TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: NTT docomo P-04B

To: FCC Part 24: 2008 Subpart E

Test Report Serial No:
RFI-RPT-RP77078JD05B_V3.0

Version 3.0 supersedes all previous versions

This Test Report Is Issued Under The Authority Of Brian Watson, COO Payments and Consultancy:	pp R. Graham
Checked By:	R. Graham
Signature:	R. Graham
Date of Issue:	30 March 2010

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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:	47CFR24
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2008: Part 24 Subpart E (Personal Communication Services)
Site Registration:	FCC: 209735
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH, United Kingdom
Test Dates:	02 March 2010 to 09 March 2010

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.107	Idle Mode AC Conducted Spurious Emissions	✓
Part 15.109	Idle Mode Radiated Spurious Emissions	✓
Part 15.207	Transmitter AC Conducted Spurious Emissions	✓
Part 24.232	Transmitter Equivalent Isotropic Radiated Power (EIRP)	✓
Part 2.1046	Transmitter Conducted Average Output Power*	✓
Part 24.235	Transmitter Frequency Stability (Temperature & Voltage Variation)	✓
Part 2.1049 / 24.238	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

**The measurement was performed on the conducted sample of the EUT which was fitted with a temporary antenna connector to facilitate the measurements.*

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-04B
IMEI:	358862030014626 *(radiated sample);* 358862030014600 *(conducted sample)*
Hardware Version Number:	Rev C
Software Version Number:	B-D01WP1-01.01.001 D01WP1_Cv48032102
FCC ID Number:	UCE210027A

Description:	Battery
Brand Name:	NTT docomo
Model Name or Number:	P20
Serial Number:	N/A

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

Description:	DC Charger
Brand Name:	NTT docomo
Model Name or Number:	FOMA DC Adapter 02
Serial Number:	N/A

Description:	Charge/USB Data cable
Brand Name:	NTT docomo
Model Name or Number:	FOMA USB Cable with Charge Function 02
Serial Number:	N/A

Description:	Micro SD memory card
Brand Name:	Not stated
Model Name or Number:	Not stated
Serial Number:	Not stated

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

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	27.3 dBm	
	GPRS	25.5 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, middle 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 prescans. 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.
- The Transmitter/idle spurious emission were tested using Circuit Switch mode as it produced the greater EIRP.
- Transmitter mode spurious emission tests were performed with the personal hands free connected to the EUT and 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:

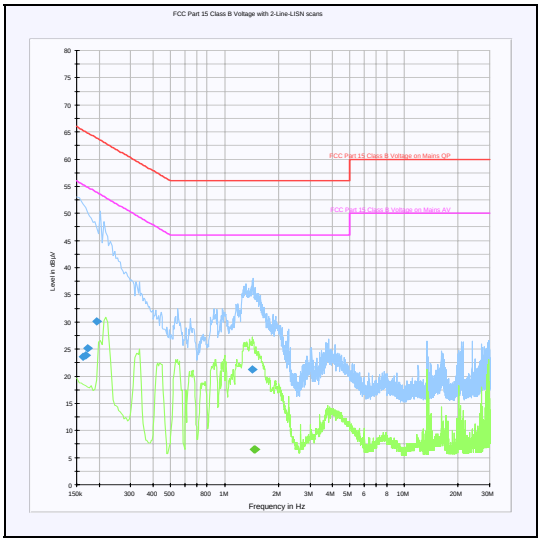
Temperature (°C):	26
Relative Humidity (%):	29

Results: Quasi Peak Detector Measurements

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.163500	Live	23.5	65.3	41.8	Complied
0.168000	Live	23.9	65.1	41.2	Complied
0.172500	Live	25.1	64.8	39.7	Complied
0.195000	Live	30.0	63.8	33.8	Complied
1.419000	Live	21.2	56.0	34.8	Complied

Results: Average Detector Measurements

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
1.468500	Live	6.6	46.0	39.4	Complied
1.473000	Live	6.6	46.0	39.4	Complied



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:

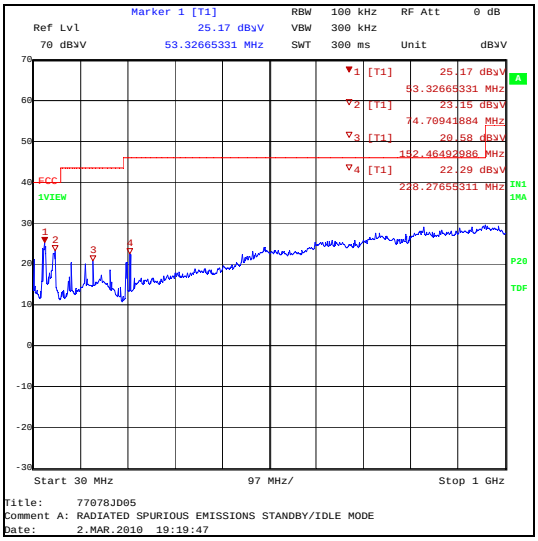
FCC Part:	15.109
Frequency Range:	30 MHz to 1000 MHz
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	20

Results:

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
50.091	Vertical	19.6	40.0	20.4	Complied
74.559	Vertical	16.6	40.0	23.4	Complied
153.306	Horizontal	22.2	43.5	21.3	Complied
229.280	Horizontal	21.0	46.0	25.0	Complied
947.441	Horizontal	29.6	46.0	16.4	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 (%):	20

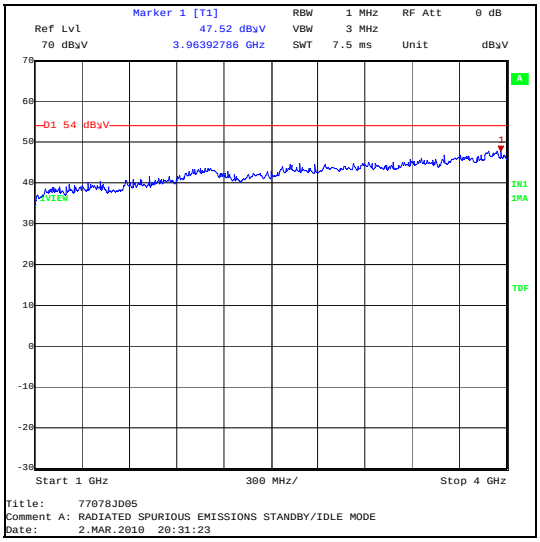
Results: Highest Peak Level

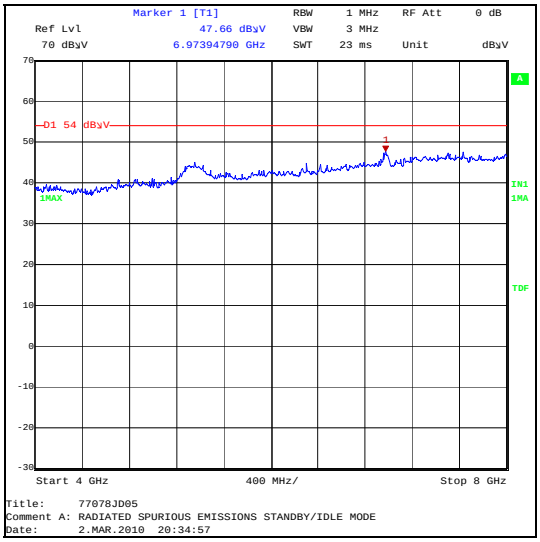
Frequency (GHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
6.9739	Vertical	47.7	54.0	6.3	Complied

