


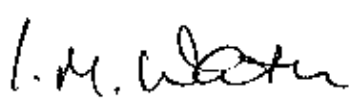
TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: Softbank 003P

FCC ID: UCE211041A

To: FCC Part 22: 2010 Subpart H, Part 24: 2010 Subpart E

Test Report Serial No:
RFI-RPT-RP81531JD07A

This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals:		
Checked By:	Ian Watch	
Signature:		
Date of Issue:	17 June 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) 2010: Part 22 Subpart H (Public Mobile Services)
Specification Reference:	47CFR24
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 24 Subpart E (Personal Communication Services)
Specification Reference:	47CFR15.107 and 47CFR15.109
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: 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:	25 May 2011 to 14 June 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:	003P
IMEI:	004401221073618
Hardware Version Number:	Rev C
Software Version Number:	003PVA00
FCC ID:	UCE211041A

Brand Name:	Softbank
Description:	Battery
Model Name or Number:	PMBBD1

Brand Name:	Softbank
Description:	AC Charger and USB 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 Bluetooth and WLAN.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Type of Radio Device:	Transceiver		
Mode:	GSM/GPRS		
Modulation Type:	GMSK		
Channel Spacing:	200 kHz		
Power Supply Requirement(s):	Nominal	3.7 V	
	Minimum	3.4 V	
	Maximum	4.2 V	
Technology Tested:	GSM850		
Maximum Output Power (ERP):	GSM	29.8 dBm	
	GPRS	24.6 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	28.1 dBm	
	GPRS	22.2 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:	Generic
Description:	Micro SD Memory Card
Model Name or Number:	128 MB

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

Brand Name:	Not marked or stated
Description:	Dummy battery
Model Name or Number:	Not marked or stated

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

- Receiver/Idle mode.
- 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 Multislot Class 12 with the unit transmitting on four timeslots in the uplink.
- 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):

- Connected to a Rohde & Schwarz CMU 200 Universal Radio Communications Tester, operating in GSM mode.
- Idle mode and transmitter mode radiated spurious emissions tests were performed with the AC 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.
- An RF connector was plugged into the rear of the EUT in order to perform conducted measurements.

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:	Andrew Edwards	Test Date:	10 June 2011
Test Sample Serial No:	004401221073618		

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

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	31

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
1.347000	Live	50.5	56.0	5.5	Complied
1.387500	Live	50.5	56.0	5.5	Complied
1.405500	Live	51.1	56.0	4.9	Complied
1.410000	Live	51.7	56.0	4.3	Complied
1.450500	Live	53.5	56.0	2.5	Complied
1.500000	Live	55.7	56.0	0.3	Complied
1.509000	Live	54.7	56.0	1.3	Complied
1.549500	Live	52.6	56.0	3.4	Complied

Results: Live / Average

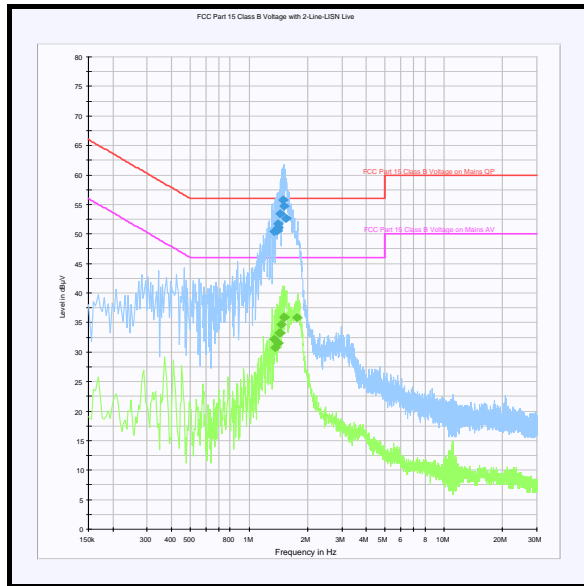
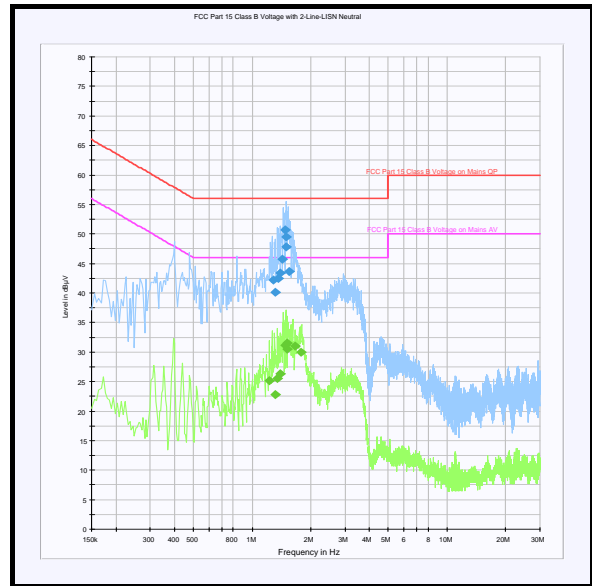
Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
1.351500	Live	32.2	46.0	13.8	Complied
1.356000	Live	30.8	46.0	15.2	Complied
1.405500	Live	31.5	46.0	14.5	Complied
1.428000	Live	33.3	46.0	12.7	Complied
1.446000	Live	33.2	46.0	12.8	Complied
1.468500	Live	34.6	46.0	11.4	Complied
1.509000	Live	35.8	46.0	10.2	Complied
1.513500	Live	35.9	46.0	10.1	Complied
1.765500	Live	35.8	46.0	10.2	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
1.288500	Neutral	42.3	56.0	13.7	Complied
1.311000	Neutral	40.1	56.0	15.9	Complied
1.360500	Neutral	42.5	56.0	13.5	Complied
1.392000	Neutral	43.5	56.0	12.5	Complied
1.428000	Neutral	45.8	56.0	10.2	Complied
1.482000	Neutral	50.7	56.0	5.3	Complied
1.486500	Neutral	47.8	56.0	8.2	Complied
1.491000	Neutral	49.5	56.0	6.5	Complied
1.549500	Neutral	43.6	56.0	12.4	Complied

Results: Neutral / Average

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
1.230000	Neutral	25.1	46.0	20.9	Complied
1.311000	Neutral	22.8	46.0	23.2	Complied
1.351500	Neutral	25.6	46.0	20.4	Complied
1.392000	Neutral	26.3	46.0	19.7	Complied
1.477500	Neutral	31.2	46.0	14.8	Complied
1.509000	Neutral	30.5	46.0	15.5	Complied
1.518000	Neutral	31.6	46.0	14.4	Complied
1.653000	Neutral	31.0	46.0	15.0	Complied
1.788000	Neutral	29.9	46.0	16.1	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:	Nick Steele	Test Date:	25 May 2011
Test Sample IMEI:	004401221073618		

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):	29
Relative Humidity (%):	11

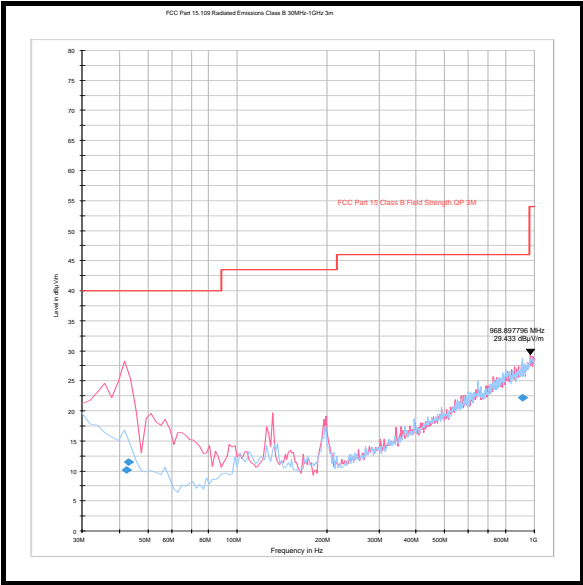
Results:

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
911.673	Horizontal	22.2	46.0	23.8	Complied

Note(s):

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



Receiver/Idle Mode Radiated Spurious Emissions (continued)**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	01 June 2011
Test Sample IMEI:	004401221073618		

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):	28
Relative Humidity (%):	20

