



TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: GE864-GPS



FCC ID: R17GE864G2

IC Certification Number: 5131A-GE864G2

To: FCC Part 22: 2010 Subpart H, Part 24: 2010 Subpart E,
RSS 132 Issue 2 September 2005 and RSS-133 Issue 5 February 2009

Test Report Serial No.:
RFI-RPT-RP80007JD06A V3.0

Version 3.0 Supersedes All Previous Versions

This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals:		
Checked By:	Ian Watch	
Signature:		
Date of Issue:	22 August 2011	

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1. Customer Information



















Company Name:	Telit Communications S.p.A.
Address:	Via Stazione di Prosecco, 5/B Sgonico TS 34010 Italy

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR22
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 22 Subpart H (Public Mobile Services)
Specification Reference:	47CFR24
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 24 Subpart E (Personal Communication Services)
Specification Reference:	47CFR15.107 and 47CFR15.109
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 15 Subpart B (Unintentional Radiators) - Sections 15.107 and 15.109
Specification Reference:	RSS-GEN Issue 3 December 2010
Specification Title:	General Requirements and Information for the Certification of Radio Apparatus
Specification Reference:	RSS-132 Issue 2 Sep 2005
Specification Title:	Cellular Telephones Employing New Technologies Operating in the Bands 824-849 MHz and 869-894 MHz
Specification Reference:	SRSP-503 Issue 7 Sep 2008
Specification Title:	Technical Requirements for Cellular Radiotelephone Systems Operating in the Bands 824 – 849 MHz and 869 – 894 MHz
Specification Reference:	RSS-133 Issue 5 Feb 2009
Specification Title:	2 GHz Personal Communications Services
Specification Reference:	SRSP-510 Issue 5 Feb 2009
Specification Title:	Technical Requirements for Personal Communications Services (PCS) in the Bands 1850-1915 MHz and 1930-1995 MHz
Site Registration:	FCC: 209735; Industry Canada: 3245B-2
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH
Test Dates:	28 April 2011 to 19 August 2011

2.2. Summary of Test Results

FCC Reference (47CFR)	IC Reference	Measurement	Result
Part 22 & RSS-132			
Part 15.109	RSS-Gen 4.10/6.1 RSS-132 4.6	Receiver/Idle Mode Radiated Spurious Emissions	
Part 22.913(a)	RSS-132 4.4 SRSP-503 5.1.3	Transmitter Output Power (Conducted)	
Part 2.1055/22.355	RSS-132 4.3 RSS Gen 4.7	Transmitter Frequency Stability (Temperature and Voltage Variation)	
Part 2.1049	RSS-Gen 4.6.1	Transmitter Occupied Bandwidth	
Part 2.1051/22.917	RSS-132 4.5	Transmitter Out of Band Conducted Emissions	
Part 2.1053/22.917	RSS-132 4.5	Transmitter Out of Band Radiated Emissions	
Part 2.1051/22.917	RSS-132 4.5	Transmitter Band Edge Conducted Emissions	
Part 2.1053/22.917	RSS-132 4.5	Transmitter Band Edge Radiated Emissions	
Part 24 & RSS-133			
Part 15.109	RSS-Gen 4.10/6.1 RSS-133 4.6	Receiver/Idle Mode Radiated Spurious Emissions	
Part 24.232	RSS-133 6.4 SRSP-510 5.1.2	Transmitter Output Power (Conducted)	
Part 2.1055/24.235	RSS-133 6.3 RSS Gen 4.7	Transmitter Frequency Stability (Temperature and Voltage Variation)	
Part 2.1049	RSS-Gen 4.6.1	Transmitter Occupied Bandwidth	
Part 2.1051/24.238	RSS-133 6.5	Transmitter Out of Band Conducted Emissions	
Part 2.1053/24.238	RSS-133 6.5	Transmitter Out of Band Radiated Emissions	
Part 2.1051/24.238	RSS-133 6.5	Transmitter Band Edge Conducted Emissions	
Part 2.1053/24.238	RSS-133 6.5	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:	ANSI C63.4 (2009)
Title:	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

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:	Telit
Model Name or Number:	GE864-GPS
IMEI:	355255049000236
Hardware Version Number:	0H00
Software Version Number:	10.00.x005
FCC ID:	R17GE864G2
IC Certification Number:	5131A-GE864G2

3.2. Description of EUT

The equipment under test was a Quad band GSM/GPRS modem mounted on a Telit development board. The EUT was mounted to the development board on four support posts and connected by two 40 pin connectors.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Type of Radio Device:	Transceiver		
Mode:	GSM/GPRS		
Modulation Type:	GMSK		
Channel Spacing:	200 kHz		
Power Supply Requirement(s):	Nominal	3.8 V	
	Minimum	3.4 V	
	Maximum	4.2 V	
Technology Tested:	GSM850		
Maximum Conducted Output Power:	GSM	32.5 dBm	
	GPRS	32.2 dBm	
Transmit Frequency Range:	824 to 849 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	128	824.2
	Middle	190	836.6
	Top	251	848.8
Receive Frequency Range:	869 to 894 MHz		
Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	128	869.2
	Middle	190	881.6
	Top	251	893.8
Technology Tested:	PCS1900		
Maximum Conducted Output Power:	GSM	29.2 dBm	
	GPRS	29.1 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
Receive Frequency Range:	1930 to 1990 MHz		
Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	512	1930.2
	Middle	660	1959.8
	Top	810	1989.8

3.5. Support Equipment

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

Description:	Protoboard
Brand Name:	Telit Communications S.p.A
Model Name or Number:	None stated
Serial Number:	CS1139BLS 230107

Description:	Bench power supply
Brand Name:	TTi
Model Name or Number:	EL302D
Serial Number:	249928

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating mode(s):

- Receiver/Idle mode.
- Constantly transmitting at full power on bottom, middle and top channels as required.
- Occupied bandwidth, ERP/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 two timeslots in the uplink.
- 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.

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.

5.2. Test Results - Part 22 & RSS-132

5.2.1. Receiver/Idle Mode Radiated Spurious Emissions

Test Summary:

Test Engineer:	Crawford Lindsay	Test Date:	09 May 2011
Test Sample IMEI:	355255049000236		

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.4 Section 8
Frequency Range:	30 MHz to 1000 MHz

Environmental Conditions:

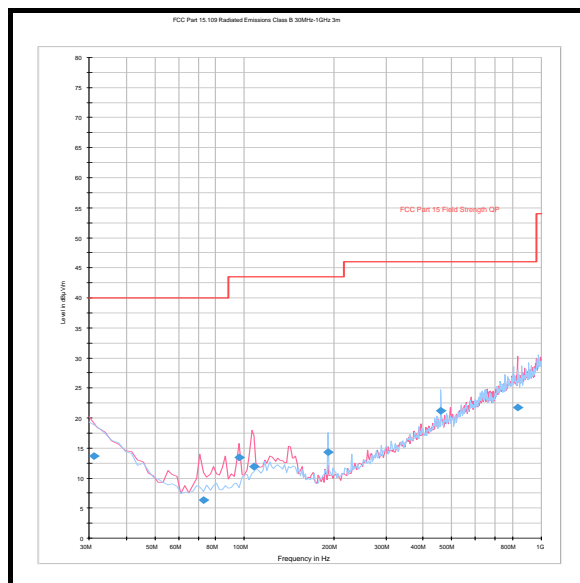
Temperature (°C):	28
Relative Humidity (%):	26

Results:

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
830.232	Vertical	21.8	46	24.2	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.



Receiver/Idle Mode Radiated Spurious Emissions (continued)

Test Summary:

Test Engineer:	Crawford Lindsay	Test Date:	28 April 2011
Test Sample IMEI:	355255049000236		

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.4 Section 8
Frequency Range:	1 GHz to 5 GHz

Environmental Conditions:

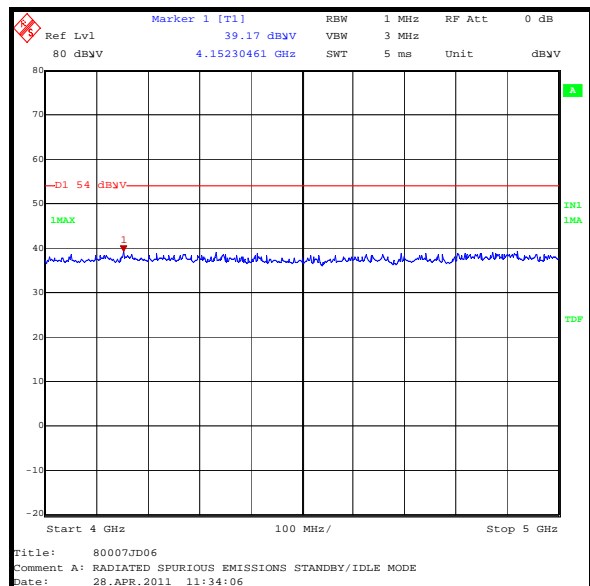
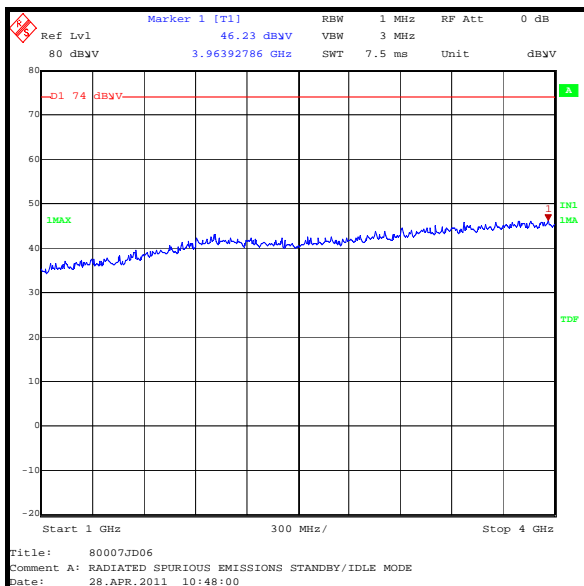
Temperature (°C):	28
Relative Humidity (%):	19

Results:

Frequency (MHz)	Antenna Polarity	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
3963.928	Vertical	46.2	54.0	7.8	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.
3. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT



5.2.2. Transmitter Output Power (Conducted)**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	28 April 2011
Test Sample IMEI:	355255049000236		

