



# TEST REPORT

**Test Report No. : UL-RPT-RP10407435JD06C V2.0**

**Manufacturer** : Apple Inc.  
**Model No.** : A1601  
**FCC ID** : BCGA1601  
**Technology** : PCS1900  
**Test Standard(s)** : FCC Part 24

1. This test report shall not be reproduced in full or partial, without the written approval of UL VS LTD.
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:** 14 September 2014

**Checked by:**

Sarah Williams  
Engineer, Radio Laboratory

**Issued by :**

pp

John Newell  
Quality Manager,  
UL VS LTD



This laboratory is accredited by UKAS.  
The tests reported herein have been  
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of accreditation.

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## UL VS LTD

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**1. Customer Information**








<b>Company Name:</b>	Apple Inc.
<b>Address:</b>	1 Infinite Loop Cupertino, CA 95014 U.S.A

## 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>	29 July 2014 to 14 August 2014

### 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	
<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>Reference:</b>	FCC KDB 971168 D01 v02r01, 7 June 2013
<b>Title:</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>	Apple Inc
<b>Model Name or Number:</b>	A1601
<b>Test Sample IMEI:</b>	352025060521607 ( <i>Conducted Sample</i> )
<b>Hardware Version Number:</b>	REV 1.0
<b>Software Version Number:</b>	iOS 12A314 BB:3.08.08
<b>FCC ID:</b>	BCGA1601

<b>Brand Name:</b>	Apple Inc
<b>Model Name or Number:</b>	A1601
<b>Test Sample IMEI:</b>	352025060511608 ( <i>Radiated Sample</i> )
<b>Hardware Version Number:</b>	REV 1.0
<b>Software Version Number:</b>	iOS 12A314 BB:3.08.08
<b>FCC ID:</b>	BCGA1601

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

The Equipment Under Test was a tablet with GSM/GPRS/EGPRS/UMTS and LTE. It also supports IEEE 802.11 a/b/g/n (MIMO 2x2) and Bluetooth®. The rechargeable battery is not user accessible.

#### **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>	PCS1900		
<b>Type of Radio Device:</b>	Transceiver		
<b>Mode:</b>	GPRS/EGPRS		
<b>Modulation Type:</b>	GMSK / 8PSK		
<b>Channel Spacing:</b>	200 kHz		
<b>Power Supply Requirement(s):</b>	Nominal	3.8 V	
	Minimum	3.4 V	
	Maximum	4.2 V	
<b>Maximum Output Power (EIRP):</b>	GPRS	32.75 dBm	
	EGPRS	32.55 dBm	
<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	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:

<b>Brand Name:</b>	Dell
<b>Description:</b>	Laptop computer
<b>Model Name or Number:</b>	Inspiron
<b>Serial Number:</b>	Asset RFI00788

<b>Brand Name:</b>	Not stated
<b>Description:</b>	USB Diagnostic cable
<b>Model Name or Number:</b>	Not stated
<b>Serial Number:</b>	Not stated

<b>Brand Name:</b>	Apple
<b>Description:</b>	USB Cable
<b>Model Name or Number:</b>	A1480
<b>Serial Number:</b>	Not Stated

<b>Brand Name:</b>	Apple
<b>Description:</b>	USB Charger
<b>Model Name or Number:</b>	A1399
<b>Serial Number:</b>	Not Stated