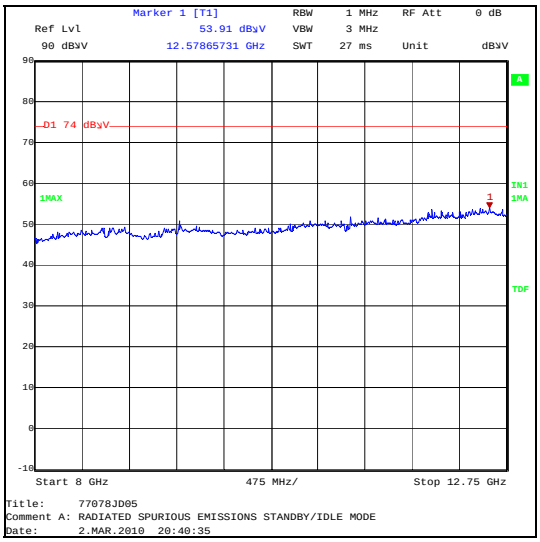
Note(s):

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.
2. All pre-scan were performed with the peak detector against average limits apart from measurement made in the range of 8 GHz to 12.75 GHz where pre-scans were performed with peak and average detector and the applicable limit apply. This was due to the noise floor exceeding the average limit when using the peak detector.

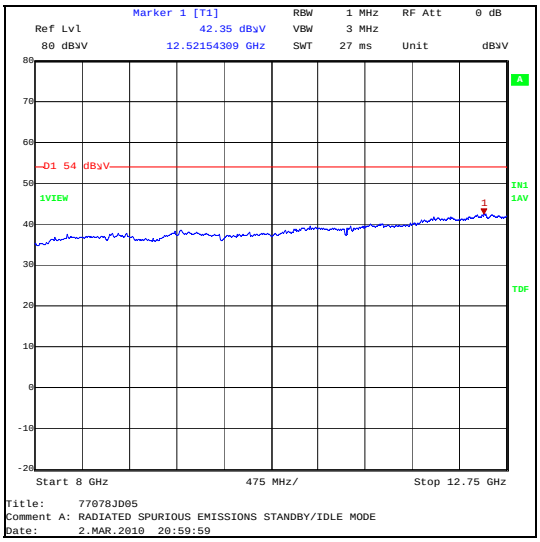
Idle Mode Radiated Spurious Emissions (continued)







Peak Detector



Average Detector

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

5.2.3. Transmitter AC Conducted Spurious Emissions

Test Summary:

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

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	25

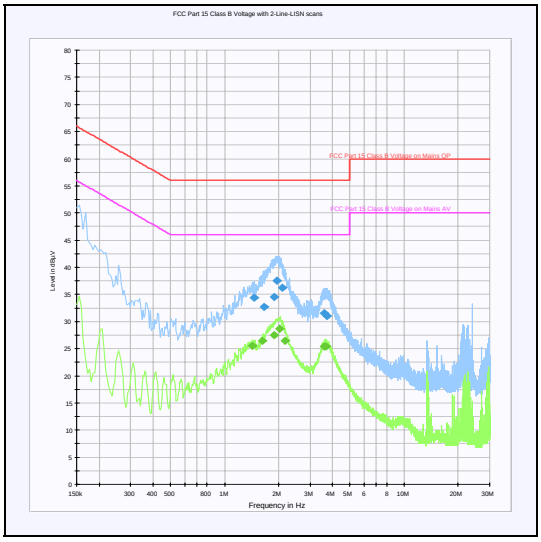
Results: Quasi Peak Detector Measurements

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
1.455000	Live	34.4	56.0	21.6	Complied
1.653000	Neutral	32.8	56.0	23.2	Complied
1.882500	Neutral	34.6	56.0	21.4	Complied
1.945500	Live	37.5	56.0	18.5	Complied
2.089500	Live	36.2	56.0	19.8	Complied
3.601500	Live	31.5	56.0	24.5	Complied
3.696000	Live	31.1	56.0	24.9	Complied

Results: Average Detector Measurements

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
1.428000	Live	25.5	46.0	20.5	Complied
1.626000	Neutral	26.4	46.0	19.6	Complied
1.896000	Neutral	27.5	46.0	18.5	Complied
2.026500	Live	28.6	46.0	17.4	Complied
2.161500	Live	26.5	46.0	19.5	Complied
3.592500	Live	25.5	46.0	20.5	Complied
3.655500	Live	25.4	46.0	20.6	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 Equivalent 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):	24
Relative Humidity (%):	22

