TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: NTT docomo P-06B

To: FCC Part 24: 2009 Subpart E

Test Report Serial No:
RFI-RPT-RP77775JD03B

Version 2.0 Supersedes All Previous Versions

This Test Report Is Issued Under The Authority Of Scott D'Adamo, Operations Manager Global Approvals:	
Checked By:	Ian Watch
Signature:	
Date of Issue:	07 June 2010

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RFI Global Services Ltd
Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire RG23 8BG
Telephone: +44 (0)1256 312000 Facsimile: +44 (0)1256 312001
Email: info@rfi-global.com Website: www.rfi-global.com

Registered in England and Wales. Company number:2117901

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Table of Contents

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) 2009: 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:	25 May 2010 to 27 May 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 24.232	Transmitter Equivalent Isotropic Radiated Power (EIRP)	✓
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

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 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-06B
IMEI Number:	358864030023375 *(radiated sample)* 358864030023573 *(conducted sample)*
Hardware Version Number:	Rev C
Software Version Number:	B-D01SW1-01.04.001 D01SW1_Cv60.05.24.02
FCC ID Number:	UCE210028A

Description:	Battery
Brand Name:	NTT
Model Name or Number:	P22
Serial Number:	Not stated

Description:	AC Charger
Brand Name:	NTT docomo
Model Name or Number:	FOMA AC Adapter 01 for Global use / MAS-BH0008-A 002
Serial Number:	Not stated

Description:	DC Charger
Brand Name:	NTT docomo
Model Name or Number:	FOMA DC Adapter 02
Serial Number:	Not stated

Description:	Charge/USB Data cable
Brand Name:	NTT docomo
Model Name or Number:	FOMA USB Cable with Charge Function 02
Serial Number:	Not stated

Description:	Personal Hands-Free
Brand Name:	NTT docomo
Model Name or Number:	Stereo Earphone Set 01
Serial Number:	Not stated

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

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	3.7V	
	Minimum	3.4V	
	Maximum	4.2V	
Maximum Output Power (EIRP):	GSM	27.9 dBm	
	GPRS	25.8 dBm	
Transmit Frequency Range:	1850 MHz 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 MHz 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
Brand Name:	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 mode and GPRS Multislot Class 10 mode 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.
- Transmitter/idle spurious emissions tests were tested using Circuit Switch mode as it produced the highest EIRP level.
- 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):	23
Relative Humidity (%):	21

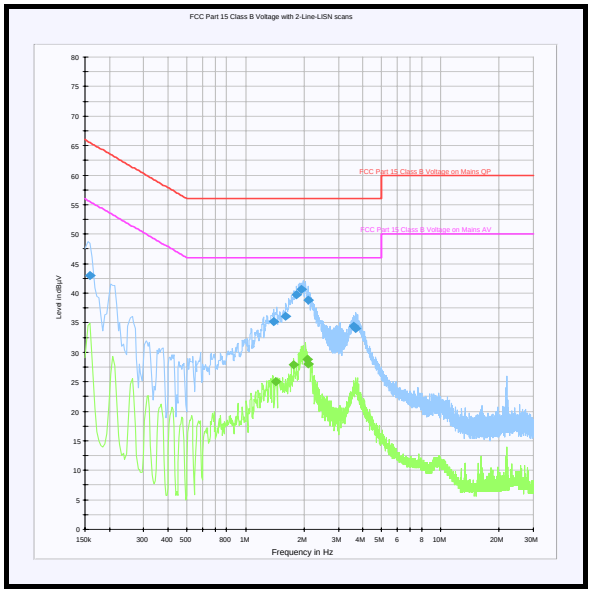
Results: Quasi Peak Detector Measurements

Frequency (MHz)	Line	Quasi Peak Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.159000	Live	43.0	65.5	22.5	Complied
1.392000	Live	35.1	56.0	20.9	Complied
1.612500	Neutral	36.1	56.0	19.9	Complied
1.828500	Neutral	39.7	56.0	16.3	Complied
1.936500	Live	40.6	56.0	15.4	Complied
2.098500	Live	38.8	56.0	17.2	Complied
3.601500	Live	34.4	56.0	21.6	Complied
3.664500	Live	34.0	56.0	22.0	Complied

