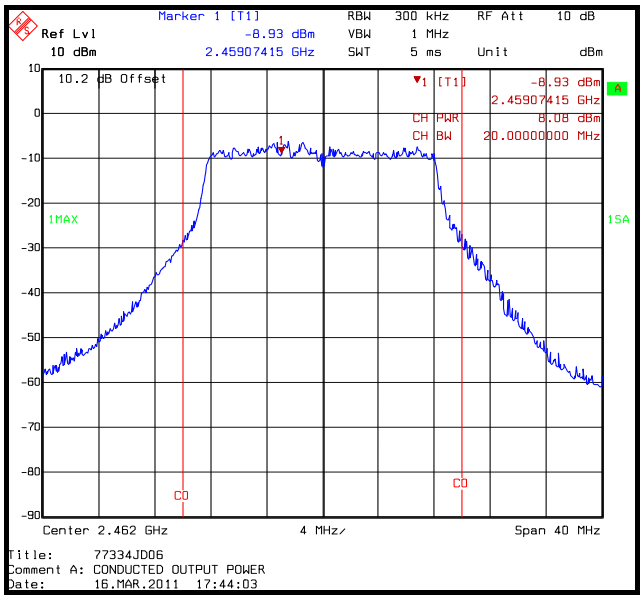




Transmitter Maximum Peak Output Power (continued) 802.11g 54 Mbps:







5.2.5. Transmitter Radiated Emissions

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	09 March 2011
Test Sample Serial No:	BS0010430000058		

FCC 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):	29
Relative Humidity (%):	23

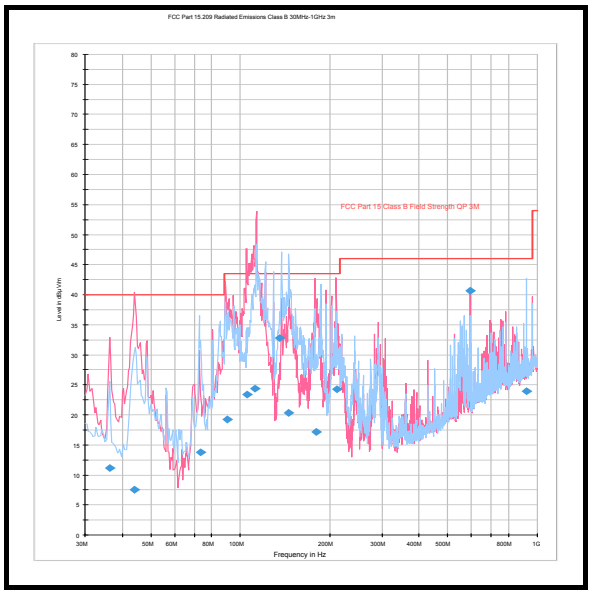
Results: Top Channel

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
36.392	Vertical	11.1	40.0	28.9	Complied
43.941	Vertical	7.5	40.0	32.5	Complied
73.398	Horizontal	13.7	40.0	26.3	Complied
90.412	Vertical	19.3	43.5	24.2	Complied
105.475	Vertical	23.4	43.5	20.1	Complied
111.903	Vertical	24.3	43.5	19.2	Complied
135.829	Horizontal	32.8	43.5	10.7	Complied
145.793	Horizontal	20.4	43.5	23.1	Complied
180.071	Vertical	17.2	43.5	26.3	Complied
210.574	Vertical	24.3	43.5	19.2	Complied
592.450	Vertical	40.6	46.0	5.4	Complied
916.461	Horizontal	23.9	46.0	22.1	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:	Nick Steele	**Test Date:**	08 March 2011
Test Sample Serial No:	BS0010430000058		

FCC Part:	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):	25
Relative Humidity (%):	20

Results: Average Bottom Channel

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4823.718	Horizontal	33.9	54.0	20.1	Complied

Results: Average Middle Channel

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4874.031	Horizontal	33.2	54.0	20.8	Complied

