

# TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: NTT docomo P-07C

FCC ID: UCE211040A

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

**Test report Serial No:**  
RFI-RPT-RP81533JD03A V2.0

**Version 2.0 supersedes all previous versions**

**This Test report Is Issued Under The Authority Of  
Chris Guy, Head of Global Approvals:**



<b>Checked By:</b>	Ian Watch
<b>Signature:</b>	
<b>Date of Issue:</b>	03 June 2011

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## **1. Customer Information**

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

## **2. Summary of Testing**

### **2.1. General Information**

<b>Specification Reference:</b>	47CFR22
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 22 Subpart H (Public Mobile Services)
<b>Specification Reference:</b>	47CFR24
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 24 Subpart E (Personal Communication Services)
<b>Specification Reference:</b>	47CFR15.107 and 47CFR15.109
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart B (Unintentional Radiators) - Sections 15.107 and 15.109
<b>Site Registration:</b>	FCC: 209735
<b>Location of Testing:</b>	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH
<b>Test Dates:</b>	10 May 2011 to 25 May 2011

### **2.2. Summary of Test Results**

FCC Reference (47CFR)	Measurement	Result	
<b>Part 22</b>			
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	✓	
<b>Part 24</b>			
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	✓	
<b>Key to Results</b>			
	= Complied		= Did not comply

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

### **2.3. Methods and Procedures**

<b>Reference:</b>	ANSI/TIA-603-C-2004
<b>Title:</b>	Land Mobile Communications Equipment, Measurements and performance Standards
<b>Reference:</b>	ANSI C63.4 (2009)
<b>Title:</b>	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)**

<b>Brand Name:</b>	NTT docomo
<b>Model Name or Number:</b>	P-07C
<b>IMEI:</b>	356333040014081
<b>Hardware Version Number:</b>	Rev C
<b>Software Version Number:</b>	laputa-ginger-inc4x-dcm-07-0249 R1E_EC06_005
<b>FCC ID:</b>	UCE211040A

*\*The customer stated this S/W version is identical to laputa-ginger-inc4x-dcm-07-0312 R1E\_EC07 except for the audio speech parameters which do not impact FCC testing.*

<b>Brand Name:</b>	NTT docomo
<b>Model Name or Number:</b>	P-07C
<b>IMEI:</b>	356333040014073
<b>Hardware Version Number:</b>	Rev C
<b>Software Version Number:</b>	laputa-ginger-inc4x-dcm-07-0312 R1E_EC07
<b>FCC ID:</b>	UCE211040A

<b>Brand Name:</b>	NTT docomo
<b>Description:</b>	Battery
<b>Model Name or Number:</b>	P24

<b>Brand Name:</b>	NTT docomo
<b>Description:</b>	AC Charger and USB cable
<b>Model Name or Number:</b>	P01

<b>Brand Name:</b>	NTT docomo
<b>Description:</b>	Personal Hands-Free
<b>Model Name or Number:</b>	LOZZ00000027

#### **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**

<b>Type of Radio Device:</b>	Transceiver		
<b>Mode:</b>	GSM/GPRS		
<b>Modulation Type:</b>	GMSK		
<b>Channel Spacing:</b>	200 kHz		
<b>Power Supply Requirement(s):</b>	Nominal	3.7	
	Minimum	3.4	
	Maximum	4.2	
<b>Technology Tested:</b>	GSM850		
<b>Maximum Output Power (ERP):</b>	GSM	33.4 dBm	
	GPRS	27.6 dBm	
<b>Transmit Frequency Range:</b>	824 to 849 MHz		
<b>Transmit Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	128	824.2
	Middle	190	836.6
	Top	251	848.8
<b>Receive Frequency Range:</b>	869 to 894 MHz		
<b>Receive Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	128	869.2
	Middle	190	881.6
	Top	251	893.8
<b>Technology Tested:</b>	PCS1900		
<b>Maximum Output Power (EIRP):</b>	GSM	28.9 dBm	
	GPRS	23.1 dBm	
<b>Transmit Frequency Range:</b>	1850 to 1910 MHz		
<b>Transmit Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	512	1850.2
	Middle	660	1879.8
	Top	810	1909.8
<b>Receive Frequency Range:</b>	1930 to 1990 MHz		
<b>Receive Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	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:

<b>Brand Name:</b>	Generic
<b>Description:</b>	Micro SD Memory Card
<b>Model Name or Number:</b>	128 MB

<b>Brand Name:</b>	Buffalo
<b>Description:</b>	USB Hub
<b>Model Name or Number:</b>	BSH3U01

<b>Brand Name:</b>	Not marked or stated
<b>Description:</b>	Dummy battery
<b>Model Name or Number:</b>	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.
- The sample with IMEI 356333040014073 was used for Idle mode radiated spurious emission tests below 1 GHz. The sample with IMEI 356333040014081 was used for all other measurements.
- 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:**

<b>Test Engineer:</b>	Ian Watch	<b>Test Date:</b>	16 May 2011
<b>Test Sample Serial No:</b>	356333040014081		

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

#### **Environmental Conditions:**

<b>Temperature (°C):</b>	27
<b>Relative Humidity (%):</b>	21

#### **Results: Live - Quasi Peak**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.433500	Live	38.0	57.2	19.2	Complied
0.469500	Live	38.6	56.5	17.9	Complied
0.595500	Live	36.0	56.0	20.0	Complied
0.757500	Live	36.1	56.0	19.9	Complied
1.135500	Live	36.4	56.0	19.6	Complied
1.446000	Live	37.9	56.0	18.1	Complied
1.504500	Live	40.5	56.0	15.6	Complied
1.527000	Live	39.0	56.0	17.0	Complied
1.540500	Live	39.2	56.0	16.8	Complied
1.648500	Live	43.8	56.0	12.2	Complied
1.689000	Live	49.6	56.0	6.4	Complied

#### **Results: Live - Average**

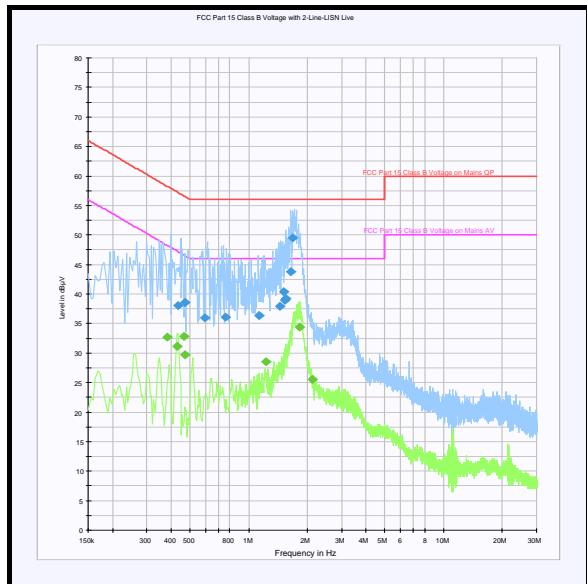
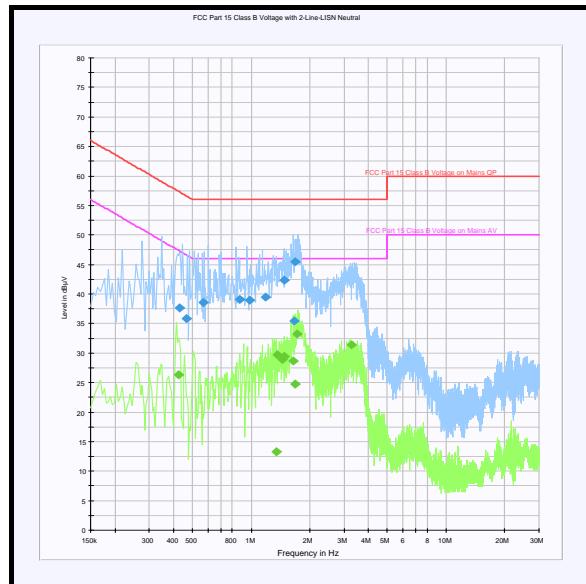
Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.379500	Live	32.7	48.3	15.6	Complied
0.429000	Live	31.1	47.3	16.2	Complied
0.465000	Live	32.9	46.6	13.7	Complied
0.469500	Live	29.7	46.5	16.8	Complied
1.221000	Live	28.6	46.0	17.4	Complied
1.819500	Live	34.4	46.0	11.6	Complied
2.112000	Live	25.6	46.0	20.4	Complied

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

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.429000	Neutral	37.7	57.3	19.6	Complied
0.465000	Neutral	35.9	56.6	20.7	Complied
0.568500	Neutral	38.5	56.0	17.5	Complied
0.874500	Neutral	39.1	56.0	16.9	Complied
0.987000	Neutral	39.0	56.0	17.0	Complied
1.180500	Neutral	39.5	56.0	16.5	Complied
1.482000	Neutral	42.3	56.0	13.7	Complied
1.666500	Neutral	35.4	56.0	20.6	Complied
1.689000	Neutral	45.4	56.0	10.6	Complied

**Results: Neutral - Average**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.424500	Neutral	26.3	47.4	21.1	Complied
1.347000	Neutral	13.3	46.0	32.7	Complied
1.365000	Neutral	29.7	46.0	16.3	Complied
1.441500	Neutral	28.9	46.0	17.1	Complied
1.482000	Neutral	29.4	46.0	16.6	Complied
1.635000	Neutral	28.6	46.0	17.4	Complied
1.689000	Neutral	24.7	46.0	21.3	Complied
1.725000	Neutral	33.2	46.0	12.8	Complied
3.255000	Neutral	31.4	46.0	14.6	Complied

