

TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: NTT docomo P-01B

To: FCC Part 24: 2008 Subpart E

Test Report Serial No:
RFI/RPT1/RP75983JD01A

**This Test Report Is Issued Under The Authority
Of Brian Watson, Operations Director:**

pp 

Checked By:	R. Graham
Signature:	
Date of Issue:	06 October 2009

This report is issued in Adobe Acrobat portable document format (PDF). It is only a valid copy of the report if it is being viewed in PDF format with the following security options not allowed: Changing the document, Selecting text and graphics, Adding or changing notes and form fields.

This report may not be reproduced other than in full, except with the prior written approval of RFI Global Services Ltd. The results in this report apply only to the sample(s) tested.

This page has been left intentionally blank.

Table of Contents

1. Customer Information	4
2. Summary of Testing	5
3. Equipment Under Test (EUT)	6
4. Operation and Monitoring of the EUT during Testing	8
5. Measurements, Examinations and Derived Results	9
6. Measurement Uncertainty	26
Appendix 1. Test Equipment Used.....	27

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:	47CFR24
Specification Title:	Code of Federal Regulations, Part 24 (CFR47) Personal Communication Services
Site Registration:	FCC: 209735
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire RG24 8AH, United Kingdom
Test Dates:	17 September 2009 to 29 September 2009

2.2. Summary of Test Results

FCC Reference (CFR 47)	Measurement	Port Type	Result
Part 15.107	Idle Mode AC Conducted Spurious Emissions	AC Mains	✓
Part 15.109	Idle Mode Radiated Spurious Emissions	Enclosure	✓
Part 15.207	Transmitter AC Conducted Spurious Emissions	AC Mains	✓
Part 24.232	Transmitter Effective Isotropic Radiated Power (EIRP)	Antenna	✓
Part 24.235	Transmitter Frequency Stability (Temperature & Voltage Variation)	Antenna	✓
Part 2.1049/24.238	Transmitter Occupied Bandwidth	Antenna	✓
Part 2.1053/24.238	Transmitter Out of Band Radiated Emissions	Antenna	✓
Part 2.1053/24.238	Transmitter Band Edge Radiated Emissions	Antenna	✓
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 (2003)
Title:	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)

Brand Name:	NTT docomo
Model Name or Number:	P-01B
Hardware Version Number:	Rev C
Software Version Number:	B-D92WP1-01.03.001 D92WP1_Cv18121508
IMEI Number:	353152030012795 & 353152030012845
FCC ID:	UCE209021A

Description:	Battery
Brand Name:	NTT
Model Name or Number:	P20

Description:	AC charger
Brand Name:	NTT docomo
Model Name or Number:	FOMA AC Adapter 01 for Global use / MAS-BH0008-A 002

Description:	DC charger
Brand Name:	NTT docomo
Model Name or Number:	FOMA DC Adapter 02

Description:	Charge/USB data cable
Brand Name:	NTT docomo
Model Name or Number:	FOMA USB Cable with Charge Function 02

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

Description:	Personal Hands-Free
Brand Name:	NTT docomo
Model Name or Number:	Stereo Earphone Set 01

3.2. Description of EUT

The equipment under test was a dual mode UMTS/GSM cellular handset with *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

Technology Tested:	PCS1900		
Type of Radio Device:	Transceiver		
Mode:	GSM/GPRS		
Modulation Type:	GMSK		
Channel Spacing:	200 kHz		
Power Supply Requirement(s):	Nominal	3.7 V	
	Minimum	3.4 V	
	Maximum	4.2 V	
Maximum Output Power (EIRP):	GSM	30.4 dBm	
	GPRS	28.0 dBm	
Transmit Frequency Range:	1850 to 1910 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	512	1850.2
	Middle	660	1879.8
	Top	810	1909.8
Receive Frequency Range:	1930 to 1990 MHz		
Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	512	1930.2
	Middle	660	1959.8
	Top	810	1989.8

3.5. Support Equipment

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

Description:	Dummy battery
Model Name or Number:	Not stated
Serial Number:	Not stated

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, centre and top channels as required.
- Occupied bandwidth, EIRP and band edge tests were performed with the EUT in GSM single timeslot circuit switched and GPRS Multislot Class 10 with the unit transmitting on two 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 GSM/GPRS system simulator, operating in transceiver mode.
- Idle mode and transmitter mode radiated spurious emissions tests were performed with the mains charger connected to the EUT via 120 VAC supply 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.

