EMI Test Report

Tested in accordance with
Federal Communications Commission (FCC)
Personal Communications Services
CFR 47, Parts 2, 22 and 24
&
Industry Canada (IC), RSS-GEN, 132 and 133

A division of Research In Motion Limited

REPORT NO.: RTS-6026-1302-28

PRODUCT MODEL NO.:	RFN81UW
TYPE NAME:	BlackBerry® smartphone
FCC ID:	L6ARFN80UW
IC:	2503A-RFN80UW
EMISSION DESIGNATOR (GSM):	246KGXW
EMISSION DESIGNATOR (EDGE):	244KG7W
EMISSION DESIGNATOR (WCDMA):	4M17F9W

DATE: February 28, 2013

RTS is accredited according to EN ISO/IEC 17025 by:

592

Statement of Performance:

The BlackBerry® smartphone, model RFN81UW, part number CER-53015-001 Rev3-905-01 and accessories perform within the requirements of the test standards when configured and operated per RIM's instructions.

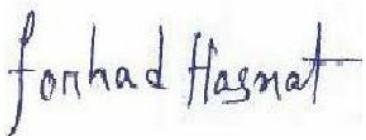
Declaration:

We hereby certify that:
The test data reported herein is an accurate record of the performance of the sample(s) tested.
The test results are valid for the tested unit (s) only.
The test equipment used was suitable for the tests performed and within manufacturer's published specifications and operating parameters.
The test methods were consistent with the methods described in the relevant standards.

Documented by:

Heng. Lin
Regulatory Compliance Specialist

Reviewed by:



Forhad Hasnat
Regulatory Compliance Specialist

Reviewed and Approved by:

Masud S. Attayi, P.Eng.
Manager, Regulatory Compliance

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A. Scope

This report details the results of compliance tests which were performed in accordance to the requirements of:

- FCC CFR 47 Part 2, Oct, 2012.
- FCC CFR 47 Part 22, Subpart H, Cellular Radiotelephone Services, Oct., 2012.
- FCC CFR 47 Part 24 Subpart E, Broadband PCS, Oct., 2012.
- Industry Canada, RSS-132 Issue 3, January 2013, Cellular Telephone Systems Operating in the Bands 824-849 MHz and 869-894 MHz.
- Industry Canada, RSS-133 Issue 6, January 2013, 2 GHz Personal Communications Services.
- Industry Canada, RSS-GEN Issue 3, December 2010, General Requirements and Information for the Certification of Radio communication Equipment.

B. Associated Documents

1. RFN81UW_HW_Declaration_CER-53015-001_Rev3-905-01
2. MultiSourceDeclaration_RFN81UW_b3901
3. Test report 1-5579/12-01-02-A

C. Product Identification

Manufactured by Research In Motion Limited whose headquarters is located at:
295 Phillip Street
Waterloo, Ontario
Canada, N2L 3W8
Phone: 519 888 7465
Fax: 519 888 6906

The equipment under test (EUT) was tested at the following locations:

RIM Testing Services EMI test facilities

305 Phillip Street	440 Phillip Street
Waterloo, Ontario	Waterloo, Ontario,
Canada, N2L 3W8	Canada , N2L 5R9
Phone: 519 888 7465	Phone: 519 888 7465
Fax: 519 888 6906	Fax: 519 888 6906

The testing was performed from November 27, 2012 to January 29, 2013.

BlackBerry® smartphone Samples Tested

Sample	Model	CER NUMBER	PIN	Software Information
1	RFN81UW	CER-52836-001 Rev3-905-01	2AB01FA6	OS: 127.0.1.3901
2	RFN81UW	CER-52836-001 Rev2-905-00	2A76E9A6	OS: 127.0.1.3123
3	RFN81UW	CER-52836-001 Rev3-905-01	2AB01F81	OS: 127.0.1.3901

RF Conducted Emissions testing was performed on samples 1, 2 and 3.

Only the characteristics that may have been affected by the changes from RFN81UW Rev2-905-00 to RFN81UW Rev3-905-01 were re-tested.
For more details, refer to RFN81UW_HW_Declaration_CER-53015-001_Rev3-905-01.

To view the differences between OS: 127.0.1.3123 and OS: 127.0.1.3901 see document MultiSourceDeclaration_RFN81UW_b3901.

BlackBerry® smartphone Accessories Tested

1) Battery, part number BAT-49702-002, capacity 1800mAh, 6.9Wh
2) Battery, part number BAT-52961-001, capacity 2100mAh, 8.0Wh

D. Support Equipment Used for the Testing of the EUT

No support equipment required; for list of equipment refer to section G, Compliance Test Equipment Used.

E. Test Results Chart

SPECIFICATION		TEST TYPE	RESULT	TEST DATA APPENDIX
FCC CFR 47	IC			
Part 2.1051 Part 22.917 Part 24.238	RSS-Gen, 4.9 RSS-132, 5.5 RSS-133, 6.5	GSM850 / PCS1900 Conducted Spurious Emissions	Pass	1A
Part 2.1049 Part 22.917 Part 24.238	RSS-GEN, 4.6	GSM 850 / PCS1900 Occupied Bandwidth and Channel Mask	Pass	1A
Part 2.1046(a)	RSS-132, 5.4 RSS-133, 6.4	GSM850 / PCS1900 Conducted RF Output Power	Pass	1B
Part 2.1055 Part 24.235	RSS-132, 5.3 RSS-133, 6.3	GSM 850 /PCS 1900 Frequency Stability vs. Temperature and Voltage	Pass	1C
Part 22.913(a)(2) Part 24.232(c)	RSS-132, 5.4 RSS-133, 6.4	GSM850 ERP PCS1900 EIRP	Pass	See Test Report 1-5579/12-01-02-A
Part 2.1053 Part 22.917 Part 24.238	RSS-Gen, 4.9 RSS-132, 5.5 RSS-133, 6.5	GSM850 / PCS1900 Radiated Spurious/Harmonic Emissions	Pass	See Test Report 1-5579/12-01-02-A
Part 2.1051 Part 22.917 Part 24.238	RSS-GEN, 4.9 RSS-132, 5.5 RSS-133, 6.5	WCDMA Band 2/5 Conducted Spurious Emissions	Pass	2A
Part 2.1049 Part 22.917 Part 24.238	RSS-GEN, 4.6	WCDMA Band 2/5 Occupied Bandwidth and Channel Mask	Pass	2A
Part 2.1046(a)	RSS-132, 5.4 RSS-133, 6.4	WCDMA Band 2/5 Conducted RF Output Power	Pass	2B
Part 2.1055(a)(d) Part 24.235	RSS-132, 5.3 RSS-133, 6.3	WCDMA Band 2/5 Frequency Stability vs. Temperature and Voltage	Pass	2C
Part 22.913(a)(2) Part 24.232(c)	RSS-132, 5.4 RSS-133, 6.4	WCDMA Band 5 ERP WCDMA Band 2 EIRP	Pass	See Test Report 1-5579/12-01-02-A
Part 2.1053 Part 22.917 Part 24.238	RSS-GEN, 4.9 RSS-132, 5.5 RSS-133, 6.5	WCDMA Band 2/5 Radiated Spurious/Harmonic Emissions	Pass	See Test Report 1-5579/12-01-02-A

F. Summary of Results

1) Conducted Emission Measurements

- The BlackBerry® smartphone met the requirements of the Tx Conducted Spurious Emissions in the GSM850 as per 47 CFR 2.1051, CFR 22.917, and RSS-132, 5.5. The EUT was measured on the low, middle and high channels. The frequency range investigated was from 30 MHz to 10 GHz.
See APPENDIX 1A for test data.

The EUT met the requirements of the Tx Conducted Spurious Emissions in the PCS1900 as per 47 CFR 2.1051, CFR 24.238(a) and RSS-133, 6.5. The EUT was measured on the low, middle and high channels. The frequency range investigated was from 30 MHz to 20 GHz.
See APPENDIX 1A for test data

- The EUT met the requirements of the Occupied Bandwidth and channel mask in the GSM850 as per 47 CFR 2.1049, CFR 22.917 and RSS-GEN, 4.6. The EUT was measured in CALL and EDGE mode on the low, middle and high channels. The worst case occupied bandwidth was 246.0 kHz on the mid channel in CALL mode, and 243.1 kHz on all channels in EDGE mode.
See APPENDIX 1A for test data.

The EUT met the requirements of the Occupied Bandwidth and channel mask in the PCS1900 as per 47 CFR 2.1049, CFR 24.238 and RSS-GEN, 4.6. The EUT was measured in CALL and EDGE mode on the low, middle and high channels. The worst case occupied bandwidth was 244.6 kHz on the high channel in CALL mode, and 243.6 kHz on the mid channel in EDGE mode.
See APPENDIX 1A for test data.

- The EUT met the requirements of the Tx Conducted RF output Power in the GSM850 as per 47 CFR 2.1046, and RSS-132, 5.4. The EUT was measured on the low, middle and high channels.
See APPENDIX1B for test data.

The EUT met the requirements of the Tx Conducted RF output Power in the PCS1900 as per 47 CFR 2.1046, and RSS-133, 6.4. The EUT was measured on the low, middle and high channels.
See APPENDIX 1B for test data

The EUT met the requirements of the Frequency Stability in the GSM850 as per 47 CFR 2.1055 and RSS-132, 5.3. The EUT was measured in GSM850 mode on the low, middle and high channels.
See APPENDIX 1C for test data.

The EUT met the requirements of the Frequency Stability in the PCS1900 as per 47 CFR 2.1055 and RSS-133, 6.3. The EUT was measured in PCS1900 mode on the low, middle and high channels.
See APPENDIX1C for test data.

- The EUT met the requirements of the Tx Conducted Spurious Emissions in the WCDMA Band 5 as per 47 CFR 2.1051, CFR 22.917, CFR 22.901(d) and RSS-132, 5.5. The EUT was measured on the low, middle and high channels. The frequency range investigated was from 30 MHz to 10 GHz.
See APPENDIX 2A for test data.

The EUT met the requirements of the Tx Conducted Spurious Emissions in the WCDMA Band 2 as per 47 CFR 2.1051, CFR 24.238(a) and RSS-133, 6.5. The EUT was measured on the low, middle and high channels. The frequency range investigated was from 30 MHz to 20 GHz.
See APPENDIX 2A for test data

- The EUT met the requirements of the Occupied Bandwidth and channel mask in the WCDMA Band 5 as per 47 CFR 2.202, CFR 22.917 and RSS-GEN, 4.6. The EUT was measured in Loopback and HSUPA mode on the low, middle and high channels. The worst case occupied bandwidth was 4.153 MHz on the low and mid channels in Voice mode, and 4.168 MHz on the high channel in HSUPA mode.
See APPENDIX 2A for test data.

The EUT met the requirements of the Occupied Bandwidth and channel mask in the WCDMA Band 2 as per 47 CFR 2.202, CFR 24.238 and RSS-GEN, 4.6. The EUT was measured in Loopback and HSUPA mode on the low, middle and high channels. The worst case occupied bandwidth was 4.168 MHz on the mid channel in Voice mode, and 4.168 MHz on the high channel in HSUPA mode.
See APPENDIX 2A for test data.

- The EUT met the requirements of the Tx Conducted RF output Power in the WCDMA Band 5 as per 47 CFR 2.1046, and RSS-132, 5.4. The EUT was measured on the low, middle and high channels.
See APPENDIX 2B for test data.

The EUT met the requirements of the Tx Conducted RF output Power in the WCDMA Band 2 as per 47 CFR 2.1046, and RSS-133, 6.4. The EUT was measured on the low, middle and high channels.
See APPENDIX 2B for test data

- The EUT met the requirements of the Frequency Stability in the WCDMA Band 5 as per 47 CFR 2.1055, and RSS-132, 5.3. The EUT was measured on the low, middle and high channels.

See APPENDIX 2C for test data.

The EUT met the requirements of the Frequency Stability in the WCDMA Band 2 as per 47 CFR 2.1055, CFR 24.235 and RSS-133, 6.3. The EUT was measured in mode on the low, middle and high channels.
See APPENDIX 2C for test data.

G. Compliance Test Equipment Used

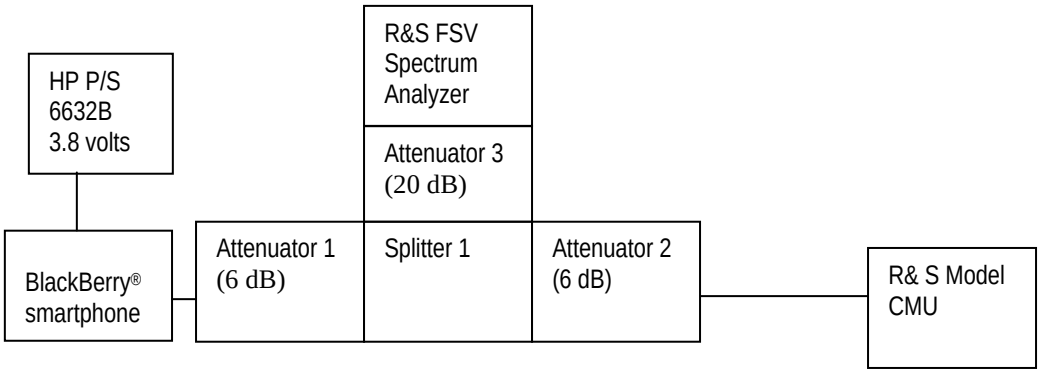
UNIT	MANUFACTURER	MODEL	SERIAL NUMBER	CAL DUE DATE (YY MM DD)	USE
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	119549	13-11-26	RF Conducted Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	109747	13-11-29	RF Conducted Emissions
DC Power Supply	HP	6632B	US37472178	13-09-25	RF Conducted Emissions
Environment Monitor	Omega	iTHX-SD	0340060	13-10-30	RF Conducted Emissions
Environment Monitor	Omega	iTHX-SD	0380567	13-10-30	RF Conducted Emissions
Spectrum Analyzer	Rohde & Schwarz	FSV	101820	13-11-28	RF Conducted Emissions
Spectrum Analyzer	Rohde & Schwarz	FSP	100884	13-11-22	RF Conducted Emissions

APPENDIX 1A – GSM CONDUCTED RF EMISSIONS TEST DATA/PLOTS

GSM Conducted RF Emission Test Data

This appendix contains measurement data pertaining to conducted spurious emissions, –26 dBc bandwidth, 99% power bandwidth and the channel mask on BlackBerry® smartphone.

Test Setup Diagram



A reference offset of 31.4 dB was applied to the spectrum analyzer reference level for the attenuators and coaxial cable loss in the test circuit.

UNIT	MANUFACTURER	MODEL	SERIAL NUMBER
Attenuator 1	Mini-Circuits	BW-S6W2+	0647
Attenuator 2	Mini-Circuits	BW-S6W2+	0648
Attenuator 3	Mini-Circuits	BW-S20-2W263+	1234
Splitter 1	Weinschel	1515	MES 92

Date of Test: January 28, 2013

The environmental conditions were: Temperature: 23.4 °C
Humidity: 21.6 %

The following measurements were performed by Berkin Can.

GSM Conducted RF Emission Test Data cont'd

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 22.917, CFR 24.238 and RSS-132 4.5 and RSS-133, 6.5 were measured from 30 MHz to 20 GHz. The EUT emissions were in the noise floor.
See figures 1-1a to 1-12a for the plots of the conducted spurious emissions.

–26 dBc Bandwidth and Occupied Bandwidth (99%)

For each carrier frequency of low, middle and high, the modulation spectrum was measured by both methods of 99% power bandwidth and –26 dBc bandwidth.
The resolution bandwidth required for out-of-band emissions in the 1 MHz bands immediately outside and adjacent to the frequency block, was determined to be at least 1% of the emission bandwidth.
The worst case –26dBc bandwidth for the GSM850 band was measured to be 282 kHz, and for the PCS1900 band was measured to be 274 kHz as shown below. Results were derived in a 3.0 kHz resolution bandwidth.
On any frequency outside the frequency block and outside the adjacent 1 MHz bands, a resolution bandwidth of at least 1 MHz was applied.

Test Data for GSM850 band and PCS1900 band in Call mode

GSM850 band Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
824.2	276.4	244.6
837.6	277.9	**246.0**
848.8	269.2	244.6

PCS1900 band Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
1850.2	267.7	243.1
1880.0	276.4	243.1
1909.8	282.2	**244.6**

Measurement Plots for 850 and 1900 bands in Call mode

See Figures 1-1a to 1-12a for the plots of the conducted spurious emissions.
See Figures 1-13a to 1-24a for the plots of 26dBc/99% Occupied Bandwidth.
See Figures 1-25a to 1-28a for the plots of the Channel mask.

GSM Conducted RF Emission Test Data cont'd

Test Data for GSM850 and PCS1900 bands in EDGE mode

GSM850 band Frequency (MHz)	99% Occupied Bandwidth (kHz)
824.2	**243.1**
837.6	**243.1**
848.8	**243.1**

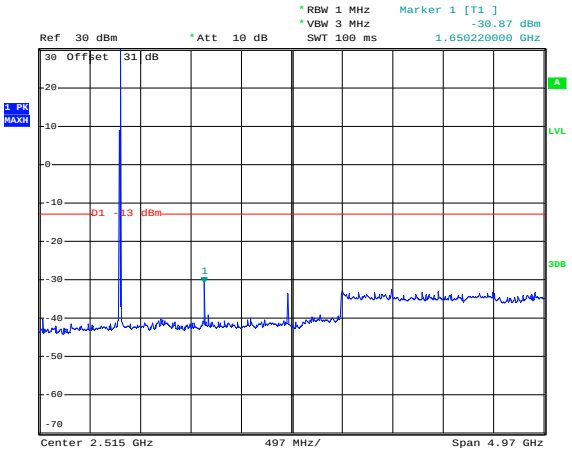
PCS1900 band Frequency (MHz)	99% Occupied Bandwidth (kHz)
1850.2	243.1
1880.0	**243.6**
1909.8	241.7

Measurement Plots for GSM850 and PCS1900 bands in EDGE mode

See Figures 1-29a to 1-34a for the plots of the 99% Occupied Bandwidth EDGE results.
See Figures 1-35a to 1-38a for the plots of channel mask EDGE results.
See Figures 1-39a to 1-50a for the plots of the conducted spurious emissions EDGE results

GSM Conducted RF Emission Test Data cont'd

Figure 1-1a: GSM850 band, Spurious Conducted Emissions, Low channel



Date: 28.JAN.2013 09:54:32

Figure 1-2a: GSM850 band, Spurious Conducted Emissions, Low channel

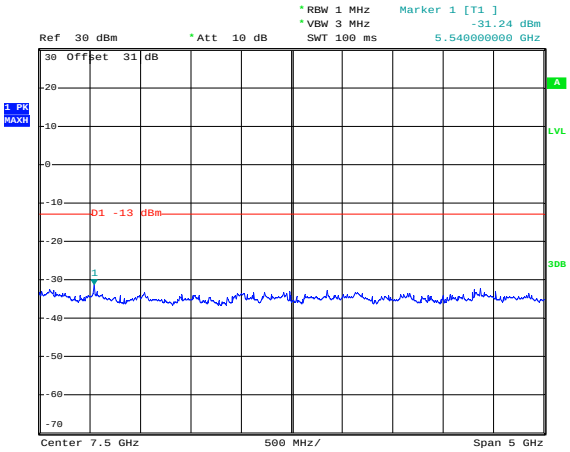


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Figure 1-3a: GSM850 band, Spurious Conducted Emissions, Middle Channel

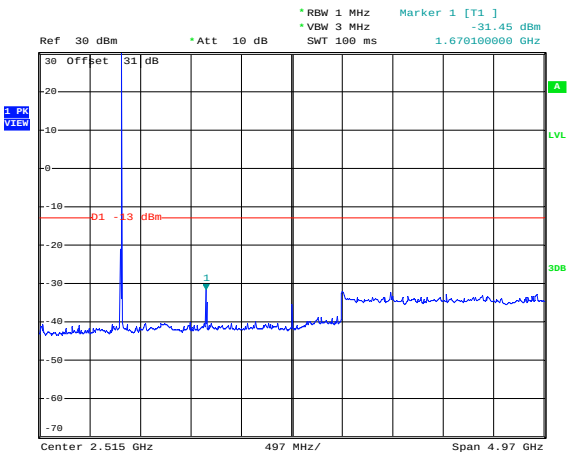

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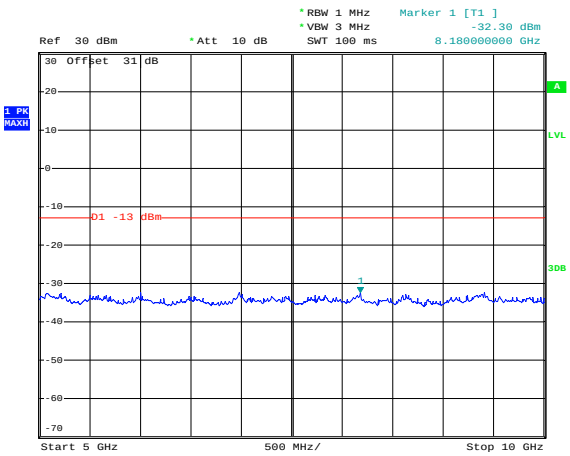
Figure 1-4a: GSM850 band, Spurious Conducted Emissions, Middle Channel



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GSM Conducted RF Emission Test Data cont'd