**Receiver/Idle Mode AC Conducted Spurious Emissions (continued)****Live****Neutral**

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

### **5.2.2. Receiver/Idle Mode Radiated Spurious Emissions**

#### **Test Summary:**

<b>Test Engineer:</b>	Patrick Jones	<b>Test Date:</b>	18 May 2011
<b>Test Sample IMEI:</b>	356333040014073		

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

#### **Environmental Conditions:**

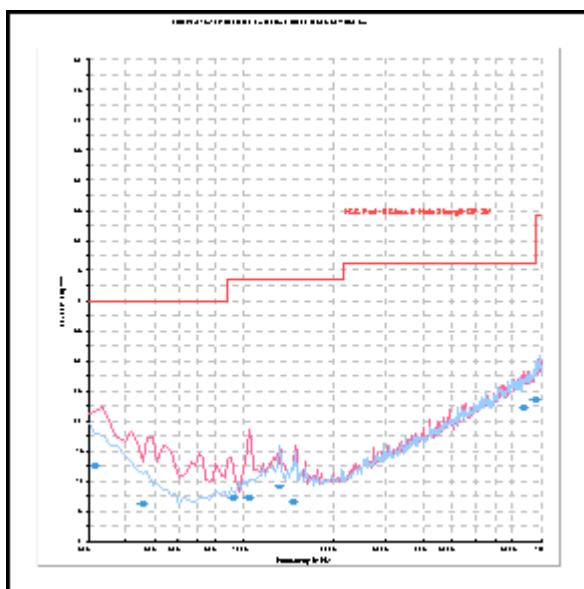
<b>Temperature (°C):</b>	30
<b>Relative Humidity (%):</b>	25

#### **Results: Quasi Peak**

<b>Frequency (MHz)</b>	<b>Antenna Polarity</b>	<b>Level (dB<math>\mu</math>V/m)</b>	<b>Limit (dB<math>\mu</math>V/m)</b>	<b>Margin (dB)</b>	<b>Result</b>
31.603	Vertical	12.7	40.0	27.3	Complied
45.701	Vertical	6.1	40.0	33.9	Complied
92.391	Vertical	7.1	43.5	36.4	Complied
103.786	Vertical	7.1	43.5	36.4	Complied
132.425	Vertical	9.1	43.5	34.4	Complied
147.485	Vertical	6.7	43.5	36.8	Complied
879.454	Vertical	22.1	46.0	23.9	Complied
958.298	Vertical	23.4	46.0	22.6	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 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:**

<b>Test Engineer:</b>	Tim Stanley	<b>Test Date:</b>	11 May 2011
<b>Test Sample IMEI:</b>	356333040014081		

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

**Environmental Conditions:**

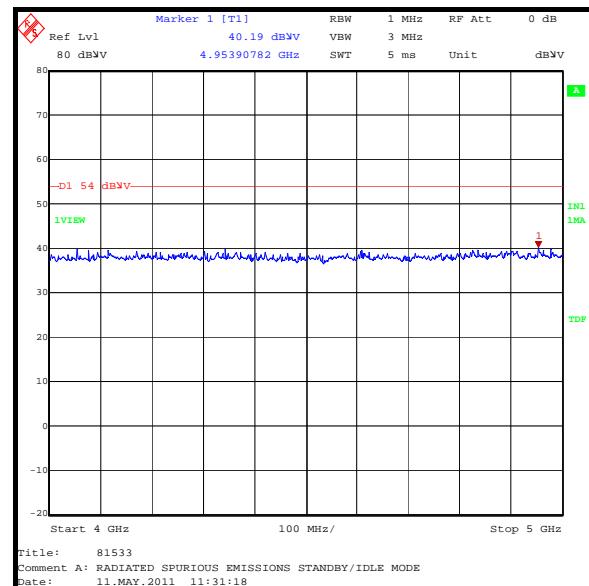
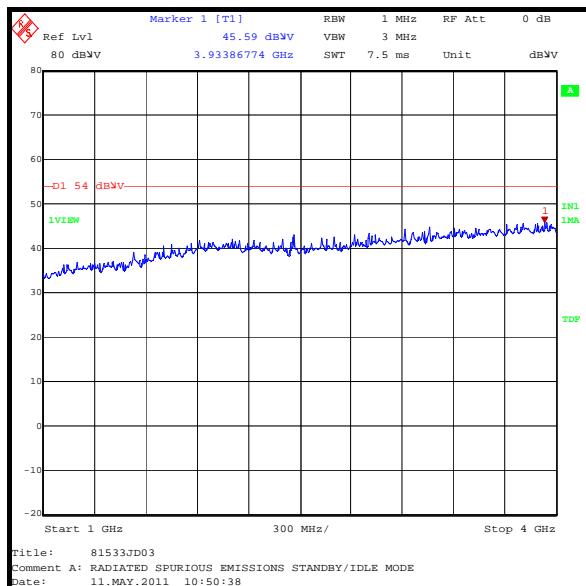
<b>Temperature (°C):</b>	26
<b>Relative Humidity (%):</b>	22

**Results:**

Frequency (MHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
3933.868	Vertical	45.6	54.0	8.4	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:**

<b>Test Engineer:</b>	Ian Watch	<b>Test Date:</b>	20 May 2011
<b>Test Sample IMEI:</b>	356333040014081		

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

**Environmental Conditions:**

<b>Temperature (°C):</b>	28
<b>Relative Humidity (%):</b>	19

**Results: GSM Circuit Switched**

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	31.3	38.45	7.15	Complied
Middle	836.6	Horizontal	33.1	38.45	5.35	Complied
Top	848.8	Vertical	33.4	38.45	5.05	Complied

**Results: GPRS**

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	25.5	38.45	12.95	Complied
Middle	836.6	Horizontal	27.3	38.45	11.15	Complied
Top	848.8	Vertical	27.6	38.45	10.85	Complied

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

<b>Test Engineer:</b>	Ian Watch	<b>Test Date:</b>	18 May 2011
<b>Test Sample IMEI:</b>	356333040014081		

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

**Environmental Conditions:**

<b>Temperature (°C):</b>	26
<b>Relative Humidity (%):</b>	28

**Results: GSM Circuit Switched**

Channel	Frequency (MHz)	Maximum Peak Conducted Power (dBm)	Maximum Average Conducted Power (dBm)
Bottom	824.2	32.9	32.7
Middle	836.6	33.0	32.8
Top	848.8	32.7	32.5

**Results: GPRS**

Channel	Frequency (MHz)	Maximum Peak Conducted Power (dBm)	Maximum Average Conducted Power (dBm)
Bottom	824.2	27.1	26.9
Middle	836.6	27.1	26.9
Top	848.8	26.9	26.7

**Note(s):**

- Conducted power tests were performed to support SAR tests.

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

<b>Test Engineer:</b>	Tim Stanley	<b>Test Date:</b>	13 & 16 May 2011
<b>Test Sample IMEI:</b>	356333040014081		

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

**Environmental Conditions:**

<b>Ambient Temperature (°C):</b>	28
<b>Ambient Relative Humidity (%):</b>	20

**Results: Middle Channel (836.6 MHz)**

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	836.600018	18	0.0125	2.5	2.4875	Complied
-20	836.599981	19	0.0227	2.5	2.4773	Complied
-10	836.599979	21	0.0251	2.5	2.4749	Complied
0	836.599975	25	0.0299	2.5	2.4701	Complied
10	836.599973	27	0.0323	2.5	2.4677	Complied
20	836.599972	28	0.0335	2.5	2.4665	Complied
30	836.599969	31	0.0371	2.5	2.4629	Complied
40	836.599967	33	0.0395	2.5	2.4605	Complied
50	836.599968	32	0.0383	2.5	2.4617	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.

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

Test Engineer:	Tim Stanley	Test Date:	16 May 2011
Test Sample IMEI:	356333040014081		

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):	20
Relative Humidity (%):	20

**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	836.599972	28	0.0335	2.5	2.4665	Complied
4.2	836.599966	34	0.0406	2.5	2.4594	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:	Tim Stanley	Test Date:	10 May 2011
Test Sample IMEI:	356333040014081		