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

5.2.1. Idle Mode AC Conducted Spurious Emissions

Test Summary:

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

Environmental Conditions:

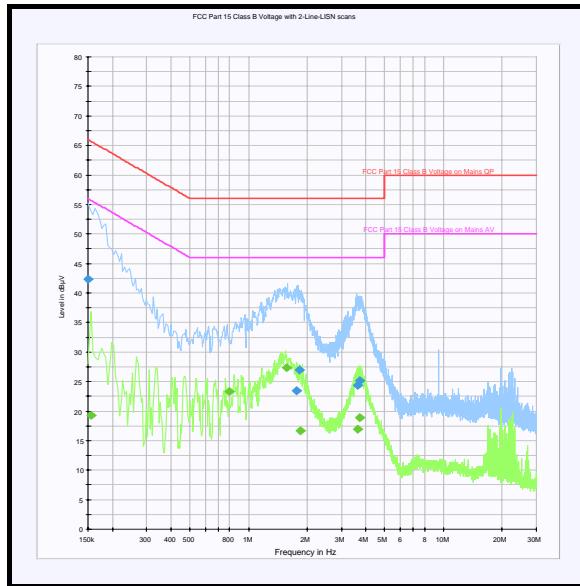
Temperature (°C):	26
Relative Humidity (%):	40

Results: Quasi Peak Detector Measurements

Frequency (MHz)	Line	Quasi Peak Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.150000	Neutral	42.4	66.0	23.6	Complied
1.761000	Live	23.4	56.0	32.6	Complied
1.833000	Live	27.0	56.0	29.0	Complied
3.619500	Live	24.4	56.0	31.6	Complied
3.723000	Live	25.1	56.0	30.9	Complied

Results: Average Detector Measurements

Frequency (MHz)	Line	Average Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.154500	Live	19.3	55.8	36.5	Complied
0.798000	Live	23.4	46.0	22.6	Complied
1.572000	Neutral	27.4	46.0	18.6	Complied
1.842000	Live	16.7	46.0	29.3	Complied
3.637500	Live	17.0	46.0	29.0	Complied
3.705000	Live	18.8	46.0	27.2	Complied

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.

5.2.2. Idle Mode Radiated Spurious Emissions

Test Summary:

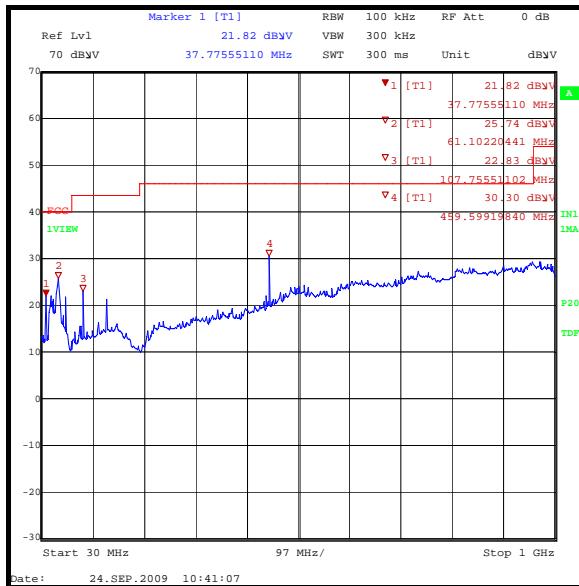
FCC Part:	15.109
Frequency Range:	30 MHz to 1000 MHz
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	31