Figure 1-5a: GSM850 band, Spurious Conducted Emissions, High Channel

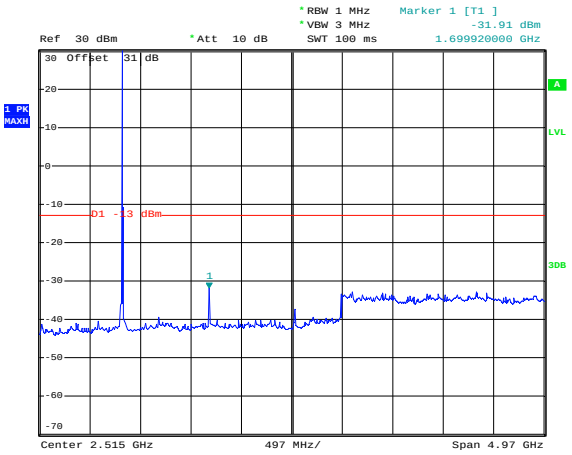

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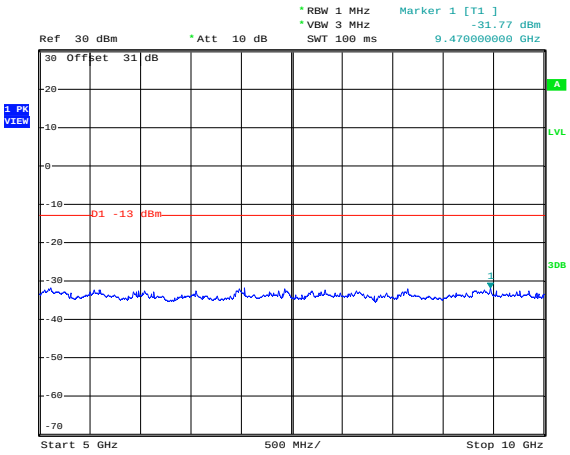
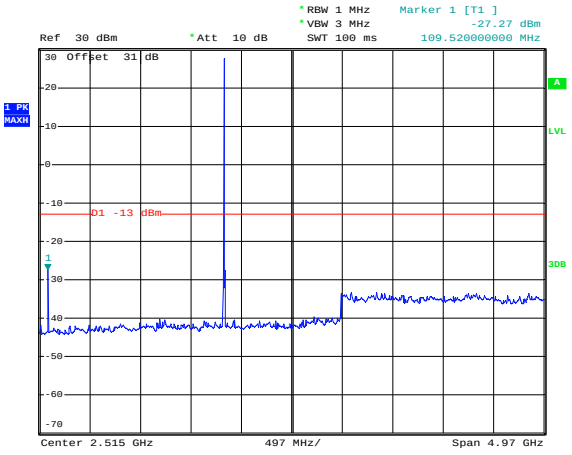
Figure 1-6a: GSM850 band, Spurious Conducted Emissions, High Channel



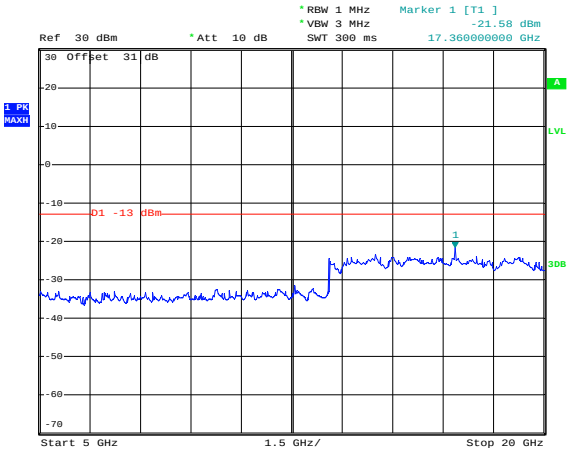
Date: 28.JAN.2013 10:04:33

Figure 1-7a: PCS1900 band, Spurious Conducted Emissions, Low Channel



Date: 28.JAN.2013 10:10:58

Figure 1-8a: PCS1900 band, Spurious Conducted Emissions, Low Channel



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GSM Conducted RF Emission Test Data cont'd

Figure 1-9a: PCS1900 band, Spurious Conducted Emissions, Middle Channel

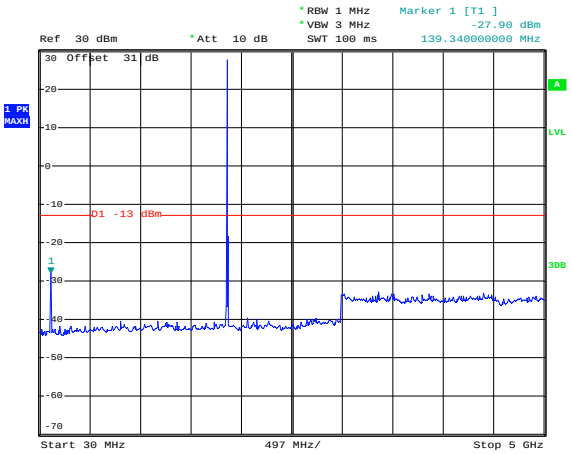

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Figure 1-10a: PCS1900 band, Spurious Conducted Emissions, Middle Channel

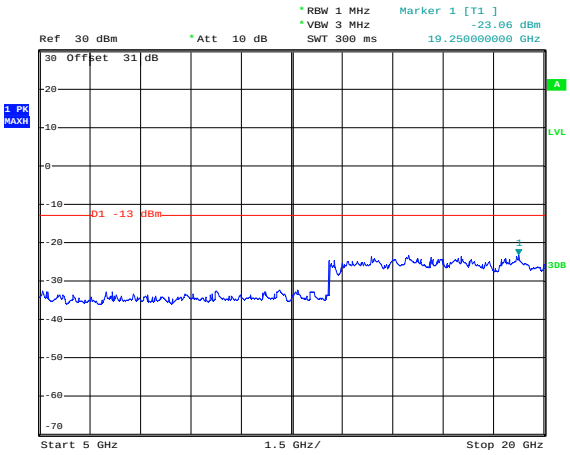

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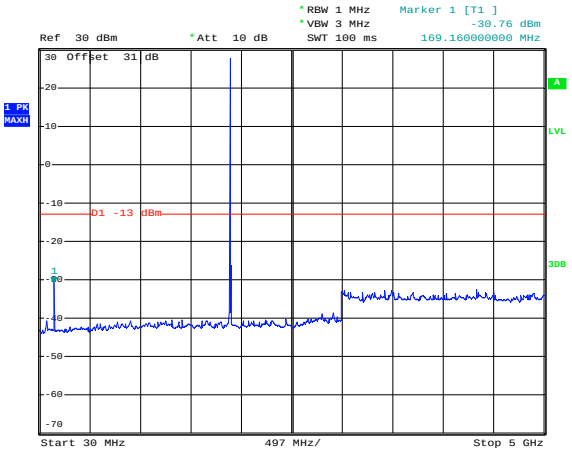
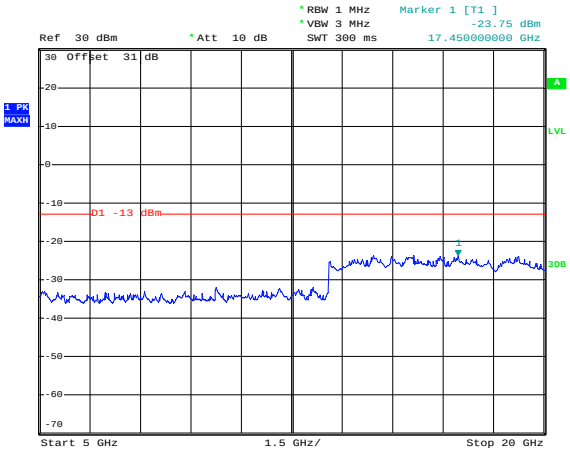
Figure 1-11a: PCS1900 band, Spurious Conducted Emissions, High Channel



Date: 28.JAN.2013 10:12:26

Figure 1-12a: PCS1900 band, Spurious Conducted Emissions, High Channel



Date: 28.JAN.2013 10:14:15

GSM Conducted RF Emission Test Data cont'd

Figure 1-13a: -26dBc bandwidth, GSM850 band Low Channel in GSM mode

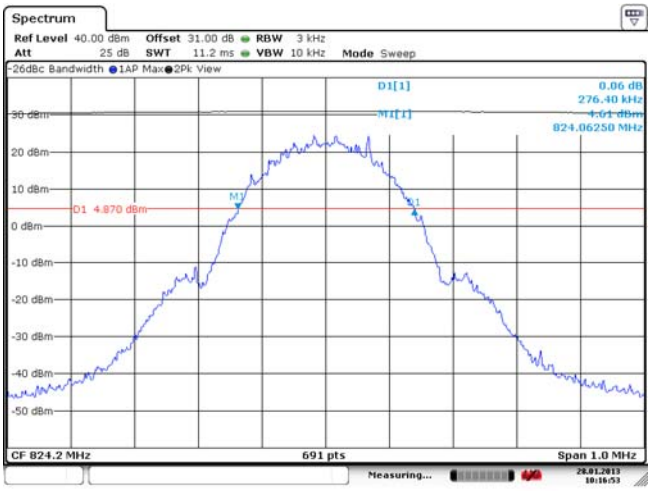


Figure 1-14a: Occupied Bandwidth, GSM850 band Low Channel in GSM mode

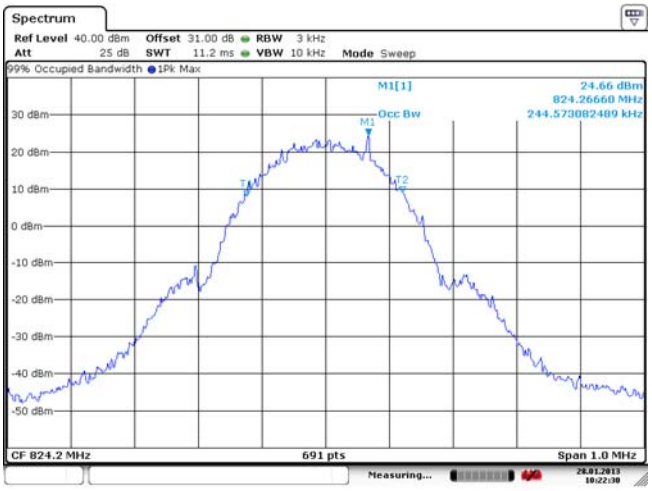


Figure 1-15a: -26dBc bandwidth, GSM850 band Middle Channel in GSM mode

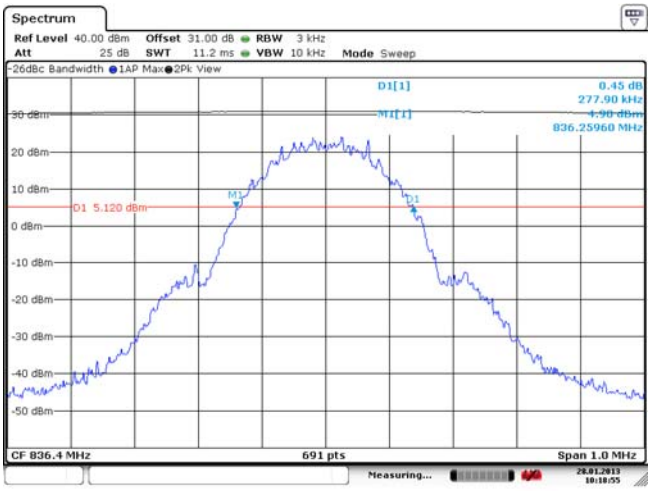
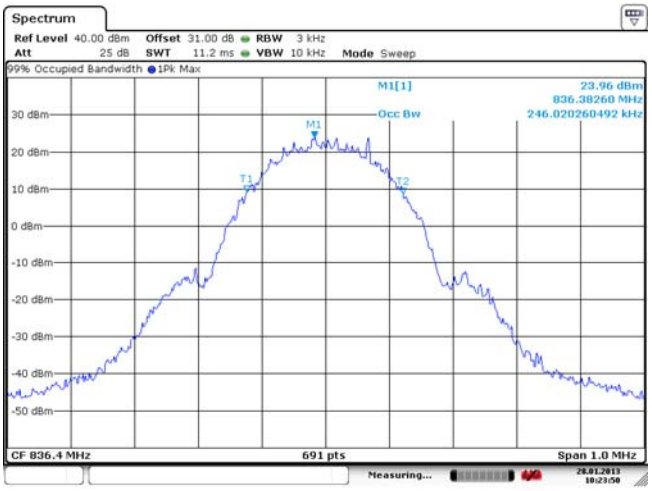


Figure 1-16a: Occupied Bandwidth, GSM850 band Middle Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-17a: -26dBc bandwidth, GSM850 band High Channel in GSM mode

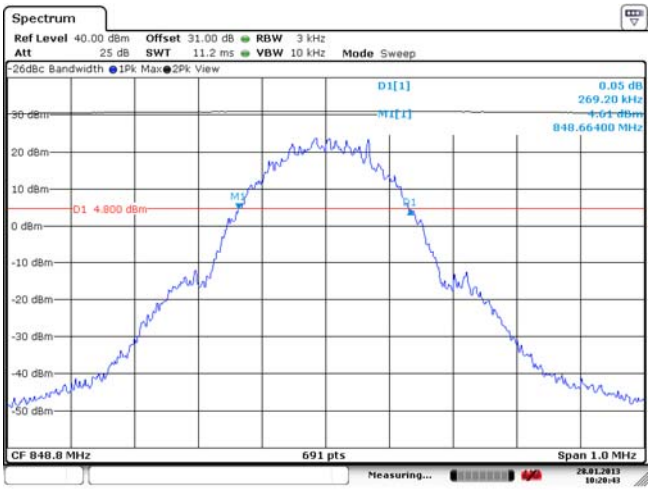


Figure 1-18a: Occupied Bandwidth, GSM850 band High Channel in GSM mode

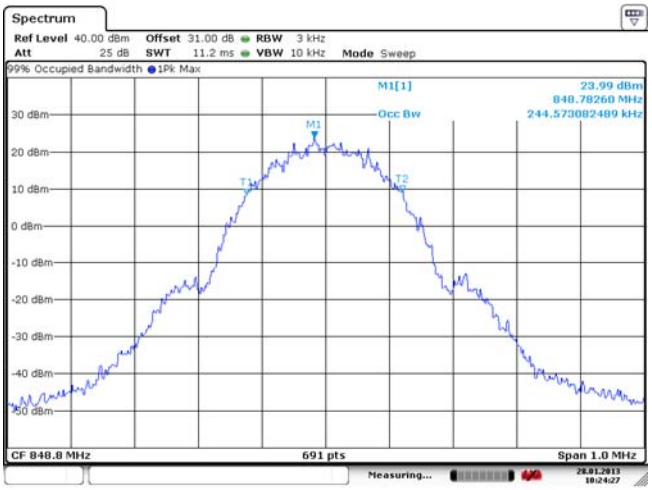


Figure 1-19a: -26dBc bandwidth, PCS1900 Low Channel in GSM mode

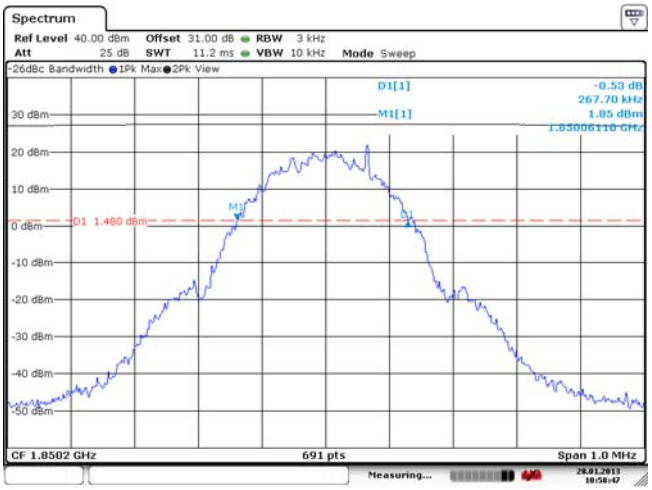
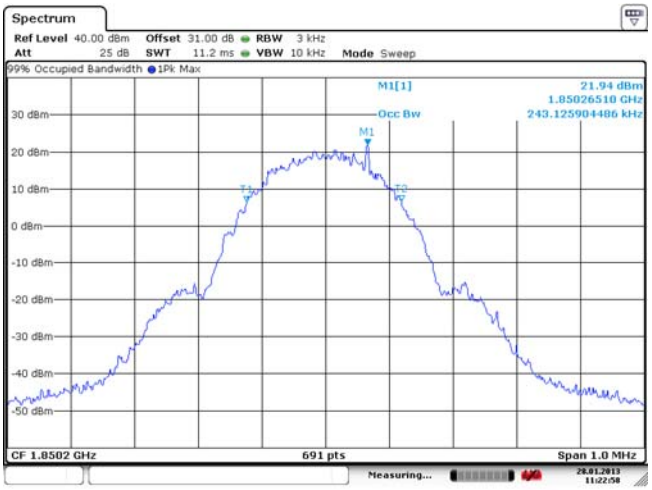


Figure 1-20a: Occupied Bandwidth, PCS1900 Low Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-21a: -26dBc bandwidth, PCS1900 Middle Channel in GSM mode

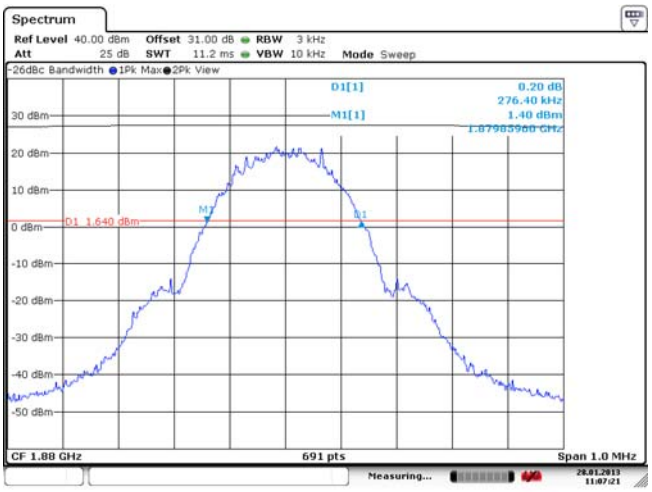


Figure 1-22a: Occupied Bandwidth, PCS1900 Middle Channel in GSM mode

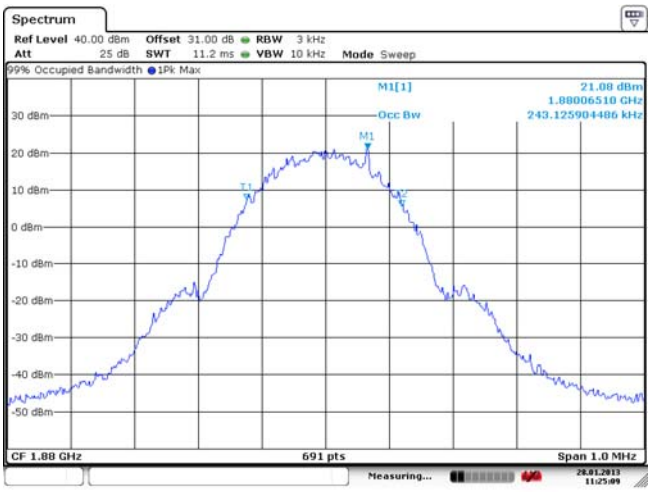


Figure 1-23a: -26dBc bandwidth, PCS1900 High Channel in GSM mode

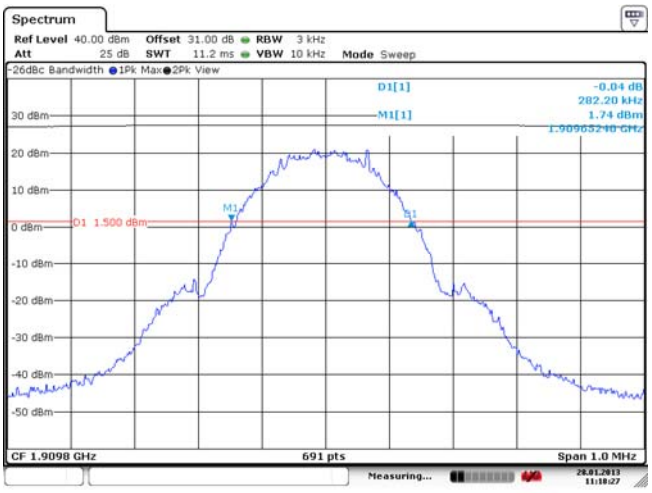
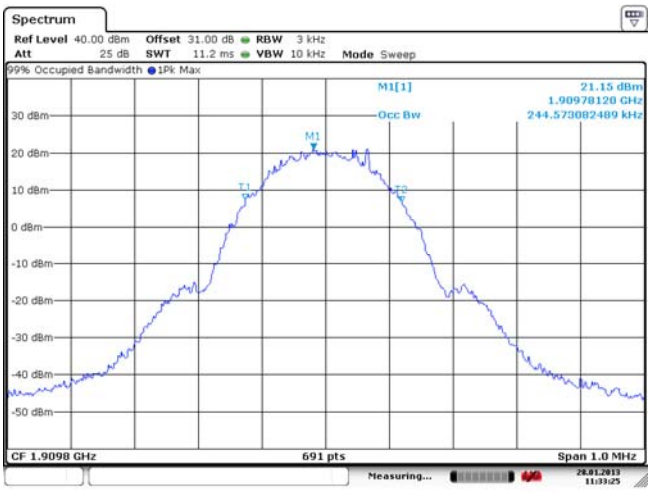


Figure 1-24a: Occupied Bandwidth, PCS1900 High Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-25a: GSM850 band, Low Channel Mask in GSM mode

