

TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: Softbank 101P

FCC ID: UCE211043A

To: FCC Part 22: 2011 Subpart H, Part 24: 2011 Subpart E,

Test Report Serial No:
RFI-RPT-RP83554JD06A V2.0

Version 2.0 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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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:	47CFR22
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 22 Subpart H (Public Mobile Services)
Specification Reference:	47CFR24
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 24 Subpart E (Personal Communication Services)
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
Site Registration:	FCC: 209735;
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH
Test Dates:	14 September 2011 to 03 October 2011

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 22		
Part 15.107(a)	Receiver/Idle Mode AC Conducted Spurious Emissions	✓
Part 15.109	Receiver/Idle Mode Radiated Spurious Emissions	✓
Part 22.913(a)	Transmitter Output Power (ERP)	✓
Part 2.1046	Transmitter Conducted Output Power	Note 1
Part 2.1055/22.355	Transmitter Frequency Stability (Temperature and Voltage Variation)	✓
Part 2.1049	Transmitter Occupied Bandwidth	✓
Part 2.1053/22.917	Transmitter Out of Band Radiated Emissions	✓
Part 2.1053/22.917	Transmitter Band Edge Radiated Emissions	✓
Part 24		
Part 15.107(a)	Receiver/Idle Mode AC Conducted Spurious Emissions	✓
Part 15.109	Receiver/Idle Mode Radiated Spurious Emissions	✓
Part 24.232	Transmitter Output Power (EIRP)	✓
Part 2.1046	Transmitter Conducted Output Power	Note 1
Part 2.1055/24.235	Transmitter Frequency Stability (Temperature and Voltage Variation)	✓
Part 2.1049	Transmitter Occupied Bandwidth	✓
Part 2.1053/24.238	Transmitter Out of Band Radiated Emissions	✓
Part 2.1053/24.238	Transmitter Band Edge Radiated Emissions	✓
Key to Results		
 = Complied	 = Did not comply	

Note 1: The measurement was performed to support SAR tests.

2.3. Methods and Procedures

Reference:	ANSI/TIA-603-C-2004
Title:	Land Mobile Communications Equipment, Measurements and performance Standards
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.

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:	004401221134063 (<i>Radiated sample</i>)
Hardware Version Number:	Revision C
Software Version Number:	ACPU: sbm-07-0319 CCPU: R1D_EC01
FCC ID:	UCE211043A

Brand Name:	Softbank
Model Name or Number:	101P
IMEI:	004401221130087 (<i>Conducted RF port sample</i>)
Hardware Version Number:	Revision C
Software Version Number:	ACPU: sbm-07-0363 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:	PM CBD1

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

Type of Radio Device:	Transceiver		
Modulation Type:	GMSK / 8PSK		
Power Supply Requirement(s):	Nominal	3.7 V	
	Minimum	3.4 V	
	Maximum	4.2 V	
Technology Tested:	GSM850		
Maximum Output Power (ERP):	GSM	31.5 dBm	
	GPRS	31.8 dBm	
	EGPRS	28.5 dBm	
Transmit Frequency Range:	824 to 849 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	128	824.2
	Middle	190	836.6
	Top	251	848.8
Receive Frequency Range:	869 to 894 MHz		
Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	128	869.2
	Middle	190	881.6
	Top	251	893.8
Technology Tested:	PCS1900		
Maximum Output Power (EIRP):	GSM	26.9 dBm	
	GPRS	27.3 dBm	
	EGPRS	26.5 dBm	
Transmit Frequency Range:	1850 to 1910 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	512	1850.2
	Middle	660	1879.8
	Top	810	1909.8
Receive Frequency Range:	1930 to 1990 MHz		
Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	512	1930.2
	Middle	660	1959.8
	Top	810	1989.8

3.5. Support Equipment

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

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

Brand Name:	Not marked or stated
Description:	Dummy Battery
Model Name or Number:	Not marked or 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):

- Receiver/Idle mode.
- Constantly transmitting at full power on bottom, middle and top channels as required.
- Occupied bandwidth, ERP/EIRP and band edge tests were performed with the EUT in GSM single timeslot circuit switched and GPRS/EGPRS Multislot Class 12 with the unit transmitting on one timeslot in the uplink. The EUT output power was initially checked when transmitting at maximum power on one, two, three and four timeslots. The highest power was observed when transmitting on one timeslot.
- Transmitter radiated spurious emissions were checked in all modes during pre-scans. Circuit switched voice was found to be the worst case and all final measurements were performed with the EUT in this mode.

4.2. Configuration and Peripherals

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

- The sample with IMEI 004401221130087 was used for conducted power measurements. The sample with IMEI 004401221134063 was used for all other measurements.
- EGPRS tests were performed with the EUT transmitting at full power on one timeslot using MCS5 unless otherwise stated.
- Idle mode and transmitter mode 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 accessories were individually connected and measurements made during pre-scans to determine the worst case combination.
- Connected to a GSM/GPRS/EGPRS system simulator, operating in transceiver mode.

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 - Part 22

5.2.1. Receiver/Idle Mode AC Conducted Spurious Emissions

Test Summary:

Test Engineer:	Patrick Jones	Test Date:	22 September 2011
Test Sample IMEI:	004401221134063		

FCC Part:	15.107(a)
Test Method Used:	As detailed in ANSI C63.4 Section 7

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	29

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.249	Live	46.5	61.8	15.3	Complied
0.420	Live	45.4	57.4	12.0	Complied
0.501	Live	44.1	56.0	11.9	Complied
0.632	Live	39.6	56.0	16.4	Complied
0.672	Live	39.7	56.0	16.3	Complied
0.875	Live	39.9	56.0	16.1	Complied
1.365	Live	41.4	56.0	14.6	Complied
1.424	Live	43.2	56.0	12.8	Complied
1.617	Live	55.2	56.0	0.8	Complied

Results: Live / Average

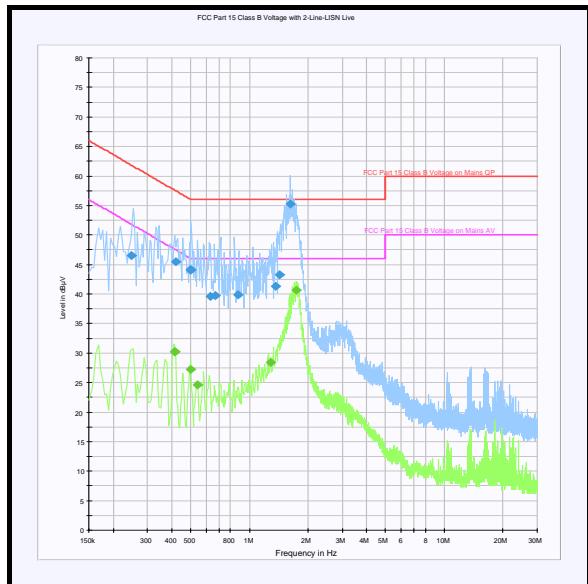
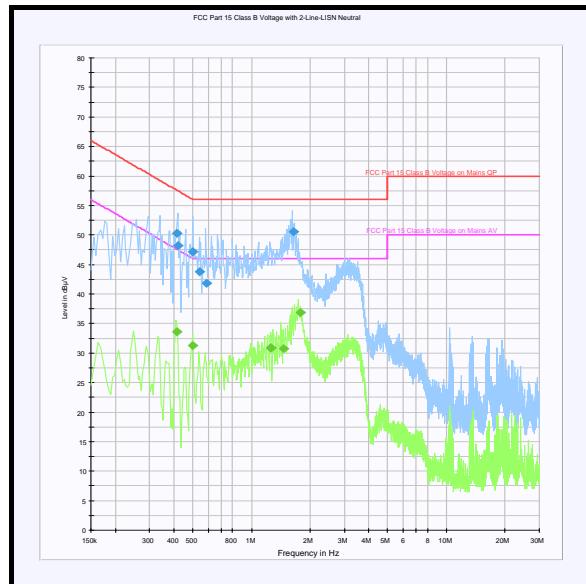
Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.416	Live	30.3	47.5	17.2	Complied
0.497	Live	27.2	46.1	18.9	Complied
0.542	Live	24.6	46.0	21.4	Complied
1.284	Live	28.4	46.0	17.6	Complied
1.739	Live	40.7	46.0	5.3	Complied

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

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.416	Neutral	50.3	57.5	7.2	Complied
0.420	Neutral	48.1	57.4	9.3	Complied
0.501	Neutral	47.2	56.0	8.8	Complied
0.542	Neutral	43.8	56.0	12.2	Complied
0.591	Neutral	41.8	56.0	14.2	Complied
1.644	Neutral	50.5	56.0	5.5	Complied

Results: Neutral / Average

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.416	Neutral	33.6	47.5	13.9	Complied
0.497	Neutral	31.3	46.1	14.8	Complied
1.253	Neutral	30.9	46.0	15.1	Complied
1.257	Neutral	30.9	46.0	15.1	Complied
1.455	Neutral	30.7	46.0	15.3	Complied
1.775	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 IMEI:	004401221130063		

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.4 Section 8
Frequency Range:	30 MHz to 1000 MHz

Environmental Conditions:

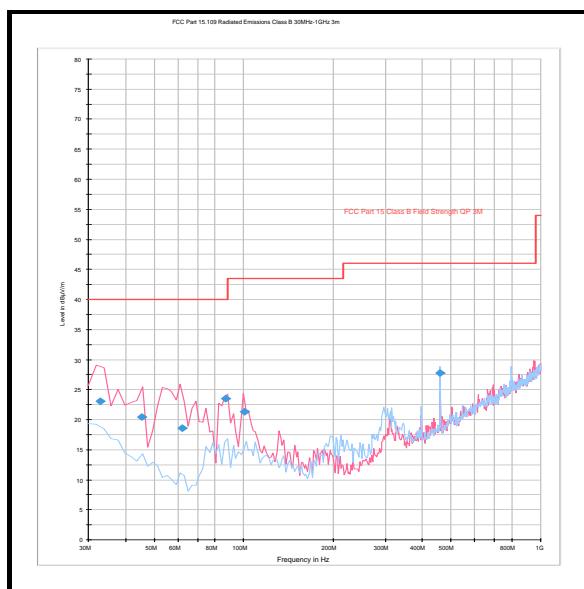
Temperature (°C):	28
Relative Humidity (%):	33

Results:

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/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:	Andrew Edwards	Test Date:	14 September 2011
Test Sample IMEI:	004401221134063		

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.4 Section 8
Frequency Range:	1 GHz to 5 GHz

Environmental Conditions:

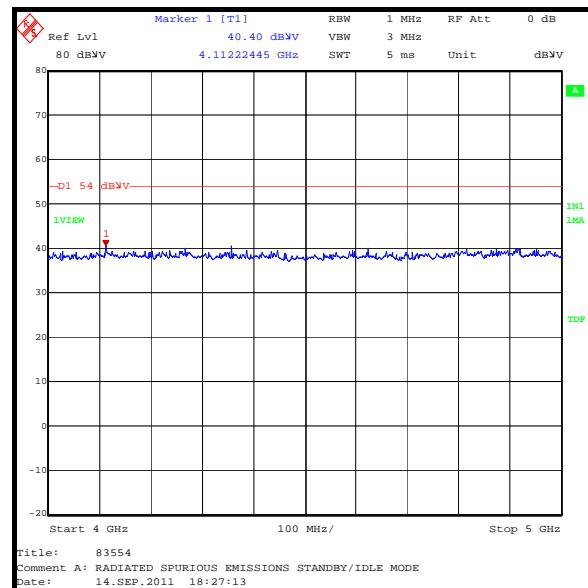
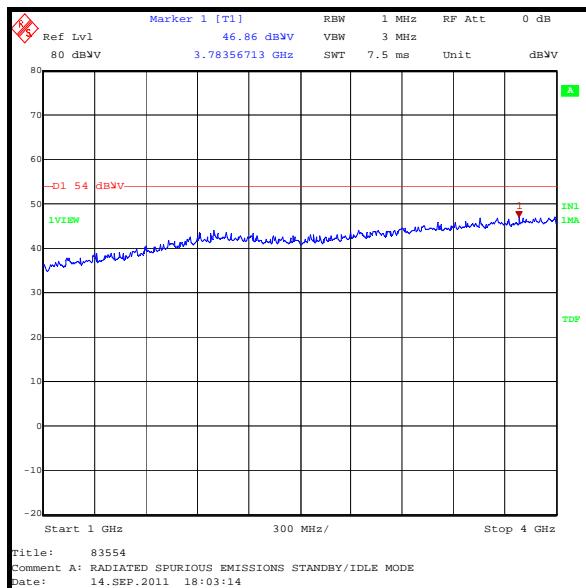
Temperature (°C):	26
Relative Humidity (%):	23

Results:

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
3783.567	Vertical	46.9	54.0	7.1	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. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.
3. 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)

5.2.3. Transmitter Output Power (ERP)**Test Summary:**

Test Engineer:	Andrew Edwards & Crawford Lindsay	Test Date:	14 September 2011 & 03 October 2011
Test Sample IMEI:	004401221134063		

FCC Part:	22.913(a)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.17.2

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	24

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	30.8	38.45	7.65	Complied
Middle	836.6	Vertical	30.2	38.45	8.25	Complied
Top	848.8	Vertical	31.5	38.45	6.95	Complied

Results: GPRS

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	29.8	38.45	8.65	Complied
Middle	836.6	Vertical	30.2	38.45	8.25	Complied
Top	848.8	Vertical	31.8	38.45	6.65	Complied

Results: EGPRS / MCS5 / 8PSK

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Horizontal	28.2	38.45	10.25	Complied
Middle	836.6	Horizontal	28.5	38.45	9.95	Complied
Top	848.8	Horizontal	28.5	38.45	9.95	Complied

5.2.4. Transmitter Conducted Output Power**Test Summary:**

Test Engineer:	Sarah Williams & Crawford Lindsay	Test Date:	29 September 2011 & 03 October 2011
Test Sample IMEI:	004401221130087		

FCC Part:	2.1046
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.1 referencing FCC CFR Part 2.1046(a)

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	33

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Maximum Peak Conducted Power (dBm)	Maximum Average Conducted Power (dBm)
Bottom	824.2	32.1	32.0
Middle	836.6	32.2	32.0
Top	848.8	32.4	32.3

Results: GPRS

Channel	Frequency (MHz)	Maximum Average Power / 4 timeslots (dBm)	Maximum Average Power / 3 timeslots (dBm)	Maximum Average Power / 2 timeslots (dBm)	Maximum Average Power / 1 timeslot (dBm)
Bottom	824.2	26.6	27.8	29.5	32.0
Middle	836.6	26.8	28.0	30.0	32.3
Top	848.8	26.8	28.0	29.9	32.2

Results: EGPRS / MCS4 / GMSK

Channel	Frequency (MHz)	Maximum Average Power / 4 timeslots (dBm)	Maximum Average Power / 3 timeslots (dBm)	Maximum Average Power / 2 timeslots (dBm)	Maximum Average Power / 1 timeslot (dBm)
Bottom	824.2	26.6	27.8	29.5	32.0
Middle	836.6	26.8	28.0	30.0	32.3
Top	848.8	26.8	28.0	29.9	32.2

Note(s):

- Conducted power tests were performed to support SAR tests.

5.2.5. Transmitter Frequency Stability (Temperature Variation)**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	23 September 2011
Test Sample IMEI:	004401221134063		

FCC Part:	2.1055 & 22.355
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.2 referencing FCC CFR Part 2.1055

Environmental Conditions:

Ambient Temperature (°C):	28
Ambient Relative Humidity (%):	29

Results: Middle Channel (836.6 MHz)

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	836.600029	29	0.0347	2.5	2.4653	Complied
-20	836.600032	32	0.0383	2.5	2.4617	Complied
-10	836.600017	17	0.0203	2.5	2.4797	Complied
0	836.599976	24	0.0287	2.5	2.4713	Complied
10	836.599933	27	0.0323	2.5	2.4677	Complied
20	836.599969	31	0.0371	2.5	2.4629	Complied
30	836.599975	25	0.0299	2.5	2.4701	Complied
40	836.599970	30	0.0359	2.5	2.4641	Complied
50	836.599982	18	0.0215	2.5	2.4785	Complied

Note(s):

1. A dummy battery was placed on the EUT and the dummy battery cables connected to a bench power supply.
2. Frequency error was measured using a calibrated Rohde & Schwarz CMU 200 Universal Radio Communications Tester in accordance with current Rohde & Schwarz application notes. The EUT was connected by suitable RF cables to the CMU 200. A bidirectional communications link was established between the EUT and CMU 200. The frequency meter value was recorded.
3. Temperature was monitored throughout the test using a calibrated digital thermometer.

5.2.6. Transmitter Frequency Stability (Voltage Variation)**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	23 September 2011
Test Sample IMEI:	004401221134063		

FCC Part:	2.1055 & 22.355
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.2 referencing FCC CFR Part 2.1055

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	29

Results: Middle Channel (836.6 MHz)

Supply Voltage (V)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
3.4	836.600021	21	0.0251	2.5	2.4749	Complied
4.2	836.600016	16	0.0191	2.5	2.4809	Complied

Note(s):

1. A dummy battery was placed on the EUT and the dummy battery cables connected to a bench power supply.
2. Frequency error was measured using a calibrated Rohde & Schwarz CMU 200 Universal Radio Communications Tester in accordance with current Rohde & Schwarz application notes. The EUT was connected by suitable RF cables to the CMU 200. A bidirectional communications link was established between the EUT and CMU 200. The frequency meter value was recorded.
3. Voltage was monitored throughout the test using a calibrated digital voltmeter.

5.2.7. Transmitter Occupied Bandwidth**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	03 October 2011
Test Sample IMEI:	004401221134063		

FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.4 Section 13.7 referencing FCC CFR Part 2.1049

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	29

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	824.2	240.481
Middle	836.6	240.481
Top	848.8	242.485

Results: GPRS

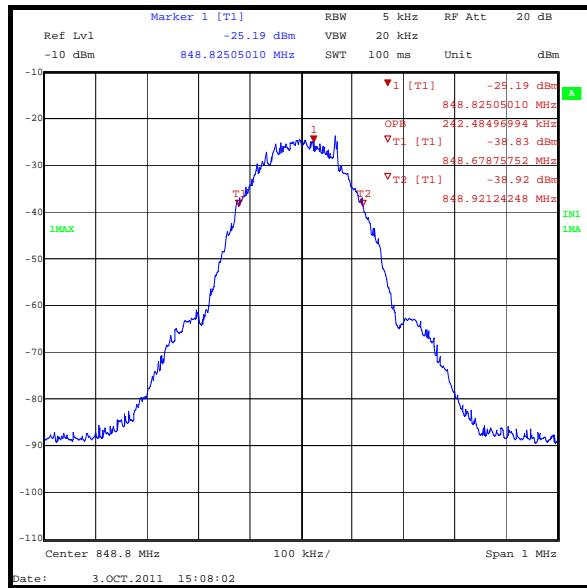
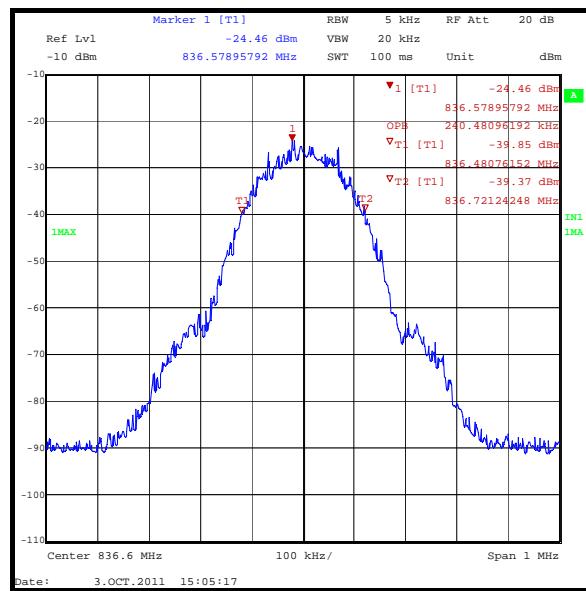
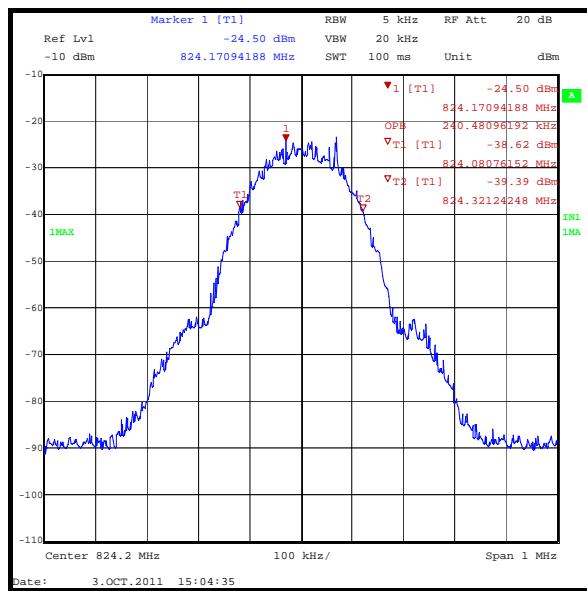
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	824.2	238.477
Middle	836.6	238.477
Top	848.8	242.485

