TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Q26Extreme

To: FCC Part 22: 2008 Subpart H and Part 24: 2008 Subpart E,
RSS-Gen Issue 2 June 2007, RSS 132 Issue 2 September 2005
and RSS-133 Issue 5 February 2009

Test Report Serial No:
RFI/RPT4/RP74544JD05A

Supersedes Test Report Serial No:
RFI/RPT3/RP74544JD05A

This Test Report Is Issued Under The Authority Of Brian Watson, Operations Director:	pp 
Checked By:	R. Graham
Signature:	
Date of Issue:	25 November 2009

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1. Customer Information

Company Name:	Sierra Wireless SA
Address:	3 Esplanade du FoncetIssy-les-Moulineaux Cedex Paris 92442 France

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR22
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2008: Part 22 Subpart H (Public Mobile Services)
Specification Reference:	47CFR24
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2008: Part 24 Subpart E (Personal Communication Services)
Specification Reference:	RSS-Gen Issue 2 June 2007
Specification Title:	General Requirements and Information for the Certification of Radiocommunication Equipment
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 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:	10 June 2009 to 03 November 2009

2.2. Summary of Test Results – GSM 850

FCC Reference (47CFR)	IC Reference	Measurement	Port Type	Result
Part 15.109	RSS-Gen 4.10/6 RSS-132 4.6	Receiver/Idle Mode Radiated Spurious Emissions	Enclosure	✓
Part 22.913(a)	RSS-132 4.4 SRSP-503 5.1.3	Transmitter Carrier Output Power	Antenna Terminals	✓
Part 22.355	RSS-132 4.3 RSS Gen 4.7	Transmitter Frequency Stability (Temperature & Voltage Variation)	Antenna	✓
Part 2.1049	RSS-Gen 4.6.1	Transmitter Occupied Bandwidth	Antenna	✓
Part 2.1053/22.917	RSS-132 4.5	Transmitter Out of Band Radiated Emissions	Antenna	✓
Part 2.1053/22.917	RSS-132 4.5	Transmitter Band Edge Radiated Emissions	Antenna	✓

Key to Results

✓ = Complied ✗ = Did not comply

2.3. Summary of Test Results – PCS 1900

FCC Reference (47CFR)	IC Reference	Measurement	Port Type	Result
Part 15.109	RSS-Gen 4.10/6 RSS-133 6.6	Idle Mode Radiated Spurious Emissions	Enclosure	✓
Part 24.232	RSS-133 6.4 SRSP-510 5.1.2	Transmitter Carrier Output Power	Antenna Terminals	✓
Part 24.235	RSS-133 6.3 RSS Gen 4.7	Transmitter Frequency Stability (Temperature & Voltage Variation)	Antenna	✓
Part 2.1049/24.238	RSS-Gen 4.6.1	Transmitter Occupied Bandwidth	Antenna	✓
Part 2.1053/24.238	RSS-133 6.5	Transmitter Out of Band Radiated Emissions	Antenna	✓
Part 2.1053/24.238	RSS 133 6.5	Transmitter Band Edge Radiated Emissions	Antenna	✓

Key to Results

✓ = Complied ✗ = Did not comply

2.4. Methods and Procedures

Reference:	ANSI/TIA-603-C-2004
Title:	Land Mobile Communications Equipment, Measurements and performance Standards
Reference:	ANSI C63.4 (2003)
Title:	American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

2.5. 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:	Q26 Extreme Wireless CPU®
Model Name or Number:	Q26Extreme
IMEI Number:	004401769021722
Hardware Version Number:	50
Software Version Number:	FW R4.2.9
Industry Canada Certification Number:	3651C-Q26EX
FCC ID Number:	O9EQ26EX

3.2. Description of EUT

The equipment under test was a dual mode GSM/GPRS/EGPRS/WCDMA modem mounted on a development board.

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/EGPRS					
Modulation Type:	GMSK and 8PSK					
Channel Spacing:	200 kHz					
Power Supply Requirement(s):	Nom	3.8 VDC	Min	3.23 VDC	Max	4.37 VDC
Technology Tested:	GSM 850					
Maximum Output Power (ERP):	GSM		32.7 dBm			
	GPRS		32.8 dBm			
	EGPRS		29.2 dBm			
Transmit Frequency Range:	824 MHz to 849 MHz					
Transmit Channels Tested:	**Channel ID**		**Channel Number**		**Channel Frequency (MHz)**	
	Bottom		128		824.2	
	Middle		190		836.4	
	Top		251		848.8	
Receive Frequency Range:	869 MHz to 894 MHz					
Receive Channels Tested:	**Channel ID**		**Channel Number**		**Channel Frequency (MHz)**	
	Bottom		128		869.2	
	Middle		190		881.4	
	Top		251		893.8	
Technology Tested:	PCS1900					
Maximum Output Power (EIRP):	GSM		29.6 dBm			
	GPRS		29.6 dBm			
	EGPRS		29.4 dBm			
Transmit Frequency Range:	1850 MHz 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 MHz 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:	Development board
Brand Name:	Wavecom
Model Name or Number:	STARTERKIT LIGTH Q2686 V2.0
Serial Number:	Not stated

Description:	¼ wave antenna with 0.1 metre coaxial cable. Terminated with an SMA male connector
Brand Name:	Hirschmann
Model Name or Number:	MCA 18 90 80
Serial Number:	Not stated

Description:	Ground plane for ¼ wave antenna
Model Name or Number:	Not stated
Serial Number:	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):

- Idle mode, not camped on but scanning all supported bands and modes.
- Constantly transmitting at full power on bottom, centre and top channels as required.
- Occupied bandwidth, ERP and band edge final measurements were performed with the EUT in GSM single timeslot circuit switched, GPRS single timeslot and EGPRS single timeslot modes. Preliminary measurements on packet switched connections were made with the EUT transmitting on 1, 2, 3 and 4 slots. Single slot transmission was found to give the maximum output power and widest bandwidth.
- All EGPRS measurements were made with the EUT using 8 PSK modulation.
- 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/EGPRS system simulator, operating in transceiver mode.
- The EUT was supplied mounted on a development board for the duration of the testing.
- External DC power was provided by a bench power supply and monitored with a calibrated voltmeter. Power from the external supply connected directly to the EUT through development board tracks.
- The Client supplied a ¼ wave antenna mounted centrally on a 0.4 m^2 metal plate. A 0.1 m length of coaxial cable was connected to the antenna base. Radiated tests were performed with the ¼ wave antenna and associated ground plane connected to the EUT. The antenna was moved as far from the EUT as the coaxial cable allowed (approximately 0.15 m) to maximise any emissions.
- There is no integral antenna on the EUT.

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 – FCC Part 22

5.2.1. Receiver/Idle Mode Radiated Spurious Emissions

Test Summary:

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

Environmental Conditions:

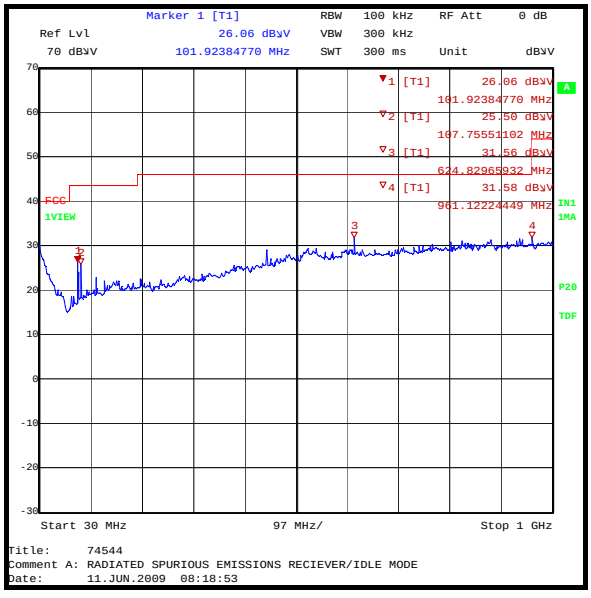
Temperature (°C):	23
Relative Humidity (%):	36

Results:

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
623.993	Vertical	31.9	46.0	14.4	Complied

Note(s):

1. All other emissions on the pre-scan plot were investigated and found to be ambients.



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Receiver/Idle Mode Radiated Spurious Emissions (continued)

Test Summary:

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

Environmental Conditions:

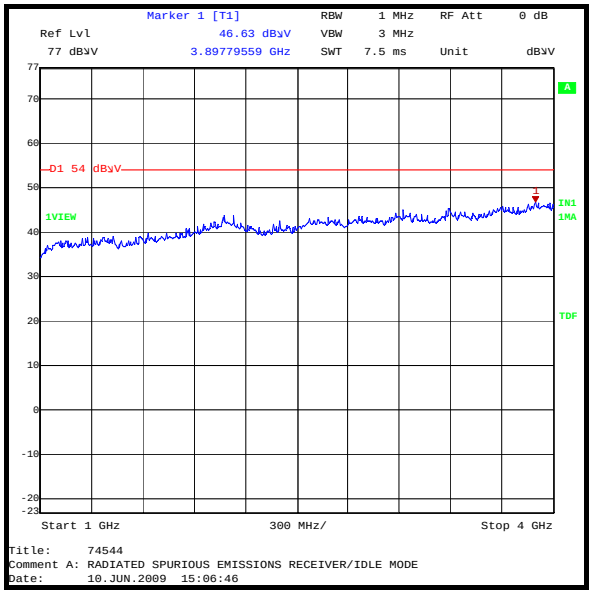
Temperature (°C):	25
Relative Humidity (%):	33

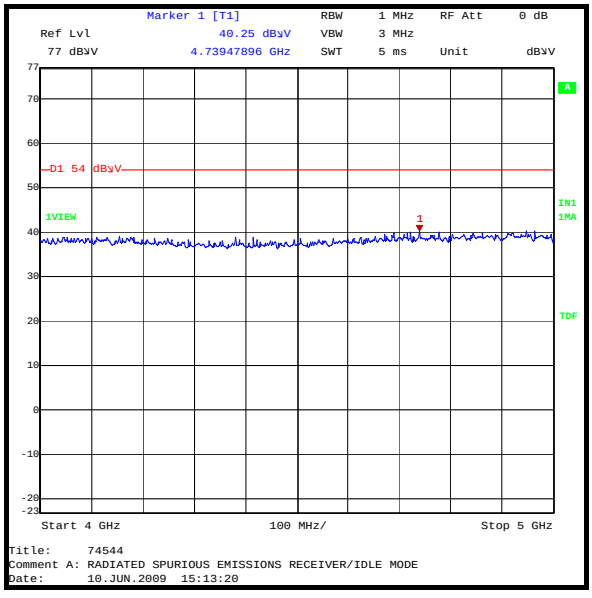
Results: Highest Peak Level

Frequency (GHz)	Antenna Polarity	Detector Level (dBµV/m)	Transducer Factor (dB)	Peak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
3.897	Horizontal	41.1	5.5	46.6	54.0	7.4	Complied

Note(s):

1. 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.





5.2.2. Transmitter Carrier Output Power

Test Summary:

FCC Part:	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):	27
Relative Humidity (%):	26

Results: GSM Circuit Switched

Channel	Measured Frequency (MHz)	Peak conducted power (dBm)	Average conducted power (dBm)	ERP Limit (dBm)	Margin (dBm)	Result
Bottom	824.2	32.7	32.6	38.5	5.8	Complied
Middle	836.4	32.7	32.5	38.5	5.8	Complied
Top	848.8	32.7	32.5	38.5	5.8	Complied

Results: GPRS

Channel	Measured Frequency (MHz)	Peak conducted power (dBm)	Average conducted power (dBm)	ERP Limit (dBm)	Margin (dBm)	Result
Bottom	824.2	32.8	32.6	38.5	5.7	Complied
Middle	836.4	32.7	32.6	38.5	5.8	Complied
Top	848.8	32.7	32.6	38.5	5.8	Complied

Results: EGPRS

Channel	Measured Frequency (MHz)	Peak conducted power (dBm)	Average conducted power (dBm)	ERP Limit (dBm)	Margin (dBm)	Result
Bottom	824.2	29.2	26.7	38.5	9.3	Complied
Middle	836.4	29.1	26.6	38.5	9.4	Complied
Top	848.8	29.0	26.5	38.5	9.5	Complied

Note(s):

1. No limit is specified for conducted output power therefore the peak conducted power was compared to the ERP limit of 38.5 dBm.
2. GPRS and EGPRS power was measured in all multislot configurations and the highest level recorded. EGPRS power was measured with the EUT using 8 PSK modulation.

5.2.3. Transmitter Frequency Stability (Temperature)

Test Summary:

FCC Part:	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):	29
Relative Humidity (%):	31

Results: Middle Channel (836.4 MHz)

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	836.399988	12	0.0143	2.5	2.4857	Complied
-20	836.399996	4	0.0048	2.5	2.4952	Complied
-10	836.399993	7	0.0084	2.5	2.4916	Complied
0	836.400006	6	0.0072	2.5	2.4928	Complied
10	836.400005	5	0.0060	2.5	2.4940	Complied
20	836.400006	6	0.0072	2.5	2.4928	Complied
30	836.400006	6	0.0072	2.5	2.4928	Complied
40	836.400006	6	0.0072	2.5	2.4928	Complied
50	836.400004	4	0.0048	2.5	2.4952	Complied

5.2.4. Transmitter Frequency Stability (Voltage Variation)

Test Summary:

FCC Part:	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):	29
Relative Humidity (%):	31

Results: Middle Channel (836.4 MHz)

Supply Voltage (V)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
3.23	836.400006	6	0.0072	2.5	2.4928	Complied
4.37	836.400006	6	0.0072	2.5	2.4928	Complied

5.2.5. Transmitter Occupied Bandwidth

Test Summary:

FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.4 Section13.1.7 and relevant annexes referencing FCC CFR Part 2.1049 (see note below)

Environmental Conditions:

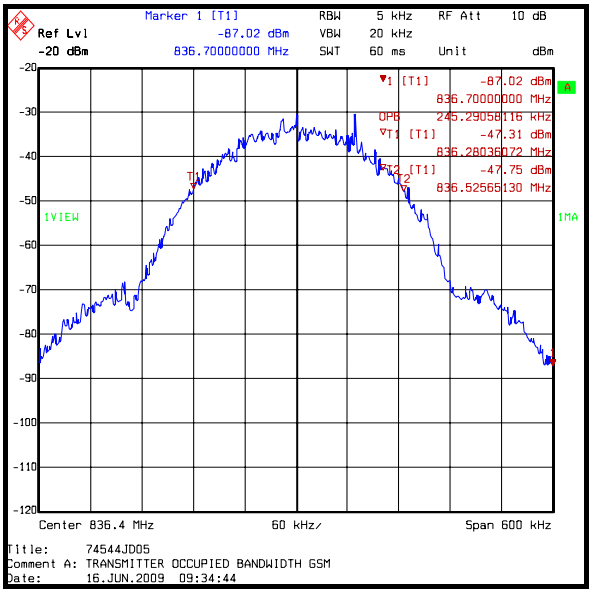
Temperature (°C):	27
Relative Humidity (%):	31

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	836.4	245.291

Note(s):

1. In lieu of the test method detailed in ANSI C63.4 Section 13.1.7 the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.