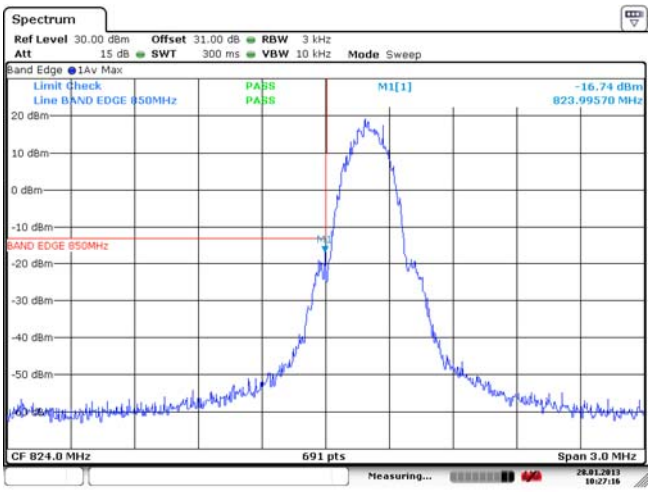


Figure 1-26a: GSM850 band High Channel Mask in GSM mode

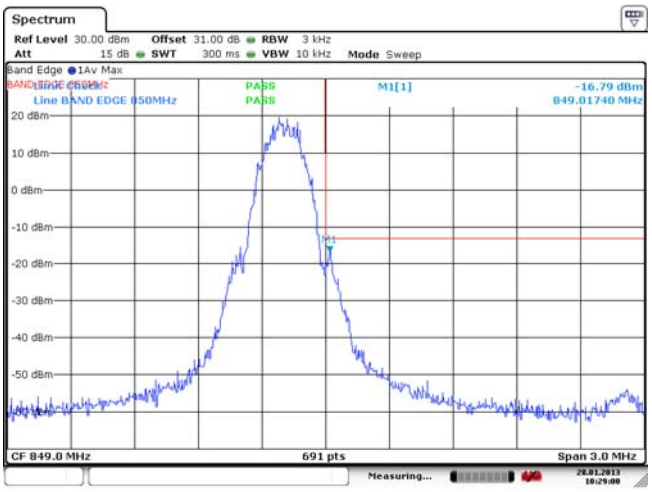


Figure 1-27a: PCS1900, Low Channel Mask in GSM mode

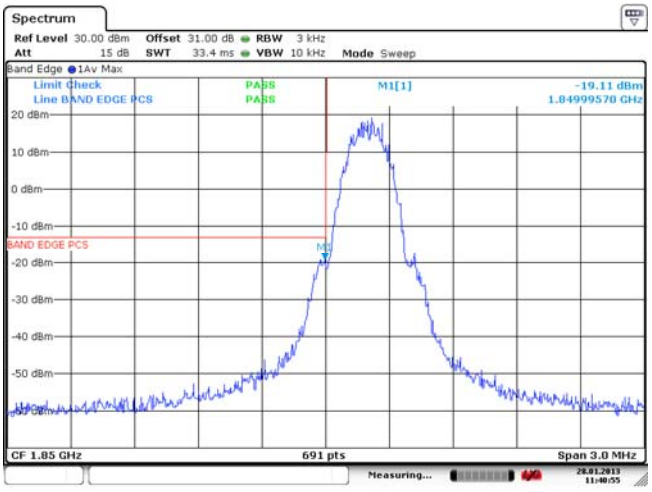
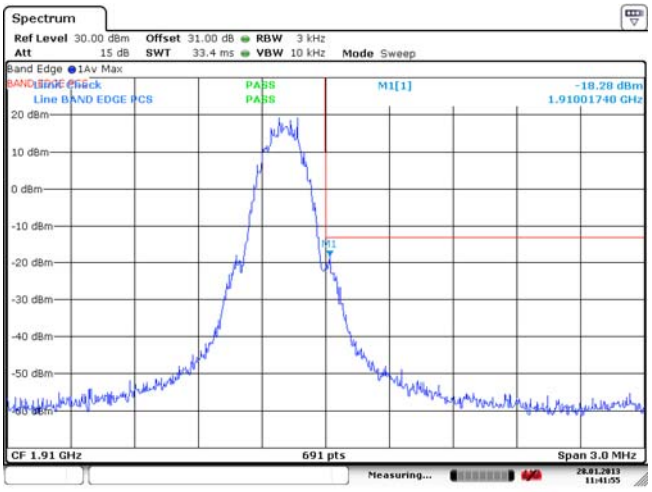


Figure 1-28a: PCS1900, High Channel Mask in GSM mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-29a: Occupied Bandwidth, GSM850 Band, Low Channel in EDGE mode

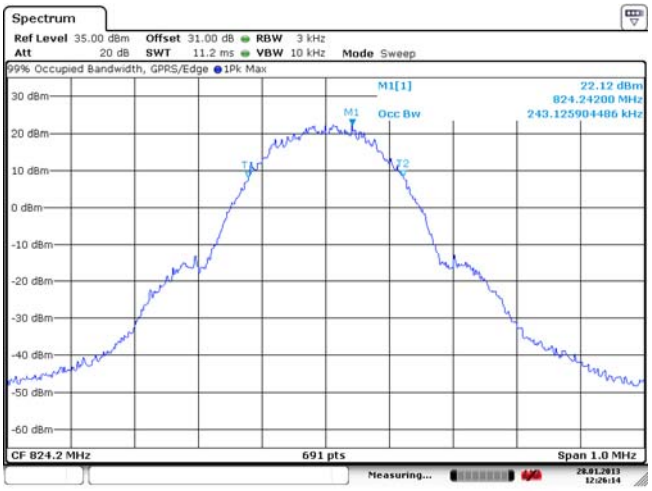


Figure 1-30a: Occupied Bandwidth, GSM850 Band, Middle Channel in EDGE mode

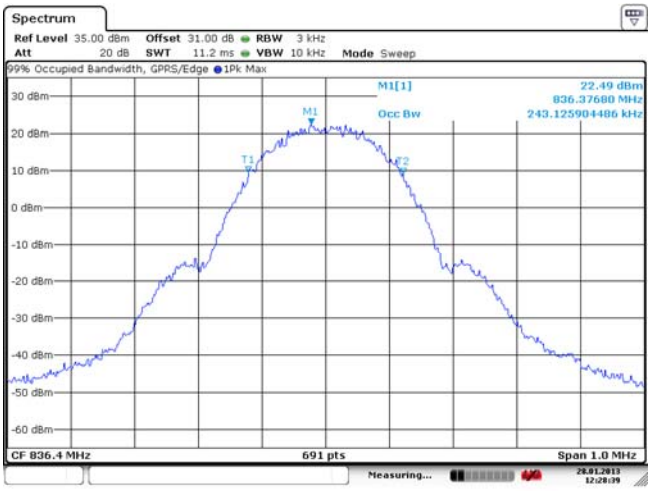


Figure 1-31a: Occupied Bandwidth, GSM850 band, High Channel in EDGE mode

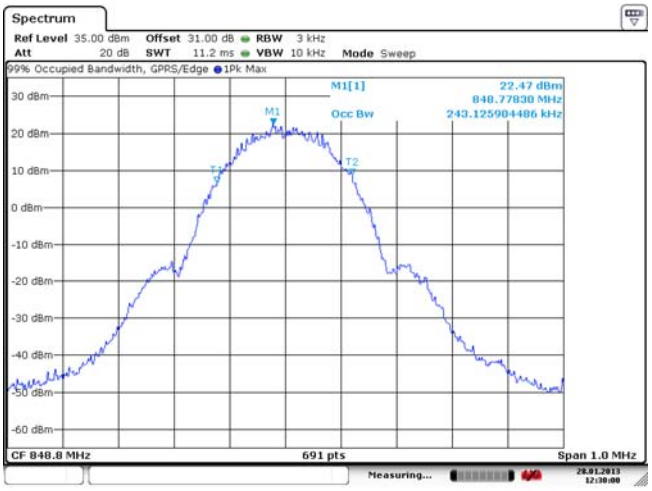
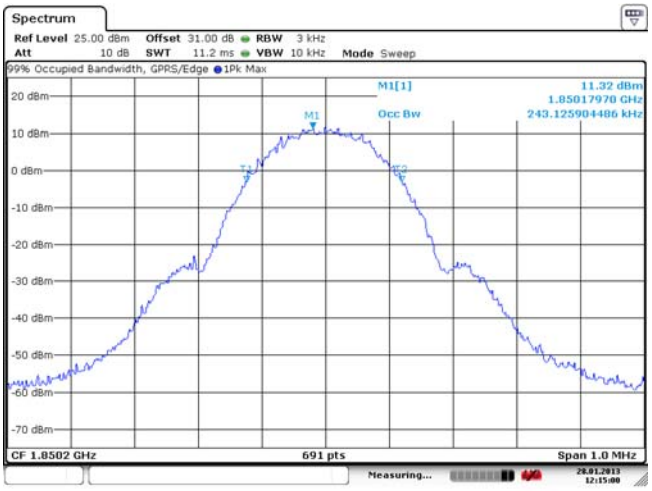


Figure 1-32a: Occupied Bandwidth, PCS1900 Band, Low Channel in EDGE mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-33a: Occupied Bandwidth, PCS1900 Band, Middle Channel in EDGE mode

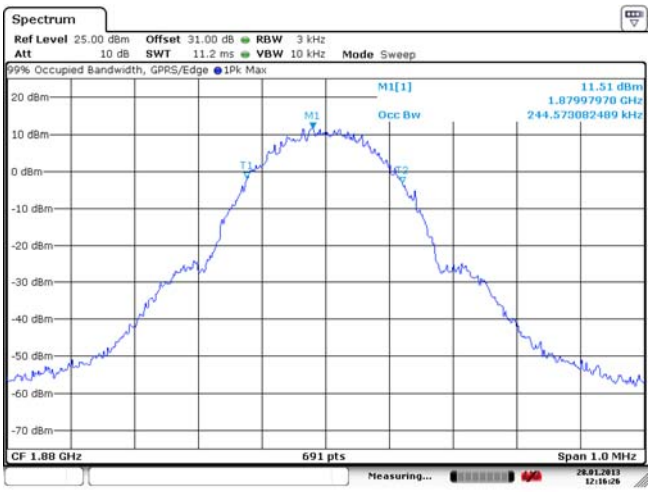


Figure 1-34a: Occupied Bandwidth, PCS1900 Band, High Channel in EDGE mode

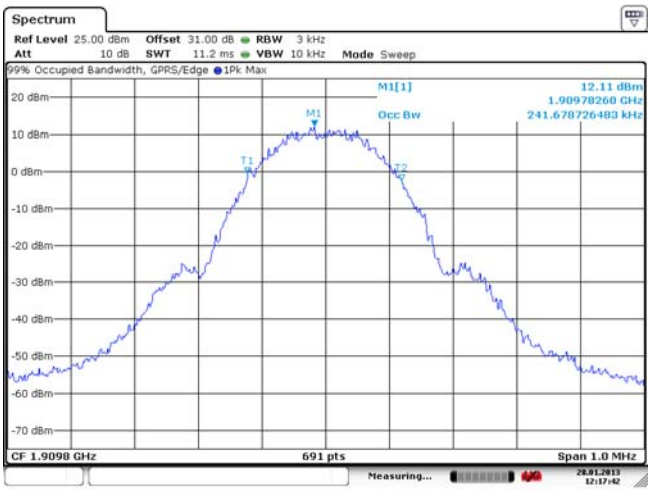


Figure 1-35a: GSM850 Band, Low Channel Mask in EDGE mode

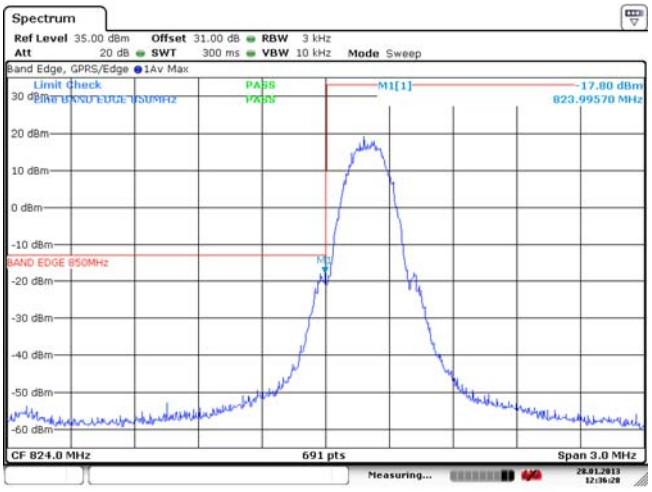
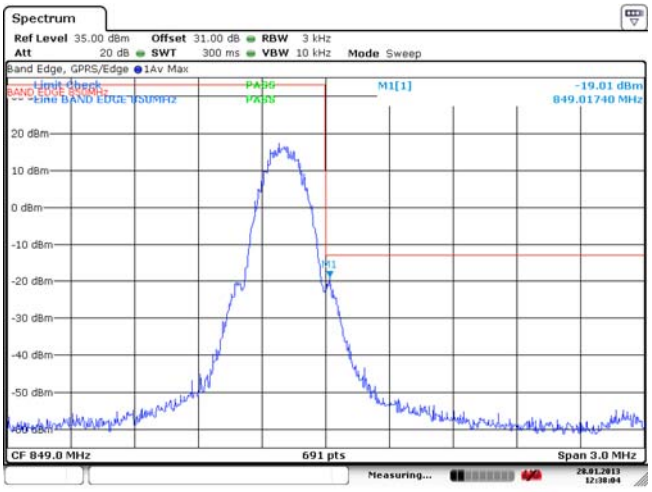


Figure 1-36a: GSM850 Band, High Channel Mask in EDGE mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-37a: PCS1900 Band, Low Channel Mask in EDGE mode

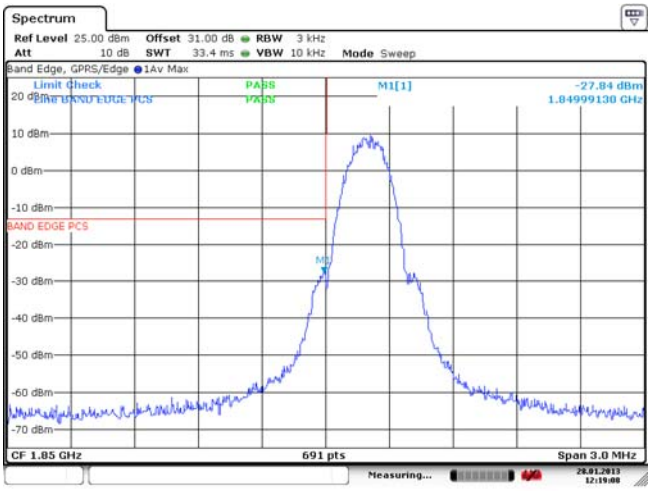
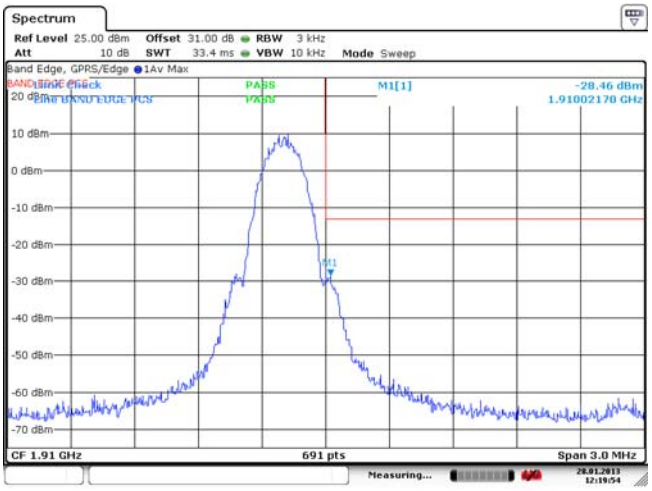
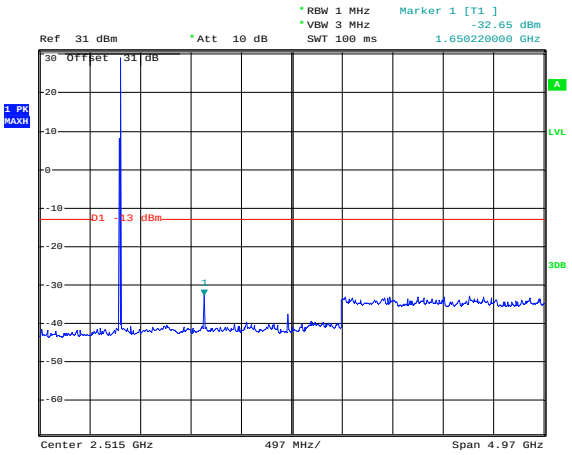


Figure 1-38a: PCS1900 Band, High Channel Mask in EDGE mode



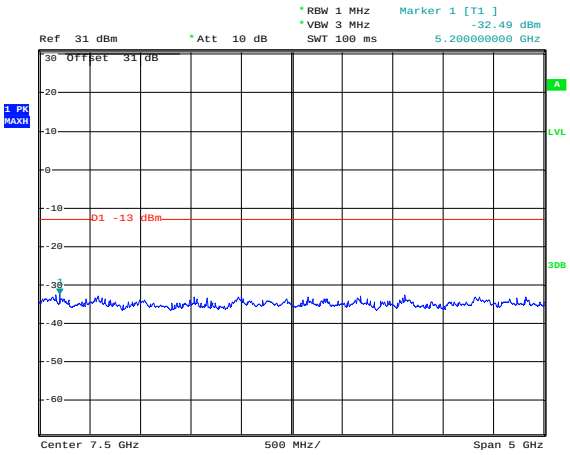
GSM Conducted RF Emission Test Data cont'd

Figure 1-39a: GSM850 band, Spurious Conducted Emissions, Low channel in EDGE Mode



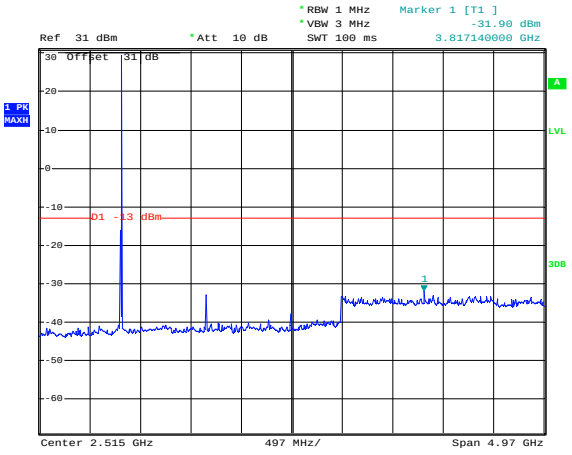
Date: 28.JAN.2013 12:04:50

Figure 1-40a: GSM850 band, Spurious Conducted Emissions, Low channel in EDGE Mode



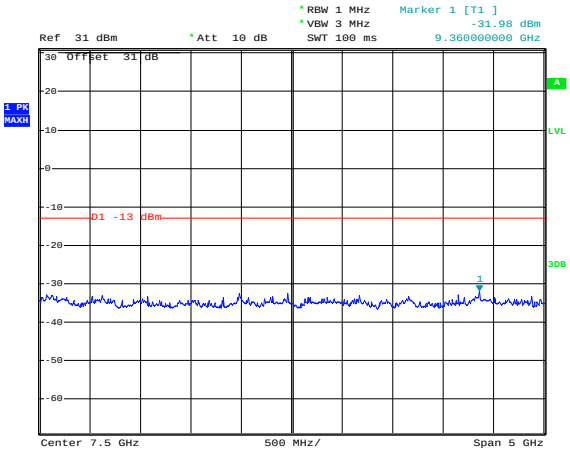
Date: 28.JAN.2013 12:07:57

Figure 1-41a: GSM850 band, Spurious Conducted Emissions, Middle channel in EDGE Mode



Date: 28.JAN.2013 12:05:21

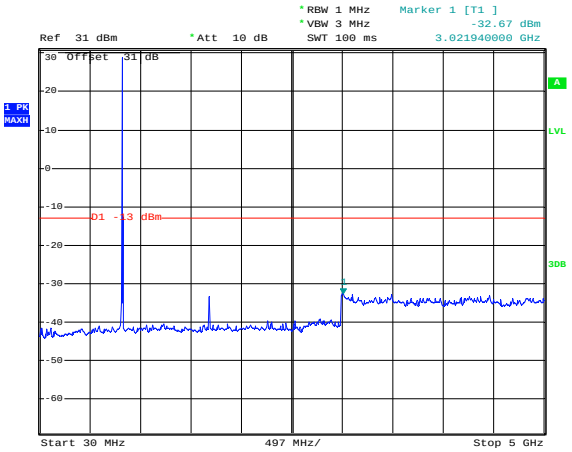
Figure 1-42a: GSM850 band, Spurious Conducted Emissions, Middle channel in EDGE Mode



Date: 28.JAN.2013 12:07:23

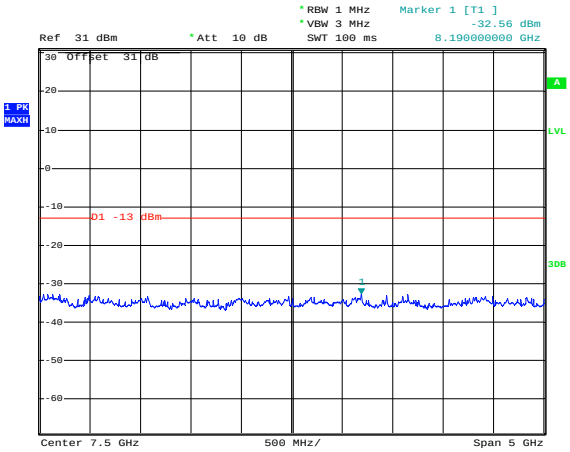
GSM Conducted RF Emission Test Data cont'd

Figure 1-43a: GSM850 band, Spurious Conducted Emissions, High channel in EDGE Mode



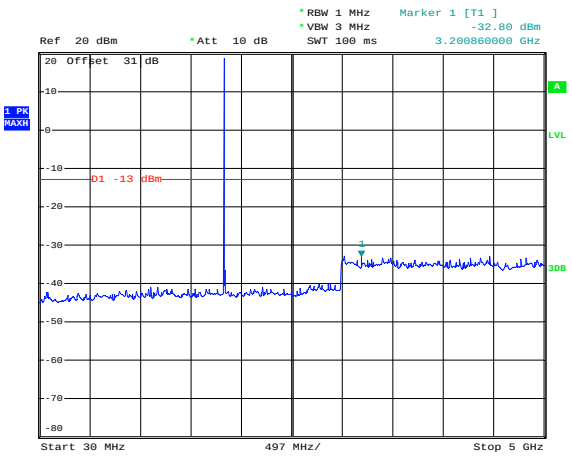
Date: 28.JAN.2013 12:06:12

Figure 1-44a: GSM850 band, Spurious Conducted Emissions, High channel in EDGE Mode