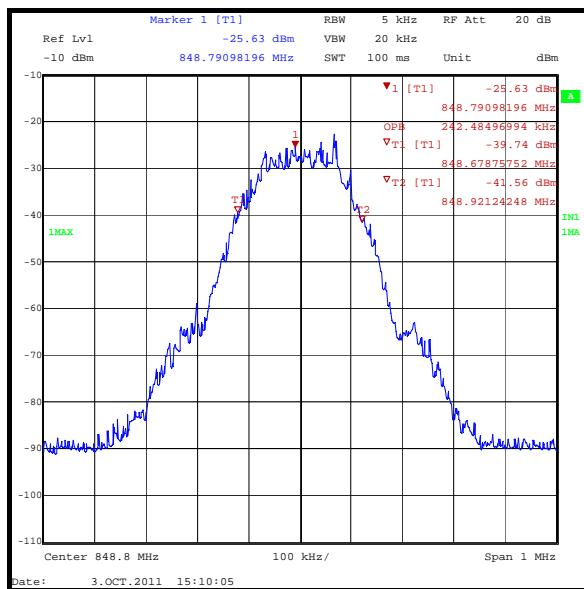
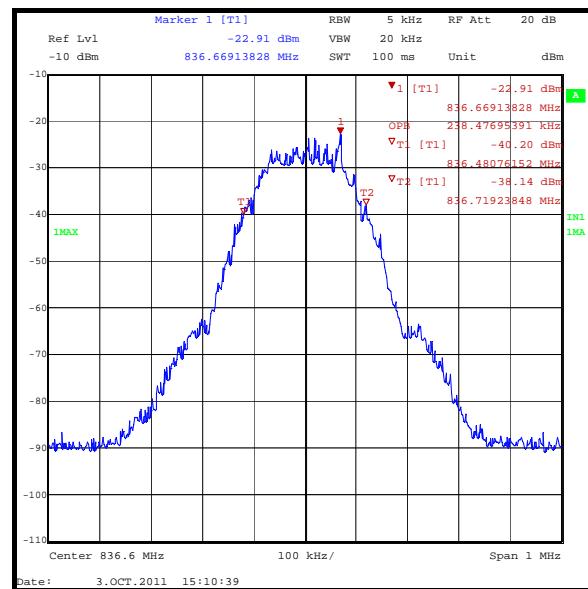
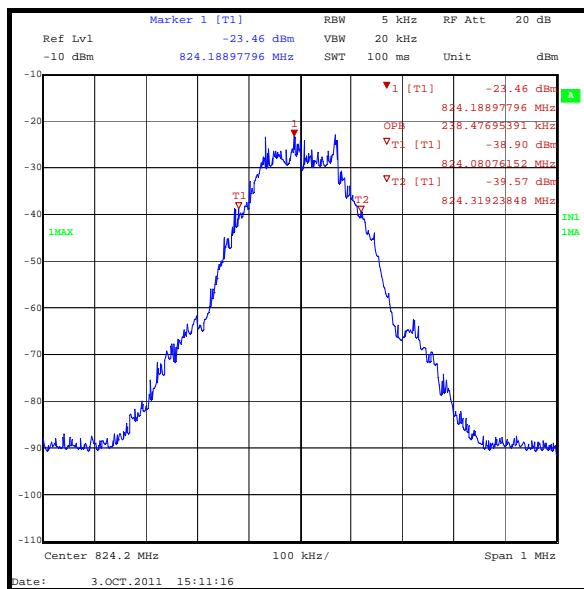
Results: EGPRS / MCS5

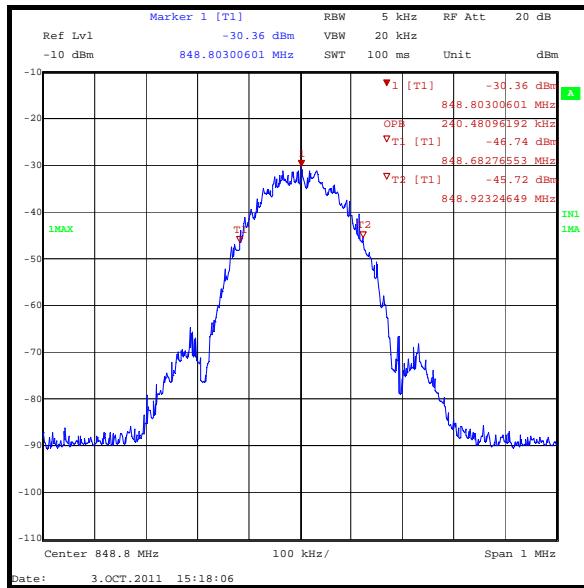
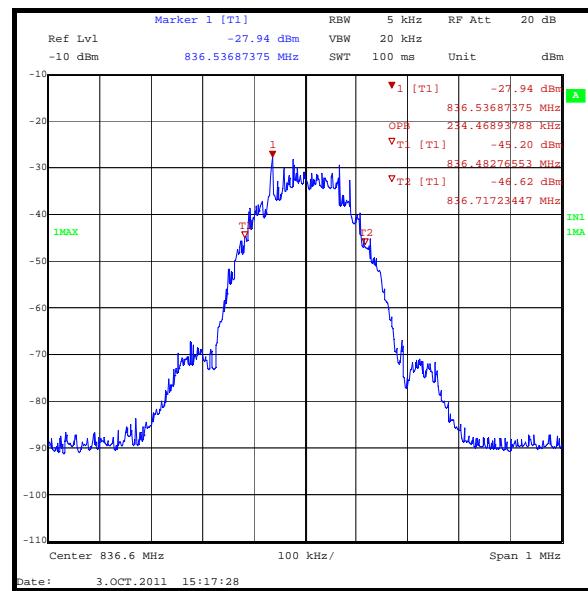
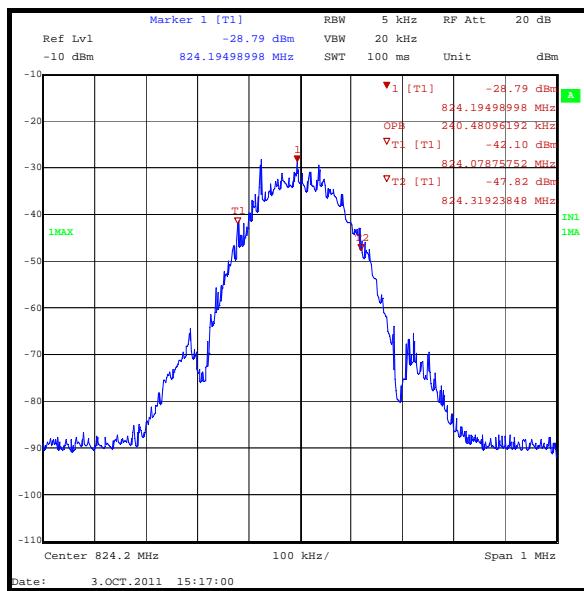
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	824.2	240.481
Middle	836.6	234.469
Top	848.8	240.481

Note(s):

1. In lieu of the test method detailed in ANSI C63.4 Section 13.7, the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.

Transmitter Occupied Bandwidth (continued)**GSM Circuit Switched**

Transmitter Occupied Bandwidth (continued)**GPRS**

Transmitter Occupied Bandwidth (continued)**EGPRS / MCS5**

5.2.8. Transmitter Out of Band Radiated Emissions

Test Summary:

Test Engineer:	Andrew Edwards & Patrick Jones	Test Date:	14 September 2011 & 15 September 2011
Test Sample IMEI:	004401221134063		

FCC Part:	2.1053 & 22.917
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Part 2.1053
Frequency Range:	30 MHz to 9 GHz
Configuration:	Circuit Switched

Environmental Conditions:

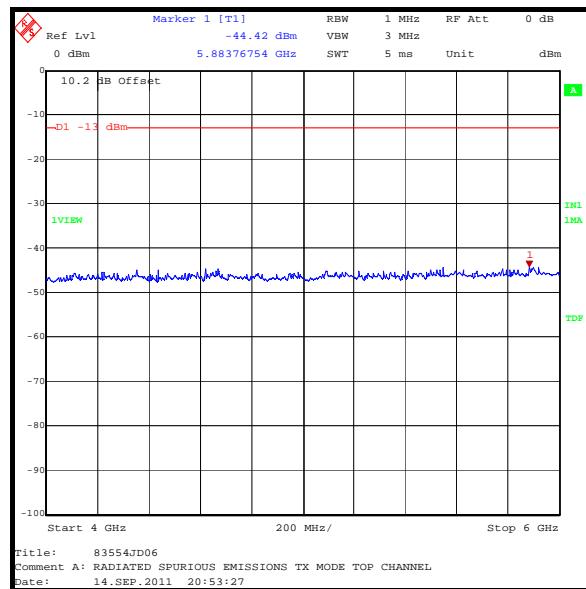
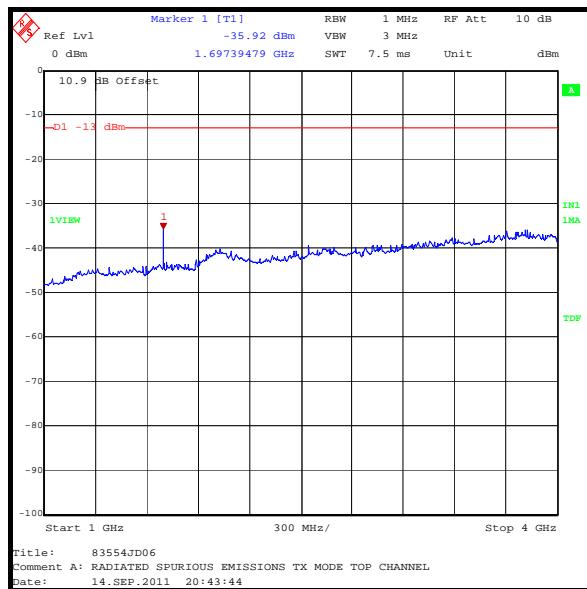
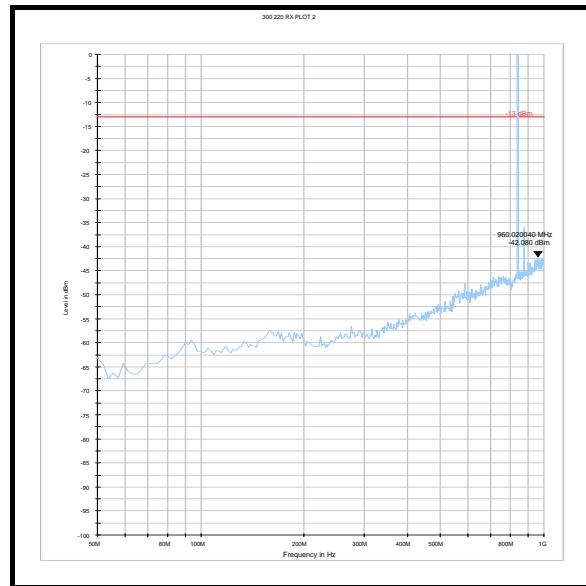
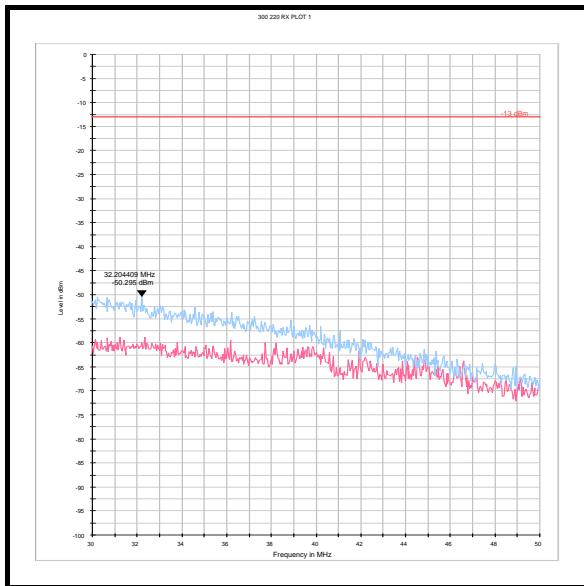
Temperature (°C):	26
Relative Humidity (%):	33

