

TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: NTT DoCoMo EB-4052

FCC ID: UCE211044A

To: FCC Part 22.913 & 22.917

Test Report Serial No:
RFI-RPT-RP84537JD02B V2.0

Version 2.0 Supersedes All Previous Versions

This Test Report Is Issued Under The Authority
Of Chris Guy, Head of Global Approvals:



Checked By:	Ian Watch
Signature:	
Date of Issue:	21 October 2011

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.

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

This page has been left intentionally blank.

Table of Contents

1. Customer Information.....	4
2. Summary of Testing.....	5
2.1. General Information	5
2.2. Summary of Test Results	5
2.3. Methods and Procedures	5
2.4. Deviations from the Test Specification	5
3. Equipment Under Test (EUT)	6
3.1. Identification of Equipment Under Test (EUT)	6
3.2. Description of EUT	6
3.3. Modifications Incorporated in the EUT	6
3.4. Additional Information Related to Testing	7
3.5. Support Equipment	8
4. Operation and Monitoring of the EUT during Testing	9
4.1. Operating Modes	9
4.2. Configuration and Peripherals	9
5. Measurements, Examinations and Derived Results	10
5.1. General Comments	10
5.2. Test Results	11
5.2.1. Transmitter Effective Radiated Power (ERP)	11
5.2.2. Transmitter Out of Band Radiated Emissions	13
5.2.3. Transmitter Radiated Emissions at Band Edges	16
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:	47CFR22
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 22 Subpart H (Public Mobile Services)
Site Registration:	209735
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	11 October 2011 to 14 October 2011

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 22.913(a)	Transmitter Effective Radiated Power (ERP)	✓
Part 2.1053/22.917	Transmitter Out of Band Radiated Emissions	✓
Part 2.1053/22.917	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

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:	EB-4052
IMEI:	357939040050427
Hardware Version Number:	V2.3
Software Version Number:	ACPU: ponyo-ginger-dcm-07-0050 CCPU: M7630A-ABBQMAZM-4.1.3010 V0.36
FCC ID:	UCE211044A

Brand Name:	NTT DoCoMo
Description:	Battery
Model Name or Number:	P25

Brand Name:	NTT DoCoMo
Description:	AC Charger
Model Name or Number:	P01

Brand Name:	NTT DoCoMo
Description:	Charge/USB Data cable
Model Name or Number:	Not Stated

Brand Name:	Jabra
Description:	Personal Hands-Free
Model Name or Number:	Not Known

3.2. Description of EUT

The equipment under test was a dual mode UMTS/GSM cellular handset with Bluetooth and WLAN.

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:	UMTS		
Type of Radio Device:	Transceiver		
Mode:	UMTS FDD V and 3GPP Rel. 5 HSDPA / Rel. 6 HSUPA		
Modulation Type:	QPSK		
Channel Spacing:	5 MHz		
Power Supply Requirement(s):	Nominal	3.7 V	
Maximum Output Power (ERP):	Voice (12.2 kbps)	22.8 dBm	
	HSDPA Sub-Test 3	22.9 dBm	
	HSUPA Sub-Test 1	22.3 dBm	
Transmit Frequency Range:	824 to 849 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	4132	826.4
	Middle	4183	836.6
	Top	4233	846.6
Receive Frequency Range:	869 to 894 MHz		
Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	4357	871.4
	Middle	4407	881.6
	Top	4458	891.6

3.5. Support Equipment

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

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

Brand Name:	Buffalo
Description:	USB Hub
Model Name or Number:	BSH3U01

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

- Constantly transmitting at full power on bottom, middle and top channels as required.
- ERP and band edge tests were performed with the EUT in Voice (12.2 kbps), HSDPA / HSUPA modes.
- Transmitter radiated spurious emissions were checked in all modes during pre-scans. Voice (12.2 kbps) 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 Rohde & Schwarz CMU 200 Universal Radio Communications Tester, operating in UMTS Band V mode.
- The SDRAM card was present in the EUT during all testing.
- Transmitter mode radiated spurious emissions tests were performed with the AC charger connected to the EUT 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 for details.