Results: GSM

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Horizontal	24.5	33.0	8.5	Complied
Middle	1879.8	Horizontal	26.8	33.0	6.2	Complied
Top	1909.8	Horizontal	27.3	33.0	5.7	Complied

Results: GPRS

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Horizontal	22.8	33.0	10.2	Complied
Middle	1879.8	Horizontal	25.2	33.0	7.8	Complied
Top	1909.8	Horizontal	25.5	33.0	7.5	Complied

5.2.5. Transmitter Conducted Average Output Power

Test Summary:

FCC Part:	2.1046
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.1

Results: GSM

Channel	Frequency (MHz)	Conducted Average Output Power (dBm)
Bottom	1850.2	29.4
Middle	1879.8	29.4
Top	1909.8	29.2

Results: GPRS

Channel	Frequency (MHz)	Conducted Average Output Power (dBm)
Bottom	1850.2	27.0
Middle	1879.8	27.0
Top	1909.8	26.9

5.2.6. Transmitter Frequency Stability (Temperature 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):	27
Relative Humidity (%):	28

Results: Bottom Channel (1850.2 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	-39	1850.199961	1850.0	0.199961	Complied
-20	-37	1850.199963	1850.0	0.199963	Complied
-10	-12	1850.199988	1850.0	0.199988	Complied
0	-19	1850.199981	1850.0	0.199981	Complied
10	-24	1850.199976	1850.0	0.199976	Complied
20	-37	1850.199963	1850.0	0.199963	Complied
30	-32	1850.199968	1850.0	0.199968	Complied
40	-34	1850.199966	1850.0	0.199966	Complied
50	-28	1850.199972	1850.0	0.199972	Complied

Results: Top Channel (1909.8 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	-44	1909.799956	1910.0	0.200044	Complied
-20	-40	1909.799960	1910.0	0.200040	Complied
-10	-41	1909.799959	1910.0	0.200041	Complied
0	-32	1909.799968	1910.0	0.200032	Complied
10	-22	1909.799978	1910.0	0.200022	Complied
20	-43	1909.799957	1910.0	0.200043	Complied
30	-38	1909.799962	1910.0	0.200038	Complied
40	-41	1909.799959	1910.0	0.200041	Complied
50	-42	1909.799958	1910.0	0.200042	Complied

5.2.7. 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):	23
Relative Humidity (%):	24

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 V	-26	1850.199974	1850.0	0.199974	Complied
4.2 V	-30	1850.199970	1850.0	0.199970	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 V	-24	1909.799976	1910.0	0.200024	Complied
4.2 V	-34	1909.799966	1910.0	0.200034	Complied

5.2.8. Transmitter Occupied Bandwidth

Test Summary:

FCC Part:	24.238
Test Method Used:	As detailed in ANSI C63.4 Section13.1.7 and relevant annexes referencing FCC CFR Part 2.1049 (see note below)

Environmental Conditions:

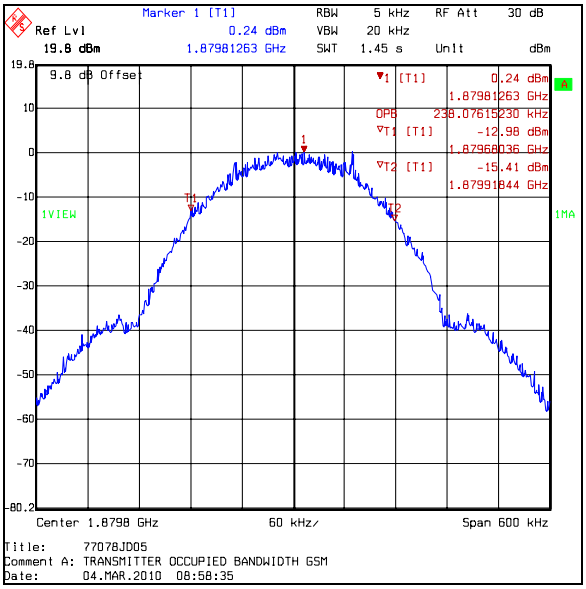
Temperature (°C):	25
Relative Humidity (%):	28

