EMI Test Report

Tested in accordance with
Federal Communications Commission (FCC)
Personal Communications Services
CFR 47, Parts 2, 22, 24

A division of BlackBerry Limited

REPORT NO.: RTS-6046-1308-21_Rev1

PRODUCT MODEL NO.:	RFW121LW
TYPE NAME:	BlackBerry® smartphone
FCC ID:	L6ARFW120LW

EMISSION DESIGNATOR (GSM):	**247KGXW**
EMISSION DESIGNATOR (EDGE):	**245KG7W**
EMISSION DESIGNATOR (WCDMA):	**4M17F9W**

DATE: September 13, 2013

This report supersedes the report RTS-6046-1308-21 dated 7 August 2013

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

592

Report Revision History:

Rev1:

1. Editorial changes in the header and footer.
2. Test result chart update with radiated GSM 850 ERP and PCS 1900 EIRP in section E.
3. New results updated in Summary of Results section F and Appendix 1C.
4. Equipment List update in section G.

Statement of Performance:

The BlackBerry® smartphone, model RFW121LW, part number CER 54733-001 Rev 2-x08-00 and accessories when configured and operated per BlackBerry's operation instructions performs within the requirements of the test standards.

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.

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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, Subpart J, Equipment Authorization Procedures, 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.

B. Associated Documents

None

C. Product Identification

Manufactured by BlackBerry 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:

RTS 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 June 12 to July 20 and Sept 12, 2013.

BlackBerry® smartphone Samples Tested

Sample	Model	CER NUMBER	PIN	Software Information
1	RFW121LW	CER 54733-001 Rev 2-x08-00	2FFFE444	OS: 10.2.0.519
2	RFW121LW	CER 54733-001 Rev 2-x08-00	2FFFE459	OS: 10.2.0.519
3	RFW121LW	CER 54733-001 Rev 2-x08-00	2FFFE438	OS: 10.2.0.519
4	RFW121LW	CER 54733-001 Rev 2-x08-00	2FFFE448	OS: 10.2.0.519
5	RFW121LW	CER 54733-001 Rev 2-x08-00	2FFFE45F	OS: 10.2.0.519
6	RFW121LW	CER 54733-001 Rev 2-x08-00	2FFFE470	OS: 10.2.0.519

RF Conducted Emissions testing was performed on samples 1, 2.
Radiated Emissions testing was performed on samples 3, 4, 5 and 6.

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			
Part 2.1051 Part 22.917 Part 24.238	GSM850 / PCS1900 Conducted Spurious Emissions	Pass	1A
Part 2.1049 Part 22.917 Part 24.238	GSM 850 / PCS1900 Occupied Bandwidth and Channel Mask	Pass	1A
Part 2.1055 Part 24.235	GSM 850 /PCS1900 Frequency Stability vs. Temperature and Voltage	Pass	1B
Part 22.913(a)(2) Part 24.232(c)	**GSM850 ERP** **PCS1900 EIRP**	Pass	1C
Part 2.1053 Part 22.917 Part 24.238	GSM850 / PCS1900 Radiated Spurious/Harmonic Emissions	Pass	1C
Part 2.1051 Part 22.917 Part 24.238	WCDMA Band 2/5 Conducted Spurious Emissions	Pass	2A
Part 2.1049 Part 22.917 Part 24.238	WCDMA Band 2/5 Occupied Bandwidth and Channel Mask	Pass	2A
Part 2.1055(a)(d) Part 24.235	WCDMA Band 2/5 Frequency Stability vs. Temperature and Voltage	Pass	2B
Part 22.913(a)(2) Part 24.232(c)	WCDMA Band 5 ERP WCDMA Band 2 EIRP	Pass	2C
Part 2.1053 Part 22.917 Part 24.238	WCDMA Band 2/5 Radiated Spurious/Harmonic Emissions	Pass	2C

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, CFR 22.901(d).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 BlackBerry® smartphone met the requirements of the Tx Conducted Spurious Emissions in the PCS1900 as per 47 CFR 2.1051, CFR 24.238(a). 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 BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask in the GSM850 as per 47 CFR 2.202, CFR 22.917 and. The EUT was measured in GSM and EDGE mode on the low, middle and high channels. The worst case occupied bandwidth was 247.5 kHz on the middle channel in CALL mode, and 243.1 kHz on middle channel in EDGE mode.
See APPENDIX 1A for test data.

The BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask in the PCS1900 as per 47 CFR 2.202, CFR 24.238.The EUT was measured in GSM and EDGE mode on the low, middle and high channels. The worst case occupied bandwidth was 246.0 kHz on middle channel in CALL mode, and 244.6 kHz on the middle channel in EDGE mode.
See APPENDIX 1A for test data.

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

The BlackBerry® smartphone met the requirements of the Frequency Stability in the PCS1900 as per 47 CFR 2.1055, CFR 24.235. The EUT was measured in PCS1900 mode on the low, middle and high channels.
See APPENDIX1B for test data.

- The BlackBerry® smartphone 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). 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 BlackBerry® smartphone met the requirements of the Tx Conducted Spurious Emissions in the WCDMA band 2 as per 47 CFR 2.1051, CFR 24.238(a). 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 BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask in the WCDMA band 5 as per 47 CFR 2.202, CFR 22.917. The EUT was measured in Voice and HSUPA mode on the low, middle and high channels. The worst case occupied bandwidth was 4.168 MHz on the low channel in Loopback mode, and 4.160 MHz on the low channel in HSUPA mode.
See APPENDIX 2A for test data.

The BlackBerry® smartphone met the requirements of the Occupied Bandwidth and channel mask in the WCDMA band 2 as per 47 CFR 2.202, CFR 24.238. The EUT was measured in Voice and HSUPA mode on the low, middle and high channels. The worst case occupied bandwidth was 4.161 MHz on the middle and high channels in Loopback mode, and 4.160 MHz on the middle and high channels in HSUPA mode.
See APPENDIX 2A for test data.

- The BlackBerry® smartphone met the requirements of the Frequency Stability in the WCDMA band 5 as per 47 CFR 2.1055. The EUT was measured in WCDMA band 5 mode on the low, middle and high channels.
See APPENDIX 2B for test data.

The BlackBerry® smartphone met the requirements of the Frequency Stability in the WCDMA band 2 as per 47 CFR 2.1055, CFR 24.235. The EUT was measured in WCDMA band 2 mode on the low, middle and high channels.
See APPENDIX 2B for test data.

2) Radiated Emission Measurements

The radiated spurious emissions/harmonics and ERP/EIRP were measured for GSM 850 and PCS 1900. The results are within the limits. The BlackBerry® smartphone was placed on a nonconductive styrofoam table, 80 cm high that was positioned on a remotely controlled turntable. The test distance used between the BlackBerry® smartphone and the receiving antenna was three meters. Then the emissions were maximized by elevating the antenna in the range of 1 to 4 meters. The turntable was rotated to determine the azimuth of the peak emissions. Both the horizontal and vertical polarizations of the emissions were measured. The maximum emissions level was recorded. The BlackBerry® smartphone was then substituted with an antenna placed in the same location as the BlackBerry® smartphone. A Dipole antenna was used for the ERP measurements and a Horn antenna was used for EIRP measurements. The substitution antenna was connected into a signal generator that was set to the test frequency.

The emissions were maximized by elevating the antenna in the range of 1 to 4 meters. The signal generator output was then adjusted to match the BlackBerry® smartphone output reading. The signal generator output was recorded. Both the horizontal and vertical polarizations of the emissions were measured.

The following measurements were done in a semi-anechoic chamber (SAC) below 1 GHz and a Semi-anechoic Chamber ((SAC) with floor absorber) above 1 GHz. The SAC's FCC registration number is **778487** and the Industry Canada (IC) file number is **2503B-1**. The SAC with floor absorber's FCC registration number is **959115** and the IC file number is **2503C-1**. The BlackBerry® smartphone was measured on the low, middle and high channels.

a) The radiated spurious emissions/harmonics and ERP/EIRP were measured for GSM 850 and PCS 1900. The results are within the limits.

- The highest ERP in the 850 band Call mode measured was 29.04 dBm (0.80 W) at 824.2 MHz (channel 128)

- The highest ERP in the 850 band EDGE mode measured was 27.78 dBm (0.60 W) at 836.60 MHz (channel 190).

- The highest EIRP in the PCS band Call mode measured was 32.77 dBm (1.89 W) at 1850.20 MHz (channel 512).

- The highest EIRP in the PCS band EDGE mode measured was 29.36 dBm (0.86 W) at 1909.80 MHz (channel 810).

The radiated spurious emission and carrier harmonics were measured up to the 10th harmonic for low, middle, and high channels in the GSM 850 and PCS 1900. Each band was measured in CALL and EDGE modes, with both the horizontal and vertical polarizations.

- The worst margin was 17.4 dB below the limit at 2509.908MHz in Call mode in band GSM850.
- The worst margin was 22.8 dB below the limit at 2466.800MHz in EDGE mode in band GSM850.
- All margins in the PCS 1900 for harmonic emissions were at least 25 dB below the limit for all test frequencies in Call mode.
- All margins in the PCS 1900 for harmonic emissions were at least 25 dB below the limit for all test frequencies in EDGE mode.

See Appendix 1C for test data.

b) The radiated spurious emissions/harmonics and ERP/EIRP were measured for WCDMA Band 5.

- The highest ERP in the WCDMA band 5, Call Service mode was 22.09 dBm (0.16 W) at 826.40 MHz (channel 4132).
- The highest ERP in the WCDMA band 5, HSUPA mode was 19.85 dBm (0.10 W) at 826.40 MHz (channel 4132).
- The highest EIRP in the WCDMA band 2, Call Service mode measured was 24.01 dBm (0.25 W) at 1852.4 MHz (channel 9262).
- The highest EIRP in the WCDMA band 2, HSUPA mode measured was 22.38 dBm (0.17 W) at 1852.4 MHz (channel 9262).

The radiated carrier harmonics were measured up to the 10th harmonic for low, middle and high channels in the WCDMA band 5 and WCDMA Band 2. Each band was measured in Call, and HSUPA modes. Both the horizontal and vertical polarizations were measured.

- All margins in the WCDMA Band 5 for harmonic emissions were at least 25 dB below the limit for all test frequencies.
- All margins in the WCDMA Band 2 for harmonic emissions were at least 25 dB below the limit for all test frequencies.

See Appendix 2C for test data.

3) Co-Location Radiated Measurements

The radiated emissions were measured up to 18 GHz for middle channels for simultaneous transmission in the following test configuration combinations:

- GSM 850 + Bluetooth(DH5) + 802.11b
- PCS 1900 + Bluetooth(2DH5) + 802.11g
- WCDMA B2 + Bluetooth(3DH5)+ 802.11n(2.4GHz).
- WCDMA B5 + Bluetooth(DH5) + 802.11a

Both the horizontal and vertical polarizations were measured. The emissions due to different simultaneous transmission did not increase the amplitude of any emissions nor did it produce any new inter-modulation products as a result of mixing.

Sample Calculation:

Corrected Signal level (CSL) is calculated as follows:
CSL (dBm) = Measured Level (dBµV) – Antenna Gain (dBi) + Free Space loss (dB) – 107(dB) + Cable Loss (dB) - Preamp (dB) + Filter Loss (dB) -2.15(dB)

Measurement Uncertainty ±4.5 dB

G. Compliance Test Equipment Used

UNIT	MANUFACTURER	MODEL	SERIAL NUMBER	CAL DUE DATE (YY MM DD)	USE
Preamplifier	Sonoma	310N/11909A	185831	13-10-10	Radiated Emissions
Preamplifier system	TDK RF Solutions	PA-02	080010	13-10-10	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA4-SP	001	**14-02-13**	Radiated Emissions
Preamplifier	Rohde & Schwarz	TS-ANA-SP	001	**14-02-13**	Radiated Emissions
Hybrid Log Antenna	EMC Automation	HLP-3003C	017301	**14-08-13**	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030101	14-08-07	Radiated Emissions
Horn Antenna	EMC Automation	HRN-0118	030201	15-05-07	Radiated Emissions
Horn Antenna	Emco	3117	47563	**15-08-07**	Radiated Emissions
Horn Antenna	ETS	3116	2538	14-09-29	Radiated Emissions
Dipole Antenna	Schwarzbeck	UHAP	974	14-11-27	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	837493/073	13-11-26	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	112394	13-11-25	Radiated Emissions
Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	109747	13-10-18	RF Conducted Emissions
EMI Receiver	Rohde & Schwarz	ESIB-40	100255	13-11-30	Radiated Emissions
EMI Receiver	Rohde & Schwarz	ESU-40	100162	13-11-30	Radiated Emissions
DC Power Supply	HP	6632B	US37472178	13-09-25	RF Conducted Emissions
Environment Monitor	Omega	iTHX-SD	0380561	13-10-30	Radiated Emissions
Environment Monitor	Omega	iTHX-SD	0340060	13-10-30	RF Conducted Emissions
Environment Monitor	Omega	iTHX-SD	0380567	13-10-30	Radiated Emissions

Compliance Test Equipment Used cont'd

UNIT	MANUFACTURER	MODEL	SERIAL NUMBER	CAL DUE DATE (YY MM DD)	USE
Universal Radio Communication Tester	Rohde & Schwarz	CMW500	101469	13-12-10	Radiated /RF Conducted Emission
Universal Radio Communication Tester	Rohde & Schwarz	CMW500	109949	13-12-08	Radiated /RF Conducted Emission
Signal Generator	Agilent	E8257D	MY45140527	14-12-10	Radiated Emissions
Signal Generator	Agilent	83630B	3844A00927	14-11-23	Radiated 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

H. Test Software used

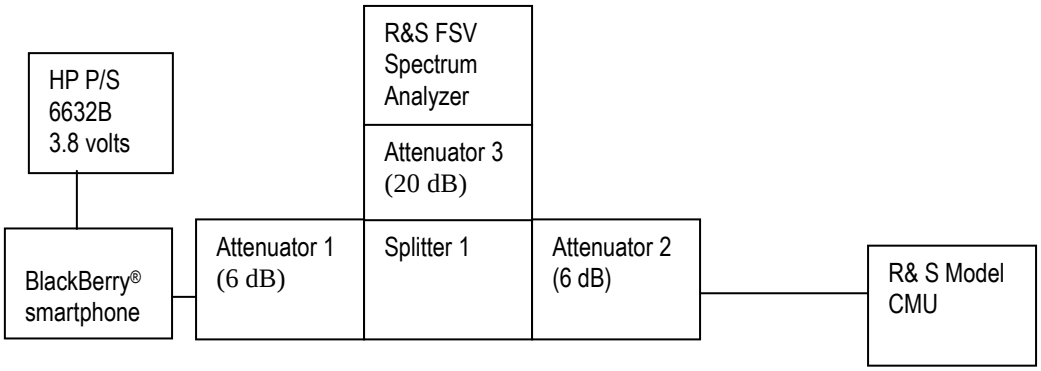
SOFTWARE	COMPANY	VERSION	USE
EMC32	Rohde & Schwarz	8.53.0	Radiated Emissions
TDK Standard Emission Test	TDK RF Solutions	8.53.1.62	Radiated Emissions

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

The environmental test conditions were:

Temperature: 25.1 ºC
Relative Humidity: 41.3 %

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, CRF 22.917, CFR 24.238(a) 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 the GSM850 band was measured to be 277.9 kHz, and for the PCS1900 band was measured to be 274.9 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	273.5	244.6
837.6	277.9	**247.5**
848.8	275.0	244.6

PCS1900 band Frequency (MHz)	-26dBc Bandwidth (kHz)	99% Occupied Bandwidth (kHz)
1850.2	270.0	244.0
1880.0	274.9	**246.0**
1909.8	271.8	242.0

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.
See figures 1-51a to 1-53a for the plots of Peak to Average Ratio.

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	241.7
837.6	**243.1**
848.8	241.7

PCS1900 band Frequency (MHz)	99% Occupied Bandwidth (kHz)
1850.2	241.7
1880.0	**244.6**
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-a: GSM850 band, Spurious Conducted Emissions, Low channel

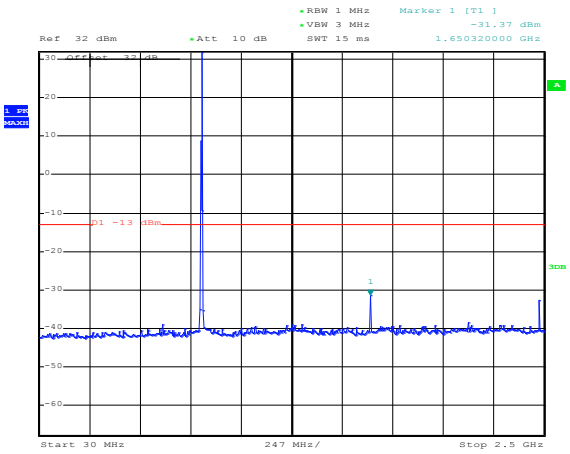


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Figure 1-1a: GSM850 band, Spurious Conducted Emissions, Low channel

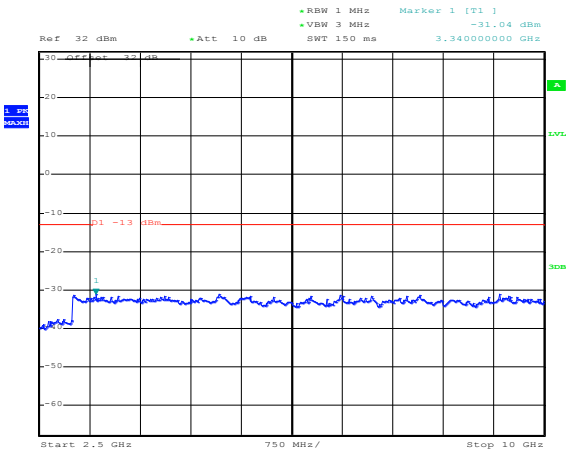

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Figure 1-2a: GSM850 band, Spurious Conducted Emissions, Middle Channel

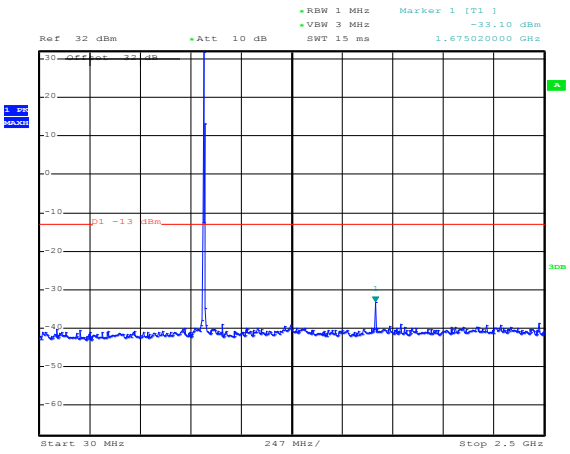

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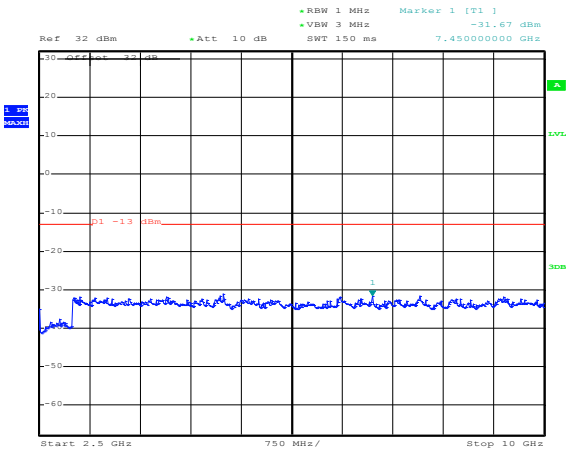
Figure 1-3a: GSM850 band, Spurious Conducted Emissions, Middle Channel



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GSM Conducted RF Emission Test Data cont'd

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

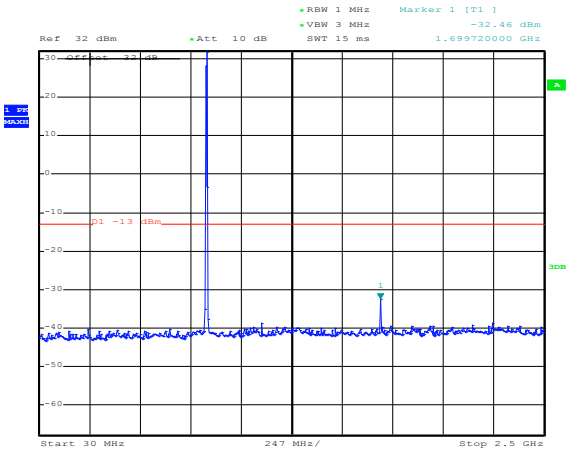

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Figure 1-5a: GSM850 band, Spurious Conducted Emissions, High Channel