Results:

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
38.006	Horizontal	16.0	40.0	24.0	Complied
61.411	Vertical	26.9	40.0	13.1	Complied
107.620	Vertical	23.8	43.5	19.7	Complied
458.693	Vertical	28.0	46.0	18.0	Complied



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

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

FCC Part:	15.109
Frequency Range:	1 GHz to 12.75 GHz
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes

Environmental Conditions:

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

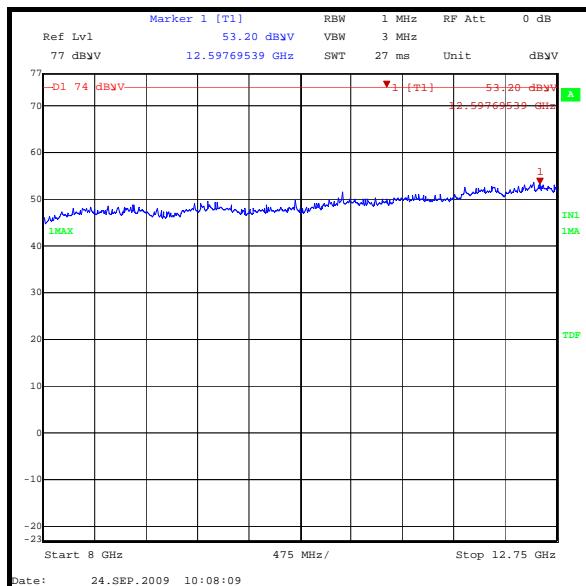
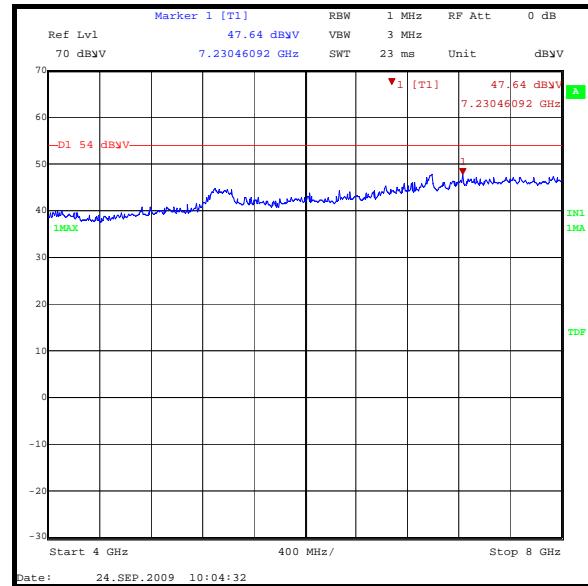
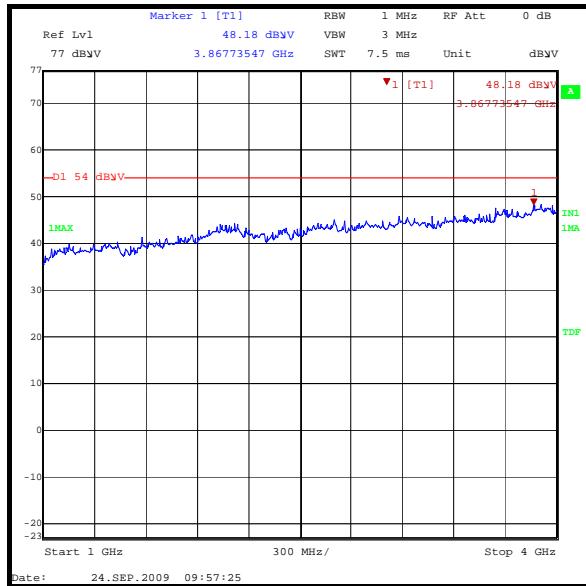
Results:

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)	Result
12593.695	Horizontal	53.2	54.0	0.8	Complied

