

# TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: NTT docomo P-02A

To: FCC Part 24: 2008 (Subpart E)

**Test Report Serial No:**  
RFI/RPT2/RP74300JD05B

**Supersedes Test Report Serial No:**  
RFI/RPT1/RP74300JD05B

**This Test Report Is Issued Under The Authority  
Of Steve Flooks, Service Leader:**



**Checked By: Steve Flooks**



**Report Copy No: PDF01**

**Issue Date: 17 December 2008**

**Test Dates: 26 November to 02 December 2008**

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## **1. Customer Information**

<b>Company Name:</b>	Panasonic Mobile Comms Dev of Europe Ltd
<b>Address:</b>	Panasonic House Willoughby Road Bracknell Berkshire RG12 8FP

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## **2. Equipment Under Test (EUT)**

### **2.1. Identification of Equipment Under Test (EUT)**

<b>Brand Name:</b>	NTT docomo
<b>Model Name or Number:</b>	P-02A
<b>IMEI Number:</b>	353713020007606
<b>Hardware Version Num:</b>	Rev C++
<b>Software Version:</b>	B-WN907D-01.02.002 08-2H_CPF_Cv061350C
<b>FCC ID Number:</b>	UCE208012A

<b>Description:</b>	128 MB Micro-SD Memory Card
<b>Brand Name:</b>	Not marked
<b>Model Name or Number:</b>	128MB MicroSD
<b>Connected to Port:</b>	Dedicated micro-SD card port

<b>Description:</b>	NTT
<b>Brand Name:</b>	Battery
<b>Model Name or Number:</b>	P19
<b>Cable Length &amp; Type:</b>	N/A
<b>Connected to Port:</b>	N/A

<b>Description:</b>	AC charger
<b>Brand Name:</b>	NTT DoCoMo
<b>Model Name or Number:</b>	FOMA AC Adapter 01 for Global use / MAS-BH0008-A 002
<b>Cable Length &amp; Type:</b>	2.0m multicore
<b>Connected to Port:</b>	Charge/Data port

<b>Description:</b>	DC Charger
<b>Brand Name:</b>	NTT docomo
<b>Model Name or Number:</b>	FOMA DC Adapter 02
<b>Cable Length &amp; Type:</b>	Spiral cord / 2.5 metre / Multicore
<b>Connected to Port:</b>	Audio/Charge/Data port

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<b>Description:</b>	Personal Hands-Free
<b>Brand Name:</b>	NTT docomo
<b>Model Name or Number:</b>	Stereo Earphone Set 01
<b>Cable Length &amp; Type:</b>	1.2 metre / multicore
<b>Connected to Port:</b>	Audio/Charge/Data port

<b>Description:</b>	Charge/USB Data cable
<b>Brand Name:</b>	NTT docomo
<b>Model Name or Number:</b>	FOMA USB Cable with Charge Function 02
<b>Cable Length &amp; Type:</b>	0.3 metre / multicore
<b>Connected to Port:</b>	Audio/Charge/Data port

## **2.2. Description of EUT**

The equipment under test is a Dual mode Cellular Mobile Telephone with PCS, UMTS FDD V and UMTS Release 5 HSDPA capabilities, incorporating Bluetooth and RFID. The Cellular Mobile Telephone operates on PCS/GPRS1900 MHz Band, UMTS/UMTS Release 5 HSDPA 850 MHz Band, Bluetooth 2400 MHz Band and RFID 13.5 MHz Band.

## **2.3. Modifications Incorporated in EUT**

During the course of testing the EUT was not modified.

## **2.4. Support Equipment**

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

<b>Description:</b>	Dummy battery
<b>Model Name or Number:</b>	Panasonic
<b>Serial Number:</b>	Dummy battery #01
<b>Cable Length and Type:</b>	0.25 metre / 2 x single core
<b>Connected to Port:</b>	Battery

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## **2.5. Additional Information Related to Testing**

<b>Technology Tested:</b>	PCS1900		
<b>Type of Unit:</b>	Transceiver		
<b>Mode:</b>	GSM/GPRS		
<b>Modulation:</b>	GMSK (GSM / GPRS): 217 Hz		
<b>Channel Spacing:</b>	200 kHz		
<b>Transmit Frequency Range:</b>	1850 to 1910 MHz		
<b>Transmit Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	512	1850.2
	Middle	660	1879.8
	Top	810	1909.8
<b>Receive Frequency Range:</b>	1930 to 1990 MHz		
<b>Receive Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	512	1930.2
	Middle	660	1959.8
	Top	810	1989.8
<b>Power Supply Requirement:</b>	Nominal Voltage	3.7	(V)
	Minimum Voltage	3.4	(V)
	Maximum Voltage	4.2	(V)
<b>Maximum Output Power (EIRP) dBm:</b>	GSM	29.6	
	GPRS	27.9	

## **2.6. Port Identification**

<b>Port</b>	<b>Description</b>
1	Charge/Data/Audio
2	USIM
3	Micro-SD

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### **3. Test Specification, Methods and Procedures**

<b>Reference:</b>	FCC Part 24: 2008 Subpart E (Broadband PCS)
<b>Title:</b>	Code of Federal Regulations, Part 24 (47CFR24) Personal Communication Services.