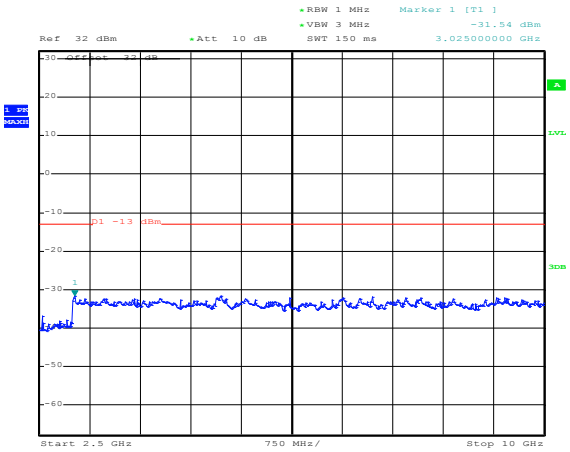

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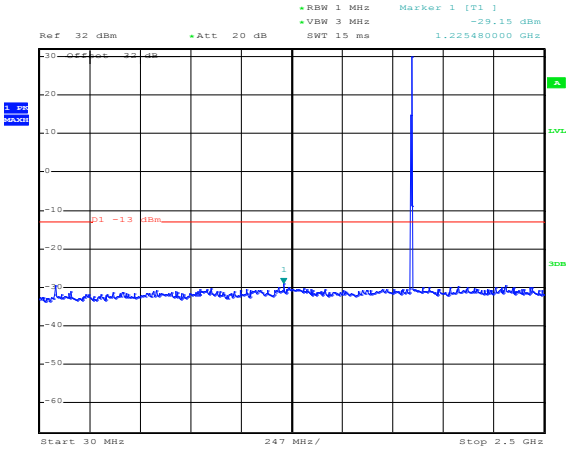
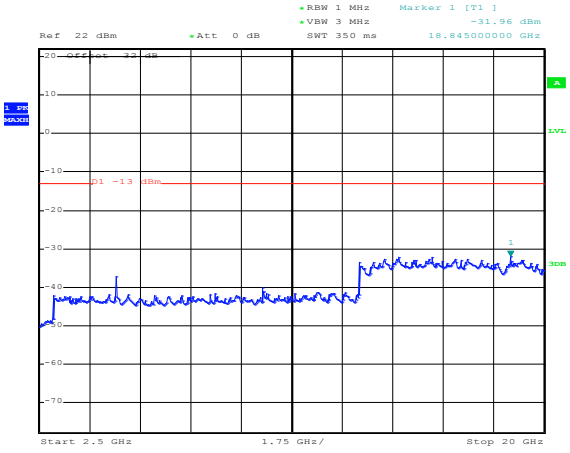
Figure 1-7a: PCS1900 band, Spurious Conducted Emissions, Low Channel



Date: 2.JUL.2013 18:53:01

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

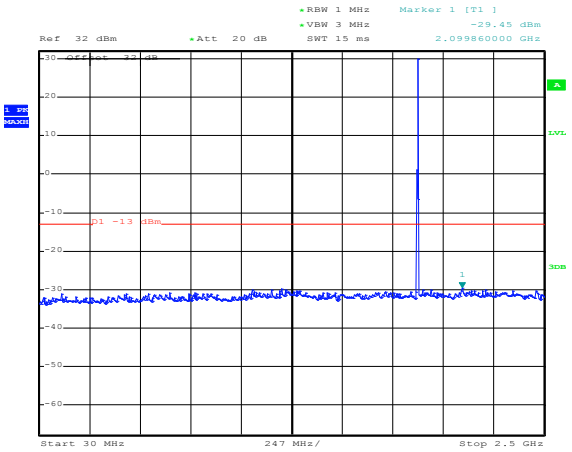

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Figure 1-10a: PCS1900 band, Spurious Conducted Emissions, Middle Channel

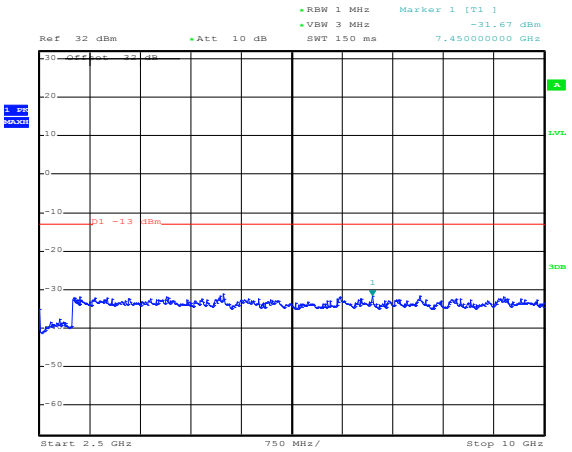

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Figure 1-11a: PCS1900 band, Spurious Conducted Emissions, High Channel

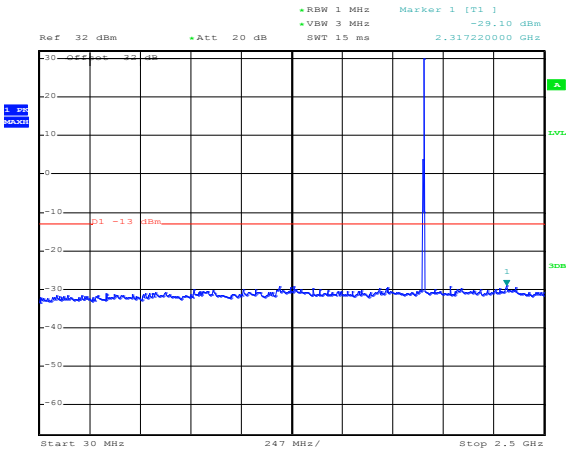

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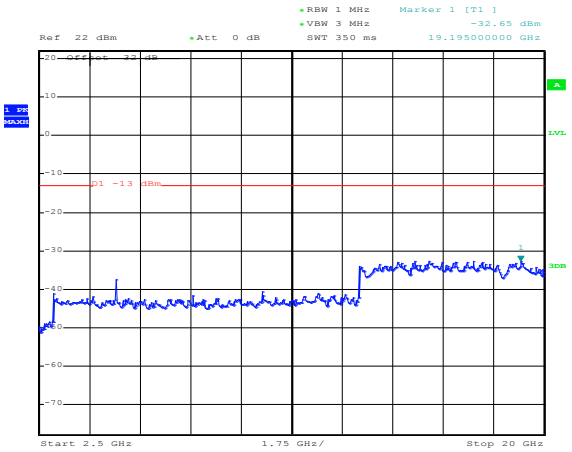
Figure 1-12a: PCS1900 band, Spurious Conducted Emissions, High Channel



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GSM Conducted RF Emission Test Data cont'd

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

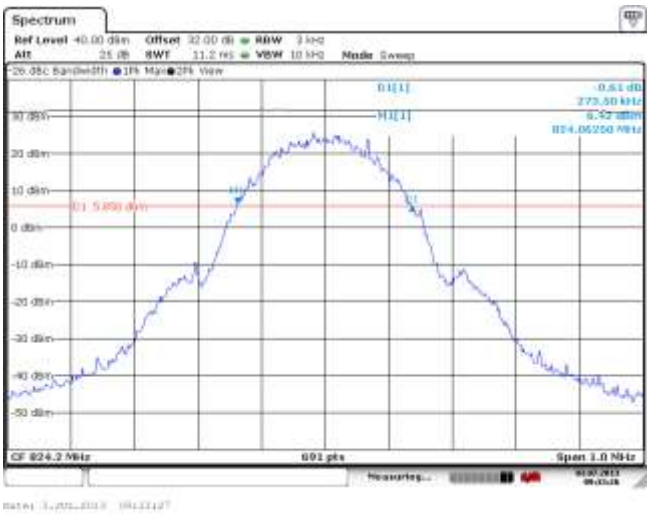


Figure 1-14a: Occupied Bandwidth, GSM850 band Low Channel in GSM mode

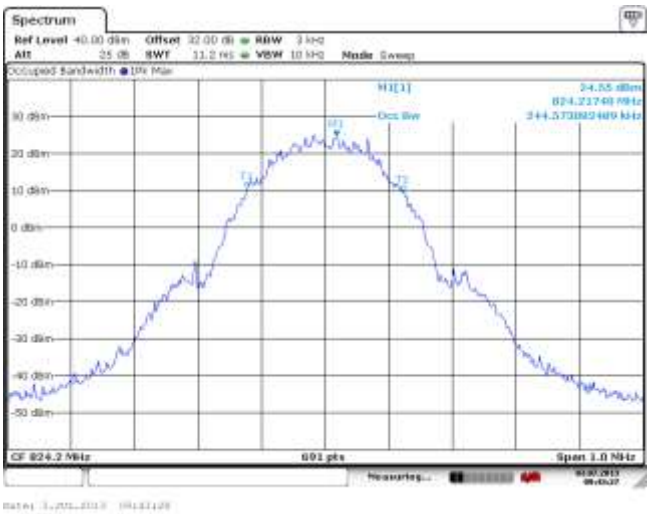


Figure 1-15a: -26dBc bandwidth, GSM850 band Middle Channel in GSM mode

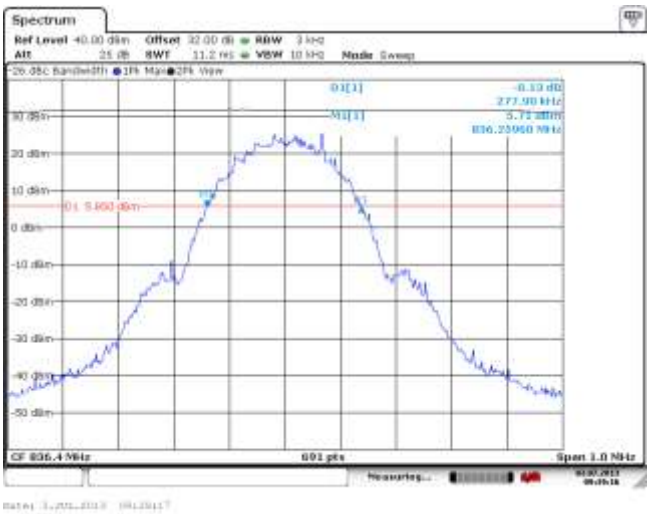
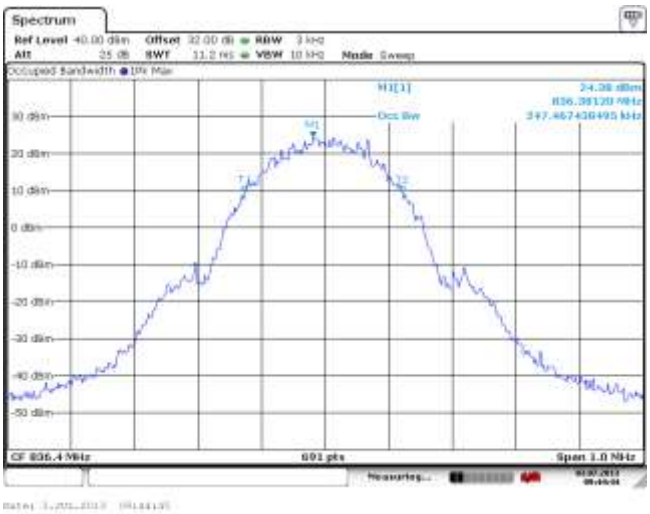


Figure 1-16a: Occupied Bandwidth, GSM850 band Middle Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

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

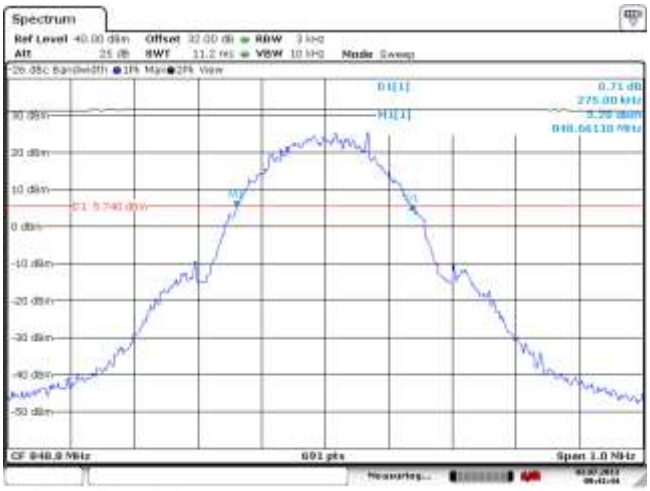


Figure 1-18a: Occupied Bandwidth, GSM850 band High Channel in GSM mode

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

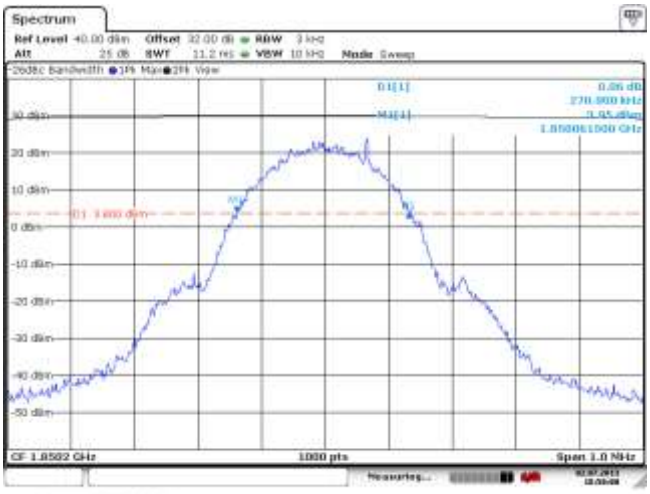
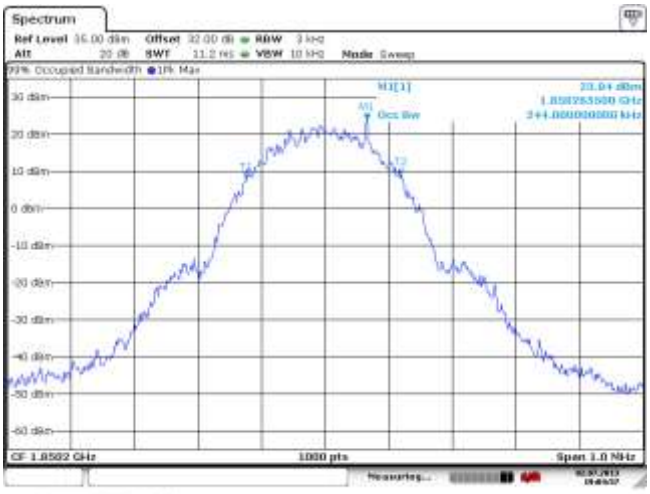


Figure 1-20a: Occupied Bandwidth, PCS1900 Low Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

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

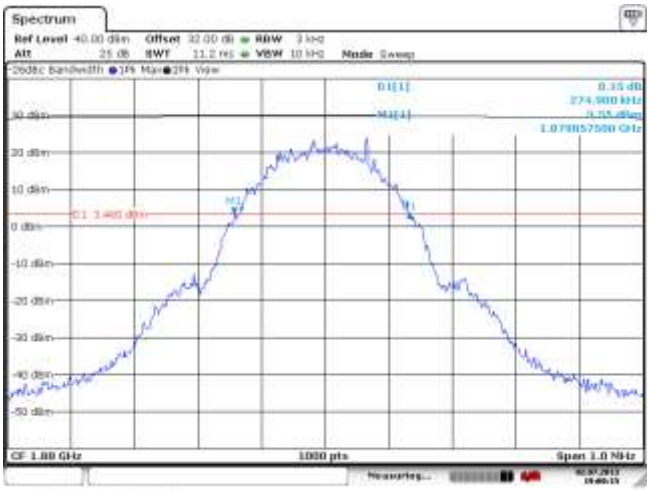


Figure 1-22a: Occupied Bandwidth, PCS1900 Middle Channel in GSM mode

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

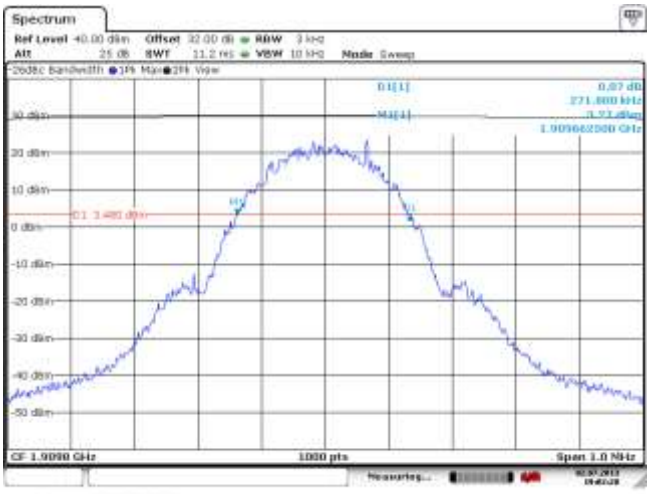
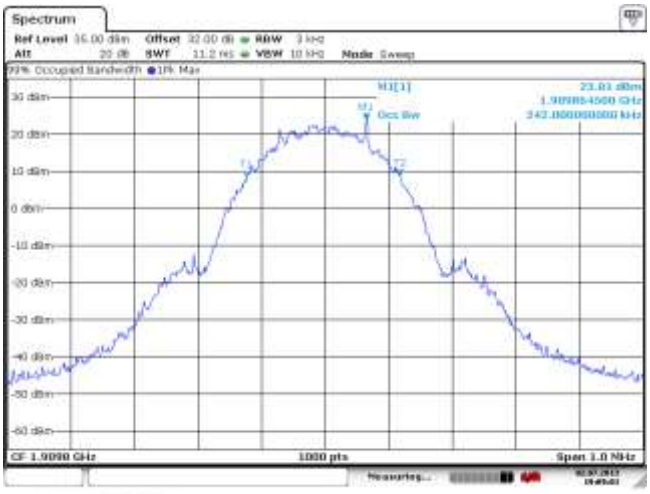


Figure 1-24a: Occupied Bandwidth, PCS1900 High Channel in GSM mode



GSM Conducted RF Emission Test Data cont'd

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

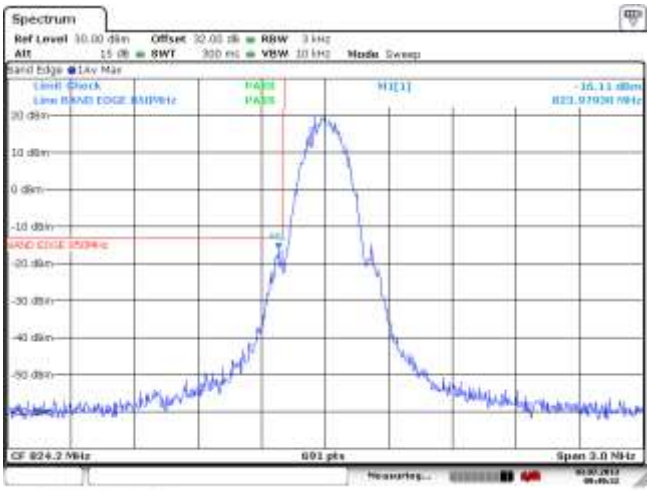


Figure 1-26a: GSM850 band High Channel Mask in GSM mode

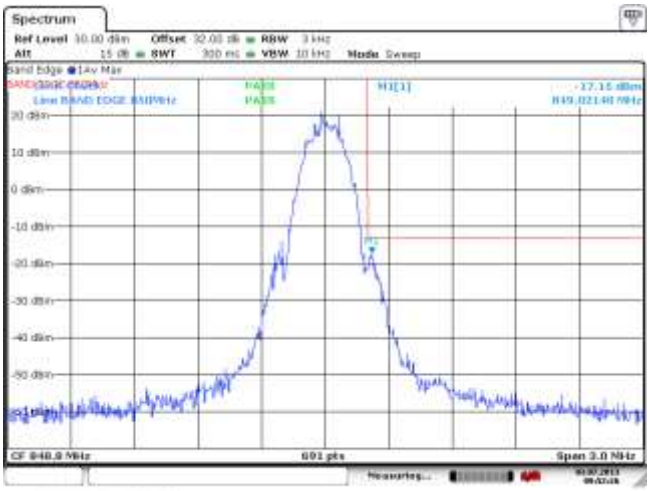


Figure 1-27a: PCS1900, Low Channel Mask in GSM mode

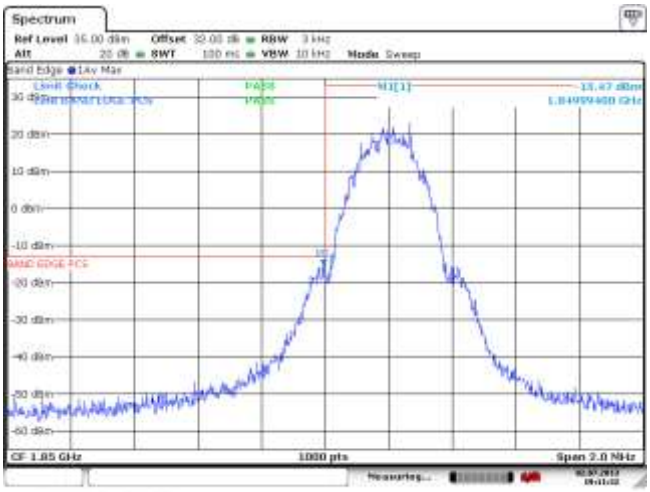
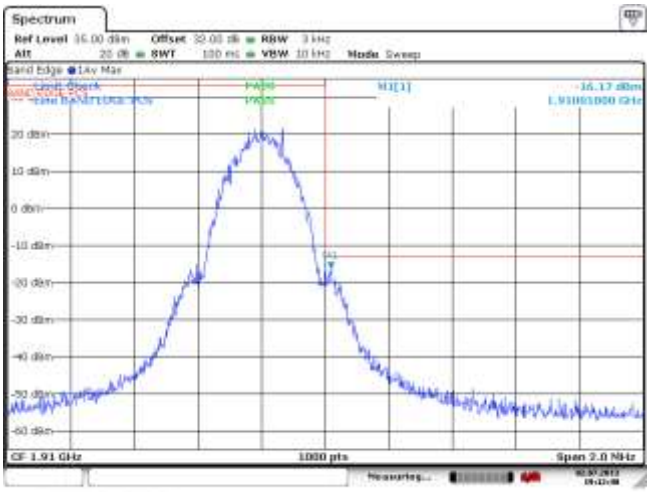