5.2. Test Results

5.2.1. Transmitter Effective Radiated Power (ERP)

Test Summary:

Test Engineer:	Crawford Lindsay	Test Date:	13 October 2011
Test Sample IMEI:	357939040050427		

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

Environmental Conditions:

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

Results: Peak ERP

Modes		HSDPA				Voice			
Sub-test		1	2	3	4	12.2 kbps			
Band	Channel	Power (dBm)	Limit (dBm)	Margin (dB)	Result				
850	4132	21.7	21.9	21.9	22.0	22.2	38.45	16.25	Complied
	4183	22.4	22.6	22.7	22.7	22.6	38.45	15.75	Complied
	4233	22.6	22.8	22.9	22.9	22.8	38.45	15.55	Complied
βc		2	12	15	15				
βd		15	15	8	4				
ΔACK, ΔNACK, ΔCQI		8	8	8	8				

Results: RMS ERP

Modes		HSDPA				Voice			
Sub-test		1	2	3	4	12.2 kbps			
Band	Channel	Power (dBm)	Limit (dBm)	Margin (dB)	Result				
850	4132	18.1	17.0	16.2	16.2	18.3	38.45	20.15	Complied
	4183	18.6	17.2	16.9	16.9	18.9	38.45	19.55	Complied
	4233	19.0	17.6	17.4	17.3	19.1	38.45	19.35	Complied
βc		2	12	15	15				
βd		15	15	8	4				
ΔACK, ΔNACK, ΔCQI		8	8	8	8				

Transmitter Effective Radiated Power (ERP) (continued)**Results: Peak ERP**

Mode		HSUPA							
Sub-test		1	2	3	4	5			
Band	Channel	Power (dBm) Peak	Peak Limit (dBm)	Margin	Result				
850	4132	20.2	19.5	20.0	19.5	19.9	38.45	18.25	Complied
	4183	21.3	20.9	21.1	20.9	20.9	38.45	17.15	Complied
	4233	22.3	21.9	22.2	21.9	22.1	38.45	16.15	Complied
Bc		11	6	15	2	15			
Bd		15	15	9	15	15			

Results: RMS ERP

Mode		HSUPA							
Sub-test		1	2	3	4	5			
Band	Channel	Power (dBm) Avg.	Peak Limit (dBm)	Margin	Result				
850	4132	16.4	16.3	15.8	16.3	15.8	38.45	22.05	Complied
	4183	17.5	17.4	17.0	17.4	16.9	38.45	20.95	Complied
	4233	18.8	18.7	18.2	18.7	18.2	38.45	19.65	Complied
Bc		11	6	15	2	15			
Bd		15	15	9	15	15			

Note(s):

1. All modes were compared on each channel and the highest power recorded was subtracted from the limit to show the margin.

5.2.2. Transmitter Out of Band Radiated Emissions

Test Summary:

Test Engineer:	Nick Steele	Test Date:	12 October 2011
Test Sample IMEI:	357939040050427		

FCC Part:	2.1053 & 22.917
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Part 2.1053
Frequency Range:	30 MHz to 9 GHz
Configuration:	Voice / 12.2 kbps

Environmental Conditions:

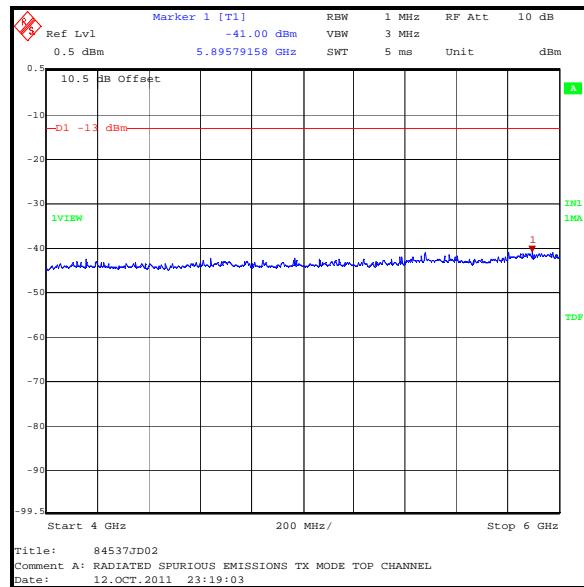
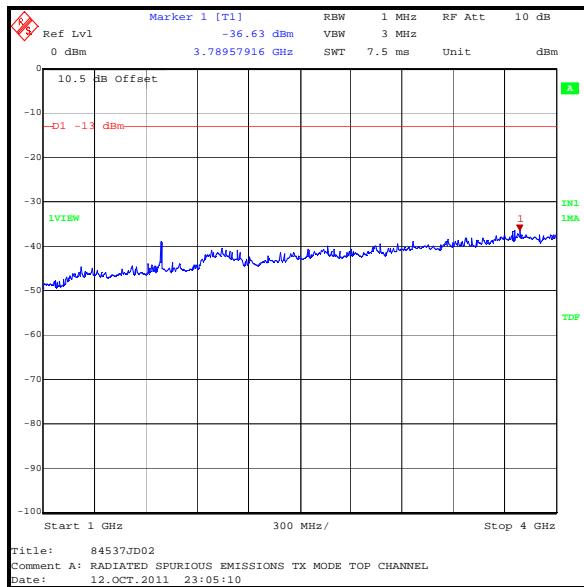
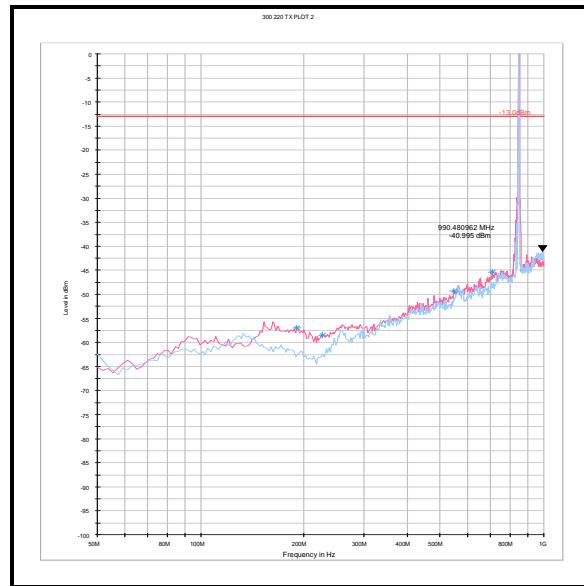
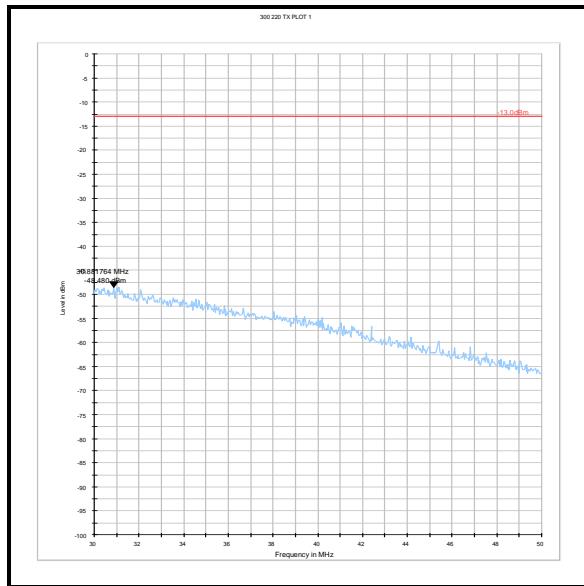
Temperature (°C):	25
Relative Humidity (%):	33

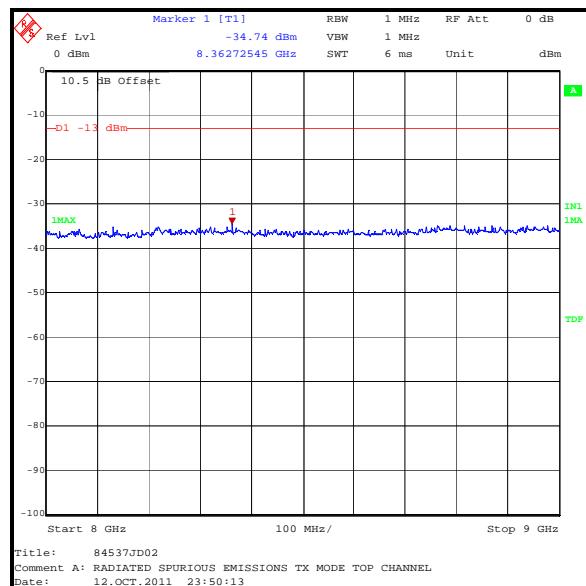
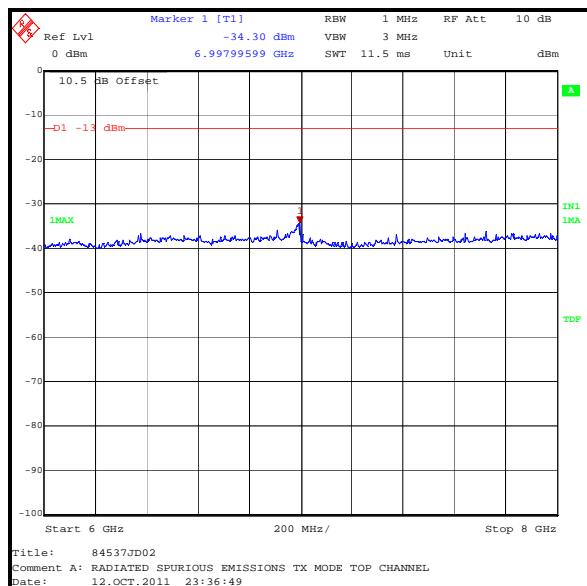
Results:

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
6997.996	-34.3	-13.0	21.3	Complied

Note(s):

1. All emissions shown on the pre-scan plots were investigated and found to be at least 20dB below the appropriate specification limit. Therefore, the highest level of noise floor has been recorded in the table above.
2. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
3. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Out of Band Radiated Emissions (continued)

Transmitter Out of Band Radiated Emissions (continued)

5.2.3. Transmitter Radiated Emissions at Band Edges

Test Summary:

Test Engineer:	Nick Steele	Test Date:	14 October 2011
Test Sample IMEI:	357939040050427		

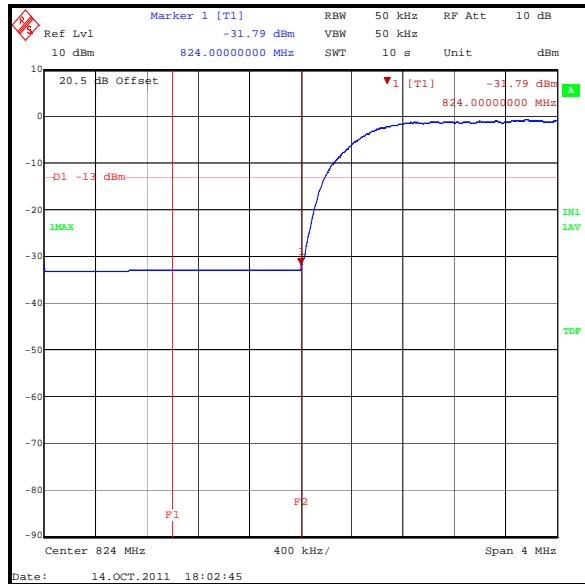
FCC Part:	2.1053 & 22.917
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Part 22.917

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	22

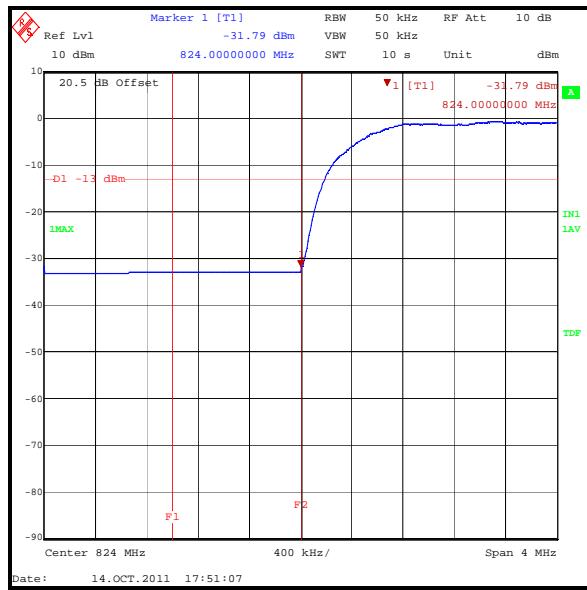
Results: Voice / 12.2 kbps

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-31.8	-13.0	18.8	Complied
849	-32.5	-13.0	19.5	Complied



