



## TEST REPORT FROM RFI GLOBAL SERVICES LT

Test of: PocketFinder LBPFK140US

To: FCC Part 22: 2008 Subpart H

**Test Report Serial No:**  
RFI/RPT1/RP74958JD03A

<b>This Test Report Is Issued Under The Authority Of Brian Watson, Operations Director:</b>	
	
<b>Checked By:</b>	A. HENRIQUES
<b>Signature:</b>	
<b>Date of Issue:</b>	14 May 2009

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**1. Customer Information**











<b>Company Name:</b>	Location Based Technologies, Inc.
<b>Address:</b>	Hendfords Farm Long Lane Stafford ST18 9PA 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) 2008: Part 22 Subpart H (Public Mobile Services)
<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>	06 May 2009 to 08 May 2009

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

FCC Reference (47CFR)	Measurement	Port Type	Result
Part 15.107	Receiver/Idle Mode AC Conducted Spurious Emissions	AC Mains	
Part 15.109	Receiver/Idle Mode Radiated Spurious Emissions	Enclosure	
Part 15.207	Transmitter AC Conducted Spurious Emissions	AC Mains	
Part 22.913(a)	Transmitter Effective Radiated Power (ERP)	Antenna	
Part 22.355	Transmitter Frequency Stability (Temperature & Voltage Variation)	Antenna	
Part 2.1049	Transmitter Occupied Bandwidth	Antenna	
Part 2.1053/22.917	Transmitter Out of Band Radiated Emissions	Antenna	
Part 2.1053/22.917	Transmitter Band Edge Radiated Emissions	Antenna	
<b>Key to Results</b>  = Complied  = Did not comply			

### **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 (2003)
<b>Title:</b>	American National Standard Methods of Measurement of Electromagnetic 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>	PocketFinder
<b>Model Name or Number:</b>	LBPFK-140US
<b>IMEI Numbers:</b>	004402010111346, 004402010110900 & 004402010111320
<b>Hardware Version Number:</b>	V2.1
<b>Software Version Number:</b>	V7.1.0
<b>FCC ID Number:</b>	XCRLBPFK-140US

<b>Description:</b>	AC Charger
<b>Brand Name:</b>	Location Based Technologies
<b>Model Name or Number:</b>	JAC05-050100-066W
<b>Serial Number:</b>	None Stated

<b>Description:</b>	Cradle for Charging
<b>Brand Name:</b>	Location Based Technologies
<b>Model Name or Number:</b>	None Stated
<b>Serial Number:</b>	None Stated

#### **3.2. Description of EUT**

The equipment under test was a GSM GPRS/GPS locator for people, pets and assets.

#### **3.3. Modifications Incorporated in the EUT**

No modifications were applied to the EUT during testing.

### 3.4. Additional Information Related to Testing

Technology Tested:	GSM850		
Type of Radio Device:	Transceiver		
Mode:	GPRS		
Modulation Type:	GMSK		
Channel Spacing:	200 kHz		
Maximum Output Power (ERP):	21.7 dBm		
Transmit Frequency Range:	824 MHz 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 MHz 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

### 3.5. Support Equipment

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

Description:	Bed Of Nails Fixture (with SMSD; USB; Dual RS232 Converter)
Brand Name:	Microcontact
Model Name or Number:	Custom
Serial Number:	None Stated

Description:	USB – Dual RS232 Converter
Brand Name:	SMSD
Model Name or Number:	USB-Serial Converter
Serial Number:	None Stated
Hardware Version Number:	V2.1

## **4. Operation and Monitoring of the EUT during Testing**

### **4.1. Operating Modes**

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

- Idle mode.
- Constantly transmitting at full power on bottom, middle and top channels as required in GPRS mode. The EUT is not capable of transmitting in GSM mode.
- All tests were performed with the EUT in GPRS Multislot Class 10 with the unit transmitting on two timeslots in the uplink. GSM circuit switched mode was not tested as the EUT was not capable of transmitting in this mode.