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**

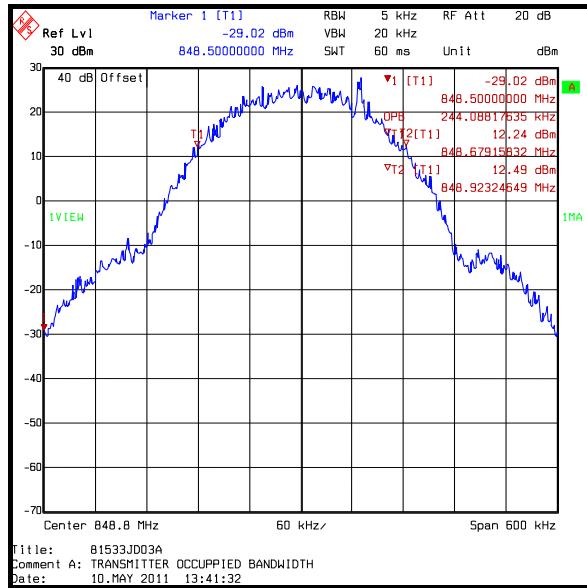
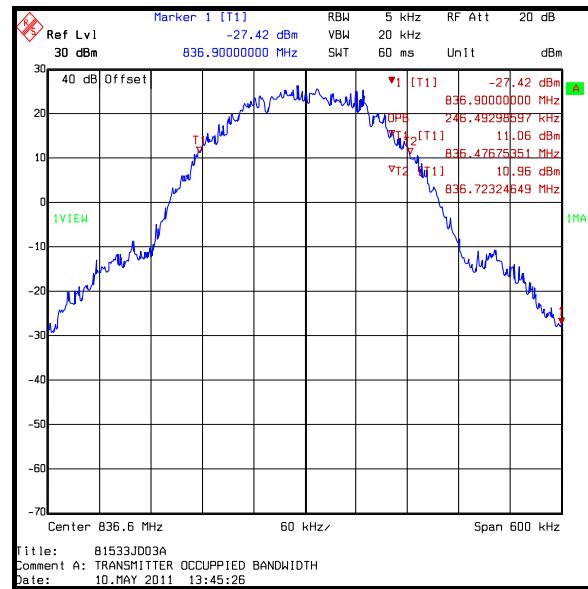
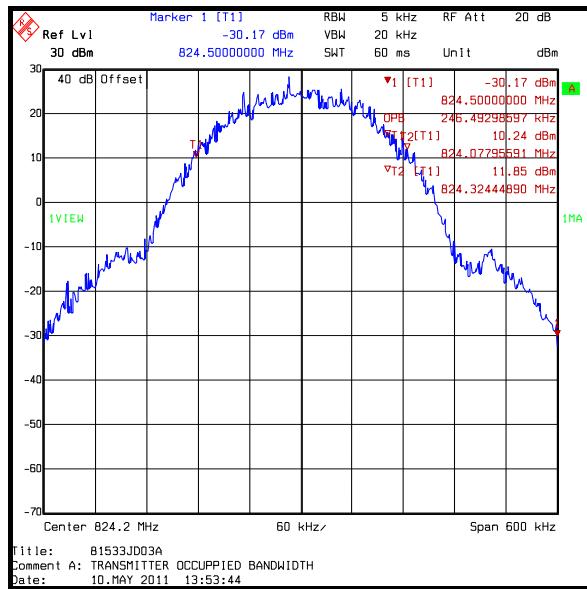
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	824.2	246.493
Middle	836.6	246.493
Top	848.8	244.088

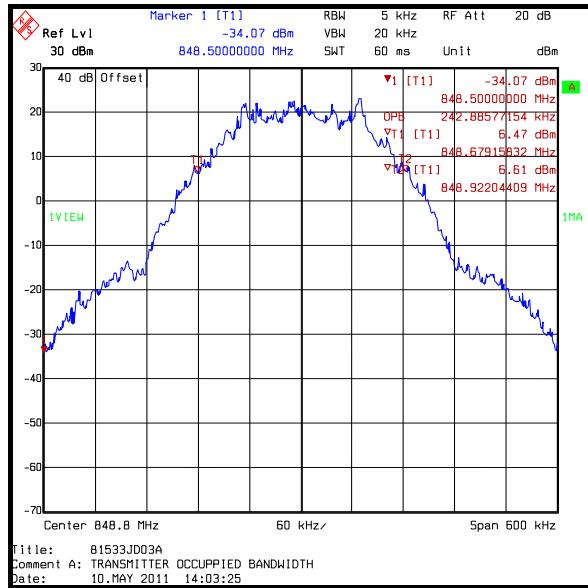
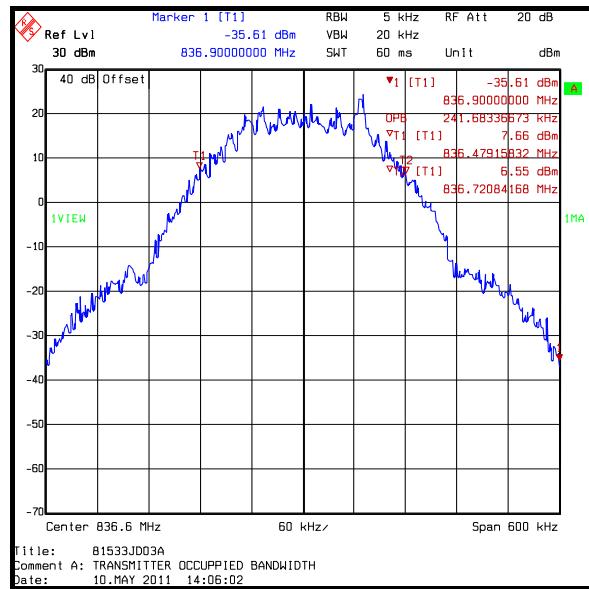
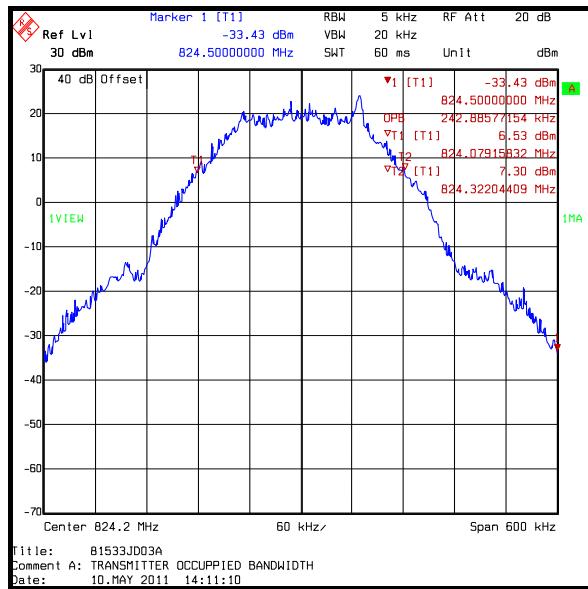
**Results: GPRS**

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

**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:**

<b>Test Engineer:</b>	Andrew Edwards & Tim Stanley	<b>Test Date:</b>	23 May 2011
<b>Test Sample IMEI:</b>	356333040014081		

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

**Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	21

**Results: Bottom Channel**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1648.330	-37.0	-13.0	24.0	Complied

**Results: Middle Channel**

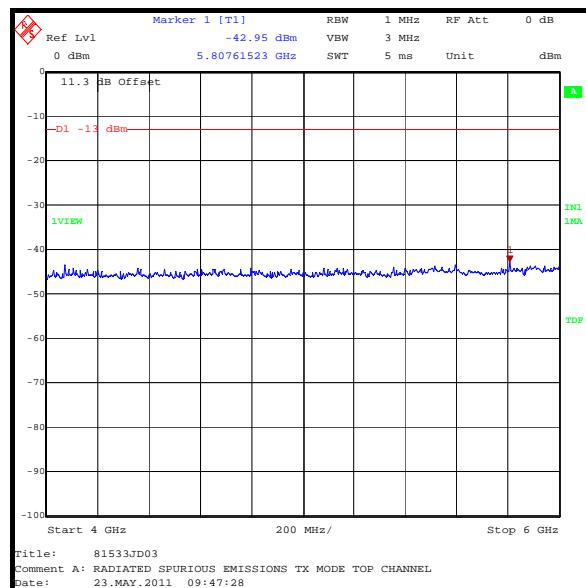
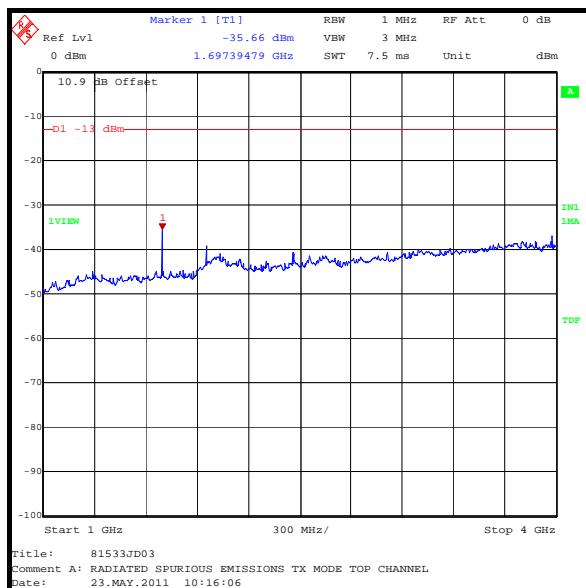
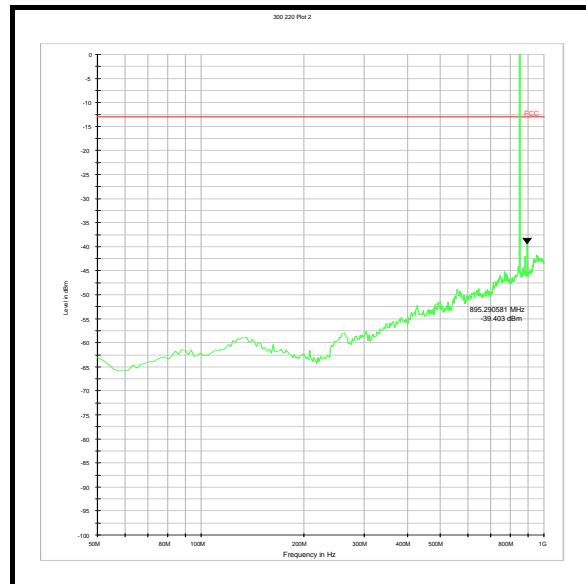
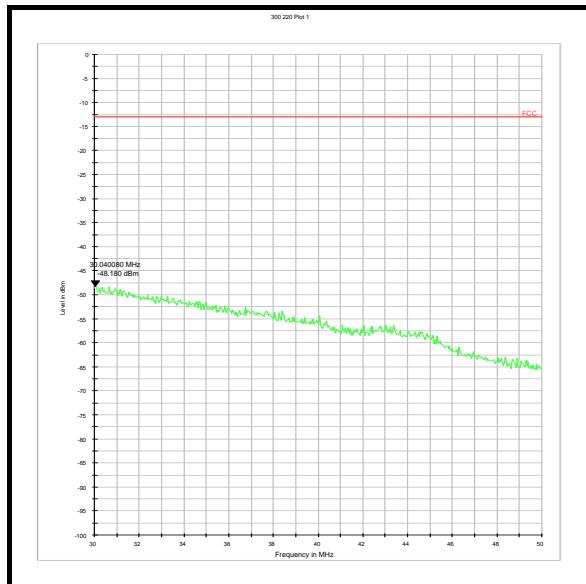
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1673.340	-35.1	-13.0	22.1	Complied