<b>Brand Name:</b>	Apple
<b>Description:</b>	PHF
<b>Model Name or Number:</b>	Apple Ear Plugs
<b>Serial Number:</b>	Not 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 GPRS/EGPRS 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.
- EGPRS tests were performed with the EUT using MCS5 (8PSK modulation).
- Transmitter radiated spurious emissions were checked in all modes during pre-scans. GPRS 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/EGPRS system simulator, operating in transceiver mode.
- Transmitter radiated spurious emission tests were performed with the EUT connected to a PHF and USB charger. The charger was connected to a 120 VAC 50 Hz supply. The EUT was placed in three orthogonal orientations X, Y and Z to determine the worst case orientation for radiated spurious emissions and all final measurements were performed in this orientation.
- Testing for frequency stability and measurements at temperature and voltage extremes was performed using a conducted sample supplied by the customer. Short 4-wire DC flying leads were connected internally to the device in place of the battery, and exited through a hole in the casing. These leads were then extended to a DC power supply for testing purposes.
- For conducted cellular measurements, the RF conducted port was created by removing a micro connector from the pcb antenna and extending it with a short flexible microstrip supplied by the customer. This microstrip exited the device through a hole in the casing and was terminated in a proprietary micro-coax to SMA adaptor.
- The conducted sample with IMEI 352025060521607 was used for frequency stability , conducted power and occupied bandwidth measurements.

The radiated sample with IMEI 352025060511608 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:**

<b>Test Engineer:</b>	David Doyle	<b>Test Date:</b>	29 July 2014
<b>Test Sample IMEI:</b>	352025060521607		

<b>FCC Reference:</b>	Part 24.232(c)
<b>Test Method Used:</b>	As detailed in KBD 971168 Section 5.1.1

#### **Environmental Conditions:**

<b>Temperature (°C):</b>	22
<b>Relative Humidity (%):</b>	45

#### **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 2.15 dBi.
3. The antenna gain was added to the conducted output power to obtain the EIRP.

**Transmitter Output Power (EIRP) (continued)****Results: GPRS**

Channel	Frequency (MHz)	Conducted Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	30.1	2.15	32.25	33.0	0.75	Complied
Middle	1879.8	30.6	2.15	32.75	33.0	0.25	Complied
Top	1909.8	30.4	2.15	32.55	33.0	0.45	Complied

**Results: EGPRS / MCS5**

Channel	Frequency (MHz)	Conducted Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	30.4	2.15	32.55	33.0	0.45	Complied
Middle	1879.8	30.0	2.15	32.15	33.0	0.85	Complied
Top	1909.8	29.8	2.15	31.95	33.0	1.05	Complied

**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1657	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12
A2504	Directional Coupler	AtlanTecRF	CDC-003060-10	13122501839	Calibrated before use	-
A2526	Attenuator	AtlanTecRF	AN18W5-20	832828#1	Calibrated before use	-
M1873	Signal Analyser	Rohde & Schwarz	FSV30	103074	15 May 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 Frequency Stability (Temperature Variation)****Test Summary:**

<b>Test Engineer:</b>	Keith Tucker	<b>Test Dates:</b>	14 August 2014
<b>Test Sample IMEI:</b>	352025060521607		

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

**Environmental Conditions:**

<b>Ambient Temperature (°C):</b>	24
<b>Ambient Relative Humidity (%):</b>	38

**Note(s):**

1. Flying leads were connected internally to the EUT in place of the battery. These leads were extended and 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
-30	13	1850.199987	1850.0	0.199987	Complied
-20	9	1850.200009	1850.0	0.200009	Complied
-10	9	1850.200009	1850.0	0.200009	Complied
0	11	1850.200011	1850.0	0.200011	Complied
10	10	1850.200010	1850.0	0.200010	Complied
20	12	1850.200012	1850.0	0.200012	Complied
30	14	1850.200014	1850.0	0.200014	Complied
40	10	1850.200010	1850.0	0.200010	Complied
50	17	1850.200017	1850.0	0.200017	Complied

**Results: Top Channel (1909.8 MHz)**

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	9	1909.799991	1910.0	0.200009	Complied
-20	15	1909.799985	1910.0	0.200015	Complied
-10	14	1909.800014	1910.0	0.199986	Complied
0	12	1909.799988	1910.0	0.200012	Complied
10	9	1909.799991	1910.0	0.200009	Complied
20	9	1909.800009	1910.0	0.199991	Complied
30	16	1909.800016	1910.0	0.199984	Complied
40	12	1909.800012	1910.0	0.199988	Complied
50	6	1909.799994	1910.0	0.200006	Complied