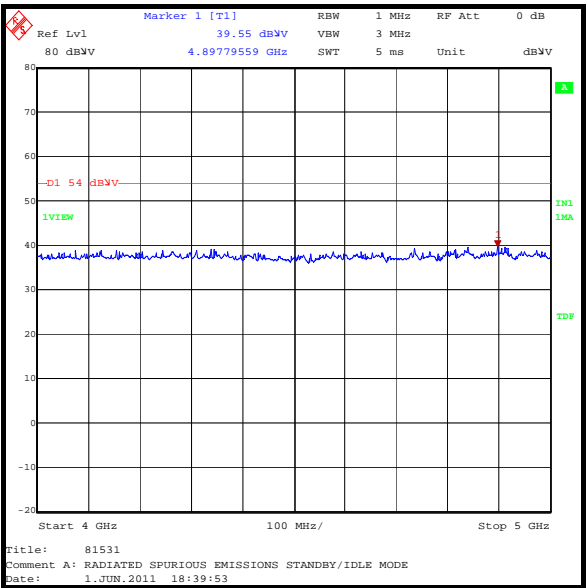
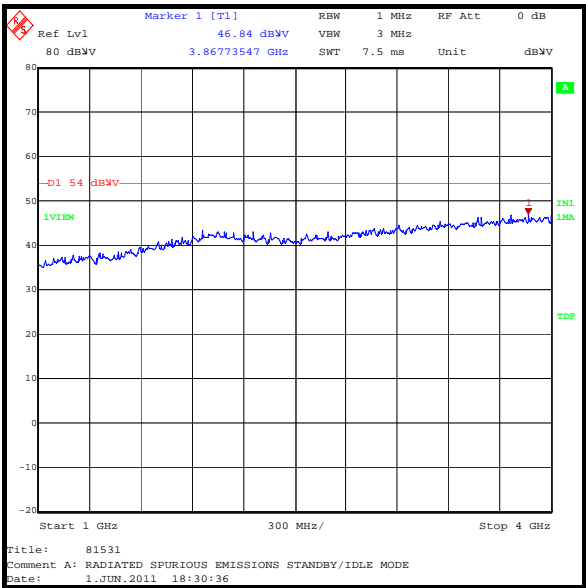
Results:

Frequency (MHz)	Antenna Polarity	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
3867.735	Vertical	46.8	54.0	7.2	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. 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:	Crawford Lindsay	Test Date:	25 May 2011
Test Sample IMEI:	004401221073618		

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):	28
Relative Humidity (%):	19

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	28.4	38.45	10.05	Complied
Middle	836.6	Vertical	29.2	38.45	9.25	Complied
Top	848.8	Vertical	29.8	38.45	8.65	Complied

Results: GPRS

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	23.5	38.45	14.95	Complied
Middle	836.6	Vertical	24.3	38.45	14.15	Complied
Top	848.8	Vertical	24.6	38.45	13.85	Complied

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

Test Engineer:	Jack Suter	Test Date:	02 June 2011
Test Sample IMEI:	004401221073618		

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):	26
Relative Humidity (%):	28

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Maximum Peak Conducted Power (dBm)	Maximum Average Conducted Power (dBm)
Bottom	824.2	32.0	31.8
Middle	836.6	32.1	32.0
Top	848.8	32.3	32.1

Results: GPRS

Channel	Frequency (MHz)	Maximum Peak Conducted Power (dBm)	Maximum Average Conducted Power (dBm)
Bottom	824.2	26.7	26.6
Middle	836.6	26.7	26.6
Top	848.8	26.8	26.7

Note(s):

1. Conducted power tests were performed to support SAR tests.

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

Test Engineer:	Ian Watch	Test Date:	03 June 2011
Test Sample IMEI:	004401221073618		

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):	27
Ambient Relative Humidity (%):	30

Results: Middle Channel (836.6 MHz)

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	836.600031	31	0.0371	2.5	2.4629	Complied
-20	836.600032	32	0.0383	2.5	2.4617	Complied
-10	836.600020	20	0.0239	2.5	2.4761	Complied
0	836.599990	10	0.0120	2.5	2.4880	Complied
10	836.600028	28	0.0335	2.5	2.4665	Complied
20	836.599991	9	0.0108	2.5	2.4892	Complied
30	836.599956	44	0.0526	2.5	2.4474	Complied
40	836.599963	37	0.0442	2.5	2.4558	Complied
50	836.599993	7	0.0084	2.5	2.4916	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 the CMU 200. The frequency meter value was recorded.
3. Temperature was monitored throughout the test with a calibrated digital thermometer.

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

Test Engineer:	Crawford Lindsay	Test Date:	03 June 2011
Test Sample IMEI:	004401221073618		

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):	27
Relative Humidity (%):	30

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	836.599983	17	0.0203	2.5	2.4797	Complied
4.2	836.599979	21	0.0251	2.5	2.4749	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 on the centre channel between the EUT and the CMU 200. The frequency meter value was recorded.
3. Voltage was monitored throughout the test with a calibrated digital voltmeter.

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

Test Engineer:	Crawford Lindsay	Test Date:	14 June 2011
Test Sample IMEI:	004401221073618		

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):	27
Relative Humidity (%):	23

Results: GSM Circuit Switched

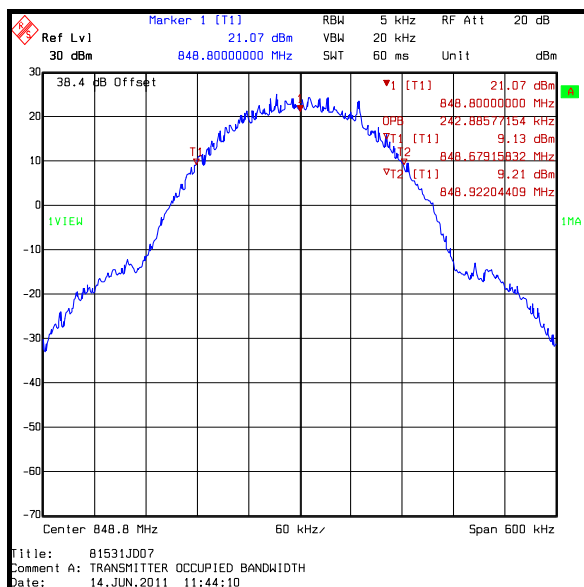
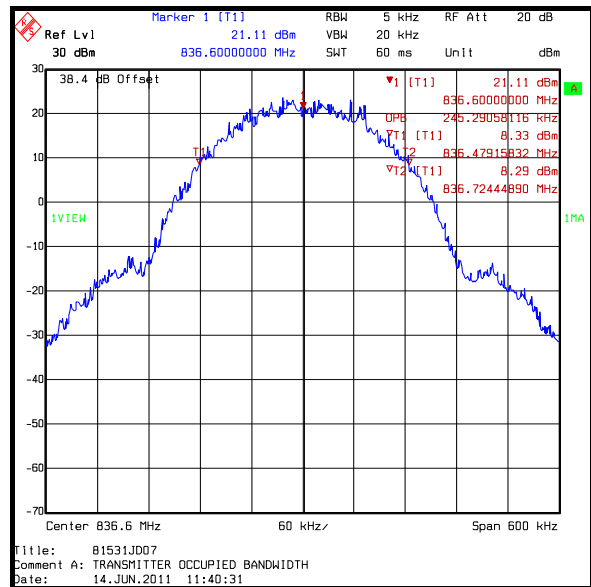
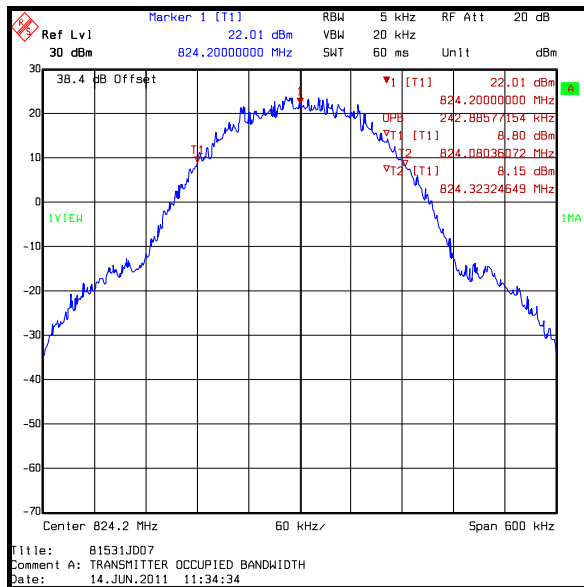
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	824.2	242.886
Middle	836.6	245.291
Top	848.8	242.886

