



TEST REPORT

Test Report No. : UL-RPT-RP10640830JD02A

Manufacturer : Panasonic Mobile Communications Development of Europe Ltd
Model No. : SoftBank 401PM
FCC ID : UCE215063A
Technology : PCS1900
Test Standard(s) : FCC Part 24

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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 1.0

Date of Issue: 19 March 2015

Checked by: *Sarah Williams*
Sarah Williams
Engineer, Radio Laboratory

Issued by : *John Newell*
pp
John Newell
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This laboratory is accredited by UKAS.
The tests reported herein have been
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of accreditation.

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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): Part 24 Subpart E (Personal Communication Services) |
| Site Registration: | 209735 |
| Location of Testing: | UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom |
| Test Dates: | 04 March 2015 to 19 March 2015 |

2.2. Summary of Test Results

| FCC Reference (47CFR) | Measurement | Result |
|--------------------------|--|--------|
| Part 24.232(c) | Transmitter Output Power (EIRP) | ✓ |
| Part 2.1055/24.235 | Transmitter Frequency Stability (Temperature and Voltage Variation) | ✓ |
| Part 2.1049 | 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: | FCC KDB 971168 D01 v02r02, October 17 2014 |
| Title: | 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)

| | |
|---------------------------------|---|
| Brand Name: | SoftBank |
| Model Name or Number: | 401PM |
| Test Sample IMEI: | 004401221425149 (<i>Radiated sample</i>) |
| Hardware Version Number: | Rev C |
| Software Version Number: | ACPU: B-S51CS1-10.01.002 CCPU: S51CS1_Cv62010101 |
| FCC ID: | UCE215063A |

| | |
|---------------------------------|---|
| Brand Name: | SoftBank |
| Model Name or Number: | 401PM |
| Test Sample IMEI: | 004401221425198 (<i>Conducted sample</i>) |
| Hardware Version Number: | Rev C |
| Software Version Number: | ACPU: B-S51CS1-10.01.002 CCPU: S51CS1_Cv62010101 |
| FCC ID: | UCE215063A |

| | |
|------------------------------|------------|
| Brand Name: | SoftBank |
| Description: | AC Adaptor |
| Model Name or Number: | Type ZTDA1 |

| | |
|------------------------------|----------------|
| Brand Name: | SoftBank |
| Description: | Stereo Headset |
| Model Name or Number: | Type ZTBBA1 |

| | |
|------------------------------|----------------|
| Brand Name: | SoftBank |
| Description: | USB Data Cable |
| Model Name or Number: | ZTFE01 |

| | |
|------------------------------|----------------------------------|
| Brand Name: | SoftBank |
| Description: | Rechargeable Li-ion Battery Pack |
| Model Name or Number: | PMBBH2 |

3.2. Description of EUT

The equipment under test was a Dual Mode GSM/UTRA Mobile Phone with Bluetooth.

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 | 3.7 VDC | |
| | Minimum | 3.4 VDC | |
| | Maximum | 4.2 VDC | |
| Maximum Output Power (EIRP): | GSM | 31.4 dBm | |
| | GPRS | 31.4 dBm | |
| Transmit Frequency Range: | 1850 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 |

3.5. Support Equipment

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

| | |
|------------------------------|----------------------|
| Description: | Micro SD Card |
| Brand Name: | Panasonic |
| Model Name or Number: | Not marked or stated |
| Serial Number: | Not marked or stated |

| | |
|------------------------------|----------------------|
| Description: | Dummy Battery |
| Brand Name: | Not marked or stated |
| Model Name or Number: | Not marked or stated |
| Serial Number: | Not marked or stated |

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.
- 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 one timeslot in the uplink. The EUT output power was initially checked when transmitting at maximum power on one and two timeslots. The highest power was observed when transmitting on one timeslot.
- 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 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 the accessories were individually connected and measurements made during the pre-scans to determine the worst case combination. The micro SD card was fitted during all tests.
- The customer supplied a dummy battery which was fitted for all conducted measurements.
- The conducted sample with IMEI 004401221425198 was used for frequency stability, conducted power and occupied bandwidth measurements.
- The radiated sample with IMEI 004401221425149 was used for all radiated measurements.

