



# TEST REPORT

**Test Report No. : UL-RPT-RP10295085JD03C V2.0**

**Manufacturer** : Sony Mobile Communications Inc.

**FCC ID** : PY7PM-0800

**Technology** : UMTS Band II

**Test Standard(s)** : FCC Part 24.238

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2. The results in this report apply only to the sample(s) tested.
3. The sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 2.0 supersedes all previous versions.

**Date of Issue:** 01 August 2014

**Checked by:**

Sarah Williams  
Engineer, Radio Laboratory

**Issued by :**

pp

John Newell  
Group Quality Manager  
Basingstoke,  
UL VS LTD



This laboratory is accredited by UKAS.  
The tests reported herein have been  
performed in accordance with its' terms  
of accreditation.

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**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 7

    3.3. Modifications Incorporated in the EUT 7

    3.4. Additional Information Related to Testing 7

    3.5. Support Equipment 7

**4. Operation and Monitoring of the EUT during Testing ..... 8**

    4.1. Operating Modes 8

    4.2. Configuration and Peripherals 8

**5. Measurements, Examinations and Derived Results ..... 9**

    5.1. General Comments 9

    5.2. Test Results 10

        5.2.1. Transmitter Out of Band Radiated Emissions 10

        5.2.2. Transmitter Band Edge Radiated Emissions 14

**6. Measurement Uncertainty .....24**

**7. Report Revision History .....25**

**1. Customer Information**

<b>Company Name:</b>	Sony Mobile Communications Inc.
<b>Address:</b>	Nya Vattentornet Mobilvägen 10 Lund 22188 Sweden

## **2. Summary of Testing**

### **2.1. General Information**

<b>Specification Reference:</b>	47CFR24
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications): Part 24 Subpart E (Personal Communication Services)
<b>Site Registration:</b>	209735
<b>Location of Testing:</b>	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
<b>Test Dates:</b>	04 June 2014 to 05 June 2014

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

<b>FCC Reference (47CFR)</b>	<b>Measurement</b>	<b>Result</b>
Part 2.1053/24.238	Transmitter Out of Band Radiated Emissions	
Part 2.1053/24.238	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
<b>Title:</b>	FCC KDB 971168 D01 v02r01, 7 June 2013
<b>Reference:</b>	Measurement Guidance for Certification of Licensed Digital Transmitters

### **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)**

<b>Brand Name:</b>	Sony
<b>IMEI:</b>	004402452705555 ( <i>Radiated sample</i> )
<b>Test Sample Serial Number:</b>	CB5A1YYLUK
<b>Hardware Version Number:</b>	A
<b>Software Version Number:</b>	23.0.A.0.204
<b>FCC ID:</b>	PY7PM-0800

<b>Brand Name:</b>	Sony
<b>Description:</b>	AC Charger
<b>Model Name or Number:</b>	EP880

<b>Brand Name:</b>	Generic
<b>Description:</b>	MHL Cable
<b>Model Name or Number:</b>	Not marked

<b>Brand Name:</b>	Sony
<b>Description:</b>	MHL Adaptor
<b>Model Name or Number:</b>	IM750

<b>Brand Name:</b>	Sony
<b>Description:</b>	USB Cable
<b>Model Name or Number:</b>	EC803

<b>Brand Name:</b>	Sony
<b>Description:</b>	Deskstand
<b>Model Name or Number:</b>	DK43

<b>Brand Name:</b>	Sony
<b>Description:</b>	PHF
<b>Model Name or Number:</b>	MH410c

### **3.2. Description of EUT**

The equipment under test (EUT) was a GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac + NFC & ANT+.

### **3.3. Modifications Incorporated in the EUT**

No modifications were applied to the EUT during testing.