#### **3.1. Methods and Procedures**

The methods and procedures used were as detailed in:

ANSI/TIA-603-B-2003

Land Mobile Communications Equipment, Measurements and performance Standards

ANSI C63.2 (1987)

Title: American National Standard for Instrumentation - Electromagnetic noise and field strength.

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.

ANSI C63.5 (1988)

Title: American National Standard for the Calibration of antennas used for Radiated Emission measurements in Electromagnetic Interference (EMI) control.

ANSI C63.7 (1988)

Title: American National Standard Guide for Construction of Open Area Test Sites for performing Radiated Emission Measurements.

CISPR 16-1: (1999)

Title: Specification For Radio Disturbance and Immunity Measuring Apparatus and Methods. Part 1: Radio Disturbance and Immunity Measuring Apparatus.

#### **3.2. Definition of Measurement Equipment**

The measurement equipment used complied with the requirements of the standards referenced in the methods & procedures Section above. Appendix 1 contains a list of the test equipment used.

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#### **4. Deviations from the Test Specification**

There were no deviations from the test specification.

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## **5. Operation of the EUT during Testing**

### **5.1. Operating Modes**

The EUT was tested in the following operating modes, unless otherwise stated:

- 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 prescans. Circuit switched voice was found to be the worst case and all final measurements were performed with the EUT in this mode.

### **5.2. Configuration and Peripherals**

The EUT was tested in the following configuration unless otherwise stated:

- Connected to a GSM/GPRS system simulator, operating in transceiver mode
- The Micro SD card was present in the EUT during all tests.
- Idle mode and transmitter mode radiated spurious emissions tests were performed with the mains charger connected to the EUT and 120VAC 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.

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## **6. Summary of Test Results**

<b>Range of Measurements</b>	<b>Specification Reference</b>	<b>Port Type</b>	<b>Result</b>
Idle Mode AC Conducted Spurious Emissions (150 kHz to 30 MHz)	C.F.R. 47 FCC Part 15: Section 15.107	AC Mains Input	Complied
Idle Mode Radiated Spurious Emissions	C.F.R. 47 FCC Part 15: Section 15.109	Enclosure	Complied
Transmitter Effective Isotropic Radiated Power (EIRP)	C.F.R. 47 FCC Part 24: Section 24.232	Antenna	Complied
Transmitter Frequency Stability (Temperature Variation)	C.F.R. 47 FCC Part 24: Section 24.235	Antenna	Complied
Transmitter Frequency Stability (Voltage Variation)	C.F.R. 47 FCC Part 24: Section 24.235	Antenna	Complied
Transmitter Occupied Bandwidth	C.F.R. 47 FCC Part 24: Section 24.238	Antenna	Complied
Transmitter Out of Band Radiated Emissions	C.F.R. 47 FCC Part 24: Section 2.1053/24.238	Antenna	Complied
Transmitter Band Edge Radiated Emissions	C.F.R. 47 FCC Part 2: Section 2.1053/24.238	Antenna	Complied

### **6.1. Location of Tests**

All the measurements described in this report were performed at the premises of RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.

### **6.2. Site Registration Numbers**

FCC: 209735

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

### **7.1. General Comments**

This Section contains test results only.

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 8 for details of measurement uncertainties.

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## **7.2. Test Results**

### **7.2.1. Idle Mode AC Conducted Spurious Emissions: Section 15.107(a)**

Ambient Temperature: 22°C      Relative Humidity: 38%

#### **Results:**

#### **Quasi-Peak Detector Measurements on Live and Neutral Lines**

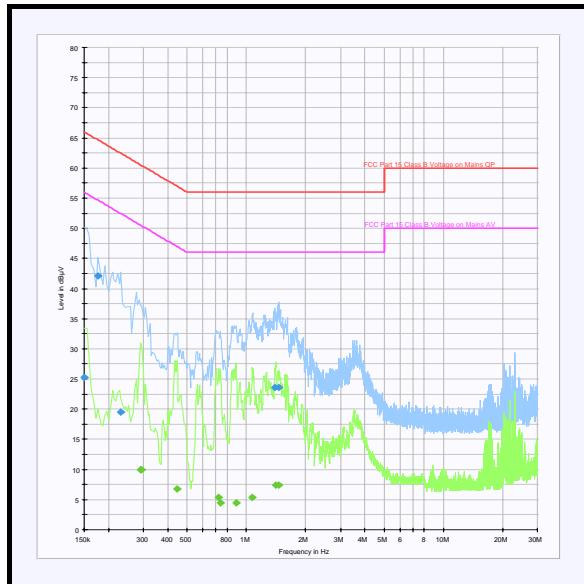
Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.150000	Live	25.3	66.0	40.7	Complied
0.177000	Live	42.1	64.6	22.5	Complied
0.231000	Live	19.5	62.4	42.9	Complied
1.392000	Neutral	23.6	56.0	32.4	Complied
1.464000	Neutral	23.6	56.0	32.4	Complied