FCC Part:	2.1046(a) & 22.913(a)
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.1 referencing FCC CFR Part 2.1046(a)

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	19

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	824.2	32.4	38.45	6.05	Complied
Middle	836.6	32.5	38.45	5.95	Complied
Top	848.8	32.5	38.45	5.95	Complied

Results: GPRS

Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	824.2	32.1	38.45	6.35	Complied
Middle	836.6	32.2	38.45	6.25	Complied
Top	848.8	32.2	38.45	6.25	Complied

Note(s):

1. SRSP-503 states the limit as an EIRP value of 11.5 Watts (40.6 dBm) which equates to an ERP limit of 7 Watts (38.45 dBm)

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

Test Engineer:	Crawford Lindsay	Test Date:	03 May 2011
Test Sample IMEI:	355255049000236		

FCC Part:	2.1055 & 22.355
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.2 referencing FCC CFR Part 2.1055

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	26

Results: Middle Channel (836.6 MHz)

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	836.600	58	0.0693	2.5	2.4307	Complied
-20	836.600	23	0.0275	2.5	2.4725	Complied
-10	836.600	22	0.0263	2.5	2.4737	Complied
0	836.600	17	0.0203	2.5	2.4793	Complied
10	836.600	17	0.0203	2.5	2.4793	Complied
20	836.600	16	0.0191	2.5	2.4809	Complied
30	836.600	16	0.0191	2.5	2.4809	Complied
40	836.600	18	0.0215	2.5	2.4785	Complied
50	836.600	17	0.0203	2.5	2.4797	Complied

Note(s):

1. Temperature was monitored throughout the test with a calibrated digital thermometer.

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

Test Engineer:	Crawford Lindsay	Test Date:	03 May 2011
Test Sample IMEI:	355255049000236		

FCC Part:	2.1055 & 22.355
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.2 referencing FCC CFR Part 2.1055

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	26

Results: Middle Channel (836.6 MHz)

Supply Voltage (V)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
3.4	836.600	18	0.0215	2.5	2.4785	Complied
4.2	836.600	16	0.0191	2.5	2.4809	Complied

Note(s):

1. Voltage was monitored throughout the test with a calibrated digital voltmeter.

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

Test Engineer:	Crawford Lindsay	Test Date:	03 May 2011
Test Sample IMEI:	355255049000236		

FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.4 Section 13.7 referencing FCC CFR Part 2.1049

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	22

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	824.2	245.291
Middle	836.6	240.481
Top	848.8	244.088

Results: GPRS

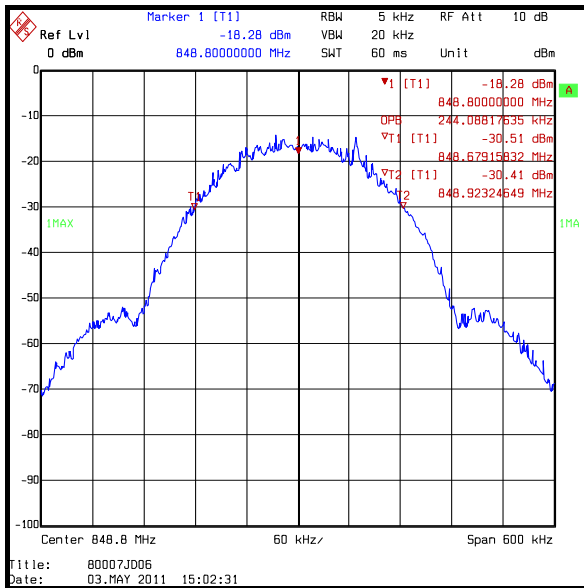
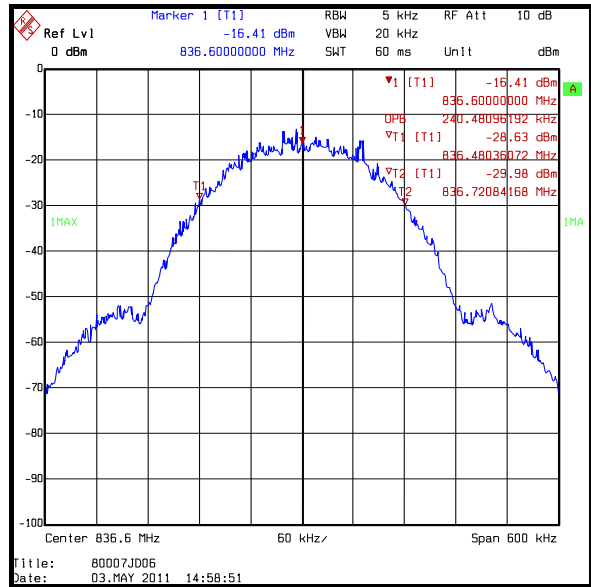
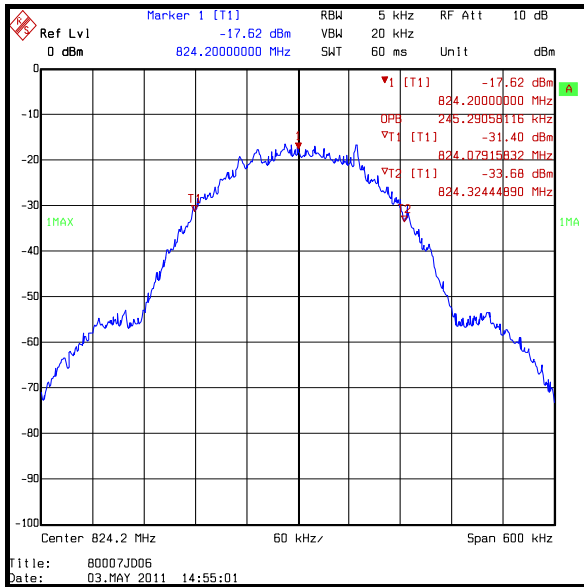
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	824.2	245.291
Middle	836.6	241.683
Top	848.8	241.683

Note(s):

1. In lieu of the test method detailed in ANSI C63.4 Section 13.7, the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.

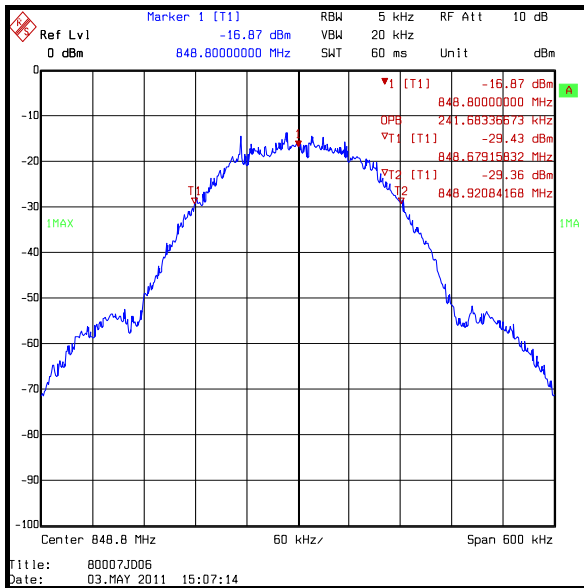
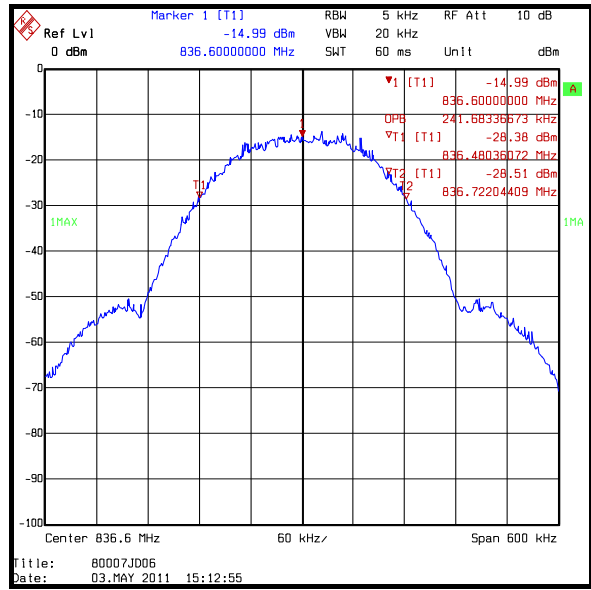
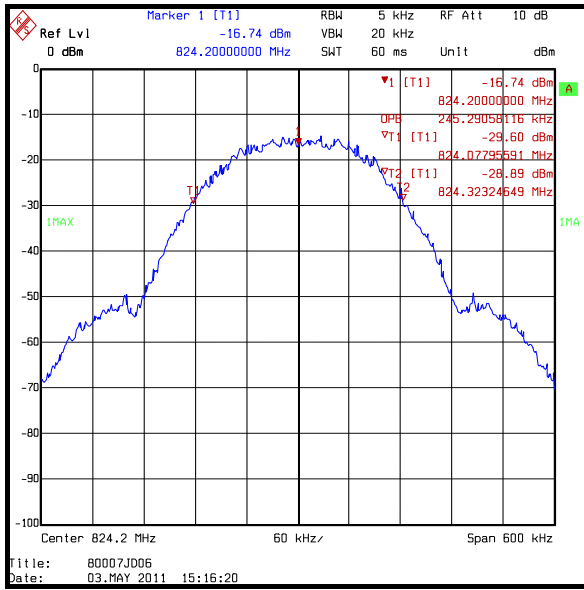
Transmitter Occupied Bandwidth (continued)

GSM Circuit Switched



Transmitter Occupied Bandwidth (continued)

GPRS



5.2.6. Transmitter Conducted Emissions**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	04 May 2011
Test Sample IMEI:	355255049000236		

FCC Part:	2.1051 & 22.917
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.13 referencing FCC CFR Parts 2.1051 and 22.917
Frequency Range:	1 MHz to 9 GHz
Configuration:	GSM Circuit Switched

