

## 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**

<b>This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals:</b>	
	
<b>Checked By:</b>	Ian Watch
<b>Signature:</b>	
<b>Date of Issue:</b>	21 October 2011

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**1. Customer Information**






<b>Company Name:</b>	Panasonic Mobile Communications Development of Europe Ltd.
<b>Address:</b>	Panasonic House Willoughby Road Bracknell Berkshire RG12 8FP United Kingdom

## **2. Summary of Testing**

### **2.1. General Information**

<b>Specification Reference:</b>	47CFR22
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 22 Subpart H (Public Mobile Services)
<b>Site Registration:</b>	209735
<b>Location of Testing:</b>	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
<b>Test Dates:</b>	11 October 2011 to 14 October 2011

### **2.2. Summary of Test Results**

<b>FCC Reference (47CFR)</b>	<b>Measurement</b>	<b>Result</b>
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	
<b>Key to Results</b>  = Complied  = Did not comply		

### **2.3. Methods and Procedures**

<b>Reference:</b>	ANSI/TIA-603-C-2004
<b>Title:</b>	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:

<b>Brand Name:</b>	Not Stated
<b>Description:</b>	Micro SD Memory Card
<b>Model Name or Number:</b>	Not Stated

<b>Brand Name:</b>	Buffalo
<b>Description:</b>	USB Hub
<b>Model Name or Number:</b>	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)	Power (dBm)	Power (dBm)	Power (dBm)	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
$\beta_c$		2	12	15	15				
$\beta_d$		15	15	8	4				
$\Delta ACK, \Delta NACK, \Delta CQI$		8	8	8	8				

#### Results: RMS ERP

Modes		HSDPA				Voice			
Sub-test		1	2	3	4	12.2 kbps			
Band	Channel	Power (dBm)	Power (dBm)	Power (dBm)	Power (dBm)	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
$\beta_c$		2	12	15	15				
$\beta_d$		15	15	8	4				
$\Delta ACK, \Delta NACK, \Delta CQI$		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	Power (dBm) Peak	Power (dBm) Peak	Power (dBm) Peak	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
βc		11	6	15	2	15			
βd		15	15	9	15	15			

**Results: RMS ERP**

Mode		HSUPA							
Sub-test		1	2	3	4	5			
Band	Channel	Power (dBm) Avg.	Power (dBm) Avg.	Power (dBm) Avg.	Power (dBm) Avg.	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
βc		11	6	15	2	15			
βd		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:**

<b>Test Engineer:</b>	Nick Steele	<b>Test Date:</b>	12 October 2011
<b>Test Sample IMEI:</b>	357939040050427		

