TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: SoftBank EB-3236

FCC ID: UCE211047A

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

Test Report Serial No.:
RFI-RPT-RP85037JD01D

This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals:	
Checked By:	Ian Watch
Signature:	
Date of Issue:	31 January 2012

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1. Customer Information

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

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR22
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 22 Subpart H (Public Mobile Services)
Specification Reference:	47CFR24
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 24 Subpart E (Personal Communication Services)
Specification Reference:	47CFR15.107 and 47CFR15.109
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart B (Unintentional Radiators) - Sections 15.107 and 15.109
Site Registration:	209735
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH
Test Dates:	05 January 2012 to 20 January 2012

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 2.1055/22.355	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 2.1055/24.235	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		

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:	EB-3236
IMEI:	004401221182088 *(Radiated sample #1)* 004401221182070 *(Radiated sample #2)* 004401221182286 *(Conducted RF port sample)*
Hardware Version Number:	Rev C
Software Version Number:	ACPU: sbm-07-0192 CCPU: R1B_1_EC02_01_S02
FCC ID:	UCE211047A

Brand Name:	SoftBank
Description:	AC Charger
Model Name or Number:	PMCBD1
Hardware Version Number:	N0JZZY000007

Brand Name:	SoftBank
Description:	Charge/USB Data cable
Model Name or Number:	Not marked or stated

Brand Name:	SoftBank
Description:	Personal Hands-Free
Model Name or Number:	Not marked or stated

3.2. Description of EUT

The equipment under test was a dual mode UMTS/GSM Mobile Phone with WLAN, *Bluetooth* and RFID.

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/EGPRS		
Modulation Type:	GMSK / 8PSK		
Channel Spacing:	200 kHz		
Power Supply Requirement(s):	Nominal	3.8 V	
	Minimum	3.4 V	
	Maximum	4.35 V	
Technology Tested:	GSM850		
Maximum Output Power (ERP):	GSM	30.7 dBm	
	GPRS	30.7 dBm	
	EGPRS	30.5 dBm	
Transmit Frequency Range:	824 to 849 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	128	824.2
	Middle	190	836.6
	Top	251	848.8
Receive Frequency Range:	869 to 894 MHz		
Receive Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	128	869.2
	Middle	190	881.6
	Top	251	893.8

Additional Information Related to Testing (continued)

Technology Tested:	PCS1900		
Maximum Output Power (EIRP):	GSM	27.3 dBm	
	GPRS	27.4 dBm	
	EGPRS	26.4 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

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, GPRS and EGPRS Multislot Class 12 with the unit transmitting on one timeslot in the uplink.
- EGPRS tests were performed with the EUT using MCS5.
- 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):

- Idle mode and transmitter mode radiated spurious emissions tests were performed with the AC charger and Personal Hands-Free connected to the EUT.
- The conducted sample with IMEI 004401221182286 was used for frequency stability and occupied bandwidth measurements.
- The radiated sample with IMEI 004401221182088 was used for ERP, EIRP, radiated transmitter spurious emission and radiated band edge measurements.
- The radiated sample with IMEI 004401221182070 was used for all other measurements.
- Connected to a GSM/GPRS/EGPRS system simulator, operating in transceiver mode.

5. Measurements, Examinations and Derived Results

5.1. General Comments

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section 6. Measurement Uncertainty* for details.

5.2. Test Results - Part 22

5.2.1. Receiver/Idle Mode AC Conducted Spurious Emissions

Test Summary:

Test Engineer:	Sarah Williams	**Test Date:**	16 January 2012
Test Sample IMEI:	004401221182070		

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

Environmental Conditions:

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

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.407	Live	38.2	57.7	19.5	Complied
0.528	Live	31.3	56.0	24.7	Complied
0.798	Live	35.3	56.0	20.7	Complied
0.960	Live	34.1	56.0	21.9	Complied
1.617	Live	35.6	56.0	20.4	Complied
2.108	Live	34.0	56.0	22.0	Complied

Results: Live / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.389	Live	30.4	48.1	17.7	Complied
1.307	Live	24.8	46.0	21.2	Complied
1.496	Live	28.3	46.0	17.7	Complied
1.496	Live	29.3	46.0	16.7	Complied
1.676	Live	25.4	46.0	20.6	Complied
1.973	Live	25.5	46.0	20.5	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions (continued)

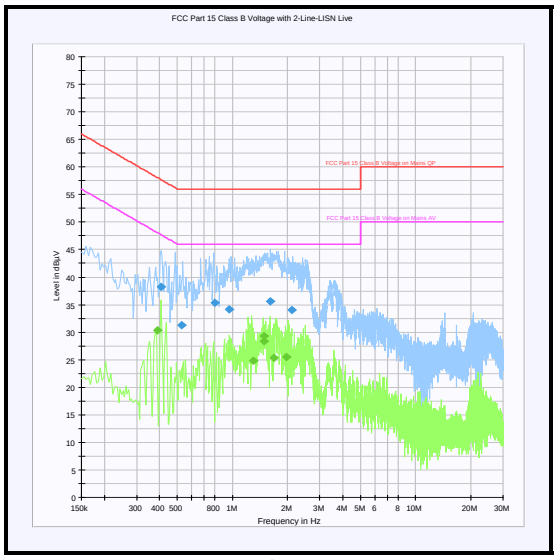
Results: Neutral / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
1.226	Neutral	30.9	56.0	25.1	Complied
1.487	Neutral	32.1	56.0	23.9	Complied
1.617	Neutral	33.1	56.0	22.9	Complied
1.649	Neutral	33.4	56.0	22.6	Complied
2.036	Neutral	33.9	56.0	22.1	Complied
2.108	Neutral	34.0	56.0	22.0	Complied

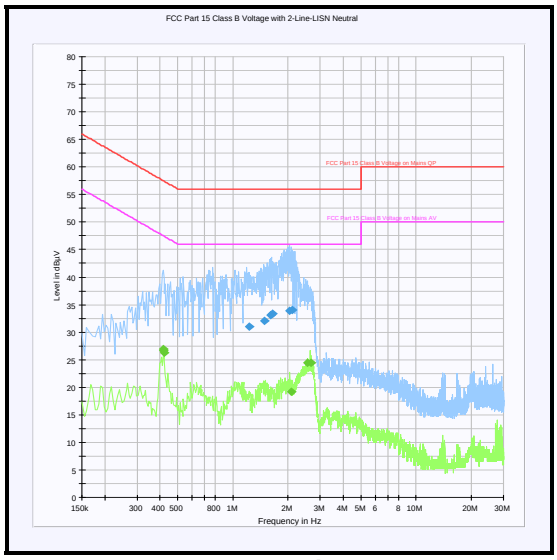
Results: Neutral / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.416	Neutral	26.7	47.5	20.8	Complied
0.416	Neutral	26.9	47.5	20.6	Complied
0.420	Neutral	26.3	47.4	21.2	Complied
2.076	Neutral	19.1	46.0	26.9	Complied
2.567	Neutral	24.4	46.0	21.6	Complied
2.666	Neutral	24.5	46.0	21.5	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:**	06 January 2012
Test Sample IMEI:	004401221182088		

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):	23
Relative Humidity (%):	26

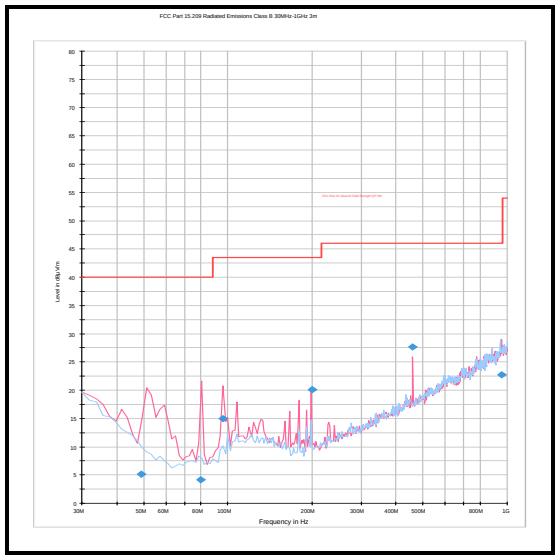
Results: Quasi Peak

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
49.002	Vertical	5.1	40.0	34.9	Complied
80.007	Vertical	4.1	40.0	35.9	Complied
96.039	Vertical	14.9	43.5	28.6	Complied
199.998	Vertical	20.1	43.5	23.4	Complied
458.777	Vertical	27.7	46.0	18.3	Complied
955.401	Vertical	22.7	46.0	23.3	Complied

Note(s):

1. The final measured value, for the given emission in the table above, incorporates the calibrated antenna factor and cable loss.
2. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Receiver/Idle Mode Radiated Spurious Emissions (continued)



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

Receiver/Idle Mode Radiated Spurious Emissions (continued)

Test Summary:

Test Engineer:	Mark Percival	**Test Date:**	05 January 2012
Test Sample IMEI:	004401221182070		

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):	21
Relative Humidity (%):	35

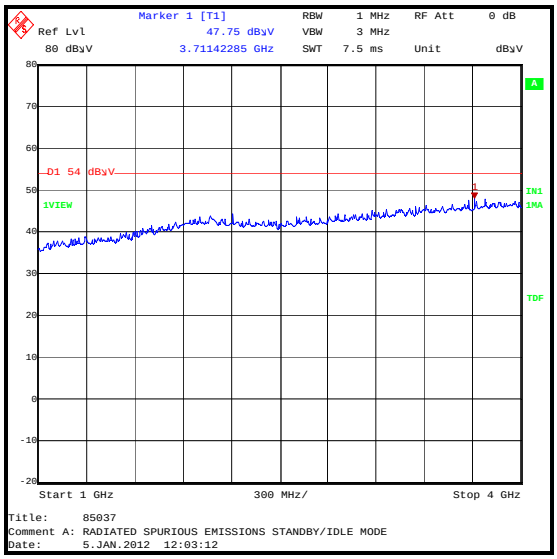
Results:

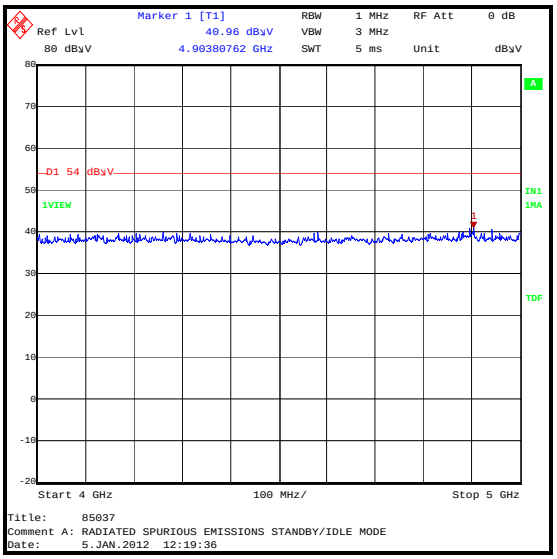
Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
3711.423	Vertical	47.8	54.0	6.2	Complied

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:	Andrew Edwards	**Test Date:**	20 January 2012
Test Sample IMEI:	004401221182088		

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):	24
Relative Humidity (%):	21

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Horizontal	29.7	38.45	8.75	Complied
Middle	836.6	Horizontal	30.7	38.45	7.75	Complied
Top	848.8	Horizontal	30.7	38.45	7.75	Complied

Results: GPRS

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Horizontal	29.7	38.45	8.75	Complied
Middle	836.6	Horizontal	30.7	38.45	7.75	Complied
Top	848.8	Horizontal	30.7	38.45	7.75	Complied

Results: EGPRS / MCS5

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Horizontal	28.4	38.45	10.05	Complied
Middle	836.6	Horizontal	29.2	38.45	9.25	Complied
Top	848.8	Horizontal	30.5	38.45	7.95	Complied

5.2.4. Transmitter Frequency Stability (Temperature Variation)

Test Summary:

Test Engineer:	David Doyle	**Test Date:**	12 January 2012
Test Sample IMEI:	004401221182286		

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):	22
Ambient Relative Humidity (%):	27

Results: Middle Channel (836.6 MHz)

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	836.599971	29	0.0347	2.5	2.4653	Complied
-20	836.599964	36	0.0430	2.5	2.4570	Complied
-10	836.599977	23	0.0275	2.5	2.4725	Complied
0	836.599986	14	0.0167	2.5	2.4833	Complied
10	836.599969	31	0.0371	2.5	2.4629	Complied
20	836.599963	37	0.0442	2.5	2.4558	Complied
30	836.599973	27	0.0323	2.5	2.4677	Complied
40	836.600029	29	0.0347	2.5	2.4653	Complied
50	836.600034	34	0.0406	2.5	2.4594	Complied

Note(s):

1. A dummy battery was fitted to 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.

5.2.5. Transmitter Frequency Stability (Voltage Variation)

Test Summary:

Test Engineer:	David Doyle	**Test Date:**	12 January 2012
Test Sample IMEI:	004401221182286		

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 (%):	27

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	836.600024	24	0.0287	2.5	2.4713	Complied
4.35	836.599967	33	0.0394	2.5	2.4606	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 Occupied Bandwidth

Test Summary:

Test Engineer:	David Doyle	**Test Date:**	13 January 2012 & 17 January 2012
Test Sample IMEI:	004401221182286		

FCC Part:	2.1049
Test Method Used:	The 99% occupied bandwidth was measured using the Occupied Bandwidth function of a spectrum analyser

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	22

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	824.2	246.493
Middle	836.6	242.886
Top	848.8	241.683

Results: GPRS

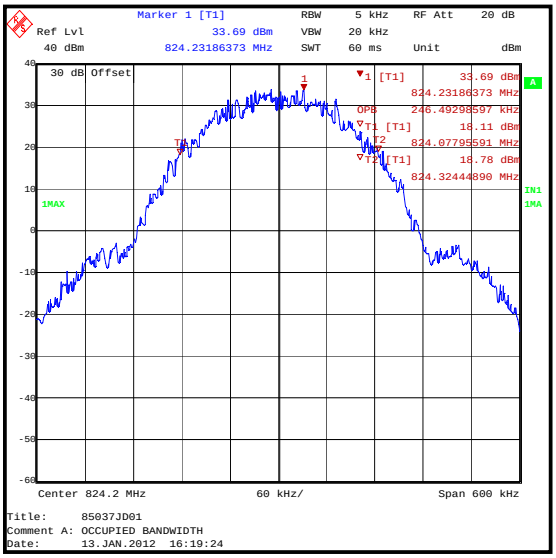
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	824.2	240.481
Middle	836.6	240.481
Top	848.8	242.886

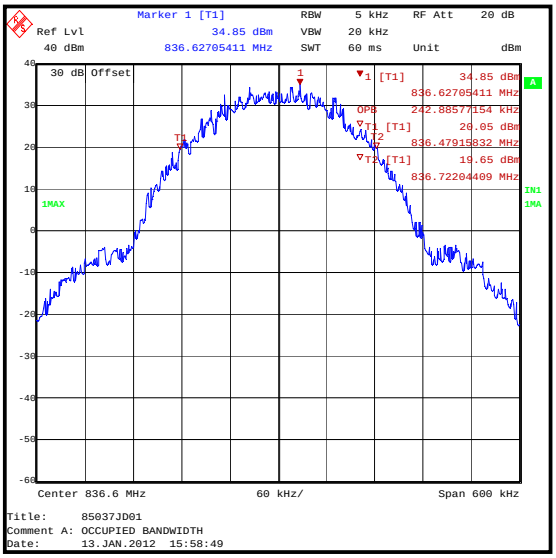
Results: EGPRS / MCS5

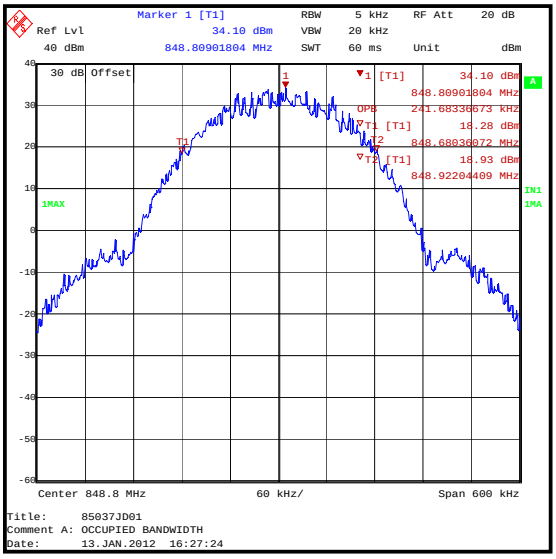
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	824.2	232.064
Middle	836.6	239.279
Top	848.8	236.874

Transmitter Occupied Bandwidth (continued)

GSM Circuit Switched

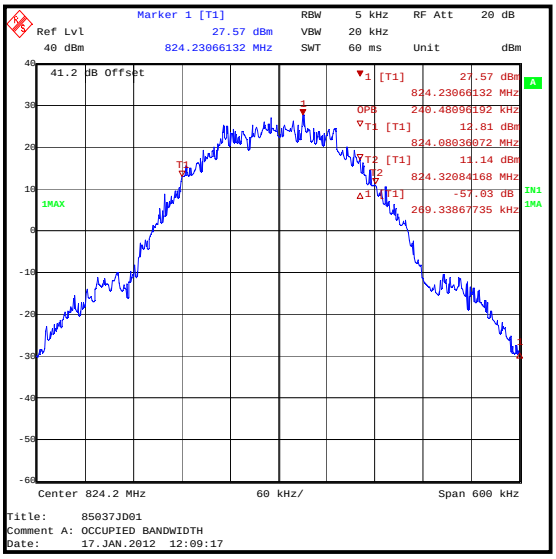


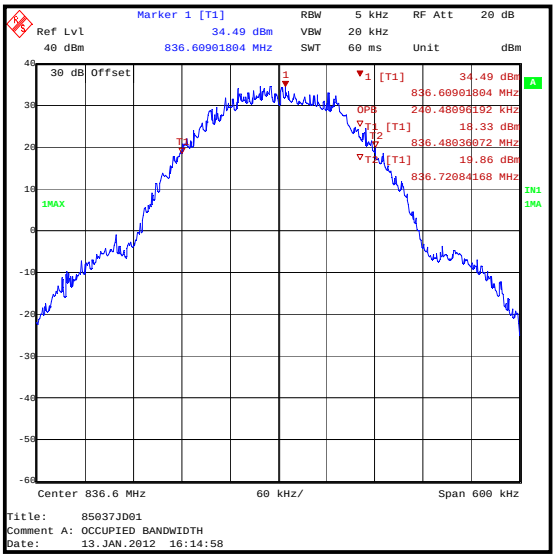


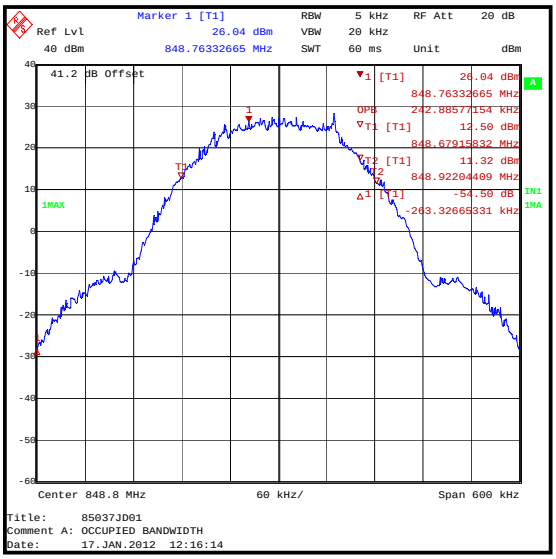


Transmitter Occupied Bandwidth (continued)