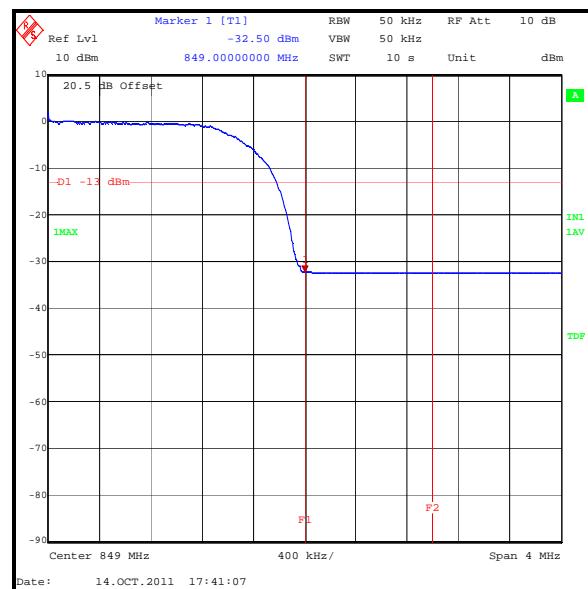
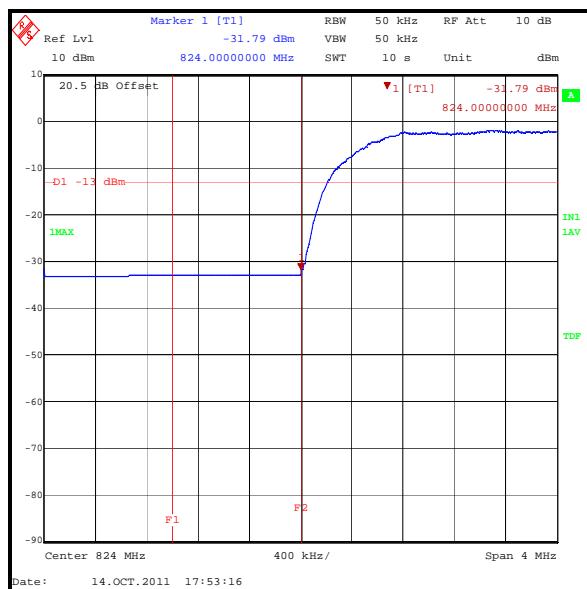
Transmitter Radiated Emissions at Band Edges (continued)**Results: HSDPA Sub-Test 1**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-31.8	-13.0	18.8	Complied
849	-32.5	-13.0	19.5	Complied



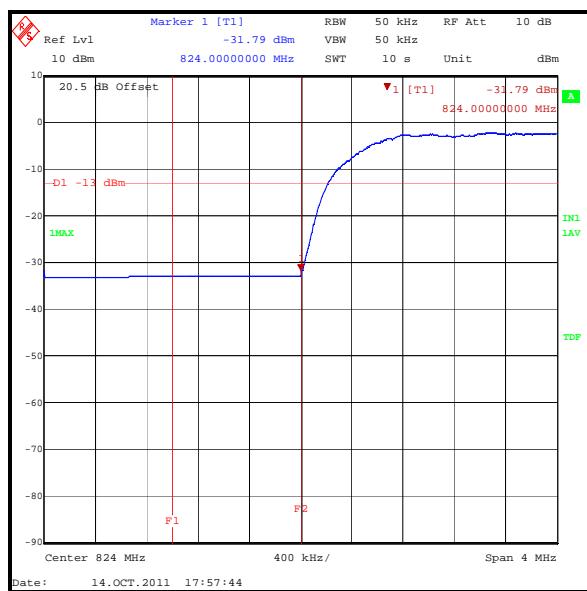
Transmitter Radiated Emissions at Band Edges (continued)**Results: HSDPA Sub-Test 2**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-31.8	-13.0	18.8	Complied
849	-32.5	-13.0	19.5	Complied



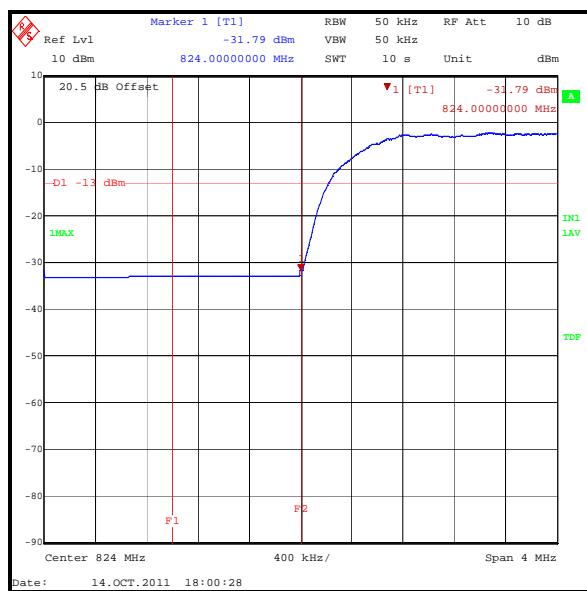
Transmitter Radiated Emissions at Band Edges (continued)**Results: HSDPA Sub-Test 3**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-31.8	-13.0	18.8	Complied
849	-32.5	-13.0	19.5	Complied
849.269	-31.2	-13.0	18.2	Complied