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

**Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	33

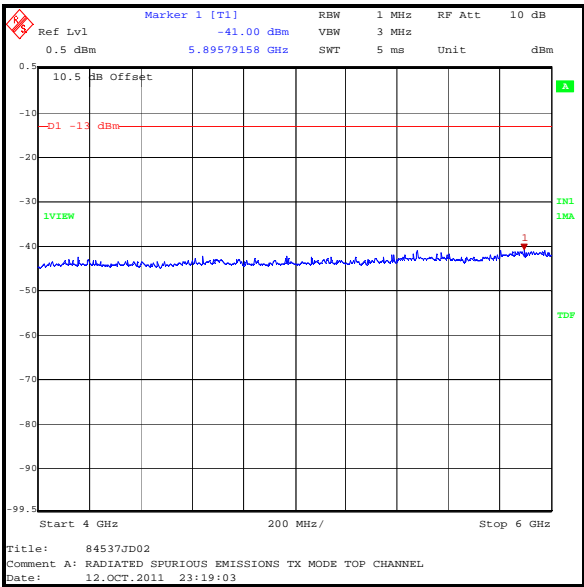
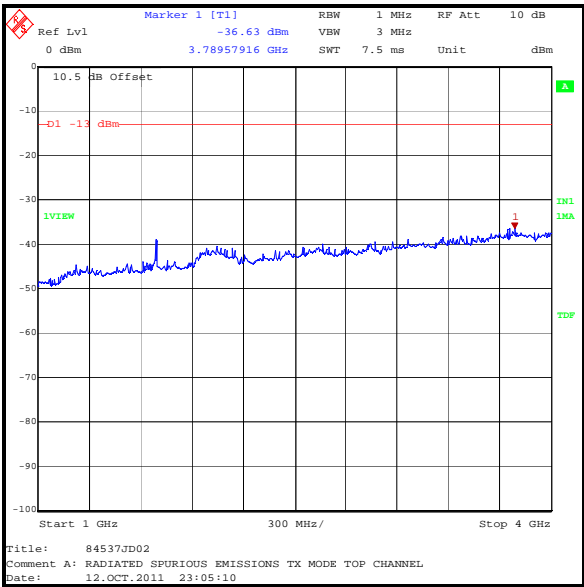
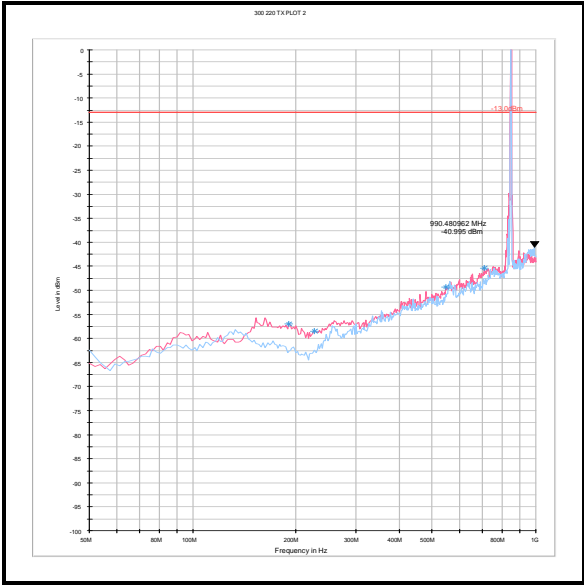
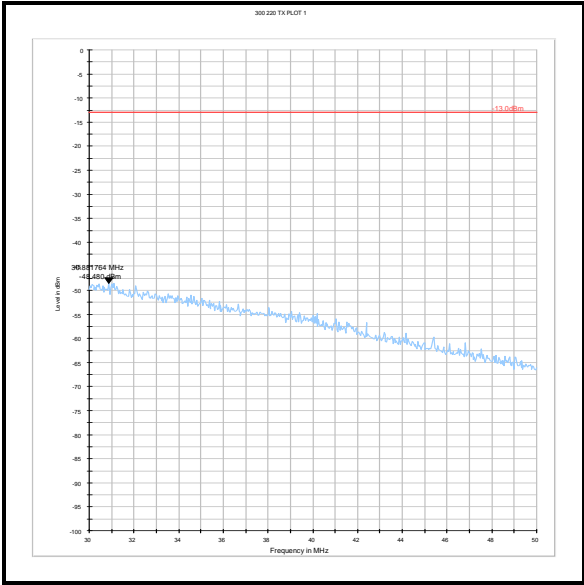
**Results:**

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

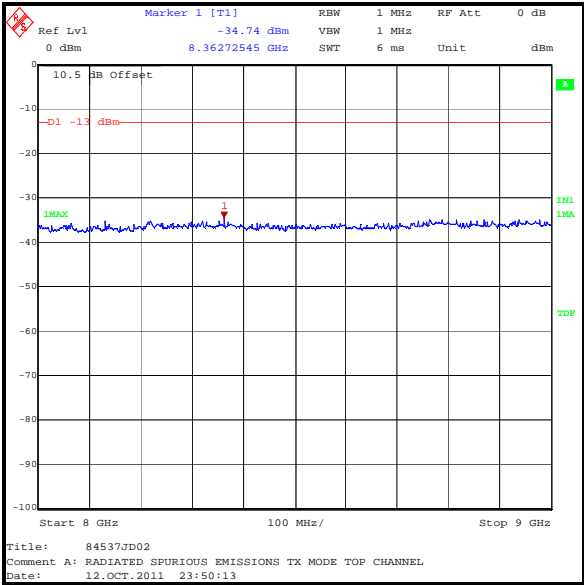
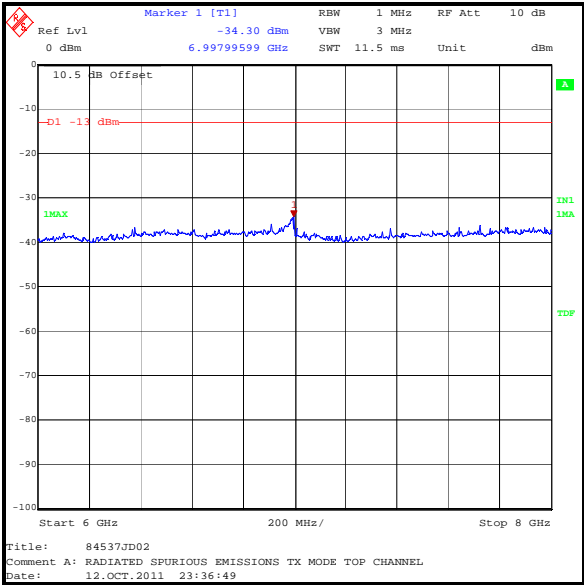
**Note(s):**