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 Output Power (EIRP)

Test Summary:

| | | | |
|-------------------|-----------------|------------|---------------|
| Test Engineer: | David Doyle | Test Date: | 04 March 2015 |
| Test Sample IMEI: | 004401221425198 | | |

| | |
|-------------------|---|
| FCC Reference: | Part 24.232(c) |
| Test Method Used: | As detailed in KBD 971168 Section 5.1.1 |

Environmental Conditions:

| | |
|------------------------|----|
| Temperature (°C): | 23 |
| Relative Humidity (%): | 30 |

Note(s):

1. The signal analyser was connected to the RF port on the EUT using suitable attenuation and RF cable. An RF level offset was entered on the signal analyser to compensate for the loss of the attenuator and RF cable.
2. The customer stated a maximum antenna gain of 2.5 dBi.
3. The antenna gain was added to the conducted output power to obtain the EIRP.

Transmitter Output Power (EIRP) (continued)**Results: GSM Circuit Switched**

| Channel | Frequency (MHz) | Conducted Output Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---------|-----------------|------------------------------|--------------------|------------|------------------|-------------|----------|
| Bottom | 1850.2 | 28.9 | 2.5 | 31.4 | 33.0 | 1.6 | Complied |
| Middle | 1879.8 | 28.7 | 2.5 | 31.2 | 33.0 | 1.8 | Complied |
| Top | 1909.8 | 28.6 | 2.5 | 31.1 | 33.0 | 1.9 | Complied |

Results: GPRS

| Channel | Frequency (MHz) | Conducted Output Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---------|-----------------|------------------------------|--------------------|------------|------------------|-------------|----------|
| Bottom | 1850.2 | 28.9 | 2.5 | 31.4 | 33.0 | 1.6 | Complied |
| Middle | 1879.8 | 28.8 | 2.5 | 31.3 | 33.0 | 1.7 | Complied |
| Top | 1909.8 | 28.6 | 2.5 | 31.1 | 33.0 | 1.9 | Complied |

Test Equipment Used:

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|-----------|---------------------|-----------------|-------------|-------------|-----------------------|------------------------|
| M1659 | Thermohygrometer | JM Handelspunkt | 30.5015.13 | None stated | 14 Mar 2015 | 12 |
| A1096 | Directional Coupler | Midisco | MDC6223 W20 | None stated | Calibrated before use | - |
| A2507 | Attenuator | AtlanTecRF | AN18-10 | 821846#2 | Calibrated before use | - |
| M1835 | Signal Analyser | Rohde & Schwarz | FSV30 | 103050 | 18 Feb 2016 | 12 |
| M1251 | Multimeter | Fluke | 175 | 89170179 | 19 May 2015 | 12 |
| S0558 | DC Power Supply | TTI | EL303R | 395825 | Calibrated before use | - |

5.2.2. Transmitter Frequency Stability (Temperature Variation)**Test Summary:**

| | | | |
|-------------------|-----------------|------------|---------------|
| Test Engineer: | David Doyle | Test Date: | 05 March 2015 |
| Test Sample IMEI: | 004401221425198 | | |

| | |
|-------------------|---|
| FCC Reference: | Parts 2.1055 & 24.235 |
| Test Method Used: | As detailed in KDB 971168 Section 9.0 referencing ANSI TIA-603-C-2004 Section 2.2.2 and FCC Part 2.1055 |
| Test Mode: | GPRS |

Environmental Conditions:

| | |
|--------------------------------|----|
| Ambient Temperature (°C): | 22 |
| Ambient Relative Humidity (%): | 33 |

Note(s):

1. A dummy battery was placed on the EUT and the dummy battery cables connected to a bench power supply.
2. Frequency error was measured using a calibrated Rohde & Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde & Schwarz application notes. The EUT was connected by suitable RF cables to the CMW 500. A bi-directional communications link was established between the EUT and CMW 500. The frequency meter value was recorded.
3. Temperature was monitored throughout the test with a calibrated digital thermometer.