Results: Average Detector Measurements

Frequency (MHz)	Line	Average Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
1.423500	Live	25.1	46.0	20.9	Complied
1.770000	Neutral	27.9	46.0	18.1	Complied
2.080500	Live	28.8	46.0	17.2	Complied
2.094000	Live	28.0	46.0	18.0	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:

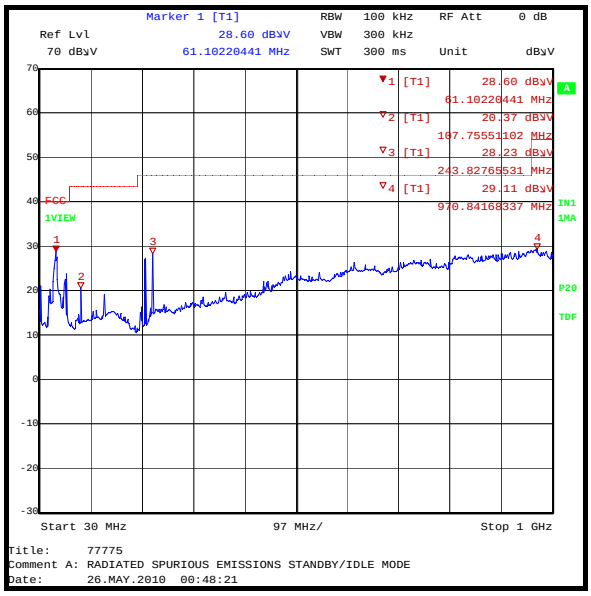
FCC Part:	15.109
Frequency Range:	30 MHz to 1000 MHz
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes

Environmental Conditions:

Temperature (°C):	30
Relative Humidity (%):	20

Results:

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
62.128	Vertical	25.8	40.0	14.2	Complied
80.030	Vertical	24.5	40.0	15.5	Complied
228.276	Vertical	27.7	46.0	18.3	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):	30
Relative Humidity (%):	20

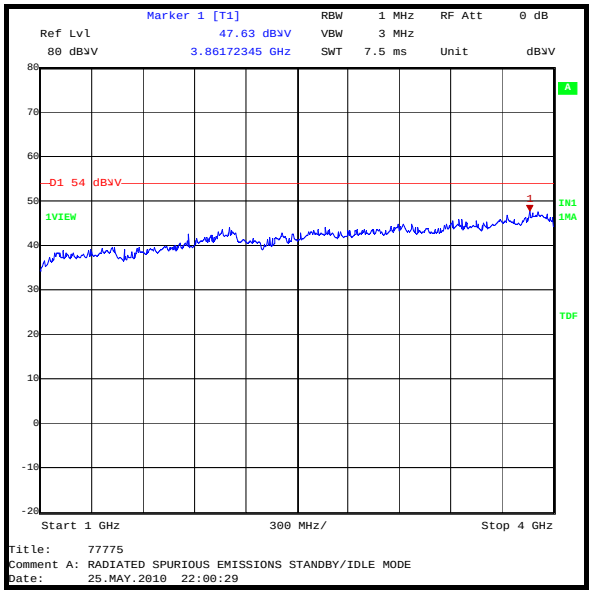
Results:

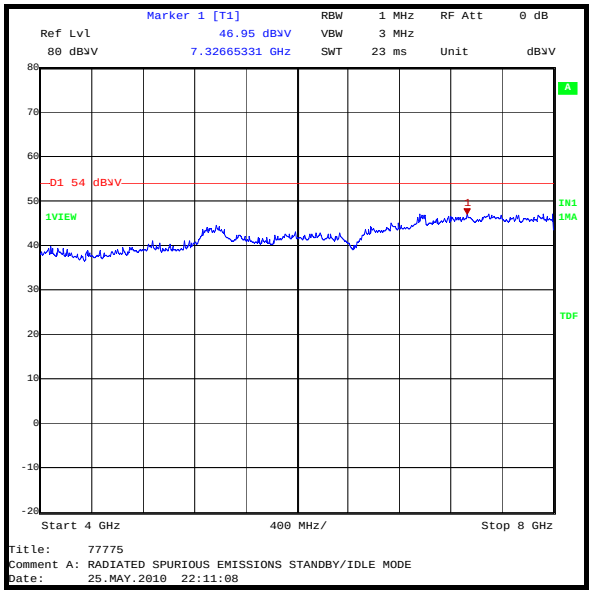
Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
3861.723	Vertical	47.6	54.0	6.4	Complied