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:**

<b>Test Engineer:</b>	Nick Steele	<b>Test Date:</b>	14 October 2011
<b>Test Sample IMEI:</b>	357939040050427		

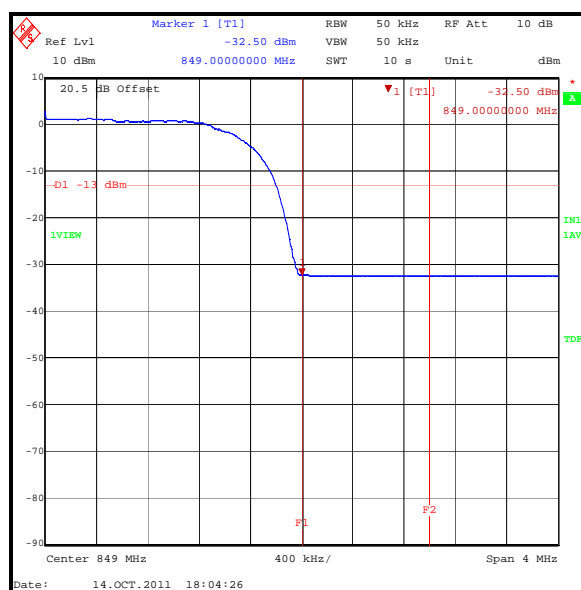
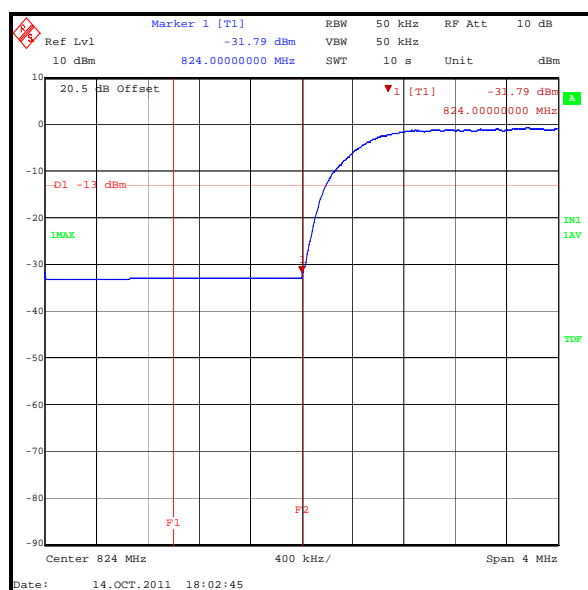
<b>FCC Part:</b>	2.1053 & 22.917
<b>Test Method Used:</b>	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Part 22.917