Results: Top Channel

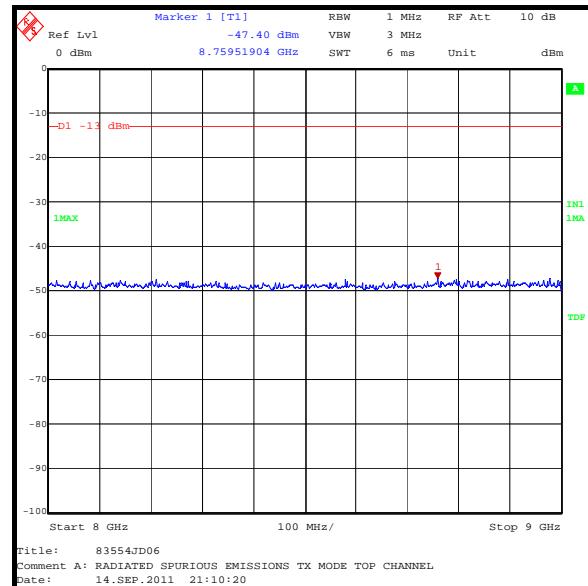
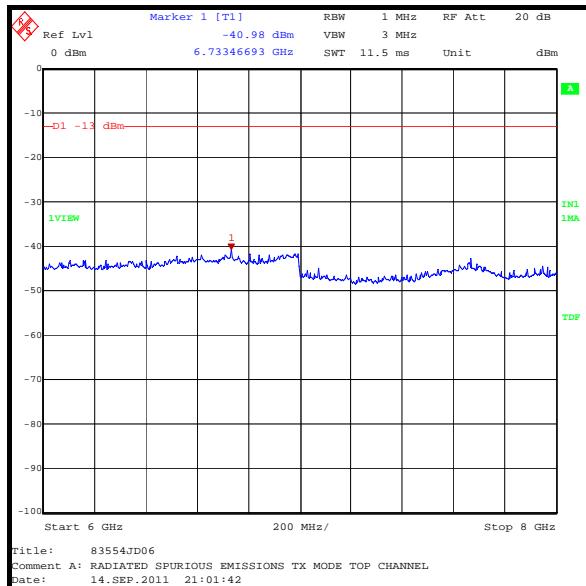
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1697.395	-35.9	-13.0	22.9	Complied

Note(s):

1. The uplink and downlink traffic channels are shown on the 30 MHz to 1 GHz plot.
2. 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.
3. Final measurements were made using appropriate RF filters and attenuators where required
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 Out of Band Radiated Emissions (continued)

Transmitter Out of Band Radiated Emissions (continued)



5.2.9. Transmitter Radiated Emissions at Band Edges

Test Summary:

Test Engineer:	Andrew Edwards & Crawford Lindsay	Test Date:	14 September 2011, 23 September 2011 & 03 October 2011
Test Sample IMEI:	004401221134063		

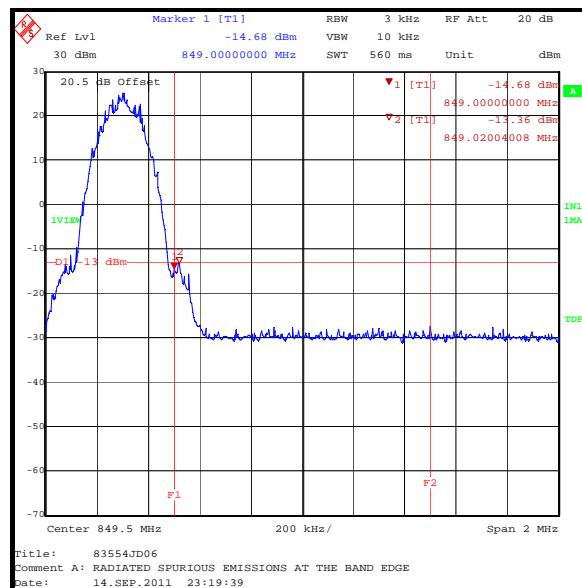
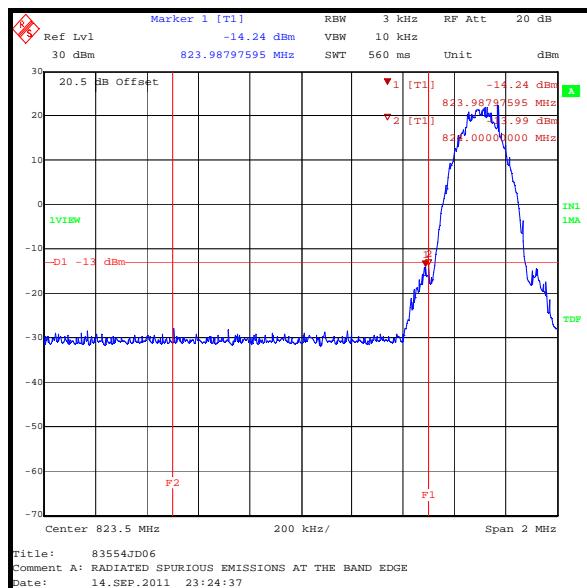
FCC Part:	2.1053 & 22.917
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Part 22.917

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	23

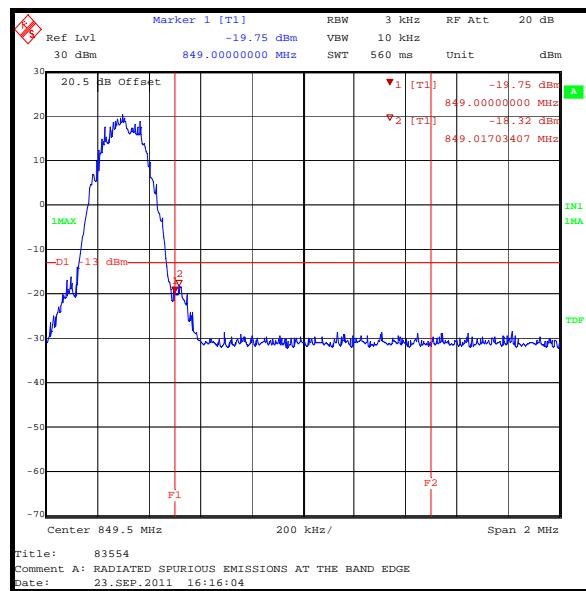
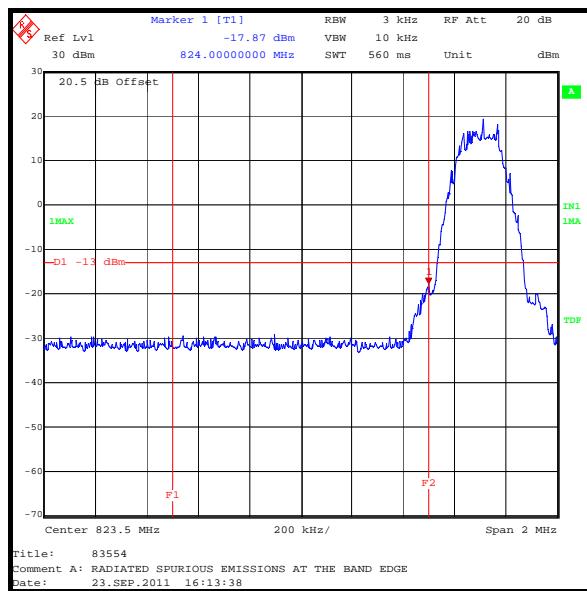
Results: GSM Circuit Switched

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
823.987	-14.2	-13.0	1.2	Complied
824	-14.0	-13.0	1.0	Complied
849	-14.7	-13.0	1.7	Complied
849.020	-13.4	-13.0	0.4	Complied



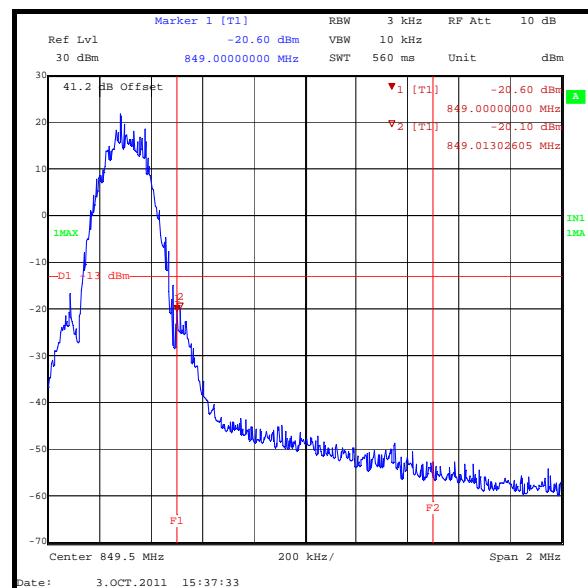
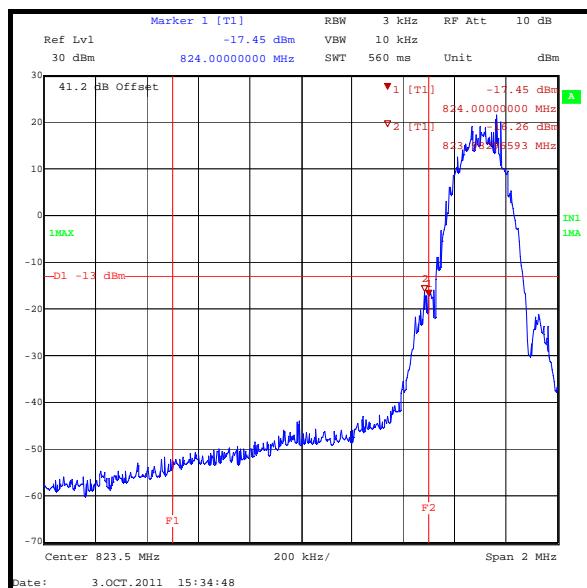
Transmitter Band Edge Radiated Emissions (continued)**Results: GPRS**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-17.9	-13.0	4.9	Complied
849	-19.8	-13.0	6.8	Complied
849.017	-18.2	-13.0	5.2	Complied



Transmitter Band Edge Radiated Emissions (continued)**Results: EGPRS / MCS5**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
823.983	-16.3	-13.0	3.3	Complied
824	-17.5	-13.0	4.5	Complied
849	-20.6	-13.0	7.6	Complied
849.013	-20.1	-13.0	7.1	Complied



5.3. Test Results - Part 24

5.3.1. Receiver/Idle Mode AC Conducted Spurious Emissions

Test Summary:

Test Engineer:	Patrick Jones	Test Date:	22 September 2011
Test Sample IMEI:	004401221134063		

FCC Part:	15.107(a)
Test Method Used:	As detailed in ANSI C63.4 Section 7

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	29

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.249	Live	46.5	61.8	15.3	Complied
0.420	Live	45.4	57.4	12.0	Complied
0.501	Live	44.1	56.0	11.9	Complied
0.632	Live	39.6	56.0	16.4	Complied
0.672	Live	39.7	56.0	16.3	Complied
0.875	Live	39.9	56.0	16.1	Complied
1.365	Live	41.4	56.0	14.6	Complied
1.424	Live	43.2	56.0	12.8	Complied
1.617	Live	55.2	56.0	0.8	Complied

