


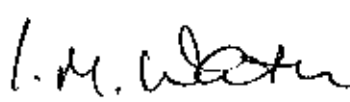
TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: REN-BP-AutOS

FCC ID: ZFWRENBPAUTOS

To: FCC Part 15.247: 2010 Subpart C

Test Report Serial No:
RFI-RPT-RP77334JD06B

This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals:		
Checked By:	Ian Watch	
Signature:		
Date of Issue:	23 May 2011	

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RFI Global Services Ltd

Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire RG23 8BG
Telephone: +44 (0)1256 312000 Facsimile: +44 (0)1256 312001
Email: info@rfi-global.com Website: www.rfi-global.com

Registered in England and Wales. Company number: 2117901

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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 14 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)(1)	Transmitter 20 dB Bandwidth	
Part 15.247(a)(1)	Transmitter Carrier Frequency Separation	
Part 15.247(a)(1)(iii)	Transmitter Number of Hopping Frequencies and Average Time of Occupancy	
Part 15.247(b)(1)	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

Tested Technology:	Bluetooth		
Power Supply Requirement:	Nominal	12 V	
Type of Unit:	Transceiver		
Channel Spacing:	1 MHz		
Mode:	Basic Rate	Enhanced Data Rate	
Modulation:	GFSK	π/4-DQPSK	8DQPSK
Packet Type: (Maximum Payload)	DH5	2DH5	3DH5
Data Rate (Mbit/s):	1	2	3
Maximum Conducted Output Power:	-3.5 dBm		
Transmit Frequency Range:	2402 MHz to 2480 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	0	2402
	Middle	39	2441
	Top	78	2480
Receive Frequency Range:	2402 MHz to 2480 MHz		
Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	0	2402
	Middle	39	2441
	Top	78	2480

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:	PC Monitor
Brand Name:	Dell
Model Name or Number:	E173FPb
Serial Number:	CN-0C5385-46633-467-1MNL

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):

- Receive/Idle Mode
- Transmit mode with Basic Rate (DH5 packets) or EDR (2DH5 or 3DH5 packets) as required.

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 Bluetooth 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.
- Both EDR/Basic rate modes were compared and tests were performed with the mode that presented the worst case result. For output power, bandwidth, band edge and channel separation, all modes were tested.
- Transmitter spurious emissions were performed with the EUT transmitting in Basic Rate 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. Measurement Uncertainty* 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

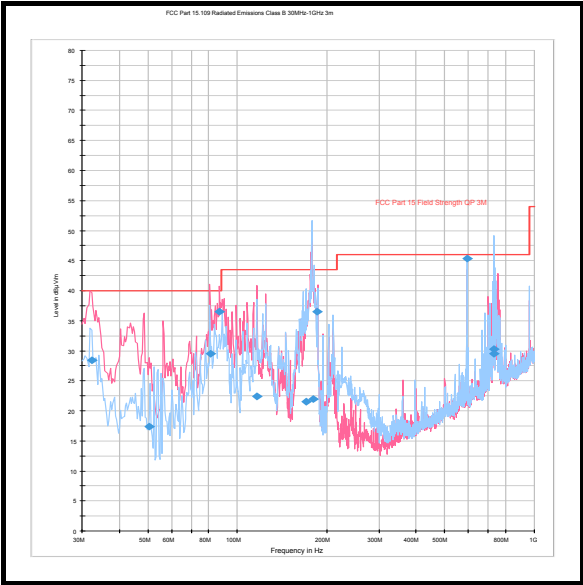
Results: Quasi Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/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:

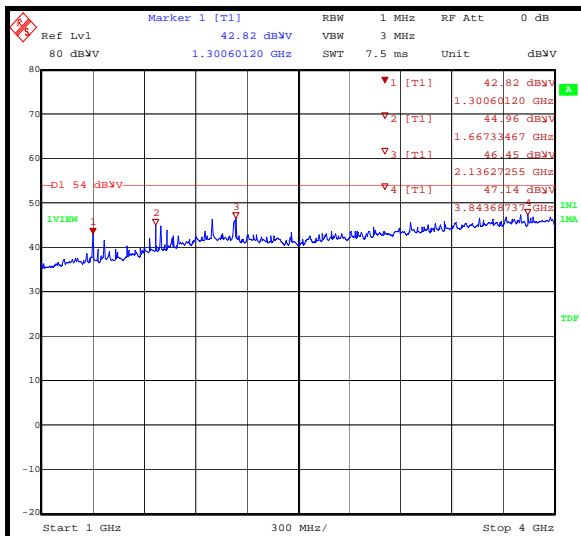
Temperature (°C):	23
Relative Humidity (%):	20

Results:

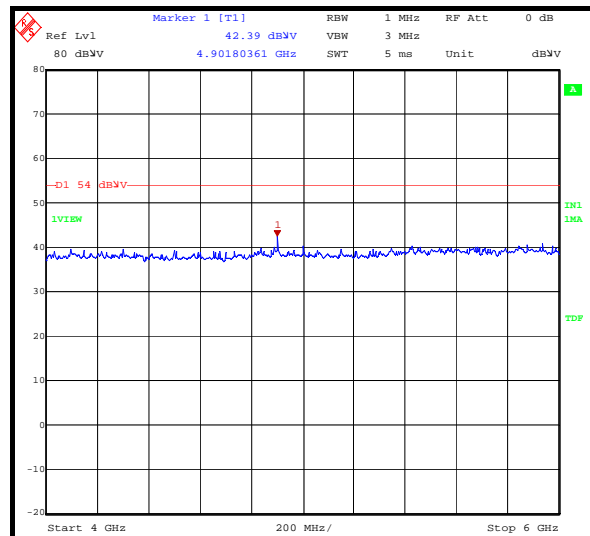
Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
1299.411	Vertical	41.5	54.0	12.5	Complied
1367.138	Vertical	41.1	54.0	12.9	Complied
1499.668	Vertical	40.5	54.0	13.5	Complied
1666.981	Vertical	45.3	54.0	8.7	Complied
1700.070	Vertical	47.0	54.0	7.0	Complied
1999.986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

Note(s):

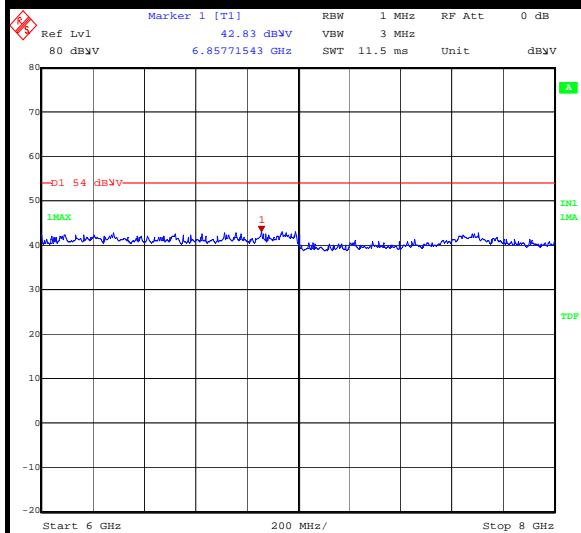
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above 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)

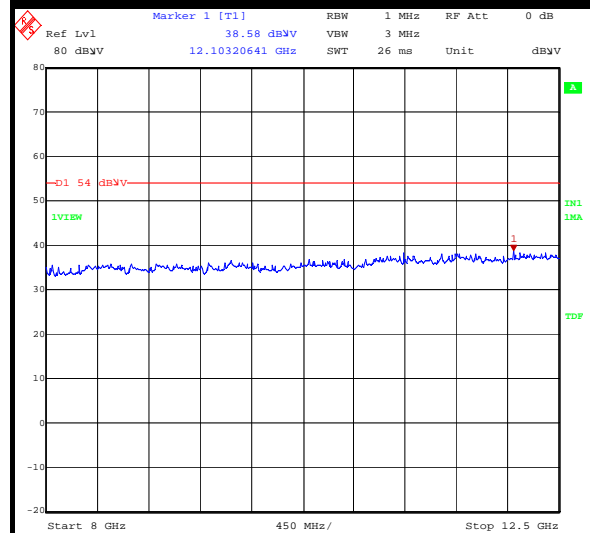
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Date: 8.MAR.2011 14:38:07



Title: 77334JD06
Comment A: RADIATED SPURIOUS EMISSIONS RX
Date: 8.MAR.2011 15:08:01



Title: 77334JD06
Comment A: RADIATED SPURIOUS EMISSIONS RX
Date: 8.MAR.2011 15:19:37



Title: 77334JD06
Comment A: RADIATED SPURIOUS EMISSIONS RX
Date: 8.MAR.2011 15:30:24

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

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

Test Engineer:	Nick Steele	Test Date:	11 March 2011
Test Sample Serial No:	BS00104300000058		

FCC Part:	15.247(a)(1)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.1

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	21

Results DH5:

Channel	20 dB Bandwidth (kHz)
Bottom	1016.032
Middle	1016.032
Top	1016.032

Results 2DH5:

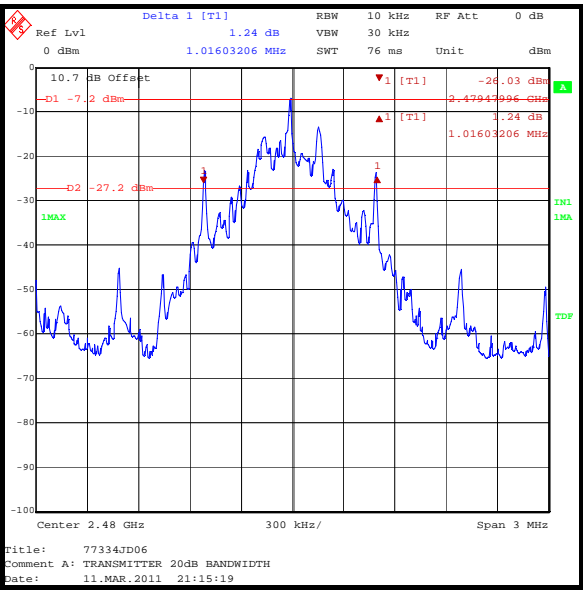
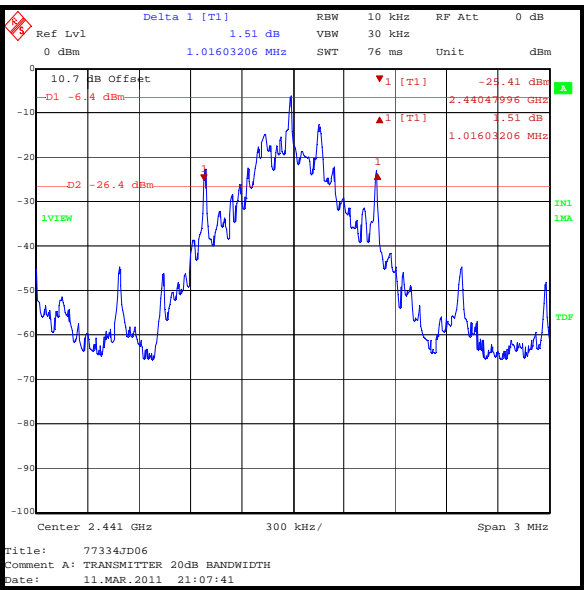
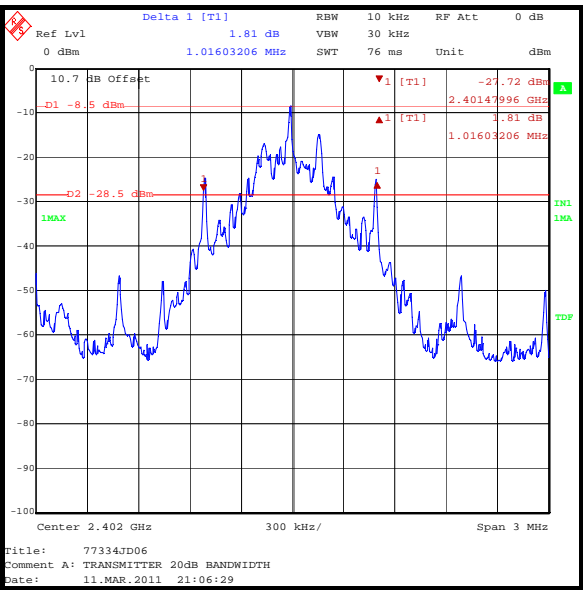
Channel	20 dB Bandwidth (kHz)
Bottom	1040.080
Middle	1040.080
Top	1040.080

Results 3DH5:

Channel	20 dB Bandwidth (kHz)
Bottom	1137.275
Middle	1136.273
Top	1142.285

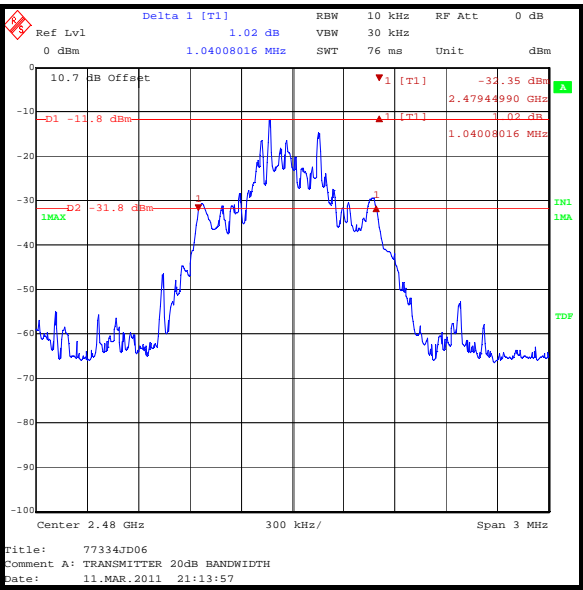
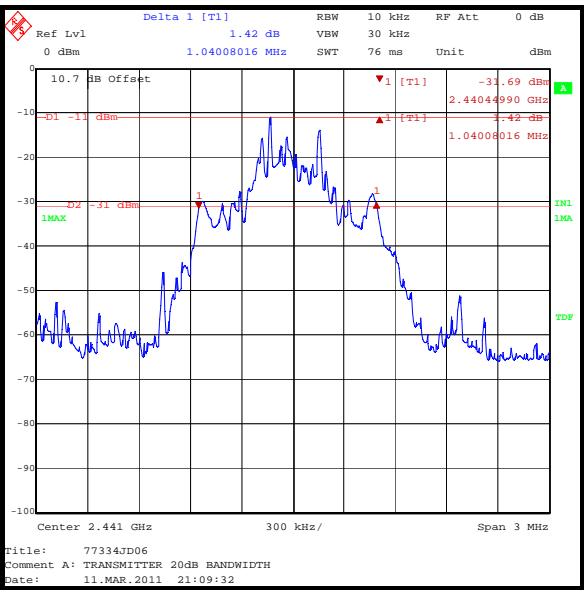
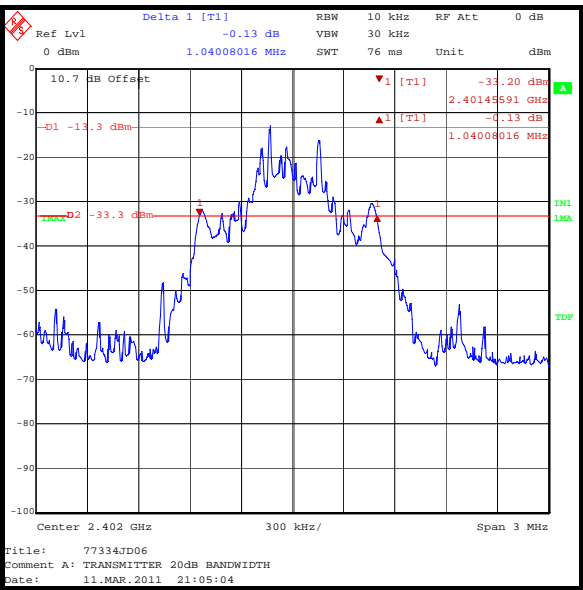
Transmitter 20 dB Bandwidth (continued)

Results DH5:



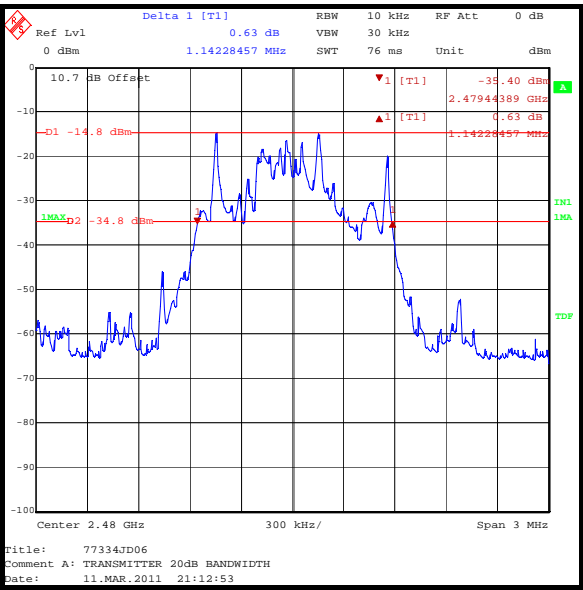
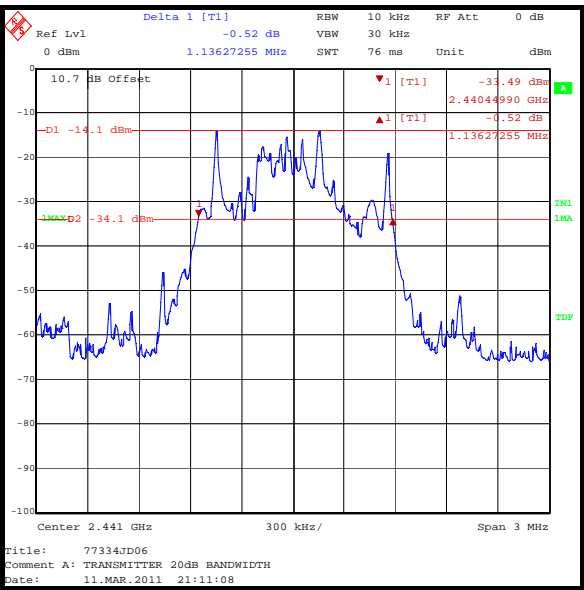
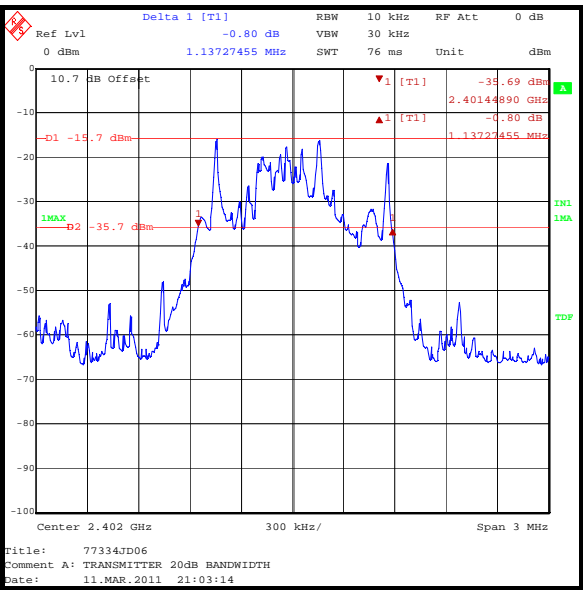
Transmitter 20 dB Bandwidth (continued)