**Environmental Conditions:**

<b>Temperature (°C):</b>	26
<b>Relative Humidity (%):</b>	22

**Results: Voice / 12.2 kbps**

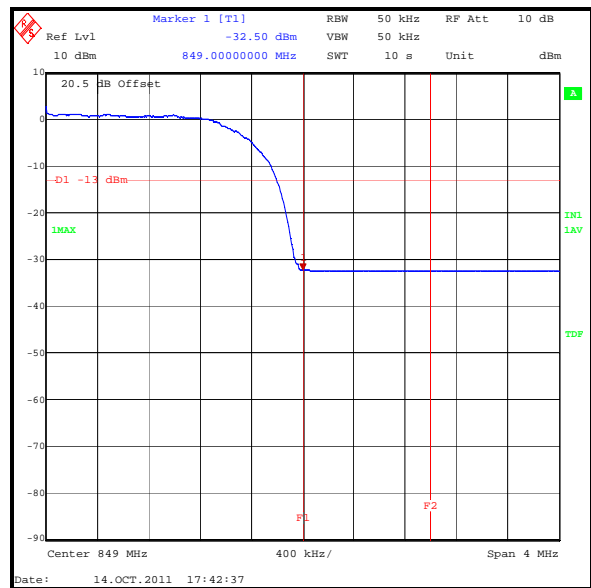
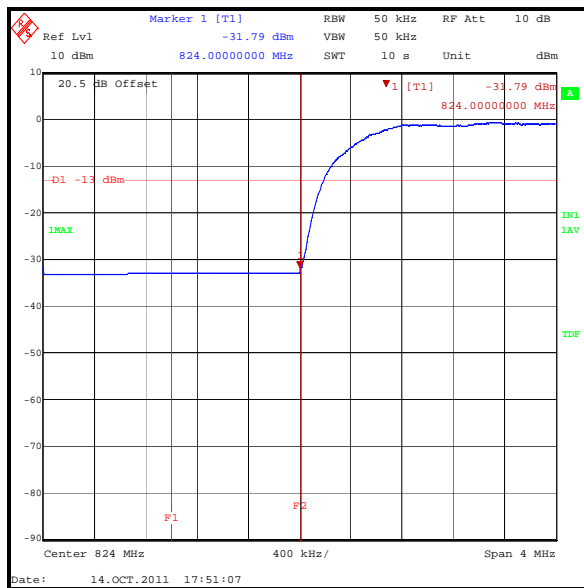
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-31.8	-13.0	18.8	Complied
849	-32.5	-13.0	19.5	Complied





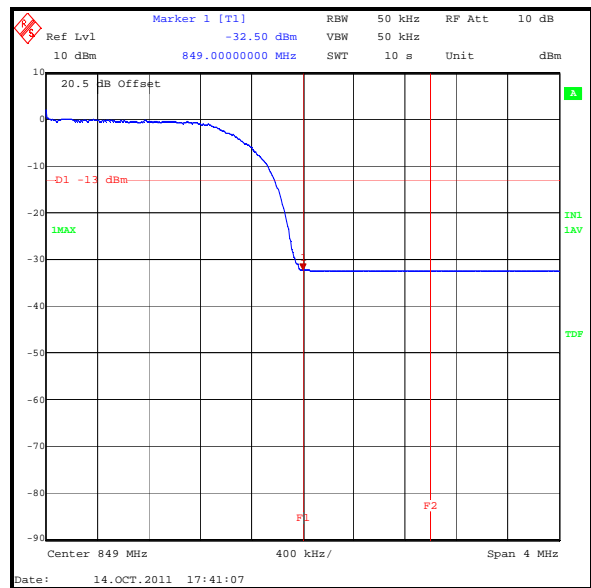
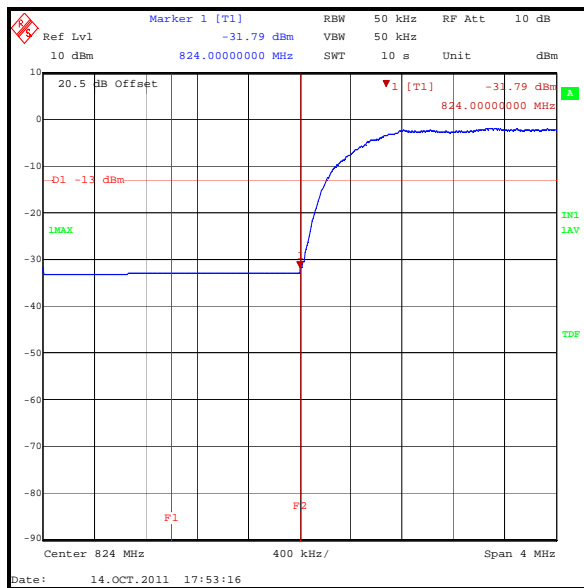
**Transmitter Radiated Emissions at Band Edges (continued)****Results: HSDPA Sub-Test 1**