### **4.2. Configuration and Peripherals**

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

- Connected to a GSM/GPRS system simulator, operating in transceiver mode.
- Transmitter mode radiated spurious emission test was performed standalone and idle mode radiated spurious emissions tests were performed with the mains charger connected to the EUT and 120 V AC supply as this was found to be the worst case during prescans. All accessories were individually connected and measurements made during prescans to determine the worst case combination.



## **5. Measurements, Examinations and Derived Results**

### **5.1. General Comments**

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

**5.2. Test Results****5.3. Receiver/Idle Mode AC Conducted Spurious Emissions****Test Summary:**

<b>FCC Part:</b>	15.107(a)
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 7 and relevant annexes
<b>EUT Tested (IMEI):</b>	0044020101110900

**Environmental Conditions:**

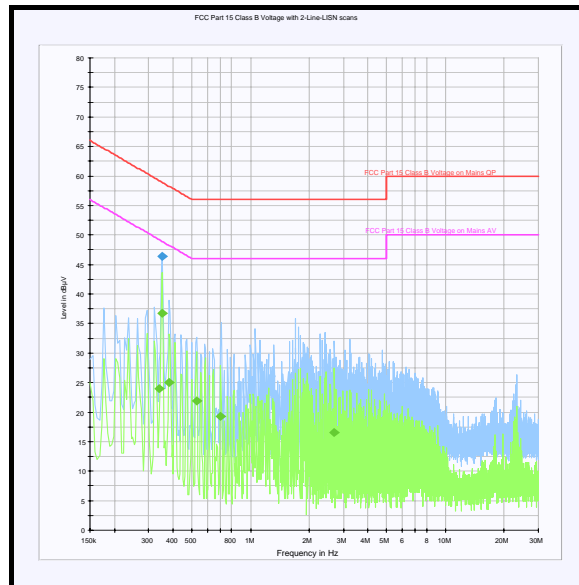
<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	33

**Results: Quasi Peak Detector Measurements**

Frequency (MHz)	Line	Quasi Peak Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.352500	Neutral	46.3	58.9	12.6	Complied

**Results: Average Detector Measurements**

Frequency (MHz)	Line	Average Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.339000	Neutral	24.0	49.2	25.2	Complied
0.352500	Neutral	36.8	48.9	12.1	Complied
0.379500	Neutral	25.0	48.3	23.3	Complied
0.528000	Neutral	21.9	46.0	24.1	Complied
0.703500	Neutral	19.3	46.0	26.7	Complied
2.692500	Neutral	16.6	46.0	29.4	Complied

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

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

## 5.4. Receiver/Idle Mode Radiated Spurious Emissions

### Test Summary:

FCC Part:	15.109
Frequency Range:	30 MHz to 1000 MHz
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes
EUT Tested (IMEI):	004402010111346

### Environmental Conditions:

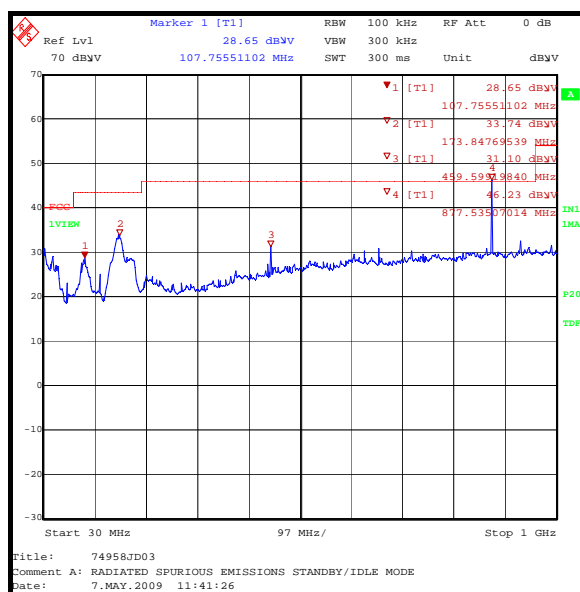
Temperature (°C):	23
Relative Humidity (%):	32

### Results:

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
107.548	Vertical	25.8	43.5	17.7	Complied
173.126	Vertical	30.7	43.5	12.8	Complied
458.750	Horizontal	32.5	46.0	13.5	Complied

### Note(s):

- The downlink traffic channel is shown on the 30 MHz GHz to 1 GHz plot at approximately 877.535 MHz and is not a spurious emission.