Results: Live / Average

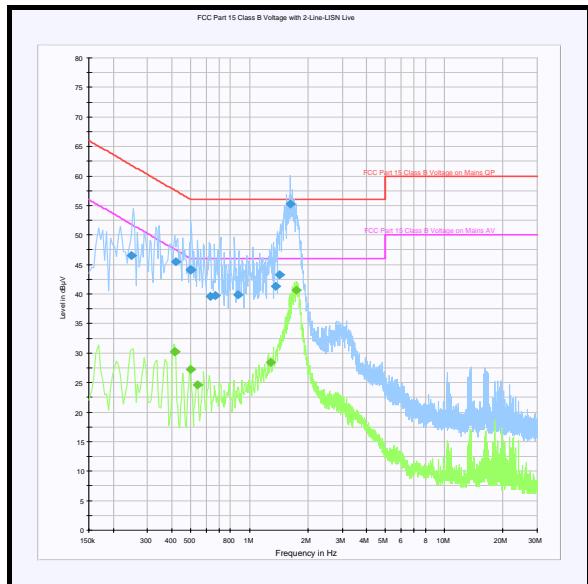
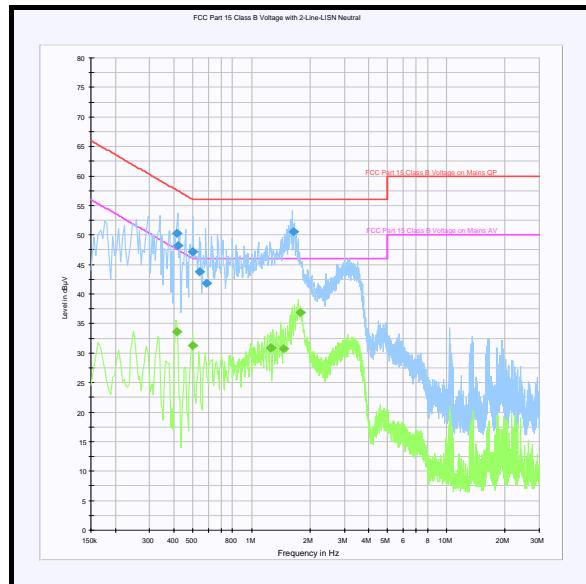
Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.416	Live	30.3	47.5	17.2	Complied
0.497	Live	27.2	46.1	18.9	Complied
0.542	Live	24.6	46.0	21.4	Complied
1.284	Live	28.4	46.0	17.6	Complied
1.739	Live	40.7	46.0	5.3	Complied

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

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.416	Neutral	50.3	57.5	7.2	Complied
0.420	Neutral	48.1	57.4	9.3	Complied
0.501	Neutral	47.2	56.0	8.8	Complied
0.542	Neutral	43.8	56.0	12.2	Complied
0.591	Neutral	41.8	56.0	14.2	Complied
1.644	Neutral	50.5	56.0	5.5	Complied

Results: Neutral / Average

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.416	Neutral	33.6	47.5	13.9	Complied
0.497	Neutral	31.3	46.1	14.8	Complied
1.253	Neutral	30.9	46.0	15.1	Complied
1.257	Neutral	30.9	46.0	15.1	Complied
1.455	Neutral	30.7	46.0	15.3	Complied
1.775	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.

5.3.2. Receiver/Idle Mode Radiated Spurious Emissions

Test Summary:

Test Engineer:	Andrew Edwards	Test Date:	27 September 2011
Test Sample IMEI:	004401221130063		

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.4 Section 8
Frequency Range:	30 MHz to 1000 MHz

Environmental Conditions:

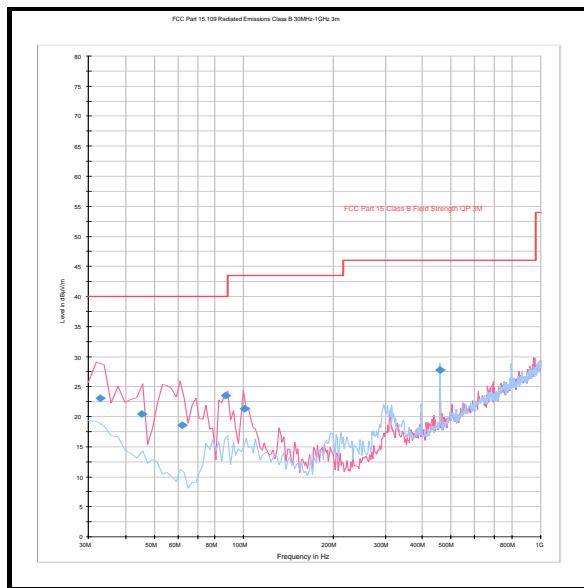
Temperature (°C):	28
Relative Humidity (%):	33

Results:

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/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:	Andrew Edwards	Test Date:	14 September 2011
Test Sample IMEI:	004401221134063		

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.4 Section 8
Frequency Range:	1 GHz to 10 GHz

Environmental Conditions:

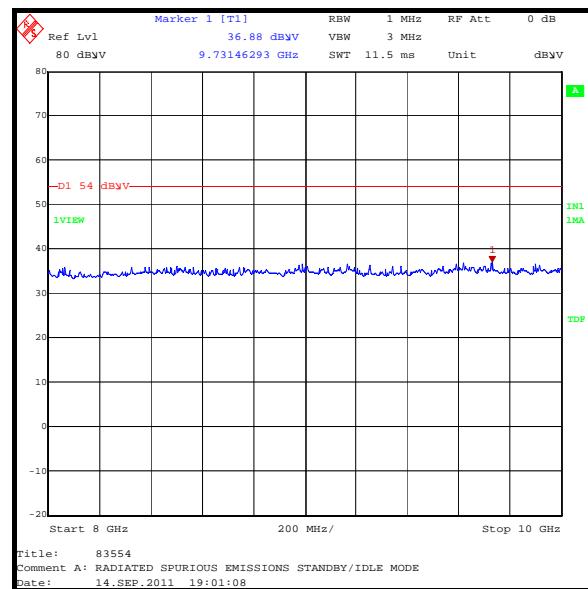
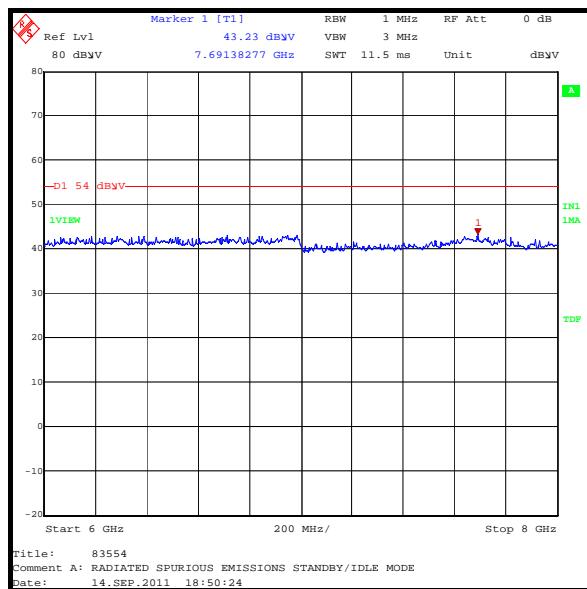
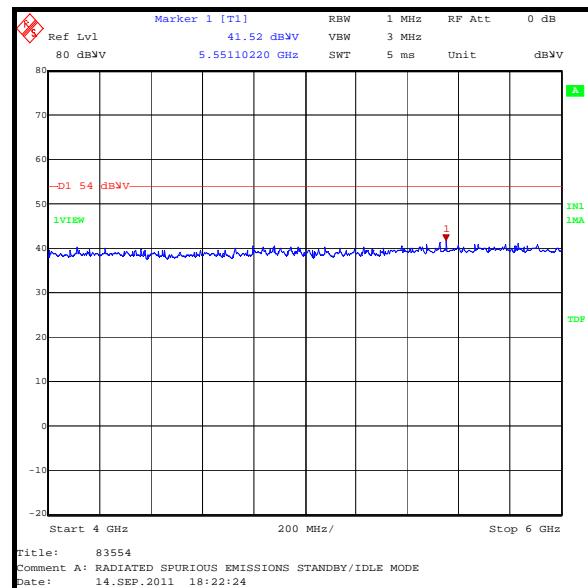
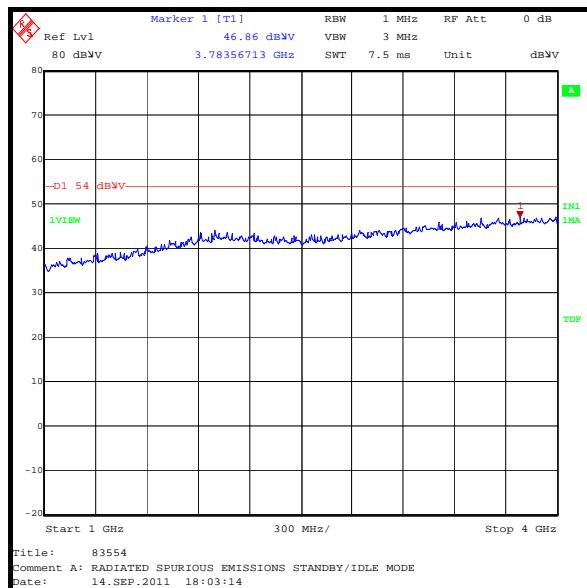
Temperature (°C):	26
Relative Humidity (%):	23

Results:

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
3783.567	Vertical	46.9	54.0	7.1	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. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.
3. 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)

5.3.3. Transmitter Output Power (EIRP)**Test Summary:**

Test Engineer:	Andrew Edwards & Crawford Lindsay	Test Date:	14 September 2011 & 03 October 2011
Test Sample IMEI:	004401221134063		

FCC Part:	24.232
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.17.2

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	24

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	27.1	33.0	5.9	Complied
Middle	1879.8	Vertical	25.7	33.0	7.3	Complied
Top	1909.8	Vertical	25.4	33.0	7.6	Complied

Results: GPRS

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	27.3	33.0	5.7	Complied
Middle	1879.8	Vertical	25.7	33.0	7.3	Complied
Top	1909.8	Vertical	25.2	33.0	7.8	Complied

Results: EGPRS / MCS5 / 8PSK

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	26.5	33.0	6.5	Complied
Middle	1879.8	Vertical	25.1	33.0	7.9	Complied
Top	1909.8	Vertical	25.0	33.0	8.0	Complied

5.3.4. Transmitter Conducted Output Power**Test Summary:**

Test Engineer:	Sarah Williams & Crawford Lindsay	Test Date:	29 September 2011 & 03 October 2011
Test Sample IMEI:	004401221130087		

FCC Part:	2.1046
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.1 referencing FCC CFR Part 2.1046(a)

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	34

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Maximum Peak Conducted Power (dBm)	Maximum Average Conducted Power (dBm)
Bottom	1850.2	29.1	28.9
Middle	1879.8	29.1	29.0
Top	1909.8	29.3	29.2

Results: GPRS

Channel	Frequency (MHz)	Maximum Average Power / 4 timeslots (dBm)	Maximum Average Power / 3 timeslots (dBm)	Maximum Average Power / 2 timeslots (dBm)	Maximum Average Power / 1 timeslot (dBm)
Bottom	1850.2	23.6	24.7	26.4	28.7
Middle	1879.8	23.6	24.8	26.5	28.8
Top	1909.8	23.7	24.8	26.5	28.8

Results: EGPRS / MCS4 / GMSK

Channel	Frequency (MHz)	Maximum Average Power / 4 timeslots (dBm)	Maximum Average Power / 3 timeslots (dBm)	Maximum Average Power / 2 timeslots (dBm)	Maximum Average Power / 1 timeslot (dBm)
Bottom	1850.2	23.6	24.7	26.4	28.7
Middle	1879.8	23.6	24.8	26.5	28.8
Top	1909.8	23.7	24.8	26.5	28.8

Note(s):

- Conducted power tests were performed to support SAR tests.