Transmitter Occupied Bandwidth (continued)

Test Summary:

FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.4 Section13.1.7 and relevant annexes referencing FCC CFR Part 2.1049 (see note below)

Environmental Conditions:

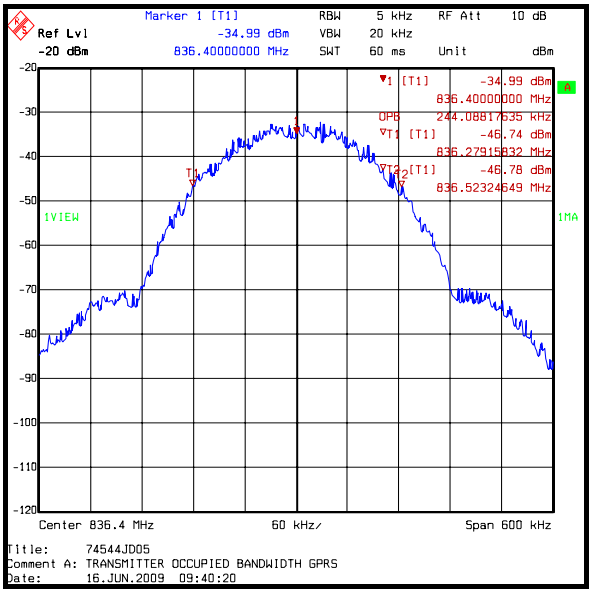
Temperature (°C):	27
Relative Humidity (%):	31

Results: GPRS

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	836.4	244.088

Note(s):

1. In lieu of the test method detailed in ANSI C63.4 Section 13.1.7 the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.



Transmitter Occupied Bandwidth (continued)

Test Summary:

FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.4 Section13.1.7 and relevant annexes referencing FCC CFR Part 2.1049 (see note below)

Environmental Conditions:

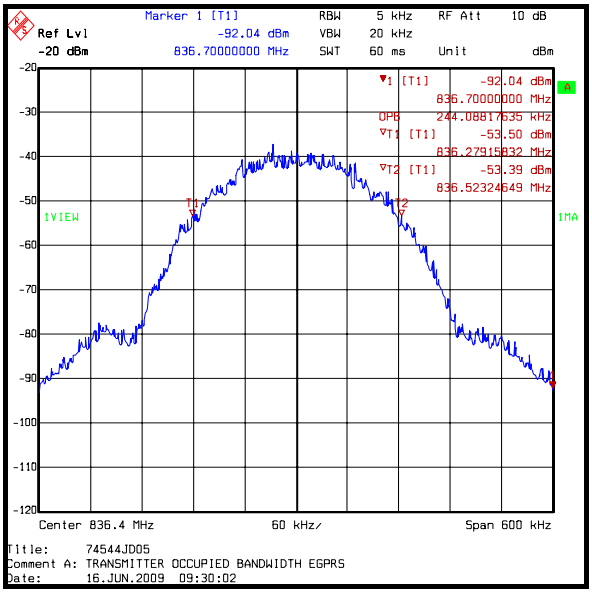
Temperature (°C):	27
Relative Humidity (%):	31

Results: EGPRS

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	836.4	244.088

Note(s):

1. In lieu of the test method detailed in ANSI C63.4 Section 13.1.7 the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.



5.2.6. Transmitter Out of Band Radiated Emissions

Test Summary:

FCC Part:	2.1053 & 22.917
Frequency Range:	30 MHz to 10 GHz
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Part 2.1053

Environmental Conditions:

Temperature (°C):	29
Relative Humidity (%):	29

Results: Bottom Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1648.430	-37.0	-13.0	24.0	Complied

Results: Middle Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1672.695	-36.6	-13.0	23.6	Complied

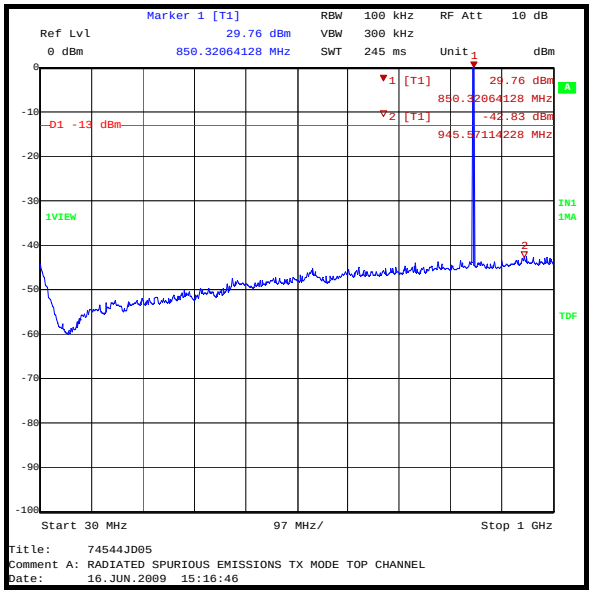
Results: Top Channel

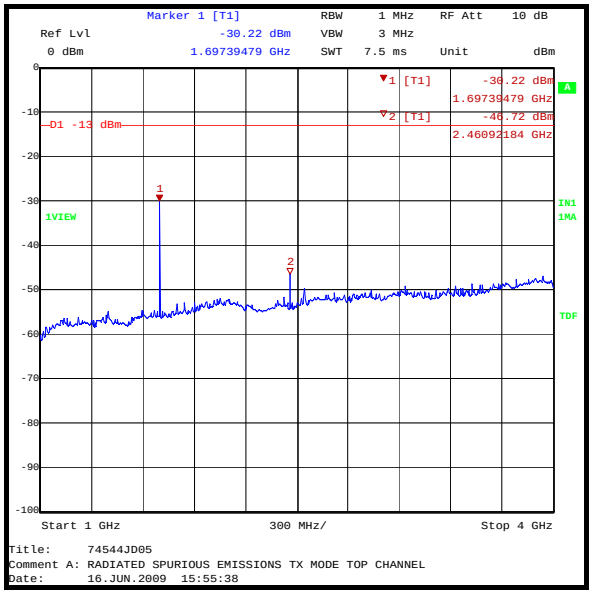
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1697.445	-35.1	-13.0	22.1	Complied
6790.341	-32.6	-13.0	19.6	Complied

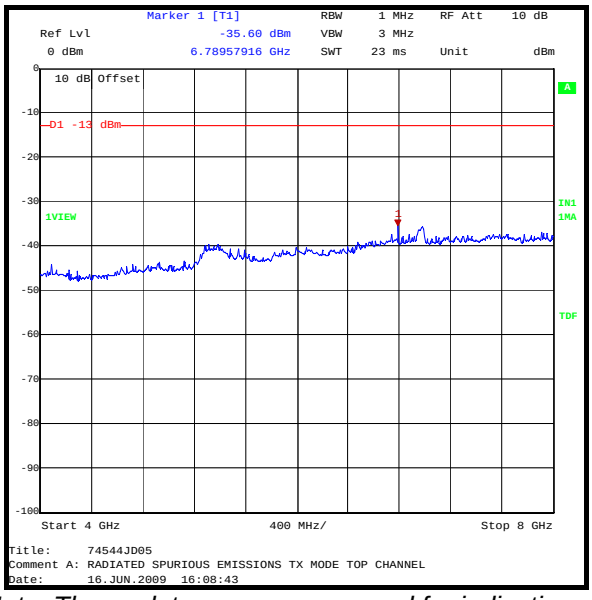
Note(s):

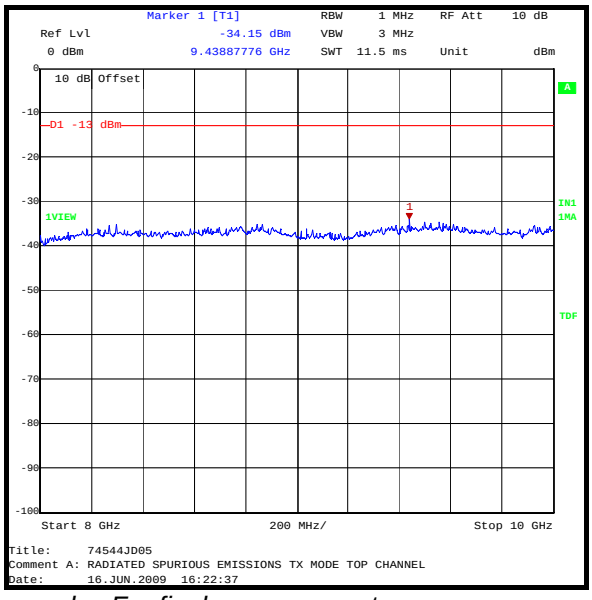
1. The uplink and downlink traffic channels are shown on the 30 MHz to 1 GHz plot at approximately 850 MHz.
2. The emission at approximately 2460 MHz was investigated and found to be ambient.
3. Final measurements were made using appropriate filters and attenuators where required.
4. All other emissions were >20dB below the limit.

