

TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: iCon451

To: FCC Part 24: 2008 Subpart E

Test Report Serial No:
RFI/RPT1/RP74528JD14A

This Test Report Is Issued Under The Authority Of Brian Watson, Operations Director:	
	
Checked By:	Nigel Davison
	
Date of Issue:	02 April 2009

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1. Customer Information

Company Name:	Option nv
Address:	Option Headquarters Gaston Geenslaan 14 3001 Leuven Belgium

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR24
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2008: Part 24 Subpart E (Personal Communication Services)
Site Registration:	FCC: 209735
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	29 January 2009 to 21 March 2009

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Port Type	Result
FCC Part 15: Section 15.107	Idle Mode AC Conducted Spurious Emissions	AC Mains	
FCC Part 15: Section 15.109	Idle Mode Radiated Spurious Emissions	Enclosure	
FCC Part 15: Section 15.207	Transmitter AC Conducted Spurious Emissions	AC Mains	
FCC Part 24: Section 24.232	Transmitter Equivalent Isotropic Radiated Power (EIRP)	Antenna	
FCC Part 24: Section 24.235	Transmitter Frequency Stability (Temperature & Voltage Variation)	Antenna	
FCC Part 24: Section 2.1049/24.238	Transmitter Occupied Bandwidth	Antenna	
FCC Part 24: Section 2.1053/24.238	Transmitter Out of Band Radiated Emissions	Antenna	
FCC Part 2: Section 2.1053/24.238	Transmitter Band Edge Radiated Emissions	Antenna	

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 (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.
Reference:	None stated
Title:	FCC SAR Measurement Procedures for 3G Devices October 2007 (Revised)
Reference:	3GPP TS 34.121-1 V8.6.0 (2009-03)
Title:	Universal Mobile Telecommunications System (UMTS); User Equipment (UE) conformance specification; Radio transmission and reception (FDD); Part 1: Conformance specification (3GPP TS 34.121-1 version 8.6.0 Release 8)

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)

Description:	USB modem
Brand Name:	Option nv
Model Name or Number:	iCON451
Serial Number:	Not stated
IMEI Number(s):	004401441081664 004401441088271 004401441080963
FCC ID Number:	NCMOGI0451

3.2. Description of EUT

The equipment under test was a quad band GSM/GPRS/EGPRS/UMTS USB modem.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Technology Tested:	UMTS		
Type of Radio Device:	HSPA USB Modem		
Mode:	UMTS Band V Circuit switched, HSDPA and HSUPA		
Modulation Type:	16QAM and QPSK		
Channel Spacing:	5 MHz		
Power Supply Requirement(s):	Nominal	5.0 V	
	Minimum	4.25 V	
	Maximum	5.75 V	
Maximum Output Power (EIRP):	25.8 dBm		
Transmit Frequency Range:	1850 to 1910 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	9262	1852.4
	Middle	9400	1880.0
	Top	9538	1907.6
Receive Frequency Range:	1930 to 1990 MHz		
Receive Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	9662	1932.4
	Middle	9800	1960.0
	Top	9938	1987.6

3.5. Support Equipment

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

Description:	Laptop PC
Model Name or Number:	Dell PR04S
Serial Number:	CN-OJ7316-36521-47C-0361
Cable Length and Type:	Not applicable
Connected to Port:	EUT through USB

Description:	100-240V 50-60 Hz AC mains power supply
Model Name or Number:	Dell ADP-65JB B
Serial Number:	CN-OF-8834-48661-55G-OMIR
Cable Length and Type:	AC cable 0.8 metres / DC cable 1.95 metres
Connected to Port:	DC power on laptop PC

Description:	Micro-SD card
Model Name or Number:	Transcend 2GB
Serial Number:	Not applicable
Cable Length and Type:	Not applicable
Connected to Port:	Micro-SD

Description:	3GPP Test USIM
Model Name or Number:	Rohde & Schwarz CRT-Z3
Serial Number:	8952535250010000346F
Cable Length and Type:	Not applicable
Connected to Port:	USIM

Description:	Modified USB cable with power breakout
Model Name or Number:	CoPartner E188601 Type CM
Serial Number:	Not applicable
Cable Length and Type:	3 metres
Connected to Port:	USB

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.
- Tests were performed with the EUT in circuit switched and packet switched HSPA modes as required.

4.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

- Connected to a UMTS Band V system simulator, operating in transceiver mode.
- A test USIM was fitted to the EUT for all tests.
- A Micro-SDRAM card was fitted to the EUT during all tests.
- The EUT was tested connected to and powered from, a USB port on a laptop PC (apart from frequency stability, voltage variation tests). Radiated emissions and ERP measurements were performed with the EUT placed at the same height as the measuring antenna in the centre of the turntable. The laptop was initially positioned in the normal user operating position with the keyboard facing upwards and screen open. Measurements were performed in this configuration. In addition to this, the laptop was placed sideways, left side downwards with the EUT at the opposite end and vertical in the centre of the turntable and the radiated measurements repeated. This was done to maximise any radiated emissions. The highest emissions and ERP were obtained with the laptop placed downwards on it's left side and the EUT at the opposite end facing upwards.
- Transmitter frequency stability (voltage variation) tests were performed with the EUT powered from a modified USB cable at voltage extremes. The USB cable had a breakout enabling the voltage to be supplied from a bench power supply and not the laptop PC. Voltage was monitored with a calibrated voltmeter.
- AC conducted emissions tests were performed with the EUT inserted into the USB port on a laptop PC. The laptop PC power supply AC input was connected to a LISN. A 120 V 60 Hz AC supply was connected to the LISN. The power supply DC output was connected to the laptop PC.

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**5.3. Idle Mode AC Conducted Spurious Emissions****Test Summary:**

FCC Part:	15.107(a)
Test Method Used:	As detailed in ANSI C63.4 Section 7 and relevant annexes
EUT Tested (IMEI):	004401441080963

Environmental Conditions:

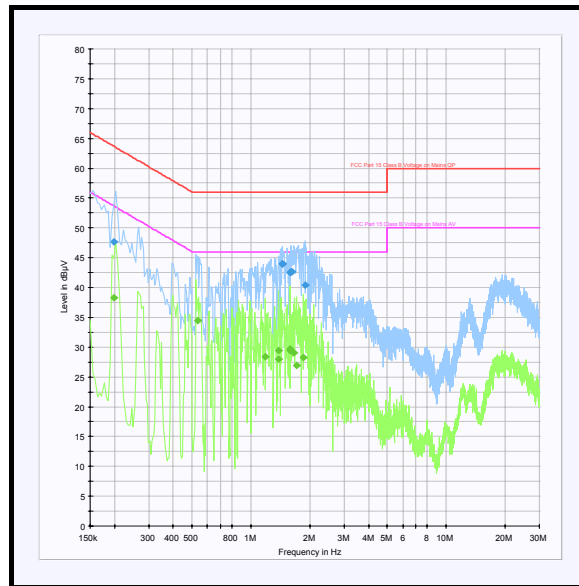
Temperature (°C):	17
Relative Humidity (%):	36

Results: Quasi Peak Detector Measurements

Frequency (MHz)	Line	Quasi Peak Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.199500	Live 1	47.7	63.6	15.9	Complied
1.450500	Neutral	44.0	56.0	12.0	Complied
1.455000	Neutral	43.9	56.0	12.1	Complied
1.581000	Live 1	42.6	56.0	13.4	Complied
1.603500	Live 1	42.7	56.0	13.3	Complied
1.626000	Neutral	42.7	56.0	13.3	Complied
1.887000	Live 1	40.4	56.0	15.6	Complied

Results: Average Detector Measurements

Frequency (MHz)	Line	Average Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.199500	Live 1	38.2	53.6	15.4	Complied
0.532500	Live 1	34.5	46.0	11.5	Complied
1.185000	Neutral	28.4	46.0	17.6	Complied
1.378500	Neutral	28.0	46.0	18.0	Complied
1.387500	Neutral	29.4	46.0	16.6	Complied
1.581000	Neutral	29.4	46.0	16.6	Complied
1.585500	Neutral	29.7	46.0	16.3	Complied
1.648500	Live 1	29.0	46.0	17.0	Complied
1.720500	Live 1	27.0	46.0	19.0	Complied
1.851000	Neutral	28.2	46.0	17.8	Complied

Idle Mode AC Conducted Spurious Emissions (continued)

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

5.4. Idle Mode Radiated Spurious Emissions**Test Summary:**

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes
Frequency Range:	30 MHz to 1000 MHz
EUT Tested (IMEI):	004401441080963

Environmental Conditions:

Temperature (°C):	21
Relative Humidity (%):	33

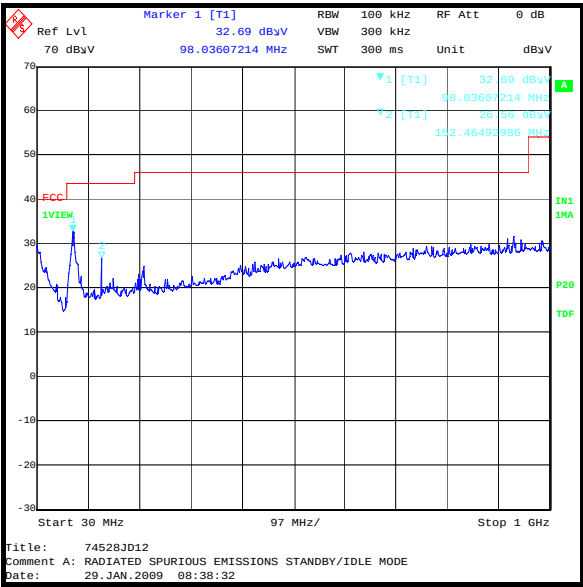
Results:

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
100.020	Horizontal	33.5	43.5	10.0	Complied
153.287	Horizontal	27.5	43.5	16.0	Complied

Note(s):

1. The emission at 100 MHz was investigated and found to be radiating from the EUT. The emission at 153 MHz was investigated and found to be ambient.