**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1657	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	14 Mar 2015	12
M1869	Wideband Radio Comms Tester	Rohde & Schwarz	CMW500	145919	06 May 2015	12
S0523	DC power supply	TTi	PL320	224235	Calibrated before use	-
M122	Multimeter	Fluke	77	64910017	24 Apr 2015	12
M1643	Thermometer	Fluke	52II	18890136	07 Apr 2015	12
E0520	Environmental Chamber	Thermatron	S-1.2CB	S-1.2CB	Calibrated before use	-

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

<b>Test Engineer:</b>	Keith Tucker	<b>Test Dates:</b>	14 August 2014
<b>Test Sample IMEI:</b>	352025060521607		

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

**Environmental Conditions:**

<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	38

**Note(s):**

1. Flying leads were connected internally to the EUT in place of the battery. These leads were extended and 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	10	1850.199990	1850.0	0.199990	Complied
4.2	11	1850.200011	1850.0	0.200011	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	6	1909.800006	1910.0	0.199994	Complied
4.2	8	1909.799992	1910.0	0.200008	Complied

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

<b>Asset 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>
M1657	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	14 Mar 2015	12
M1869	Wideband Radio Comms Tester	Rohde & Schwarz	CMW500	145919	06 May 2015	12
S0523	DC power supply	TTi	PL320	224235	Calibrated before use	-
M122	Multimeter	Fluke	77	64910017	24 Apr 2015	12



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

<b>Test Engineer:</b>	David Doyle	<b>Test Date:</b>	29 July 2014
<b>Test Sample IMEI:</b>	352025060521607		

<b>FCC Reference:</b>	Part 2.1049
<b>Test Method Used:</b>	As detailed in KBD 971168 Section 4.2

**Environmental Conditions:**

<b>Temperature (°C):</b>	22
<b>Relative Humidity (%):</b>	45

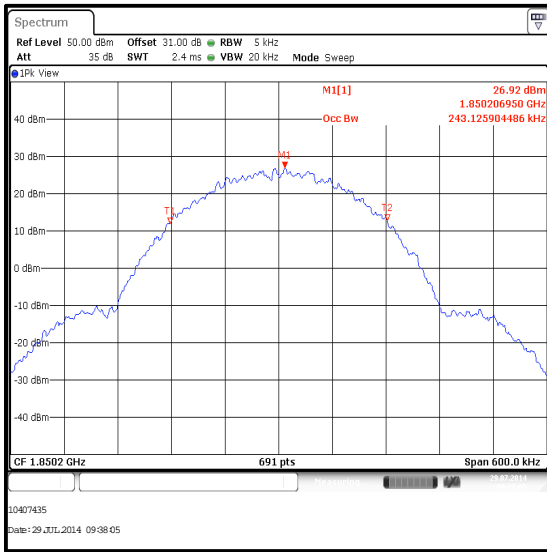
**Note(s):**

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

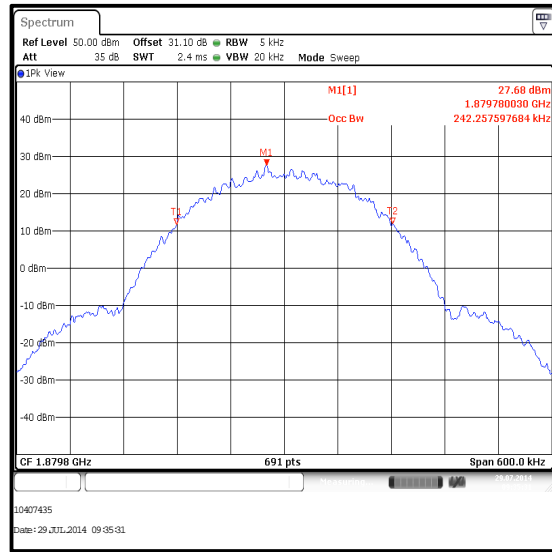
**Transmitter Occupied Bandwidth (continued)**