Transmitter Frequency Stability (Temperature Variation) (continued)**Results: Bottom Channel (1850.2 MHz)**

| Temperature (°C) | Frequency Error (Hz) | Measured Frequency (MHz) | Lower Band Edge Limit (MHz) | Margin (MHz) | Result |
|------------------|----------------------|--------------------------|-----------------------------|--------------|----------|
| -10 | 18 | 1850.200018 | 1850.0 | 0.200018 | Complied |
| 0 | 14 | 1849.199986 | 1850.0 | 0.199986 | Complied |
| 10 | 14 | 1849.199986 | 1850.0 | 0.199986 | Complied |
| 20 | 10 | 1850.200010 | 1850.0 | 0.200010 | Complied |
| 30 | 14 | 1850.200014 | 1850.0 | 0.200014 | Complied |
| 40 | 11 | 1850.200011 | 1850.0 | 0.200011 | Complied |
| 50 | 10 | 1849.199990 | 1850.0 | 0.199990 | Complied |
| 55 | 23 | 1849.199977 | 1850.0 | 0.199977 | Complied |

Results: Top Channel (1909.8 MHz)

| Temperature (°C) | Frequency Error (Hz) | Measured Frequency (MHz) | Upper Band Edge Limit (MHz) | Margin (MHz) | Result |
|------------------|----------------------|--------------------------|-----------------------------|--------------|----------|
| -10 | 15 | 1909.800015 | 1910.0 | 0.199985 | Complied |
| 0 | 10 | 1909.799990 | 1910.0 | 0.200010 | Complied |
| 10 | 20 | 1909.799980 | 1910.0 | 0.200020 | Complied |
| 20 | 11 | 1909.799989 | 1910.0 | 0.200011 | Complied |
| 30 | 15 | 1909.800015 | 1910.0 | 0.199985 | Complied |
| 40 | 14 | 1909.799986 | 1910.0 | 0.200014 | Complied |
| 50 | 15 | 1909.799985 | 1910.0 | 0.200015 | Complied |
| 55 | 14 | 1909.799986 | 1910.0 | 0.200014 | Complied |

Test Equipment Used:

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|-----------|-----------------------------|-----------------|----------------|-------------|-----------------------|------------------------|
| M1659 | Thermohygrometer | JM Handelpunkt | 30.5015.13 | None stated | 14 Mar 2015 | 12 |
| M1859 | Wideband Radio Comms Tester | Rohde & Schwarz | CMW500 | 145920 | 09 May 2015 | 12 |
| E0513 | Environmental Chamber | TAS | LT600 Series 3 | 23900506 | Calibrated before use | - |
| M1642 | Thermometer | Fluke | 52II | 18890119 | 07 Apr 2015 | 12 |
| M1251 | Multimeter | Fluke | 175 | 89170179 | 19 May 2015 | 12 |
| S0558 | DC Power Supply | TTI | EL303R | 395825 | Calibrated before use | - |

5.2.3. Transmitter Frequency Stability (Voltage Variation)**Test Summary:**

| | | | |
|-------------------|-----------------|------------|---------------|
| Test Engineer: | David Doyle | Test Date: | 05 March 2015 |
| Test Sample IMEI: | 004401221425198 | | |

| | |
|-------------------|---|
| FCC Reference: | Parts 2.1055 & 24.235 |
| Test Method Used: | As detailed in KDB 971168 Section 9.0 referencing ANSI TIA-603-C-2004 Section 2.2.2 and FCC Part 2.1055 |
| Test Mode: | GPRS |

Environmental Conditions:

| | |
|------------------------|----|
| Temperature (°C): | 22 |
| Relative Humidity (%): | 33 |

Note(s):

1. A dummy battery was placed on the EUT and the dummy battery cables connected to a bench power supply.
2. Frequency error was measured using a calibrated Rohde & Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde & Schwarz application notes. The EUT was connected by suitable RF cables to the CMW 500. A bi-directional communications link was established between the EUT and CMW 500. The frequency meter value was recorded.
3. Voltage was monitored throughout the test with a calibrated digital voltmeter.

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 | 21 | 1849.199979 | 1850.0 | 0.199979 | Complied |
| 4.2 | 15 | 1849.199985 | 1850.0 | 0.199985 | Complied |

Results: Top Channel (1909.8 MHz)

| Supply Voltage (V) | Frequency Error (Hz) | Measured Frequency (MHz) | Upper Band Edge Limit (MHz) | Margin (MHz) | Result |
|--------------------|----------------------|--------------------------|-----------------------------|--------------|----------|
| 3.4 | 13 | 1909.799987 | 1910.0 | 0.200013 | Complied |
| 4.2 | 13 | 1909.800013 | 1910.0 | 0.199987 | Complied |

Transmitter Frequency Stability (Voltage Variation) (continued)**Test Equipment Used:**