Idle Mode Radiated Spurious Emissions (continued)



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

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.4 Section 8 and relevant annexes
Frequency Range:	1 GHz to 12.75 GHz
EUT Tested (IMEI):	004401441080963

Environmental Conditions:

Temperature (°C):	21
Relative Humidity (%):	33

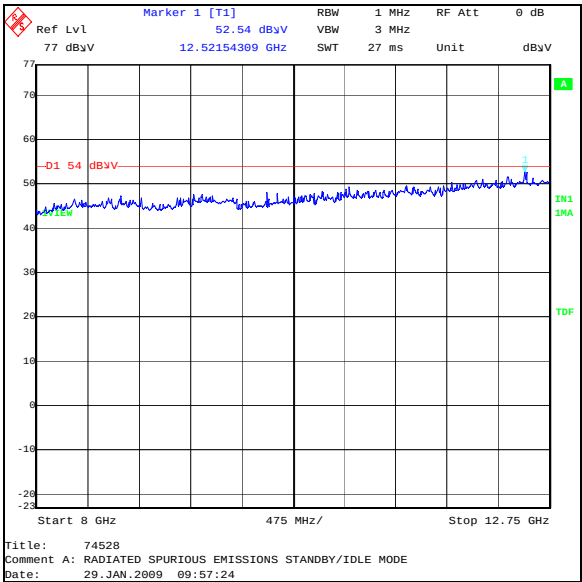
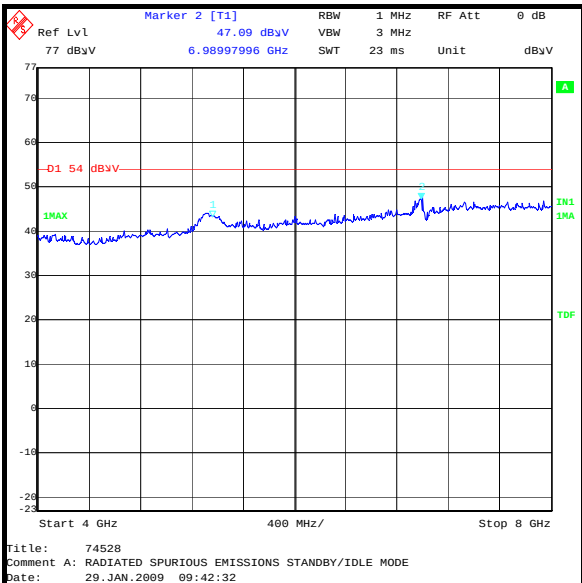
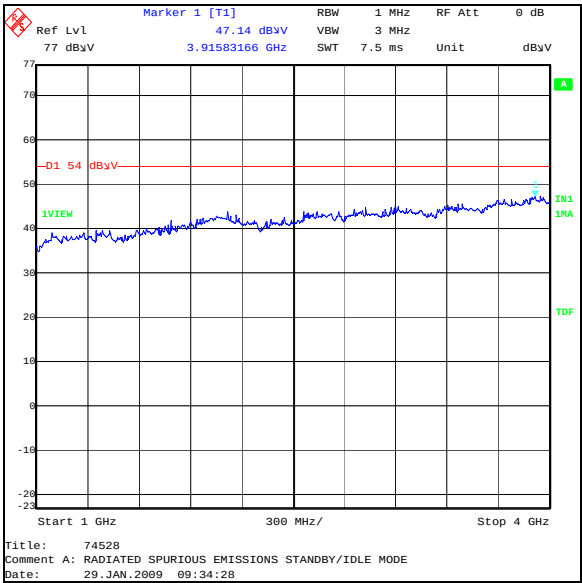
Highest Peak Level:

Frequency (GHz)	Antenna Polarity	Detector Level (dB μ V)	Transducer Factor (dB)	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
12.521	Horizontal	39.6	12.9	52.5	54.0	1.5	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.

Idle Mode Radiated Spurious Emissions (continued)



5.5. Transmitter AC Conducted Spurious Emissions**Test Summary:**

FCC Part:	15.207(a)
Test Method Used:	As detailed in ANSI C63.4 Section 7 and relevant annexes
EUT Tested (IMEI):	004401441088271

Environmental Conditions:

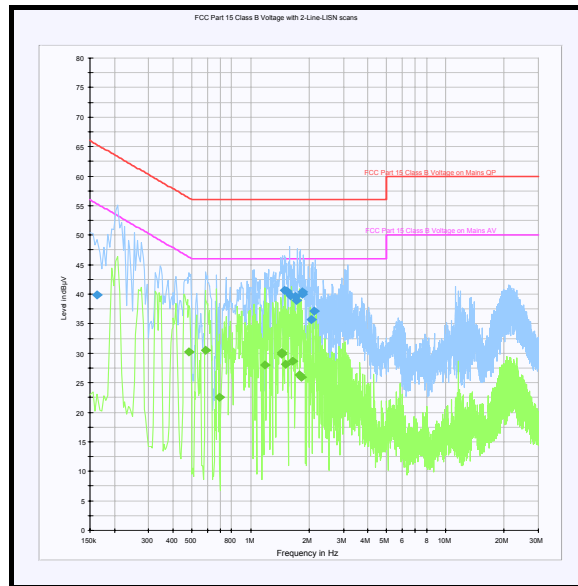
Temperature (°C):	17
Relative Humidity (%):	33

Results: Quasi Peak Detector Measurements

Frequency (MHz)	Line	Quasi Peak Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.163500	Neutral	39.9	65.3	25.5	Complied
1.500000	Neutral	40.7	56.0	15.3	Complied
1.531500	Live 1	40.5	56.0	15.5	Complied
1.603500	Neutral	39.8	56.0	16.2	Complied
1.707000	Live 1	39.6	56.0	16.4	Complied
1.720500	Live 1	38.9	56.0	17.1	Complied
1.842000	Live 1	39.9	56.0	16.1	Complied
1.846500	Neutral	40.4	56.0	15.6	Complied
2.049000	Live 1	35.7	56.0	20.3	Complied
2.112000	Neutral	37.1	56.0	18.9	Complied

Results: Average Detector Measurements

Frequency (MHz)	Line	Average Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.483000	Live 1	30.2	46.3	16.1	Complied
0.591000	Neutral	30.5	46.0	15.5	Complied
0.690000	Live 1	22.5	46.0	23.5	Complied
1.185000	Neutral	28.0	46.0	18.0	Complied
1.446000	Neutral	30.0	46.0	16.0	Complied
1.450500	Live 1	29.9	46.0	16.1	Complied
1.513500	Live 1	28.2	46.0	17.8	Complied
1.644000	Live 1	28.7	46.0	17.3	Complied
1.779000	Live 1	26.3	46.0	19.7	Complied
1.815000	Live 1	25.9	46.0	20.1	Complied

Transmitter AC Conducted Spurious Emissions (continued)

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

5.6. Transmitter Equivalent Isotropic Radiated Power (EIRP)**Test Summary:**

FCC Part:	24.232
Test Method Used:	As detailed in 3GPP TS 34.121-1 V8.6.0 (2009-03) and ANSI TIA-603-C-2004 Section 2
EUT Tested (IMEI):	004401441088271

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	23

Results: Peak EIRP

Mode		HSDPA							
Sub-test		1	2	3	4	RMC 12.2kbps			
Band	Channel	Power (dBm) Peak	Power (dBm) Peak	Power (dBm) Peak	Power (dBm) Peak	Power (dBm) Peak	Peak Limit (dBm)	Margin	Result
1900	9262	24.5	24.4	24.8	25.4	24.8	33.0	8.2	Complied
	9400	23.9	24.3	25.0	24.6	24.0	33.0	8.0	Complied
	9538	25.9	25.3	25.3	25.7	24.8	33.0	7.1	Complied
β_c		2	12	15	15				
β_d		15	15	8	4				
$\Delta ACK, \Delta NACK, \Delta CQI$		8	8	8	8				