#### **Average Detector Measurements on Live and Neutral Lines**

Frequency (MHz)	Line	Level (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Result
0.289500	Neutral	10.0	50.5	40.5	Complied
0.294000	Live	10.0	50.4	40.4	Complied
0.442500	Neutral	6.7	47.0	40.3	Complied
0.721500	Neutral	5.3	46.0	40.7	Complied
0.739500	Neutral	4.5	46.0	41.5	Complied
0.883500	Neutral	4.5	46.0	41.5	Complied
1.072500	Live	5.3	46.0	40.7	Complied
1.410000	Neutral	7.4	46.0	38.6	Complied
1.450500	Neutral	7.4	46.0	38.6	Complied

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**Idle Mode AC Conducted Spurious Emissions: Section 15.107(a) (Continued)**

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### **7.2.2. Idle Radiated Spurious Emissions: Section 15.109**

Ambient Temperature: 24°C      Relative Humidity: 31%

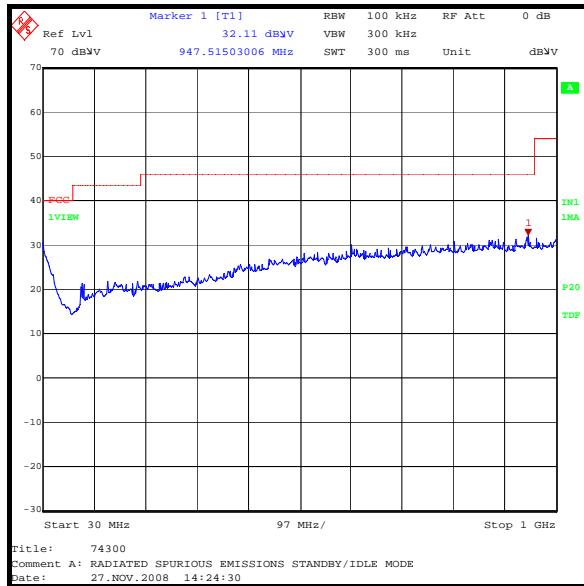
## **Results:**

## Electric Field Strength Measurements (Frequency Range: 30 to 1000 MHz)

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
947.515	Horizontal	32.1	46.0	13.9	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.

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**7.2.3. Idle Radiated Spurious Emissions: Section 15.109 (Continued)**

**Results:**

**Electric Field Strength Measurements (Frequency Range: 1 to 12.75 GHz)**

**Highest Peak Level:**

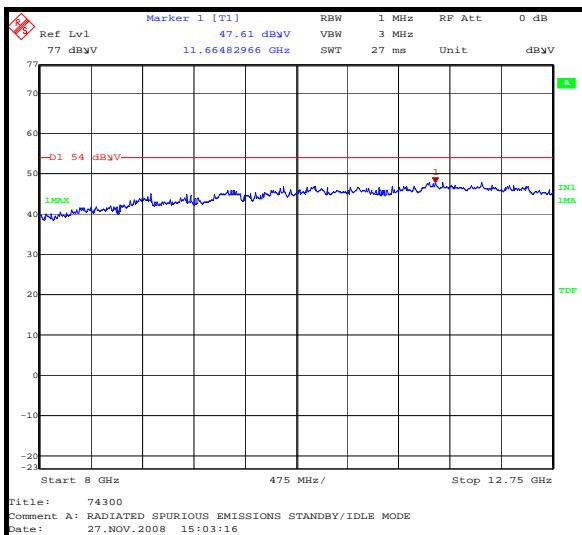
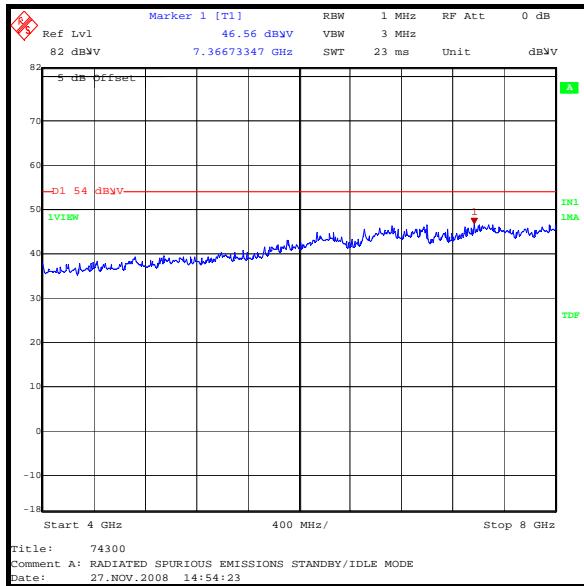
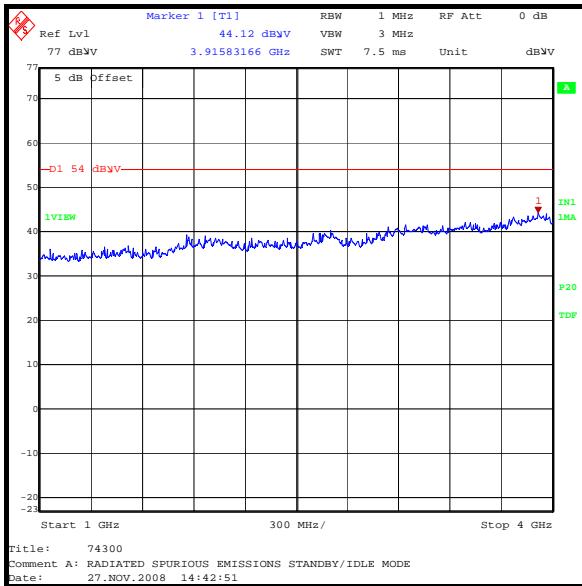
Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V)	Transducer Factor (dB)	Peak Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
11.664	Horizontal	44.8	2.8	47.6	54.0	6.4	Complied

