TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Softbank 101P

FCC ID: UCE211043A

To: FCC Part 15.247: 2011 Subpart C

Test Report Serial No:
RFI-RPT-RP83554JD03A 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:	17 October 2011

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Registered in England and Wales. Company number:2117901

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1. Customer Information

Company Name:	Panasonic Mobile Communications Development of Europe Ltd.
Address:	Panasonic House Willoughby Road Bracknell Berkshire RG12 8FP United Kingdom

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.247
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart C (Intentional Radiators) - Section 15.247
Specification Reference:	47CFR15.107 and 47CFR15.109
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart B (Unintentional Radiators) - Sections 15.107 and 15.109
Specification Reference:	47CFR15.207 and 47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 15.209
Site Registration:	FCC: 209735
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	12 September 2011 to 28 September 2011

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.107(a)	Receiver/Idle Mode AC Conducted Emissions	✓
Part 15.109	Receiver/Idle Mode Radiated Spurious Emissions	✓
Part 15.207	Transmitter AC Conducted 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:	Softbank
Model Name or Number:	101P
IMEI:	004401221134089*(Radiated sample #1)* 004401221130087*(Conducted RF port sample)*
Hardware Version Number:	Revision C
Software Version Number:	ACPU: sbm-07-0363 CCPU: R1D_EC01
FCC ID:	UCE211043A

Brand Name:	Softbank
Model Name or Number:	101P
IMEI:	004401221134063*(Radiated sample #2)*
Hardware Version Number:	Revision C
Software Version Number:	ACPU: sbm-07-0319 CCPU: R1D_EC01
FCC ID:	UCE211043A

Brand Name:	Softbank
Description:	Battery
Model Name or Number:	PMBBE1

Brand Name:	Softbank
Description:	AC Charger
Model Name or Number:	PMCBD1

Brand Name:	Softbank
Description:	Desktop Charger
Model Name or Number:	PMEBE1

Brand Name:	Softbank
Description:	Charge/USB Data cable
Model Name or Number:	PMCBD1

Brand Name:	Softbank
Description:	Personal Hands-Free
Model Name or Number:	PMLBD1

3.2. Description of EUT

The equipment under test was a Dual mode UMTS/GSM cellular handset with BT, WLAN & RFID

3.3. Modifications Incorporated in the EUT

The Customer stated that the final software version is ACPU: sbm-07-0363 CCPU: R1D_EC01

Initial software version ACPU: sbm-07-0319 CCPU: R1D_EC01 was installed in the sample with IMEI 004401221134063. The Customer stated this version was to enable operation of WLAN therefore allowing WLAN test cases to be performed. Otherwise this software is identical to the final software version and has no impact on the test results contained within this test report.

3.4. Additional Information Related to Testing

Tested Technology:	*Bluetooth*		
Power Supply Requirement:	Nominal	3.7 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 Peak Conducted Output Power:	2.7 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:

Brand Name:	Panasonic
Description:	Laptop PC
Model Name or Number:	Toughbook CF-74

Brand Name:	Not marked
Description:	Micro SD Memory Card
Model Name or Number:	Not stated

Brand Name:	Buffalo
Description:	USB Hub
Model Name or Number:	BSH3U01

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):

- For Transmit tests: Standalone, connected via a radio link to a Bluetooth tester in order to place the EUT into Bluetooth test mode. The laptop PC with the Client's bespoke application was used to place the EUT into Bluetooth mode.
- Receive/Idle tests: Standalone, with the Bluetooth mode active but not transmitting.
- 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.
- Idle and transmitter radiated spurious emissions tests were performed with the Desktop Charger connected to the EUT as this was found to be the worst case during pre-scans. All the accessories were individually connected and measurements made during the pre-scans to determine the worst case combination.
- The EUT conducted sample was used for 20 dB bandwidth, carrier frequency separation, average time of occupancy and conducted power tests
- The EUT radiated sample was used for AC conducted emissions and radiated spurious emissions 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:

Test Engineer:	Patrick Jones	**Test Date:**	22 September 2011
Test Sample Serial No:	004401221134089		

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

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	30

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.249000	Live	46.5	61.8	15.3	Complied
0.420000	Live	45.4	57.4	12.0	Complied
0.501000	Live	44.0	56.0	12.0	Complied
0.501000	Live	44.1	56.0	11.9	Complied
0.631500	Live	39.6	56.0	16.4	Complied
0.672000	Live	39.7	56.0	16.3	Complied
0.874500	Live	39.9	56.0	16.1	Complied
1.365000	Live	41.4	56.0	14.6	Complied
1.423500	Live	43.2	56.0	12.8	Complied
1.617000	Live	55.2	56.0	0.8	Complied

Results: Live / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.415500	Live	30.3	47.5	17.2	Complied
0.415500	Live	30.3	47.5	17.2	Complied
0.496500	Live	27.2	46.1	18.9	Complied
0.541500	Live	24.6	46.0	21.4	Complied
1.284000	Live	28.4	46.0	17.6	Complied
1.738500	Live	40.7	46.0	5.3	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions (continued)

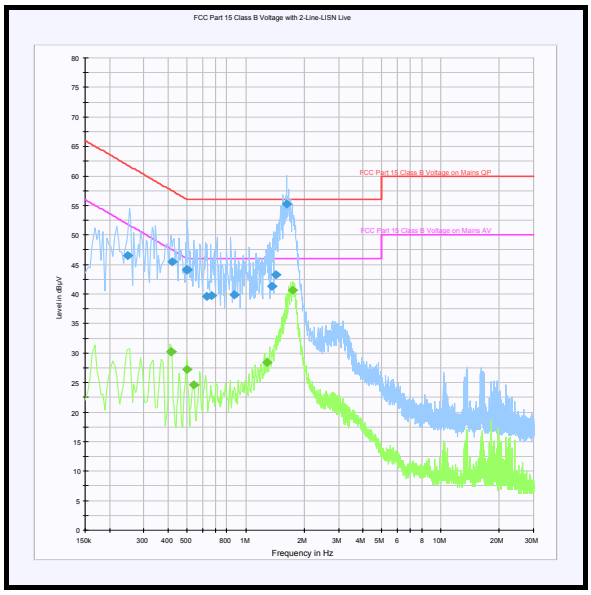
Results: Neutral / Quasi Peak

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.415500	Neutral	50.3	57.5	7.2	Complied
0.420000	Neutral	48.1	57.4	9.3	Complied
0.501000	Neutral	47.2	56.0	8.8	Complied
0.541500	Neutral	43.8	56.0	12.2	Complied
0.591000	Neutral	41.8	56.0	14.2	Complied
1.644000	Neutral	50.5	56.0	5.5	Complied

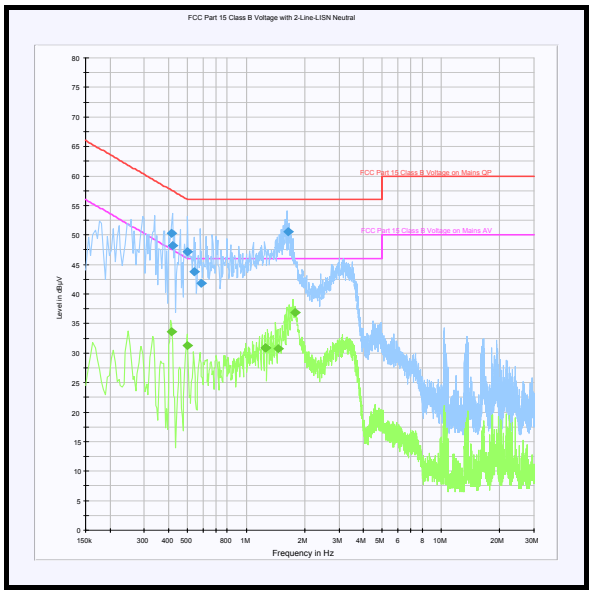
Results: Neutral / Average

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.415500	Neutral	33.6	47.5	13.9	Complied
0.496500	Neutral	31.3	46.1	14.8	Complied
1.252500	Neutral	30.9	46.0	15.1	Complied
1.257000	Neutral	30.9	46.0	15.1	Complied
1.455000	Neutral	30.7	46.0	15.3	Complied
1.774500	Neutral	36.8	46.0	9.2	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions (continued)



Live



Neutral

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

5.2.2. Receiver/Idle Mode Radiated Spurious Emissions

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	27 September 2011
Test Sample Serial No:	004401221134063		

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):	28
Relative Humidity (%):	33

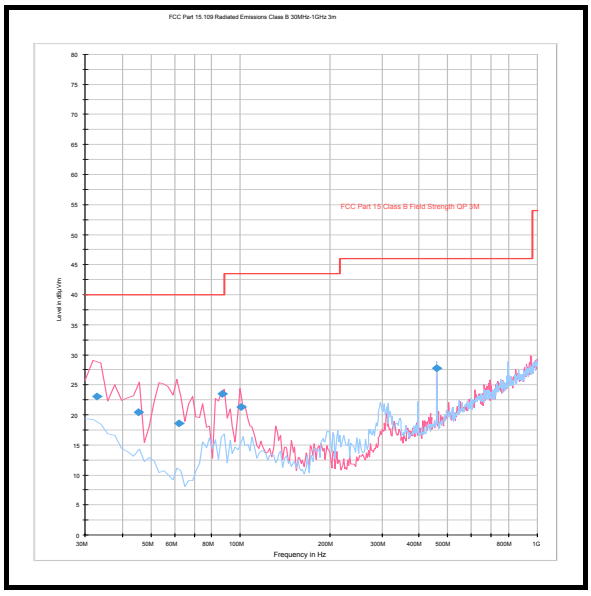
Results: Quasi Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
32.907	Vertical	23.0	40.0	17.0	Complied
45.276	Vertical	20.4	40.0	19.6	Complied
61.991	Vertical	18.6	40.0	21.4	Complied
86.945	Vertical	23.5	40.0	16.5	Complied
100.513	Vertical	21.3	43.5	22.2	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. 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:	Sarah Williams & Patrick Jones	**Test Date:**	12 September 2011
Test Sample Serial No:	004401221134089		

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 12.75 GHz

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	31

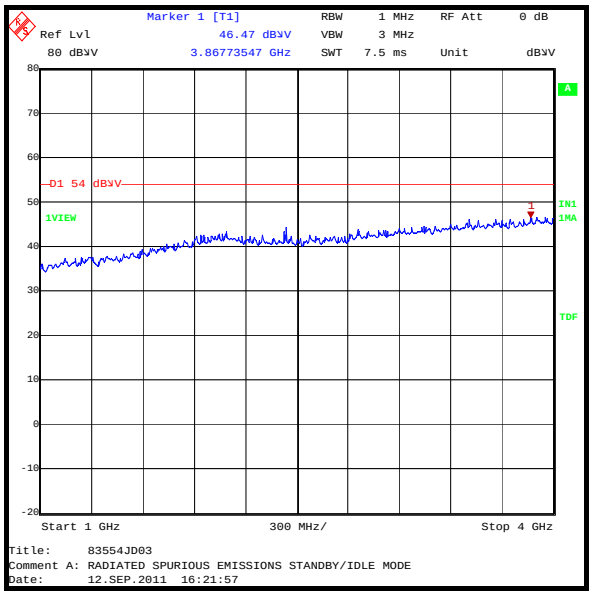
Results:

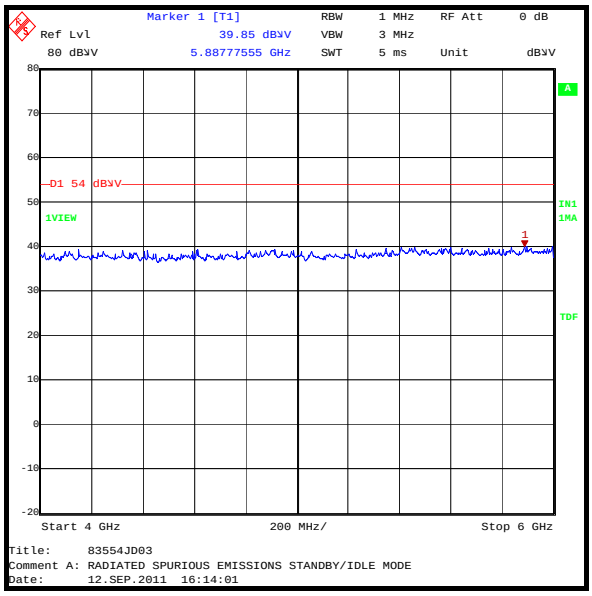
Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
3867.735	Vertical	46.5	54.0	7.5	Complied

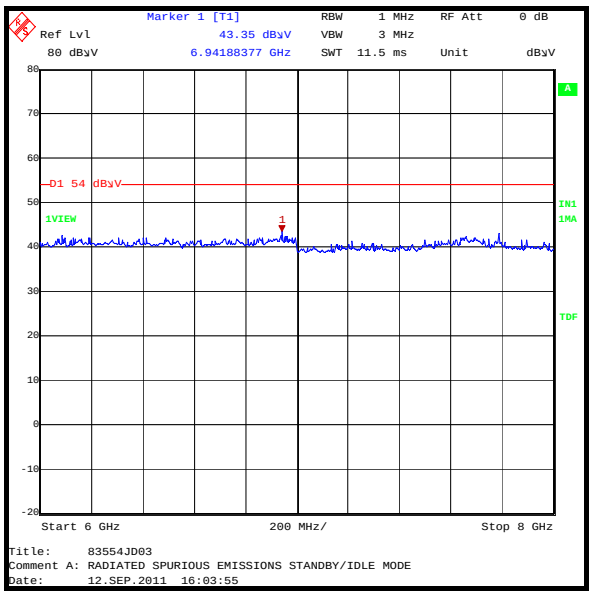
Note(s):

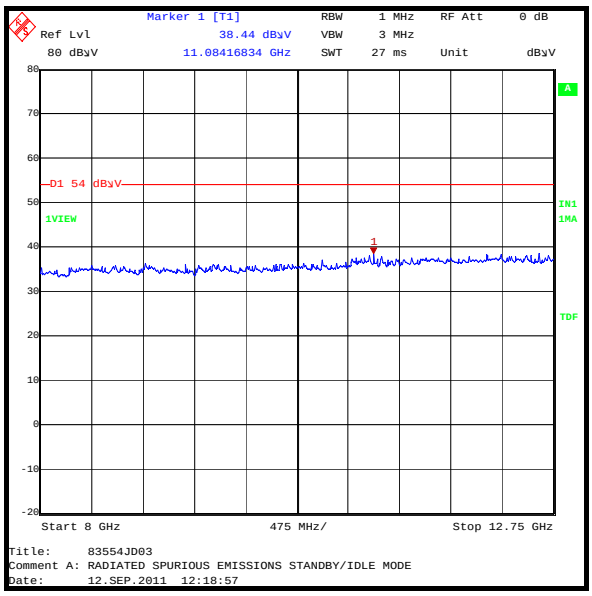
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above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









5.2.3. Transmitter AC Conducted Spurious Emissions

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	26 September 2011
Test Sample Serial No:	004401221134089		

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

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	31

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
1.225500	Live	35.0	56.0	21.0	Complied
1.225500	Live	35.3	56.0	20.7	Complied
1.396500	Live	38.0	56.0	18.0	Complied
1.423500	Live	38.7	56.0	17.3	Complied
1.450500	Live	39.0	56.0	17.0	Complied
1.464000	Live	37.9	56.0	18.1	Complied
1.468500	Live	37.9	56.0	18.1	Complied
1.473000	Live	38.0	56.0	18.0	Complied
1.473000	Live	37.4	56.0	18.6	Complied
1.482000	Live	37.2	56.0	18.8	Complied

Results: Live / Average

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.316500	Live	33.5	49.8	16.3	Complied
0.636000	Live	28.8	46.0	17.2	Complied
1.347000	Live	26.7	46.0	19.3	Complied
1.383000	Live	26.7	46.0	19.3	Complied
1.626000	Live	25.8	46.0	20.2	Complied
2.440500	Live	27.4	46.0	18.6	Complied
2.440500	Live	27.2	46.0	18.8	Complied
2.476500	Live	26.7	46.0	19.3	Complied
2.625000	Live	27.4	46.0	18.6	Complied
2.625000	Live	27.5	46.0	18.5	Complied

Transmitter AC Conducted Spurious Emissions (continued)

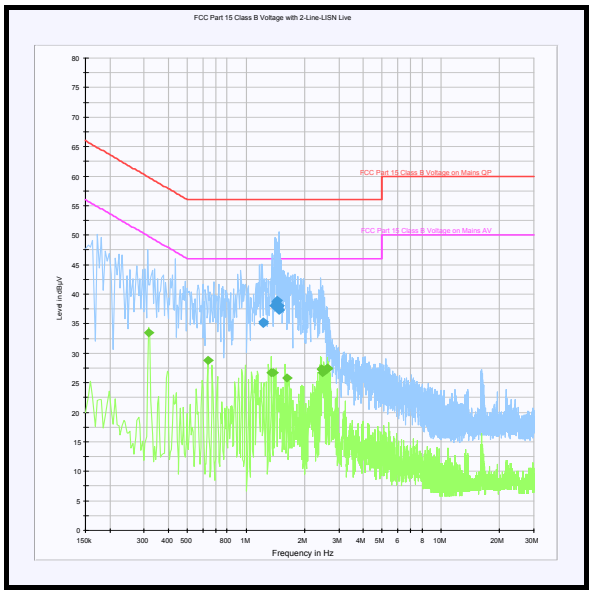
Results: Neutral / Quasi Peak

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.316500	Neutral	45.7	59.8	14.1	Complied
0.316500	Neutral	45.8	59.8	14.0	Complied
0.397500	Neutral	40.6	57.9	17.3	Complied
0.478500	Neutral	35.0	56.4	21.4	Complied
0.636000	Neutral	41.2	56.0	14.8	Complied
0.829500	Neutral	39.6	56.0	16.4	Complied
1.239000	Neutral	39.0	56.0	17.0	Complied
1.392000	Neutral	44.4	56.0	11.6	Complied
2.377500	Neutral	39.1	56.0	16.9	Complied
2.458500	Neutral	37.9	56.0	18.1	Complied

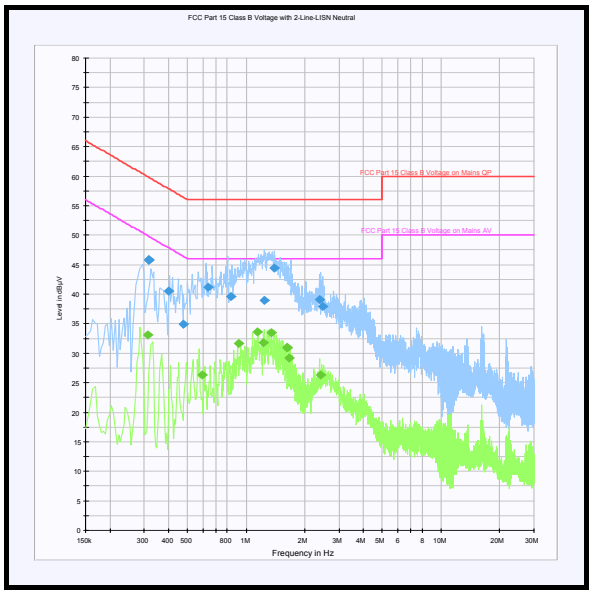
Results: Neutral / Average

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.312000	Neutral	33.1	49.9	16.8	Complied
0.595500	Neutral	26.3	46.0	19.7	Complied
0.910500	Neutral	31.7	46.0	14.3	Complied
1.149000	Neutral	33.6	46.0	12.4	Complied
1.230000	Neutral	31.8	46.0	14.2	Complied
1.347000	Neutral	33.5	46.0	12.5	Complied
1.626000	Neutral	30.9	46.0	15.1	Complied
1.626000	Neutral	31.0	46.0	15.0	Complied
1.666500	Neutral	29.2	46.0	16.8	Complied
2.418000	Neutral	26.3	46.0	19.7	Complied

Transmitter AC Conducted Spurious Emissions (continued)



Live



Neutral

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

5.2.4.Transmitter 20 dB Bandwidth

Test Summary:

Test Engineer:	Sarah Williams	**Test Date:**	21 September 2011
Test Sample Serial No:	004401221130087		

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 (%):	30

Results DH5:

Channel	20 dB Bandwidth (kHz)
Bottom	941.884
Middle	941.884
Top	961.924

Results 2DH5:

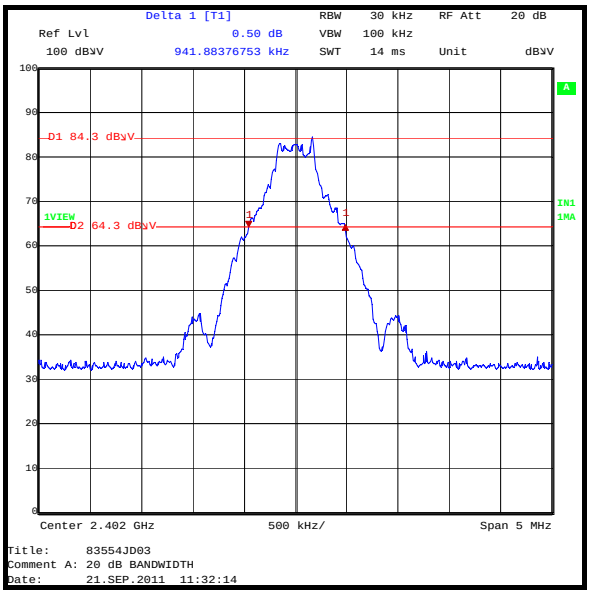
Channel	20 dB Bandwidth (kHz)
Bottom	1342.685
Middle	1342.685
Top	1342.685