Results: Average Top Channel

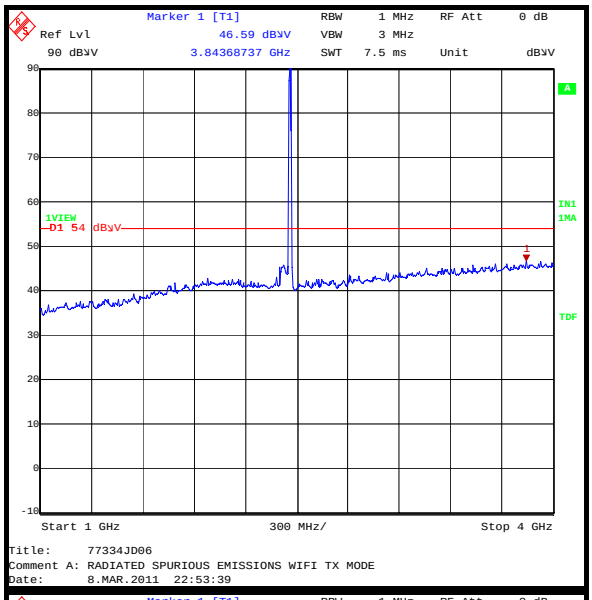
Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
4924.067	Horizontal	32.0	54.0	22.0	Complied

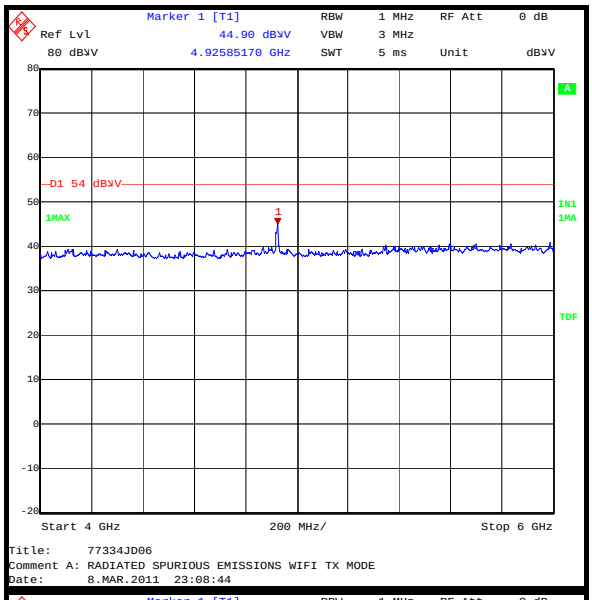
Transmitter Radiated Emissions (continued)

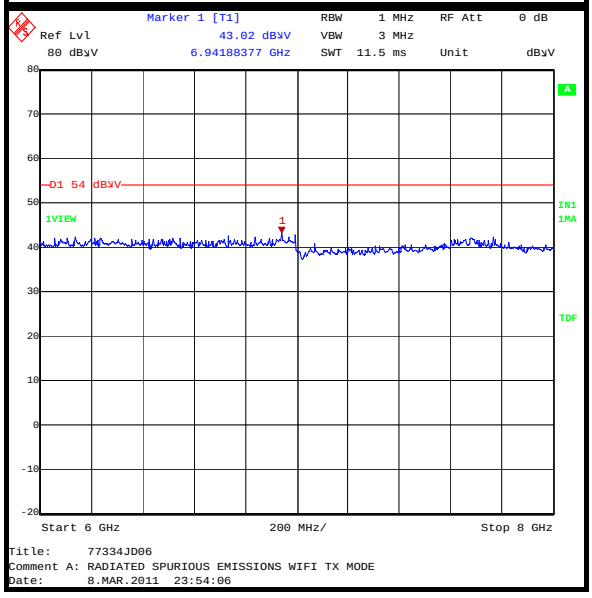
Note(s):