Results: Average EIRP

Mode		HSDPA							
Sub-test		1	2	3	4	RMC 12.2kbps			
Band	Channel	Power (dBm) Avg.	Power (dBm) Avg.	Power (dBm) Avg.	Power (dBm) Avg.	Power (dBm) Avg.	Peak Limit (dBm)	Margin	Result
1900	9262	20.9	20.1	20.2	20.7	21.3	33.0	11.7	Complied
	9400	20.3	20.0	19.8	19.9	20.3	33.0	12.7	Complied
	9538	20.7	20.7	20.6	20.7	21.2	33.0	11.8	Complied
β_c		2	12	15	15				
β_d		15	15	8	4				
$\Delta ACK, \Delta NACK, \Delta CQI$		8	8	8	8				

Transmitter Effective Isotropic Radiated Power (EIRP) (continued)**Results: Peak EIRP**

Mode		HSUPA							
Sub-test		1	2	3	4	5			
Band	Channel	Power (dBm) Peak	Power (dBm) Peak	Power (dBm) Peak	Power (dBm) Peak	Power (dBm) Peak	Peak Limit (dBm)	Margin	Result
1900	9262	24.8	24.6	25.3	24.9	25.1	33.0	7.7	Complied
	9400	24.2	23.9	23.7	24.1	24.1	33.0	8.8	Complied
	9538	25.8	25.3	25.0	24.7	25.1	33.0	7.2	Complied
β_c		11	6	15	2	15			
β_d		15	15	9	15	15			

Results: Average EIRP

Mode		HSUPA							
Sub-test		1	2	3	4	5			
Band	Channel	Power (dBm) Avg.	Power (dBm) Avg.	Power (dBm) Avg.	Power (dBm) Avg.	Power (dBm) Avg.	Peak Limit (dBm)	Margin	Result
1900	9262	20.7	20.7	20.5	20.8	20.8	33.0	12.2	Complied
	9400	20.0	20.2	19.1	20.3	19.7	33.0	12.7	Complied
	9538	21.3	21.4	21.0	21.1	20.4	33.0	11.6	Complied
β_c		11	6	15	2	15			
β_d		15	15	9	15	15			

Note(s):

1. All modes were compared on each channel and the highest power recorded was subtracted from the limit to show the margin.
2. The EUT was tested in circuit switched mode and packet switched HSPA modes.
3. Measurements were performed with the test antenna in the vertical and horizontal planes. The highest level was recorded.
4. The average readings were performed for information only. As there is no average limit, the results were compared against the peak limit.

5.7. Transmitter Frequency Stability (Temperature 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
EUT Tested (IMEI):	004401441088271

Environmental Conditions:

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

Results: Bottom Channel (1852.4 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-30	37	1852.400037	1850.0	2.400037	Complied
-20	39	1852.400039	1850.0	2.400039	Complied
-10	36	1852.400036	1850.0	2.400036	Complied
0	26	1852.400026	1850.0	2.400026	Complied
10	36	1852.400036	1850.0	2.400036	Complied
20	-33	1852.399967	1850.0	2.399967	Complied
30	-28	1852.399972	1850.0	2.399972	Complied
40	-36	1852.399964	1850.0	2.399964	Complied
50	-30	1852.399970	1850.0	2.399970	Complied

Results: Top Channel (1907.6 MHz)

Temperature (°C)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-30	31	1907.600031	1910.0	2.399969	Complied
-20	38	1907.600038	1910.0	2.399962	Complied
-10	-41	1907.599959	1910.0	2.400041	Complied
0	28	1907.600028	1910.0	2.399972	Complied
10	44	1907.600044	1910.0	2.399956	Complied
20	33	1907.600033	1910.0	2.399967	Complied
30	-32	1907.599968	1910.0	2.400032	Complied
40	35	1907.600035	1910.0	2.399965	Complied
50	-41	1907.599959	1910.0	2.400041	Complied

5.8. 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
EUT Tested (IMEI):	004401441088271

Environmental Conditions:

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

Bottom Channel (1852.4 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
4.25	-33	1852.399967	1850.0	2.399967	Complied
5.75	-28	1852.399972	1850.0	2.399972	Complied

Bottom Channel (1907.6 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
4.25	-36	1907.599964	1910.0	2.400036	Complied
5.75	38	1907.600038	1910.0	2.399962	Complied

5.9. Transmitter Occupied Bandwidth

Test Summary:

FCC Part:	24.238
Test Method Used:	As detailed in ANSI C63.4 Section 13.1.7 and relevant annexes referencing FCC CFR Part 2.1049 (see note below)
EUT Tested (IMEI):	004401441088271

Environmental Conditions:

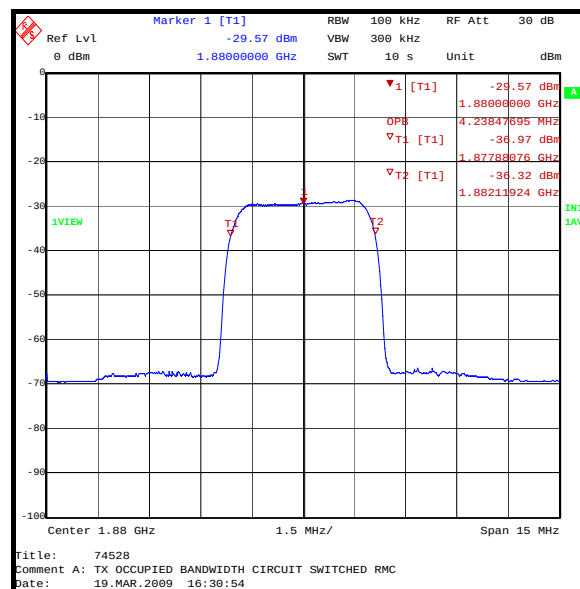
Temperature (°C):	25
Relative Humidity (%):	23

Results: Circuit Switched / RMC

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1880.0	4238.477

Note(s):

- 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.

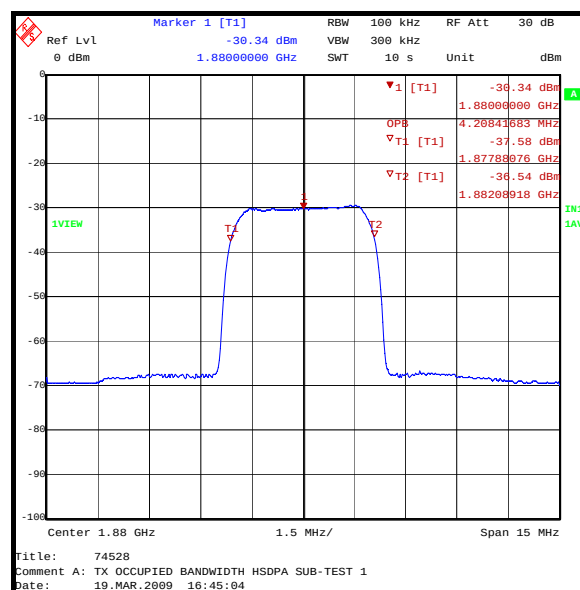


Transmitter Occupied Bandwidth (continued)**Results: HSDPA 1**

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1880.0	4208.417

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.

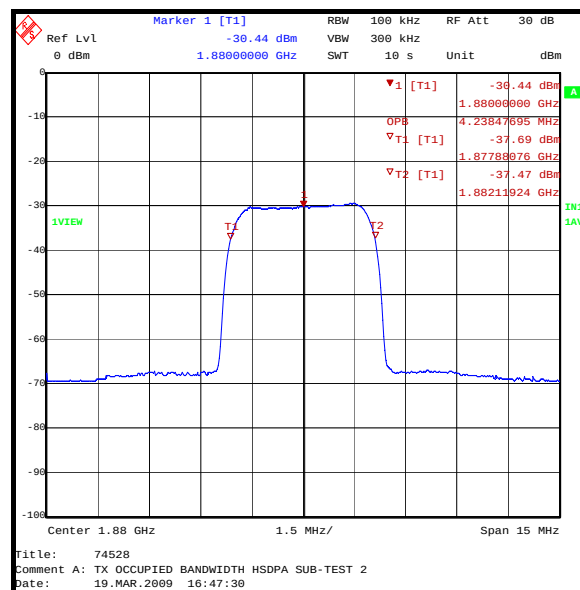


Transmitter Occupied Bandwidth (continued)**Results: HSDPA 2**

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1880.0	4238.477

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.

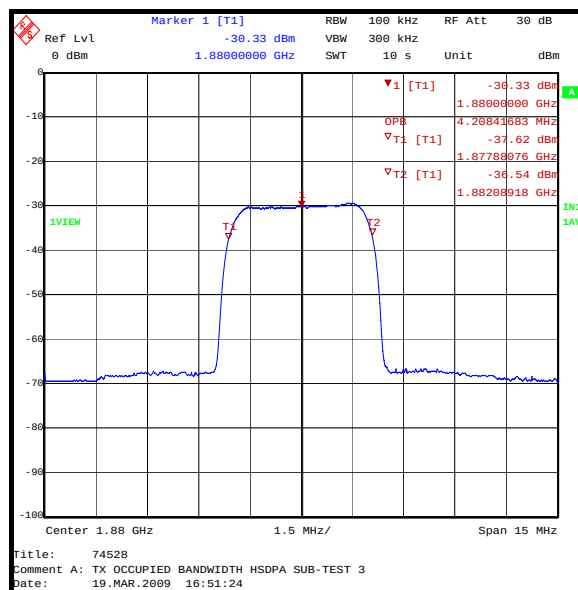


Transmitter Occupied Bandwidth (continued)**Results: HSDPA 3**

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1880.0	4208.417

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.