**Results: GPRS**

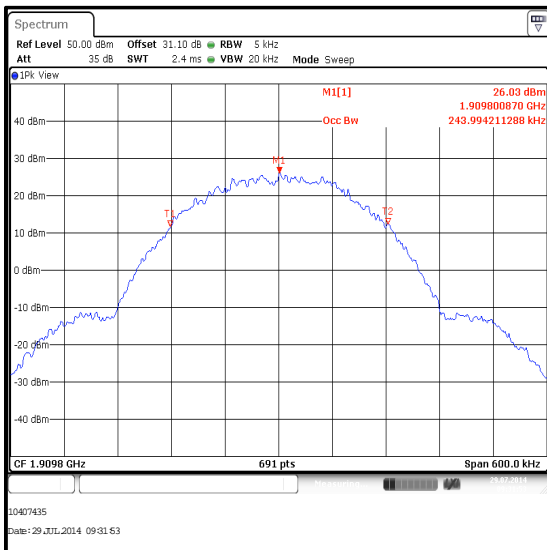
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	243.126
Middle	1879.8	242.258
Top	1909.8	243.994



**Bottom Channel**



**Middle Channel**

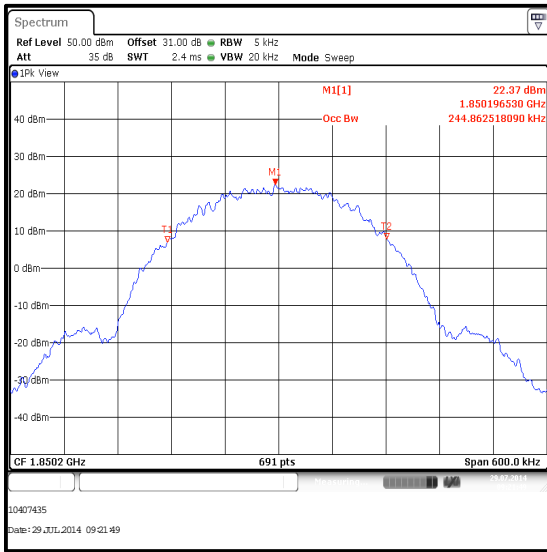


**Top Channel**

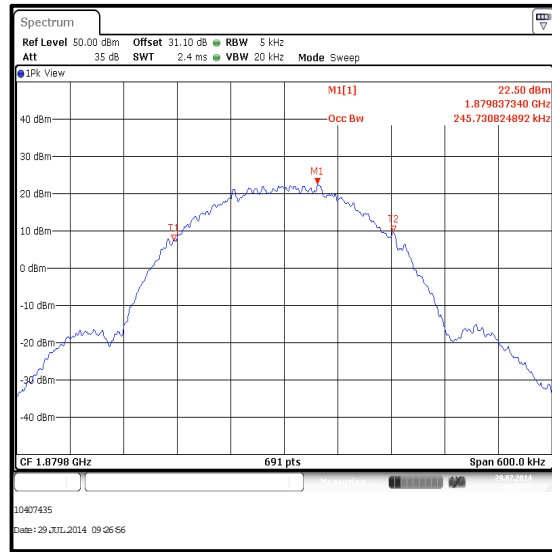
**Transmitter Occupied Bandwidth (continued)**