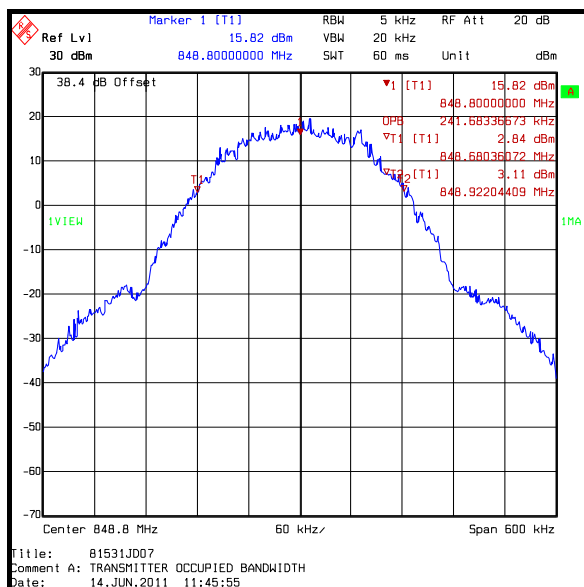
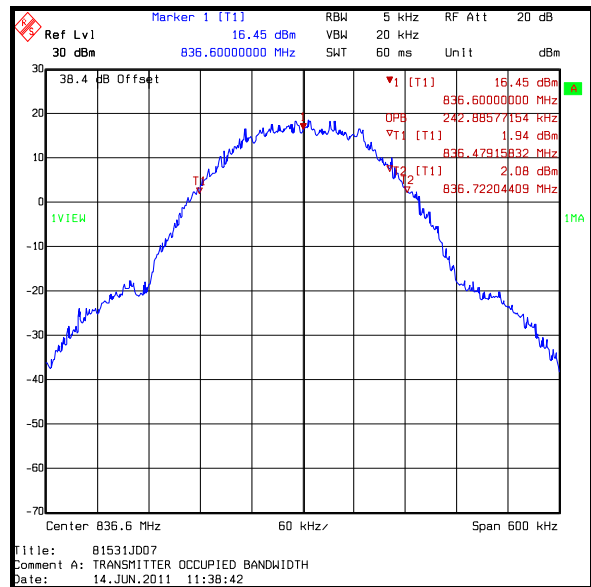
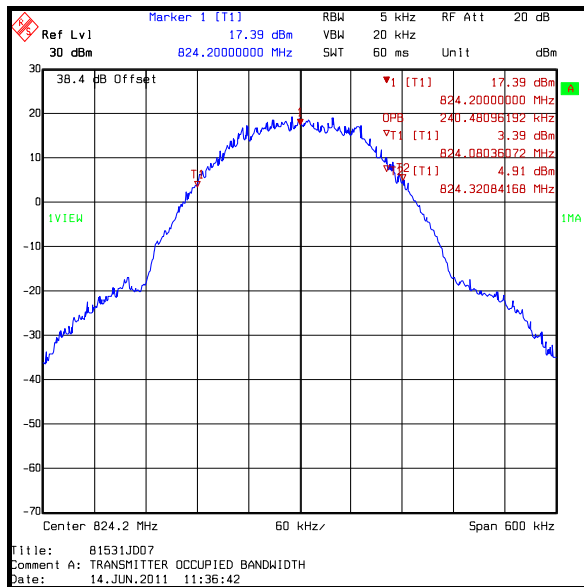
Results: GPRS

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	824.2	240.481
Middle	836.6	242.886
Top	848.8	241.683

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**

5.2.8. Transmitter Out of Band Radiated Emissions**Test Summary:**

Test Engineer:	Crawford Lindsay & Andrew Edwards	Test Date:	25 May 2011 & 13 June 2011
Test Sample IMEI:	004401221073618		

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:	GSM Circuit Switched

Environmental Conditions:

Temperature (°C):	29
Relative Humidity (%):	18

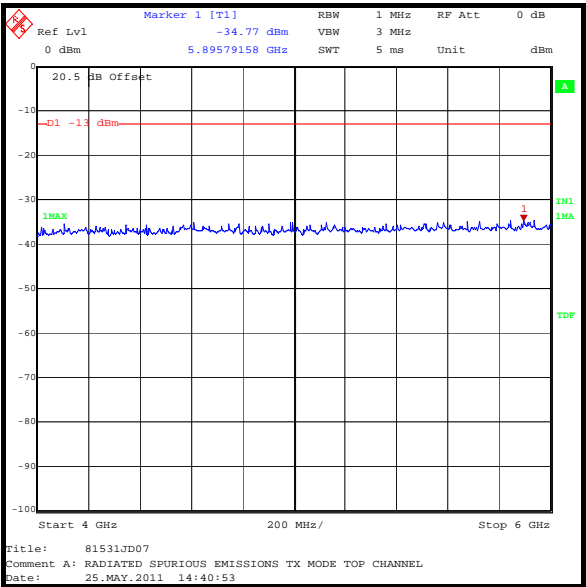
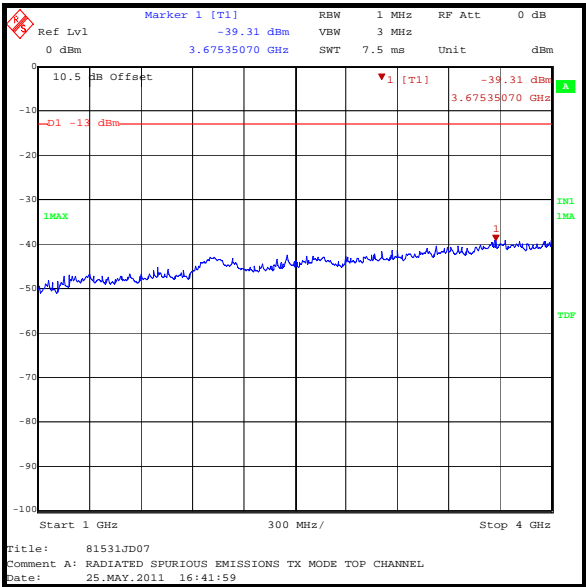
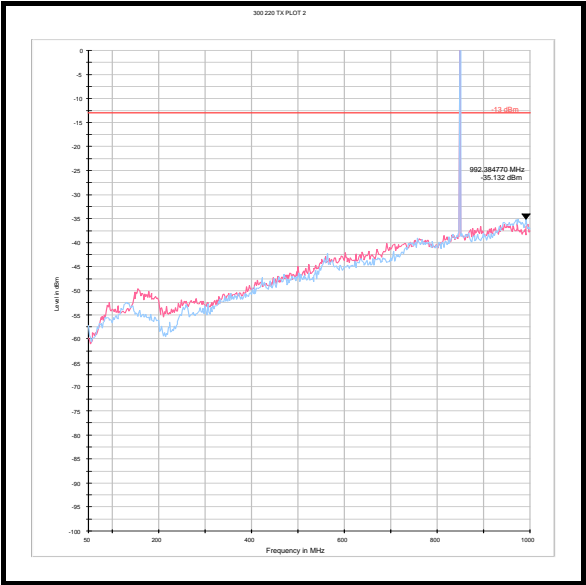
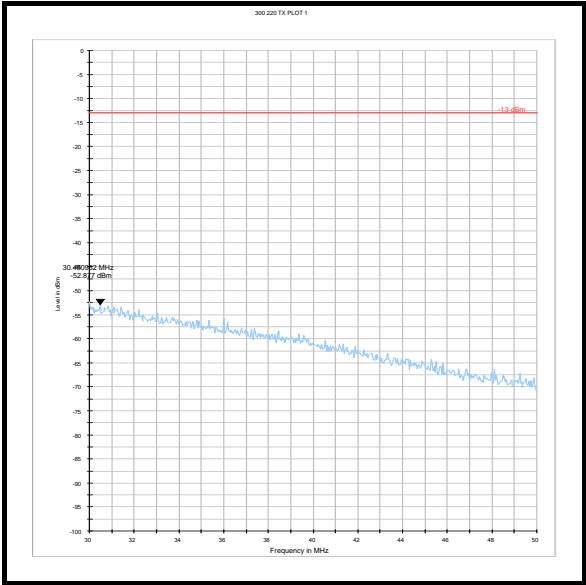
Results:

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
5895.792	-34.8	-13.0	21.8	Complied

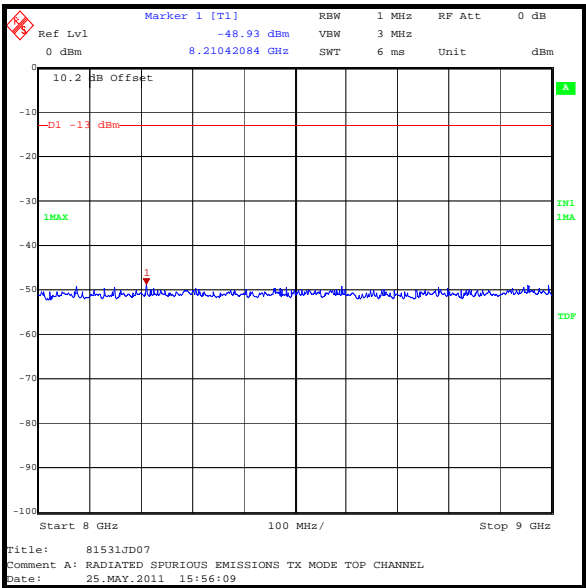
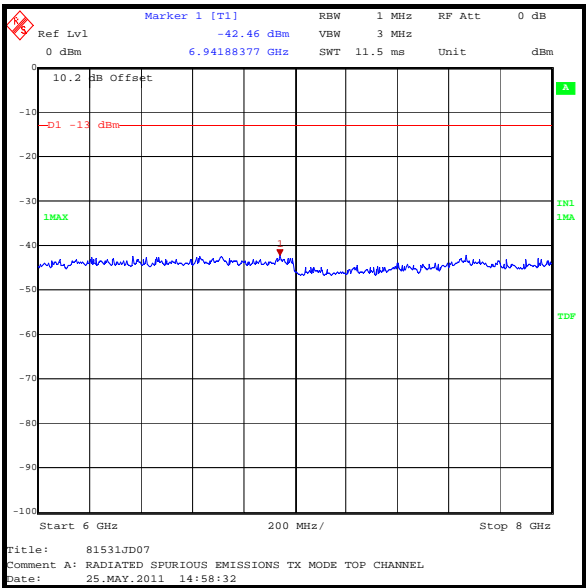
Note(s):

