



TEST REPORT

Test Report No. : UL-RPT-RP10295106JD03A V2.0

Manufacturer : Sony Mobile Communications Inc.
FCC ID : PY7PM-0806
Technology : UMTS Band II
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 2.0 supersedes all previous versions.

Date of Issue: 04 August 2014

Checked by:

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Issued by :

pp

John Newell
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1. Customer Information

| | |
|----------------------|--|
| Company Name: | Sony Mobile Communications Inc. |
| Address: | Nya Vattentornet Mobilvägen 10 Lund 22188 Sweden |

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: | 09 June 2014 to 11 June 2014 |

2.2. Summary of Test Results

| FCC Reference (47CFR) | Measurement | Result |
|---|--|---|
| Part 24.232(c) | Transmitter Output Power (EIRP) |  |
| 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 |  |
| Part 2.1055/24.235 | Transmitter Frequency Stability (Temperature and Voltage Variation) |  |
| 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 |
| Title: | FCC KDB 971168 D01 v02r01, 7 June 2013 |
| Reference: | 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: | Sony |
| IMEI: | 004402452728243 (<i>Radiated sample</i>) |
| Test Sample Serial Number: | CB5A1Z2H3A |
| Hardware Version Number: | A |
| Software Version Number: | 23.0.A.0.204 |
| FCC ID: | PY7PM-0806 |

| | |
|-----------------------------------|---|
| Brand Name: | Sony |
| IMEI: | 004402452727773 (<i>Conducted sample with RF port #1</i>) |
| Test Sample Serial Number: | CB5A1Z2H1P |
| Hardware Version Number: | A |
| Software Version Number: | 23.0.A.0.204 |
| FCC ID: | PY7PM-0806 |

| | |
|-----------------------------------|---|
| Brand Name: | Sony |
| IMEI: | 004402452727757 (<i>Conducted sample with RF port #2</i>) |
| Test Sample Serial Number: | CB5A1Z2H54 |
| Hardware Version Number: | A |
| Software Version Number: | 23.0.A.0.204 |
| FCC ID: | PY7PM-0806 |

| | |
|------------------------------|------------|
| Brand Name: | Sony |
| Description: | AC Charger |
| Model Name or Number: | EP880 |

| | |
|------------------------------|------------|
| Brand Name: | Generic |
| Description: | MHL Cable |
| Model Name or Number: | Not marked |

| | |
|------------------------------|-------------|
| Brand Name: | Sony |
| Description: | MHL Adaptor |
| Model Name or Number: | IM750 |

Identification of Equipment Under Test (EUT) (continued)

| | |
|------------------------------|-----------|
| Brand Name: | Sony |
| Description: | USB Cable |
| Model Name or Number: | EC803 |

| | |
|------------------------------|-----------|
| Brand Name: | Sony |
| Description: | Deskstand |
| Model Name or Number: | DK43 |

| | |
|------------------------------|--------|
| Brand Name: | Sony |
| Description: | PHF |
| Model Name or Number: | 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

| | | | |
|-------------------------------------|-------------------|-----------------------|--------------------------------|
| Technology Tested: | UMTS1900 | | |
| Type of Radio Device: | Transceiver | | |
| Mode: | UMTS FDD II | | |
| Modulation Type: | QPSK / 8PSK | | |
| Channel Spacing: | 5 MHz | | |
| Power Supply Requirement(s): | Nominal | 3.8 V | |
| | Minimum | 3.42 V | |
| | Maximum | 4.18 V | |
| Maximum Output Power (EIRP): | Voice (12.2 kbps) | 27.7 dBm | |
| | HSDPA Sub-Test 2 | 29.4 dBm | |
| | HSUPA Sub-Test 5 | 29.4 dBm | |
| Transmit Frequency Range: | 1850 to 1910 MHz | | |
| Transmit Channels Tested: | Channel ID | Channel Number | Channel Frequency (MHz) |
| | Bottom | 9262 | 1852.4 |
| | Middle | 9400 | 1880.0 |
| | Top | 9538 | 1907.6 |

3.5. Support Equipment

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

| | |
|------------------------------|--------------------|
| Description: | 2 GB Micro SD Card |
| Brand Name: | SanDisk |
| Model Name or Number: | Not marked |

| | |
|------------------------------|--------------------------------|
| Description: | 22" High Definition Television |
| Brand Name: | Logik |
| Model Name or Number: | L22FE12A |
| Serial Number: | 1309020661 |

| | |
|------------------------------|-----------------------|
| Description: | Voltage variation jig |
| Brand Name: | Not marked |
| Model Name or Number: | Not marked |
| Serial Number: | Not marked |

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 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.

- Testing at temperature and voltage extremes was performed using a voltage variation jig and adaptor supplied by the customer. The adaptor plugs onto the handset in place of the battery connector.
- The voltage variation jig and adaptor were used for conducted measurements set at the nominal voltage.
- The conducted sample with IMEI 004402452727773 was used for conducted power and occupied bandwidth measurements.
- The conducted sample with IMEI 004402452727757 was used for frequency stability measurements.
- The radiated sample with IMEI 004402452728243 was used for all other 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: | 09 June 2014 |
| Test Sample IMEI: | 004402452727773 | | |

| | |
|--------------------------|---|
| FCC Reference: | Part 24.232(c) |
| Test Method Used: | As detailed in KDB 971168 Section 5.1.1 and 5.2.1 |

Environmental Conditions:

| | |
|-------------------------------|----|
| Temperature (°C): | 24 |
| Relative Humidity (%): | 36 |

Note(s):

1. All modes were compared on each channel and the highest power recorded was subtracted from the limit to show the margin.
2. 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.
3. The customer stated a maximum antenna gain of 2.1 dBi
4. The antenna gain was added to the conducted output power to obtain the EIRP.