Transmitter Out of Band Radiated Emissions (continued)









Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

5.2.7. Transmitter Radiated Emissions at Band Edges

Test Summary:

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

Environmental Conditions:

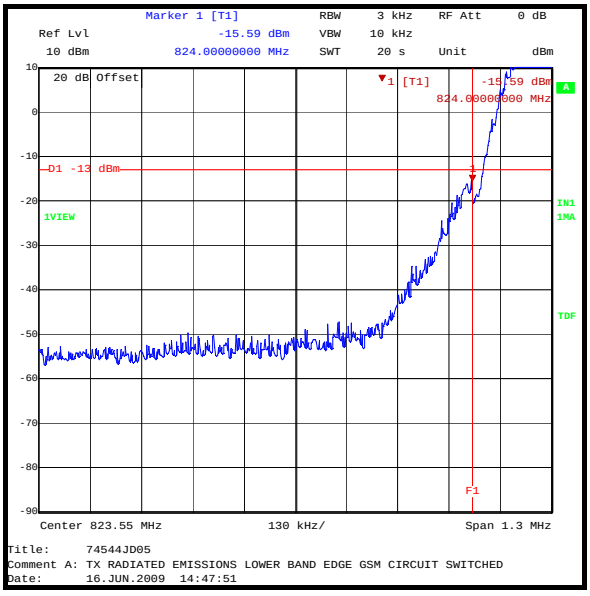
Temperature (°C):	28
Relative Humidity (%):	28

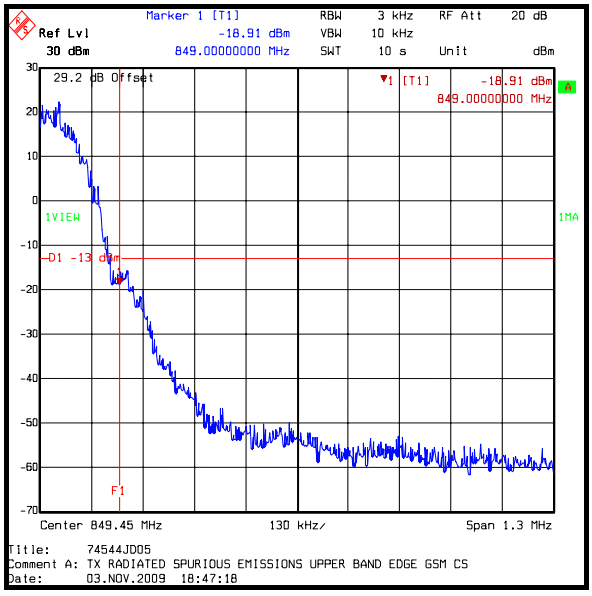
Results: GSM - Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
824	-15.6	-13.0	2.6	Complied

Results: GSM - Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
849	-18.9	-13.0	5.9	Complied





Transmitter Radiated Emissions at Band Edges (continued)

Test Summary:

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

Environmental Conditions:

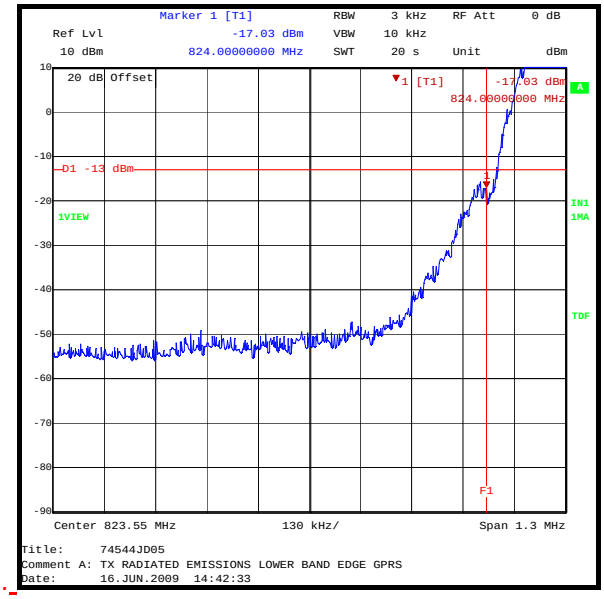
Temperature (°C):	28
Relative Humidity (%):	28

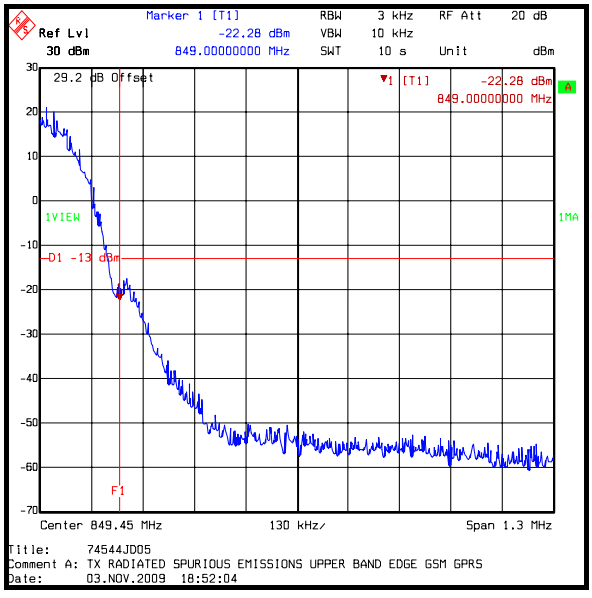
Results: GPRS - Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
824	-17.0	-13.0	4.0	Complied

Results: GPRS - Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
849	-22.3	-13.0	9.3	Complied





Transmitter Radiated Emissions at Band Edges (continued)

Test Summary:

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

Environmental Conditions:

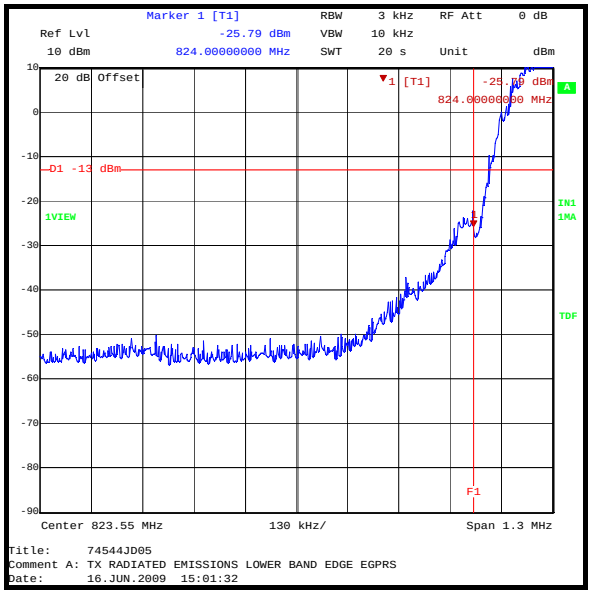
Temperature (°C):	28
Relative Humidity (%):	28

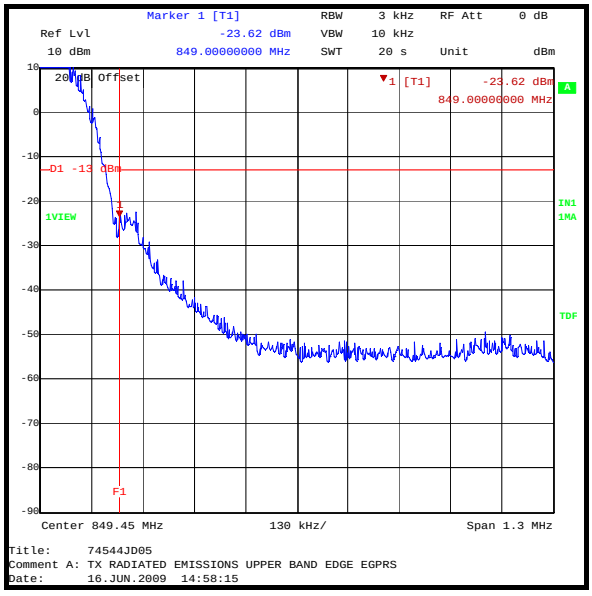
Results: EGPRS - Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
824	-25.8	-13.0	12.8	Complied