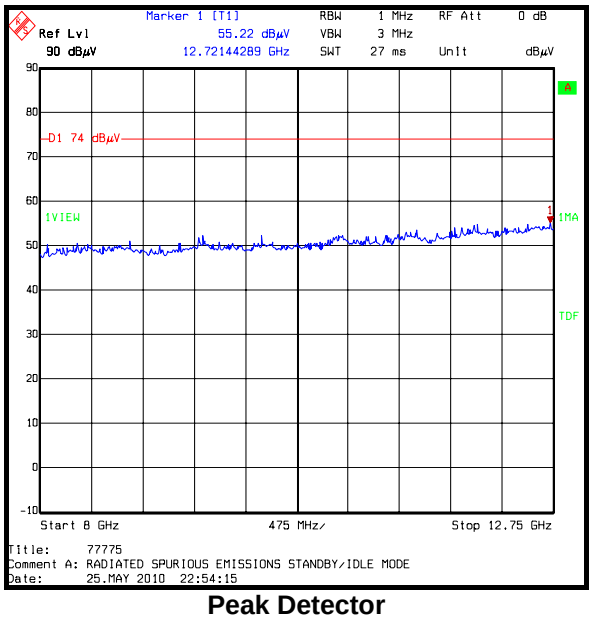
Note(s):

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.

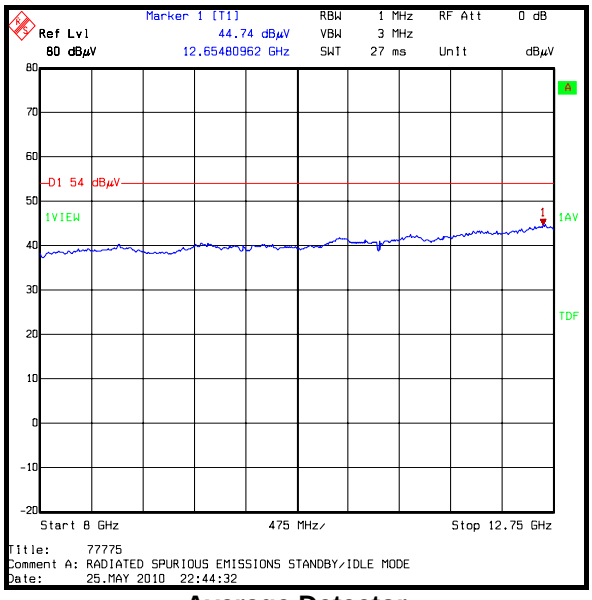
Idle Mode Radiated Spurious Emissions (continued)







Peak Detector



Average Detector

5.2.3. Transmitter Effective Isotropic Radiated Power (EIRP)

Test Summary:

FCC Part:	24.232 and 2.1046
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.17.2

Environmental Conditions:

Temperature (°C):	30
Relative Humidity (%):	20

Results: GSM

Channel	Measured Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dBm)	Result
Bottom	1850.2	Vertical	27.9	33.0	5.1	Complied
Middle	1879.8	Horizontal	27.0	33.0	6.0	Complied
Top	1909.8	Horizontal	27.1	33.0	5.9	Complied

Results: GPRS

Channel	Measured Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dBm)	Result
Bottom	1850.2	Vertical	25.8	33.0	7.2	Complied
Middle	1879.8	Horizontal	25.5	33.0	7.5	Complied
Top	1909.8	Horizontal	25.1	33.0	7.9	Complied

Transmitter Conducted Average Power

Results: GSM

Channel	Frequency (MHz)	Conducted Average Output Power (dBm)
Bottom	1850.2	29.3
Middle	1879.8	29.1
Top	1909.8	28.9

Results: GPRS

Channel	Frequency (MHz)	Conducted Average Output Power (dBm)
Bottom	1850.2	27.3
Middle	1879.8	27.3
Top	1909.8	26.9

5.2.4. 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:

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

Results: Bottom Channel (1850.2 MHz)