Transmitter Output Power (EIRP) (continued)**Results: Peak EIRP / HSDPA and Voice**

| Modes | | HSDPA | | | | Voice | | | |
|---|---------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------|
| Sub-test | | 1 | 2 | 3 | 4 | 12.2 kbps | | | |
| Band | Channel | Power (dBm) | Limit (dBm) | Margin (dB) | Result |
| 1900 | 9262 | 27.5 | 29.4 | 29.1 | 29.2 | 27.6 | 33.0 | 3.6 | Complied |
| | 9400 | 27.2 | 28.5 | 28.9 | 29.3 | 27.6 | 33.0 | 3.7 | Complied |
| | 9538 | 27.5 | 29.1 | 28.9 | 28.8 | 27.7 | 33.0 | 3.9 | Complied |
| β_c | | 2 | 12 | 11 | 15 | | | | |
| β_d | | 15 | 15 | 8 | 4 | | | | |
| $\Delta\text{ACK}, \Delta\text{NACK}, \Delta\text{CQI}$ | | 8 | 8 | 8 | 8 | | | | |

Results: Peak EIRP / HSUPA

| Modes | | HSUPA | | | | | | | |
|---|---------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------|
| Sub-test | | 1 | 2 | 3 | 4 | 5 | | | |
| Band | Channel | Power (dBm) | Limit (dBm) | Margin (dB) | Result |
| 1900 | 9262 | 28.9 | 28.9 | 29.1 | 27.5 | 29.4 | 33.0 | 3.6 | Complied |
| | 9400 | 29.3 | 28.7 | 29.4 | 27.5 | 28.7 | 33.0 | 3.6 | Complied |
| | 9538 | 29.1 | 28.3 | 29.1 | 27.4 | 28.9 | 33.0 | 3.9 | Complied |
| β_c | | 10 | 6 | 15 | 2 | 15 | | | |
| β_d | | 15 | 15 | 9 | 15 | 1 | | | |
| $\Delta\text{ACK}, \Delta\text{NACK}, \Delta\text{CQI}$ | | 8 | 8 | 8 | 8 | 8 | | | |

Transmitter Output Power (EIRP) (continued)**Results: RMS EIRP / HSDPA and Voice**

| Modes | | HSDPA | | | | Voice | | | |
|---------------------------------------|---------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------|
| Sub-test | | 1 | 2 | 3 | 4 | 12.2 kbps | | | |
| Band | Channel | Power (dBm) | Limit (dBm) | Margin (dB) | Result |
| 1900 | 9262 | 21.6 | 21.7 | 21.8 | 21.7 | 22.3 | 33.0 | 10.7 | Complied |
| | 9400 | 21.6 | 21.5 | 21.6 | 21.6 | 22.0 | 33.0 | 11.0 | Complied |
| | 9538 | 21.6 | 21.6 | 21.6 | 21.7 | 22.3 | 33.0 | 10.7 | Complied |
| β_c | | 2 | 11 | 15 | 15 | | | | |
| β_d | | 15 | 15 | 8 | 4 | | | | |
| $\Delta ACK, \Delta NACK, \Delta CQI$ | | 8 | 8 | 8 | 8 | | | | |

Results: RMS EIRP / HSUPA

| Modes | | HSUPA | | | | | | | |
|---------------------------------------|---------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------|
| Sub-test | | 1 | 2 | 3 | 4 | 5 | | | |
| Band | Channel | Power (dBm) | Limit (dBm) | Margin (dB) | Result |
| 1900 | 9262 | 21.7 | 21.7 | 21.6 | 21.7 | 21.6 | 33.0 | 11.3 | Complied |
| | 9400 | 21.6 | 21.5 | 21.6 | 21.5 | 21.5 | 33.0 | 11.4 | Complied |
| | 9538 | 21.7 | 21.6 | 21.7 | 21.6 | 21.5 | 33.0 | 11.3 | Complied |
| β_c | | 10 | 6 | 15 | 2 | 15 | | | |
| β_d | | 15 | 15 | 9 | 15 | 1 | | | |
| $\Delta ACK, \Delta NACK, \Delta CQI$ | | 8 | 8 | 8 | 8 | 8 | | | |

Test Equipment Used:

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|-----------|---------------------|-----------------|---------------|-------------|-----------------------|------------------------|
| M1656 | Thermohygrometer | JM Handelspunkt | 30.5015.13 | None stated | 14 Mar 2015 | 12 |
| A2533 | Directional Coupler | Atlan TecRF | CDC-003060-20 | 14041701717 | Calibrated before use | - |
| A2525 | Attenuator | Atlan TecRF | AN18W5-10 | 832827#3 | Calibrated before use | - |
| L1138 | Signal Analyser | Rohde & Schwarz | FSV13.6 | 101389 | 17 Apr 2015 | 12 |
| M1269 | Multimeter | Fluke | 179 | 90250210 | 19 May 2015 | 12 |
| S0523 | DC Power Supply | TTI | PL320 | 224235 | Calibrated before use | - |