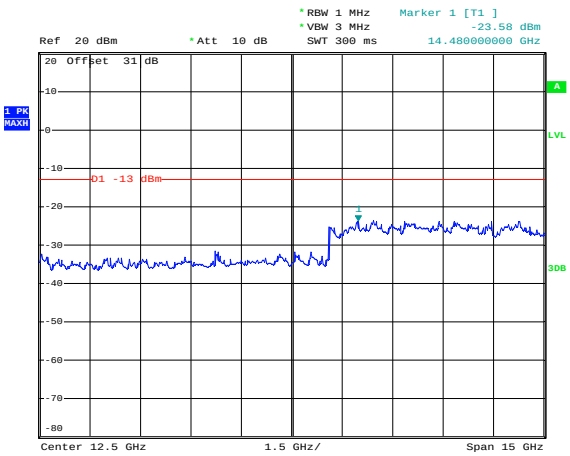
Date: 28.JAN.2013 12:06:58

Figure 1-45a: PCS1900 band, Spurious Conducted Emissions, Low channel in EDGE Mode



Date: 28.JAN.2013 12:11:15

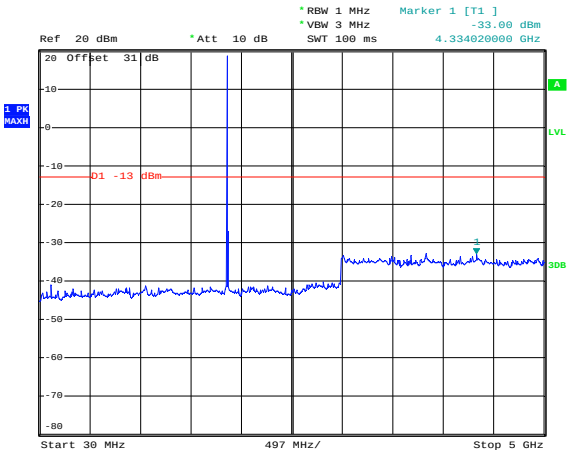
Figure 1-46a: PCS1900 band, Spurious Conducted Emissions, Low channel in EDGE Mode



Date: 28.JAN.2013 12:13:54

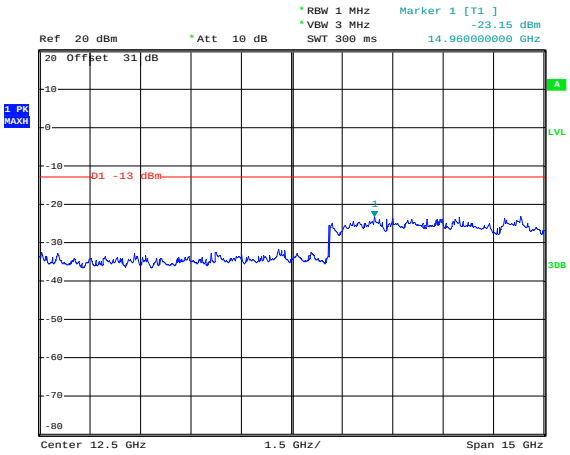
GSM Conducted RF Emission Test Data cont'd

Figure 1-47a: PCS1900 band, Spurious Conducted Emissions, middle channel in EDGE Mode



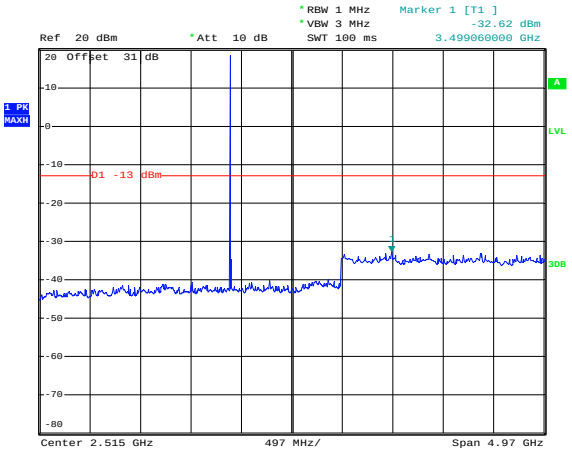
Date: 28.JAN.2013 12:11:41

Figure 1-48a: PCS1900 band, Spurious Conducted Emissions, middle channel in EDGE Mode



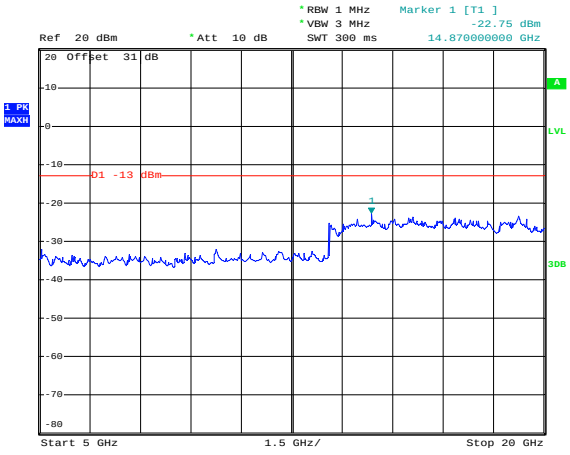
Date: 28.JAN.2013 12:13:27

Figure 1-49a: PCS1900 band, Spurious Conducted Emissions, High channel in EDGE Mode



Date: 28.JAN.2013 12:12:07

Figure 1-50a: PCS1900 band, Spurious Conducted Emissions, High channel in EDGE Mode



Date: 28.JAN.2013 12:12:57

APPENDIX 1B – GSM CONDUCTED RF OUTPUT POWER TEST DATA

GSM Conducted RF Output Power Test Data

The conducted RF output power was measured on the EUTusing the Communication Tester, Rohde & Schwarz, model CMU 200. The low, middle and high channels were measured at maximum output power. The insertion loss of the coaxial cable from the CMU 200 to the EUTwas compensated for in the measurements.

Date of Test: November 27, 2012 – January 29, 2013

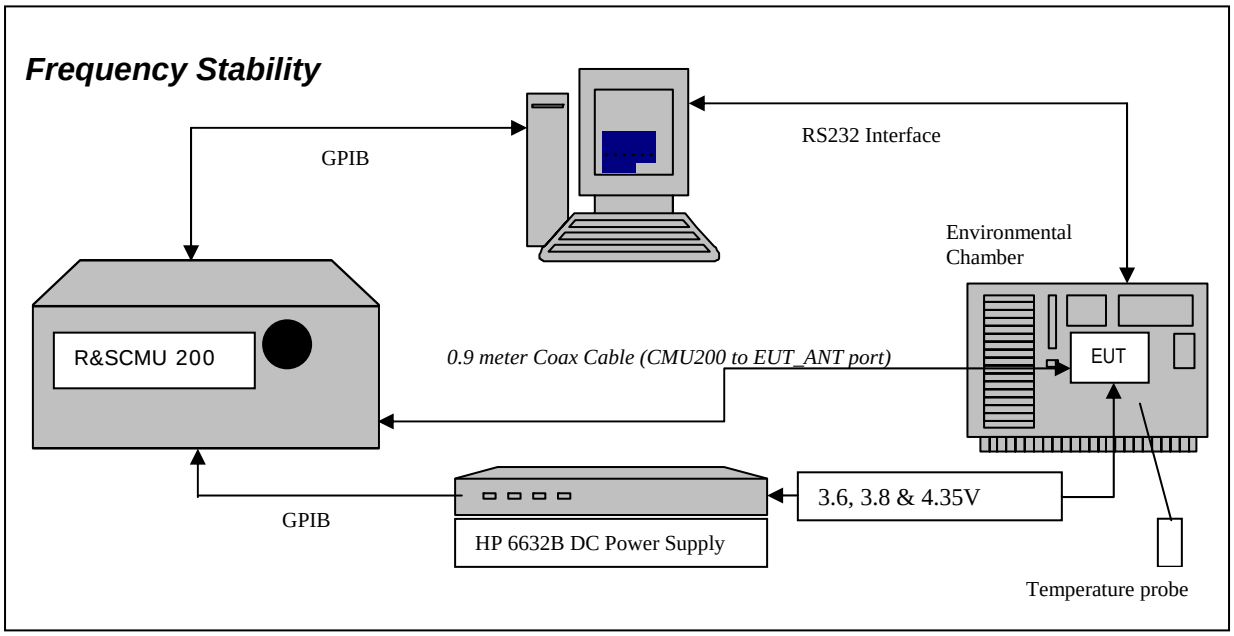
The environmental conditions were: Temperature: 21.6 - 23.2 °C
Humidity: 20.5 - 27.6 %

The measurements were performed by Daoud Attayi

Channel	Frequency (MHz)	Maximum Output Power (dBm)	Channel	Frequency (MHz)	Maximum Output Power (dBm)
GSM850			GSM850 EDGE		
128	824.20	32.2	128	824.20	30.5
189	837.60	31.9	189	837.60	30.1
251	848.80	32.0	251	848.80	30.1
PCS			PCS EDGE		
512	1850.2	29.3	512	1850.2	29.2
661	1880.0	29.2	661	1880.0	29.1
810	1909.8	29.0	810	1909.8	29.0

APPENDIX 1C – GSM FREQUENCY STABILITY TEST DATA

GSM Frequency Stability Test Data



The measurements were performed by Berkin Can.

CFR 47 Chapter 1 - Federal Communications Commission Rules

Part 2 Required Measurements
2.1055 Frequency Stability - Procedures
(a,b) Frequency Stability - Temperature Variation
(d) Frequency Stability - Voltage Variation

The EUT meets the requirements as stated in CFR 47 chapter 1, RSS-132, 4.3 Frequency Stability.
Frequency Stability measurement devices were configured as presented in the block diagram recording frequency, power, data, temperatures, and stepped voltages controlled via a GPIB interface linked to the Environmental chamber, a DC power supply, and the Communications Test Set. A 0.9-metre coax cable was calibrated to characterize the insertion loss for the transmitted frequencies between the RF input/output of the CMU 200 and the EUT antenna port.
Calibration for the Cable Loss was performed in the RF Laboratory using the Agilent power meter and Agilent Signal Generator.

Test setup:

The EUT was placed in the Temperature chamber and connected to CMU 200 outside as shown in the figure above. Dry air was pumped inside the temperature chamber to maintain a backpressure during the test. The EUT was kept in the off condition at all times except when the measurements were to be made.

The chamber was switched on and the temperature was set to -30°C.
After the chamber stabilized at -30 °C there was a soak period of one hour to alleviate moisture in the chamber, the EUT voltage was enabled.
The system software recorded the frequency, power, and associated measurements.

A Computer system controlled the automated software. This application was given the command of activating all machines intrinsic to the temperature and voltage tests controlling the CMU 200 via the GPIB Bus. The Environmental Chamber was instructed through an RS-232 serial line. The EUT dialogue was passed through a serial connection.

The EUT repetitively transmitted 100 bursts for each set of programmed parameters recording temperature, voltage settings, and systematically selected frequencies. The power supply was cycled from minimum voltage 3.6 volts, to 3.8 and to 4.35 volts maximum voltage. The frequency error was measured at a maximum output power and recorded by the automated system test software.

The EUT output power and frequency was measured at 3.6 volts, 3.8 and 4.35 volts. The transmit frequency was varied in 3 steps consisting of 824.2, 836.4, and 848.8 MHz for the GSM850 band, 1850.2, 1880.0 and 1909.8 MHz for the PCS1900 band. This frequency was recorded in MHz and deviation from nominal, in Parts Per Million.
After the initial one-hour soak at the beginning of the tests, a period of thirty minutes soak was initialized between each ascending temperature step, before proceeding to the next measurement test cycle.

Procedure:

The test system software for commencing the Frequency Stability Tests carried through the following cycle.

1. Switch on the HP 6632B power supply; CMU 200 Communications test Set, and Environmental Chamber.
2. Start test program
3. Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
4. Set power supply voltage to 3.6 volts.
5. Set up CMU 200 Radio Communication Tester.
6. Command the CMU 200 to switch to the low channel.
7. Enable the voltage to the EUT, and connect a link to the CMU 200 test set.
8. EUT is commanded to Transmit 100 Bursts.
9. Software logs the following data from the CMU 200, power supply and temperature chamber: Traffic Channel Number, Traffic Channel Frequency, Power Level, Chamber Temperature, Supply Voltage, Power and Frequency Error.
10. The CMU 200 commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
11. Repeat steps 5 to 10 changing the supply voltage to 3.8 Volts
12. Increase temperature by 10°C and soak for 1/2 hour.
13. Repeat steps 4 - 12 for temperatures –30°C to 60°C.
14. Repeat steps 5 to 10 changing the supply voltage to 4.35 volts

Procedure 5 to 10 was repeated at room temperature (20°C) with the power supply voltage set to 3.6, 3.8 and 4.35 volts.

The maximum frequency error in the GSM850 band measured was -**0.0327 PPM**.
The maximum frequency error in the PCS1900 band measured was **0.0356PPM**.

Date of Test: January 28-29, 2013

The environmental conditions were: Temperature: 23.4 - 23.6 °C
Humidity: 23.4 - 26.1 %

GSM850 results: channels 128, 189 and 251 @ 20°C maximum transmitted power

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.6	20	-4.05	-0.0049
189	836.40	3.6	20	-5.59	-0.0067
251	848.60	3.6	20	-5.26	-0.0062
Traffic Channel Number	**GSM850 Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
128	824.20	3.8	20	-8.98	-0.0109
189	836.40	3.8	20	-8.87	-0.0106
251	848.60	3.8	20	-5.33	-0.0063
Traffic Channel Number	**GSM850 Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
128	824.20	4.35	20	-12.26	-0.0149
189	836.40	4.35	20	-16.54	-0.0198
251	848.60	4.35	20	-12.62	-0.0149

GSM850 Results: channel 128 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	3.6	-30	-12.37	-0.0150
128	824.20	3.6	-20	7.59	0.0092
128	824.20	3.6	-10	12.52	0.0152
128	824.20	3.6	0	17.47	0.0212
128	824.20	3.6	10	-7.30	-0.0089
128	824.20	3.6	20	-4.05	-0.0049
128	824.20	3.6	30	-19.94	-0.0242
128	824.20	3.6	40	-13.23	-0.0161
128	824.20	3.6	50	-7.36	-0.0089
128	824.20	3.6	60	-9.96	-0.0121
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
128	824.20	3.8	-30	-20.30	-0.0246
128	824.20	3.8	-20	-4.72	-0.0057
128	824.20	3.8	-10	13.77	0.0167
128	824.20	3.8	0	20.50	0.0249
128	824.20	3.8	10	-5.48	-0.0066
128	824.20	3.8	20	-8.98	-0.0109
128	824.20	3.8	30	-22.75	-0.0276
128	824.20	3.8	40	-11.65	-0.0141
128	824.20	3.8	50	-6.10	-0.0074
128	824.20	3.8	60	-7.12	-0.0086
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
128	824.20	4.35	-30	-23.57	-0.0286
128	824.20	4.35	-20	-3.06	-0.0037
128	824.20	4.35	-10	14.44	0.0175
128	824.20	4.35	0	17.87	0.0217
128	824.20	4.35	10	-2.24	-0.0027
128	824.20	4.35	20	-12.26	-0.0149
128	824.20	4.35	30	-17.48	-0.0212
128	824.20	4.35	40	-7.74	-0.0094
128	824.20	4.35	50	12.60	0.0153
128	824.20	4.35	60	-5.42	-0.0066

GSM850 Results: channel 189 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
189	836.40	3.6	-30	-13.41	-0.0160
189	836.40	3.6	-20	-3.71	-0.0044
189	836.40	3.6	-10	17.22	0.0206
189	836.40	3.6	0	16.66	0.0199
189	836.40	3.6	10	-7.32	-0.0088
189	836.40	3.6	20	-5.59	-0.0067
189	836.40	3.6	30	-20.02	-0.0239
189	836.40	3.6	40	-10.78	-0.0129
189	836.40	3.6	50	-9.03	-0.0108
189	836.40	3.6	60	-5.41	-0.0065
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
189	836.40	3.8	-30	-21.91	-0.0262
189	836.40	3.8	-20	-10.00	-0.0120
189	836.40	3.8	-10	14.22	0.0170
189	836.40	3.8	0	19.88	0.0238
189	836.40	3.8	10	-8.30	-0.0099
189	836.40	3.8	20	-8.87	-0.0106
189	836.40	3.8	30	-24.90	-0.0298
189	836.40	3.8	40	-7.25	-0.0087
189	836.40	3.8	50	-9.37	-0.0112
189	836.40	3.8	60	-9.22	-0.0110
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
189	836.40	4.35	-30	**-27.38**	**-0.0327**
189	836.40	4.35	-20	11.03	0.0132
189	836.40	4.35	-10	15.82	0.0189
189	836.40	4.35	0	9.41	0.0113
189	836.40	4.35	10	-5.52	-0.0066
189	836.40	4.35	20	-16.54	-0.0198
189	836.40	4.35	30	-21.08	-0.0252
189	836.40	4.35	40	-13.95	-0.0167
189	836.40	4.35	50	-5.84	-0.0070
189	836.40	4.35	60	-5.57	-0.0067

GSM850 Results: channel 251 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
251	848.8	3.6	-30	-20.94	-0.0247
251	848.8	3.6	-20	-4.45	-0.0052
251	848.8	3.6	-10	16.88	0.0199
251	848.8	3.6	0	23.04	0.0271
251	848.8	3.6	10	-5.65	-0.0067
251	848.8	3.6	20	-5.26	-0.0062
251	848.8	3.6	30	-21.24	-0.0250
251	848.8	3.6	40	-9.91	-0.0117
251	848.8	3.6	50	8.07	0.0095
251	848.8	3.6	60	-6.08	-0.0072
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
251	848.8	3.8	-30	-13.53	-0.0159
251	848.8	3.8	-20	-9.31	-0.0110
251	848.8	3.8	-10	13.34	0.0157
251	848.8	3.8	0	18.87	0.0222
251	848.8	3.8	10	-5.51	-0.0065
251	848.8	3.8	20	-5.33	-0.0063
251	848.8	3.8	30	-19.90	-0.0234
251	848.8	3.8	40	-5.17	-0.0061
251	848.8	3.8	50	-2.50	-0.0029
251	848.8	3.8	60	-5.27	-0.0062
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
251	848.8	4.35	-30	-22.01	-0.0259
251	848.8	4.35	-20	12.42	0.0146
251	848.8	4.35	-10	12.37	0.0146
251	848.8	4.35	0	20.19	0.0238
251	848.8	4.35	10	-3.50	-0.0041
251	848.8	4.35	20	-12.62	-0.0149
251	848.8	4.35	30	-14.87	-0.0175
251	848.8	4.35	40	-8.54	-0.0101
251	848.8	4.35	50	-6.62	-0.0078
251	848.8	4.35	60	12.44	0.0147

PCS results: channels 512, 661, & 810 @ 20°C maximum transmitted power

Traffic Channel Number	PCS Frequency (MHz	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	3.6	20	37.29	0.0202
661	1880.00	3.6	20	32.35	0.0172
810	1909.80	3.6	20	31.35	0.0164
Traffic Channel Number	**PCS Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
512	1850.20	3.8	20	28.45	0.0154
661	1880.00	3.8	20	28.58	0.0152
810	1909.80	3.8	20	30.24	0.0158
Traffic Channel Number	**PCS Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
512	1850.20	4.35	20	29.04	0.0157
661	1880.00	4.35	20	28.33	0.0151
810	1909.80	4.35	20	23.95	0.0125

PCS1900 Results: channel 512 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	3.6	-30	-6.85	-0.0037
512	1850.20	3.6	-20	39.12	0.0211
512	1850.20	3.6	-10	47.22	0.0255
512	1850.20	3.6	0	64.85	0.0351
512	1850.20	3.6	10	38.19	0.0206
512	1850.20	3.6	20	37.29	0.0202
512	1850.20	3.6	30	9.48	0.0051
512	1850.20	3.6	40	23.92	0.0129
512	1850.20	3.6	50	23.82	0.0129
512	1850.20	3.6	60	24.19	0.0131
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
512	1850.20	3.8	-30	-7.36	-0.0040
512	1850.20	3.8	-20	26.00	0.0141
512	1850.20	3.8	-10	40.88	0.0221
512	1850.20	3.8	0	56.86	0.0307
512	1850.20	3.8	10	38.29	0.0207
512	1850.20	3.8	20	28.45	0.0154
512	1850.20	3.8	30	-11.62	-0.0063
512	1850.20	3.8	40	16.35	0.0088
512	1850.20	3.8	50	16.77	0.0091
512	1850.20	3.8	60	30.76	0.0166
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
512	1850.20	4.35	-30	19.14	0.0103
512	1850.20	4.35	-20	33.51	0.0181
512	1850.20	4.35	-10	37.02	0.0200
512	1850.20	4.35	0	59.68	0.0323
512	1850.20	4.35	10	40.22	0.0217
512	1850.20	4.35	20	29.04	0.0157
512	1850.20	4.35	30	-8.08	-0.0044
512	1850.20	4.35	40	19.42	0.0105
512	1850.20	4.35	50	18.95	0.0102
512	1850.20	4.35	60	17.96	0.0097