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	1850.200149	149	0.08	2.5	2.42	Complied
-20	1850.199933	67	0.04	2.5	2.46	Complied
-10	1850.199919	81	0.04	2.5	2.46	Complied
0	1850.199951	49	0.03	2.5	2.47	Complied
10	1850.199947	53	0.03	2.5	2.47	Complied
20	1850.199919	81	0.04	2.5	2.46	Complied
30	1850.199874	126	0.07	2.5	2.43	Complied
40	1850.199910	90	0.05	2.5	2.45	Complied
50	1850.199940	60	0.03	2.5	2.47	Complied

Results: Top Channel (1909.8 MHz)

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	1909.800158	158	0.08	2.5	2.42	Complied
-20	1909.799963	37	0.02	2.5	2.48	Complied
-10	1909.799896	104	0.05	2.5	2.45	Complied
0	1909.799959	41	0.02	2.5	2.48	Complied
10	1909.799943	57	0.03	2.5	2.47	Complied
20	1909.799930	70	0.04	2.5	2.46	Complied
30	1909.799900	100	0.05	2.5	2.45	Complied
40	1909.799918	82	0.04	2.5	2.46	Complied
50	1909.799938	62	0.03	2.5	2.47	Complied

5.2.5. 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):	25
Relative Humidity (%):	30

Results: Bottom Channel (1850.2 MHz)

Supply Voltage (V)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
3.4	1850.199899	101	0.05	2.5	2.45	Complied
4.2	1850.199888	112	0.06	2.5	2.44	Complied

Results: Top Channel (1909.8 MHz)

Supply Voltage (V)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
3.4	1909.799885	115	0.06	2.5	2.44	Complied
4.2	1909.799894	106	0.06	2.5	2.44	Complied

5.2.6. Transmitter Occupied Bandwidth

Test Summary:

FCC Part:	24.238
Test Method Used:	As detailed in ANSI C63.4 Section 13.7 and relevant annexes referencing FCC CFR Part 2.1049 (see note below)

Environmental Conditions:

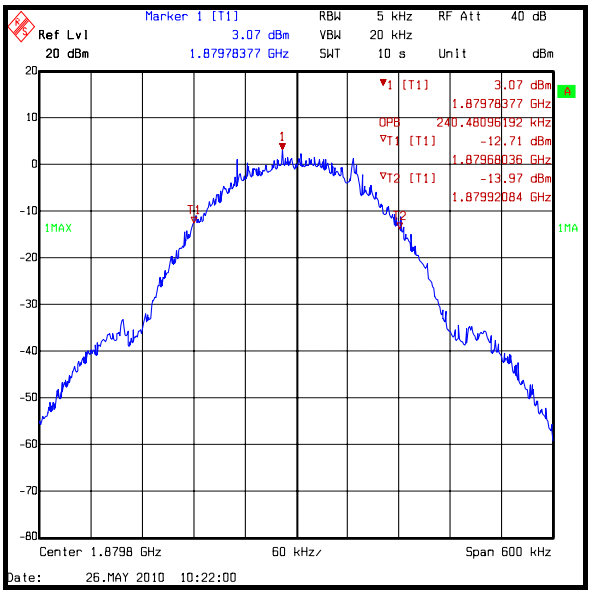
Temperature (°C):	25
Relative Humidity (%):	30

Results: GSM

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1879.8	240.481

Note(s):

1. In lieu of the test method detailed in ANSI C63.4 Section13.7, 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 13.7 and relevant annexes referencing FCC CFR Part 2.1049 (see note below)

Environmental Conditions:

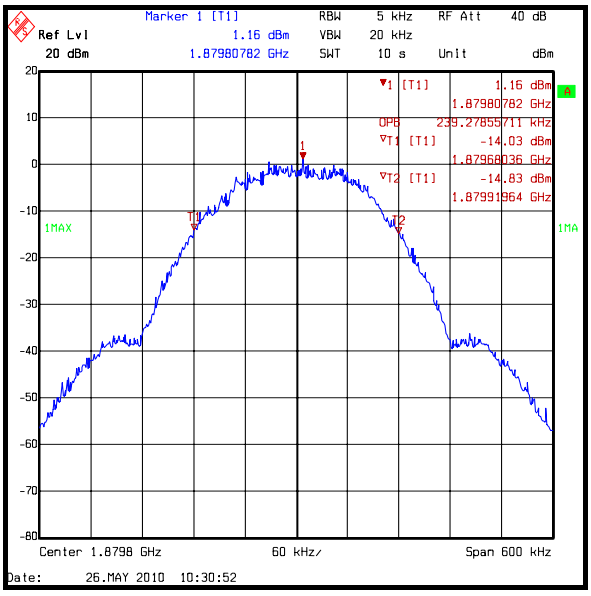
Temperature (°C):	25
Relative Humidity (%):	30