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

| | | | |
|--------------------------|-----------------|-------------------|--------------|
| Test Engineer: | David Doyle | Test Date: | 09 June 2014 |
| Test Sample IMEI: | 004402452727773 | | |

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

Environmental Conditions:

| | |
|-------------------------------|----|
| Temperature (°C): | 24 |
| Relative Humidity (%): | 36 |

Note(s):

1. Occupied bandwidth (99% bandwidth) was measured using a signal analyser occupied bandwidth function.
2. The signal analyser was connected to the RF port on the EUT using suitable attenuation and RF cable.

Transmitter Occupied Bandwidth (continued)

Results: Voice / 12.2 kbps

| Channel | Frequency (MHz) | Occupied Bandwidth (kHz) |
|---------|-----------------|--------------------------|
| Middle | 1880.0 | 4167.873 |



Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSDPA Sub-Test 1

| Channel | Frequency (MHz) | Occupied Bandwidth (kHz) |
|---------|-----------------|--------------------------|
| Middle | 1880.0 | 4167.873 |

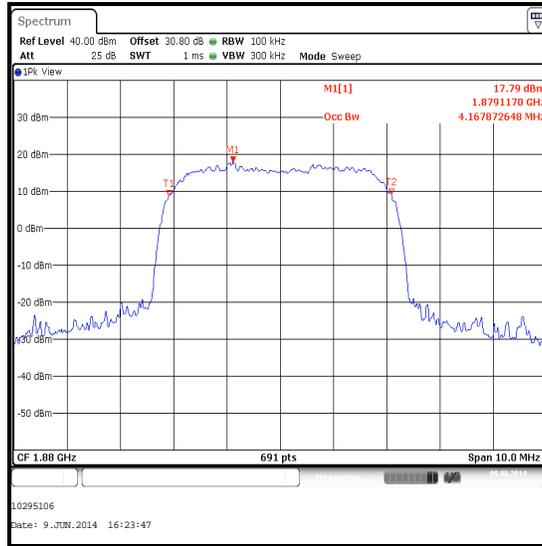


Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSDPA Sub-Test 2

| Channel | Frequency (MHz) | Occupied Bandwidth (kHz) |
|---------|-----------------|--------------------------|
| Middle | 1880.0 | 4167.873 |

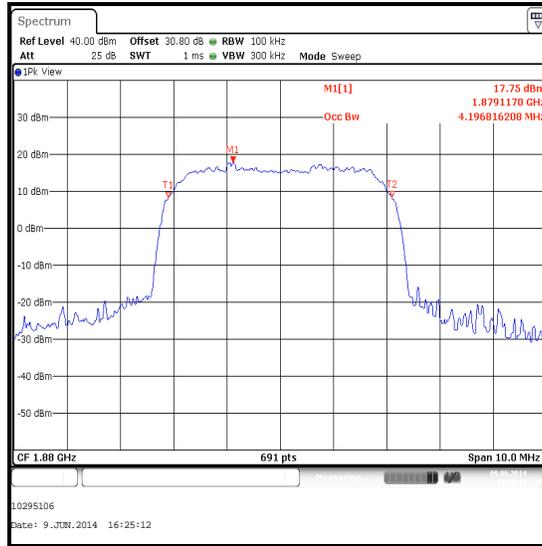


Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSDPA Sub-Test 3

| Channel | Frequency (MHz) | Occupied Bandwidth (kHz) |
|---------|-----------------|--------------------------|
| Middle | 1880.0 | 4196.816 |



Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSDPA Sub-Test 4

| Channel | Frequency (MHz) | Occupied Bandwidth (kHz) |
|---------|-----------------|--------------------------|
| Middle | 1880.0 | 4196.816 |

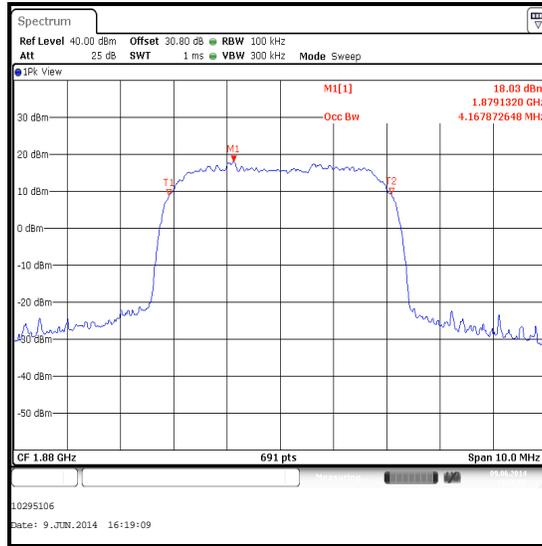


Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSUPA Sub-Test 1

| Channel | Frequency (MHz) | Occupied Bandwidth (kHz) |
|---------|-----------------|--------------------------|
| Middle | 1880.0 | 4167.873 |



Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSUPA Sub-Test 2

| Channel | Frequency (MHz) | Occupied Bandwidth (kHz) |
|---------|-----------------|--------------------------|
| Middle | 1880.0 | 4167.873 |

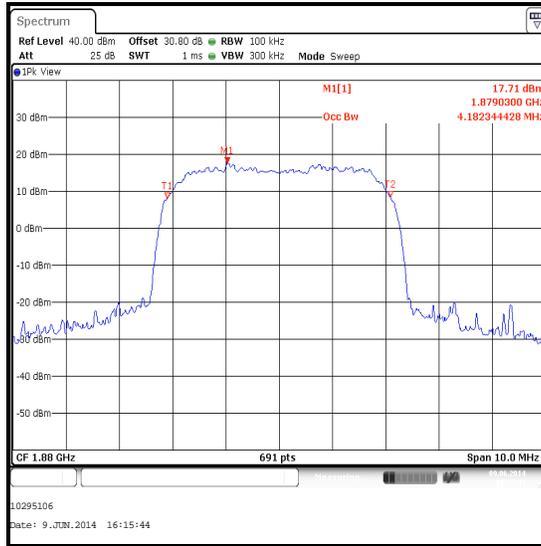


Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSUPA Sub-Test 3

| Channel | Frequency (MHz) | Occupied Bandwidth (kHz) |
|---------|-----------------|--------------------------|
| Middle | 1880.0 | 4182.344 |

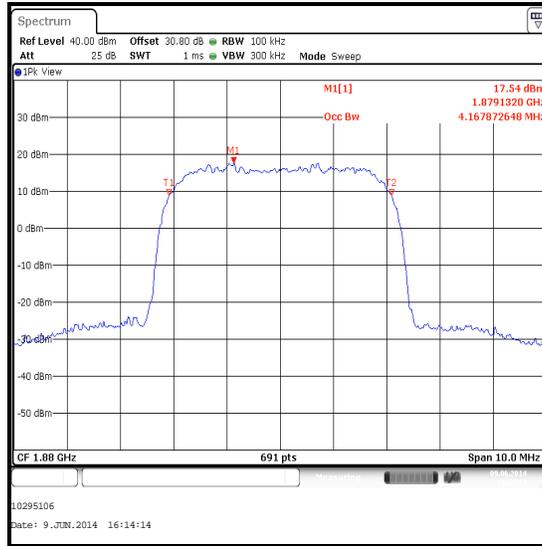


Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSUPA Sub-Test 4

| Channel | Frequency (MHz) | Occupied Bandwidth (kHz) |
|---------|-----------------|--------------------------|
| Middle | 1880.0 | 4167.873 |



Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSUPA Sub-Test 5

| Channel | Frequency (MHz) | Occupied Bandwidth (kHz) |
|---------|-----------------|--------------------------|
| Middle | 1880.0 | 4167.873 |



Middle Channel

Test Equipment Used:

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|-----------|---------------------|-----------------|---------------|-------------|-----------------------|------------------------|
| M1656 | Thermohygrometer | JM Handelspunkt | 30.5015.13 | None stated | 14 Mar 2015 | 12 |
| A2533 | Directional Coupler | Atlan TecRF | CDC-003060-20 | 14041701717 | Calibrated before use | - |
| A2525 | Attenuator | Atlan TecRF | AN18W5-10 | 832827#3 | Calibrated before use | - |
| L1138 | Signal Analyser | Rohde & Schwarz | FSV13.6 | 101389 | 17 Apr 2015 | 12 |
| M1269 | Multimeter | Fluke | 179 | 90250210 | 19 May 2015 | 12 |
| S0523 | DC Power Supply | TTI | PL320 | 224235 | Calibrated before use | - |

5.2.3. Transmitter Out of Band Radiated Emissions**Test Summary:**

| | | | |
|--------------------------|----------------------------------|--------------------|--------------------------------|
| Test Engineers: | David Doyle & Georgios Vrezas | Test Dates: | 10 June 2014 & 11 June 2014 |
| Test Sample IMEI: | 004402452728243 | | |

| | |
|--------------------------|---|
| 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: | Voice / 12.2 kbps |

Environmental Conditions:

| | |
|-------------------------------|----------|
| Temperature (°C): | 24 to 26 |
| Relative Humidity (%): | 31 to 40 |