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 30 MHz to 1 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. 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.
5. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter 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:	Crawford Lindsay	Test Date:	14 June 2011
Test Sample IMEI:	004401221073618		

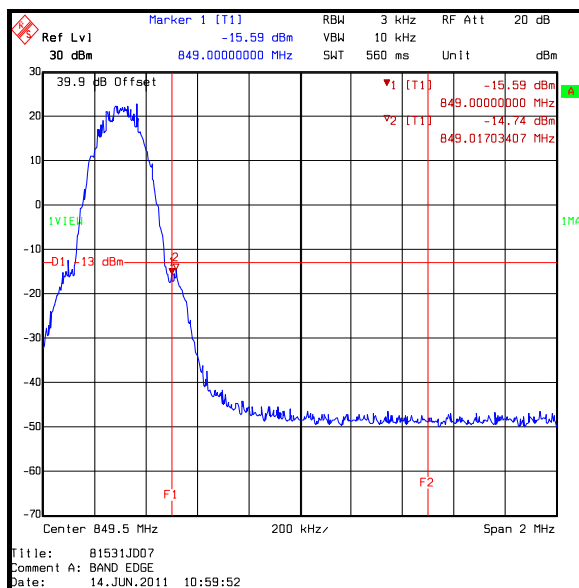
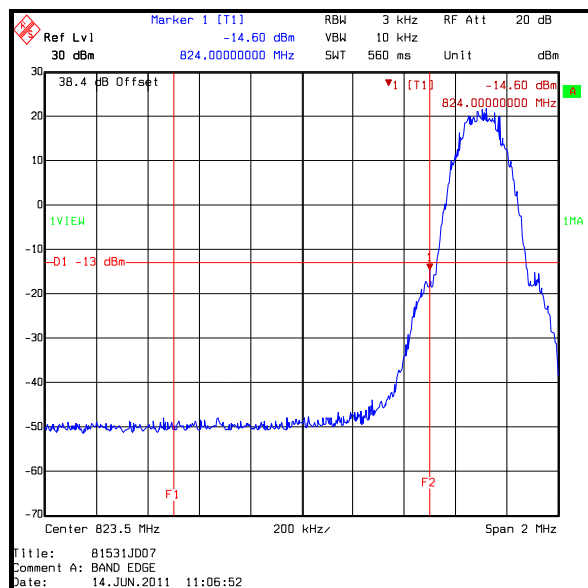
FCC Part:	2.1053 & 22.917
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Part 22.917

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	21

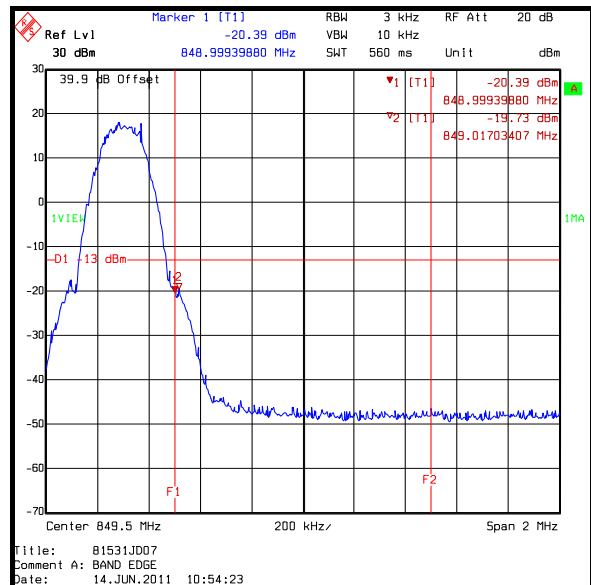
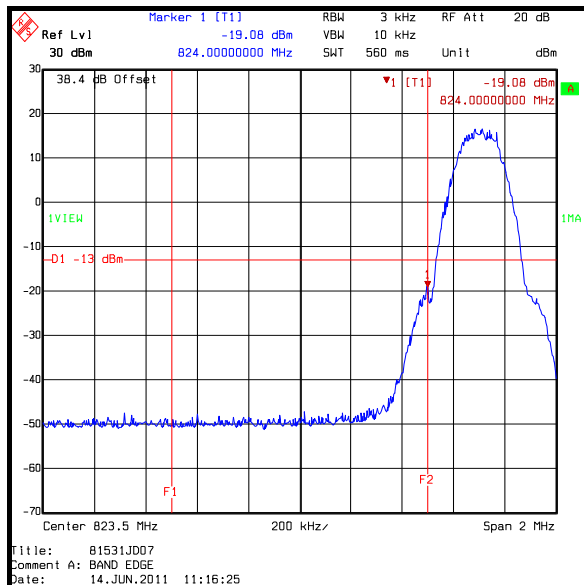
Results: GSM Circuit Switched

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-14.6	-13.0	1.6	Complied
849	-15.6	-13.0	2.6	Complied
849.017	-14.7	-13.0	1.7	Complied



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

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-19.1	-13.0	6.1	Complied
849	-20.4	-13.0	7.4	Complied
849.017	-19.7	-13.0	6.7	Complied



5.3. Test Results - Part 24**5.3.1. Receiver/Idle Mode AC Conducted Spurious Emissions****Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	10 June 2011
Test Sample Serial No:	004401221073618		

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

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	31

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
1.347000	Live	50.5	56.0	5.5	Complied
1.387500	Live	50.5	56.0	5.5	Complied
1.405500	Live	51.1	56.0	4.9	Complied
1.410000	Live	51.7	56.0	4.3	Complied
1.450500	Live	53.5	56.0	2.5	Complied
1.500000	Live	55.7	56.0	0.3	Complied
1.509000	Live	54.7	56.0	1.3	Complied
1.549500	Live	52.6	56.0	3.4	Complied

Results: Live / Average

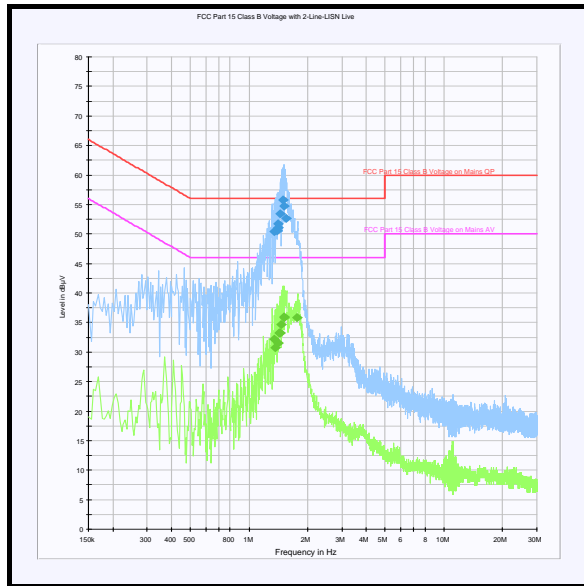
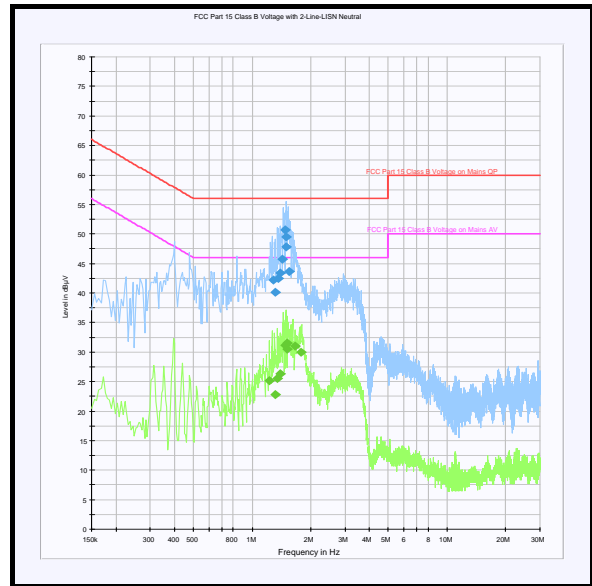
Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
1.351500	Live	32.2	46.0	13.8	Complied
1.356000	Live	30.8	46.0	15.2	Complied
1.405500	Live	31.5	46.0	14.5	Complied
1.428000	Live	33.3	46.0	12.7	Complied
1.446000	Live	33.2	46.0	12.8	Complied
1.468500	Live	34.6	46.0	11.4	Complied
1.509000	Live	35.8	46.0	10.2	Complied
1.513500	Live	35.9	46.0	10.1	Complied
1.765500	Live	35.8	46.0	10.2	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
1.288500	Neutral	42.3	56.0	13.7	Complied
1.311000	Neutral	40.1	56.0	15.9	Complied
1.360500	Neutral	42.5	56.0	13.5	Complied
1.392000	Neutral	43.5	56.0	12.5	Complied
1.428000	Neutral	45.8	56.0	10.2	Complied
1.482000	Neutral	50.7	56.0	5.3	Complied
1.486500	Neutral	47.8	56.0	8.2	Complied
1.491000	Neutral	49.5	56.0	6.5	Complied
1.549500	Neutral	43.6	56.0	12.4	Complied