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



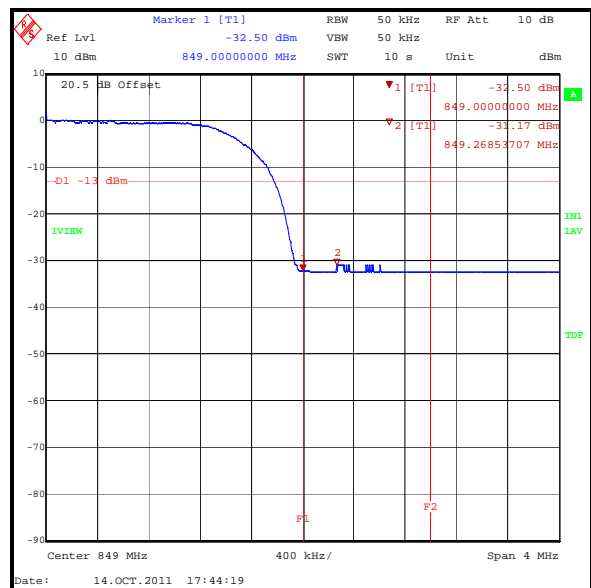
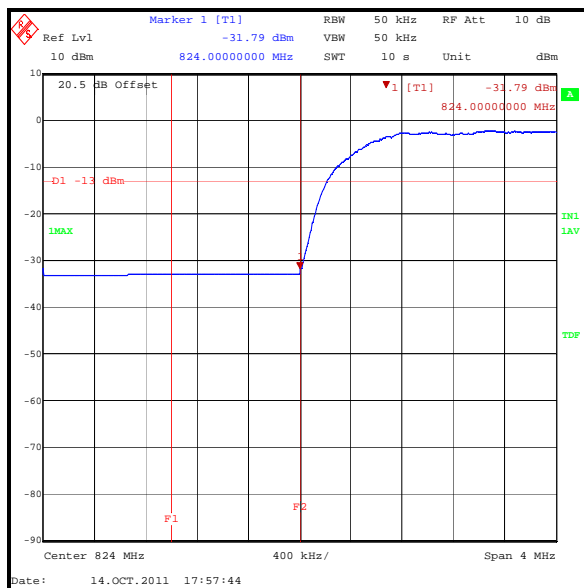
**Transmitter Radiated Emissions at Band Edges (continued)****Results: HSDPA Sub-Test 2**

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



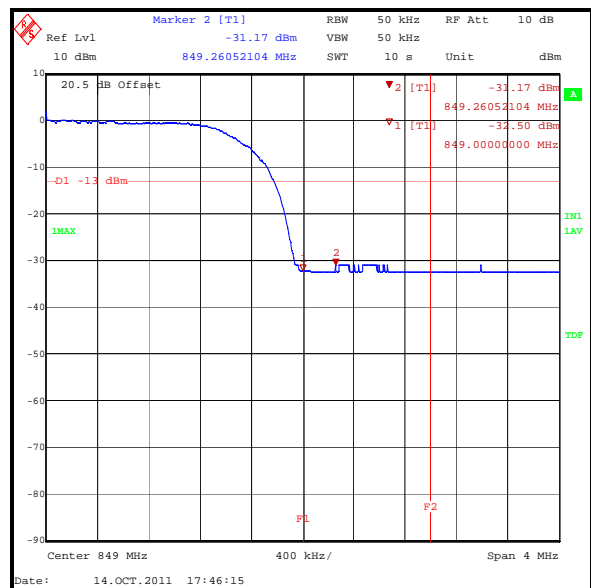
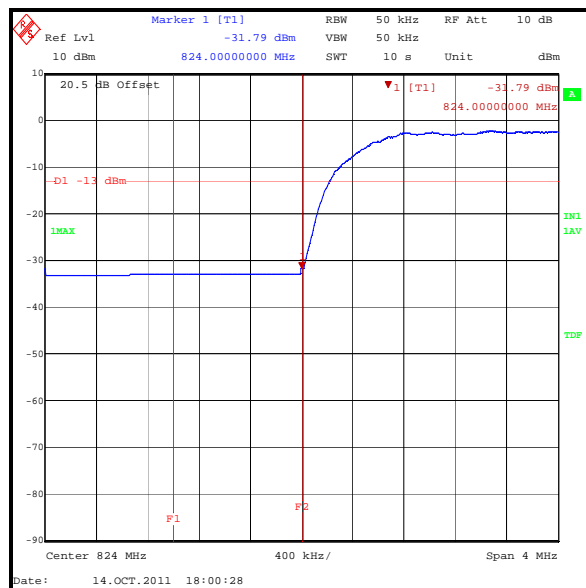
**Transmitter Radiated Emissions at Band Edges (continued)****Results: HSDPA Sub-Test 3**