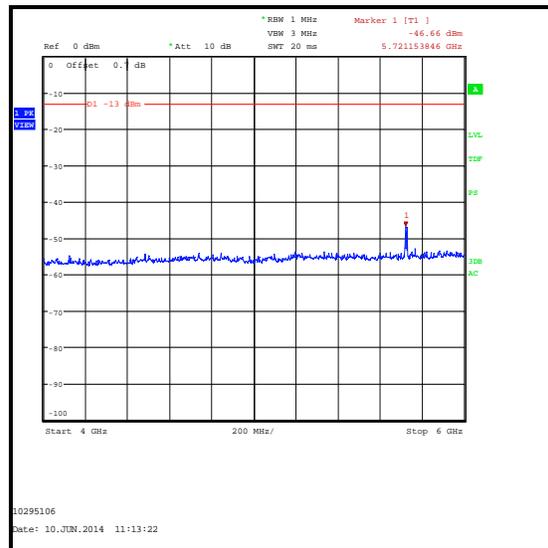
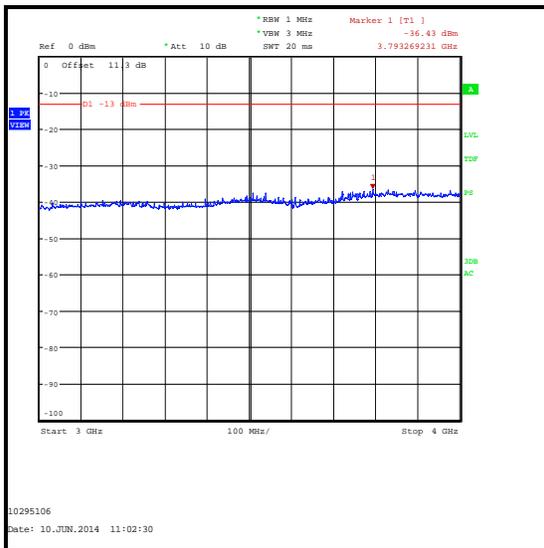
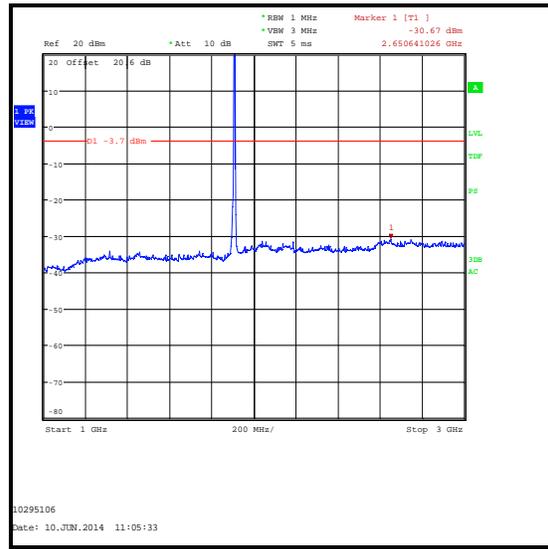
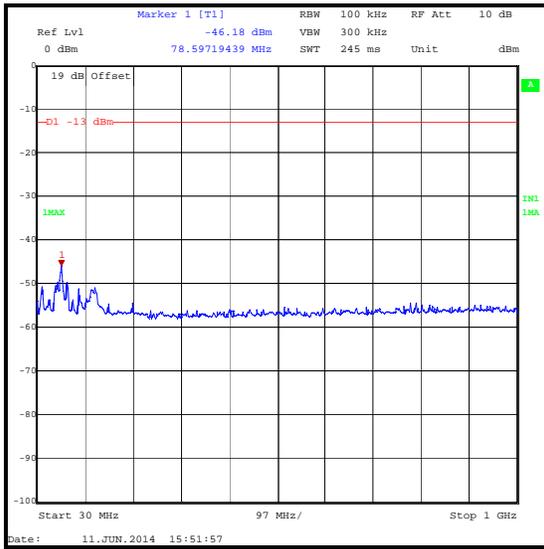
Note(s):

- The uplink traffic channel is shown on the 1 GHz to 3 GHz plot.
- 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.
- 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.
- 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.