Results 2DH5:



Transmitter 20 dB Bandwidth (continued)

Results 3DH5:



5.2.3. Transmitter Carrier Frequency Separation**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	11 March 2011
Test Sample Serial No:	BS00104300000058		

FCC Part:	15.247(a)(1)
Test Method Used:	As detailed in ANSI C63.10 Section 7.7.2

Environmental Conditions:

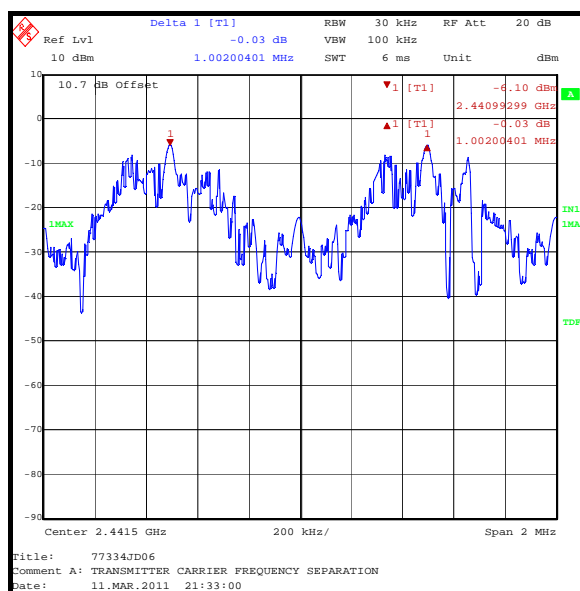
Temperature (°C):	25
Relative Humidity (%):	21

Results: DH5

Carrier Frequency Separation (kHz)	Limit ($2/3$ of 20 dB BW) (kHz)	Margin (kHz)	Result
1002.004	677.355	324.649	Complied

Note(s):

- The 20 dB bandwidth measured for the middle channel operating at 2441 MHz was used to calculate the limit.

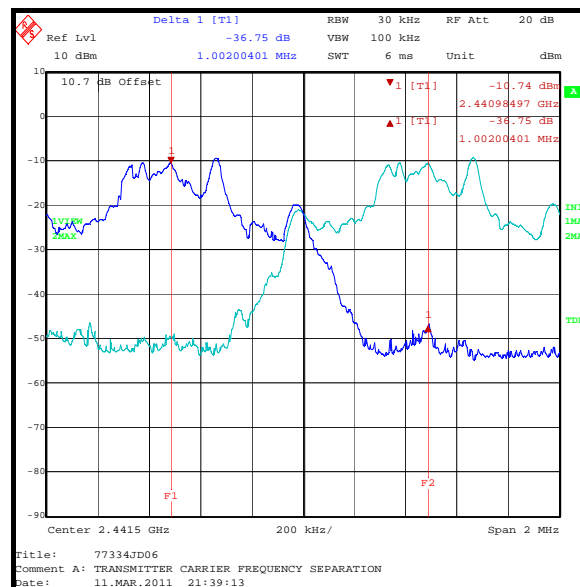


Transmitter Carrier Frequency Separation (continued)**Results: 2DH5**

Carrier Frequency Separation (kHz)	Limit ($^{2}/_3$ of 20 dB BW) (kHz)	Margin (kHz)	Result
1002.004	693.387	308.617	Complied

Note(s):

- The 20 dB bandwidth measured for the middle channel operating at 2441 MHz was used to calculate the limit.

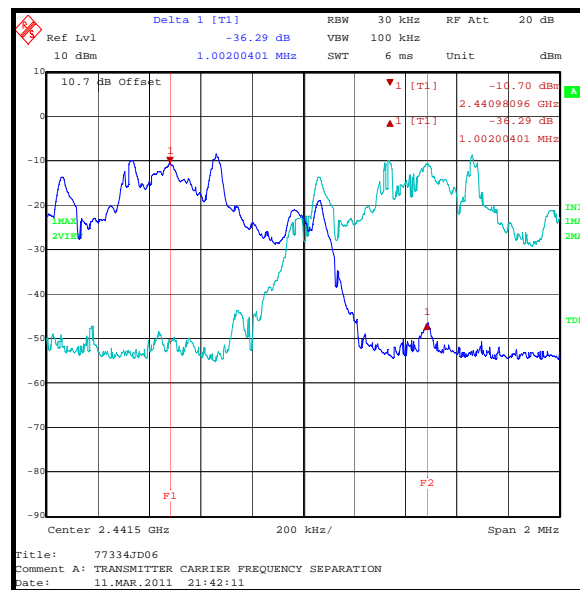


Transmitter Carrier Frequency Separation (continued)**Results: 3DH5**

Carrier Frequency Separation (kHz)	Limit ($^{2}/_3$ of 20 dB BW) (kHz)	Margin (kHz)	Result
1002.004	757.515	244.489	Complied

Note(s):

- The 20 dB bandwidth measured for the middle channel operating at 2441 MHz was used to calculate the limit.



5.2.4. Transmitter Number of Hopping Frequencies and Average Time of Occupancy**Test Summary:**

Test Engineer:	Nick Steele	Test Date:	11 March 2011
Test Sample Serial No:	BS00104300000058		

FCC Part:	15.247(a)(1)(iii)
Test Method Used:	As detailed in ANSI C63.10 Section 7.7.3 & 7.7.4

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	21

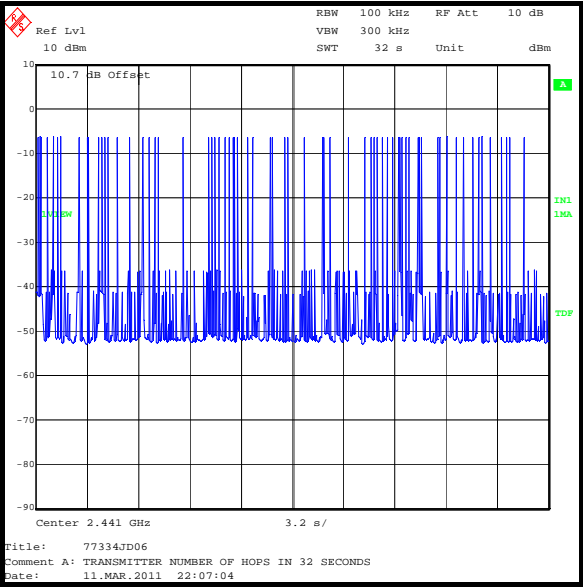
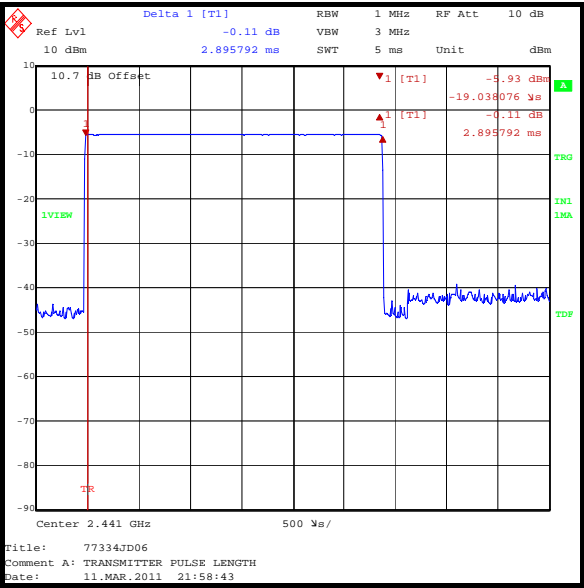
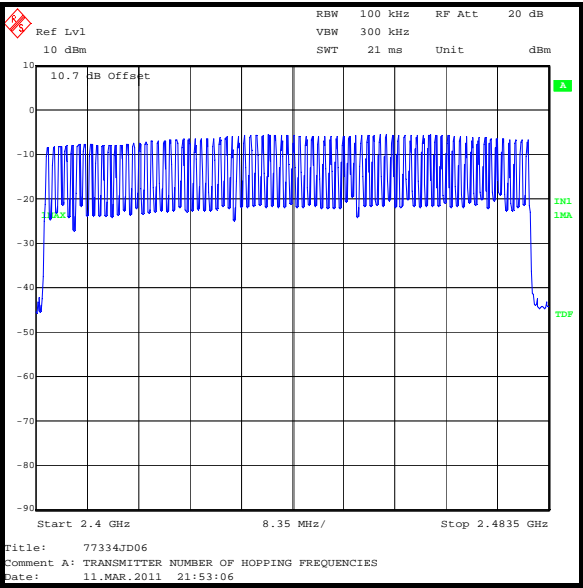
Results:

Emission Width (μs)	Number of Hops in 31.6 Seconds	Average Time of Occupancy (s)	Limit (s)	Margin (s)	Result
2895.792	109	0.316	0.4	0.084	Complied

Note(s):

1. Tests were performed to identify the average time of occupancy in number of channels (79) x 0.4 seconds. The calculated period is 31.6 seconds.