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	22

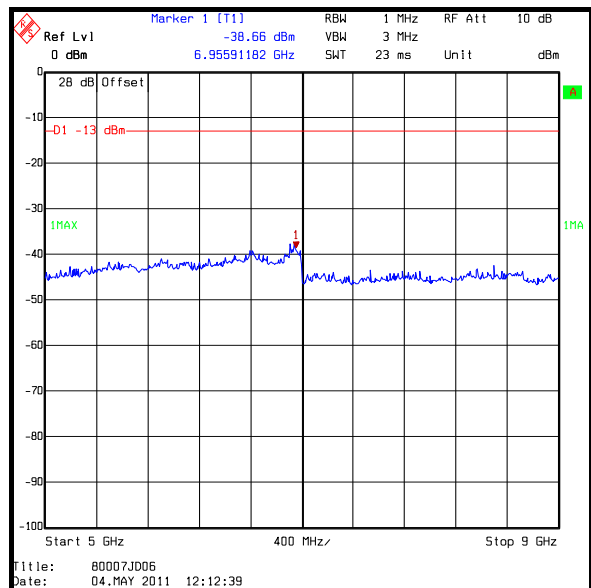
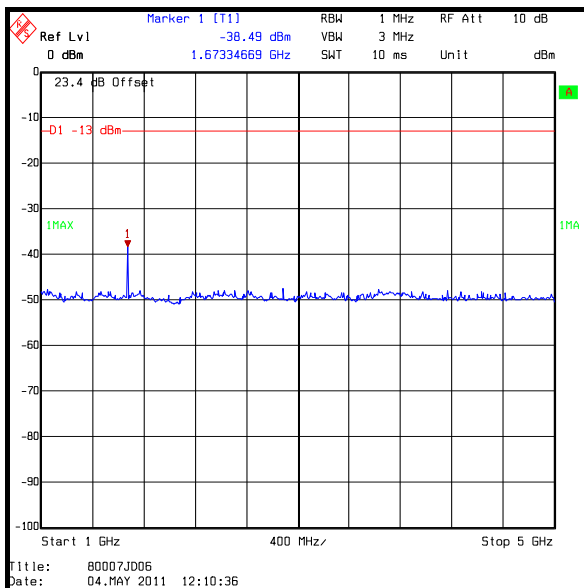
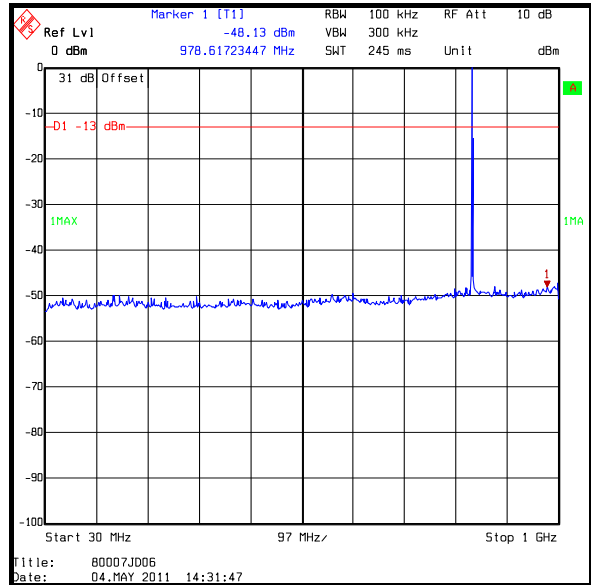
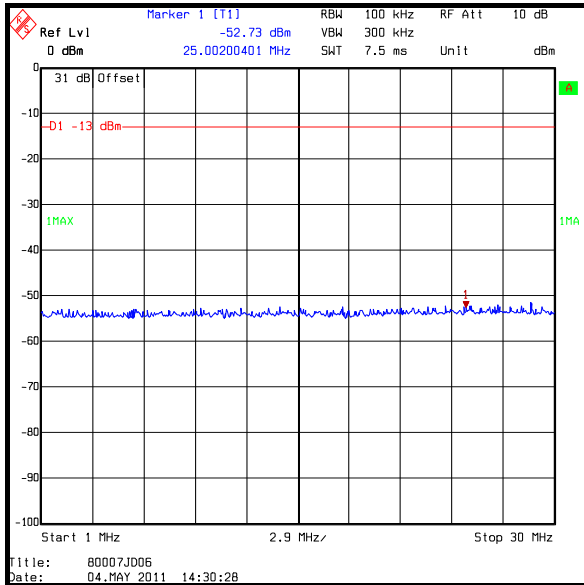
Results:

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1673.347	-38.5	-13.0	25.5	Complied

Note(s):

1. All emissions were investigated and found to be at least 20 dB below the specified limit; therefore the highest emission level was recorded as shown in the table above.
2. The uplink and downlink traffic channels are shown on the 30 MHz to 1 GHz plot.

Transmitter Conducted Emissions (Continued)



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

Test Engineer:	Crawford Lindsay	Test Date:	28 April 2011 & 09 May 2011
Test Sample IMEI:	355255049000236		

FCC Part:	2.1053 & 22.917
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Part 2.1053
Frequency Range:	30 MHz to 9 GHz
Configuration:	GSM Circuit Switched

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	19

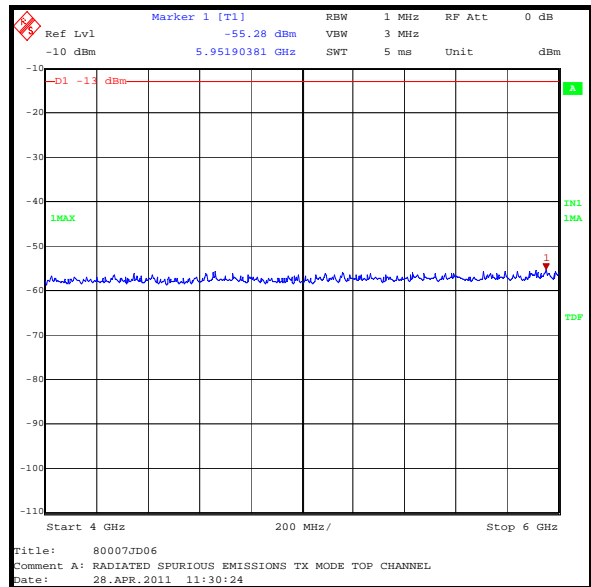
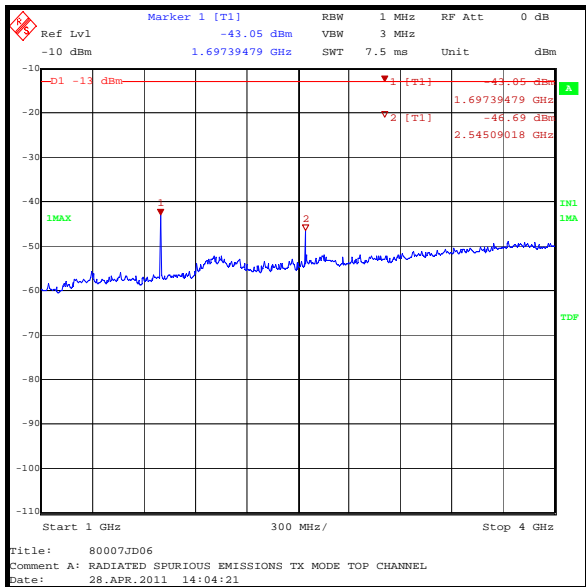
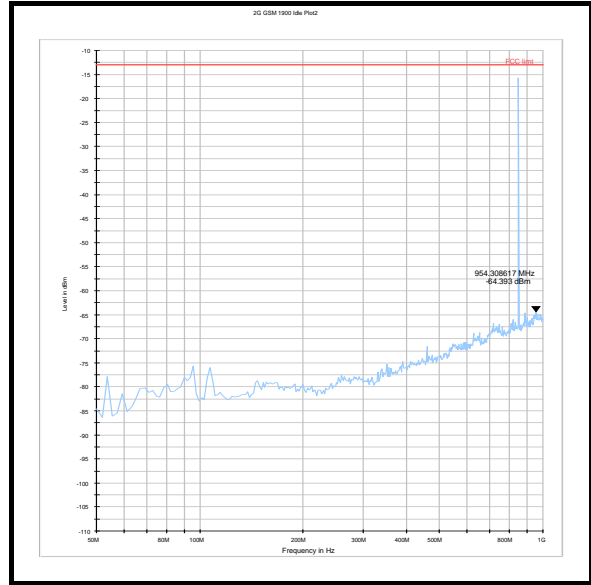
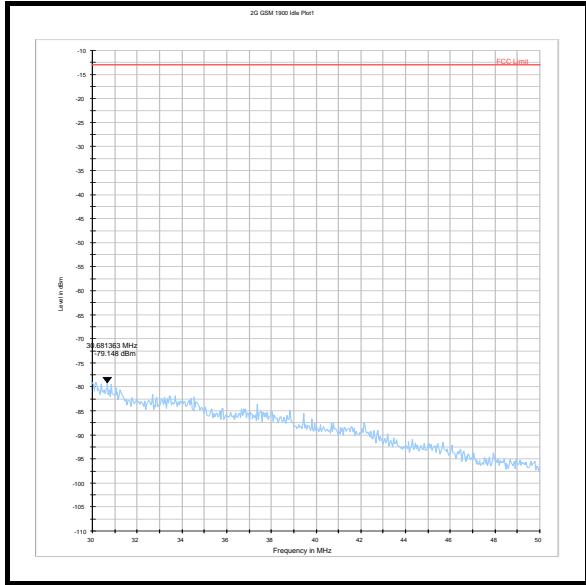
Results: Bottom Channel

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1673.395	-43.0	-13.0	30.0	Complied