Results: GPRS

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

Note(s):

2. In lieu of the test method detailed in ANSI C63.4 Section13.7, the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.



5.2.7. 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):	30
Relative Humidity (%):	20

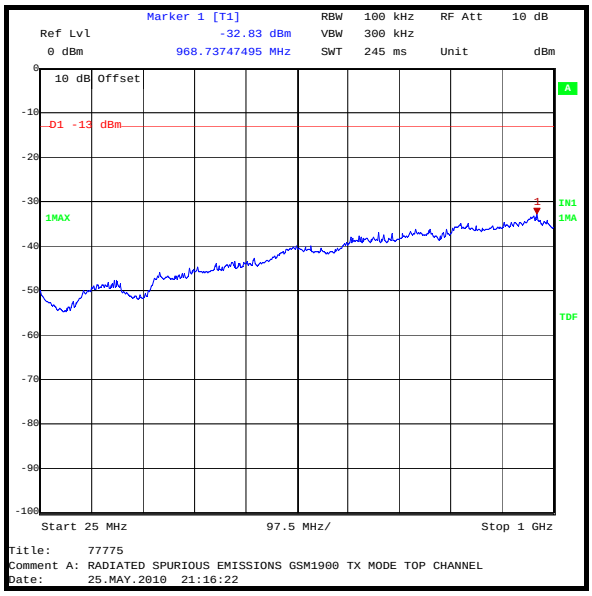
Results:

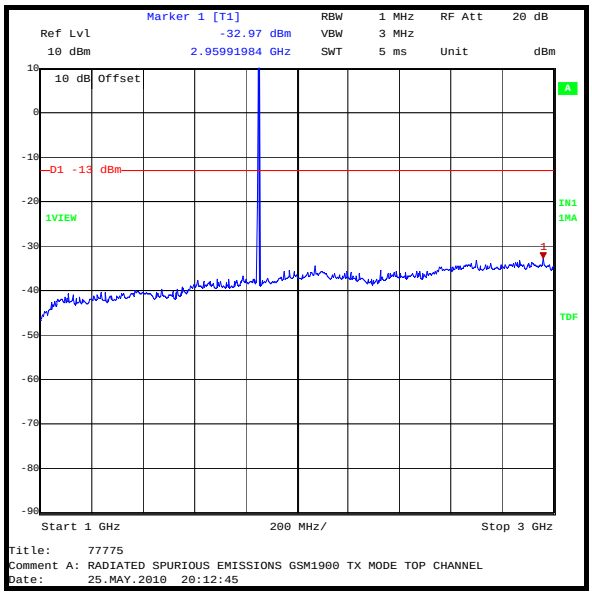
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
12492.986	-31.5	-13.0	18.5	Complied

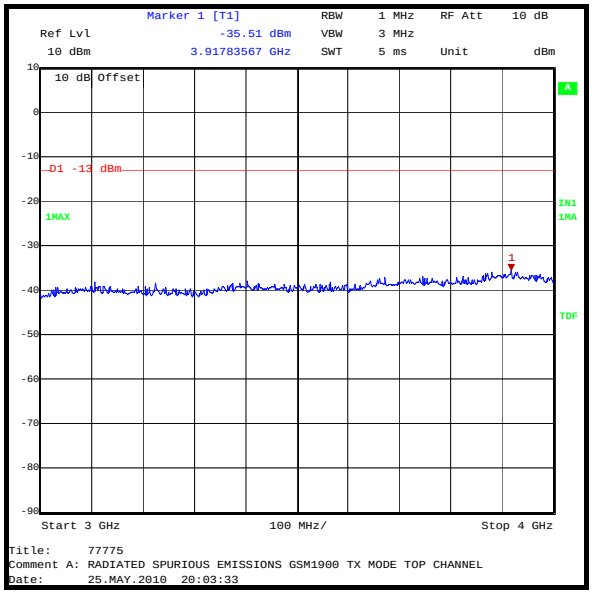
Note(s):