Figure 1-28a: PCS1900, High Channel Mask in GSM mode



GSM Conducted RF Emission Test Data cont'd

Figure 1-51a: PCS1900 Band, PAR Low Channel

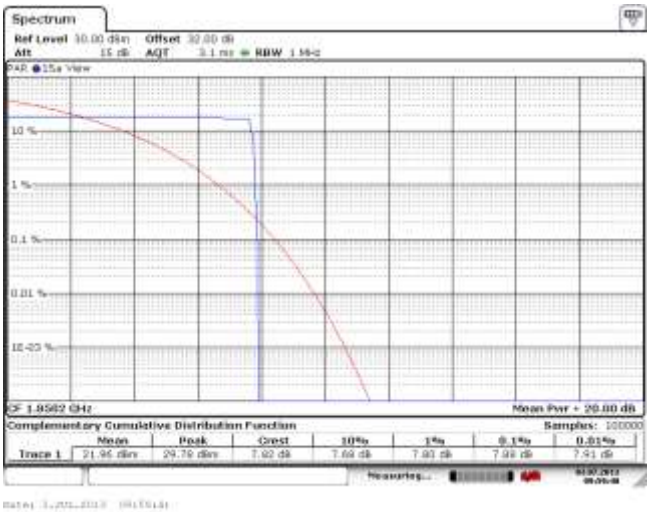


Figure 1-52a: PCS1900 Band, PAR Mid Channel

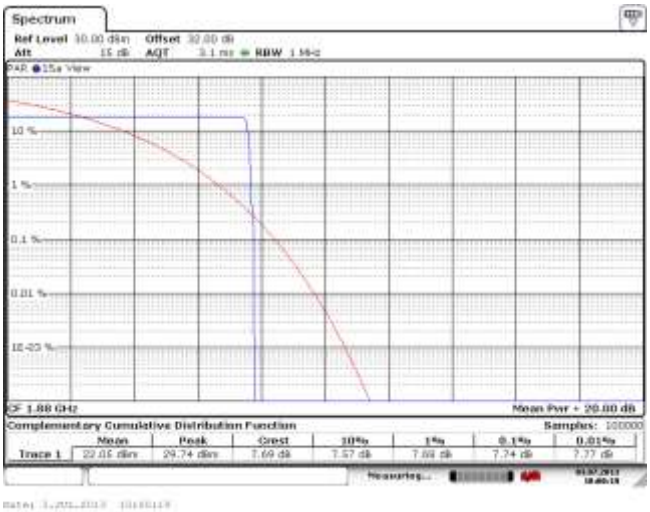
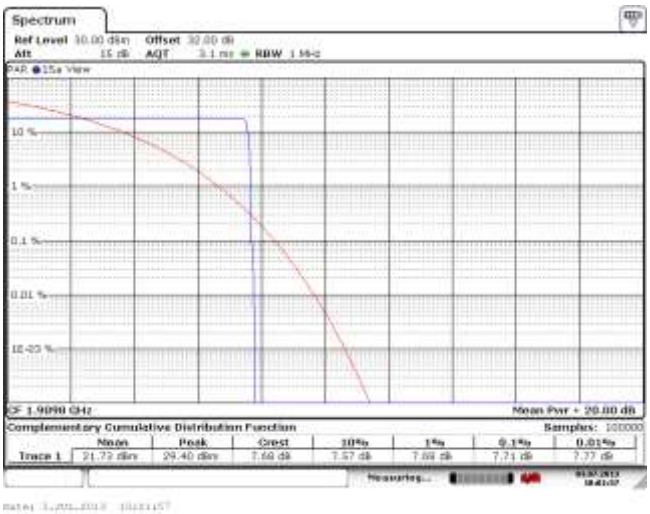


Figure 1-53a: PCS1900 Band, PAR High Channel



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

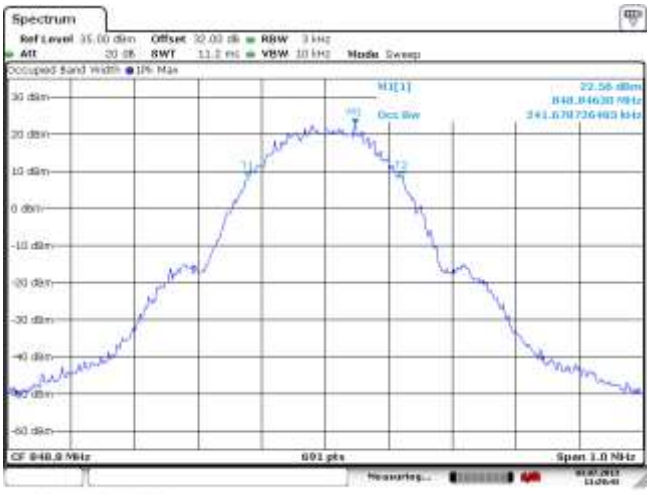
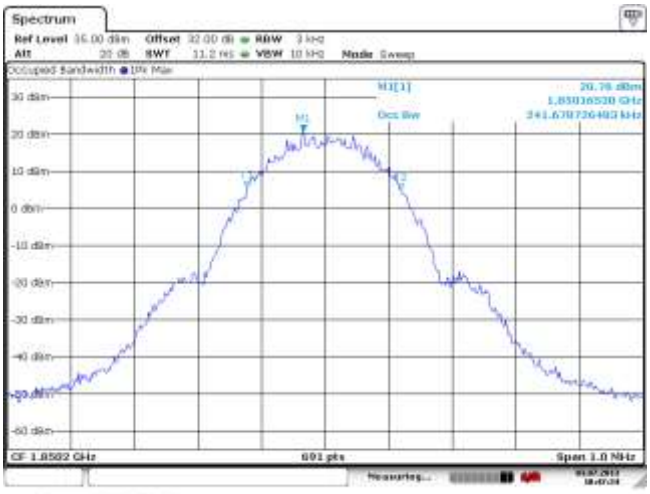


Figure 1-32a: Occupied Bandwidth, PCS1900 Band, Low Channel in EDGE mode



GSM Conducted RF Emission Test Data cont'd

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

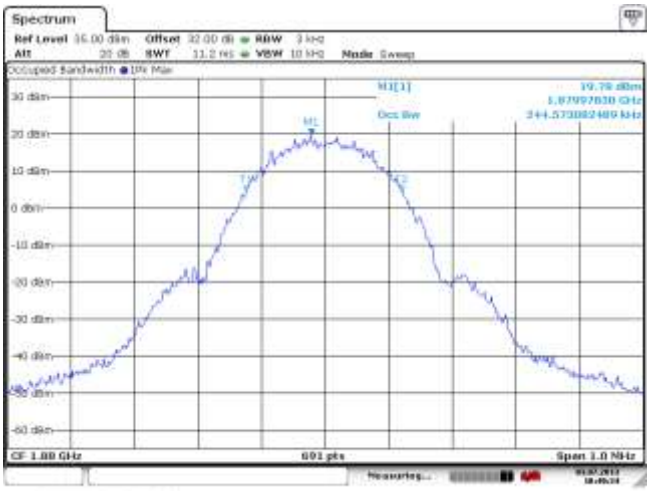


Figure 1-34a: Occupied Bandwidth, PCS1900 Band, High Channel in EDGE mode

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

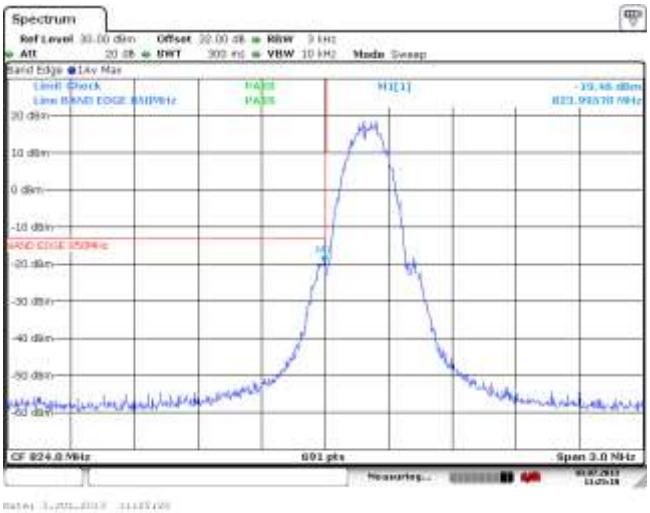
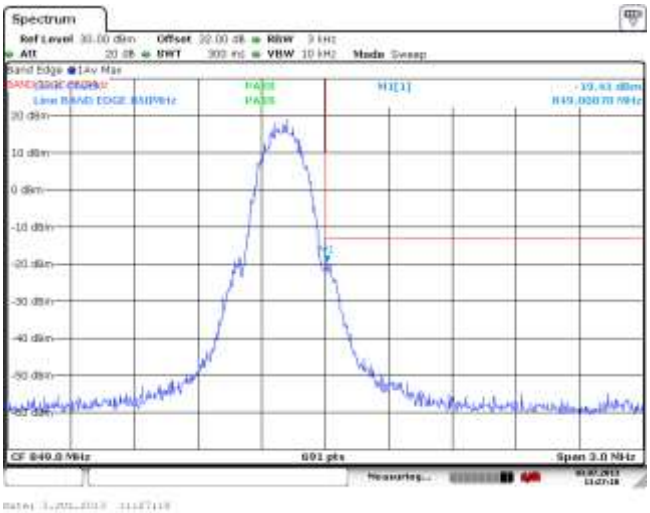


Figure 1-36a: GSM850 Band, High Channel Mask in EDGE mode



GSM Conducted RF Emission Test Data cont'd

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

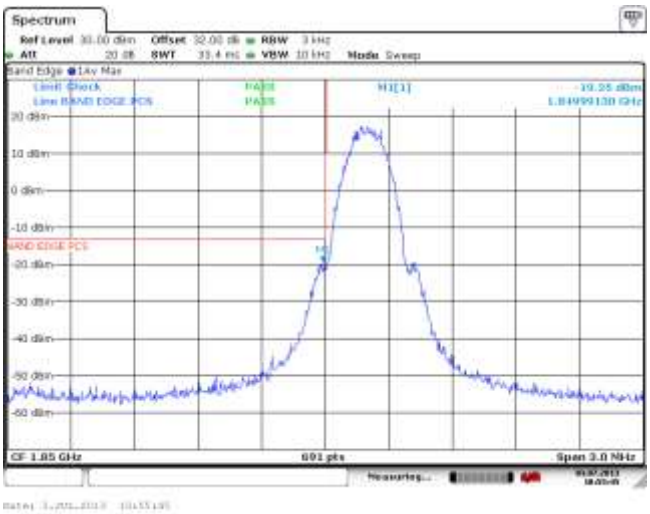
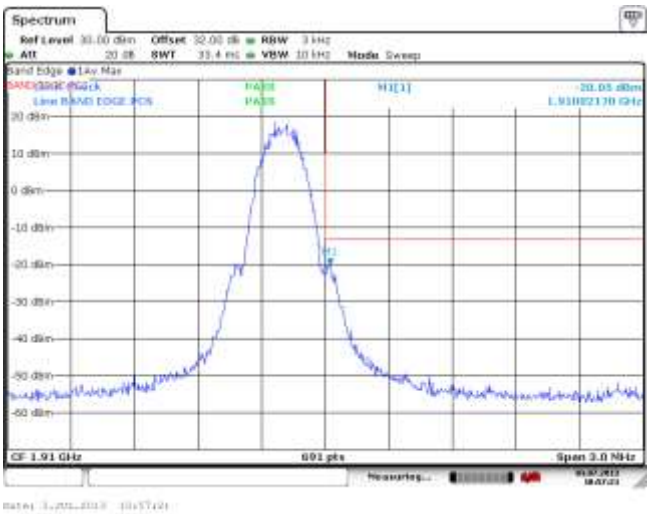
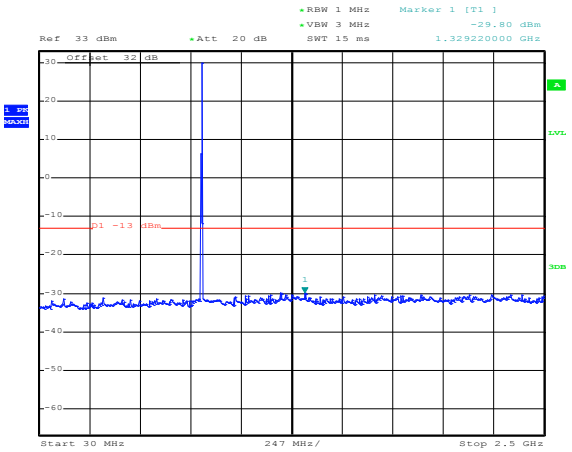


Figure 1-38a: PCS1900 Band, High Channel Mask in EDGE mode



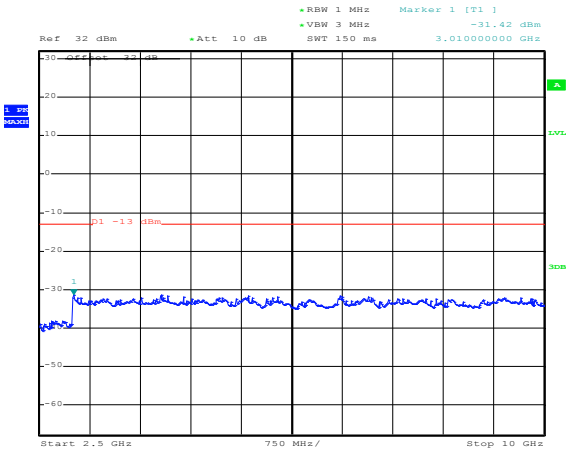
GSM Conducted RF Emission Test Data cont'd

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



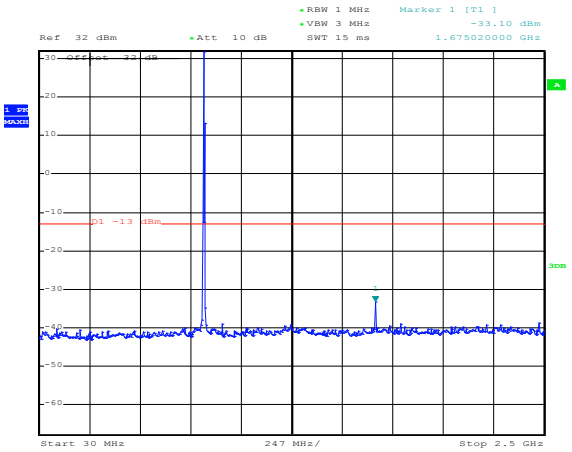
Date: 3.JUL.2013 11:57:24

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



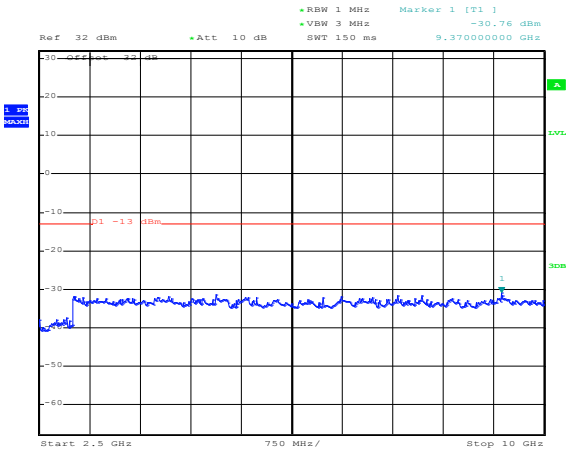
Date: 3.JUL.2013 12:01:48

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



Date: 2.JUL.2013 18:43:22

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



Date: 3.JUL.2013 12:00:43

GSM Conducted RF Emission Test Data cont'd

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

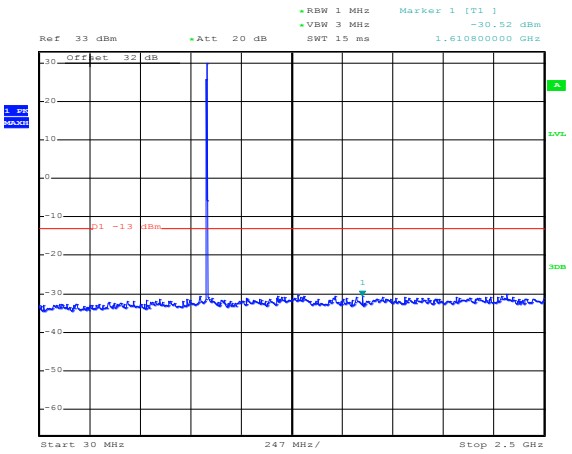


Figure 1-44a: GSM850 band, Spurious Conducted Emissions, High channel in Edge Mode

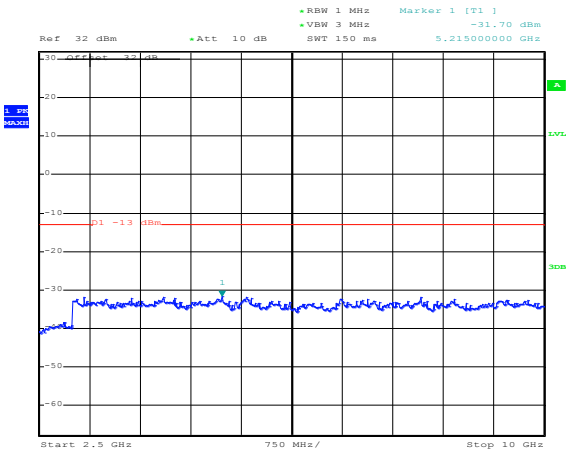


Figure 1-45a: PCS1900 band, Spurious Conducted Emissions, Low channel in Edge Mode

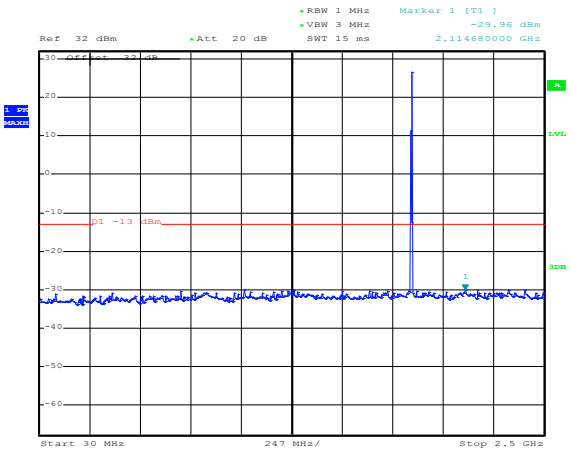
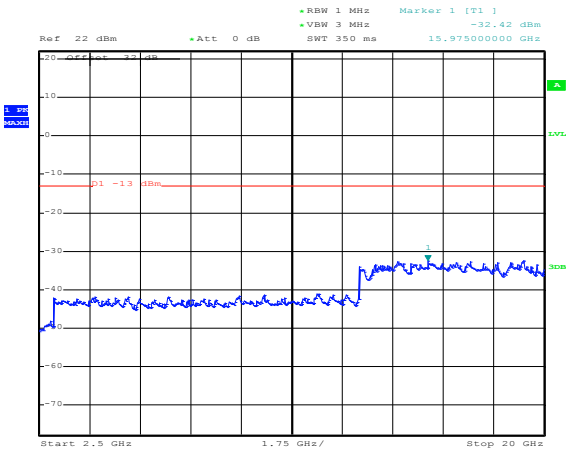
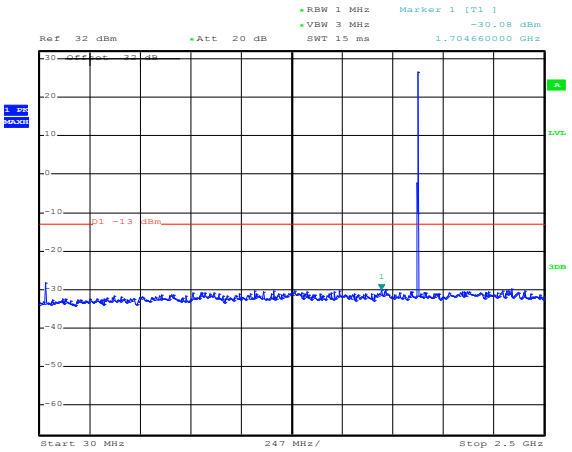


Figure 1-46a: PCS1900 band, Spurious Conducted Emissions, Low channel in Edge Mode