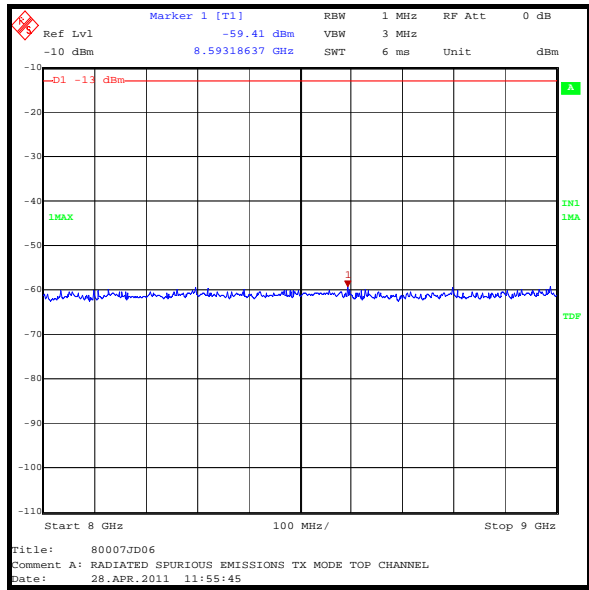
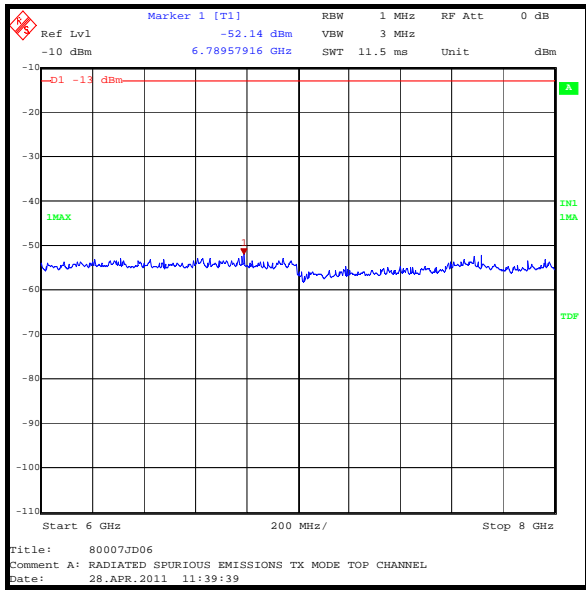
Note(s):

1. No spurious emissions were detected within 20 dB; the highest peak noise floor reading of the measuring receiver was recorded.
2. The uplink and downlink traffic channels are shown on the 50 MHz to 1 GHz plot.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
4. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Out of Band Radiated Emissions (continued)



Transmitter Out of Band Radiated Emissions (continued)



5.2.8. Transmitter Band Edge Conducted Emissions

Test Summary:

Test Engineer:	Sarah Williams	Test Date:	19 August 2011
Test Sample IMEI:	355255049000236		

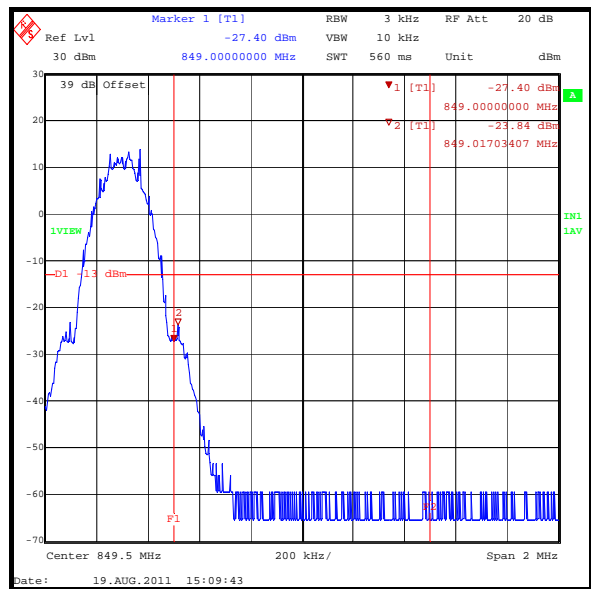
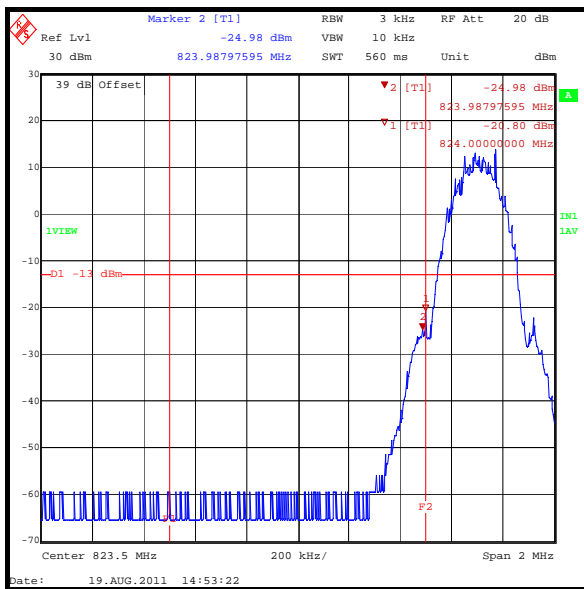
FCC Part:	2.1051 & 22.917
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.13 referencing FCC CFR Parts 2.1051 and 22.917

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	23

Results: GSM Circuit Switched

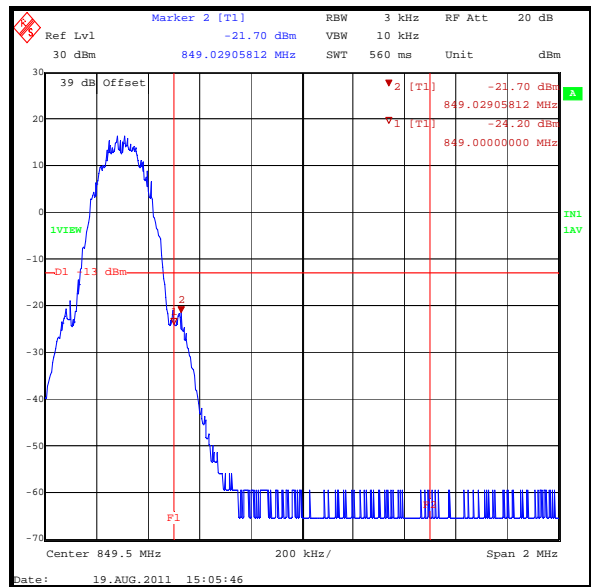
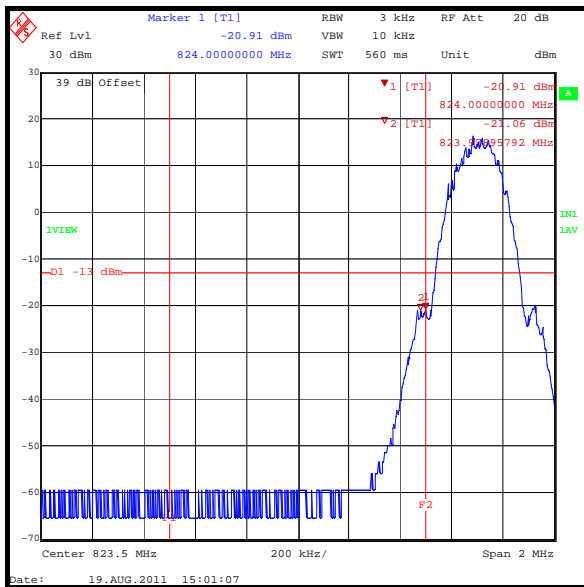
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
823.988	-25.0	-13.0	12.0	Complied
824.000	-20.8	-13.0	7.8	Complied
849.000	-27.4	-13.0	14.4	Complied
849.017	-23.8	-13.0	10.8	Complied



Transmitter Band Edge Conducted Emissions (continued)

Results: GPRS

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
823.979	-21.1	-13.0	8.1	Complied
824.000	-20.9	-13.0	7.9	Complied
849.000	-24.2	-13.0	11.2	Complied
849.029	-21.7	-13.0	8.7	Complied



5.2.9. Transmitter Radiated Emissions at Band Edges**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	09 May 2011
Test Sample IMEI:	355255049000236		

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

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	26

Results: GSM Circuit Switched

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
Note 1				

Note(s):

1. Transmitter Band Edge Radiated Emissions was not performed for GSM850, as the residual carrier power seen on the emissions plot is lower than the specified -13.0dBm limit and therefore complies with the band edge limit by inspection.

5.3. Test Results - Part 24 & RSS-133**5.3.1. Receiver/Idle Mode Radiated Spurious Emissions****Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	09 May 2011
Test Sample IMEI:	355255049000236		

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.4 Section 8
Frequency Range:	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	26

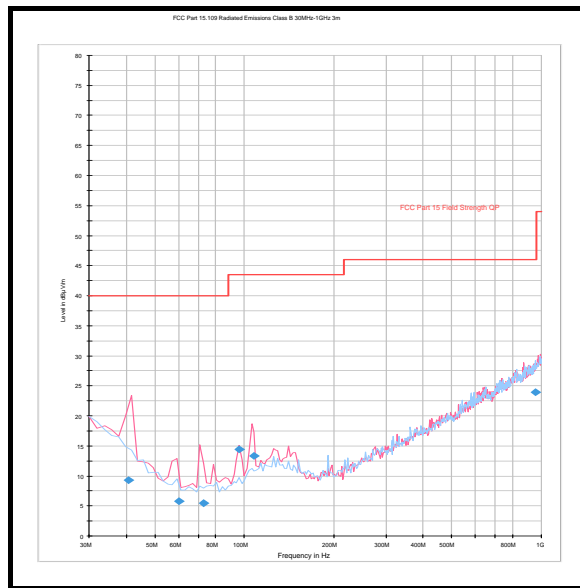
Results:

Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
955.565	Horizontal	24.0	46.0	22.0	Complied

Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Receiver/Idle Mode Radiated Spurious Emissions (continued)



Receiver/Idle Mode Radiated Spurious Emissions (continued)**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	28 April 2011
Test Sample IMEI:	355255049000236		

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.4 Section 8
Frequency Range:	1 GHz to 10 GHz

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	19

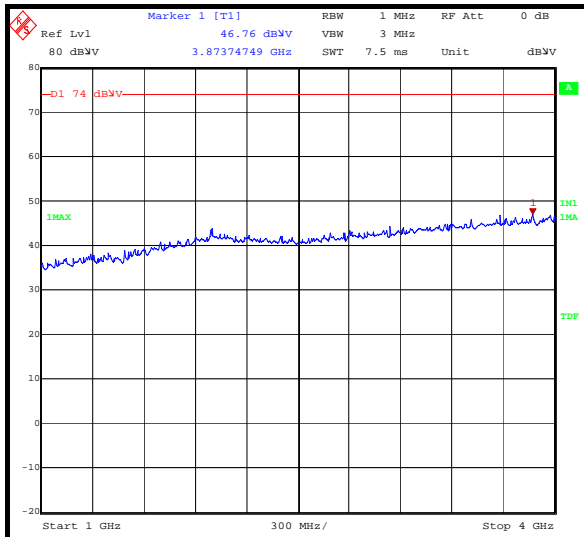
Results:

Frequency (MHz)	Antenna Polarity	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
3873.747	Vertical	46.8	54.0	7.2	Complied

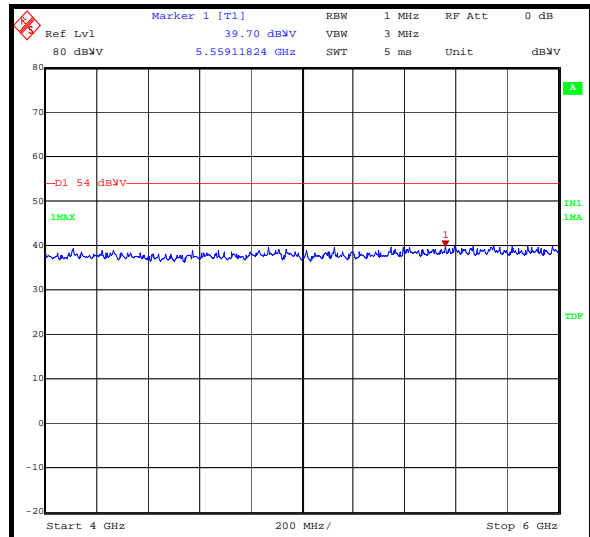
Note(s):

1. The final measured value, for the given emission, in the table above incorporates the calibrated antenna factor and cable loss.
2. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.
3. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT

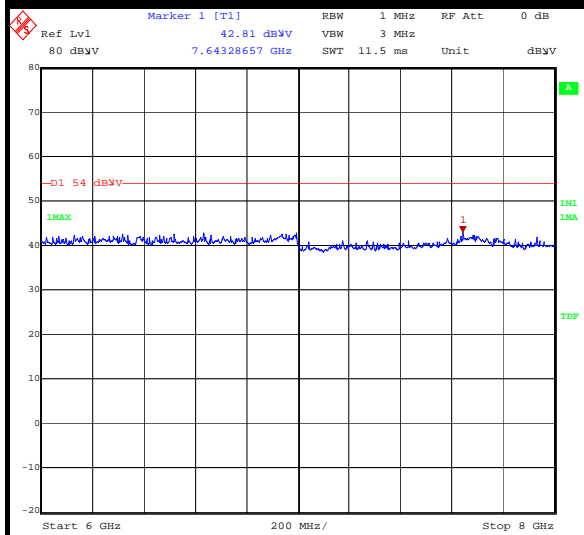
Receiver/Idle Mode Radiated Spurious Emissions (continued)



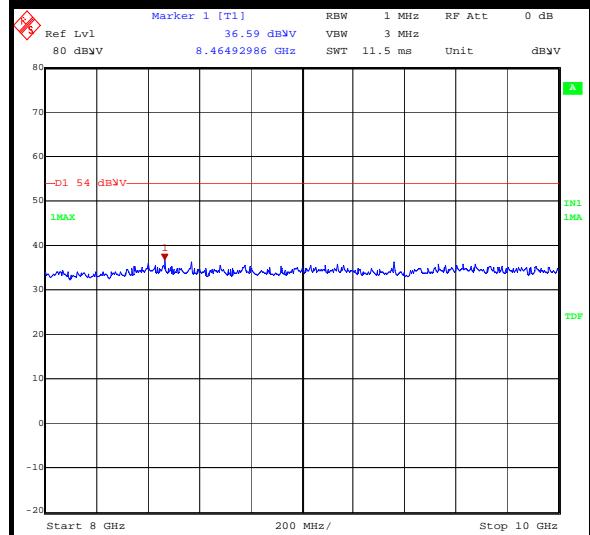
Title: 80007JD06
Comment A: RADIATED SPURIOUS EMISSIONS STANDBY/IDLE MODE
Date: 28.APR.2011 10:56:11



Title: 80007JD06
Comment A: RADIATED SPURIOUS EMISSIONS STANDBY/IDLE MODE
Date: 28.APR.2011 11:24:07



Title: 80007JD06
Comment A: RADIATED SPURIOUS EMISSIONS STANDBY/IDLE MODE
Date: 28.APR.2011 11:45:51



Title: 80007JD06
Comment A: RADIATED SPURIOUS EMISSIONS STANDBY/IDLE MODE
Date: 28.APR.2011 12:05:08

5.3.2. Transmitter Output Power (Conducted)**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	28 April 2011
Test Sample IMEI:	355255049000236		

FCC Part:	2.1046(a) & 24.232
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.1 referencing FCC CFR Part 2.1046(a)

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	19

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	29.1	33.0	3.9	Complied
Middle	1879.8	29.2	33.0	3.8	Complied
Top	1909.8	29.0	33.0	4.0	Complied

Results: GPRS

Channel	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	29.0	33.0	4.0	Complied
Middle	1879.8	29.1	33.0	3.9	Complied
Top	1909.8	29.0	33.0	4.0	Complied

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

Test Engineer:	Crawford Lindsay	Test Date:	03 May 2011
Test Sample IMEI:	355255049000236		

FCC Part:	2.1055 & 24.235
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.2 referencing FCC CFR Part 2.1055

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	26

Results: Bottom Channel (1850.2 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	67	1850.200067	1850.0	0.200067	Complied
-20	68	1850.200068	1850.0	0.200068	Complied
-10	65	1850.200065	1850.0	0.200065	Complied
0	59	1850.200059	1850.0	0.200059	Complied
10	62	1850.200062	1850.0	0.200062	Complied
20	64	1850.200064	1850.0	0.200064	Complied
30	61	1850.200061	1850.0	0.200061	Complied
40	59	1850.200059	1850.0	0.200059	Complied
50	58	1850.200000	1850.0	0.200058	Complied

Results: Top Channel (1909.8 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	72	1909.800072	1910.0	0.1999928	Complied
-20	95	1909.800095	1910.0	0.1999905	Complied
-10	70	1909.800070	1910.0	0.1999930	Complied
0	67	1909.800067	1910.0	0.1999933	Complied
10	66	1909.800066	1910.0	0.1999934	Complied
20	64	1909.800064	1910.0	0.1999936	Complied
30	58	1909.800058	1910.0	0.1999942	Complied
40	68	1909.800068	1910.0	0.1999932	Complied
50	66	1909.800000	1910.0	0.1999934	Complied

Transmitter Frequency Stability (Temperature Variation) (continued)

Note(s):

1. Temperature was monitored throughout the test with a calibrated digital thermometer.

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

Test Engineer:	Crawford Lindsay	Test Date:	03 May 2011
Test Sample IMEI:	355255049000236		

FCC Part:	2.1055 & 24.235
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.2 referencing FCC CFR Part 2.1055

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	26

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	60	1850.200060	1850.0	0.200060	Complied
4.2	58	1850.200058	1850.0	0.200058	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	62	1909.800062	1910.0	0.199938	Complied
4.2	63	1909.800063	1910.0	0.199937	Complied

Note(s):

1. Voltage was monitored throughout the test with a calibrated digital voltmeter.

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

Test Engineer:	Crawford Lindsay	Test Date:	03 May 2011
Test Sample IMEI:	355255049000236		

FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.4 Section 13.7 referencing FCC CFR Part 2.1049

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	22

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	242.886
Middle	1879.8	244.088
Top	1909.8	241.683

Results: GPRS

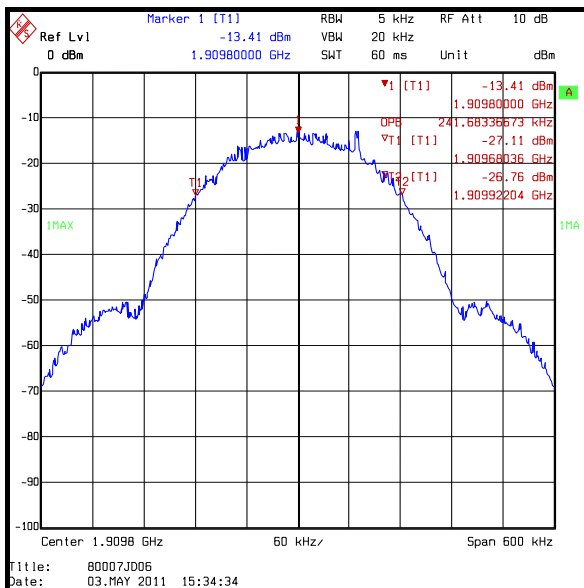
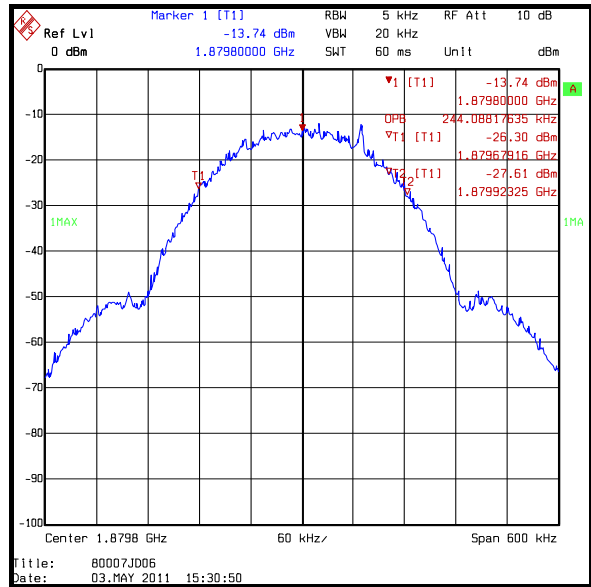
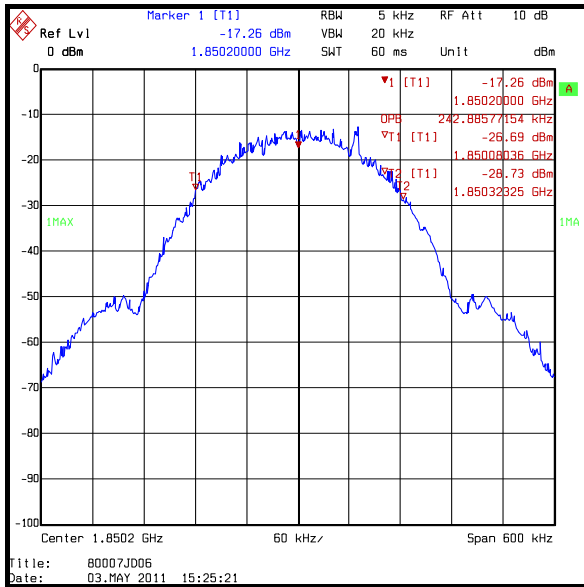
Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	244.088
Middle	1879.8	241.683
Top	1909.8	242.886

Note(s):

1. In lieu of the test method detailed in ANSI C63.4 Section 13.7, the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.