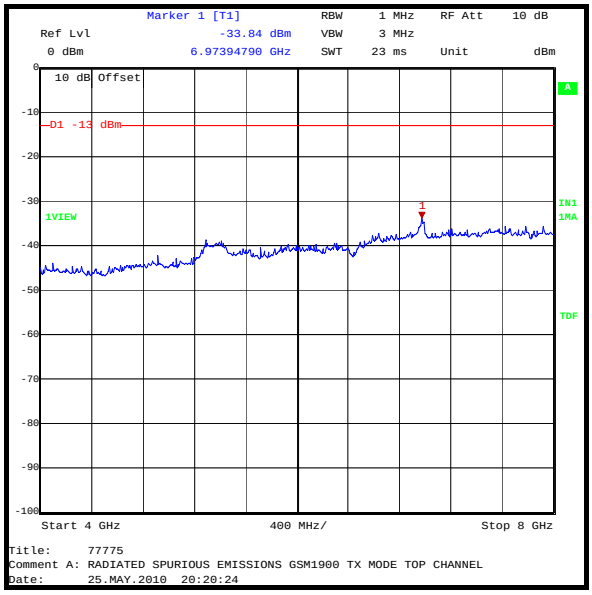
1. No spurious emissions were detected above the noise floor of the measuring receiver; the highest peak noise floor reading of the measuring receiver was recorded.
2. The transmitter fundamental is shown on the 1 GHz to 4 GHz plot at approximately 1909.8 MHz.

Transmitter Out of Band Radiated Emissions (continued)