Transmitter Number of Hopping Frequencies and Average Time of Occupancy (continued)



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

Test Engineer:	Andrew Edwards	Test Date:	14 March 2011
Test Sample Serial No:	BS00104300000042		

FCC Part:	15.247(b)(1)
Test Method Used:	As detailed in ANSI C63.10 Section 6.10.1

Environmental Conditions:

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

Results: DH5**Conducted Limit Comparison**

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	-4.1	30.0	34.1	Complied
Middle	-3.5	30.0	33.5	Complied
Top	-3.5	30.0	33.5	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	-4.1	7.5	3.4	36.0	32.6	Complied
Middle	-3.5	7.5	4.0	36.0	32.0	Complied
Top	-3.5	7.5	4.0	36.0	32.0	Complied

Transmitter Maximum Peak Output Power (continued)**Results: 2DH5****Conducted Limit Comparison**

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	-6.8	30.0	36.8	Complied
Middle	-6.2	30.0	36.2	Complied
Top	-6.2	30.0	36.2	Complied

De Facto EIRP Limit Comparison

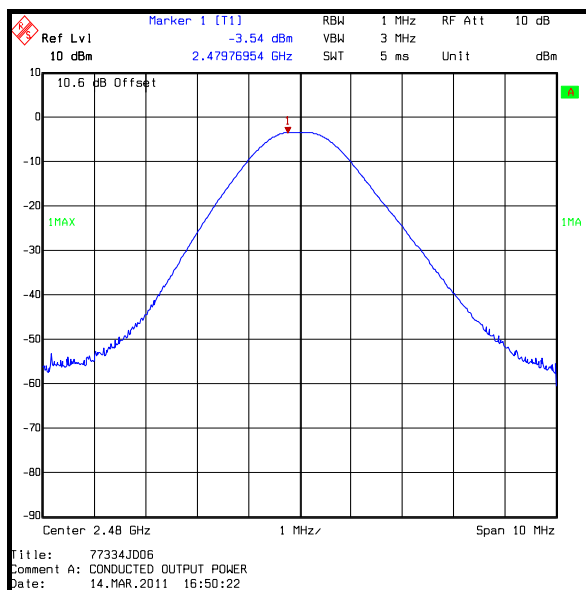
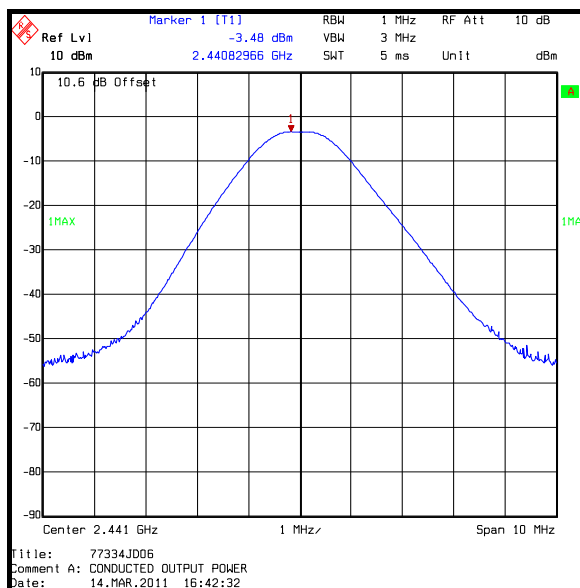
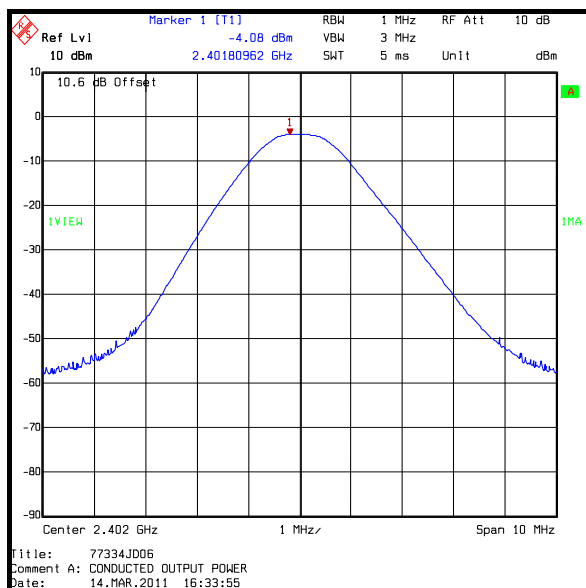
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	-6.8	7.5	0.7	36.0	35.3	Complied
Middle	-6.2	7.5	1.3	36.0	34.7	Complied
Top	-6.2	7.5	1.3	36.0	34.7	Complied

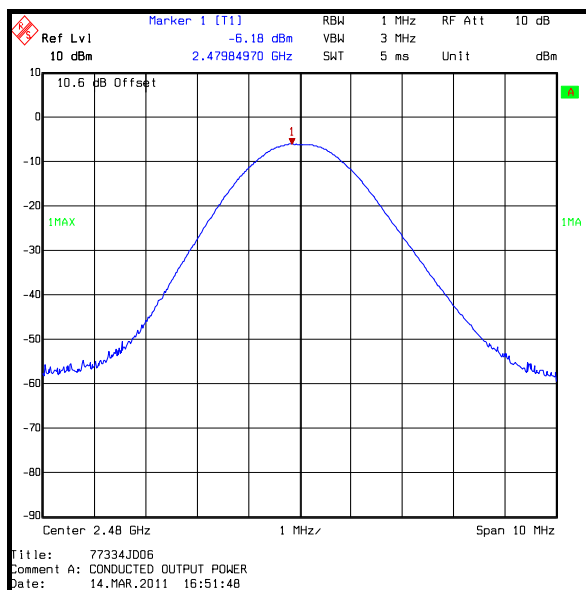
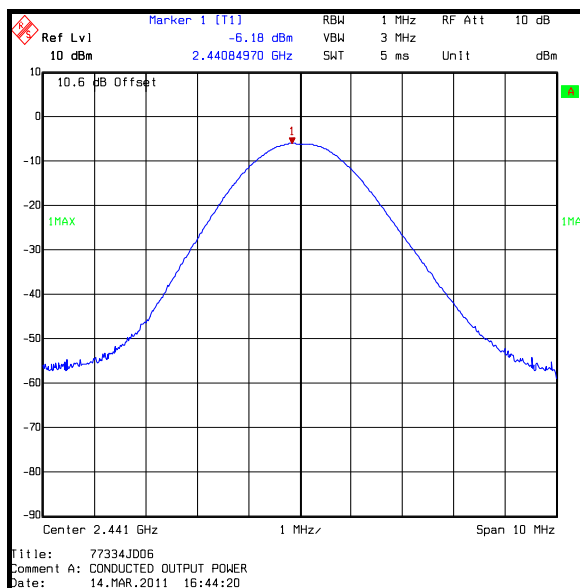
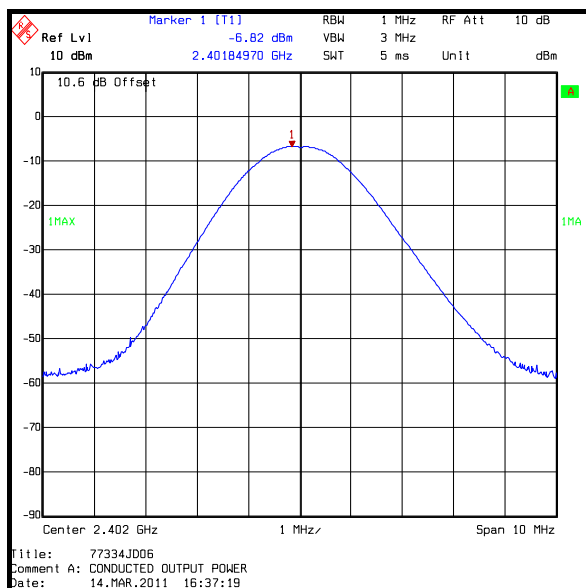
Results: 3DH5**Conducted Limit Comparison**

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	-6.6	30.0	36.6	Complied
Middle	-5.9	30.0	35.9	Complied
Top	-5.9	30.0	35.9	Complied