**Results: EGPRS / MCS5**

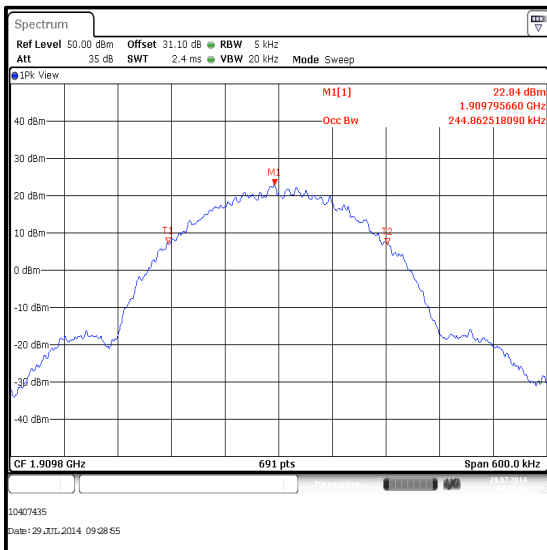
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	244.863
Middle	1879.8	245.731
Top	1909.8	244.863



**Bottom Channel**



**Middle Channel**



**Top Channel**

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

<b>Asset 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>
M1657	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12
A2504	Directional Coupler	AtlanTecRF	CDC-003060-10	13122501839	Calibrated before use	-
A2526	Attenuator	AtlanTecRF	AN18W5-20	832828#1	Calibrated before use	-
M1873	Signal Analyser	Rohde & Schwarz	FSV30	103074	15 May 2015	12