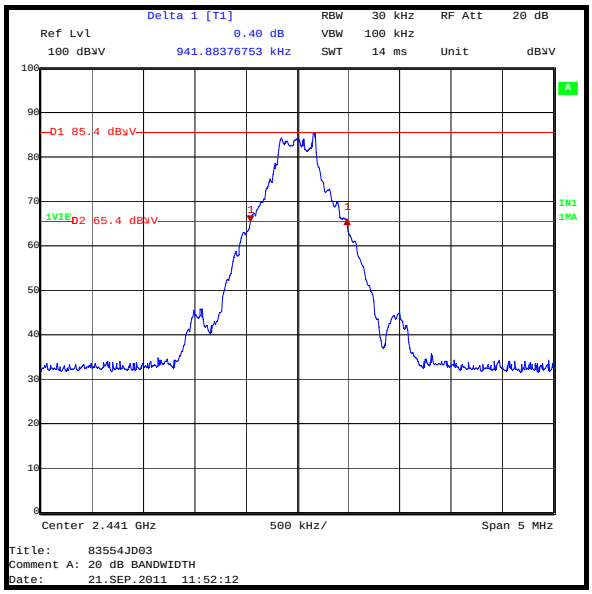
Results 3DH5:

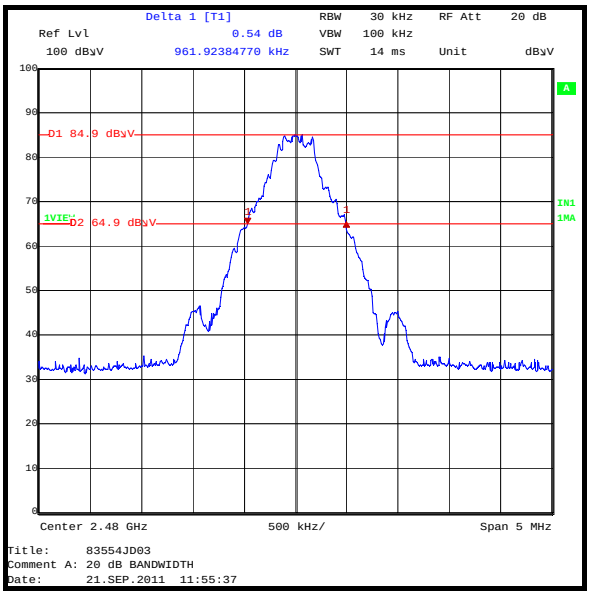
Channel	20 dB Bandwidth (kHz)
Bottom	1342.685
Middle	1342.685
Top	1312.625

Transmitter 20 dB Bandwidth (continued)

Results DH5:

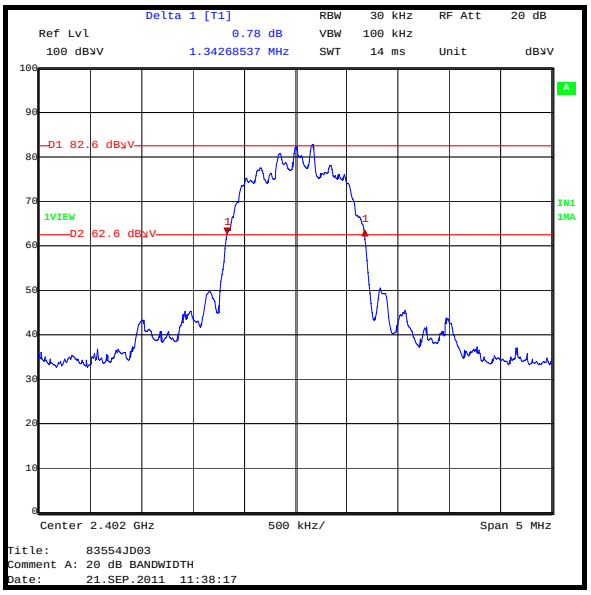


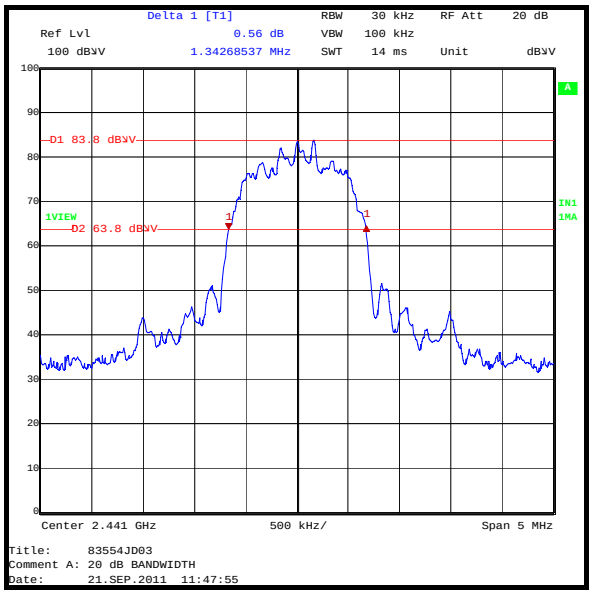


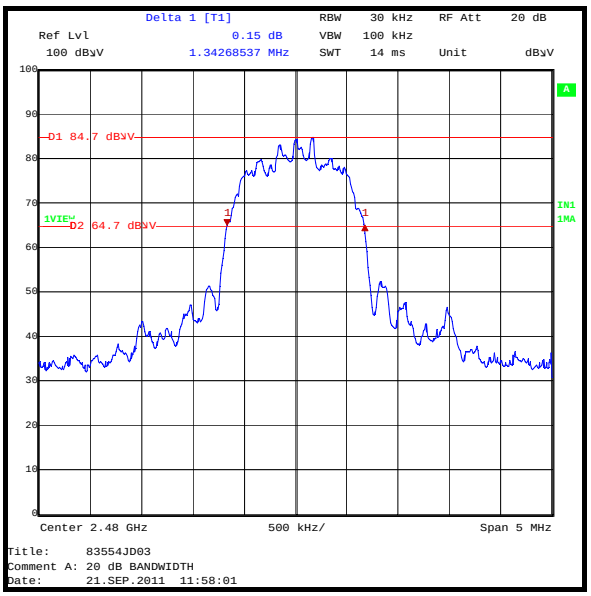


Transmitter 20 dB Bandwidth (continued)

Results 2DH5:

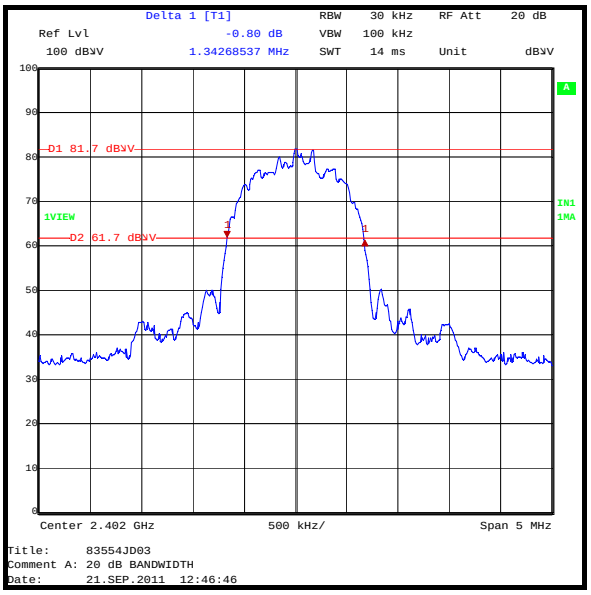


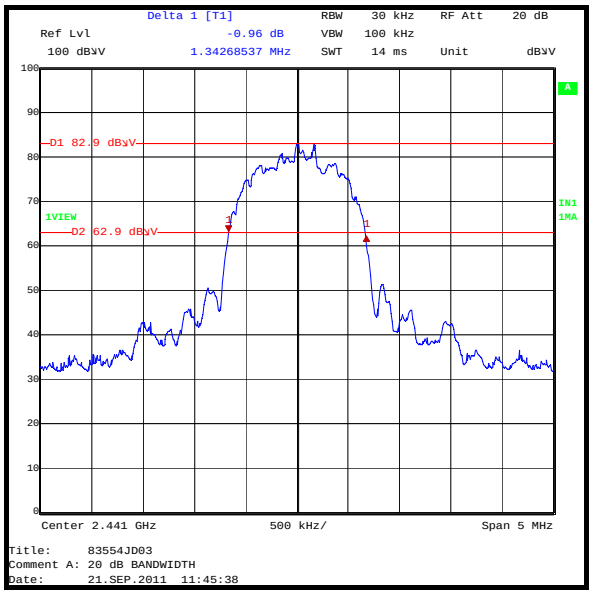


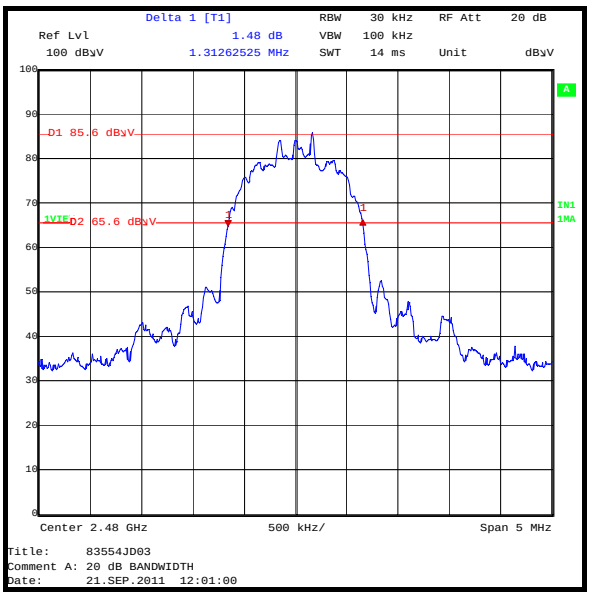


Transmitter 20 dB Bandwidth (continued)

Results 3DH5:







5.2.5. Transmitter Carrier Frequency Separation

Test Summary:

Test Engineer:	Sarah Williams	**Test Date:**	21 September 2011
Test Sample Serial No:	004401221130087		

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

Environmental Conditions:

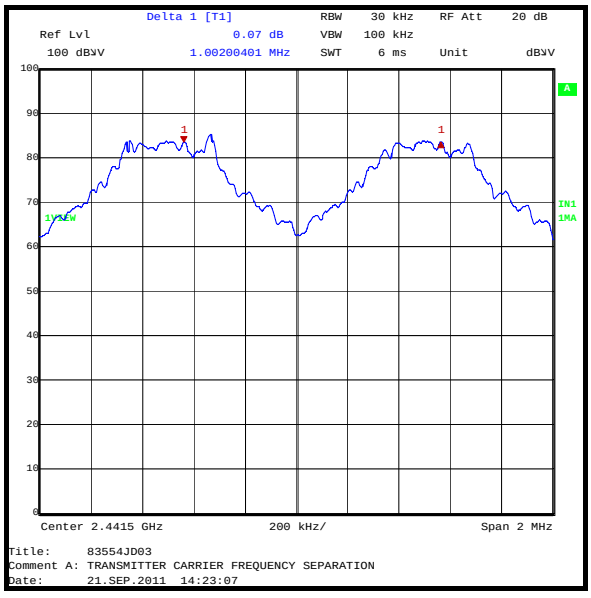
Temperature (°C):	26
Relative Humidity (%):	30