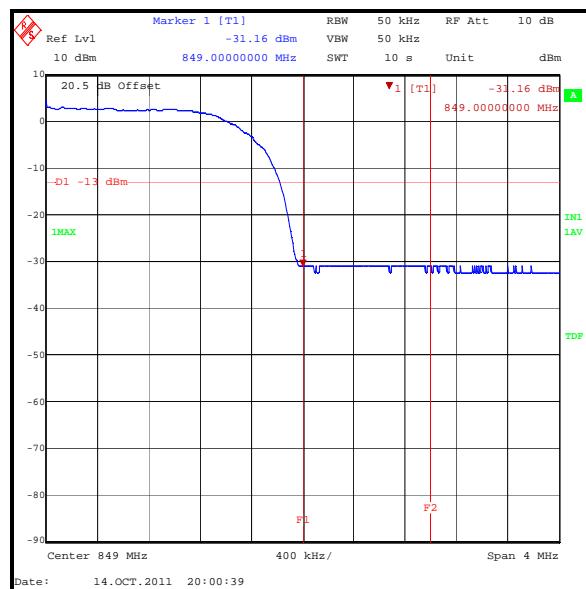
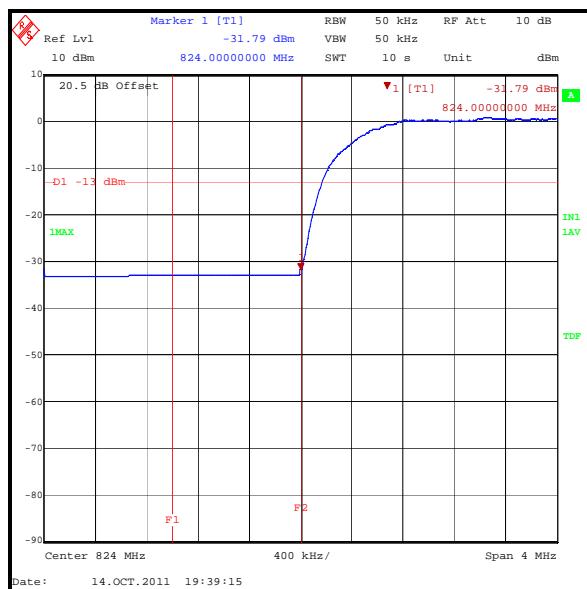
Transmitter Radiated Emissions at Band Edges (continued)**Results: HSDPA Sub-Test 4**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-31.8	-13.0	18.8	Complied
849	-32.5	-13.0	19.5	Complied
849.261	-31.2	-13.0	18.2	Complied



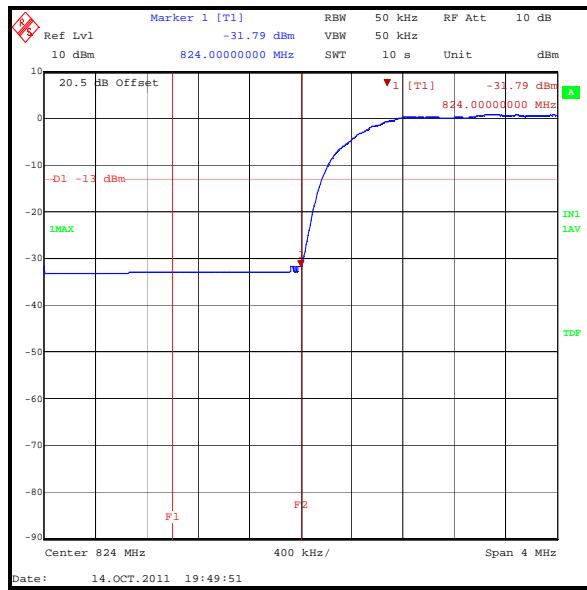
Transmitter Radiated Emissions at Band Edges (continued)**Results: HSUPA Sub-Test 1**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-31.8	-13.0	18.8	Complied
849	-31.2	-13.0	18.2	Complied