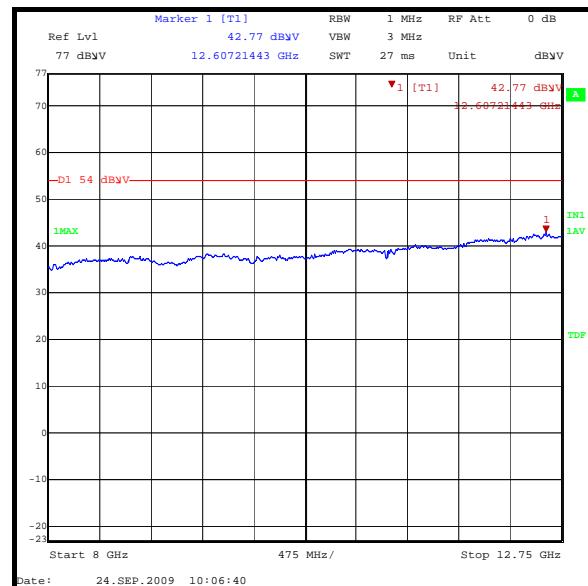
Note(s):

1. 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.

Idle Mode Radiated Spurious Emissions (continued)



Peak Detector



Average Detector

5.2.3. 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

Environmental Conditions:

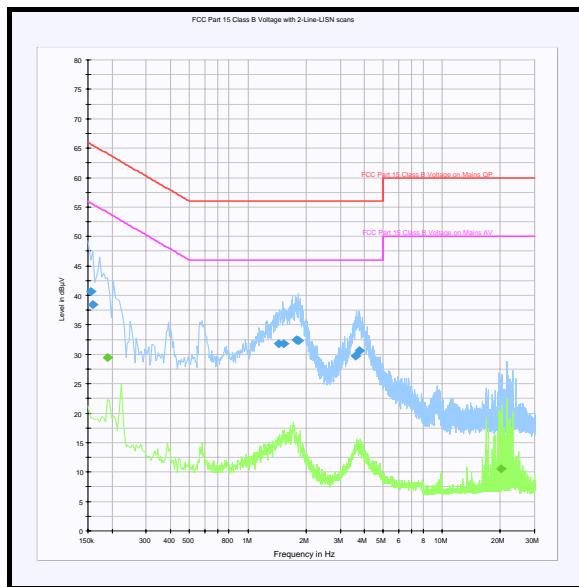
Temperature (°C):	26
Relative Humidity (%):	40

Results: Quasi Peak Detector Measurements

Frequency (MHz)	Line	Quasi Peak Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.154500	Neutral	40.6	65.8	25.2	Complied
0.159000	Live	38.5	65.5	27.0	Complied
1.446000	Live	31.7	56.0	24.3	Complied
1.527000	Live	31.8	56.0	24.2	Complied
1.779000	Live	32.5	56.0	23.5	Complied
1.815000	Live	32.4	56.0	23.6	Complied
3.570000	Live	29.8	56.0	26.2	Complied
3.777000	Live	30.6	56.0	25.4	Complied

Results: Average Detector Measurements

Frequency (MHz)	Line	Average Level (dB μ V)	Limit (dB μ V)	Margin (dB)	Result
0.190500	Live	29.4	54.0	24.6	Complied
20.076000	Neutral	10.6	50.0	39.4	Complied

Transmitter AC Conducted Spurious Emissions (continued)

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

5.2.4. Transmitter Effective Isotropic Radiated Power (EIRP)**Test Summary:**

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

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	37

Results: GSM

Channel	Measured Frequency (MHz)	Antenna Polarity	Maximum Transmitter (dBm)	Limit (dBm)	Margin (dBm)	Result
Bottom	1850.2	Horizontal	29.0	33.0	4.0	Complied
Middle	1879.8	Horizontal	29.3	33.0	3.7	Complied
Top	1909.8	Horizontal	30.4	33.0	2.6	Complied