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:**

FCC Part:	15.109
Frequency Range:	1 GHz to 5 GHz
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes
EUT Tested (IMEI):	004402010111346

**Environmental Conditions:**

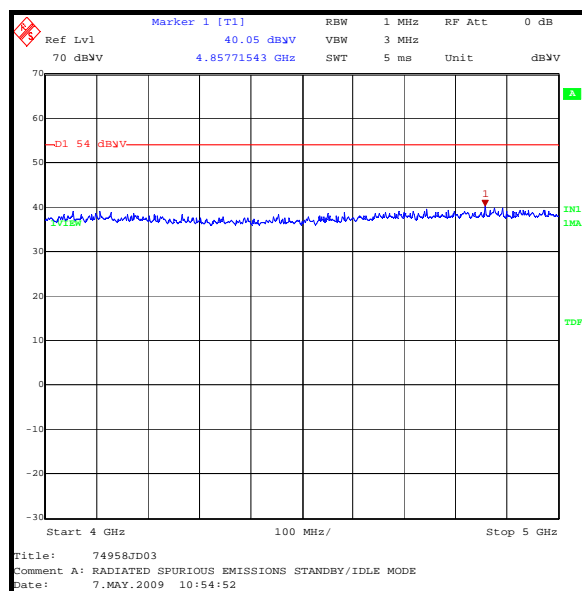
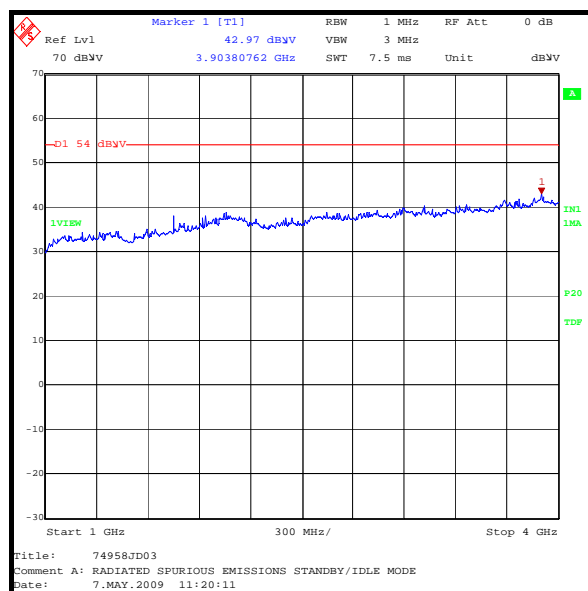
Temperature (°C):	23
Relative Humidity (%):	33

**Results: Highest Peak Level**

Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V/m)	Transducer Factor (dB)	Peak Level (dB $\mu$ V/m)	Average Limit (dB $\mu$ V/m)	Margin (dB)	Result
3.903	Vertical	37.4	5.6	43.0	54.0	11.0	Complied

**Note(s):**

- 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.



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

**5.5. Transmitter AC Conducted Spurious Emissions****Test Summary:**

FCC Part:	15.207
Test Method Used:	As detailed in ANSI C63.4 Section 7 and relevant annexes
EUT Tested (IMEI):	0044020101110900

**Environmental Conditions:**

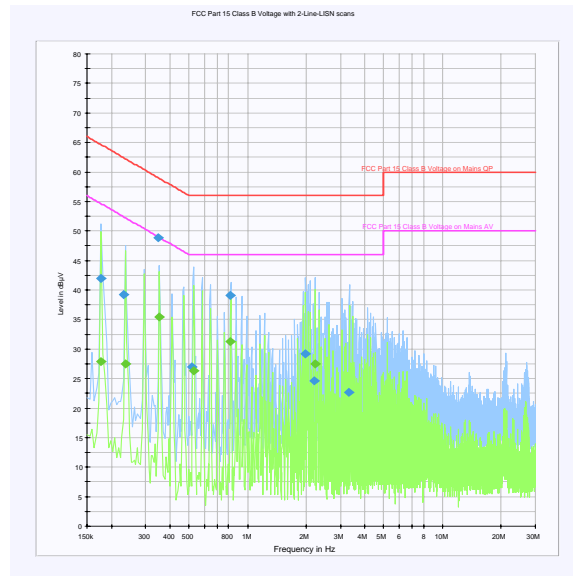
Temperature (°C):	25
Relative Humidity (%):	33