Results: EGPRS - Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
849	-23.6	-13.0	10.6	Complied





5.3. Test Results – FCC Part 24

5.3.1. Receiver/Idle Mode Radiated Spurious Emissions

Test Summary:

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

Environmental Conditions:

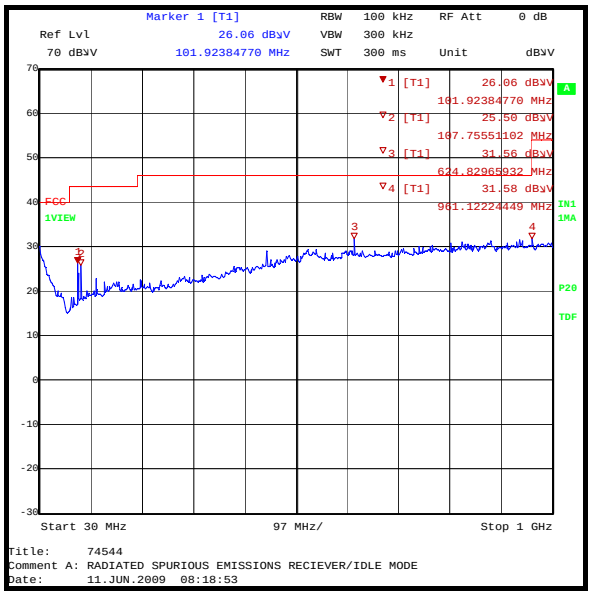
Temperature (°C):	23
Relative Humidity (%):	36

Results:

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
623.993	Vertical	31.9	46.0	14.4	Complied

Note(s):

1. All other emissions on the pre-scan plot were investigated and found to be ambients.



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying table.

Receiver/Idle Mode Radiated Spurious Emissions (continued)

Test Summary:

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

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	33

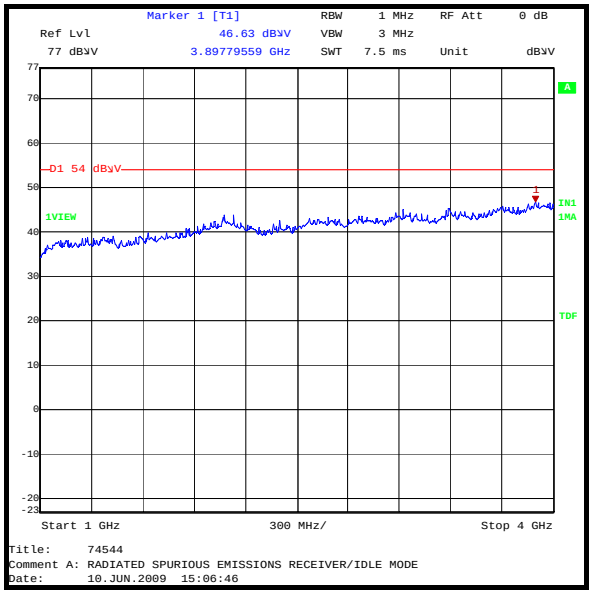
Results: Highest Peak Level

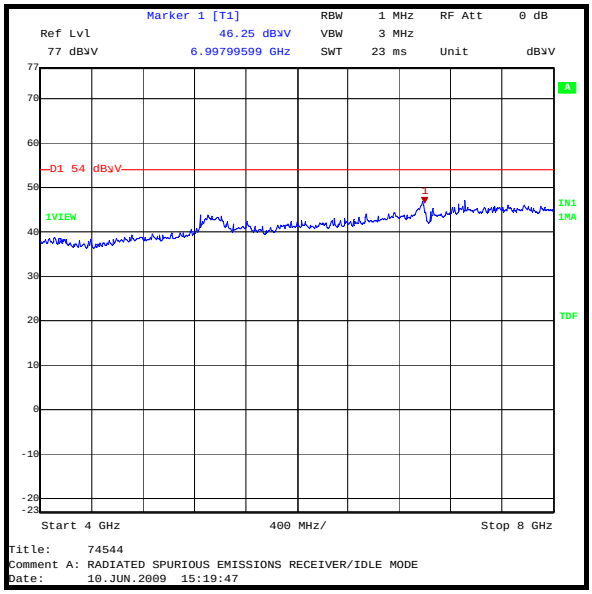
Frequency (GHz)	Antenna Polarity	Detector Level (dBμV/m)	Transducer Factor (dB)	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)	Result
9.531	Horizontal	40.1	8.6	48.7	54.0	5.3	Complied

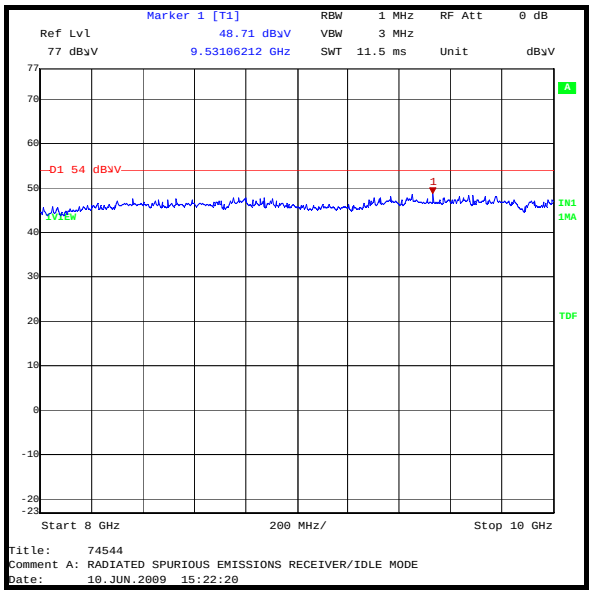
Note(s):

1. 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.

Receiver/Idle Mode Radiated Spurious Emissions (continued)







5.3.2. Transmitter Carrier Output Power

Test Summary:

FCC Part:	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):	29
Relative Humidity (%):	24

Results: GSM Circuit Switched

Channel	Measured Frequency (MHz)	Peak conducted power (dBm)	Average conducted power (dBm)	EIRP Limit (dBm)	Margin (dBm)	Result
Bottom	1850.2	29.6	29.4	33.0	3.4	Complied
Middle	1879.8	29.4	29.2	33.0	3.6	Complied
Top	1909.8	29.4	29.3	33.0	3.6	Complied

Results: GPRS

Channel	Measured Frequency (MHz)	Peak conducted power (dBm)	Average conducted power (dBm)	EIRP Limit (dBm)	Margin (dBm)	Result
Bottom	1850.2	29.6	29.4	33.0	3.4	Complied
Middle	1879.8	29.4	29.2	33.0	3.6	Complied
Top	1909.8	29.4	29.2	33.0	3.6	Complied

Results: EGPRS

Channel	Measured Frequency (MHz)	Peak conducted power (dBm)	Average conducted power (dBm)	EIRP Limit (dBm)	Margin (dBm)	Result
Bottom	1850.2	29.4	26.3	33.0	3.6	Complied
Middle	1879.8	29.1	26.0	33.0	3.9	Complied
Top	1909.8	29.2	26.3	33.0	3.8	Complied

Note(s):

1. No limit is specified for conducted output power therefore the peak conducted power was compared to the EIRP limit of 33.0 dBm.
2. GPRS and EGPRS power was measured in all multislot configurations and the highest level recorded. EGPRS power was measured with the EUT using 8 PSK modulation.