5.3.5. Transmitter Frequency Stability (Temperature Variation)**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	23 September 2011
Test Sample IMEI:	004401221134063		

FCC Part:	2.1055 & 24.235
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.2 referencing FCC CFR Part 2.1055

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	29

Results: Bottom Channel (1850.2 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	45	1850.200045	1850.0	0.200045	Complied
-20	58	1850.200058	1850.0	0.200058	Complied
-10	51	1850.200051	1850.0	0.200051	Complied
0	48	1850.199952	1850.0	0.199952	Complied
10	62	1850.199938	1850.0	0.199938	Complied
20	40	1850.199960	1850.0	0.199960	Complied
30	55	1850.199945	1850.0	0.199945	Complied
40	54	1850.199946	1850.0	0.199946	Complied
50	63	1850.199937	1850.0	0.199937	Complied

Results: Top Channel (1909.8 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	62	1909.800062	1910.0	0.199938	Complied
-20	41	1909.800041	1910.0	0.199959	Complied
-10	31	1909.799969	1910.0	0.200031	Complied
0	62	1909.799938	1910.0	0.200062	Complied
10	75	1909.799925	1910.0	0.200075	Complied
20	57	1909.799943	1910.0	0.200057	Complied
30	63	1909.799937	1910.0	0.200063	Complied
40	69	1909.799931	1910.0	0.200069	Complied
50	65	1909.799935	1910.0	0.200065	Complied

Transmitter Frequency Stability (continued)**Note(s):**

1. A dummy battery was placed on the EUT and the dummy battery cables connected to a bench power supply.
2. Frequency error was measured using a calibrated Rohde & Schwarz CMU 200 Universal Radio Communications Tester in accordance with current Rohde & Schwarz application notes. The EUT was connected by suitable RF cables to the CMU 200. A bidirectional communications link was established between the EUT and CMU 200. The frequency meter value was recorded.
3. Temperature was monitored throughout the test using a calibrated digital thermometer.

5.3.6. Transmitter Frequency Stability (Voltage Variation)**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	23 September 2011
Test Sample IMEI:	004401221134063		

FCC Part:	2.1055 & 24.235
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.2 referencing FCC CFR Part 2.1055

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	29

Results: Bottom Channel (1850.2 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
3.4	53	1850.200053	1850.0	0.200053	Complied
4.2	58	1850.200058	1850.0	0.200058	Complied

Results: Top Channel (1909.8 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
3.4	68	1909.799932	1910.0	0.200068	Complied
4.2	65	1909.800065	1910.0	0.199935	Complied

Note(s):

1. A dummy battery was placed on the EUT and the dummy battery cables connected to a bench power supply.
2. Frequency error was measured using a calibrated Rohde & Schwarz CMU 200 Universal Radio Communications Tester in accordance with current Rohde & Schwarz application notes. The EUT was connected by suitable RF cables to the CMU 200. A bidirectional communications link was established between the EUT and CMU 200. The frequency meter value was recorded.
3. Voltage was monitored throughout the test using a calibrated digital voltmeter.

5.3.7. Transmitter Occupied Bandwidth**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	03 October 2011
Test Sample IMEI:	004401221134063		

FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.4 Section 13.7 referencing FCC CFR Part 2.1049

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	29

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	242.485
Middle	1879.8	240.481
Top	1909.8	240.481

Results: GPRS

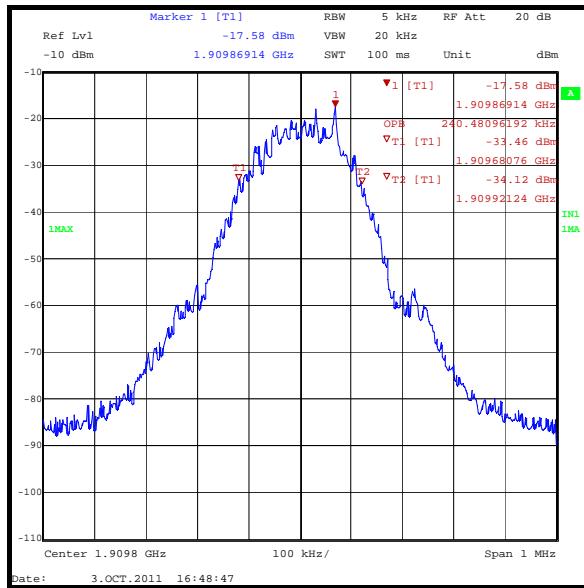
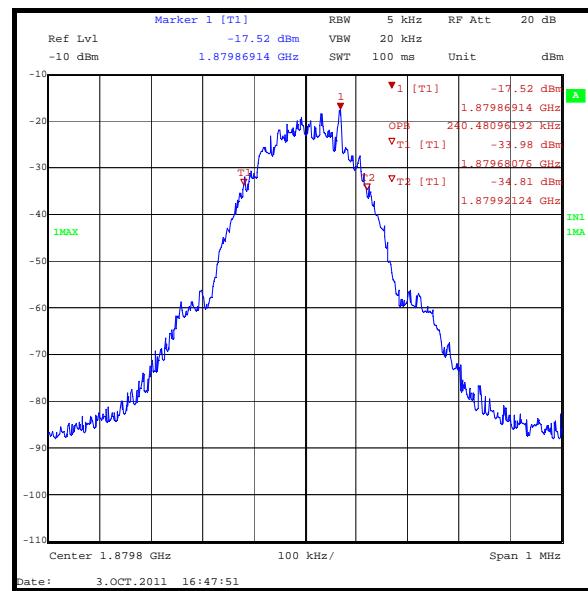
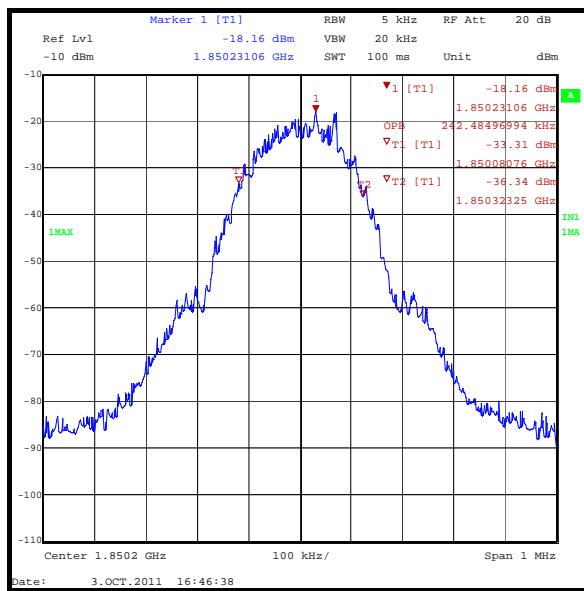
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	238.477
Middle	1879.8	240.481
Top	1909.8	240.481

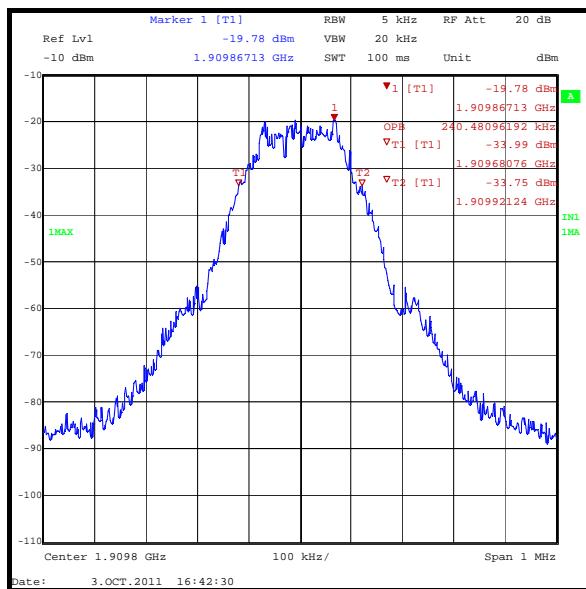
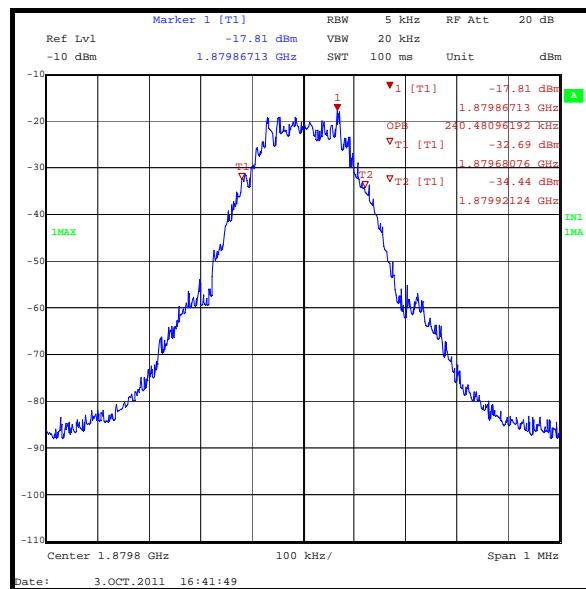
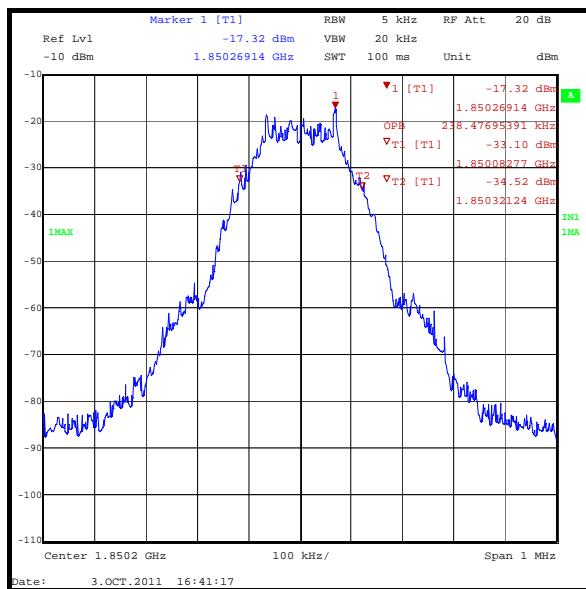
Results: EGPRS / MCS5