Results: GPRS

Channel	Measured Frequency (MHz)	Antenna Polarity	Maximum Transmitter (dBm)	Limit (dBm)	Margin (dBm)	Result
Bottom	1850.2	Horizontal	27.4	33.0	5.6	Complied
Middle	1879.8	Horizontal	27.5	33.0	5.5	Complied
Top	1909.8	Horizontal	28.0	33.0	5.0	Complied

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

FCC Part:	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):	29
Relative Humidity (%):	29

Results: Bottom Channel (1850.2 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	15	1850.200015	1850.0	0.200015	Complied
-20	-11	1850.199989	1850.0	0.199989	Complied
-10	16	1850.200016	1850.0	0.200016	Complied
0	18	1850.200018	1850.0	0.200018	Complied
10	20	1850.200020	1850.0	0.200020	Complied
20	-14	1850.199986	1850.0	0.199986	Complied
30	-24	1850.199976	1850.0	0.199976	Complied
40	-26	1850.199974	1850.0	0.199974	Complied
50	-29	1850.199971	1850.0	0.199971	Complied

Results: Top Channel (1909.8 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	11	1909.800011	1910.0	0.199989	Complied
-20	-16	1909.799984	1910.0	0.200016	Complied
-10	10	1909.800010	1910.0	0.199990	Complied
0	-21	1909.799979	1910.0	0.200021	Complied
10	18	1909.800018	1910.0	0.199982	Complied
20	-15	1909.799985	1910.0	0.200015	Complied
30	-25	1909.799975	1910.0	0.200025	Complied
40	-28	1909.799972	1910.0	0.200028	Complied
50	-29	1909.799971	1910.0	0.200029	Complied

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

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

Environmental Conditions:

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

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	-19	1850.199981	1850.0	0.199981	Complied
4.2	-20	1850.199980	1850.0	0.199980	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	-14	1909.799986	1910.0	0.200014	Complied
4.2	-27	1909.799973	1910.0	0.200027	Complied

5.2.7. Transmitter Occupied Bandwidth

Test Summary:

FCC Part:	24.238
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)

Environmental Conditions:

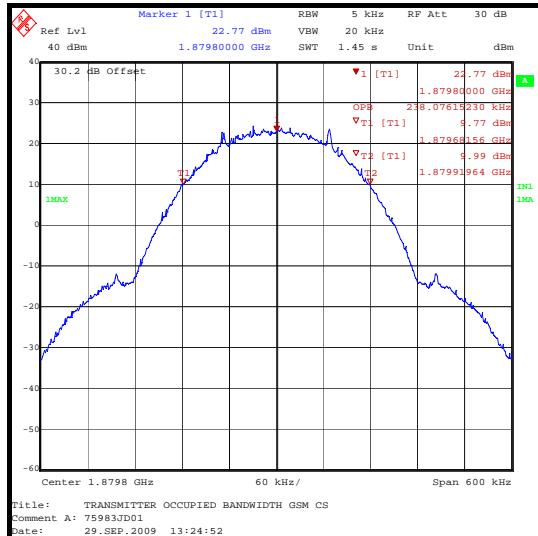
Temperature (°C):	27
Relative Humidity (%):	32

Results: GSM

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1879.8	238.076

Note(s):

1. 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.



Transmitter Occupied Bandwidth (continued)**Test Summary:**

FCC Part:	24.238
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)

Environmental Conditions:

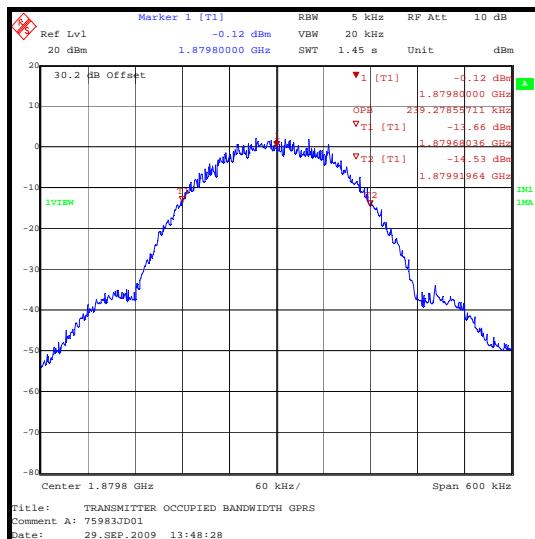
Temperature (°C):	27
Relative Humidity (%):	32

Results: GPRS

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1879.8	239.279

Note(s):

1. 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.