GPRS

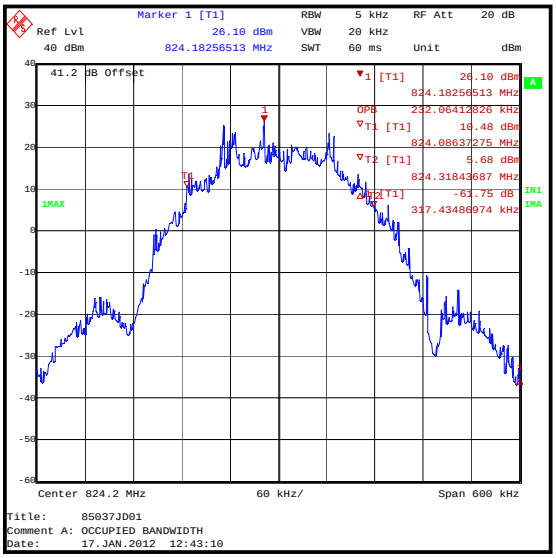


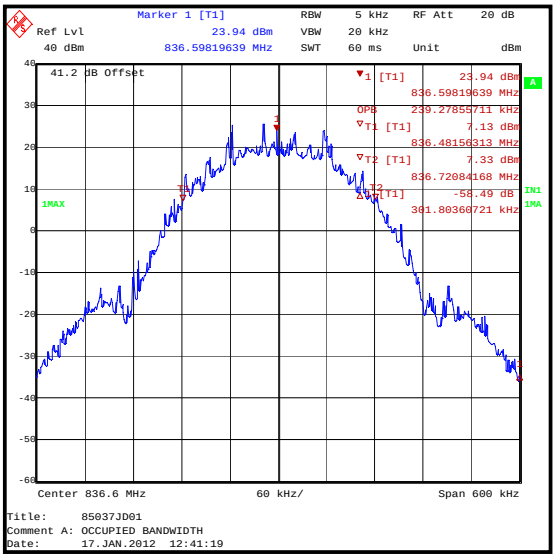


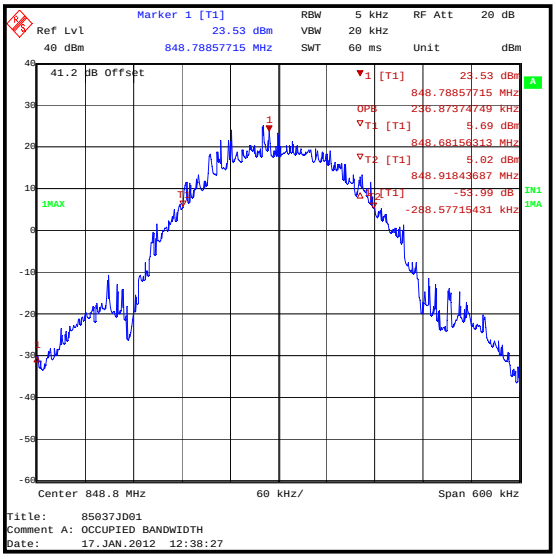


Transmitter Occupied Bandwidth (continued)

EGPRS / MCS5







5.2.7. Transmitter Out of Band Radiated Emissions

Test Summary:

Test Engineer:	Nick Steele	**Test Dates:**	05 January 2012 & 06 January 2012
Test Sample IMEI:	004401221182088		

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):	23
Relative Humidity (%):	23

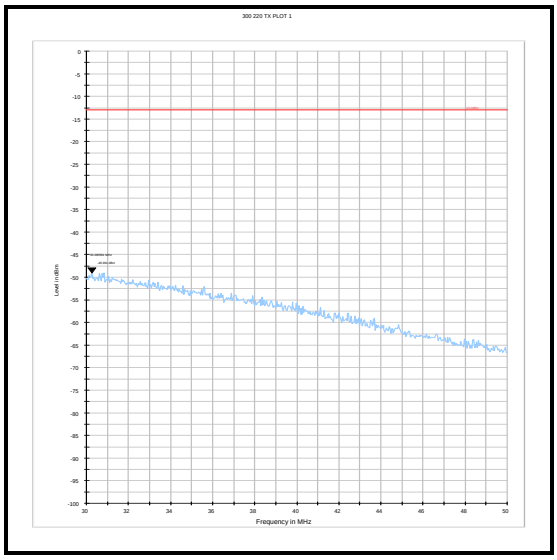
Results:

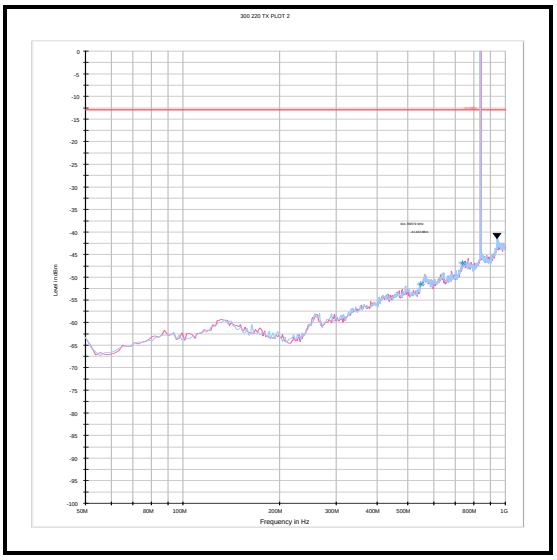
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
8967.936	-34.3	-13.0	21.3	Complied

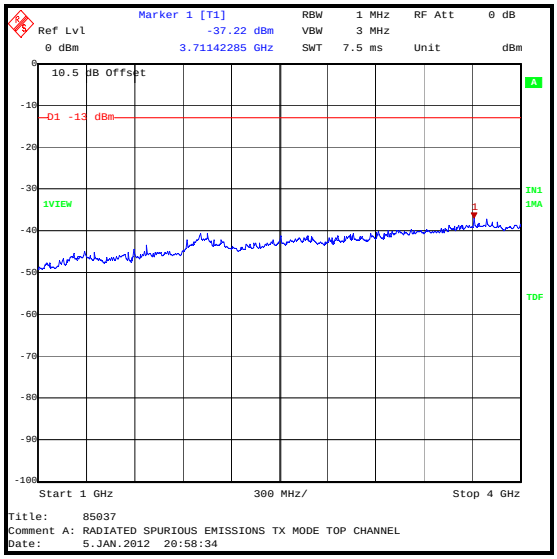
Note(s):

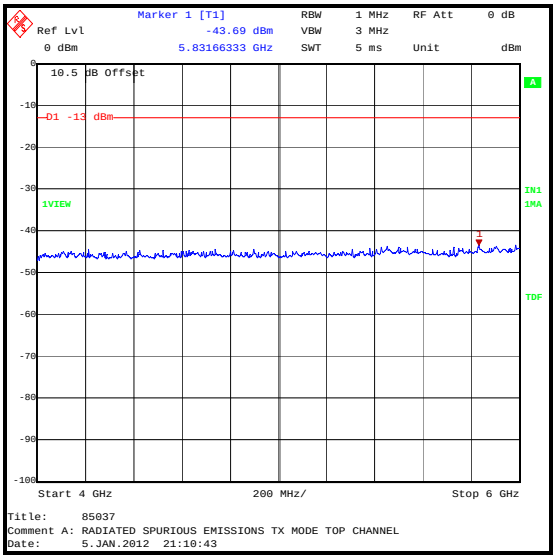
1. No spurious emissions were detected above the noise floor of the measuring receiver; the highest peak noise floor reading of the measuring receiver was recorded.
2. The uplink traffic channel is shown on the 30 MHz to 1 GHz plot.
3. Pre-scans above 1 GHz were performed in a fully anechoic chamber (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.