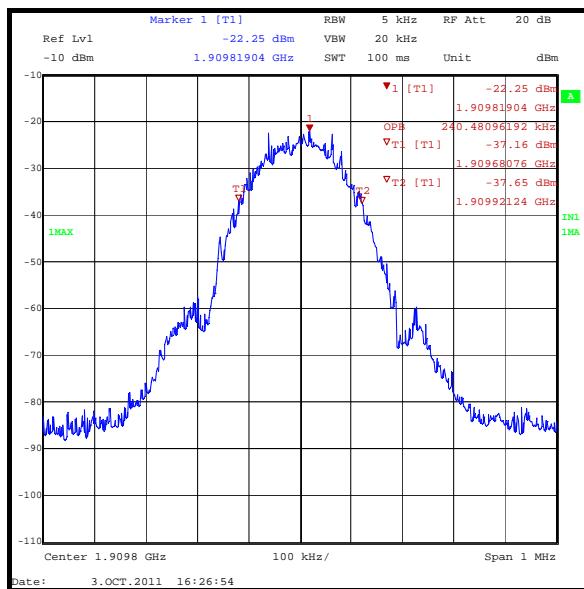
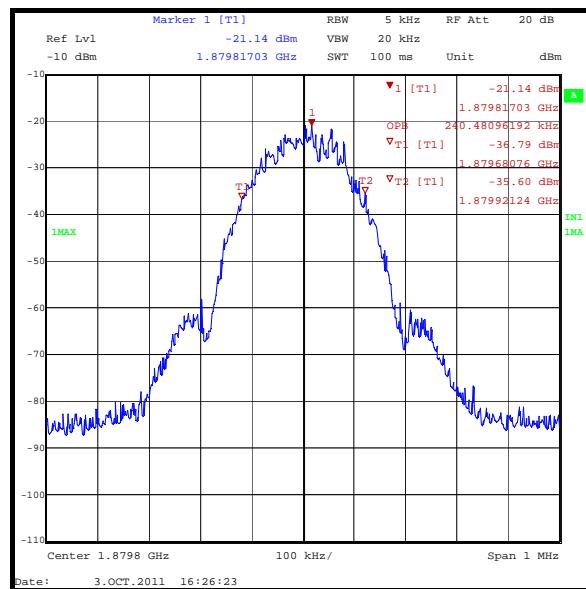
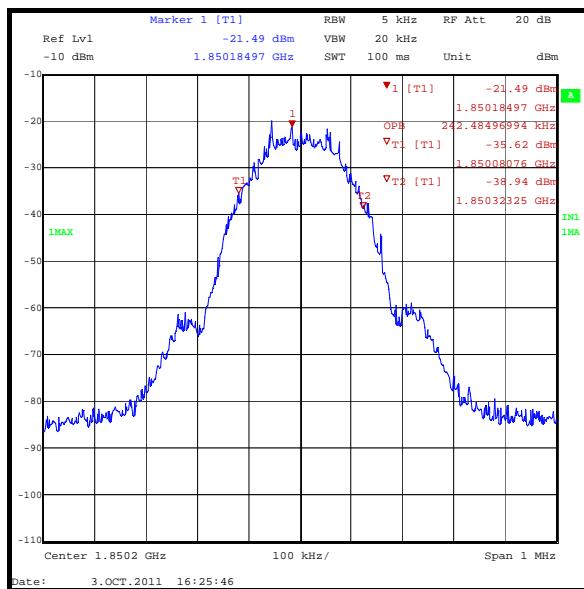
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	242.485
Middle	1879.8	240.481
Top	1909.8	240.481

Note(s):

1. In lieu of the test method detailed in ANSI C63.4 Section 13.7, the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.

Transmitter Occupied Bandwidth (continued)**GSM Circuit Switched**

Transmitter Occupied Bandwidth (continued)**GPRS**

Transmitter Occupied Bandwidth (continued)**EGPRS / MCS5**

5.3.8. Transmitter Out of Band Radiated Emissions

Test Summary:

Test Engineer:	Andrew Edwards & Patrick Jones	Test Date:	14 September 2011 & 15 September 2011
Test Sample IMEI:	004401221134063		

FCC Part:	2.1053 & 24.238
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Parts 2.1053 and 24.238
Frequency Range:	30 MHz to 20 GHz
Configuration:	GSM Circuit Switched

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	23

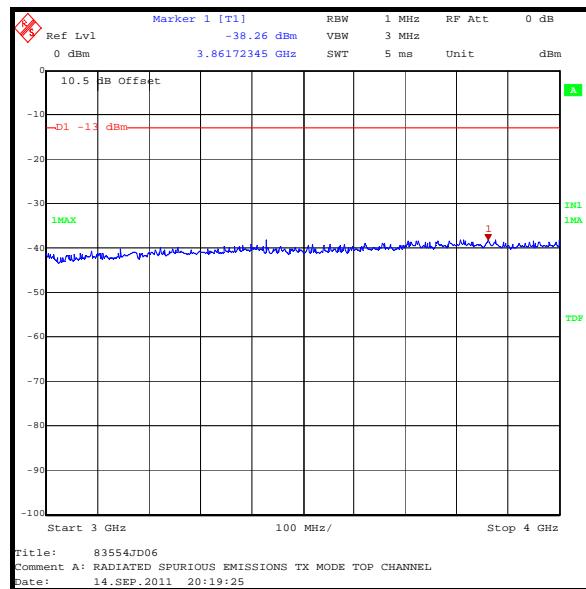
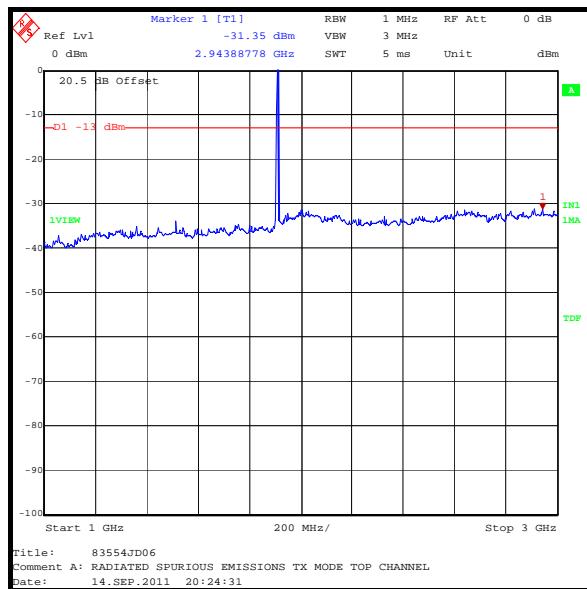
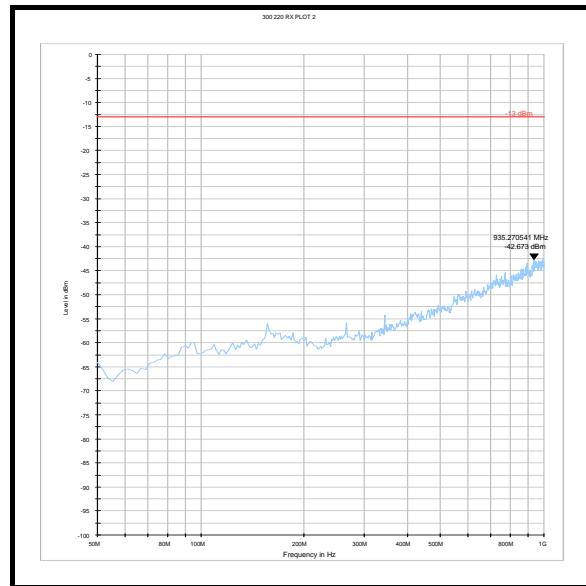
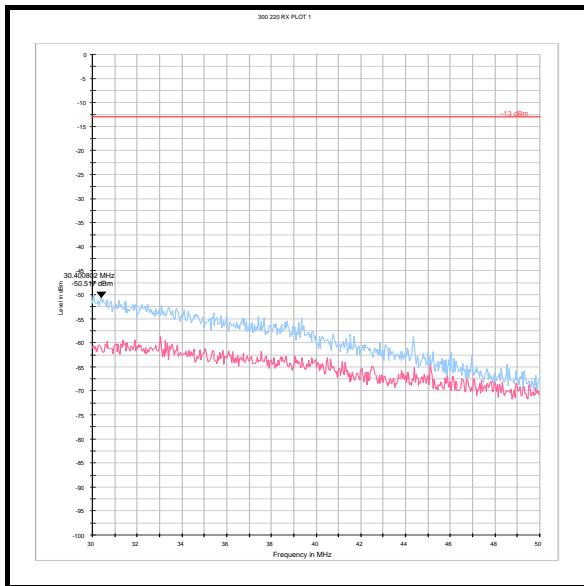
Results:

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
2943.888	-31.4	-13.0	18.4	Complied

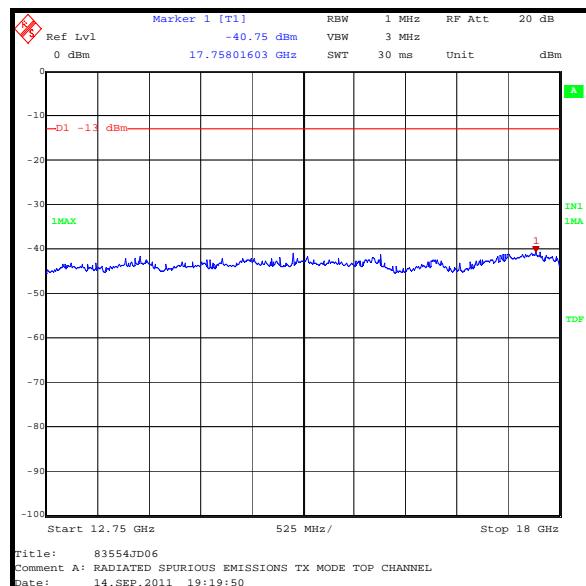
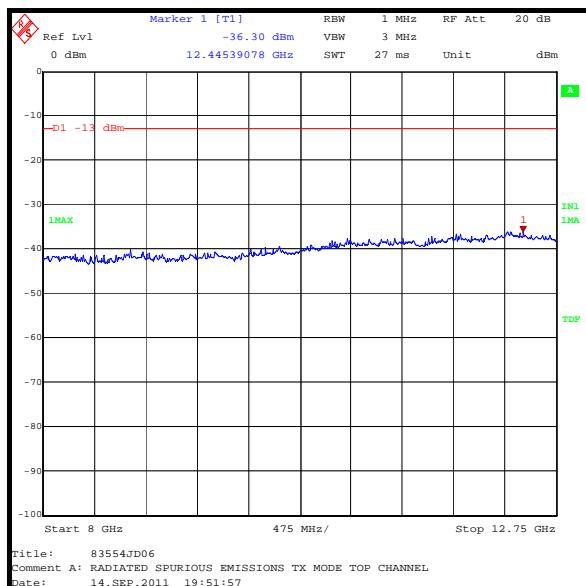
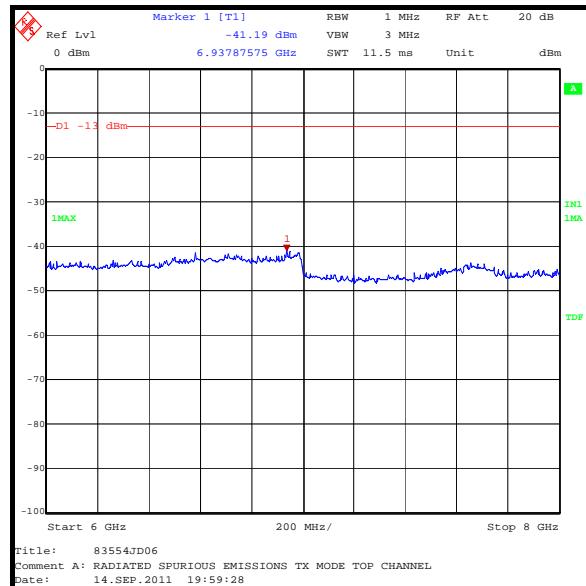
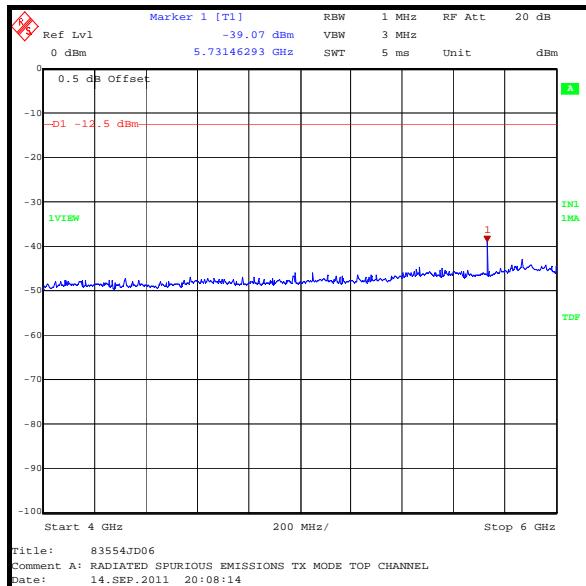
Note(s):