Results: Neutral / Average

Frequency (MHz)	Line	Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
1.230000	Neutral	25.1	46.0	20.9	Complied
1.311000	Neutral	22.8	46.0	23.2	Complied
1.351500	Neutral	25.6	46.0	20.4	Complied
1.392000	Neutral	26.3	46.0	19.7	Complied
1.477500	Neutral	31.2	46.0	14.8	Complied
1.509000	Neutral	30.5	46.0	15.5	Complied
1.518000	Neutral	31.6	46.0	14.4	Complied
1.653000	Neutral	31.0	46.0	15.0	Complied
1.788000	Neutral	29.9	46.0	16.1	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:	Nick Steele	Test Date:	25 May 2011
Test Sample IMEI:	004401221073618		

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):	29
Relative Humidity (%):	18

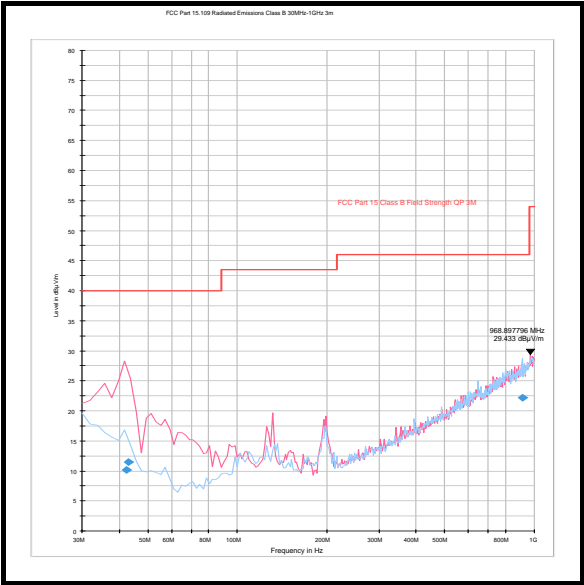
Results:

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
911.673	Horizontal	22.2	46.0	23.8	Complied

Note(s):

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



Receiver/Idle Mode Radiated Spurious Emissions (continued)**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	01 June 2011
Test Sample IMEI:	004401221073618		

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

Environmental Conditions:

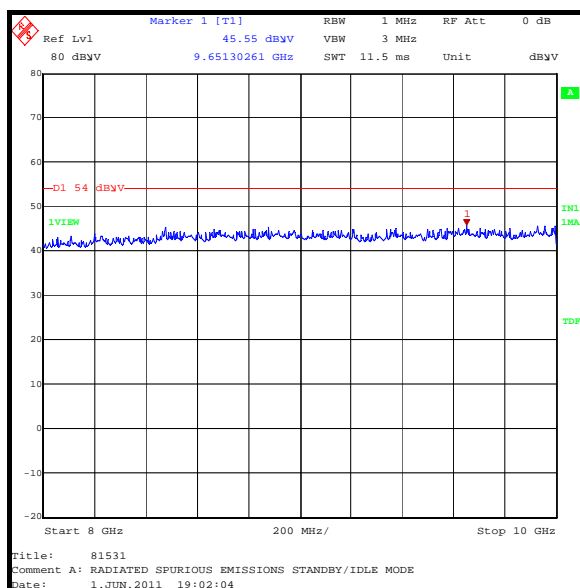
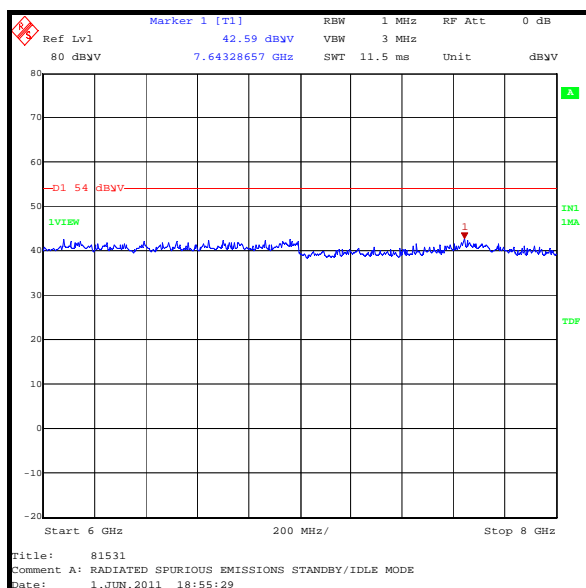
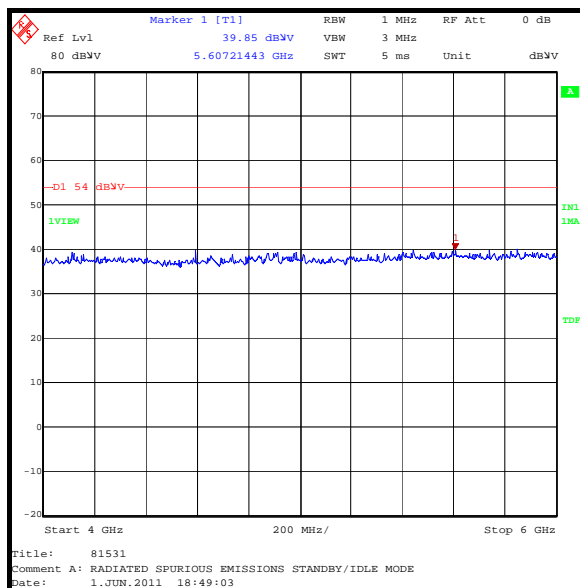
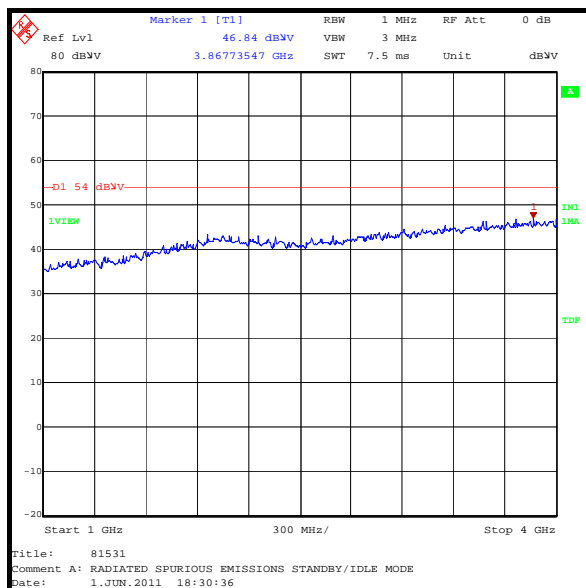
Temperature (°C):	28
Relative Humidity (%):	20

Results:

Frequency (MHz)	Antenna Polarity	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
3867.735	Vertical	46.8	54.0	7.2	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. 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:	Crawford Lindsay	Test Date:	25 May 2011
Test Sample IMEI:	004401221073618		

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

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	19

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	27.2	33.0	5.8	Complied
Middle	1879.8	Vertical	26.8	33.0	6.2	Complied
Top	1909.8	Vertical	28.1	33.0	4.9	Complied

Results: GPRS

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	21.3	33.0	11.7	Complied
Middle	1879.8	Vertical	21.1	33.0	11.9	Complied
Top	1909.8	Vertical	22.2	33.0	10.8	Complied

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

Test Engineer:	Jack Suter	Test Date:	02 June 2011
Test Sample IMEI:	004401221073618		

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):	26
Relative Humidity (%):	28

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Maximum Peak Conducted Power (dBm)	Maximum Average Conducted Power (dBm)
Bottom	1850.2	30.1	30.0
Middle	1879.8	30.0	29.9
Top	1909.8	30.1	30.0

Results: GPRS

Channel	Frequency (MHz)	Maximum Peak Conducted Power (dBm)	Maximum Average Conducted Power (dBm)
Bottom	1850.2	24.0	23.9
Middle	1879.8	24.2	24.1
Top	1909.8	24.2	24.0

Note(s):

1. 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:	03 June 2011
Test Sample IMEI:	004401221073618		

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:

Ambient Temperature (°C):	27
Ambient Relative Humidity (%):	30

Results: Bottom Channel (1850.2 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	49	1850.199951	1850.0	0.199951	Complied
-20	42	1850.199958	1850.0	0.199958	Complied
-10	42	1850.200042	1850.0	0.200042	Complied
0	63	1850.199937	1850.0	0.199937	Complied
10	62	1850.199938	1850.0	0.199938	Complied
20	67	1850.199933	1850.0	0.199933	Complied
30	70	1850.199930	1850.0	0.199930	Complied
40	72	1850.199928	1850.0	0.199928	Complied
50	67	1850.199933	1850.0	0.199933	Complied

Results: Top Channel (1909.8 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	53	1909.799947	1910.0	0.200053	Complied
-20	48	1909.799952	1910.0	0.200048	Complied
-10	38	1909.799962	1910.0	0.200038	Complied
0	63	1909.799937	1910.0	0.200063	Complied
10	70	1909.799930	1910.0	0.200070	Complied
20	63	1909.799937	1910.0	0.200063	Complied
30	73	1909.799927	1910.0	0.200073	Complied
40	73	1909.799927	1910.0	0.200073	Complied
50	58	1909.799942	1910.0	0.200058	Complied

Transmitter Frequency Stability (Temperature Variation) (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 the CMU 200. The frequency meter value was recorded.
3. Temperature was monitored throughout the test with a calibrated digital thermometer.