Results: DH5

Carrier Frequency Separation (kHz)	Limit ($^2/_3$ of 20 dB BW) (kHz)	Margin (kHz)	Result
1002.004	627.923	374.081	Complied

Note(s):

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



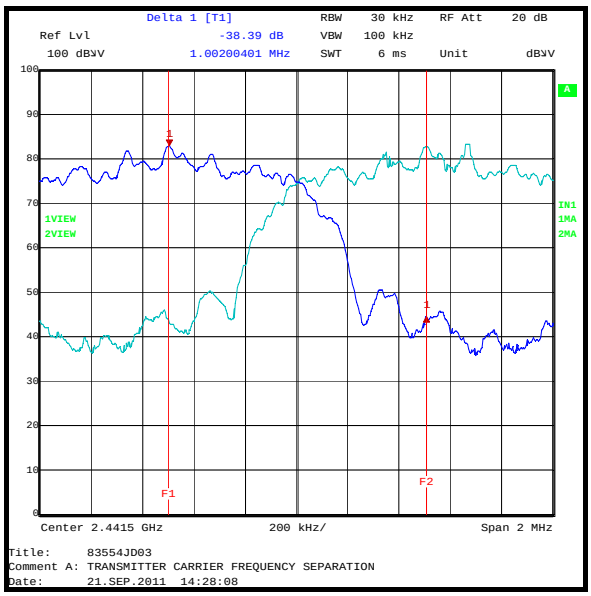
Transmitter Carrier Frequency Separation (continued)

Results: 2DH5

Carrier Frequency Separation (kHz)	Limit ($^2/_3$ of 20 dB BW) (kHz)	Margin (kHz)	Result
1002.004	895.123	106.881	Complied

Note(s):

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



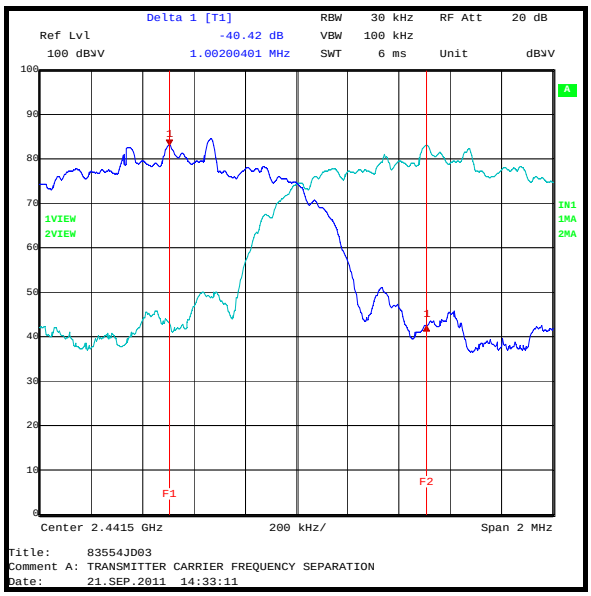
Transmitter Carrier Frequency Separation (continued)

Results: 3DH5

Carrier Frequency Separation (kHz)	Limit ($^2/_3$ of 20 dB BW) (kHz)	Margin (kHz)	Result
1002.004	895.123	106.881	Complied

Note(s):

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



5.2.6. Transmitter Number of Hopping Frequencies and Average Time of Occupancy

Test Summary:

Test Engineer:	Sarah Williams	**Test Date:**	21 September 2011
Test Sample Serial No:	004401221130087		

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):	26
Relative Humidity (%):	30

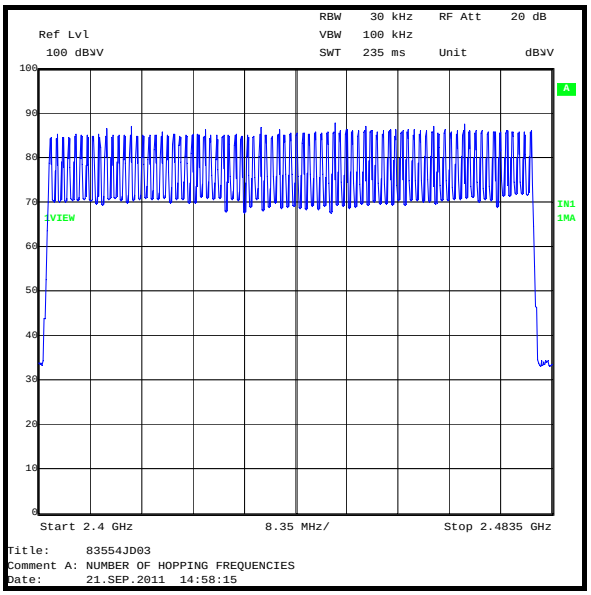
Results:

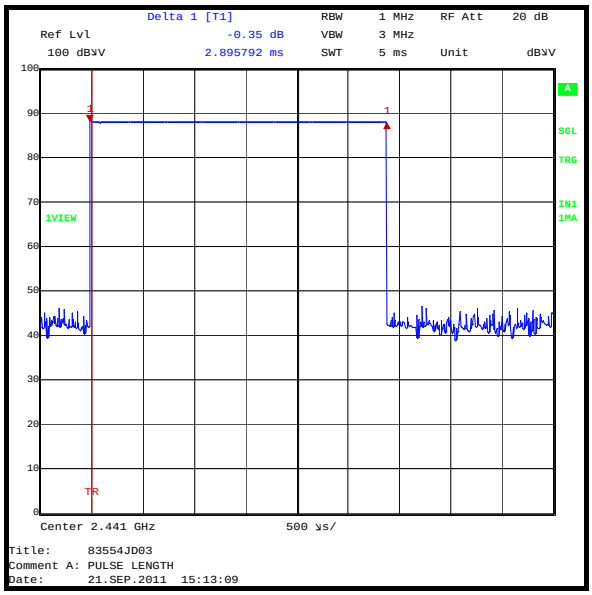
Emission Width (μs)	Number of Hops in 31.6 Seconds	Average Time of Occupancy (s)	Limit (s)	Margin (s)	Result
2895.792	97	0.281	0.4	0.119	Complied

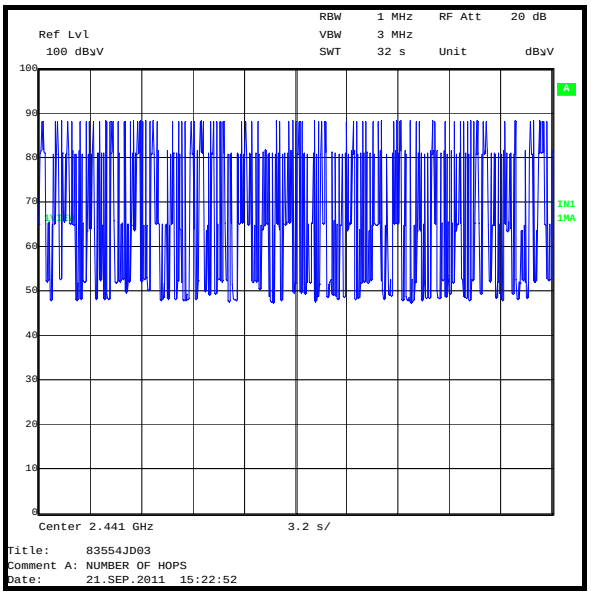
Note(s):

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)







5.2.7. Transmitter Maximum Peak Output Power

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	22 September 2011
Test Sample Serial No:	004401221130087		

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

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	24

Results: DH5

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	-1.4	30.0	31.4	Complied
Middle	0.4	30.0	29.6	Complied
Top	0.5	30.0	29.5	Complied

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	-1.4	-1.3	-2.7	36.0	38.7	Complied
Middle	0.4	-1.3	-0.9	36.0	36.9	Complied
Top	0.5	-1.3	-0.8	36.0	36.8	Complied

Results: 2DH5

Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	0.1	21.0	20.9	Complied
Middle	1.9	21.0	19.1	Complied
Top	2.0	21.0	19.0	Complied

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	0.1	-1.3	-1.2	27.0	28.2	Complied
Middle	1.9	-1.3	0.6	27.0	26.4	Complied
Top	2.0	-1.3	0.7	27.0	26.3	Complied

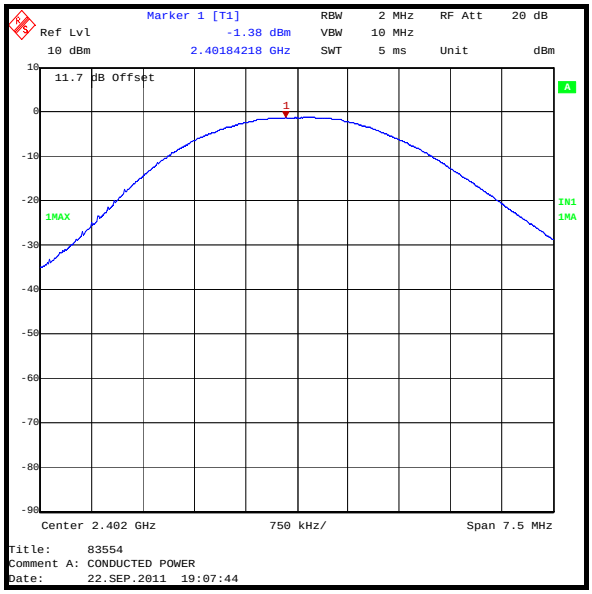
Results: 3DH5

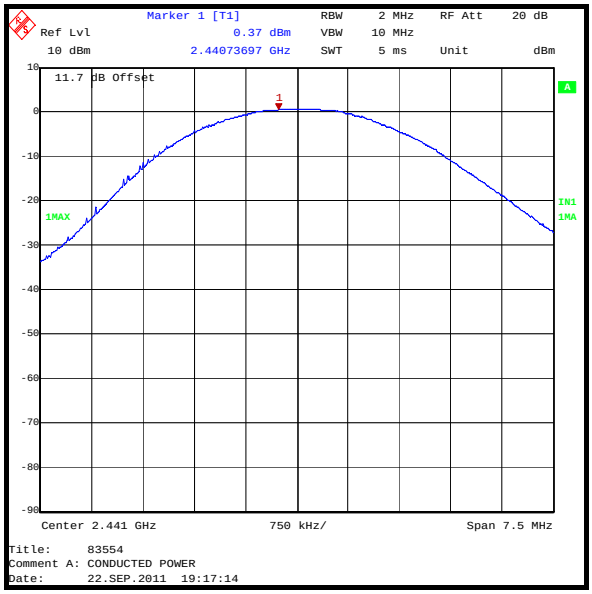
Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	0.9	21.0	20.1	Complied
Middle	2.6	21.0	18.4	Complied
Top	2.7	21.0	10.3	Complied