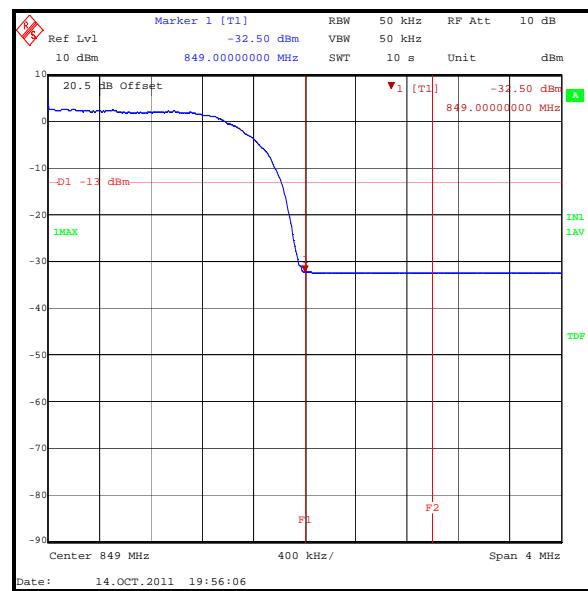
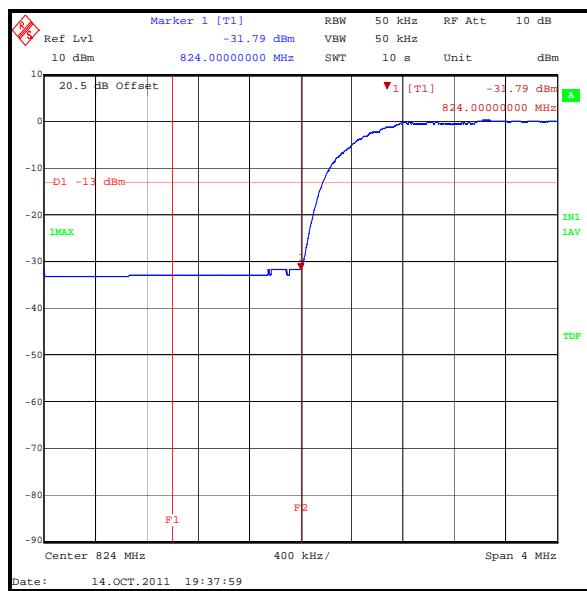
Transmitter Radiated Emissions at Band Edges (continued)**Results: HSUPA Sub-Test 2**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-31.8	-13.0	18.8	Complied
849	-31.2	-13.0	18.2	Complied



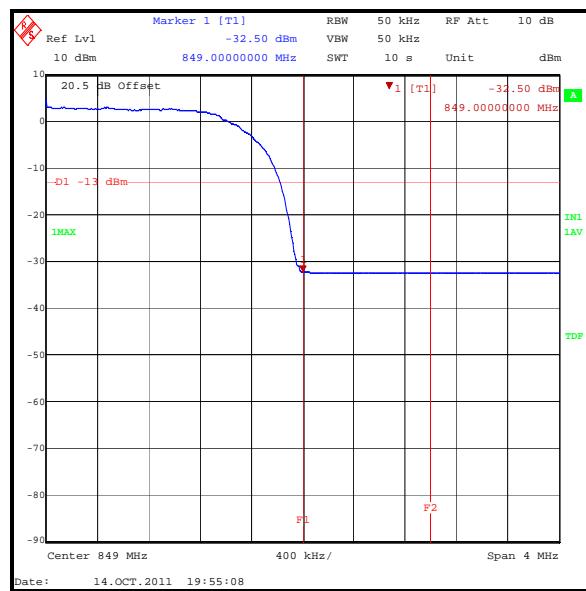
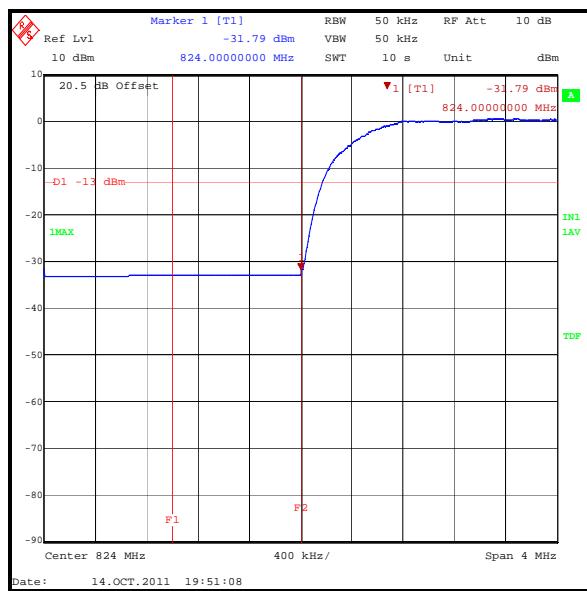
Transmitter Radiated Emissions at Band Edges (continued)**Results: HSUPA Sub-Test 3**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-31.8	-13.0	18.8	Complied
849	-32.5	-13.0	19.5	Complied