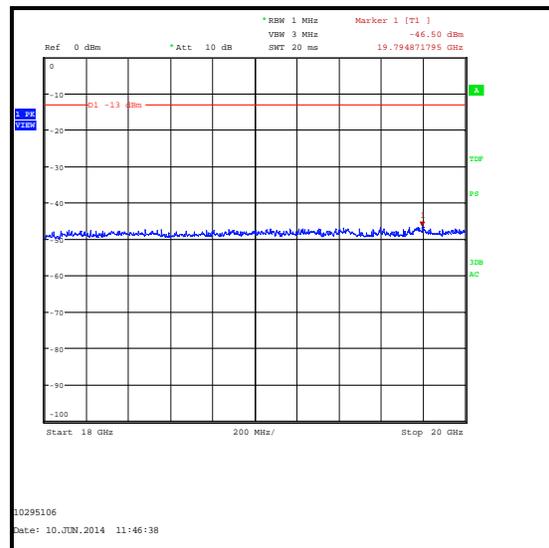
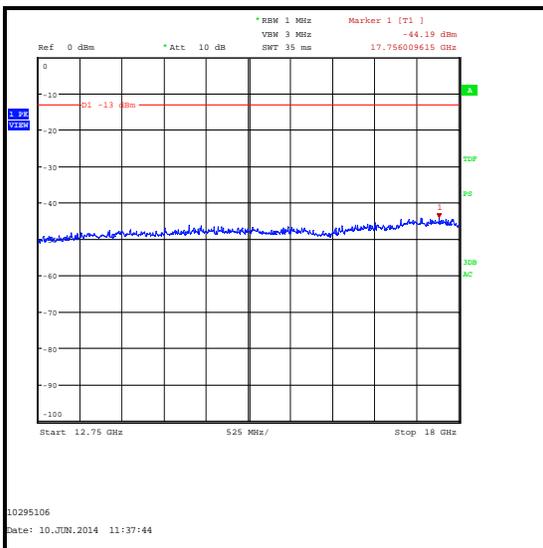
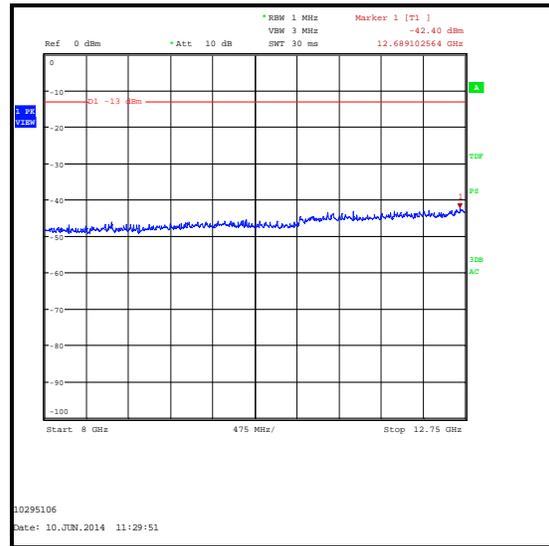
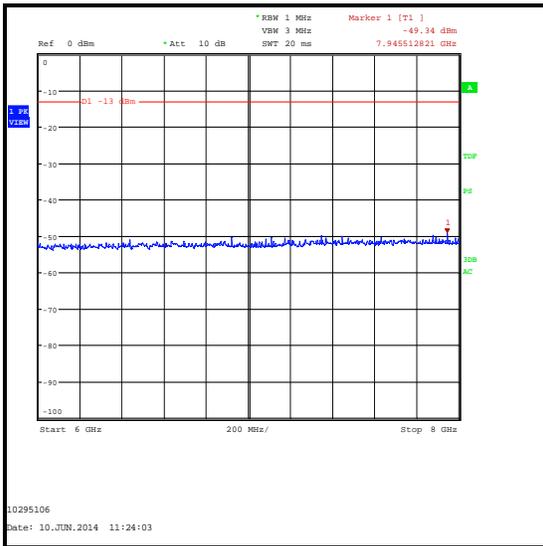
Results: Voice / 12.2 kbps – Top Channel

| Frequency (MHz) | Peak Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|----------|
| 2650.641 | -30.7 | -13.0 | 17.7 | 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 |

5.2.4. Transmitter Band Edge Radiated Emissions

Test Summary:

| | | | |
|--------------------------|-----------------|-------------------|--------------|
| Test Engineer: | David Doyle | Test Date: | 10 June 2014 |
| Test Sample IMEI: | 004402452728243 | | |

| | |
|--------------------------|---|
| 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): | 24 |
| Relative Humidity (%): | 43 |

Results: Voice / 12.2 kbps

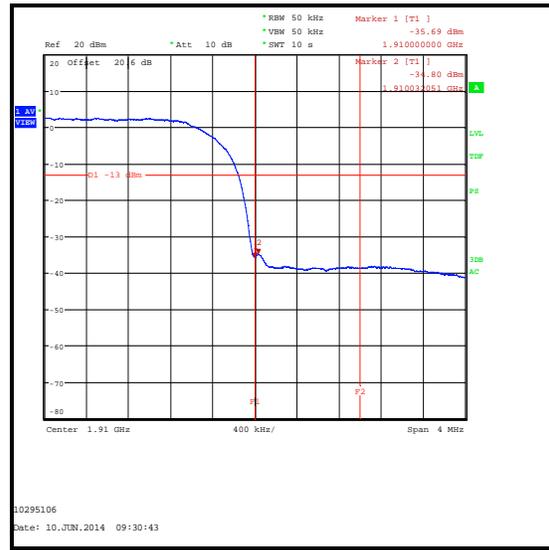
| Frequency (MHz) | Peak Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|----------|
| 1849.968 | -32.1 | -13.0 | 19.1 | Complied |
| 1850 | -33.0 | -13.0 | 20.0 | Complied |
| 1910 | -35.6 | -13.0 | 22.6 | Complied |
| 1910.019 | -35.1 | -13.0 | 22.1 | Complied |



Transmitter Band Edge Radiated Emissions (continued)

Results: HSDPA Sub-Test 1

| Frequency (MHz) | Peak Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|----------|
| 1849.962 | -32.3 | -13.0 | 19.3 | Complied |
| 1850 | -33.4 | -13.0 | 20.4 | Complied |
| 1910 | -35.7 | -13.0 | 22.7 | Complied |
| 1910.032 | -34.8 | -13.0 | 21.8 | Complied |



Transmitter Band Edge Radiated Emissions (continued)

Results: HSDPA Sub-Test 2

| Frequency (MHz) | Peak Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|----------|
| 1849.968 | -32.2 | -13.0 | 19.2 | Complied |
| 1850 | -32.5 | -13.0 | 19.5 | Complied |
| 1910 | -35.1 | -13.0 | 22.1 | Complied |
| 1910.032 | -34.9 | -13.0 | 21.9 | Complied |



Transmitter Band Edge Radiated Emissions (continued)