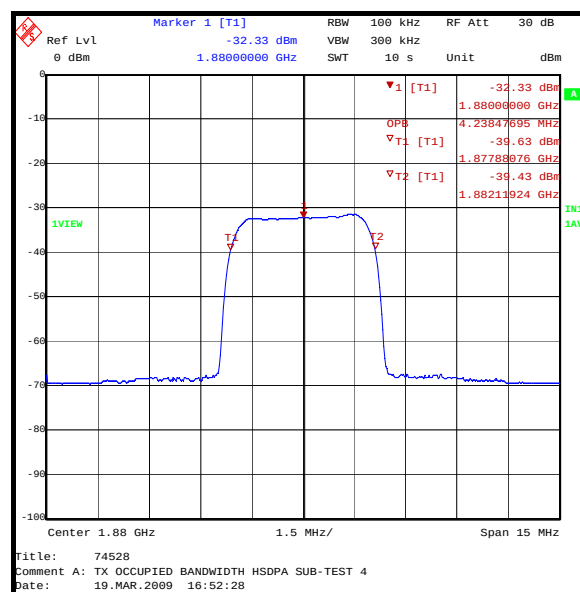


Transmitter Occupied Bandwidth (continued)**Results: HSDPA 4**

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1880.0	4238.477

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.

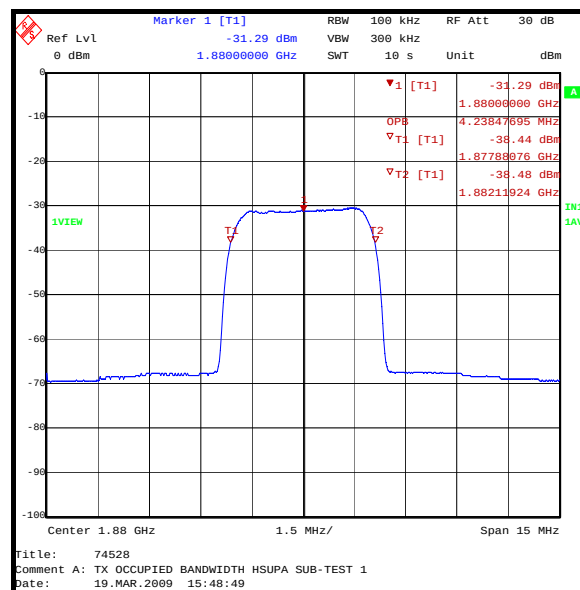


Transmitter Occupied Bandwidth (continued)**Results: HSUPA 1**

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1880.0	4238.477

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.

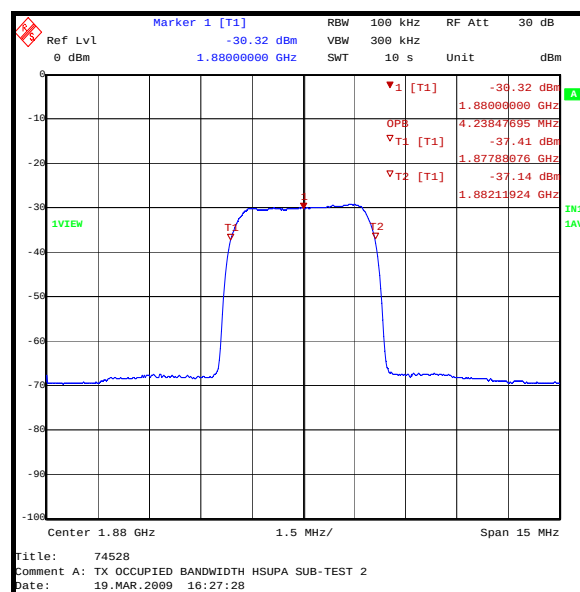


Transmitter Occupied Bandwidth (continued)**Results: HSUPA 2**

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1880.0	4238.477

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.

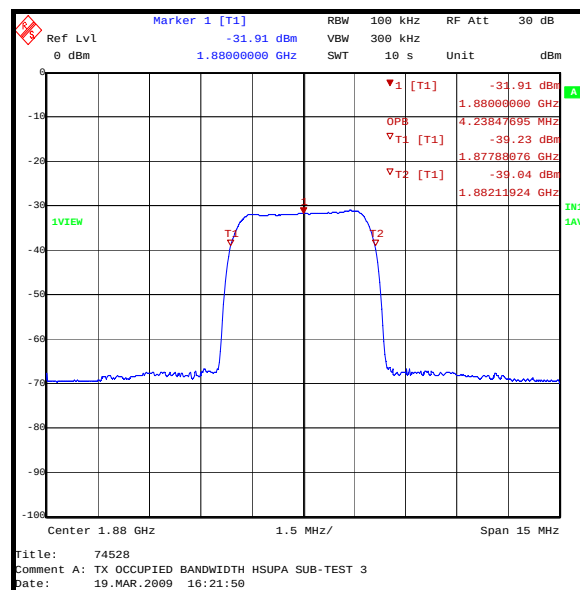


Transmitter Occupied Bandwidth (continued)**Results: HSUPA 3**

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1880.0	4238.477

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.

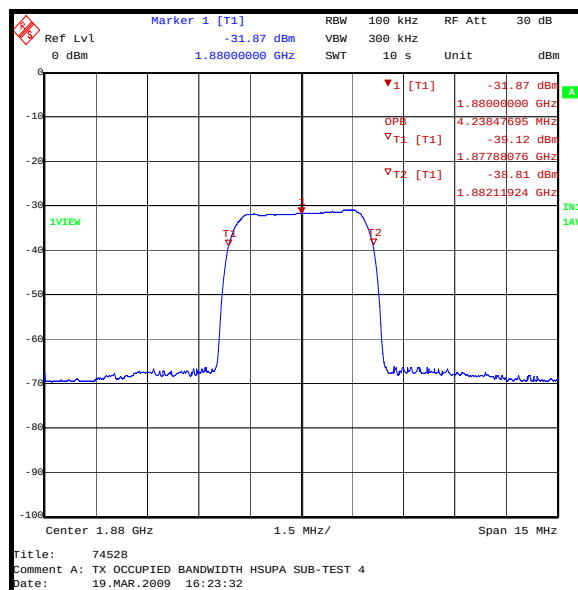


Transmitter Occupied Bandwidth (continued)**Results: HSUPA 4**

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1880.0	2438.477

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.

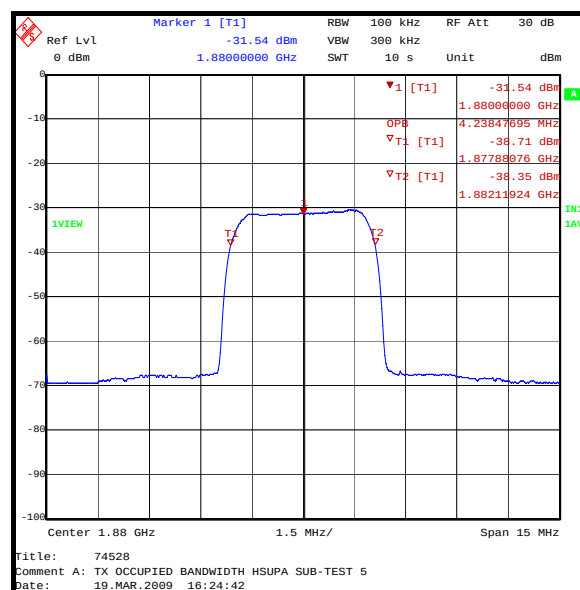


Transmitter Occupied Bandwidth (continued)**Results: HSUPA 5**

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	1880.0	2438.477

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.



5.10. Transmitter Out of Band Radiated Emissions

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
EUT Tested (IMEI):	004401441088271

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	23

Note(s):

1. The carrier is shown on the 1 GHz to 4 GHz plot at approximately 1907.8 MHz.
2. Pre-scans were performed in HSUPA Sub-test 1/H-Set 1 QPSK as this combination produced the highest EIRP. Final measurements were performed in HSUPA Sub-test 1 mode/H-Set 1 QPSK, HSUPA Sub-test 1 mode/H-Set 1 16QAM, circuit switched RMC 12.2 kbps with HSDPA and circuit switched voice modes.
3. The emission shown at approximately 6.997 GHz was investigated and found to be ambient.
4. Measurements were performed with the test antenna in the vertical and horizontal planes. The highest level was recorded.