De Facto EIRP Limit Comparison

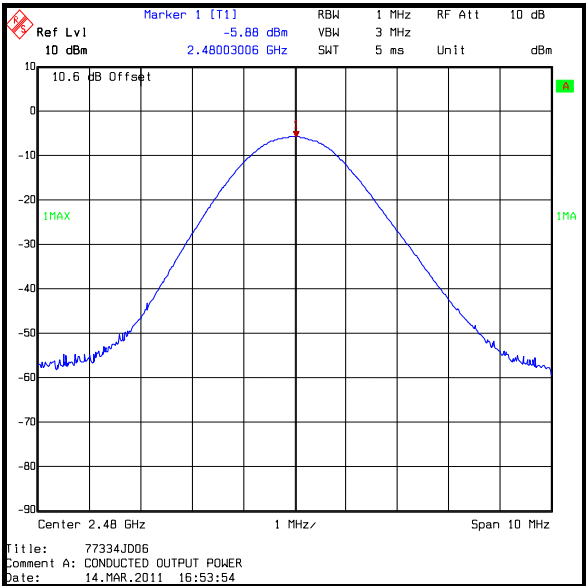
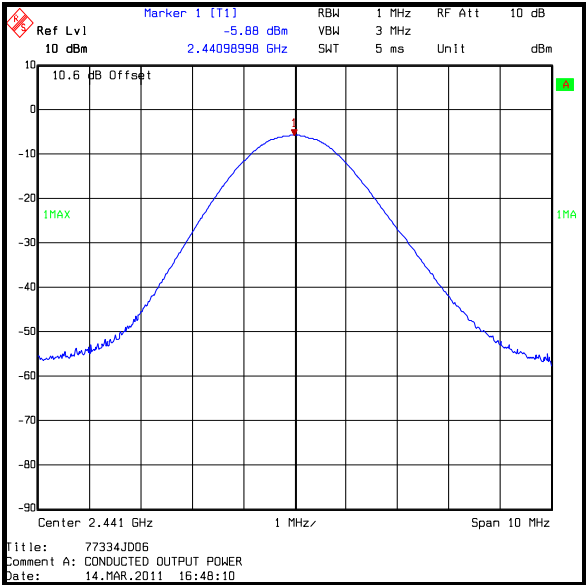
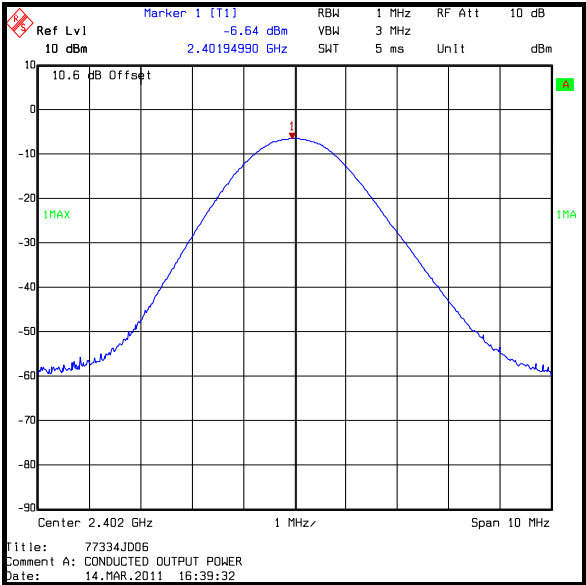
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	-6.6	7.5	0.9	36.0	35.1	Complied
Middle	-5.9	7.5	1.6	36.0	34.4	Complied
Top	-5.9	7.5	1.6	36.0	34.4	Complied

Transmitter Maximum Peak Output Power (continued)**Results: Basic Rate DH5**

Transmitter Maximum Peak Output Power (continued)**Results: 2DH5**

Transmitter Maximum Peak Output Power (continued)

Results: 3DH5



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

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

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):	25
Relative Humidity (%):	31

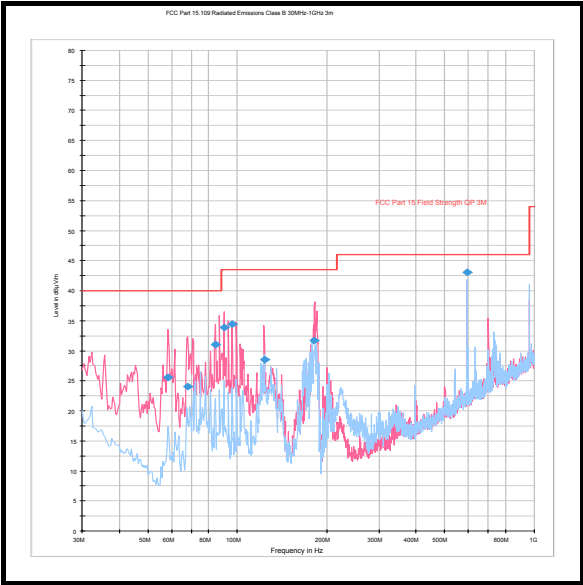
Results: Quasi-Peak DH5

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
58.554	Vertical	25.6	40.0	14.4	Complied
68.051	Vertical	24.1	40.0	15.9	Complied
84.247	Vertical	31.0	40.0	9.0	Complied
90.244	Vertical	33.9	43.5	9.6	Complied
96.279	Vertical	34.4	43.5	9.1	Complied
123.362	Vertical	28.6	43.5	14.9	Complied
181.082	Vertical	31.6	43.5	11.9	Complied
592.454	Horizontal	43.1	46.0	2.9	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss
2. The 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 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. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Radiated Emissions (continued)



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

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

Test Engineer:	Andrew Edwards	Test 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 25.0 GHz

Environmental Conditions:

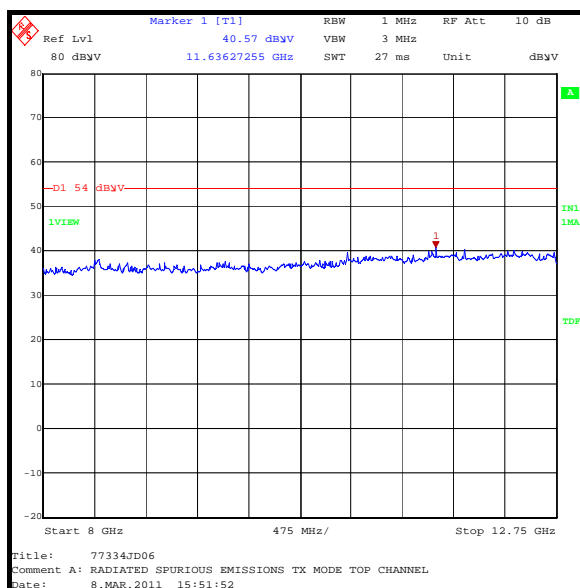
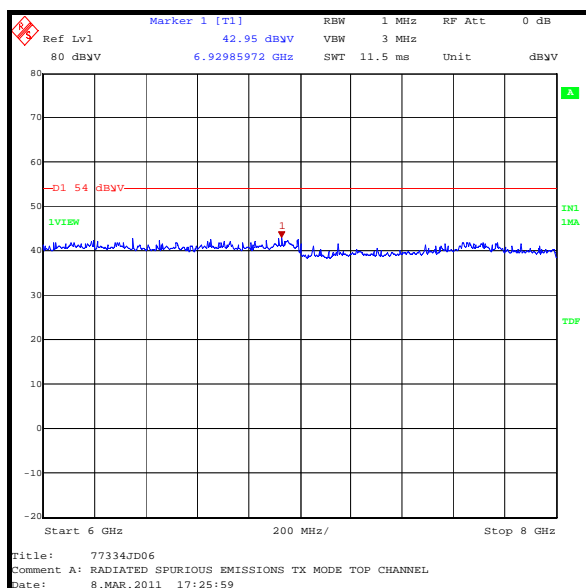
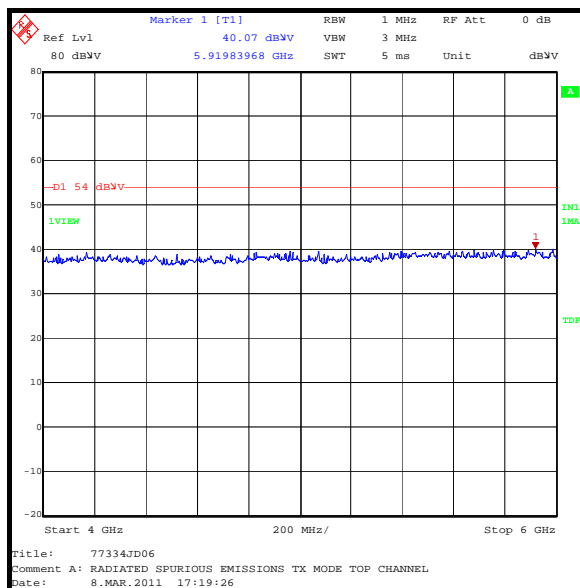
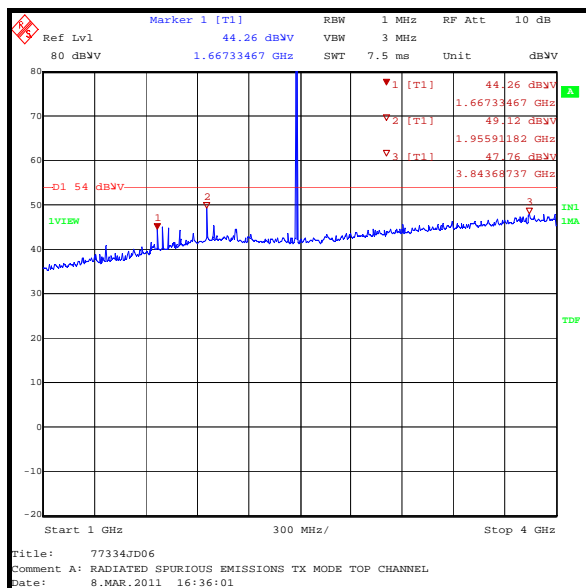
Temperature (°C):	24
Relative Humidity (%):	20