5.2.8. Transmitter Out of Band Radiated Emissions

Test Summary:

FCC Part:	2.1053 & 24.238
Frequency Range:	30 MHz to 20 GHz
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):	27
Relative Humidity (%):	36

Results: Bottom Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
3700.410	-22.6	-13.0	9.6	Complied
5550.398	-25.8	-13.0	12.8	Complied
7400.709	-31.1	-13.0	18.1	Complied
9250.759	-16.8	-13.0	3.8	Complied
11101.106	-34.2	-13.0	21.2	Complied

Results: Middle Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
3759.434	-22.7	-13.0	9.7	Complied
5639.405	-26.0	-13.0	13.0	Complied
7519.115	-31.3	-13.0	18.3	Complied
9399.225	-16.4	-13.0	3.4	Complied
11278.675	-34.8	-13.0	21.8	Complied

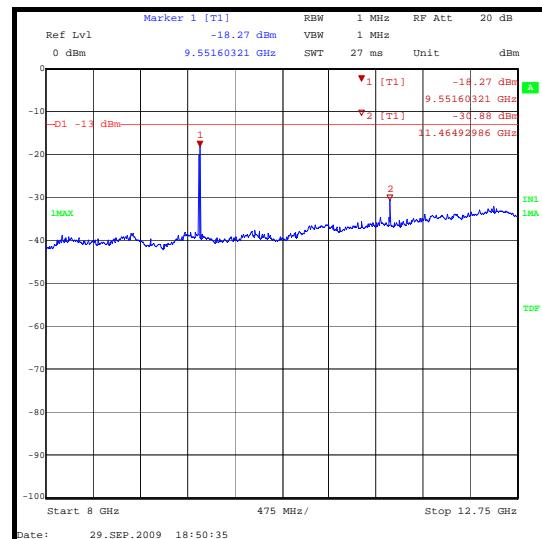
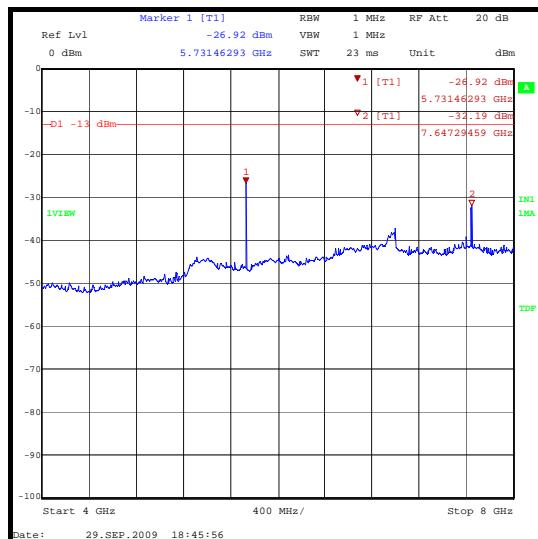
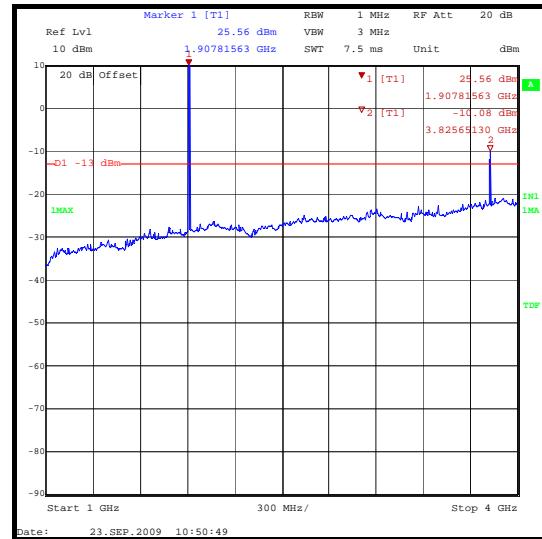
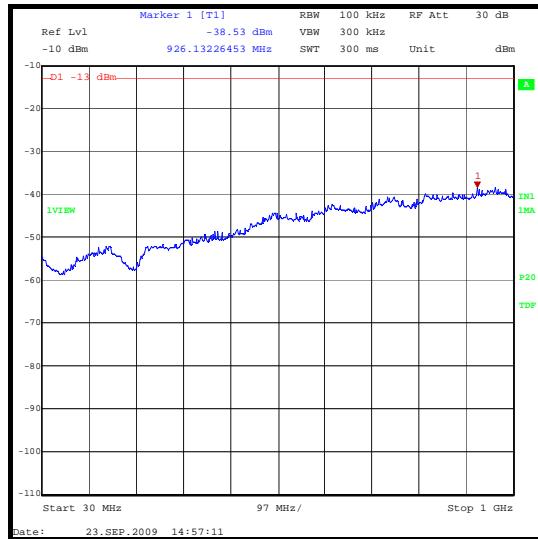
Results: Top Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
3819.509	-23.3	-13.0	10.3	Complied
5729.619	-26.1	-13.0	13.1	Complied
7638.828	-31.9	-13.0	18.9	Complied
9549.110	-17.9	-13.0	4.9	Complied
11458.362	-32.3	-13.0	19.3	Complied