PCS1900 Results: channel 661 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
661	1880.00	3.6	-30	-4.50	-0.0024
661	1880.00	3.6	-20	36.43	0.0194
661	1880.00	3.6	-10	47.47	0.0253
661	1880.00	3.6	0	67.05	0.0357
661	1880.00	3.6	10	41.57	0.0221
661	1880.00	3.6	20	32.35	0.0172
661	1880.00	3.6	30	7.44	0.0040
661	1880.00	3.6	40	24.34	0.0129
661	1880.00	3.6	50	25.96	0.0138
661	1880.00	3.6	60	16.60	0.0088
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
661	1880.00	3.8	-30	-6.88	-0.0037
661	1880.00	3.8	-20	23.80	0.0127
661	1880.00	3.8	-10	37.57	0.0200
661	1880.00	3.8	0	57.57	0.0306
661	1880.00	3.8	10	39.16	0.0208
661	1880.00	3.8	20	28.58	0.0152
661	1880.00	3.8	30	-10.84	-0.0058
661	1880.00	3.8	40	25.52	0.0136
661	1880.00	3.8	50	26.08	0.0139
661	1880.00	3.8	60	23.10	0.0123
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
661	1880.00	4.35	-30	20.52	0.0109
661	1880.00	4.35	-20	29.89	0.0159
661	1880.00	4.35	-10	42.51	0.0226
661	1880.00	4.35	0	58.40	0.0311
661	1880.00	4.35	10	38.96	0.0207
661	1880.00	4.35	20	28.33	0.0151
661	1880.00	4.35	30	-10.83	-0.0058
661	1880.00	4.35	40	17.46	0.0093
661	1880.00	4.35	50	16.43	0.0087
661	1880.00	4.35	60	22.74	0.0121

PCS1900 Results: channel 810 @ maximum transmitted power

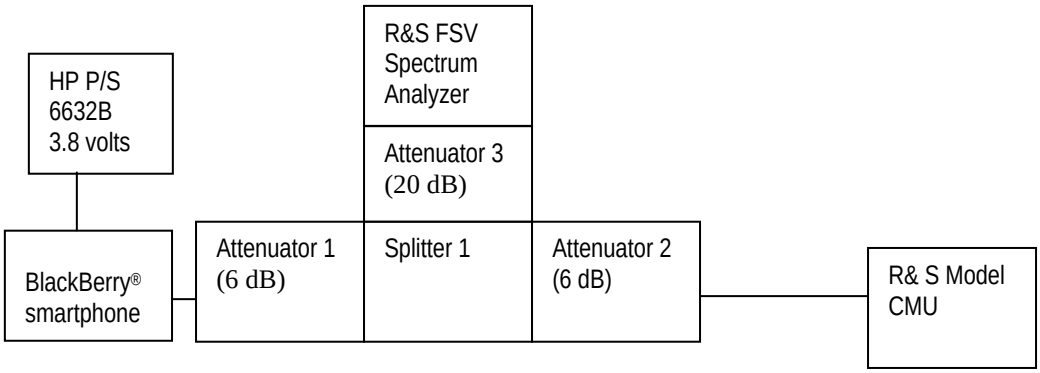
Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
810	1909.80	3.6	-30	-5.94	-0.0031
810	1909.80	3.6	-20	35.34	0.0185
810	1909.80	3.6	-10	45.27	0.0237
810	1909.80	3.6	0	**68.08**	**0.0356**
810	1909.80	3.6	10	42.85	0.0224
810	1909.80	3.6	20	31.35	0.0164
810	1909.80	3.6	30	9.89	0.0052
810	1909.80	3.6	40	16.34	0.0086
810	1909.80	3.6	50	16.44	0.0086
810	1909.80	3.6	60	18.51	0.0097
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
810	1909.80	3.8	-30	11.64	0.0061
810	1909.80	3.8	-20	28.65	0.0150
810	1909.80	3.8	-10	35.68	0.0187
810	1909.80	3.8	0	58.63	0.0307
810	1909.80	3.8	10	38.74	0.0203
810	1909.80	3.8	20	30.24	0.0158
810	1909.80	3.8	30	-4.76	-0.0025
810	1909.80	3.8	40	21.17	0.0111
810	1909.80	3.8	50	19.23	0.0101
810	1909.80	3.8	60	20.49	0.0107
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
810	1909.80	4.35	-30	29.67	0.0155
810	1909.80	4.35	-20	33.17	0.0174
810	1909.80	4.35	-10	41.73	0.0219
810	1909.80	4.35	0	51.92	0.0272
810	1909.80	4.35	10	40.12	0.0210
810	1909.80	4.35	20	23.95	0.0125
810	1909.80	4.35	30	-12.70	-0.0066
810	1909.80	4.35	40	19.24	0.0101
810	1909.80	4.35	50	17.76	0.0093
810	1909.80	4.35	60	33.85	0.0177

APPENDIX 2A– WCDMA Band 2/5 CONDUCTED RF EMISSIONS TEST DATA/PLOTS

WCDMA BAND 2/5 Conducted RF Emission Test Data

This appendix contains measurement data pertaining to conducted spurious emissions, 99% power bandwidth and the channel mask.

Test Setup Diagram



A reference offset of 31.4 dB was applied to the spectrum analyzer reference level for the attenuators and coaxial cable loss in the test circuit.

UNIT	MANUFACTURER	MODEL	SERIAL NUMBER
Attenuator 1	Mini-Circuits	BW-S6W2+	0647
Attenuator 2	Mini-Circuits	BW-S6W2+	0648
Attenuator 3	Mini-Circuits	BW-S20-2W263+	1234
Splitter 1	Weinschel	1515	MES 92

Date of Test: January 28, 2013

The environmental test conditions were: Temperature: 23.4 ºC
Relative Humidity: 26.1 %

The following measurements were performed by Berkin Can.

WCDMA Conducted RF Emission Test Data cont'd

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 24.238(a), CFR 2.202, CFR 22 Subpart H, CFR 27.53, RSS-132 and RSS - 133 were measured from 30 MHz to 20 GHz.

–26 dBc Bandwidth and Occupied Bandwidth (99%)

For each carrier frequency of low, middle and high, the modulation spectrum was measured by both methods of 99% power bandwidth and –26 dBc bandwidth.
The resolution bandwidth required for out-of-band emissions in the 1 MHz bands immediately outside and adjacent to the frequency block, was determined to be at least 1% of the emission bandwidth.
The worst case –26dBc bandwidth for WCDMA band 5 was measured to be 4.602 MHz, and for the WCDMA band 2 was measured to be 4.595 MHz as shown below. Results were derived in a 100 kHz resolution bandwidth.
On any frequency outside the frequency block and outside the adjacent 1 MHz bands, a resolution bandwidth of at least 1 MHz was applied.

Test Data for WCDMA Band 5/2 selected Frequencies in Loopback mode

WCDMA Band 5 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
826.400	4.595	**4.153**
836.400	4.580	**4.153**
846.600	4.573	4.146

WCDMA Band 2 Frequency (MHz)	26dBc Occupied Bandwidth (MHz	99% Occupied Bandwidth (MHz)
1852.400	4.580	4.161
1880.000	4.595	**4.168**
1907.600	4.573	4.161

Peak to Average Ratio (PAR)

The peak to average ratio was measured on the low, middle and high channels.
On any frequency outside the frequency block and outside the adjacent 1 MHz bands, a resolution bandwidth of at least 1 MHz was applied.
The worst case measured was 3.68 dB on the low channel.

Measurement Plots for WCDMA Band 5 and WCDMA Band 2 in Voice mode

See Figures 1-1b to 1-12b for the plots of the conducted spurious emissions.
See Figures 1-13b to 1-24b for the plots of 99% Occupied Bandwidth and -26 dBc Bandwidth.
See Figures 1-25b to 1-28b for the plots of the Channel mask.
See figures 1-29b to 1-31b for the plots of the Peak to Average Ratio (WCDMA Band 2).

WCDMA Conducted RF Emission Test Data cont'd

Figure 1-1b: Band 5, Spurious Conducted Emissions, Low channel

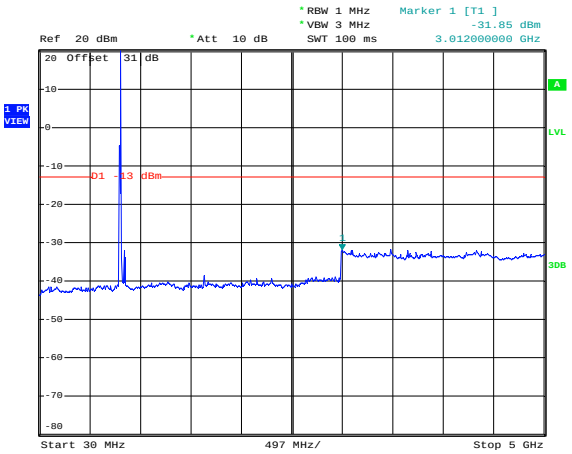


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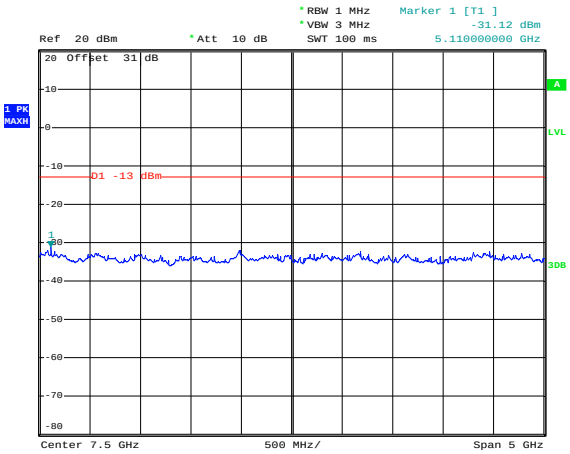
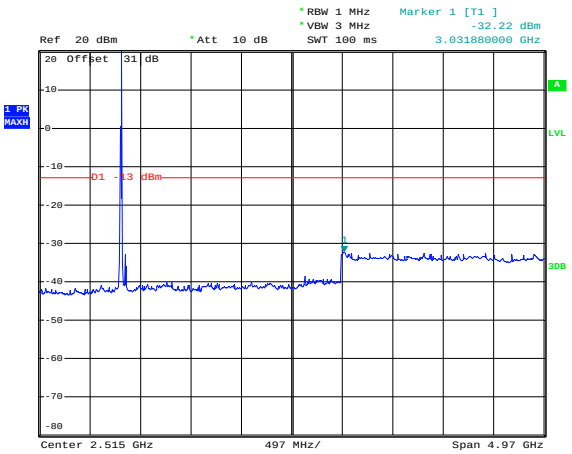
Figure 1-2b: Band 5, Spurious Conducted Emissions, Low channel



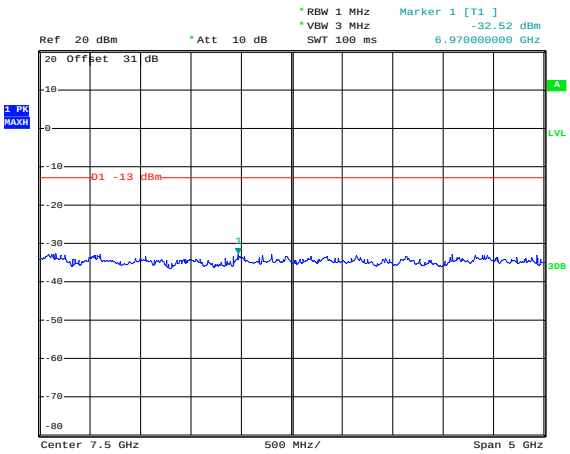
Date: 27.JAN.2013 17:11:40

Figure 1-3b: Band 5, Spurious Conducted Emissions, Middle channel



Date: 27.JAN.2013 17:29:11

Figure 1-4b: Band 5, Spurious Conducted Emissions, Middle channel



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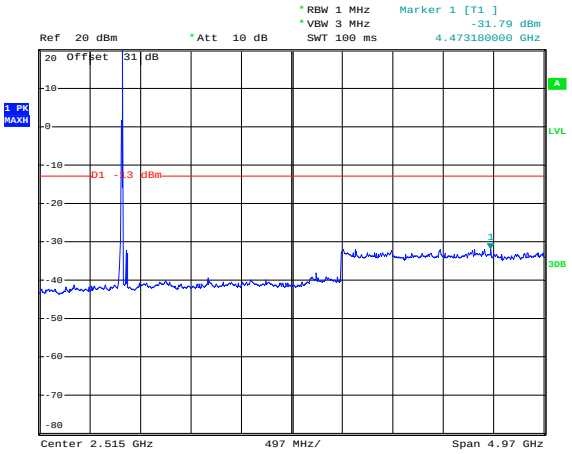
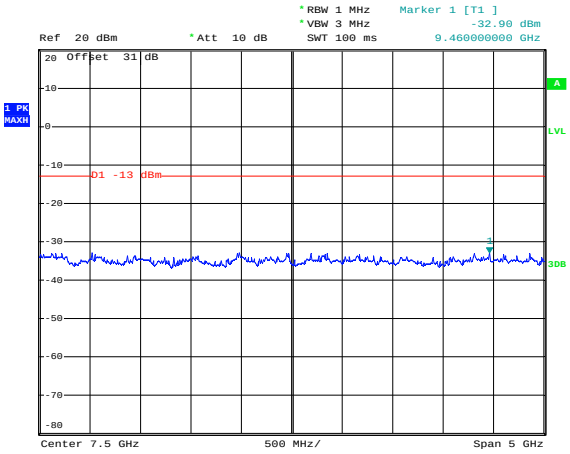
WCDMA Conducted RF Emission Test Data cont'd

Figure 1-5b: Band 5, Spurious Conducted Emissions, High Channel



Date: 27.JAN.2013 17:37:29

Figure 1-6b: Band 5, Spurious Conducted Emissions, High Channel



Date: 27.JAN.2013 17:07:08

Figure 1-7b:, BAND 2 Spurious Conducted Emissions, Low Channel

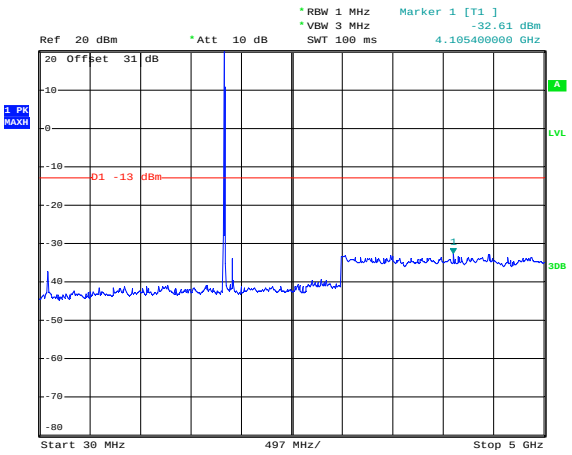


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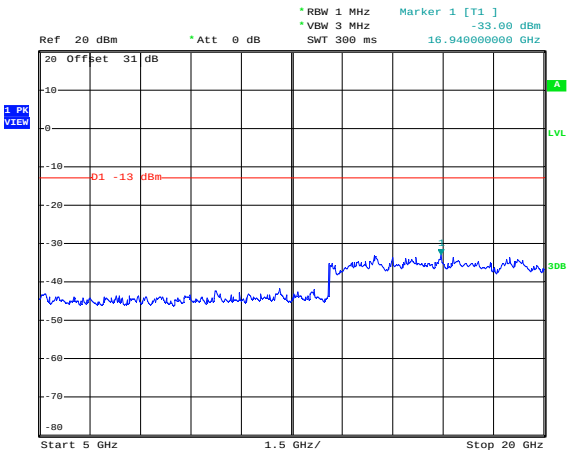
Figure 1-8b: BAND 2, Spurious Conducted Emissions, Low Channel



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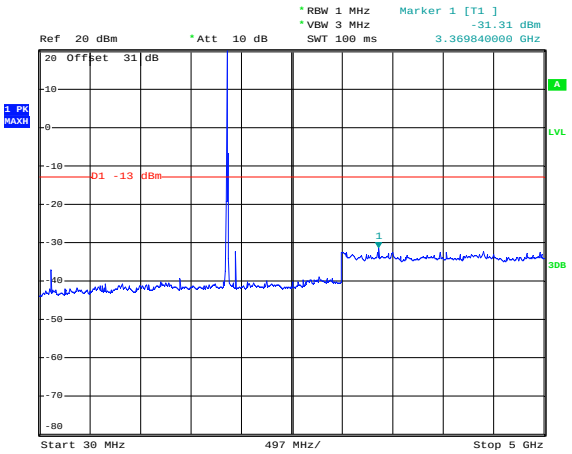
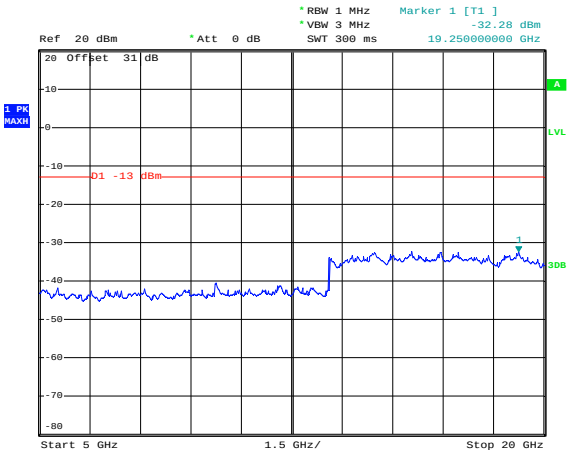
WCDMA Conducted RF Emission Test Data cont'd

Figure 1-9b: BAND 2, Spurious Conducted Emissions, Middle Channel



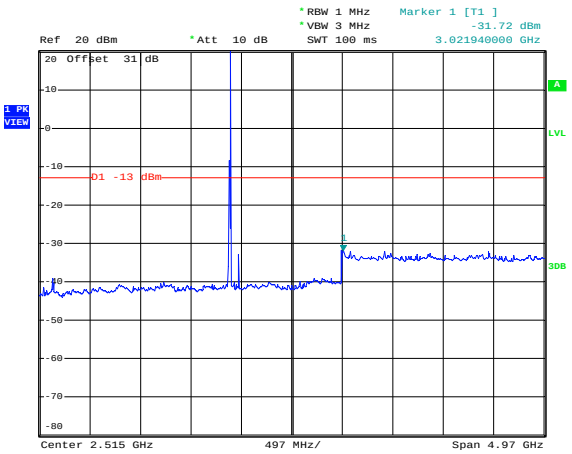
Date: 27.JAN.2013 16:49:55

Figure 1-10b: BAND 2, Spurious Conducted Emissions, Middle Channel



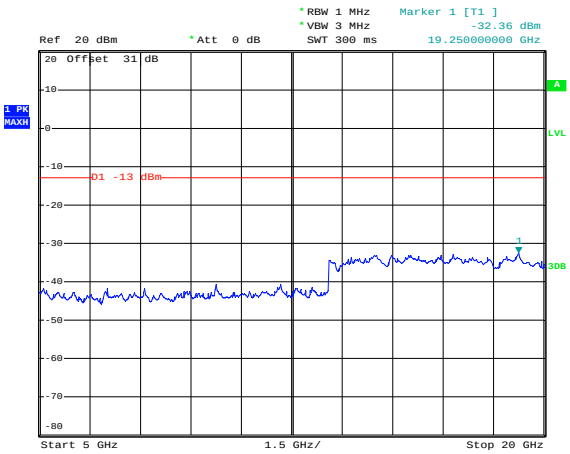
Date: 27.JAN.2013 16:58:29

Figure 1-11b: BAND 2, Spurious Conducted Emissions, High Channel



Date: 27.JAN.2013 16:46:17

Figure 1-12b: BAND 2, Spurious Conducted Emissions, High Channel



Date: 27.JAN.2013 17:02:07

WCDMA Conducted RF Emission Test Data cont'd

Figure 1-13b: Occupied Bandwidth, Band 5 Low Channel

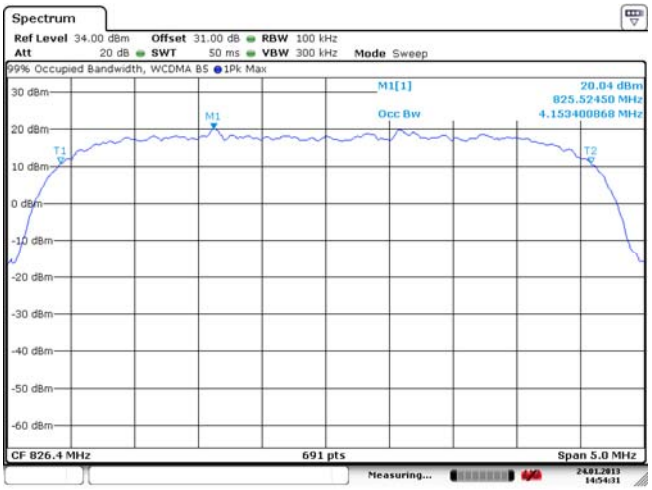


Figure 1-14b: Occupied Bandwidth, Band 5 Middle Channel

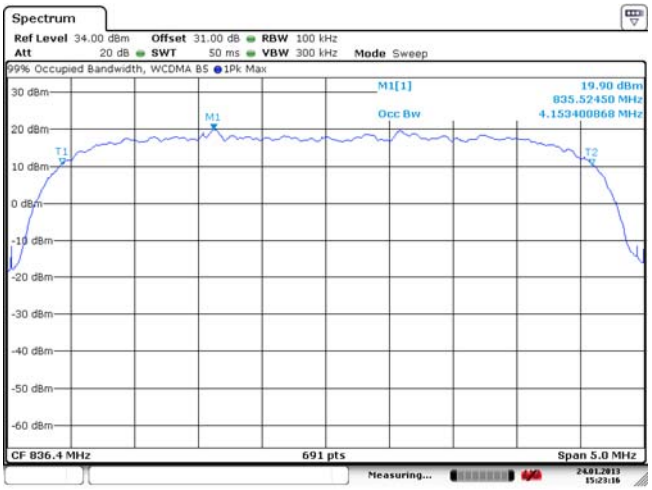


Figure 1-15b: Occupied Bandwidth, Band 5 High Channel

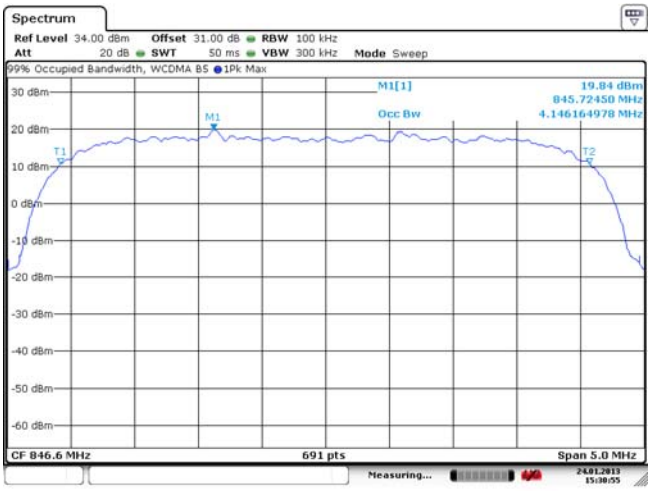
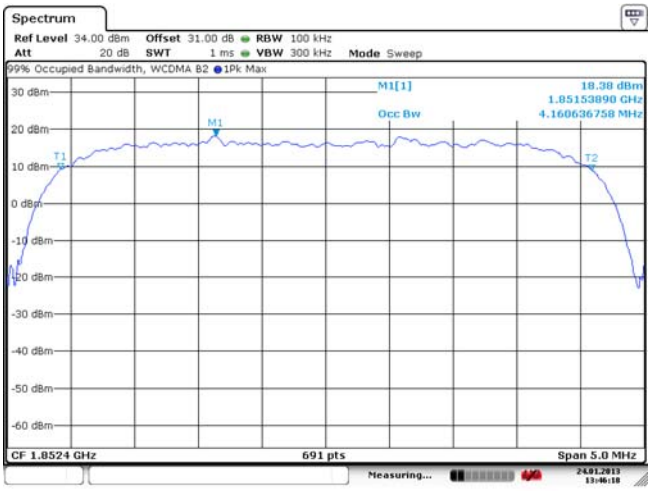