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 Section13.1.7 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 Section13.1.7 and relevant annexes referencing FCC CFR Part 2.1049 (see note below)

Environmental Conditions:

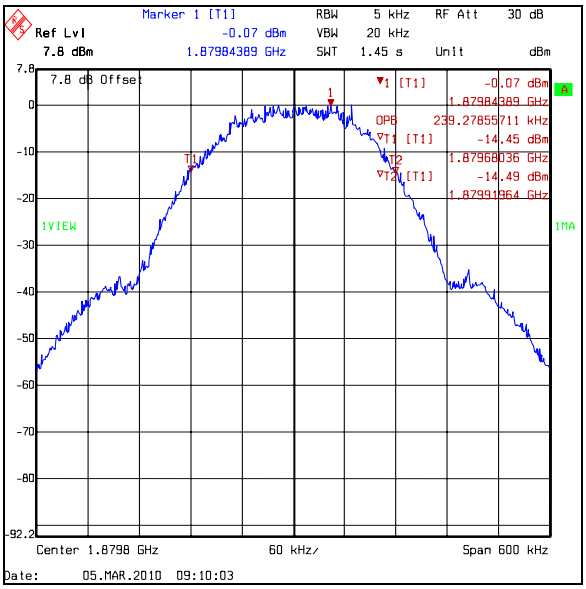
Temperature (°C):	24
Relative Humidity (%):	27

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 Section13.1.7 the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.



5.2.9. 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):	25
Relative Humidity (%):	18

Results: Bottom Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
5550.733	-27.9	-13.0	14.9	Complied
7400.820	-28.9	-13.0	15.9	Complied
9250.723	-20.8	-13.0	7.8	Complied

Results: Middle Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
5639.505	-26.3	-13.0	13.3	Complied
7519.276	-29.9	-13.0	16.9	Complied
9348.632	-17.8	-13.0	4.8	Complied

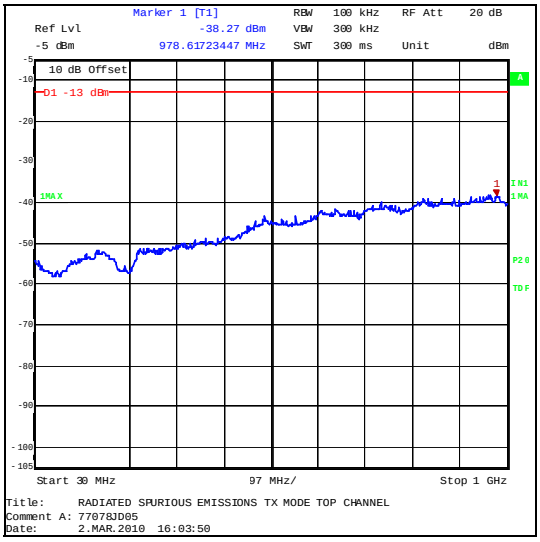
Results: Top Channel

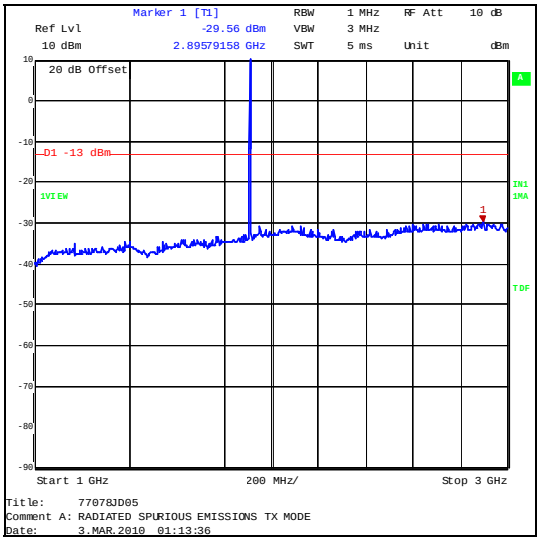
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
5729.580	-29.9	-13.0	16.9	Complied
7639.176	-27.4	-13.0	14.4	Complied
9549.254	-16.8	-13.0	3.8	Complied