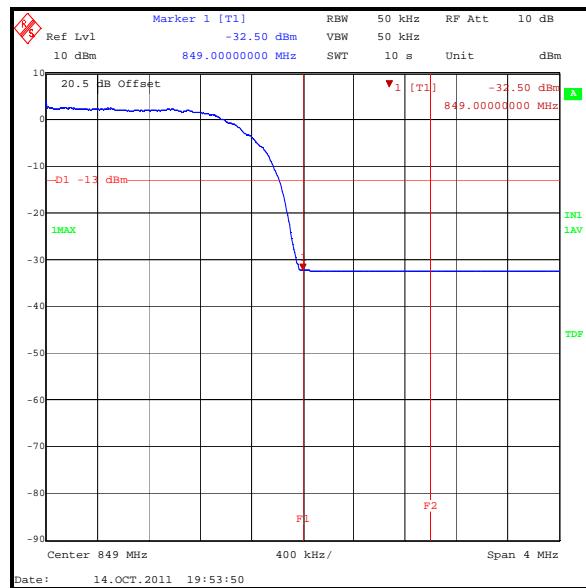
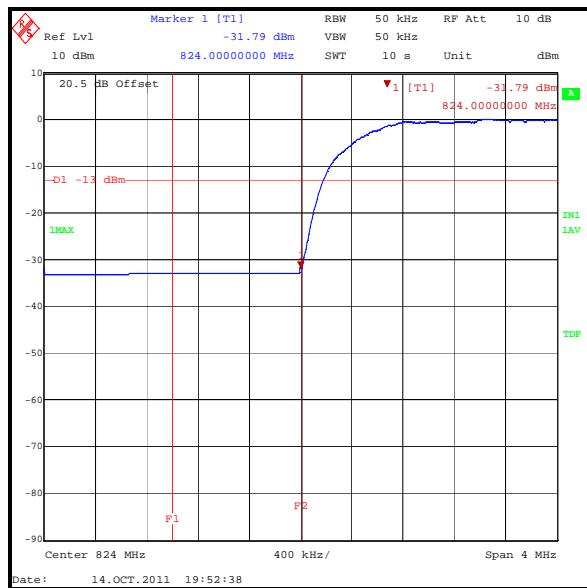
Transmitter Radiated Emissions at Band Edges (continued)**Results: HSUPA Sub-Test 4**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-31.8	-13.0	18.8	Complied
849	-32.5	-13.0	19.5	Complied



Transmitter Radiated Emissions at Band Edges (continued)**Results: HSUPA Sub-Test 5**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-31.8	-13.0	18.8	Complied
849	-32.5	-13.0	19.5	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
Effective Radiated Power (ERP)	824 MHz to 849 MHz	95%	±2.94 dB
Conducted Output Power	824 MHz to 849 MHz	95%	±0.27 dB
Radiated Spurious Emissions	30 MHz to 9 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)
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	08 Jul 2012	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	08 Jul 2012	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	09 Oct 2012	12
A1818	Antenna	EMCO	3115	00075692	09 Oct 2012	12
A1834	Attenuator	Hewlett Packard	8491B	10444	26 Jul 2012	12
A1974	High Pass Filter	AtlanTecRF	AFH-01000	090000283	29 Dec 2011	12
A253	Antenna	Flann Microwave	12240-20	128	09 Oct 2012	12
A254	Antenna	Flann Microwave	14240-20	139	09 Oct 2012	12
A255	Antenna	Flann Microwave	16240-20	519	09 Oct 2012	12
A288	Antenna	Chase	CBL6111A	1589	25 Aug 2012	12
A553	Antenna	Chase	CBL6111A	1593	26 Mar 2012	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	29 May 2012	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	09 Oct 2012	12
L1021	Comms Test Set	Rohde & Schwarz	CMU 200	111379	11 Jan 2012	12
M1124	Test Receiver	Rohde & Schwarz	ESI26	100046K	29 Jun 2012	12
M1273	Test Receiver	Rohde & Schwarz	ESIB26	100275	04 Feb 2012	12

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