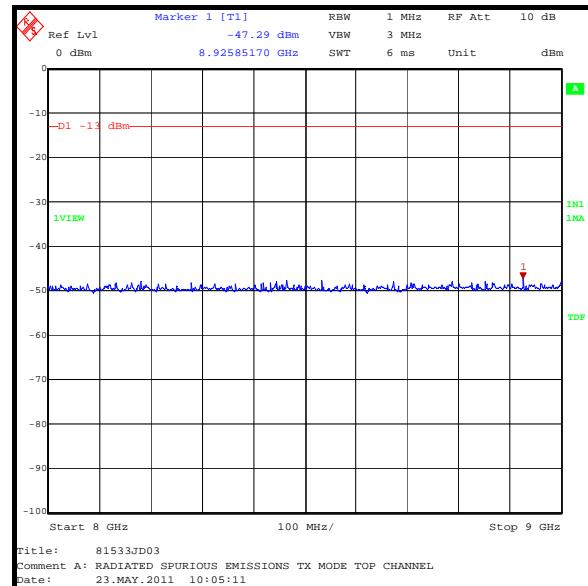
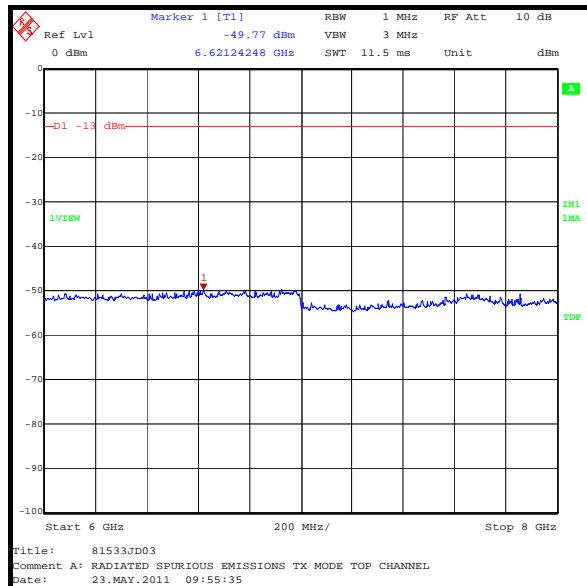
**Results: Top Channel**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1697.448	-34.6	-13.0	21.6	Complied

**Transmitter Out of Band Radiated Emissions (continued)****Note(s):**

1. The uplink and downlink traffic channels are shown on the 30 MHz to 1 GHz plot.
2. All other emissions shown on the pre-scan plots were investigated and found to be below the measurement system noise floor or ambient.
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.
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:**

<b>Test Engineer:</b>	Ian Watch	<b>Test Date:</b>	18 May 2011
<b>Test Sample IMEI:</b>	356333040014081		

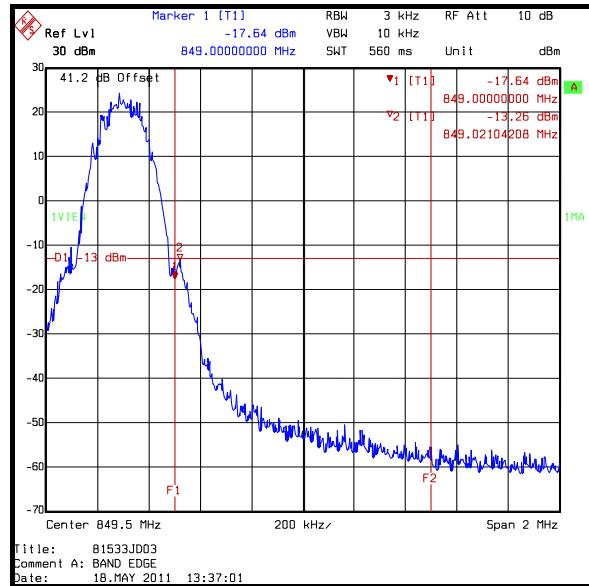
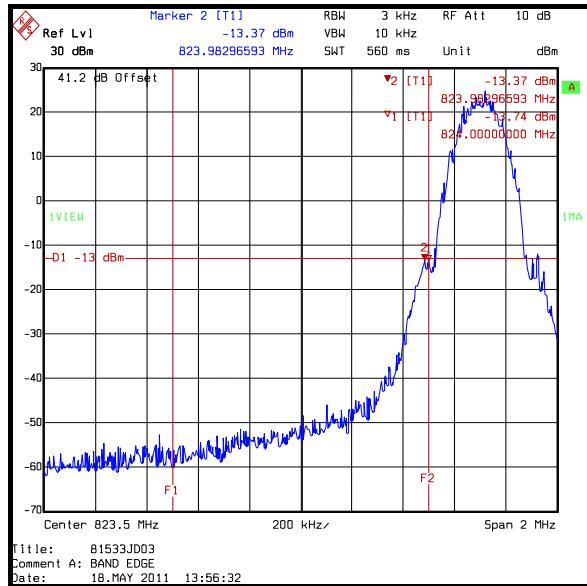
<b>FCC Part:</b>	2.1053 & 22.917
<b>Test Method Used:</b>	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Part 22.917

### **Environmental Conditions:**

Temperature (°C):	28
Relative Humidity (%):	26

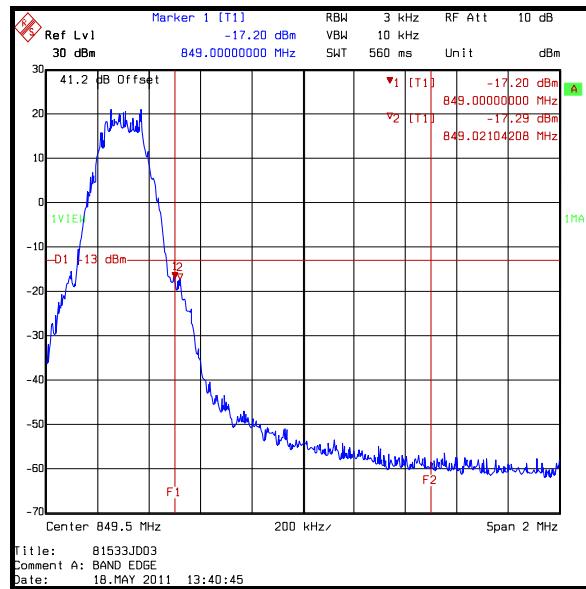
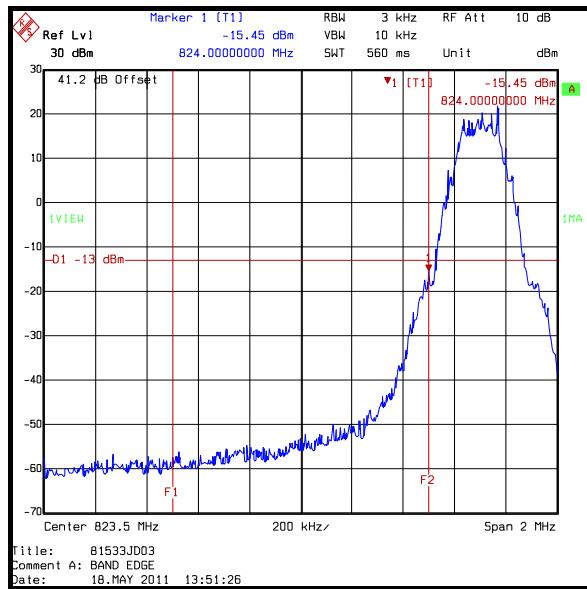
## Results: GSM Circuit Switched

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824.983	-13.4	-13.0	0.4	Complied
824.000	-13.7	-13.0	0.7	Complied
849.000	-17.6	-13.0	4.6	Complied
849.021	-13.3	-13.0	0.3	Complied



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

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824.000	-15.5	-13.0	2.5	Complied
849.000	-17.2	-13.0	4.1	Complied



### **5.3. Test Results – Part 24**

#### **5.3.1. Receiver/Idle Mode AC Conducted Spurious Emissions**

##### **Test Summary:**

<b>Test Engineer:</b>	Ian Watch	<b>Test Date:</b>	16 May 2011
<b>Test Sample Serial No:</b>	356333040014081		

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

##### **Environmental Conditions:**

<b>Temperature (°C):</b>	27
<b>Relative Humidity (%):</b>	21

##### **Results: Live - Quasi Peak**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.433500	Live	38.0	57.2	19.2	Complied
0.469500	Live	38.6	56.5	17.9	Complied
0.595500	Live	36.0	56.0	20.0	Complied
0.757500	Live	36.1	56.0	19.9	Complied
1.135500	Live	36.4	56.0	19.6	Complied
1.446000	Live	37.9	56.0	18.1	Complied
1.504500	Live	40.5	56.0	15.6	Complied
1.527000	Live	39.0	56.0	17.0	Complied
1.540500	Live	39.2	56.0	16.8	Complied
1.648500	Live	43.8	56.0	12.2	Complied
1.689000	Live	49.6	56.0	6.4	Complied