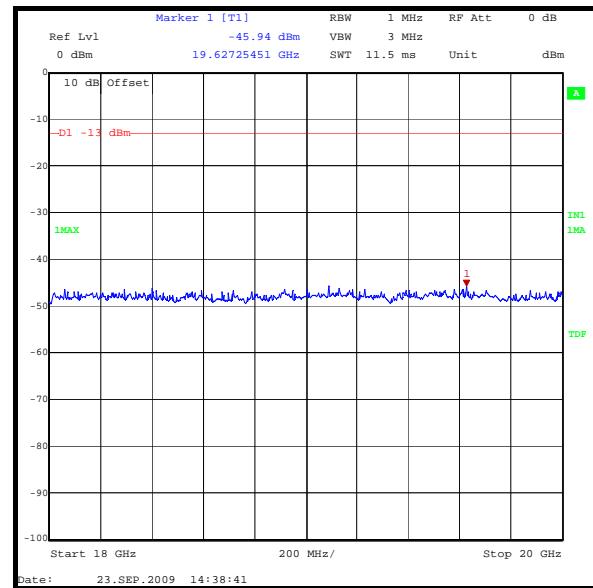
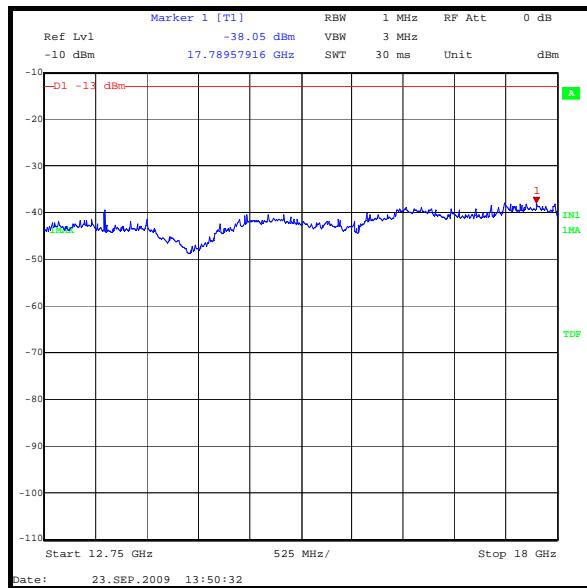
Note(s):

1. The transmitter fundamental is shown on the 1 GHz to 4 GHz pre-scan plot at approximately 1908 MHz.
2. Final measurements were performed using appropriate RF filters and attenuators where required.