Transmitter Out of Band Radiated Emissions (continued)

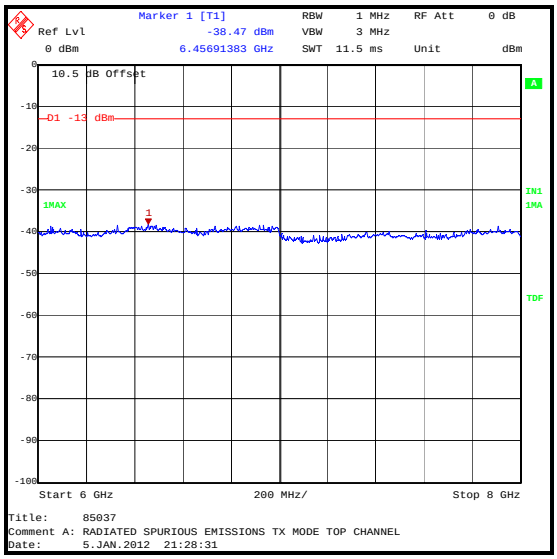


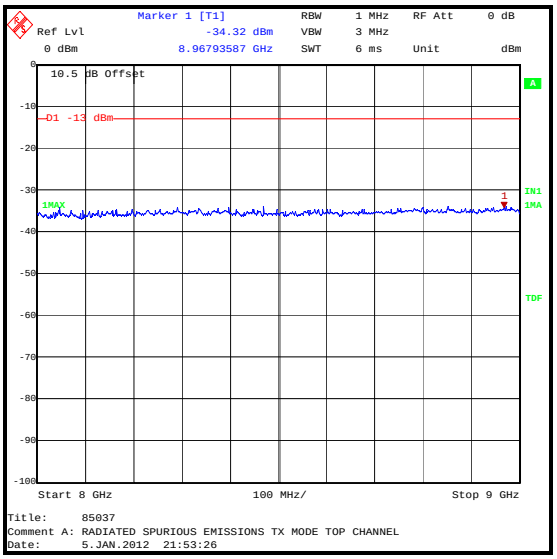






Transmitter Out of Band Radiated Emissions (continued)





5.2.8. Transmitter Radiated Emissions at Band Edges

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	05 January 2012
Test Sample IMEI:	004401221182088		

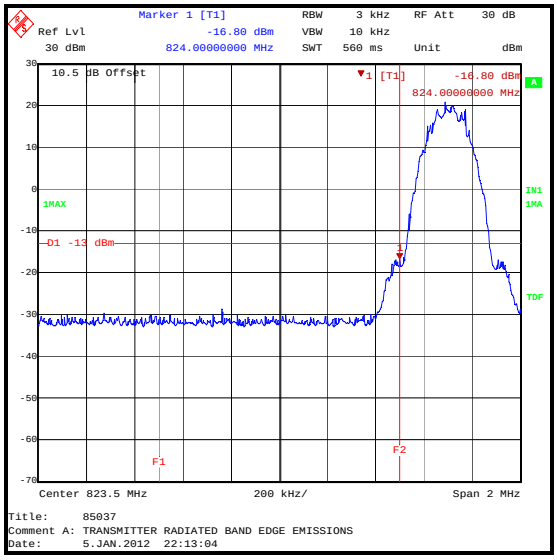
FCC Part:	2.1053 & 22.917
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Part 22.917

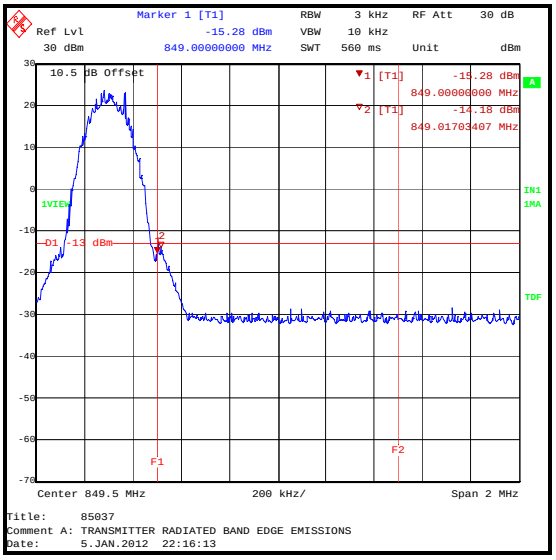
Environmental Conditions:

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

Results: GSM Circuit Switched

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-16.8	-13.0	3.8	Complied
849	-15.3	-13.0	2.3	Complied
849.017	-14.2	-13.0	1.2	Complied

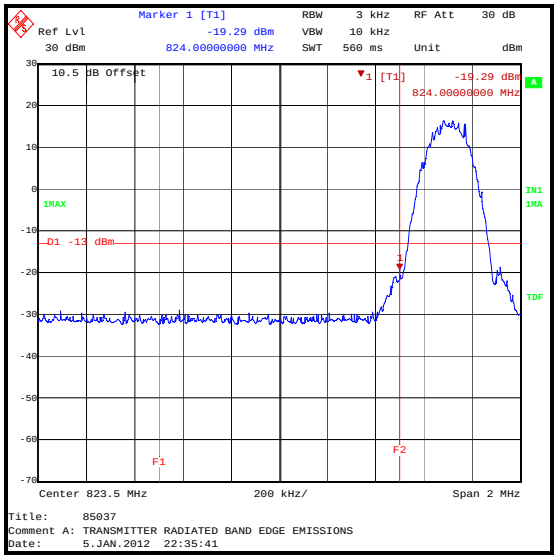


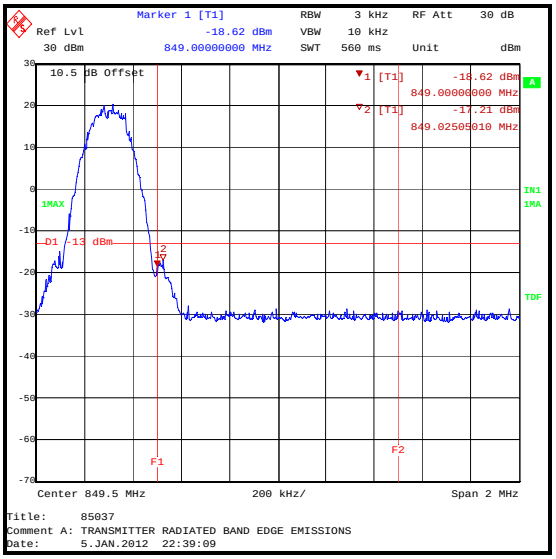


Transmitter Band Edge Radiated Emissions (continued)

Results: GPRS

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-19.3	-13.0	6.3	Complied
849	-18.6	-13.0	5.6	Complied
849.025	-17.2	-13.0	4.2	Complied

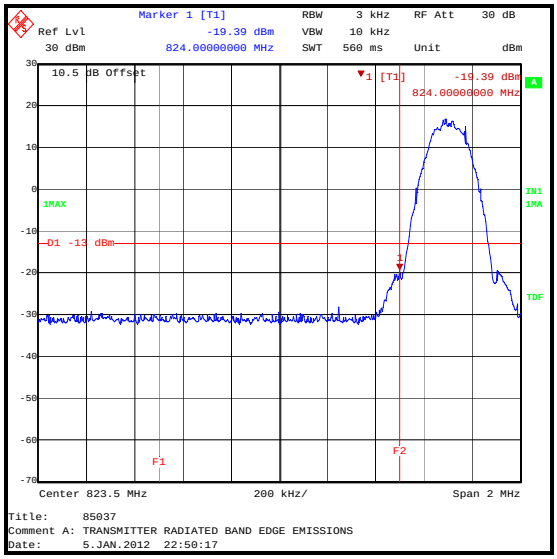


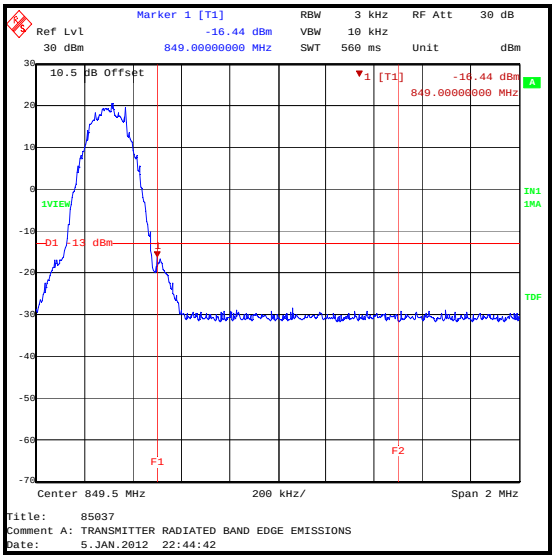


Transmitter Band Edge Radiated Emissions (continued)

Results: EGPRS / MCS5

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-19.4	-13.0	6.4	Complied
849	-16.4	-13.0	3.4	Complied





5.3. Test Results - Part 24

5.3.1. Receiver/Idle Mode AC Conducted Spurious Emissions

Test Summary:

Test Engineer:	Sarah Williams	**Test Date:**	16 January 2012
Test Sample IMEI:	004401221182070		

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

Environmental Conditions:

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

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.407	Live	38.2	57.7	19.5	Complied
0.528	Live	31.3	56.0	24.7	Complied
0.798	Live	35.3	56.0	20.7	Complied
0.960	Live	34.1	56.0	21.9	Complied
1.617	Live	35.6	56.0	20.4	Complied
2.108	Live	34.0	56.0	22.0	Complied

Results: Live / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.389	Live	30.4	48.1	17.7	Complied
1.307	Live	24.8	46.0	21.2	Complied
1.496	Live	28.3	46.0	17.7	Complied
1.496	Live	29.3	46.0	16.7	Complied
1.676	Live	25.4	46.0	20.6	Complied
1.973	Live	25.5	46.0	20.5	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions (continued)

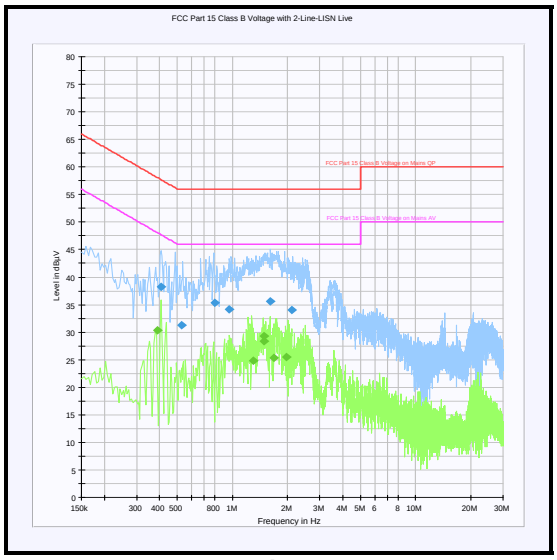
Results: Neutral / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
1.226	Neutral	30.9	56.0	25.1	Complied
1.487	Neutral	32.1	56.0	23.9	Complied
1.617	Neutral	33.1	56.0	22.9	Complied
1.649	Neutral	33.4	56.0	22.6	Complied
2.036	Neutral	33.9	56.0	22.1	Complied
2.108	Neutral	34.0	56.0	22.0	Complied