Results: Bottom Channel HSUPA and QPSK modulation

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3706.212	19.5	-13.0	6.5	Complied

Results: Middle Channel HSUPA and QPSK modulation

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3761.713	-20.6	-13.0	7.6	Complied

Results: Top Channel HSUPA and QPSK modulation

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3813.417	-18.2	-13.0	5.2	Complied

Transmitter Out of Band Radiated Emissions (continued)**Result: Bottom Channel HSUPA and 16QAM modulation**

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3706.212	19.5	-13.0	6.5	Complied

Results: Middle Channel HSUPA and 16QAM modulation

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3761.713	-20.6	-13.0	7.6	Complied

Results: Top Channel HSUPA and 16QAM modulation

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3813.417	-18.2	-13.0	5.2	Complied

Result: Bottom Channel Circuit switched / RMC 12.2 kbps with HSDPA

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3706.212	19.5	-13.0	6.5	Complied

Results: Middle Channel Circuit switched / RMC 12.2 kbps with HSDPA

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3761.713	-20.7	-13.0	7.7	Complied

Results: Top Channel Circuit switched / RMC 12.2 kbps with HSDPA

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3813.417	-18.5	-13.0	5.5	Complied

Transmitter Out of Band Radiated Emissions: Section 2.1053/24.238 (continued)**Result: Bottom Channel Circuit switched / Voice**

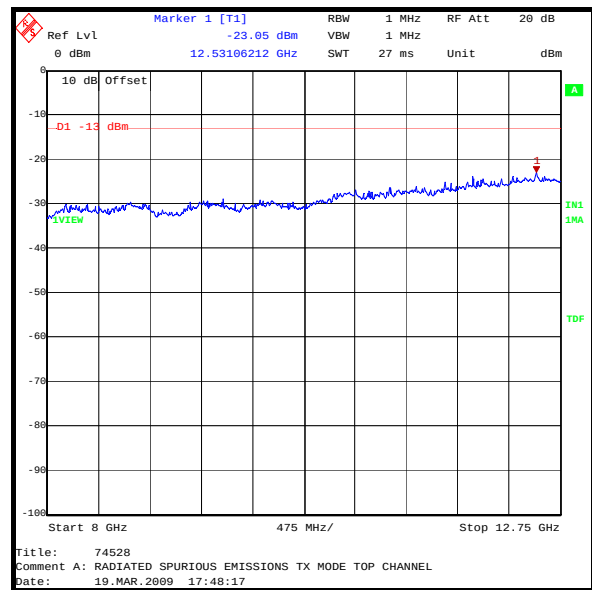
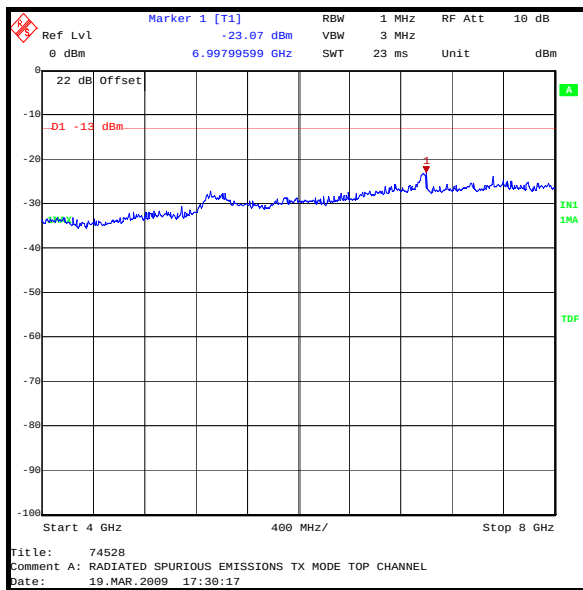
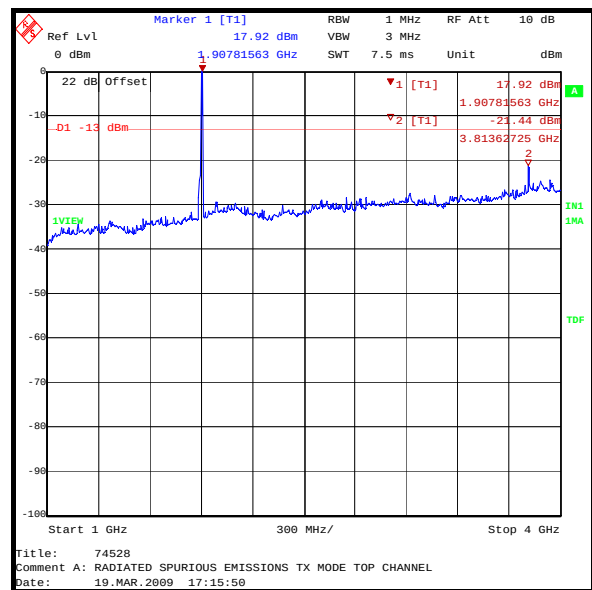
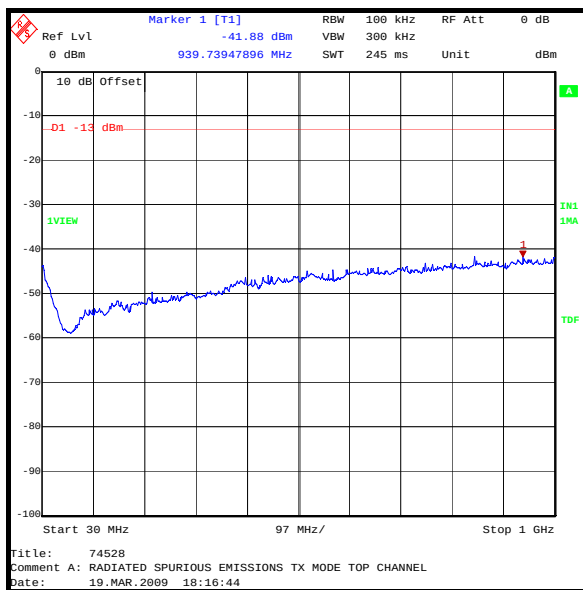
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3706.212	20.8	-13.0	7.8	Complied

Results: Middle Channel Circuit switched / Voice

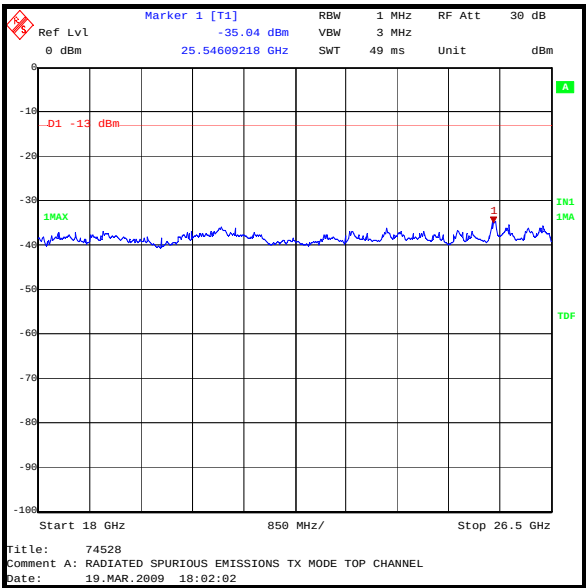
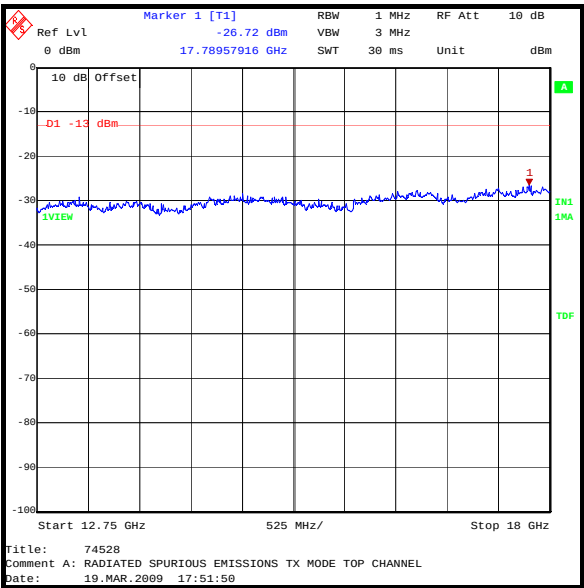
Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3761.713	-22.2	-13.0	9.2	Complied

Results: Top Channel Circuit switched / Voice

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
3813.417	-18.8	-13.0	5.8	Complied

Transmitter Out of Band Radiated Emissions (continued)

Transmitter Out of Band Radiated Emissions (continued)



Transmitter Out of Band Radiated Emissions (continued)**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
EUT Tested (IMEI):	004401441088271

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	23

Note(s):