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|-----------|-----------------------------|-----------------|------------|-------------|-----------------------|------------------------|
| M1659 | Thermohygrometer | JM Handelpunkt | 30.5015.13 | None stated | 14 Mar 2015 | 12 |
| M1859 | Wideband Radio Comms Tester | Rohde & Schwarz | CMW500 | 145920 | 09 May 2015 | 12 |
| M1251 | Multimeter | Fluke | 175 | 89170179 | 19 May 2015 | 12 |
| S0558 | DC Power Supply | TTI | EL303R | 395825 | Calibrated before use | - |

5.2.4. Transmitter Occupied Bandwidth**Test Summary:**

| | | | |
|--------------------------|-----------------|-------------------|---------------|
| Test Engineer: | David Doyle | Test Date: | 19 March 2015 |
| Test Sample IMEI: | 004401221425198 | | |

| | |
|--------------------------|---------------------------------------|
| FCC Reference: | Part 2.1049 |
| Test Method Used: | As detailed in KBD 971168 Section 4.2 |

Environmental Conditions:

| | |
|-------------------------------|----|
| Temperature (°C): | 23 |
| Relative Humidity (%): | 29 |

Note(s):

1. The signal analyser was connected to the RF port on the EUT using suitable attenuation and RF cable.

Transmitter Occupied Bandwidth (continued)**Results: GSM Circuit Switched**

| Channel | Frequency (MHz) | Occupied Bandwidth (kHz) |
|---------|-----------------|--------------------------|
| Bottom | 1850.2 | 239.423 |
| Middle | 1879.8 | 238.462 |
| Top | 1909.8 | 239.423 |

**Bottom Channel****Middle Channel****Top Channel**

Transmitter Occupied Bandwidth (continued)**Results: GPRS**

| Channel | Frequency (MHz) | Occupied Bandwidth (kHz) |
|---------|-----------------|--------------------------|
| Bottom | 1850.2 | 238.462 |
| Middle | 1879.8 | 238.462 |
| Top | 1909.8 | 238.462 |

**Bottom Channel****Middle Channel****Top Channel**

Transmitter Occupied Bandwidth (continued)**Test Equipment Used:**

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|-----------|---------------------|-----------------|-------------|-------------|-----------------------|------------------------|
| M1782 | Thermohygrometer | JM Handelpunkt | 30.5015.10 | None stated | 21 Mar 2015 | 12 |
| A1096 | Directional Coupler | Midisco | MDC6223 W20 | None stated | Calibrated before use | - |
| A2507 | Attenuator | AtlanTecRF | AN18-10 | 821846#2 | Calibrated before use | - |
| M1874 | Signal Analyser | Rohde & Schwarz | ESU26 | 100553 | 13 May 2015 | 12 |
| M1251 | Multimeter | Fluke | 175 | 89170179 | 19 May 2015 | 12 |
| S0558 | DC Power Supply | TTI | EL303R | 395825 | Calibrated before use | - |

5.2.5. Transmitter Out of Band Radiated Emissions

Test Summary:

| | | | |
|--------------------------|-----------------|-------------------|---------------|
| Test Engineer: | Andrew Edwards | Test Date: | 05 March 2015 |
| Test Sample IMEI: | 004401221425149 | | |

| | |
|--------------------------|---|
| FCC Reference: | Parts 2.1053 & 24.238 |
| Test Method Used: | As detailed in KDB 971168 Section 6.1 referencing FCC Part 2.1053 |
| Frequency Range: | 30 MHz to 20 GHz |
| Configuration: | GSM Circuit Switched |

Environmental Conditions:

| | |
|-------------------------------|----|
| Temperature (°C): | 23 |
| Relative Humidity (%): | 31 |