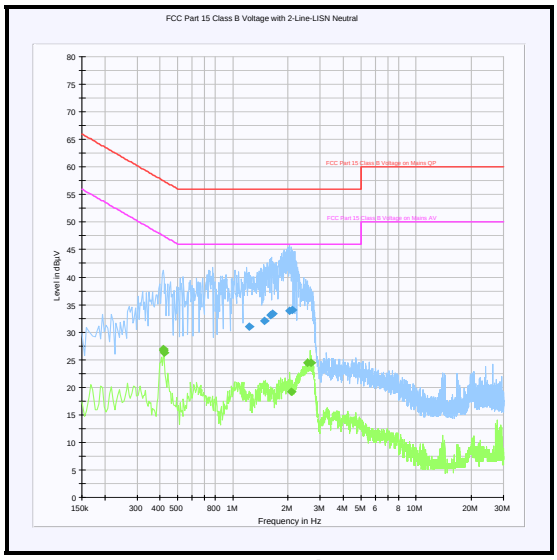
Results: Neutral / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.416	Neutral	26.7	47.5	20.8	Complied
0.416	Neutral	26.9	47.5	20.6	Complied
0.420	Neutral	26.3	47.4	21.2	Complied
2.076	Neutral	19.1	46.0	26.9	Complied
2.567	Neutral	24.4	46.0	21.6	Complied
2.666	Neutral	24.5	46.0	21.5	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:**	06 January 2012
Test Sample IMEI:	004401221182088		

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):	23
Relative Humidity (%):	26

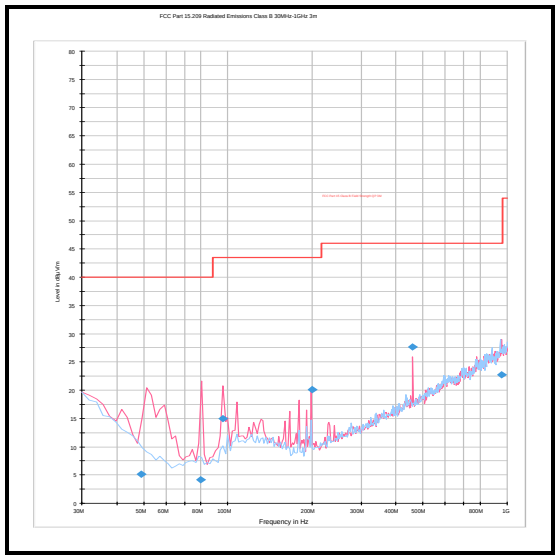
Results:

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
49.002	Vertical	5.1	40.0	34.9	Complied
80.007	Vertical	4.1	40.0	35.9	Complied
96.039	Vertical	14.9	43.5	28.6	Complied
199.998	Vertical	20.1	43.5	23.4	Complied
458.777	Vertical	27.7	46.0	18.3	Complied
955.401	Vertical	22.7	46.0	23.3	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Receiver/Idle Mode Radiated Spurious Emissions (continued)



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

Receiver/Idle Mode Radiated Spurious Emissions (continued)

Test Summary:

Test Engineer:	Mark Percival	**Test Date:**	05 January 2012
Test Sample IMEI:	004401221182070		

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):	21
Relative Humidity (%):	35

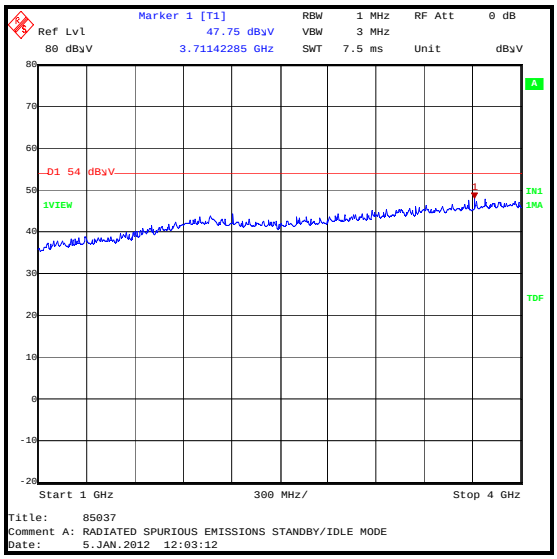
Results:

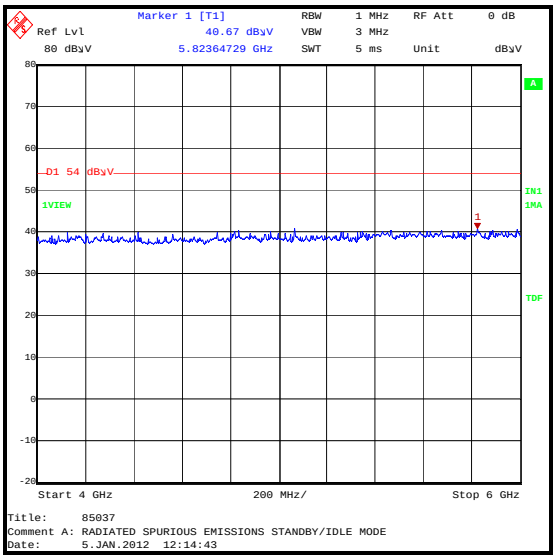
Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
3711.423	Horizontal	47.8	54.0	6.2	Complied

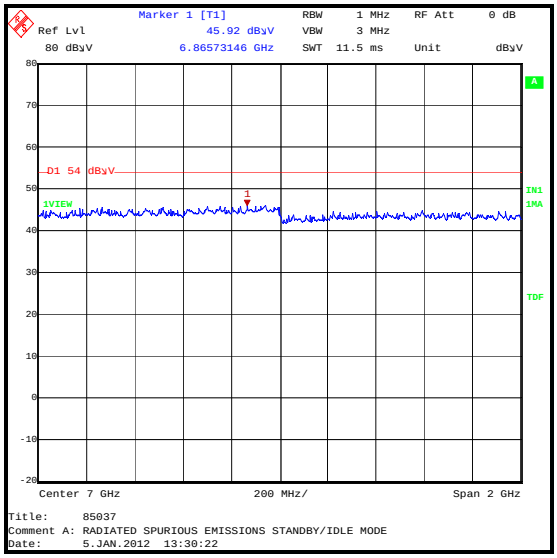
Note(s):

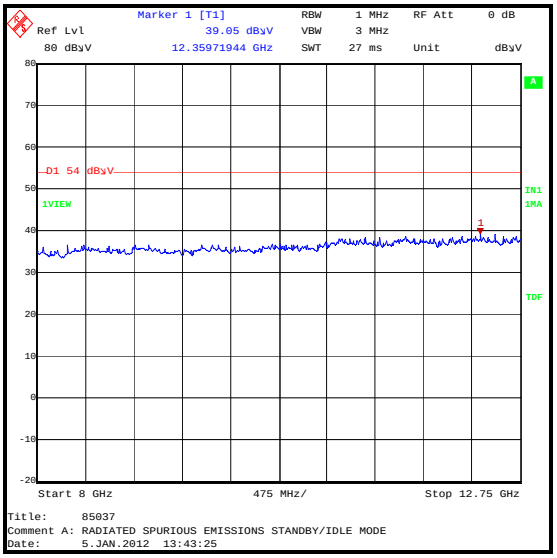
1. The final measured value, for the given emission in the table above, incorporates the calibrated antenna factor and cable loss.
2. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded 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:	Andrew Edwards	**Test Date:**	19 January 2012
Test Sample IMEI:	004401221182088		

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

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	22

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Horizontal	27.3	33.0	5.7	Complied
Middle	1879.8	Horizontal	24.5	33.0	8.5	Complied
Top	1909.8	Horizontal	27.2	33.0	5.8	Complied

Results: GPRS

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Horizontal	27.2	33.0	5.8	Complied
Middle	1879.8	Horizontal	24.5	33.0	8.5	Complied
Top	1909.8	Horizontal	27.4	33.0	5.6	Complied

Results: EGPRS / MCS5

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Horizontal	26.3	33.0	6.7	Complied
Middle	1879.8	Horizontal	24.5	33.0	8.5	Complied
Top	1909.8	Horizontal	26.4	33.0	6.6	Complied

5.3.4. Transmitter Frequency Stability (Temperature Variation)

Test Summary:

Test Engineer:	David Doyle	**Test Date:**	12 January 2012
Test Sample IMEI:	004401221182286		

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):	25
Ambient Relative Humidity (%):	22

Results: Bottom Channel (1850.2 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	60	1850.200060	1850.0	0.200060	Complied
-20	54	1850.200054	1850.0	0.200054	Complied
-10	56	1850.200056	1850.0	0.200056	Complied
0	48	1850.199952	1850.0	0.199952	Complied
10	68	1850.199932	1850.0	0.199932	Complied
20	69	1850.199931	1850.0	0.199931	Complied
30	75	1850.199925	1850.0	0.199925	Complied
40	56	1850.199944	1850.0	0.199944	Complied
50	34	1850.200034	1850.0	0.200034	Complied

Results: Top Channel (1909.8 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	64	1909.800064	1910.0	0.199936	Complied
-20	41	1909.800041	1910.0	0.199959	Complied
-10	73	1909.799927	1910.0	0.200073	Complied
0	58	1909.799942	1910.0	0.200058	Complied
10	68	1909.799932	1910.0	0.200068	Complied
20	51	1909.799949	1910.0	0.200051	Complied
30	58	1909.799942	1910.0	0.200058	Complied
40	69	1909.799931	1910.0	0.200069	Complied
50	64	1909.799936	1910.0	0.200064	Complied