**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.*

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**7.2.4. Transmitter Effective Isotropic Radiated Power (EIRP): Section 24.232**

Ambient Temperature: 24°C      Relative Humidity: 28%

**Results: GSM**

Channel	Measured Frequency (MHz)	Antenna Polarity	Maximum Transmitter EIRP (dBm)	Limit EIRP (dBm)	Margin (dB)	Result
Bottom	1850.2	Horizontal	29.6	33.0	3.4	Complied
Middle	1879.8	Horizontal	27.7	33.0	5.3	Complied
Top	1909.8	Horizontal	28.9	33.0	4.1	Complied

**Results: GPRS**

Channel	Measured Frequency (MHz)	Antenna Polarity	Maximum Transmitter EIRP (dBm)	Limit EIRP (dBm)	Margin (dB)	Result
Bottom	1850.2	Horizontal	27.9	33.0	5.1	Complied
Middle	1879.8	Horizontal	27.0	33.0	6.0	Complied
Top	1909.8	Horizontal	26.2	33.0	6.8	Complied

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**7.2.5. Transmitter Frequency Stability (Temperature Variation): Section 24.235**

Ambient Temperature: 24°C

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	11	1850.200011	1850.0	0.200011	Complied
-20	20	1850.200020	1850.0	0.200020	Complied
-10	24	1850.200024	1850.0	0.200024	Complied
0	12	1850.200012	1850.0	0.200012	Complied
10	5	1850.200005	1850.0	0.200005	Complied
20	-8	1850.199992	1850.0	0.199992	Complied
30	12	1850.200012	1850.0	0.200012	Complied
40	22	1850.200022	1850.0	0.200022	Complied
50	17	1850.200017	1850.0	0.200017	Complied

**Top Channel (1909.8 MHz)**

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	23	1909.800023	1910.0	0.199977	Complied
-20	39	1909.800039	1910.0	0.199961	Complied
-10	34	1909.800034	1910.0	0.199966	Complied
0	19	1909.800019	1910.0	0.199981	Complied
10	6	1909.800006	1910.0	0.199994	Complied
20	12	1909.800012	1910.0	0.199988	Complied
30	27	1909.800027	1910.0	0.199973	Complied
40	17	1909.800017	1910.0	0.199983	Complied
50	20	1909.800020	1910.0	0.199980	Complied

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**7.2.6. Transmitter Frequency Stability (Voltage Variation): Section 24.235**

Ambient Temperature: 24°C      Relative Humidity: 28%

**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	28	1850.200028	1850	0.200028	Complied
4.2	31	1850.200031	1850	0.200031	Complied

**Bottom Channel (1909.8 MHz)**

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
3.4	18	1909.800018	1910	0.199982	Complied
4.2	27	1909.800027	1910	0.199973	Complied

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### **7.2.7. Transmitter Occupied Bandwidth: Section 24.238**