5.3.3. Transmitter Frequency Stability (Temperature)

Test Summary:

FCC Part:	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):	29
Relative Humidity (%):	32

Results: Bottom Channel (1850.2 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	15	1850.200015	1850.0	0. 200015	Complied
-20	9	1850.199991	1850.0	0.199991	Complied
-10	10	1850.199990	1850.0	0.199990	Complied
0	18	1850.200018	1850.0	0.200018	Complied
10	18	1850.200018	1850.0	0.200018	Complied
20	21	1850.200021	1850.0	0.200021	Complied
30	18	1850.200018	1850.0	0.200018	Complied
40	20	1850.200020	1850.0	0.200020	Complied
50	27	1850.200027	1850.0	0.200027	Complied

Results: Top Channel (1909.8 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	7	1909.799993	1910.0	0.200007	Complied
-20	11	1909.800011	1910.0	0.199989	Complied
-10	15	1909.800015	1910.0	0.199985	Complied
0	20	1909.800020	1910.0	0.199980	Complied
10	21	1909.800021	1910.0	0.199979	Complied
20	23	1909.800023	1910.0	0.199977	Complied
30	16	1909.800016	1910.0	0.199984	Complied
40	14	1909.800014	1910.0	0.199986	Complied
50	14	1909.800014	1910.0	0.199986	Complied

5.3.4. Transmitter Frequency Stability (Voltage Variation)

Test Summary:

FCC Part:	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):	29
Relative Humidity (%):	30

Results: Bottom Channel (1850.2 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
3.23	17	1850.200017	1850.0	0.200017	Complied
4.37	13	1850.200013	1850.0	0.200013	Complied

Results: Top Channel (1909.8 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
3.23	16	1909.800016	1910.0	0.199990	Complied
4.37	10	1909.800010	1910.0	0.199990	Complied

5.3.5. Transmitter Occupied Bandwidth

Test Summary:

FCC Part:	24.238
Test Method Used:	As detailed in ANSI C63.4 Section13.1.7 and relevant annexes referencing FCC CFR Part 2.1049 (see note below)

Environmental Conditions:

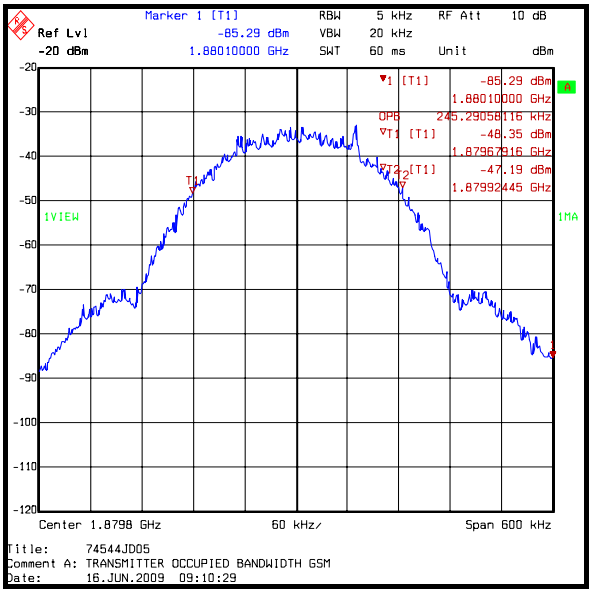
Temperature (°C):	27
Relative Humidity (%):	31

Results: GSM Circuit Switched

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1879.8	245.291

Note(s):

1. In lieu of the test method detailed in ANSI C63.4 Section 13.1.7 the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.



Transmitter Occupied Bandwidth (continued)

Test Summary:

FCC Part:	24.238
Test Method Used:	As detailed in ANSI C63.4 Section13.1.7 and relevant annexes referencing FCC CFR Part 2.1049 (see note below)

Environmental Conditions:

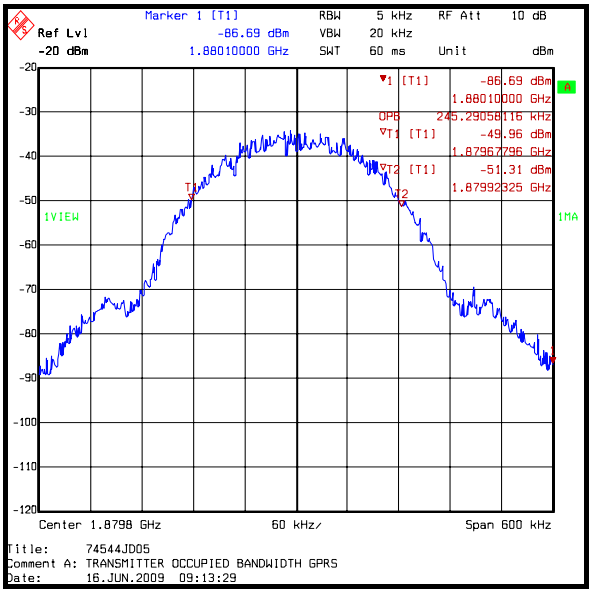
Temperature (°C):	27
Relative Humidity (%):	31

Results: GPRS

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1879.8	245.291

Note(s):

1. In lieu of the test method detailed in ANSI C63.4 Section 13.1.7 the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.



Transmitter Occupied Bandwidth (continued)

Test Summary:

FCC Part:	24.238
Test Method Used:	As detailed in ANSI C63.4 Section13.1.7 and relevant annexes referencing FCC CFR Part 2.1049 (see note below)

Environmental Conditions:

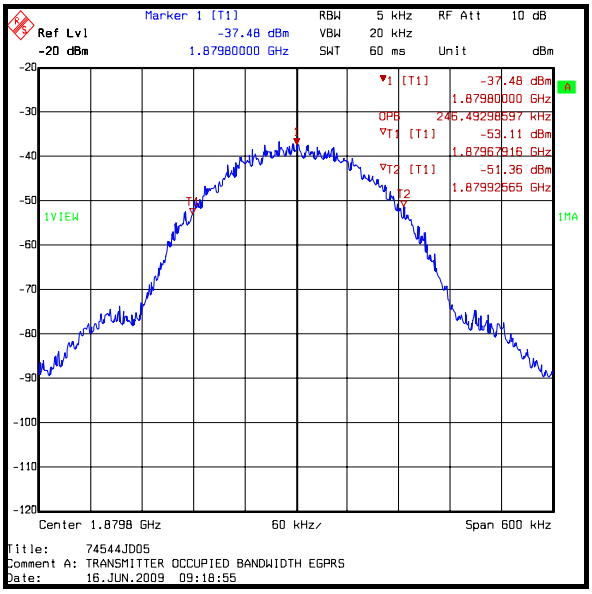
Temperature (°C):	27
Relative Humidity (%):	31

Results: EGPRS

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1879.8	246.493

Note(s):

1. In lieu of the test method detailed in ANSI C63.4 Section 13.1.7 the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser.



5.3.6. Transmitter Out of Band Radiated Emissions

Test Summary:

FCC Part:	2.1053 & 24.238
Frequency Range:	30 MHz to 20 GHz
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):	29
Relative Humidity (%):	29

Results: Bottom Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
7400.862	-28.9	-13.0	15.9	Complied

Results: Middle Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
7519.180	-30.2	-13.0	17.2	Complied