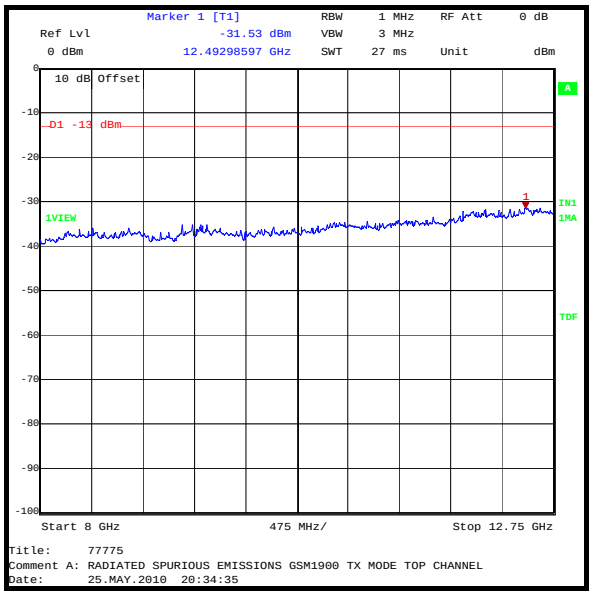


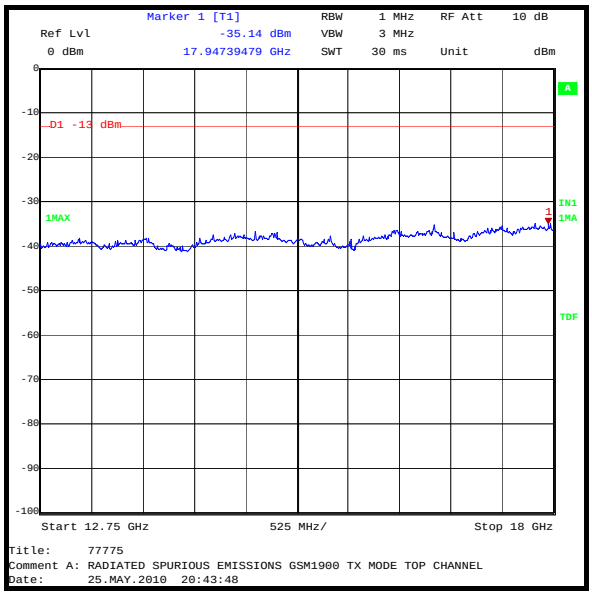


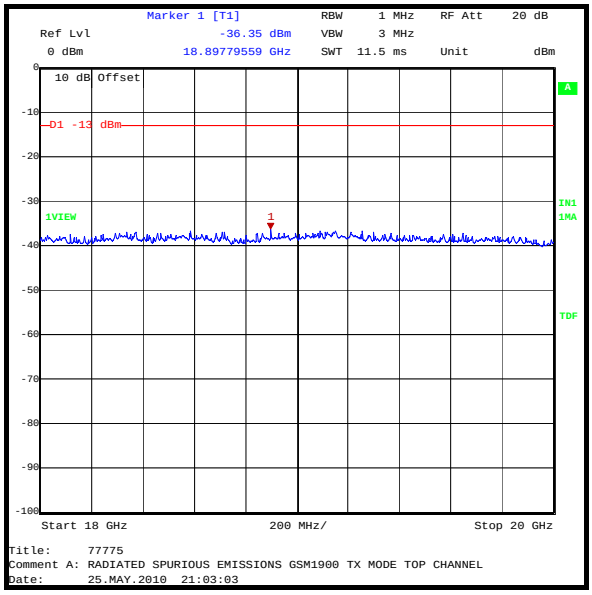




Transmitter Out of Band Radiated Emissions (continued)







5.2.8. Transmitter Radiated Emissions at Band Edges

Test Summary:

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:

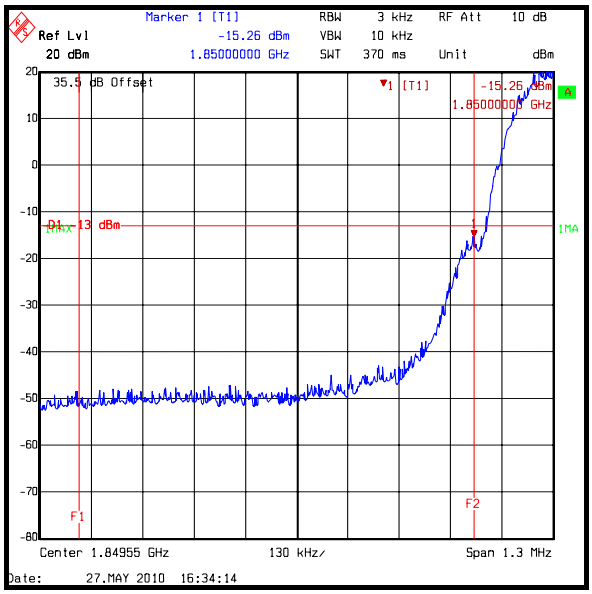
Temperature (°C):	25
Relative Humidity (%):	28

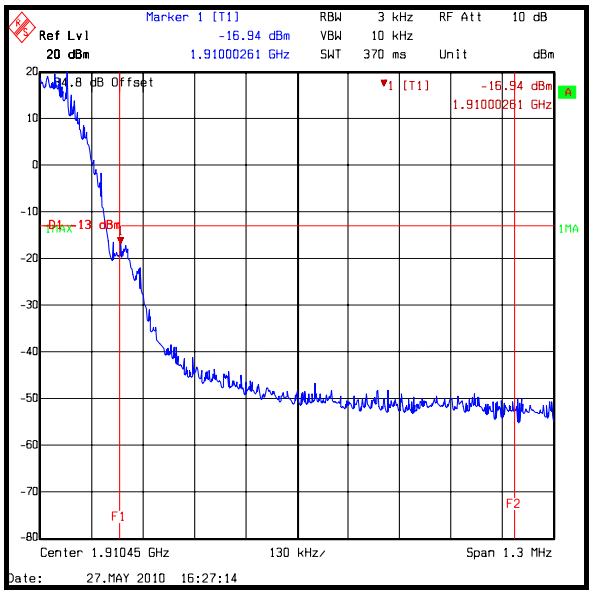
Results: GSM - Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1850	-15.3	-13.0	2.3	Complied

Results: GSM - Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1910	-16.9	-13.0	3.9	Complied