Transmitter Frequency Stability (Temperature Variation) (continued)

Note(s):

1. A dummy battery was fitted to 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.

5.3.5. Transmitter Frequency Stability (Voltage Variation)

Test Summary:

Test Engineer:	David Doyle	**Test Date:**	12 January 2012
Test Sample IMEI:	004401221182286		

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):	20
Relative Humidity (%):	22

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	24	1850.200024	1850.0	0.200024	Complied
4.35	33	1850.199967	1850.0	0.199967	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	40	1909.799960	1910.0	0.200040	Complied
4.35	41	1909.799959	1910.0	0.200041	Complied

Note(s):

1. A dummy battery was fitted to 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 Occupied Bandwidth

Test Summary:

Test Engineer:	David Doyle	**Test Date:**	17 January 2012
Test Sample IMEI:	004401221182286		

FCC Part:	2.1049
Test Method Used:	The 99% occupied bandwidth was measured using the Occupied Bandwidth function of a spectrum analyser

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	21

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	244.088
Middle	1879.8	241.683
Top	1909.8	244.088

Results: GPRS

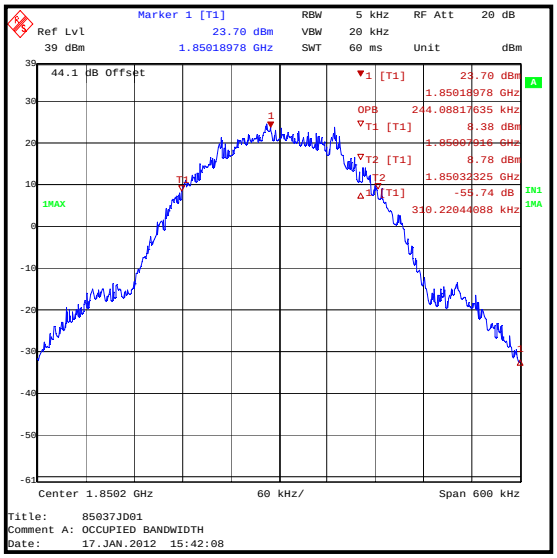
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	241.683
Middle	1879.8	242.886
Top	1909.8	236.874

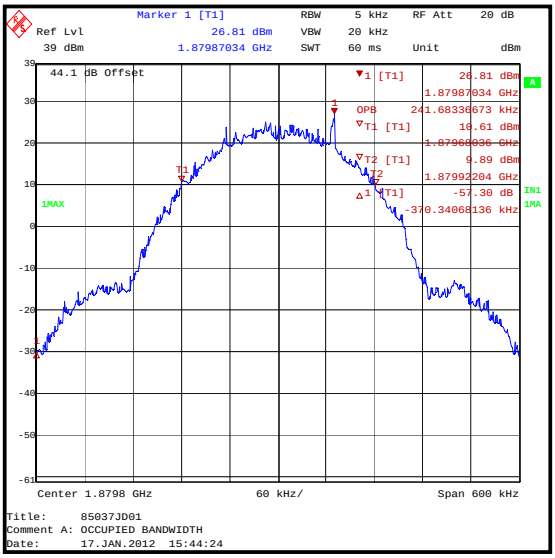
Results: EGPRS / MCS5

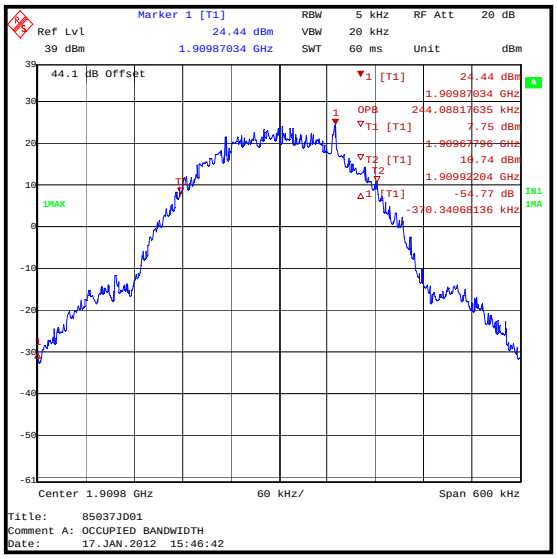
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	240.481
Middle	1879.8	241.683
Top	1909.8	242.886

Transmitter Occupied Bandwidth (continued)

GSM Circuit Switched

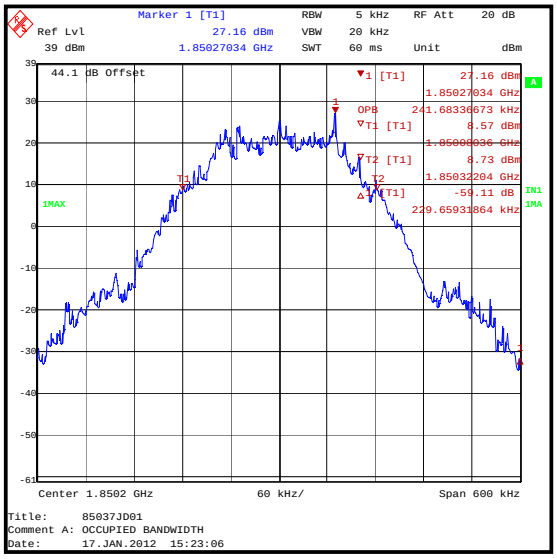


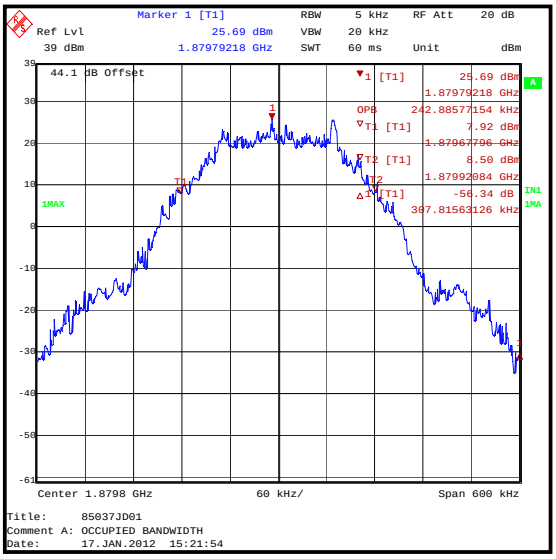


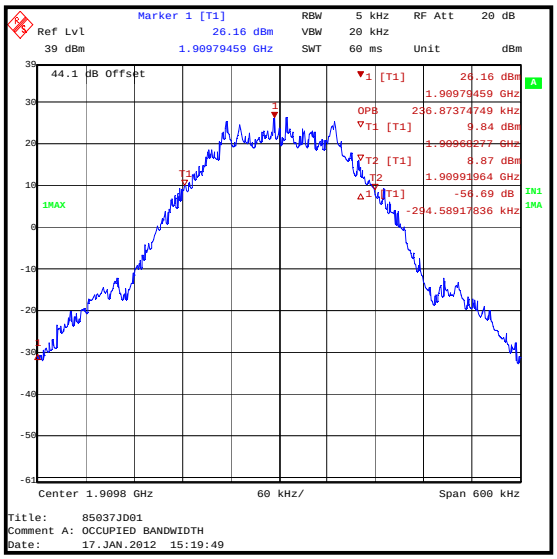


Transmitter Occupied Bandwidth (continued)

GPRS

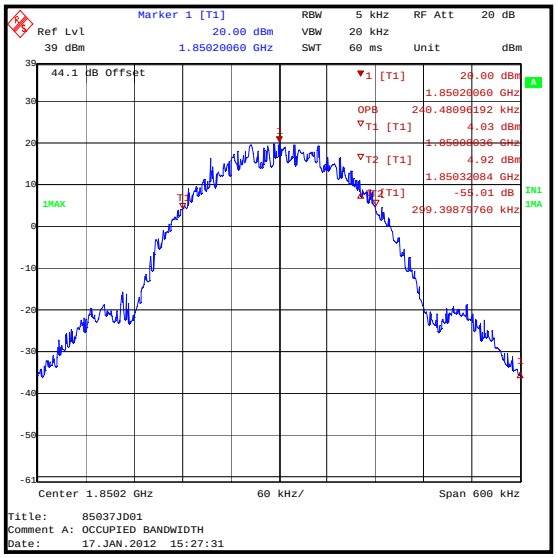


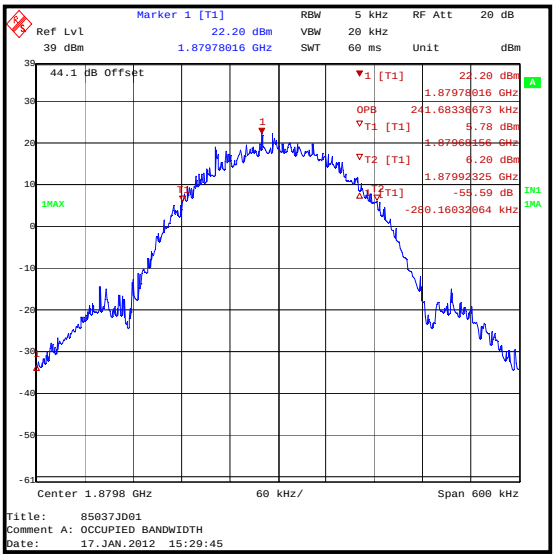


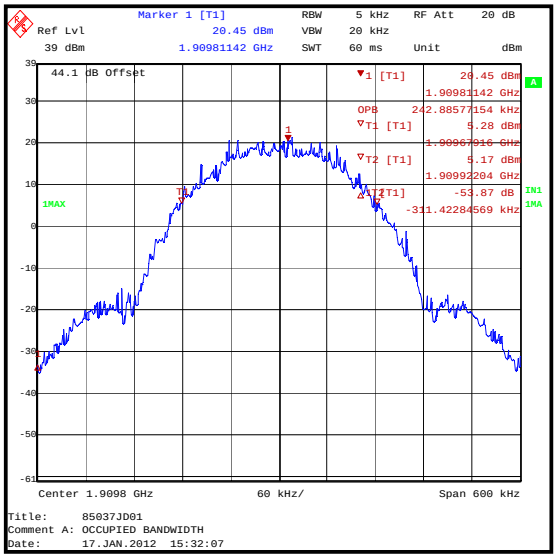


Transmitter Occupied Bandwidth (continued)