Results: HSDPA Sub-Test 3

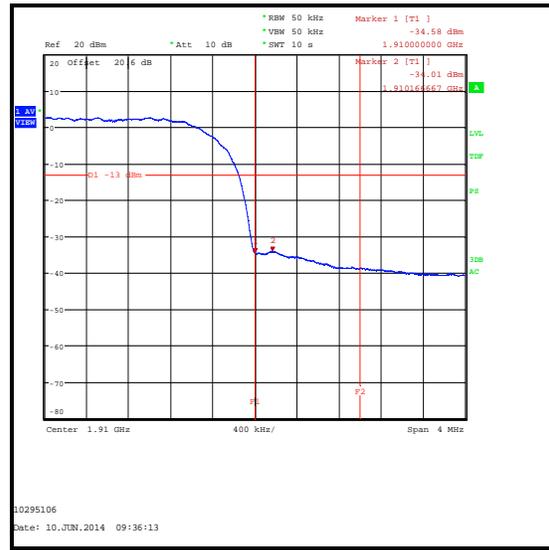
| Frequency (MHz) | Peak Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|----------|
| 1849.827 | -30.5 | -13.0 | 17.5 | Complied |
| 1850 | -31.8 | -13.0 | 18.8 | Complied |
| 1910 | -34.6 | -13.0 | 21.6 | Complied |
| 1910.167 | -34.4 | -13.0 | 21.4 | Complied |



Transmitter Band Edge Radiated Emissions (continued)

Results: HSDPA Sub-Test 4

| Frequency (MHz) | Peak Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|----------|
| 1849.846 | -30.2 | -13.0 | 17.2 | Complied |
| 1850 | -31.9 | -13.0 | 18.9 | Complied |
| 1910 | -34.6 | -13.0 | 21.6 | Complied |
| 1910.167 | -34.0 | -13.0 | 21.0 | Complied |



Transmitter Band Edge Radiated Emissions (continued)

Results: HSUPA Sub-Test 1

| Frequency (MHz) | Peak Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|----------|
| 1849.955 | -32.4 | -13.0 | 19.4 | Complied |
| 1850 | -32.7 | -13.0 | 19.7 | Complied |
| 1910 | -35.1 | -13.0 | 22.1 | Complied |



Transmitter Band Edge Radiated Emissions (continued)

Results: HSUPA Sub-Test 2

| Frequency (MHz) | Peak Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|----------|
| 1849.968 | -32.5 | -13.0 | 19.5 | Complied |
| 1850 | -33.4 | -13.0 | 20.4 | Complied |
| 1910 | -35.4 | -13.0 | 22.4 | Complied |
| 1910.032 | -34.9 | -13.0 | 21.9 | Complied |



Transmitter Band Edge Radiated Emissions (continued)

Results: HSUPA Sub-Test 3

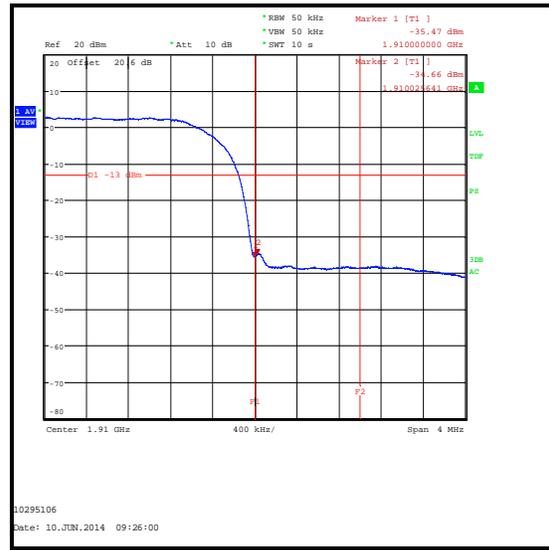
| Frequency (MHz) | Peak Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|----------|
| 1849.833 | -30.6 | -13.0 | 17.6 | Complied |
| 1850 | -31.9 | -13.0 | 18.9 | Complied |
| 1910 | -34.8 | -13.0 | 21.8 | Complied |
| 1910.173 | -34.5 | -13.0 | 21.5 | Complied |



Transmitter Band Edge Radiated Emissions (continued)

Results: HSUPA Sub-Test 4

| Frequency (MHz) | Peak Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|----------|
| 1849.974 | -32.4 | -13.0 | 19.4 | Complied |
| 1850 | -33.3 | -13.0 | 20.3 | Complied |
| 1910 | -35.5 | -13.0 | 22.5 | Complied |
| 1910.026 | -34.7 | -13.0 | 21.7 | Complied |



Transmitter Band Edge Radiated Emissions (continued)

Results: HSUPA Sub-Test 5

| Frequency (MHz) | Peak Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|------------------|-------------|-------------|----------|
| 1849.968 | -33.1 | -13.0 | 20.1 | Complied |
| 1850 | -33.5 | -13.0 | 20.5 | Complied |
| 1910 | -35.7 | -13.0 | 22.7 | Complied |
| 1910.051 | -35.4 | -13.0 | 22.4 | 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 | Thermohygrometer | JM Handlungspunkt | 30.5015.13 | Not stated | 14 Mar 2015 | 12 |

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

| | | | |
|--------------------------|-----------------|--------------------|--------------------------------|
| Test Engineer: | Keith Tucker | Test Dates: | 09 June 2014 & 10 June 2014 |
| Test Sample IMEI: | 004402452727757 | | |

| | |
|--------------------------|--|
| 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 |