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

Test Engineer:	Crawford Lindsay	Test Date:	03 June 2011
Test Sample IMEI:	004401221073618		

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):	27
Relative Humidity (%):	30

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	30	1850.199970	1850.0	0.199970	Complied
4.2	68	1850.199932	1850.0	0.199932	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	62	1909.799938	1910.0	0.200062	Complied
4.2	60	1909.799940	1910.0	0.200060	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 the CMU 200. The frequency meter value was recorded.
3. Voltage was monitored throughout the test with a calibrated digital voltmeter.

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

Test Engineer:	Crawford Lindsay	Test Date:	14 June 2011
Test Sample IMEI:	004401221073618		

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):	27
Relative Humidity (%):	23

Results: GSM Circuit Switched

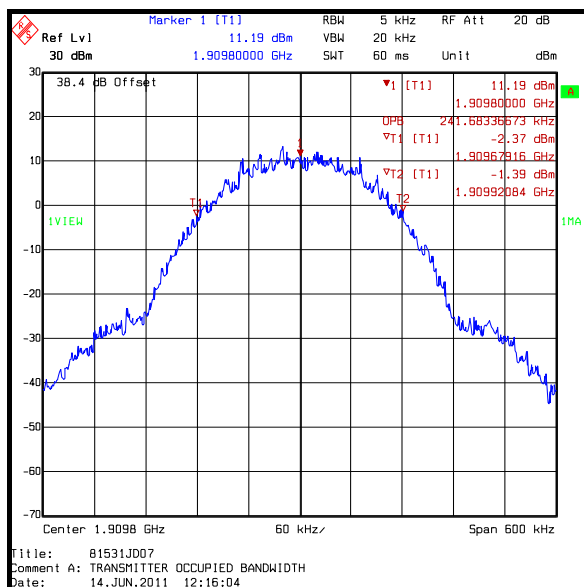
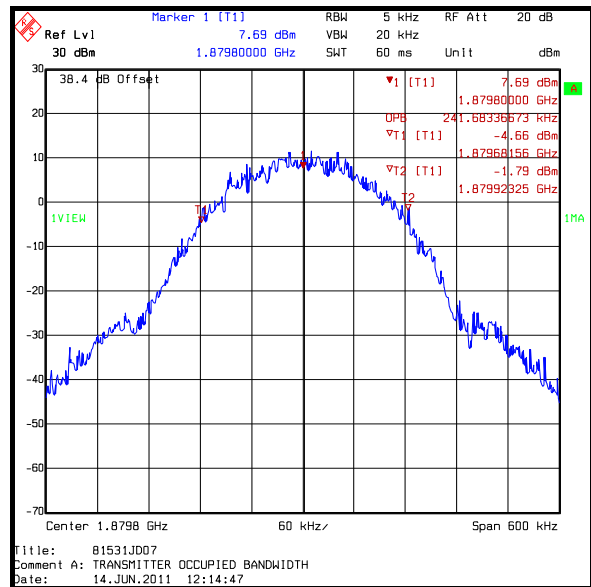
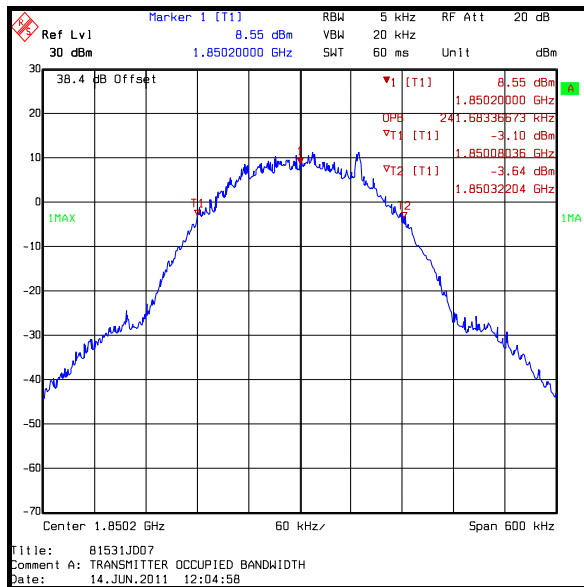
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	241.683
Middle	1879.8	241.683
Top	1909.8	241.683

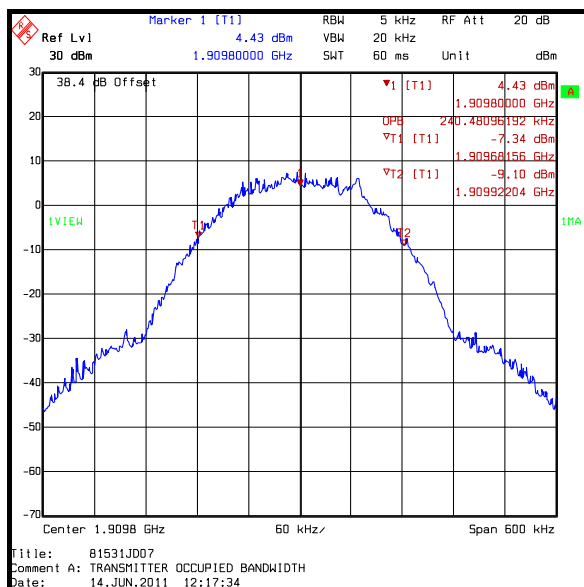
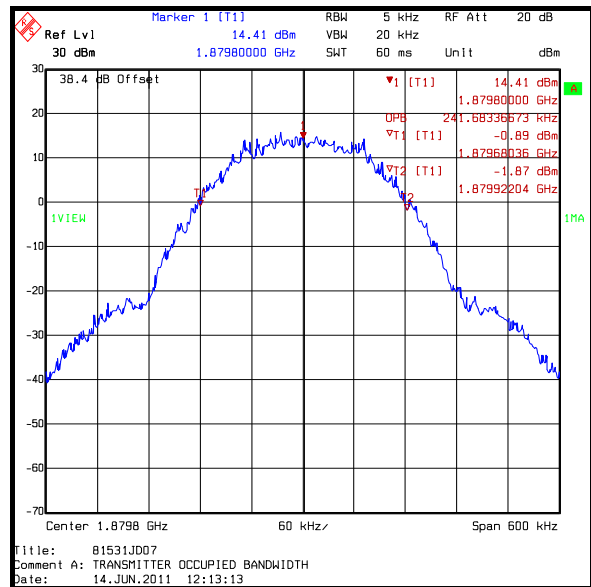
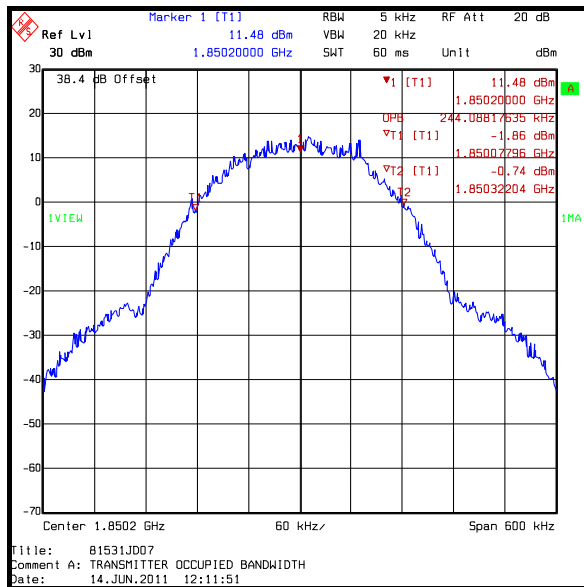
Results: GPRS

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	244.088
Middle	1879.8	241.683
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**

5.3.8. Transmitter Out of Band Radiated Emissions**Test Summary:**

Test Engineer:	Crawford Lindsay & Nick Steele	Test Date:	25 May 2011 & 26 May 2011
Test Sample IMEI:	004401221073618		

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):	29 to 31
Relative Humidity (%):	18 to 20