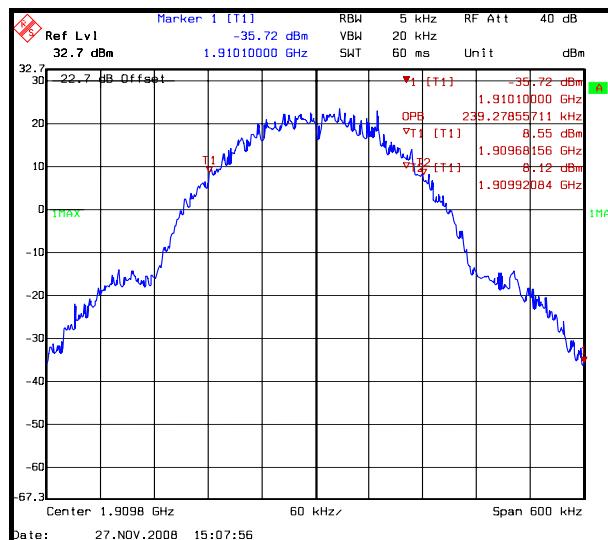
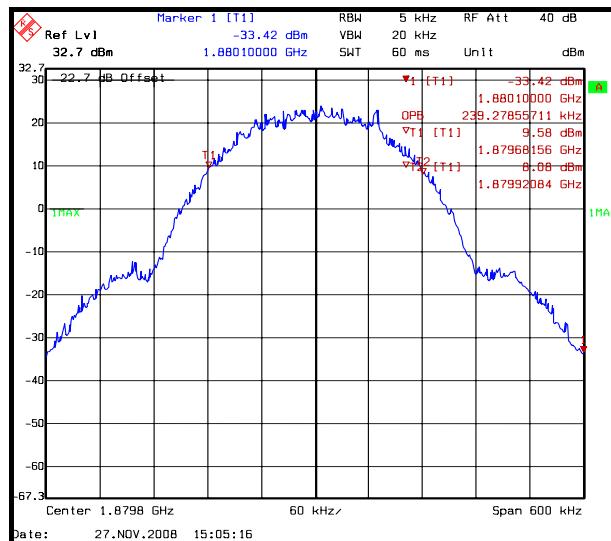
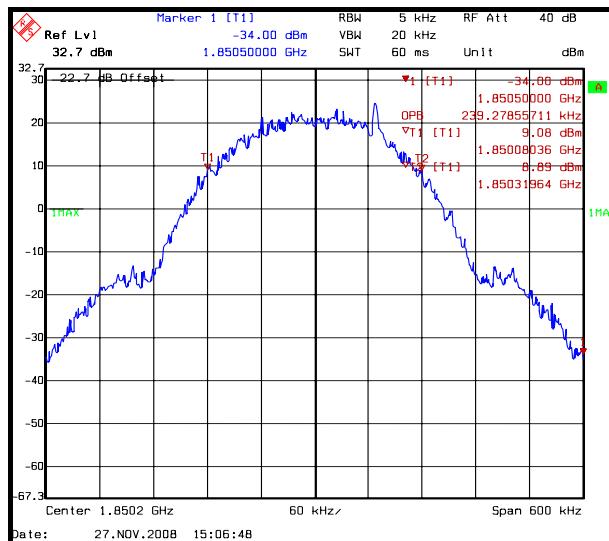
Ambient Temperature: 24°C

Relative Humidity: 28%

Occupied bandwidth is measured using the spectrum analyser Occupied Bandwidth Function.

#### **Results: GSM**

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	239.279
Middle	1879.8	239.279
Top	1909.8	239.279



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### **7.2.8. Transmitter Occupied Bandwidth: Section 24.238**

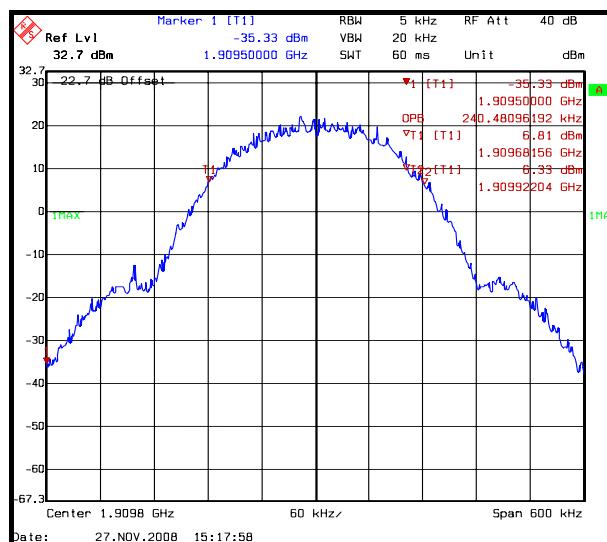
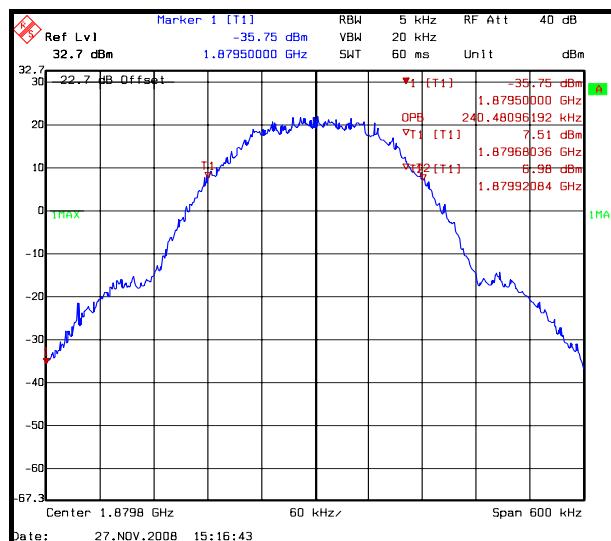
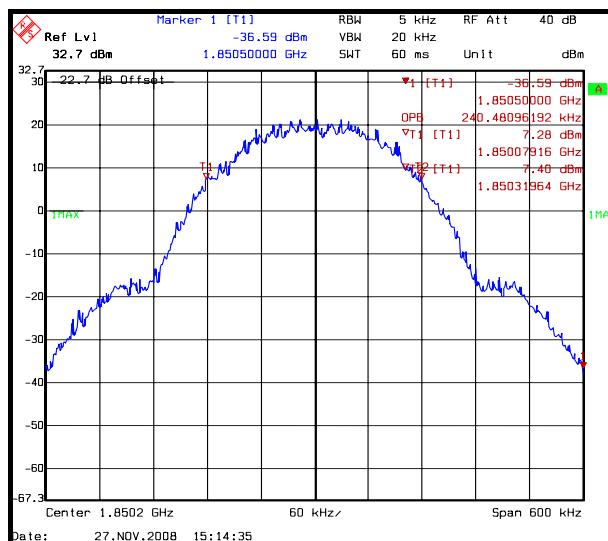
Ambient Temperature: 24°C

Relative Humidity: 28%

Occupied bandwidth is measured using the spectrum analyser Occupied Bandwidth Function.