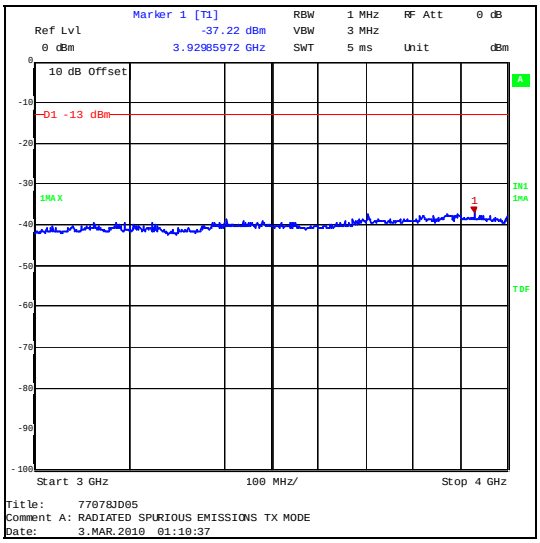
Note(s):

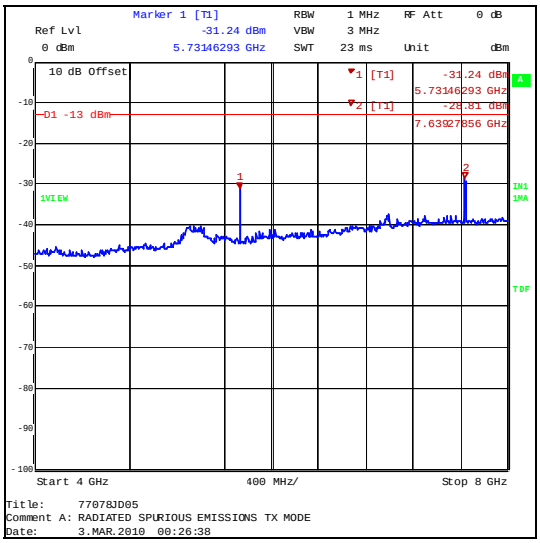
1. The transmitter fundamental is shown on the 1 GHz to 3 GHz plot.

Transmitter Out of Band Radiated Emissions (continued)