Environmental Conditions:

| | |
|---------------------------------------|----------|
| Ambient Temperature (°C): | 23 to 25 |
| Ambient Relative Humidity (%): | 37 to 40 |

Note(s):

1. A voltage variation jig was connected to the EUT which was powered via a bench power supply at the nominal voltage of 3.8V.
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 (1852.4 MHz)**

| Temperature (°C) | Frequency Error (Hz) | Measured Frequency (MHz) | Lower Band Edge Limit (MHz) | Margin (MHz) | Result |
|------------------|----------------------|--------------------------|-----------------------------|--------------|----------|
| -30 | 8 | 1852.400008 | 1850.0 | 2.400008 | Complied |
| -20 | 10 | 1852.399990 | 1850.0 | 2.399990 | Complied |
| -10 | 11 | 1852.399989 | 1850.0 | 2.399989 | Complied |
| 0 | 10 | 1852.399990 | 1850.0 | 2.399990 | Complied |
| 10 | 10 | 1852.399990 | 1850.0 | 2.399990 | Complied |
| 20 | 7 | 1852.399993 | 1850.0 | 2.399993 | Complied |
| 30 | 6 | 1852.400006 | 1850.0 | 2.400006 | Complied |
| 40 | 9 | 1852.400009 | 1850.0 | 2.400009 | Complied |
| 50 | 11 | 1852.400011 | 1850.0 | 2.400011 | Complied |

Results: Top Channel (1907.6 MHz)

| Temperature (°C) | Frequency Error (Hz) | Measured Frequency (MHz) | Upper Band Edge Limit (MHz) | Margin (MHz) | Result |
|------------------|----------------------|--------------------------|-----------------------------|--------------|----------|
| -30 | 8 | 1907.600008 | 1910.0 | 2.399992 | Complied |
| -20 | 14 | 1907.600014 | 1910.0 | 2.399986 | Complied |
| -10 | 17 | 1907.600017 | 1910.0 | 2.399983 | Complied |
| 0 | 16 | 1907.600016 | 1910.0 | 2.399984 | Complied |
| 10 | 19 | 1907.600019 | 1910.0 | 2.399981 | Complied |
| 20 | 12 | 1907.600012 | 1910.0 | 2.399988 | Complied |
| 30 | 9 | 1907.600009 | 1910.0 | 2.399991 | Complied |
| 40 | 6 | 1907.600006 | 1910.0 | 2.399994 | Complied |
| 50 | 7 | 1907.599993 | 1910.0 | 2.400007 | Complied |

Test Equipment Used:

| Asset No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|-----------|-----------------------------|-----------------|----------------|-------------|-----------------------|------------------------|
| M1659 | Thermohyrometer | JM Handelpunkt | 30.5015.13 | None stated | 14 Mar 2015 | 12 |
| M1870 | Wideband Radio Comms Tester | Rohde & Schwarz | CMW500 | 145919 | 05 May 2015 | 12 |
| E0513 | Environmental Chamber | TAS | LT600 Series 3 | 23900506 | Calibrated before use | - |
| M1249 | Thermometer | Fluke | 52II | 88800049 | 02 May 2015 | 12 |
| S021 | Dual DC power supply | Tti | CPX200 | 061034 | Calibrated before use | - |
| M1251 | Multimeter | Fluke | 175 | 89170179 | 19 May 2015 | 12 |

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

| | | | |
|--------------------------|-----------------|--------------------|--------------------------------|
| Test Engineer: | Keith Tucker | Test Dates: | 09 June 2014 & 10 June 2014 |
| Test Sample IMEI: | 004402452727757 | | |

| | |
|--------------------------|--|
| 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 |

Environmental Conditions:

| | |
|-------------------------------|----------|
| Temperature (°C): | 23 to 25 |
| Relative Humidity (%): | 37 to 40 |

Note(s):

1. A voltage variation jig was connected to the EUT which was powered via 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 (1852.4 MHz)

| Supply Voltage (V) | Frequency Error (Hz) | Measured Frequency (MHz) | Lower Band Edge Limit (MHz) | Margin (MHz) | Result |
|--------------------|----------------------|--------------------------|-----------------------------|--------------|----------|
| 3.42 | 10 | 1852.399990 | 1850.0 | 2.399990 | Complied |
| 4.18 | 7 | 1852.399993 | 1850.0 | 2.399993 | Complied |

Results: Top Channel (1907.6 MHz)

| Supply Voltage (V) | Frequency Error (Hz) | Measured Frequency (MHz) | Upper Band Edge Limit (MHz) | Margin (MHz) | Result |
|--------------------|----------------------|--------------------------|-----------------------------|--------------|----------|
| 3.42 | 15 | 1907.600015 | 1910.0 | 2.399985 | Complied |
| 4.18 | 14 | 1907.600014 | 1910.0 | 2.399986 | 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 |
| M1870 | Wideband Radio Comms Tester | Rohde & Schwarz | CMW500 | 145919 | 05 May 2015 | 12 |
| S021 | Dual DC power supply | Tti | CPX200 | 061034 | Calibrated before use | - |
| M1251 | Multimeter | Fluke | 175 | 89170179 | 19 May 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% | ±2.94 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 ---