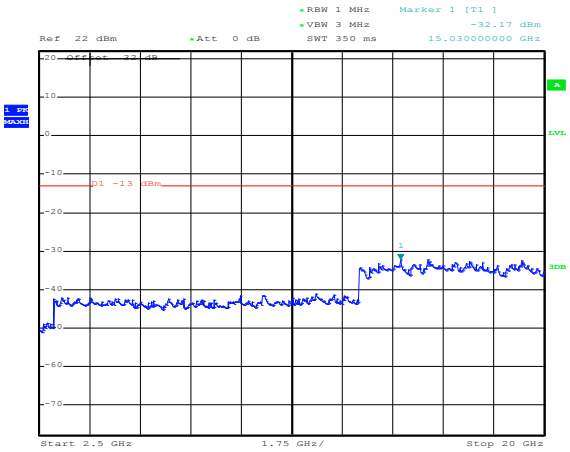
GSM Conducted RF Emission Test Data cont'd

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



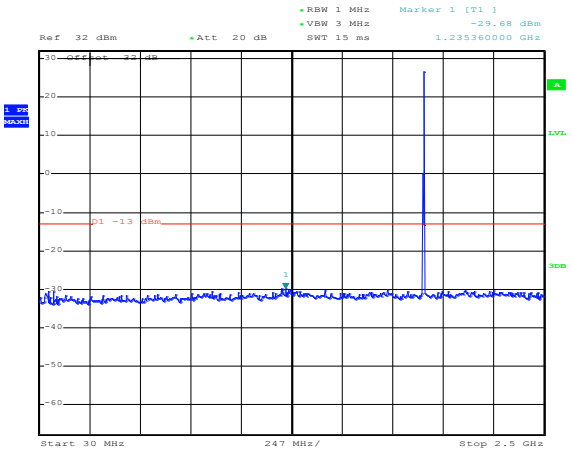
Date: 3.JUL.2013 13:52:45

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



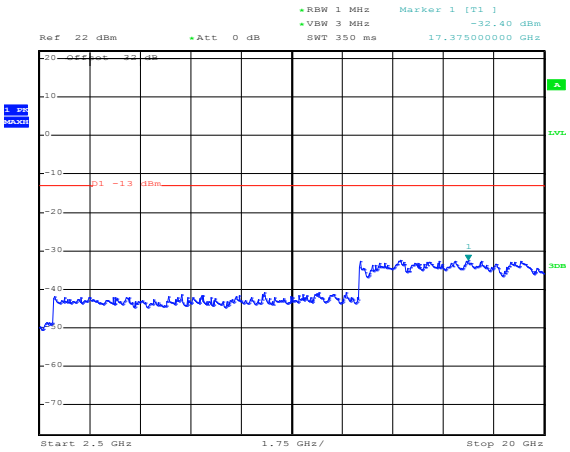
Date: 3.JUL.2013 13:54:25

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



Date: 3.JUL.2013 13:53:18

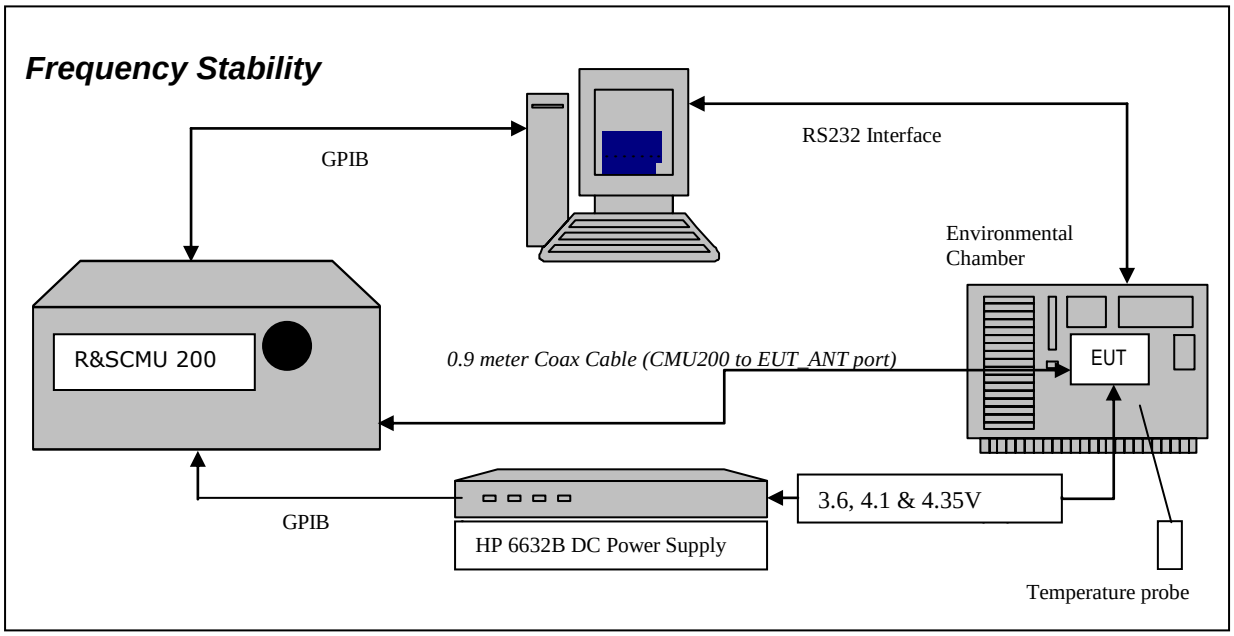
Figure 1-50a: PCS1900 band, Spurious Conducted Emissions, High channel in Edge Mode



Date: 3.JUL.2013 13:55:14

APPENDIX 1B – 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
2.995 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 24.235, CFR 47 chapter 1, Section 22.917 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 4.1 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, 4.1 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 4.1 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, 4.1 and 4.35 volts.

The maximum frequency error in the GSM850 band measured was -0.0394 PPM.
The maximum frequency error in the PCS1900 band measured was -0.0256 PPM.

Date of Test: June 18, 2013

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	-5.84	-0.0071
189	836.40	3.6	20	3.42	0.0041
251	848.60	3.6	20	5.04	0.0059

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.1	20	5.51	0.0067
189	836.40	4.1	20	7.00	0.0084
251	848.60	4.1	20	10.83	0.0128

Traffic Channel Number	GSM850 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
128	824.20	4.35	20	7.40	0.0090
189	836.40	4.35	20	5.74	0.0069
251	848.60	4.35	20	7.77	0.0092

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	-22.96	-0.0279
128	824.20	3.6	-20	-17.36	-0.0211
128	824.20	3.6	-10	9.37	0.0114
128	824.20	3.6	0	-4.50	-0.0055
128	824.20	3.6	10	-11.81	-0.0143
128	824.20	3.6	20	-5.84	-0.0071
128	824.20	3.6	30	-4.81	-0.0058
128	824.20	3.6	40	7.79	0.0095
128	824.20	3.6	50	4.88	0.0059
128	824.20	3.6	60	5.16	0.0063
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
128	824.20	4.1	-30	-28.95	-0.0351
128	824.20	4.1	-20	-19.35	-0.0235
128	824.20	4.1	-10	11.30	0.0137
128	824.20	4.1	0	-9.51	-0.0115
128	824.20	4.1	10	-9.11	-0.0111
128	824.20	4.1	20	5.51	0.0067
128	824.20	4.1	30	-22.27	-0.0270
128	824.20	4.1	40	-4.63	-0.0056
128	824.20	4.1	50	-6.54	-0.0079
128	824.20	4.1	60	-6.28	-0.0076
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
128	824.20	4.35	-30	-31.46	-0.0382
128	824.20	4.35	-20	-27.33	-0.0332
128	824.20	4.35	-10	15.43	0.0187
128	824.20	4.35	0	-4.42	-0.0054
128	824.20	4.35	10	-11.89	-0.0144
128	824.20	4.35	20	7.40	0.0090
128	824.20	4.35	30	-15.25	-0.0185
128	824.20	4.35	40	3.81	0.0046
128	824.20	4.35	50	-9.62	-0.0117
128	824.20	4.35	60	-9.17	-0.0111

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	-23.45	-0.0280
189	836.40	3.6	-20	-18.94	-0.0226
189	836.40	3.6	-10	12.32	0.0147
189	836.40	3.6	0	-5.44	-0.0065
189	836.40	3.6	10	-9.57	-0.0114
189	836.40	3.6	20	3.42	0.0041
189	836.40	3.6	30	-8.99	-0.0107
189	836.40	3.6	40	5.86	0.0070
189	836.40	3.6	50	-4.05	-0.0048
189	836.40	3.6	60	5.60	0.0067
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
189	836.40	4.1	-30	-24.29	-0.0290
189	836.40	4.1	-20	-21.55	-0.0258
189	836.40	4.1	-10	15.91	0.0190
189	836.40	4.1	0	-7.58	-0.0091
189	836.40	4.1	10	-7.87	-0.0094
189	836.40	4.1	20	7.00	0.0084
189	836.40	4.1	30	-16.19	-0.0194
189	836.40	4.1	40	3.35	0.0040
189	836.40	4.1	50	-6.66	-0.0080
189	836.40	4.1	60	-7.52	-0.0090
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
189	836.40	4.35	-30	**-32.99**	**-0.0394**
189	836.40	4.35	-20	-29.12	-0.0348
189	836.40	4.35	-10	20.14	0.0241
189	836.40	4.35	0	-4.55	-0.0054
189	836.40	4.35	10	-12.14	-0.0145
189	836.40	4.35	20	5.74	0.0069
189	836.40	4.35	30	-19.98	-0.0239
189	836.40	4.35	40	-7.31	-0.0087
189	836.40	4.35	50	-9.72	-0.0116
189	836.40	4.35	60	-8.60	-0.0103

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	-28.31	-0.0334
251	848.8	3.6	-20	-16.38	-0.0193
251	848.8	3.6	-10	15.03	0.0177
251	848.8	3.6	0	-5.78	-0.0068
251	848.8	3.6	10	-8.03	-0.0095
251	848.8	3.6	20	5.04	0.0059
251	848.8	3.6	30	-24.71	-0.0291
251	848.8	3.6	40	8.64	0.0102
251	848.8	3.6	50	4.49	0.0053
251	848.8	3.6	60	4.05	0.0048
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
251	848.8	4.1	-30	-30.15	-0.0355
251	848.8	4.1	-20	-23.90	-0.0282
251	848.8	4.1	-10	14.90	0.0176
251	848.8	4.1	0	-11.75	-0.0138
251	848.8	4.1	10	-10.98	-0.0129
251	848.8	4.1	20	10.83	0.0128
251	848.8	4.1	30	-17.72	-0.0209
251	848.8	4.1	40	-5.43	-0.0064
251	848.8	4.1	50	-5.59	-0.0066
251	848.8	4.1	60	-7.42	-0.0087
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
251	848.8	4.35	-30	-25.06	-0.0295
251	848.8	4.35	-20	-29.00	-0.0342
251	848.8	4.35	-10	20.63	0.0243
251	848.8	4.35	0	4.81	0.0057
251	848.8	4.35	10	-10.63	-0.0125
251	848.8	4.35	20	7.77	0.0092
251	848.8	4.35	30	-14.29	-0.0168
251	848.8	4.35	40	-12.17	-0.0143
251	848.8	4.35	50	-10.84	-0.0128
251	848.8	4.35	60	-5.87	-0.0069

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	-4.71	-0.0025
661	1880.00	3.6	20	-7.09	-0.0038
810	1909.80	3.6	20	-19.04	-0.0100

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperatur e (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	4.1	20	-27.88	-0.0151
661	1880.00	4.1	20	-17.36	-0.0092
810	1909.80	4.1	20	-17.12	-0.0090

Traffic Channel Number	PCS Frequency (MHz)	Voltage (Volts)	Temperatur e (Celsius)	Frequency Error (Hz)	PPM
512	1850.20	4.35	20	-14.33	-0.0077
661	1880.00	4.35	20	-12.99	-0.0069
810	1909.80	4.35	20	-16.99	-0.0089

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	-27.62	-0.0149
512	1850.20	3.6	-20	-21.24	-0.0115
512	1850.20	3.6	-10	-23.51	-0.0127
512	1850.20	3.6	0	-9.90	-0.0054
512	1850.20	3.6	10	-10.74	-0.0058
512	1850.20	3.6	20	-4.71	-0.0025
512	1850.20	3.6	30	10.42	0.0056
512	1850.20	3.6	40	-26.06	-0.0141
512	1850.20	3.6	50	11.00	0.0059
512	1850.20	3.6	60	11.24	0.0061
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
512	1850.20	4.1	-30	-40.71	-0.0220
512	1850.20	4.1	-20	-35.62	-0.0193
512	1850.20	4.1	-10	-29.67	-0.0160
512	1850.20	4.1	0	-12.90	-0.0070
512	1850.20	4.1	10	-22.63	-0.0122
512	1850.20	4.1	20	-27.88	-0.0151
512	1850.20	4.1	30	16.11	0.0087
512	1850.20	4.1	40	-27.56	-0.0149
512	1850.20	4.1	50	-9.26	-0.0050
512	1850.20	4.1	60	-7.69	-0.0042
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
512	1850.20	4.35	-30	-35.24	-0.0190
512	1850.20	4.35	-20	-43.47	-0.0235
512	1850.20	4.35	-10	-31.54	-0.0170
512	1850.20	4.35	0	-12.84	-0.0069
512	1850.20	4.35	10	-15.90	-0.0086
512	1850.20	4.35	20	-14.33	-0.0077
512	1850.20	4.35	30	14.83	0.0080
512	1850.20	4.35	40	-22.49	-0.0122
512	1850.20	4.35	50	-15.07	-0.0081
512	1850.20	4.35	60	-18.89	-0.0102

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	-24.46	-0.0130
661	1880.00	3.6	-20	-24.30	-0.0129
661	1880.00	3.6	-10	-21.18	-0.0113
661	1880.00	3.6	0	-11.60	-0.0062
661	1880.00	3.6	10	-12.26	-0.0065
661	1880.00	3.6	20	-7.09	-0.0038
661	1880.00	3.6	30	17.02	0.0091
661	1880.00	3.6	40	-22.24	-0.0118
661	1880.00	3.6	50	15.36	0.0082
661	1880.00	3.6	60	11.69	0.0062
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
661	1880.00	4.1	-30	-37.31	-0.0198
661	1880.00	4.1	-20	-34.31	-0.0183
661	1880.00	4.1	-10	-32.48	-0.0173
661	1880.00	4.1	0	-11.72	-0.0062
661	1880.00	4.1	10	-18.16	-0.0097
661	1880.00	4.1	20	-17.36	-0.0092
661	1880.00	4.1	30	19.80	0.0105
661	1880.00	4.1	40	-20.89	-0.0111
661	1880.00	4.1	50	-6.17	-0.0033
661	1880.00	4.1	60	-10.99	-0.0058
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
661	1880.00	4.35	-30	-33.00	-0.0176
661	1880.00	4.35	-20	-28.96	-0.0154
661	1880.00	4.35	-10	-32.51	-0.0173
661	1880.00	4.35	0	-12.70	-0.0068
661	1880.00	4.35	10	-18.60	-0.0099
661	1880.00	4.35	20	-12.99	-0.0069
661	1880.00	4.35	30	18.11	0.0096
661	1880.00	4.35	40	-14.93	-0.0079
661	1880.00	4.35	50	-16.87	-0.0090
661	1880.00	4.35	60	-15.03	-0.0080

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	-22.96	-0.0120
810	1909.80	3.6	-20	-28.10	-0.0147
810	1909.80	3.6	-10	-22.34	-0.0117
810	1909.80	3.6	0	7.09	0.0037
810	1909.80	3.6	10	-17.29	-0.0091
810	1909.80	3.6	20	-19.04	-0.0100
810	1909.80	3.6	30	20.10	0.0105
810	1909.80	3.6	40	-16.05	-0.0084
810	1909.80	3.6	50	17.08	0.0089
810	1909.80	3.6	60	12.52	0.0066
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
810	1909.80	4.1	-30	-39.79	-0.0208
810	1909.80	4.1	-20	-32.52	-0.0170
810	1909.80	4.1	-10	-33.72	-0.0177
810	1909.80	4.1	0	-12.99	-0.0068
810	1909.80	4.1	10	-20.63	-0.0108
810	1909.80	4.1	20	-17.12	-0.0090
810	1909.80	4.1	30	18.61	0.0097
810	1909.80	4.1	40	-23.63	-0.0124
810	1909.80	4.1	50	-12.55	-0.0066
810	1909.80	4.1	60	-12.29	-0.0064
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
810	1909.80	4.35	-30	**-48.84**	**-0.0256**
810	1909.80	4.35	-20	-23.88	-0.0125
810	1909.80	4.35	-10	-29.53	-0.0155
810	1909.80	4.35	0	4.07	0.0021
810	1909.80	4.35	10	-17.40	-0.0091
810	1909.80	4.35	20	-16.99	-0.0089
810	1909.80	4.35	30	17.17	0.0090
810	1909.80	4.35	40	-11.48	-0.0060
810	1909.80	4.35	50	-17.11	-0.0090
810	1909.80	4.35	60	-15.65	-0.0082

APPENDIX 1C – GSM RADIATED EMISSIONS TEST DATA

Radiated Power Test Data Results

Date of test: July 15 and Sept 12, 2013

The following measurements were performed by Rex Zhang.
The environmental tests conditions were: Temperature: 25.6 °C
Relative Humidity: 15.0 %

The BlackBerry® smartphone was standalone, horizontal with LCD facing down and bottom pointing to RX antenna when the turntable is at 0 degree position.
Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height.

GSM850 Band in Call Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBm)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole) (dBm)	(W)	Limit (dBm)	Diff. To Limit (dB)
F0	128	824.20	850	Dipole	V	-30.66	-22.88	V-V	11.91	**29.04**	**0.80**	38.50	**9.46**
F0	128	824.20	850	Dipole	H	-22.88		H-H	10.60				
F0	190	836.60	850	Dipole	V	-30.83	-22.45	V-V	12.22	29.02	0.80	38.50	9.48
F0	190	836.60	850	Dipole	H	-22.45		H-H	11.46				
F0	251	848.80	850	Dipole	V	-30.35	-22.78	V-V	11.93	28.71	0.74	38.50	9.79
F0	251	848.80	850	Dipole	H	-22.78		H-H	11.70				

GSM850 Band in EDGE Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) (dBm)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole) (dBm)	(W)	Limit (dBm)	Diff. To Limit (dB)
F0	128	824.20	850	Dipole	V	-33.47	-25.30	V-V	9.15	26.28	0.42	38.50	12.22
F0	128	824.20	850	Dipole	H	-25.30		H-H	7.72				
F0	190	836.60	850	Dipole	V	-34.69	-24.16	V-V	10.98	**27.78**	**0.60**	38.50	**10.72**
F0	190	836.60	850	Dipole	H	-24.16		H-H	7.55				
F0	251	848.80	850	Dipole	V	-33.82	-24.95	V-V	10.80	27.58	0.57	38.50	10.92
F0	251	848.80	850	Dipole	H	-24.95		H-H	8.41				

Radiated Power Test Data Results cont'd

Date of test: July 19 and Sept 12, 2013
The following measurements were performed by Kevin Guo.

The environmental tests conditions were: Temperature: 25.2 °C
Relative Humidity: 37.4 %

The BlackBerry® smartphone was standalone, horizontal with LCD facing down and bottom pointing to RX antenna when the turntable is at 0 degree position.
Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height.

PCS1900 Band in Call Mode

								Substitution Method					
EUT				Receive Antenna		Spectrum Analyzer		Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) dBuV	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator) (dBm)	(W)	Limit (dBm)	Diff to Limit (dB)
F0	512	1850.20	1900	Horn	V	82.31	90.95	V-V	-2.38	**32.77**	**1.89**	33	**0.23**
F0	512	1850.20	1900	Horn	H	90.95		H-H	-2.04				
F0	661	1880.00	1900	Horn	V	83.74	89.9	V-V	-3.50	32.02	1.59	33	0.98
F0	661	1880.00	1900	Horn	H	89.90		H-H	-2.88				
F0	810	1909.80	1900	Horn	V	83.15	90	V-V	-1.7	32.43	1.75	33	0.57
F0	810	1909.80	1900	Horn	H	90		H-H	-1.52				

PCS1900 Band in EDGE Mode

								Substitution Method					
EUT				Receive Antenna		Spectrum Analyzer		Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBuV)	Max (V,H) dBuV	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator) (dBm)	(W)	Limit (dBm)	Diff to Limit (dB)
F0	512	1850.20	1900	Horn	V	77.81	87.27	V-V	-5.73	29.15	0.82	33	3.85
F0	512	1850.20	1900	Horn	H	87.27		H-H	-5.66				
F0	661	1880.00	1900	Horn	V	76.45	86.82	V-V	-6.27	28.63	0.73	33	4.37
F0	661	1880.00	1900	Horn	H	86.82		H-H	-6.48				
F0	810	1909.80	1900	Horn	V	76.17	86.79	V-V	-4.59	**29.36**	**0.86**	33	**3.64**
F0	810	1909.80	1900	Horn	H	86.79		H-H	-4.83				

Radiated Emissions Test Data Results cont'd

GSM850 Call Mode

Date of Test: July 12, 2013

The following measurements were performed by Rex Zhang.
The environmental test conditions were: Temperature: 25.7 ºC
Relative Humidity: 17.5 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 30 MHz to 1000 MHz.

The BlackBerry® smartphone was standalone, with USB facing down and top pointing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in GSM850 Call Tx mode, channels 128, 190, 251.

All emissions were at least 25.0 dB below the limit.