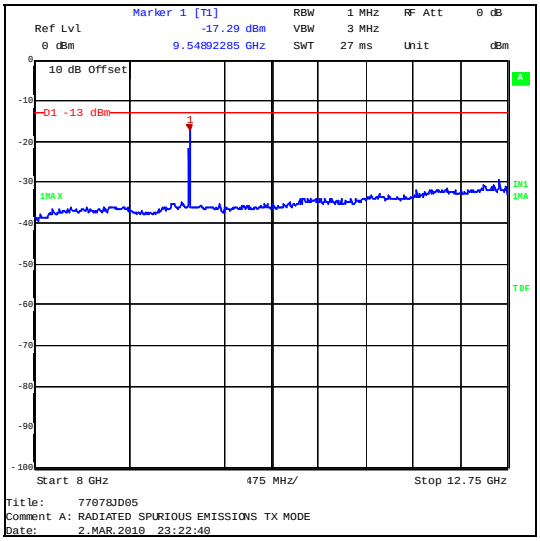


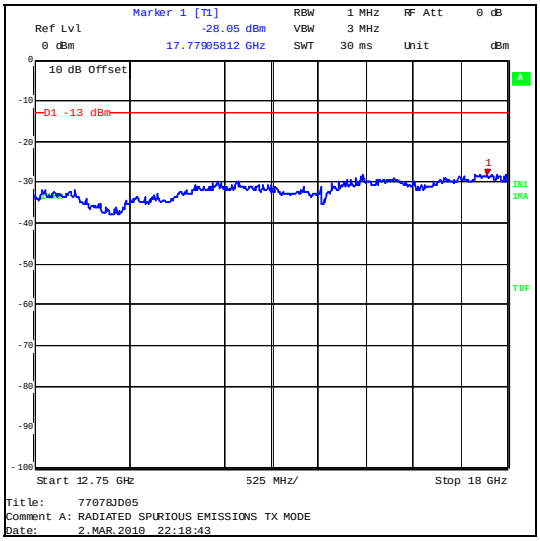


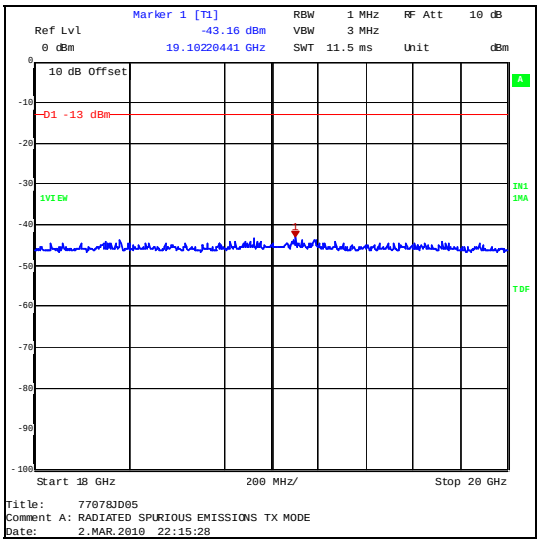


Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Transmitter Out of Band Radiated Emissions (continued)







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

5.2.10. 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:

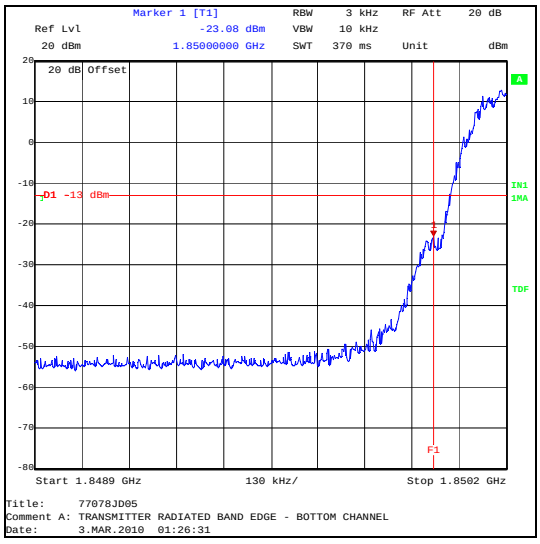
Temperature (°C):	25
Relative Humidity (%):	18

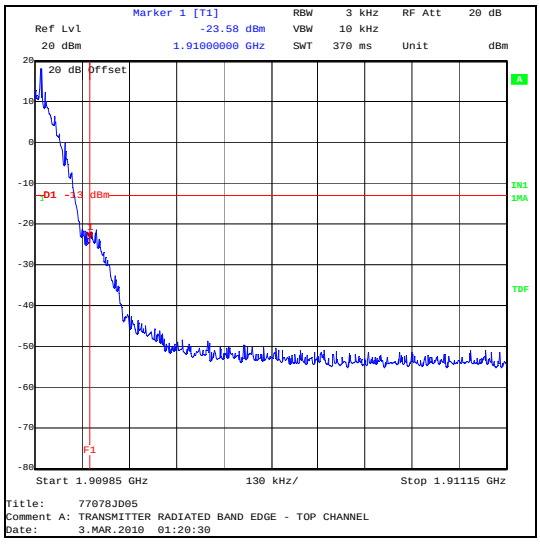
Results: GSM - Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850.0	-23.1	-13.0	10.1	Complied

Results: GSM - Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910.0	-23.6	-13.0	10.6	Complied





Transmitter Radiated Emissions at Band Edges (continued)

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:

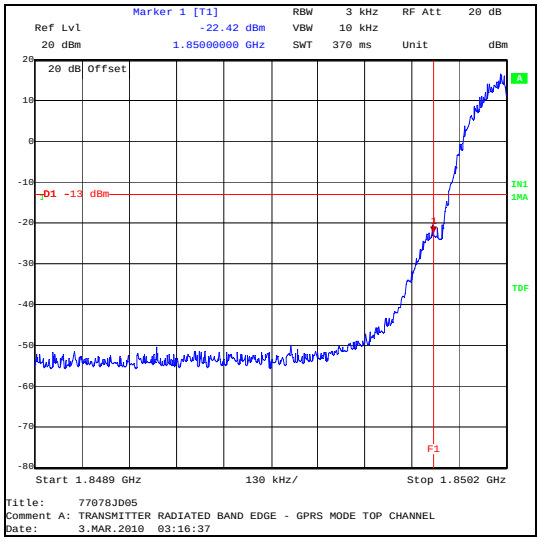
Temperature (°C):	25
Relative Humidity (%):	18

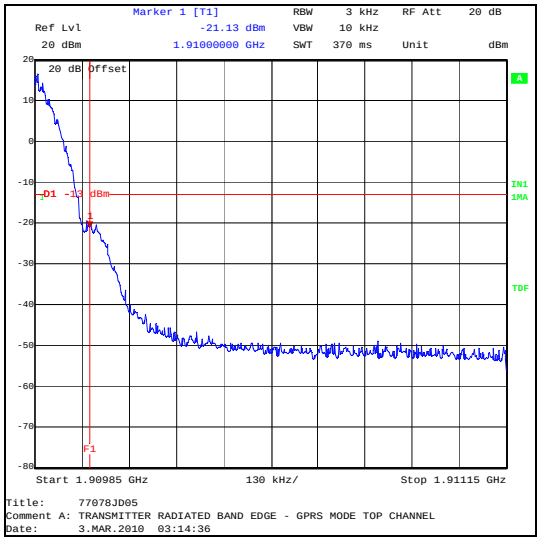
Results: GPRS - Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850.0	-22.4	-13.0	9.4	Complied

Results: GPRS - Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910.0	-21.1	-13.0	8.1	Complied





NB – the above plot has been incorrectly labelled as TOP CHANNEL, when it shows the BOTTOM CHANNEL.

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)	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 12.75 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)
A067	LISN	Rohde & Schwarz	ESH3-Z5	890603/002	03 Jun 2009	12
A1391	Attenuator	HUBER + SUHNER AG	757987	6810.17.B	Calibrated before use	-
A1399	Attenuator	Weinschel Associates	WA46-10	A126	Calibrated before use	-
A1400	Attenuator	Weinschel Associates	WA46-10	A127	Calibrated before use	-
A1534	Pre Amplifier	Hewlett Packard	8449B OPT H02	3008A00405	Calibrated before use	-
A1818	Antenna	EMCO	3115	00075692	27 Nov 2009	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	01 Mar 2010	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	Calibrated before use	-
A288	Antenna	Chase	CBL6111A	1589	13 Mar 2009	12
A436	Antenna	Flann	20240-20	330	24 Apr 2009	36
C363	Cable	Rosenberger	RG142	None	23 Feb 2010	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
K0003	Bench Test Site	RFI Global Services Ltd	N/A	N/A	Calibration not required	-
K0008	Conducted AC Emissions Test Site	RFI Global Services Ltd	N/A	N/A	Calibration not required	-
L1004	CMU200	Rohde & Schwarz	CMU200	117194	02 Feb 2010	-
M1068	Thermometer	Iso-Tech	RS55	93102884	01 Oct 2009	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	09 Mar 2009	12
M1138	CMU 200	Rohde & Schwarz	1100.0008.02	836202/093	Calibration not required	-
M122	Digital Voltmeter	Fluke	77	64910017	23 Jun 2009	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	10 Jul 2009	12
M1379	Spectrum Analyser	Rohde & Schwarz	ESIB7	100330	20 Aug 2009	12
M208	Thermometer / Hygrometer	RS Components	RS212-124	None	30 Apr 2009	12
S0536	Dual Power Supply	TTI	EL302D	249944	Calibrated before use	-

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