M1269	Multimeter	Fluke	179	90250210	19 May 2015	12
S0523	DC Power Supply	TTI	PL320	224235	Calibrated before use	-

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

<b>Test Engineers:</b>	David Doyle & Nick Steele	<b>Test Dates:</b>	31 July 2014 & 09 August 2014
<b>Test Sample IMEI:</b>	352025060511608		

<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>	GPRS

**Environmental Conditions:**

<b>Temperature (°C):</b>	24 to 25
<b>Relative Humidity (%):</b>	31 to 46

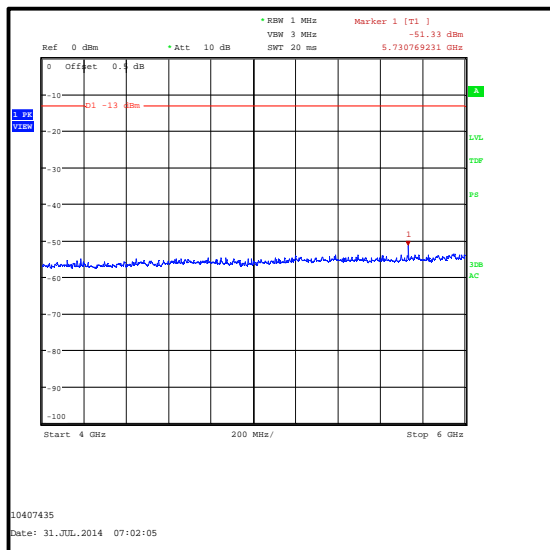
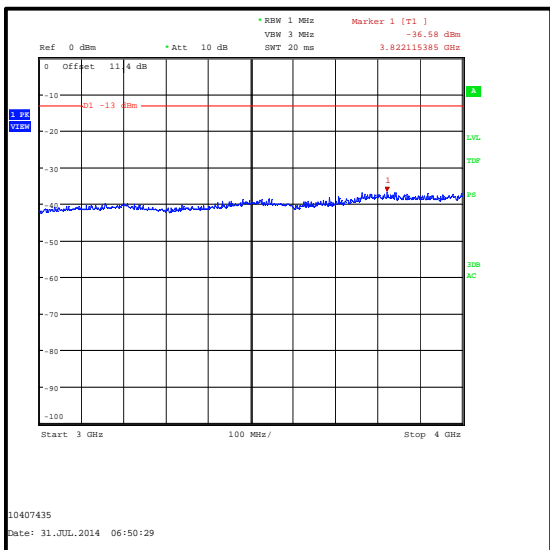
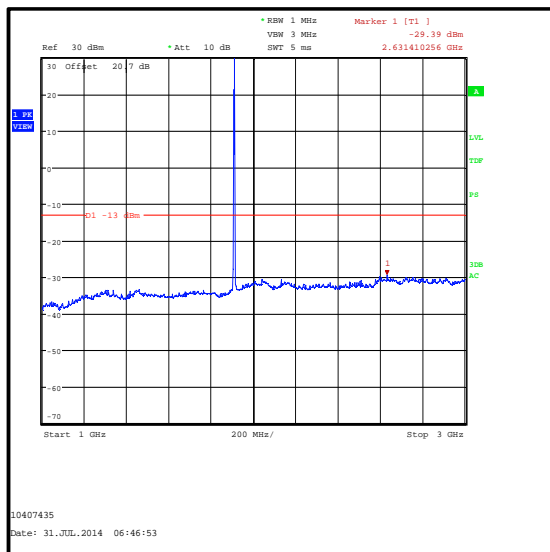
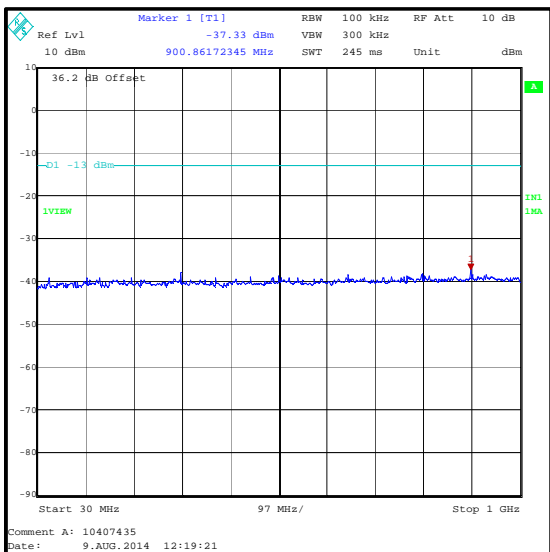
**Note(s):**