##### **Results: Live - Average**

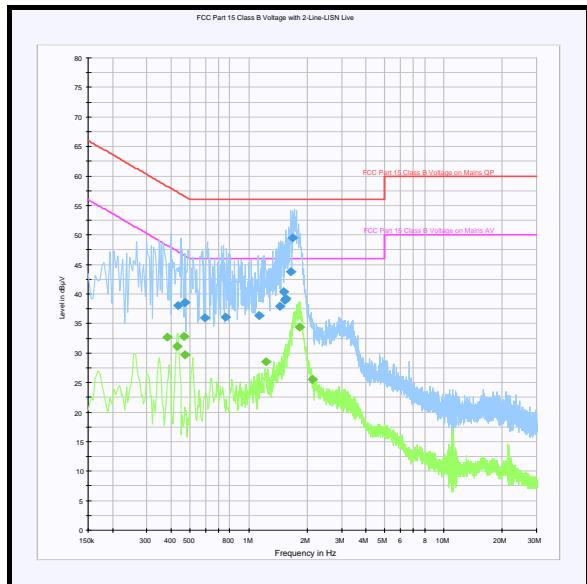
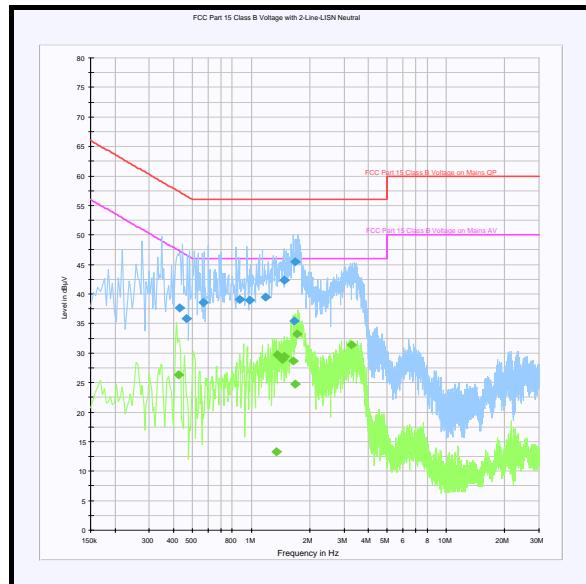
Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.379500	Live	32.7	48.3	15.6	Complied
0.429000	Live	31.1	47.3	16.2	Complied
0.465000	Live	32.9	46.6	13.7	Complied
0.469500	Live	29.7	46.5	16.8	Complied
1.221000	Live	28.6	46.0	17.4	Complied
1.819500	Live	34.4	46.0	11.6	Complied
2.112000	Live	25.6	46.0	20.4	Complied

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

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.429000	Neutral	37.7	57.3	19.6	Complied
0.465000	Neutral	35.9	56.6	20.7	Complied
0.568500	Neutral	38.5	56.0	17.5	Complied
0.874500	Neutral	39.1	56.0	16.9	Complied
0.987000	Neutral	39.0	56.0	17.0	Complied
1.180500	Neutral	39.5	56.0	16.5	Complied
1.482000	Neutral	42.3	56.0	13.7	Complied
1.666500	Neutral	35.4	56.0	20.6	Complied
1.689000	Neutral	45.4	56.0	10.6	Complied

**Results: Neutral - Average**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.424500	Neutral	26.3	47.4	21.1	Complied
1.347000	Neutral	13.3	46.0	32.7	Complied
1.365000	Neutral	29.7	46.0	16.3	Complied
1.441500	Neutral	28.9	46.0	17.1	Complied
1.482000	Neutral	29.4	46.0	16.6	Complied
1.635000	Neutral	28.6	46.0	17.4	Complied
1.689000	Neutral	24.7	46.0	21.3	Complied
1.725000	Neutral	33.2	46.0	12.8	Complied
3.255000	Neutral	31.4	46.0	14.6	Complied

**Receiver/Idle Mode AC Conducted Spurious Emissions (continued)****Live****Neutral**

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

**5.3.2. Receiver/Idle Mode Radiated Spurious Emissions****Test Summary:**

Test Engineer:	Patrick Jones	Test Date:	18 May 2011
Test Sample IMEI:	356333040014073		

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

**Environmental Conditions:**

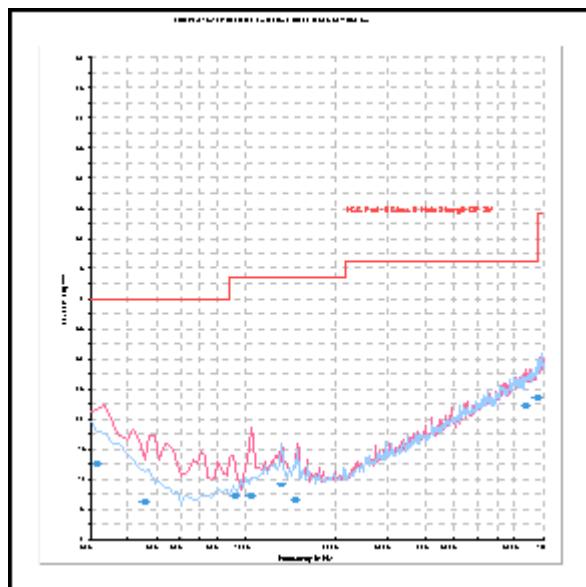
Temperature (°C):	30
Relative Humidity (%):	25

**Results: Quasi Peak**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
31.603	Vertical	12.7	40.0	27.3	Complied
45.701	Vertical	6.1	40.0	33.9	Complied
92.391	Vertical	7.1	43.5	36.4	Complied
103.786	Vertical	7.1	43.5	36.4	Complied
132.425	Vertical	9.1	43.5	34.4	Complied
147.485	Vertical	6.7	43.5	36.8	Complied
879.454	Vertical	22.1	46.0	23.9	Complied
958.298	Vertical	23.4	46.0	22.6	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 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:**

<b>Test Engineer:</b>	Tim Stanley	<b>Test Date:</b>	11 May 2011
<b>Test Sample IMEI:</b>	356333040014081		

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

**Environmental Conditions:**

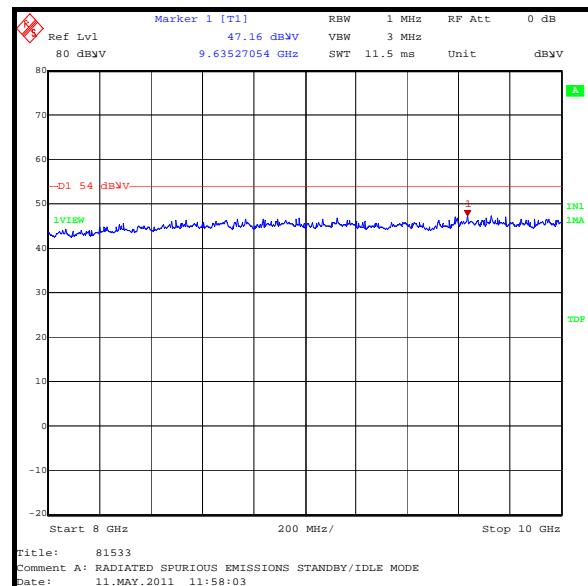
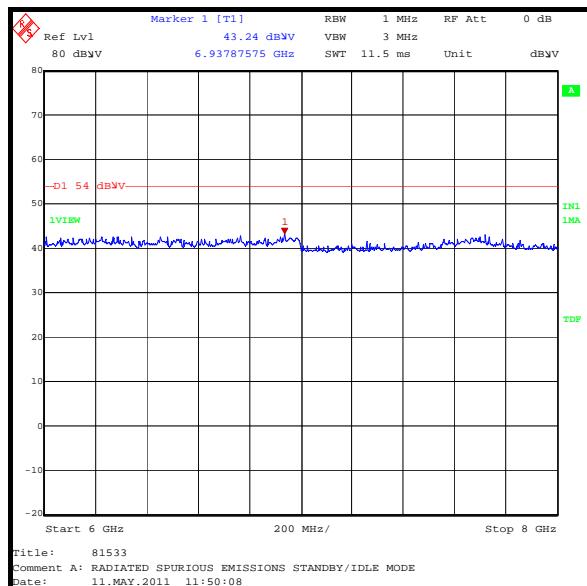
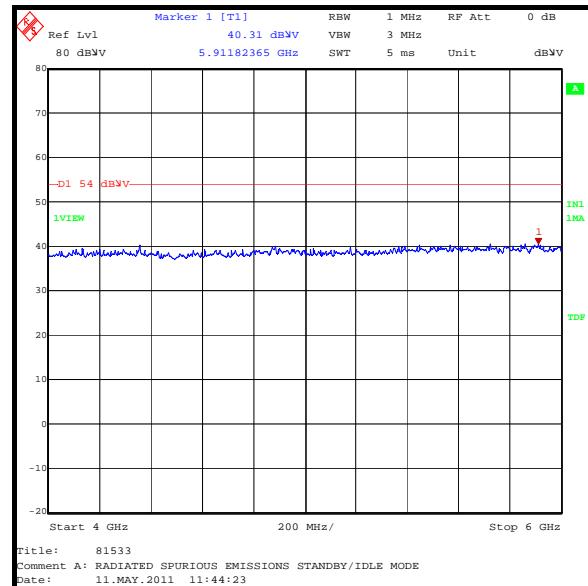
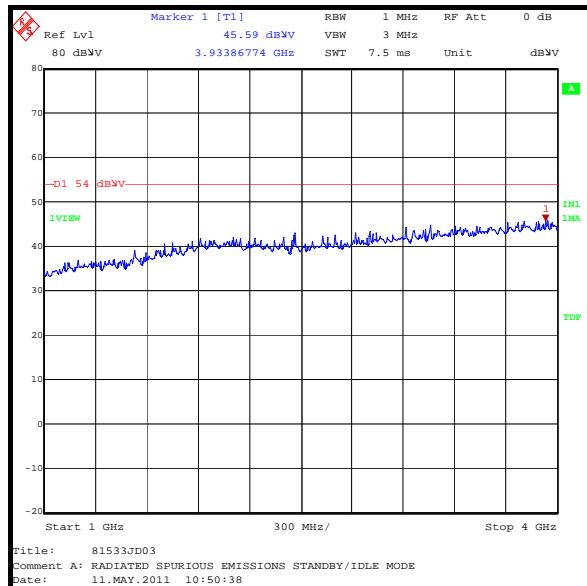
<b>Temperature (°C):</b>	26
<b>Relative Humidity (%):</b>	22