#### **Results: GPRS**

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



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### **7.2.9. Transmitter Out of Band Radiated Emissions: Section 2.1053/24.238**

Ambient Temperature: 24°C      Relative Humidity: 28%

## **Results:**

## Bottom Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
5550.940	-45.5	-13.0	32.5	Complied
9250.979	-35.1	-13.0	22.1	Complied

## Middle Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
5639.339	-45.5	-13.0	32.5	Complied
9399.420	-35.3	-13.0	22.3	Complied

## Top Channel

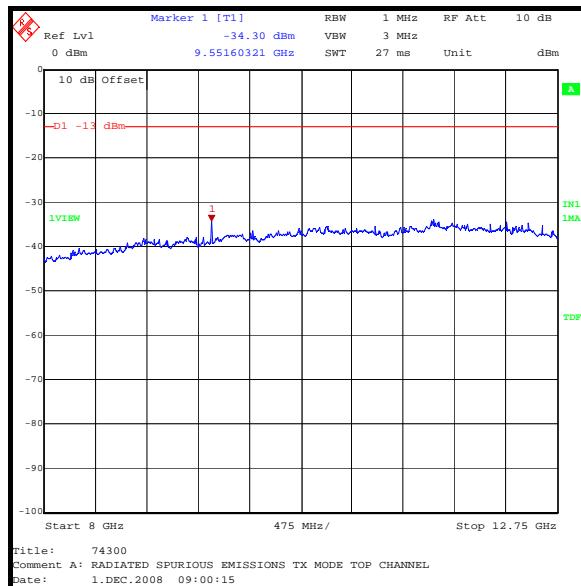
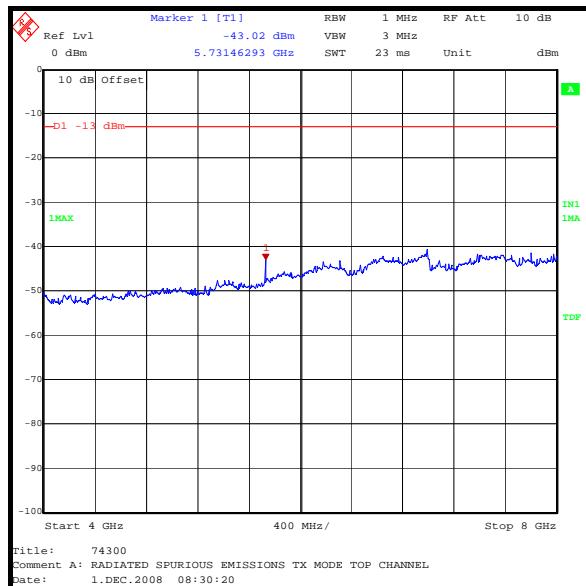
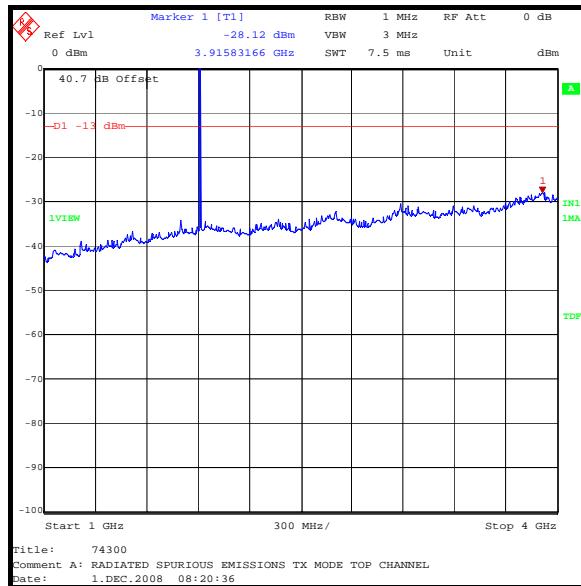
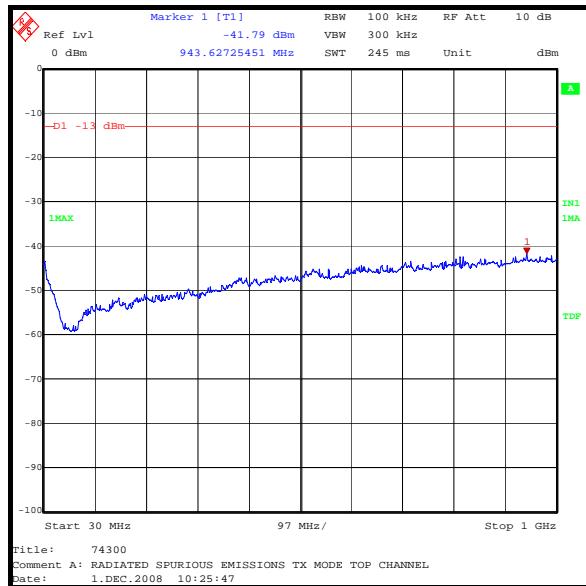
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
5729.478	-41.4	-13.0	28.4	Complied
9549.258	-37.9	-13.0	24.9	Complied