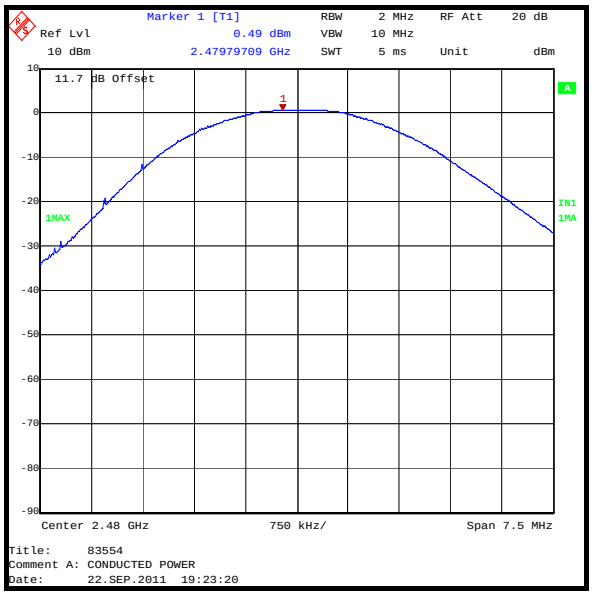
Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	0.9	-1.3	-0.4	27.0	27.4	Complied
Middle	2.6	-1.3	1.3	27.0	25.7	Complied
Top	2.7	-1.3	1.4	27.0	25.6	Complied

Transmitter Maximum Peak Output Power (continued)

Results: Basic Rate DH5

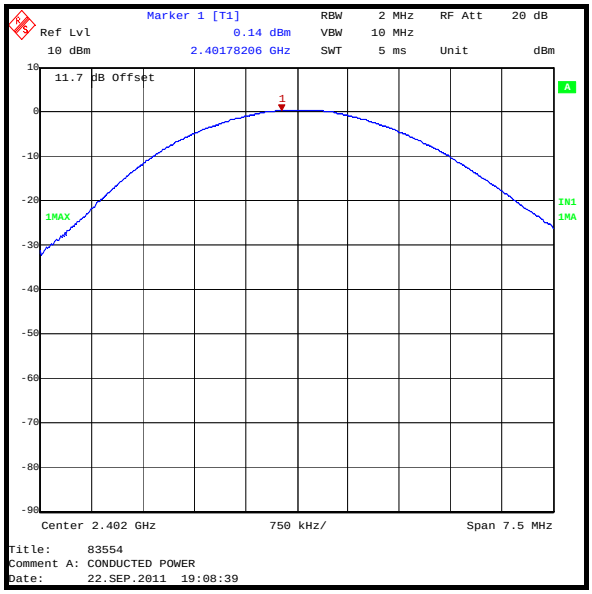


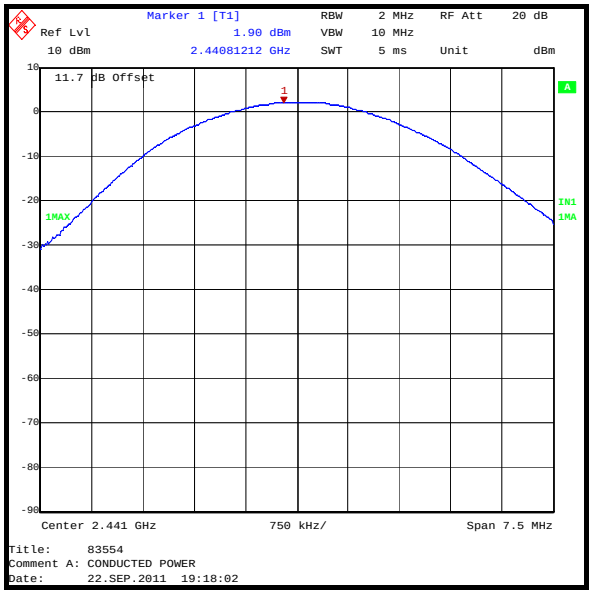


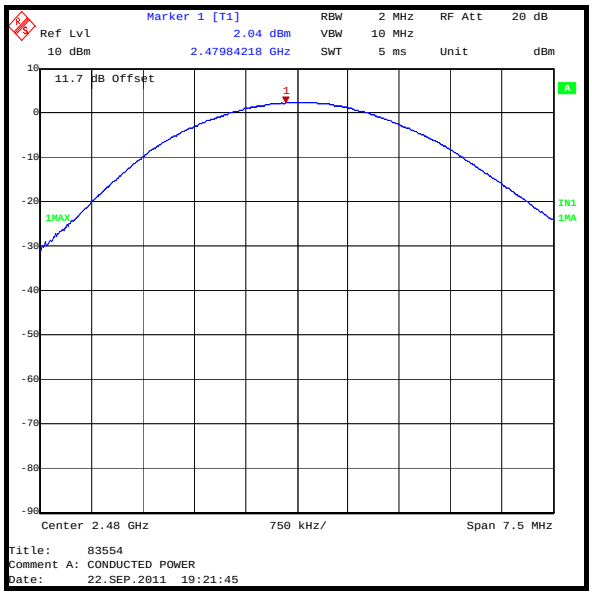


Transmitter Maximum Peak Output Power (continued)

Results: 2DH5

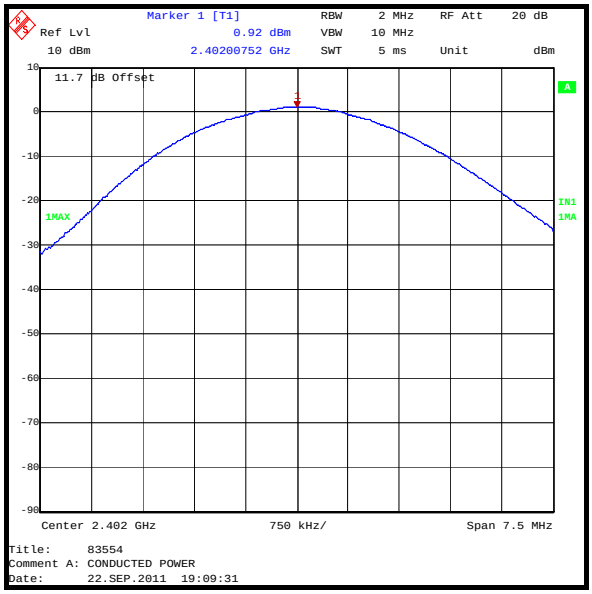


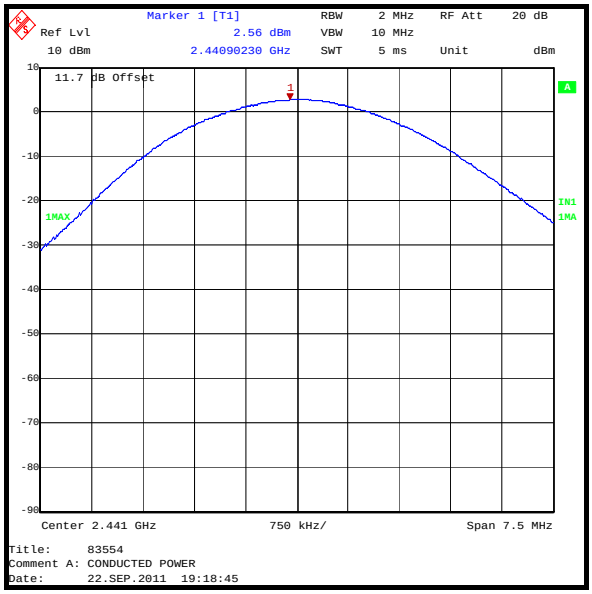


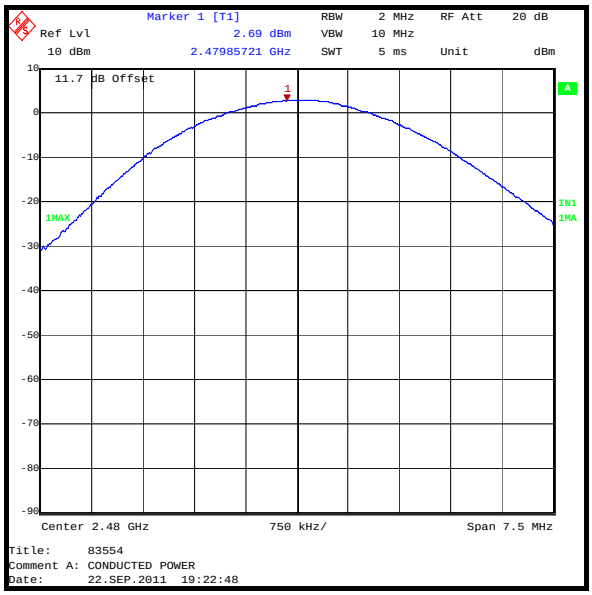


Transmitter Maximum Peak Output Power (continued)

Results: 3DH5







5.2.8. Transmitter Radiated Emissions

Test Summary:

Test Engineer:	Sarah Williams	**Test Date:**	28 September 2011
Test Sample Serial No:	004401221134089		

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 (%):	40

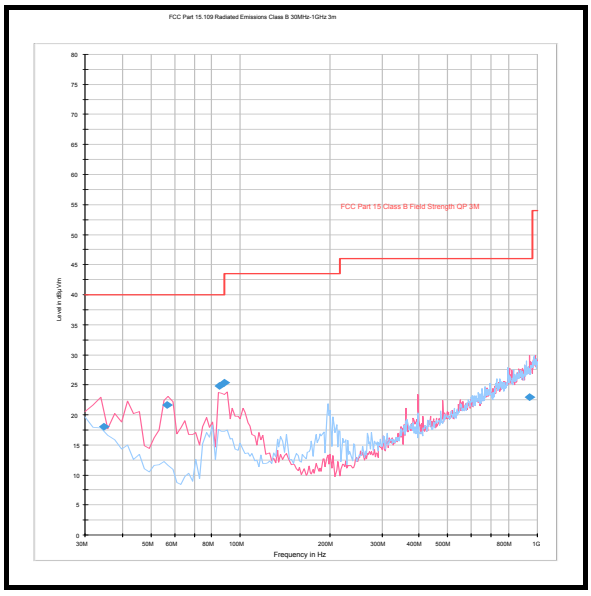
Results: Quasi-Peak 3-DH5

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
34.798	Vertical	18.0	40.0	22.0	Complied
56.690	Vertical	21.7	40.0	18.3	Complied
85.069	Vertical	24.8	40.0	15.2	Complied
88.138	Vertical	25.3	43.5	18.2	Complied
943.814	Vertical	22.9	46.0	23.1	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 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:	Sarah Williams & Patrick Jones	**Test Date:**	12 September 2011
Test Sample Serial No:	004401221134089		

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):	26
Relative Humidity (%):	31