**Results:**

Frequency (MHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
9635.270	Vertical	47.2	54.0	6.8	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. 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:**

<b>Test Engineer:</b>	Tim Stanley	<b>Test Date:</b>	12 May 2011
<b>Test Sample IMEI:</b>	356333040014081		

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

**Environmental Conditions:**

<b>Temperature (°C):</b>	28
<b>Relative Humidity (%):</b>	19

**Results: GSM Circuit Switched**

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	26.7	33.0	6.3	Complied
Middle	1879.8	Vertical	26.4	33.0	6.6	Complied
Top	1909.8	Vertical	28.9	33.0	4.1	Complied

**Results: GPRS**

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	21.1	33.0	11.9	Complied
Middle	1879.8	Vertical	20.5	33.0	12.5	Complied
Top	1909.8	Vertical	23.1	33.0	9.9	Complied

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

<b>Test Engineer:</b>	Ian Watch	<b>Test Date:</b>	18 May 2011
<b>Test Sample IMEI:</b>	356333040014081		

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

**Environmental Conditions:**

<b>Temperature (°C):</b>	26
<b>Relative Humidity (%):</b>	28

**Results: GSM Circuit Switched**

Channel	Frequency (MHz)	Maximum Peak Conducted Power (dBm)	Maximum Average Conducted Power (dBm)
Bottom	1850.2	29.7	29.5
Middle	1879.8	29.7	29.5
Top	1909.8	29.6	29.5

**Results: GPRS**

Channel	Frequency (MHz)	Maximum Peak Conducted Power (dBm)	Maximum Average Conducted Power (dBm)
Bottom	1850.2	23.7	23.6
Middle	1879.8	23.7	23.5
Top	1909.8	24.0	23.8

**Note(s):**

- Conducted power tests were performed to support SAR tests.

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

<b>Test Engineer:</b>	Tim Stanley	<b>Test Date:</b>	13 May 2011 & 16 May 2011
<b>Test Sample IMEI:</b>	356333040014081		

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

**Environmental Conditions:**

<b>Ambient Temperature (°C):</b>	31
<b>Relative Humidity (%):</b>	18

**Results: Bottom Channel (1850.2 MHz)**

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	10	1850.200010	1850.0	0.200010	Complied
-20	37	1850.199963	1850.0	0.199963	Complied
-10	35	1850.199965	1850.0	0.199965	Complied
0	16	1850.199984	1850.0	0.199984	Complied
10	36	1850.199964	1850.0	0.199964	Complied
20	67	1850.199933	1850.0	0.199933	Complied
30	64	1850.199936	1850.0	0.199936	Complied
40	65	1850.199935	1850.0	0.199935	Complied
50	64	1850.199936	1850.0	0.199936	Complied

**Results: Top Channel (1909.8 MHz)**

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	4	1909.800004	1910.0	0.199996	Complied
-20	43	1909.799957	1910.0	0.200043	Complied
-10	8	1909.800008	1910.0	0.199992	Complied
0	70	1909.799930	1910.0	0.200070	Complied
10	70	1909.799930	1910.0	0.200070	Complied
20	71	1909.799929	1910.0	0.200071	Complied
30	69	1909.799931	1910.0	0.200069	Complied
40	65	1909.799935	1910.0	0.200065	Complied
50	71	1909.799929	1910.0	0.200071	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. Voltage was monitored throughout the test with a calibrated digital voltmeter.

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

<b>Test Engineer:</b>	Tim Stanley	<b>Test Date:</b>	16 May 2011
<b>Test Sample IMEI:</b>	356333040014081		

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

**Environmental Conditions:**

<b>Temperature (°C):</b>	20
<b>Relative Humidity (%):</b>	20

**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	68	1850.199932	1850.0	0.199932	Complies
4.2	69	1850.199931	1850.0	0.199931	Complies

**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	74	1909.799926	1910.0	0.200074	Complies
4.2	71	1909.799929	1910.0	0.200071	Complies

**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:**

<b>Test Engineer:</b>	Tim Stanley	<b>Test Date:</b>	10 May 2011
<b>Test Sample IMEI:</b>	356333040014081		

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

**Environmental Conditions:**

<b>Temperature (°C):</b>	27
<b>Relative Humidity (%):</b>	30

**Results: GSM Circuit Switched**

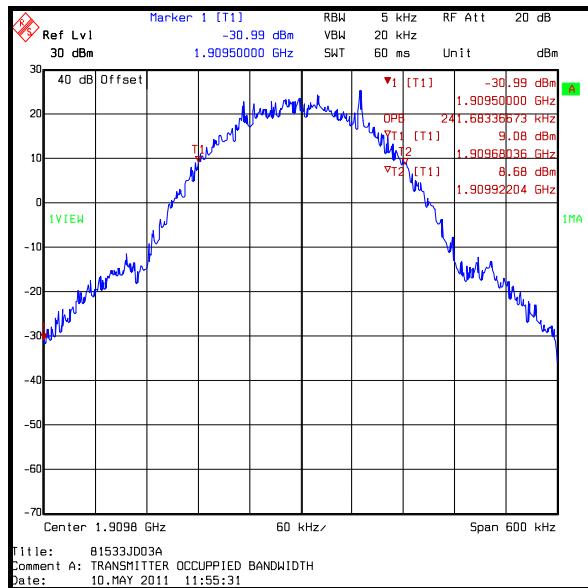
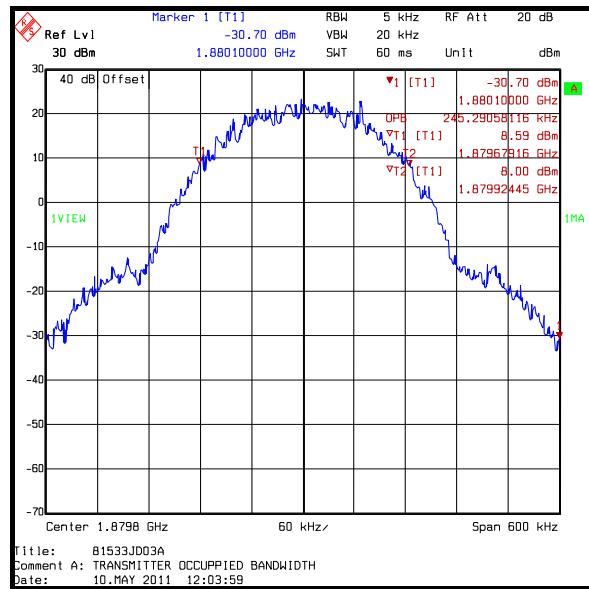
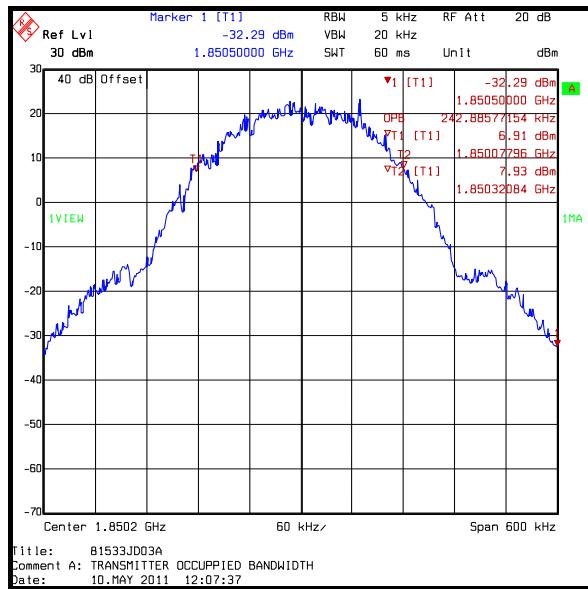
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	242.886
Middle	1879.8	245.291
Top	1909.8	241.683