**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 1909.8 MHz

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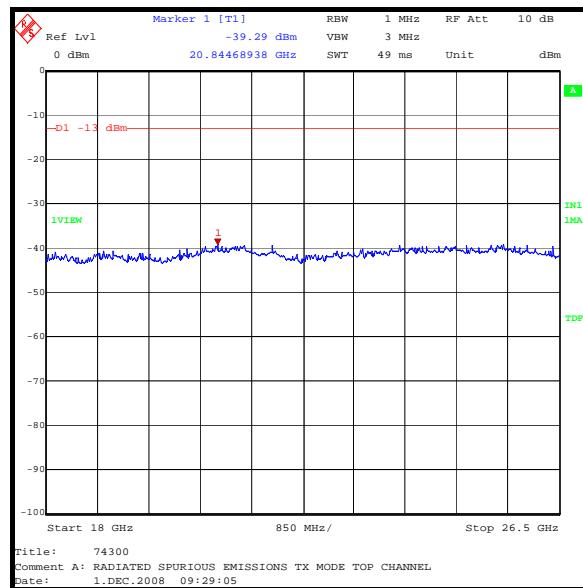
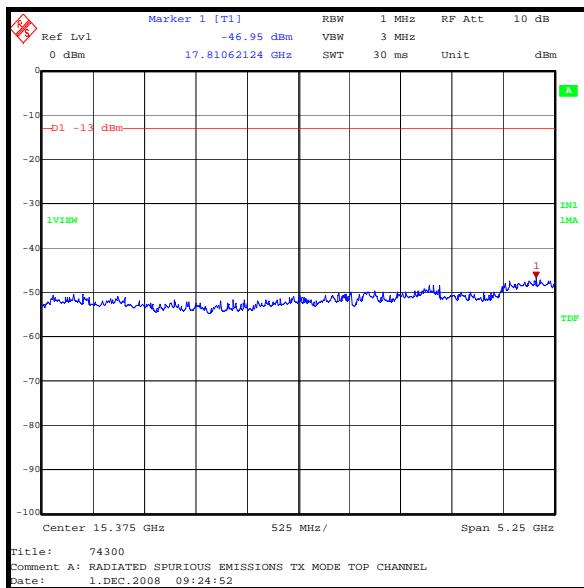
**Transmitter Out of Band Radiated Emissions: Section 2.1053/24.238 (Continued)**



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### **7.2.10. Transmitter Radiated Emissions at Band Edges: Section 2.1053/24.238**

Ambient Temperature: 24°C

Relative Humidity: 28%

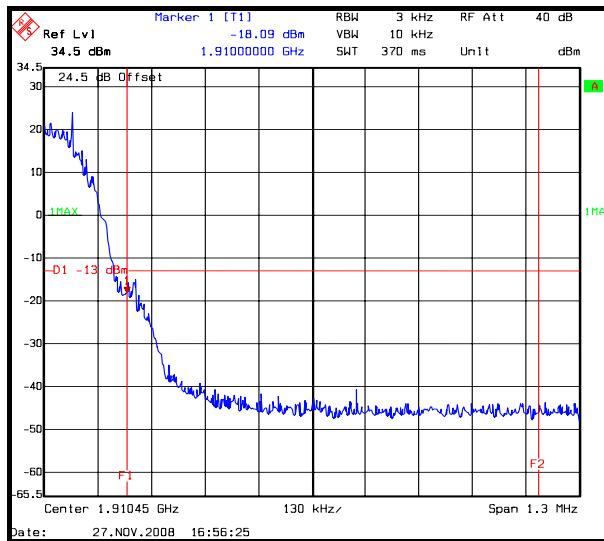
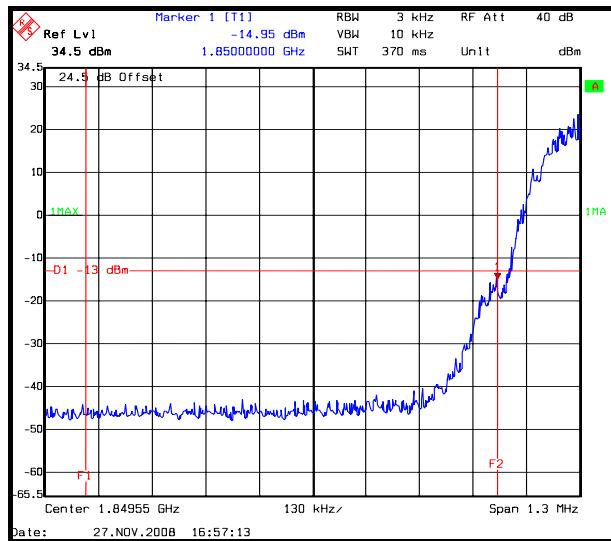
#### **Results: GSM**