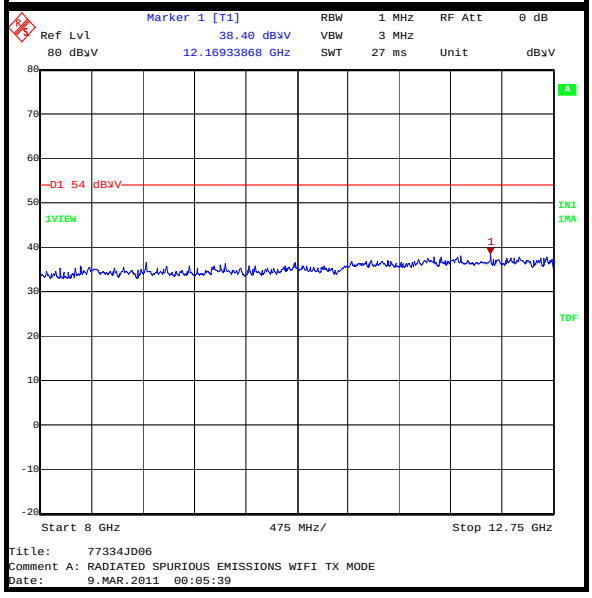
1. The second harmonic peak levels on the bottom, middle and top channels were all greater than 20 dB below the limit and, therefore, were not recorded.
2. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss
3. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
4. The emission shown on the 1 GHz to 4 GHz plot is the EUT fundamental.
5. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Radiated Emissions (continued)

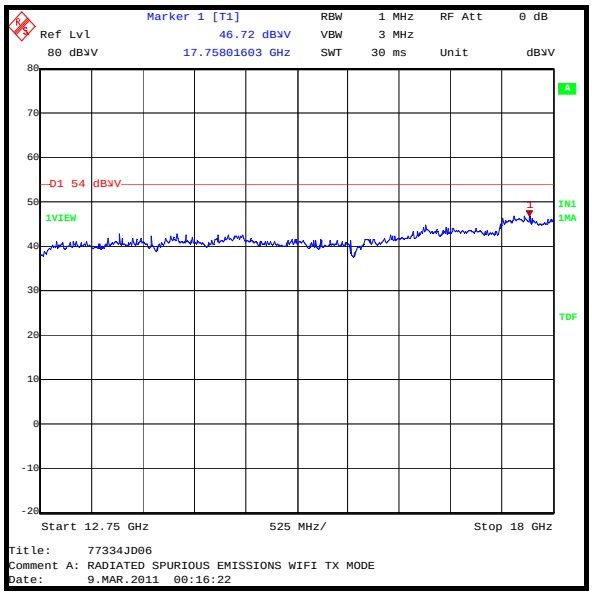


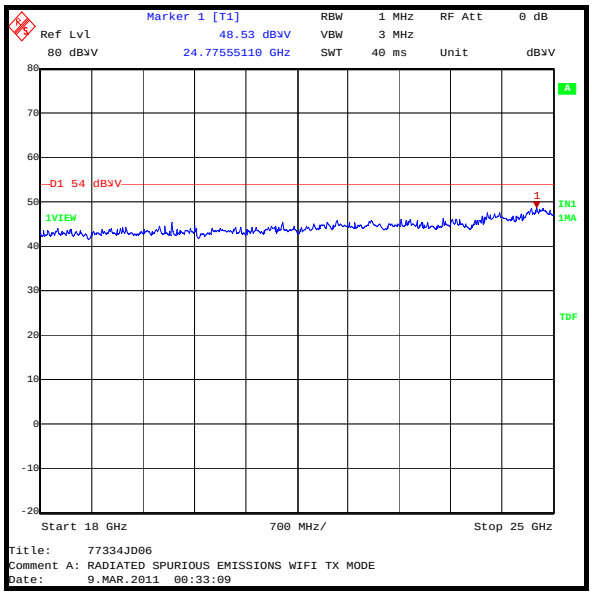






Transmitter Radiated Emissions (continued)





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

5.2.6. Transmitter Band Edge Radiated Emissions

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	11 March 2011
Test Sample Serial No:	BS0010430000058		

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

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	20

Results 802.11b 11Mbps: Peak

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2400	45.3	*75.1**	30.2	Complied
2483.5	53.2	74.0	20.8	Complied