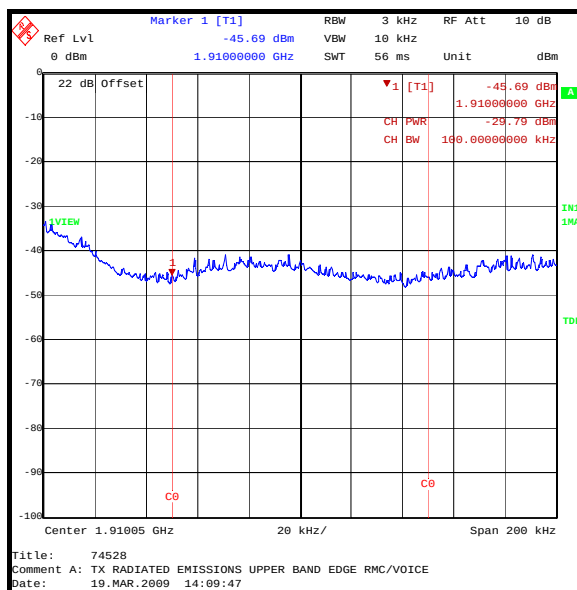
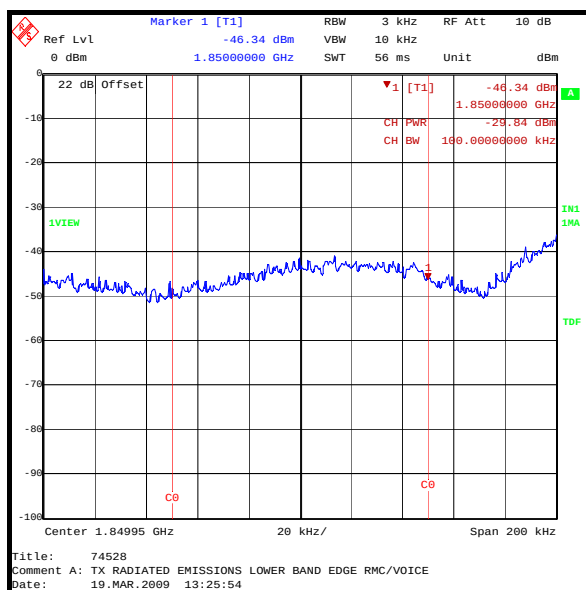
- The band edge result was obtained by integrating a 100 kHz strip immediately adjacent to the band edge using a channel power function of the measurement analyser.

Results: Circuit Switched / RMC. Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-29.8	-13.0	16.8	Complied

Results: Circuit Switched / RMC. Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-29.8	-13.0	16.8	Complied

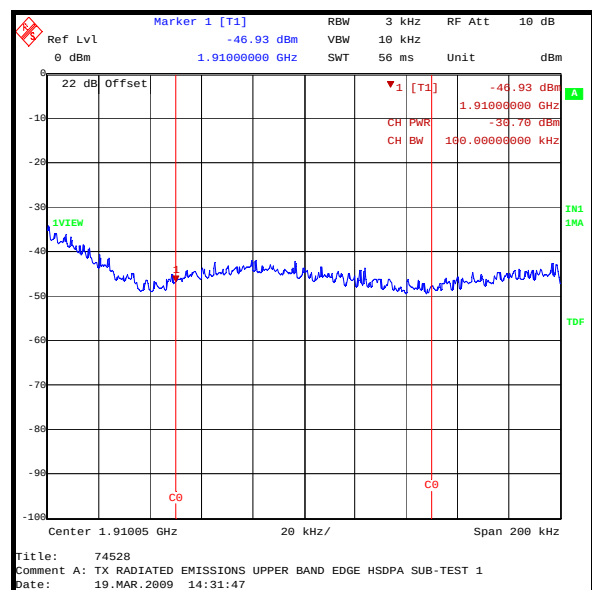
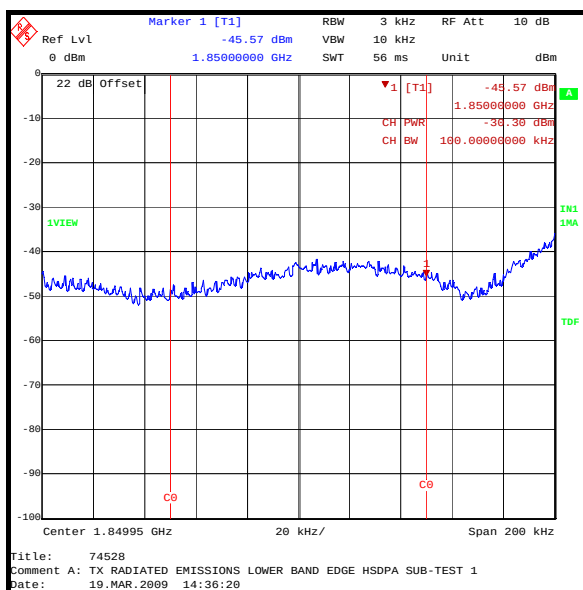


Transmitter Out of Band Radiated Emissions (continued)**Results: HSDPA Sub-test 1. Bottom Band Edge**

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-30.3	-13.0	17.3	Complied

Results: HSDPA Sub-test 1. Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-30.7	-13.0	17.7	Complied

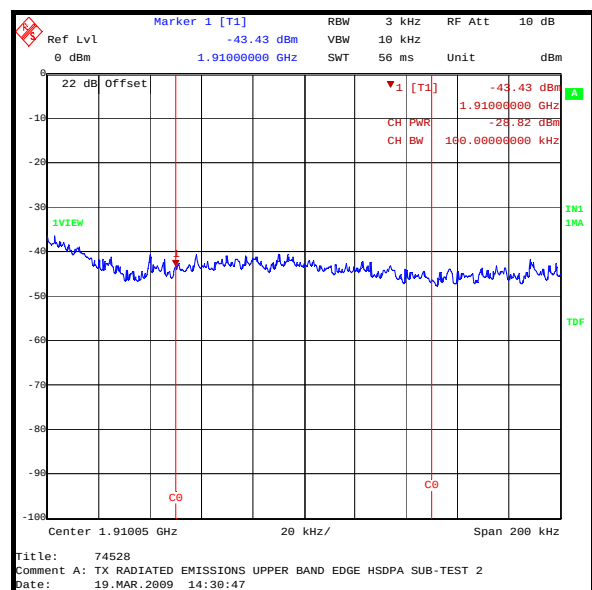
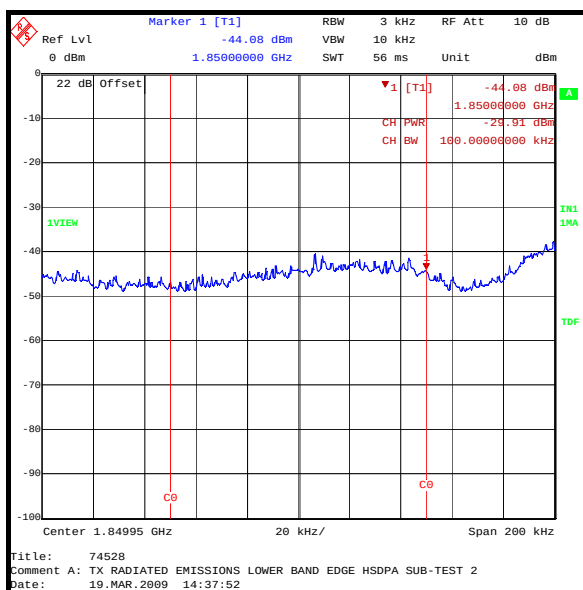


Transmitter Out of Band Radiated Emissions (continued)**Results: HSDPA 2 Sub-test 2. Bottom Band Edge**

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-29.9	-13.0	16.9	Complied

Results: HSDPA 2 Sub-test 2. Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-28.8	-13.0	15.8	Complied



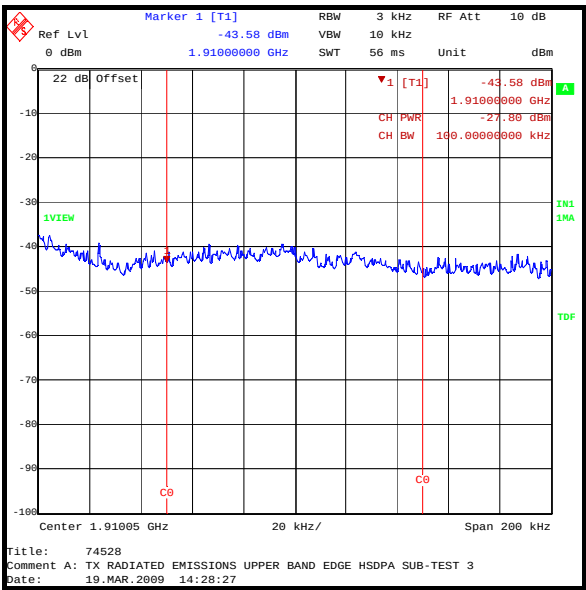
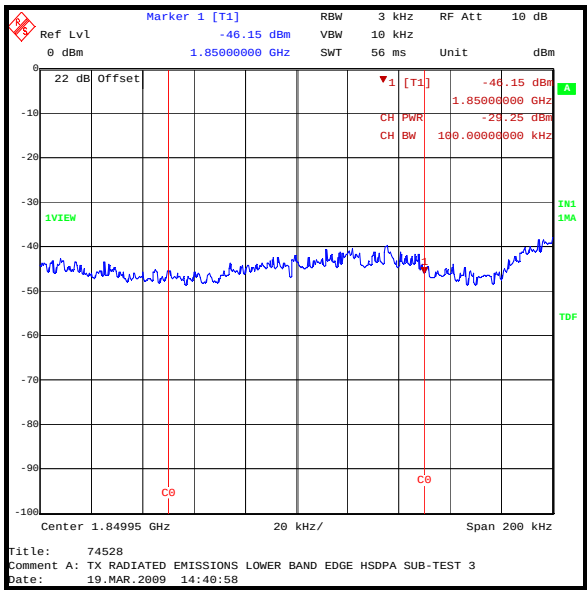
Transmitter Out of Band Radiated Emissions (continued)