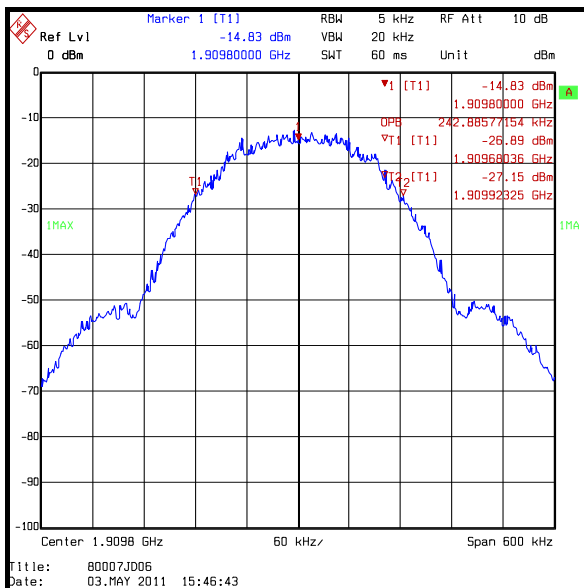
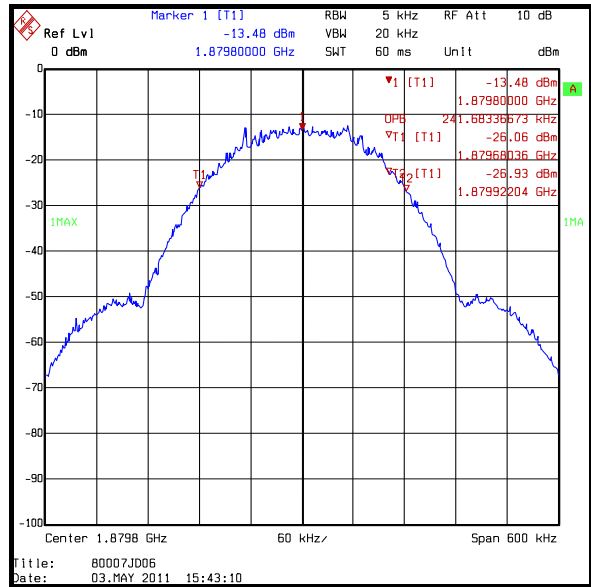
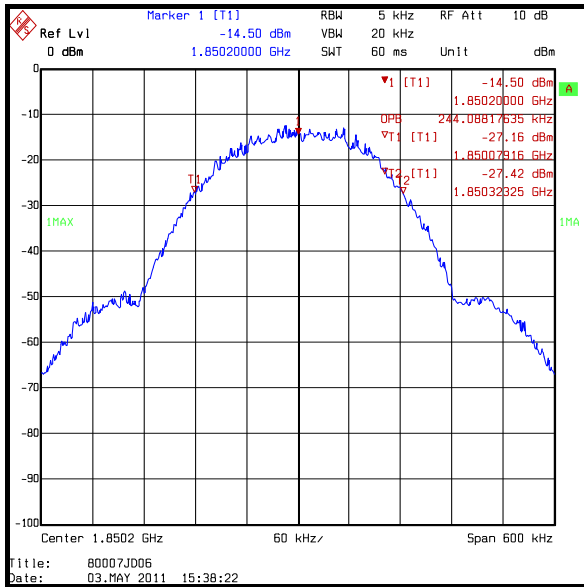
Transmitter Occupied Bandwidth (continued)

GSM Circuit Switched



Transmitter Occupied Bandwidth (continued)

GPRS



5.3.6. Transmitter Conducted Emissions**Test Summary:**

Test Engineer:	Crawford Lindsay	Test Date:	04 May 2011
Test Sample IMEI:	355255049000236		

FCC Part:	2.1051 & 24.238
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.13 referencing FCC CFR Parts 2.1051 and 24.238
Frequency Range:	1 MHz to 20 GHz
Configuration:	GSM Circuit Switched

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	22

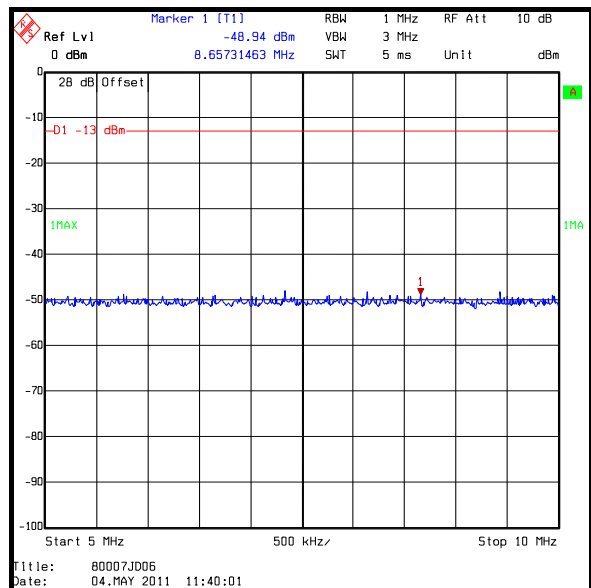
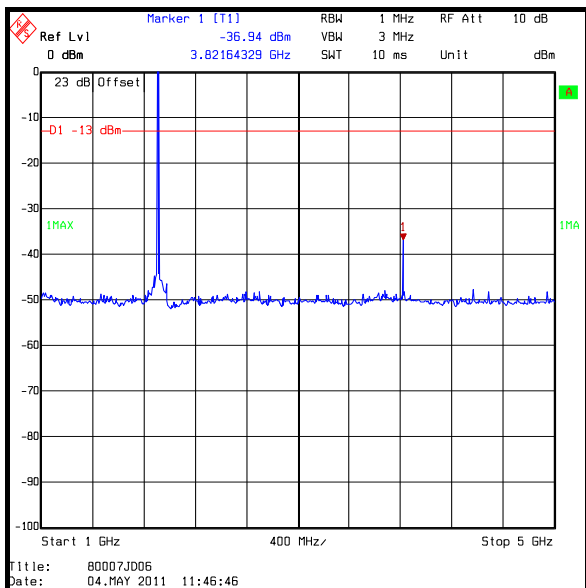
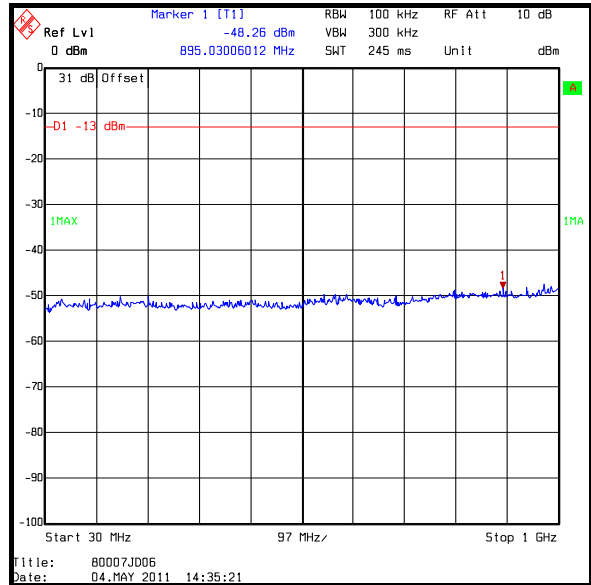
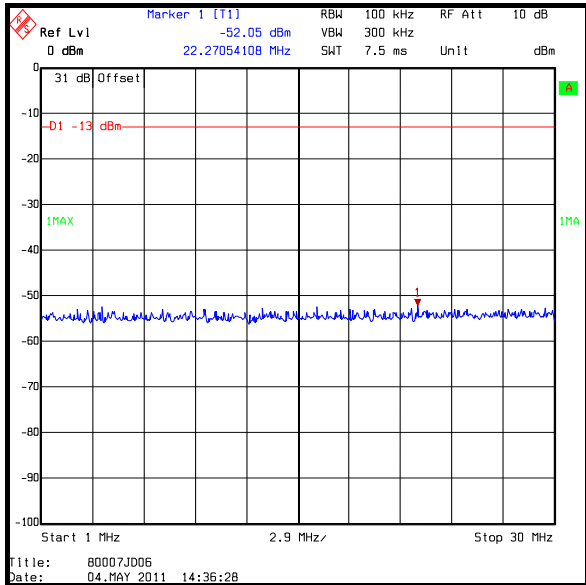
Results:

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
16342.685	-33.6	-13.0	20.6	Complied

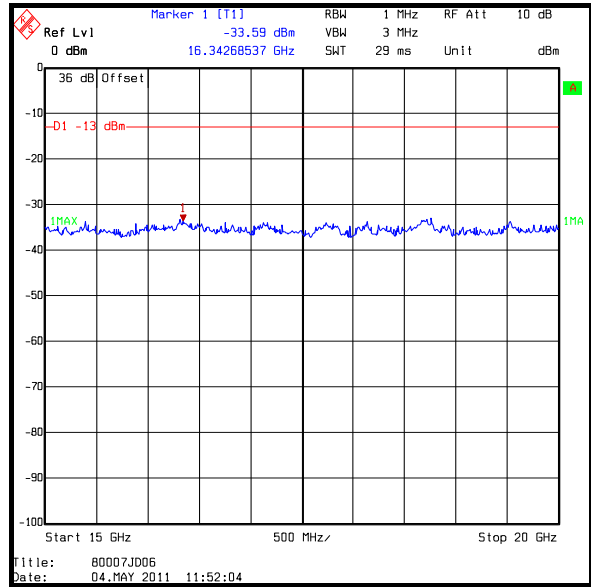
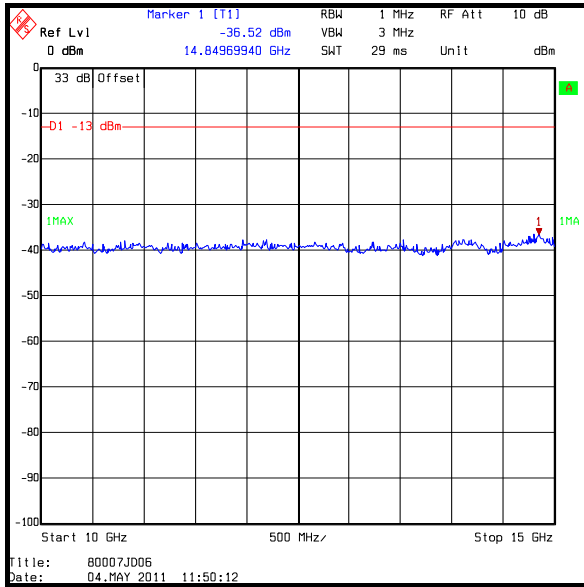
Note(s):

1. All emissions were investigated and found to be at least 20 dB below the specified limit; therefore the highest emission level was recorded as shown in the table above.
2. The uplink and downlink traffic channels are shown on the 1 GHz to 5 GHz plot.