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



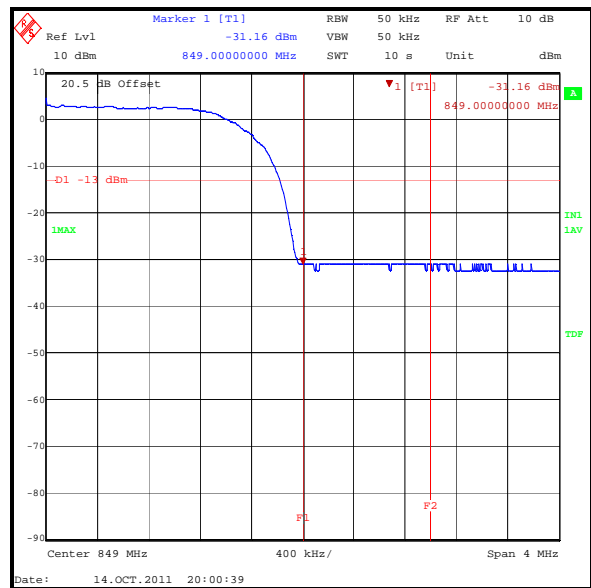
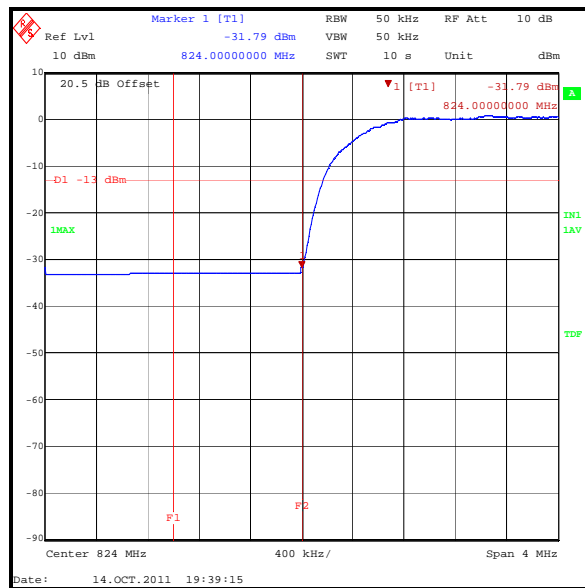
**Transmitter Radiated Emissions at Band Edges (continued)****Results: HSDPA Sub-Test 4**

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



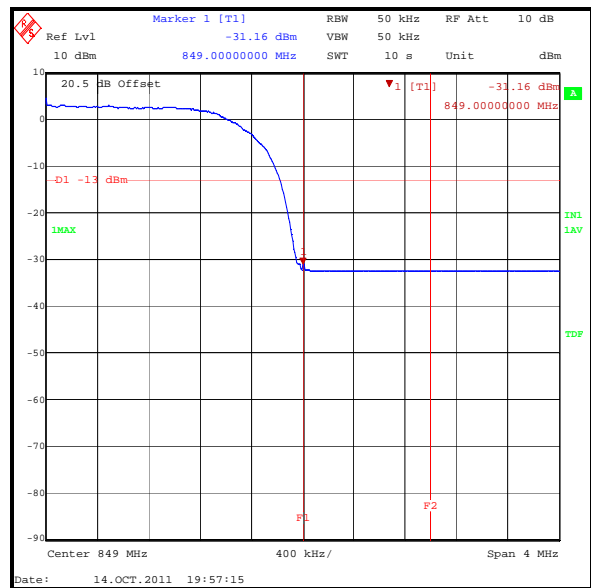
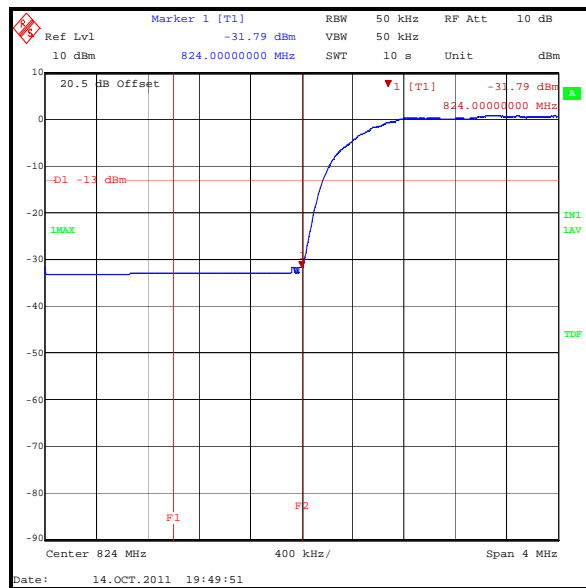
**Transmitter Radiated Emissions at Band Edges (continued)****Results: HSUPA Sub-Test 1**