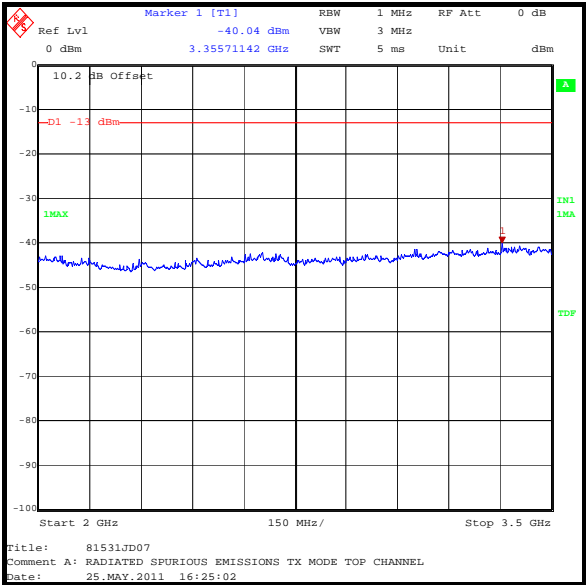
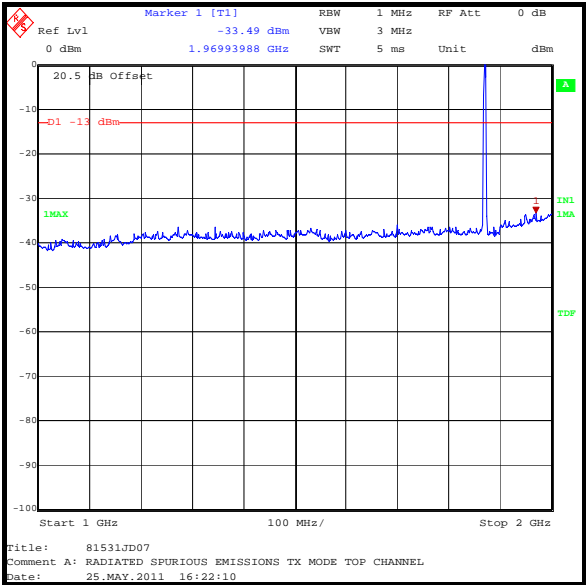
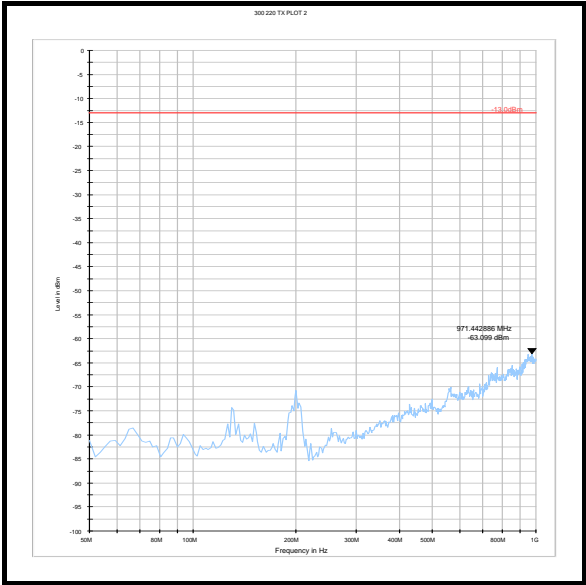
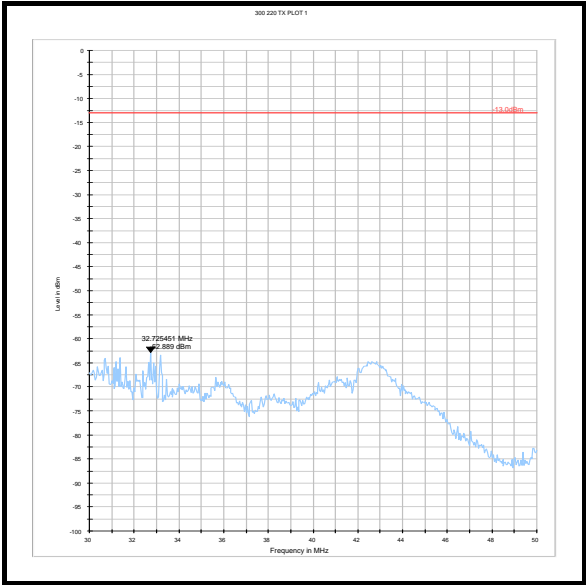
Results:

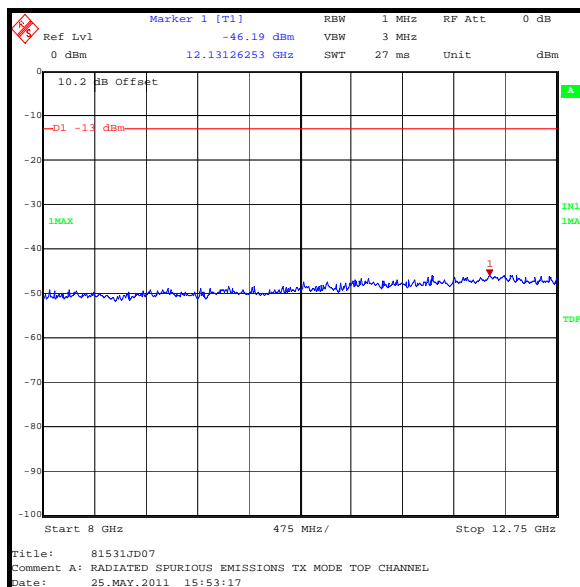
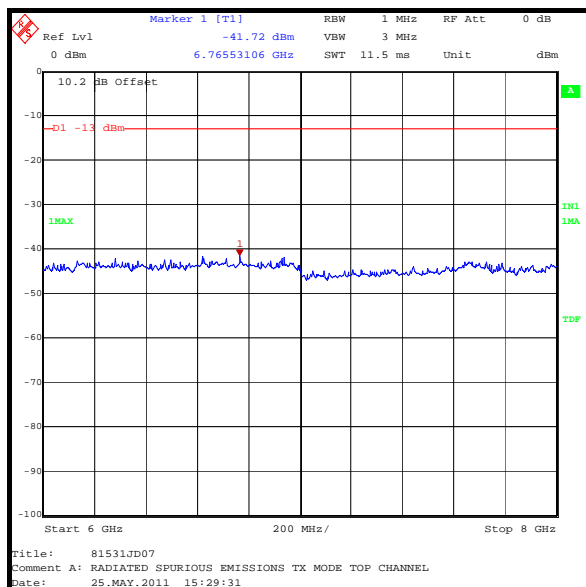
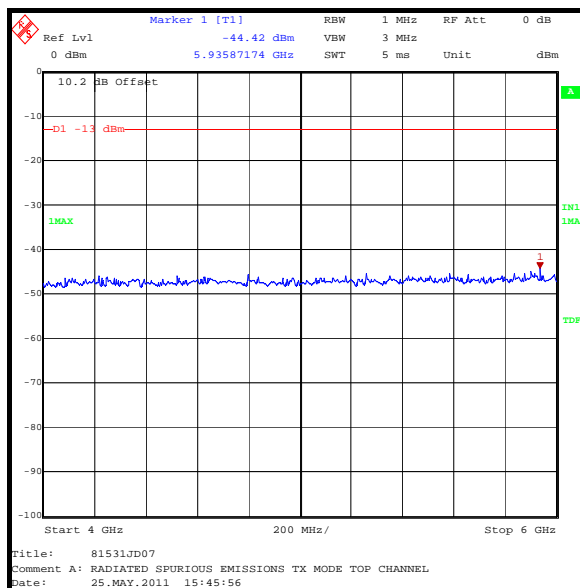
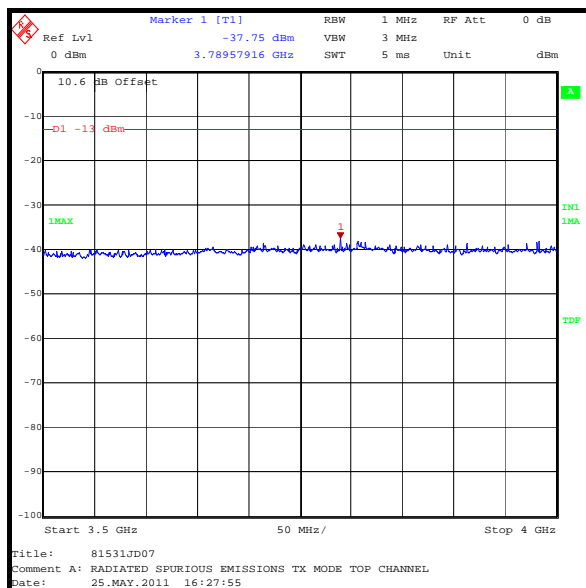
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1969.940	-33.5	-13.0	20.5	Complied

Note(s):