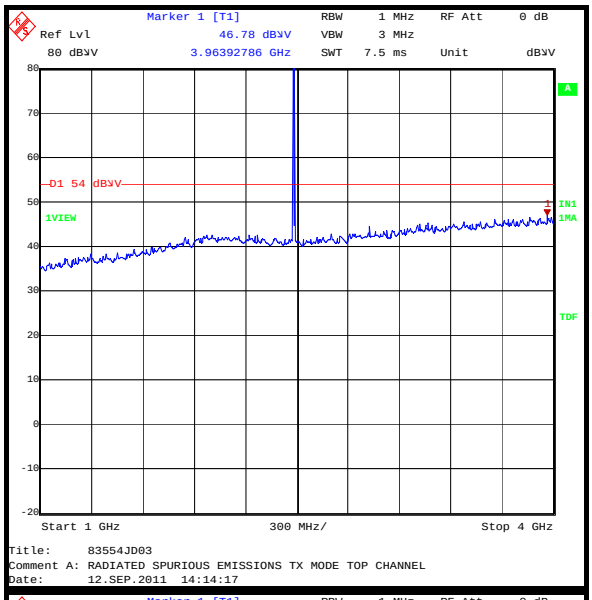
Results: 3-DH5

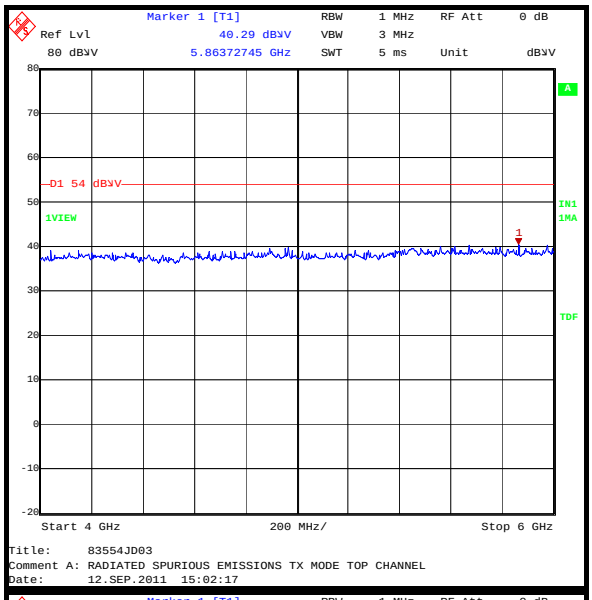
Frequency (MHz)	Antenna Polarity	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
24803.607	Vertical	48.7	54.0	5.3	Complied

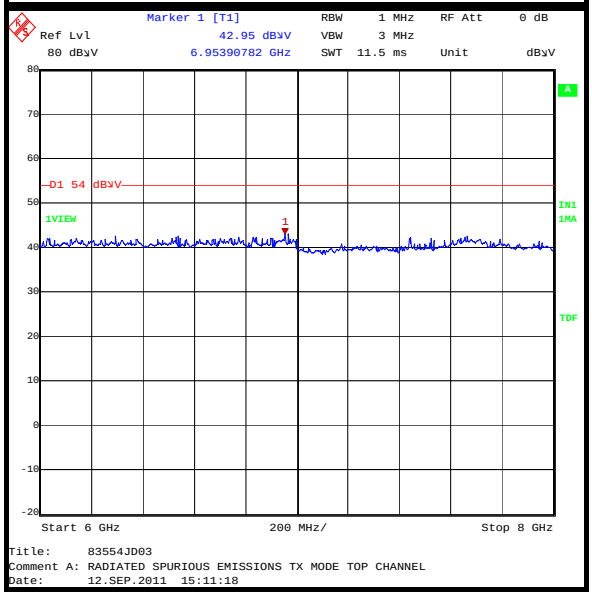
Note(s):

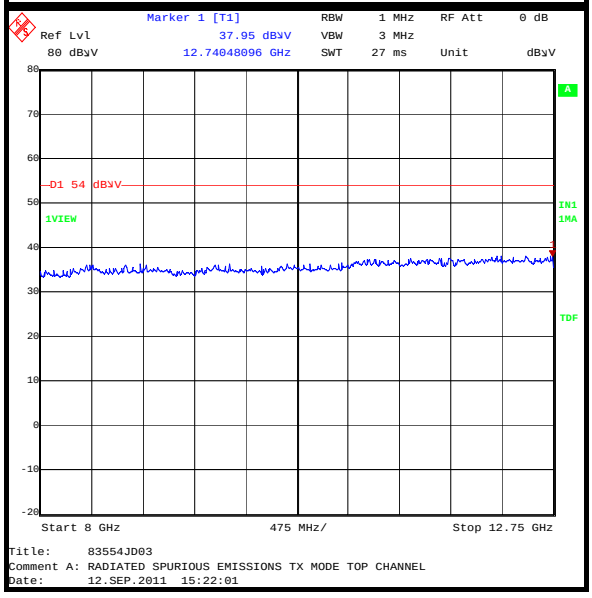
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss
2. The emission shown on the 1 GHz to 4 GHz plot is the EUT fundamental at 2480 MHz.
3. No spurious emissions were detected above the noise floor of the measuring receiver 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.
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)

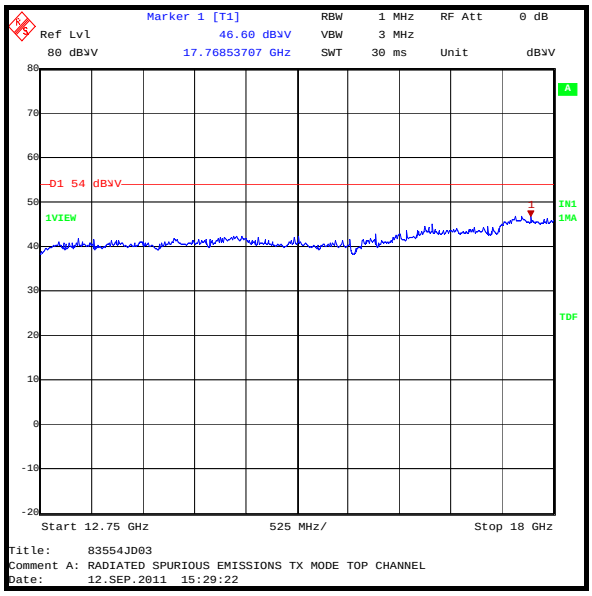


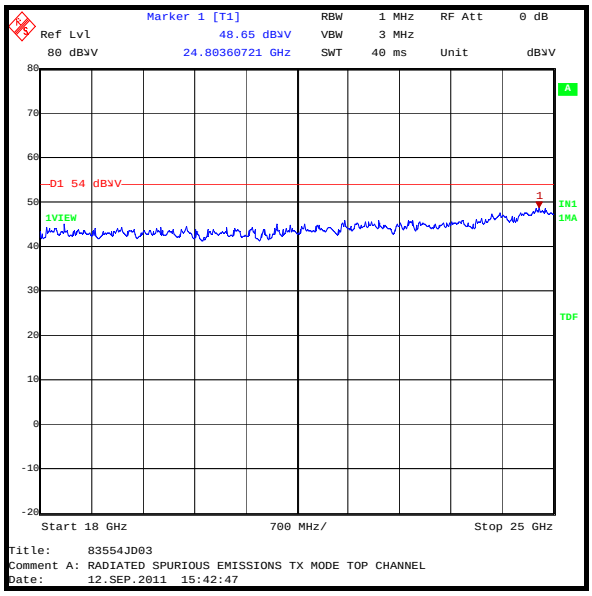






Transmitter Radiated Emissions (continued)





5.2.9. Transmitter Band Edge Radiated Emissions

Test Summary:

Test Engineer:	Andrew Edwards	**Test Date:**	12 September 2011
Test Sample Serial No:	004401221134089		

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):	26
Relative Humidity (%):	30

Results: Static Mode DH5

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2400.0	Vertical	40.9	68.3*	27.4	Complied
2483.5	Vertical	51.4	74.0	22.6	Complied

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

Results: Hopping Mode DH5

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2400.0	Vertical	40.3	68.7*	28.4	Complied
2483.5	Vertical	51.7	74.0	22.3	Complied

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

Results: Static Mode 2DH5

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2400.0	Vertical	42.7	67.7*	25.0	Complied
2483.5	Vertical	52.5	74.0	21.5	Complied

Frequency (MHz)	Antenna Polarity	Average Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	Vertical	40.7	54.0	13.3	Complied

Results: Hopping Mode 2DH5

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2400.0	Vertical	41.4	67.8*	26.4	Complied
2483.5	Vertical	50.4	74.0	23.6	Complied

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

Results: Static Mode 3DH5

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2400.0	Vertical	42.1	67.7*	25.6	Complied
2483.5	Vertical	52.6	74.0	21.4	Complied

Frequency (MHz)	Antenna Polarity	Average Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	Vertical	40.6	54.0	13.4	Complied

Results: Hopping Mode 3DH5

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2400.0	Vertical	41.1	67.7*	26.6	Complied
2483.5	Vertical	52.6	74.0	21.4	Complied

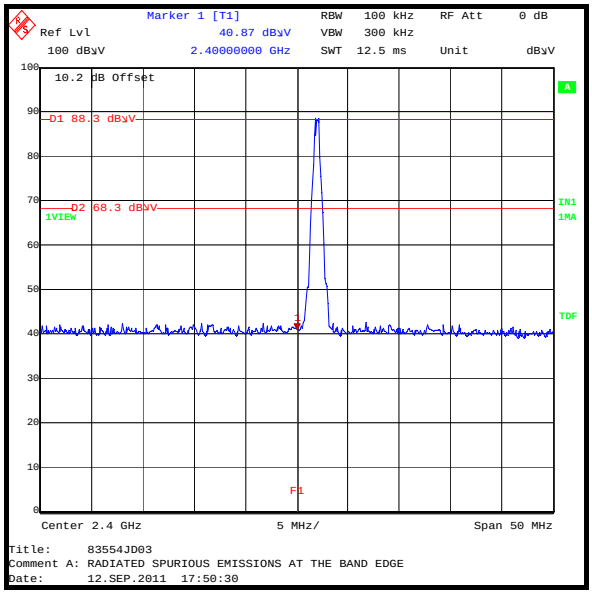
Frequency (MHz)	Antenna Polarity	Average Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
2483.5	Vertical	38.0	54.0	16.0	Complied

Note(s):

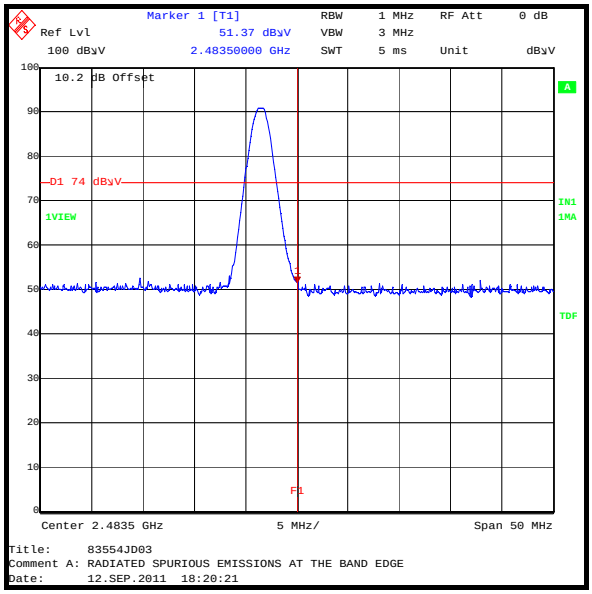
1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. * -20 dBc limit