1. The uplink traffic channel is shown on the 1 GHz to 3 GHz plot.
2. No spurious emissions were detected above the noise floor of the measuring receiver; the highest peak noise floor reading of the measuring receiver was recorded.
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.

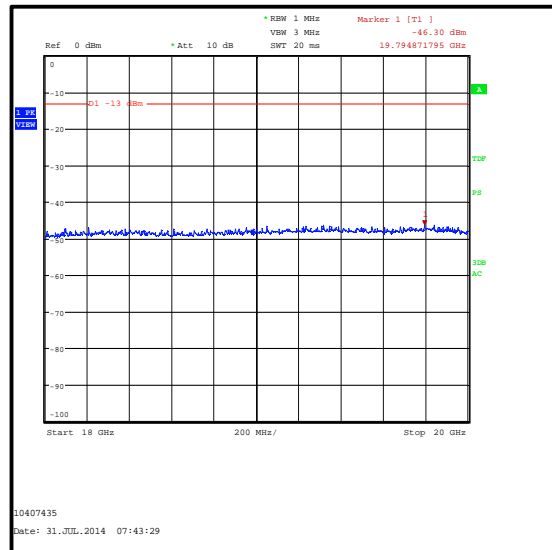
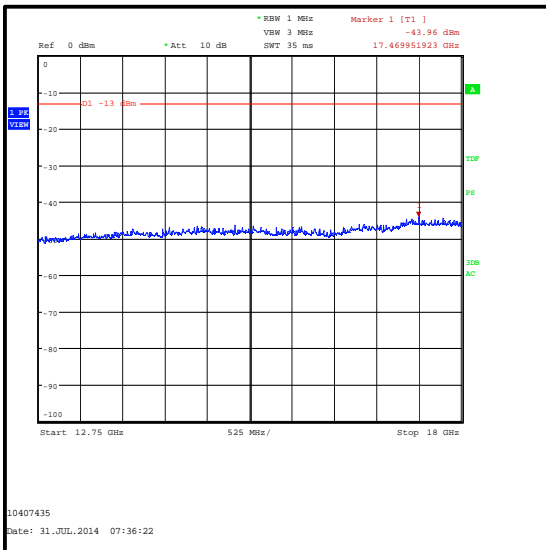
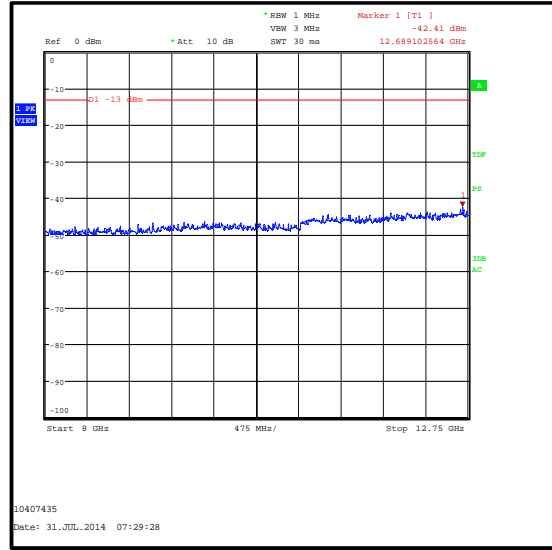
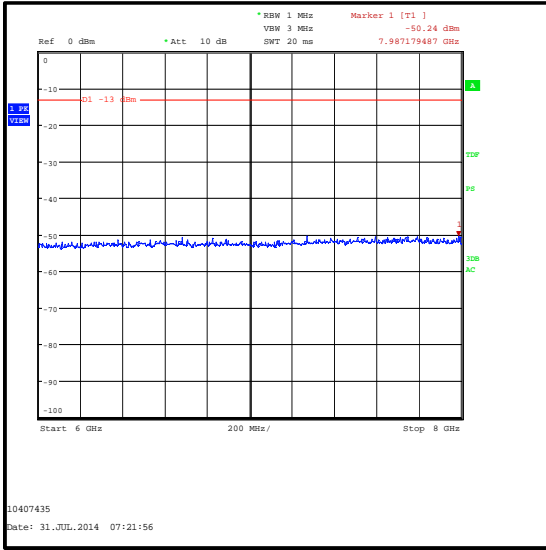
**Results: GPRS - Top Channel**

<b>Frequency (MHz)</b>	<b>Peak Level (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>	<b>Result</b>
2631.410	-29.4	-13.0	16.4	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)
M1622	Thermohygrometer	JM Handelspunkt	30.5015.06	None stated	31 Dec 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	26 Nov 2014	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	15 Feb 2015	12
G0543	Amplifier	Sonoma	310N	230801	19 Aug 2014	3
A490	Antenna	Chase	CBL6111A	1590	29 Apr 2015	12
A1834	Attenuator	Hewlett Packard	8491B	10444	15 Nov 2014	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
A1818	Antenna	EMCO	3115	00075692	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
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



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

<b>Test Engineer:</b>	David Doyle	<b>Test Date:</b>	31 July 2014
<b>Test Sample IMEI:</b>	352025060511608		

<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>	24
<b>Relative Humidity (%):</b>	46