**Results: Quasi Peak Detector Measurements**

Frequency (MHz)	Line	Quasi Peak Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.177000	Live	41.9	64.6	22.7	Complied
0.231000	Live	39.2	62.4	23.2	Complied
0.348000	Neutral	48.9	59.0	10.2	Complied
0.519000	Neutral	26.9	56.0	29.1	Complied
0.816000	Neutral	39.1	56.0	16.9	Complied
1.977000	Neutral	29.2	56.0	26.8	Complied
2.206500	Neutral	24.6	56.0	31.4	Complied
3.313500	Neutral	22.6	56.0	33.4	Complied

**Results: Average Detector Measurements**

Frequency (MHz)	Line	Average Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.177000	Live	27.9	54.6	26.7	Complied
0.235500	Live	27.5	52.3	24.8	Complied
0.352500	Live	35.5	48.9	13.4	Complied
0.528000	Neutral	26.3	46.0	19.7	Complied
0.816000	Neutral	31.3	46.0	14.7	Complied
2.220000	Neutral	27.5	46.0	18.5	Complied

**Transmitter AC Conducted Spurious Emissions (continued)**

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

**5.6. Transmitter Effective Radiated Power (ERP)****Test Summary:**

FCC Part:	22.913(a)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.17.2
EUT Tested (IMEI):	004402010111346

**Environmental Conditions:**

Temperature (°C):	23
Relative Humidity (%):	29

**Results: GPRS**

Channel	Measured Frequency (MHz)	Antenna Polarity	Maximum Transmitter (dBm)	Limit (dBm)	Margin (dBm)	Result
Bottom	824.2	Horizontal	19.2	38.5	19.3	Complied
Middle	836.6	Horizontal	20.5	38.5	18.0	Complied
Top	848.8	Horizontal	21.7	38.5	16.8	Complied

**Note(s):**

1. Measurements were performed with the test antenna in the vertical and horizontal planes and the EUT in the X, Y and Z planes. The highest level was recorded.



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

<b>FCC Part:</b>	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
<b>EUT Tested (IMEI):</b>	004402010111320

**Environmental Conditions:**

<b>Temperature (°C):</b>	16
<b>Relative Humidity (%):</b>	34

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

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	836.600060	60	0.07	2.5	2.43	Complied
-20	836.600046	46	0.05	2.5	2.45	Complied
-10	836.600054	54	0.06	2.5	2.44	Complied
0	836.600049	49	0.06	2.5	2.44	Complied
10	836.599986	-14	0.02	2.5	2.48	Complied
20	836.599968	-32	0.04	2.5	2.46	Complied
30	836.599980	-20	0.02	2.5	2.48	Complied
40	836.599988	-12	0.01	2.5	2.49	Complied
50	836.600050	50	0.06	2.5	2.44	Complied

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

<b>FCC Part:</b>	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
<b>EUT Tested (IMEI):</b>	004402010111320

**Environmental Conditions:**

<b>Temperature (°C):</b>	16
<b>Relative Humidity (%):</b>	34

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

<b>Supply Voltage (V)</b>	<b>Measured Frequency (MHz)</b>	<b>Frequency Error (Hz)</b>	<b>Frequency Error (ppm)</b>	<b>Limit (ppm)</b>	<b>Margin (ppm)</b>	<b>Result</b>
3.3	836.599990	-10	0.01	2.5	2.49	Complied
4.2	836.599990	-10	0.01	2.5	2.49	Complied

## 5.9. Transmitter Occupied Bandwidth

### Test Summary:

FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.4 Section 13.1.7 and relevant annexes referencing FCC CFR Part 2.1049 (see note below)
EUT Tested (IMEI):	004402010111346