Date of Test: July 15 - 17, 2013

The following measurements were performed by Mahmood Ahmed.
The environmental test conditions were: Temperature: 24.5 - 25.4 ºC
Relative Humidity: 23.6 - 41.7 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 1 GHz to 9 GHz.

The BlackBerry® smartphone was standalone, with USB port pointing up and the LCD facing to the RX antenna when the turntable is at 0 degree position.

The measurements were performed in GSM850 Call Tx mode, channels 128, 190, 251.

Frequency (MHz)	Channel Of Occurrence	Antenna Pol. (V/H)	Antenna Height (meters)	Test Angle (Deg.)	Detector (PK or QP)	Measured Level (dBµV)	Correction Factor for preamp/antenna/ cables/ filter (dB)	Field Strength Level (reading+corr) (dBm)	Limit @ 3.0 m (dBm)	Test Margin (dB)
2509.908	190	V	2.07	187	PK	48.32	-86.32	-30.413	-13.00	-17.4

All other emissions were at least 25.0 dB below the limit.

Radiated Emissions Test Data Results cont'd

GSM850 EDGE Mode

Date of Test: July 12, 2013

The environmental test conditions were: Temperature: 25.7 ºC
Relative Humidity: 17.5 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 30 MHz to 1000 MHz.

The BlackBerry® smartphone was standalone, with USB facing down and top pointing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in GSM850 EDGE Tx mode, channels 128, 190, 251.
All emissions were at least 25.0 dB below the limit.

Date of Test: July 15 - 17, 2013

The environmental test conditions were: Temperature: 24.5 - 25.4 ºC
Relative Humidity: 23.6 - 41.7 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 1 GHz to 9 GHz.

The BlackBerry® smartphone was standalone, with USB jack pointing up and the LCD facing to the RX antenna when the turntable is at 0 degree position.

The measurements were performed in GSM850 EDGE Tx mode, channels 128, 190, 251.

Frequency (MHz)	Channel Of Occurrence	Antenna		Test Angle (Deg.)	Detector (PK or QP)	Measured Level (dBµV)	Correction Factor for preamp/antenna/ cables/ filter (dB)	Field Strength Level (reading+corr) (dBm)	Limit @ 3.0 m (dBm)	Test Margin (dB)
		Pol. (V/H)	Height (meters)							
2466.800	190	V	3.16	255	PK	49.71	85.56	-35.842	-13.00	-22.8

All other emissions were at least 25.0 dB below the limit.

Radiated Emissions Test Data Results cont'd

PCS1900 CALL Mode

Date of Test: July 12, 2013

The following measurements were performed by Feras Obeid.
The environmental test conditions were: Temperature: 25.7 ºC
Relative Humidity: 17.5 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 30 MHz to 1000 MHz.

The BlackBerry® smartphone was standalone, with USB jack pointing down and the LCD facing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in PCS1900 Call Tx mode, channels 512, 661, 810.
All emissions were at least 25.0 dB below the limit.

Date of Test: July 16 - 21, 2013

The following measurements were performed by Mahmood Ahmed.
The environmental test conditions were: Temperature: 24.3 – 25.4 ºC
Relative Humidity: 23.6 – 42.5 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 1 GHz to 20 GHz.

The BlackBerry® smartphone was standalone, with USB jack pointing up and the LCD facing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in PCS1900 Call Tx mode, channels 512, 661, 810.

All emissions were at least 25.0 dB below the limit.

Radiated Emissions Test Data Results cont'd

PCS1900 EDGE Mode

Date of Test: July 12, 2013

The environmental test conditions were: Temperature: 25.7 ºC
Relative Humidity: 17.5 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 30 MHz to 1000 MHz.

The BlackBerry® smartphone was standalone, with USB jack pointing down and the LCD facing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in PCS1900 EDGE Tx mode, channels 512, 661, 810.
All emissions were at least 25.0 dB below the limit.

Date of Test: July 16 - 21, 2013

The environmental test conditions were: Temperature: 24.3 – 25.4 ºC
Relative Humidity: 23.6 – 42.5 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 1 GHz to 20 GHz.

The BlackBerry® smartphone was standalone, with USB jack pointing up and the LCD facing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in PCS1900 EDGE Tx mode, channels 512, 661, 810.

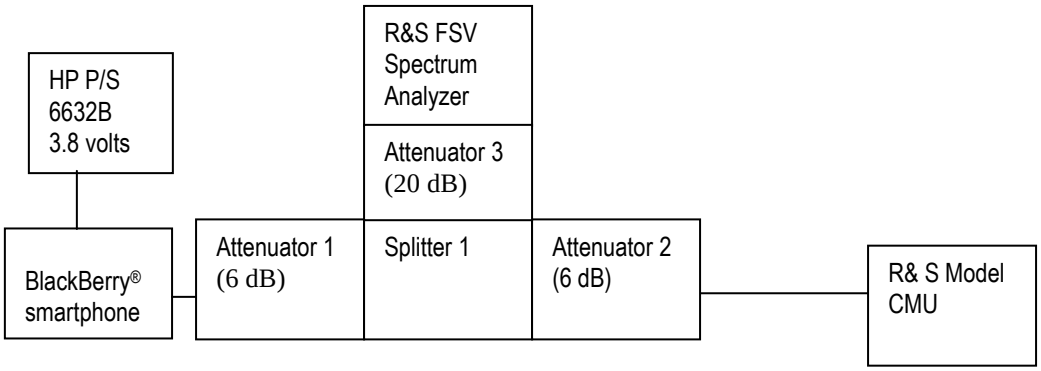
All emissions were at least 25.0 dB below the limit.

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: July 4, 2013

The environmental test conditions were: Temperature: 25.4ºC
Relative Humidity: 35.4%

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 22.917, CFR 24.238(a), 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 4.573 MHz, and for the WCDMA band 2 was measured to be 4.58 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 Voice mode

WCDMA Band 5 Frequency (MHz)	26dBc Occupied Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
826.400	4.573	**4.168**
836.400	4.566	4.161
846.600	4.573	4.161

WCDMA Band 2 Frequency (MHz)	26dBc Occupied Bandwidth (MHz	99% Occupied Bandwidth (MHz)
1852.400	4.580	4.153
1880.000	4.580	**4.161**
1907.600	4.559	**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 3.58 dB on the low channel.

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

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

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

WCDMA Band 5 Frequency (MHz)	99% Occupied Bandwidth (MHz)
826.400	**4.160**
836.400	4.155
846.600	4.150

WCDMA Band 2 Frequency (MHz)	99% Occupied Bandwidth (MHz)
1852.400	4.155
1880.000	**4.160**
1907.600	**4.160**

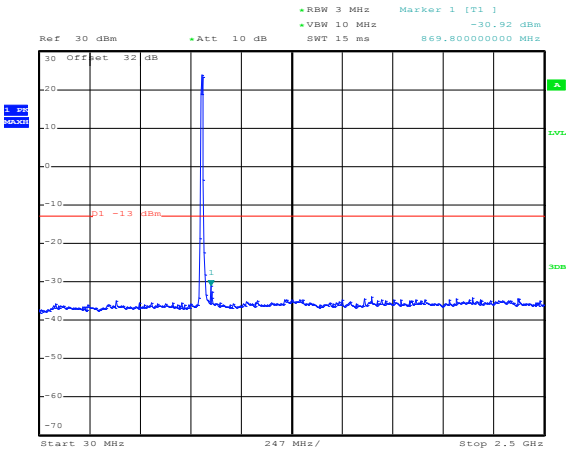
Measurement Plots for WCDMA Band 5 and WCDMA Band 2 in HSUPA mode

Refer to the following measurement plots for more detail:

See Figures 2-32a to 2-43a for the plots of the conducted spurious emissions.
See Figures 2-44a to 2-49a for the plots of 99% Occupied Bandwidth.
See Figures 2-50a to 2-53a for the plots of the Channel mask.

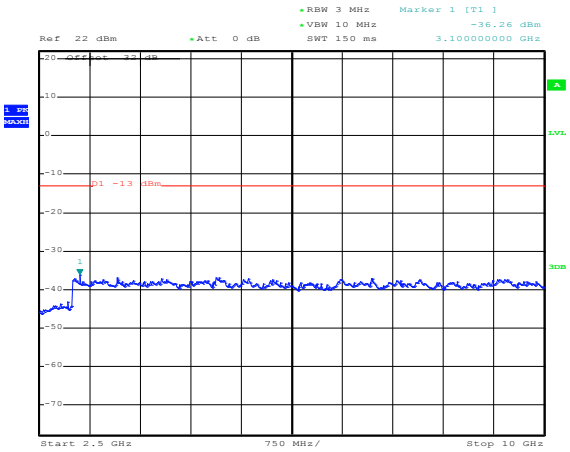
WCDMA Conducted RF Emission Test Data cont'd

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



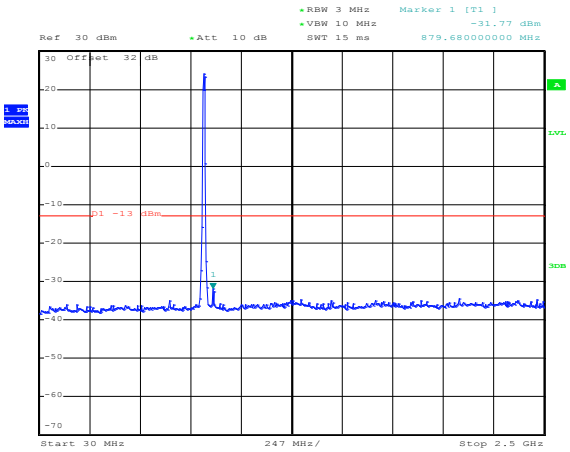
Date: 4.JUL.2013 11:24:10

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



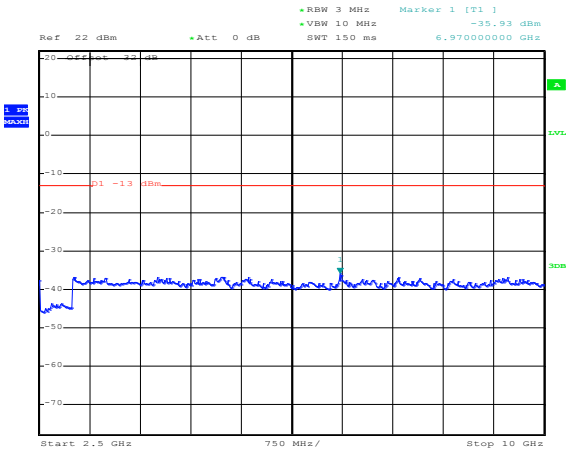
Date: 4.JUL.2013 11:28:05

Figure 2-3a: Band 5, Spurious Conducted Emissions, Middle channel



Date: 4.JUL.2013 11:24:50

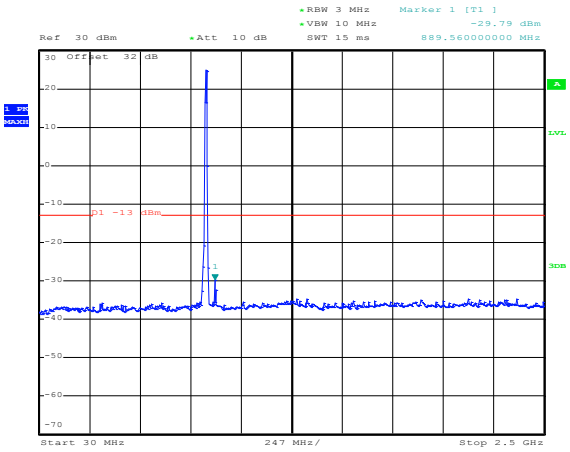
Figure 2-4a: Band 5, Spurious Conducted Emissions, Middle channel



Date: 4.JUL.2013 11:27:37

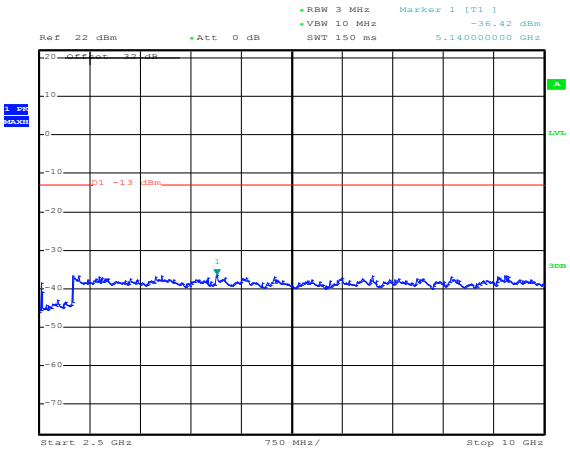
WCDMA Conducted RF Emission Test Data cont'd

Figure 2-5a: Band 5, Spurious Conducted Emissions, High Channel



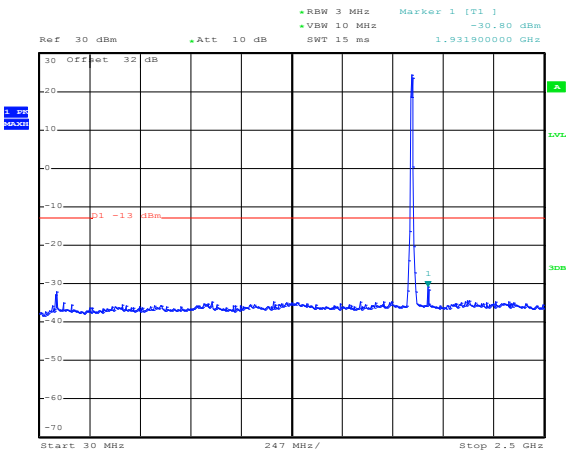
Date: 4.JUL.2013 11:25:20

Figure 2-6a: Band 5, Spurious Conducted Emissions, High Channel



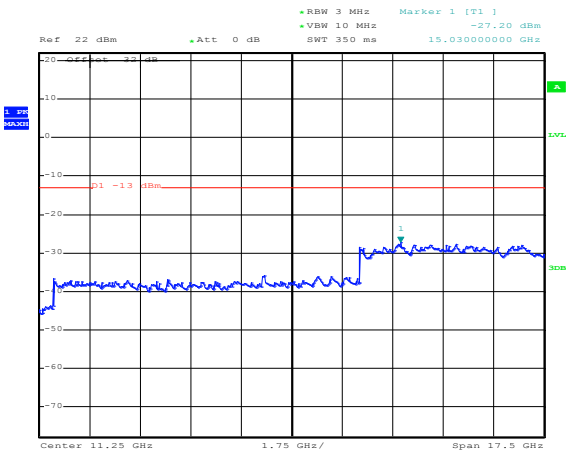
Date: 4.JUL.2013 11:26:56

Figure 2-2a:, BAND 2 Spurious Conducted Emissions, Low Channel



Date: 4.JUL.2013 11:31:31

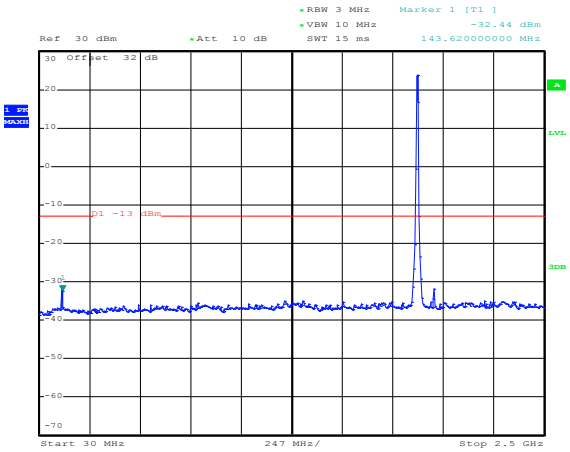
Figure 2-8a: BAND 2, Spurious Conducted Emissions, Low Channel



Date: 4.JUL.2013 11:38:56

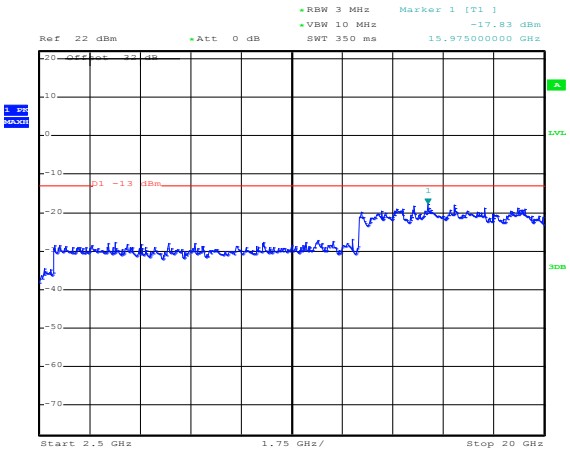
WCDMA Conducted RF Emission Test Data cont'd

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



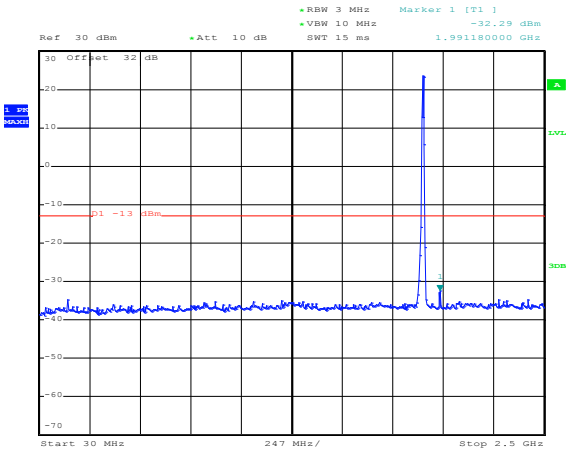
Date: 4.JUL.2013 11:32:04

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



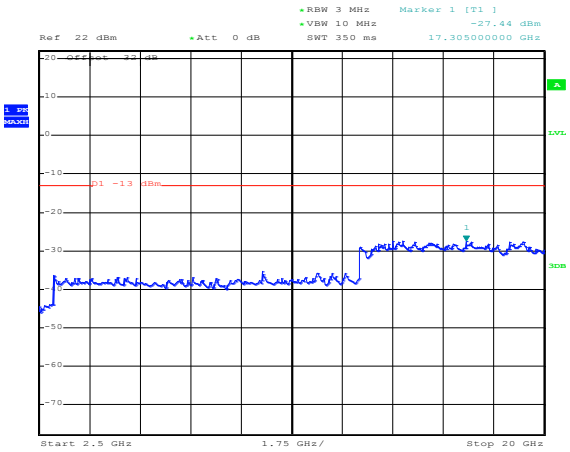
Date: 4.JUL.2013 11:38:15

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



Date: 4.JUL.2013 11:37:34

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



Date: 4.JUL.2013 11:36:58

WCDMA Conducted RF Emission Test Data cont'd

Figure 2-13a: Occupied Bandwidth, Band 5 Low Channel

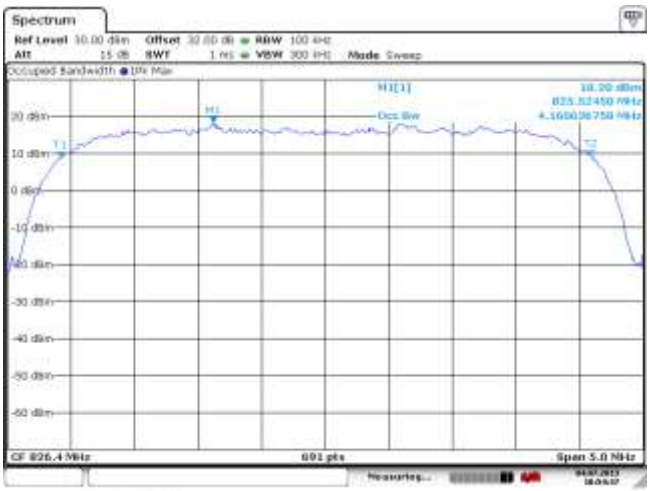


Figure 2-14a: Occupied Bandwidth, Band 5 Middle Channel

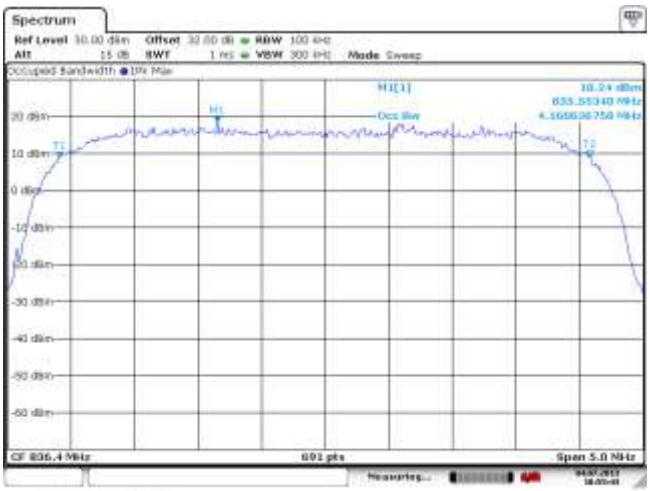


Figure 2-15a: Occupied Bandwidth, Band 5 High Channel

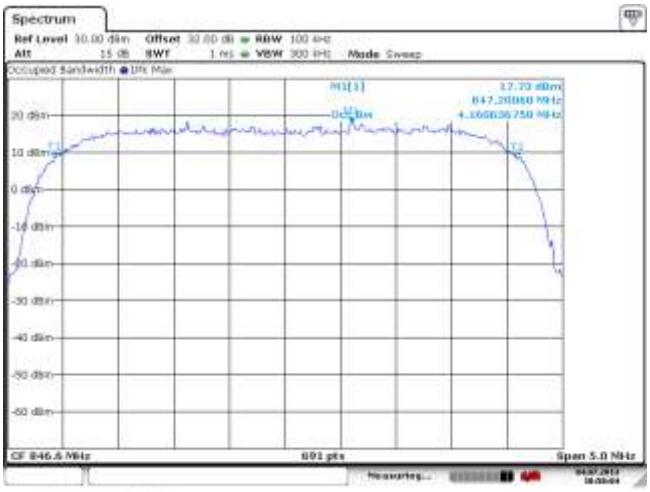
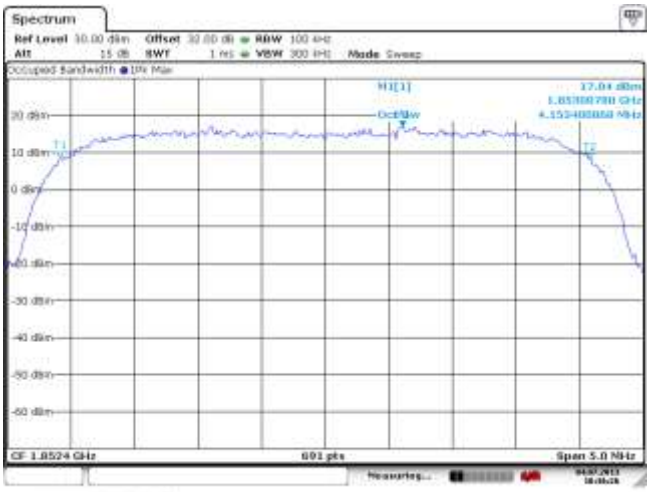