Figure 1-16b: Occupied Bandwidth, Band 2 Low Channel



WCDMA Conducted RF Emission Test Data cont'd

Figure 1-17b: Occupied Bandwidth, Band 2 Middle Channel

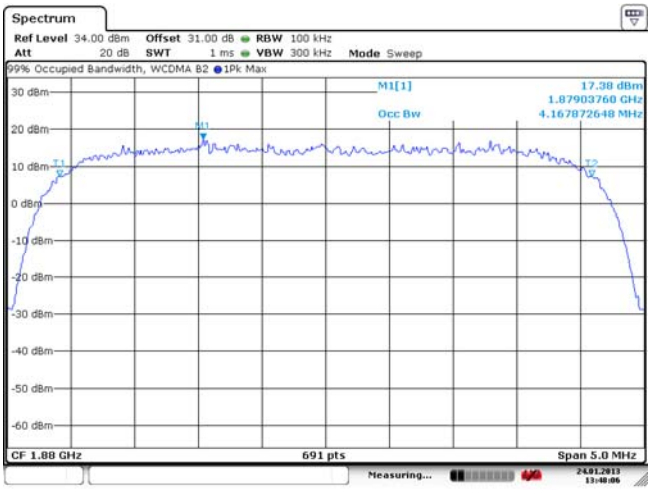


Figure 1-18b: Occupied Bandwidth, Band 2 High Channel

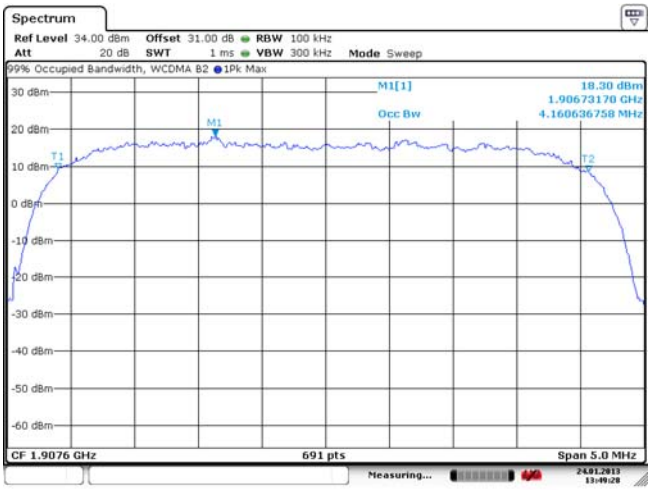


Figure 1-19b: -26 dBc Bandwidth, Band 5 Low Channel

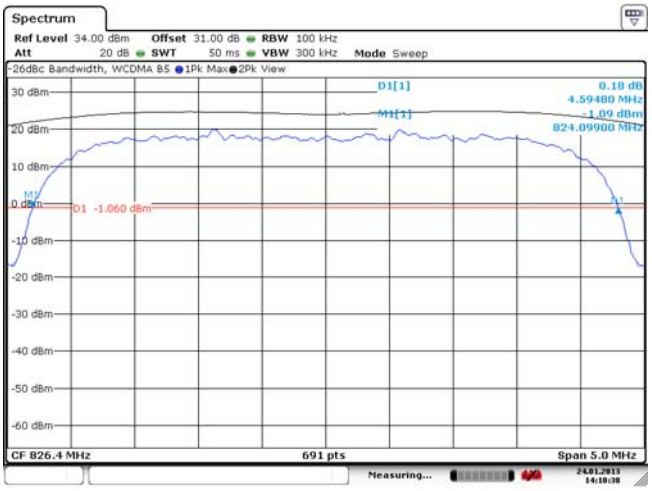
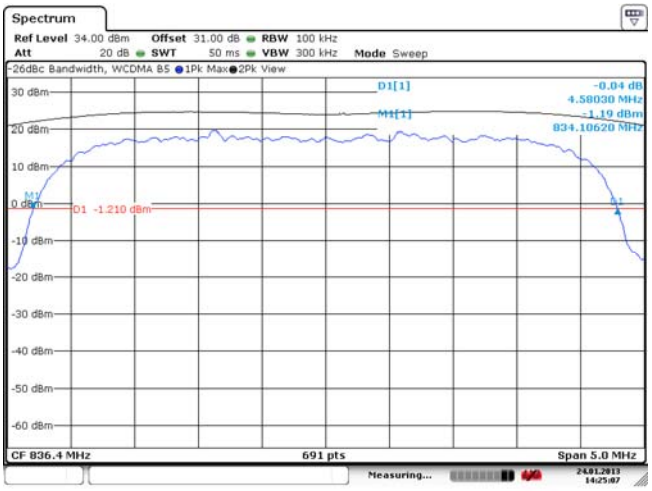


Figure 1-20b: -26 dBc Bandwidth, Band 5 Middle Channel



WCDMA Conducted RF Emission Test Data cont'd

Figure 1-21b: -26 dBc Bandwidth, Band 5 High Channel

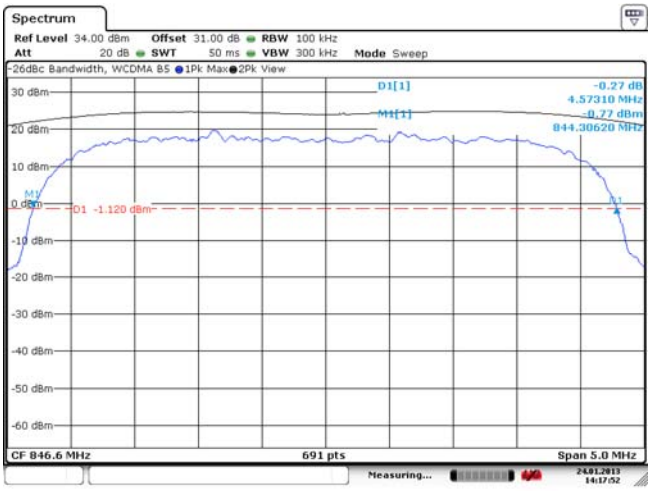


Figure 1-22b: -26 dBc Bandwidth, Band 2 Low Channel

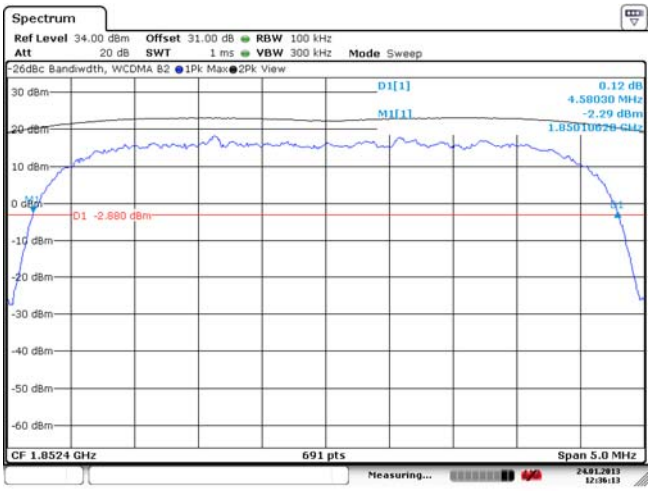


Figure 1-23b: -26 dBc Bandwidth, Band 2 Middle Channel

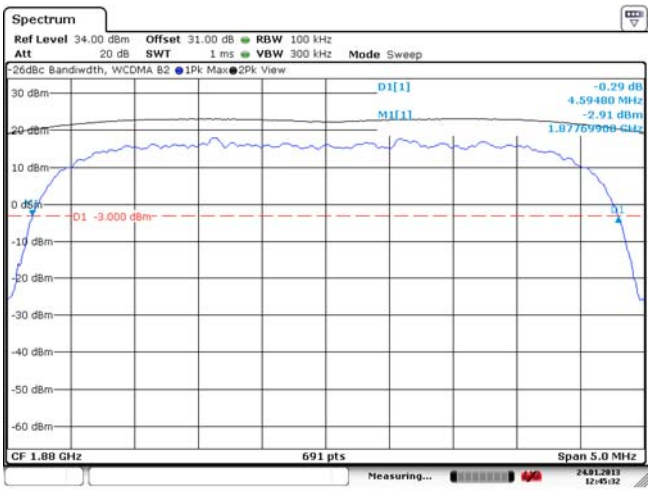
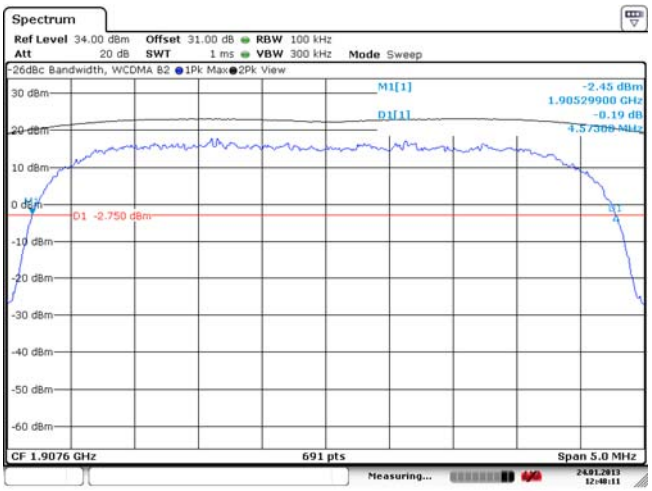


Figure 1-24b: -26 dBc Bandwidth, Band 2 High Channel



WCDMA Conducted RF Emission Test Data cont'd

Figure 1-25b: Band 5 Low Channel Mask

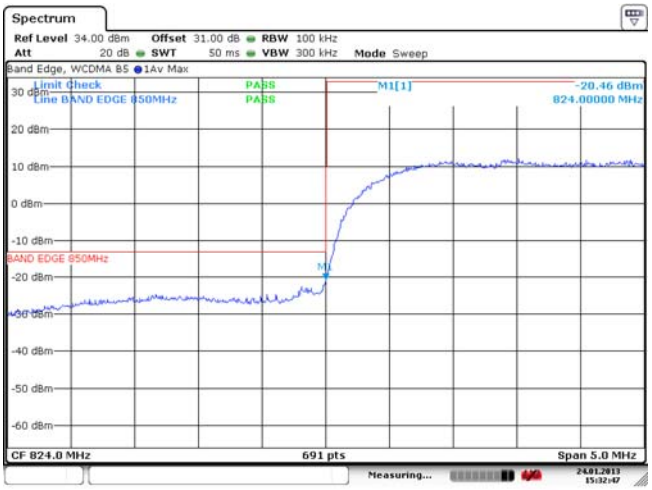


Figure 1-26b: Band 5 High Channel Mask

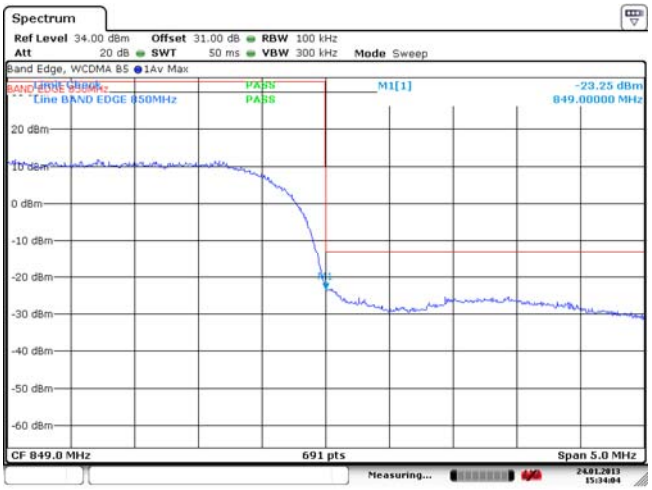


Figure 1-27b: Band 2 Low Channel Mask

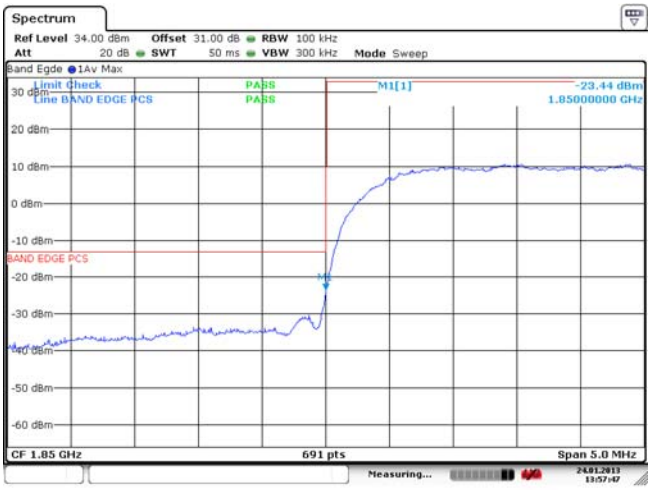
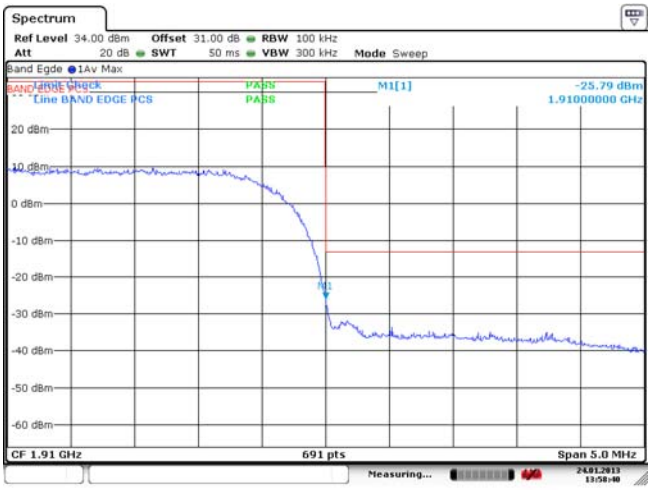


Figure 1-28b: Band 2 High Channel Mask



WCDMA Conducted RF Emission Test Data cont'd

Figure 1-29b: Band 2, PAR Low Channel

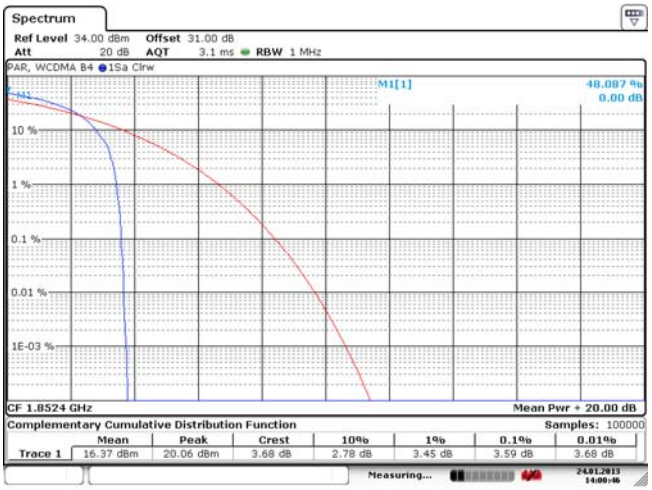


Figure 1-30b: Band 2, PAR Mid Channel

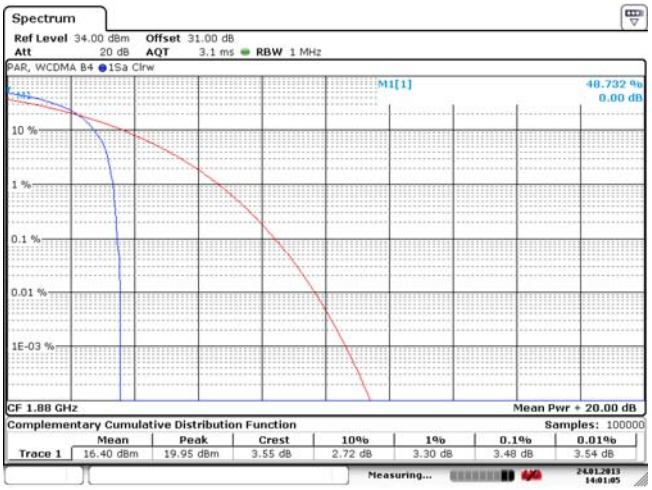
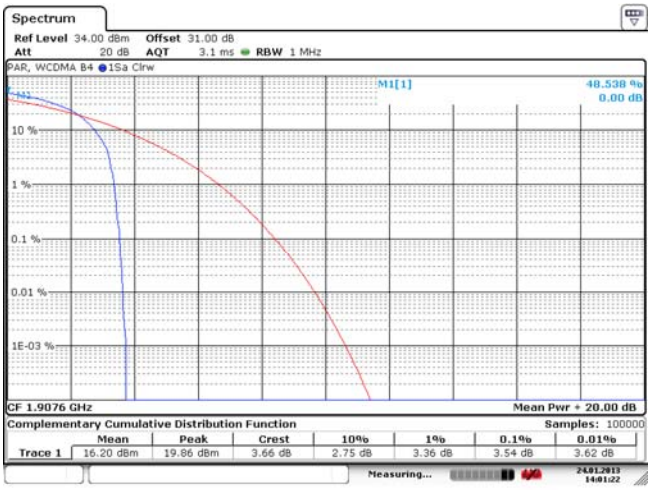


Figure 1-31b: Band 2, PAR High Channel



WCDMA Conducted RF Emission Test Data cont'd

The conducted spurious emissions – As per 47 CFR 2.1051, CFR 24.238(a), CFR 22 Subpart H, RSS-132 and RSS - 133 were measured from 10 MHz to 20 GHz.

Date of Test: January 24 - 28, 2013

The environmental test conditions were: Temperature: 22.0 – 23.4 ºC
Relative Humidity: 19.7 – 26.1 %

Test Data for WCDMA Band 5 / 2 selected Frequencies in HSUPA mode

WCDMA Band 5 Frequency (MHz)	99% Occupied Bandwidth (MHz)
826.400	4.153
836.400	4.161
846.600	**4.168**

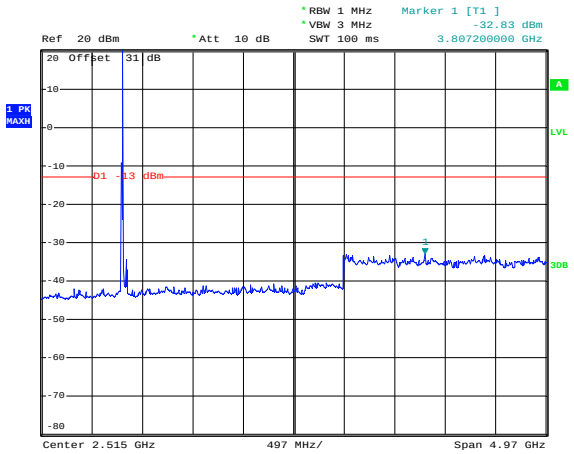
WCDMA Band 2 Frequency (MHz)	99% Occupied Bandwidth (MHz)
1852.400	4.161
1880.000	4.153
1907.600	**4.168**

Measurement Plots for WCDMA Band 5 and WCDMA Band 2 in HSUPA mode
Refer to the following measurement plots for more detail:

See Figures 1-32b to 1-43b for the plots of the conducted spurious emissions.
See Figures 1-44b to 1-49b for the plots of 99% Occupied Bandwidth.
See Figures 1-50b to 1-53b for the plots of the Channel mask.