### Environmental Conditions:

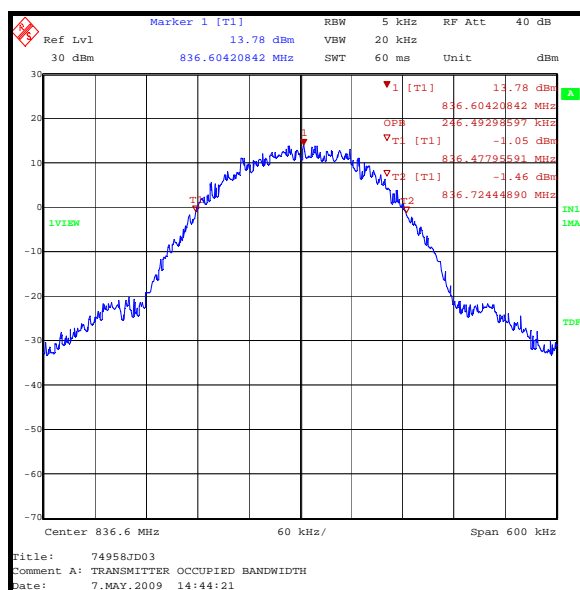
Temperature (°C):	23
Relative Humidity (%):	33

### Results: GPRS

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	836.6	246.493

### Note(s):

- In lieu of the test method detailed in ANSI C63.4 Section 13.1.7 the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser



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

<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 10 GHz
<b>EUT Tested (IMEI):</b>	004402010111346

**Environmental Conditions:**

<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	29

**Results: Bottom Channel**

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1648.482	-16.8	-13.0	3.8	Complied
2472.669	-24.8	-13.0	11.8	Complied
3296.646	-24.2	-13.0	11.3	Complied
4120.701	-30.7	-13.0	17.7	Complied
4945.202	-33.9	-13.0	20.9	Complied