Figure 2-16a: Occupied Bandwidth, Band 2 Low Channel



WCDMA Conducted RF Emission Test Data cont'd

Figure 2-17a: Occupied Bandwidth, Band 2 Middle Channel

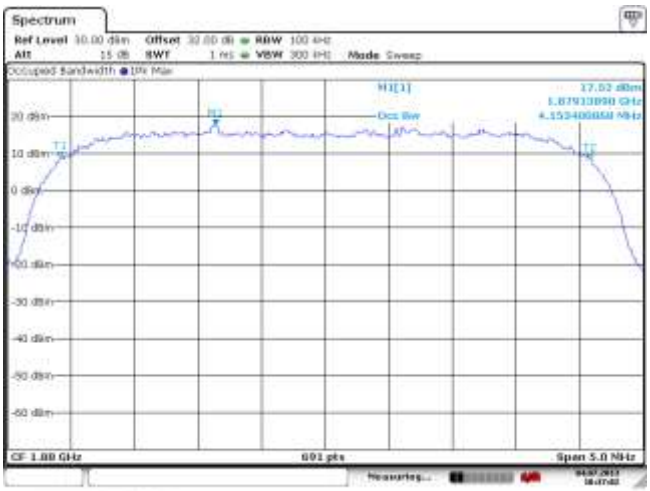


Figure 2-18a: Occupied Bandwidth, Band 2 High Channel

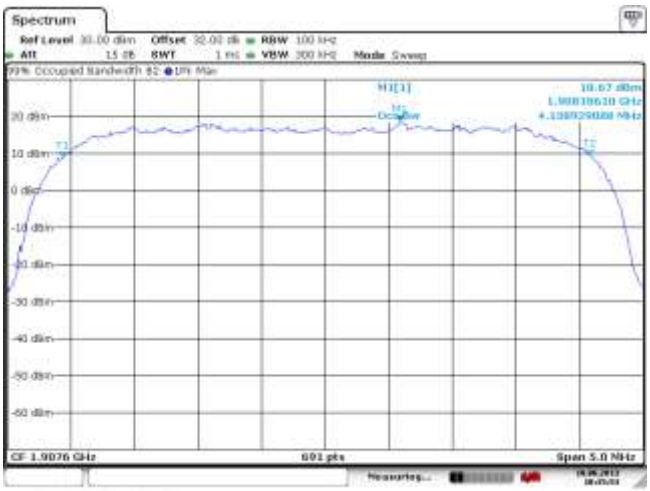


Figure 2-19a: -26 dBc Bandwidth, Band 5 Low Channel

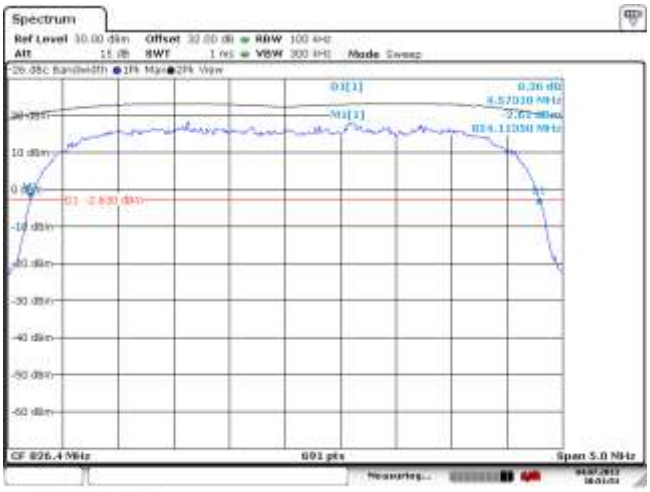
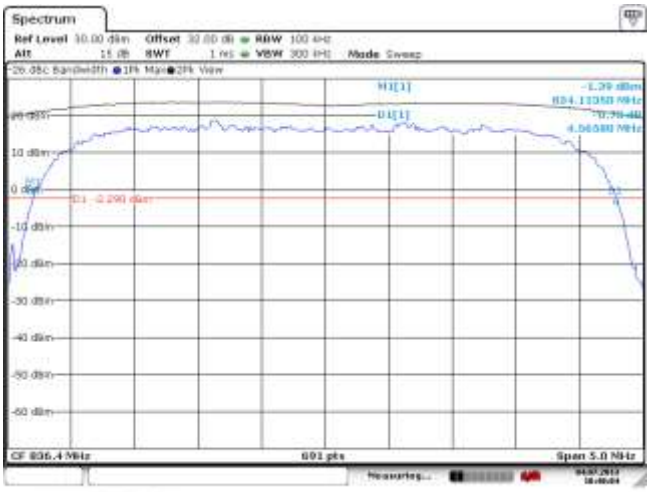


Figure 2-20a: -26 dBc Bandwidth, Band 5 Middle Channel



WCDMA Conducted RF Emission Test Data cont'd

Figure 2-21a: -26 dBc Bandwidth, Band 5 High Channel

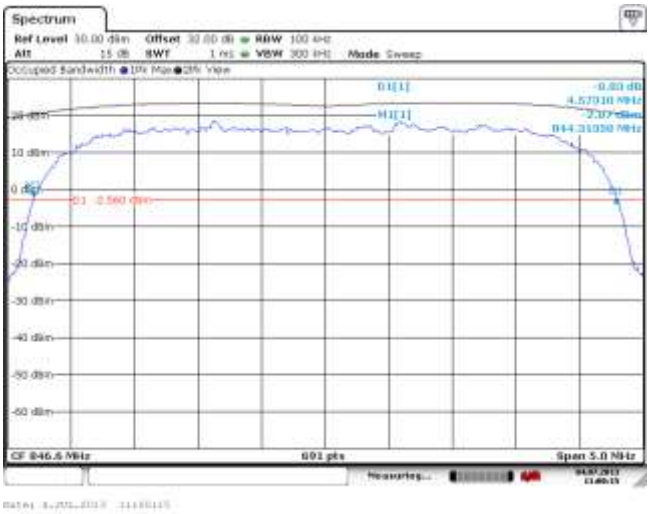


Figure 2-22a: -26 dBc Bandwidth, Band 2 Low Channel

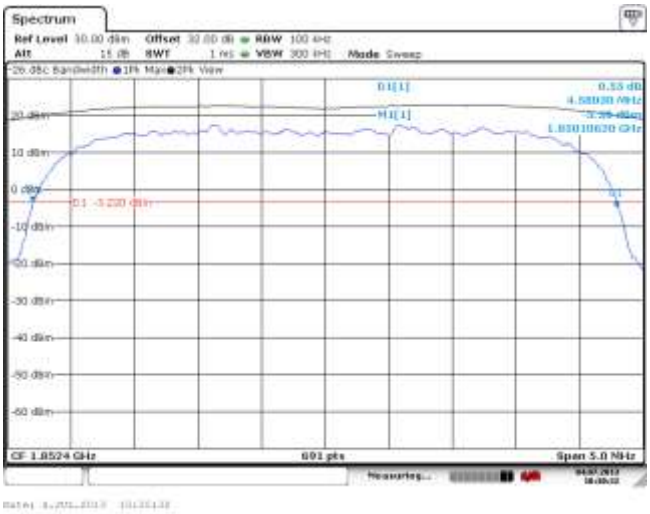


Figure 2-23a: -26 dBc Bandwidth, Band 2 Middle Channel

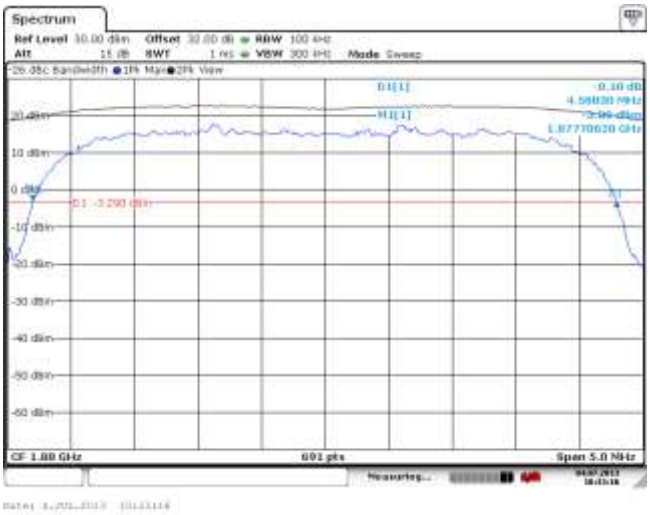
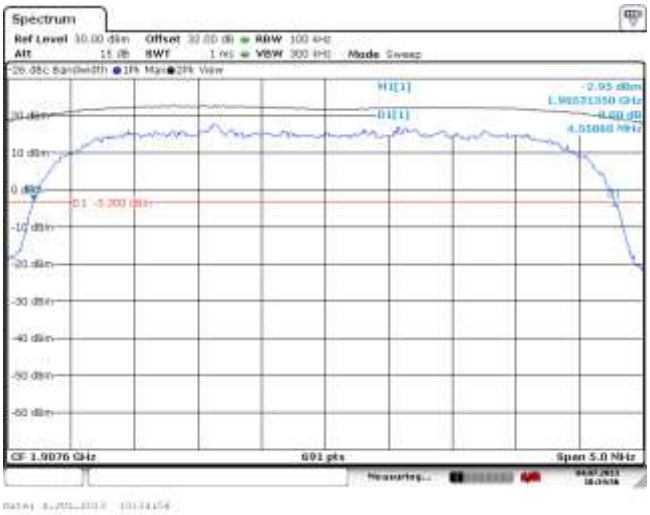


Figure 2-24a: -26 dBc Bandwidth, Band 2 High Channel



WCDMA Conducted RF Emission Test Data cont'd

Figure 2-25a: Band 5 Low Channel Mask

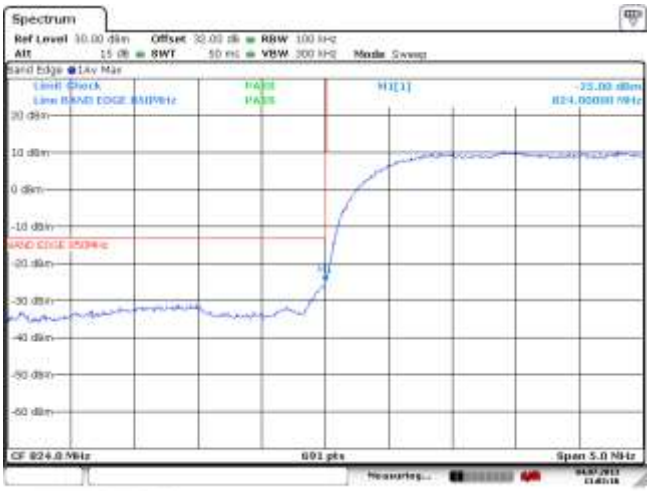


Figure 2-26a: Band 5 High Channel Mask

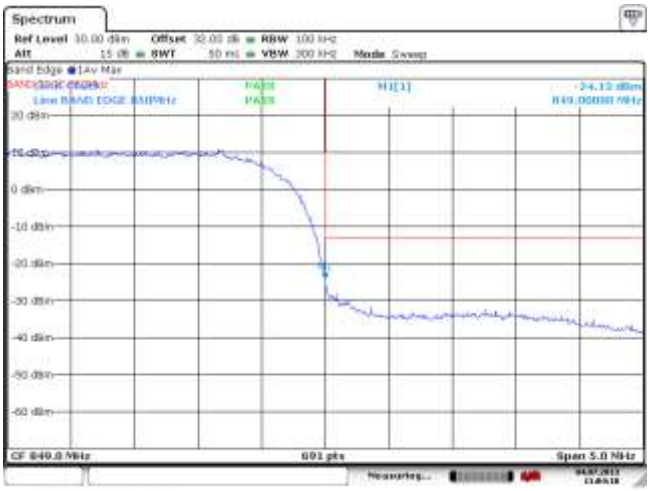


Figure 2-27a: Band 2 Low Channel Mask

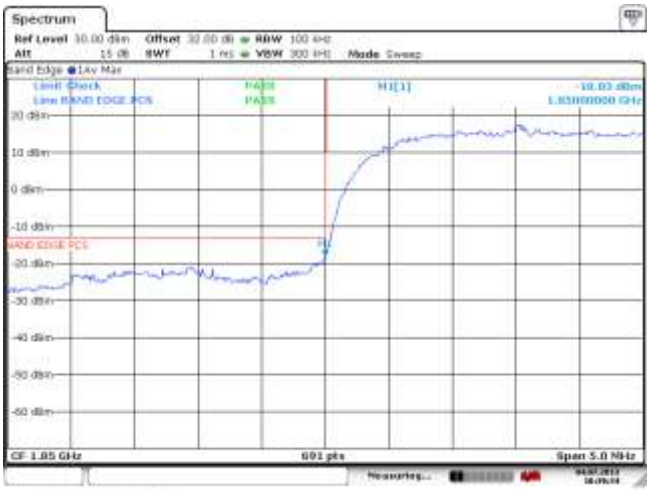
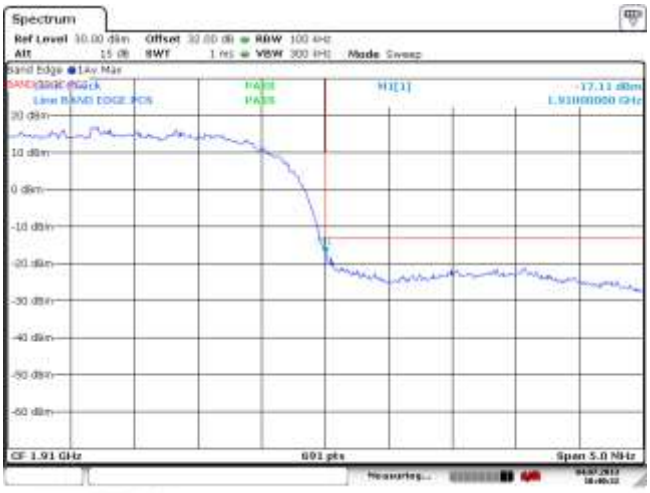


Figure 2-28a: Band 2 High Channel Mask

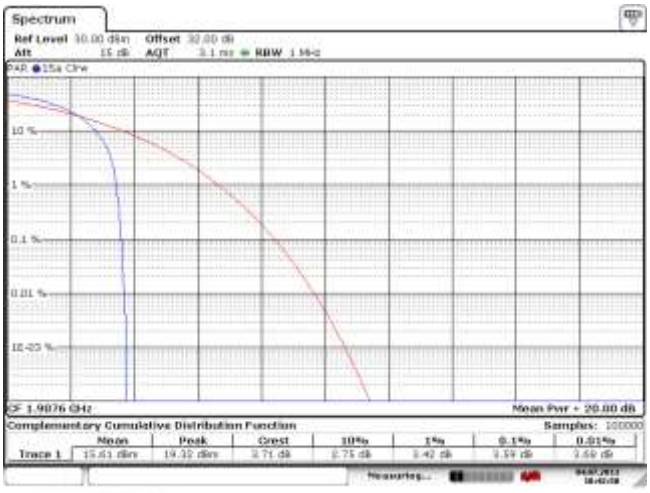


WCDMA Conducted RF Emission Test Data cont'd

Figure 2-29a: Band 2, PAR Low Channel

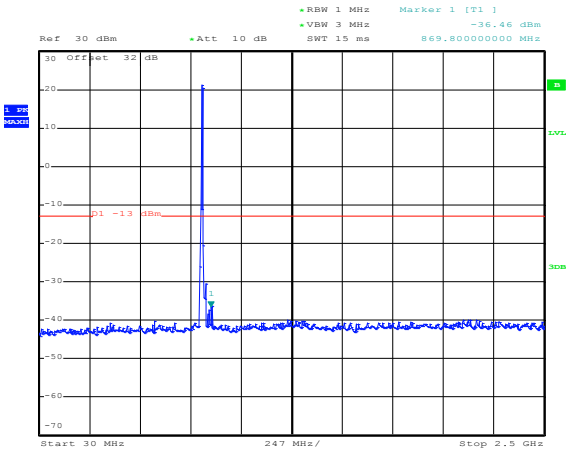
Figure 2-30a: Band 2, PAR Mid Channel

Figure 2-31a: Band 2, PAR High Channel



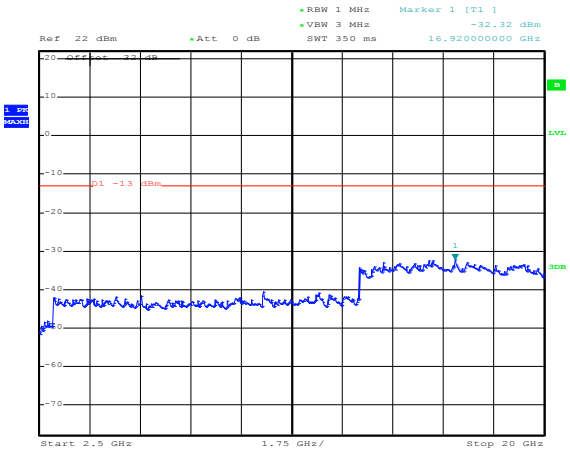
WCDMA Conducted RF Emission Test Data cont'd

Figure 2-32a: Band 5 HSUPA, Spurious Conducted Emissions, Low channel



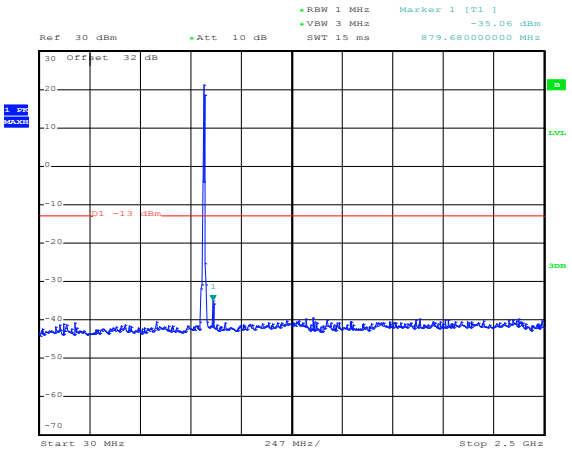
Date: 4.JUL.2013 12:36:30

Figure 2-33a: Band 5 HSUPA, Spurious Conducted Emissions, Low channel



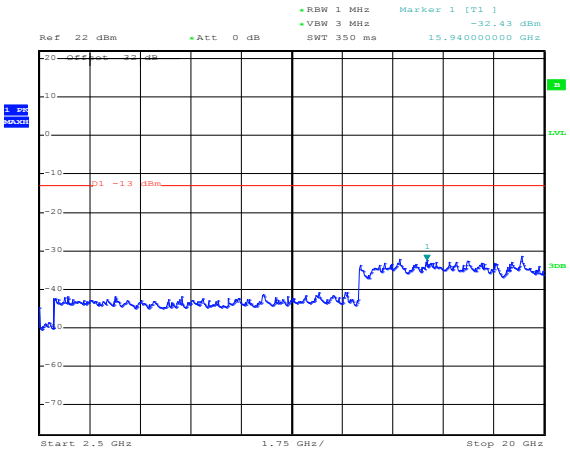
Date: 4.JUL.2013 12:37:15

Figure 2-34a: Band 5 HSUPA, Spurious Conducted Emissions, Middle channel



Date: 4.JUL.2013 12:35:50

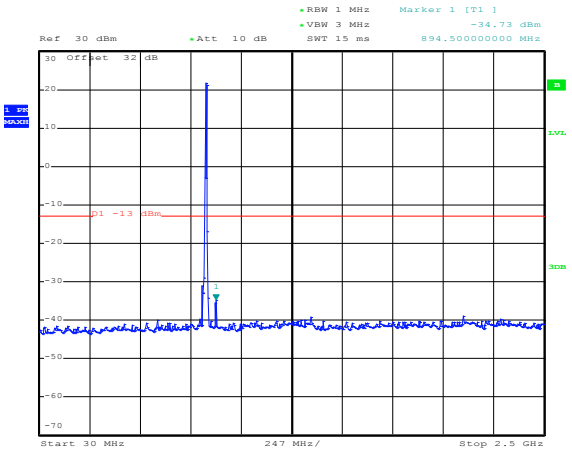
Figure 2-35a: Band 5 HSUPA, Spurious Conducted Emissions, Middle channel