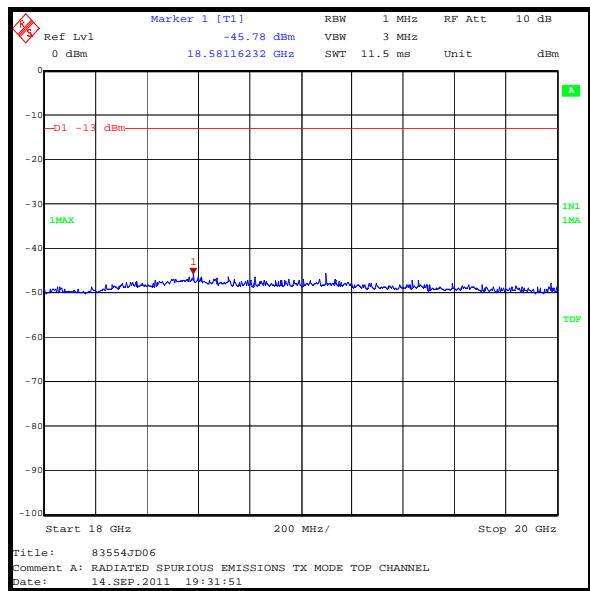
1. No spurious emissions were detected above the noise floor of the measuring receiver; the highest peak noise floor reading of the measuring receiver was recorded.
2. The uplink and downlink traffic channels are shown on the 1 GHz to 4 GHz plot.
3. All emissions shown on the pre-scan plots were investigated and found to be below the measurement system noise floor or ambient.
4. Final measurements were made using appropriate RF filters and attenuators where required.
5. 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.
6. 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 Out of Band Radiated Emissions (continued)



Transmitter Out of Band Radiated Emissions (continued)



Transmitter Out of Band Radiated Emissions (continued)

5.3.9. Transmitter Band Edge Radiated Emissions

Test Summary:

Test Engineer:	Andrew Edwards & Crawford Lindsay	Test Date:	14 September 2011 & 03 October 2011
Test Sample IMEI:	004401221134063		

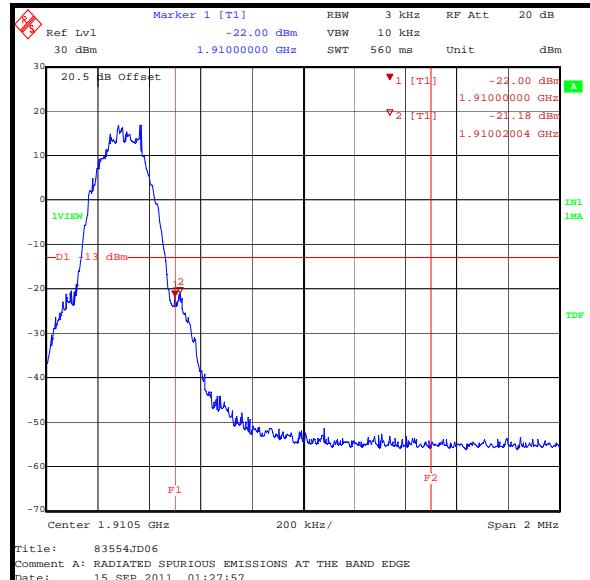
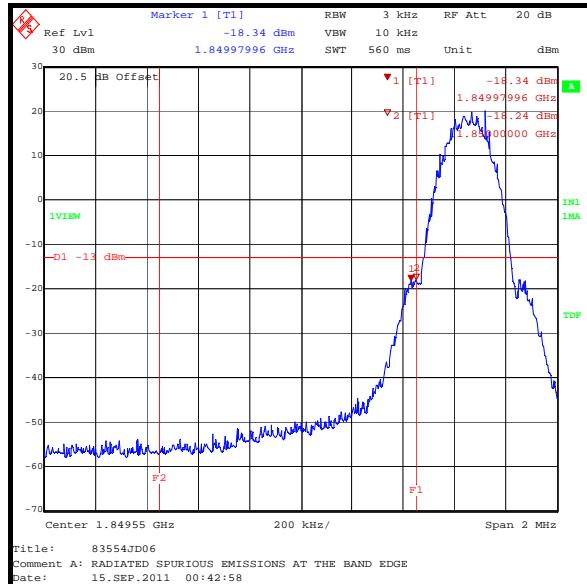
FCC Part:	2.1053 & 24.238
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Parts 2.1053 and 24.238

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	23

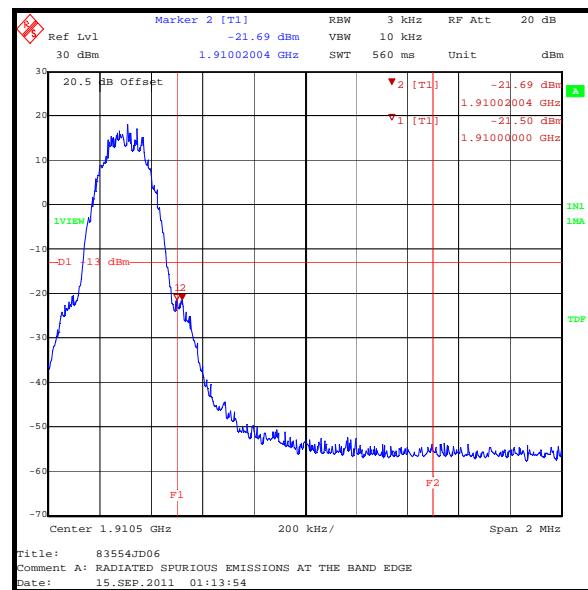
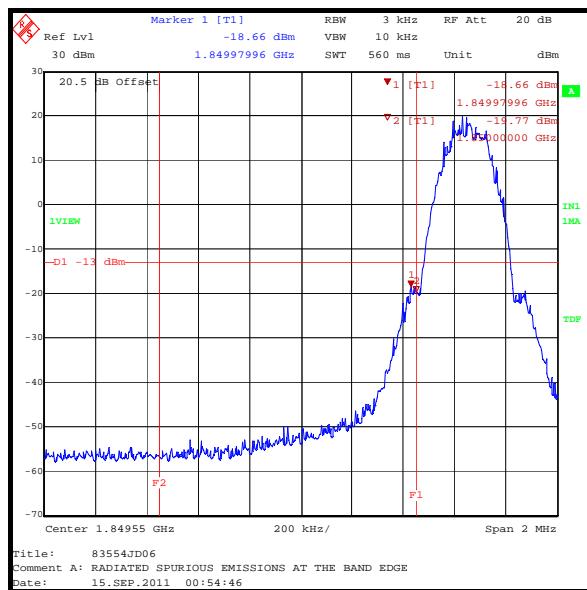
Results: GSM Circuit Switched

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.998	-18.3	-13.0	5.3	Complied
1850	-18.2	-13.0	5.2	Complied
1910	-22.0	-13.0	9.0	Complied
1910.020	-21.2	-13.0	8.2	Complied



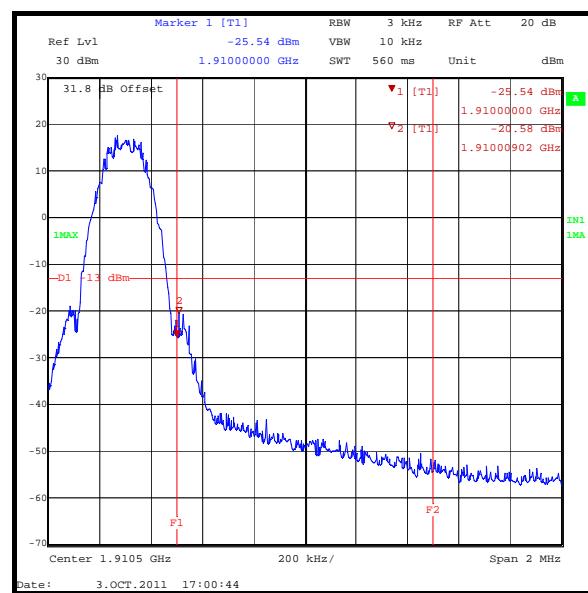
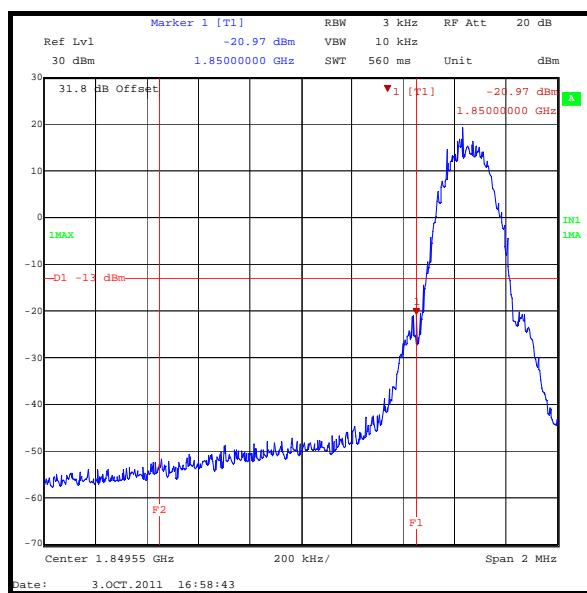
Transmitter Band Edge Radiated Emissions (continued)**Results: GPRS**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.998	-18.7	-13.0	5.7	Complied
1850	-19.8	-13.0	6.8	Complied
1910	-21.7	-13.0	8.7	Complied
1910.020	-21.5	-13.0	8.5	Complied



Transmitter Band Edge Radiated Emissions (continued)**Results: EGPRS / MCS5**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-21.0	-13.0	8.0	Complied
1910	-25.5	-13.0	12.5	Complied
1910.009	-20.6	-13.0	7.6	Complied



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
Effective Radiated Power (ERP)	824 to 849 MHz	95%	±2.94 dB
Effective Isotropic Radiated Power (EIRP)	1850 to 1910 MHz	95%	±2.94 dB
Conducted Output Power	824 to 849 MHz / 1850 to 1910 MHz	95%	±0.27 dB
Frequency Stability	824 to 849 MHz / 1850 to 1910 MHz	95%	±0.92 ppm
Occupied Bandwidth	824 to 849 MHz / 1850 to 1910 MHz	95%	±0.92 ppm
Radiated Spurious Emissions	30 MHz to 20 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)
A1393	Attenuator	Huber & Suhner	757456	6820.17.B	08 Jul 2012	12
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	Rohde & Schwarz	ESH3-Z2	100668	05 Mar 2012	12
A1834	Attenuator	Hewlett Packard	8491B	10444	26 Jul 2012	12
A1974	High Pass Filter	AtlanTecRF	AFH-01000	090000283	29 Dec 2011	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	29 Dec 2011	12
A253	Antenna	Flann Microwave	12240-20	128	13 Oct 2011	12
A254	Antenna	Flann Microwave	14240-20	139	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
A288	Antenna	Chase	CBL6111A	1589	25 Aug 2012	12
A436	Antenna	Flann	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
E013	Environmental Chamber	Sanyo	ATMOS chamber	None	Calibrated before use	-
K0001	5m RSE 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
L1021	Comms Tester	Rohde & Schwarz	CMU 200	111379	11 Jan 2012	12
M1068	Thermometer	Iso-Tech	RS55	93102884	10 Nov 2011	12
M1124	Spectrum Analyser	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
M1269	Multimeter	Fluke	179	90250210	20 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.