Transmitter Out of Band Radiated Emissions (continued)



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

Transmitter Out of Band Radiated Emissions (continued)

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

5.2.9. Transmitter Radiated Emissions at Band Edges

Test Summary:

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

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	32

Results: GSM - Bottom Band Edge

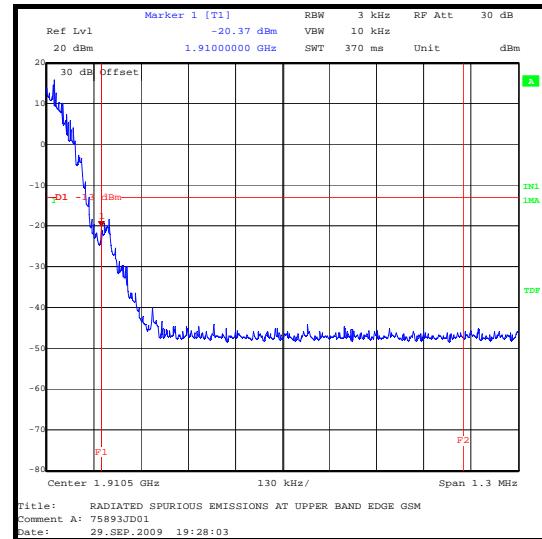
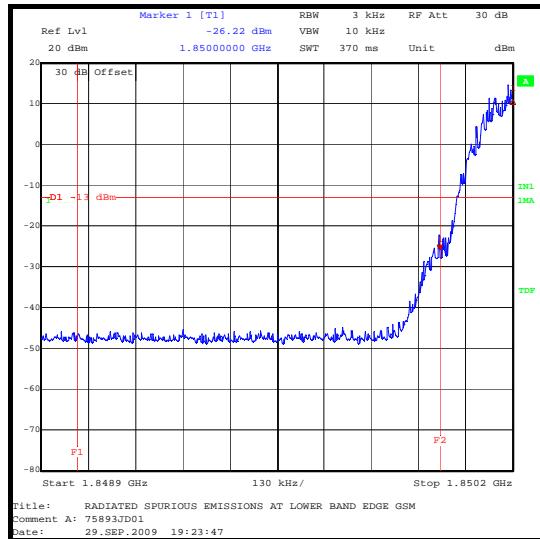
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1850.0	-26.2	-13.0	13.2	Complied

Results: GSM - Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1910.0	-20.4	-13.0	7.4	Complied

Note(s):

1. GSM circuit switched mode results are shown above. Emission levels were found to be higher in this mode than in GPRS mode.



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%	±3.72 dB
Effective Isotropic Radiated Power (EIRP)	1850 MHz to 1910 MHz	95%	±2.94 dB
Frequency Stability	1850 MHz to 1910 MHz	95%	±0.92 ppm
Occupied Bandwidth	1850 MHz 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 Last Calibrated	Cal. Interval (Months)
A1141	Directional Coupler	Hewlett Packard	11691D	1212A02494	Calibrated before use	-
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
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	Calibrated before use	12
A288	Antenna	Chase	CBL6111A	1589	13 Mar 2009	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	01 Sep 2009	12
L0990	Comms Test Set	R&S	CMU 200	S220447	18 Feb 2009	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	09 Mar 2009	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	22 Apr 2009	12
M1269	Multimeter	Fluke	179	90250210	23 Jun 2009	12
M1379	Test Receiver	Rohde & Schwarz	ESIB7	100330	20 Aug 2009	12
S021	DC Power Supply	Thurlby Thandar	CPX200	061034	Calibrated before use	-

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