Date: 4.JUL.2013 12:37:59

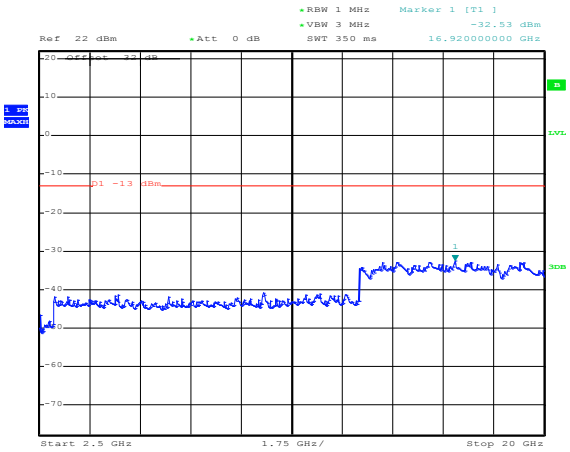
WCDMA Conducted RF Emission Test Data cont'd

Figure 2-36a: Band 5 HSUPA, Spurious Conducted Emissions, High Channel



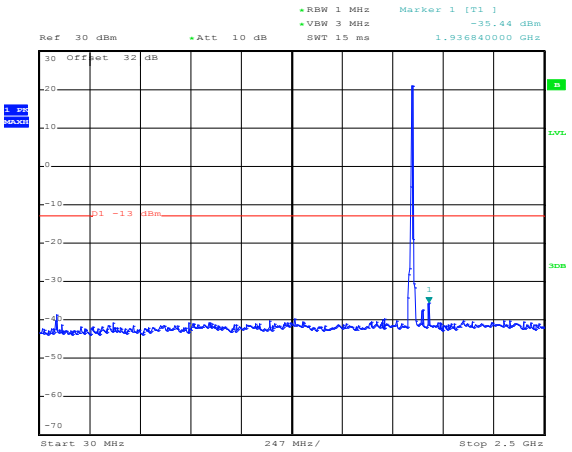
Date: 4.JUL.2013 12:34:06

Figure 2-37a: Band 5 HSUPA, Spurious Conducted Emissions, High Channel



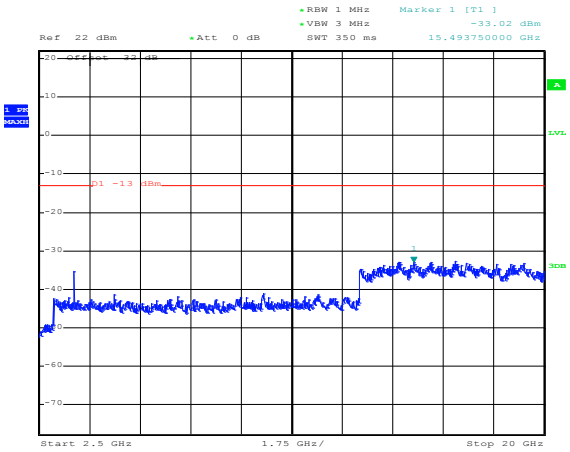
Date: 4.JUL.2013 12:38:28

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



Date: 4.JUL.2013 12:26:58

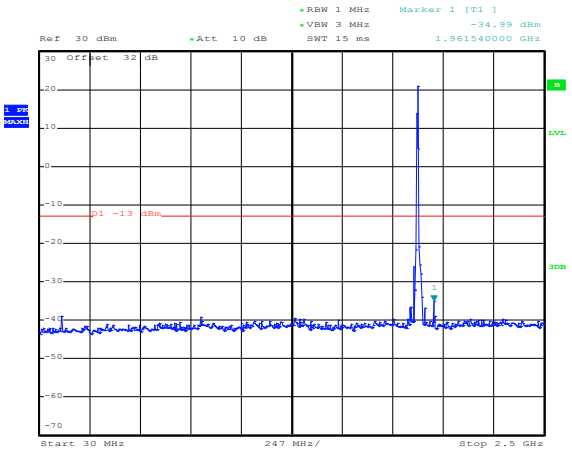
Figure 2-39a: Band 2 HSUPA, Spurious Conducted Emissions, Low Channel



Date: 18.JUN.2013 15:41:17

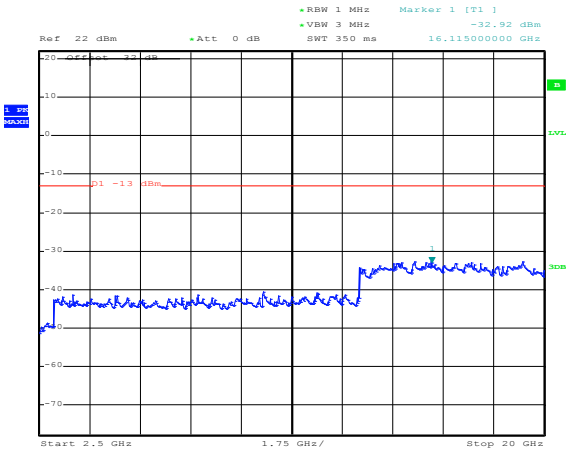
WCDMA Conducted RF Emission Test Data cont'd

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



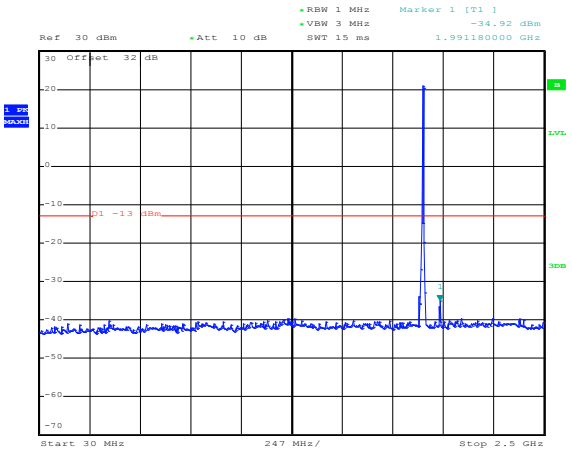
Date: 4.JUL.2013 12:27:29

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



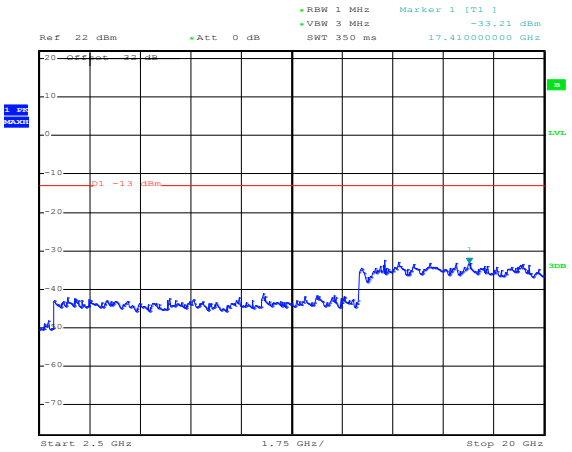
Date: 4.JUL.2013 12:28:59

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



Date: 4.JUL.2013 12:27:55

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



Date: 4.JUL.2013 12:28:31

WCDMA Conducted RF Emission Test Data cont'd

Figure 2-44a: Occupied Bandwidth, Band 5 HSUPA Low Channel

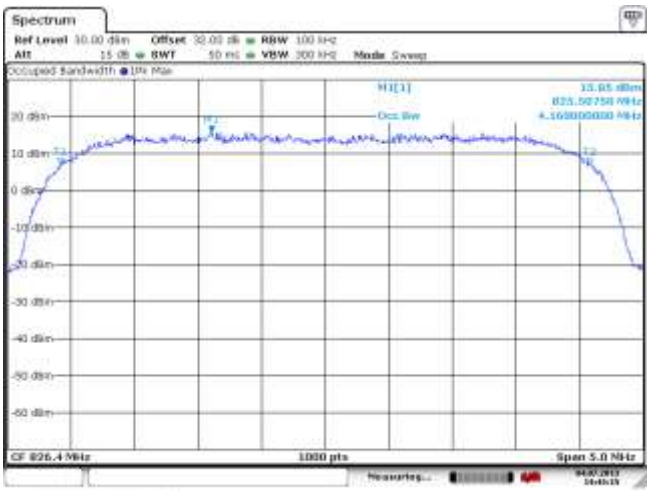


Figure 2-45a: Occupied Bandwidth, Band 5 HSUPA Middle Channel

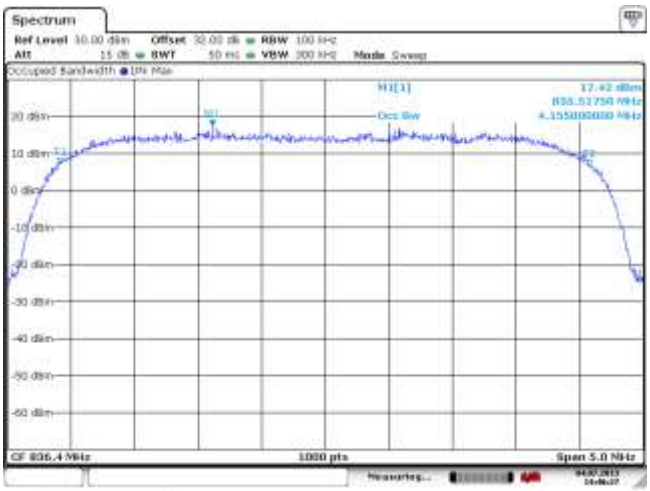


Figure 2-46a: Occupied Bandwidth, Band 5 HSUPA High Channel

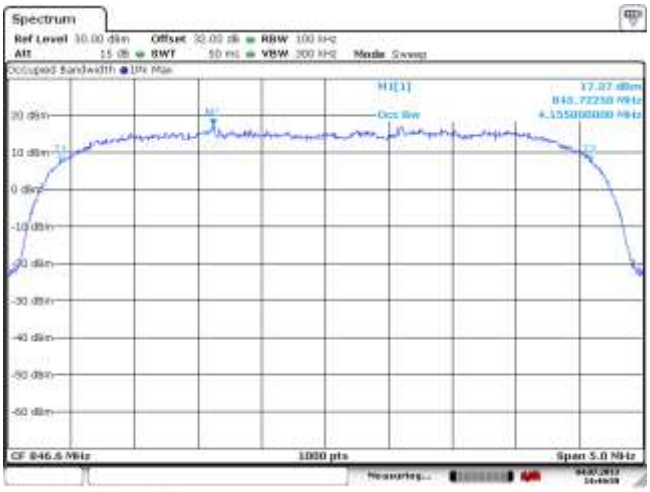
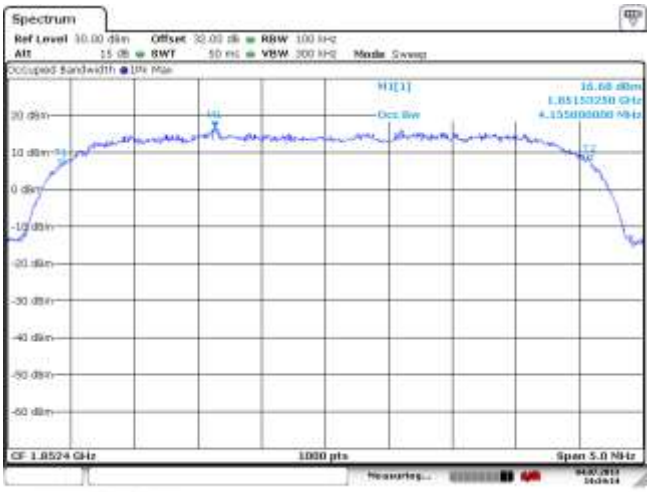


Figure 2-47a: Occupied Bandwidth, Band 2 HSUPA Low Channel



WCDMA Conducted RF Emission Test Data cont'd

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

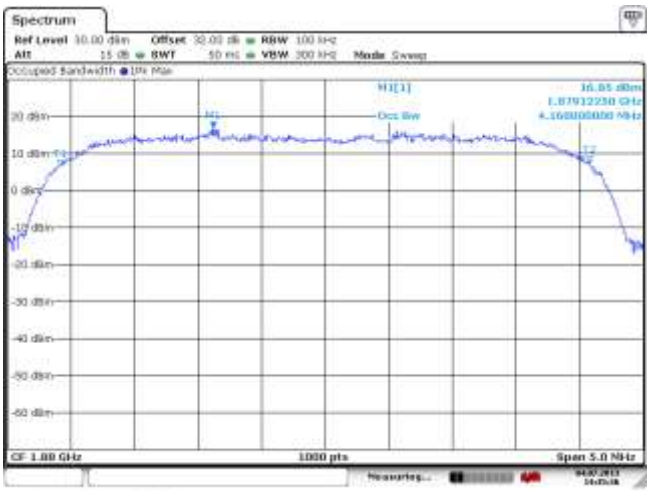


Figure 2-49a: Occupied Bandwidth, Band 2 HSUPA High Channel

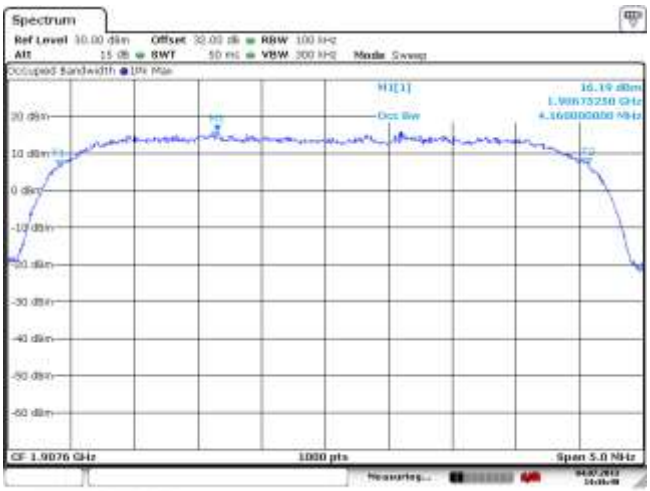


Figure 2-50a: Band 5 , HSUPA Low Channel Mask

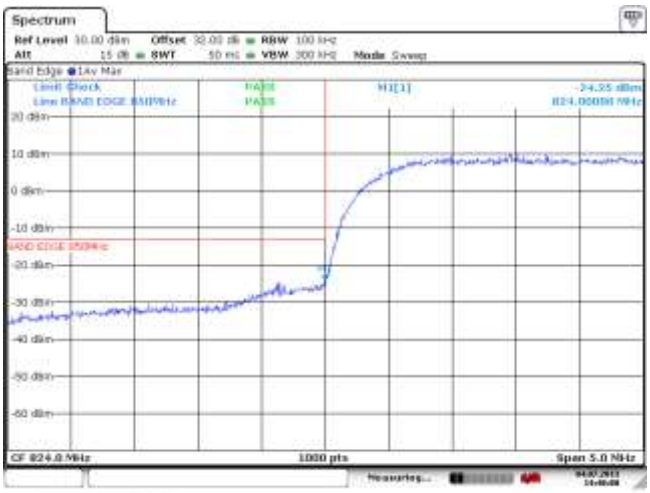
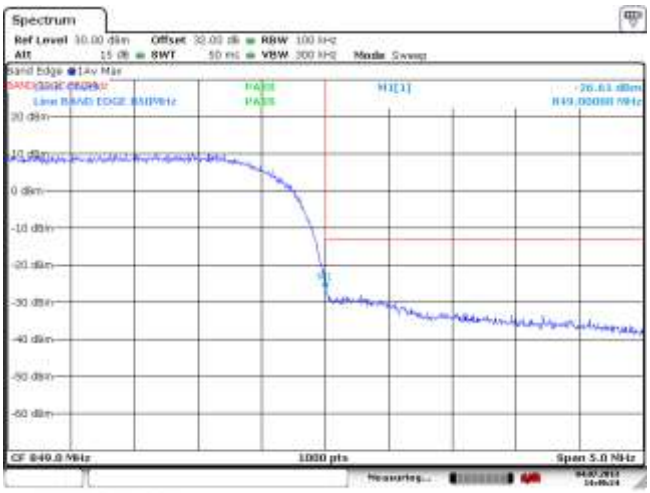


Figure 2-51a: Band 5 , HSUPA High Channel Mask



WCDMA Conducted RF Emission Test Data cont'd

Figure 2-52a: Band 2, HSUPA Low Channel Mask

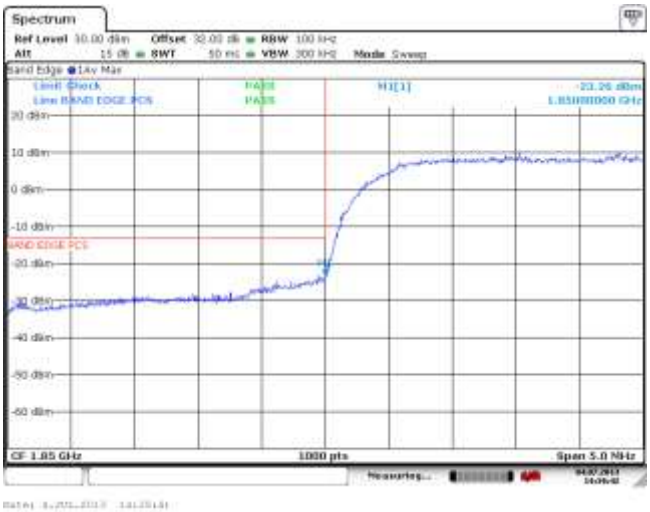
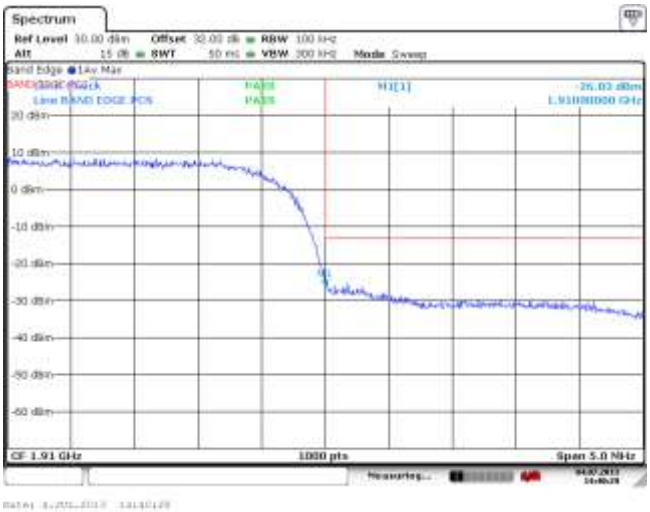
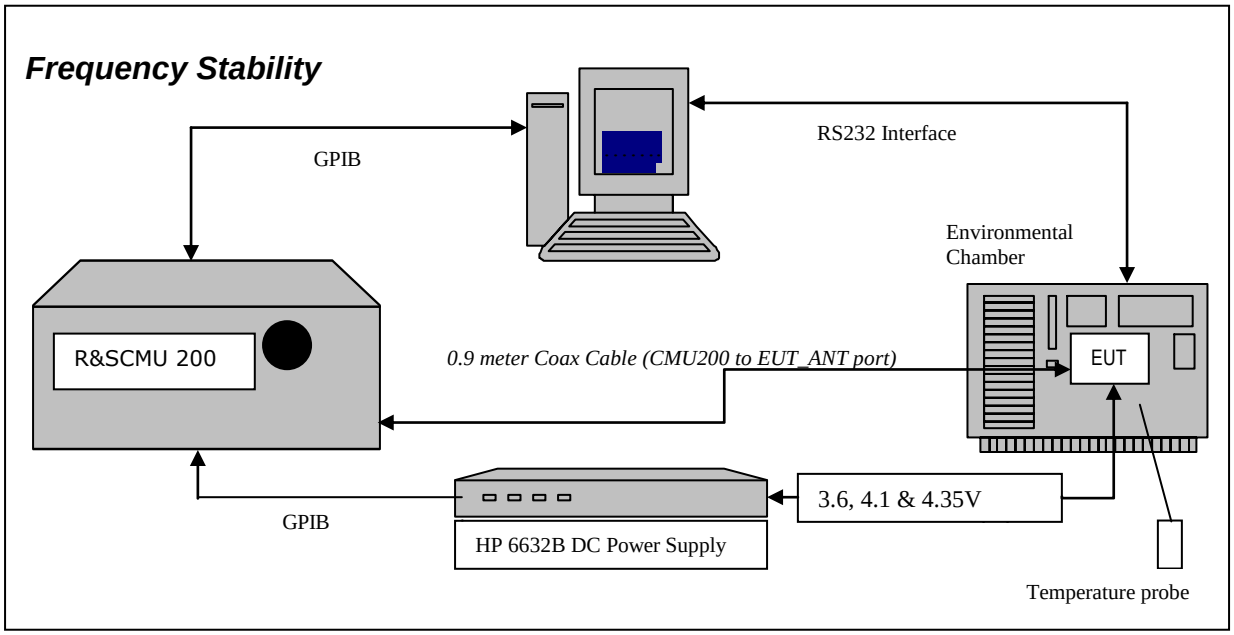