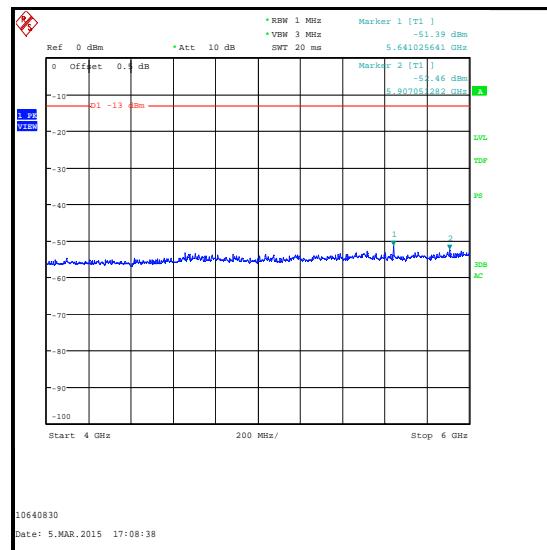
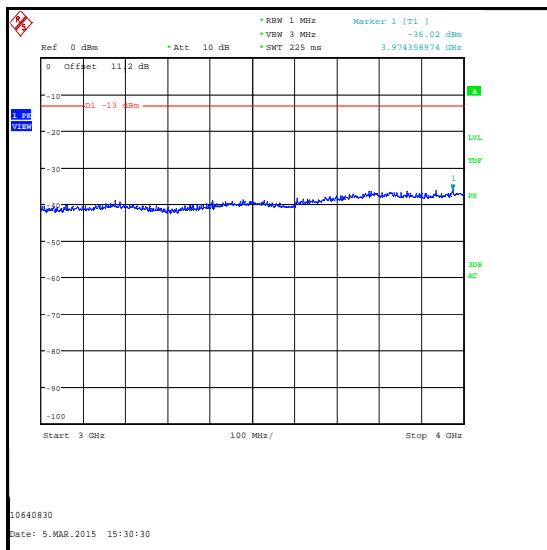
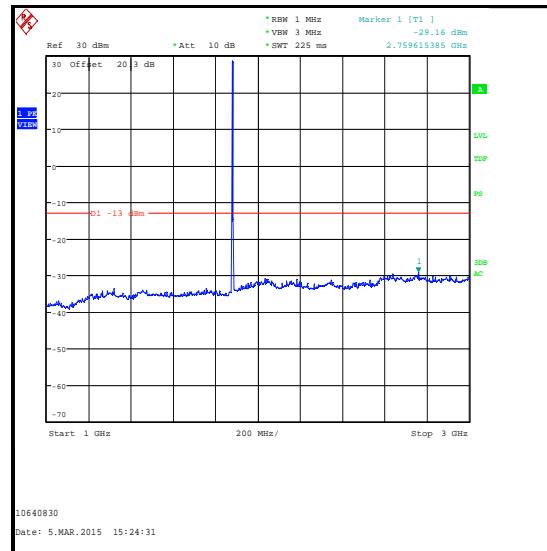
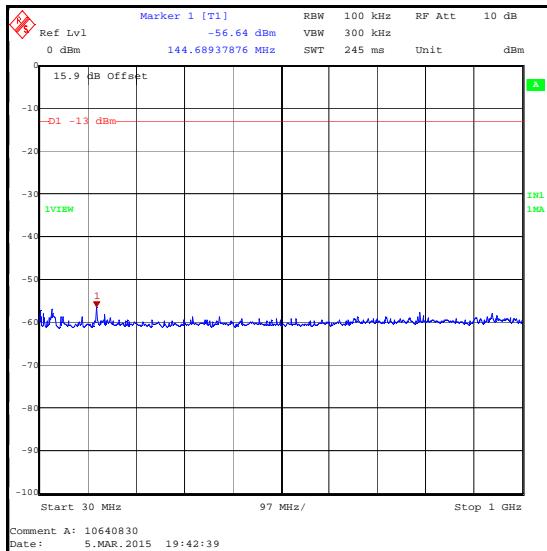
Note(s):

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.