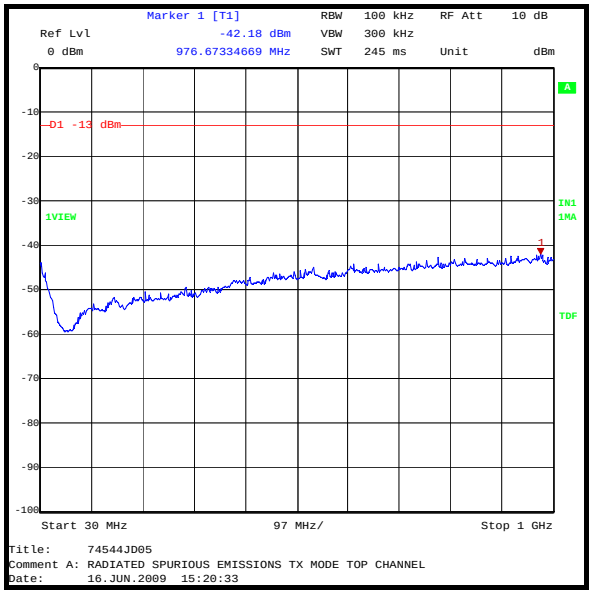
Results: Top Channel

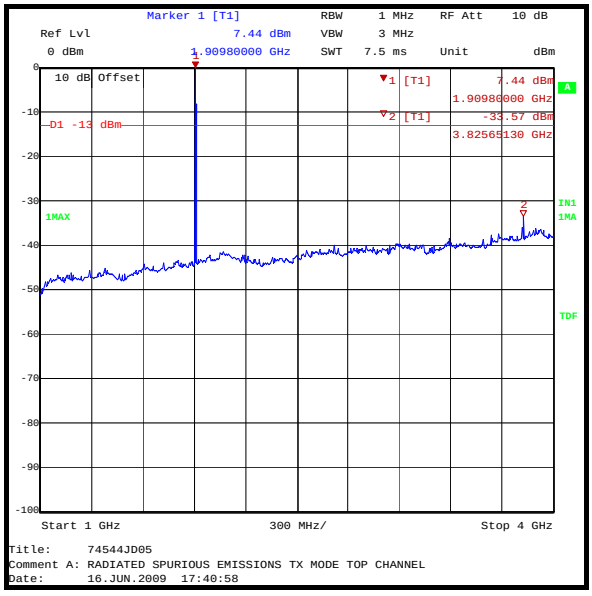
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
7639.278	-30.7	-13.0	17.7	Complied

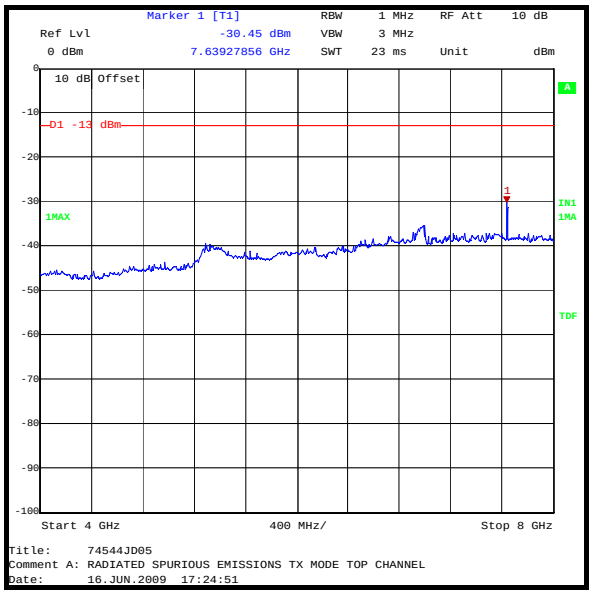
Note(s):

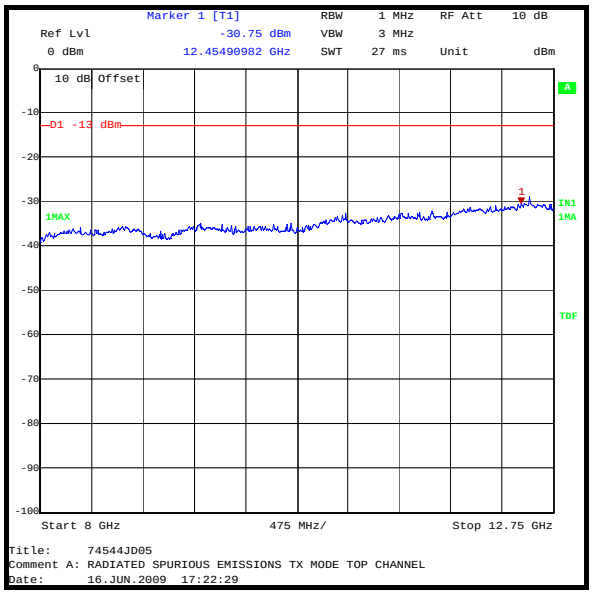
1. The uplink and downlink traffic channels are shown on the 1 GHz to 4 GHz plot at approximately 1909.8 MHz.
2. All other emissions were >20dB below the limit.

Transmitter Out of Band Radiated Emissions (continued)



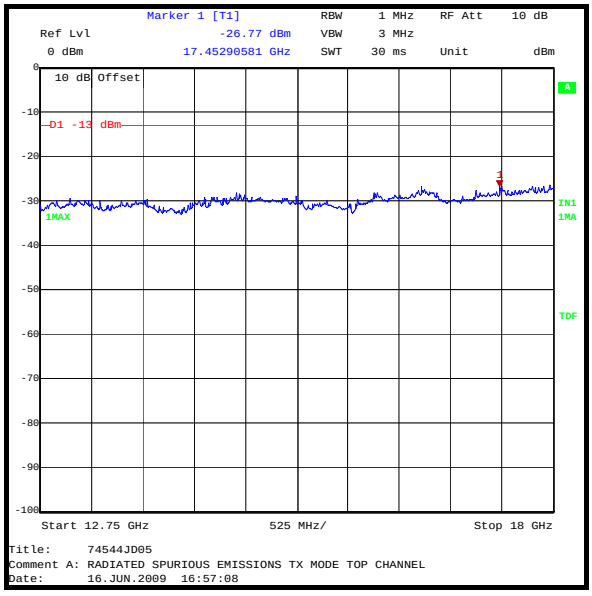


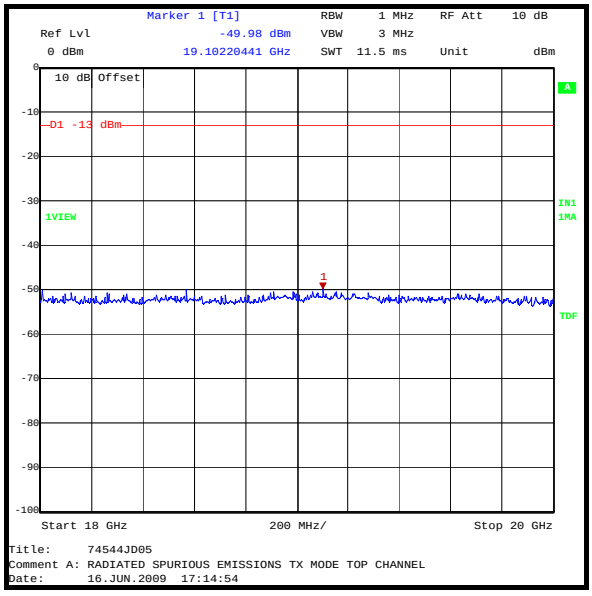




Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Transmitter Out of Band Radiated Emissions (continued)





Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

5.3.7. Transmitter Radiated Emissions at Band Edges

Test Summary:

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:

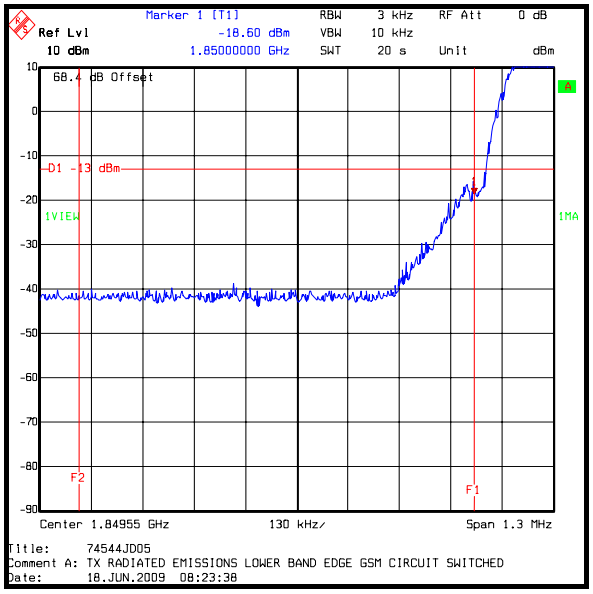
Temperature (°C):	28
Relative Humidity (%):	33