Results: HSDPA Sub-test 3. Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-29.3	-13.0	16.3	Complied

Results: HSDPA Sub-test 3. Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-27.8	-13.0	14.8	Complied

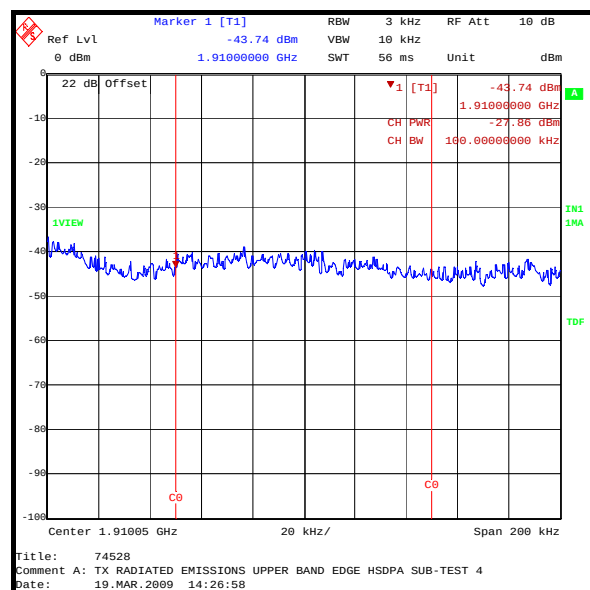
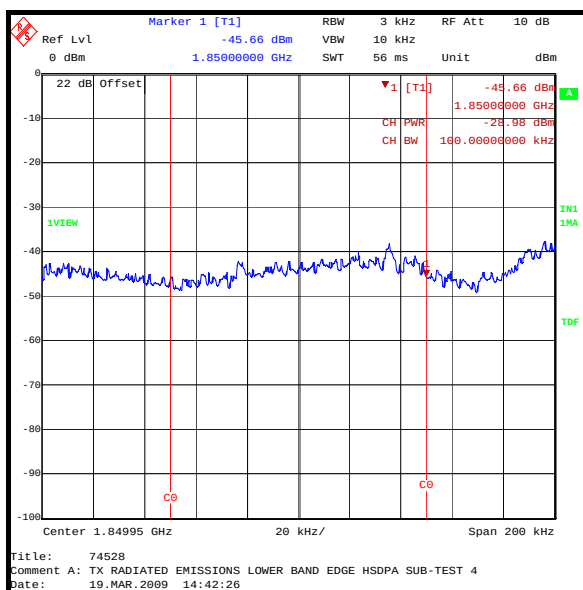


Transmitter Out of Band Radiated Emissions (continued)**Results: HSDPA Sub-test 4. Bottom Band Edge**

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-29.0	-13.0	16.0	Complied

Results: HSDPA Sub-test 4. Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-27.8	-13.0	14.8	Complied

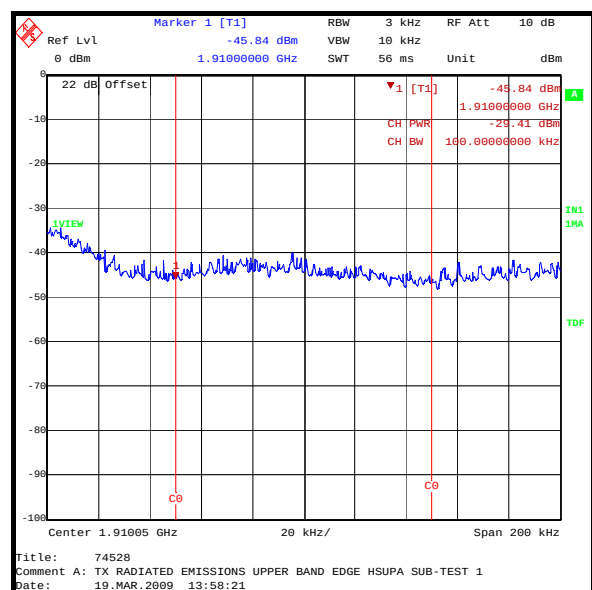
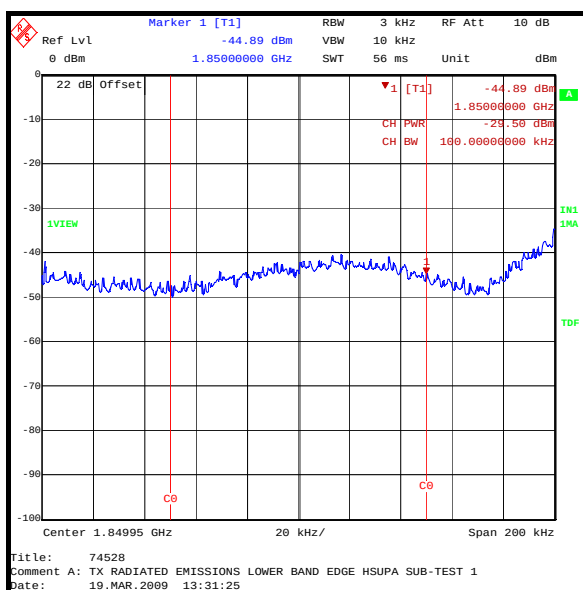


Transmitter Out of Band Radiated Emissions (continued)**Results: HSUPA Sub-test 1. Bottom Band Edge**

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-29.5	-13.0	16.5	Complied

Results: HSUPA Sub-test 1. Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-29.4	-13.0	16.4	Complied

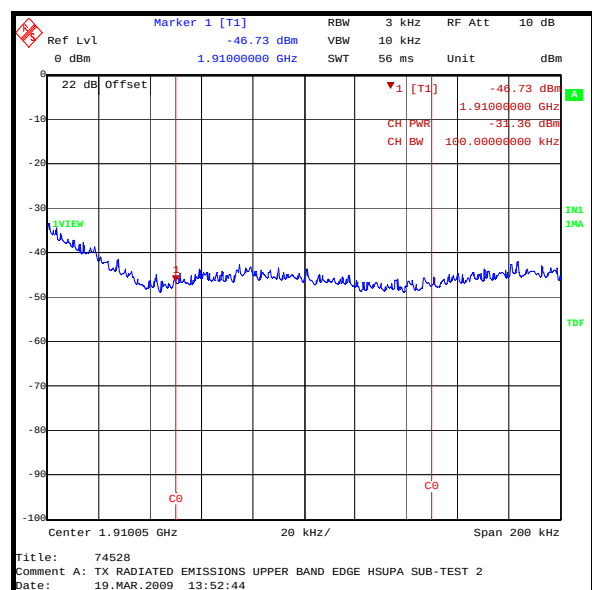
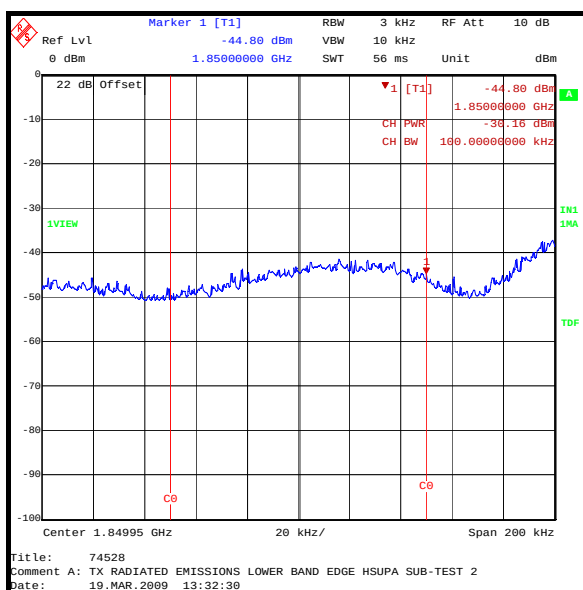


Transmitter Out of Band Radiated Emissions (continued)**Results: HSUPA Sub-test 2. Bottom Band Edge**

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-30.2	-13.0	17.2	Complied

Results: HSUPA Sub-test 2. Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-31.4	-13.0	18.4	Complied