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

<b>Technology Tested:</b>	UMTS1900		
<b>Type of Radio Device:</b>	Transceiver		
<b>Mode:</b>	UMTS FDD II		
<b>Modulation Type:</b>	QPSK / 8PSK		
<b>Channel Spacing:</b>	5 MHz		
<b>Power Supply Requirement(s):</b>	Nominal	3.8 V	
<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	9262	1852.4
	Top	9538	1907.6

### **3.5. Support Equipment**

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

<b>Description:</b>	2 GB Micro SD Card
<b>Brand Name:</b>	SanDisk
<b>Model Name or Number:</b>	Not marked

<b>Description:</b>	22" High Definition Television
<b>Brand Name:</b>	Logik
<b>Model Name or Number:</b>	L22FE12A
<b>Serial Number:</b>	1309020661

## **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 and top channels as required.
- Band edge tests were performed with the EUT in Voice (12.2 kbps), HSDPA (Sub-tests 1 to 4) or HSUPA (Sub-tests 1 to 5) 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 CMW 500 Universal Radio Communications Tester, operating in UMTS Band II mode.
- Transmitter radiated spurious emission tests were performed with the following configurations, employing all available accessories:
  - Configuration 1 – Handset with the AC charger, USB Cable, MHL cable (terminated in to a television), MHL adaptor and PHF
  - Configuration 2 – Handset with the AC charger, USB Cable, Deskstand and PHF.

Pre-scans below 1 GHz were performed in both configurations 1 and 2, with final measurements limited to the configuration which provided worst case results. Pre-scans above 1 GHz were performed in the configuration that employed the most accessories (Configuration 1), with any final measurements being performed in both configurations.

## **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.

In accordance with UKAS requirements all the measurement equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

## **5.2. Test Results**

### **5.2.1. Transmitter Out of Band Radiated Emissions**

#### **Test Summary:**

<b>Test Engineers:</b>	Andrew Edwards & David Doyle	<b>Test Dates:</b>	04 June 2014 & 05 June 2014
<b>Test Sample IMEI:</b>	004402452705555		

<b>FCC Reference:</b>	Parts 2.1053 & 24.238
<b>Test Method Used:</b>	As detailed in KDB 971168 Section 6.1 referencing FCC Part 2.1053
<b>Frequency Range:</b>	30 MHz to 20 GHz
<b>Configuration:</b>	Voice / 12.2 kbps

#### **Environmental Conditions:**

<b>Temperature (°C):</b>	23 to 24
<b>Relative Humidity (%):</b>	33 to 42

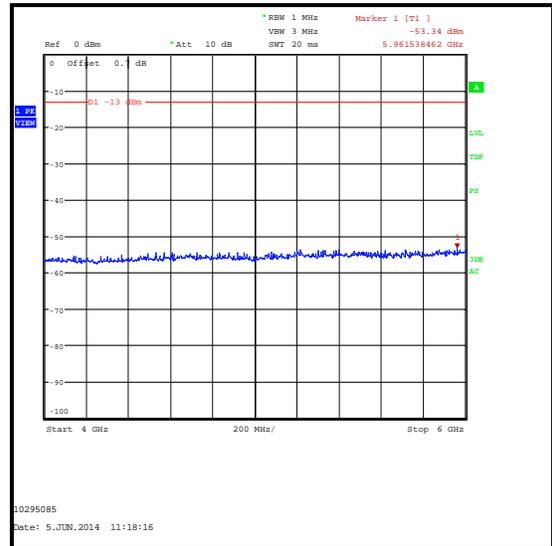
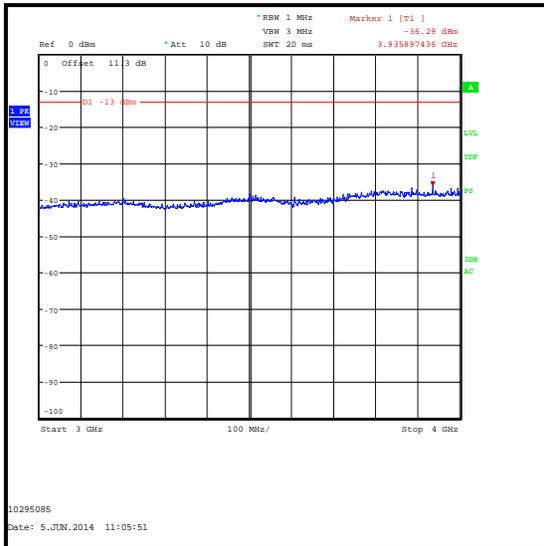
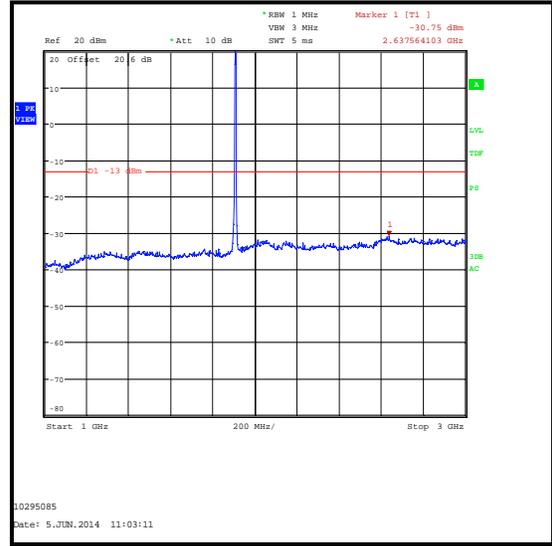
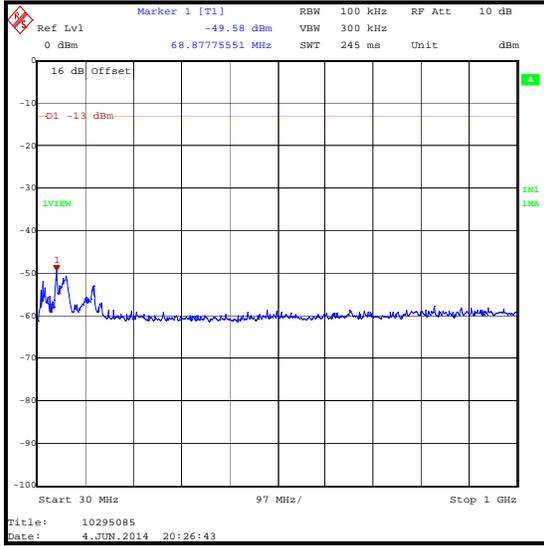
#### **Note(s):**