Transmitter Conducted Emissions (Continued)



Transmitter Conducted Emissions (Continued)



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

Test Engineer:	Crawford Lindsay	Test Date:	28 April 2011 & 09 May 2011
Test Sample IMEI:	355255049000236		

FCC Part:	2.1053 & 24.238
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Parts 2.1053 and 24.238
Frequency Range:	30 MHz to 20 GHz
Configuration:	GSM Circuit Switched

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	19

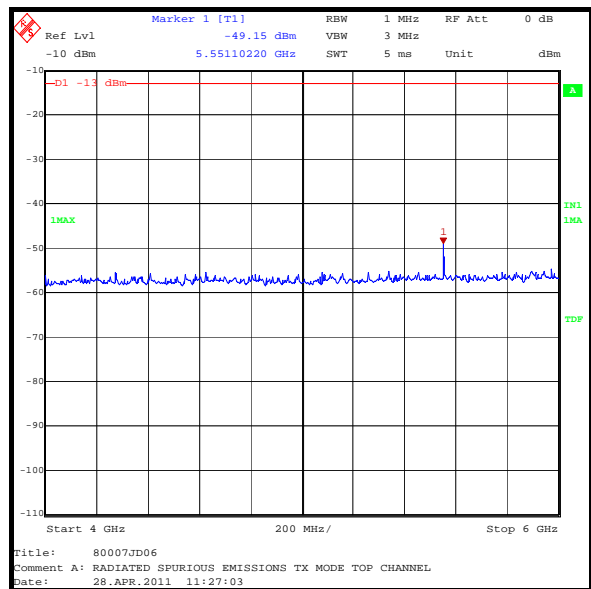
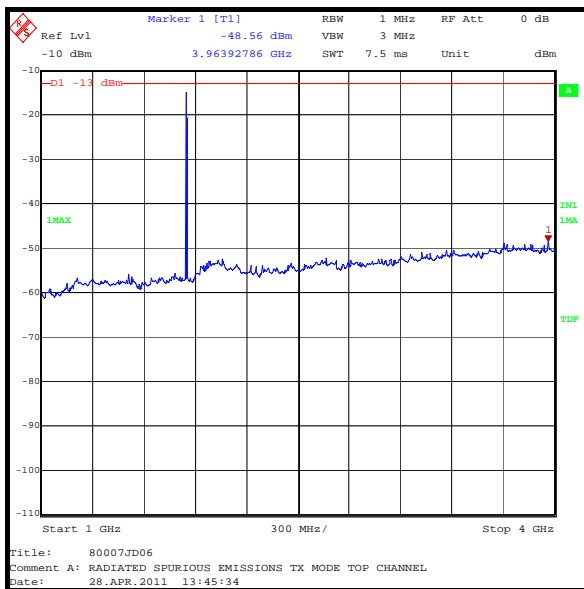
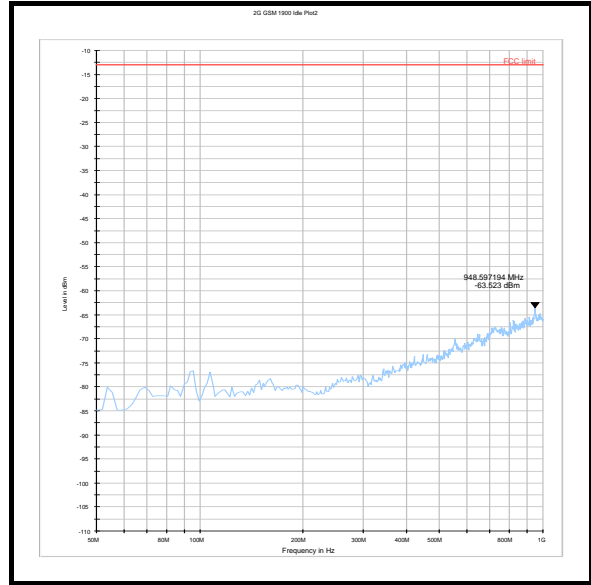
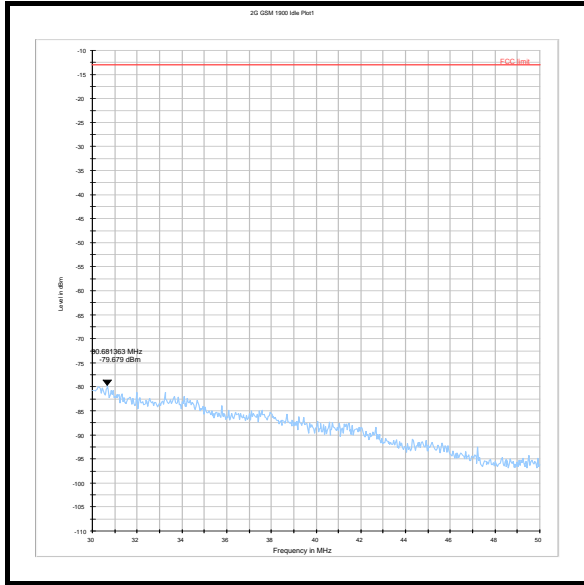
Results:

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
12949.900	-41.0	-13.0	28.0	Complied

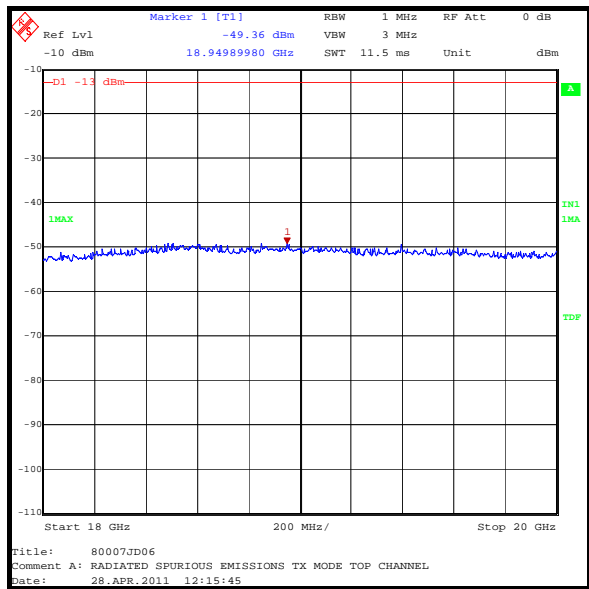
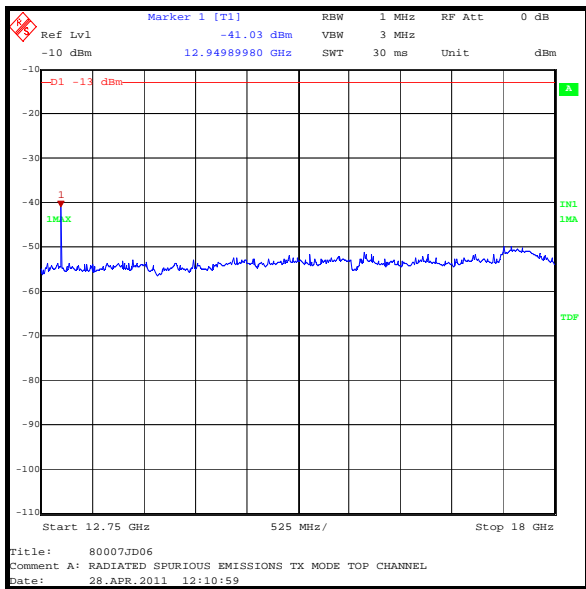
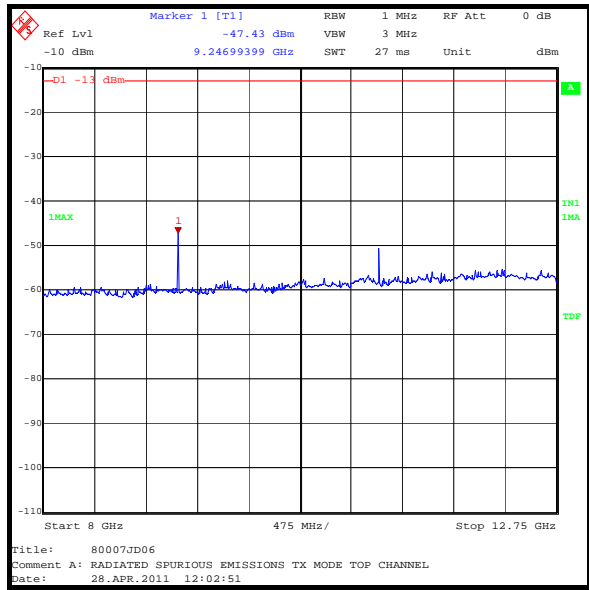
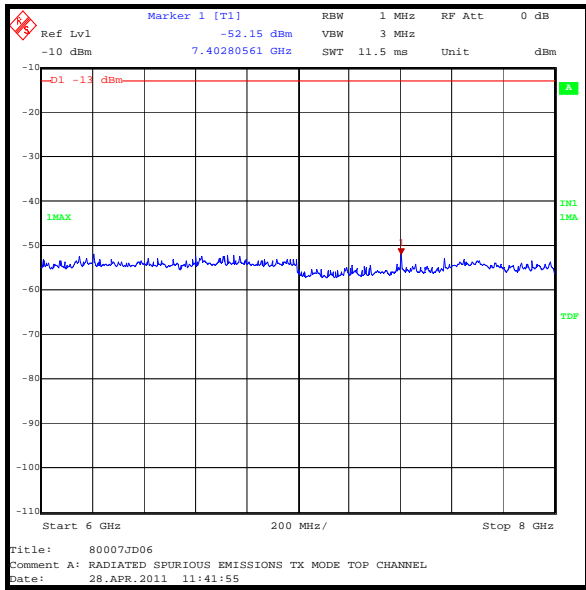
Note(s):