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



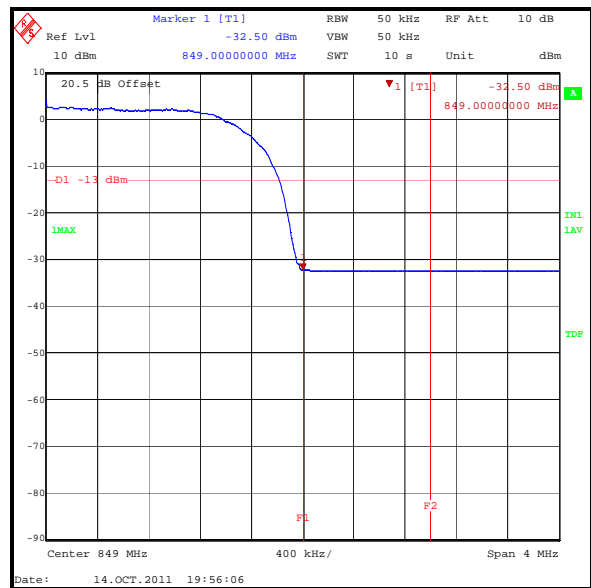
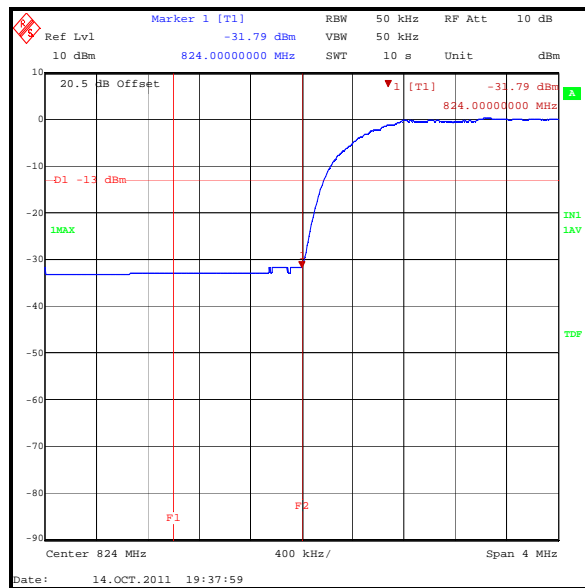
**Transmitter Radiated Emissions at Band Edges (continued)****Results: HSUPA Sub-Test 2**