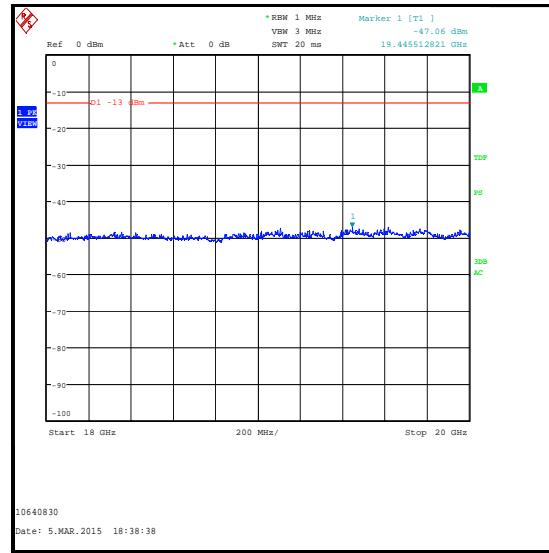
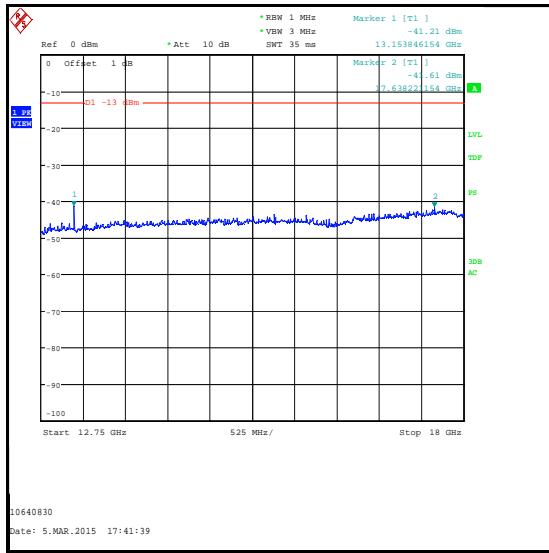
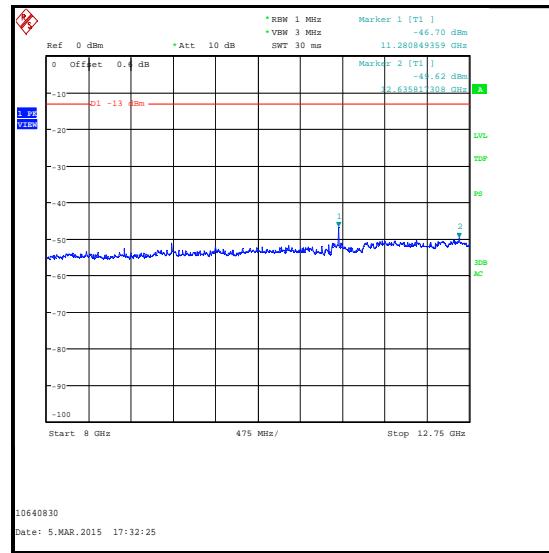
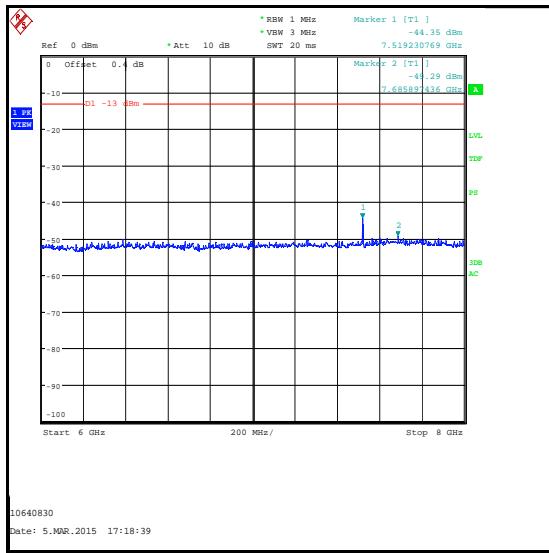
Results: Middle Channel

| Frequency (MHz) | Peak Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|----------|
| 2759.615 | -29.2 | -13.0 | 16.2 | 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) |
|-----------|------------------|-----------------|------------|------------|-----------------------|------------------------|
| M1624 | Thermohygrometer | JM Handelpunkt | 30.5015.10 | 0 | 07 Jan 2016 | 12 |
| K0001 | 5m RSE Chamber | Rainford EMC | N/A | N/A | 26 Mar 2015 | 12 |
| M1124 | Test Receiver | Rohde & Schwarz | ESIB26 | 100046K | 06 Oct 2015 | 12 |
| A490 | Antenna | Chase | CBL6111A | 1590 | 29 Apr 2015 | 12 |
| G0543 | Amplifier | Sonoma | 310N | 230801 | 05 Jun 2015 | 3 |
| A1834 | Attenuator | Hewlett Packard | 8491B | 10444 | 05 Mar 2016 | 12 |
| M1656 | Thermohygrometer | JM Handelpunkt | 30.5015.13 | Not stated | 14 Mar 2015 | 12 |
| K0002 | 3m RSE Chamber | Rainford EMC | N/A | N/A | 31 Mar 2015 | 12 |
| M1630 | Test Receiver | Rohde & Schwarz | ESU40 | 100233 | 20 Feb 2016 | 12 |
| A1534 | Pre Amplifier | Hewlett Packard | 8449B | 3008A00405 | 21 Dec 2015 | 12 |
| A1818 | Antenna | EMCO | 3115 | 00075692 | 20 Dec 2015 | 12 |
| A253 | Antenna | Flann Microwave | 12240-20 | 128 | 20 Dec 2015 | 12 |
| A254 | Antenna | Flann Microwave | 14240-20 | 139 | 20 Dec 2015 | 12 |
| A255 | Antenna | Flann Microwave | 16240-20 | 519 | 20 Dec 2015 | 12 |
| A256 | Antenna | Flann Microwave | 18240-20 | 400 | 20 Dec 2015 | 12 |
| A436 | Antenna | Flann Microwave | 20240-20 | 330 | 21 Dec 2015 | 12 |
| A2140 | Attenuator | AtlanTecRF | AN18-10 | 090918-14 | 25 Apr 2015 | 12 |
| A2143 | Attenuator | AtlanTecRF | AN18-20 | 081120-23 | Calibrated before use | - |
| A1975 | High Pass Filter | AtlanTecRF | AFH-03000 | 090424010 | 12 Apr 2015 | 12 |
| A2176 | High Pass Filter | AtlanTecRF | AFH-07000 | 800980 | 12 Apr 2015 | 12 |