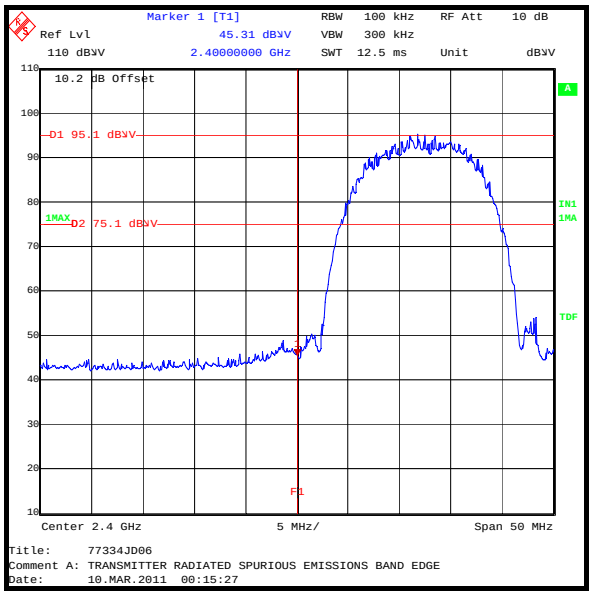
Results 802.11b 11Mbps: Average

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	40.2	54.0	13.8	Complied

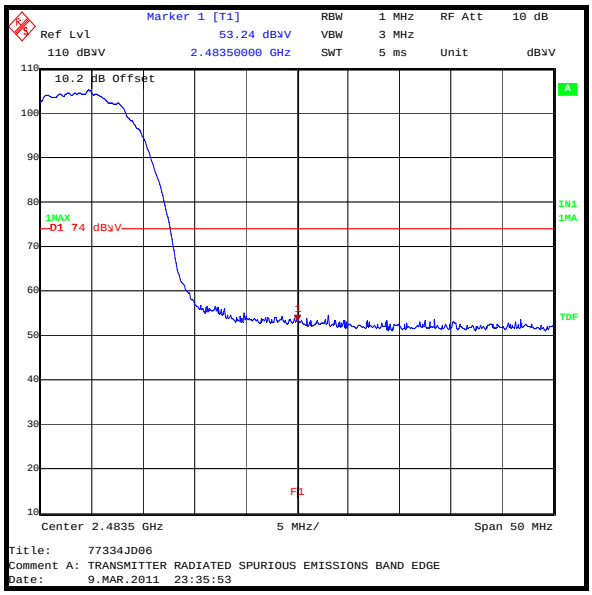
Note(s):

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.

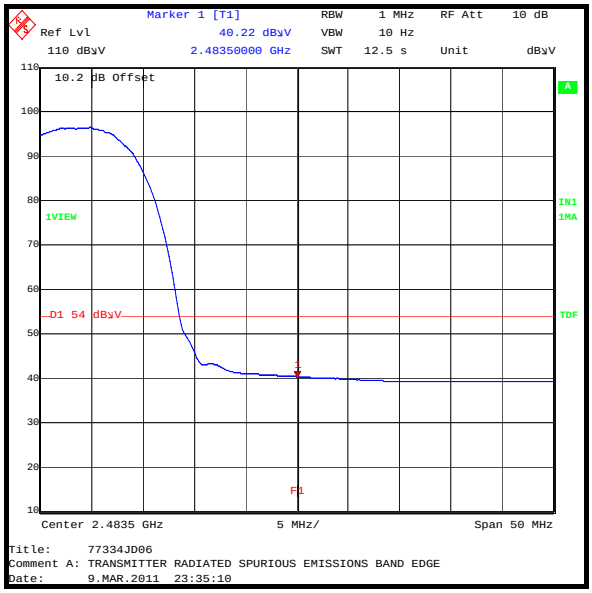
Transmitter Band Edge Radiated Emissions (continued)



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (continued)

Results 802.11g 9Mbps: Peak

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2400	57.4	68.4*	11.0	Complied
2483.5	55.0	74.0	19.0	Complied

Results 802.11g 9Mbps: Average

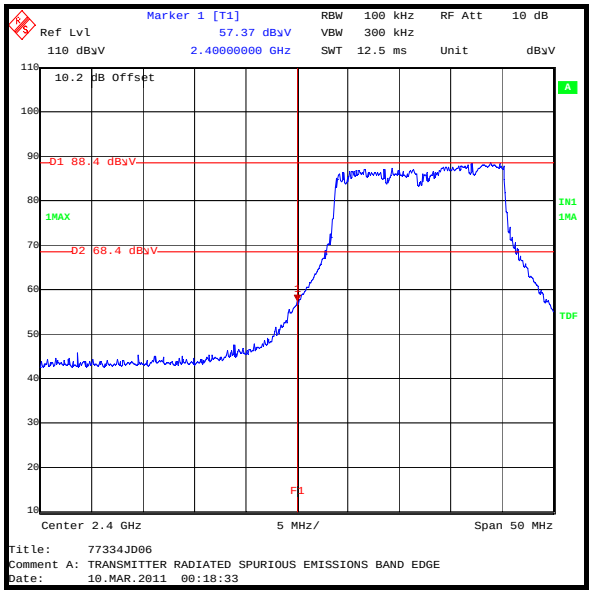
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2483.5	40.9	54.0	13.1	Complied