1. The uplink traffic channel is shown on the 1 GHz to 3 GHz plot.
2. All emissions shown on the pre-scan plots were investigated. Final measurements were made using appropriate RF filters and attenuators where required. All emissions shown on the pre-scan plots were found to be below the measurement system noise floor or ambient, therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (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.
4. Pre-scans above 1 GHz were performed in a fully anechoic chamber (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 (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.

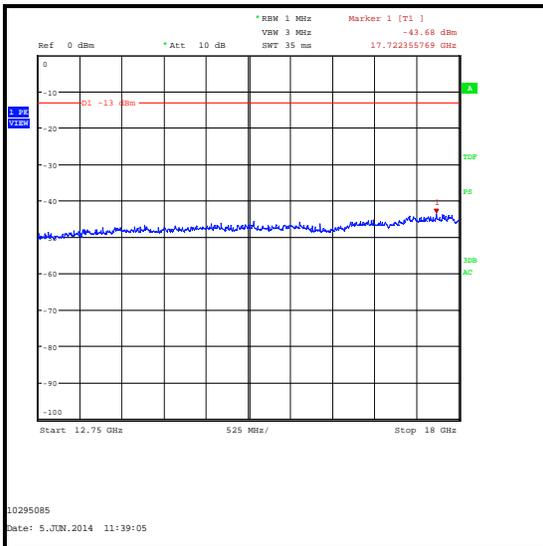
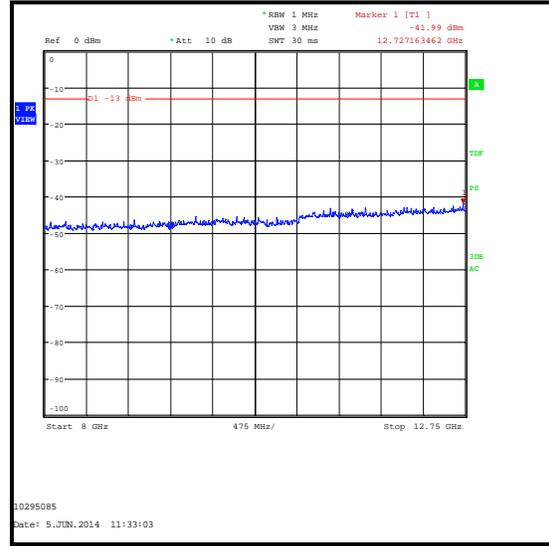
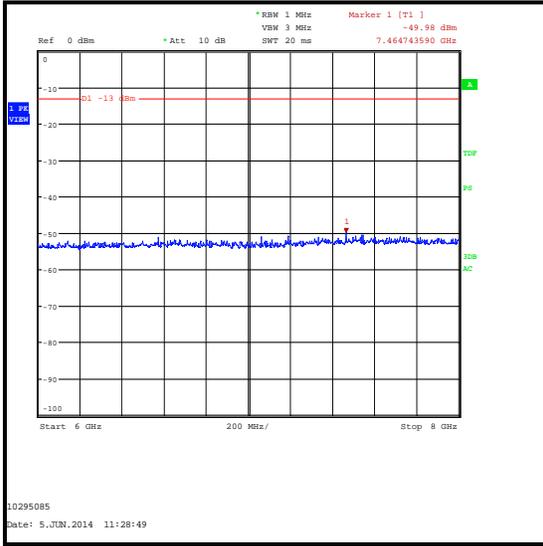
#### **Results: Voice / 12.2 kbps – Top Channel**