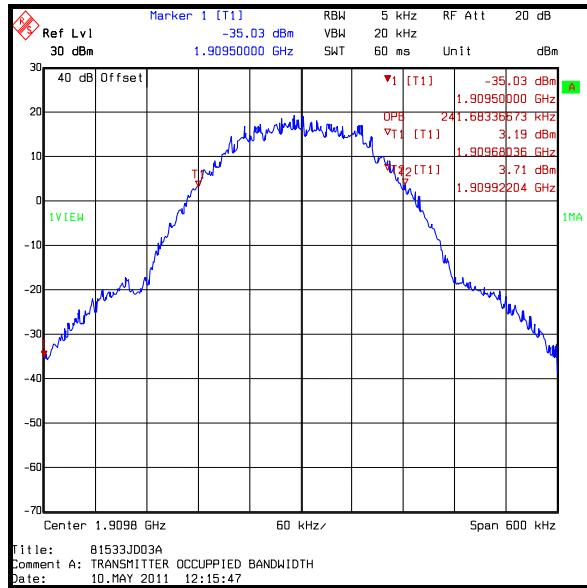
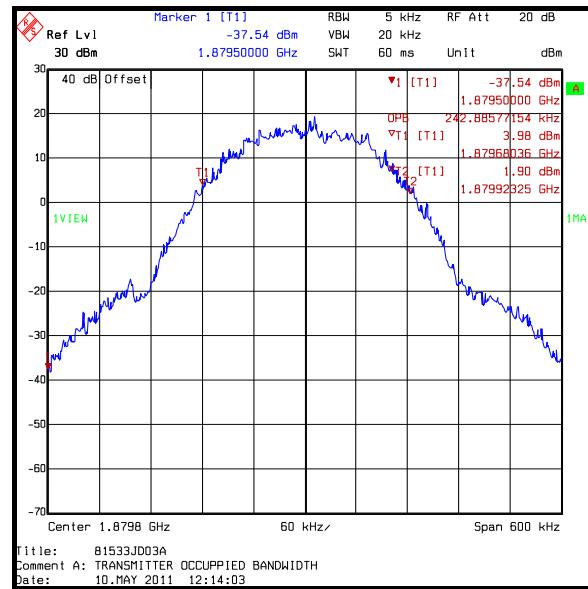
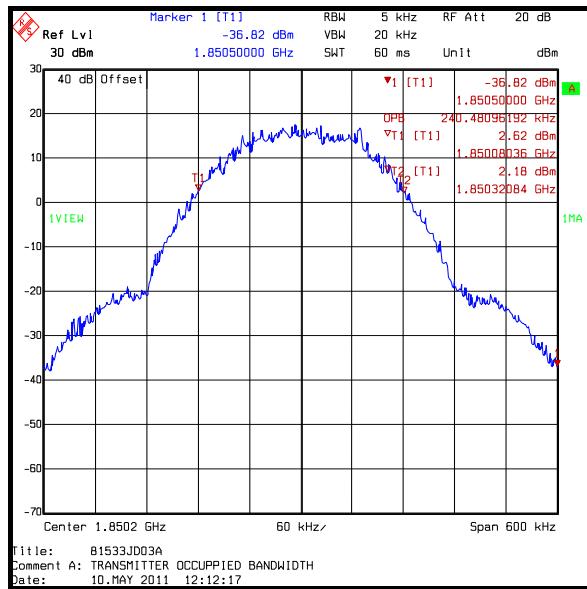
**Results: GPRS**

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	240.481
Middle	1879.8	242.886
Top	1909.8	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**

### **5.3.8. Transmitter Out of Band Radiated Emissions**

#### **Test Summary:**

<b>Test Engineer:</b>	Andrew Edwards & Nick Steele	<b>Test Date:</b>	23 May 2011 & 25 May 2011
<b>Test Sample IMEI:</b>	356333040014081		

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

#### **Environmental Conditions:**

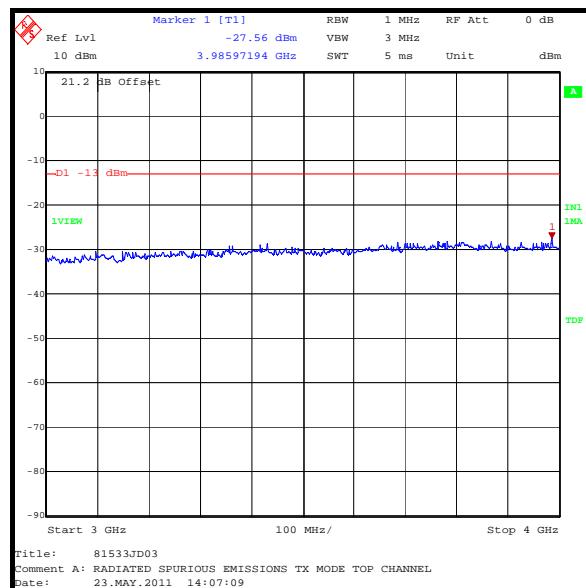
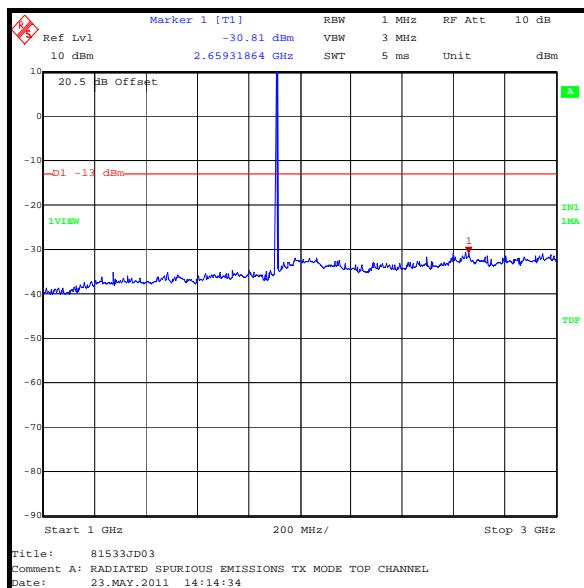
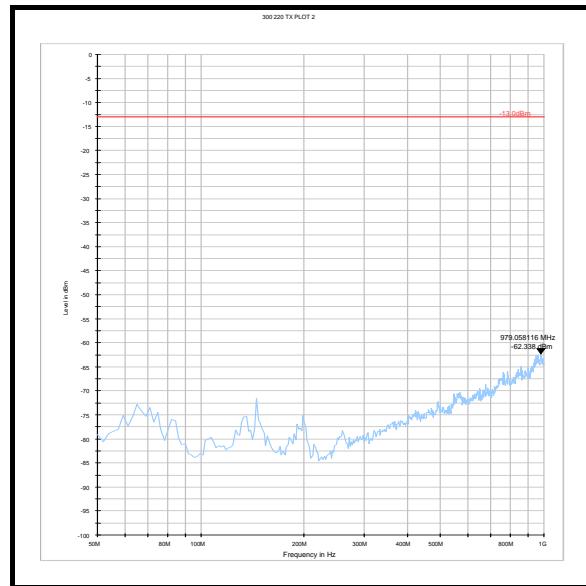
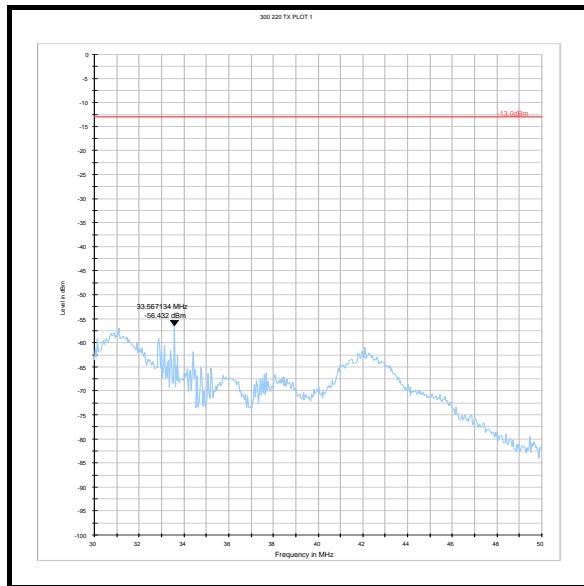
<b>Temperature (°C):</b>	26 to 28
<b>Relative Humidity (%):</b>	20 to 25

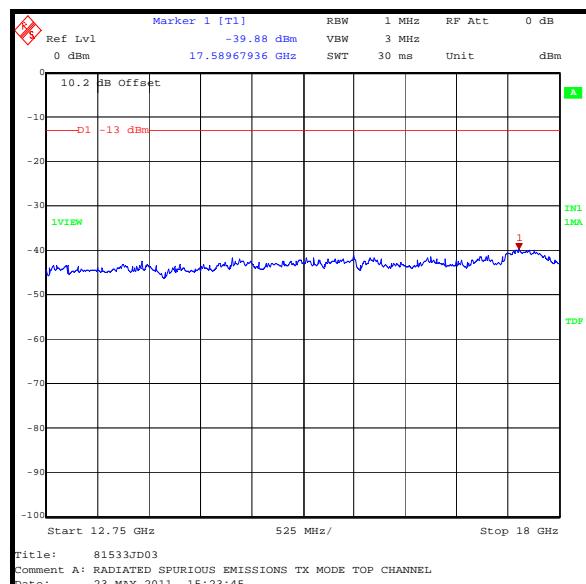
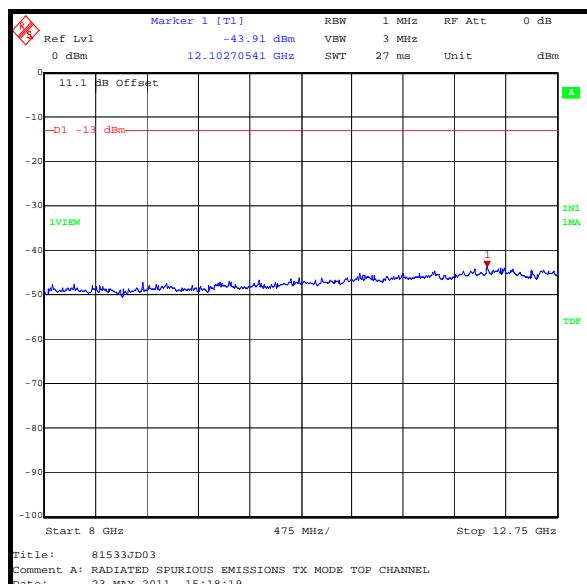
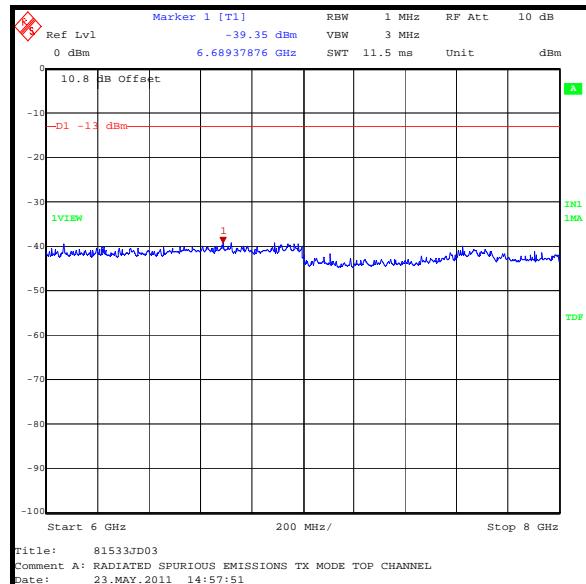
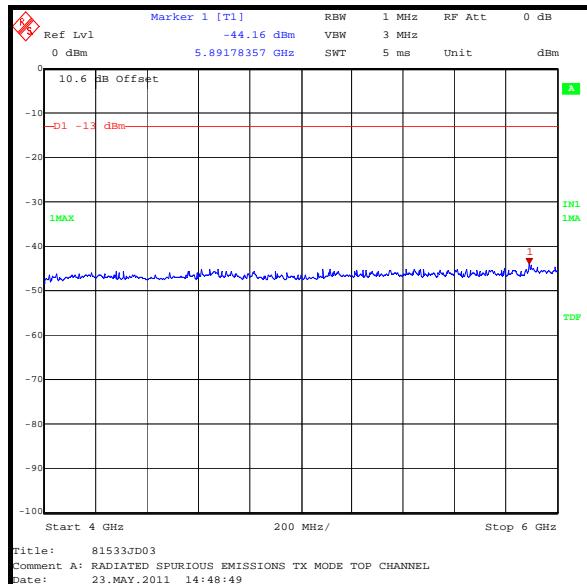
#### **Results:**