Results: Peak DH5

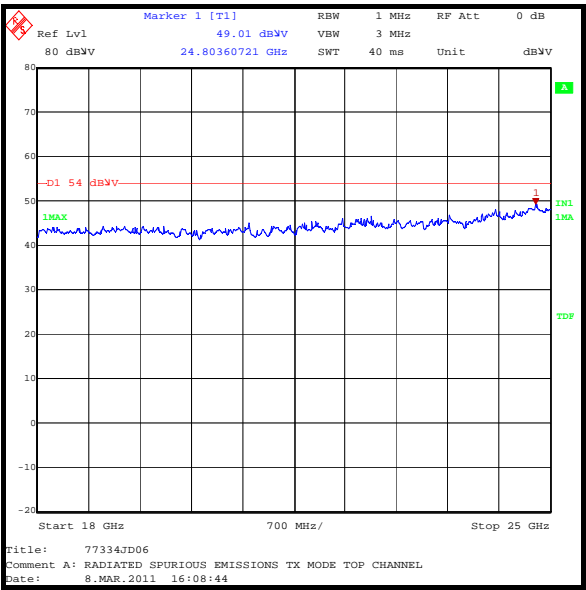
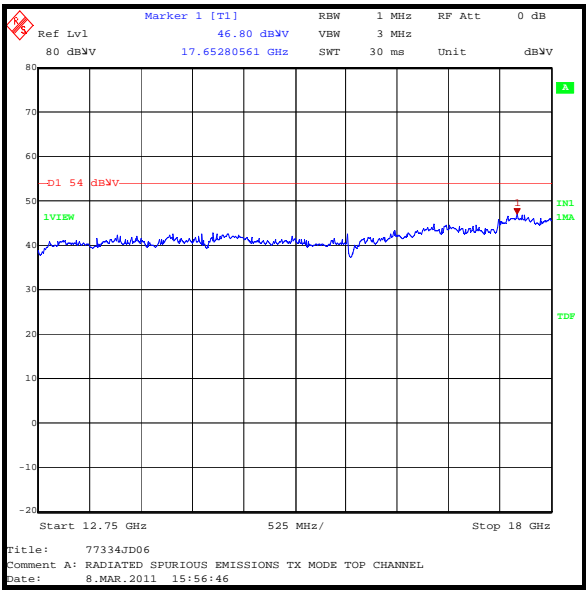
Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
1955.912	Vertical	49.1	54.0	4.9	Complied

Note(s):

1. The peak levels on the 1 GHz to 4 GHz pre-scan 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. The emission shown on the 1 GHz to 4 GHz plot is the EUT fundamental at 2480 MHz.
4. 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.
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.

5.2.7. 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 Sections 6.9.2

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	21

Results: Static Mode DH5

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400.0	Vertical	43.8	67.5*	23.7	Complied
2483.5	Vertical	58.2	74.0	15.8	Complied

Frequency (MHz)	Antenna Polarity	Average Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	Vertical	38.5	54.0	15.5	Complied

Results: Hopping Mode DH5

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400.0	Vertical	46.2	67.5*	21.3	Complied
2483.5	Vertical	53.4	74.0	20.6	Complied

Frequency (MHz)	Antenna Polarity	Average Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	Vertical	37.8	54.0	16.2	Complied

Results: Static Mode 2DH5

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400.0	Vertical	43.3	65.6*	24.2	Complied
2483.5	Vertical	58.5	74.0	15.5	Complied

Frequency (MHz)	Antenna Polarity	Average Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	Vertical	37.9	54.0	16.1	Complied

Transmitter Band Edge Radiated Emissions (continued)**Results: Hopping Mode 2DH5**

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400.0	Vertical	44.1	65.6*	24.2	Complied
2483.5	Vertical	56.0	74.0	18.0	Complied

Frequency (MHz)	Antenna Polarity	Average Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	Vertical	37.6	54.0	16.4	Complied

Results: Static Mode 3DH5

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400.0	Vertical	42.8	65.8*	23.0	Complied
2483.5	Vertical	58.1	74.0	15.9	Complied

Frequency (MHz)	Antenna Polarity	Average Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	Vertical	38.3	54.0	15.7	Complied

Results: Hopping Mode 3DH5

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400.0	Vertical	43.9	65.6*	21.7	Complied
2483.5	Vertical	57.7	74.0	16.3	Complied

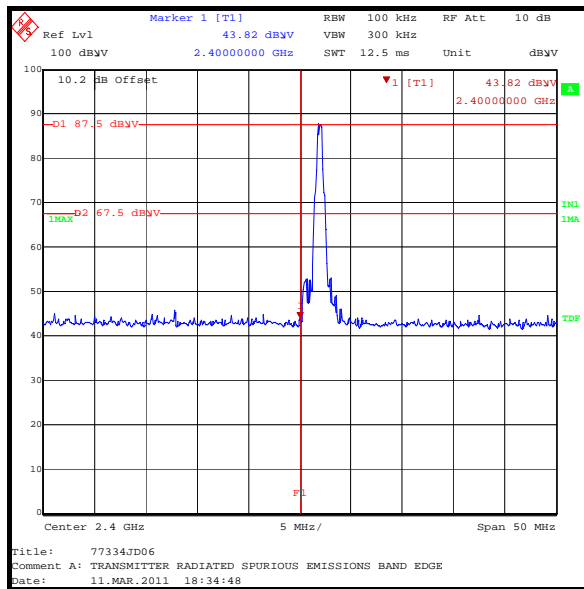
Frequency (MHz)	Antenna Polarity	Average Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	Vertical	37.7	54.0	16.3	Complied

Note(s):

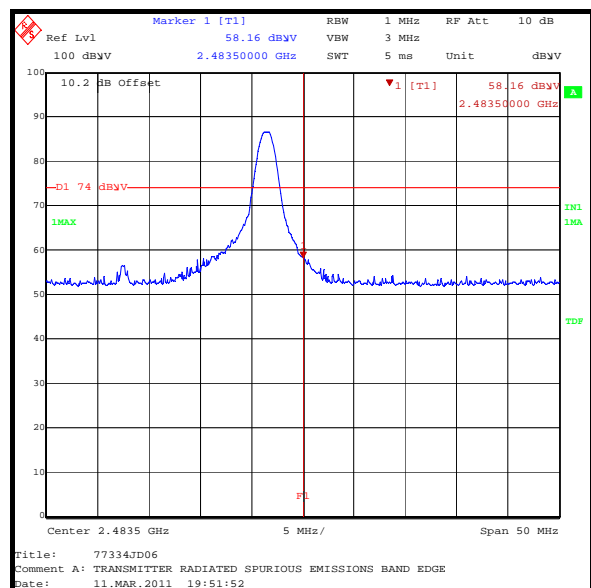
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. * -20 dBc limit

Transmitter Band Edge Radiated Emissions (continued)