<b>Frequency (MHz)</b>	<b>Peak Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>	<b>Result</b>
2637.564	-30.8	-13.0	17.8	Complied

### Transmitter Out of Band Radiated Emissions (continued)



**Transmitter Out of Band Radiated Emissions (continued)**



**Transmitter Out of Band Radiated Emissions (continued)****Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
A490	Antenna	Chase	CBL6111A	1590	29 Apr 2015	12
A1834	Attenuator	Hewlett Packard	8491B	10444	15 Nov 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	26 Nov 2014	12
G0543	Amplifier	Sonoma	310N	230801	19 Aug 2014	3
M1622	Thermohygrometer	JM Handelspunkt	30.5015.06	Not stated	31 Dec 2014	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	15 Feb 2015	12
A253	Antenna	Flann Microwave	12240-20	128	14 Nov 2014	12
A254	Antenna	Flann Microwave	14240-20	139	14 Nov 2014	12
A255	Antenna	Flann Microwave	16240-20	519	14 Nov 2014	12
A256	Antenna	Flann Microwave	18240-20	400	14 Nov 2014	12
A436	Antenna	Flann Microwave	20240-20	330	14 Nov 2014	12
A1534	Pre-Amplifier	Hewlett Packard	8449B	3008A00405	18 May 2015	12
A1818	Antenna	EMCO	3115	00075692	14 Nov 2014	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	02 May 2015	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	02 May 2015	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	12 Apr 2015	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
M1874	Test Receiver	Rohde & Schwarz	ESU26	100553	13 May 2015	12
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	Not stated	14 Mar 2015	12

**5.2.2. Transmitter Band Edge Radiated Emissions**

**Test Summary:**

<b>Test Engineer:</b>	David Doyle	<b>Test Date:</b>	05 June 2014
<b>Test Sample IMEI:</b>	004402452705555		

<b>FCC Reference:</b>	Parts 2.1053 & 24.238
<b>Test Method Used:</b>	As detailed in KDB 971168 Section 6.1 referencing FCC Part 24.238

**Environmental Conditions:**

<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	42

**Results: Voice / 12.2 kbps**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.962	-36.2	-13.0	23.2	Complied
1850	-37.2	-13.0	24.2	Complied
1910	-34.3	-13.0	21.3	Complied



**Transmitter Band Edge Radiated Emissions (continued)**

**Results: HSDPA Sub-Test 1**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.968	-36.7	-13.0	23.7	Complied
1850	-37.9	-13.0	24.9	Complied
1910	-34.4	-13.0	21.4	Complied
1910.038	-33.5	-13.0	20.5	Complied



**Transmitter Band Edge Radiated Emissions (continued)**

**Results: HSDPA Sub-Test 2**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.974	-37.1	-13.0	24.1	Complied
1850	-37.5	-13.0	24.5	Complied
1910	-34.2	-13.0	21.2	Complied



**Transmitter Band Edge Radiated Emissions (continued)**

**Results: HSDPA Sub-Test 3**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.846	-35.7	-13.0	22.7	Complied
1850	-36.6	-13.0	23.6	Complied
1910	-34.1	-13.0	21.1	Complied