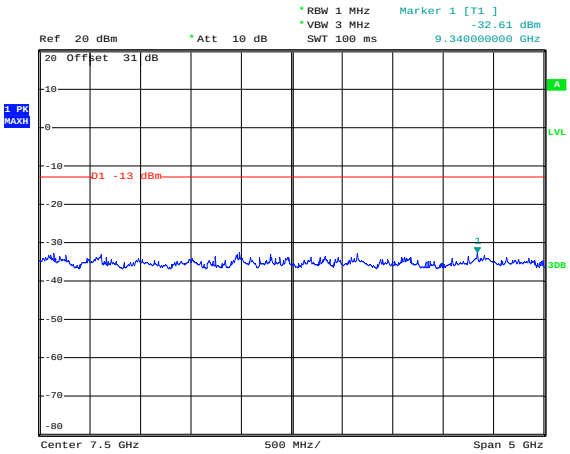
WCDMA Conducted RF Emission Test Data cont'd

Figure 1-32b: Band 5 HSUPA, Spurious Conducted Emissions, Low channel



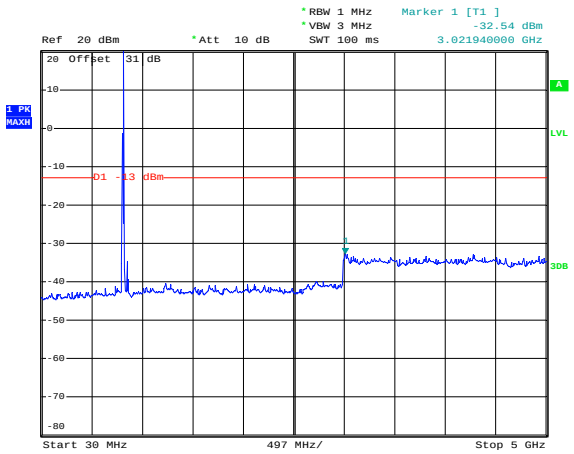
Date: 28.JAN.2013 14:56:51

Figure 1-33b: Band 5 HSUPA, Spurious Conducted Emissions, Low channel



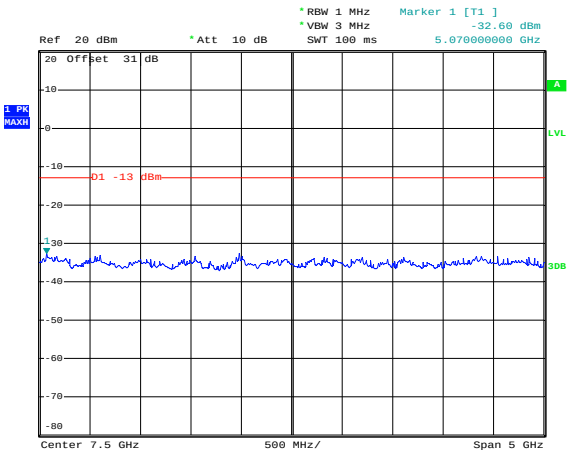
Date: 28.JAN.2013 14:55:40

Figure 1-34b: Band 5 HSUPA, Spurious Conducted Emissions, Middle channel



Date: 28.JAN.2013 14:57:29

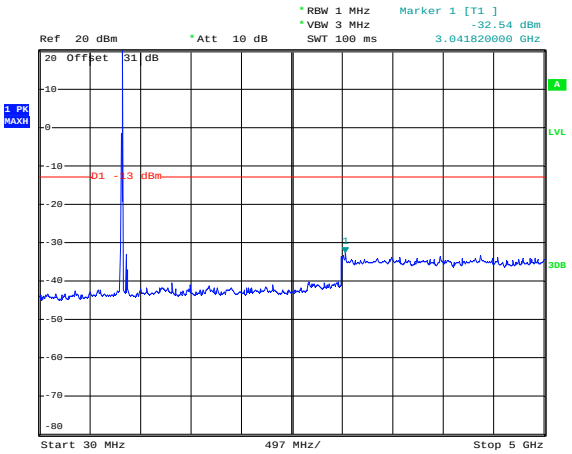
Figure 1-35b: Band 5 HSUPA, Spurious Conducted Emissions, Middle channel



Date: 28.JAN.2013 14:55:17

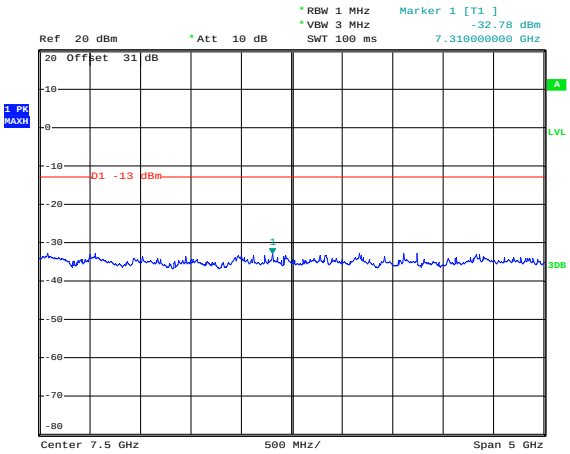
WCDMA Conducted RF Emission Test Data cont'd

Figure 1-36b: Band 5 HSUPA, Spurious Conducted Emissions, High Channel



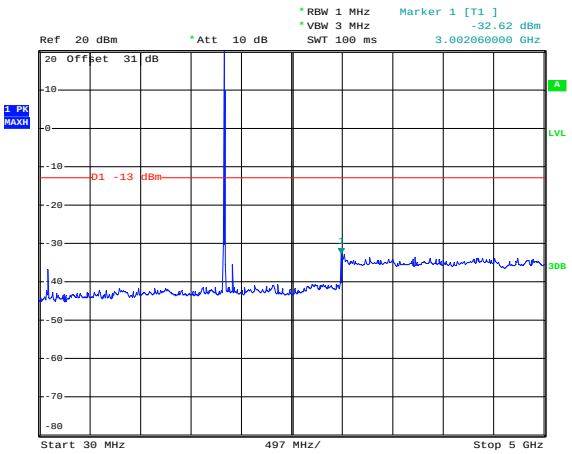
Date: 28.JAN.2013 14:57:56

Figure 1-37b: Band 5 HSUPA, Spurious Conducted Emissions, High Channel



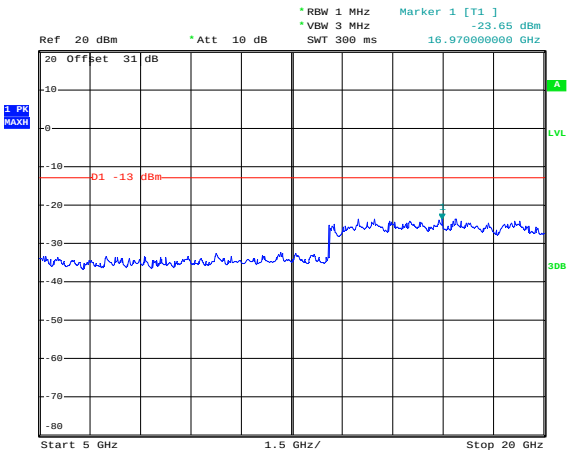
Date: 28.JAN.2013 14:54:10

Figure 1-38b: Band 2 HSUPA, Spurious Conducted Emissions, Low Channel



Date: 28.JAN.2013 14:45:51

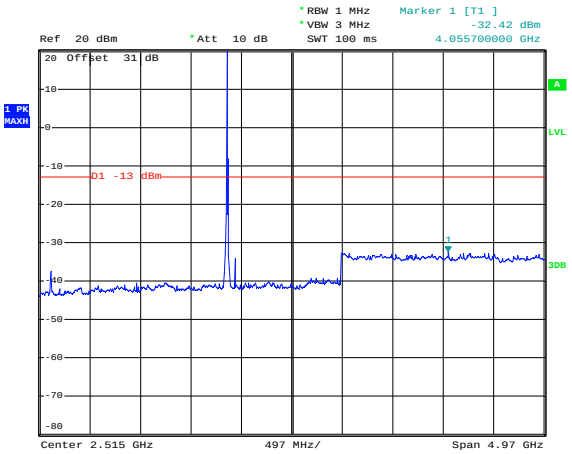
Figure 1-39b: Band 2 HSUPA, Spurious Conducted Emissions, Low Channel



Date: 28.JAN.2013 14:52:12

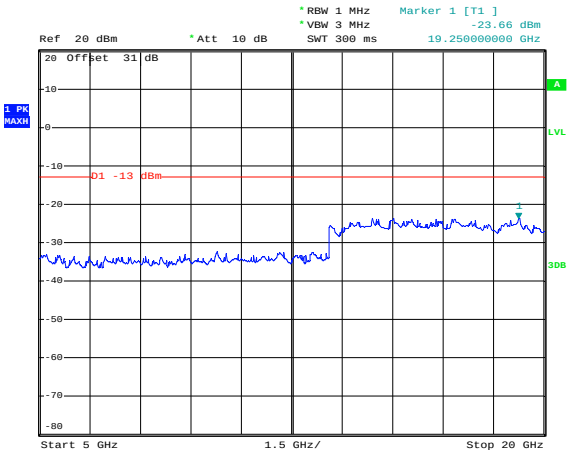
WCDMA Conducted RF Emission Test Data cont'd

Figure 1-40b: Band 2 HSUPA, Spurious Conducted Emissions, Middle Channel



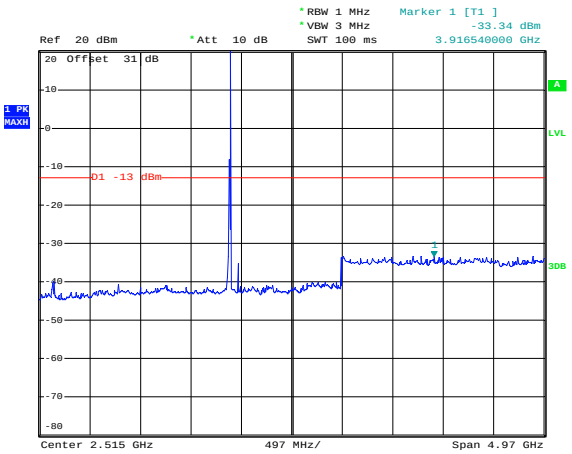
Date: 28.JAN.2013 14:49:22

Figure 1-41b: Band 2 HSUPA, Spurious Conducted Emissions, Middle Channel



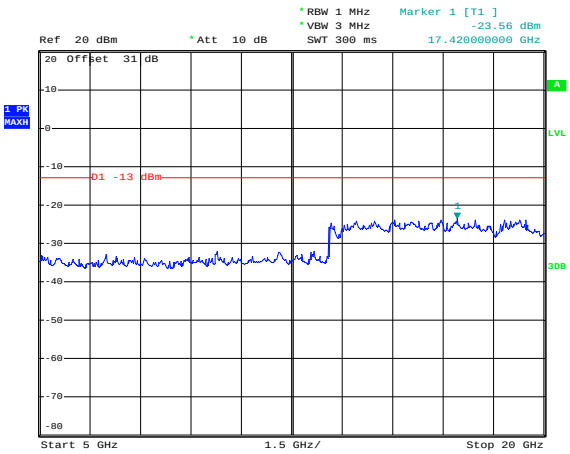
Date: 28.JAN.2013 14:51:27

Figure 1-42b: Band 2 HSUPA, Spurious Conducted Emissions, High Channel



Date: 28.JAN.2013 14:50:04

Figure 1-43b: Band 2 HSUPA, Spurious Conducted Emissions, High Channel



Date: 28.JAN.2013 14:50:56

WCDMA Conducted RF Emission Test Data cont'd

Figure 1-44b: Occupied Bandwidth, Band 5 HSUPA Low Channel

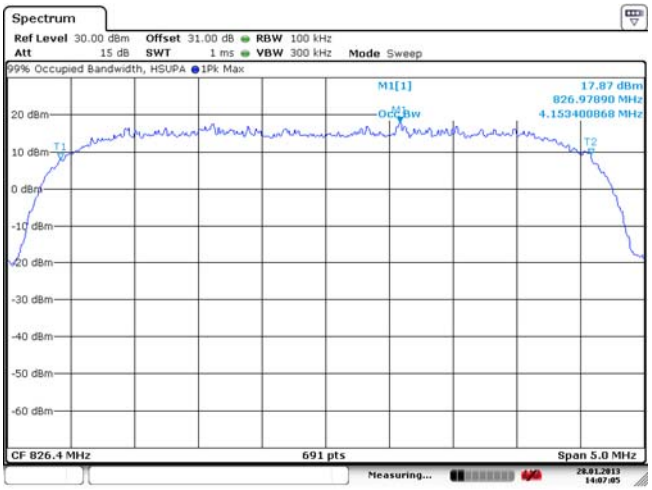


Figure 1-45b: Occupied Bandwidth, Band 5 HSUPA Middle Channel

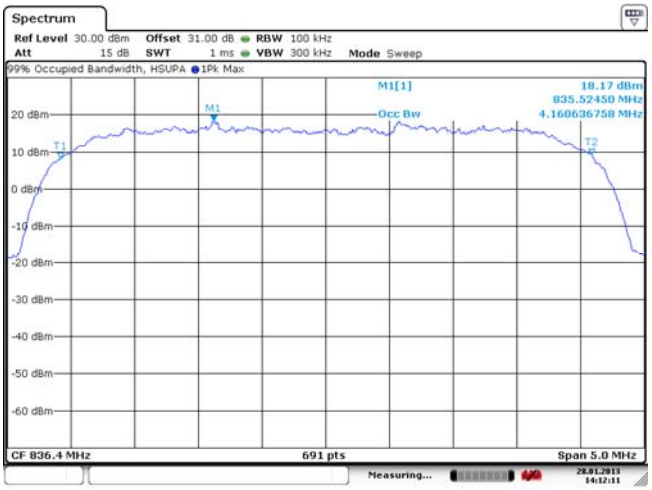


Figure 1-46b: Occupied Bandwidth, Band 5 HSUPA High Channel

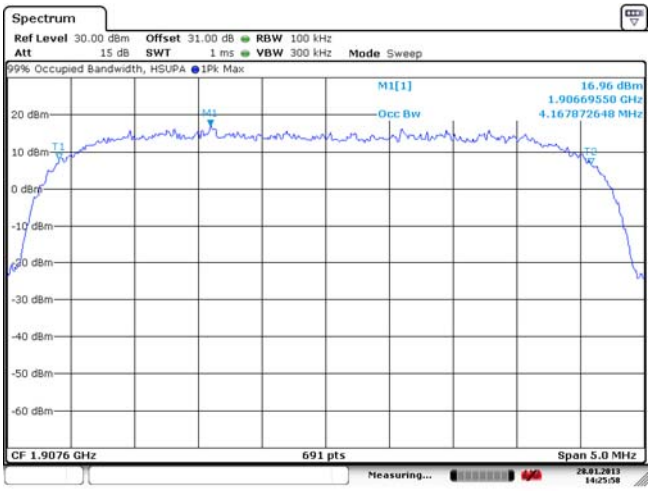
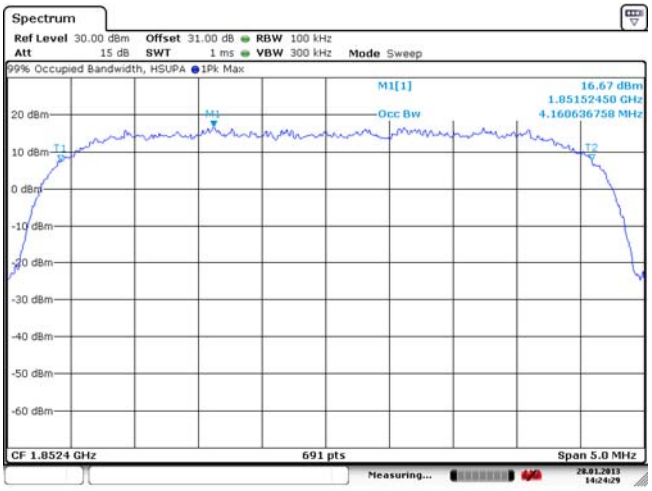


Figure 1-47b: Occupied Bandwidth, Band 2 HSUPA Low Channel



WCDMA Conducted RF Emission Test Data cont'd

Figure 1-48b: Occupied Bandwidth, Band 2 HSUPA Middle Channel

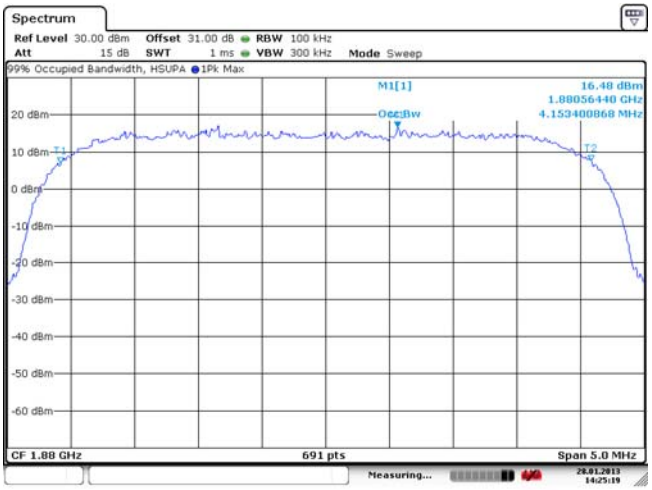


Figure 1-49b: Occupied Bandwidth, Band 2 HSUPA High Channel

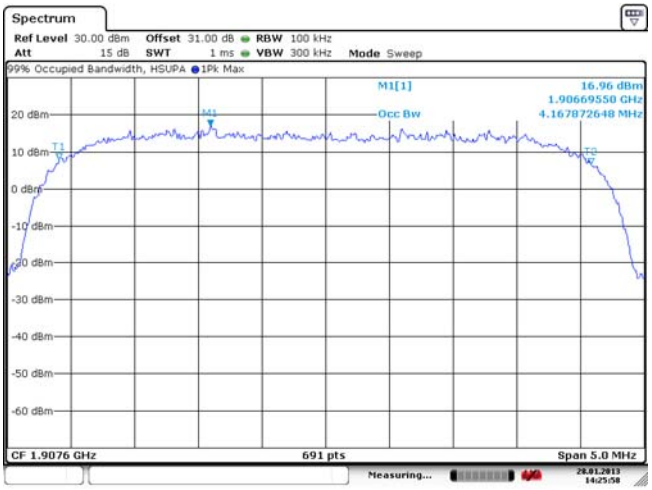


Figure 1-50b: Band 5 , HSUPA Low Channel Mask

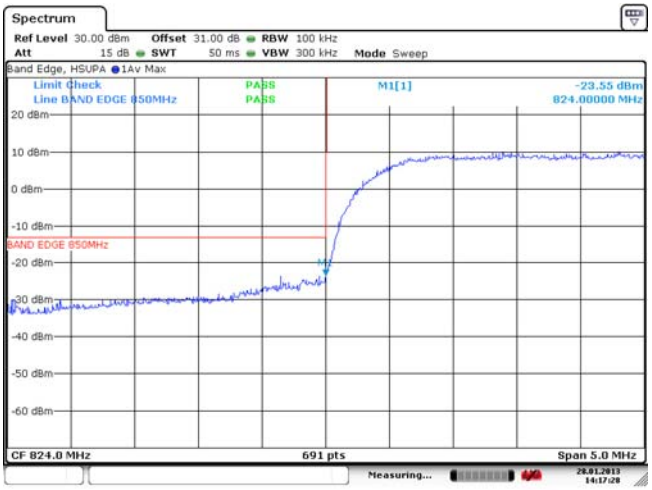
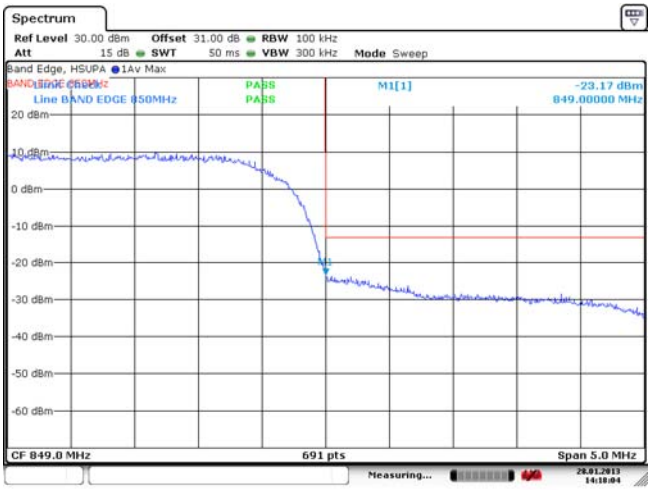


Figure 1-51b: Band 5 , HSUPA High Channel Mask



WCDMA Conducted RF Emission Test Data cont'd

Figure 1-52b: Band 2, HSUPA Low Channel Mask

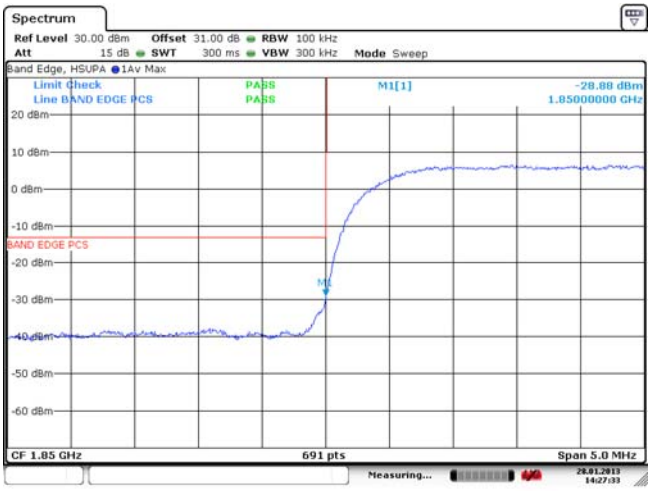
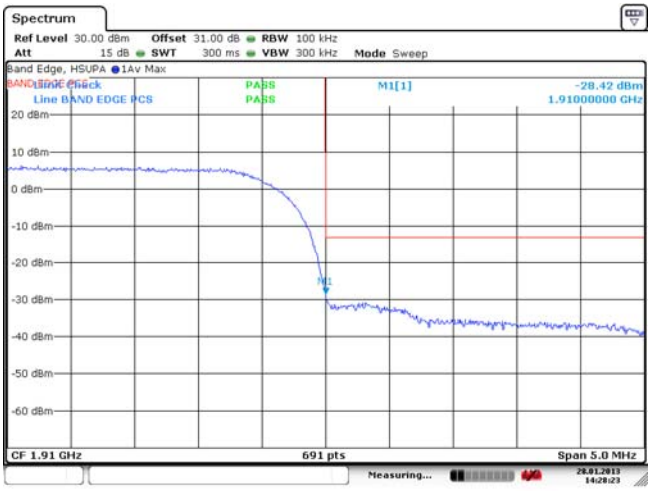


Figure 1-53b: Band 2, HSUPA High Channel Mask



APPENDIX 2B – WCDMA Band 2/5 CONDUCTED RF OUTPUT POWER TEST DATA

WCDMA Band 2/5 Conducted RF Output Power Test Data

The conducted RF output power was measured using the CMU200 base station simulator. Low, middle and high channels were measured at maximum radio output power at different service options and modes.