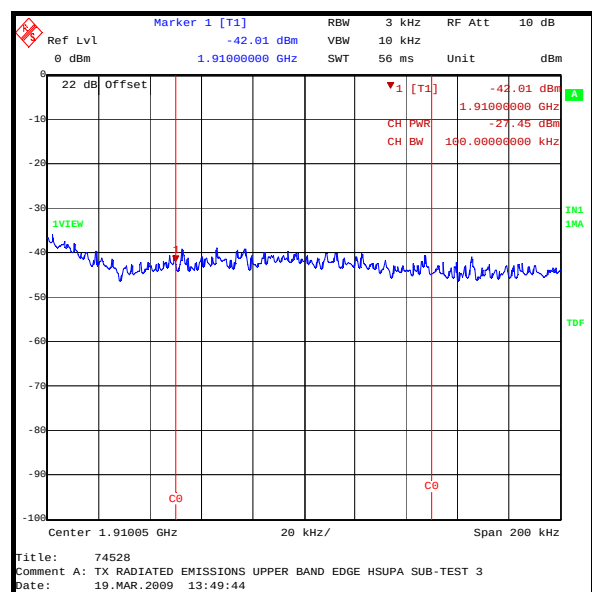
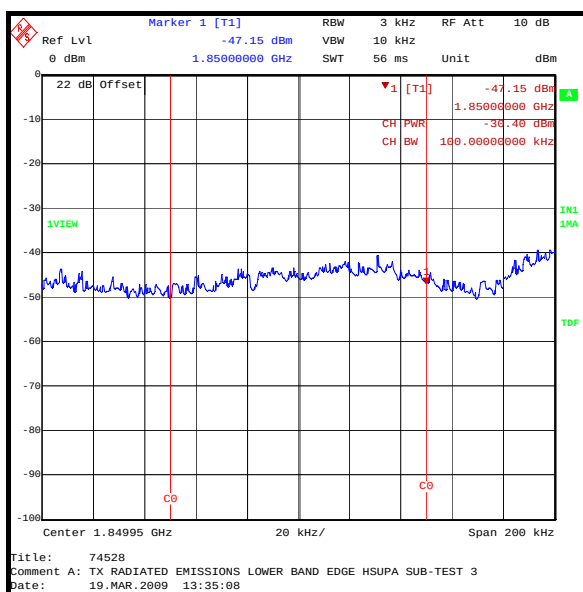


Transmitter Out of Band Radiated Emissions (continued)**Results: HSUPA Sub-test 3. Bottom Band Edge**

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-30.4	-13.0	17.4	Complied

Results: HSUPA Sub-test 3. Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-27.5	-13.0	14.5	Complied



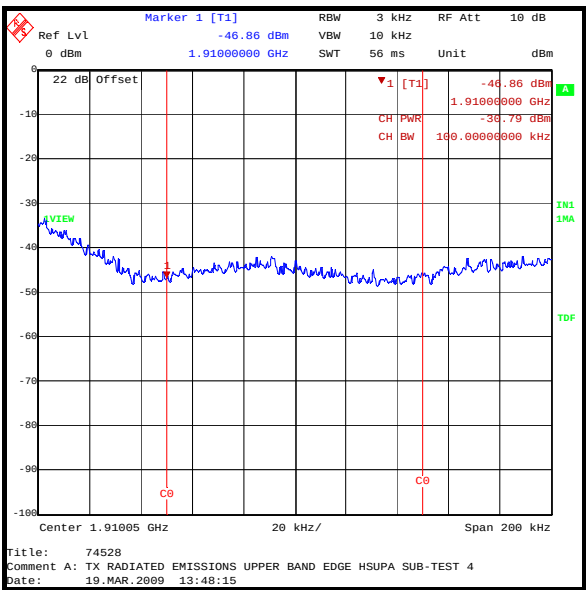
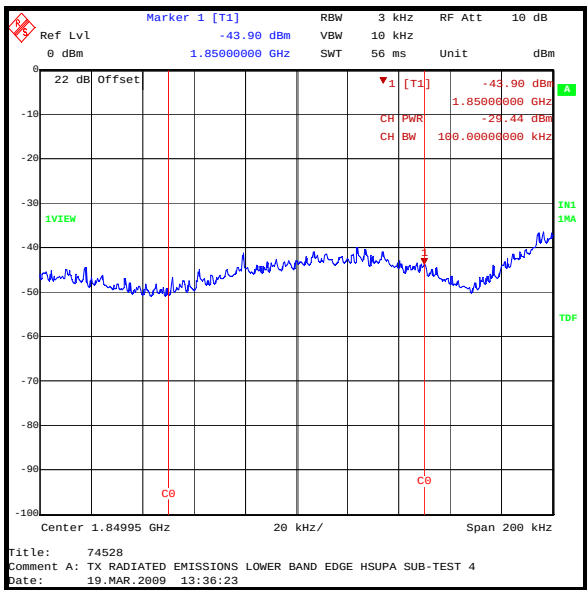
Transmitter Out of Band Radiated Emissions (continued)

Results: HSUPA Sub-test 4. Bottom Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-29.4	-13.0	16.4	Complied

Results: HSUPA Sub-test 4. Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-30.8	-13.0	17.8	Complied

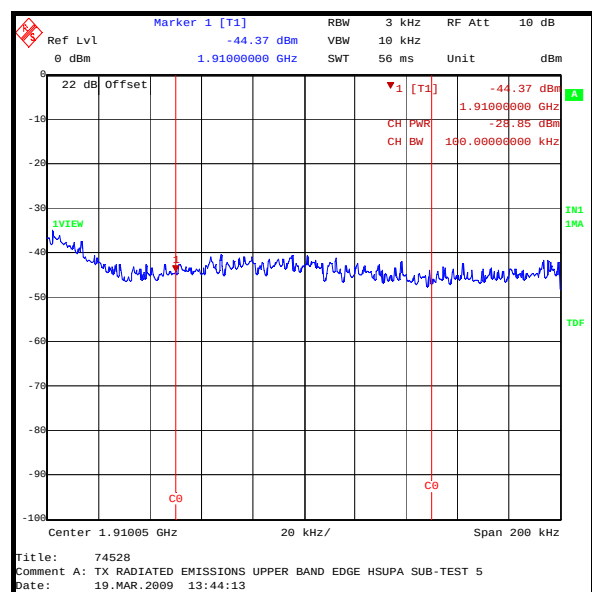
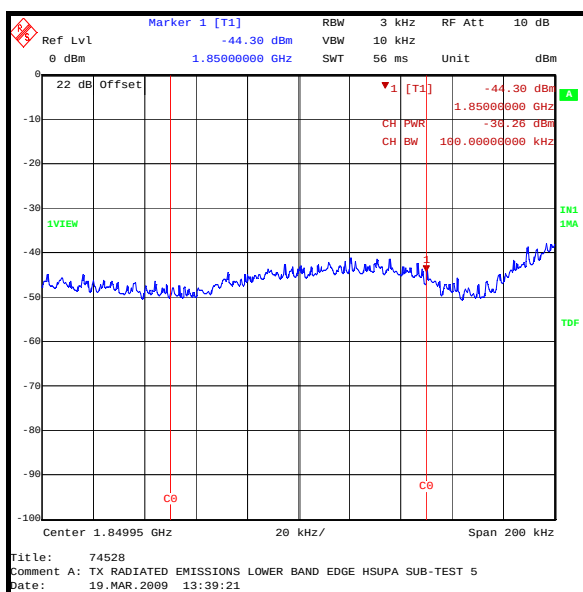


Transmitter Out of Band Radiated Emissions (continued)**Results: HSUPA Sub-test 5. Bottom Band Edge**

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-30.3	-13.0	17.3	Complied

Results: HSUPA Sub-test 5. Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-28.9	-13.0	15.9	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
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.72 dB
Effective Isotropic Radiated Power (EIRP)	1850 to 1910 MHz	95%	±2.94 dB
Frequency Stability	1850 to 1910 MHz	95%	±11.4 ppm
Occupied Bandwidth	1850 to 1910 MHz	95%	±11.4 ppm
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±4.64 dB
Radiated Spurious Emissions	1 GHz 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)
A004	Line Impedance Stabilization Network	Rohde & Schwarz	ESH3-Z5	890604/027	19 May 2008	12
A1299	Antenna	Schaffner	CBL6143	5094	28 Jul 2008	12
A1394	Attenuator	HUBER + SUHNER AG	753459	6806.17.B	Calibrated before use	-
A1396	Attenuator	HUBER + SUHNER AG	757987	6810.17.B	Calibrated before use	-
A1524	Garminetrex GPS	Garmin	None Stated	None Stated	Calibration not required	-
A1534	Pre Amplifier	Hewlett Packard	8449B OPT H02	3008A00405	Calibrated before use	-
A1818	Antenna	EMCO	3115	00075692	25 Oct 2008	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	05 Jan 2009	12
A239	Attenuator	Schaffner	6806-17-B	NONE	Calibration not required	-
E013	Environmental Chamber	Sanyo	ATMOS chamber	None	Calibrated before use	-
K0002	Site Reference 4421	Rainford EMC	N/A	N/A	Calibration not required	-
K0004	Site Reference 4428	RFI Global Services Ltd	N/A	N/A	Calibration not required	-
K0008	Site Reference 4422	RFI Global Services Ltd	N/A	N/A	Calibration not required	-
L0991	CMU 200	R&S	CMU200	111688	Calibration not required	-
M1068	Thermometer	Iso-Tech	RS55	93102884	09 Jul 2008	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	09 Mar 2009	12
M1242	Spectrum Analyser	Rohde & Schwarz, Inc.	FSEM30	845986/022	09 Dec 2008	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	16 Feb 2009	12
M1269	Multimeter	Fluke	179	90250210	09 Apr 2008	12
M1379	Test Receiver	Rohde and Schwarz	ESIB7	100330	14 Aug 2008	12

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