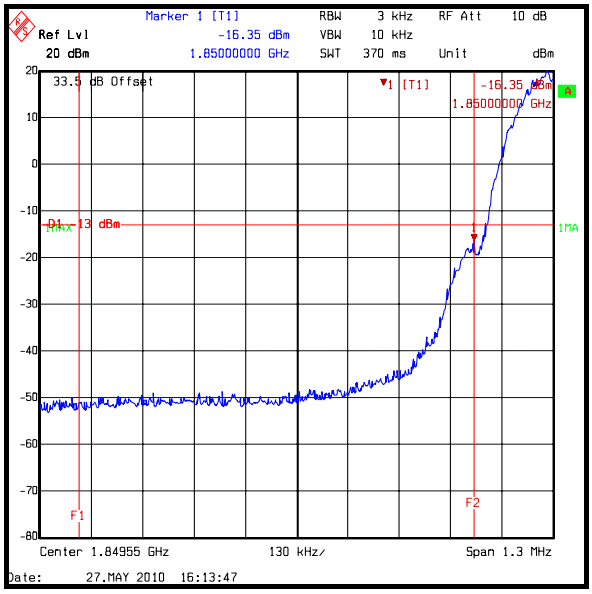
Transmitter Radiated Emissions at Band Edges (continued)

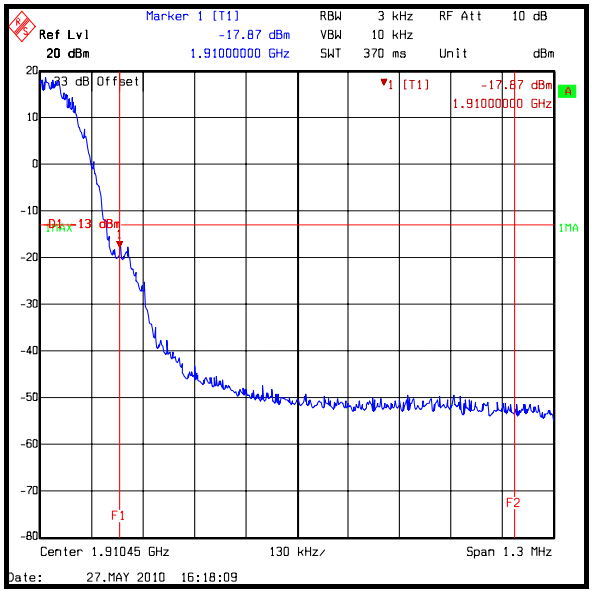
Results: GPRS - Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1850	-16.4	-13.0	3.4	Complied

Results: GPRS - Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1910	-17.9	-13.0	4.9	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 Isotropic Radiated Power (EIRP)	1850 to 1910 MHz	95%	±2.94 dB
Frequency Stability	1850 to 1910 MHz	95%	±0.92 ppm
Occupied Bandwidth	1850 to 1910 MHz	95%	±0.92 ppm
Radiated Spurious Emissions	30 MHz to 20 GHz	95%	±2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
A1069	Single Phase LISN	Rohde & Schwarz	ESH3-Z5	837469/012	13 Apr 2011	12
A1396	Attenuator	Huber & Suhner	757987	6810.17.B	Calibrated before use	-
A1428	Directional Coupler	Narda	3292-1	02439	Calibrated before use	-
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	Calibrated before use	-
A1818	Antenna	EMCO	3115	00075692	27 Nov 2010	12
A1830	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100668	01 Mar 2011	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	Calibrated before use	-
A244	Attenuator	Schaffner	6820-17-B	None	Calibrated before use	-
A288	Antenna	Chase	CBL6111A	1589	16 Mar 2011	12
A436	Antenna	Flann	20240-20	330	11 May 2013	36
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	01 Sep 2010	12
K0008	Site Reference 4422	RFI Global Services Ltd	N/A	N/A	Calibration not required	-
L1005	CMU200	Rohde & Schwarz	CMU200	116284	23 Mar 2011	12
M1068	Thermometer	Iso-Tech	RS55	93102884	01 Oct 2010	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESI26	100046K	22 Apr 2011	12
M122	Digital Voltmeter	Fluke	77	64910017	23 Jun 2010	12
M1223	Environmental Chamber	Votsch	VT4002	585660727200 10	Calibrated before use	-
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	10 Jul 2010	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	08 Apr 2011	12

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

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