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



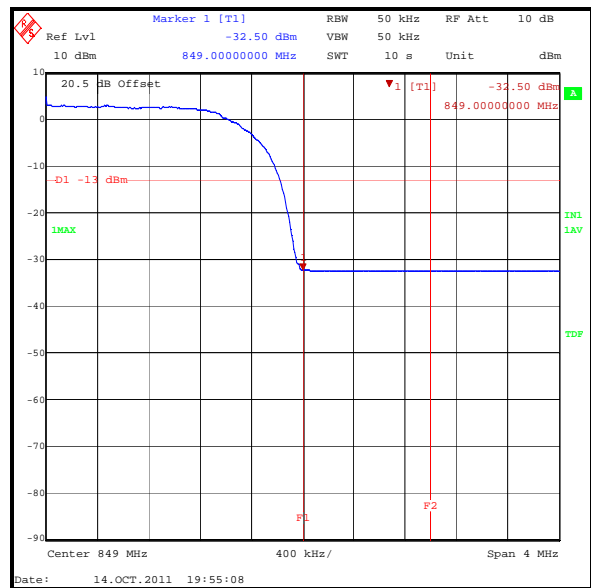
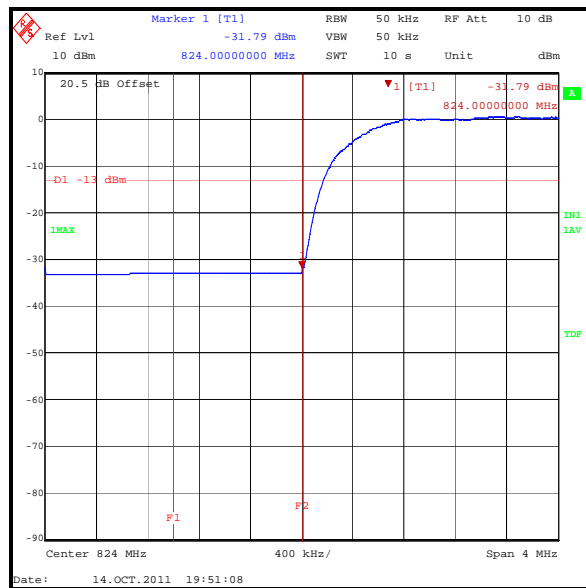
**Transmitter Radiated Emissions at Band Edges (continued)****Results: HSUPA Sub-Test 3**

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**

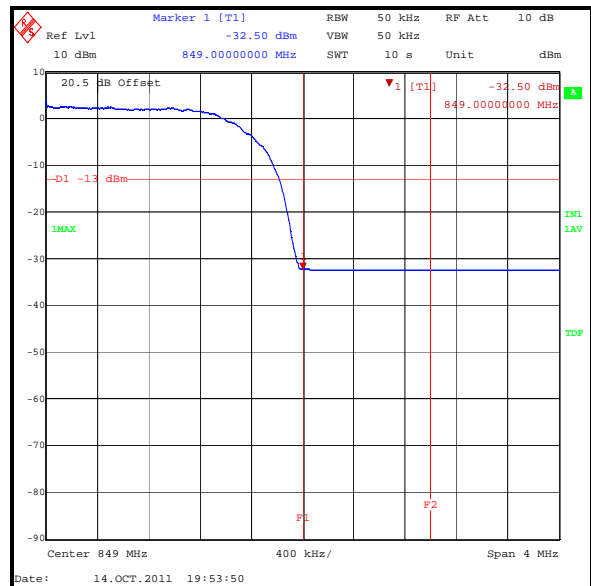
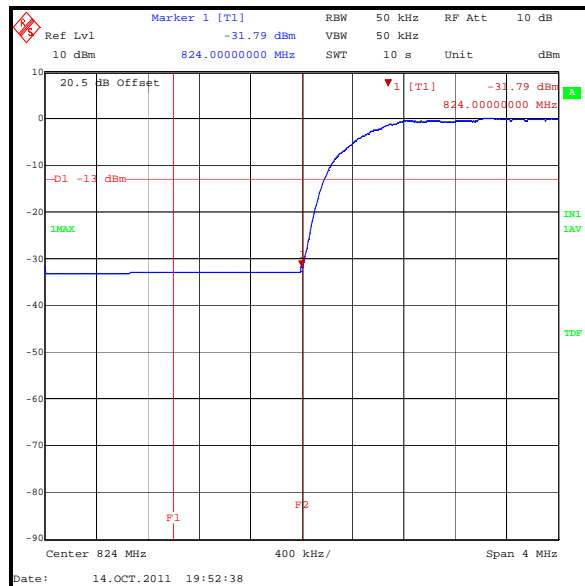
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-31.8	-13.0	18.8	Complied
849	-32.5	-13.0	19.5	Complied





**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”.

<b>Measurement Type</b>	<b>Range</b>	<b>Confidence Level (%)</b>	<b>Calculated Uncertainty</b>
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**

<b>RFI No.</b>	<b>Instrument</b>	<b>Manufacturer</b>	<b>Type No.</b>	<b>Serial No.</b>	<b>Date Calibration Due</b>	<b>Cal. Interval (Months)</b>
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.