Transmitter Band Edge Radiated Emissions (continued)

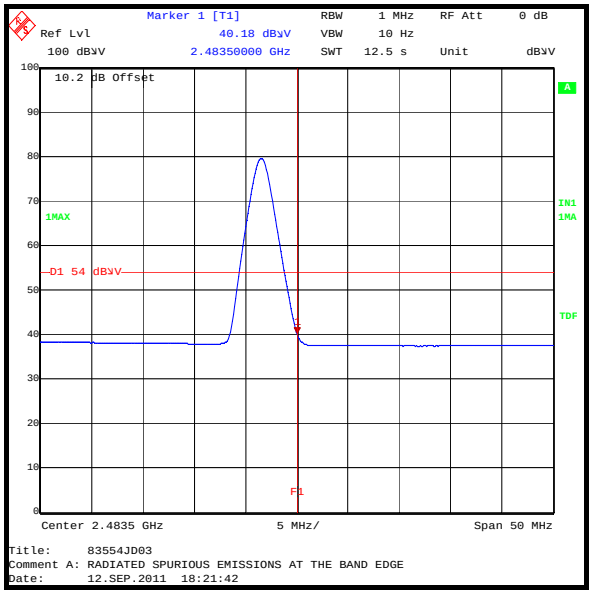
DH5 Static Mode



Lower Band Edge Peak Static



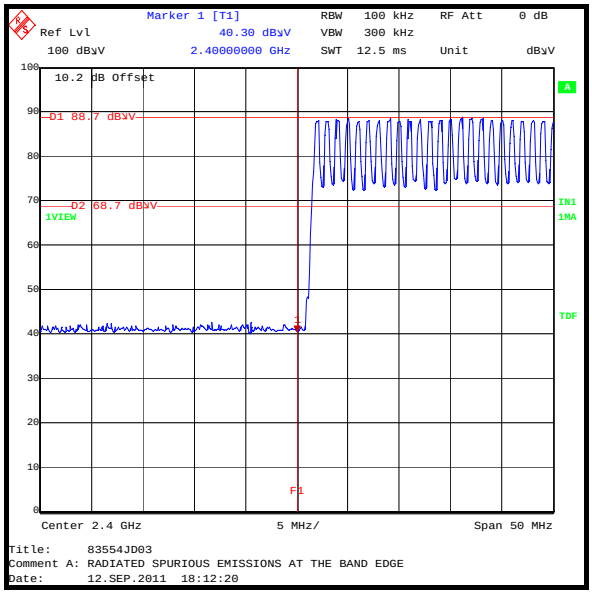
Upper Band Edge Peak Static



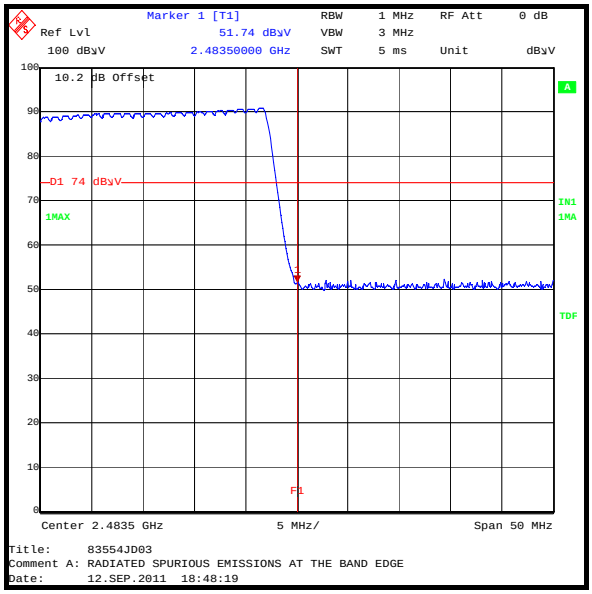
Upper Band Edge Average Static

Transmitter Band Edge Radiated Emissions (continued)

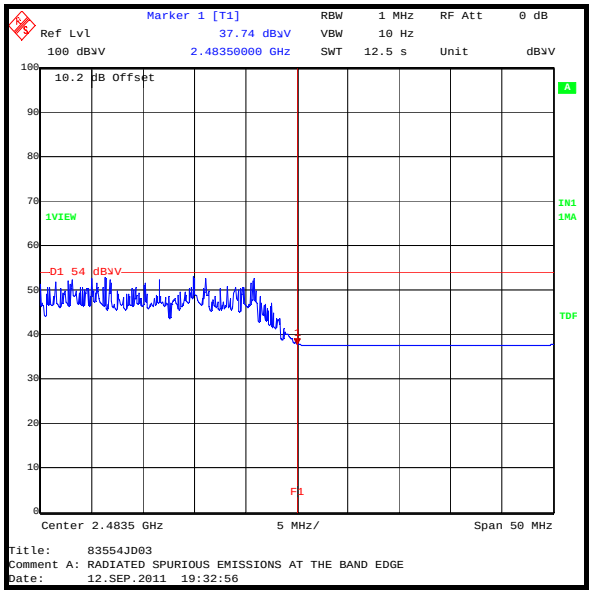
DH5 Hopping Mode



Lower Band Edge Peak Hopping



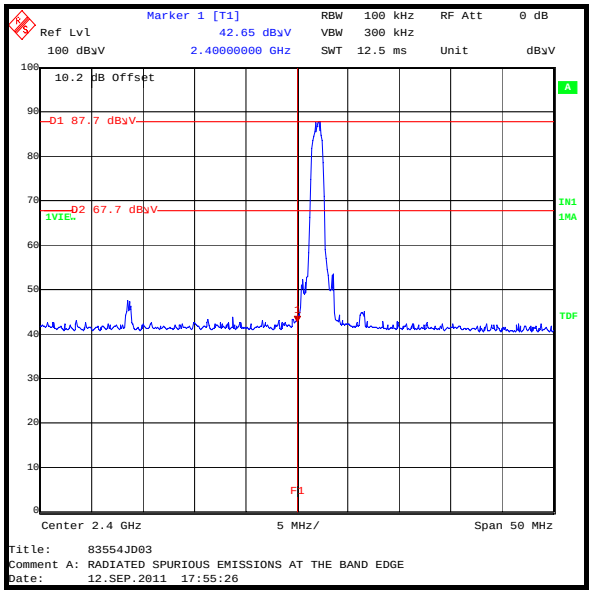
Upper Band Edge Peak Hopping



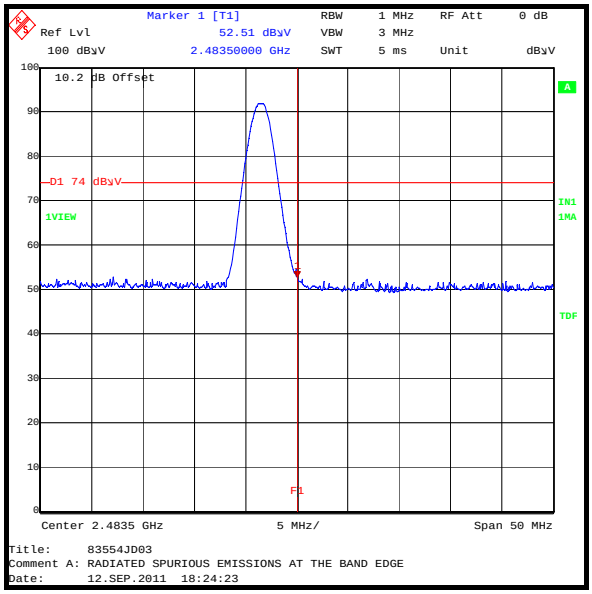
Upper Band Edge Average Hopping

Transmitter Band Edge Radiated Emissions (continued)

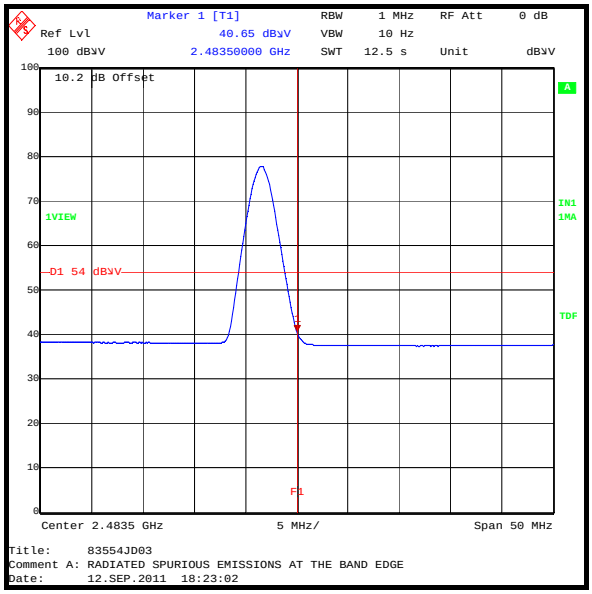
2DH5 Static Mode



Lower Band Edge Peak Static



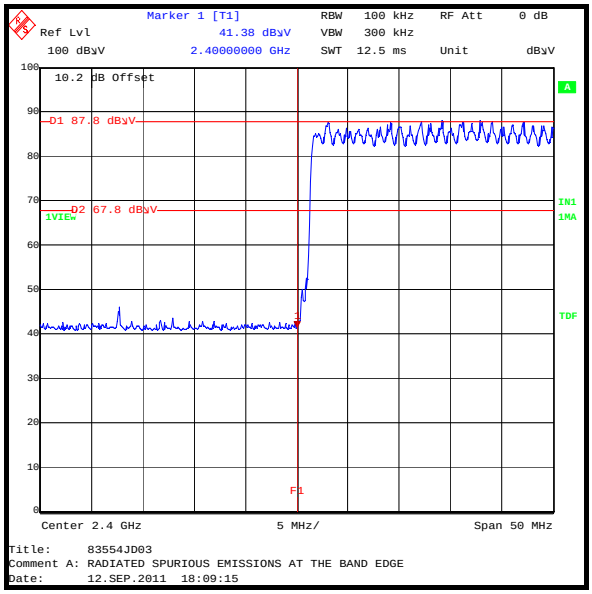
Upper Band Edge Peak Static



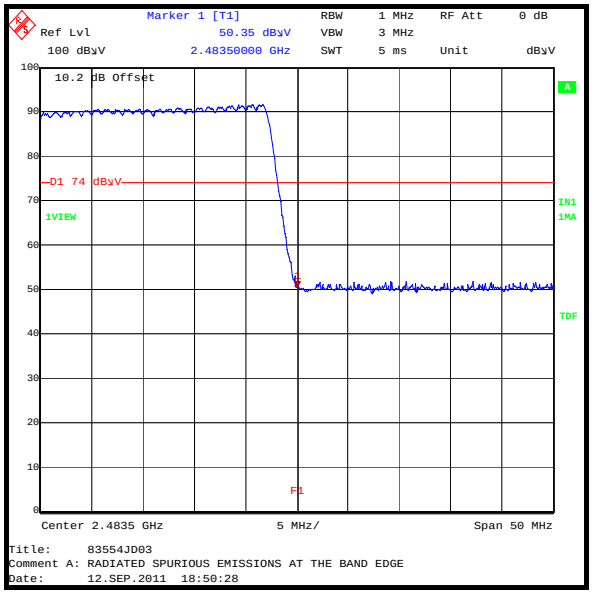
Upper Band Edge Average Static

Transmitter Band Edge Radiated Emissions (continued)