5.2.6. Transmitter Band Edge Radiated Emissions**Test Summary:**

| | | | |
|-------------------|-----------------|------------|---------------|
| Test Engineer: | Andrew Edwards | Test Date: | 05 March 2015 |
| Test Sample IMEI: | 004401221425149 | | |

| | |
|-------------------|---|
| FCC Reference: | Parts 2.1053 & 24.238 |
| Test Method Used: | As detailed in KDB 971168 Section 6.1 referencing FCC Part 24.238 |

Environmental Conditions:

| | |
|------------------------|----|
| Temperature (°C): | 23 |
| Relative Humidity (%): | 33 |

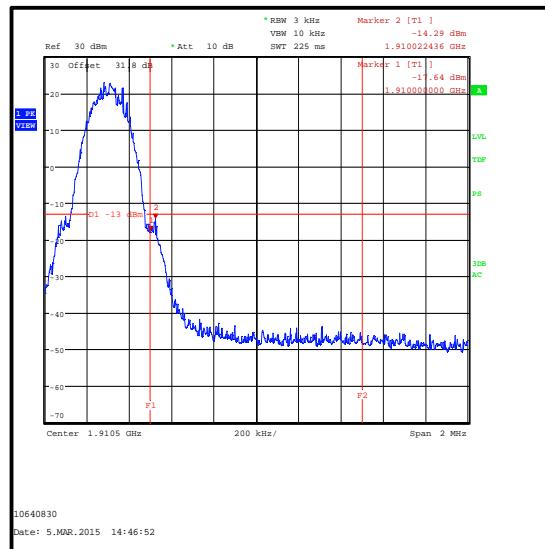
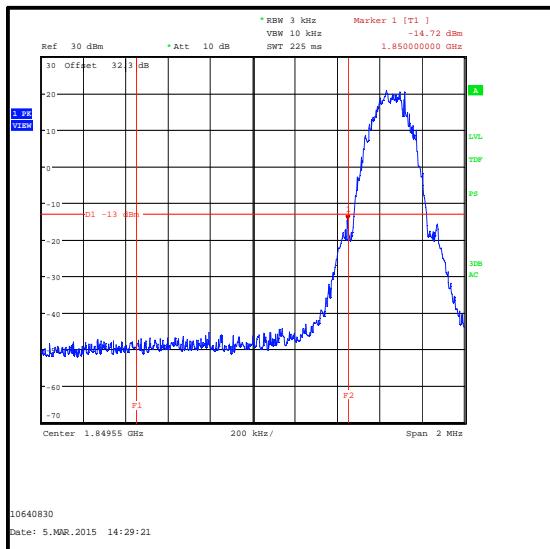
Note(s):

1. Measurements 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. The measurement antenna was placed at a fixed height of 1.5 metres above the test chamber floor in line with the EUT. In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 3 kHz (1% of 300 kHz, the 26 dB emission bandwidth) and video bandwidth 10 kHz (as close to three times the resolution bandwidth as the the test receiver allowed). Sweep time was set to auto and a peak detector with a trace mode of Max Hold was used.