EGPRS / MCS5







5.3.7. Transmitter Out of Band Radiated Emissions

Test Summary:

Test Engineer:	Nick Steele	**Test Dates:**	05 January 2012 & 06 January 2012
Test Sample IMEI:	004401221182088		

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):	23
Relative Humidity (%):	24

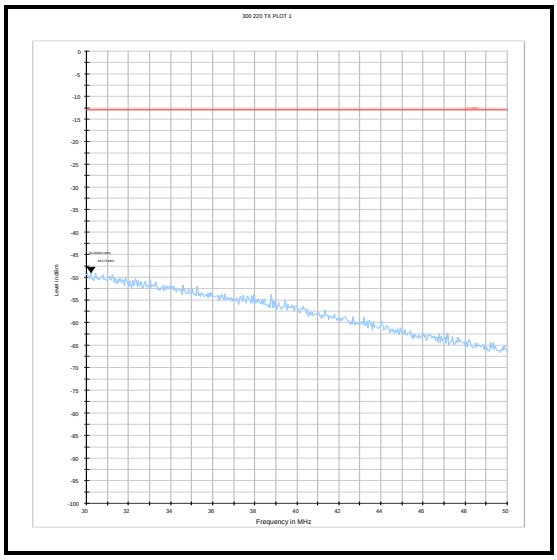
Results:

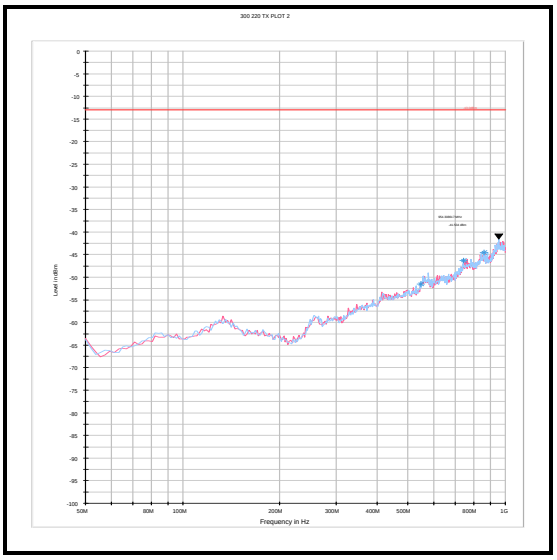
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
6993.988	-35.8	-13.0	22.8	Complied

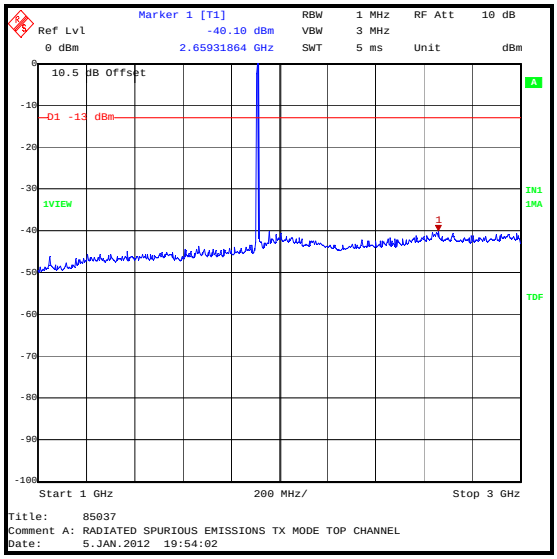
Note(s):

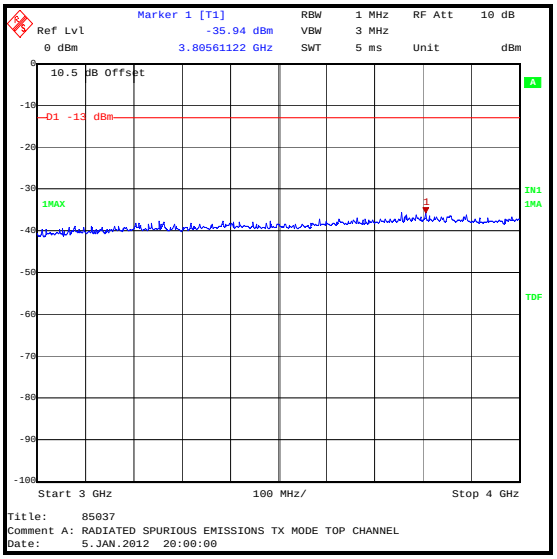
1. No spurious emissions were detected above the noise floor of the measuring receiver; the highest peak noise floor reading of the measuring receiver was recorded.
2. The uplink traffic channels are shown on the 1 GHz to 3 GHz plot.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (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)

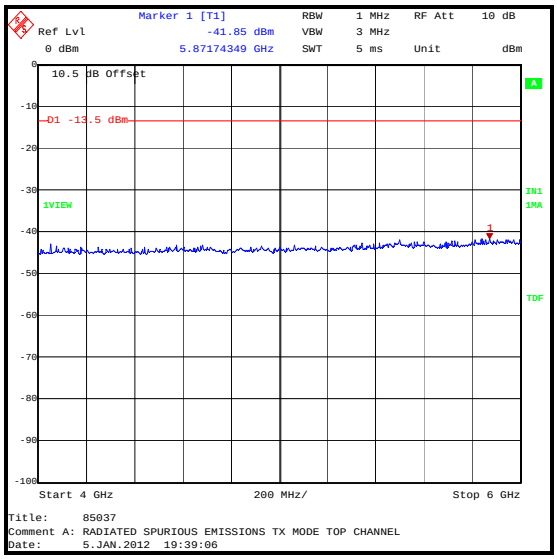


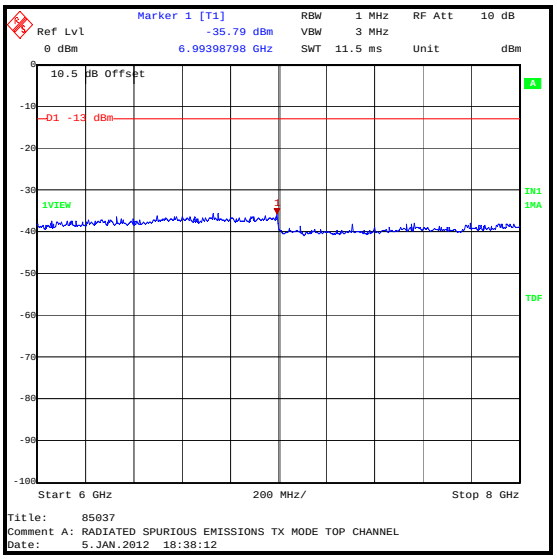


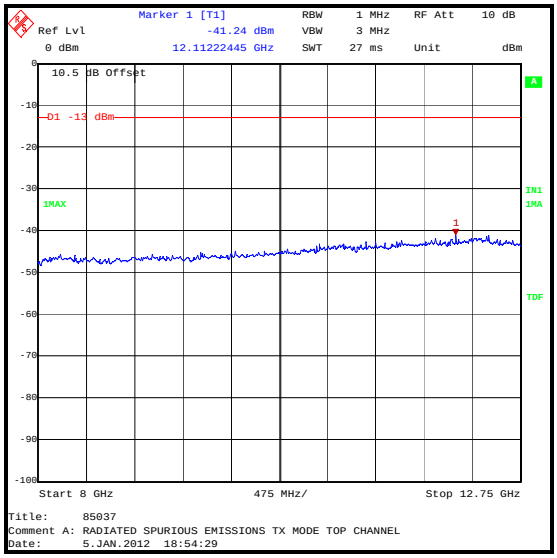


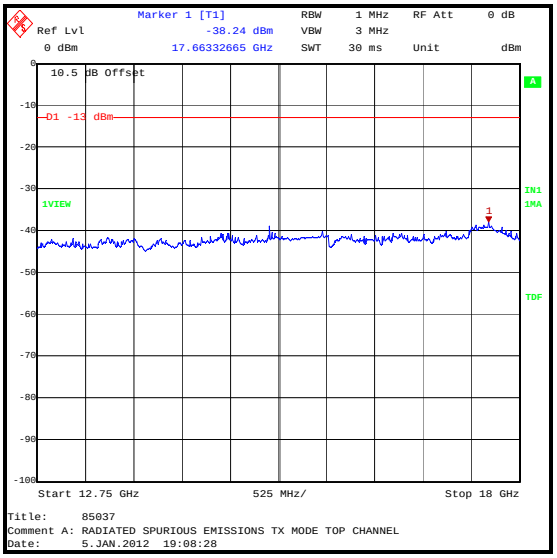


Transmitter Out of Band Radiated Emissions (continued)