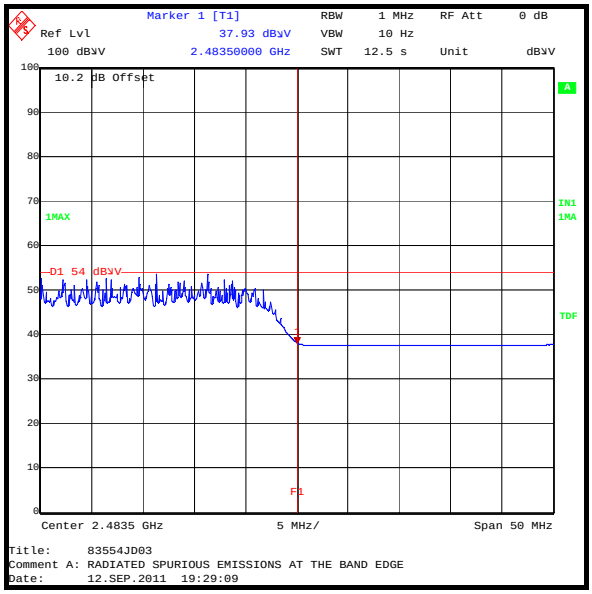
2DH5 Hopping Mode



Lower Band Edge Peak Hopping



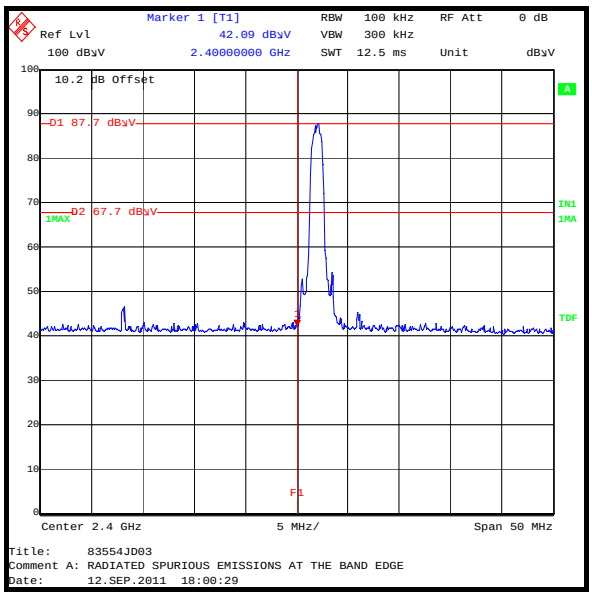
Upper Band Edge Peak Hopping



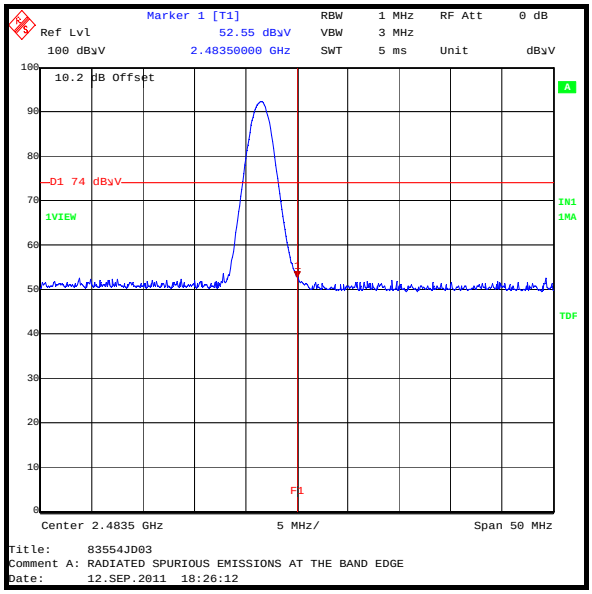
Upper Band Edge Average Hopping

Transmitter Band Edge Radiated Emissions (continued)

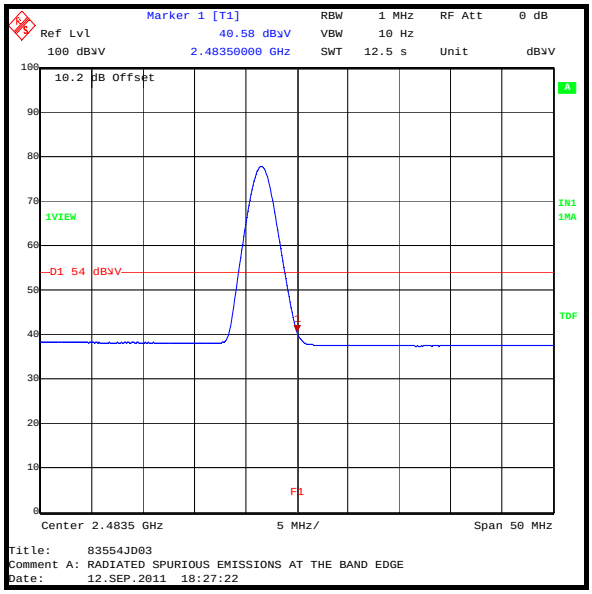
3DH5 Static Mode



Lower Band Edge Peak Static



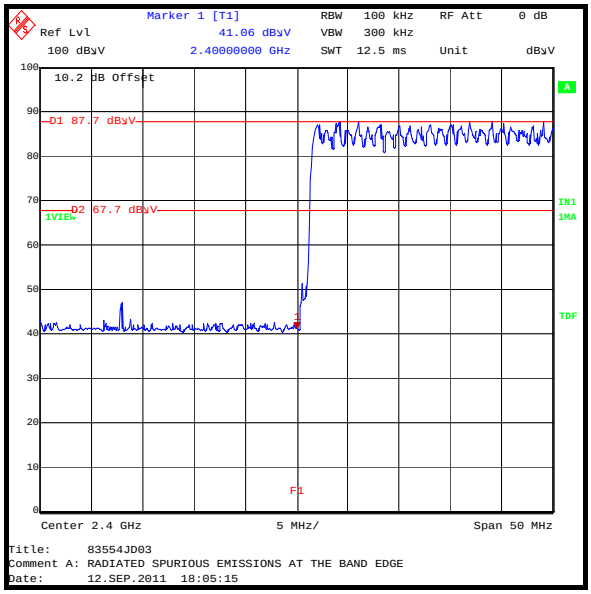
Upper Band Edge Peak Static



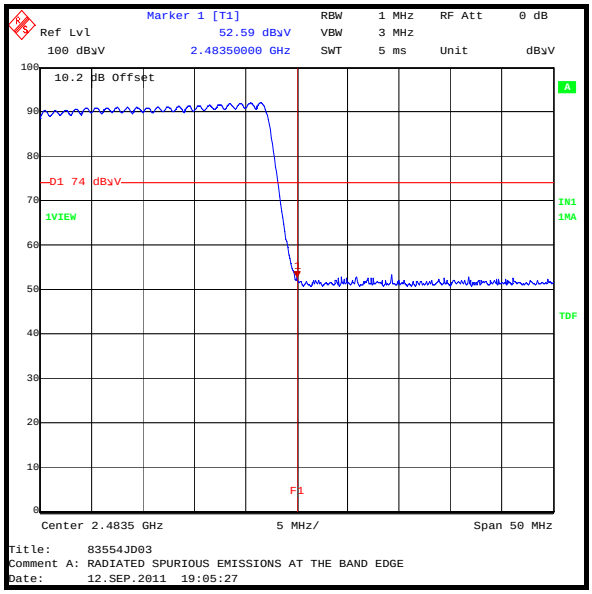
Upper Band Edge Average Static

Transmitter Band Edge Radiated Emissions (continued)

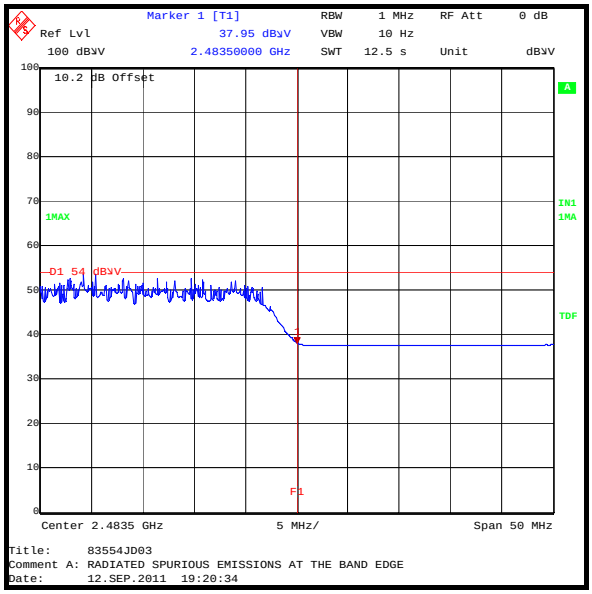
3DH5 Hopping Mode



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
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
Maximum Peak Output Power	2.4 GHz to 2.4835 GHz	95%	±2.94 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)
A1249	Coaxial Coupler	Narda	252888	0955-0125	Calibrated before use	-
A1396	Attenuator	Huber & Suhner	757987	6810.17.B	08 Jul 2012	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	20 Jun 2012	12
A1818	Antenna	EMCO	3115	00075692	13 Oct 2011	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	05 Mar 2012	12
A1834	Attenuator	Hewlett Packard	8491B	10444	26 Jul 2012	12
A2032	Attenuator	Narda	4242B	03547	Calibrated before use	-
A253	Antenna	Flann Microwave	12240-20	128	13 Oct 2011	12
A255	Antenna	Flann Microwave	16240-20	519	13 Oct 2011	12
A256	Antenna	Flann Microwave	18240-20	400	13 Oct 2011	12
A427	Antenna	Flann Microwave	14240-20	150	21 Nov 2013	36
A436	Antenna	Flann Microwave	20240-20	330	13 Oct 2011	12
A553	Antenna	Chase	CBL6111A	1593	26 Mar 2012	12
A649	LISN	Rohde & Schwarz	ESH3-Z5	825562/008	05 Apr 2012	12
K0001	5m Semi-Anechoic Chamber	Rainford EMC	N/A	N/A	29 May 2012	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	13 Oct 2011	12
L1023	Bluetooth tester	Tescom	TC-3000A	3000A310042	Calibration not required	-
M1124	Test Receiver	Rohde & Schwarz	ESI26	100046K	29 Jun 2012	12
M1242	Spectrum Analyser	Rohde & Schwarz	FSEM30	845986/022	03 Dec 2011	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	13 Jul 2012	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	04 Feb 2012	12

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