Note(s):

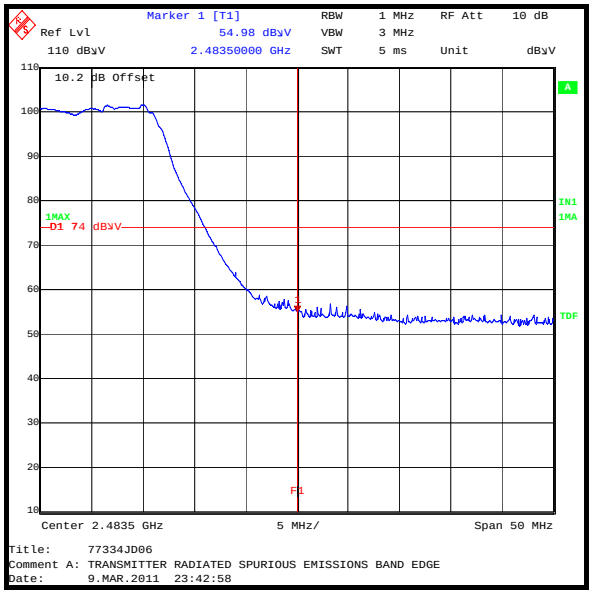
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. * -20 dBc limit.

Transmitter Band Edge Radiated Emissions (continued)

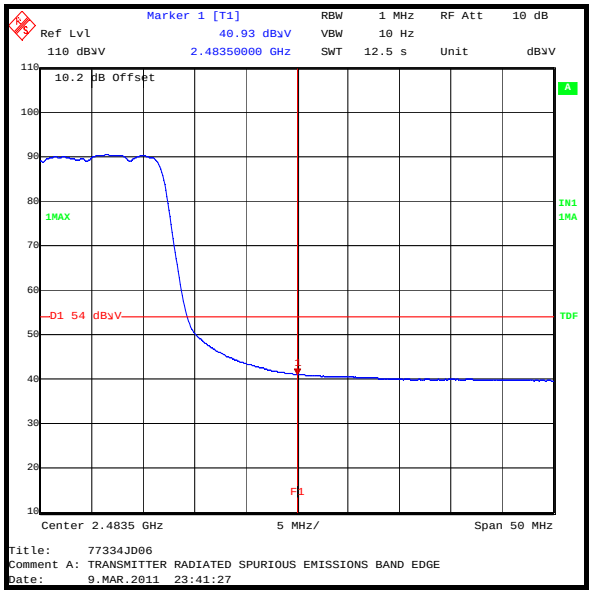
802.11g 9Mbps



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (continued)

Results 802.11g 18Mbps: Peak

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2400	55.9	*68.8**	12.9	Complied
2483.5	55.1	74.0	18.9	Complied

Results 802.11g 18Mbps: Average

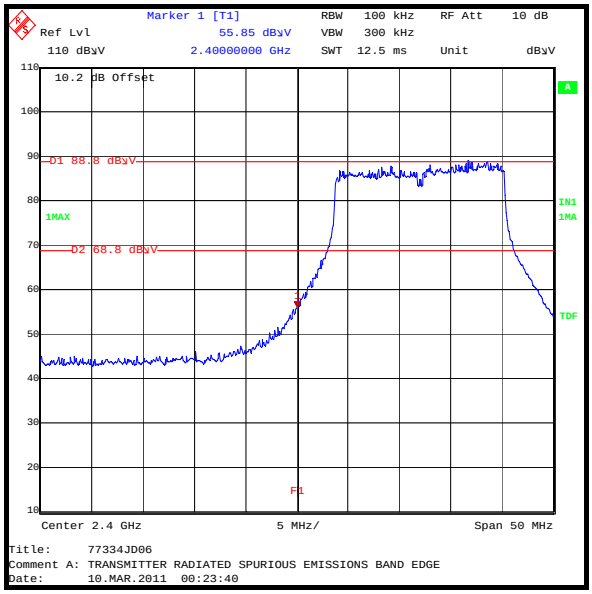
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2483.5	40.8	54.0	13.2	Complied