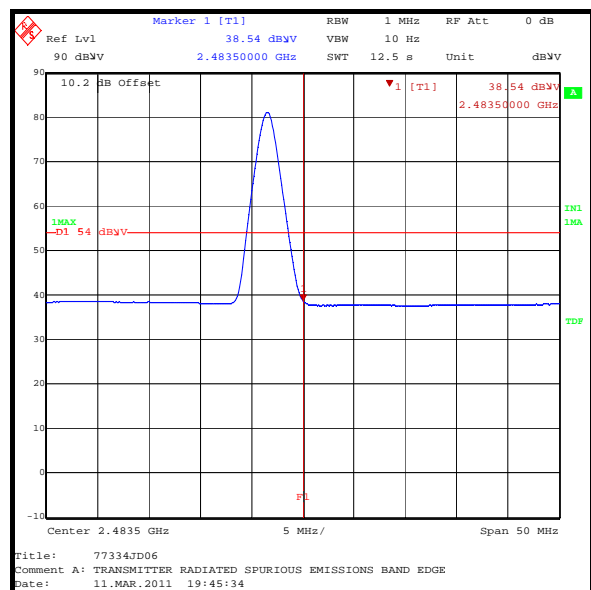
DH5 Static Mode



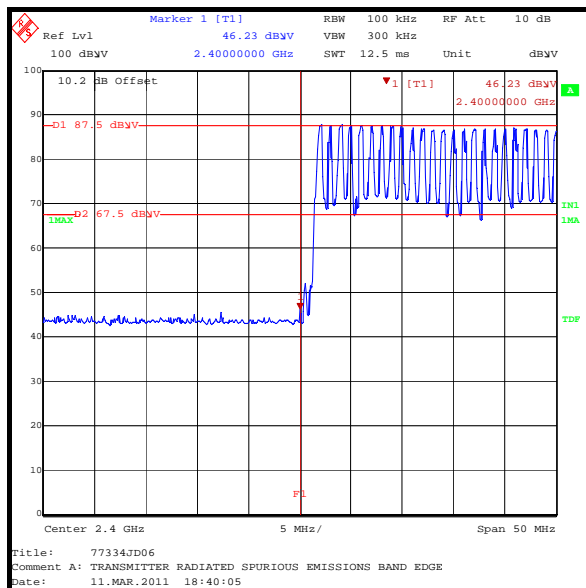
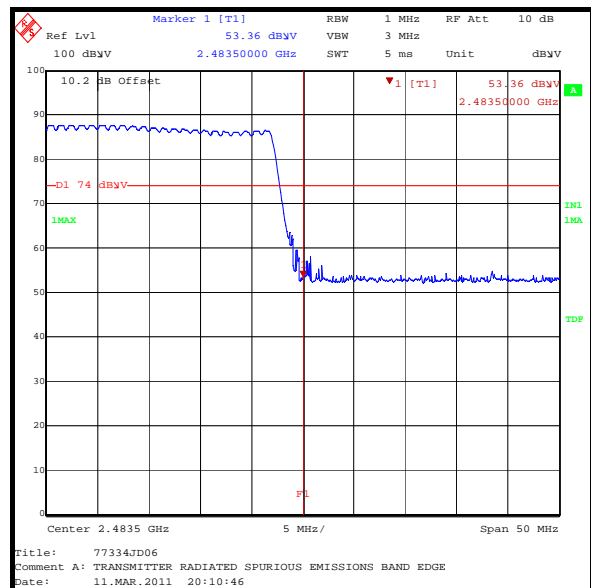
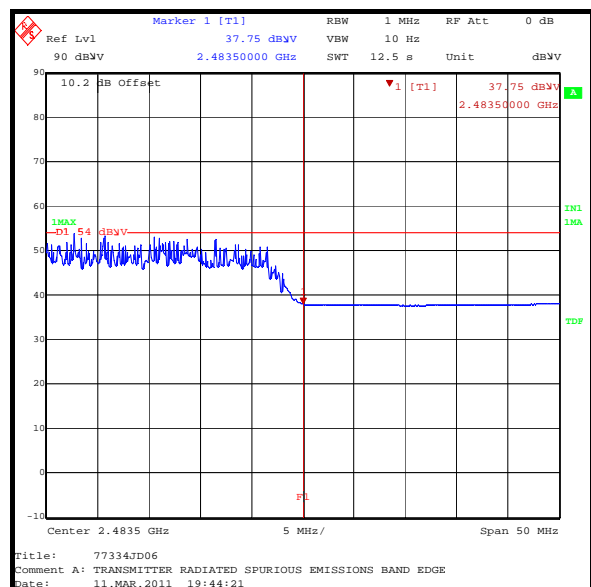
Lower Band Edge Peak Static



Upper Band Edge Peak Static

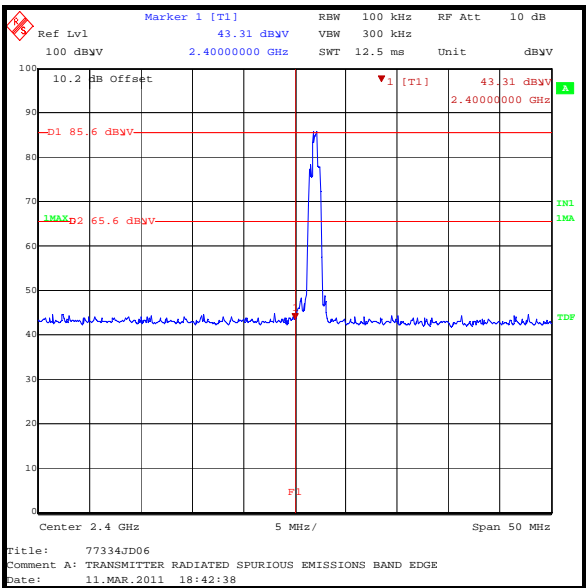


Upper Band Edge Average Static

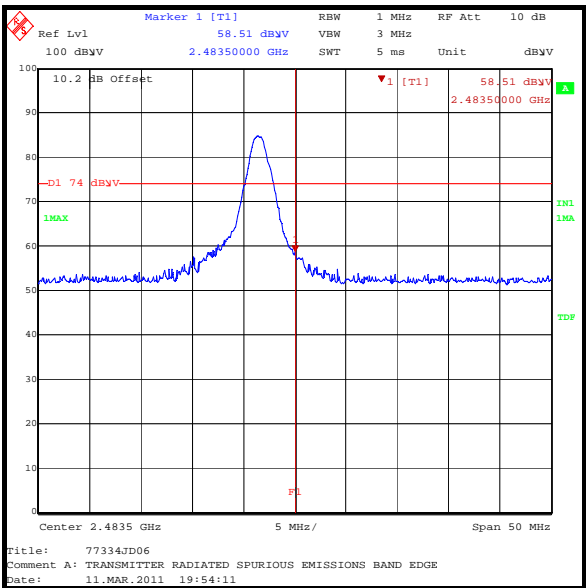
Transmitter Band Edge Radiated Emissions (continued)**DH5 Hopping Mode****Lower Band Edge Peak Hopping****Upper Band Edge Peak Hopping****Upper Band Edge Average Hopping**

Transmitter Band Edge Radiated Emissions (continued)

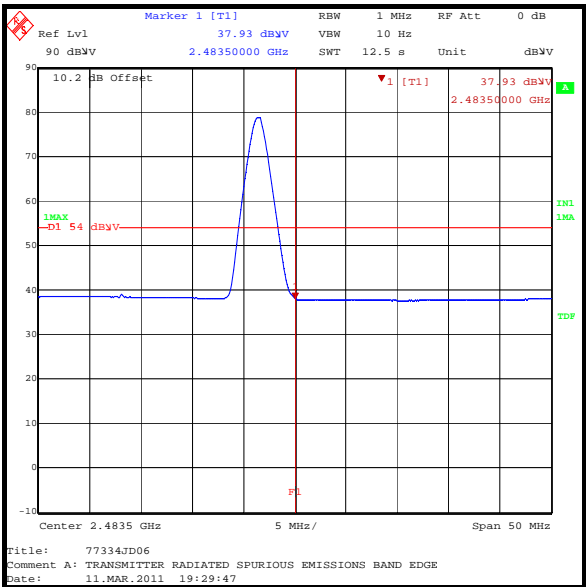
2DH5 Static Mode



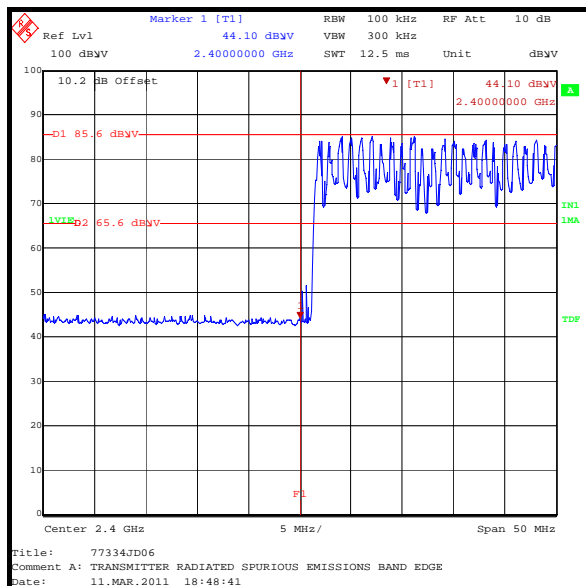
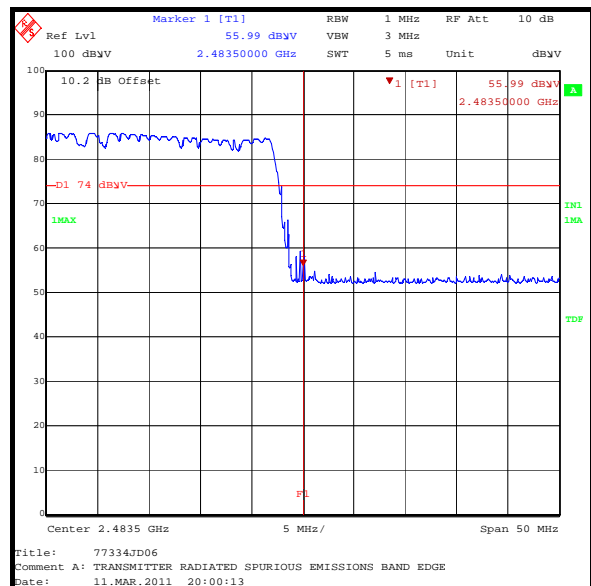
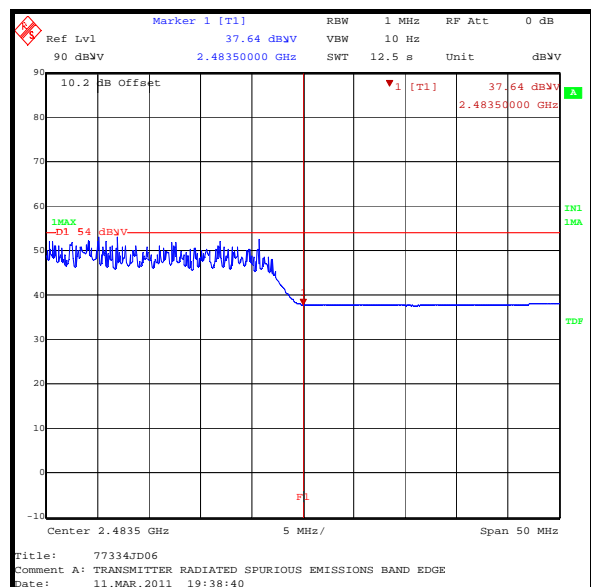
Lower Band Edge Peak Static