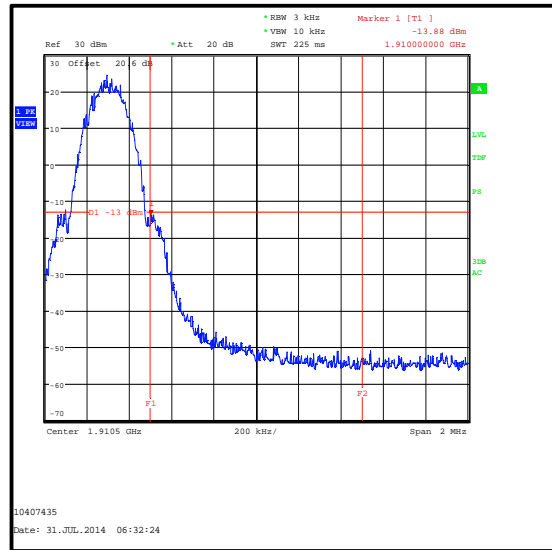
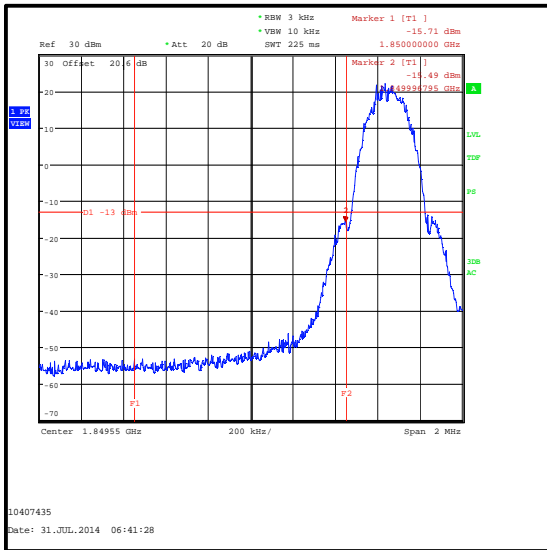
**Note(s):**

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 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: GPRS**

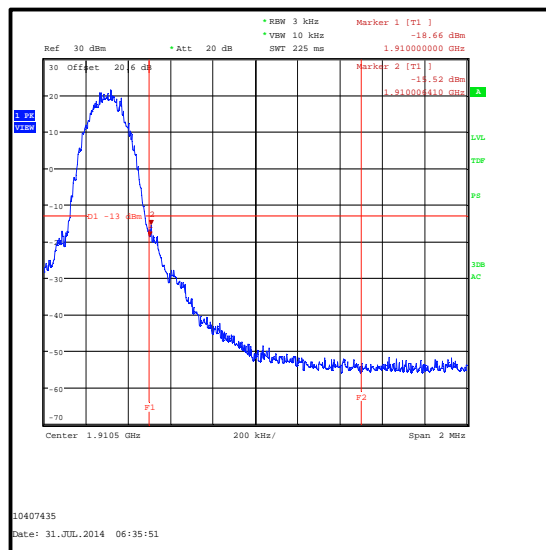
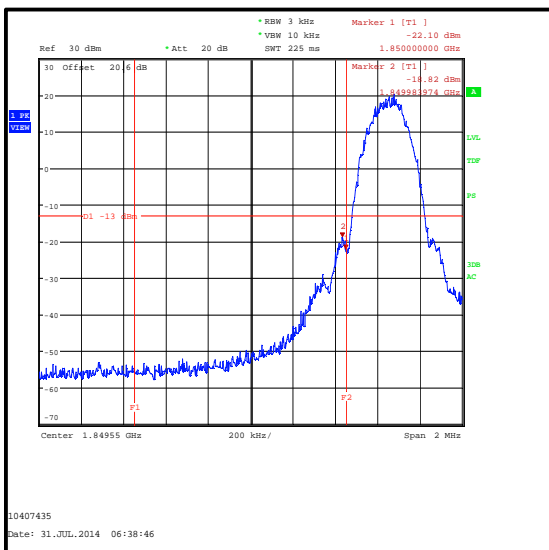
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.997	-15.5	-13.0	2.5	Complied
1850	-15.7	-13.0	2.7	Complied
1910	-13.9	-13.0	0.9	Complied



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

**Results: EGPRS / MCS5**

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.984	-18.8	-13.0	5.8	Complied
1850	-22.1	-13.0	9.1	Complied
1910	-18.7	-13.0	5.7	Complied
1910.006	-15.5	-13.0	2.5	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>
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	-	-	Admin updates

--- END OF REPORT ---