Note(s):

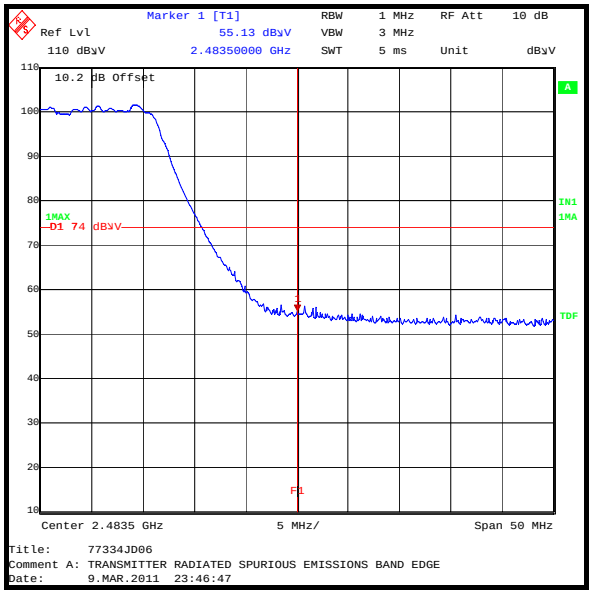
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. * -20 dBc limit.

Transmitter Band Edge Radiated Emissions (continued)

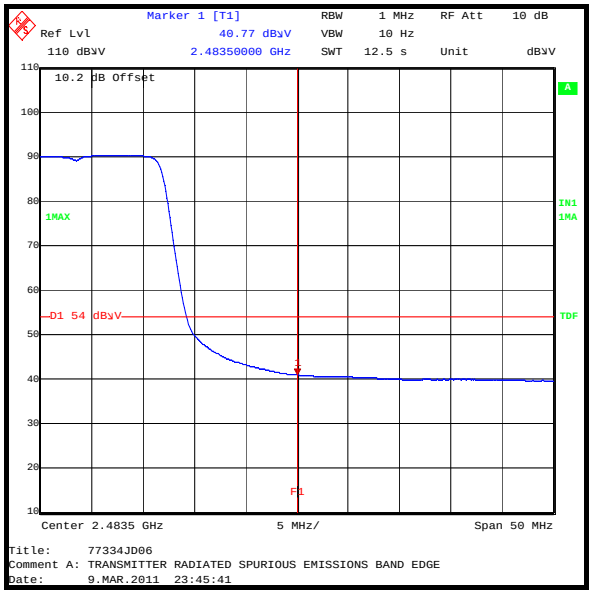
802.11g 18Mbps



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (continued)

Results 802.11g 48Mbps: Peak

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2400	57.0	*70.2**	13.2	Complied
2483.5	57.3	74.0	16.7	Complied

Results 802.11g 48Mbps: Average

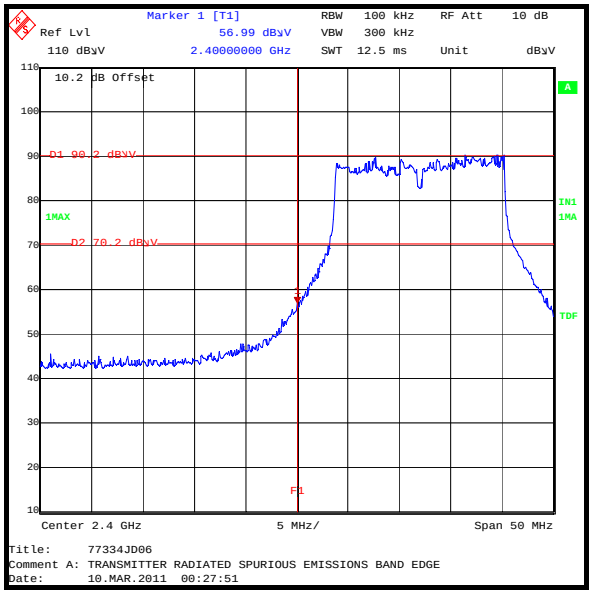
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2483.5	40.8	54.0	13.2	Complied