Upper Band Edge Peak Static

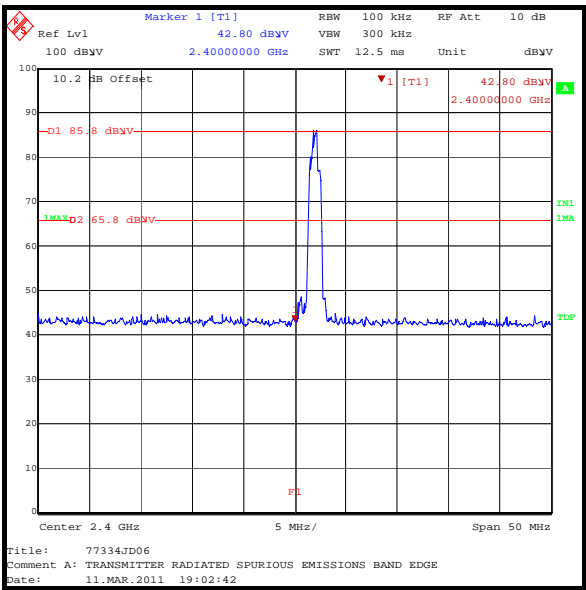


Upper Band Edge Average Static

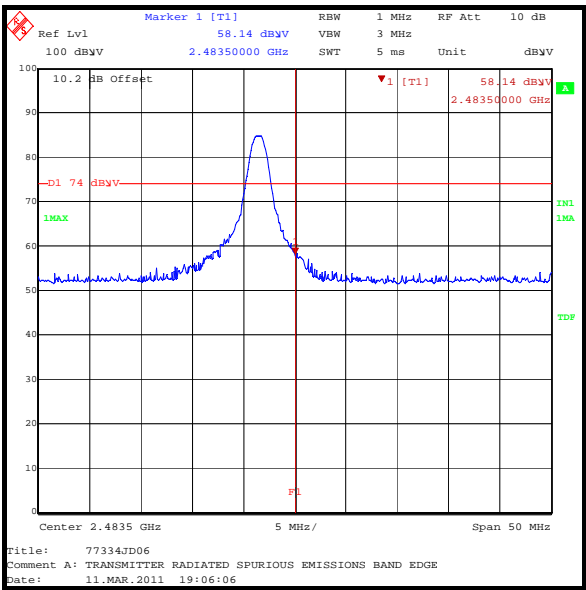
Transmitter Band Edge Radiated Emissions (continued)**2DH5 Hopping Mode****Lower Band Edge Peak Hopping****Upper Band Edge Peak Hopping****Upper Band Edge Average Hopping**

Transmitter Band Edge Radiated Emissions (continued)

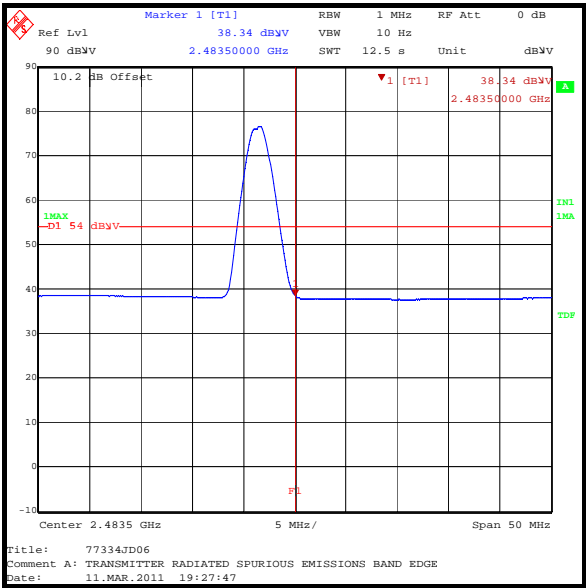
3DH5 Static Mode



Lower Band Edge Peak Static



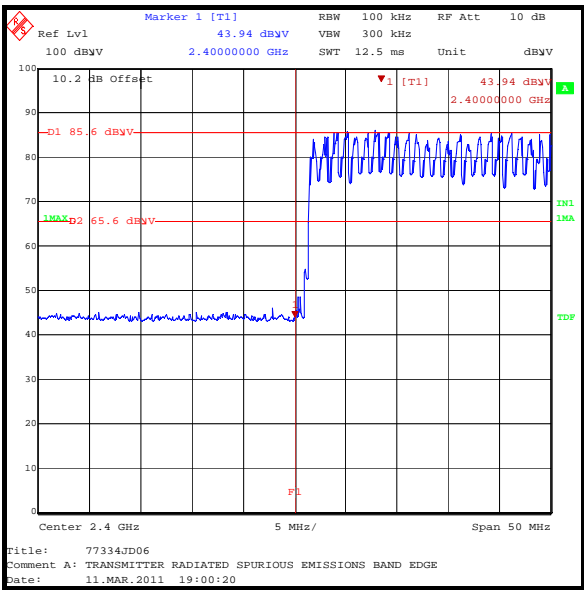
Upper Band Edge Peak Static



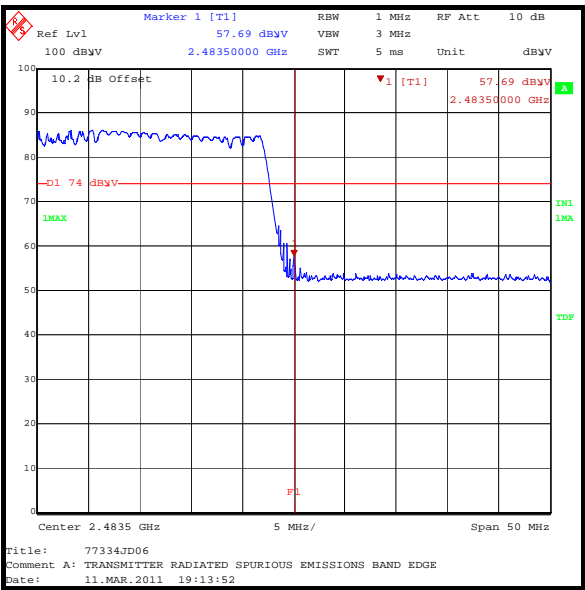
Upper Band Edge Average Static

Transmitter Band Edge Radiated Emissions (continued)

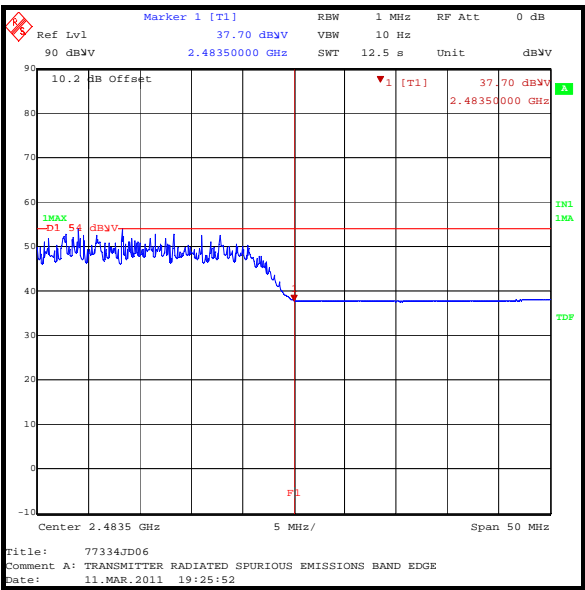
3DH5 Hopping Mode



Lower Band Edge Peak Hopping



Upper Band Edge Peak Hopping



Upper Band Edge Average Hopping

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
Radiated Maximum Peak Output Power	2.4 GHz to 2.4835 GHz	95%	±2.94 dB
Conducted Maximum Peak Output Power	2.4 GHz to 2.4835 GHz	95%	±0.27 dB
Carrier Frequency Separation	2.4 GHz to 2.4835 GHz	95%	±0.92 ppm
Average Time of Occupancy	2.4 GHz to 2.4835 GHz	95%	±0.3 ns
20 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 Months
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
A1996	Attenuator	Huber + Suhner	6810.17.B	301749	09 Feb 2012	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 Microwave	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

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