Date of Test: November 27, 2012 – January 29, 2013

The environmental conditions were: Temperature: 23.2 °C
Humidity: 27.6 %

The measurements were performed by Daoud Attayi.

WCDMA Band 5 RF Conducted RF Output Power

	Band	**WCDMA Band 5 (850)**		
	Channel	4132	4182	4233
	Freq (MHz)	826.4	836.4	846.6
Mode	**Subtest**	**Max burst averaged conducted power (dBm)**		
Rel99	12.2 kbps RMC	24.63	24.42	24.27
Rel99	12.2 kbps, Voice, AMR, SRB 3.4 kbps	24.69	24.37	24.33
Rel6 HSUPA	1	23.22	23.00	22.80
Rel6 HSUPA	2	22.80	22.48	22.33
Rel6 HSUPA	3	23.70	23.38	23.26
Rel6 HSUPA	4	23.55	23.30	23.15
Rel6 HSUPA	5	21.65	21.55	21.30
Rel7 HSDPA+	1	22.90	22.92	22.91
Rel7 HSDPA+	2	22.16	22.11	22.15
Rel7 HSDPA+	3	21.80	21.72	22.05
Rel7 HSDPA+	4	21.41	21.60	22.01

WCDMA (Rel99) / HSPA/HSPA+ conducted power measurements

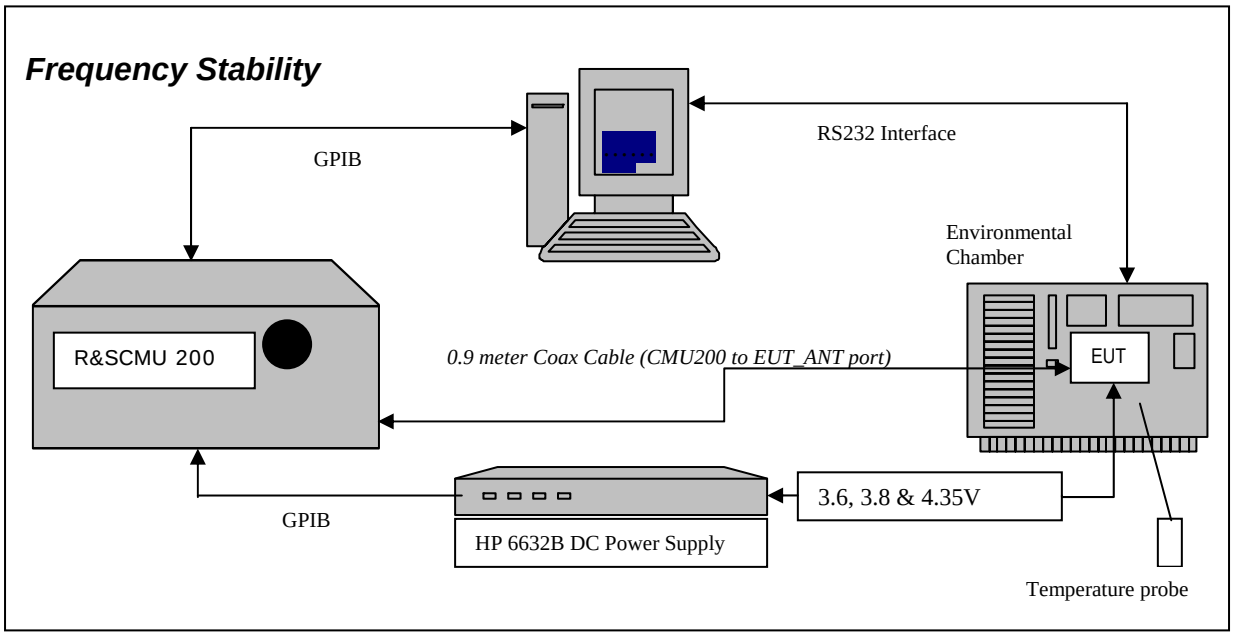
WCDMA Band 2 RF Conducted RF Output Power

	Band	**WCDMA Band 2 (1900)**		
	Channel	9262	9400	9538
	Freq (MHz)	1852.4	1880.0	1907.6
Mode	**Subtest**	**Max burst averaged conducted power (dBm)**		
Rel99	12.2 kbps RMC	23.10	22.95	22.98
Rel99	12.2 kbps, Voice, AMR, SRB 3.4 kbps	23.10	22.94	22.96
Rel6 HSUPA	1	22.71	22.51	22.54
Rel6 HSUPA	2	22.41	22.20	22.11
Rel6 HSUPA	3	23.09	22.92	22.95
Rel6 HSUPA	4	23.00	22.85	22.83
Rel6 HSUPA	5	21.20	21.00	20.95
Rel7 HSDPA+	1	22.60	22.81	22.81
Rel7 HSDPA+	2	22.05	22.04	22.10
Rel7 HSDPA+	3	22.48	22.41	22.32
Rel7 HSDPA+	4	21.25	21.10	21.20

WCDMA (Rel99) / HSPA/HSPA+ conducted power measurements

APPENDIX 2C – WCDMA Band 2/5 FREQUENCY STABILITY TEST DATA

WCDMA Frequency Stability Test Data



The following measurements were performed by Berkin Can.

CFR 47 Chapter 1 - Federal Communications Commission Rules

Part 2 Required Measurements
2.1055 Frequency Stability - Procedures
(a,b) Frequency Stability - Temperature Variation
(d) Frequency Stability - Voltage Variation

24.235 *Frequency Stability*.
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

The EUT meets the requirements as stated in CFR 47 chapter 1, Section 27.54, CFR 47 and RSS-139, 6.3 Frequency Stability.
Frequency Stability measurement devices were configured as presented in the block diagram recording frequency, power, data, temperatures, and stepped voltages controlled via a GPIB interface linked to the Environmental chamber, a DC power supply, and the Communications Test Set. A 0.9-metre coax cable was calibrated to characterize the insertion loss for the transmitted frequencies between the RF input/output of the CMU 200 and the EUT antenna port.

Test Setup:

The EUT was placed in the Temperature chamber and connected to CMU 200 outside as shown in the figure above. Dry air was pumped inside the temperature chamber to maintain a backpressure during the test. The EUT was kept in the off condition at all times except when the following measurements were to be made.

The chamber was switched on and the temperature was set to -30°C.
After the chamber stabilized at -30 °C there was a soak period of one hour to alleviate moisture in the chamber, the EUT voltage was enabled.
The system software recorded the frequency, power, and associated measurements.

A Computer system controlled the automated software. This application was given the command of activating all machines intrinsic to the temperature and voltage tests controlling the CMU 200 via the GPIB Bus. The Environmental Chamber was instructed through an RS-232 serial line. The EUT dialogue was passed through a serial connection.

The EUT repetitively transmitted 100 bursts for each set of programmed parameters recording temperature, voltage settings, and systematically selected frequencies. The power supply was cycled from minimum voltage 3.6 volts, 3.8 volts and to 4.35 volts maximum voltage. The frequency error was measured at a maximum output power and recorded by the automated system test software.

The EUT output power and frequency was measured at 3.6 volts, 3.8 volts and 4.35 volts. The transmit frequency was varied in 3 steps consisting of 1852.4, 1880.0 and 1907.6 MHz for the WCDMA band 2. This frequency was recorded in MHz and deviation from nominal, in Parts Per Million.
After the initial one-hour soak at the beginning of the tests, a period of thirty minutes soak was initialized between each ascending temperature step, before proceeding to the next measurement test cycle.

Procedure:

The test system software for commencing the Frequency Stability Tests carried through the following cycle.

1. Switch on the HP 6632B power supply; CMU 200 Communications test Set, and Environmental Chamber.
2. Start test program
3. Set the Temperature to –30°C and maintain a period of one- hour soak time, with the EUT supply voltage disabled.
4. Set power supply voltage to 3.6 volts.
5. Set up CMU 200 Radio Communication Tester.
6. Command the CMU 200 to switch to the low channel.
7. Enable the voltage to the EUT, and connect a link to the CMU 200 test set.
8. EUT is commanded to Transmit 100 Bursts.
9. Software logs the following data from the CMU 200, power supply and temperature chamber: Traffic Channel Number, Traffic Channel Frequency, Power Level, Chamber Temperature, Supply Voltage, Power and Frequency Error.
10. The CMU 200 commands the EUT to change frequency to the middle channel and high channel and repeats steps 7 to 9.
11. Repeat steps 5 to 10 changing the supply voltage to 3.8 Volts
12. Increase temperature by 10°C and soak for 1/2 hour.
13. Repeat steps 4 - 12 for temperatures –30°C to 60°C.
14. Repeat steps 5 to 10 changing the supply voltage to 4.35 volts

Procedure 5 to 10 was repeated at room temperature (20°C) with the power supply voltage set to 3.6, 3.8 and 4.35 volts

The maximum frequency error in the WCDMA band 5 measured was **0.0535 PPM**.
The maximum frequency error in the WCDMA band 2 measured was **0.0141 PPM.**

Date of Test: January 27-28, 2013

The environmental conditions were: Temperature: 22.0 - 23.4 °C
Humidity: 20.1 - 26.1 %

WCDMA Band 5 results: channels 4132, 4182 and 4233 @ 20°C maximum transmitted power

Traffic Channel Number	WCDMA Band 5 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	3.6	20	42.03	0.0509
4182	836.4	3.6	20	32.59	0.0390
4233	846.6	3.6	20	36.00	0.0425

Traffic Channel Number	WCDMA Band 5 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	3.8	20	28.45	0.0344
4182	836.4	3.8	20	0.38	0.0005
4233	846.6	3.8	20	23.01	0.0272

Traffic Channel Number	WCDMA Band 5 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	4.35	20	-5.82	-0.0070
4182	836.4	4.35	20	-17.15	-0.0205
4233	846.6	4.35	20	23.41	0.0277

WCDMA Band 5 Results: channel 4132 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	3.6	-30	27.56	0.0333
4132	826.4	3.6	-20	-9.24	-0.0112
4132	826.4	3.6	-10	-6.61	-0.0080
4132	826.4	3.6	0	3.60	0.0044
4132	826.4	3.6	10	28.33	0.0343
4132	826.4	3.6	20	42.03	0.0509
4132	826.4	3.6	30	26.54	0.0321
4132	826.4	3.6	40	**43.89**	**0.0535**
4132	826.4	3.6	50	-0.20	-0.0002
4132	826.4	3.6	60	32.51	0.0393
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
4132	826.4	3.8	-30	-14.79	-0.0179
4132	826.4	3.8	-20	-19.88	-0.0241
4132	826.4	3.8	-10	28.84	0.0349
4132	826.4	3.8	0	19.71	0.0239
4132	826.4	3.8	10	10.38	0.0126
4132	826.4	3.8	20	28.45	0.0344
4132	826.4	3.8	30	40.71	0.0493
4132	826.4	3.8	40	25.42	0.0308
4132	826.4	3.8	50	20.40	0.0247
4132	826.4	3.8	60	36.39	0.0440
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
4132	826.4	4.35	-30	41.85	0.0506
4132	826.4	4.35	-20	0.99	0.0012
4132	826.4	4.35	-10	28.95	0.0350
4132	826.4	4.35	0	32.95	0.0399
4132	826.4	4.35	10	25.22	0.0305
4132	826.4	4.35	20	-5.82	-0.0070
4132	826.4	4.35	30	20.80	0.0252
4132	826.4	4.35	40	27.04	0.0327
4132	826.4	4.35	50	-2.69	-0.0033
4132	826.4	4.35	60	-4.66	-0.0056

WCDMA Band 5 Results: channel 4182 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4182	836.4	3.6	-30	-1.16	-0.0014
4182	836.4	3.6	-20	24.39	0.0292
4182	836.4	3.6	-10	-21.27	-0.0254
4182	836.4	3.6	0	27.90	0.0334
4182	836.4	3.6	10	10.52	0.0126
4182	836.4	3.6	20	32.59	0.0390
4182	836.4	3.6	30	-3.85	-0.0050
4182	836.4	3.6	40	13.47	0.0161
4182	836.4	3.6	50	23.74	0.0284
4182	836.4	3.6	60	32.37	0.0387
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
4182	836.4	3.8	-30	-13.07	-0.0156
4182	836.4	3.8	-20	-14.79	-0.0177
4182	836.4	3.8	-10	27.94	0.0334
4182	836.4	3.8	0	24.62	0.0294
4182	836.4	3.8	10	27.77	0.0332
4182	836.4	3.8	20	0.38	0.0005
4182	836.4	3.8	30	-8.77	-0.0105
4182	836.4	3.8	40	10.46	0.0125
4182	836.4	3.8	50	26.27	0.0314
4182	836.4	3.8	60	27.21	0.0325
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
4182	836.4	4.35	-30	-0.50	-0.0006
4182	836.4	4.35	-20	15.07	0.0180
4182	836.4	4.35	-10	41.52	0.0496
4182	836.4	4.35	0	3.23	0.0039
4182	836.4	4.35	10	-10.92	-0.0131
4182	836.4	4.35	20	-17.15	-0.0205
4182	836.4	4.35	30	34.95	0.0418
4182	836.4	4.35	40	13.52	0.0162
4182	836.4	4.35	50	15.49	0.0185
4182	836.4	4.35	60	28.83	0.0345

WCDMA Band 5 Results: channel 4233 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4233	846.6	3.6	-30	-10.15	-0.0120
4233	846.6	3.6	-20	1.70	0.0020
4233	846.6	3.6	-10	22.32	0.0264
4233	846.6	3.6	0	21.22	0.0251
4233	846.6	3.6	10	23.51	0.0278
4233	846.6	3.6	20	36.00	0.0425
4233	846.6	3.6	30	42.16	0.0498
4233	846.6	3.6	40	24.30	0.0287
4233	846.6	3.6	50	25.71	0.0304
4233	846.6	3.6	60	24.67	0.0291
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
4233	846.6	3.8	-30	34.56	0.0408
4233	846.6	3.8	-20	28.68	0.0339
4233	846.6	3.8	-10	37.45	0.0442
4233	846.6	3.8	0	33.46	0.0395
4233	846.6	3.8	10	32.83	0.0388
4233	846.6	3.8	20	23.01	0.0272
4233	846.6	3.8	30	34.66	0.0409
4233	846.6	3.8	40	0.07	0.0001
4233	846.6	3.8	50	19.75	0.0233
4233	846.6	3.8	60	3.44	0.0041
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
4233	846.6	4.35	-30	23.27	0.0275
4233	846.6	4.35	-20	28.20	0.0333
4233	846.6	4.35	-10	5.50	0.0065
4233	846.6	4.35	0	35.29	0.0417
4233	846.6	4.35	10	23.23	0.0274
4233	846.6	4.35	20	23.41	0.0277
4233	846.6	4.35	30	27.35	0.0323
4233	846.6	4.35	40	23.65	0.0279
4233	846.6	4.35	50	33.69	0.0398
4233	846.6	4.35	60	14.70	0.0174

WCDMA Band 2 results: channels 9262, 9400, & 9538 @ 20°C maximum transmitted power

Traffic Channel Number	WCDMA1900 Frequency (MHz	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	3.6	20	-4.01	-0.0022
9400	1880.00	3.6	20	-1.66	-0.0009
9538	1907.60	3.6	20	11.22	0.0059

Traffic Channel Number	WCDMA1900 Frequency (MHz	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	3.8	20	-0.49	-0.0003
9400	1880.00	3.8	20	-5.04	-0.0027
9538	1907.60	3.8	20	12.95	0.0068

Traffic Channel Number	WCDMA1900 Frequency (MHz	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	4.35	20	-5.34	-0.0029
9400	1880.00	4.35	20	0.46	0.0002
9538	1907.60	4.35	20	13.72	0.0072

WCDMA Band 2 Results: channel 9262 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	3.6	-30	-3.27	-0.0018
9262	1852.40	3.6	-20	-8.05	-0.0043
9262	1852.40	3.6	-10	-7.86	-0.0042
9262	1852.40	3.6	0	-5.55	-0.0030
9262	1852.40	3.6	10	-2.89	-0.0016
9262	1852.40	3.6	20	-4.01	-0.0022
9262	1852.40	3.6	30	11.40	0.0062
9262	1852.40	3.6	40	12.01	0.0065
9262	1852.40	3.6	50	15.87	0.0086
9262	1852.40	3.6	60	16.89	0.0091
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
9262	1852.40	3.8	-30	-0.24	-0.0001
9262	1852.40	3.8	-20	-6.18	-0.0033
9262	1852.40	3.8	-10	-13.68	-0.0074
9262	1852.40	3.8	0	-6.99	-0.0038
9262	1852.40	3.8	10	**26.20**	**0.0141**
9262	1852.40	3.8	20	-0.49	-0.0003
9262	1852.40	3.8	30	-7.11	-0.0038
9262	1852.40	3.8	40	16.16	0.0087
9262	1852.40	3.8	50	13.50	0.0073
9262	1852.40	3.8	60	1.99	0.0011
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
9262	1852.40	4.35	-30	-6.15	-0.0033
9262	1852.40	4.35	-20	-13.26	-0.0072
9262	1852.40	4.35	-10	-12.35	-0.0067
9262	1852.40	4.35	0	-8.57	-0.0046
9262	1852.40	4.35	10	-1.97	-0.0011
9262	1852.40	4.35	20	-5.34	-0.0029
9262	1852.40	4.35	30	14.75	0.0080
9262	1852.40	4.35	40	17.19	0.0093
9262	1852.40	4.35	50	20.26	0.0109
9262	1852.40	4.35	60	-14.81	-0.0080

WCDMA Band 2 Results: channel 9400 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9400	1880.00	3.6	-30	-3.25	-0.0017
9400	1880.00	3.6	-20	13.56	0.0072
9400	1880.00	3.6	-10	20.93	0.0111
9400	1880.00	3.6	0	-3.59	-0.0019
9400	1880.00	3.6	10	11.61	0.0062
9400	1880.00	3.6	20	-1.66	-0.0009
9400	1880.00	3.6	30	-0.23	-0.0001
9400	1880.00	3.6	40	7.30	0.0039
9400	1880.00	3.6	50	0.06	0.0000
9400	1880.00	3.6	60	-4.77	-0.0025
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
9400	1880.00	3.8	-30	-3.25	-0.0017
9400	1880.00	3.8	-20	13.56	0.0072
9400	1880.00	3.8	-10	20.93	0.0111
9400	1880.00	3.8	0	-3.59	-0.0019
9400	1880.00	3.8	10	11.61	0.0062
9400	1880.00	3.8	20	-1.66	-0.0009
9400	1880.00	3.8	30	-0.23	-0.0001
9400	1880.00	3.8	40	7.30	0.0039
9400	1880.00	3.8	50	0.06	0.0000
9400	1880.00	3.8	60	-4.77	-0.0025
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
9400	1880.00	4.35	-30	-2.91	-0.0015
9400	1880.00	4.35	-20	9.16	0.0049
9400	1880.00	4.35	-10	12.01	0.0064
9400	1880.00	4.35	0	23.42	0.0125
9400	1880.00	4.35	10	-1.82	-0.0010
9400	1880.00	4.35	20	0.46	0.0002
9400	1880.00	4.35	30	-7.31	-0.0039
9400	1880.00	4.35	40	14.09	0.0075
9400	1880.00	4.35	50	-12.60	-0.0067
9400	1880.00	4.35	60	1.56	0.0008

WCDMA Band 2 Results: channel 9538 @ maximum transmitted power

Traffic Channel Number	Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9538	1907.60	3.6	-30	13.46	0.0071
9538	1907.60	3.6	-20	20.02	0.0105
9538	1907.60	3.6	-10	17.94	0.0094
9538	1907.60	3.6	0	24.52	0.0129
9538	1907.60	3.6	10	14.24	0.0075
9538	1907.60	3.6	20	11.22	0.0059
9538	1907.60	3.6	30	-1.73	-0.0009
9538	1907.60	3.6	40	22.60	0.0118
9538	1907.60	3.6	50	-6.38	-0.0033
9538	1907.60	3.6	60	0.14	0.0001
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
9538	1907.60	3.8	-30	9.55	0.0050
9538	1907.60	3.8	-20	19.46	0.0102
9538	1907.60	3.8	-10	16.16	0.0085
9538	1907.60	3.8	0	13.89	0.0074
9538	1907.60	3.8	10	16.72	0.0088
9538	1907.60	3.8	20	12.95	0.0068
9538	1907.60	3.8	30	-4.98	-0.0026
9538	1907.60	3.8	40	-2.55	-0.0013
9538	1907.60	3.8	50	13.64	0.0072
9538	1907.60	3.8	60	14.99	0.0079
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
9538	1907.60	4.35	-30	14.54	0.0076
9538	1907.60	4.35	-20	21.45	0.0112
9538	1907.60	4.35	-10	15.46	0.0081
9538	1907.60	4.35	0	14.63	0.0077
9538	1907.60	4.35	10	25.00	0.0131
9538	1907.60	4.35	20	13.72	0.0072
9538	1907.60	4.35	30	-5.39	-0.0028
9538	1907.60	4.35	40	-4.57	-0.0024
9538	1907.60	4.35	50	10.95	0.0057
9538	1907.60	4.35	60	-11.72	-0.0061