Note(s):

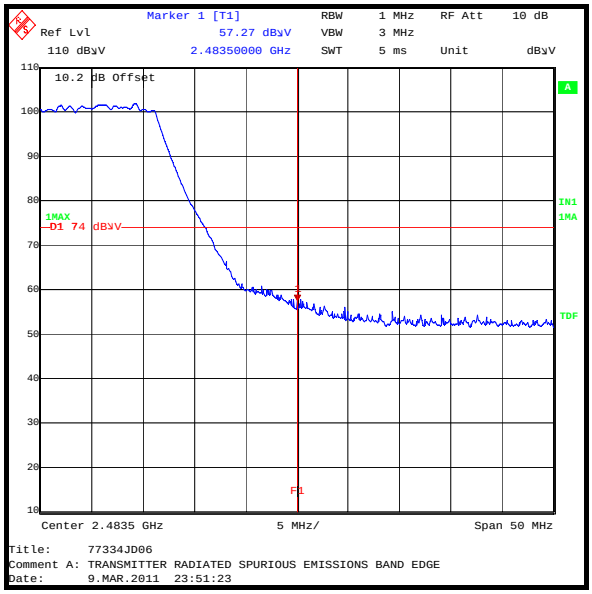
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. * -20 dBc limit.

Transmitter Band Edge Radiated Emissions (continued)

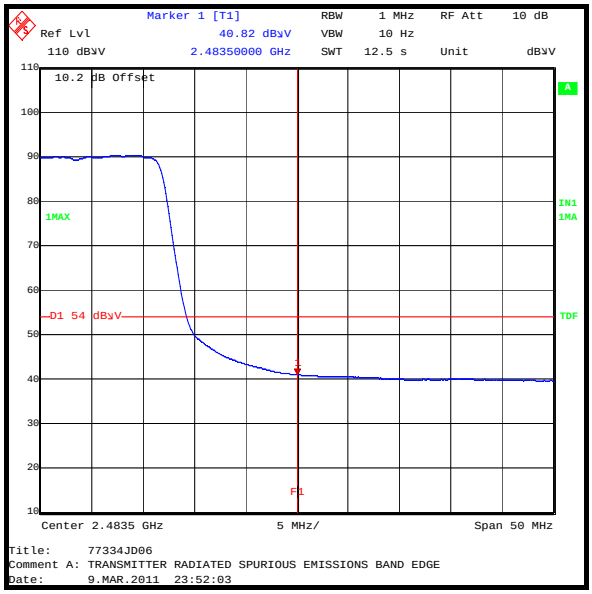
802.11g 48Mbps



Lower Band Edge Peak Measurement



Upper Band Edge Peak Measurement



Upper Band Edge Average Measurement

Transmitter Band Edge Radiated Emissions (continued)

Results 802.11g 54Mbps: Peak

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2400	57.0	*69.6**	12.6	Complied
2483.5	54.8	74.0	19.2	Complied

Results 802.11g 54Mbps: Average

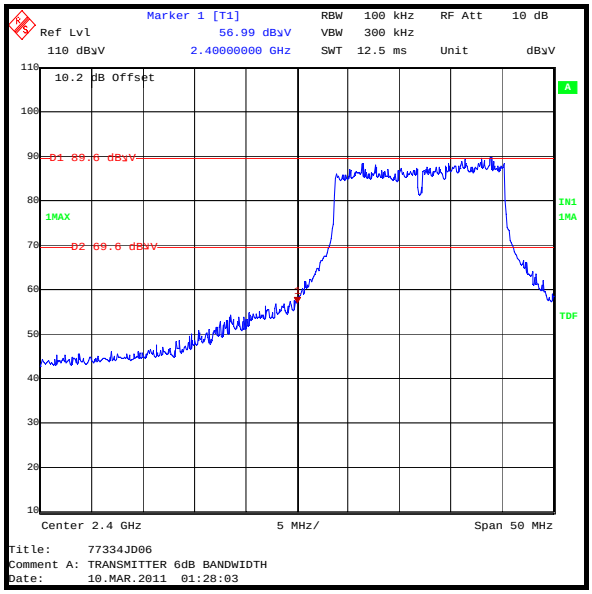
Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
2483.5	40.8	54.0	13.2	Complied