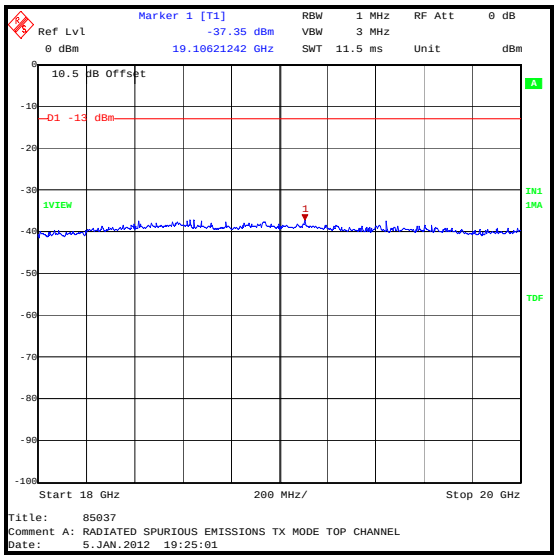








Transmitter Out of Band Radiated Emissions (continued)



5.3.8. Transmitter Band Edge Radiated Emissions

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	05 January 2012
Test Sample IMEI:	004401221182088		

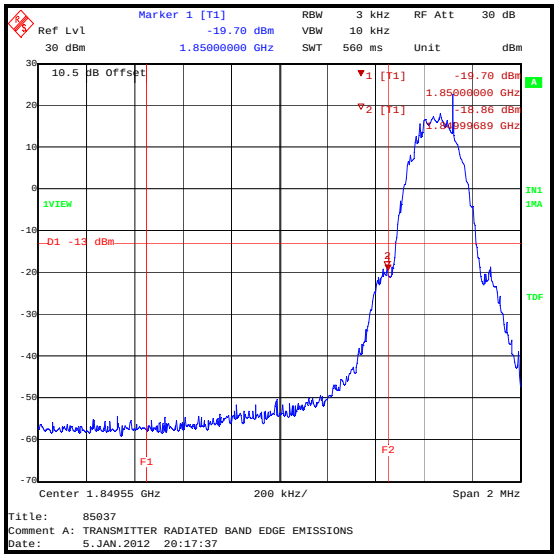
FCC Part:	2.1053 & 24.238
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Parts 2.1053 and 24.238

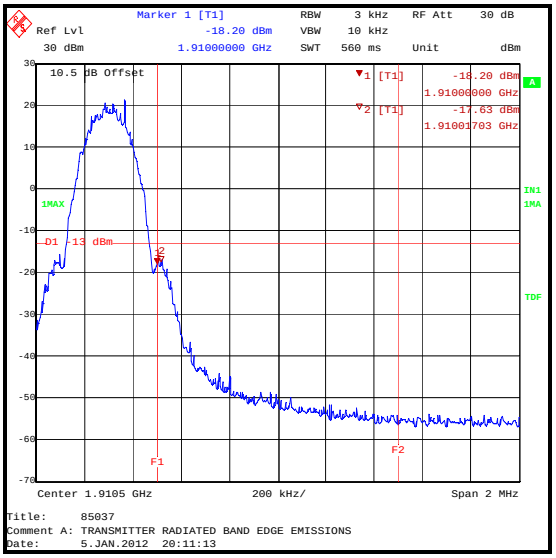
Environmental Conditions:

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

Results: GSM Circuit Switched

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.997	-18.9	-13.0	5.9	Complied
1850	-19.7	-13.0	6.7	Complied
1910	-18.2	-13.0	5.2	Complied
1910.017	-17.6	-13.0	4.6	Complied

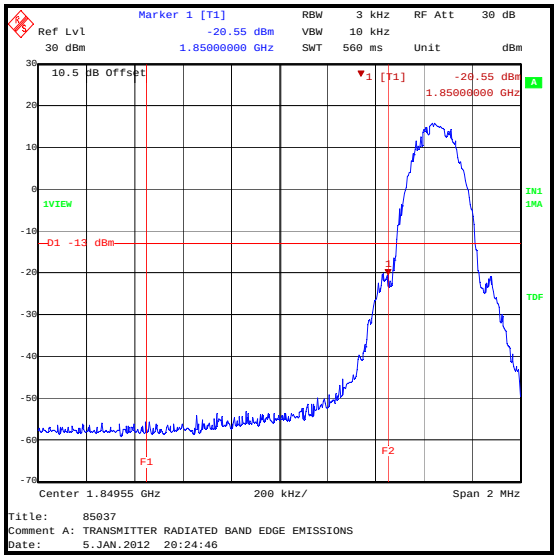


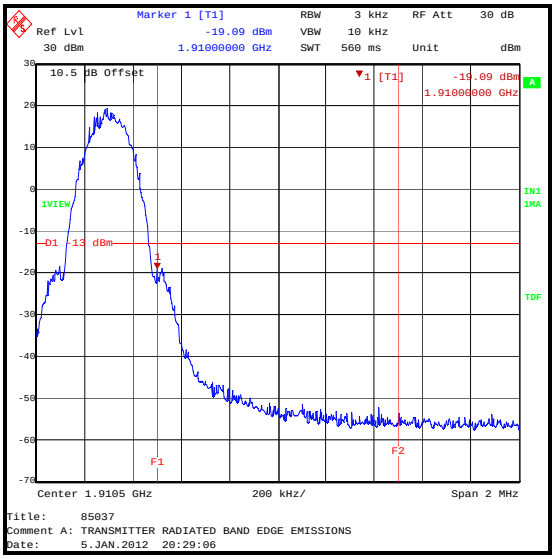


Transmitter Band Edge Radiated Emissions (continued)

Results: GPRS

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-20.6	-13.0	7.6	Complied
1910	-19.1	-13.0	6.1	Complied

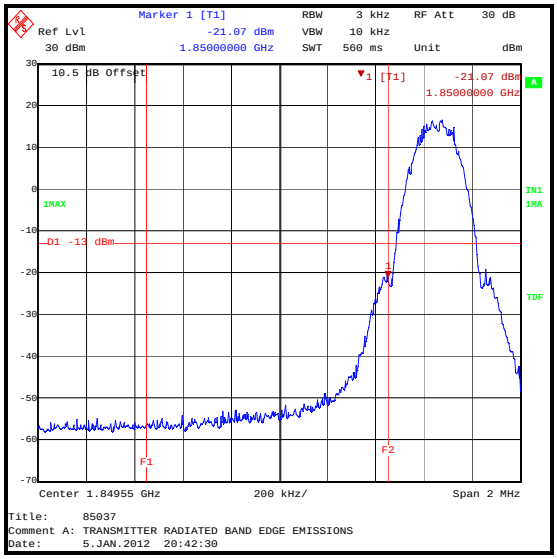


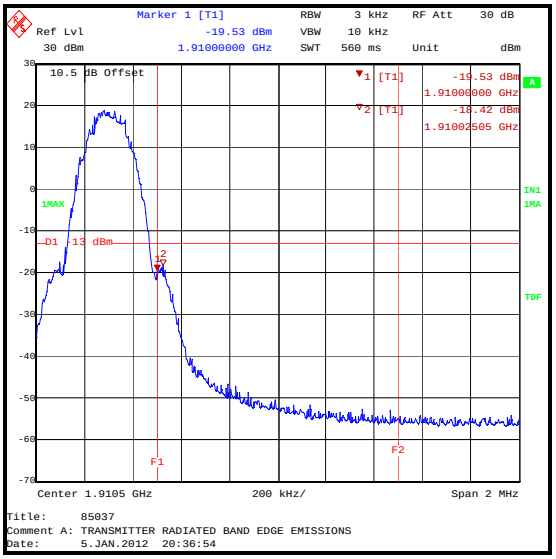


Transmitter Band Edge Radiated Emissions (continued)

Results: EGPRS / MCS5

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-21.1	-13.0	8.1	Complied
1910	-19.5	-13.0	6.5	Complied
1910.025	-18.4	-13.0	5.4	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
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
A067	LISN	Rohde & Schwarz	ESH3-Z5	890603/002	02 Jun 2012	12
A1393	Attenuator	Huber & Suhner	757456	6820.17.B	08 Jul 2012	12
A1396	Attenuator	Huber & Suhner	757987	6810.17.B	08 Jul 2012	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	09 Oct 2012	12
A1818	Antenna	EMCO	3115	00075692	09 Oct 2012	12
A1830	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100668	05 Mar 2012	12
A1834	Attenuator	Hewlett Packard	8491B	10444	26 Jul 2012	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	28 Feb 2012	12
A244	Attenuator	Schaffner	6820-17-B	None	09 Feb 2012	12
A253	Antenna	Flann Microwave	12240-20	128	09 Oct 2012	12
A254	Antenna	Flann Microwave	14240-20	139	09 Oct 2012	12
A255	Antenna	Flann Microwave	16240-20	519	09 Oct 2012	12
A256	Antenna	Flann Microwave	18240-20	400	09 Oct 2012	12
A288	Antenna	Chase	CBL6111A	1589	25 Aug 2012	12
A436	Antenna	Flann	20240-20	330	09 Oct 2012	12
A553	Antenna	Chase	CBL6111A	1593	26 Mar 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
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	29 May 2012	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	09 Oct 2012	12
M1068	Thermometer	Iso-Tech	RS55	93102884	15 Nov 2012	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESI26	100046K	29 Jun 2012	12
M1251	Digital Multimeter	Fluke	175	89170179	29 Jul 2012	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	13 Jul 2012	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	04 Feb 2012	12
M1379	Test Receiver	Rohde & Schwarz	ESIB7	100330	20 Sep 2012	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	11 May 2012	12
M1620	Radio Comms.Tester	Rohde & Schwarz	CMU200	111379	10 Feb 2012	12

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