##### **Bottom Band Edge**

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-14.9	-13.0	1.9	Complied

##### **Top Band Edge**

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-18.1	-13.0	5.1	Complied



Test of: **NTT docomo P-02A**  
To: **FCC Part 24: 2008 (Subpart E)**

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### **7.2.11. Transmitter Radiated Emissions at Band Edges: Section 2.1053/24.238**

Ambient Temperature: 24°C

Relative Humidity: 28%

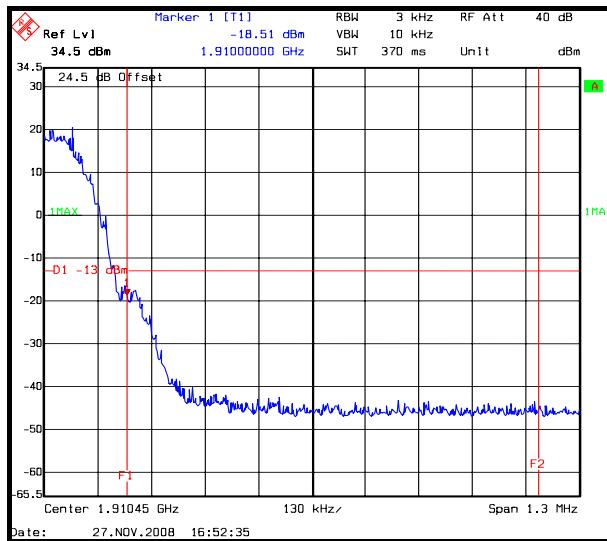
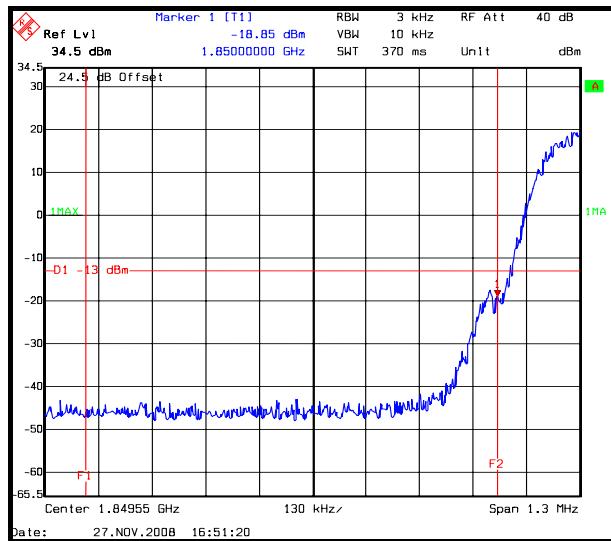
#### **Results: GPRS**

##### **Bottom Band Edge**

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-18.9	-13.0	5.9	Complied

##### **Top Band Edge**

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-18.5	-13.0	5.5	Complied



Test of: **NTT docomo P-02A**  
 To: **FCC Part 24: 2008 (Subpart E)**

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## **8. 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)	Not applicable	95%	±2.94 dB
Frequency Stability	Not applicable	95%	±11.4 ppm
Occupied Bandwidth	1850 to 1910 MHz	95%	±11.4 ppm
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±4.64 dB
Radiated Spurious Emissions	1 GHz 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.

**Test of:** **NTT docomo P-02A**  
**To:** **FCC Part 24: 2008 (Subpart E)**

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## Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A004	Line Impedance Stabilization Network	Rohde & Schwarz	ESH3-Z5	890604/027	19 May 2008	12
A1299	Antenna	Schaffner	CBL6143	5094	28 Jul 2008	12
A1368	Directional Coupler	Pasternack Enterprises	PE2214-10	None	Calibrated before use	-
A1818	Antenna	EMCO	3115	00075692	25 Oct 2008	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	16 Jan 2008	12
A436	Antenna	Flann	20240-20	330	24 Apr 2006	36
K0002	Site Reference 4421	Rainford EMC	N/A	N/A	26 Aug 2008	12
L0983	R&S CMU	R&S	CMU200	101376	Calibration not required	-
M1068	Thermometer	Iso-Tech	RS55	93102884	09 Jul 2008	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	19 Feb 2008	12
M1229	Digital Multimeter	Fluke	179	87640015	09 May 2008	12
M1242	Spectrum Analyser	Rohde & Schwarz	FSEM30	845986/022	29 Dec 2007	12
M1252	Signal Generator	HP	83640A	3119A00489	02 Oct 2009	12
M1253	Spectrum Analyser	HP	8564E	3442A00262	21 Oct 2008	12
M1267	Thermal Power Sensor	Rohde & Schwarz	NRV-Z52	100155	24 Apr 2008	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	24 Apr 2008	12

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