Note(s):

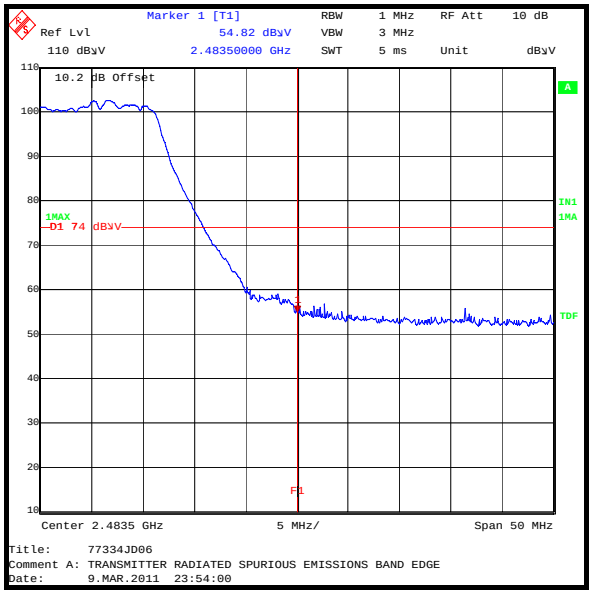
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. * -20 dBc limit.

Transmitter Band Edge Radiated Emissions (continued)

802.11g 54Mbps

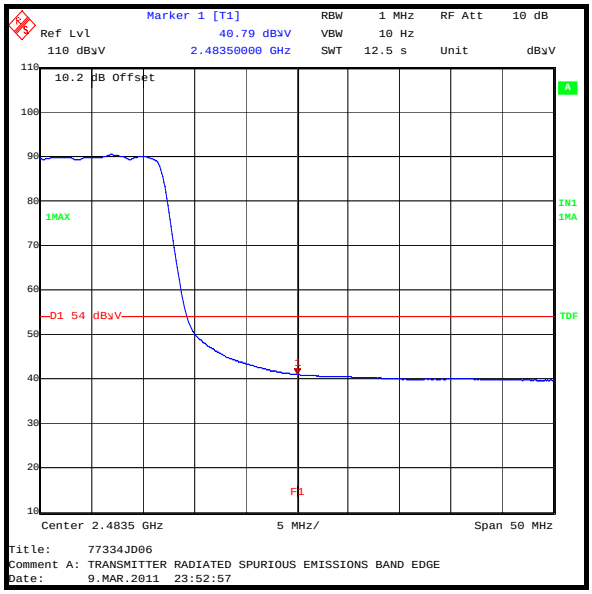


Lower Band Edge Peak Measurement



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”.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
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
6 dB 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
A1391	Attenuator	Huber + Suhner	757987	6810.17.B	09 Feb 2012	12
A1396	Attenuator	Huber + Suhner	757987	6810.17.B	06 Jul 2011	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	06 Jun 2011	12
A1818	Antenna	EMCO	3115	00075692	05 Sep 2011	12
A1834	Attenuator	Hewlett Packard	8491B	10444	30 Jun 2011	12
A253	Antenna	Flann Microwave	12240-20	128	05 Sep 2011	12
A254	Antenna	Flann Microwave	14240-20	139	05 Sep 2011	12
A255	Antenna	Flann Microwave	16240-20	519	05 Sep 2011	12
A256	Antenna	Flann Microwave	18240-20	400	05 Sep 2011	12
A436	Antenna	Flann	20240-20	330	05 Sep 2011	12
A553	Antenna	Chase	CBL6111A	1593	16 Mar 2011	12
G0543	Amplifier	Sonoma Instrument	310N	230801	30 Jun 2011	12
K0001	5m Semi-Anechoic Chamber	Rainford EMC	N/A	N/A	25 Apr 2011	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	05 Sep 2011	12
L1001	Test Receiver	Rohde & Schwarz	ESU26	100239	16 Mar 2011	12
M1124	Test Receiver	Rohde & Schwarz	ESI26	100046K	22 Apr 2011	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	15 Sep 2011	12

Note: Assets A553 and L1001 indicate they were out of calibration during testing. It shall be noted however that the assets were in calibration for the tests for which they were used.

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