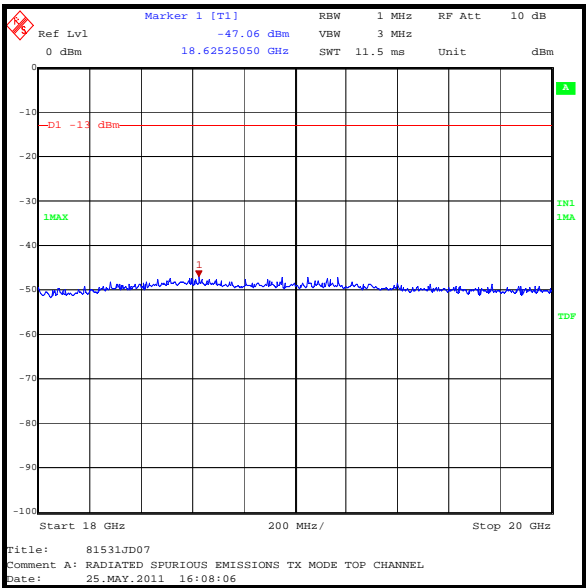
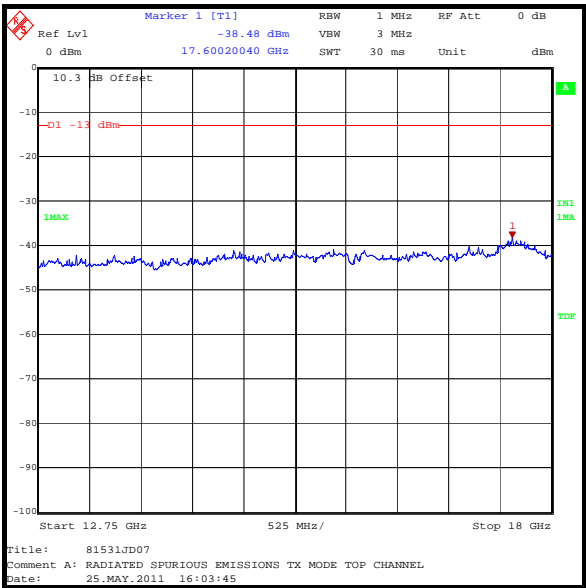
1. No spurious emissions were detected above the noise floor of the measuring receiver; the highest peak noise floor reading of the measuring receiver was recorded.
2. The uplink traffic channels are shown on the 1 GHz to 2 GHz plot.
3. All emissions shown on the pre-scan plots were investigated and found to be below the measurement system noise floor or ambient.
4. 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.
5. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres

Transmitter 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:	Nick Steele	Test Date:	14 June 2011
Test Sample IMEI:	004401221073618		

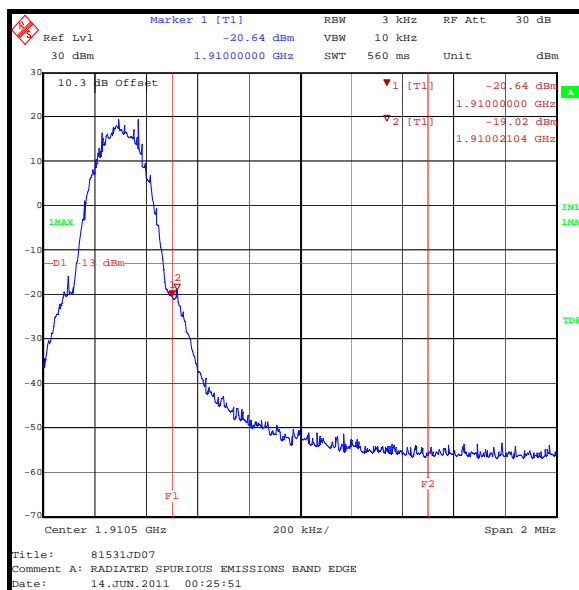
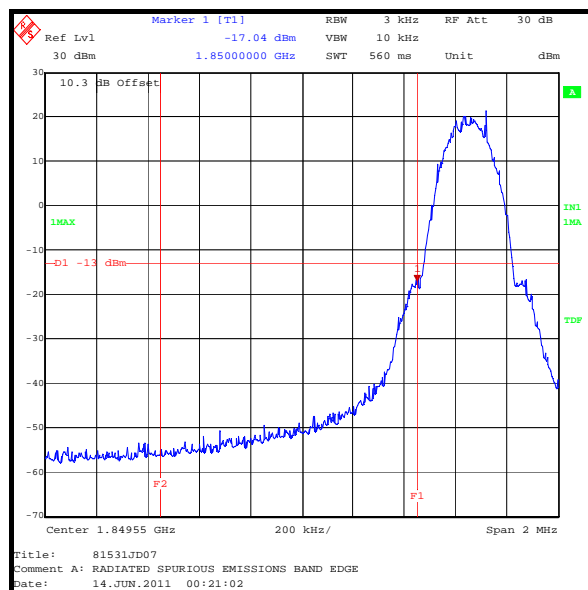
FCC Part:	2.1053 & 24.238
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Parts 2.1053 and 24.238

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	21

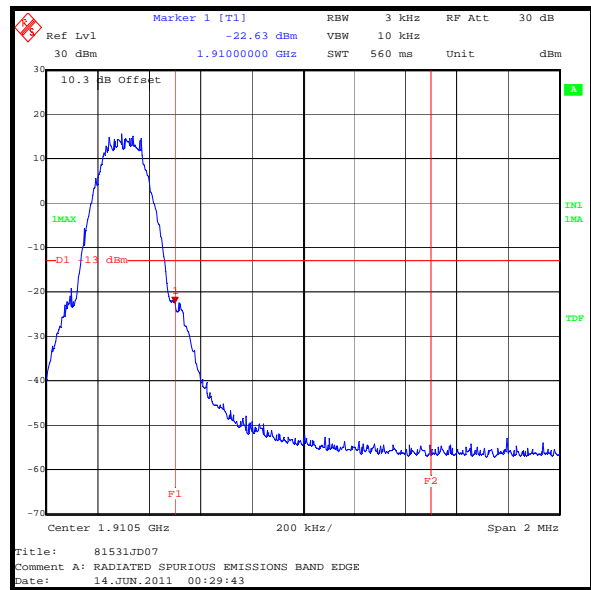
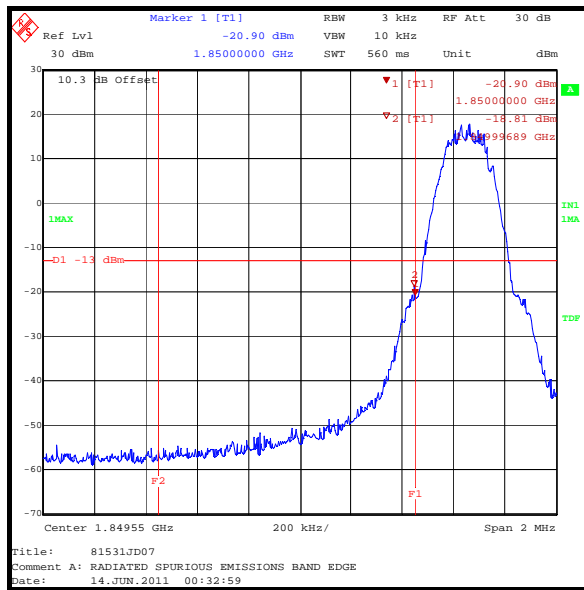
Results: GSM Circuit Switched

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-17.0	-13.0	4.0	Complied
1910	-20.6	-13.0	7.6	Complied
1910.021	-19.0	-13.0	6.0	Complied



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

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-20.5	-13.0	7.5	Complied
1910	-22.6	-13.0	9.6	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	06 Jul 2011	12
A1396	Attenuator	Huber + Suhner	757987	6810.17.B	06 Jul 2011	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	06 Jul 2011	12
A1537	Directional Coupler	Hewlett Packard	778D	1144A05122	Calibrated before use	-
A1818	Antenna	EMCO	3115	00075692	05 Sep 2011	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	05 Mar 2012	12
A1834	Attenuator	Hewlett Packard	8491B	10444	30 Jun 2011	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	29 Dec 2011	12
A1998	Attenuator	Huber + Suhner	6820.17.B	07101	09 Feb 2012	12
A2000	Attenuator	Huber + Suhner	6830.17.B	301623	09 Feb 2012	12
A253	Antenna	Flann Microwave	12240-20	128	05 Sep 2011	12
A254	Antenna	Flann Microwave	14240-20	139	05 Sep 2011	12
A255	Antenna	Flann Microwave	16240-20	519	05 Sep 2011	12
A256	Antenna	Flann Microwave	18240-20	400	05 Sep 2011	12
A288	Antenna	Chase	CBL6111A	1589	05 Sep 2011	12
A427	Antenna	Flann Microwave	14240-20	150	21 Nov 2013	36
A436	Antenna	Flann Microwave	20240-20	330	05 Sep 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	-
G0543	Amplifier	Sonoma	310N	230801	30 Jun 2011	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	05 Sep 2011	12
L1021	Comms Test Set	Rohde & Schwarz	CMU 200	111379	11 Jan 2012	12
M1068	Thermometer	Iso-Tech	RS55	93102884	10 Nov 2011	12
M1124	Test Receiver	Rohde & Schwarz	ESI26	100046K	22 Jun 2011	12
M1229	Digital Multimeter	Fluke	179	87640015	15 Jul 2011	12
M1242	Spectrum Analyser	Rohde & Schwarz	FSEM30	845986/022	03 Dec 2011	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	28 Jun 2011	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.