Transmitter Band Edge Radiated Emissions (continued)

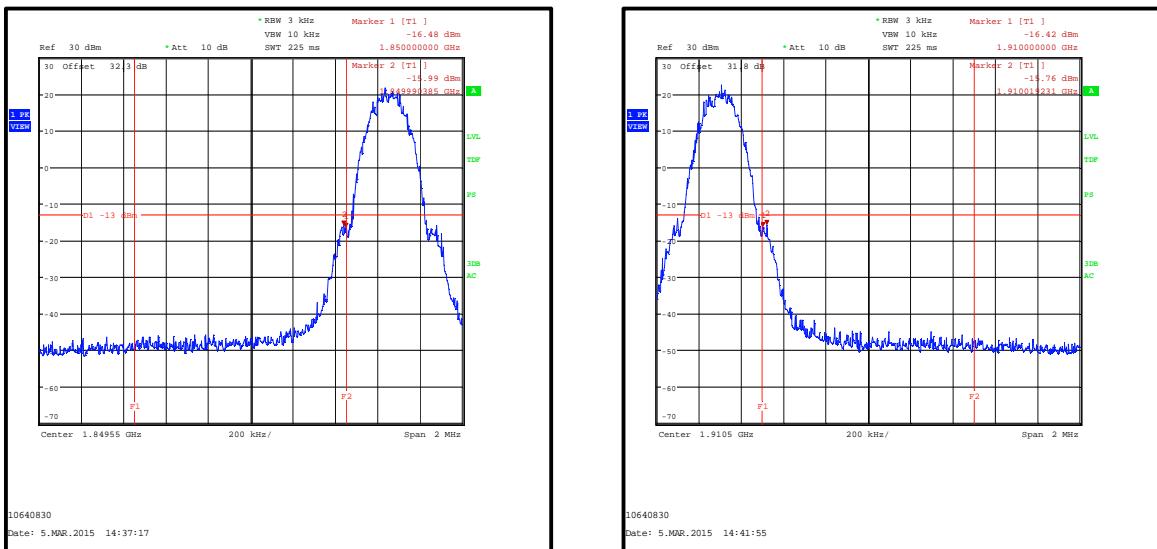
Results: GSM Circuit Switched

| Frequency (MHz) | Peak Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|----------|
| 1850 | -14.7 | -13.0 | 1.7 | Complied |
| 1910 | -17.6 | -13.0 | 4.6 | Complied |
| 1910.002 | -14.3 | -13.0 | 1.3 | Complied |



Transmitter Band Edge Radiated Emissions (continued)**Results: GPRS**

| Frequency (MHz) | Peak Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|----------|
| 1849.990 | -16.0 | -13.0 | 3.0 | Complied |
| 1850 | -16.5 | -13.0 | 3.5 | Complied |
| 1910 | -16.4 | -13.0 | 3.4 | Complied |
| 1910.002 | -15.8 | -13.0 | 2.8 | Complied |

**Test Equipment Used:**

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|-----------|------------------|-----------------|------------|------------|----------------------|------------------------|
| M1656 | Thermohygrometer | JM Handelpunkt | 30.5015.13 | Not stated | 14 Mar 2015 | 12 |
| K0002 | 3m RSE Chamber | Rainford EMC | N/A | N/A | 31 Mar 2015 | 12 |
| M1630 | Test Receiver | Rohde & Schwarz | ESU40 | 100233 | 20 Feb 2016 | 12 |
| A1534 | Pre Amplifier | Hewlett Packard | 8449B | 3008A00405 | 21 Dec 2015 | 12 |
| A1818 | Antenna | EMCO | 3115 | 00075692 | 20 Dec 2015 | 12 |
| A2000 | Attenuator | Huber & Suhner | 6830.17.B | 301623 | 12 Apr 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".

| Measurement Type | Range | Confidence Level (%) | Calculated Uncertainty |
|-----------------------------|------------------|----------------------|------------------------|
| Conducted Output Power | 1850 to 1910 MHz | 95% | ±1.13 dB |
| Frequency Stability | 1850 to 1910 MHz | 95% | ±23 Hz |
| Occupied Bandwidth | 1850 to 1910 MHz | 95% | ±3.92 % |
| Radiated Spurious Emissions | 30 MHz to 1 GHz | 95% | ±5.65 dB |
| Radiated Spurious Emissions | 1 GHz to 20 GHz | 95% | ±2.54 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 |

--- END OF REPORT ---