1. No spurious emissions were detected within 20 dB; the highest peak noise floor reading of the measuring receiver was recorded.
2. The uplink and downlink traffic channels are shown on the 1 GHz to 4 GHz plot.
3. Measurements below 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
4. Pre-scans above 1 GHz were performed in a fully anechoic chamber (RFI Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (RFI Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Transmitter Out of Band Radiated Emissions (continued)



Transmitter Out of Band Radiated Emissions (continued)



5.3.8. Transmitter Band Edge Conducted Emissions

Test Summary:

Test Engineer:	Sarah Williams	Test Date:	19 August 2011
Test Sample IMEI:	355255049000236		

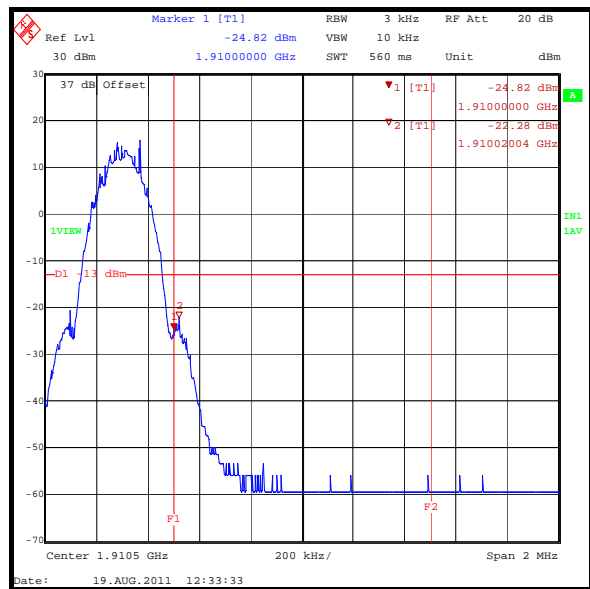
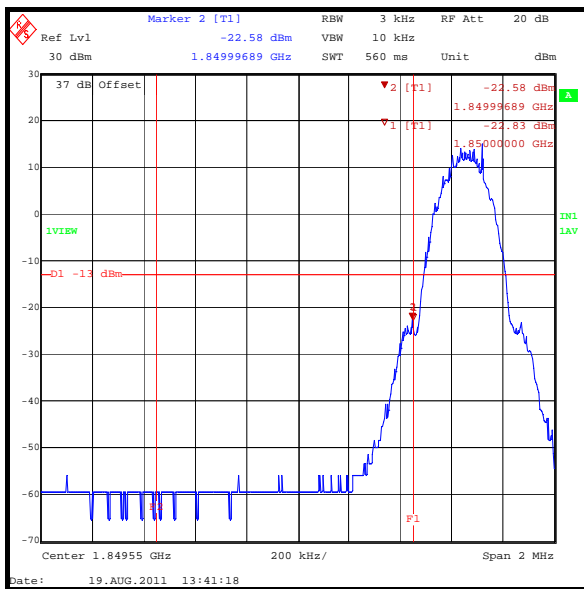
FCC Part:	2.1051 & 24.238
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.13 referencing FCC CFR Parts 2.1051 and 24.238

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	23

Results: GSM Circuit Switched

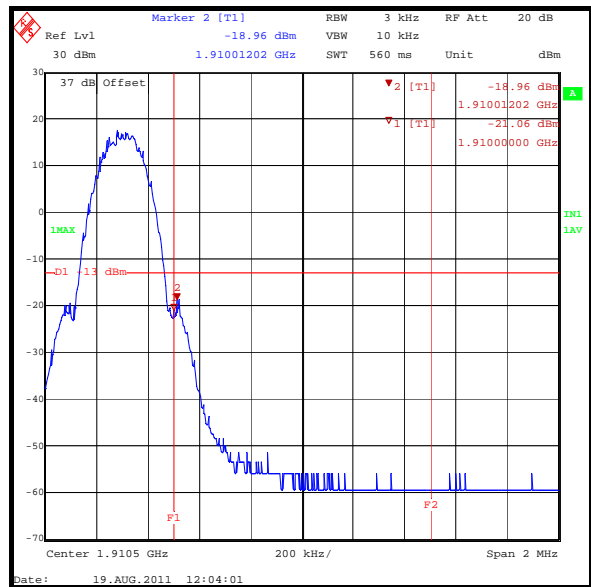
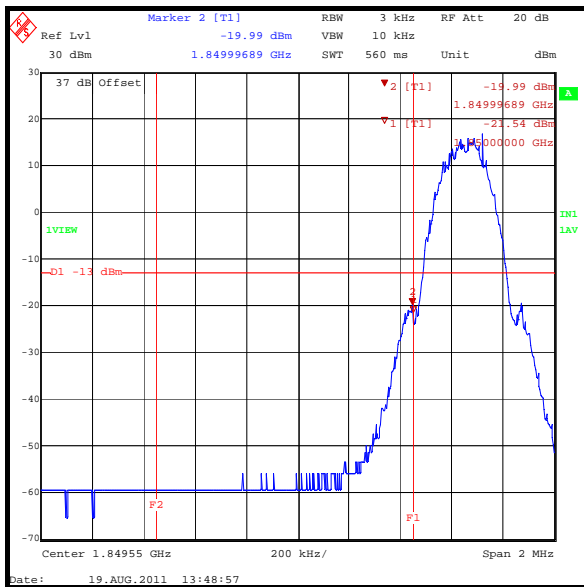
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.997	-22.6	-13.0	9.6	Complied
1850.000	-22.8	-13.0	9.8	Complied
1910.000	-24.8	-13.0	11.8	Complied
1910.020	-22.3	-13.0	9.3	Complied



Transmitter Band Edge Conducted Emissions (continued)

Results: GPRS

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.997	-20.0	-13.0	7.0	Complied
1850.000	-21.5	-13.0	8.5	Complied
1910.000	-21.1	-13.0	8.1	Complied
1910.012	-19.0	-13.0	6.0	Complied



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

Test Engineer:	Crawford Lindsay	Test Date:	28 April 2011
Test Sample IMEI:	355255049000236		

FCC Part:	2.1053 & 24.238
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Parts 2.1053 and 24.238

Environmental Conditions:

Temperature (°C):	28
Relative Humidity (%):	19

Results: GSM Circuit Switched

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
Note 1				

Note(s):

1. Transmitter Band Edge Radiated Emissions was not performed for GSM1900, as the residual carrier power seen on the emissions plot is lower than the specified -13.0 dBm limit and therefore complies with the band edge limit by inspection.

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	824 to 849 MHz / 1850 to 1910 MHz	95%	±0.27 dB
Frequency Stability	824 to 849 MHz / 1850 to 1910 MHz	95%	±0.92 ppm
Occupied Bandwidth	824 to 849 MHz / 1850 to 1910 MHz	95%	±0.92 ppm
Conducted Spurious Emissions	1 MHz to 20 GHz	95%	±2.64 dB
Radiated Spurious Emissions	30 MHz 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.

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval Months
A1368	Directional Coupler	Pasternack	PE2214-10	None	Calibrated before use	-
A1396	Attenuator	Huber + Suhner	757987	6810.17.B	06 Jul 2011	12
A1513	Directional Coupler	Narda	3020A	30413	Calibrated before use	-
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A0040 5	06 Jun 2011	12
A1537	Directional Coupler	Hewlett Packard	778D	1144A0512 2	Calibrated before use	-
A1818	Antenna	EMCO	3115	00075692	05 Sep 2011	12
A1834	Attenuator	Hewlett Packard	8491B	10444	30 Jun 2011	12
A1974	High Pass Filter	AtlanTecRF	AFH-01000	090000283	29 Dec 2011	12
A1997	Attenuator	Huber + Suhner AG	6810.17.B	301749	09 Feb 2012	12
A253	Antenna	Flann Microwave	12240-20	128	05 Sep 2011	12
A255	Antenna	Flann Microwave	16240-20	519	05 Sep 2011	12
A256	Antenna	Flann Microwave	18240-20	400	05 Sep 2011	12
A427	Antenna	Flann Microwave	14240-20	150	21 Nov 2013	36
A436	Antenna	Flann Microwave	20240-20	330	05 Sep 2011	12
A553	Antenna	Chase	CBL6111A	1593	26 Mar 2012	12
G0543	Amplifier	Sonoma Instrument	310N	230801	30 Jun 2011	12
L1021	Comms Test Set	Rohde & Schwarz	CMU 200	111379	11 Jan 2012	12
K0001	5m Semi-Anechoic Chamber	Rainford EMC	N/A	N/A	25 June 2011	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	05 Sep 2011	12
M1068	Thermometer	Iso-Tech	RS55	93102884	10 Nov 2011	12
M1124	Test Receiver	Rohde & Schwarz	ESI26	100046K	22 June 2011	12
M1223	Environmental Chamber	Votsch	VT4002	5856607272 0010	Calibrated before use	-
M1242	Spectrum Analyser	Rohde & Schwarz	FSEM30	845986/022	08 June 2011	12

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval Months
M1269	Multimeter	Fluke	179	90250210	15 Jul 2011	12
M127	Spectrum Analyser	Rohde & Schwarz	FSEB 30	842 659/016	15 Sep 2011	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	04 Feb 2012	12
S011	DC Power Supply	INSTEK	PR-3010H	9401270	Calibrated before use	-
S0537	DC Power Supply	TTI	EL302D	249928	Calibrated before use	-

NB In accordance with UKAS requirements all the measurement equipment is on a calibration schedule.

NOTE: All equipment used was within its' calibration period on the specific date of test.