Figure 2-53a: Band 2, HSUPA High Channel Mask



APPENDIX 2B – 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 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, 4.1 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, 4.1 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 4.1 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, 4.1 and 4.35 volts

The maximum frequency error in the WCDMA band 5 measured was **0.0392 PPM**.
The maximum frequency error in the WCDMA band 2 measured was **0.0157 PPM.**

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	20.16	0.0244
4182	836.4	3.6	20	-5.65	-0.0068
4233	846.6	3.6	20	-6.47	-0.0076

Traffic Channel Number	WCDMA Band 5 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	4.1	20	-8.31	-0.0101
4182	836.4	4.1	20	21.81	0.0261
4233	846.6	4.1	20	-13.93	-0.0165

Traffic Channel Number	WCDMA Band 5 Frequency (MHz)	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
4132	826.4	4.35	20	-6.62	-0.0080
4182	836.4	4.35	20	-9.97	-0.0119
4233	846.6	4.35	20	-6.86	-0.0081

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	-10.75	-0.0130
4132	826.4	3.6	-20	-2.98	-0.0036
4132	826.4	3.6	-10	11.93	0.0144
4132	826.4	3.6	0	-4.84	-0.0059
4132	826.4	3.6	10	-6.11	-0.0074
4132	826.4	3.6	20	20.16	0.0244
4132	826.4	3.6	30	-13.84	-0.0167
4132	826.4	3.6	40	17.64	0.0213
4132	826.4	3.6	50	17.76	0.0215
4132	826.4	3.6	60	-3.36	-0.0041
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
4132	826.4	4.1	-30	18.24	0.0221
4132	826.4	4.1	-20	-4.79	-0.0058
4132	826.4	4.1	-10	-4.13	-0.0050
4132	826.4	4.1	0	-3.89	-0.0047
4132	826.4	4.1	10	18.06	0.0219
4132	826.4	4.1	20	-8.31	-0.0101
4132	826.4	4.1	30	-2.97	-0.0036
4132	826.4	4.1	40	-2.08	-0.0025
4132	826.4	4.1	50	-2.76	-0.0033
4132	826.4	4.1	60	26.45	0.0320
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
4132	826.4	4.35	-30	-14.51	-0.0176
4132	826.4	4.35	-20	-6.67	-0.0081
4132	826.4	4.35	-10	-3.95	-0.0048
4132	826.4	4.35	0	-6.23	-0.0075
4132	826.4	4.35	10	19.33	0.0234
4132	826.4	4.35	20	-6.62	-0.0080
4132	826.4	4.35	30	-2.25	-0.0027
4132	826.4	4.35	40	17.02	0.0206
4132	826.4	4.35	50	20.87	0.0253
4132	826.4	4.35	60	-5.63	-0.0068

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	13.43	0.0161
4182	836.4	3.6	-20	18.05	0.0216
4182	836.4	3.6	-10	-7.46	-0.0089
4182	836.4	3.6	0	21.37	0.0255
4182	836.4	3.6	10	14.62	0.0175
4182	836.4	3.6	20	-5.65	-0.0068
4182	836.4	3.6	30	19.95	0.0239
4182	836.4	3.6	40	1.38	0.0016
4182	836.4	3.6	50	0.44	0.0005
4182	836.4	3.6	60	**32.76**	**0.0392**
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
4182	836.4	4.1	-30	10.75	0.0129
4182	836.4	4.1	-20	-7.14	-0.0085
4182	836.4	4.1	-10	-7.29	-0.0087
4182	836.4	4.1	0	17.46	0.0209
4182	836.4	4.1	10	-6.96	-0.0083
4182	836.4	4.1	20	21.81	0.0261
4182	836.4	4.1	30	14.14	0.0169
4182	836.4	4.1	40	18.85	0.0225
4182	836.4	4.1	50	18.91	0.0226
4182	836.4	4.1	60	-8.62	-0.0103
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
4182	836.4	4.35	-30	11.41	0.0136
4182	836.4	4.35	-20	13.13	0.0157
4182	836.4	4.35	-10	13.17	0.0157
4182	836.4	4.35	0	15.86	0.0190
4182	836.4	4.35	10	-7.86	-0.0094
4182	836.4	4.35	20	-9.97	-0.0119
4182	836.4	4.35	30	19.98	0.0239
4182	836.4	4.35	40	-3.43	-0.0041
4182	836.4	4.35	50	-5.85	-0.0070
4182	836.4	4.35	60	31.91	0.0382

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	14.75	0.0174
4233	846.6	3.6	-20	-5.12	-0.0060
4233	846.6	3.6	-10	-13.52	-0.0160
4233	846.6	3.6	0	17.40	0.0206
4233	846.6	3.6	10	-6.75	-0.0080
4233	846.6	3.6	20	-6.47	-0.0076
4233	846.6	3.6	30	13.24	0.0156
4233	846.6	3.6	40	17.07	0.0202
4233	846.6	3.6	50	22.26	0.0263
4233	846.6	3.6	60	-7.01	-0.0083
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
4233	846.6	4.1	-30	16.03	0.0189
4233	846.6	4.1	-20	16.83	0.0199
4233	846.6	4.1	-10	19.66	0.0232
4233	846.6	4.1	0	20.64	0.0244
4233	846.6	4.1	10	16.41	0.0194
4233	846.6	4.1	20	-13.93	-0.0165
4233	846.6	4.1	30	-5.87	-0.0069
4233	846.6	4.1	40	-1.47	-0.0017
4233	846.6	4.1	50	-2.05	-0.0024
4233	846.6	4.1	60	-9.71	-0.0115
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
4233	846.6	4.35	-30	-6.56	-0.0077
4233	846.6	4.35	-20	-6.40	-0.0076
4233	846.6	4.35	-10	15.25	0.0180
4233	846.6	4.35	0	17.97	0.0212
4233	846.6	4.35	10	18.59	0.0220
4233	846.6	4.35	20	-6.86	-0.0081
4233	846.6	4.35	30	16.41	0.0194
4233	846.6	4.35	40	-6.82	-0.0081
4233	846.6	4.35	50	-4.70	-0.0056
4233	846.6	4.35	60	-2.81	-0.0033

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	16.46	0.0089
9400	1880.00	3.6	20	-8.89	-0.0047
9538	1907.60	3.6	20	-12.62	-0.0066

Traffic Channel Number	WCDMA1900 Frequency (MHz	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	4.1	20	-7.94	-0.0043
9400	1880.00	4.1	20	14.81	0.0079
9538	1907.60	4.1	20	-12.91	-0.0068

Traffic Channel Number	WCDMA1900 Frequency (MHz	Voltage (Volts)	Temperature (Celsius)	Frequency Error (Hz)	PPM
9262	1852.40	4.35	20	-8.78	-0.0047
9400	1880.00	4.35	20	-10.23	-0.0054
9538	1907.60	4.35	20	-13.90	-0.0073

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	-11.61	-0.0063
9262	1852.40	3.6	-20	-3.34	-0.0018
9262	1852.40	3.6	-10	14.80	0.0080
9262	1852.40	3.6	0	-8.29	-0.0045
9262	1852.40	3.6	10	-9.24	-0.0050
9262	1852.40	3.6	20	16.46	0.0089
9262	1852.40	3.6	30	-15.26	-0.0082
9262	1852.40	3.6	40	12.53	0.0068
9262	1852.40	3.6	50	11.40	0.0062
9262	1852.40	3.6	60	-7.67	-0.0041
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
9262	1852.40	4.1	-30	18.08	0.0098
9262	1852.40	4.1	-20	-7.56	-0.0041
9262	1852.40	4.1	-10	-10.99	-0.0059
9262	1852.40	4.1	0	-7.73	-0.0042
9262	1852.40	4.1	10	15.18	0.0082
9262	1852.40	4.1	20	-7.94	-0.0043
9262	1852.40	4.1	30	-4.47	-0.0024
9262	1852.40	4.1	40	-9.08	-0.0049
9262	1852.40	4.1	50	-10.63	-0.0057
9262	1852.40	4.1	60	27.75	0.0150
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
9262	1852.40	4.35	-30	-14.07	-0.0076
9262	1852.40	4.35	-20	-7.63	-0.0041
9262	1852.40	4.35	-10	-12.58	-0.0068
9262	1852.40	4.35	0	-8.63	-0.0047
9262	1852.40	4.35	10	18.53	0.0100
9262	1852.40	4.35	20	-8.78	-0.0047
9262	1852.40	4.35	30	-4.12	-0.0022
9262	1852.40	4.35	40	17.62	0.0095
9262	1852.40	4.35	50	18.07	0.0098
9262	1852.40	4.35	60	-10.68	-0.0058

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	13.02	0.0069
9400	1880.00	3.6	-20	14.69	0.0078
9400	1880.00	3.6	-10	-12.06	-0.0064
9400	1880.00	3.6	0	18.43	0.0098
9400	1880.00	3.6	10	12.57	0.0067
9400	1880.00	3.6	20	-8.89	-0.0047
9400	1880.00	3.6	30	15.07	0.0080
9400	1880.00	3.6	40	-6.11	-0.0033
9400	1880.00	3.6	50	-4.15	-0.0022
9400	1880.00	3.6	60	**29.44**	**0.0157**
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
9400	1880.00	4.1	-30	12.10	0.0064
9400	1880.00	4.1	-20	-7.51	-0.0040
9400	1880.00	4.1	-10	-7.99	-0.0043
9400	1880.00	4.1	0	13.73	0.0073
9400	1880.00	4.1	10	-8.67	-0.0046
9400	1880.00	4.1	20	14.81	0.0079
9400	1880.00	4.1	30	15.24	0.0081
9400	1880.00	4.1	40	17.29	0.0092
9400	1880.00	4.1	50	15.28	0.0081
9400	1880.00	4.1	60	-10.20	-0.0054
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
9400	1880.00	4.35	-30	9.46	0.0050
9400	1880.00	4.35	-20	11.29	0.0060
9400	1880.00	4.35	-10	10.03	0.0053
9400	1880.00	4.35	0	10.45	0.0056
9400	1880.00	4.35	10	-8.04	-0.0043
9400	1880.00	4.35	20	-10.23	-0.0054
9400	1880.00	4.35	30	12.56	0.0067
9400	1880.00	4.35	40	-5.93	-0.0032
9400	1880.00	4.35	50	-10.60	-0.0056
9400	1880.00	4.35	60	29.22	0.0155

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	15.69	0.0082
9538	1907.60	3.6	-20	-6.65	-0.0035
9538	1907.60	3.6	-10	-10.40	-0.0055
9538	1907.60	3.6	0	17.34	0.0091
9538	1907.60	3.6	10	-9.71	-0.0051
9538	1907.60	3.6	20	-12.62	-0.0066
9538	1907.60	3.6	30	15.67	0.0082
9538	1907.60	3.6	40	15.97	0.0084
9538	1907.60	3.6	50	15.26	0.0080
9538	1907.60	3.6	60	-9.04	-0.0047
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**PPM**
9538	1907.60	4.1	-30	11.48	0.0060
9538	1907.60	4.1	-20	12.50	0.0066
9538	1907.60	4.1	-10	14.05	0.0074
9538	1907.60	4.1	0	15.27	0.0080
9538	1907.60	4.1	10	14.17	0.0074
9538	1907.60	4.1	20	-12.91	-0.0068
9538	1907.60	4.1	30	-9.37	-0.0049
9538	1907.60	4.1	40	-3.40	-0.0018
9538	1907.60	4.1	50	-5.16	-0.0027
9538	1907.60	4.1	60	-13.74	-0.0072
Traffic Channel Number	**Frequency (MHz)**	**Voltage (Volts)**	**Temperature (Celsius)**	**Frequency Error (Hz)**	**21BPPM**
9538	1907.60	4.35	-30	-11.06	-0.0058
9538	1907.60	4.35	-20	-8.32	-0.0044
9538	1907.60	4.35	-10	11.93	0.0063
9538	1907.60	4.35	0	12.01	0.0063
9538	1907.60	4.35	10	17.92	0.0094
9538	1907.60	4.35	20	-13.90	-0.0073
9538	1907.60	4.35	30	12.21	0.0064
9538	1907.60	4.35	40	-8.28	-0.0043
9538	1907.60	4.35	50	-12.56	-0.0066
9538	1907.60	4.35	60	-9.16	-0.0048

APPENDIX 2C – WCDMA Band 2/5 RADIATED EMISSIONS TEST DATA

Radiated Power Test Data Results

Date of Test: July 23, 2013

The following measurements were performed by Feras Obeid.
The environmental tests conditions were: Temperature: 25.0 °C
Relative Humidity: 29.5 %

The BlackBerry® smartphone was standalone, horizontally with LCD facing up and top pointing to the RX antenna when the turntable is at 0 degree position.
Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height.

WCDMA Band 5 Call Service Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBm)	Max (V,H) (dBm)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole) (dBm)	Corrected Reading (relative to Dipole) (W)	Limit (dBm)	Diff. To Limit (dB)
F0	4132	826.40	5	Dipole	V	-43.72	-30.14	V-V	4.98	**22.09**	**0.16**	38.5	16.41
F0	4132	826.40	5	Dipole	H	-30.14		H-H	3.07				
F0	4182	836.40	5	Dipole	V	-44.09	-30.89	V-V	4.49	21.30	0.13	38.5	17.20
F0	4182	836.40	5	Dipole	H	-30.89		H-H	2.85				
F0	4233	846.60	5	Dipole	V	-41.10	-30.68	V-V	4.02	20.84	0.12	38.5	17.66
F0	4233	846.60	5	Dipole	H	-30.68		H-H	3.32				

WCDMA Band 5 HSUPA Mode

EUT				Rx Antenna		Spectrum Analyzer		Substitution Method Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBm)	Max (V,H) (dBm)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Dipole) (dBm)	Corrected Reading (relative to Dipole) (W)	Limit (dBm)	Diff. To Limit (dB)
F0	4132	826.40	5	Dipole	V	-40.99	-32.33	V-V	2.74	**19.85**	**0.10**	38.50	18.65
F0	4132	826.40	5	Dipole	H	-32.33		H-H	0.83				
F0	4182	836.40	5	Dipole	V	-43.13	-32.71	V-V	2.67	19.48	0.09	38.50	19.02
F0	4182	836.40	5	Dipole	H	-32.71		H-H	1.05				
F0	4233	846.60	5	Dipole	V	-42.73	-32.78	V-V	1.90	18.72	0.07	38.50	19.78
F0	4233	846.60	5	Dipole	H	-32.78		H-H	1.15				

Radiated Power Test Data Results cont'd

Date of Test: July 22, 2013

The following measurements were performed by Feras Obeid.
The environmental test conditions were: Temperature: 25.2 ºC
Relative Humidity: 36.8 %

The BlackBerry® smartphone was standalone, horizontally with LCD facing up and top pointing to the RX antenna when the turntable is at 0 degree position.
Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height.

WCDMA Band 2 Call Service Mode

								Substitution Method					
EUT				Rx Antenna		Spectrum Analyzer		Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBm)	Max (V,H) (dBm)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic radiator) (dBm)	(W)	Limit (dBm)	Diff to Limit (dB)
F0	9262	1852.40	2	Horn	V	-26.19	-26.19	V-V	-16.31	**24.01**	**0.25**	33.0	8.99
F0	9262	1852.40	2	Horn	H	-27.27		H-H	-15.33				
F0	9400	1880.00	2	Horn	V	-27.18	-27.18	V-V	-17.04	22.97	0.20	33.0	10.03
F0	9400	1880.00	2	Horn	H	-27.39		H-H	-16.02				
F0	9538	1907.60	2	Horn	V	-26.89	-26.89	V-V	-16.87	23.07	0.20	33.0	9.93
F0	9538	1907.60	2	Horn	H	-27.52		H-H	-15.81				

WCDMA Band 2 HSUPA Mode

								Substitution Method					
EUT				Rx Antenna		Spectrum Analyzer		Tracking Generator					
Type	Ch	Frequency (MHz)	Band	Type	Pol.	Reading (dBm)	Max (V,H) (dBm)	Pol. Tx-Rx	Reading (dBm)	Corrected Reading (relative to Isotropic Radiator) (dBm)	(W)	Limit (dBm)	Diff to Limit (dB)
F0	9262	1852.40	2	Horn	V	-27.79	-27.79	V-V	-17.93	**22.38**	**0.17**	33.0	10.62
F0	9262	1852.40	2	Horn	H	-28.96		H-H	-16.96				
F0	9400	1880.00	2	Horn	V	-28.31	-28.31	V-V	-18.23	21.82	0.15	33.0	11.18
F0	9400	1880.00	2	Horn	H	-29.01		H-H	-17.17				
F0	9538	1907.60	2	Horn	V	-28.30	-28.30	V-V	-18.32	21.62	0.15	33.0	11.38
F0	9538	1907.60	2	Horn	H	-29.09		H-H	-17.26				

Radiated Emissions Test Data Results cont'd

WCDMA Band 5 Call Service Mode

Date of Test: July 13, 2013

The following measurements were performed by Savtej Sandhu.

The environmental test conditions were: Temperature: 23.9 ºC
Relative Humidity: 36.9 %

The BlackBerry® smartphone was standalone, with USB facing up and top pointing to the RX antenna when the turntable is at 0 degree position.

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and the frequency range scanned was 30MHz – 1GHz.

Measurements were performed in WCDMA band 5 Call mode on channels 4132, 4182, and 4233.

All emissions were at least 25.0 dB below the limit.

Date of Test: July 16 - 18, 2013

The following measurements were performed by Mahmood Ahmed
The environmental test conditions were: Temperature: 23.2 - 25.6 ºC
Relative Humidity: 17.7 - 31.7 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 1 GHz to 9 GHz.

The BlackBerry® smartphone was standalone, horizontal with LCD facing down and top pointing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in WCDMA Band 5 Call mode on channels 4132, 4182, and 4233.

All emissions were at least 25.0 dB below the limit.

Radiated Emissions Test Data Results cont'd

WCDMA 5 HSUPA Mode

Date of Test: July 13, 2013

The following measurements were performed by Savtej Sandhu.

The environmental test conditions were: Temperature: 23.9 ºC
Relative Humidity: 36.9 %

The BlackBerry® smartphone was standalone, with USB facing up and top pointing to the RX antenna when the turntable is at 0 degree position.

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and the frequency range scanned was 30MHz – 1GHz.

Measurements were performed in WCDMA band 5 HSUPA mode on channels 4132, 4182, and 4233.

All emissions were at least 25.0 dB below the limit.

Date of Test: July 16 - 18, 2013

The following measurements were performed by Mahmood Ahmed
The environmental test conditions were: Temperature: 23.2 - 25.6 ºC
Relative Humidity: 17.7 - 31.7 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 1 GHz to 9 GHz.

The BlackBerry® smartphone was standalone, horizontal with LCD facing down and top pointing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in WCDMA Band 5 HSUPA mode on channels 4132, 4182, and 4233.

All emissions were at least 25.0 dB below the limit.

Radiated Emissions Test Data Results cont'd

WCDMA Band 2 Call Service mode

Date of Test: July 13, 2013

The following measurements were performed by Savtej Sandhu.

The environmental test conditions were: Temperature: 23.9 ºC
Relative Humidity: 36.9 %

The BlackBerry® smartphone was standalone, with USB facing down and top pointing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in WCDMA Band 2 Call mode on channels 9262, 9400 and 9538.

All emissions were at least 25.0 dB below the limit.

Date of Test: July 15 - 21, 2013

The following measurements were performed by Mahmood Ahmed
The environmental test conditions were: Temperature: 23.2 - 25.6 ºC
Relative Humidity: 17.7 - 31.7 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 1GHz to 20 GHz.

The BlackBerry® smartphone was standalone, horizontal with LCD facing up and top pointing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in WCDMA Band 2 Call mode on channels 9262, 9400, 9538.

All emissions were at least 25.0 dB below the limit.

Radiated Emissions Test Data Results cont'd

WCDMA Band 2 HSUPA Mode

Date of Test: July 13, 2013

The following measurements were performed by Savtej Sandhu.

The environmental test conditions were: Temperature: 23.9 ºC
Relative Humidity: 36.9 %

The BlackBerry® smartphone was standalone, with USB facing down and top pointing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in WCDMA Band 2 HSUPA mode on channels 9262, 9400, and 9538.

All emissions were at least 25.0 dB below the limit.

Date of Test: July 15 - 21, 2013

The following measurements were performed by Mahmood Ahmed

The environmental test conditions were: Temperature: 23.2 - 25.6 ºC
Relative Humidity: 17.7 - 31.7 %

Test Distance was 3.0 meters with the RX antenna height scans between 1-4 meters height, and a frequency range of 1GHz to 20 GHz.

The BlackBerry® smartphone was standalone, horizontal with LCD facing up and top pointing to the RX antenna when the turntable is at 0 degree position.

Measurements were performed in WCDMA Band 2 HSUPA mode on channels 9262, 9400, 9538.

All emissions were at least 25.0 dB below the limit.