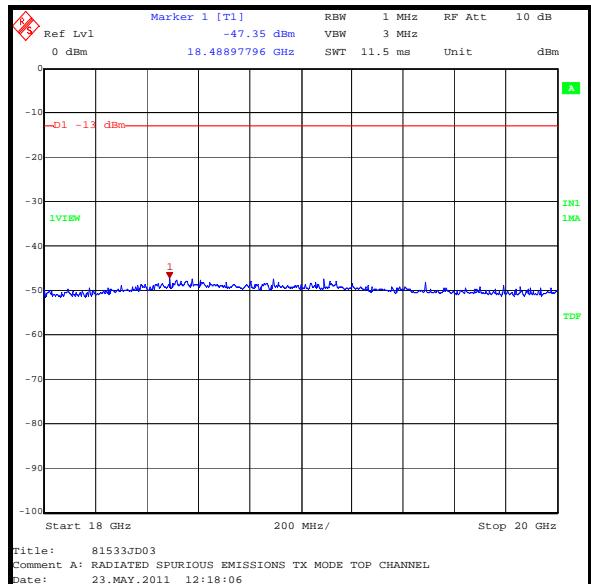
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
3985.972	-27.6	-13.0	14.6	Complied

#### **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. 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:**

<b>Test Engineer:</b>	Ian Watch	<b>Test Date:</b>	18 May 2011
<b>Test Sample IMEI:</b>	356333040014081		

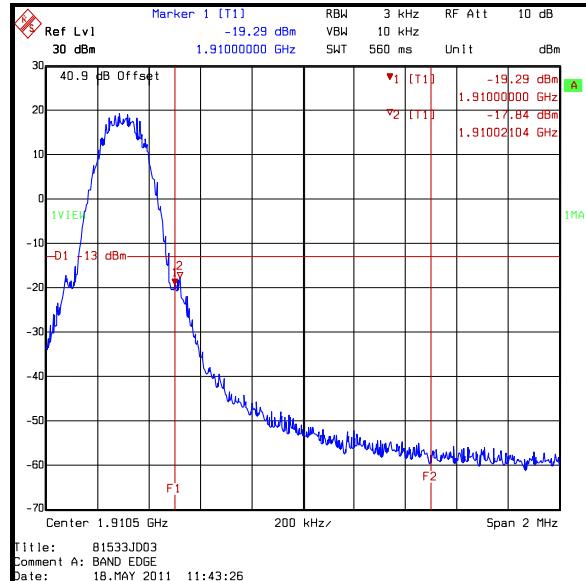
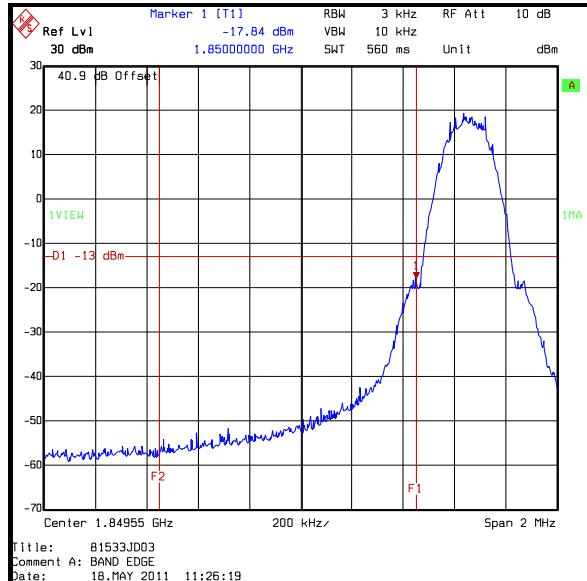
<b>FCC Part:</b>	2.1053 & 24.238
<b>Test Method Used:</b>	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Parts 2.1053 and 24.238

#### **Environmental Conditions:**

<b>Temperature (°C):</b>	26
<b>Relative Humidity (%):</b>	27

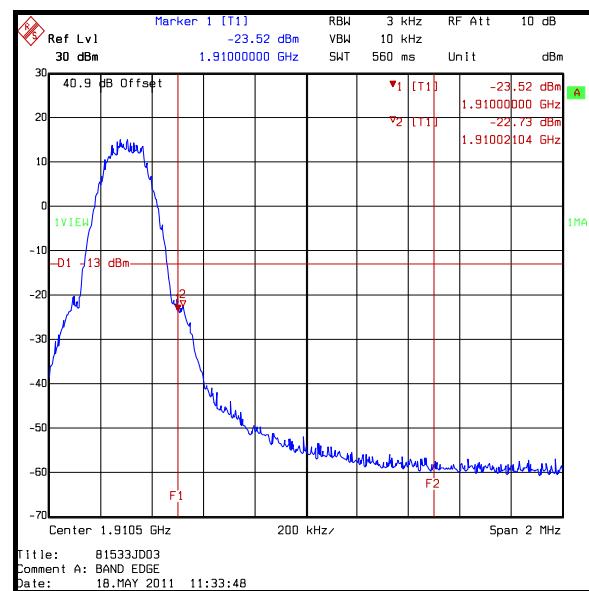
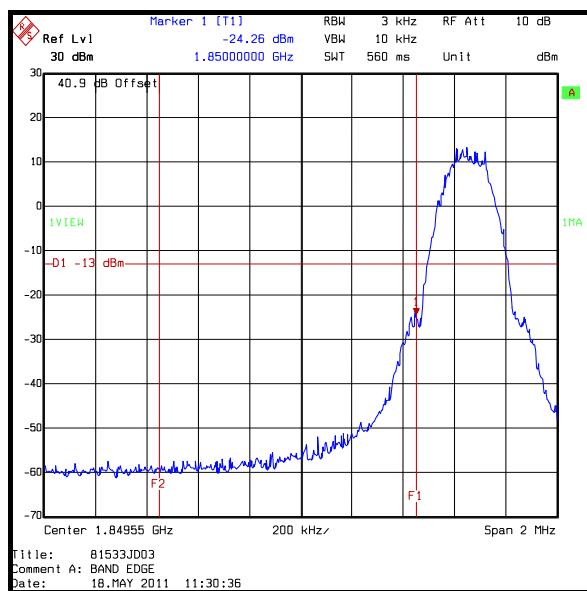
#### **Results: GSM Circuit Switched**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850.000	-17.8	-13.0	4.8	Complied
1910.000	-19.3	-13.0	6.3	Complied
1910.021	-17.8	-13.0	4.8	Complied



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

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850.000	-24.3	-13.0	11.3	Complied
1910.000	-23.5	-13.0	10.5	Complied
1910.021	-22.7	-13.0	9.7	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
A1510	Attenuator	Narda	4002	0579	18 Mar 2012	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	06 Jun 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
A1974	High Pass Filter	AtlanTecRF	AFH-01000	090000283	29 Dec 2011	12
A1996	Attenuator	Huber + Suhner AG	6810.17.B	301749	09 Feb 2012	12
A1999	Attenuator	Huber + Suhner AG	6820.17.B	07101	18 Mar 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
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	-
G040	Signal Generator	Rohde & Schwarz	SMY 02	841 070/004	16 Jun 2012	24
G0543	Amplifier	Sonoma Instrument	310N	230801	30 Jun 2011	12
K0001	5m Semi-Anechoic Chamber	Rainford EMC	N/A	N/A	25 Jun 2011	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
M1242	Spectrum Analyser	Rohde & Schwarz	FSEM30	845986/022	03 Dec 2011	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	28 Jun 2011	12
M1269	Multimeter	Fluke	179	90250210	15 Jul 2011	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	15 Sep 2011	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	04 Feb 2012	12
S0537	DC Power Supply	TTI	EL302D	249928	Calibrated before use	-

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