**Results: Middle Channel**

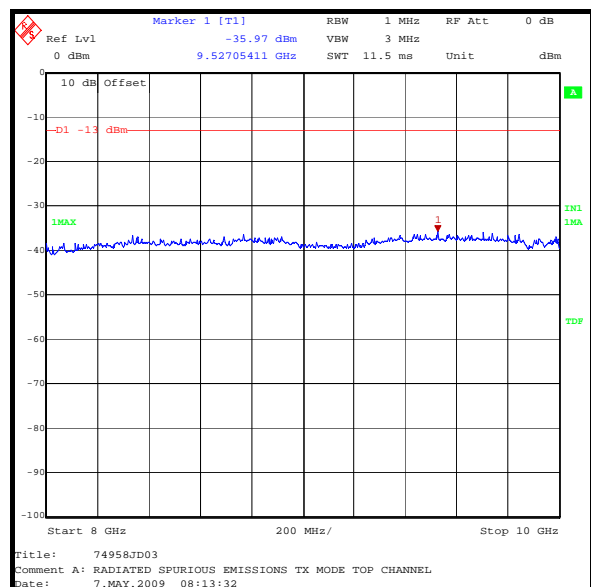
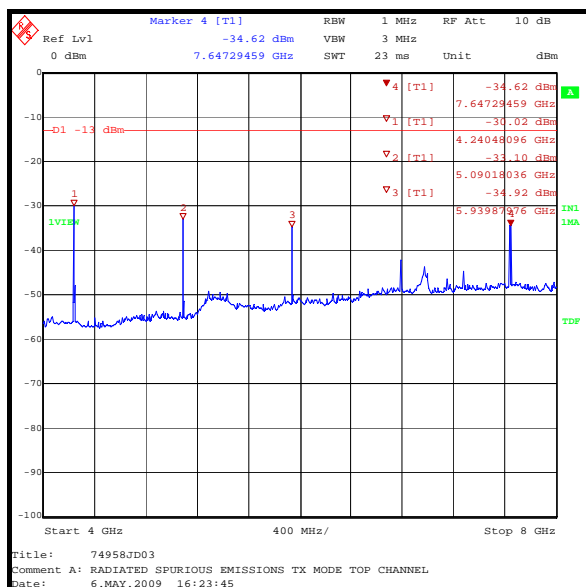
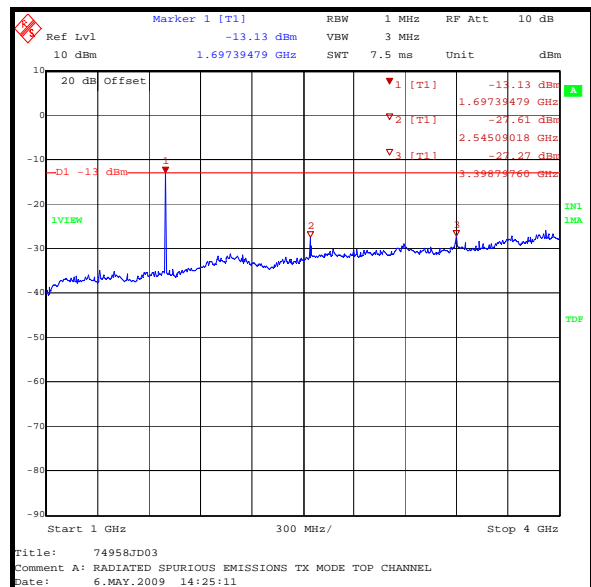
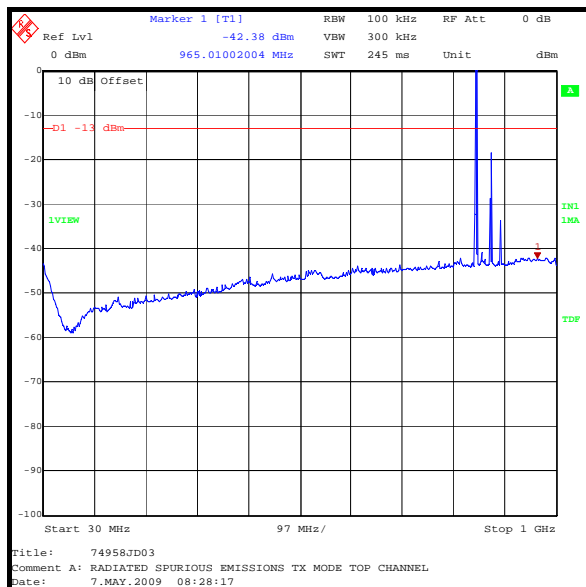
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1673.318	-17.0	-13.0	4.0	Complied
2509.675	-25.2	-13.0	12.2	Complied
3346.031	-23.9	-13.0	10.9	Complied
4182.729	-30.8	-13.0	17.8	Complied
5019.225	-35.7	-13.0	22.7	Complied

**Results: Top Channel**

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1697.395	-15.6	-13.0	2.6	Complied
2546.501	-24.3	-13.0	11.3	Complied
3395.243	-23.7	-13.0	10.7	Complied
4243.958	-29.6	-13.0	16.6	Complied
5090.180	-32.2	-13.0	19.2	Complied

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

1. The uplink and downlink traffic channels and downlink control channel are shown on the 30 MHz to 1 GHz plot and are not spurious emissions. The marker is positioned on the highest level of the noise floor on this plot as no other out of band emissions were observed.
2. All other emissions were investigated and found to be at least 20 dB below the specified limit.

**Transmitter Out of Band Radiated Emissions (continued)**

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

## 5.11. Transmitter Radiated Emissions at Band Edges

### Test Summary:

FCC Part:	2.1053 & 22.917
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Parts 2.1053 and 22.917
EUT Tested (IMEI):	004402010111346

### Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	29

### Results: GPRS - Bottom Band Edge

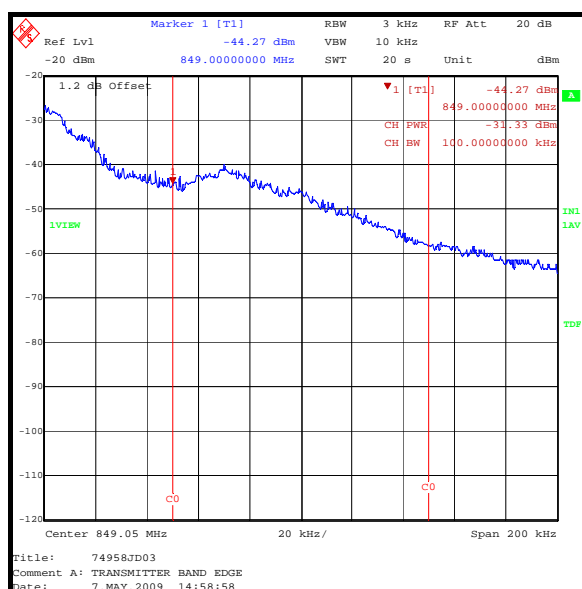
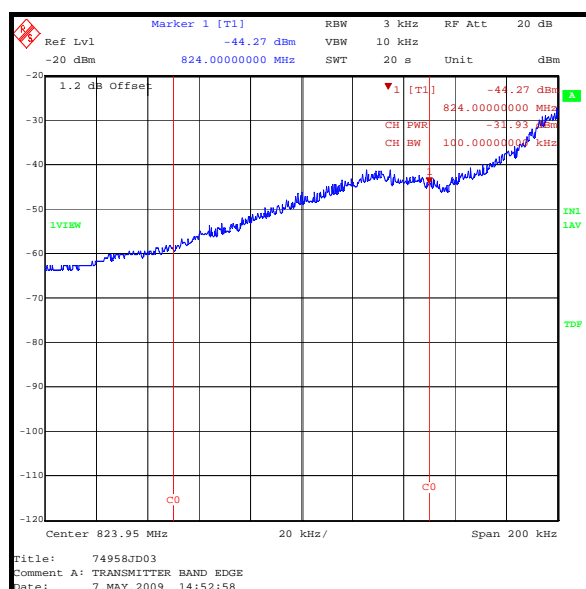
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
824	-31.9	-13.0	18.9	Complied

### Results: GPRS - Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
849	-31.3	-13.0	18.3	Complied

### Note(s):

- The band edge result was obtained by integrating the 100 kHz strip immediately adjacent to the band edge using a channel power function of the measurement analyser.



## **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”.

<b>Measurement Type</b>	<b>Range</b>	<b>Confidence Level (%)</b>	<b>Calculated Uncertainty</b>
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.72 dB
Effective Radiated Power (ERP)	Not applicable	95%	±2.94 dB
Frequency Stability	Not applicable	95%	±0.92 ppm
Occupied Bandwidth	Not applicable	95%	±0.92 ppm
Radiated Spurious Emissions	30 MHz to 26 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**

<b>RFI No.</b>	<b>Instrument</b>	<b>Manufacturer</b>	<b>Type No.</b>	<b>Serial No.</b>	<b>Date Last Calibrated</b>	<b>Cal. Interval (Months)</b>
A1299	Antenna	Schaffner	CBL6143	5094	28 Jul 2008	12
A1392	Attenuator	Huber + Suhner	757456	6820.17.B	Calibrated before use	-
A1534	Pre Amplifier	Hewlett Packard	8449B OPT H02	3008A00405	Calibrated before use	-
A1818	Antenna	EMCO	3115	00075692	25 Oct 2008	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	05 Jan 2009	12
A1933	High Pass Filter	AtlanTEC RF	AFH-03000	30R-JFBN07-001	14 Oct 2008	12
A649	LISN	Rohde & Schwarz	ESH3-Z5	825562/008	19 Mar 2009	12
E013	Environmental Chamber	Sanyo	ATMOS chamber	None	Calibrated before use	-
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	26 Aug 2008	12
L0990	Comms Test Set	R&S	CMU 200	S220447	18 Feb 2009	12
M1068	Thermometer	Iso-Tech	RS55	93102884	09 Jul 2008	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	09 Mar 2009	12
M1229	Digital Multimeter	Fluke	179	87640015	09 May 2008	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	21 Aug 2008	12
M1379	Test Receiver	Rohde & Schwarz	ESIB7	100330	14 Aug 2008	12
S021	Power Supply Unit	Thurlby Thandar	CPX200	061034	Calibrated before use	-

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