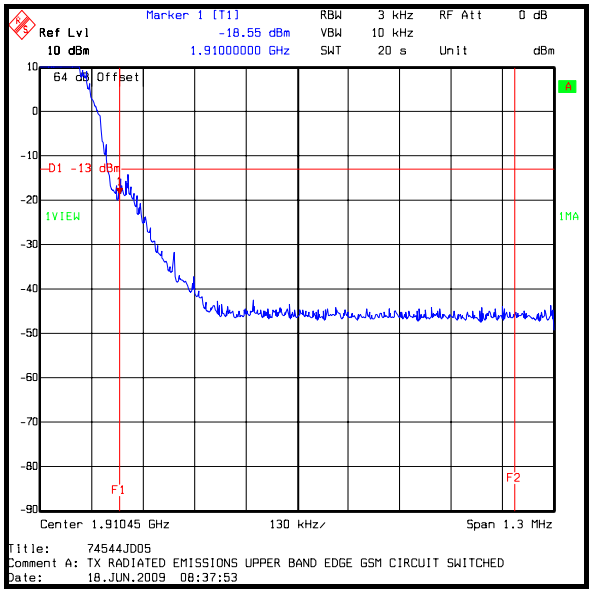
Results: GSM Circuit Switched - Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1850	-18.6	-13.0	5.6	Complied

Results: GSM Circuit Switched - Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1910	-18.6	-13.0	5.6	Complied





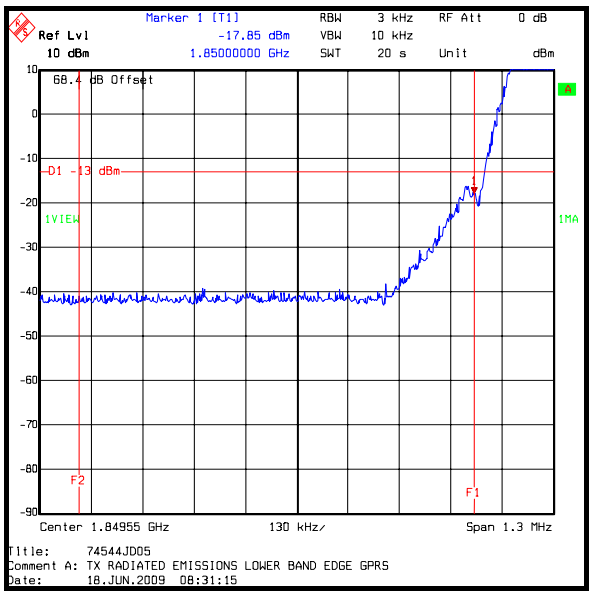
Transmitter Radiated Emissions at Band Edges (continued)

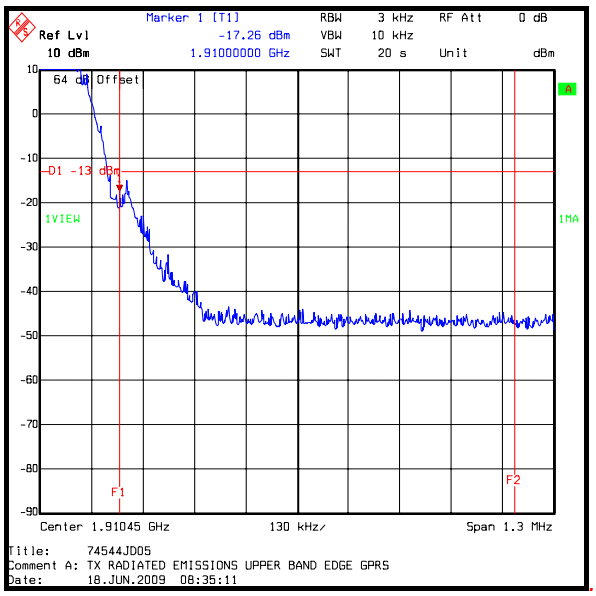
Results: GPRS - Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1850	-17.9	-13.0	4.9	Complied

Results: GPRS - Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1910	-17.3	-13.0	4.3	Complied





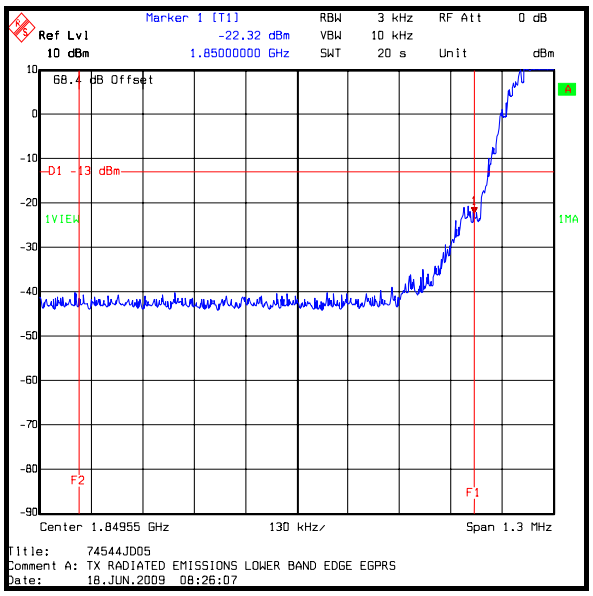
Transmitter Radiated Emissions at Band Edges (continued)

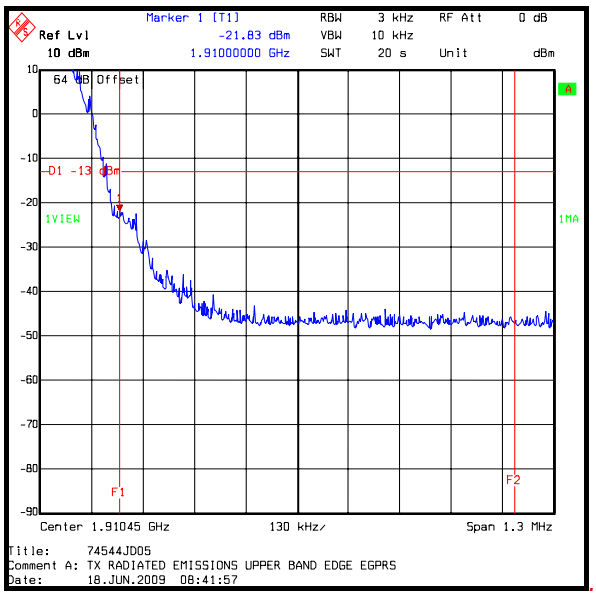
Results: EGPRS - Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1850	-22.3	-13.0	9.3	Complied

Results: EGPRS - Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dBm)	Result
1910	-21.8	-13.0	8.8	Complied





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
Effective Radiated Power (ERP)	Not applicable	95%	±2.94 dB
Effective Isotropic Radiated Power (EIRP)	Not applicable	95%	±2.94 dB
Frequency Stability	Not applicable	95%	±0.92 ppm
Occupied Bandwidth	824 to 849 MHz	95%	±0.92 ppm
Radiated Spurious Emissions	30 MHz to 26 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 Last Calibrated	Cal. Interval (Months)
A1299	Antenna	Schaffner	CBL6143	5094	13 Aug 2009	12
A1368	Directional Coupler	Pasternack Enterprises.	PE2214-10	None	Calibrated before use	12
A1391	Attenuator	Huber + Suhner	757987	6810.17.B	Calibrated before use	-
A1392	Attenuator	Huber + Suhner	757456	6820.17.B	Calibrated before use	-
A1534	Pre Amplifier	Hewlett Packard	8449B OPT H02	3008A00405	Calibrated before use	-
A1818	Antenna	EMCO	3115	00075692	25 Oct 2008	12
A1933	High Pass Filter	AtlanTEC RF	AFH-03000	30R-JFBN07	25 Oct 2009	12
A436	Antenna	Flann	20240-20	330	24 Apr 2007	36
E0516	Environmental Chamber	TAS	LT1000	23880706	Calibrated before use	-
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	01 Sep 2009	12
L0990	Comms Test Set	R&S	CMU 200	S220447	18 Feb 2009	12
M1068	Thermometer	Iso-Tech	RS55	93102884	09 Jul 2009	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	09 Mar 2009	12
M1242	Spectrum Analyser	Rohde & Schwarz	FSEM30	845986/022	09 Dec 2008	12
M1269	Multimeter	Fluke	179	90250210	09 Apr 2009	12

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