**Transmitter Band Edge Radiated Emissions (continued)**

**Results: HSDPA Sub-Test 4**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.846	-35.2	-13.0	22.2	Complied
1850	-36.5	-13.0	23.5	Complied
1910	-33.7	-13.0	20.7	Complied



**Transmitter Band Edge Radiated Emissions (continued)**

**Results: HSUPA Sub-Test 1**

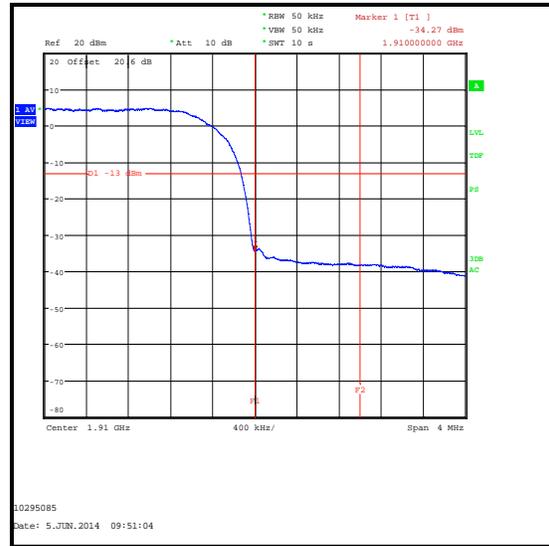
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.968	-37.1	-13.0	24.1	Complied
1850	-37.3	-13.0	24.3	Complied
1910	-34.2	-13.0	21.2	Complied



**Transmitter Band Edge Radiated Emissions (continued)**

**Results: HSUPA Sub-Test 2**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.962	-35.9	-13.0	22.9	Complied
1850	-36.8	-13.0	23.8	Complied
1910	-34.3	-13.0	21.3	Complied



**Transmitter Band Edge Radiated Emissions (continued)**

**Results: HSUPA Sub-Test 3**

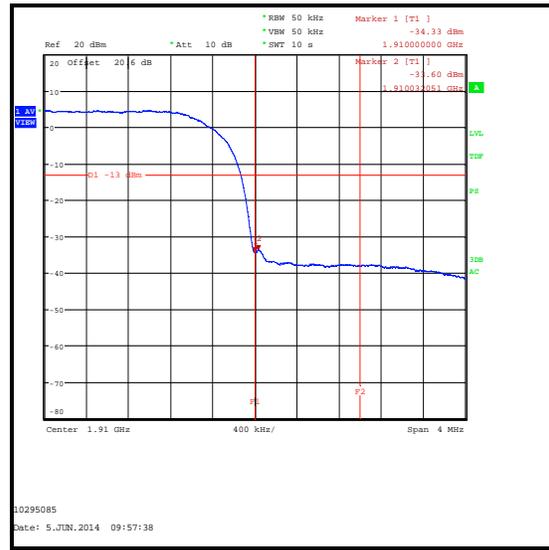
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-37.1	-13.0	24.1	Complied
1910	-34.0	-13.0	21.0	Complied



**Transmitter Band Edge Radiated Emissions (continued)**

**Results: HSUPA Sub-Test 4**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.974	-36.6	-13.0	23.6	Complied
1850	-37.8	-13.0	24.8	Complied
1910	-34.3	-13.0	21.3	Complied
1910.032	-33.6	-13.0	20.6	Complied



**Transmitter Band Edge Radiated Emissions (continued)**

**Results: HSUPA Sub-Test 5**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.974	-37.5	-13.0	24.5	Complied
1850	-37.9	-13.0	24.9	Complied
1910	-34.7	-13.0	21.7	Complied
1910.038	-34.2	-13.0	21.2	Complied



**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
A1534	Pre-Amplifier	Hewlett Packard	8449B	3008A00405	18 May 2015	12
A1818	Antenna	EMCO	3115	00075692	14 Nov 2014	12
A1393	Attenuator	Huber & Suhner	6820.17B	757456	02 May 2015	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
M1874	Test Receiver	Rohde & Schwarz	ESU26	100553	13 May 2015	12
M1656	Thermohyrometer	JM Handelspunkt	30.5015.13	Not stated	14 Mar 2015	12

## **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>
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Spurious Emissions	1 GHz 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.

## **7. Report Revision History**

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version
2.0	-	-	EUT Description update

--- END OF REPORT ---